City of Oregon City

625 Center Street
Oregon City, OR 97045
503-657-0891

Meeting Agenda

Planning Commission

Monday, February 26, 2018 | **7:00 PM** | **Commission Chambers**

1. Call To Order

2. Public Comments

3. Public Hearings

3a. L 17-03: Legislative Amendment to amend to Chapter 12.04.205 of the Oregon City Municipal Code for alternative mobility standards for the Highway 213 intersection at Beavercreek, and to amend the Transportation System Plan project list.

Sponsors: Public Works Director John Lewis

Attachments:
- Commission Report
- LE 17-03 Revised Staff Report
- Exhibit 1. Planning Commission Issues Matrix for 2.26.18
- Exhibit 1a. 1993-05-19 City Commission Minutes
- Exhibit 1b. HWY 213 improvements before and after images
- Exhibit 1c. Hwy 213 Corridor Study 2000
- Exhibit 1d. ODOT Stormwater improvements images
- Exhibit 1e. GOCWC Watershed Action Plan
- Exhibit 2. Alternative Mobility Targets Final Report
- Exhibit 2. Final Report Appendices
- Exhibit 3.12.04.205 Proposed Changes
- Exhibit 4. TSP Amendments revised
- Exhibit 5. TSP Projects Map
- Exhibit 6. Map of Newell Creek Holly Lane Shared Use Path
- Public Comments as of 2.15.18
- Land Use Application Form
- Applicant's Narrative and Code Responses
- Combined Neighborhood Meeting Materials

3b. Site Plan and Design Review and Variance for a 24 Unit Multi-Family Development at 314 Pleasant Avenue (Planning files SP 17-0119 and VR 17-0011)

Sponsors: Community Development Director Laura Terway

Attachments: Commission Report

SP 17-119 and VR 17-0011 Staff Report

Exhibit 1: Vicinity Map

Exhibit 2: Application

Exhibit 2: Plans

Exhibit 2: Stormwater Memo

Exhibit 2: Traffic Analysis Letter

Exhibit 2: Geotechnical Investigation

Exhibit 2: Origional Materials Which Have Been Revised

Exhibit 3: Public Comments

Exhibit 4: Comments from John Replinger of Replinger and Associates

Exhibit 5: Heritage Tree Nomination

3c. L 17-04: Proposed Amendments to the Development Sections of the Oregon City Municipal Code (Including Lot Averaging)

Sponsors: Community Development Director Laura Terway

Attachments: Commission Report

L 17-04 Staff report

Exhibit 1: Narrative and Code Responses

Exhibit 2: Presentation from February 12, 2018

Exhibit 3. February 26 2018 Proposed Draft Code Changes

Exhibit 4: Public Comments

4. Communications

5. Adjournment

Public Comments: The following guidelines are given for citizens presenting information or raising issues relevant to the City but not listed on the agenda.

- *Complete a Comment Card prior to the meeting and submit it to the staff member.*
- *When the Chair calls your name, proceed to the speaker table and state your name and city of residence into the microphone.*
- *Each speaker is given 3 minutes to speak. To assist in tracking your speaking time, refer to the timer at the dais.*
- *As a general practice, Oregon City Officers do not engage in discussion with those making comments.*

Agenda Posted at City Hall, Pioneer Community Center, Library, and City Web site(oregon-city.legistar.com).
Video Streaming & Broadcasts: The meeting is streamed live on Oregon City's Web site at www.orcity.org and is available on demand following the meeting.
ADA: City Hall is wheelchair accessible with entry ramps and handicapped parking located on the east side of the building. Hearing devices may be requested from the City staff member prior to the meeting. Disabled individuals requiring other assistance must make their request known 48 hours preceding the meeting by contacting the City Recorder's Office at 503-657-0891.

City of Oregon City

625 Center Street
Oregon City, OR 97045
503-657-0891

Staff Report

File Number: PC 18-023

Agenda Date: 2/26/2018

Status: Draft

To: Planning Commission

Agenda #: 3a.

From: Public Works Director John Lewis

File Type: Land Use Item

SUBJECT:
L 17-03: Legislative Amendment to amend to Chapter 12.04.205 of the Oregon City Municipal Code for alternative mobility standards for the Highway 213 intersection at Beavercreek, and to amend the Transportation System Plan project list.

RECOMMENDED ACTION (Motion):
Staff recommends the Planning Commission recommend approval of L 17-03 and forward to the City Commission.

BACKGROUND:
Oregon City's 2013 Transportation System Plan (TSP) determined that the Highway 213 (OR213) corridor from Redland Road to Molalla Avenue (including the intersection of Beavercreek Road) will exceed the current mobility target in 2035, resulting in more congestion than is allowed.

Lacking the financial capability of implementing major capacity-increasing projects at these locations, alternative mobility targets are necessary at this intersection; however, some improvements are feasible in the cost-constrained TSP to improve safety and minimize future congestion.

The amendments to Chapter 12.04.205 of the municipal code reflect the recommendations of a Community Advisory Group and Technical Advisory Group on the appropriate mobility targets for Highway 213 at Beavercreek Road. The targets are based on volume to capacity ratio (v/c), which is a common and accepted measure of congestion in Oregon.

For the intersection of OR213 and Beavercreek Road, the following mobility standards are proposed:

- During the first, second and third hours, a maximum v/c ratio of 1.00 shall be maintained.

Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

The following improvements are recommended for the intersection of OR213 and Beavercreek Road and are proposed as new TSP Projects:

- Construct a westbound right-turn merge lane. High visibility pavement markings and signage are recommended for pedestrians and bicycles to cross the channelized lane safely, and consideration should be given to installing a rectangular rapid flash beacon (RRFB) for increased visibility.

- Infill sidewalk on Beavercreek Road from south of the Coltrane Path to north of Marjorie Lane.
- Install various safety improvements in the area.

BUDGET IMPACT:
Amount:
FY(s):
Funding Source:

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

STAFF REPORT AND RECOMMENDATION
REVISED February 16, 2018

FILE NO.:	LE 17-03: Alternate Mobility Standards Code Amendments
APPLICANT:	City of Oregon City 625 Center Street, Oregon City, Oregon 97045
REQUEST:	Amendments to Chapter 12 of the Oregon City Municipal Code, and to the Oregon City Transportation System Plan (TSP), to adopt mobility standards for the Highway 213 and Beavercreek Road intersection. The amendment also includes changes to the TSP project list.
LOCATION:	Highway 213 Corridor including Redland Rd. and Beavercreek Rd. intersections
RECOMMENDATION:	Approval
REVIEWER:	Kelly Reid, AICP, Planner

17.50.170 - Legislative hearing process.
A. Purpose. Legislative actions involve the adoption or amendment of the city's land use regulations, comprehensive plan, maps, inventories and other policy documents that affect the entire city or large portions of it. Legislative actions which affect land use must begin with a public hearing before the planning commission.
B. Planning Commission Review.
1. Hearing Required. The planning commission shall hold at least one public hearing before recommending action on a legislative proposal. Any interested person may appear and provide written or oral testimony on the proposal at or prior to the hearing. The community development director shall notify the Oregon Department of Land Conservation and Development (DLCD) as required by the post-acknowledgment procedures of ORS 197.610 to 197.625, as applicable.
2. The community development director's Report. Once the planning commission hearing has been scheduled and noticed in accordance with Section 17.50.090(C) and any other applicable laws, the community development director shall prepare and make available a report on the legislative proposal at least seven days prior to the hearing.
3. Planning Commission Recommendation. At the conclusion of the hearing, the planning commission shall adopt a recommendation on the proposal to the city commission. The planning commission shall make a report and recommendation to the city commission on all legislative proposals. If the planning commission recommends adoption of some form of the proposal, the planning commission shall prepare and forward to the city commission a report and recommendation to that effect.
C. City Commission Review.
1. City Commission Action. Upon a recommendation from the planning commission on a legislative action, the city commission shall hold at least one public hearing on the proposal. Any interested person may provide written or oral testimony on the proposal at or prior to the hearing. At the conclusion of the hearing, the city commission may adopt, modify or reject the legislative proposal, or it may remand the matter to the planning commission for further consideration. If the decision is to adopt at least some form of the proposal, and thereby amend the city's land use regulations, comprehensive plan, official zoning maps or some component of any of these documents, the city commission decision shall be enacted as an ordinance.

2. Notice of Final Decision. Not later than five days following the city commission final decision, the community development director shall mail notice of the decision to DLCD in accordance with ORS 197.615(2).

I. Proposal

This application is being submitted as a legislative amendment to amend the municipal code and the Transportation System Plan project list. The Transportation System Plan is an ancillary document to the Comprehensive Plan.

The applicant provided the following background information:

Oregon City's 2013 Transportation System Plan (TSP) determined that the Highway 213 (OR213) corridor from Redland Road to Molalla Avenue (including the intersection of Beavercreek Road) will exceed the current mobility target in 2035, resulting in more congestion than is allowed. The OR213 intersections with Molalla Avenue and Redland Road are anticipated to meet the target; however, Beavercreek Road is not anticipated to meet the target.

Highway 213/Beavercreek Road

Figure 1. Highway 213 and Beavercreek Road intersection

The existing mobility target at the OR213/Beavercreek Road intersection is a volume-to-capacity (v/c) ratio at or below 0.99 during the peak first and second hours. The previously identified intersection improvement projects and newly identified alternatives that would meet the existing mobility targets at the OR213/Beavercreek Road intersection are not cost feasible (≥$50 million), given the financial

constraints of the City and other agency partners such as Clackamas County and ODOT. However, adoption of the alternate mobility targets does not preclude further consideration of the financially infeasible improvements in the future if additional funding becomes available.

Lacking the financial capability of implementing major capacity-increasing projects at this location, the existing Transportation System Plan employs a variety of tools to alleviate congestion at the intersection of Highway 213 and Beavercreek. The adopted plan included identification of vehicular, pedestrian and bicycle accessways around the intersection including a wide variety of parallel and alternate routes to provide choices for the public. In addition, this study was identified to work with the community to identify investments in improvements to increase the capacity and safety for all modes at the intersection and adopt alternative mobility targets are necessary.

Adoption of the alternative mobility targets results in the identification of the following improvements at the intersection of OR213 and Beavercreek Road to increase the overall capacity and safety for all modes of transportation:

- Construct a westbound right-turn merge lane. High visibility pavement markings and signage are recommended for pedestrians and bicycles to cross the channelized lane safely, and consideration should be given to installing a rectangular rapid flash beacon (RRFB) for increased visibility.
- Infill sidewalk on Beavercreek Road from south of the Coltrane Path to north of Marjorie Lane.
- Install various safety improvements outlined on pages 33 and 35 of the final report.

After adoption of the plan, the City may begin to collect funding and a proportionate share of the cost of improvements from developments which impact the intersection.

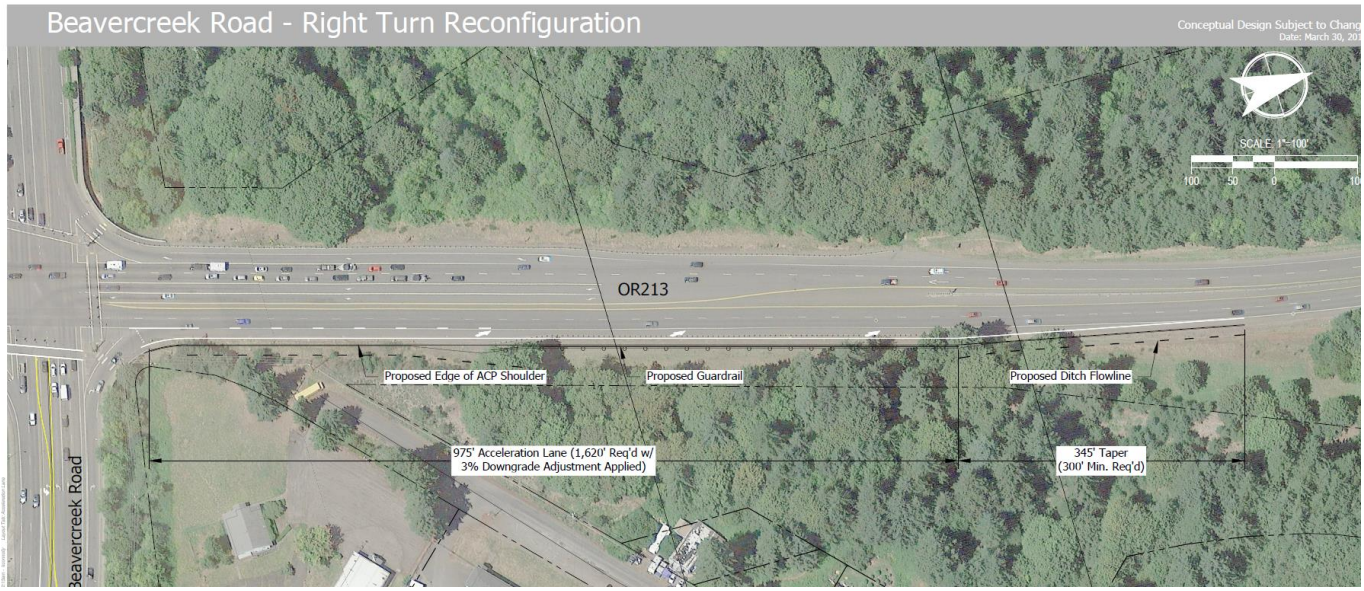


Figure 3. Depiction of right turn lane project at Beavercreek and Highway 213

For the intersection of OR213 and Beavercreek Road, the following mobility standards are proposed:

- Rather than a maximum v/c of 0.99 for the first and second hours, a maximum v/c ratio of 1.00 shall be maintained for the first, second and third hours (generally 3-6pm).
- Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

Changes to the TSP to incorporate these improvements and the alternative mobility targets are part of this Legislative application to City's Planning Commission and City Commission. The alternative mobility

target and financially feasible improvements that are needed will need to be agreed upon by ODOT and approved by the Oregon Transportation Commission.

Highway 213/Redland Road

Improvements to the intersection of Highway 213 and Redland Road were identified as part of the TSP and are not proposed to change. The improvements identified in the TSP are part of Phase 2 of the "Jughandle" project, a project that focused on the intersection of OR213 and Washington Street that was implemented in 2013. The Phase 2 improvements, including improvements at OR213/Redland Road are already 90% designed. The improvements identified in Phase 2 future construction include an additional northbound and southbound through lane resulting in three northbound and three southbound lanes through the intersection, as showin in Figure 4 below.

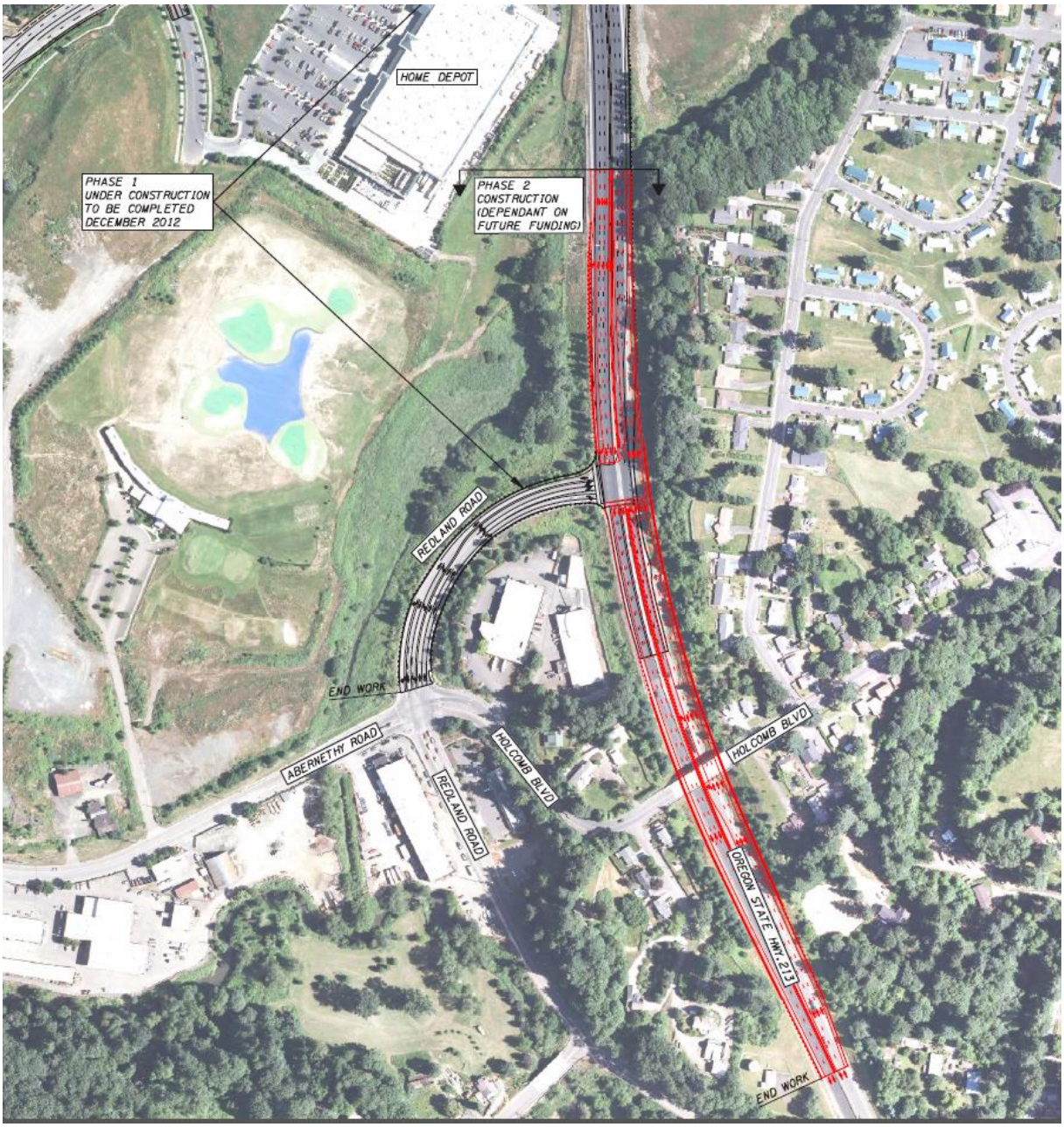


Figure 4. Depiction of Highway 213 at Redland Road planned improvements

The project at Highway 213 and Redland Road was anticipated for alternative mobility targets because it was not identified as likely to be funded in the Oregon City Transportation System Plan, however because it is identified in the Regional transportation System (RTP) it is feasible and thus no alternative mobility targets is not needed.

The attached full report (Exhibit 1) discusses the process and proposal in greater detail.

II. Draft Code Amendments

A copy of the draft code can be found in the Exhibits. The proposed amendments are to Chapter 12.04.205 – Mobility Standards.

III. Draft Transportation System Plan Project List Amendments

The proposal includes the addition of the following projects to the TSP Project List. Exhibits 5 and 6 includes a map of the projects.

Project #	Project Description	Project Extent	Project Elements	Priority	Cost Estimate
D95	Hwy 213 & Beavercreek Road Westbound Right Turn Merge Lane	Hwy 213 & Beavercreek Road to the north	Addition of a free flow right turn lane from Beavercreek Road to Hwy 213 Northbound and associated merge lane on Hwy 213 northbound	Short-Term	$2,700,000
W83	Beavercreek Road Sidewalk Infill	South of the Coltrane Path to North of Marjorie Lane	Sidewalk Infill	Medium Term	$330,000
W84	Hwy 213 & Beavercreek Road Area Safety Improvements	Hwy 213 & Beavercreek Road Intersection to Beavercreek Road & Maple Lane Intersection	Implement feasible Safety Improvements as identified in the Hwy 213 Corridor Alternative Mobility Targets Final Report	Medium-Term	$275,000
S13	Newell Creek Canyon/ Holly Lane Shared Use Path	Donovan Road to Beavercreek Rd	Add a shared use path between Holly Lane and HWY 213 to Maplelane Ct and beyond, connecting to the Oregon City Loop Trail at Beavercreek Road. (RTP project 10147)	Long Term Phase 2	$1,515,000

IV. Public Involvement and Public Comment

The Alternate Mobility Targets Project was led by Oregon City Public Works and included robust opportunities for public through the Community advisory group, Technical Advisory Group, open house, public hearing process, multiple project mailings, newspaper noticing, meetings with the Transportation

Advisory Committee, and Citizen Involvement Committee. A full description of the public engagement process is included in the full Report (Exhibit 2).

The City brought together a Community Advisory Group for the decisionmaking process that included a variety of stakeholders from the community. The 16 member Community Advisory Group met 4 times with the purpose of guiding the process to evaluate alternatives, and provide a recommendation to the City. The recommended trail alignments reflect the near-consensus of the Advisory Group, with one member unable to support the recommendation.

The Alternate Mobility Targets project and associated materials has been available for review on the Oregon City website at the following address: https://www.orcity.org/publicworks/project/ps-16-024

Notice of the first public hearing date was published in the newspaper on December 29, 2017. Notice of the public hearing was mailed to all property owners within the Oregon City limits and Urban Growth Boundary on December 29, 2017.

In accordance with ORS 197.610 and OAR 660-018-0020, a Notice of Proposed Amendment to the Oregon City Comprehensive Plan was provided to the Oregon Department of Land Conservation and Development 35 days prior to the first noticed Evidentiary Hearing).

Notice of the proposed amendment was provided to a variety of affected agencies including: South Fork Water Board (SFWB), Clackamas River Water (CRW), Clackamas County, Clackamas Fire District #1, Oregon City School District, Tri-City Services District, Metro, TriMet, and Oregon Department of Transportation (ODOT).

Public comments that have been received before, at the first hearing on January 22, 2018 and subsequent to the hearing are addressed in the Issues Matrix (Exhibit A).

Commenter	**Summary of Comment**
Cathy Behrendt	Concerned about the lack of improvement to the City's road network. Supports light rail connections to the City, and HOV lanes on Highway 213. Would like to see Clackamas County bear responsibility for the improvement costs due to the traffic generated by County facilities, and would like to see an expansion of Beavercreek Road.
Carl and Roseann Sheeon	Concerned about overcrowded schools and traffic congestion.
Janine Offut	Would rather see the City cap development temporarily and encourage citizens to drive less.
Rose Holden, Oregon City Golf Club	Supports the alternative mobility standards in order to allow implementation of the Beavercreek Road Concept Plan area. Concerned that the lack of standards and resulting delays in the approval process has pushed developers to other parts of the region.
Jon Makler, Planning Manager, ODOT Region 1	Supports the City's proposed alternative mobility standards and right turn merge lane project. Confirmation that alternative standards are not needed at Redland Road. Commitment to work with the City to bring the proposal to the Oregon Transportation Commission.
Paul Edgar	Requested a continuance of the first hearing January 22nd, 2018. Raises concerns that increased congestion will have impact on freight routes. Points out that Seaside, OR has also gone through a process with ODOT for alternate

	mobility standards. Information on the experience in Seaside is attached to the comment.
Steve Callistini	Would like to see large intersection improvements rather than the alternate mobility standard. Supports the right turn merge lane and would like to see a speed limit reduction as well.
Lynn Andersen	Concerned that improvement projects are good ideas but they do not do enough to solve the congestion problem. Discussed sewer moratorium as example of how City handled the sewer capacity issue. Urges city to force County, state, and Metro to help fund real solutions.
Bill Merchant	Concerned that the intersection does not meet ADA requirements and that the Oregon Transportation Commission will not approve 1.0 v/c.
William Gifford	Urges the Planning Commission to approve the recommendation of the two committees that looked at this over the last year. A moratorium in Oregon City would not address the outside growth. Supports the plan as a reasonable compromise, acknowledges that it isn't fair that the City has to pay for all of it, but that is the reality.
Tammy Stevens, Hamlet of Beavercreek	Brought up the 1993 agreement for the interchange project. Concern about growth in the area and that development in enterprise zone does not pay full taxes or SDCs. There is a fear among Hamlet residents that Beavercreek Road won't be able to carry additional traffic generated by growth in the area.
Dave McNeel	As a former public works employee, remembers history of intersection planning and agreements between state, city, and county. Submitted a copy of a 1993 agreement signed by the City agreeing to plan for the grade separated interchanges. Concerned that state won't allow more than 0.99 v/c. Urges city to force County, state, and Metro to help fund a real solution. Businesses cannot afford to have their trucks tied up in traffic.
Christine Kosinski	Concerned that the merge lane will cause more rear end crashes. Supports grade separated intersection. Suggests putting the alternative mobility standards to a vote of the people.
Paul Edgar	Concerned that our projections do not account for the amount of growth that is occurring. Urges a larger solution than what is proposed, and that City demand more help from ODOT and Metro.
James Nicita	Suggests that the improvements to the intersection also include improvements to the Newell Creek culvert to provide better fish passage opportunities. Would like to see more inclusion of bicycle mobility, specifically the planned trail that parallels Highway 213 and Newell Creek. Concerned that there are no bus or transit improvements in plan.
Dan Fowler	Supports the proposal as a practical approach and a reasonable next step, but not the ultimate solution. Thinks the right turn merge lane will help people in the area. Suggested to keep the dialogue open with the state and county and consider a traffic shed, urban renewal funding. Wants the City to adopt this so they can begin collecting SDCs for the project
Robert Heiberg	Opposed to more growth and density; traffic system seems to be at capacity. Concerned that real problem is at I-205.

The above comments that pertain to approval criteria or otherwise raise issues for which the Planning Commission requested more information are addressed in the Issues Matrix (Exhibit 1). The request for a continuance was granted with a continuance of the hearing to February 26, 2018. None of the

comments provided indicate that an approval criterion has not been met or cannot be met through the Conditions of Approval attached to this Staff Report.

DECISION-MAKING CRITERIA:

Transportation System Plan

Finding: Complies as Proposed. The Transportation System Plan (TSP) adopted in 2013 identified the need to adopt Alternate Mobility Standards for these two intersections. Two of the objectives of the TSP include the identification of alternative standards for state highway corridors such as Highway 213. On page 38 of the TSP, the state highway mobility issues are outlined:

"State owned streets should comply with the mobility targets included in the Oregon Highway Plan. However, for proposed development that is permitted, either conditionally, outright, or through detailed development master plan approval, the OR 99E/I-205 SB Ramps, OR 99E/I-205 NB Ramps, OR 213/ Beavercreek Road, and I- 205/OR 213 Interchange intersections shall be exempt from meeting the state mobility targets until further solutions (beyond those included in the TSP) or alternative mobility targets are explored for the intersections."

The TSP also included a project, Project #D0, OR 213/Beavercreek Road Refinement Plan. The project was needed to Identify and evaluate circulation options to reduce motor vehicle congestion along the corridor and to explore alternative mobility targets.
Thus, this proposal fulfills the Transportation System Plan's identified need for alternative standards.

All of the City's mobility standards are found in Chapter 12.04 of the Municipal Code. This proposal includes amendments to Chapter 12.04 to adopt alternate standards for the HWY 213/Beavercreek intersection.

The proposal also includes the addition of the following projects to the TSP Project List.

Project #	Project Description	Project Extent	Project Elements	Priority	Cost Estimate
D95	Hwy 213 & Beavercreek Road Westbound Right Turn Merge Lane	Hwy 213 & Beavercreek Road to the north	Addition of a free flow right turn lane from Beavercreek Road to Hwy 213 Northbound and associated merge lane on Hwy 213 northbound	Short-Term	$2,700,000
W83	Beavercreek Road Sidewalk Infill	South of the Coltrane Path to North of Marjorie Lane	Sidewalk Infill	Medium Term	$330,000
W84	Hwy 213 & Beavercreek Road Area Safety Improvements	Hwy 213 & Beavercreek Road Intersection to Beavercreek Road & Maple Lane Intersection	Implement feasible Safety Improvements as identified in the Hwy 213 Corridor Alternative Mobility Targets Final Report	Medium-Term	$275,000

S13	Newell Creek Canyon/ Holly Lane Shared Use Path	Donovan Road to Beavercreek Rd	Add a shared use path between Holly Lane and HWY 213 to Maplelane Ct and beyond, connecting to the Oregon City Loop Trail at Beavercreek Road. (RTP project 10147)	Long Term Phase 2	$1,515,000

CHAPTER 17.68: ZONE CHANGES AND AMENDMENTS

17.68.020 Criteria.

The criteria for a zone change are set forth as follows:

A. The proposal shall be consistent with the goals and policies of the Comprehensive Plan.

Oregon City Comprehensive Plan

According to the 2004 Oregon City Comprehensive Plan (Introduction, "Implementing the Plan" Page 4): "Ancillary Plans are adopted by the City Commission for such things as parks and recreation, transportation systems, water facilities, and sewer facilities. Usually prepared by City departments through a public process, ancillary plans are approved by the City Planning Commission and adopted by the City Commission to provide operational guidance to city departments in planning for and carrying out city services. These plans are updated more frequently than the Comprehensive Plan."

This proposal amends the Transportation System Plan, which is an adopted ancillary document to the Oregon City Comprehensive Plan. The TSP is both a technical document and a conceptual guide that requires regular review.

Chapter O. Comprehensive Plan Maintenance and Update

Regular Review and Update. Another method of Plan maintenance and updating is a continuous technical review of the Plan by the Planning staff. This review and any subsequent recommendations for Plan updating should be presented to the Neighborhood Associations, Planning Commission and City Commission for input and discussion in the same manner as requested Plan changes. The continuous review should consider:

Plan implementation process;

Finding: Complies as Proposed. The applicant, Oregon City Public Works Department, has presented the update for input by the residents, affected agencies, property owners, the Transportation Advisory Committee, Neighborhood Associations, Planning Commission and City Commission in accordance with the recommended method described in the Comprehensive Plan and pursuant to the applicable process described in Oregon City Municipal Code section 17.50.170. The plan implementation process is consistent with the Comprehensive Plan.

Adequacy of the Plan to guide land use actions, including an examination of trends.

Finding: Complies as Proposed. The final report provides an analysis of existing conditions and provides direction for future development, funding and needs. The proposal is based on updated and advanced traffic models and on real traffic data collected within the last 18 months.

Whether the Plan still reflects community needs, desires, attitudes and conditions. This shall include changing demographic patterns and economics.
Finding: **Complies as Proposed.** The proposal was created through a robust public engagement process in order to reflect community needs, desires, attitudes, and conditions.

Addition of updated factual information including that made available to the City by regional, state and federal governmental agencies.
Finding: **Complies as Proposed.** The proposal includes an analysis of existing conditions including natural resources and slopes, ODOT plans and conditions, advanced traffic models that forecast future population and travel growth, and all updated master plans adopted by the City.

Section 1 Citizen Involvement
Goal 1.1 Citizen Involvement Program Implement a Citizen Involvement Program that will provide an active and systematic process for citizen participation in all phases of the land-use decision making process to enable citizens to consider and act upon a broad range of issues affecting the livability, community sustainability, and quality of neighborhoods and the community as a whole.
Policy 1.1.1 - Utilize neighborhood associations as the vehicle for neighborhood-based input to meet the requirements of the Land Conservation and Development Commission (LCDC) Statewide Planning Goal 1,
PWF Medical Center Master Plan Modification and Comprehensive Plan/Zone Change Application 20
Citizen Involvement. The Citizen Involvement Committee (CIC) shall serve as the officially recognized citizen committee needed to meet LCDC Statewide Planning Goal 1.
Goal 1.2 Community and Comprehensive Planning - Ensure that citizens, neighborhood groups, and affected property owners are involved in all phases of the comprehensive planning program.
Policy 1.2.1 - Encourage citizens to participate in appropriate government functions and land-use planning.
Goal 1.3 Community Education - Provide education for individuals, groups, and communities to ensure effective participation in decision-making processes that affect the livability of neighborhoods.
Goal 1.4 Community Involvement - Provide complete information for individuals, groups, and communities to participate in public policy planning and implementation of policies.
Policy 1.4.1 - Notify citizens about community involvement opportunities when they occur.
Finding: Complies as Proposed. The City brought together a Community Advisory Group and Technical Advisory Group for the planning process that included a wide variety of stakeholders. Recruitment for the Community Advisory Group was open to all and was promoted heavily among neighborhood associations, businesses, and community groups.
The Community Advisory Group included slots for the following stakeholder representatives:

- Planning Commission representative
- City Commission representative
- Citizen Involvement Committee representative
- Transportation Advisory Committee representative
- Resident/Property Owner:
    - Maple Lane/Thayer Road area
    - Forest Edge area
- City wide
- Advocate for:
    - Accessibility
    - Transit
    - Cycling
- Business/Property Owner: Commercial/Industrial
- Community Development Department Stakeholder Group representative
- Oregon City Chamber of Commerce representative

- Oregon City Business Alliance representative
- Clackamas Community College representative
- Hamlet of Beavercreek representative

Technical Advisory Group (TAG)

- Oregon Department of Transportation (ODOT)
    - Traffic
    - Transportation Planning
- Metro
- Oregon Department of Land Conservation and Development (DLCD)
- Clackamas County
    - Traffic
    - Transportation Planning
- TriMet
- City of Oregon City
    - Planning
    - Economic Development
    - Engineering
    - Traffic Consultant

The City shared information on a project webpage throughout the project, presented the project to the Citizen Involvement Committee, Development Stakeholder Group, Transportation Advisory Committee, and hosted an open house in December 2017. This application was noticed through mailings to all property owners in the city limits and UGB limits and was noticed in the newspaper. Neighborhood meetings were held as required.

Section 2: Land Use

Goal 2.1: Ensure that property planned for residential, commercial, office and industrial uses is used efficiently and that land is developed following principles of sustainable development.

Finding: Not Applicable. This proposal does not change development patterns or the use of land.

Goal 2.2 Downtown Oregon City Develop the Downtown area, which includes the Historic Downtown Area, the "north end" of the Downtown, Clackamette Cove, and the End of the Oregon Trail area, as a quality place for shopping, living, working, cultural and recreational activities, and social interaction. Provide walkways for pedestrian and bicycle traffic, preserve views of Willamette Falls and the Willamette River, and preserve the natural amenities of the area.

Finding: Not Applicable. This proposal does not change development patterns or plans for downtown.

Goal 2.4: Neighborhood Livability - Provide a sense of place and identity for residents and visitors by protecting and maintaining neighborhoods as the basic unit of community life in Oregon City while implementing the goals and policies of the other sections of the Comprehensive Plan.

Finding: Complies as Proposed. This proposal does not change Oregon City's neighborhood development patterns. The result of the proposed change will be a relatively small increase in congestion at the Highway 213/Beavercreek Road intersection (general a maximum v/c of 0.99 for the first two hours, to a v/c of 1.0 for the first three hours with a suite of capacity and safety improvements), which is balanced against the alternative of increasing fees and taxes to afford the costly infrastructure projects. The City does not find it to be equitable to increase fees or taxes in order to pay for improvements to one intersection, when the alternative standards can be implemented with relatively little additional congestion.

Alternatives to modify the existing intersection configuration and traffic control, which would bring the intersection into compliance with the current mobility standards in the year 2035, identified at a cost of ≥$50 million and included:

- Addition of lanes to current configuration,
- Quadrant road in the southwest quadrant of the intersection,
- Variations of displaced left-turns (also referred to as continuous flow intersection), and
- Grade-separated interchange forms.

Potential improvements for the intersection of Beavercreek Road and OR213 that focused on significantly increasing the intersection capacity to meet the current mobility target were presented to the TAG and CAG in December 2016 and January 2017. None of the alternatives were determined to be financially feasible, even by the 2035 horizon year of the TSP given the financial constraints of the city and other agency partners. In addition, some of the potential alternatives could have additional consequences including right-of-way impacts, environmental impacts, and could potentially complicate the provision of services for bicyclists, pedestrians, and transit users.

As a majority of trips neither start nor stop in Oregon City, additional trips are anticipated at the intersection regardless of the change in development within the City.

Goal 2.5: Retail and Neighborhood Commercial. Encourage the provision of appropriately scaled services to neighborhoods.

Finding: Not Applicable. This proposal does not change the scale or use of commercial areas.

Goal 2.6 - Industrial Land Development - Ensure an adequate supply of land for major industrial employers with family-wage jobs.

Finding: Not Applicable. This proposal does not change the industrial land supply.

Goal 2.7: Comprehensive Plan Map - Maintain and review the comprehensive plan map as the official long-range planning guide for land use development of the city by type, density and location.

Finding: Not Applicable. This proposal does not change the comprehensive plan map.

Section 5: Natural Resources

Goal 5.1 - Establish an open space system that conserves fish and wildlife habitat and provides recreational opportunities, scenic vistas, access to nature and other community benefits.

Finding: Not Applicable. This proposal does not change the open space system in Oregon City.

Goal 5.2 Scenic Views and Scenic Sites - Protect the scenic qualities of Oregon City and scenic views of the surrounding landscape.

Finding: Not Applicable. This proposal does not impact scenic views.

Goal 5.3 Historic Resources - Encourage the preservation and rehabilitation of homes and other buildings of historic or architectural significance in Oregon City.

Finding: Not Applicable. This proposal does not change the preservation program in Oregon City.

Goal 5.4 Natural Resources

Identify and seek strategies to conserve and restore Oregon City's natural resources, including air, surface and subsurface water, geologic features, soils, vegetation, and fish and wildlife, in order to sustain quality of life for current and future citizens and visitors, and the long-term viability of the ecological systems.

Policy 5.4.1 - Conserve and restore ecological structure, processes and functions within the city to closely approximate natural ecosystem structure, processes, and functions.
Policy 5.4.2 - Cooperate with Clackamas County, Metro and other agencies to identify and protect wildlife habitat, distinctive natural areas, corridors and linkages and other ecological resources within the Urban Growth Boundary and incorporate the information into the Urban Growth Management Agreement with Clackamas County.
Policy 5.4.4- Consider natural resources and their contribution to quality of life as a key community value when planning, evaluating and assessing costs of City actions.
Policy 5.4.8 - Conserve natural resources that have significant functions and values related to flood protection, sediment and erosion control, water quality, groundwater recharge and discharge, education, vegetation and fish, and wildlife habitat.
Policy 5.4.9 - Protect and enhance riparian corridors along streams in Oregon City to increase shade, reduce streambank erosion and intrusion of sediments, and provide habitat for a variety of plants, animals, and fish.
Policy 5.4.12 - Use a watershed-scale assessment when reviewing and planning for the potential effects from development, whether private or public, on water quality and quantity entering streams.
Finding: Complies as Proposed. The planning process for this proposal involved an assessment of each alternative's impact on natural resources, including nearby Newell Creek. While some of the intersection improvements would have led to large impacts on the stream, the proposed project to add a right turn merge lane minimizes the addition of impervious surface in the Natural Resource Overlay District. It also avoids any changes to the north side of HWY 213 that would impact the stream or its regulated buffer area.

Newell Creek passes under HWY 213 at Beavercreek Road by means of a culvert. According to documentation from the Greater Oregon City Watershed Council (GOCWC), fish are present in the lower and middle reaches of Newell Creek, including juvenile coho, juvenile steelhead, trout, and lamprey. It is not clear if fish passage currently occurs at the HWY 213 culvert due to natural topography of the creek leading to the area, and lamprey are more likely to be able to pass than other fish species. The GOCWC's action plan does not include any specific fish passage improvements for Newell Creek.

Regardless of the proposed code changes to Chapter 12.04 and the TSP project amendments, the applicability of the Natural Resource Overlay District is the same. Addition of new impervious area within the NROD is expected to be necessary for the proposed right turn lane project, and this project will be required to undergo review per Chapter 17.49 of the Oregon City Municipal code. Mitigation will be required for any new impervious surface added. It is not expected that changes to the culvert will be required by City code. New stream crossings are required to be by bridge or bottomless culvert; upgrade to existing stream crossings are not likely to be required, but may be proposed by ODOT as part of an improvement project.

Section 6: Quality of Air, Water and Land Resources
Goal 6.1 Air Quality -Promote the conservation, protection and improvement of the quality of the air in Oregon City.
Policy 6.1.2 -Ensure that development practices comply with or exceed regional, state, and federal standards for air quality.
Finding: Complies as Proposed. The proposed amendment adds a TSP project for a right turn merge lane that adds a limited amount of capacity to the intersection.
The adoption of alternate mobility standards will result in the City's ability to accept greater levels of traffic congestion at these intersections during peak congestion times. This recommendation balances various goals, including the provision of public facilities, traffic safety, protection of natural resources, economic development, and livability. The proposal includes improvements to bicycle and pedestrian infrastructure that could result in greater use of alternative transportation modes, which promotes better air quality.

Goal 6.2: Water Quality - Control erosion and sedimentation associated with construction and development activities to protect water quality.

Finding: Complies as Proposed. This proposal does not change erosion control measures and policies, set forth in OCMC 15.48, that would protect riparian areas from erosion and sedimentation caused by road widening projects. The right turn lane project does include limited pavement widening along the edge of the right of way, which is partially within the Natural Resource Overlay District. The City will be required to undergo land use review for the impacts associated with the new impervious surface, and will be required to provide mitigation along with the construction of the new pavement as required by OCMC 17.49.180. The appropriate reviews will occur during and after the project is designed and engineered, and before construction.

The Advisory Groups considered, among the alternatives, infrastructure upgrades that would alleviate more congestion but that would also have a larger impact on nearby natural resources such as Newell Creek and associated wetlands and vegetated corridors.

Goal 6.3: Light - Protect the night skies above Oregon City and facilities that utilize the night sky, such as the Haggart Astronomical Observatory, while providing for night-lighting at appropriate levels to ensure safety for residents, businesses, and users of transportation facilities, reduces light trespass onto neighboring properties, conserves energy, and reduces light pollution via use of night-friendly lighting.

Finding: Not Applicable. This proposal does not change lighting regulations or uses.

Goal 6.4: Noise - To prevent excessive sound that may jeopardize the health, welfare, or safety of the citizens or degrade the quality of life.

Finding: Complies as Proposed. This proposal allows slightly higher congestion levels at the intersection of HWY 213 and Beavercreek, which will not have a significant impact on noise levels.

Goal 6.5: Solid Waste - Reduce solid waste and promote recycling.

Finding: Not Applicable. This proposal does not change solid waste measures in Oregon City.

Goal 6.6: Mineral and Aggregate Operations - Protect the livability and environment of Oregon City by prohibiting commercial aggregate extraction operations within the City and urban growth area.

Finding: Not Applicable. This proposal does not change the prohibition on mineral and aggregate operations.

Section 7: *Natural Hazards*

Protect life and reduce property loss from the destruction associated with natural hazards.

Finding: Complies as Proposed. This proposal does not change any regulations related to natural hazards in Oregon City, including Geologic Hazard and floodplain overlay districts. When the right turn merge lane project is implemented, it will be reviewed for compliance with the City's regulations found in Chapter 17.44 – Geologic Hazards.

Section 8 Parks and Recreation.

Finding: Not Applicable. This proposal does not affect any parks or recreation facilities in Oregon City.

Section 9: Economic Development

Goal 9.1 Improve Oregon City's Economic Health - Provide a vital, diversified, innovative economy including an adequate supply of goods and services and employment opportunities to work toward an economically reasonable, ecologically sound and socially equitable economy.

Finding: Complies as Proposed. This proposal allows for greater employment opportunities by allowing potential new development in industrial areas such as the Beavercreek Concept Plan Area which may not be implemented until zoning may be applied.

Section 10: Housing

Finding: Complies as Proposed. This proposal allows for greater housing opportunities by allowing potential new development in residential areas such as the Beavercreek Concept Plan Area which may not be implemented until zoning may be applied.

Section 11: Public Facilities
Goal 11.1 Provision of Public Facilities
Serve the health, safety, education, welfare, and recreational needs of all Oregon City residents through the planning and provision of adequate public facilities.
Policy 11.1.1
Ensure adequate public funding for the following public facilities and services, if feasible:
• Transportation infrastructure

Finding: Complies as Proposed. The City does not have funding to complete large infrastructure projects at this intersection to fully alleviate congestion. Thus, the Advisory Groups evaluated various alternatives, considering the costs and benefits of each.
Alternatives to modify the existing intersection configuration and traffic control, which would bring the intersection into compliance with the current mobility standards in the year 2035, were identified and included:

- Addition of lanes to current configuration,
- Quadrant road in the southwest quadrant of the intersection,
- Variations of displaced left-turns (also referred to as continuous flow intersection), and
- Grade-separated interchange forms.

Potential improvements for the intersection of Beavercreek Road and OR213 that focused on significantly increasing the intersection capacity to meet the current mobility target were presented to the TAG and CAG in December 2016 and January 2017. None of the alternatives were determined to be financially feasible, even by the 2035 horizon year of the TSP given the financial constraints of the city and other agency partners. In addition, some of the potential alternatives could have additional consequences including right-of-way impacts, environmental impacts, and could potentially complicate the provision of services for bicyclists, pedestrians, and transit users.

As a result of this study, some improvements were identified that, while not allowing the mobility standard to be fully met, would increase the intersection capacity, improve safety, and are within the financial capabilities of the city and its partner agencies.

The proposed projects for HWY 213 and Beavercreek are estimated to cost $2.7M, which is achievable with the City's current and projected resources.

Goal 11.2: Wastewater
Goal 11.3: Water Distribution
Goal 11.4: Stormwater Management
Goal 11.5: Solid Waste

Finding: Not Applicable. This proposal does not affect any of the above listed city utilities.

Goal 11.6 Transportation Infrastructure
Optimize the City's investment in transportation infrastructure.
Policy 11.6.1
Make investments to accommodate multi-modal traffic as much as possible to include bike lanes, bus turnouts and shelters, sidewalks, etc., especially on major and minor arterial roads, and in regional and employment centers.

Finding: Complies as Proposed. . The City does not have funding to complete large infrastructure projects at this intersection to fully alleviate congestion. Thus, the Advisory Groups evaluated various alternatives, considering the costs and benefits of each. The proposed project for HWY 213 and Beavercreek is estimated to cost $2.7M, which is achievable with the City's current and project resources.

Beavercreek Road in the immediate vicinity of the intersection currently includes bicycle lanes and sidewalks, except for a gap between Maplelane Road and the Coltrane pedestrian path. This proposal includes an additional TSP project to fill the sidewalk gap in the project area on Beavercreek Road. Highway 213 does not include bicycle and pedestrian infrastructure as a state highway. No changes to existing planned bike and trail TSP projects are proposed. All existing bike lanes and paths in the TSP will be retained.

Safety improvements identified by the City for further investigation, or to be included as part of future projects in the area include:

- Install intersection enhancements including potential raised crosswalks, bike lane striping continuation, ladder-style crosswalks, and lane narrowing.
- Add wayfinding signage for people walking and biking.
- Enhance bike lanes on Beavercreek Road with additional markings and green striping in transition areas.
- Add buffers to bike lanes on Beavercreek Road where feasible.
- Add ADA curb ramps in the OR213/Beavercreek Road area where missing.
- Add pedestrian facilities to Maple Lane Road between Beavercreek Road and Thayer Road.
- Add transit stop amenities to existing stops in the area.

These projects will contribute to the multi-modal goals of the Oregon City transportation system.

Goal 11.7: Non-City Utility Operations
Goal 11.8: Health and Education
Goal 11.9: Fire Protection
Goal 11.10: Police Protection
Goal 11.11: Civic Facilities
Goal 11.12: Library
Finding: Not Applicable. This proposal does not affect any of the above listed public services.

Section 12: Transportation
Goal 12.1 Land Use-Transportation Connection
Ensure that the mutually supportive nature of land use and transportation is recognized in planning for the future of Oregon City.
Policy 12.1.1 - Maintain and enhance citywide transportation functionality by emphasizing multi-modal travel options for all types of land uses.
Finding: Complies as Proposed. This proposal includes an additional TSP project to fill the sidewalk gap in the project area on Beavercreek Road and to add multimodal improvements in the project area. No changes to planned bike and trail TSP projects are proposed. All existing bike lanes and paths in the TSP will be retained.

Policy 12.1.4 - Provide walkable neighborhoods. They are desirable places to live, work, learn and play, and therefore a key component of smart growth.
Finding: Complies as Proposed. Beavercreek Road currently includes bicycle lanes and sidewalks, except for a gap between Maplelane Road and the Coltrane pedestrian path. This proposal includes an

additional TSP project to fill the sidewalk gap in the project area on Beavercreek Road. Highway 213 does not include bicycle and pedestrian infrastructure as a state highway.

Goal 12.2 Local and Regional Transit
Promote regional mass transit (South Corridor bus, Bus Rapid Transit, and light rail) that will serve Oregon City.
Finding: Complies as Propsoed. This proposal does not change public transit service in the area. Currently, TriMet line 32 uses the Hwy 213 & Beavercreek intersection. They use the Beavercreek eastbound to 213 southbound, and 213 northbound to Beavercreek westbound movements. Neither of those movements are ones that see the heavy movements and delays.
The TriMet Southeast Service Enhancement Plan provides a vision for the future of transit in the southeast portion of TriMet's transit district. The plan identifies the area along Beavercreek Road (and areas of south Oregon City) as part of a new community/job connector service in the neighborhoods in South Oregon City.
The community/job connectors are identified to serve areas that would be uneconomical with full-fledged TriMet service. This vision recommends community/jobs connector service in places where the businesses and/or homes are so scattered or are located on so much land that there aren't enough people within walking distance of bus stops to cost-effectively provide traditional fixed route bus service. In some instances there aren't enough roadway connections to allow people to walk to and from bus stops safely. The Clackamas Industrial Area, generally between Highway 212 and Sunnyside, and South Oregon City are candidates for community/jobs connector service in the Southeast.
The Beavercreek Road Concept Plan mentions that transit-oriented land uses have been strategically located to increase the feasibility of transit service in the future.
In order for any transit service to be successful, the area would need to develop at appropriate densities to warrant service.

Goal 12.3 Multi-Modal Travel Options
Develop and maintain a transportation system that provides and encourages a variety of multi-modal travel options to meet the mobility needs of all Oregon
City residents.
Policy 12.3.1 -Provide an interconnected and accessible street system that minimizes vehicle miles traveled and inappropriate neighborhood cut through traffic.
Policy 12.3.2 -Provide an interconnected and accessible pedestrian system that links residential areas with major pedestrian generators such as employment centers, public facilities, and recreational areas.
Policy 12.3.3 - Provide a well-defined and accessible bicycle network that links residential areas, major bicycle generators, employment centers, recreational areas, and the arterial and collector roadway network.
Policy 12.3.4 -Ensure the adequacy of pedestrian and bicycle connections to local, county, and regional trails.
Policy 12.3.5 -Promote and encourage a public transit system that ensures efficient accessibility, mobility, and interconnectivity between travel modes for all residents of Oregon City.
Policy 12.3.6 -Establish a truck route network that ensures efficient access and mobility to commercial and industrial areas while minimizing adverse residential impacts.
Policy 12.3.8 -Ensure that the multi-modal transportation system preserves, protects, and supports the environmental integrity of the Oregon City community.
Policy 12.3.9 -Ensure that the city's transportation system is coordinated with regional transportation facility plans and policies of partnering and affected agencies.
Finding: Complies as Proposed. Beavercreek Road currently includes bicycle lanes and sidewalks, except for a gap between Maplelane Road and the Coltrane pedestrian path. This proposal includes an additional TSP project to fill the sidewalk gap in the project area on Beavercreek Road. Highway 213 does not include bicycle and pedestrian infrastructure as a state highway. This proposal includes an amendment to TSP project S13 to make it consistent with the Regional Transportation Plan Project 10147 for a shared use path parallel to Highway 213.

No changes to planned bike and trail TSP projects are proposed. All existing bike lanes and paths in the TSP will be retained.
Safety improvements identified by the City for further investigation, or to be included as part of future projects in the area include:

- Install intersection enhancements including potential raised crosswalks, bike lane striping continuation, ladder-style crosswalks, and lane narrowing.
- Add wayfinding signage for people walking and biking.
- Enhance bike lanes on Beavercreek Road with additional markings and green striping in transition areas.
- Add buffers to bike lanes on Beavercreek Road where feasible.
- Add ADA curb ramps in the OR213/Beavercreek Road area where missing.
- Add pedestrian facilities to Maple Lane Road between Beavercreek Road and Thayer Road.
- Add transit stop amenities to existing stops in the area.

These projects will contribute to the multi-modal goals of the Oregon City transportation system.

Goal 12.4: Light-Rail
Promote light rail that serves Oregon City and locate Park and Ride facilities at convenient neighborhood nodes to facilitate access to regional transit.
Finding: Complies as Proposed. This proposal does not change public transit service in the area. There is an existing park and ride location at Clackamas Community College which is not proposed to change. In order for any light rail service to be successful, the area would need to develop at appropriate densities to warrant service. The Beavercreek Road Concept Plan area will add increased density of housing and jobs to the area, improving the environment for successful transit service.

Goal 12.5 Safety
Develop and maintain a transportation system that is safe.
Policy 12.5.1 -Identify improvements that are needed to increase the safety of the transportation system for all users.
Policy 12.5.2 -Identify and implement ways to minimize conflict points between different modes of travel.
Policy 12.5.3 -Improve the safety of vehicular, rail, bicycle, and pedestrian crossings.
Finding: Complies as Proposed. The OR213/Beavercreek Road intersection was identified in the 2013 TSP as a high collision intersection. The intersection was in the top 5% of the ODOT Safety Priority Index System (SPIS) List for the years 2012-2014. The SPIS List is maintained by ODOT and updated each year with the latest available year of crash records and traffic volumes. 2012-2014 is the most current SPIS list. The intersection also has a crash rate that exceeds the Critical Crash Rate meaning that it exceeds the crash rate of other comparable intersections.
As shown in the final report, the most predominant crash type at the OR213/Beavercreek Road intersection is rear-end crashes. Beavercreek Road is the first at-grade intersection on OR213 for over two miles south of Redland Road, in a corridor that generally feels rural. A lack of driver expectation of southbound queues from the signal may contribute to the high number of reported rear-end crashes at the intersection. The reported fatality occurred in 2011, and was an angle crash in which the driver ran a red light under dark and rainy conditions. The 2010-2014 crash rate of 1.20 is already lower than the crash rate of 2.05 identified in the 2013 TSP, indicating that safety and/or driver attentiveness have improved in recent years. Lengthening the dual eastbound left-turn lanes to provide additional storage (Project D27; funded) and an advanced queue warning system on southbound 213 will further improve safety at the intersection.
As shown in the final report, the planned TSP and proposed improvements will reduce the number of expected annual crashes at the OR213/Beavercreek Road intersection. The potential financially feasible

improvements at OR213/Beavercreek Road are predicted to reduce crashes at the intersection by almost 5%.

Goal 12.6 Capacity
Develop and maintain a transportation system that has enough capacity to meet users' needs.
Policy 12.6.1 - Provide a transportation system that serves existing and projected travel demand.
Policy 12.6.2 - Identify transportation system improvements that mitigate existing and projected areas of congestion.
Policy 12.6.3 - Ensure the adequacy of travel mode options and travel routes (parallel systems) in areas of congestion.
Policy 12.6.4 - Identify and prioritize improved connectivity throughout the city street system.
Finding: Complies as Proposed. The analysis in the final report shows that, without improvements, the OR213/Beavercreek Road intersection will exceed current mobility targets in 2040. With potentially financially feasible improvements in place (i.e. a westbound right-turn merge lane at OR213/Beavercreek), the intersection will still exceed the existing mobility targets under 30th highest hour traffic conditions. Therefore, it is recommended that alternative mobility targets be based on average annual conditions, allowing the v/c ratio to exceed 0.99 for one hour per day at the OR213/Beavercreek Road intersection (upper limit of 1.0).
The proposal maintains freight mobility, which peaks during midday and will not be affected by the allowance of higher levels of congestion in the AM and PM peak hours.

Goal 12.7 Sustainable Approach
Promote a transportation system that supports sustainable practices.
Policy 12.7.4 - Promote multi-modal transportation links and facilities as a means of limiting traffic congestion.
Finding: Complies as Proposed. No changes to planned bike and trail TSP projects are proposed. All existing bike lanes and paths in the TSP will be retained. Beavercreek Road currently includes bicycle lanes and sidewalks, except for a gap between Maplelane Road and the Coltrane pedestrian path. This proposal includes an additional TSP project to fill the sidewalk gap in the project area on Beavercreek Road. Highway 213 does not include bicycle and pedestrian infrastructure as a state highway. This proposal includes an amendment to TSP project S13 to make it consistent with the Regional Transportation Plan Project 10147 for a shared use path parallel to Highway 213 (See Exhibit 6).
Safety improvements identified by the City for further investigation, or to be included as part of future projects in the area include:

- Install intersection enhancements including potential raised crosswalks, bike lane striping continuation, ladder-style crosswalks, and lane narrowing.
- Add wayfinding signage for people walking and biking.
- Enhance bike lanes on Beavercreek Road with additional markings and green striping in transition areas.
- Add buffers to bike lanes on Beavercreek Road where feasible.
- Add ADA curb ramps in the OR213/Beavercreek Road area where missing.
- Add pedestrian facilities to Maple Lane Road between Beavercreek Road and Thayer Road.
- Add transit stop amenities to existing stops in the area.

These projects will contribute to the multi-modal goals of the Oregon City transportation system.

Goal 12.8 Implementation/Funding
Identify and implement needed transportation system improvements using available funding.
Policy 12.8.1 - Maximize the efficiency of the Oregon City transportation system, thus minimizing the required financial investment in transportation improvements, without adversely impacting neighboring jurisdictions and facilities.

Finding: Complies as Proposed.
The cost of the westbound right-turn merge lane at OR213/Beavercreek Road is estimated to be approximately $2.7 million based on the design shown in Figure 2. This estimate does not include right of- way acquisition.

The KAI and OBEC cost estimates, as well as exhibits of the proposed financially feasible improvements at OR213/Beavercreek Road can be found in Appendix "G" of the final report.

The City is committed to nominating both the Redland project and the Beavercreek project for inclusion in a potential regional bond measure that is being considered.

Local funds that can be used for these projects include SDCs and gas taxes. SDCs are paid by new development and they apply to all development, even in enterprise zone areas. SDCs can only be reduced if a developers build improvement projects themselves that would otherwise be funded by SDCs. The City also analyzed what a local bond measure would mean if city residents voted to pay for a $10M project here – Each household would be assessed an average of $769. No changes to fees, SDCs, taxes, or a bond are proposed at this time. Adding the project to the SDC financially constrained list means that the City can use SDCs collected to fund the right-turn merge lane project.

Section 13: Energy Conservation
Goal 13.1 Conserve energy in all forms through efficient land-use patterns, public transportation, building siting and construction standards, and city programs, facilities, and activities.
Finding: Complies as Proposed. This proposal allows the city's systems to be used more efficiently through the addition of a right turn merge lane on Highway 213, and avoids the overbuilding of infrastructure that can lead to increased energy use.

Section 14: Urbanization
Goal 14.2: *Orderly Redevelopment of Existing City Areas- Reduce the need to develop land within the Urban Growth Boundary by encouraging redevelopment of underdeveloped or blighted areas within the existing city limits.*
Finding: Not applicable. This proposal applies equally to all lands in the City and has no impact on policies that encourage redevelopment in underdeveloped areas.

17.68.020.B. That public facilities and services (water, sewer, storm drainage, transportation, schools, police and fire protection) are presently capable of supporting the uses allowed by the zone, or can be made available prior to issuing a certificate of occupancy. Service shall be sufficient to support the range of uses and development allowed by the zone.
Finding: Not Applicable. No zone map change is proposed.

17.68.020.C. The land uses authorized by the proposal are consistent with the existing or planned function, capacity and level of service of the transportation system serving the proposed zoning district.
Finding: Not Applicable. No zone map change is proposed.

17.68.020.D. Statewide planning goals shall be addressed if the comprehensive plan does not contain specific policies or provisions which control the amendment.
Finding: Complies as Proposed. While the Comprehensive Plan complies with statewide planning goals, staff provides additional findings as follows:

STATEWIDE PLANNING GOAL 1:

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

Finding: Complies as Proposed. This goal is implemented through the applicable Goals and Policies in Section 1 of the Oregon City Comprehensive Plan: Citizen Involvement. Development of the plan included an extensive public involvement effort.

STATEWIDE PLANNING GOAL 2:

To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.

Finding: Complies as Proposed. This goal is implemented through the applicable Goals and Policies in Section 2 of the Oregon City Comprehensive Plan: Land Use. Because the plan is an ancillary document to the City's Transportation System Plan and Comprehensive Plan, the application was processed pursuant to the legislative hearing process outlined in Section 17.50.170 of the Oregon City Municipal Code.

STATEWIDE PLANNIG GOAL 3: Agricultural Lands and GOAL 4: Forest Lands

Finding: Not Applicable. By definition, Oregon City does not have rural resource lands such as for agricultural or forest use within its city limits or UGB and therefore those goals are not applicable.

STATEWIDE PLANNING GOAL 5:

To protect natural resources and conserve scenic and historic areas and open spaces.

Finding: Complies as Proposed. This goal is implemented through the applicable Goals and Policies in Section 5 of the Oregon City Comprehensive Plan: Open Spaces, Scenic and Historic Areas, and Natural Resources. The Oregon City Municipal Code contains review criteria for uses within overlay districts to assure that designated Goal 5 resources are appropriately considered when development is proposed. In particular, the Natural Resource Overlay District designation: "provides a framework for protection of Metro Titles 3 and 13 lands, and Statewide Planning Goal 5 resources within Oregon City. The Natural Resource Overlay District (NROD) implements the Oregon City Comprehensive Plan Natural Resource Goals and Policies, as well as Federal Clean Water Act requirements for shading of streams and reduction of water temperatures, and the recommendations of the Metro ESEE Analysis. Trails, paths, and roads are permitted either outright or with restrictions in the Natural Resource Overlay District as identified in OCMC 17.49.150 as part of a Type II or Type III review process.

No scenic, historic areas, or open spaces are identified in the project area. Natural resources include Newell Creek. Newell Creek passes under HWY 213 at Beavercreek Road by means of a culvert. According to documentation from the Greater Oregon City Watershed Council (GOCWC), fish are present in the lower and middle reaches of Newell Creek, including juvenile coho, juvenile steelhead, trout, and lamprey. It is not clear if fish passage currently occurs at the HWY 213 culvert due to natural topography of the creek leading to the area, and lamprey are more likely to be able to pass than other fish species. The GOCWC's action plan does not include any specific fish passage improvements for Newell Creek.

Regardless of the proposed code changes to Chapter 12.04 and the TSP project amendments, the applicability of the Natural Resource Overlay District is the same. Addition of new impervious area within the NROD is expected to be necessary for the proposed right turn lane project, and this project will be required to undergo review per Chapter 17.49 of the Oregon City Municipal code. Mitigation will be required for any new impervious surface added. It is not expected that changes to the culvert will be required by City code. New stream crossings are required to be by bridge or bottomless culvert; upgrade to existing stream crossings are not likely to be required, but may be proposed by ODOT as part of an improvement project.

STATEWIDE PLANNING GOAL 6:
To maintain and improve the quality of the air, water and land resources of the state.
Finding: Complies as Proposed. This goal is implemented through the applicable Goals and Policies in Section 6 of the Oregon City Comprehensive Plan: Quality of Air, Water and Land Resources. By planning system improvements based on projected demand and land use patterns, the plan will ensure that land suited for development will be served efficiently. All new development will be subject to the City's Natural Resource Overlay District standards and erosion control standards, which implement state and local water quality standards.

The improvements recommended in the plan will result in less pollution by providing a safe opportunity for pedestrian and bicycle travel.

STATEWIDE PLANNING Goal 7:
To protect life and property from natural disasters and hazards.
Finding: Not Applicable. This proposal does not change any regulations related to natural hazards in Oregon City, including Geologic Hazard and floodplain overlay districts.

STATEWIDE PLANNING GOAL 8:
To satisfy the recreational needs of the citizens of the state and visitors, and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.
Finding: Not Applicable. This proposal does not affect any parks or recreation facilities in Oregon City.

STATEWIDE PLANNING GOAL 9:
To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.
Finding: Complies as Proposed. The adoption of these standards will allow the City to approve new development in the area that contributes to economic vitality.

STATEWIDE PLANNING Goal 10:
To provide for the housing needs of citizens of the state.
Finding: Complies as Proposed. This proposal allows for greater housing opportunities by allowing potential new development in residential areas such as the Beavercreek Concept Plan Area to meet transportation requirements.

STATEWIDE PLANNING GOAL 11:
To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.
Finding: Complies as Proposed. This goal is implemented through the applicable Goals and Policies in Section 11 of the Oregon City Comprehensive Plan: Public Facilities. As stated in Section 11, the transportation infrastructure in Oregon City is governed by the Oregon City Transportation System Plan (Oregon City TSP). The relevant Public Facilities goals and policies and findings are discussed in greater detail above. The proposal includes upgrades to public facilities that balances costs, environmental impacts, livability, safety, and traffic congestion.

STATEWIDE PLANNING GOAL 12:
To provide and encourage a safe, convenient and economic transportation system.
Finding: Complies as Proposed. This goal is implemented at the local level through the applicable Goals and Policies in the updated TSP, Section 2 (The Vision). This goal is also implemented at the state level

through the Transportation Planning Rule (TPR), OAR 660-012. The proposal will result in fewer crashes and will increase the capacity of the intersection.

STATEWIDE PLANNING GOAL 13: To conserve energy.
Land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles.
Finding: Complies as Proposed. This goal is implemented through the applicable Goals and Policies in Section 13 of the Oregon City Comprehensive Plan: Energy Conservation. The multimodal transportation system and improvements proposed will support efficient use of land and encourage walking and biking by providing a cohesive transportation system for a variety of modes.

Oregon Transportation Plan (2006)

The Oregon Transportation Plan (OTP) is the state's long-range multimodal transportation plan. The OTP is the overarching policy document among a series of plans that together form the state transportation system plan (TSP). A TSP must be consistent with applicable OTP goals and policies. Findings of compatibility will be part of the basis for TSP approval. The most pertinent OTP goals and policies for city transportation system planning are provided below.
POLICY 1.2 – Equity, Efficiency and Travel Choices
It is the policy of the State of Oregon to promote a transportation system with multiple travel choices that are easy to use, reliable, cost-effective and accessible to all potential users, including the transportation disadvantaged.
POLICY 4.1 - Environmentally Responsible Transportation System
It is the policy of the State of Oregon to provide a transportation system that is environmentally responsible and encourages conservation and protection of natural resources.
POLICY 5.1 – Safety
It is the policy of the State of Oregon to continually improve the safety and security of all modes and transportation facilities for system users including operators, passengers, pedestrians, recipients of goods and services, and property owners.
POLICY 7.1 – A Coordinated Transportation System
It is the policy of the State of Oregon to work collaboratively with other jurisdictions and agencies with the objective of removing barriers so the transportation system can function as one system.
POLICY 7.3 – Public Involvement and Consultation
It is the policy of the State of Oregon to involve Oregonians to the fullest practical extent in transportation planning and implementation in order to deliver a transportation system that meets the diverse needs of the state.
POLICY 7.4 – Environmental Justice
It is the policy of the State of Oregon to provide all Oregonians, regardless of race, culture or income, equal access to transportation decision-making so all Oregonians may fairly share in benefits and burdens and enjoy the same degree of protection from disproportionate adverse impacts.
Finding: Complies as Proposed. The City's Transportation System Plan has been found to be in compliance with the Oregon Transportation Plan. The proposed amendments to the TSP address equity, efficiency, choice, environmental issues and safety. The proposal was developed with Advisory Groups including multiple ODOT staff. The proposal will go before the Oregon Transportation Commission for final approval.

Oregon Highway Plan
The 1999 Oregon Highway Plan (OHP) establishes policies and investment strategies for Oregon's state highway system over a 20-year period and refines the goals and policies found in the OTP. Policies in the

OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems. The policies applicable to the Oregon City TSP are addressed below.
Policy 1A (Highway Classification) defines the function of state highways to serve different types of traffic that should be incorporated into and specified through IAMPs.
Policy 1C (State Highway Freight System) states the need to balance the movement of goods and services with other uses.
Policy 1B (Land Use and Transportation) recognizes the need for coordination between state and local jurisdictions.
Policy 1F (Highway Mobility Standards) sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system by identifying necessary improvements that would allow the interchange to function in a manner consistent with OHP mobility standards.
Policy 1G (Major Improvements) requires maintaining performance and improving safety by improving efficiency and management before adding capacity. ODOT works with regional and local governments to address highway performance and safety.
Policy 2F (Traffic Safety) improves the safety of the highway system.
Finding: Complies as Proposed. The OHP Policy 1F establishes mobility targets (as defined by motorized vehicle volume-to-capacity ratios) for state facilities that vary by region, facility classification, and whether or not the roadway is located inside an urban growth boundary (UGB). It states, "It is the policy of the State of Oregon to maintain acceptable and reliable levels of mobility on the state highway system, consistent with expectation for each facility type, location and functional objectives. Highway mobility targets will be the initial tool to identify deficiencies and consider solutions for vehicular mobility on the state system.

Specifically, mobility targets shall be used for:
• Identifying state highway mobility performance expectations for planning and plan implementation;
• Evaluating the impacts on state highways of amendments to transportation plans, acknowledged comprehensive plans and land use regulations pursuant to the Transportation Planning Rule (OAR 660-12-0060); and
• Guiding operations decisions such as managing access and traffic control systems to maintain acceptable highway performance."

The OHP Policy 1F allows for development of alternative mobility targets in areas where it is "infeasible or impractical to meet the mobility targets". The policy allows for the use of alternative mobility targets to "balance overall transportation system efficiency with multiple objectives of the area being addressed." It requires that targets "shall be clear and objective and shall provide standardized procedures to ensure consistent application of the selected measure. The alternative mobility target(s) shall be adopted by the Oregon Transportation Commission as an amendment to the OHP." The OHP currently includes alternative mobility targets in many locations throughout the State; however, none have been adopted within the Portland Metro area to date.

The proposal maintains freight mobility, which peaks during midday and will not be affected by the allowance of higher levels of congestion in the AM and PM peak hours.

OAR 660 Division 12 Transportation Planning Rule (TPR)

The purpose of the TPR is "to implement Statewide Planning Goal 12 (Transportation) and promote the development of safe, convenient and economic transportation systems that are designed to reduce reliance on the automobile so that the air pollution, traffic and other livability problems faced by urban areas in other parts of the country might be avoided." A major purpose of the Transportation Planning Rule (TPR) is to promote more careful coordination of land use and transportation planning, to ensure that planned land uses are supported by and consistent with planned transportation facilities and improvements.

Finding: Complies as Proposed. Mobility targets for state highways, as established in this policy or as otherwise adopted by the Oregon Transportation Commission (OTC) as alternative mobility targets, are considered the highway system performance standards in compliance with the Transportation Planning Rule (TPR) (OAR 660-012), including applicability for actions that fall under Section -0060 of the TPR. The TPR Section -0060 applies when cities or counties are considering zone changes or plan amendments that would allow for additional development that would significantly impact or worsen the performance of existing or planned transportation facilities. Currently, significant impacts are found to exist when levels of automobile traffic cause roadway facilities to exceed motorized vehicle standards, such as mobility targets. If there is a significant impact, jurisdictions are required to "ensure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted Transportation System Plan."

Regional Transportation Plan

The Regional Transportation Functional Plan (RTFP) directs how Oregon City should implement the RTP through the TSP and other land use regulations. The RTFP codifies existing and new requirements which local plans must comply with to be consistent with the RTP. If a TSP is consistent with the RTFP, Metro will find it to be consistent with the RTP.

Finding: Complies as Proposed. The RTP includes a project in the area for Southbound OR 213 Advanced Warning System. This project is retained in the existing proposal. The RTP also includes a project for Redland Road improvements, which will also be retained.

CHAPTER 17.50 ADMINISTRATION AND PROCEDURES

17.50.030 Summary of the City's Decision-Making Processes.

Finding: Complies as Proposed. The proposed Legislative application is being reviewed pursuant to the Type IV process. Notice was posted, online and mailed to all property owners in the City and UGB and posted in the paper.

17.50.050 Preapplication Conference

A. Preapplication Conference. Prior to submitting an application for any form of permit, the applicant shall schedule and attend a preapplication conference with City staff to discuss the proposal. To schedule a preapplication conference, the applicant shall contact the Planning Division, submit the required materials, and pay the appropriate conference fee. At a minimum, an applicant should submit a short narrative describing the proposal and a proposed site plan, drawn to a scale acceptable to the City, which identifies the proposed land uses, traffic circulation, and public rights-of-way and all other required plans. The purpose of the preapplication conference is to provide an opportunity for staff to provide the applicant with information on the likely impacts, limitations, requirements, approval standards, fees and other information that may affect the proposal. The Planning Division shall provide the applicant(s) with the identity and contact persons for all affected neighborhood associations as well as a written summary of the preapplication conference. Notwithstanding any representations by City staff at a preapplication conference, staff is not authorized to waive any requirements of this code, and

any omission or failure by staff to recite to an applicant all relevant applicable land use requirements shall not constitute a waiver by the City of any standard or requirement.
B.A preapplication conference shall be valid for a period of six months from the date it is held. If no application is filed within six months of the conference or meeting, the applicant must schedule and attend another conference before the city will accept a permit application. The community development director may waive the preapplication requirement if, in the Director's opinion, the development does not warrant this step. In no case shall a preapplication conference be valid for more than one year.
Finding: Complies as Proposed. On June 28, 2017, a pre-application conference was held. The application was filed with the City within six months of the pre-application conference. These criteria are met.

17.50.055 Neighborhood Association Meeting
Finding: Complies as Proposed. The applicant held neighborhood meetings with all neighborhoods bordering the HWY 213 intersections involved in the proposal, including Caufield, Gaffney Lane, Park Place, and Hillendale. The meeting notes are included in application materials. This standard has been met.

17.50.060 Application Requirements.
Finding: Complies as Proposed. All application materials required are submitted with this narrative.

17.50.070 Completeness Review and 120-day Rule.
Finding: Complies as Proposed. This land use application was submitted on December 15, 2017. The application was deemed complete on December 16, 2017.

17.50.080 Complete Application--Required Information.
Finding: Complies as Proposed. This land use application was submitted on December 15, 2017. The application was deemed incomplete on July 20, 2017.

17.50.090 Public Notices.
Finding: Complies as Proposed. Staff provided public notice citywide and in the Urban Growth Boundary via mail, posted on the Oregon City website and in a general circulation newspaper. Staff provided email transmittal or the application and notice to affected agencies, and to all Neighborhood Associations requesting comment.

17.50.100 Notice Posting Requirements.
Finding: Complies as Proposed. No signs were posted as there is no specific property involved for this proposed Legislative amendment.

RECOMMENDATION
Based on the findings identified above, the proposal to amend the mobility standards in Chapter 12.04 and revise the TSP Project list appears to comply with the review criteria. Staff recommends approval of Planning file L 17-03.

EXHIBITS
1) Issues Matrix
2) Alternate Mobility Targets Final Report and Appendices
3) Proposed code amendments
4) Proposed TSP Project List amendments
5) Proposed TSP Project List Map

6) Existing TSP/RTP Map of Newell Creek/Holly Lane Shared Use Path

Planning Commission Issues for February 26, 2018 Hearing

L 17-03 Alternate Mobility Targets

Issue	Description	Specific Concerns	Explanation or Proposed Change
1.	Half Diamond and Displaced Left turn projects	Clarify why the half diamond and the displaced left turn ideas were not brought forward	The half diamond project did have a significant improvement to capacity, however, the impacts to private property, natural resources, bicycle and pedestrian movement are high. The cost of that project is also very high. Alternative #3 (Southbound Displaced Left) provides nearly the same capacity as a full interchange, at a fraction of the costs. However, the following issues kept the CAG and TAG from recommending it: • This concept is new to ODOT and is not well-tested in Oregon. This creates uncertainty at ODOT when a new concept is proposed. A new type of facility that drivers are not accustomed to creates a risk of driver confusion. • ODOT is concerned with the close spacing of the signals. • Storage at the left-turn signal would likely require significant widening & earthwork, impacting the geologic hazard area and natural resource overlay district (NROD) significantly. It would also require significant acquisition of private property. • The pedestrian crossing distance, already long, would be increased. Staff believes that as these types of facilities become more common and are built in more areas this could be a viable long term option for the intersection. Please refer to item #7 in this matrix for a discussion of how this idea can be further investigated in the long term.
2.	ADA requirements	How is the project meeting ADA requirements?	Any new project would be built to current ADA standards. This was not explicitly noted in the report, but is understood and a requirement for any new construction or modifications to existing infrastructure. As an example, in order to construct the Meyers Road Extension and add the 4th leg to the intersection the City is required to update the entire signal (including pedestrian push buttons) & all the pedestrian ADA ramps to current standards.

Issue	Description	Specific Concerns	Explanation or Proposed Change
3.	1993 agreement for interchange	In 1993 the City, County, and ODOT signed a Memorandum of Understanding that agreed on an at-grade intersection and a future grade separated interchange. What happened to this agreement?	It appears that the County requested a change to the agreement that the City commit to denying new development at the intersection if traffic analysis demonstrates that the intersection will not operate at Level of Service D or better or if the development will impede implementation of or substantially increase cost of grade-separated interchange improvements. The City had concerns over this request and rescinded its approval of the agreement according to meeting minutes from May 19, 1993.[1] There is no evidence of a replacement agreement or a re-negotiation in the months and years following this decision. The City went through a TSP update in 2001 and identified an intersection expansion project that included exclusive right turn lanes, signal modification, and expansion of left turn lanes. The project cost was estimated at $5.45M with $2.5M to come from a City match through urban renewal funds. That project was built in 2004 with a combination of funds, including urban renewal funds.[2] The 2001 TSP also referred to the grade-separated interchange idea, and included a long term project for a single point diamond interchange. This 2001 TSP identified the interchange project cost as $20M, and noted that $5M would come from the City and $15M would come from ODOT/Metro. The two aforementioned projects were based on the Highway 213 Corridor Study completed in 2000.[3] The Advisory groups who participated in this project recommended the at-grade intersection expansion that became a 2001 TSP project. The Corridor Study notes that the expansion would provide capacity

[1] See document in record entitled 1993-05-19 City Commission Minutes

[2] See document in record entitles HWY 213 improvements before and after images

[3] See document in record entitled HWY 213 Corridor Study, 2000

Issue	Description	Specific Concerns	Explanation or Proposed Change
			through 2015, and the City would have to consider changes, such as the grade separated interchange, at that time. The study also indicated that other system connections may preclude the need for this interchange. When the City updated its TSP in 2013, the interchange project was eliminated from the project list due to livability, multi-modal access and funding constraints within the 2035 planning horizon. The TSP instead called for alternative mobility targets for this intersection, and said the interchange project should be reconsidered beyond the 2035 planning horizon if targets cannot be met.
4.	Newell Creek fish passage	• Stormwater outflows into culvert under HWY 213 that is connected to Newell Creek • Could the culvert and drainage be improved to allow fish passage?	The photo provided at the January 22nd hearing is older, and ODOT has since upgraded the stormwater infrastructure in the area.[4] They recently completed work to stop erosion under the retaining wall and in the outfall area, including additions of rip rap to the area and filling in under the retaining wall with concrete. Staff reviewed the Greater Oregon City Watershed Council Assessment and Action Plans for information on fish presence in Newell Creek. Fish are present in the lower and middle reaches of the creek, including juvenile coho, juvenile steelhead, trout, and lamprey. It is not clear if fish passage currently occurs at the culvert due to natural topography of the creek leading to the area, and lamprey are more likely to be able to pass than other fish species. The GOCWC's action plan does not include any specific fish passage improvements for Newell Creek.[5] Regardless of the proposed code changes to Chapter 12.04 and the TSP project

[4] See item in record titled ODOT Stormwater improvements images

[5] See item in record titled GOCWC Watershed Action Plan

Issue	Description	Specific Concerns	Explanation or Proposed Change
			amendments, the Natural Resource Overlay District will adequately protect designated riparian areas. Addition of new impervious area within the NROD is expected to be necessary for the proposed right turn lane project, and this project will be required to undergo review per Chapter 17.49 of the Oregon City Municipal code. Mitigation will be required for any new impervious surface added. It is not expected that changes to the culvert will be required by City code. New stream crossings are required to be by bridge or bottomless culvert; upgrade to existing stream crossings are not likely to be required, but may be proposed by ODOT as part of an improvement project.
5.	Bike routes	• Are the planned bike routes in the area still a possibility? • Would like to see a separated bike route to the high school along the south side of Beavercreek Road • There is a shared use path planned parallel to HWY 213 that could provide a bike route all the way to Washington Street area	• No changes to planned bike and trail TSP projects are proposed, other than the addition of a shared use path project explained below. Wayfinding signage and bike lane improvements on Beavercreek Rd are proposed as part of TSP project W84. All existing bike lanes and paths in the TSP will be retained. • The current plan for Beavercreek Rd includes bike lanes and sidewalks all the way south past the high school. As properties along Beavercreek Road redevelop, city staff will work with developers on the design details for the street improvements. Through the land use process, staff has the ability to modify the design of street improvements, and could potentially include a separated bike path instead of a bike lane on-street. This modification is a Type II process through Chapter 12.04.007. • The planned shared use path that parallels HWY 213 is a project in the Regional Transportation Plan (Project # 10147 Newell Creek Canyon/Holly Lane Shared-Use Path) and is in the City's trails master plan. The full path is not currently on the City's TSP project list; project #S12 covers a portion of the trail near Ogden Middle School. Metro has acquired properties within this corridor for future development of the trail. • Staff has added a revision to the # S13 shared use path project to the TSP project list proposed amendments in an effort to bring consistency to the

Issue	Description	Specific Concerns	Explanation or Proposed Change
			city's trail and transportation plans, and reflect regional plans. See revised TSP project list for project #S13.
6.	Trimet service	Why can't we improve transit service in the area or connect light rail down here?	Currently TriMet line 32 uses the Hwy 213 & Beavercreek intersection. They use the Beavercreek EB to 213 SB & 213 NB to Beavercreek WB movements. Neither of those movements are ones that see the heavy movements and delays. The TriMet Southeast Service Enhancement Plan provides a vision for the future of transit in the southeast portion of TriMet's transit district. The plan identifies the area along Beavercreek Road (and areas of south Oregon City) as part of a new community/job connector service in the neighborhoods in South Oregon City. The community/job connectors are identified to serve areas that would be uneconomical with full-fledged TriMet service. This vision recommends community/jobs connector service in places where the businesses and/or homes are so scattered or are located on so much land that there aren't enough people within walking distance of bus stops to cost-effectively provide traditional fixed route bus service. In some instances there aren't enough roadway connections to allow people to walk to and from bus stops safely. The Clackamas Industrial Area, generally between Highway 212 and Sunnyside, and South Oregon City are candidates for community/jobs connector service in the Southeast. The Beavercreek Road Concept Plan mentions that transit-oriented land uses have been strategically located to increase the feasibility of transit service in the future. In order for any transit service to be successful, the area would need to develop at appropriate densities to warrant service. The City may consider a future request that TriMet consider re-routing an existing line onto Meyers and Beavercreek Road once the Meyers Road extension is constructed and development begins to occur in the area.

Issue	Description	Specific Concerns	Explanation or Proposed Change
7.	Option to retain full interchange project	How can we ensure that the larger improvement project ideas are not lost and remain future possibilities?	The City is required to update its Transportation System Plan every 10 years. During the next TSP update, the City will study the HWY 213/Beavercreek Road intersection to determine if it will operate within the standards through 2045. If operations are shown to be above the adopted standard, the City will need to consider these larger improvement projects to improve capacity. Staff advises against adding a project at this time when models show that the City can meet the 1.0 v/c standard through 2035 without a large project. If the City were to add a larger improvement project to the current TSP, it would have to also add the project to the SDC list, which would further raise already high Transportation SDC rates. Alternative #3 (Southbound Displaced Left) provides nearly the same capacity as a full interchange, at a fraction of the costs. Other solutions analyzed through this process may also be viable projects in the future, such as the triple left turn alternative.
8.	V/C Ratio	• What does v/c 1.0 feel like? • Aren't we just going to exceed the standard in a few years and be back where we started?	The v/c ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available and vehicles are not expected to experience significant queues and delays. As the v/c ratio approaches 1.0, traffic flow increases, and delay and queuing conditions may occur. Once the demand exceeds the capacity (a v/c ratio greater than 1.0), delay and queuing is expected. Under these conditions, vehicles may require more than one signal cycle to pass through the intersection (known as a cycle failure). For design purposes, a v/c ratio between 0.85 and 0.95 generally is used for the peak hour of the horizon year (generally 20 years out). Overdesigning for an intersection should be avoided due to negative impacts to pedestrians associated with wider street crossings, the potential for speeding,

Issue	Description	Specific Concerns	Explanation or Proposed Change
			land use impacts, and cost. Models show that we will stay within the standard through 2035.
9.	Freight impact	Will accepting higher congestion at this intersection hurt freight movement?	Peak freight movement occurs between 9AM and 3PM. The intersection operations are acceptable during these hours. The proposal to change the mobility standard only applies to peak hour (3-6PM) travel.
10.	Funding constraints	• Why can't ODOT or the County fund these improvements? • The City should demand that ODOT help with costs and should build the full interchange improvement as soon as possible.	The larger transportation bill at the state level is looking at I-205, I-5, Highway 217 and larger projects in the Portland region, where congestion affects a larger portion of the day and impacts freight movement more significantly. State priorities include Highway 217 widening, Cornelius Pass widening, completing the Sunrise Corridor project and upgrading the I-205 Abernethy Bridge. Hwy 213 is not a priority compared to these projects. Clackamas County priorities are focused solely on maintenance. The City is committed to nominating both the Redland project and the Beavercreek project for inclusion in a potential regional bond measure that is being considered. Local funds that can be used to fund City transportation projects include System Development Charges (SDCs) and gas taxes. SDCs are paid by new development and they apply to all development, even in enterprise zone areas. SDCs can only be reduced if a developers build improvement projects themselves that would otherwise be funded by SDCs. Fees could be collected from city residents via utility bills, in a similar fashion to the pavement maintenance fee. When sewer capacity upgrades were necessary, the City raised sewer rates citywide in order to afford the upgrades. The City also analyzed what a local bond measure would mean if city

Issue	Description	Specific Concerns	Explanation or Proposed Change
			residents voted to pay for a $10M project here – Each household would be assessed an average of $769. A $50M project would mean an assessment of almost $4,000 per household. No new fees or bond measures are proposed at this time. In a separate process in spring 2018, the City Commission will be considering SDC rate changes based on the new project list.
11.	Seaside, OR example	The City of Seaside adopted alternate mobility standards recently and we should learn from their experience	Staff reviewed the information about the Seaside Alternate Mobility Standards provided by Paul Edgar, and confirmed with the City of Seaside that the mobility standards are approved and officially adopted. The Oregon Transportation Commission approved a 1.0 mobility standard for four intersections along Highway 101, based on average annual conditions. The number of hours the new standard applies varies for each intersection with the maximum being 3 hours (from 3 to 6PM) for the intersection of US101 and Broadway. The standards used in Seaside, as approved by the Oregon Transportation Commission, are the same or very similar to what is being proposed for Highway 213 in Oregon City. Seaside similarly adopted transportation projects to enhance bicycle and pedestrian connectivity and safety in the area. They also invested in parallel local routes and made agreements with ODOT regarding pursuit of funding for bike, ped, and local street improvements.

scheduling, the Budget Committee meeting scheduled for Monday, May 24, 1993 will be canceled in favor of the Volunteer Appreciation Dinner also scheduled for that evening. Also attached was an agenda that is proposed to be followed for each meeting.

It was recommended that the Commission appoint the City Manager as Budget Officer for fiscal year 1993-94.

It was moved by Light, second by Ebert, to appoint the City Manager as Budget Officer for fiscal year 1993-94.

Roll call: Powell, Aye; VanOrman, Aye; Ebert, Aye; Light, Aye; Fowler, Aye.

Light requested that a resolution expressing City Commission opposition to the Jennings Lodge/Candy Lane withdrawal from the Oregon City School District be presented on a future agenda. Presentation approved by Commission consensus.

Fowler requested an Attorney General's opinion regarding the OCA ballot measure and to what extent the City Commission authority extends regarding this matter.

With no further business, the meeting adjourned with the Commission meeting in Executive Session pursuant to ORS 192.660 (1)(e) Real Property Transactions.

CHARLES LEESON, Recording Secretary

REGULAR MEETING Oregon City, Oregon, May 19, 1993

A regular meeting of the City Commission was held in the Commission Chambers of City Hall on the above date at 8:00 p.m.

Roll call showed the following present:

Mayor Daniel W. Fowler
Commissioner Suzanne VanOrman
Commissioner Robert M. Light
Commissioner James R. Ebert

Charles Leeson, City Manager
Edward J. Sullivan, City Attorney

The flag salute was lead by Mayor Fowler, after which he called for approval of the minutes. It was moved by VanOrman, second by Ebert, to approve the Special Meeting minutes of March 31, 1993. Approved unanimously.

On the call for citizen presentations and future agenda items, Bill Green, addressed the Commission regarding the proposed street of dreams in Newell Creek Canyon. He distributed a handout for Commission review. He advised the Commission on the cost of copies of City Codes and Comprehensive Plans in the following cities: Hillsboro, Comprehensive Plan is free and the

Municipal Code is $8.00; Wilsonville, $7.50 each for a total of $15.00; Milwaukie, $11.00 , City Code $5.00 (with a cover add $4.00 more); Lake Oswego, both for $25.00; Beaverton, $10.00 and $15.00; Tualatin, both for $50.00; West Linn, $25.00 and $30.00 or free specific pages if requested); Forest Grove, $95.00 and $11.00; Clackamas County, $45.00 for the Comprehensive Plan, $80.00 for Code; and, Oregon City, Comprehensive Plan is being revised and not available for another 6 months, City Code, $150.00 and photocopying is $.50 per page. Oregon City has copies of the City Code at the Library. He then asked why the high cost.

VanOrman noted that the $.50 per page photocopying has been in effect for years, and the Comprehensive Plan is in short supply. This was referred to staff for response.

An unidentified male addressed the Commission for the purpose of apologizing for prior testimony in which he came across as being sarcastic.

Denyse McGriff, Principal Planner, addressed the Commission on behalf of a citizen who was not able to be here. She was representing Darlene Trevino, one of the owners of The Heritage Coffee Shop, 212 7th Street, who was requesting to have two tables outside the restaurant, on public right-of-way on 7th Street.

The City Attorney advised that if the Commission were to allow right-of-way to be used, which right-of-way must be specified. Fowler noted assuming it to be directly in front of the business. He also noted this may not be the last request from the businesses and maybe the Commission should look at criteria that would allow staff approval. VanOrman then questioned why matters such as this and service of alcoholic beverages in City parks is brought before the Commission. The Attorney responded that the ordinance requires Commission approval. Fowler suggested setting criteria for the park issue and the use of public sidewalk right-of-way be brought back for Commission approval.

Commission Report No. 93-109, Authorization to Publish Notice of Intent to Issue Sewer Revenue Bonds - Resolution No. 93-34, was presented by the Manager. The report noted that added to the May 19, 1993 agenda was proposed Resolution No. 93-34 which requests authorization to publish Notice of Intent to Issue Sewer Revenue Bonds. There is need to publish this notice at the earliest possible time to meet an August 1 sale date.

The report continued by noting that the purpose for issuance of the sewer bonds is to finance the cost of reconstruction for sewer separation mandated by the Environmental Protection Agency as a condition of the grant used to build the Tri-City Sewer Plant. The current interest rate on financing through Tri-City Service District is 6.9 percent. The bond issue would be at approximately 5 percent interest which computes to a savings of about $90,000 in the first year.

Based upon the information above, it was recommended that Resolution No. 93-34 be adopted. Following adoption, the resolution will be published pursuant to ORS Chapter 288.

Scott Harper, Finance Officer, reiterated the information in the Commission Report.

It was moved by Ebert, second by Light, to adopt Resolution No. 93-34.

Roll call: VanOrman, Aye; Light, Aye; Ebert, Aye; Fowler, Aye.

RESOLUTION NO. 93-34

A RESOLUTION AUTHORIZING THE ISSUANCE OF SEWER REVENUE BONDS AND DIRECTING THE PUBLISHING OF A NOTICE OF INTENT TO ISSUE REVENUE BONDS.

WHEREAS, the City of Oregon City, Oregon (the "Issuer") plans to construct certain additions and improvements to the Issuer's sewer system (the "Facilities"); and

WHEREAS, the additions and improvements to the Facilities will cost an estimated $6,000,000 and the Issuer intends to issue bonds to finance the cost of the additions and improvements to the Facilities; and

WHEREAS, the Issuer finds it desirable to issue sewer revenue bonds (the "Bonds") in an amount not to exceed $6,000,000 to finance the cost of the additions and improvements to the Facilities pursuant to Oregon Revised Statutes 288.805 to 288.945, inclusive (the "Uniform Revenue Bond Act"), and to pledge for payment of the Bonds the unobligated net revenues of the Issuer's sewer system, being a revenue producing facility providing services related to the services to be financed by the Bonds.

NOW, THEREFORE, BE IT RESOLVED by the City Commission of the City of Oregon City, Oregon:

Section 1. The Issuer hereby authorizes the issuance of the Bonds in a principal amount not to exceed $6,000,000 for the purpose of financing the cost of construction of the additions and improvements to the Facilities and paying for engineering fees, attorney fees and other related costs.

Section 2. The Bonds shall not be general obligations of the Issuer or a charge upon the tax revenues of the Issuer. The unobligated net revenues of the Issuer's sewer system are hereby pledged to the payment of the principal of and interest on Bonds, after payment of the ordinary operation and maintenance expenses of the sewer system from the gross revenues thereof. So long as the Bonds are outstanding, the Issuer shall fix rates and collect charges for sewer services adequate to provide sufficient revenues to pay, in addition to all other expenses and obligated indebtedness, principal of and interest on the Bonds.

Section 3. The Issuer hereby designates the Bonds for purposes of paragraph (3) of Section 265(b) of the Internal Revenue Code of 1986, as amended, (the "Code") as "qualified tax-exempt obligations" and covenants that the Bonds do not constitute private activity bonds as defined in Section 141 of the Code, and that not more than $10,000,000 aggregate principal amount of obligations, the interest on which is excludable under Section 103(a) of the Code from gross income for federal income for tax purposes (excluding, however, private activity bonds other than qualified 501(c)(3) bonds) including the Bonds, have been or shall be issued by the Issuer, including all subordinate entities of the Issuer, if any, during the calendar year 1993.

Section 4. The Finance Officer is authorized and directed to publish a Notice of Intent to Issue Bonds describing the purposes for which the Bonds are to be sold, in the form attached hereto as Exhibit A, in one issue of THE REVIEW, a newspaper of general circulation within the geographical boundaries of the Issuer. In addition, the Finance Officer shall cause the Notice of Intent to Issue Bonds to be given in the same manner as are other public notices of the Issuer. The Bonds may not be sold at public competitive bid, nor shall a purchase agreement be executed for a private negotiated sale, for at least 60 days following publication of the Notice of Intent to Issue Bonds.

Section 5. Voters residing within the geographical boundaries of the Issuer may file a petition with the Issuer asking to have the question of whether to issue the Bonds referred to a vote. If the Issuer receives petitions containing valid signatures of the Issuer's electors totaling not less than five percent (5%) of the Issuer's electors, the question of issuing the Bonds shall be placed on the ballot at the next legally available election date. In the event the Issuer receives such a petition within 60 days from publication of the Notice of Intent to Issue Bonds, the Bonds shall not be sold until this Resolution is approved by a majority of the electors of the Issuer voting on this Resolution.

Section 6. The Bonds may be sold at a private negotiated sale in accordance with the Uniform Revenue Bond Act and Seattle-Northwest Securities Corporation is hereby designated to serve as underwriter in connection with the issuance of the Bonds.

Section 7. Rankin Mersereau & Shannon is hereby designated to serve as bond counsel in connection with the issuance of the Bonds.

Adopted, signed and approved this 19th day of May, 1993.

/s/Daniel W. Fowler
Mayor

/w/James R. Ebert
Commissioner

/s/Suzanne VanOrman
Commissioner

_____
Commissioner

/s/Robert M. Light
Commissioner

Comprising the City Commission
of Oregon City, Oregon

Request for continuance of Ordinance No. 93-1007, An Ordinance Amending the Natural Resources Element of the Comprehensive Plan to Add a New Section on Water Resources; and, request for continuance of Ordinance No. 93-1008, An Ordinance Amending Title 17: Zoning, Chapter 17.06.020 Classification of Zoning Districts, and Adding a New Chapter 49, of the Oregon City Municipal Code, 1991, was presented. At the March 31, 1993 meeting, the City Commission reviewed two proposals to adopt planning and zoning regulations for Water Resources. The Commission continued the request to allow for additional information to be obtained relating to the quality and quantity of the Water Resources. The City has entered into a contract with a consulting firm to assist in completing the work. A continuance for a period of 45 days to allow for staff and consultant to complete the work is requested.

It was moved by Ebert, second by Light, to continue this to the June 30, 1993, Special Meeting.

Roll call: VanOrman, Aye; Light, Aye; Ebert, Aye; Fowler, Aye.

Commission Report No. 93-96, Proposed Ordinance No. 93-1010, An Ordinance Deleting Title 13: Public Services, Chapter 12: Storm Drainage System, of the Oregon City Municipal Code, 1991, and Declaring an Emergency, was presented by the Manager. The report noted that at its July 17, 1991 meeting, the City Commission adopted Ordinance No. 91-1021 which added Chapter 13.20 and replaced a number of Municipal Code chapters that established a system development charge for individual public facilities. Ordinance No. 91-1021 did not specifically delete Chapter 13.12.

The report continued that on the May 19, 1993 agenda was proposed Ordinance No. 93-1010 which would delete Chapter 13.12 of the Municipal Code. This was presented as part of the continuing "housekeeping" of the Code.

Notice of proposed Ordinance No. 93-1010 was posted at City Hall, Courthouse and Senior Center by direction of the City Recorder. An emergency clause was included with the ordinance because Chapter 13.12 creates a conflict with Chapter 13.20; therefore, it was recommended that first and second readings be approved unanimously for enactment of the ordinance to become effective immediately.

It was moved by VanOrman, second by Ebert, to approve first reading of proposed Ordinance No. 93-1010.

Roll call: Light, Aye; Ebert, Aye; VanOrman, Aye; Fowler, Aye.

Second reading was called after which it was moved by VanOrman, second by Ebert, to approve second reading for final enactment to become effective immediately.

Roll call: Light, Aye; Ebert, Aye; VanOrman, Aye; Fowler, Aye.

Commission Report No. 93-101, Mausoleum Design Services Contract, was presented by the Manager. The report noted that at its April 21, 1993 meeting, the City Commission approved the recommendation for the City Manager to negotiate the terms of the contract with Milne Registered Engineers and to re-submit the signed agreement for the Commission to review and give final approval.

The report continued that the contract was attached and provided the City design services for the construction of the new Mausoleum structures. A lump sum amount of $25,500 was negotiated to perform those services identified in the contract to construct a structure totalling approximately $500,000. Based upon the information presented, it was recommended that the City Manager be authorized to sign the agreement.

VanOrman asked if the City Attorney was comfortable with the contract. He responded affirmatively.

It was moved by Light, second by VanOrman, to approve the agreement and authorize the City Manager to execute.

Roll call: Ebert, Aye; VanOrman, Aye; Light, Aye; Fowler, Aye.

Commission Report No. 93-102, City Commission Policy 1-16 - Development Reimbursement Agreements, was presented by the Manager. The report noted that during the 1993-94 budget preparation, it came to the attention of the Manager that the City needed a uniform policy to guide development construction cost-sharing because such a policy was occasionally desirable/necessary, and was a budgetable item. An established policy would provide assurance that developers were treated fairly and uniformly and would maintain the interests of the City in the areas of public safety, fiscal responsibility and consistency with long-term planning.

Attached was proposed Policy 1-16 for Commission review. It was recommended that Policy 1-16 be accepted and authorize inclusion in the City Policy Manual.

The Manager presented the report and explained that in dealing with persons who do business in Oregon City there is the position of negotiating things the City will and will not do. This is an attempt to specifically identify how the City can do certain things. This is not the answer to everything that can be done but this is the first step. It shows participation and partnership on the part of the City. This will be monitored with changes made as necessary.

It was moved by Ebert, second by VanOrman, to adopt Commission Policy 1-16 to be included in the City Policy Manual.

Roll call: Light, Aye; VanOrman, Aye; Ebert, Aye; Fowler, Aye.

Commission Report No. 93-105, Recommendation from Metro Enhancement Committee, was presented by the Manager. The report noted that on the May 19, 1993 agenda were two recommendations from the Oregon City Metro Enhancement Committee.

The report continued that at the May 6, 1993 meeting, the Metro Enhancement Committee reviewed two requests for funds, i.e. Straight Cemetery Restoration and Kelly Field/EOT Site Improvements.

The first request was for restoration of Straight Pioneer Cemetery monuments in the amount of $3,345. Kathy Wheeler and Lori Garcia, Park Place residents, were the project sponsors. The project would involve the placement of markers and monuments on graves at the cemetery. The Enhancement Committee voted to allocate $3,345 for the restoration project.

The second request was for the End of the Trail/Abernethy Green site improvements. This project was sponsored by the End of the Trail Foundation. The purpose of the project was to clean up the Preview Center project site prior to spring/summer activities. The Committee voted to allocate $12,000 for this project.

In addition, the Committee discussed the re-allocation of $30,000 given to the End of the Trail Foundation. The Foundation had requested and received approval of funding to purchase artifacts for the Preview Center. The Foundation asked the Committee to allow for the money to be used for staffing ($10,000). The remaining funds of $20,000 would be used for the purchase of artifacts. After a great deal of discussion, the Committee decided to allow for the one time only allocation of the $10,000 for staff to implement the projects. The Committee asked for Commission concurrence.

The report concluded that based upon the above information, it was recommended that the Commission approve the recommendation of the Oregon City Enhancement Committee for the Straight Cemetery Restoration in the amount of $3,345 and $12,000 for the Abernethy Green Site Improvements.

Light noted that one item in the application included a $4,500 hydro-seed application to the Abernethy Green site. He understood that this may be donated. Fowler responded that this is a donated project. The Committee, at the time noted that some of the items that were donated, they would allow the funds to be used so long as they were still used for the site.

VanOrman understood that the Enhancement Committee was recommending that the Commission approve the amounts of $3,345 and $12,000 for two different projects. This was affirmative.

It was moved by VanOrman, second by Ebert, to approve the two recommendations of the Enhancement Committee.

Roll call: Light, Aye; Ebert, Aye; VanOrman, Aye; Fowler, Abstain.

Fowler added that in the past weeks, the Foundation has received donations of approximately $50,000, in terms of trees, grading and hydroseeding and fencing, etc.

CONSENT AGENDA

The following items were routine and could be approved in one motion. On the call for discussion of a particular item, no discussion was requested.

With reference to Commission Report No. 93-98, 1993 Slurry Seal on Various Streets - Bid Award and Commission Report No. 93-99, 1993 Asphalt Overlay on Various Streets - Bid Award, VanOrman asked how the streets were selected for which process.

Rick McClung, Public Works Director, explained that the street are viewed to determine the condition of individual streets with that determining the process to be used. He advised that the department was going to try to do chip seal in addition to the other two process. with chip seal and slurry seal, the cost is less than overlay. Fowler asked if the department was moving toward a Pavement Management System. McClung responded affirmatively and when that is in place the computer will produce documentation on each street regarding traffic volume, when last upgrade was completed, etc.

It was moved by Light, second by Ebert, to approve the items on the Consent Agenda as recommended in the reports.

Roll call: VanOrman, Aye; Ebert, Aye; Light, Aye; Fowler, Aye.

Commission Report No. 93-100, Brendon Estates Subdivision - Construction Compliance Agreement II, was presented. The report noted that on the May 19, 1993 agenda was a Construction Compliance Agreement with the Brendon Estates Limited Partnership for Commission approval. The Compliance agreement required the Brendon Estates development to do certain on and off-site improvements and provided for City participation in the off-site improvements that benefit other property. The City storm participation would come from system development charges and reimbursement from the Glen Oak Advance Finance District.

* * * * *

Commission Report No. 93-94, Service of Alcoholic Beverages in City Parks, was presented. The report noted that at its November 21, 1990 meeting, the City Commission adopted Ordinance No. 90-1060 which states in part, the following: "...DRINKING IN PUBLIC PLACES...the City Commission may permit the service and consumption of alcoholic liquors within designated Municipal buildings and Municipal parks on such terms and conditions as the Commission provide."

On the May 19, 1993 agenda was the following request for Commission approval for the service of alcoholic liquors in Municipal parks for specific occasions: Mary Smith for Buena Vista Club House for August 20, 1993

A reservation has been submitted for the park of interest and the rental fee has been paid and a signed Indemnity Agreement submitted. It was recommended that the Commission approve the service of beer and wine and that the beverages be served in non-breakable containers only.

* * * * *

Commission Report No. 93-98, 1993 Slurry Seal on Various Streets - Bid Award, was presented. The report noted that Contained within the 1993 budget was funding for slurry seal of various streets within the City. Those streets proposed for this maintenance were depicted on a map attached for Commission review.

The report continued that on May 7, 1993, the City received and opened sealed bids for the slurry seal project. A Tabulation of the bids received was attached. Review of the bids showed that Asphalt Maintenance Associates, Inc. submitted the low bid in the amount of $32,994.81 with the bid being responsive and meeting the bid specifications. It was recommended that the low bid submitted by Asphalt Maintenance Associates, Inc. in the amount of $32,994.81 be accepted.

* * * * *

Commission Report No. 93-99, 1993 Asphalt Overlay on Various Streets - Bid Award, was presented. The report noted that contained within the 1993 budget was funding for the asphalt overlay of various streets within the City. Those streets proposed for maintenance were depicted on an attached map.

The report continued that on May 7, 1993, the City received and opened sealed bids for the asphalt overlay project. Attached was the Tabulation of the bids received. A review of the bids showed that Parker Northwest Paving Company submitted the low bid in the amount of $183,504.90 and the bid was responsive to and met the bid specifications. It was recommended that the low bid submitted by Parker Northwest Paving Company in the amount of $183,504.90 be accepted.

* * * * *

Commission Report No. 93-97, Dissolution of Funds - Resolution No. 93-31, was presented. The report noted that ORS 294.475 entitled "Elimination of unnecessary fund; disposition of balance" states as follows: "Subject to the provisions contained in the charter of any city or county or in any law relating to municipal corporations, when the necessity for maintaining any fund of the municipal corporation has ceased to exist and a balance remains in the fund, the governing body shall so declare by ordinance or other order and upon such declaration such balance shall forthwith be transferred to the general fund of the municipal corporation unless other provisions have been made in the original creation of the fund."

The report continued that on the May 19, 1993 agenda was proposed Resolution No. 93-31 which would dissolve the Brush Pickup Fund and transfer any fund balance to the General Fund with identification consistent with the purpose.

The Brush Pickup Fund was created to record tax receipts and payment of contract costs for yard debris pickup. The final payment on the contract was made in the year ended June 30, 1992.

In consultation with the Oregon Department of Revenue, three alternatives were discussed: 1) close the fund to the General Fund and budget the surplus for current usage; 2) return the excess to the

County and have them complete an offset for 1992-93; or, 3) close the fund to the General Fund and reserve the excess as a reduction of taxes to be levied in 1993-94.

The levying of Brush Pickup Funds was not capable of precise budgeting. To return the funds to the County would involve a complicated reapportionment. The balance of funds is low compared to any other use to which it could be applied. This type of incident is uncommon and both City and County costs for affecting a redistribution would be high. Therefore, closing the fund to the General Fund and budgeting the surplus for current usage is the most reasonable answer to closing the fund. The total resources of the fund in this fiscal year is expected to be $4,100. The monies will be received in the General Fund as a resource to add to the beginning fund balance for fiscal year 1993-94. It was recommended that Resolution No. 93-31 be adopted.

RESOLUTION NO. 93-31

WHEREAS, a fund known as the Brush Pickup Fund has been maintained to make payments for yard debris removal; and

WHEREAS, after the service was placed within the garbage service, a need no longer exists for the maintenance of said fund; and

WHEREAS, a surplus balance of $4,100 exists in said fund.

NOW, THEREFORE, BE IT RESOLVED by the City Commission of Oregon City that pursuant to ORS 294.475 said Brush Pickup Fund is dissolved and the proceeds thereof in the amount of $4,100 are hereby transferred to the General Fund.

Adopted, signed and approved this 19th day of May, 1993.

/s/Daniel W. Fowler
Mayor

/s/James R. Ebert
Commissioner

/s/Suzanne VanOrman
Commissioner

_____
Commissioner

/s/Robert M. Light
Commissioner

Comprising the City Commission
of Oregon City, Oregon

* * * * *

Commission Report No. 93-95, Utility Easement for Sanitary and Storm Drainage - Glen Oak Sanitary Sewer Project, was presented. The report noted that on the May 19, 1993 agenda was a Utility Easement for sanitary and storm drainage for the Glen Oak Sanitary Sewer Project. It was recommended that the easement be accepted and the Mayor and City Recorder be authorized to execute.

* * * * *

Commission Report No. 93-104, Request for Purchase of Installation and Staff Training of Metropolitan Transportation (MTC) Pavement Management System Software - Street Division - Bid Award, was presented. The report noted that contained within the 1993 Street Division of the Public

Works Department budget was funding for the installation and staff training of the Pavement Management System (PMS).

The report continued that the City received six requests for the Request for Proposal, however, only two proposals were returned to the City. The proposals were received and opened on March 26, 1993 with the following results:

Austin Research Engineering, Inc.	Option 1	$39,087
	Option 2	$33,030
Bowman & Williams		$36,530

Option 2 from Austin Research Engineering, Inc. (ARE) was the low bid but was not compatible with our previously purchased Pavement Management software.

Both AREs Option 1 and Bowman & Williams bids were responsive to and met the bid specifications. It was recommended that the bid submitted by Bowman & Williams in the amount of $36,530 be accepted.

* * * * *

Commission Report No. 93-103, Bikeway Agreement - Linn Avenue Bikeway Project, was presented. The report noted that in August 1992, application was made to the Oregon Department of Transportation, through its Bikeway Program, for grant funds to construct bikelanes on Linn Avenue, from Warner Parrott Road, north to Jackson Street. The grant for $50,000 was approved in December 1992, and required Commission approval of an intergovernmental agreement. The Commission held a work session on May 12 to discuss issues related to the project and directed staff to proceed with design.

The report continued that during grant review, State Bikeway Program personnel toured the route of the proposed bikelane project and agreed that the project would be beneficial to bicyclists and should be undertaken. The Transportation Master Plan identified Linn Avenue as a collector street which should have bike lanes. This project was not an attempt to bring Linn Avenue up to a full urban collector standard, but was intended to increase safety and capacity for bicyclists and pedestrians at a reasonable cost. The project also presents an opportunity to maximize City funds through partial State Bikeway funding.

The project would construct bikelanes (and possibly a shared roadway) on Linn Avenue. The "shared roadway" is sometimes the best solution when there is inadequate width to provide full bike lanes; it is basically a wide travel lane (typically 14 feet) which allows a motor vehicle and a bicycle to operate side-by-side. The project would need to be designed before any final decisions were made regarding bikelane versus shared roadway. When design work beings, a neighborhood meeting for properties along Linn Avenue would be held. Comments from Mt. Pleasant Elementary School (administration and PTA) were requested prior to the work session.

The project is estimated to cost $150,000 and is listed in the 5-Year Capital Improvement Program. Eighty-percent of the project cost (not to exceed $50,000) would be from the bikeway grant; the City's share would come from system development charges. Adequate funds are available for the project.

The report concluded by noting that the Bikeway Project Agreement was attached and specified State and City obligations under the approved grant. It was recommended that the Commission approve the agreement so design of the project could begin.

* * * * *

At this time, the Manager advised of two additions to the agenda. He requested discussion and action regarding the improvement of Highway 213/Beavercreek Intersection from Beavercreek Road up to and including intersection with Molalla Avenue and the Red Soils extension. The participation of financing of the project is confusing. He has identified the roles of responsibility and funding and expressed concern regarding what the City committed to do.

He requested that the Commission reconsider their February approval of an agreement between the State, the County and the City to participate in the eventual correction of the intersection of Highway 213 and Beavercreek Road. The City's participation in the agreement was that the City would restrict future land uses of some areas within the City's control. At the February meeting, the City Attorney advised that the Commission should be careful of restricting property because it amounted to the taking of property. After discussion at the February meeting, the Commission executed the agreement with it forwarded to the County and State.

He advised that the County has not yet executed the agreement and he has taken the opportunity to review the agreement and feels the City cannot afford to do what was stated. He was now asking the Commission to rescind the agreement and direct staff to re-negotiate the entire partnership and arrangement.

He noted that there was discussion at the February meeting regarding participation of Federal funds on the Abernethy realignment if the City did not sign the agreement. That should not be a factor in this decision.

The original decision was a bad decision that was recommended to the Commission and now there must be recognition of that fact and now recommends rescinding the decision.

It was moved by Light, second by Ebert, to rescind approval of the agreement and authorize staff to re-negotiate the City's partnership in the project.

Roll call: VanOrman, Aye; Light, Aye; Ebert, Aye; Fowler, Aye.

Fowler expressed hoping the City does not get involved in the right-of-way acquisition portion of the agreement because it is a County road and State highway.

At this time, Fowler advised of talking with the City Attorney regarding process procedure for the evaluation of the City Manager. The City Attorney noted that a two-step process was being considered. The forms for evaluation would be forwarded in the next packet and be discussed at the next regularly scheduled Commission meeting. Prior reviews and commitments made at that time would be reviewed. There would be need for an Executive Session to review the completed forms and to evaluate the Manager based on the same criteria that was used the last time. If the criteria were to be changed a public hearing would have to be held.

The Commission expressed comfortability with the criteria and did not feel a need for change. VanOrman asked if the last process was ever completed. The City Attorney felt that an

announcement had not been made after the process was complete. He suggested the evaluation be held at the second meeting after the Commission has a chance to review.

Fowler reiterated that the information would be in the packets with the Commission having an opportunity to review it, hold a meeting to discuss the information then fill out the forms and have a second review then announce the results at a third meeting, perhaps at the Special Meeting on June 30. This process was approved by consensus.

VanOrman announced a Trust meeting at 6:30 p.m. on June 9, 1993.

Light reminded of his earlier request for staff to review the necessity of newspaper recycling boxes in neighborhoods.

At this time, Mayor Fowler announced the appointment of Terri Powers to the Metro Enhancement Committee to represent the Planning Commission with term expiring June 30, 1994; and, appoint Thor Wegner to a vacant position on the Budget Committee through 1994.

Jack Lynch, Fire Chief, spoke calling attention to the project that is progressing in the Hillendale Park. This was the turning of an "eyesore" to an opportunity for the children in Oregon City to experience fishing blue gill and bass.

At this time, the Manager presented a videotape which outlined signage throughout the City. The project was researched and staffed by Denyse McGriff and Kate Daschel. McGriff explained that she and other employees took a tour of the City and examined where the signing is currently located and the size of the signs as they relate to the direction for tourists to see the sights in Oregon City. She presented the plan for a sign of up to 30 inches for the Main section which listed a number of places for tourists to visit. She noted feeling that the signage used by the City of Salem was clear and understandable.

Rick McClung, Public Works Director, spoke noting that two sign designs were being planned, one with the McLoughlin House and one with a covered wagon. VanOrman asked why the current pioneer sign could not be used. McGriff explained that sign was too detailed with the need for simplicity.

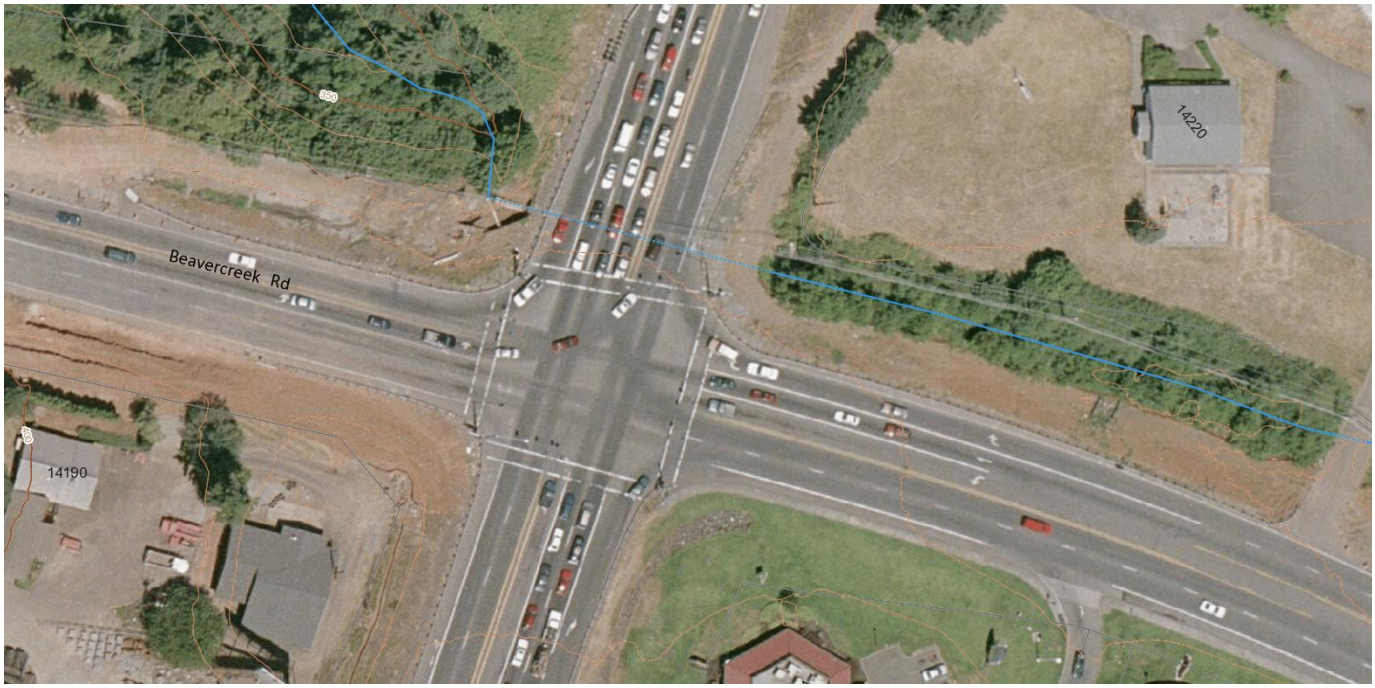
The video was viewed at this time.

After viewing and discussing the video, McGriff displayed samples of signs. VanOrman felt that the silhouette of the pioneers could be used as a silhouette only without the detail of the wagon. Commission consensus related to portions of samples that were viewed.

McClung then showed a portion of the video as it related to five trees that blew down at Clackamette Park this evening. He noted that they were Cottonwood trees that showed advanced heart rot. When the storm hit, the Park was packed with people who scrambled for safety. The only damaged vehicle belonged to Dave's Tree Service who was working in the Park.

With no further business, the meeting adjourned at 9:30 p.m.

CHARLES LEESON, Recording Secretary



HWY 213 and Beavercreek – 2003

HWY 213 and Beavercreek – 2004 (after expansion project)

Highway 213
Urban Corridor Design Study

June 2000

LONG TERM
- "System" connections between I-205 and Hwy 213
- "Service" connections between I-205/Hwy 213 and End of Oregon Trail area
- Interchanges overlap

SHORT TERM
- Capacity improvements on Hwy 213 - I-205 to Holcomb

Match Divided Highway Section

HIGHWAY 213

Adequate Long Term Capacity

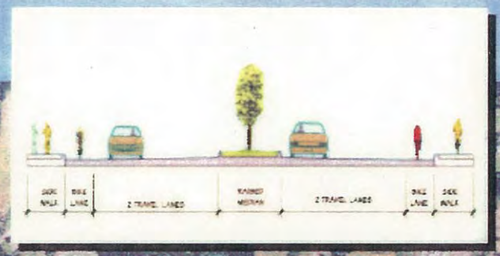
PHASE I - At-grade improvements

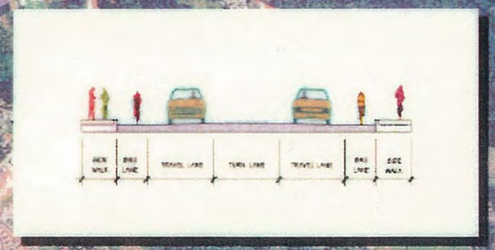
PHASE II - Grade separation improvements if needed

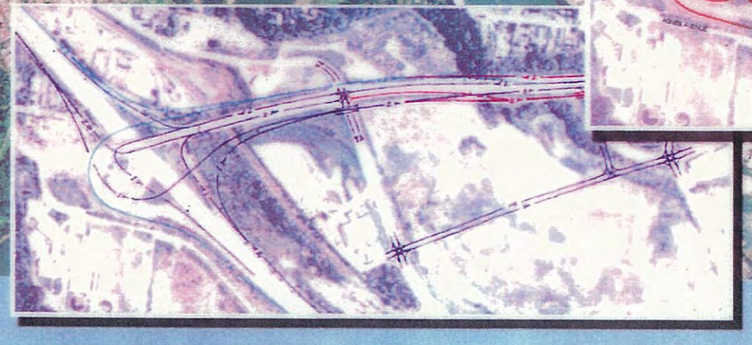
At-grade improvements

Signalize intersection

Match Rural Section







I-205

ng term I-205 operations d design needs

CLACKAMAS RIVER DRIVE

Connectivity needs between Gladstone and End of Oregon Trail area

WASHINGTON

ABERNETHY

Connectivity needs between Clackamette Cove and End of Oregon Trail area

Long term I-205 operations and design needs

MOLALLA

HENRICI

City of Oregon City, Oregon

Kittelson & Associates, Inc.

Final Report

Highway 213 Urban Corridor Design Study

Oregon City, Oregon

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Project No.: 2561
June 2000

Acknowledgments

The Highway 213 Urban Corridor Design Study was funded by Metro and sponsored by the City of Oregon City. ODOT, Metro, and the City of Oregon City worked diligently to create a successful plan to satisfy future travel demand on the Highway 213 Corridor. The project Technical Advisory Committee and Citizen Advisory Committee also contributed significantly to the success of this project. The Project Team thanks the City of Oregon City, Metro, ODOT the Technical Advisory Committee and Citizen Advisory Committee for all of their hard work and valuable contributions.

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ODOT, Region 1

Nancy Kraushaar
City of Oregon City

Glenn Taylor
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The JD White Company

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APPENDIX B: EXISITING CONDITIONS AND ANALYSIS OF OPERATIONS

APPENDIX C: CASH ANALYSIS

APPENDIX D: FUTURE CONDITIONS AND OPERATION ANALYSIS

APPENDIX E: PHASING PLANS

Summary of Project, Findings and Recommendations

Purpose

The Highway 213 Urban Corridor Design Study was conducted to evaluate existing and future congestion on the Highway 213 corridor between Henrici Road and I-205 and to identify immediate and long-term transportation system improvements to mitigate this congestion.

Findings

Highway 213 between Henrici Road and I-205 changes from a high order facility, with limited pedestrian and bicycle facilities near I-205, to a rural two lane high access facility in the vicinity of Henrici Road. Under existing p.m. peak hour conditions, there is congestion and delay on the Highway 213 corridor between I-205 and Henrici Road at the key intersections of Washington Street, Redland Road, and Beavercreek Road. Motorists on I-205 between the Gladstone and the Highway 99E interchanges also experience p.m. peak hour congestion, particularly in the southbound direction.

Traffic volumes in this area are expected to continue to grow. The forecast increase in traffic comes from residential and commercial development in Oregon City and surrounding communities, as well as potential Urban Growth Boundary expansion to the south of Oregon City. With this growth in traffic volumes, peak hour congestion experienced by motorists today is expected to worsen.

The City of Oregon City is currently completing its Transportation System Plan (TSP). The City identified a need for more specific analysis along the Highway 213 corridor to develop the appropriate improvements for adoption into the TSP. This report documents the analysis and findings of the Highway 213 Urban Corridor Design Study. The study considered Highway 213 between I-205 and Henrici Road and, to assure system integration, I-205 between the Gladstone and Highway 99E interchanges.

Scope

In this study, the project team, Citizens Advisory Committee (CAC) and Technical Advisory Committee (TAC) completed the following significant tasks:

- Evaluated existing facilities, traffic operations, land uses, and environmental opportunities and constraints along the Highway 213 corridor between I-205 and Henrici Road, and on I-205 between the Gladstone Interchange and the Highway 99E Interchange,
- Forecasted and evaluated future travel demand in the study area,
- Evaluated forecast traffic operations and identified forecast future deficiencies,
- Identified alternative solution concepts to address the existing and future deficiencies, and
- Assisted the project Citizens Advisory Committee (CAC) and Technical Advisory Committee (TAC) with refining, evaluating, and identifying a most promising solution concept for the corridor.

Recommendations

To address the existing geometric and operational deficiencies as well as to serve forecast travel demand, the TAC and CAC recommended the solution concepts shown in Figures 1, 2, 3 and 4A through 4C. Figure 1 shows the solution concept preferred by the TAC and CAC at the north end of the project corridor. Considering the estimated construction costs and the current regional funding availability, Figure 2 was identified by the TAC and CAC as a preferred and financially feasible first phase of the larger solution concept shown in Figure 1. Additional I-205 corridor planning, environmental and engineering analysis will be required prior to adopting this specific solution concept. Metro and ODOT have plans for an I-205 corridor study. The future study will incorporate technical elements and recommendations from the Highway 213 Urban Corridor Design Study.

Figures 3, and 4A through 4C show the TAC and CAC preferred improvements for Highway 213 from Beavercreek Road south to Henrici Road. In this area, the City of Oregon City, the CAC and the TAC recommend pursuing at-grade improvements that:

- Expand capacity,
- Provide for pedestrian and bicycle accessibility,
- Serve future transit needs
- Safely transition from an urban facility to a rural facility, and
- Allow for continued direct, but managed access onto Highway 213.

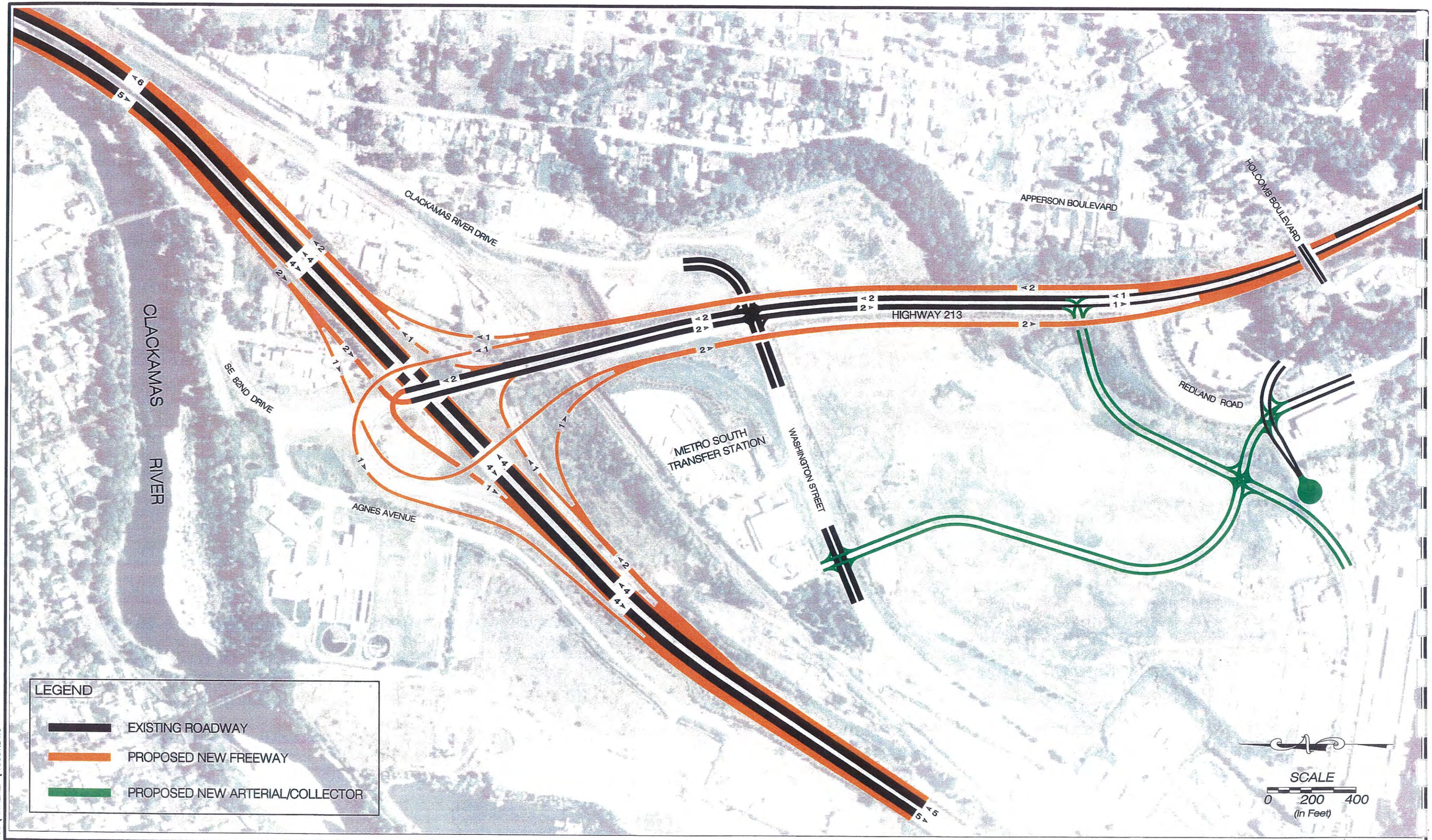
Implementation

Alternative 3 Phase 1 (Figure 2) will cost in the magnitude of $10 Million. This does not include right-of-way or environmental issues related to construction in a landfill. Metro has suggested that Alternative 3 Phase 1 is feasible from a financial perspective; however contributions would most likely be required from public agencies as well as from future public/private funding partnerships. However, no definitive funding plan has been outlined and, as any other identified improvement solution, this project would have to compete for MTIP support and to be listed on the Metro Regional Transportation Plan. Metro, the Oregon Department of Transportation (ODOT) and the City of Oregon City are planning to continue to develop the implementation strategy for Alternative 3 Phase 1.

The City of Oregon City has been awarded Metro Regional Transportation (Federal TEA-21) funds for an improvement project at Beavercreek Road/Highway 213, intersection. The City is planning to design and construct the at-grade improvement concept shown in Figure 3. It is estimated that the at-grade intersection will cost approximately $5.45 Million to construct (not including right-of-way acquisition and environmental factors).

South of Beavercreek Road, the City of Oregon City needs to pursue further refinement to the solution concept presented in Figures 4A through 4C. Traffic signals at Henrici Road/Highway 213 and Glen Oak Road/Highway 213 intersections will be required to maintain traffic operations at an acceptable level of service and should be included in the City's planning efforts. Further, access to Highway 213 south of Molalla will ultimately be more formally controlled than as existing. The amount and location of access onto the highway will need to be developed as part of an access management plan with a significant amount of public involvement. This effort should be undertaken with consideration of the possible UGB expansion in the south part of Oregon City.

Detailed documentation of the study process and findings is included in the following sections of this report.



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HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

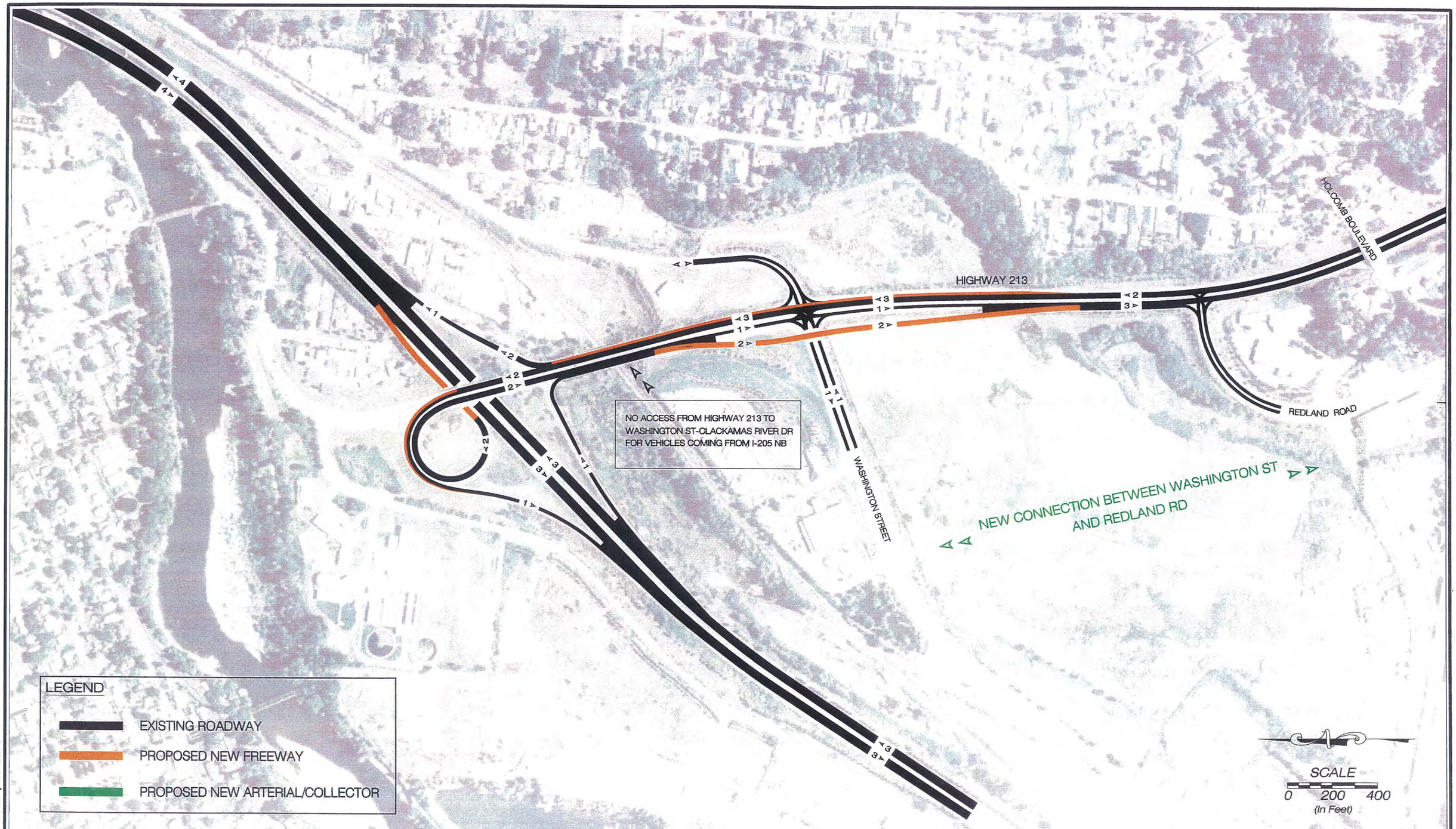
OREGON CITY, OREGON
JUNE 2000

HIGHWAY 213/I-205 INTERCHANGE CONCEPT ALTERNATIVE 3

FIGURE NO. 1

PROJECT NO. 2561

h: \PROJFILE\2561\DWGS\FINALREP\FIG001.DWG



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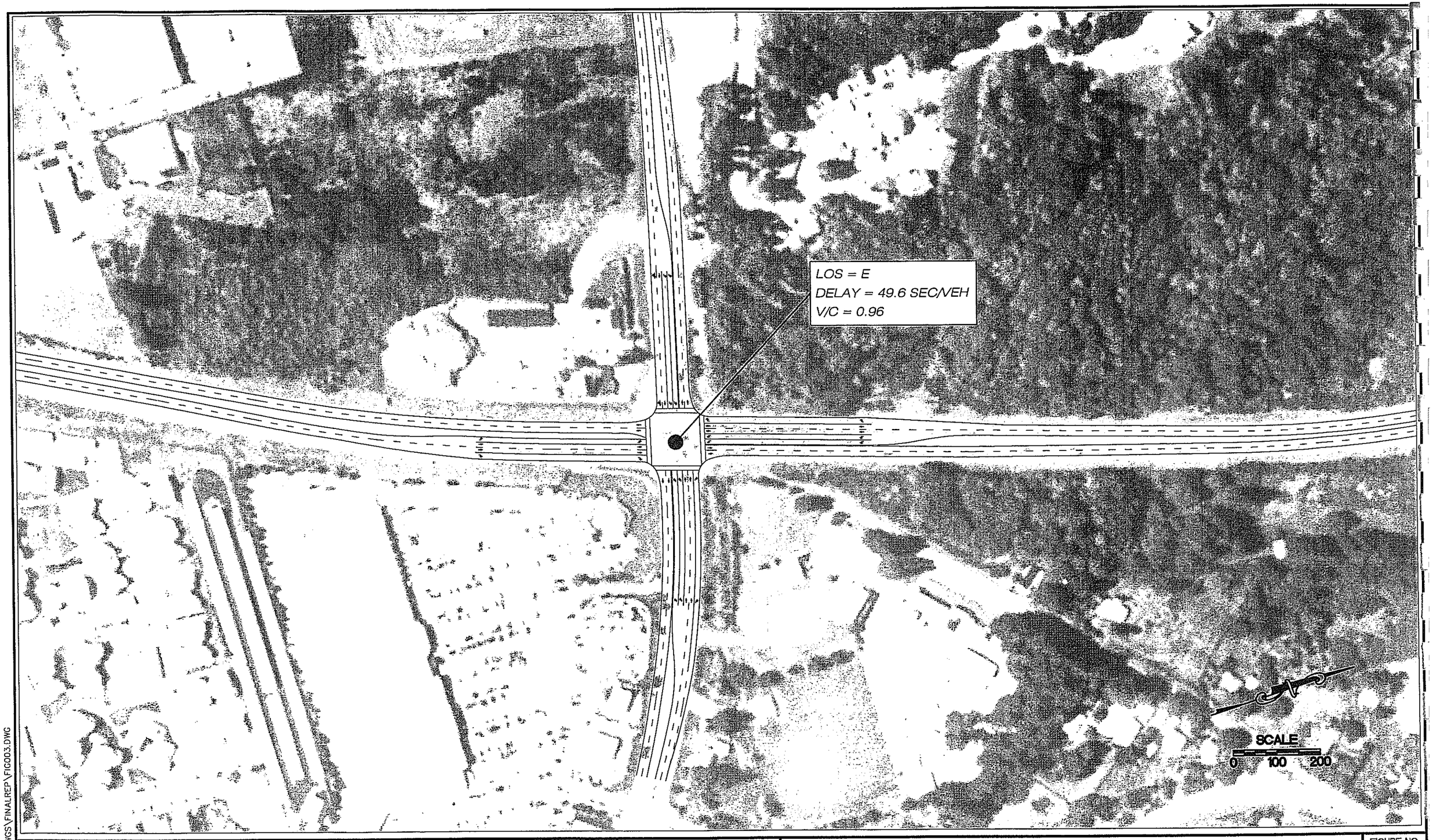
HIGHWAY 213/I-205 INTERCHANGE CONCEPT ALTERNATIVE 3 - PHASE 1 IMPROVEMENT

FIGURE NO. 2

PROJECT NO. 2561

h: \PROJFILE\2561\DWGS\FINALREP\FIG002.DWG



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BEAVERCREEK/HIGHWAY 213 IMPROVEMENT PLAN IMPROVED AT-GRADE INTERSECTION CONCEPT 2018 WEEKDAY PM PEAK LEVELS OF SERVICE

FIGURE NO.
3

PROJECT NO.
2561

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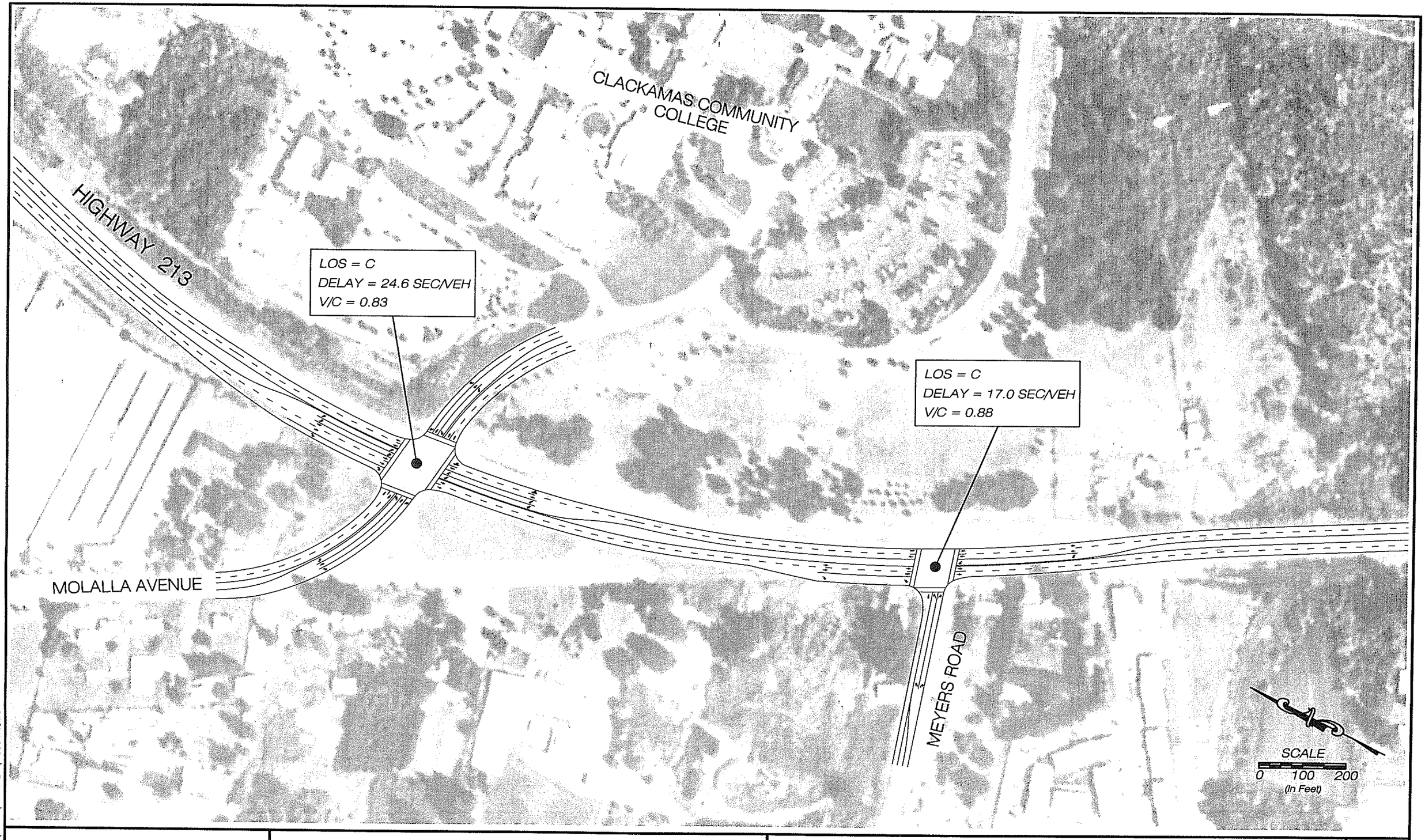

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OREGON CITY, OREGON
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HIGHWAY 213 IMPROVEMENT PLAN CONCEPT
MOLALLA AVENUE TO HENRICI ROAD
2018 WEEKDAY PM PEAK LEVELS OF SERVICE

FIGURE NO. 4A

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG004A.DWG

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JUNE 2000

HIGHWAY 213 IMPROVEMENT PLAN CONCEPT
MOLALLA AVENUE TO HENRICI ROAD
2018 WEEKDAY PM PEAK LEVELS OF SERVICE

FIGURE NO. 4B

PROJECT NO. 2561

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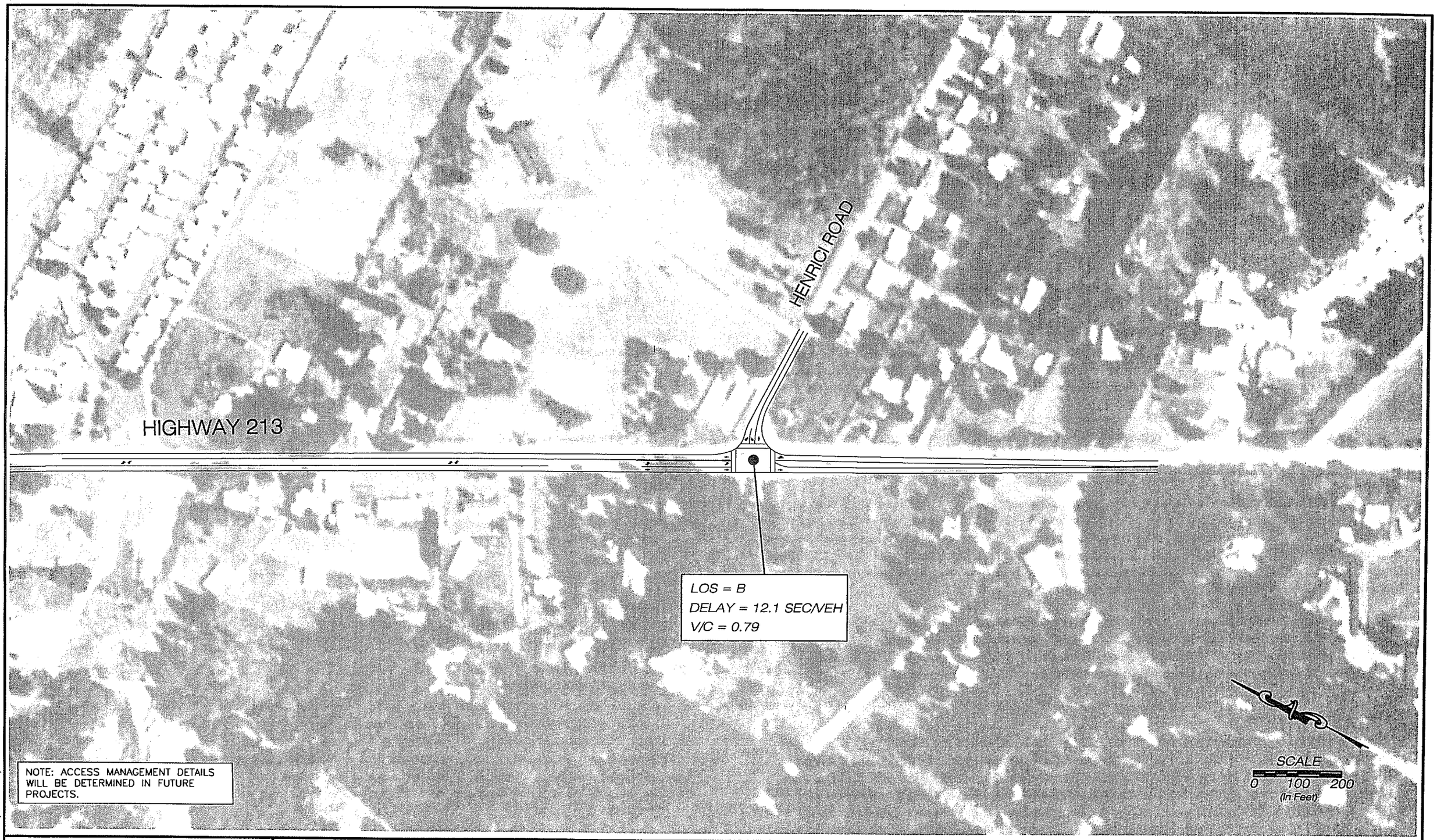

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HIGHWAY 213 IMPROVEMENT PLAN CONCEPT
MOLALLA AVENUE TO HENRICI ROAD
2018 WEEKDAY PM PEAK LEVELS OF SERVICE

FIGURE NO. 4C

PROJECT NO. 2561

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Introduction

Project Need

The Highway 213 facility between I-205 and Henrici Road has different characteristics and needs. At the north end of the study corridor, the I-205 interchange and the intersection of Washington Street/Highway 213 dominate the landscape. These are large, high-order facilities serving high volumes, with limited pedestrian and bicycle accessibility. The intersection of Washington Street/Highway 213 provides access to Oregon City and possible future development to the south and access to residential development to the north along the Clackamas River. Redland Road also provides access to residential development, Oregon City, and possible future development.

South of Redland Road to Beavercreek Road, Highway 213 is a high-speed, access-controlled facility through Newell Canyon. It is a four-lane facility with freeway characteristics. Beavercreek Road/Highway 213 is a high volume intersection providing access to and from Highway 213 from Beavercreek Road residential and retail development.

Between Beavercreek Road and Molalla Avenue, Oregon City would like Highway 213 to provide accessibility for pedestrian and bicyclists traveling along and across the roadway. However, the high traffic volumes and associated environment are not currently conducive to non-auto modes of transportation.

South of Newell Canyon, Highway 213 transitions from an urban arterial type facility in the vicinity of Beavercreek Road and Molalla Avenue to a rural two-lane highway in the vicinity of Henrici Road. This is a problematic transition in that under existing conditions the transition is abrupt and does not control travel speeds nor provide for pedestrians or bicyclists.

Under existing traffic volumes, there is significant congestion along the Highway 213 corridor. In the p.m. peak period (study design-volume period) the intersections of Washington Street/Highway 213, Redland Road/Highway 213, and Beavercreek Road/Highway 213 all operate under congested conditions. In the a.m. peak period, queues in the northbound direction from the northbound I-205 on-ramp at Highway 213 spill congestion back through the Highway 213/Washington Street intersection. As traffic volumes continue to grow in the future, congestion will worsen at these locations.

In addition, p.m. peak hour traffic volumes on I-205 currently exceed the facility capacity causing congestion and queuing along the freeway and at the Highway 213/I-205 interchange. In the future as traffic volumes continue to grow, congestion on I-205 will worsen. Without any modifications to I-205 in the study area, there will be unacceptable operational conditions during the forecast 20-year p.m. peak hour.

Planning Framework

The City of Oregon City is currently completing their Transportation System Plan (TSP). This project identified Highway 213 as a critical link in the City's transportation system. The City identified a need for this facility to provide mobility for motorists traveling within and to/from Oregon City. The TSP analysis showed existing congestion along the corridor and forecast future congestion as well. Therefore, for the TSP to be successfully implemented, the City of Oregon City needed to identify improvement concepts for the Highway 213 corridor and incorporate them into the TSP. The conceptual corridor improvements were to be developed in this Highway 213 Urban Corridor Design Study. This report documents the process, results and recommendations from this study.

Study Area

Figure 5 depicts the project study area, and the intersection traffic control at the key study intersections. The study primarily focuses on the Highway 213 corridor (principal study area). However, Interstate 205 between the Gladstone interchange and the Highway 99E interchange (secondary study area) was included to ensure that improvements identified at the Highway 213/I-205 interchange were compatible with the existing Interstate 205 and possible future improvements along the I-205 corridor.

Scope and Approach

The purpose of the study was to identify near-term and long-term solution concepts for existing and future transportation system deficiencies identified in the study area. The existing deficiencies were identified based on existing p.m. peak hour traffic operations analyses, field reviews and input from the project Technical Advisory Committee (TAC) and Citizen's Advisory Committee (CAC). 20-Year future p.m. peak hour traffic conditions were forecast from Metro's travel demand model, refined to more accurately reflect local conditions within Oregon City. Forecast p.m. peak hour operational deficiencies were identified based on traffic operations analyses and discussions with representatives from the City of Oregon City, Clackamas County, the Oregon Department of Transportation, Metro and the CAC.

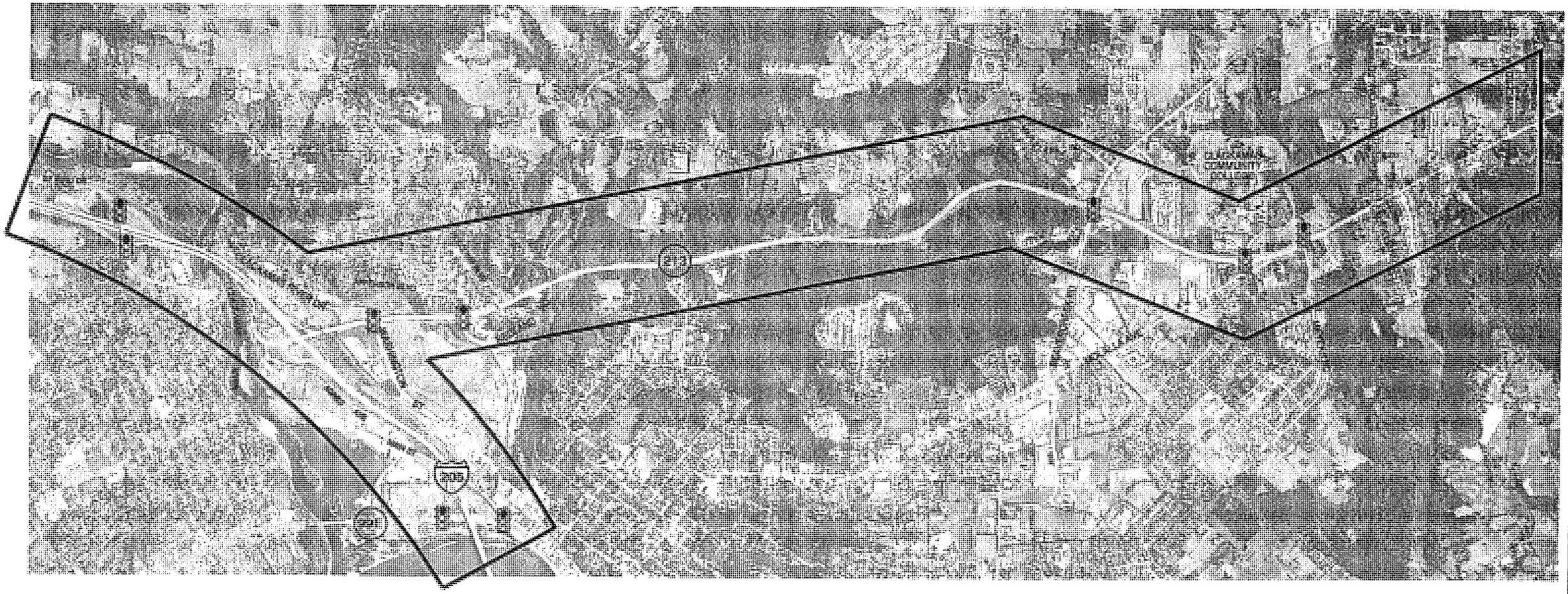
Solution concepts were developed using single-line techniques on aerial photography (see Figure 1) to efficiently generate a number of improvement alternatives. The concepts were refined with input from City of Oregon City, Clackamas County, the Oregon Department of Transportation, Metro, Tri-Met, the TAC, and the CAC. Functional plans of the most promising solution concepts between Beavercreek Road and Henrici Road, and single-line solution concepts in the vicinity of the I-205/Hwy 213 interchange document these efforts. In addition to the design considerations, traffic operations analyses and qualitative land use and environmental analyses were also conducted to verify that the solution concepts being generated were consistent with State and local policies.

The project process relied on close coordination between the TAC, CAC and the City of Oregon City to review project analysis, findings, concept development and recommendations as the project evolved. A brief overview of each of the project tasks follows:

Existing Conditions Analysis

Initial project activities focused on understanding the constraints and opportunities along the Highway 213 corridor. Surrounding land uses and environmental features were studied, as well as the traffic flow characteristics, roadway safety characteristics, and the roadway geometric features of the corridor. The Project Team relied on field visits, previously collected data and reports from the Oregon Department of Transportation (ODOT), the City of Oregon City, and Metro, and input from the City of Oregon City, TAC and CAC to complete these analyses. The findings from this task formed the basis and direction of the concept development phases of the project.

NORTH
(NOT TO SCALE)



LEGEND

STUDY AREA

TRAFFIC SIGNAL

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OREGON CITY, OREGON
JUNE 2000

PROJECT STUDY AREA

FIGURE NO. 5

PROJECT NO. 2561

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Future No-Build Analysis

Future p.m. peak hour traffic volumes applied in this project are the same as those developed for the City of Oregon City Transportation System Plan. The forecast was developed using the Metro travel demand model. The Metro transportation analysis zones (TAZs) were refined in the local Oregon City area to better reflect existing and anticipated land use, and the land use inputs to the model are based on Oregon City's existing Comprehensive Plan. No significant modifications were made to the existing transportation network in the study area. These inputs yielded a 20-year no-build p.m. peak hour traffic volume forecast. Details of this process are included in the documentation for the TSP project.

A future conditions traffic operations analysis was performed on the 20-year future p.m. peak hour traffic volumes. The results provided an understanding of how significant future deficiencies would be with no improvements to existing conditions. Based on this analysis, forecast future traffic operations in the study corridor were evaluated and preliminary solution concepts were identified. This information was reported to the TAC and CAC.

Concept Development and Refinement

City of Oregon City, TAC and CAC input and assessment of the results of the existing conditions and future no-build conditions analysis led the development of single-line and double-line solution concepts to the identified corridor deficiencies. The concepts ranged from expanded at-grade intersections, to access management, to full interchanges at Beavercreek Road, and the Highway 213: I-205 to Redland Road corridor. Concept development included operational and design evaluations.

The City of Oregon City, TAC and CAC reviewed the preliminary solution concepts and provided input as to the financial, political, operational and engineering feasibility of each of the solution concepts. Given this input, the concepts were refined and revised. The most promising solution concepts throughout the corridor were identified as an outcome of this process.

Functional Plans

Functional plans of the most promising solution concepts were developed from Beavercreek Road to Henrici Road following final concept input from the TAC and CAC. Single-line exhibits were developed for the Highway 213 corridor between I-205 and Redland Road. The concepts plans are of sufficient detail to determine traffic operations and design features, estimate planning level order of magnitude cost estimates, and preliminary land use and environmental impacts. More detailed environmental and design analyses and public involvement activities will be required before a preferred alternative can be chosen.

Cost Proportionality

Highway 213 is a district-level state facility used by motorists making local, county and regional trips. Modifications to improve and maintain traffic operations will be almost exclusively on the state roadway. However, financial responsibility for these improvements should be shared among jurisdictions contributing to congestion on the Highway. The final step of the project was an assessment the City of Oregon City's, and ODOT's proportionate share financial responsibility for improvements on the corridor.

Organization of Report

This Highway 213 Urban Corridor Design Study Final Report is a compilation of technical memoranda and presentations prepared throughout the project. The document is intended to be a summary of the analysis and findings from the project. It is also intended to highlight key recommendations made as an outcome of project analyses and meetings. These recommendations should form the basis for future engineering and environmental planning activities. The report is organized into the following sections:

- Introduction
- Existing Conditions Analysis,
- Future Conditions Analysis,
- Concept Development and Preferred Solutions,
- Summary

Existing Conditions Analysis

The existing conditions analysis was conducted to develop an understanding of the opportunities and constraints in the study area. To complete the analysis, the project team evaluated existing land use and environmental constraints as well as the existing features and traffic operations of the transportation system. The results of this assessment formed the foundation of problem identification and preliminary solution concepts. The Project Team relied on input from the TAC and CAC to review the preliminary results of the analysis and provide context for the identified issues. The specific analyses performed include: geometrics, traffic operations, safety and a qualitative land use/environmental analyses.

Geometric/Operations Evaluation

As-built plans, aerial photography, and field observations were used to evaluate the existing geometric characteristics of Highway 213 and I-205 within the study area. The geometric evaluation was performed based on the criteria rating summarized in Appendix A. These criteria are based on American Association of State Highway and Transportation Officials (AASHTO) policy. Like many transportation departments, ODOT uses AASHTO criteria as the basis for its own design standards.

Each feature was assigned a Good, Fair, or Poor rating based on the how closely the facilities met the AASHTO guidelines for design speed. The features analyzed were grouped into three categories:

- Geometric (G): horizontal alignment, vertical alignment, stopping sight distance, cross section, decision sight distance, exit and entrance ramp design;
- Operational (O): lane and route continuity, lane balance, ramp sequence; and
- Performance Measure (PM): level of service, accident rates.

The geometric analysis is based on roadway design speeds. A roadway feature that met or exceeded the design speed was rated good. Features that were within 10 mph of the design speed were rated fair. Features that were more than 10 mph below the design speed were rated poor. Research indicates accidents increase when speed differentials exceed 10 mph. Operational features were based on AASHTO guidelines, while level-of-service and accident rates were compared to ODOT and Oregon City standards, respectively.

This exercise was performed for the sections of both northbound and southbound I-205 and Highway 213 in the study area. Figures 6A through 6H consist of an aerial photograph of the study area overlaid with a directional grid matrix that lists each performance measure and roadway feature evaluation result. For each direction of traffic, the matrix is shaded to reflect whether a criteria rating of "good" (single hatch), "fair" (cross-hatch), or "poor" (solid) was designated to the evaluation feature at that particular location along the facility.

With a few exceptions, the existing configuration and geometric conditions of I-205 and Highway 213 in the study area conforms to AASHTO criteria with regards to the majority of geometric and operational features. The exceptions are:

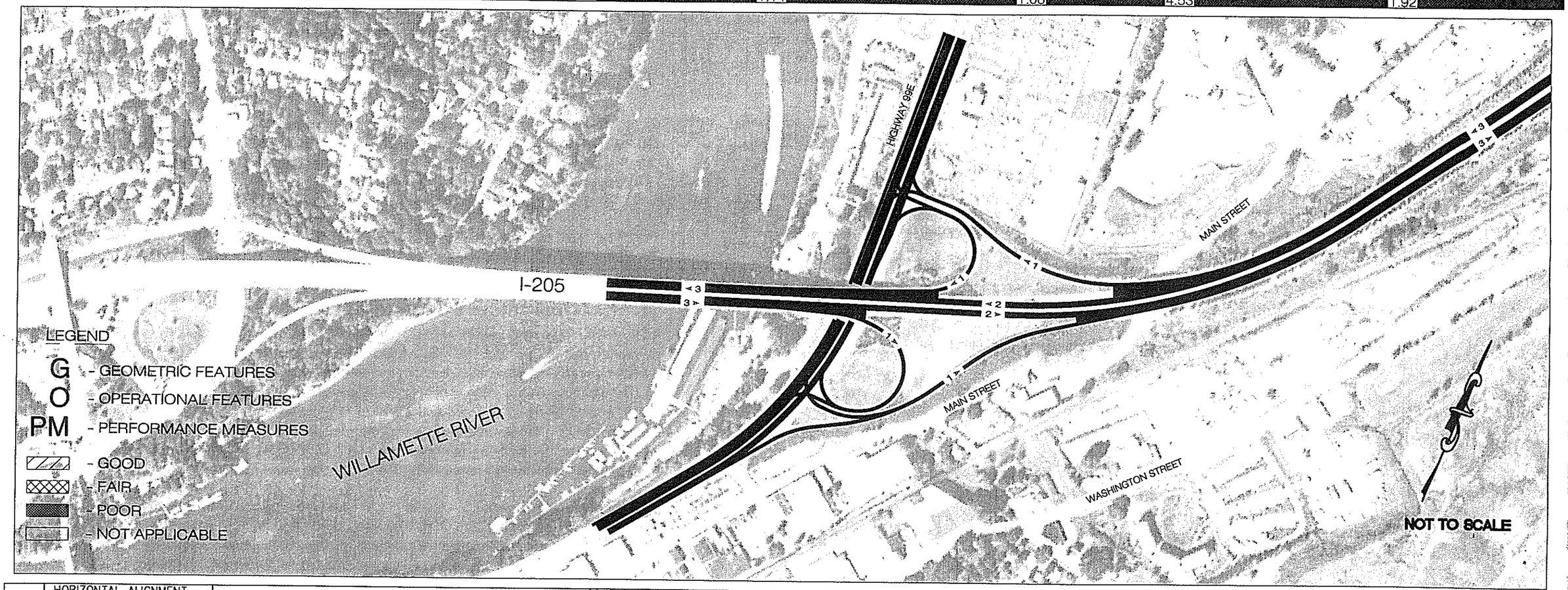
- The geometric design of both the I-205 SB/Highway 213 and I-205 NB/Highway 99E off-ramps provides insufficient deceleration distance for the controlling curvature of those ramp loops, requiring vehicles to decelerate on the freeway mainline.
- The cross-section of I-205 from the Gladstone-SE 82nd Drive interchange across the Clackamas River Bridge provides inadequate right shoulder width.
- True lane balance is not maintained at three locations along I-205 (I-205 Southbound/Highway 99E off-ramp, I-205
- At the Northbound/Highway 99E off-ramp, I-205 Northbound/Gladstone off-ramp), however, brief recovery areas are provided after the lane drop at these locations to allow vehicles in the drop lane to merge with mainline traffic after the off-ramp.
- The existing cross-section of Highway 213 between the Redland Road and Beavercreek Road intersections provide inadequate left shoulder width.

Traffic Operations Evaluation

The *1997 Highway Capacity Manual* (HCM) analysis methodology was used for all freeway operations evaluations. As per the 1997 HCM, the vehicle capacity for a freeway lane of traffic in the basic freeway segment and ramp merge/diverge sections was assumed to be 2,300 vehicles per hour per lane; in the weaving sections the vehicle capacity was assumed to be 2,000 vehicles per hour per lane. For I-205, a state highway of *Interstate Level of Importance*, the ODOT operational standard is level of service (LOS) "D" in urban regions of metropolitan areas. Because of limitations in the Highway Capacity Manual weaving methodology, the Joel E. Leisch methodology for weaving analysis was applied on Highway 213 between I-205 and Washington Street.

The operational performance of Highway 213 and Interstate 205 were rated based on the City of Oregon City, Clackamas County, and ODOT standards. These standards indicate that Level-of-Service (LOS) "A" through "D" are acceptable for existing signalized intersection operations, and LOS "E" and "F" are unacceptable. For unsignalized intersections, the City of Oregon City, Clackamas County, and ODOT standards outline operational LOS "A" though "D" as acceptable, LOS "E" as marginally acceptable, and LOS "F" as unacceptable.

G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	D E E
	ACCIDENT RATES	1.14 1.08 4.53 1.92



G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	D E D
	ACCIDENT RATES	0.53 2.22 1.63 0.76

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HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

OREGON CITY, OREGON
JUNE 2000

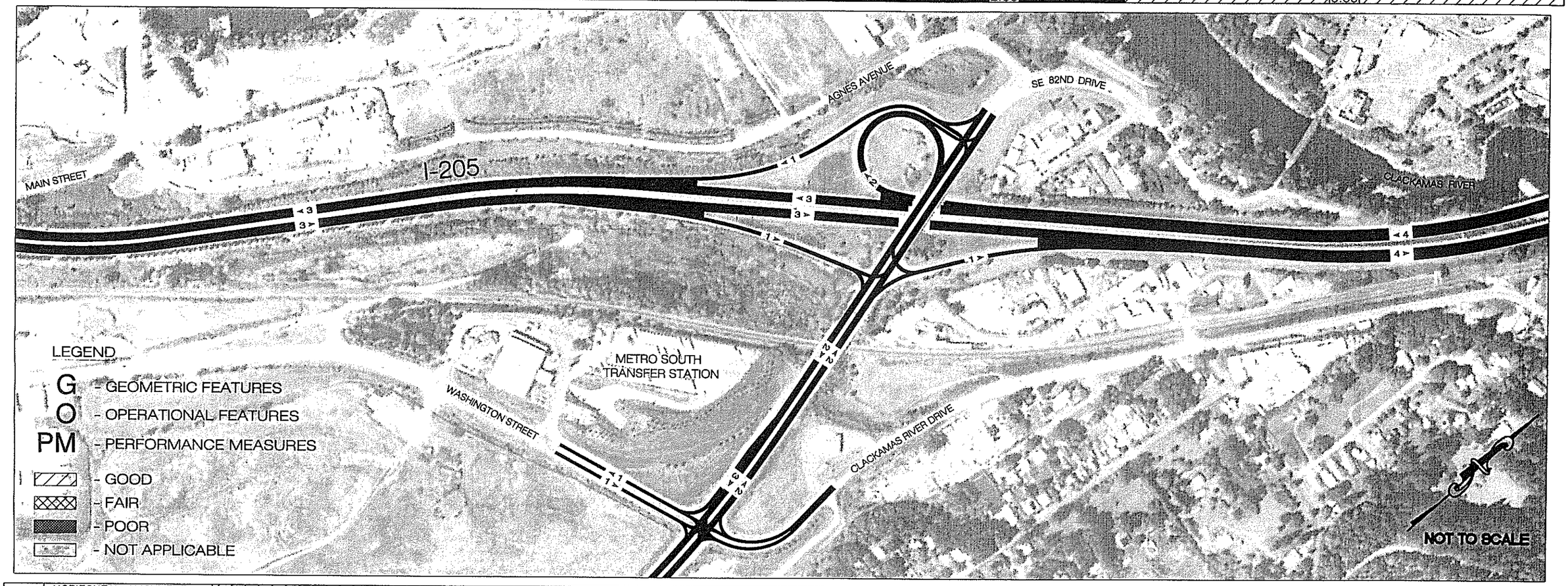
EVALUATION OF EXISTING CONDITIONS SUMMARY

FIGURE NO. 6A

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG006.DWG

G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	E / D / E
	ACCIDENT RATES	1.92 / 0.52 / 1.20 / 2.66 / 0.09



LEGEND

G - GEOMETRIC FEATURES

O - OPERATIONAL FEATURES

PM - PERFORMANCE MEASURES

- GOOD
- FAIR
- POOR
- NOT APPLICABLE

G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	D / D / D / C / E
	ACCIDENT RATES	0.76 / 0.98 / 3.27 / 1.48 / 0.07

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OREGON CITY, OREGON
JUNE 2000

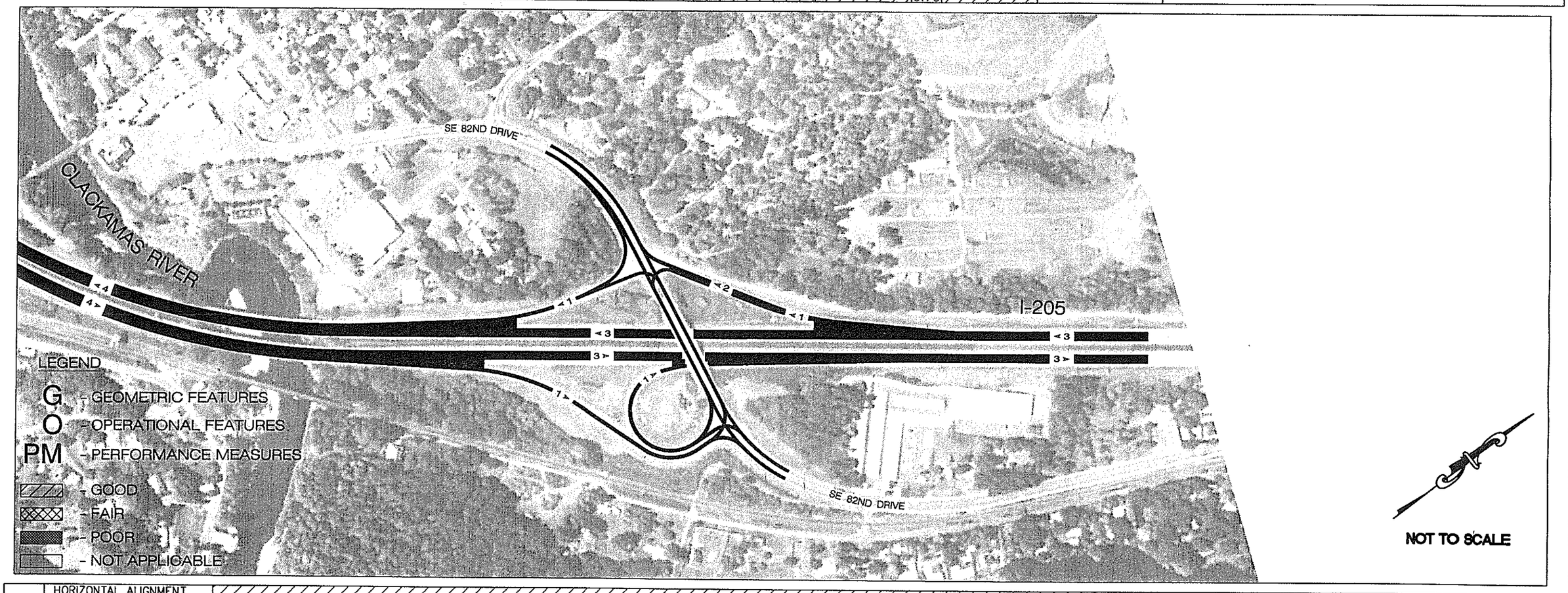
EVALUATION OF EXISTING CONDITIONS SUMMARY

FIGURE NO. 6B

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG006B.DWG

G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	E / D / E / E
	ACCIDENT RATES	0.09 / 1.28 / 0.58 / 0.70



NOT TO SCALE

G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	E / D / C / D
	ACCIDENT RATES	1.04 / 0.82 / 0.52

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OREGON CITY, OREGON
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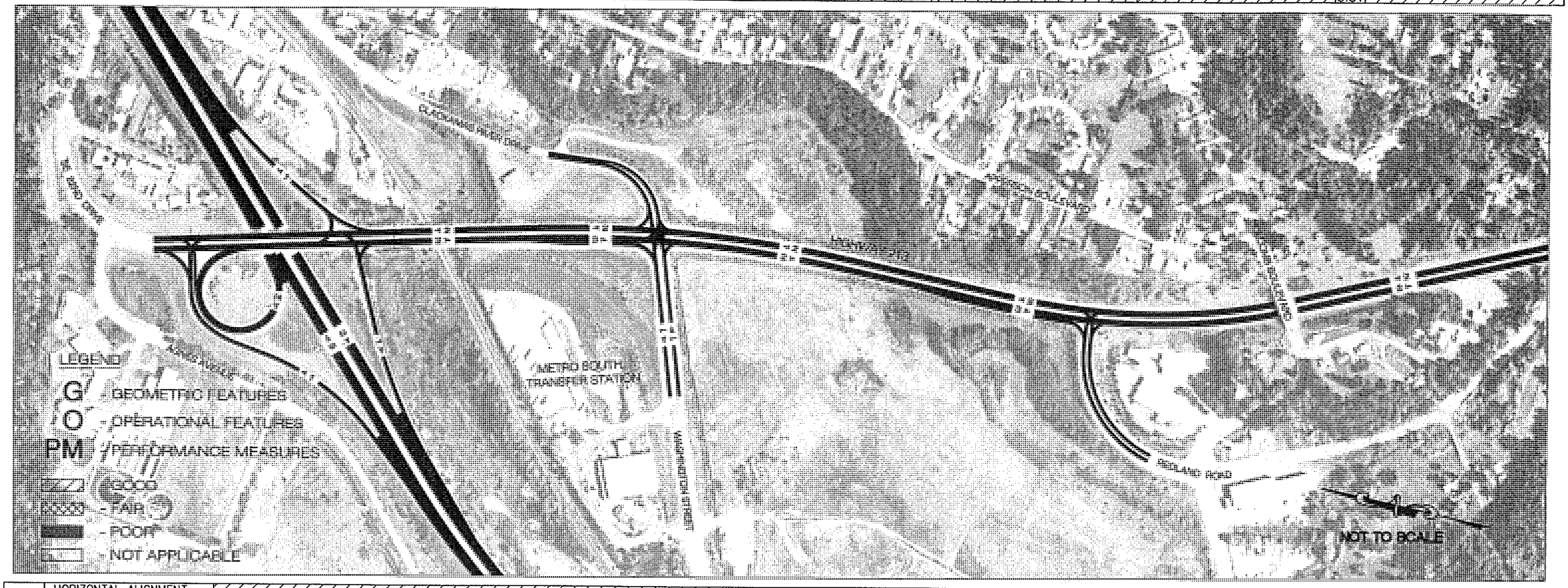
EVALUATION OF EXISTING CONDITIONS SUMMARY

FIGURE NO. 6C

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG006.DWG

G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	B / F / C / B / B
	ACCIDENT RATES	3.37 / 2.21 / 10.31



G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	B / F / C / B / C
	ACCIDENT RATES	6.39 / 12.48 / 0.46

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JUNE 2000

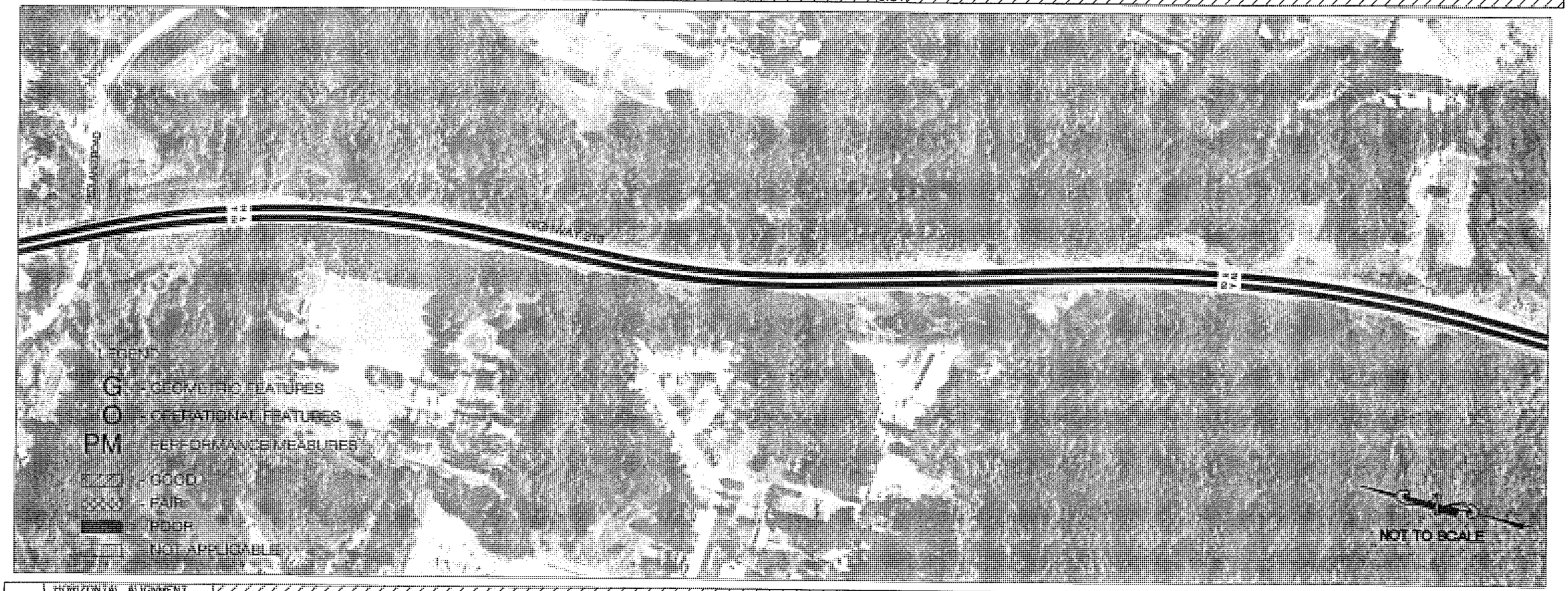
EVALUATION OF EXISTING CONDITIONS SUMMARY

FIGURE NO. 6D

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG006.DWG

G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	
	ACCIDENT RATES	[B] 0.31



G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	
	ACCIDENT RATES	[C] 0.46

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JUNE 2000

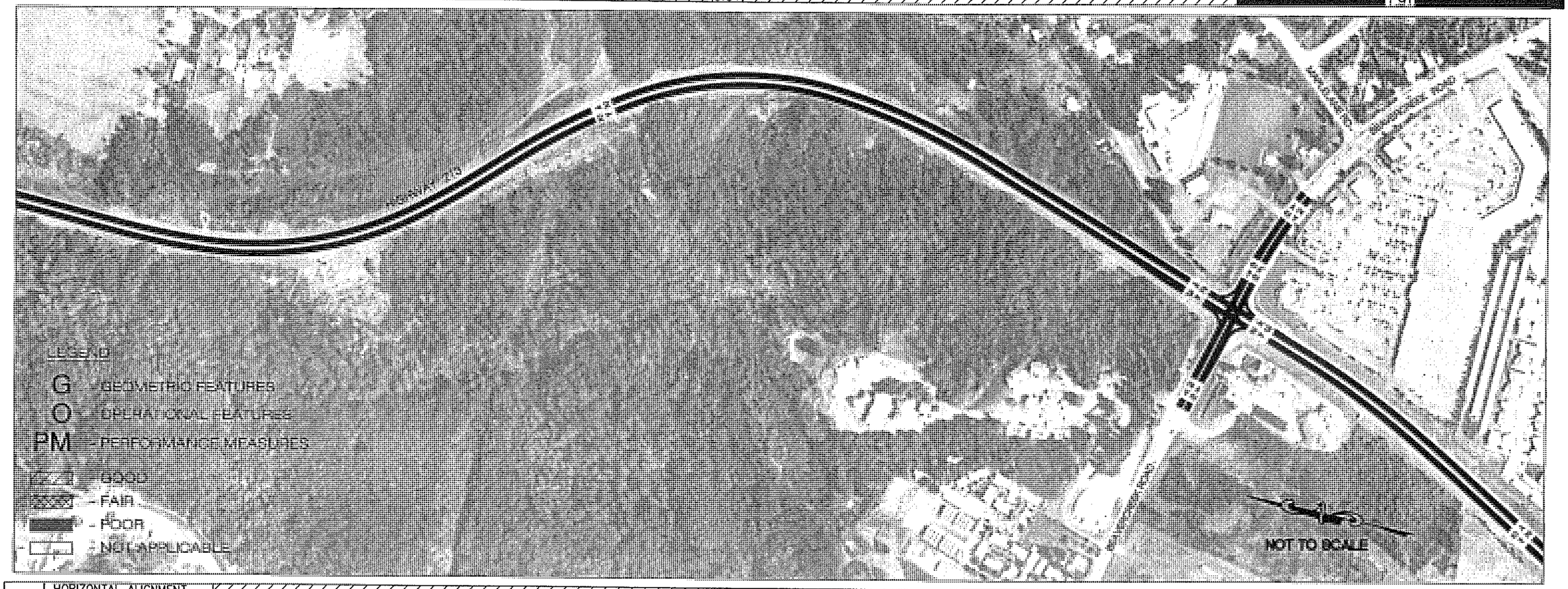
EVALUATION OF EXISTING CONDITIONS SUMMARY

FIGURE NO. 6E

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG006.DWG

G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	B 0.31 F 1.91
	ACCIDENT RATES	



G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	C 0.46 F 1.70
	ACCIDENT RATES	

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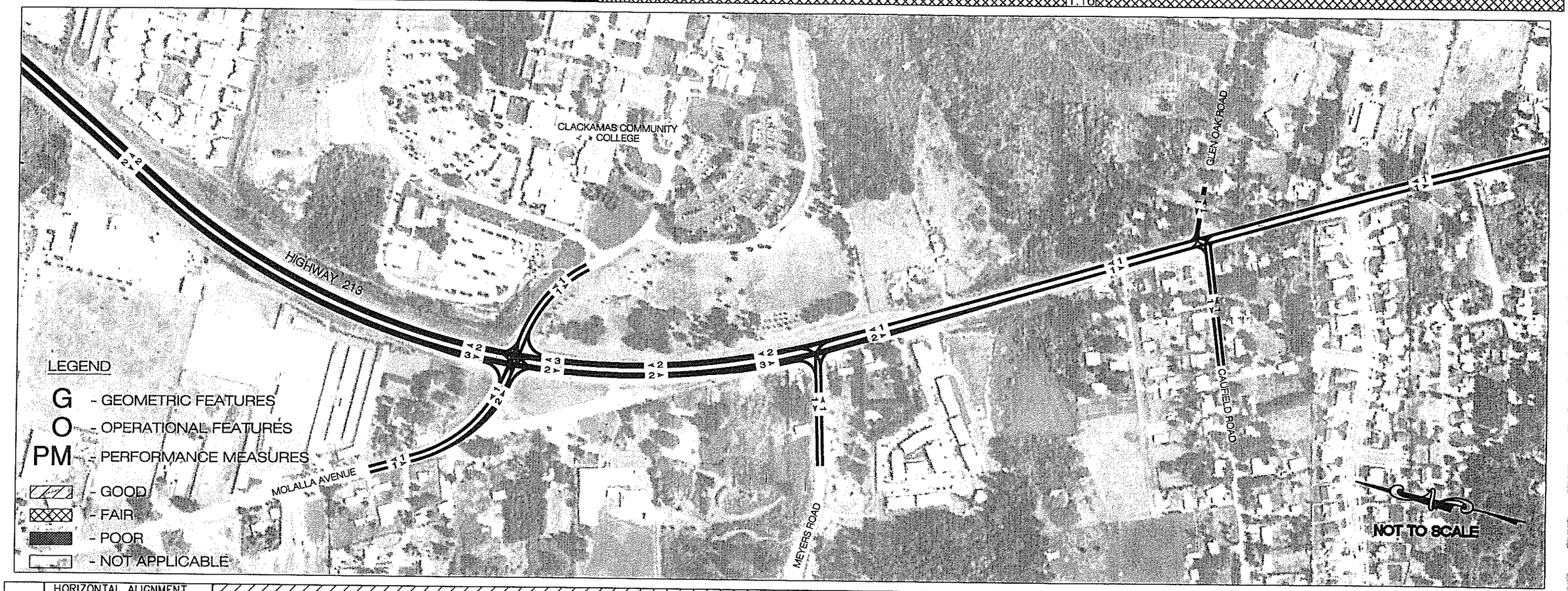
EVALUATION OF EXISTING CONDITIONS SUMMARY

FIGURE NO. 6F

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG006.DWG

G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	C B F
	ACCIDENT RATES	1.91 1.16



G	HORIZONTAL ALIGNMENT	
	VERTICAL ALIGNMENT	
	STOPPING SIGHT DISTANCE	
	CROSS SECTION	
	DECISION SIGHT DISTANCE	
	EXIT & ENTRANCE DESIGN	
O	LANE & ROUTE CONTINUITY	
	LANE BALANCE	
	RAMP SEQUENCE	
PM	LEVEL OF SERVICE	C B F
	ACCIDENT RATES	1.70 0.75

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OREGON CITY, OREGON
JUNE 2000

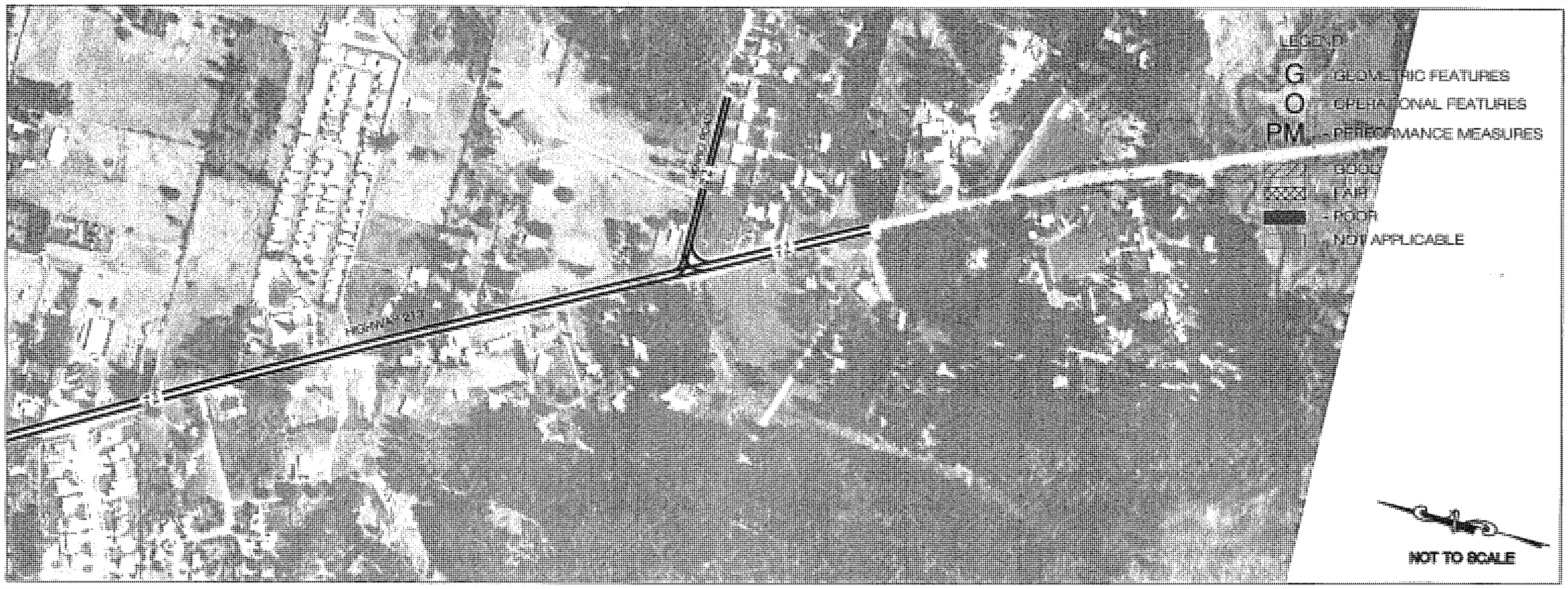
EVALUATION OF EXISTING CONDITIONS SUMMARY

FIGURE NO. 6G

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG006.DWG

G	HORIZONTAL ALIGNMENT		
	VERTICAL ALIGNMENT		
	STOPPING SIGHT DISTANCE		
	CROSS SECTION		
	DECISION SIGHT DISTANCE		
	EXIT & ENTRANCE DESIGN		
O	LANE & ROUTE CONTINUITY		
	LANE BALANCE		
	RAMP SEQUENCE		
PM	LEVEL OF SERVICE	JCI	
	ACCIDENT RATES	1.16	



G	HORIZONTAL ALIGNMENT		
	VERTICAL ALIGNMENT		
	STOPPING SIGHT DISTANCE		
	CROSS SECTION		
	DECISION SIGHT DISTANCE		
	EXIT & ENTRANCE DESIGN		
O	LANE & ROUTE CONTINUITY		
	LANE BALANCE		
	RAMP SEQUENCE		
PM	LEVEL OF SERVICE	JCI	
	ACCIDENT RATES	0.75	

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EVALUATION OF EXISTING CONDITIONS SUMMARY

FIGURE NO. 6H

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG006.DWG

Existing PM Peak Intersection Operations

Several of the principal intersections in the study area are operating under congested conditions. The intersections of Washington Street/Highway 213, and Beavercreek/Highway 213 are both operating near or over capacity. The weaving movement between the northbound I-205 to southbound Highway 213 to Clackamas River Drive further exacerbates the capacity constraints at the Washington Street/Highway 213 intersection. In addition, the northbound I-205 ramp terminal intersection is also operating over capacity.

Figures 7A and 7B show the existing p.m. peak hour traffic volumes. Figure 8 shows the existing intersection lane configurations and traffic control devices. Figures 9 and 10 show the existing traffic operations along Highway 213 and I-205, respectively. Appendix B contains a detailed, tabular summary of the traffic operations analysis.

Existing PM Peak Hour Freeway Operations

Under existing conditions, traffic operations in the study corridor are congested during the p.m. peak hour. On I-205, queuing regularly occurs in the southbound direction between the Gladstone and the Highway 99E interchange. The weaving sections on SB I-205 between the Gladstone on-ramp and the Hwy 213 off-ramp, and the between the Hwy 213 on-ramp to the Highway 99E off-ramp operate at LOS E. The northbound weaving section between the Highway 213 on-ramp and the Gladstone interchange off-ramp operates at LOS D.

The basic freeway segments other than the above weaving segments operate in the LOS E and LOS D range. Northbound I-205 between the Highway 213 off-ramp and the Highway 213 on-ramp operates at LOS C due to the high volume of traffic exiting from northbound I-205 to Highway 213.

Safety Evaluation

A safety analysis and accident evaluation for the study corridor was performed using data provided by ODOT. The study period for this analysis was January 1, 1993 through May 30, 1997. The safety analysis was performed to identify whether there are any crash trends that need to be specifically addressed in this project. For example, a location with a high incidence of accidents may be attributed to a specific geometric or operational feature that could be eliminated with improvements.

The detailed segment analysis revealed that, while no fatalities were reported, the majority of the I-205 freeway segments analyzed experienced accident rates higher than the statewide average. The statewide accident rate for similar type facilities is 0.91 accidents/million vehicle miles (acc/mvm). Locations below statewide averages include:

- The Gladstone interchange area,
- I-205 southbound around the Highway 213 on-ramp,
- I-205 northbound around the Highway 99E off-ramp, and
- I-205 northbound in the basic section between Highway 99E and Highway 213.

The segment of I-205 southbound around the Highway 99E off-ramp was found to have the highest accident rate, 4.52 accidents/million vehicle miles traveled. The segment of I-205 northbound in the Highway 213 interchange area was also found to experience a substantially higher than average accident rate of 3.27 accidents/million vehicle miles. These high accident rates can likely be attributed to the congested conditions that occur along I-205. In addition, the inadequate freeway off-ramp geometry at the Highway 213 and Highway 99E interchanges influences freeway mainline operations, resulting in congestion and queuing particularly during the peak hour periods.

On Highway 213, a total of 221 crashes were reported during the 53-month period under review. While 117 of these accidents involved personal injury, there were no reported fatalities. Further evaluation of the reported accident locations revealed that the majority of the accidents occurring along Highway 213 could be attributed to conflicts in or around an intersection, with rear-end accidents being the most common type of accident occurring. These observations are consistent with the congested operational conditions at the intersections as discussed in the operational analysis review. Site-specific tabular summaries of this crash information are included in Appendix C.

Environmental Evaluation

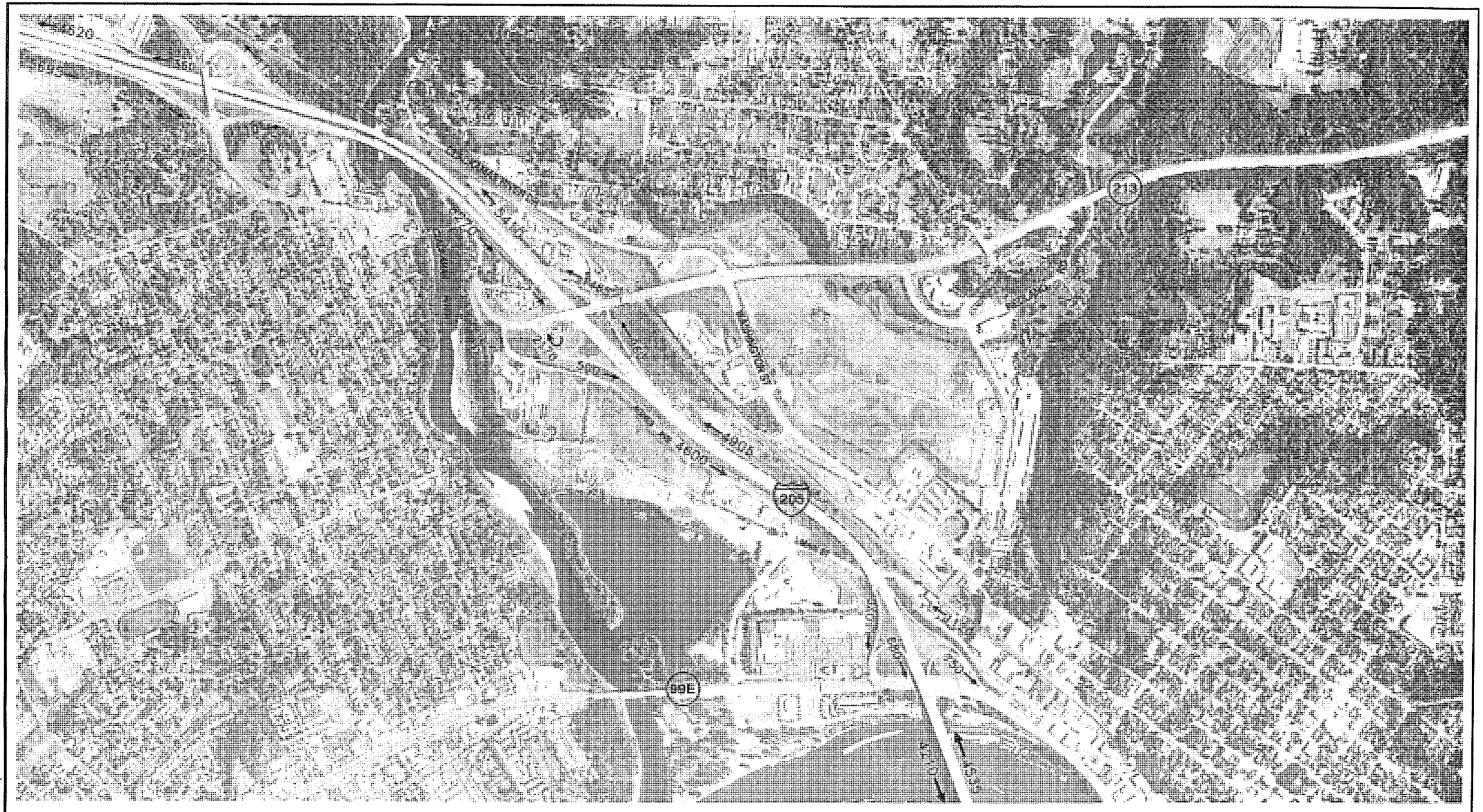
A baseline review of environmental issues and constraints identified the physical or regulatory constraints that were to be considered as part of the project planning process. The constraints include:

- Steep slopes along portions of the study corridor in the vicinity of Washington Street, the Canyon and Beavercreek Road.
- Stream crossings near Beavercreek Road and between Washington Street and Redland Road provide wildlife and potential fish habitat to be considered and protected in alternative solution concepts.
- Wetlands exist near Washington Street and I-205. These would also require protection. However, none of the identified issues represent a likely fatal flow for potential corridor improvements. Additional investigations will be required in latter phases of project development to determine the extent of jurisdictional wetlands and the presence of protected fish and wildlife species, or their critical habitat.

Summary of Existing Conditions

From the perspective of roadway geometric characteristics, Highway 213 and the I-205 corridor are in relatively good condition. There are a few geometric deficiencies on I-205 in the vicinity of the Highway 213, Highway 99E and the Clackamas River Bridge. However, these deficiencies are relatively minor and do not cause significant negative impacts.

There is insufficient capacity to meet existing southbound I-205 p.m. peak hour travel demand between the Gladstone Interchange and Highway 99E and on southbound Highway 213 between I-205 and Washington Street. Congestion also occurs at the Beavercreek/Highway 213 intersection. These congested locations cause delay and queuing for motorists and increase the propensity for traffic crashes.



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OREGON CITY, OREGON
JUNE 2000

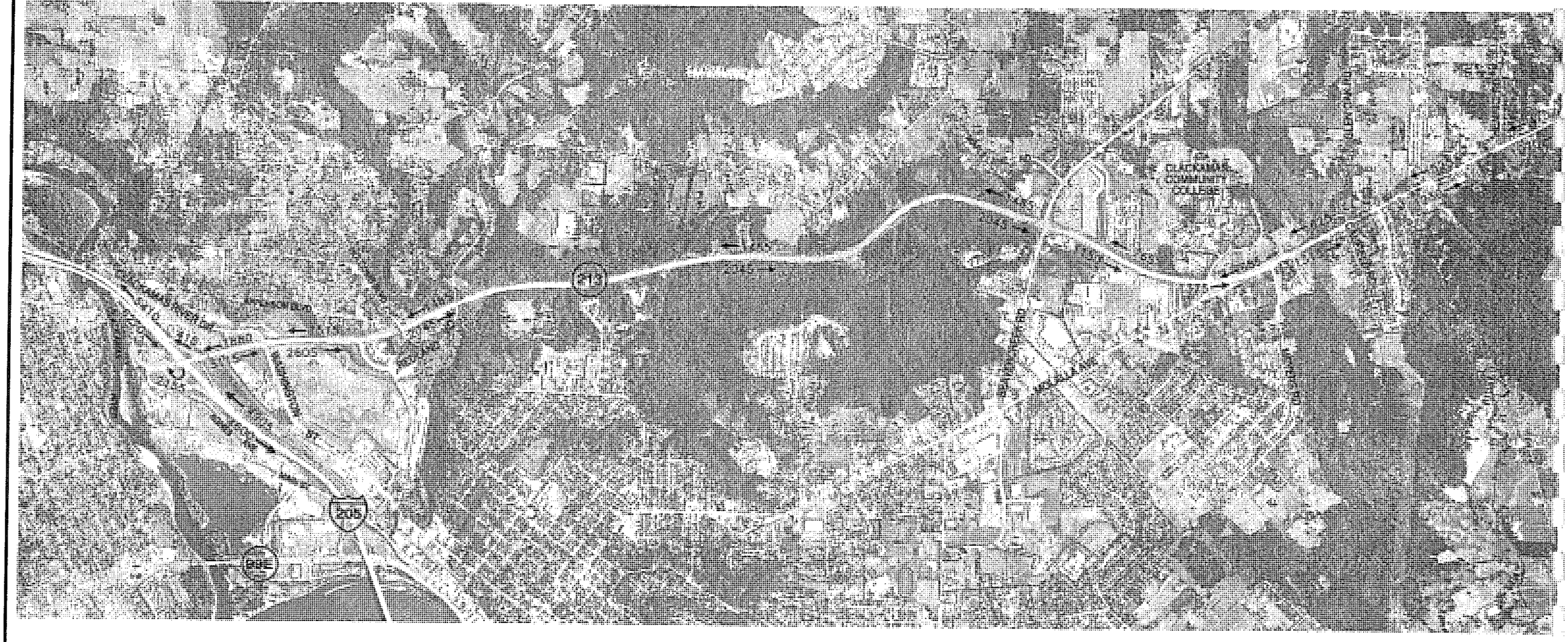
1998 EXISTING TRAFFIC VOLUMES WEEKDAY PM PEAK HOUR

FIGURE NO.
7A

PROJECT NO.
2561

h:\PROJFILE\2561\DWGS\FINALREP\FIGD7A.DWG

NORTH
(NOT TO SCALE)



h:\PROJFILE\2561\DWGS\FINALREP\FIG07B.DWG

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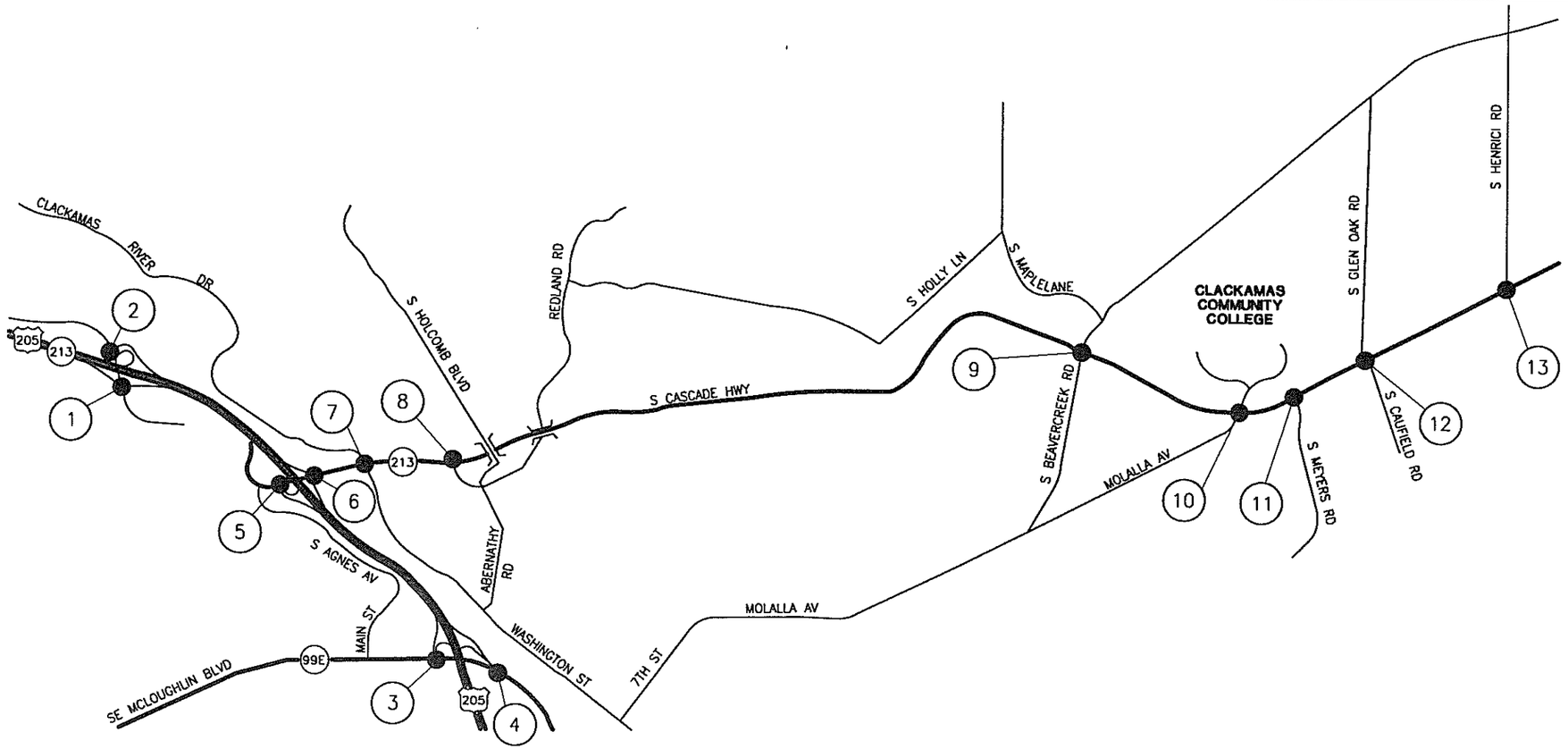
OREGON CITY, OREGON
JUNE 2000

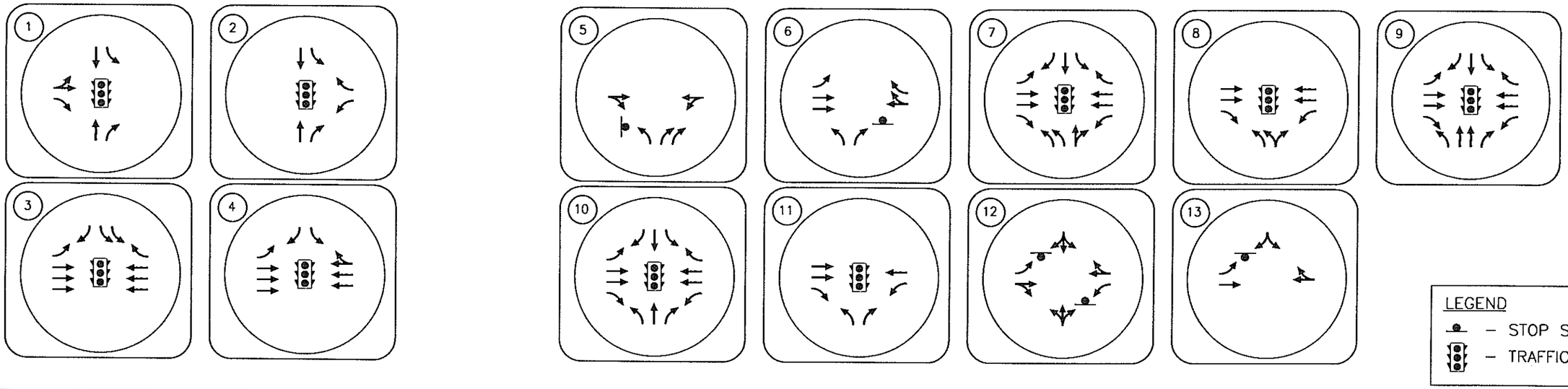
1998 EXISTING TRAFFIC VOLUMES WEEKDAY PM PEAK HOUR

FIGURE NO.
7B

PROJECT NO.
2561

NORTH
(NOT TO SCALE)





LEGEND
- STOP SIGN
- TRAFFIC SIGNAL

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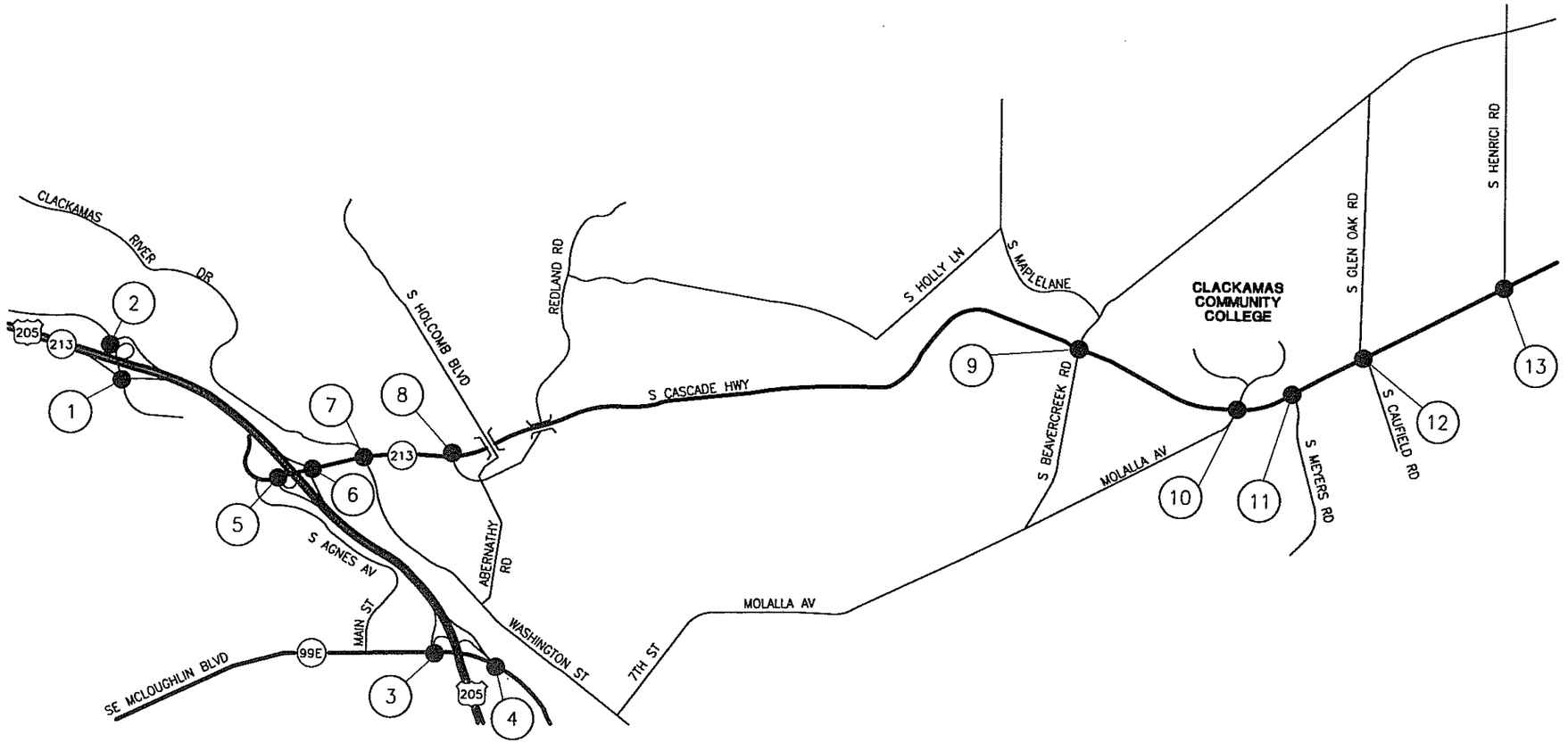
EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES

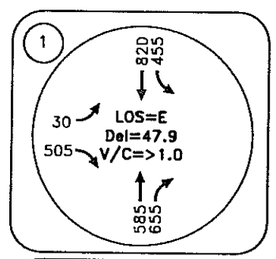
FIGURE NO. 8

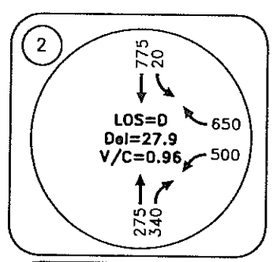
PROJECT NO. 2561

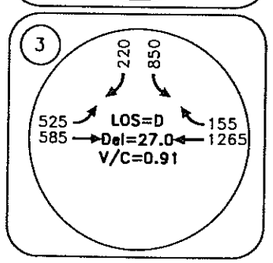
h:\PROJFILE\2561\DWGS\FINALREP\FIG008.DWG

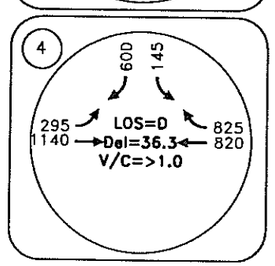
NORTH
(NOT TO SCALE)

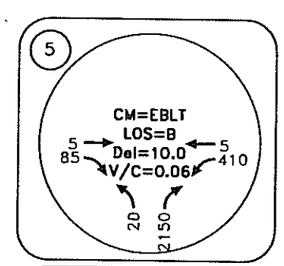


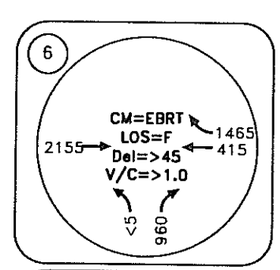


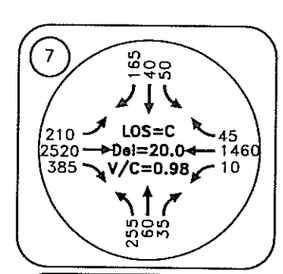


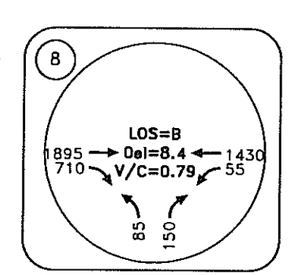


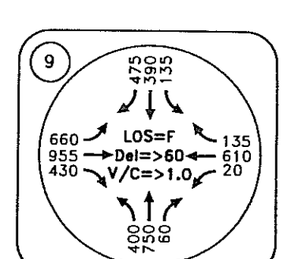


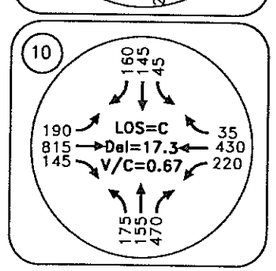


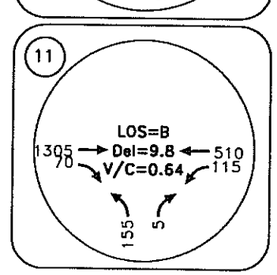


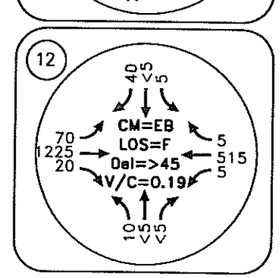


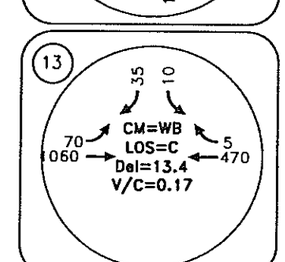












LEGEND
- CM = CRITICAL MOVEMENT (UNSIGNALIZED)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
- Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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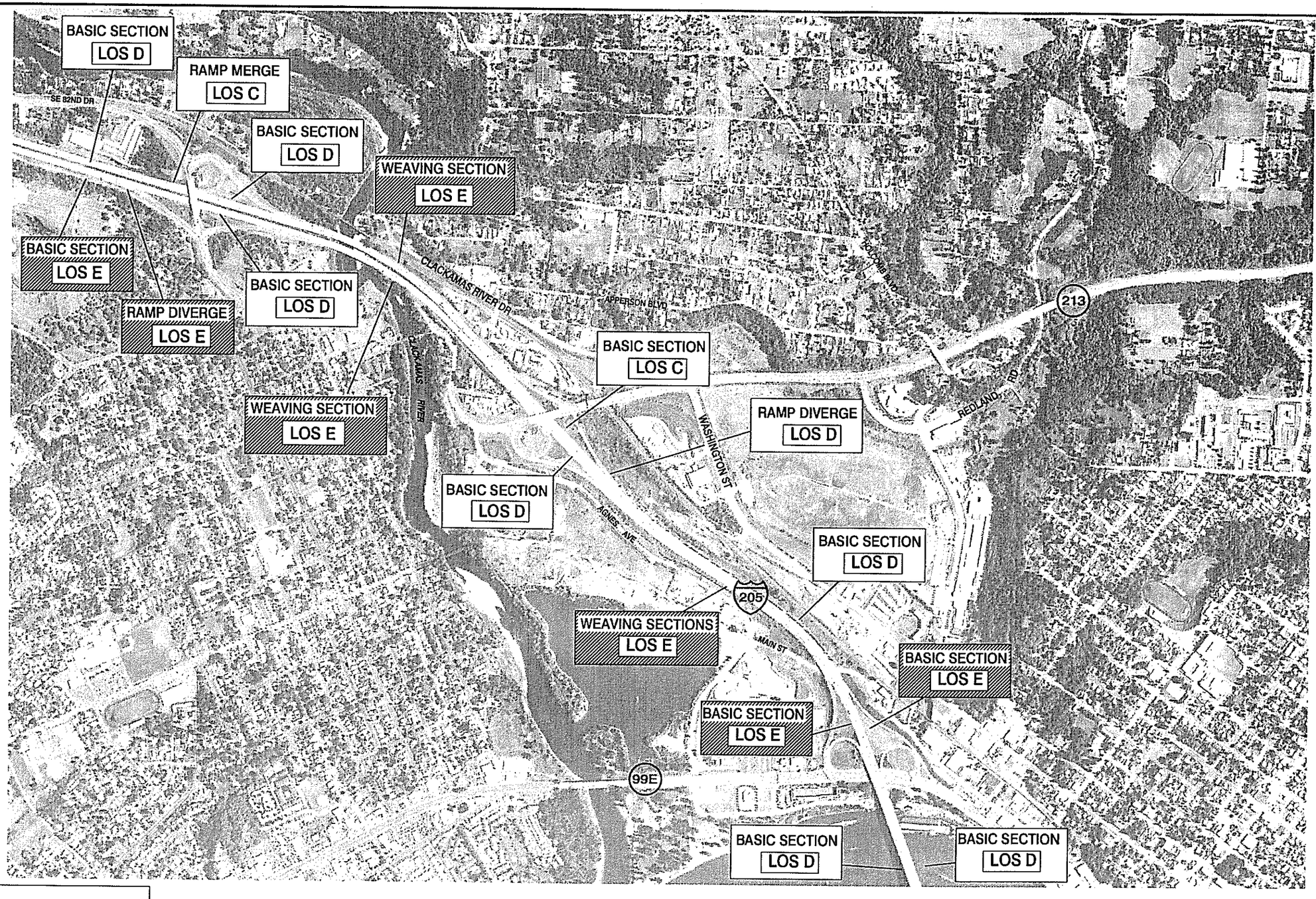
OREGON CITY, OREGON
JUNE 2000

EXISTING HIGHWAY 213 TRAFFIC OPERATIONS WEEKDAY PM PEAK HOUR

FIGURE NO.
9

PROJECT NO.
2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG009.DWG



NORTH
(NOT TO SCALE)

LEGEND

FAILS TO MEET ODOT LOS STANDARDS

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HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

OREGON CITY, OREGON
JUNE 2000

EXISTING I-205 TRAFFIC OPERATIONS WEEKDAY PM PEAK HOUR

FIGURE NO.
10

PROJECT NO.
2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG010.DWG

Future Conditions "No-Build" Analysis

The future conditions "No-Build" Scenario evaluates the traffic conditions likely to exist in the year 2018. This assumes there will be growth in travel demand and no modifications to the existing roadway network. The analysis of the forecast p.m. peak hour traffic volumes serves as the basis for identifying the projected future transportation system deficiencies at the study intersections and freeway segments. This information, in combination with the deficiencies identified through the existing conditions analysis, led to the development of the future Build Alternative design concepts for the study corridor.

The Metro 2015 travel demand model was used as the basis for determining a growth rate to forecast 2018 p.m. peak hour traffic volumes. This is consistent with the City of Oregon City Transportation System Plan work. No improvements were assumed for the model network because there are no committed projects along the Highway 213 or I-205 study area corridors, or projects acknowledged in the Metro 2015 regional model network. The land use inputs to the travel demand forecast were also consistent with the inputs for the Oregon City Transportation System Plan Study. These assumptions reflect the City of Oregon City's Comprehensive Plan with refinements to the transportation analysis zones to reflect more detail along the Highway 213 corridor.

2018 PM Peak Hour Traffic Volumes and Travel Desires

All roadways in the study area are forecast to experience significant growth in traffic volumes over the 20-year planning horizon. Over the course of 20 years, traffic volumes on I-205 are forecast to grow by approximately 35 percent. The ramps from I-205 into Oregon City at the Highway 99E interchange and the Highway 213 interchange could also experience dramatic growth in traffic volumes. This increase in demand for the two Oregon City I-205 interchanges is consistent with the significant future growth and development projected for the greater Oregon City area, particularly in the southern portion of the city.

On Highway 213, traffic volumes are projected to increase an average of 30 percent in the southbound direction and 40 percent in the northbound direction over the 20-year study time period. Consistent with the dramatic demand increase of the Highway 213/I-205 interchange, the travel demand on Highway 213 in the vicinity of the interchange (i.e. the segment from north of the interchange to Washington Street) is also forecast to increase at an above average rate (45 to 65 percent). These are significant traffic volume growth rates. The 2018 forecast p.m. peak hour traffic volumes are shown in Figures 11A and 11B.

Travel desires show that 70 percent of all traffic on southbound Highway 213 north of Redland Road have traveled from southbound I-205. Of the motorists on southbound Highway 213 at Redland Road, approximately 25 percent continue southbound on Highway 213 south of Henrici Road.

Southbound Highway 213 experiences the most significant travel demand between the northbound I-205 ramp terminal intersection and Clackamas River Drive. Of the motorists exiting northbound I-205 at the Highway 213 off-ramp, 40 percent will make a left-hand turn from southbound Highway 213 to Clackamas River Drive. The high increase in traffic demand for this travel pattern is expected due to the anticipated growth assigned to the Clackamas River Drive area. This is a significant movement that needs to be accommodated in the project design concepts. Several travel desires are summarized schematically in Figures 12A through 12D.

2018 PM Peak Hour Intersection Operations

Given this significant projected growth in p.m. peak hour traffic volumes with one exception, all of the study intersections will operate over capacity in the future. The one exception is at the Meyers Road/Highway 213 intersection. This is a substantial degradation over existing conditions. A schematic of forecast p.m. peak hour intersection operations is shown in Figure 13. A tabular summary of 2018 p.m. peak hour no-build intersection operations is included in Appendix D.

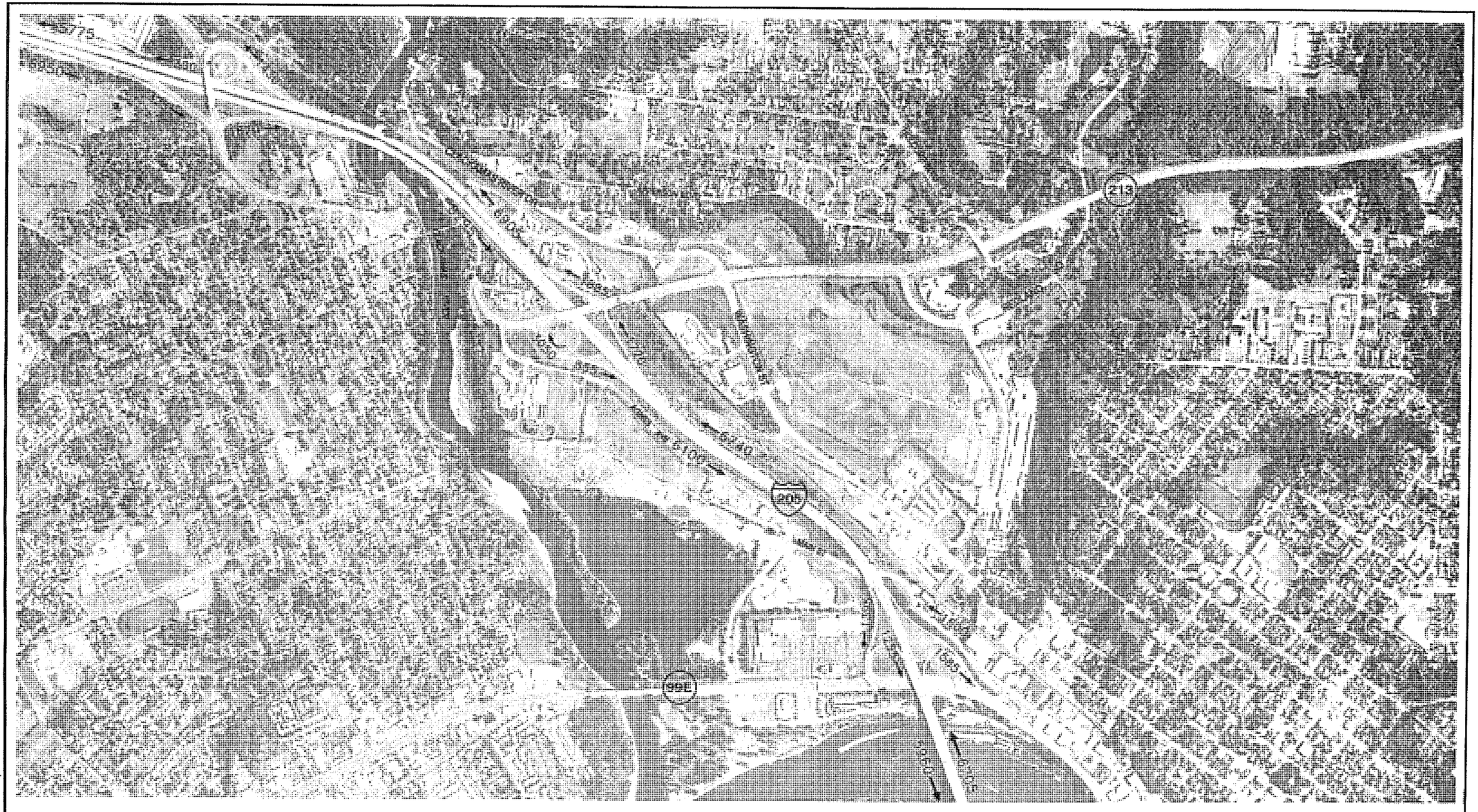
2018 PM Peak Hour Freeway Operations

On Highway 213 the two-lane freeway section between Redland Road and Beavercreek Road will have sufficient capacity to accommodate future travel demand through the corridor.

The growth in forecast p.m. peak hour traffic volumes has a significant impact on operations along I-205. All but one mainline segment of I-205 in the study corridor is forecast to operate at unacceptable levels of service. There will be significant roadway congestion and queuing. The exception is on northbound I-205 mainline between the Highway 213 off-ramp and the Highway 213 on-ramp, which will operate at level of service C.

The weaving sections on southbound I-205 between the Gladstone on-ramp and the Highway 213 off-ramp, and on southbound I-205 between the Highway 213 on-ramp to the Highway 99E off-ramp will both operate at level of service F.

Traffic operations at the merge/diverge locations will also operate below ODOT level of service standards. The exception is the I-205 northbound/Gladstone on-ramp merge. A schematic of forecast p.m. peak hour freeway operations is shown in Figure 14. A tabular summary of the 2018 p.m. peak hour freeway operations is included in Appendix D.



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TRANSPORTATION PLANNING\TRAFFIC ENGINEERING

HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

OREGON CITY, OREGON
JUNE 2000

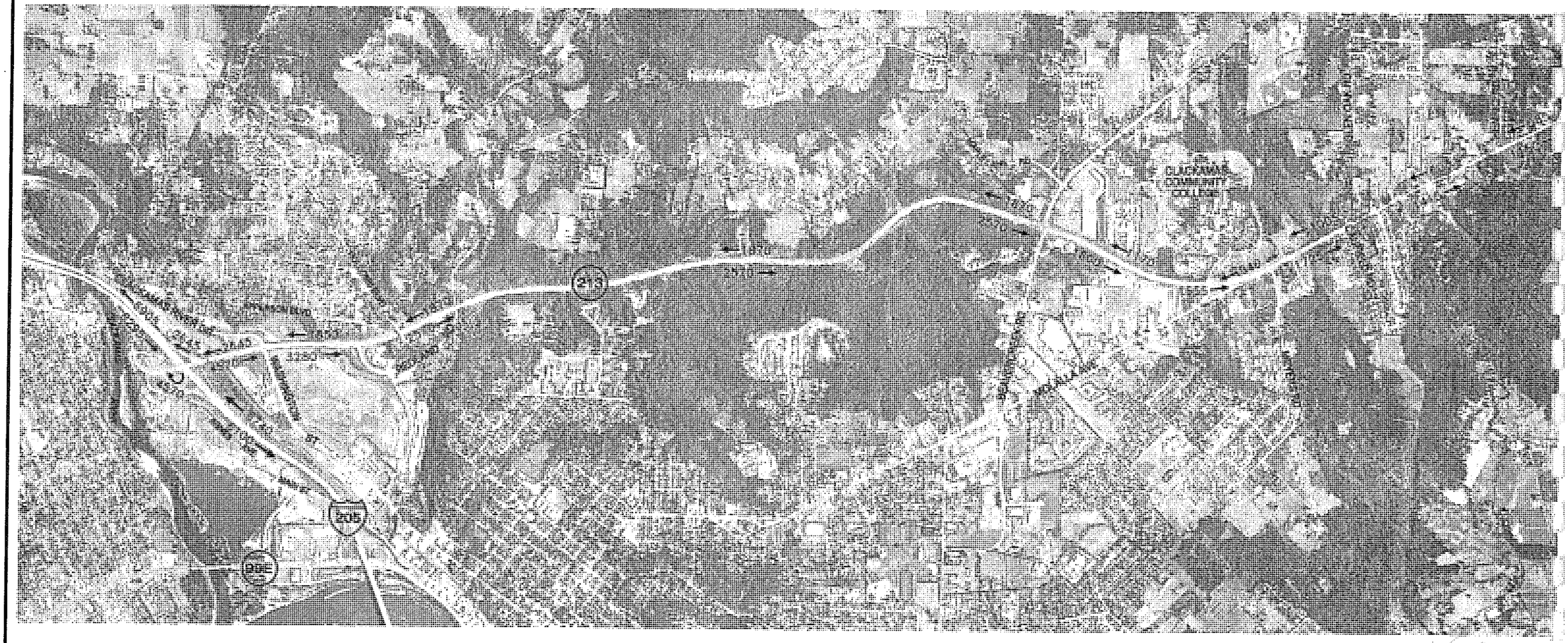
2018 FORECAST TRAFFIC VOLUMES WEEKDAY PM PEAK HOUR

FIGURE NO.
11A

PROJECT NO.
2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG11A.DWG

NORTH
(NOT TO SCALE)

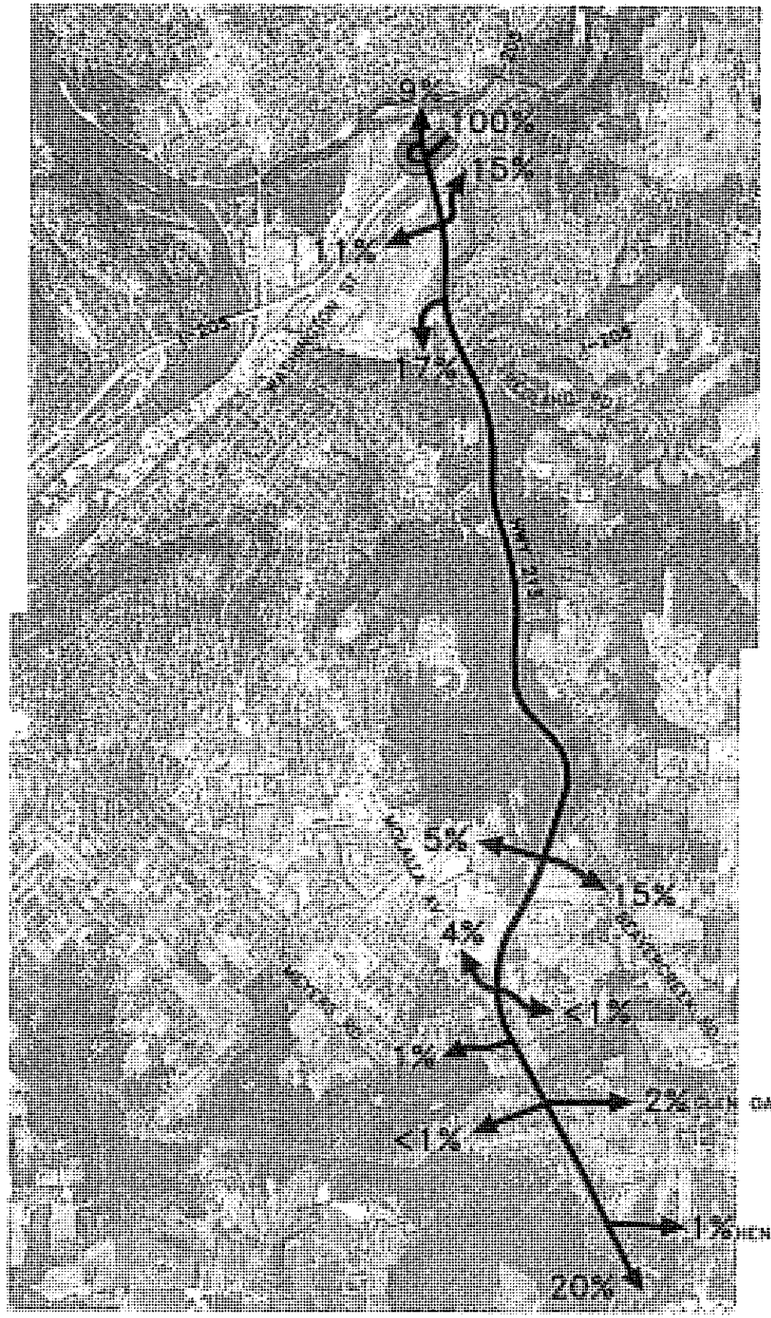


3,700

18,500 / 14,800 = X / 37,000
X = 24,300

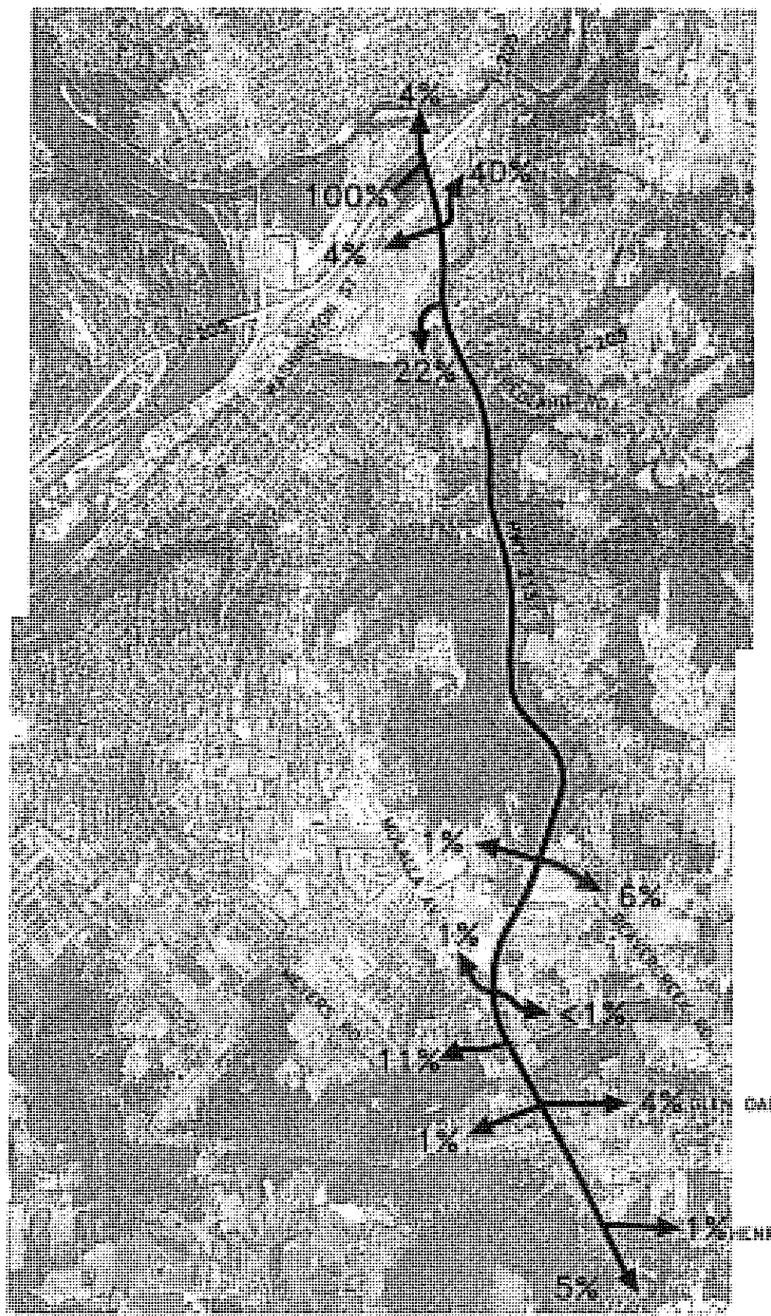
KITTELSON & ASSOCIATES, INC. 610 S.W. ALDER, SUITE 700 PORTLAND, OREGON 97205 (503) 228-5230 TRANSPORTATION PLANNING\TRAFFIC ENGINEERING	HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY OREGON CITY, OREGON JUNE 2000	*2018 FORECAST TRAFFIC VOLUMES* *WEEKDAY PM PEAK HOUR*	FIGURE NO. 11B PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG11B.DWG



HWY 213 FROM I-205 SOUTHBOUND

NOT TO SCALE



HWY 213 FROM I-205 NORTHBOUND

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HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

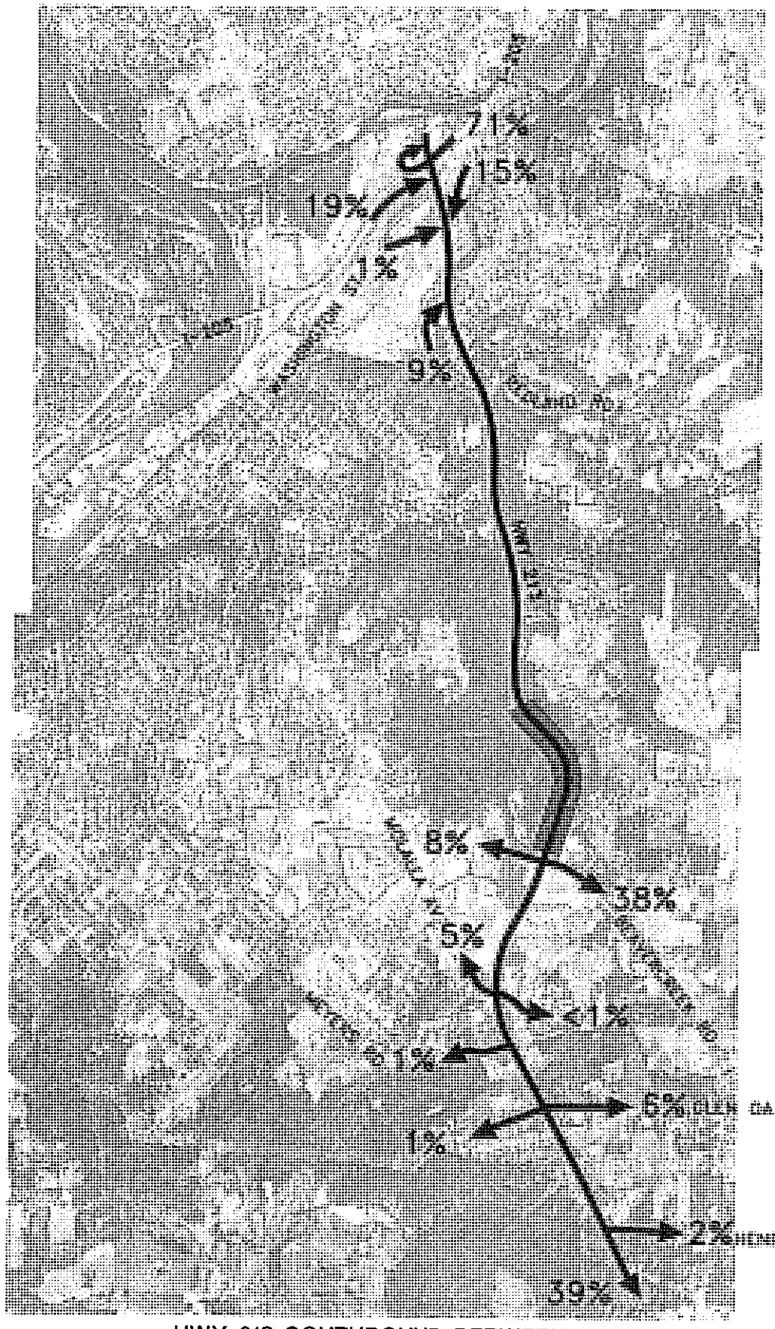
OREGON CITY, OREGON
JUNE 2000

2018 FORECAST TRAVEL DESIRES FROM I-205

FIGURE NO. 12A

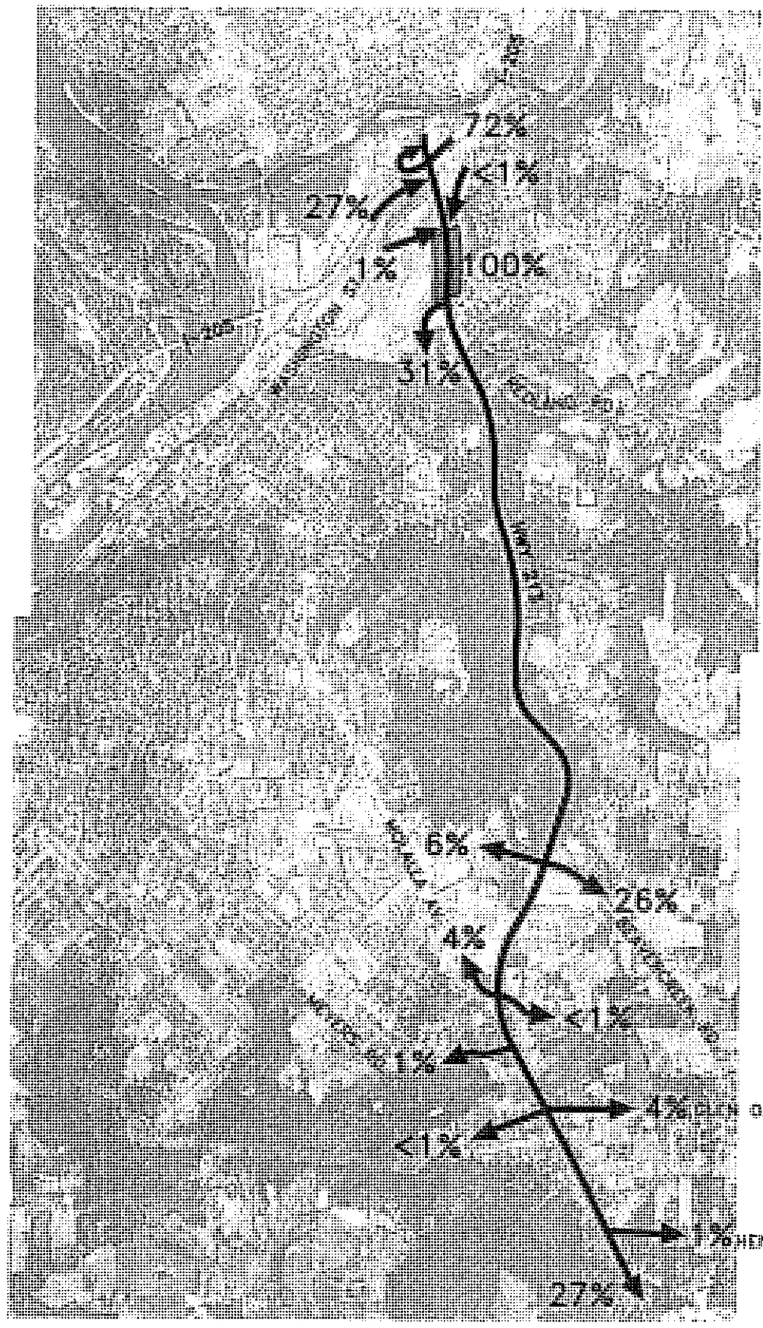
PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG12A.DWG



HWY 213 SOUTHBOUND BETWEEN
REDLAND ROAD AND BEAVERCREEK ROAD

NOT TO SCALE



HWY 213 SOUTHBOUND BETWEEN
WASHINGTON STREET AND REDLAND ROAD

h:\PROJFILE\2561\DWGS\FINALREP\FIG12B.DWG

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HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

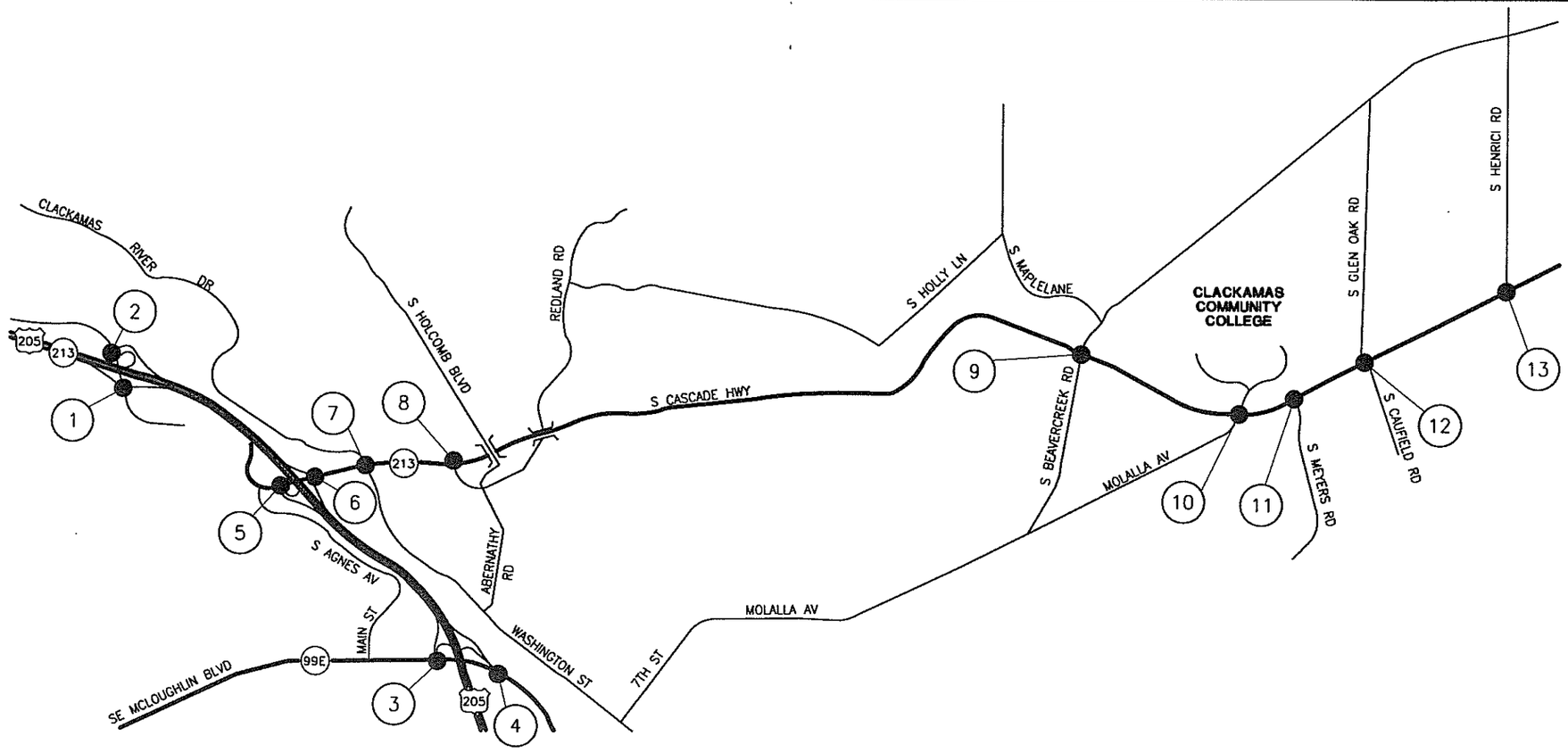
OREGON CITY, OREGON
JUNE 2000

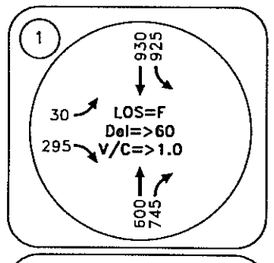
2018 FORECAST TRAVEL DESIRES ON HIGHWAY 213

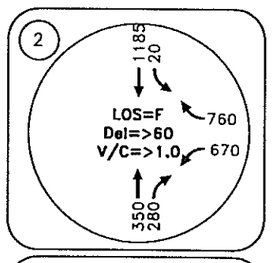
FIGURE NO.
12B

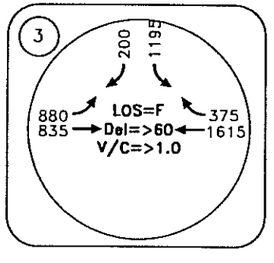
PROJECT NO.
2561

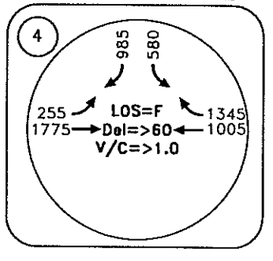
NORTH
(NOT TO SCALE)

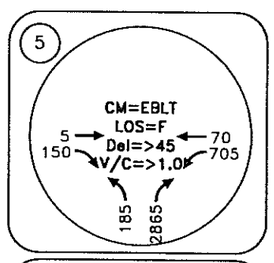


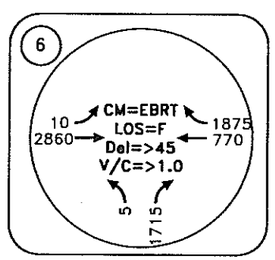


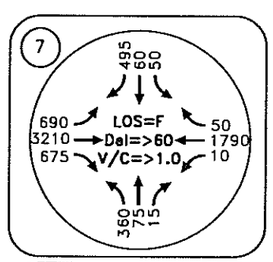


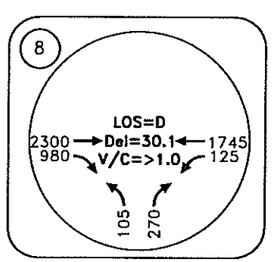


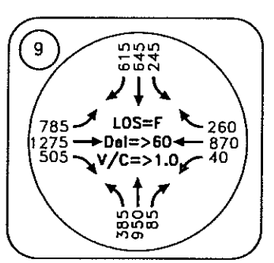


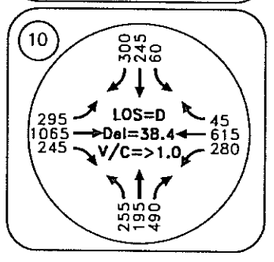


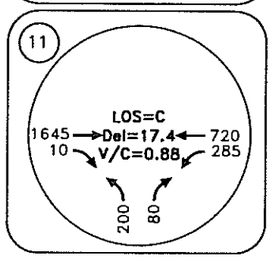


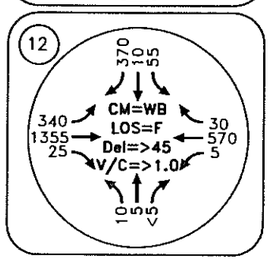


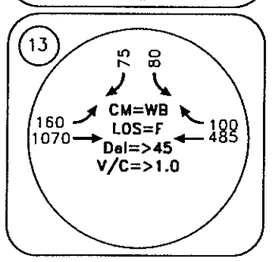












LEGEND
- CM = CRITICAL MOVEMENT (UNSIGNALIZED)
- LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
- Del = INTERSECTION AVERAGE DELAY (SIGNALIZED)/ CRITICAL MOVEMENT DELAY (UNSIGNALIZED)
- V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

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HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

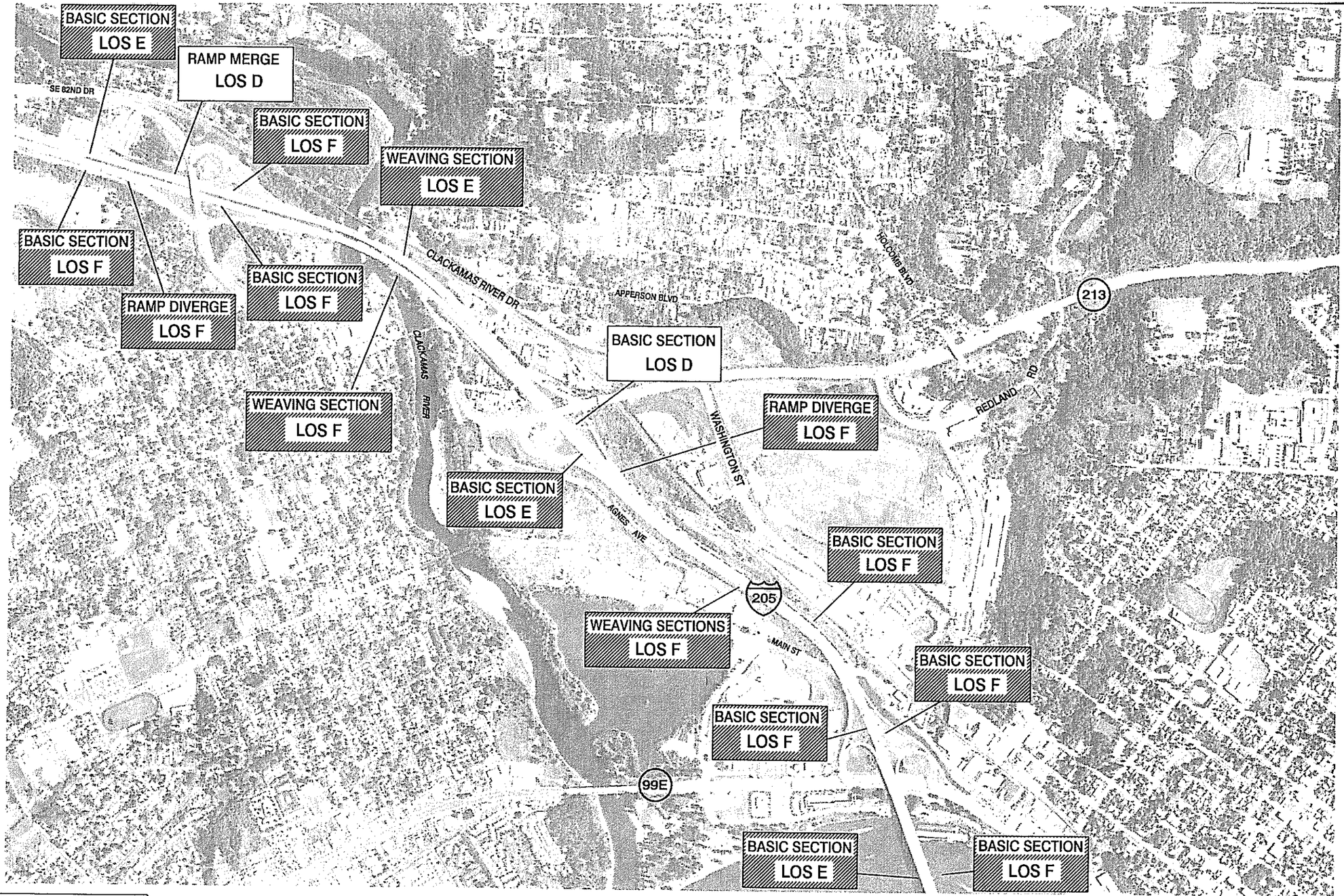
OREGON CITY, OREGON
JUNE 2000

2018 FORECAST INTERSECTION OPERATIONS WEEKDAY PM PEAK HOUR NO-BUILD ANALYSIS SCENARIO

FIGURE NO. 13

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG013.DWG



LEGEND

FAILS TO MEET ODOT LOS STANDARDS

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HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

OREGON CITY, OREGON
JUNE 2000

2018 FORECAST FREEWAY LEVELS OF SERVICE WEEKDAY PM PEAK HOUR NO-BUILD ANALYSIS SCENARIO

FIGURE NO. 14

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIGD14.DWG

Concept Development and Preferred Solutions

Concept Development

The project study area was divided into three distinct areas: the north area in the vicinity of the I-205/Highway 213 interchange (including Highway 213 between I-205 and Redland Road), and the south area from the Beavercreek/Highway 213 intersection, and Molalla Avenue south to Henrici Road. For each of these areas a number of improvement concepts were developed to address existing and forecast deficiencies, and to address the corridor vision developed by the TAC and CAC.

Initial alternatives were developed using single-line and double-line sketching techniques over aerial base mapping. These alternative solution concepts were presented to the TAC and CAC for review and refinement. Based on input from the TAC and CAC, the concepts were refined and prepared in a final format. Vertical and horizontal profile checks, planning level cost estimates, and traffic operations analyses were also conducted to verify that the solution concepts could be constructed and funded and would meet the appropriate level of service standards.

The TAC and CAC comparatively evaluated the concepts based on the following evaluation criteria:

- Traffic operations
- Phased implementation and expandability
- Constructability/maintenance of traffic
- Right-of-way requirements
- Compatibility with public transportation
- Compatibility with pedestrians/bicyclists
- Local access and circulation
- Satisfies operations and design requirements
- Compatibility with surrounding land uses
- Funding feasibility
- Cost/benefit

Good, Fair, and Poor ratings for the project evaluation criteria were assigned to each of the concepts to assist with alternatives evaluation and ranking. Details of the concept alternatives by sub-area are presented below.

North End Concepts

The forecast 2018 traffic volumes on I-205 cannot be accommodated without significant improvements on the I-205 facility. The analysis showed that improvements would be required on I-205 in the study area, throughout the adjacent I-205 corridor. These improvements could include capacity expansion on the I-205 Bridges over the Willamette and Clackamas Rivers. ODOT and Metro have recognized the potential congestion issues on the I-205 corridor and are beginning to plan for a corridor study to address future plans for the I-205 corridor. The Highway 213/I-205 interchange would be one component of this larger corridor analysis.

The TAC and CAC recommended the need for developing a most promising solution concept for the Highway 213/I-205 interchange that could be integrated into a plan for the I-205 corridor. The project team, TAC and CAC, recommended developing a concept that could be developed in phases to:

- Allow Oregon City to continue to evaluate development proposals in the vicinity of Washington Street,
- Be integrated efficiently with future interchange improvements, and
- Be a feasible way to immediately address congestion issues in this part of the Highway 213 corridor.

The CAC and TAC also identified that the north end of the Highway 213 corridor should be geared to moving vehicles under relatively high operating conditions. There should be limited delay, and to the extent feasible the intersections of Washington Street/Highway 213 and Redland Road/Highway 213 should be integrated with the Highway 213/I-205 interchange.

Three alternative solution concepts were developed and evaluated at the north end of the corridor. These are shown in Figures 15, 16, and 17. In all three Figures, the black lines depict existing roadway, the orange lines depict new freeway construction, and the green lines depict new arterial/collector streets off of the state highway system. All three alternatives introduced modifications that would reduce congestion at the Washington Street intersection, and accommodate the high volume p.m. peak hour movement from southbound I-205 to southbound Highway 213. Also each alternative relies on new arterial/collector connection(s) between Abernethy Road and Washington Street.

The concepts show two basic "system interchange" forms. A system interchange connects two high-type facilities (typically freeways) without sending traffic through an at-grade signalized intersection. A system interchange form is needed here to serve the forecast travel demand without degrading operations along I-205. The interchange concepts presented are trumpet forms and directional forms. Trumpet forms can have a loop ramp in advance or beyond the crossing highway (in this case, Highway 213). These forms serve the demand for the highway to freeway movements between I-205 and Highway 213 and minimize the potential for vehicle queues to back up onto the Interstate. Alternatives 1 and 2 are trumpet forms. Alternative 3 is a directional interchange. All of these alternatives include expanding I-205 to four basic lanes in each direction, plus auxiliary lanes in some locations.

In addition to serving the I-205 to Highway 213 (freeway to freeway) traffic, local access to Washington Street and Redland Road also needs to be served. This access is provided via "service interchange" forms. Service interchanges provide access between highways and local arterials, generally via signalized ramp terminal intersections. Given that the system and service interchanges need to be placed so close, the ramps must be physically separated on bridges to allow all the movements to occur in the

limited amount of space. Potential improvement phasing concepts for each of these alternatives are shown in Appendix F.

The traffic operations analysis conducted for Alternatives 1, 2 and 3 are summarized in Figures 18, 19, and 20 respectively. For each alternative, significant operational improvements on I-205 can be achieved through developing four basic lanes on the freeway. However, the weaving section on southbound I-205 between the Gladstone and the Highway 213 interchanges will continue to operate at LOS F in all alternatives. In addition in each alternative, p.m. peak hour congestion at the intersection of Washington Street/Highway 213 can be eliminated by grade separating the Highway 213 through movements from the more local trips turning to and from Washington Street and Clackamas River Drive.

North End Preferred Solution

The CAC and TAC reviewed the quantitative and qualitative evaluation criteria and developed the summary good, fair, poor alternatives evaluation shown in Table 1. The evaluation and the consensus of both the TAC and the CAC was, that in the long-term, Alternative 3 was the most promising solution concept and was ranked as the number one preference. Among other advantages, this concept appears to have the least right-of-way and environmental impacts. The construction costs are estimated to be the lowest of the three alternatives and this concept is the most expandable and conducive to being constructed in phases. It is estimated that these interchange concepts may cost in the range of $75 Million to $100 Million; possibly more depending upon environmental mitigation. Alternative 3 will be at the lower end of this cost range, Alternative 1 in the middle, and Alternative 2 at the higher end. These costs do not include cost for right-of-way acquisition nor system level I-205 improvements.

The ability to phase Alternative 3 such that congestion relief at the Highway 213/Washington Street intersection could be achieved in the near future was critical to the City of Oregon City, the TAC and the CAC. The preliminary phasing shown in Figure 21 depicts the Washington Street overcrossing for southbound Highway 213 traffic. Eliminating this traffic from the at-grade intersection allows the intersection of Washington Street/Highway 213 to continue to operate at acceptable p.m. peak hour levels of service through the year 2015. When traffic operations do degrade below acceptable levels of service, a grade-separated intersection will likely be required to minimize traffic congestion.

In the vicinity of Washington Street, 70 percent of the motorists from I-205 to Oregon City destinations or beyond. These are regional trips and are appropriate on the State Highway system. Therefore, in this area, the cost proportionality split for roadway improvement projects between ODOT and the City of Oregon City should be 70 percent ODOT and 30 percent City of Oregon City.

Beavercreek/Highway 213 Concept Development

Highway 213 between Beavercreek Road and Molalla Avenue was identified by the CAC and TAC as an urban corridor that will need to incorporate pedestrian and bicycle travel needs along and across the highway. With the retail development, Clackamas Community College and residential development in the surrounding area, pedestrian and bicyclist needs along and across the highway should be planned for and accommodated. This amount of activity also means relatively high forecast travel demands through the Beavercreek/Highway 213 intersection.

At the intersection of Beavercreek/Highway 213, the high p.m. peak hour left turning movements from southbound Highway 213 to eastbound Beavercreek Road cause the intersection to operate over capacity. Three solution concepts were developed to address this deficiency:

- A partial cloverleaf interchange concept,
- A diamond concept, and
- An expanded at-grade intersection concept.

The diamond concept could be in the form of a single point diamond or tight urban diamond. These are shown in Figures 22 and 23, respectively.

The forecast weekday p.m. peak hour traffic operations are also shown in these Figures. Acceptable traffic operations for the 20-year planning horizon can be achieved with the partial cloverleaf concept and the diamond concepts. The at-grade solution concept may exceed the ODOT volume to capacity ratio operational requirements of 0.95 by the year 2015. At this time, the intersection would most likely need to be grade-separated to accommodate the forecast travel demand.

Beavercreek/Highway 213 Preferred Solution

The project team reviewed the evaluation criteria and developed the alternatives evaluation rating shown in Table 2.

Following the review, refinement and evaluation of the alternatives, the CAC and TAC favored the at-grade expanded intersection solution concept.

- This concept has the greatest compatibility with pedestrians and public transportation
- Initially has the lowest construction costs
- Has the greatest potential for receiving project funding
- And appears to have the least adverse environmental and community impacts. There is a possibility for other roadways to be constructed across Highway 213 (but not connecting to Highway 213) that could extend the life of the Beavercreek Road/Highway 213 intersection.

At this location, approximately 50% of the motorists have destinations in Oregon City. Therefore, the cost proportionality split for improvements is 50% ODOT and 50% City of Oregon City.

Table 1. North End Alternatives Evaluation

● GOOD ◒ FAIR ○ POOR	Alternative 1	Alternative 2	Alternative 3
Traffic Operations	◒	●	●
Phased Implementation and Expandibility	◒	○	●
Environmental and Community Impacts	○	○	◒
Constructability/ Maintenance of Traffic	◒	○	●
Construction Costs	◒	○	●
Right of Way Requirements	○	○	◒
Compatibility with Public Transportation	○	◒	●
Compatibility with Pedestrians/Bicyclists	○	○	◒
Local Access and Circulation	○	◒	◒
Satisfies Operations and Design Requirement	◒	◒	◒
Compatibility with Surrounding Land Uses	○	○	◒
Funding Feasibility	○	○	○
Cost/Benefit	◒	◒	●

These interchange concepts may cost in the range of $75 to $100 Million; possibly more depending upon environmental mitigation. Alternative 3 will be at the lower end of this range, Alternative 1 in the middle, and Alternative 2 at the higher end. These costs do not include right-of-way nor system-level I-205 improvements.

Table 2. Beavercreek/Highway 213 Alternatives Evaluation

● GOOD ◒ FAIR ○ POOR	At Grade Intersection	Partial Cloverleaf Interchange	Single Point Diamond
Traffic Operations	○	●	●
Phased Implementation and Expandibility	○	○	○
Environmental and Community Impacts	●	○	◒
Constructability/ Maintenance of Traffic	●	○	◒
Construction Costs	●	◒	○
Right of Way Requirements	●	○	◒
Compatibility with Public Transportation	●	○	○
Compatibility with Pedestrians/Bicyclists	●	○	◒
Local Access and Circulation	●	●	●
Satisfies Operations and Design Requirement	○	◒	●
Compatibility with Surrounding Land Uses	◒	○	◒
Funding Feasibility	●	○	○
Cost/Benefit	●	○	○

The alternatives may cost in the magnitude of:

At Grade Intersection = $3 Million
Partial Cloverleaf Interchange = $15 Million
Single Point Diamond = $20 Million

These costs do not incude right-of-way nor environmental mitigatons.

CLACKAMAS RIVER

CLACKAMAS RIVER DRIVE

SE 82ND DRIVE

HIGHWAY 213

AGNES AVENUE

METRO SOUTH TRANSFER STATION

WASHINGTON STREET

APPERSON BOULEVARD

HOLCOMB BOULEVARD

REDLAND ROAD

LEGEND

- EXISTING ROADWAY
- PROPOSED NEW FREEWAY
- PROPOSED NEW ARTERIAL/COLLECTOR

SCALE

0 200 400

(In Feet)

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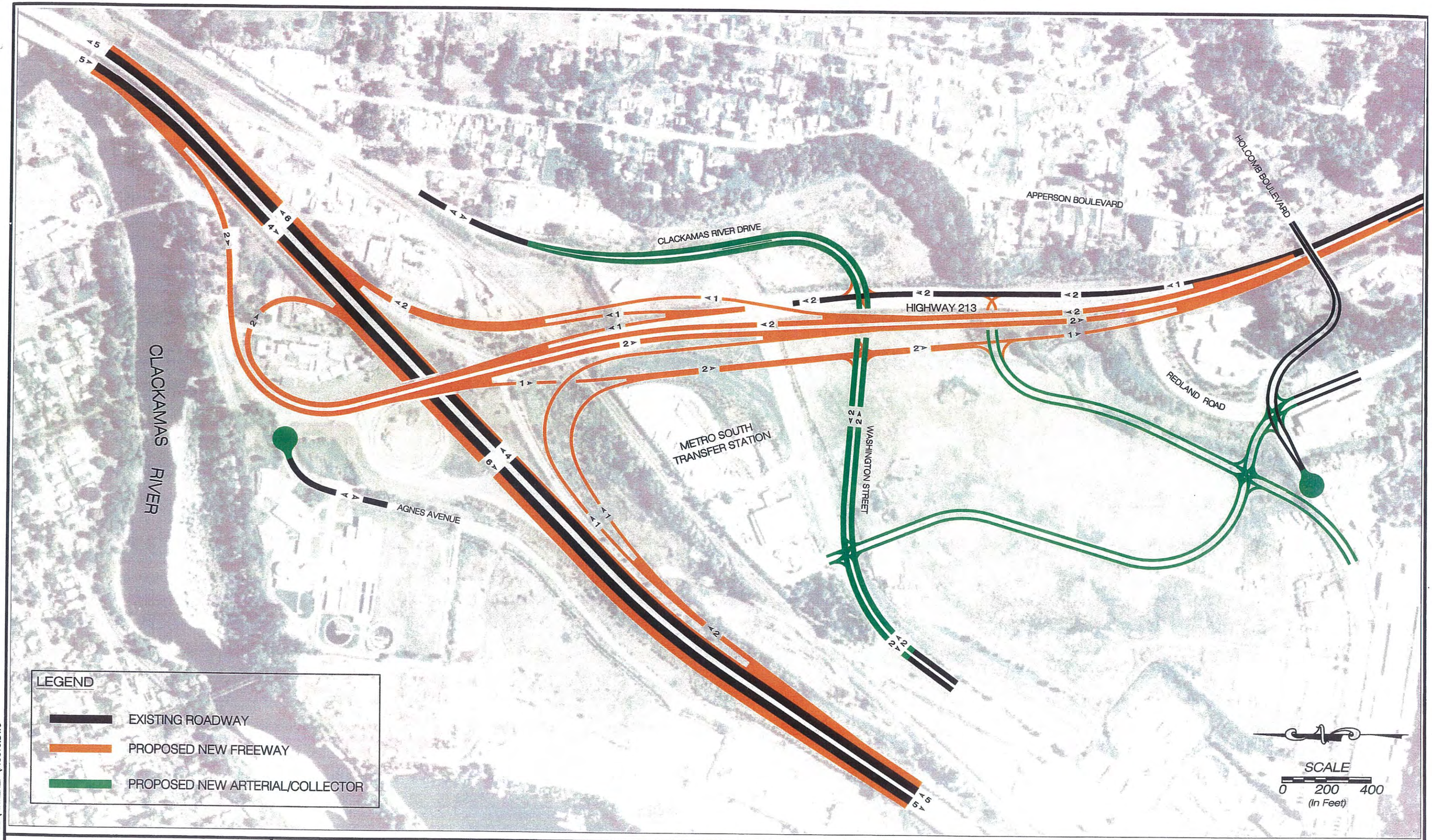
JUNE 2000

HIGHWAY 213/I-205 INTERCHANGE CONCEPT ALTERNATIVE 1

FIGURE NO. 15

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG015.DWG



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HIGHWAY 213/I-205 INTERCHANGE CONCEPT ALTERNATIVE 2

FIGURE NO. 16

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG016.DWG

CLACKAMAS RIVER DRIVE

APPERSON BOULEVARD

HOLCOMB BOULEVARD

HIGHWAY 213

SE 82ND DRIVE

CLACKAMAS RIVER

METRO SOUTH TRANSFER STATION

WASHINGTON STREET

REDLAND ROAD

AGNES AVENUE

LEGEND

- EXISTING ROADWAY
- PROPOSED NEW FREEWAY
- PROPOSED NEW ARTERIAL/COLLECTOR

SCALE

0 200 400

(In Feet)

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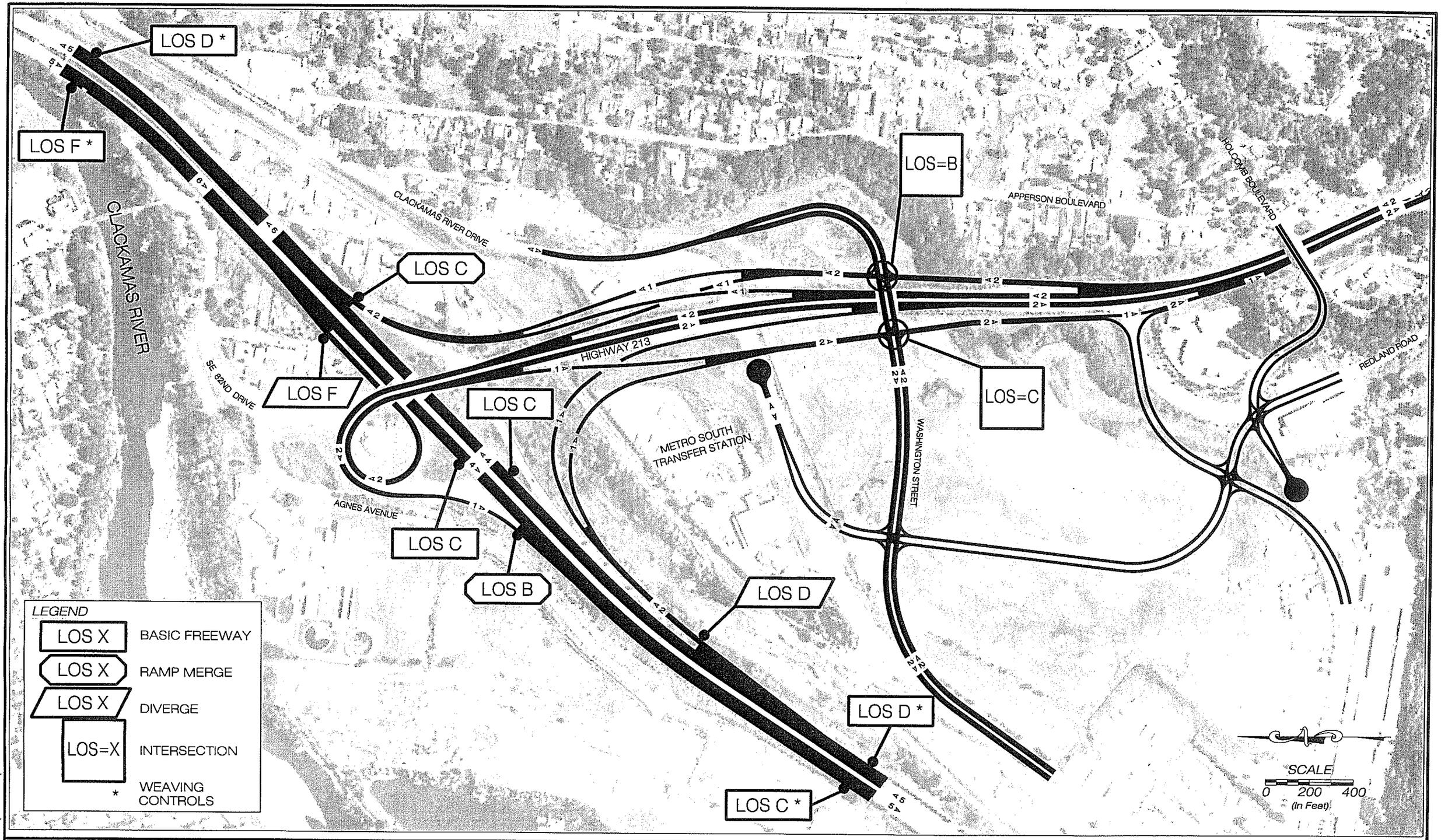
HIGHWAY 213/I-205 INTERCHANGE CONCEPT ALTERNATIVE 3

FIGURE NO. 17

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG017.DWG



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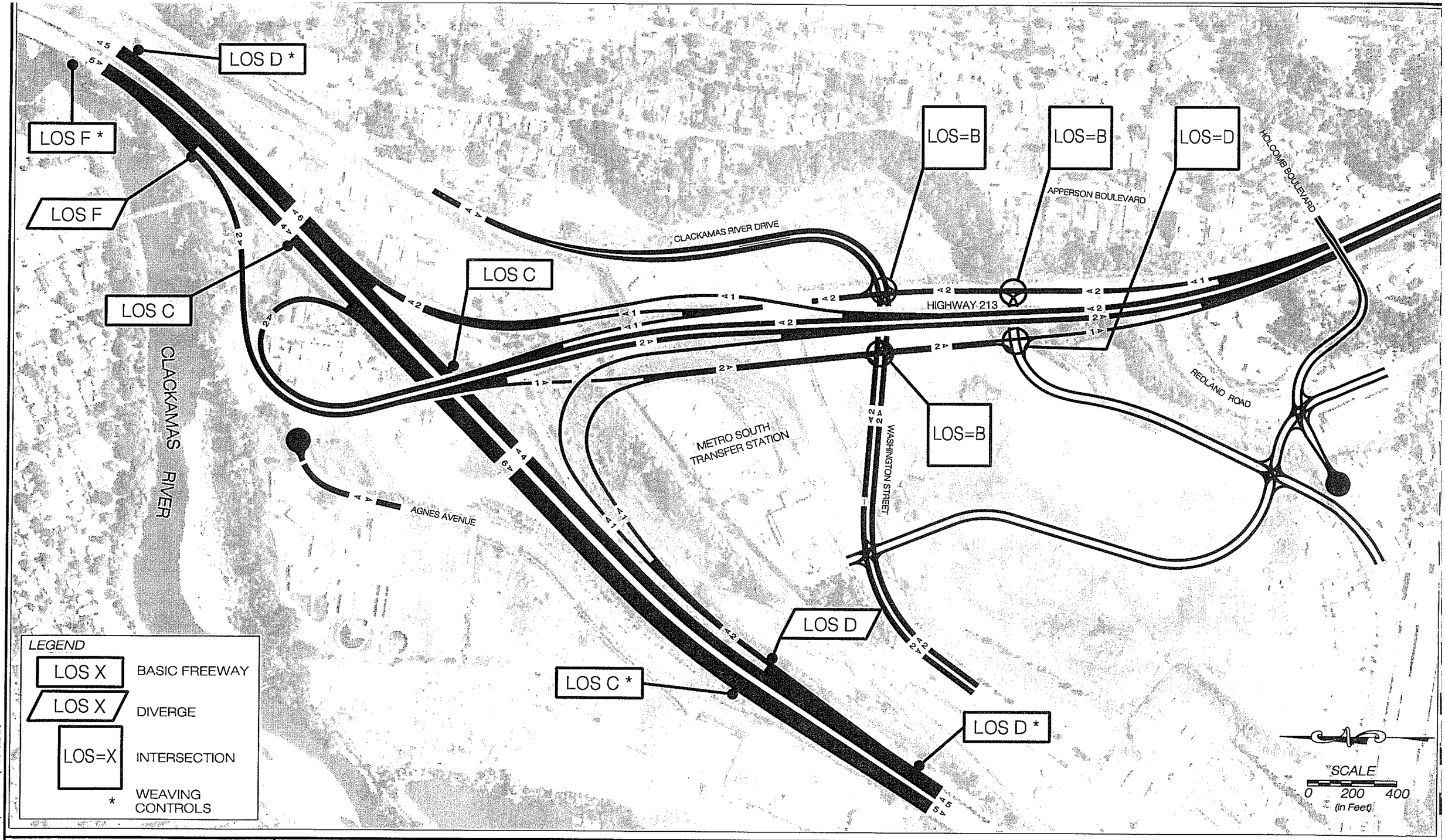
JUNE 2000

FREEWAY LEVELS OF SERVICE
2018 WEEKDAY PM PEAK HOUR
HIGHWAY 213/I-205 ALTERNATIVE 1

FIGURE NO. 18

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG018.DWG



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OREGON CITY, OREGON
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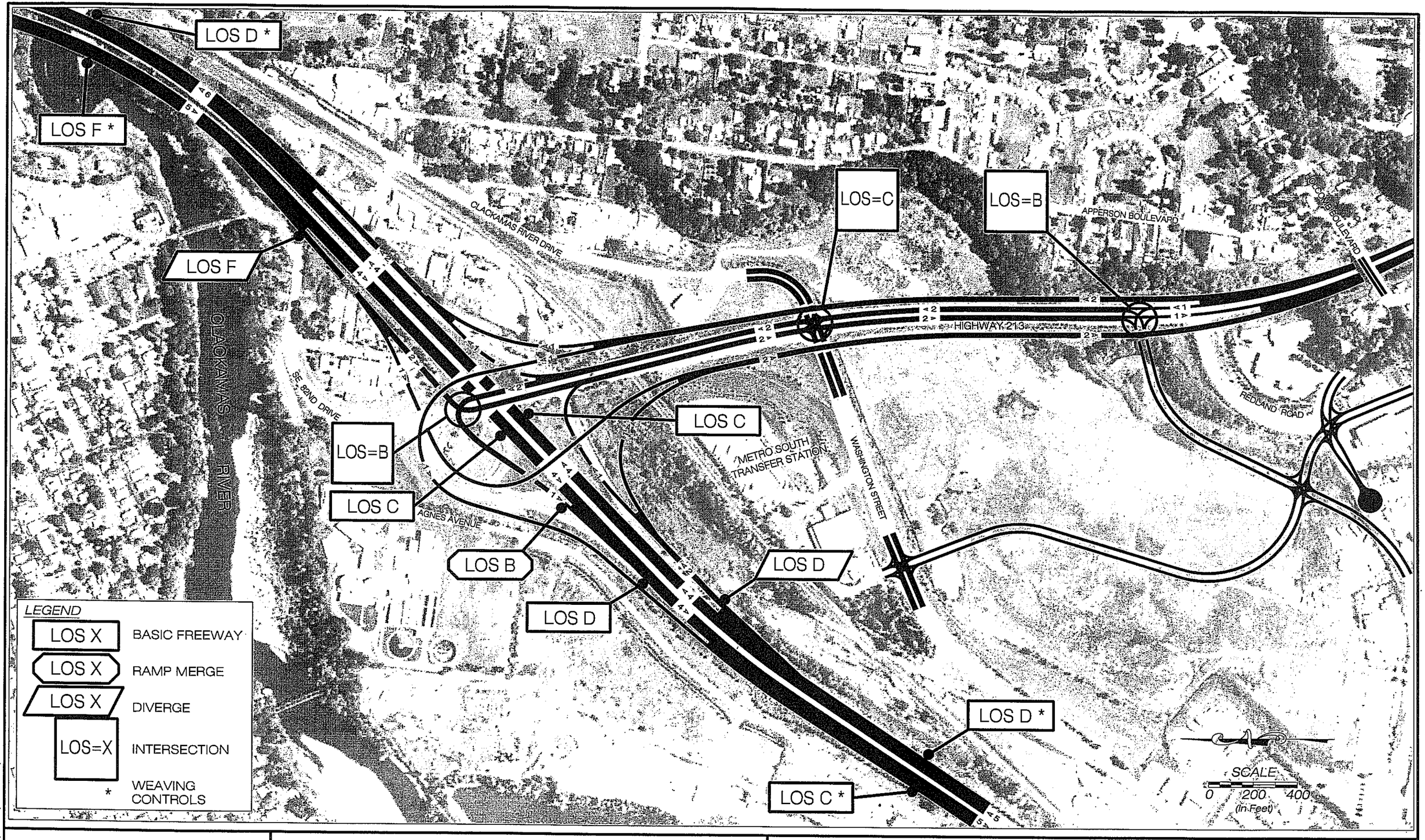
FREEWAY LEVELS OF SERVICE
2018 WEEKDAY PM PEAK HOUR
HIGHWAY 213/I-205 ALTERNATIVE 2

FIGURE NO. 19

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG019.DWG



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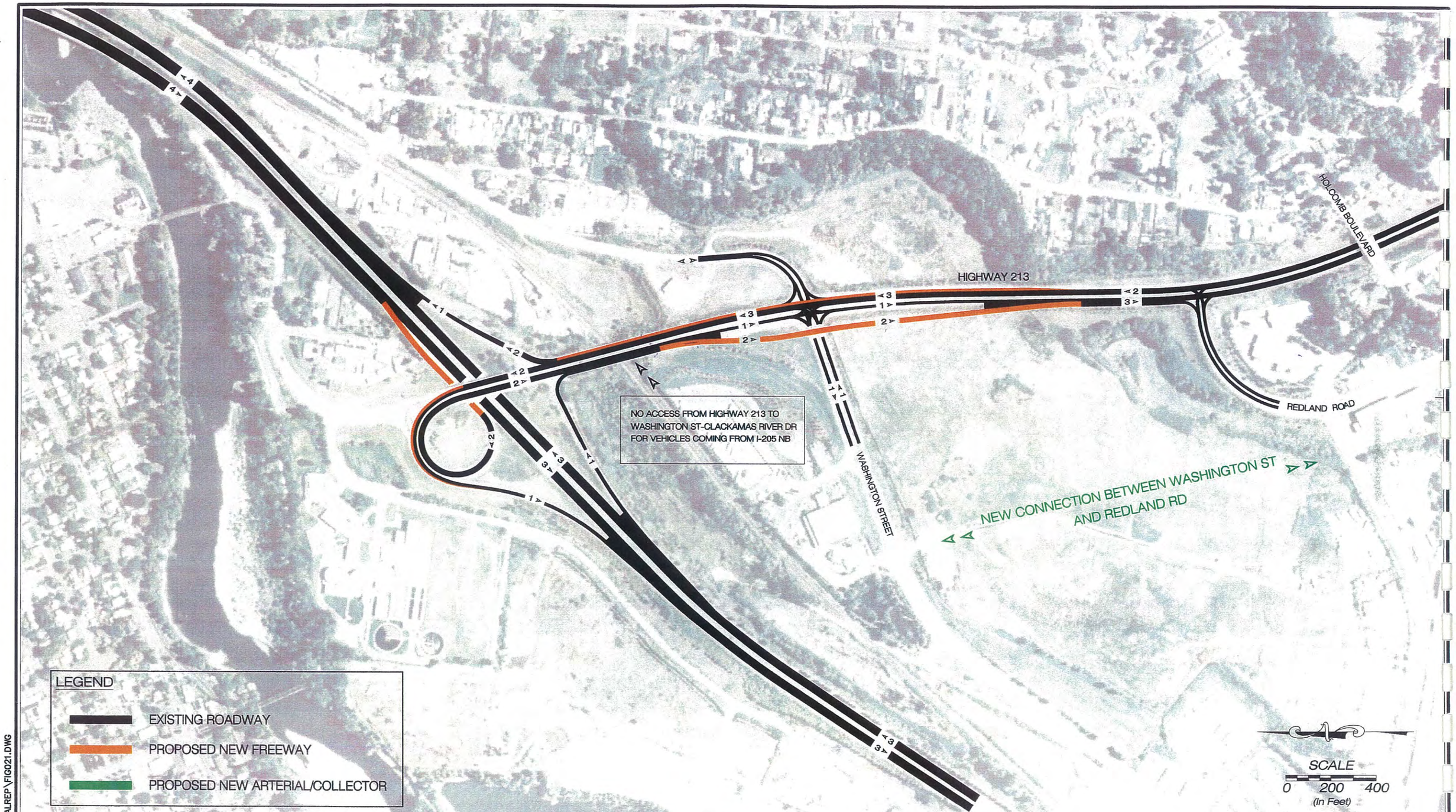
FREEWAY LEVELS OF SERVICE 2018 WEEKDAY PM PEAK HOUR HIGHWAY 213/I-205 ALTERNATIVE 3

FIGURE NO. 20

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG020.DWG



h: \PROJFILE\2561\DWGS\FINALREP\FIG021.DWG

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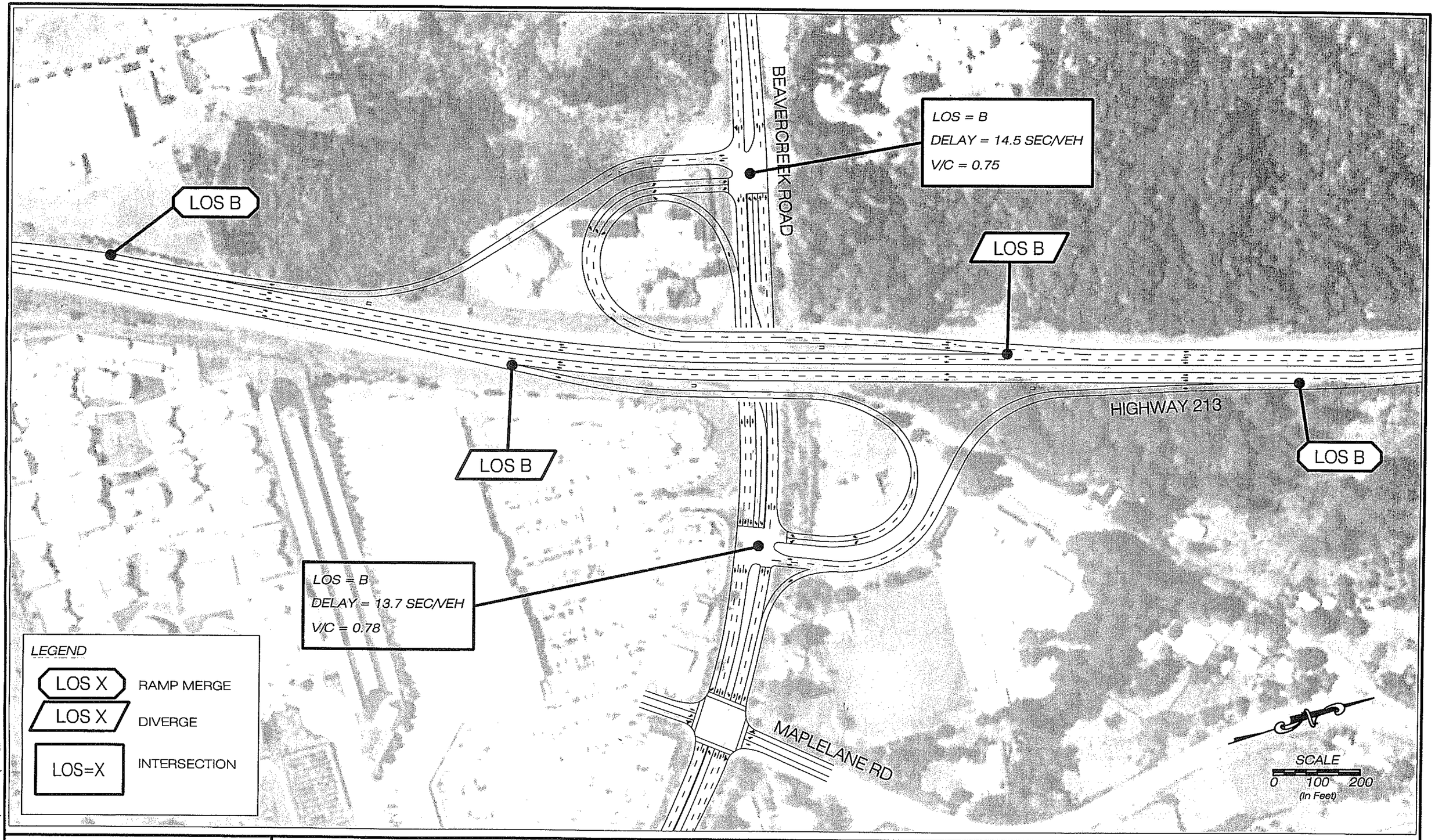
JUNE 2000

HIGHWAY 213/I-205 INTERCHANGE CONCEPT ALTERNATIVE 3 - PHASE 1 IMPROVEMENT

FIGURE NO. 21

PROJECT NO. 2561



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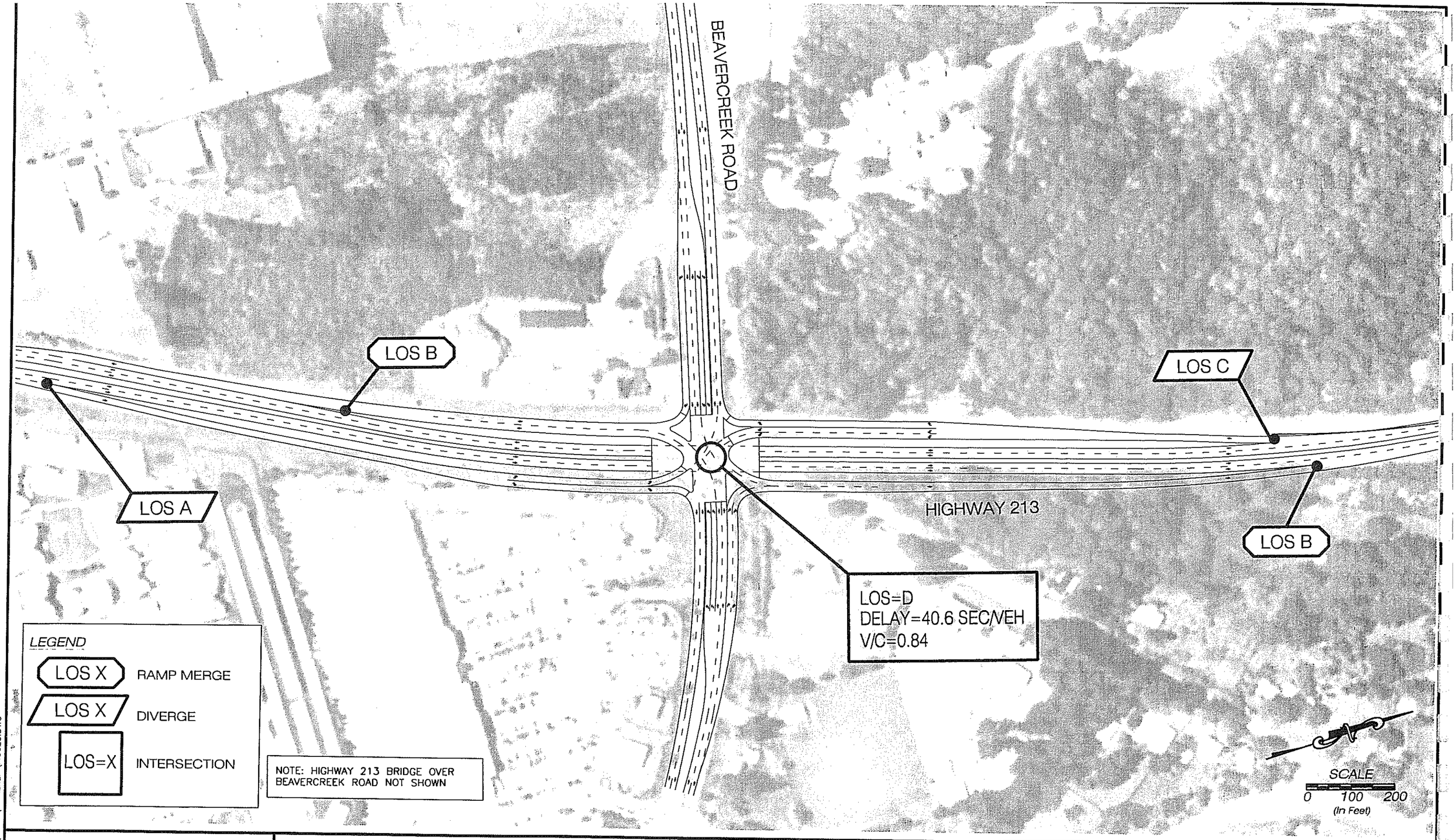
OREGON CITY, OREGON
JUNE 2000

BEAVERCREEK/HIGHWAY 213 IMPROVEMENT PLAN PARTIAL CLOVERLEAF INTERCHANGE CONCEPT

FIGURE NO.
22

PROJECT NO.
2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG022.DWG



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BEAVERCREEK/HIGHWAY 213 INTERCHANGE PLAN SINGLE POINT DIAMOND CONCEPT

FIGURE NO. 23

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG023.DWG

South End Preferred Solution Concept

From Molalla Avenue south to Henrici Road, the critical project issue was to develop a travel corridor that:

- Meets future capacity needs,
- Provides appropriate levels of direct, but managed access, and
- Safely transitions the Highway from a rural facility (Henrici Road) to an urban facility in the vicinity of Molalla Avenue and Beavercreek Road.

The concept shown in Figure 24 depicts the solution developed to meet these needs. South of Molalla Avenue, Highway 213 would be a four-lane facility with a median and turn lanes at critical intersections. At Glen Oak Road, the facility would transition to a three-lane facility with one travel lane in each direction plus a two-way median left turn lane. At Henrici Road, the facility would transition from a three-lane facility back to the rural two-lane facility. The location of direct accesses onto Highway 213 will need to be further evaluated as part of the future design and environmental evaluations.

Figures 25A, 25B and 25C also show the results of the 2018 weekday p.m. peak hour traffic operational analysis. If the improvements were implemented, all of the study intersections would operate under capacity and at LOS C or better. This concept also requires constructing traffic signals at the Henrici Road/Highway 213 and at Glen Oak/Highway 213 intersections, and re-aligning the Glen Oak Road-Caulfield Road/Highway 213 intersection.

In this area, the percentage of trips with trip ends in Oregon City decrease slightly to 45 percent. Therefore for the improvements identified in this area, the cost proportionality split should be 55 percent ODOT and 45 percent City of Oregon City.

Summary

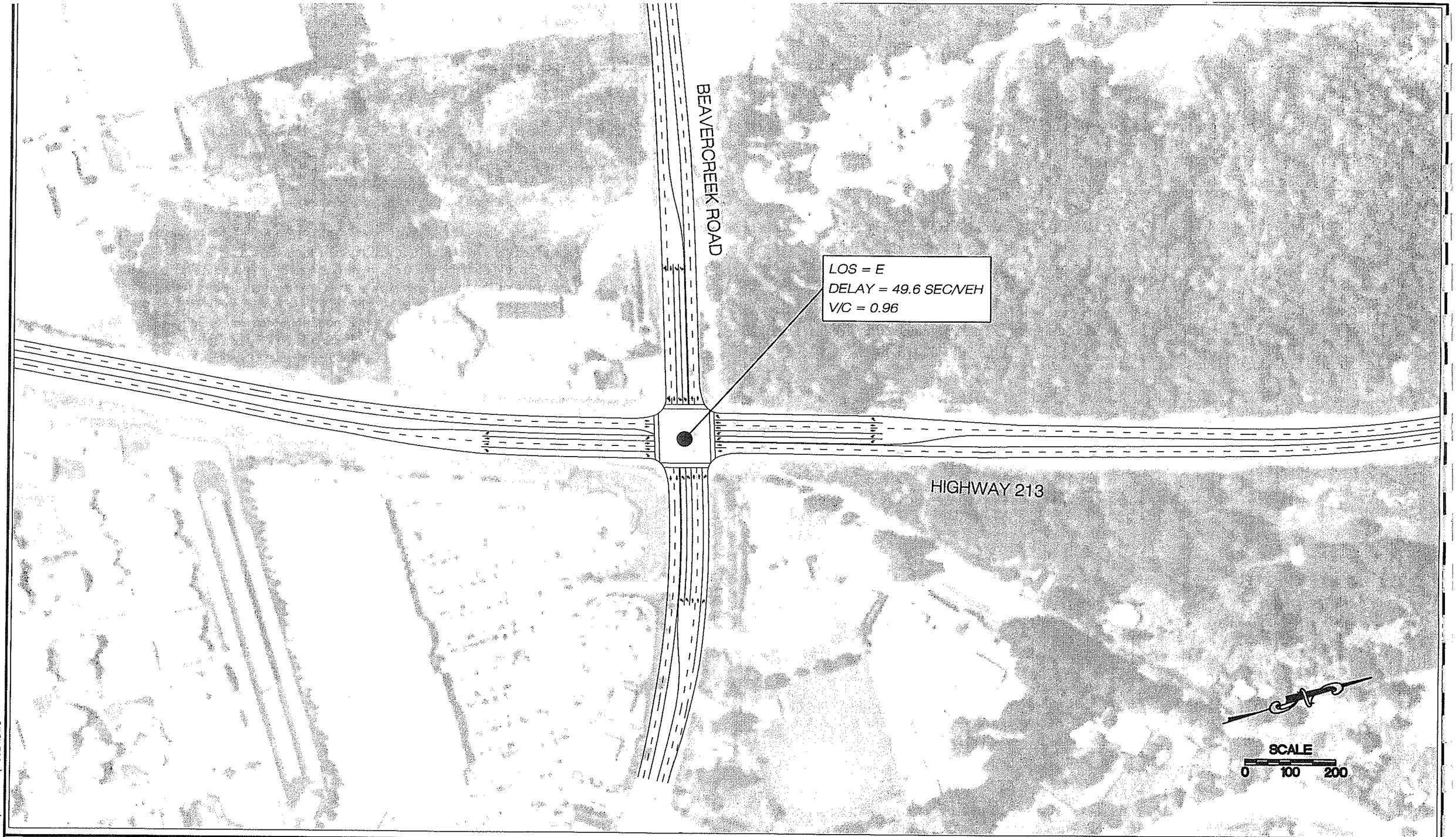
The City of Oregon City, and the project TAC and CAC voiced that congestion relief needs to be developed as soon as possible along the Highway 213 corridor. At the north end of the corridor, the project stakeholders recognized that solutions to the traffic congestion on I-205 would be developed as part of a longer-term I-205 corridor study. However, the stakeholders also strongly advocate that an interim solution, that would not preclude longer-term interchange concepts, should be implemented as soon as possible.

This interim solution is Alternative 3 Phase 1 (Figure 21). Implementing this concept provides immediate congestion relief at the intersection of Washington Street/Highway 213 and allows Oregon City to continue to plan for development in this vicinity. The construction costs associated with this facility would be shared at a local, regional, and state level, and likely also with private funding sources.

The City and ODOT will also plan to construct an expanded at-grade intersection at Beavercreek Road/Highway 213 (Figure 24). This expanded intersection will include double left-turn lanes at all intersection approaches. It requires significant expansion of Beavercreek Road to service forecast travel. Constructing this intersection provides capacity through the year 2015. At that time, ODOT and the City of Oregon City will need to consider constructing a grade-separated intersection. Other system connections under consideration may preclude the need for this. Funding has been secured for this at-grade improvement project through the Metro Regional Transportation Plan process.

South of Beavercreek Road, from Molalla Avenue to Henrici Road, the City of Oregon City and ODOT should include traffic signals at the intersections of Henrici Road/Highway 213 and Glen Oak Road/Highway 213 in their TSP and capital planning efforts. To implement this concept, an access management plan should also be developed with community input to ensure that an appropriate balance between access needs and traffic operations and safety is achieved.

The results of the Highway 213 Urban Corridor Design Study will be incorporated into the Oregon City TSP. As the TSP is adopted, so too will be the recommendations from this project. These project findings will provide direction for the City of Oregon City to proceed with community development plans in this corridor. Implementing the near-term improvements (Beavercreek Road/Highway 213 at-grade intersection expansion, Alternative 3 Phase 1), will provide mobility for today; however critical to the longer-term vitality of the Oregon City transportation system are identifying improvements on I-205 to accommodate future travel demand. In this regard, the City of Oregon City should begin working with ODOT and Metro to develop and implement a corridor study project.



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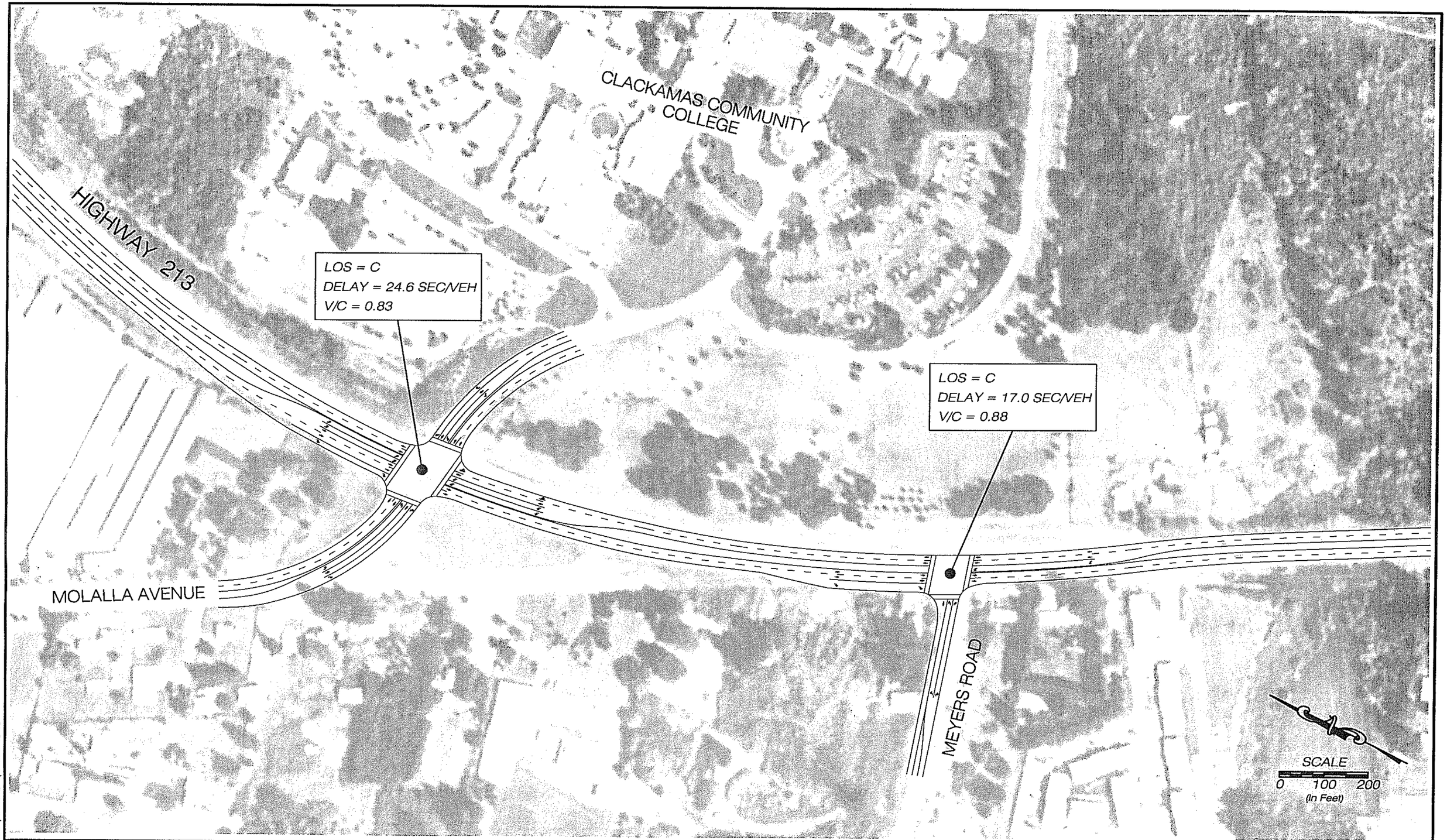
OREGON CITY, OREGON
JUNE 2000

BEAVERCREEK/HIGHWAY 213 IMPROVEMENT PLAN IMPROVED AT-GRADE INTERSECTION CONCEPT

FIGURE NO. 24

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG024.DWG



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HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

OREGON CITY, OREGON
JUNE 2000

HIGHWAY 213 IMPROVEMENT PLAN CONCEPT MOLALLA AVENUE TO HENRICI ROAD

FIGURE NO.
25A

PROJECT NO.
2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG025A.DWG

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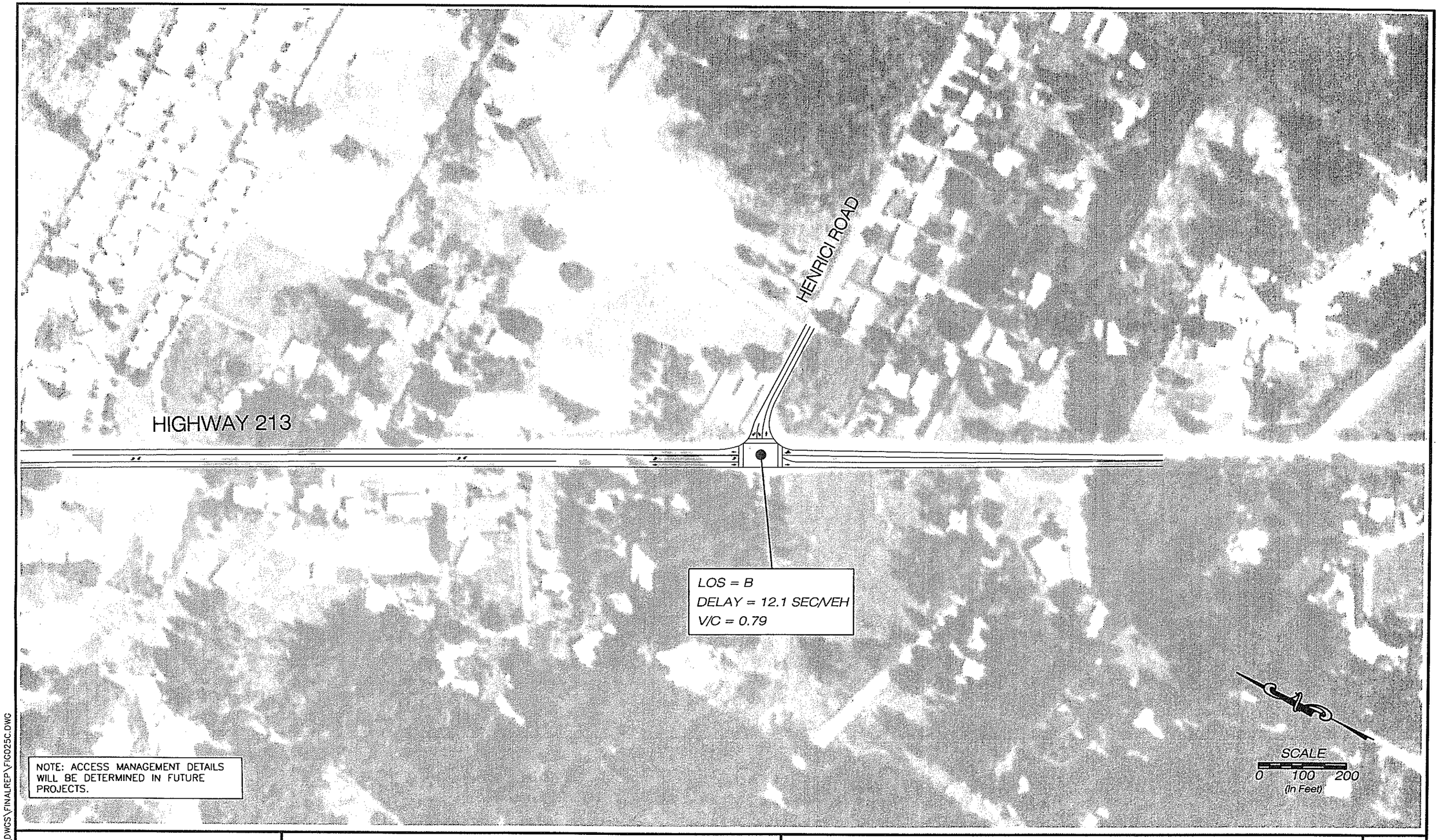
OREGON CITY, OREGON
JUNE 2000

HIGHWAY 213 IMPROVEMENT PLAN CONCEPT MOLALLA AVENUE TO HENRICI ROAD

FIGURE NO. 25B

PROJECT NO. 2561

h:\PROJFILE\2561\DWGS\FINALREP\FIG025B.DWG



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HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

OREGON CITY, OREGON
JUNE 2000

HIGHWAY 213 IMPROVEMENT PLAN CONCEPT MOLALLA AVENUE TO HENRICI ROAD

FIGURE NO. 25C

PROJECT NO. 2561

H:\PROJFILE\2561\DWGS\FINALREPT\FIG025C.DWG

Appendix A
Geometric Conditions
Criteria Rating

Table A-1. Freeway & Interchange Rating Criteria (Assumed design speed= 60 mph)

Feature	Rating			1990 AASHTO Reference
	Good	Fair	Poor	
Geometric Features				
Horizontal Alignment Degree of Curvature	Less than 5°15'	5°15' to 8°15'	Greater than 8°15'	169
Vertical Alignment I-205 (level) HWY 213 (rolling)	Level to 3% Level to 4%	3% to 4% 4% to 6%	Greater than 4% Greater than 6%	585 585
Stopping Sight Distance	Greater than 525'	400' to 525'	Less than 400'	284
Cross Section	See Table A-2			
Decision Sight Distance	Greater than 1275'	1025' to 1275'	Less than 1025'	127
Exit/Entrance Design				
Entrance Taper	Greater than 50:1	40:1 to 50:1	Less than 40:1	985
Exit Diverge	Less than 4°	4° to 5°	Greater than 5°	989
Acceleration Length	Greater than 910'	500' to 910'	Less than 500'	986
Deceleration Length	Greater than 430'	315' to 430'	Less then 315'	991
Operational Features				
Lane & Route Continuity	Maintains Continuity	N/A	Lacks Continuity	938-941
Lane Balance	Maintains Balance	N/A	Lacks Balance	942-946
Ramp Spacing/Sequence				
Entrance-Entrance/Exit-Exit	Greater than 1500'	1000' to 1500'	Less than 1000'	983
Exit to Entrance	Greater than 750'	500' to 750'	Less than 500'	983
Entrance to Exit	Greater than 3000'	2000 to 3000'	Less than 2000'	983

Table A-1 continued

Feature	Rating			1990 AASHTO Reference
	Good	Fair	Poor	
Performance Measures				
Level of Service Volume-to-Capacity	A-C Less than 0.70	D 0.70 to 0.84	E-F Greater than 0.84	263
Accident Rate Million Vehicle Miles	<1.75	N/A	>1.75	ODOT Accident Rates

Table A-2. Cross Section Rating Criteria

RATING	DESIGN CRITERIA
GOOD (Each of the criteria must be met)	• Lane width of 12 feet. • Right shoulder width at least 10 feet. • Left shoulder width at least 4 feet. • Fore-slope designed to 6:1 for 0 to 5 feet of fill; and 4:1 for greater than 5 feet of fill. • Roadside Barrier designed and placed according to current AASHTO standards. • Median barrier provided for width and traffic volumes as described by current AASHTO standards.
FAIR (Each of the criteria must be met)	• Lane width of 12 feet. • Right shoulder width at least 4 feet paved. • Left shoulder width of 1 to 4 feet. • Fore-slope designed to 4:1 for 0 to 15 feet of fill; and 3:1 for greater than 15 feet of fill. • Roadside Barrier (concrete or guardrail) with only minor deficiencies relative to current AASHTO standards.
POOR (Rating warranted if any of the features has noted deficiency)	• Lane width less than 12 feet. • Right shoulder width less than 10 feet. • No left shoulder. • Unprotected fore-slope 3:1 or steeper.

Appendix B
Existing Conditions
Analysis of Operation

Table B-1.
Existing Conditions Intersection Level of Service

Intersection	Average Weekday PM Peak Hour						
	Signalized Intersection			Unsignalized Intersection			
	V/C[1]	Average Delay (sec/veh)	LOS[2]	Critical Movement	V/C[3]	Average Delay[4] (sec/veh)	LOS[5]
Hwy 213/I-205 SB Ramps				EB-LT[6]	0.06	10.0	B
Hwy 213/I-205 NB Ramps				EB-RT[7]	1.00	>45.0	F
Hwy 213/Washington Street	0.98	20.0	C				
Hwy 213/Redland Road	0.79	8.4	B				
Hwy 213/Beavercreek Road	>1.00	>60.0	F				
Hwy 213/Molalla Avenue	0.67	17.3	C				
Hwy 213/Meyers Road	0.64	9.8	B				
Hwy 213/Glen Oak Road				EB	0.19	>45.0	F
Hwy 213/Henrici Road				WB[8]	0.17	13.4	C
I-205 SB/Gladstone Ramps	>1.00	47.9	E				
I-205 NB/Gladstone Ramps	0.96	27.9	D				
I-205 SB/Hwy 99E Ramps	0.91	27.0	D				
I-205 NB/Hwy 99E Ramps	>1.00	36.3	D				

Table B-1. Legend

[1] V/C = Volume-to-Capacity ratio

[2] LOS = Level of Service

[3] Volume-to-Capacity ratio for the critical movement

[4] Average delay for the critical movement

[5] Level of Service ratio for the critical movement

[6] EB-LT = eastbound left-turn from I-205 SB off-ramp to northbound Highway 213

[7] EB-RT = eastbound right-turn from I-205 NB off-ramp to southbound Highway 213

[8] WB = westbound

Table B-2.
Existing Conditions Freeway Levels of Service – Basic Freeway Segments

Freeway Segment	Volume (veh/h)	Density (veh/mile/lane)	Speed of Traffic (mph)	Level of Service
I-205 Southbound				
North of Gladstone Off-Ramp	5695	35.6	56.1	E
Gladstone Off-Ramp to Gladstone On-Ramp	5160	30.8	58.7	D
Park Place Off-Ramp to Park Place On-Ramp	4100	24.0	60.0	D
Hwy 99E Off-Ramp to Hwy 99E On-Ramp	3530	32.0	58.1	E
South of Hwy 99E On-Ramp	4210	24.6	60.0	D
I-205 Northbound				
South of Hwy 99E Off-Ramp	4535	26.6	59.9	D
Hwy 99E Off-Ramp to Hwy 99E On-Ramp	3785	35.5	56.1	E
Hwy 99E On-Ramp to Park Place Off-Ramp	4605	27.0	59.8	D
Park Place Off-Ramp to Park Place On-Ramp	3945	23.1	60.0	C
Gladstone Off-Ramp to Gladstone On-Ramp	4260	24.9	60.0	D
North of Gladstone On-Ramp	4620	27.2	59.7	D

Table B-3.
Existing Conditions Freeway Levels of Service – Freeway Weaving Sections

Freeway Segment	Non-Weaving Volume	Weaving Volume	LOS
I-205 Southbound			
Gladstone On-Ramp to Hwy 213 Off-Ramp	3515	2755	E
Hwy 213 On-Ramp to Hwy 99E Off-Ramp	3170	1430	E
I-205 Northbound			
Hwy 213 On-Ramp to Gladstone Off-Ramp	3310	2100	E

Table B-4.
Existing Conditons Freeway Levels of Service – Ramp Merge/Diverge Segments

Freeway Segment	Ramp Volume (veh/h)	Density (veh/mile/lane)	Speed of Traffic (mph)	Level of Service
I-205 Southbound				
Gladstone Off-Ramp Diverge	535	36	54	E
I-205 Northbound				
Park Place Off-Ramp Diverge	960	30	53	D
Gladstone On-Ramp Merge	360	26	54	C

Appendix C
Crash Analysis

Table C-1.
I-205 Crash History - 1/1/93 to 5/30/97

Highway Section	Crash Severity			Crash Type				Total
	PDO[1]	Injury	Fatal	Side Swipe	Rear End	Fixed Object	Other	
I-205 Southbound								
Off-Ramp to SE 82nd Drive (MP 11.18 to 11.28)	4	1	0	3	1	1	0	5
Gladstone Interchange Area (MP 10.85 to 11.17)	7	5	0	4	4	2	2	12
On-Ramp from SE 82nd Drive (MP 10.74 to 10.84)	4	6	0	4	4	2	0	10
Basic Section (MP 10.31 to 10.73)	2	1	0	1	1	1	0	3
Off-Ramp to Highway 213 (MP 10.18 to 10.30)	14	11	0	1	16	2	6	25
Highway 213 Interchange Area (MP 10.04 to 10.17)	3	5	0	2	4	1	1	8
On-Ramp from Highway 213 (MP 9.93 to 10.03)	1	2	0	3	0	0	0	3
Basic Section (MP 9.62 to 9.92)	22	11	0	12	19	1	1	33
Off-Ramp to Highway 99E (MP 9.51 to 9.61)	12	14	0	5	16	1	4	26
Highway 99E Interchange Area (MP 9.29 to 9.50)	6	4	0	2	8	0	0	10
On-Ramp from Highway 99E (MP 9.18 to 9.28)	2	4	0	0	3	1	2	6

Table C-1. Continued

Highway Section	Crash Severity			Crash Type				Total
	PDO[1]	Injury	Fatal	Side Swipe	Rear End	Fixed Object	Other	
I-205 Northbound								
Off-Ramp to Highway 99E (MP 9.18 to 9.28)	2	1	0	1	1	1	0	3
Highway 99E Interchange Area (MP 9.29 to 9.50)	12	10	0	0	19	1	2	22
On-Ramp from Highway 99E (MP 9.51 to 9.61)	8	2	0	0	8	2	0	10
Basic Section (MP 9.62 to 9.92)	11	3	0	4	3	7	0	14
Off-Ramp to Highway 213 (MP 9.93 to 10.03)	1	5	0	3	2	1	0	6
Highway 213 Interchange Area (MP 10.04 to 10.40)	33	25	0	12	17	9	20	58
On-Ramp from Highway 213 (MP 10.41 to 10.51)	4	6	0	2	8	0	0	10
Basic Section (MP 10.52 to 10.73)	0	1	0	1	0	0	0	1
Off-Ramp to SE 82nd Drive (MP 10.74 to 10.84)	4	3	0	2	2	1	2	7
Gladstone Interchange Area (MP 10.85 to 11.17)	8	6	0	2	6	3	3	14
On-Ramp from SE 82nd Drive (MP 11.18 to 11.28)	1	2	0	0	2	1	0	3

PDO = property damage only. (2) Assumed 250 to 300 feet in each direction for ramp influence area.

Table C-2.
I-205 Crash Rates

Highway Section	Number of Crashes[1]	ADT[2]	Crash Rate (acc/mvm)[3]	Average Statewide Crash Rate (acc/mvm)[4]
I-205 Southbound				
Off-Ramp to SE 82nd Drive (MP 11.18 to 11.28)	5	56,950	0.70	0.91
Gladstone Interchange Area (MP 10.85 to 11.17)	12	51,600	0.58	0.91
On-Ramp from SE 82nd Drive (MP 10.74 to 10.84)	10	62,700	1.28	0.91
Basic Section (MP 10.31 to 10.73)	3	62,700	0.09	0.91
Off-Ramp to Highway 213 (MP 10.18 to 10.30)	25	62,700	2.66	0.91
Highway 213 Interchange Area (MP 10.04 to 10.17)	8	41,000	1.20	0.91
On-Ramp from Highway 213 (MP 9.93 to 10.03)	3	46,000	0.52	0.91
Basic Section (MP 9.62 to 9.92)	33	46,000	1.92	0.91
Off-Ramp to Highway 99E (MP 9.51 to 9.61)	26	46,000	4.53	0.91
Highway 99E Interchange Area (MP 9.28 to 9.50)	10	35,300	1.08	0.91
On-Ramp from Highway 99E (MP 9.18 to 9.28)	6	42,100	1.14	0.91

Table C-2. Continued

Highway Section	Number of Crashes[1]	ADT[2]	Crash Rate (acc/mvm)[3]	Average Statewide Crash Rate (acc/mvm)[4]
I-205 Northbound				
Off-Ramp to Highway 99E (MP 9.18 to 9.28)	3	45,350	0.53	0.91
Highway 99E Interchange Area (MP 9.28 to 9.50)	22	37,850	2.22	0.91
On-Ramp from Highway 99E (MP 9.51 to 9.61)	10	49,050	1.63	0.91
Basic Section (MP 9.62 to 9.92)	14	49,050	0.76	0.91
Off-Ramp to Highway 213 (MP 9.93 to 10.03)	6	49,050	0.98	0.91
Highway 213 Interchange Area (MP 10.04 to 10.40)	58	39,450	3.27	0.91
On-Ramp from Highway 213 (MP 10.41 to 10.51)	10	54,100	1.48	0.91
Basic Section (MP 10.52 to 10.73)	1	54,100	0.07	0.91
Off-Ramp to SE 82nd Drive (MP 10.74 to 10.84)	7	54,100	1.04	0.91
Gladstone Interchange Area (MP 10.85 to 11.17)	14	42,600	0.82	0.91
On-Ramp from SE 82nd Drive (MP 11.18 to 11.28)	3	46,200	0.52	0.91

[1]Number of accidents reported between 1/1/93 and 5/30/97
[2]ADT = average daily directional traffic volume
[3]acc/mvm = accident rate expressed in number of accidents per million vehicle miles traveled
[4]Average of 1993, 1996, 1997 average statewide accident rates for Urban Freeway Primary Highways

Table C-3.
Highway 213 Crash History - 1/1/93 to 5/30/97

Highway Section	Crash Severity			Crash Type				Total
	PDO[1]	Injury	Fatal	Turn	Rear-End	Fixed Object	Other	
I-205 (MP 0.00) to Washington Street (MP 0.14)	29	26	0	11	37	0	7	55
Washington Street (MP 0.14) to Redland Road (MP 0.48)	29	25	0	7	45	1	1	54
Redland Road (MP 0.48) to Beavercreek Road (MP 2.98)	22	33	0	5	41	4	5	55
Beavercreek Road (MP 2.98) to Molalla Avenue (MP 3.59)	15	19	0	8	17	1	8	34
Molalla Avenue (MP 3.59) to Henrici Road (MP 4.37)	9	14	0	5	14	1	3	23

[1] PDO = property damage only

Table C-4. Highway 213 Crash Rates

Highway Section	Number of Crashes[1]	ADT[2]	Crash Rate (acc/mvm)[3]	Average Statewide Crash Rate (acc/mvm)
Highway 213 Southbound				
I-205 to Washington Street (MP 0.00 – MP 0.14)	36	24,975	6.39	3.01[4]
Washington Street to Redland Road (MP 0.14 – MP 0.48)	28	20,600	2.48	3.01
Redland Road to Beavercreek Road (MP 0.48 – MP 2.98)	33	17,650	0.46	1.73[5]
Beavercreek Road to Molalla Avenue (MP 2.98 – MP 3.59)	16	9,575	1.70	1.73
Molalla Avenue to Henrici Road (MP 3.59 – MP 4.37)	9	9,590	0.75	1.73
I-205 to Washington Street (MP 0.00 – MP 0.14)	19	24,975	3.37	3.01[4]
Washington Street to Redland Road (MP 0.14 – MP 0.48)	25	20,600	2.21	3.01
Redland Road to Beavercreek Road (MP 0.48 – MP 2.98)	22	17,650	0.31	1.73[5]
Beavercreek Road to Molalla Avenue (MP 2.98 – MP 3.59)	18	9,575	1.91	1.73
Molalla Avenue to Henrici Road (MP 3.59 – MP 4.37)	14	9,590	1.16	1.73

[1]Number of accidents reported between 1/1/93 and 5/30/97
[2]ADT = average daily directional traffic volume
[3]Acc/mvm = accident rate expressed in number of accidents per million vehicle miles traveled
[4]Average of 1993, 1996, and 1997 average statewide accident rates for Urban Non-freeway Secondary Highways
[5]Average of 1993, 1996, and 1997 average statewide accident rates for Sub-urban Non-freeway Secondary Highways

Appendix D
Future Conditions
Operation Analysis

Table D-1.
2018 "No-Build" Scenario Intersection Levels of Service

Intersection	Average Weekday PM Peak Hour						
	Signalized Intersection			Unsignalized Intersection			
	V/C[1]	Average Delay (sec/veh)	LOS[2]	Critical Movement	V/C[3]	Average Delay[4] (sec/veh)	LOS[5]
Hwy 213/I-205 SB Ramps				EB-LT[6]	>1.20	>45.0	F
Hwy 213/I-205 NB Ramps				EB-RT[7]	>1.20	>45.0	F
Hwy 213/Washington Street	>1.20	>60.0	F				
Hwy 213/Redland Road	1.06	30.1	D				
Hwy 213/Beavercreek Road	>1.20	>60.0	F				
Hwy 213/Molalla Avenue	1.07	38.4	D				
Hwy 213/Meyers Road	0.88	17.4	C				
Hwy 213/Glen Oak Road				WB[8]	>1.20	>45.0	F
Hwy 213/Henrici Road				WB	>1.20	>45.0	F
I-205 SB/Gladstone Ramps	1.20	>60.0	F				
I-205 NB/Gladstone Ramps	>1.20	>60.0	F				
I-205 SB/Hwy 99E Ramps	>1.20	>60.0	F				
I-205 NB/Hwy 99E Ramps	>1.20	>60.0	F				

[1] V/C = Volume-to-Capacity ratio

[2] LOS = Level of Service

[3] Volume-to-Capacity ratio for the critical movement

[4] Average delay for the critical movement

[5] Level of Service ratio for the critical movement

[6] EB-LT = eastbound left-turn from I-205 SB off-ramp to northbound Highway 213

[7] EB-RT = eastbound right-turn from I-205 NB off-ramp to southbound Highway 213

[8] WB = westbound

Table D-2.
2018 "No-Build" Scenario Conditions Freeway Level of Service – Basic Freeway Segments

Freeway Segment	Volume (veh/h)	Density (veh/mile/lane)[1]	Speed (mph)[1]	Level of Service
I-205 Southbound				
North of Gladstone Off-Ramp	6950			F
Gladstone Off-Ramp to Gladstone On-Ramp	6625			F
Park Place Off-Ramp to Park Place On-Ramp	5245	31.5	58.4	E
Hwy 99E Off-Ramp to Hwy 99E On-Ramp	4705			F
South of Hwy 99E On-Ramp	5960	38.5	54.4	E
I-205 Northbound				
South of Hwy 99E Off-Ramp	6705			F
Hwy 99E Off-Ramp to Hwy 99E On-Ramp	5140			F
Hwy 99E On-Ramp to Park Place Off-Ramp	6740			F
Park Place Off-Ramp to Park Place On-Ramp	5020	29.8	59.1	D
Gladstone Off-Ramp to Gladstone On-Ramp	5475	33.6	57.2	E
North of Gladstone On-Ramp	5775	36.5	55.6	E

[1] Density and speed are highly variable at LOS "F".

Table D-3.
2018 "No-Build" Scenario Conditions Freeway Level of Service – Freeway Weaving Sections

Freeway Segment	Non-Weaving Volume	Weaving Volume[1]	Weaving Vehicles	
			Speed (mph)	LOS
I-205 Southbound				
Gladstone On-Ramp to Hwy 213 Off-Ramp	4645	3650	41	F
Park Place On-Ramp to Hwy 99E Off-Ramp	4205	1895	48	F
I-205 Northbound				
Hwy 213 On-Ramp to Gladstone Off-Ramp	4225	2680	42	F

[1] These volumes exceed the HCM parameters for weaving analysis; as such the Leisch Procedure for Analysis and Design of Weaving Sections was used.

Table D-4.
2018 "No-Build" Scenario Conditions Freeway Level of Service – Ramp Merge/Diverge Segments

Freeway Segment	Ramp Volume (veh/h)	Density[1] (veh/mile/lane)	Speed[1] (mph)	Level of Service
I-205 Southbound				
Gladstone Off-Ramp Diverge	325			F
I-205 Northbound				
Park Place Off-Ramp Diverge	1720			F
Gladstone On-Ramp Merge	300	31	52	D

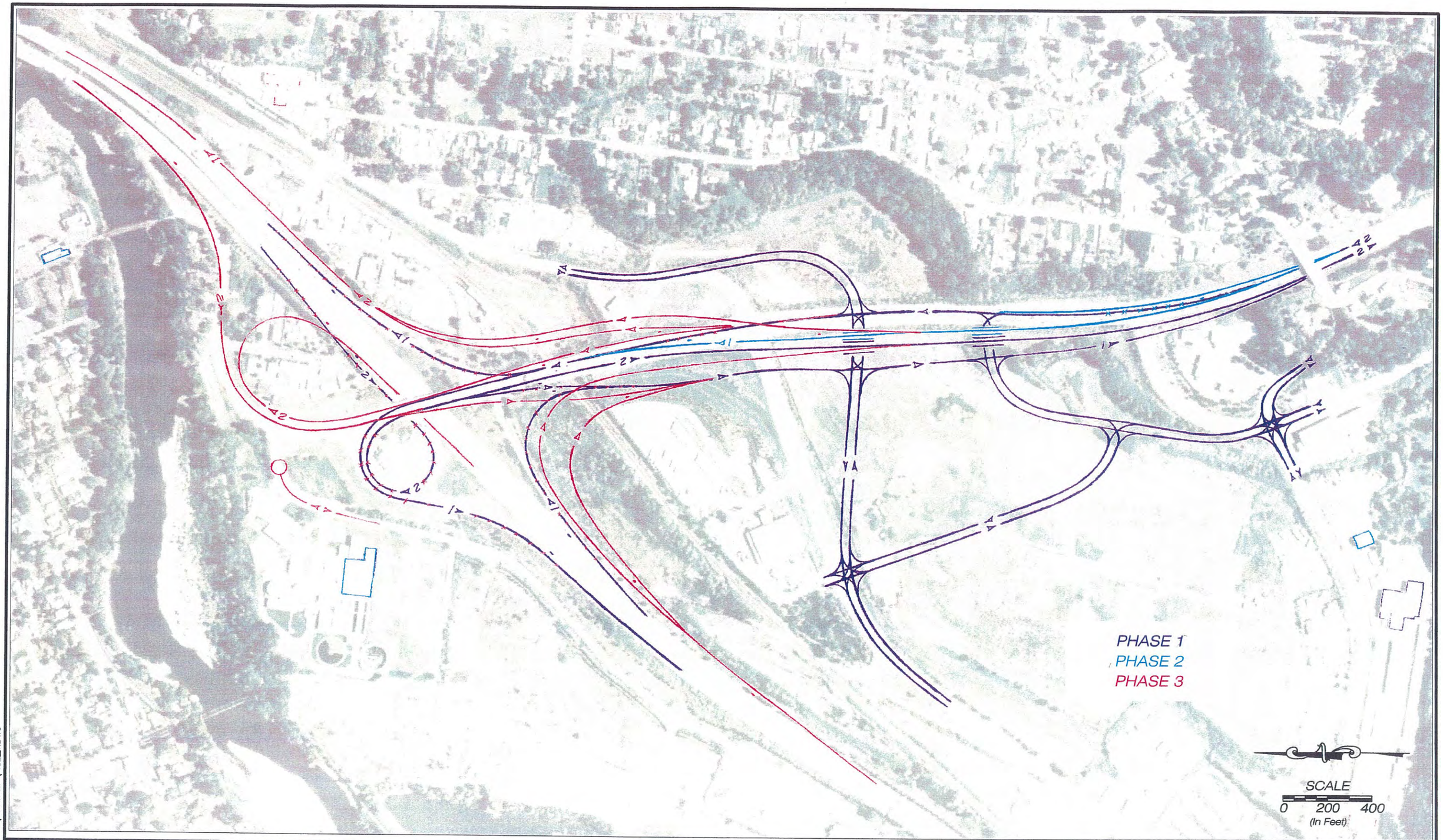
[1] Density and Speed of Traffic are highly variable at LOS "F".

Table D-5.
Freeway Operational Analysis Comparison

Freeway Segment		Operational Level of Service	
		1998 Existing Conditions	2018 "No-Build" Scenario Conditions
Basic Freeway Segments			
I-205 SB	North of Gladstone Off-Ramp	E	F
	Gladstone Off-Ramp to Gladstone On-Ramp	D	F
	Park Place Off-Ramp to Park Place On-Ramp	D	E
	Hwy 99E Off-Ramp to Hwy 99E On-Ramp	E	F
	South of Hwy 99E On-Ramp	D	E
I-205 NB	South of Hwy 99E Off-Ramp	D	F
	Hwy 99E Off-Ramp to Hwy 99E On-Ramp	E	F
	Hwy 99E On-Ramp to Park Place Off-Ramp	D	F
	Park Place Off-Ramp to Park Place On-Ramp	C	D
	Gladstone Off-Ramp to Gladstone On-Ramp	D	E
	North of Gladstone On-Ramp	D	E
Freeway Weaving Segments			
I-205 SB	Gladstone On-Ramp to Hwy 213 Off-Ramp	E	F
I-205 SB	Hwy 213 On-Ramp to Hwy 99E Off-Ramp	E	F
I-205 NB	Hwy 213 On-Ramp to Gladstone Off-Ramp	E	F
Freeway Ramp Merge/Diverge Segments			
I-205 SB	Gladstone Off-Ramp Diverge	E	F
I-205 NB	Park Place Off-Ramp Diverge	D	F
	Gladstone On-Ramp Merge	C	D

Appendix E

Highway 213/I-205 Interchange Concept Phasing Plans



KITTELSON & ASSOCIATES, INC.
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TRANSPORTATION PLANNING\TRAFFIC ENGINEERING

HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY

OREGON CITY, OREGON
JUNE 2000

HIGHWAY 213/I-205 INTERCHANGE CONCEPT ALTERNATIVE 2 -- PHASING PLAN

FIGURE NO.
E-1

PROJECT NO.
2561

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PHASE 1
PHASE 2
PHASE 3

SCALE
0 200 400
(In Feet)

KITTELSON & ASSOCIATES, INC. 610 S.W. ALDER, SUITE 700 PORTLAND, OREGON 97205 (503) 228-5230 TRANSPORTATION PLANNING\TRAFFIC ENGINEERING	HIGHWAY 213 URBAN CORRIDOR DESIGN STUDY OREGON CITY, OREGON JUNE 2000	HIGHWAY 213/I-205 INTERCHANGE CONCEPT ALTERNATIVE 3 -- PHASING PLAN	FIGURE NO. E-2 PROJECT NO. 2561

H:\PROJFILE\2561\DWGS\FINALREP\FIGE_2.DWG

Greater Oregon City Watershed Council **Watershed Action Plan** | May 2010

ICF INTERNATIONAL

GREATER OREGON CITY WATERSHED COUNCIL WATERSHED RESTORATION ACTION PLAN

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May 2010

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Acronyms and Abbreviations

BMPs	best management practices
GOCWC	Greater Oregon City Watershed Council
NRCS	Natural Resources Conservation Service
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
OWEB	Oregon Watershed Enhancement Board
OWRD	Oregon Water Resources Department
ROTC	Reserve Officers' Training Corps
SM	stream mile
SWCD	Soil and Water Conservation District
UGB	Urban Growth Boundary
USFWS	U.S. Fish and Wildlife Service

Introduction and Purpose

This action plan will serve as a guide for the Greater Oregon City Watershed Council (GOCWC) in its selection, implementation, and monitoring of projects in the Greater Oregon City Watershed over a 10-year period. The action plan describes:

- How GOCWC will engage in a long-term, science-based program to advance adaptive and accountable restoration within the Greater Oregon City subwatersheds: Abernethy Creek, Beaver Creek, and Willamette Tributaries.
- The GOCWC restoration priorities and strategies to reduce historical and current threats to watershed health and to restore streams, fish populations, and water quality.
- The range of activities that the GOCWC will engage in, including public outreach and education, restoration, and monitoring.
- A framework and roadmap for increasing the pace and improving the effectiveness of watershed restoration by implementing voluntary watershed restoration projects and landowner education.

The action plan builds on background information and restoration rationale outlined in the *Greater Oregon City Watershed Assessment* (ICF International 2010). The assessment described the characteristics of the three subwatersheds; provided detailed information on the watershed's physical characteristics, fish populations, streamside vegetation, and water quality; and delineated the threats that impair the viability of the watershed.

Watershed and Subwatershed Overview

This section summarizes information from the *Greater Oregon City Watershed Assessment* (ICF International 2010).

The watershed assessment area encompasses the stream network for three subwatersheds: Abernethy Creek, Beaver Creek, and Willamette River (Figure 1).

- Abernethy Creek enters the Willamette River at river mile 25.3 and is tidally influenced at its confluence with the river. Lower Columbia River anadromous (i.e., residing in the ocean as adults and returning to rivers and streams to spawn) runs of coho salmon and steelhead trout are present in this subwatershed.
- Beaver Creek, of which Parrott Creek is a large tributary, enters the river above Willamette Falls at river mile 31.4; this system is not tidally influenced. Because Beaver Creek is above the falls, which historically blocked some fish runs, this stream is part of the Upper Willamette River system. The Beaver Creek subwatershed contains resident cutthroat trout and Pacific lamprey and may now be accessible to Upper Willamette River steelhead.
- The Willamette River subwatershed consists of small tributaries that begin within the Oregon City Urban Growth Boundary (UGB) and flow over steep-sided bluffs directly into the river. These small streams are very high gradient and do not contain fish with the exception of lower channel habitats within the Willamette River floodplain. Fish occupy the lower floodplain portions of these small streams during high-flow periods.

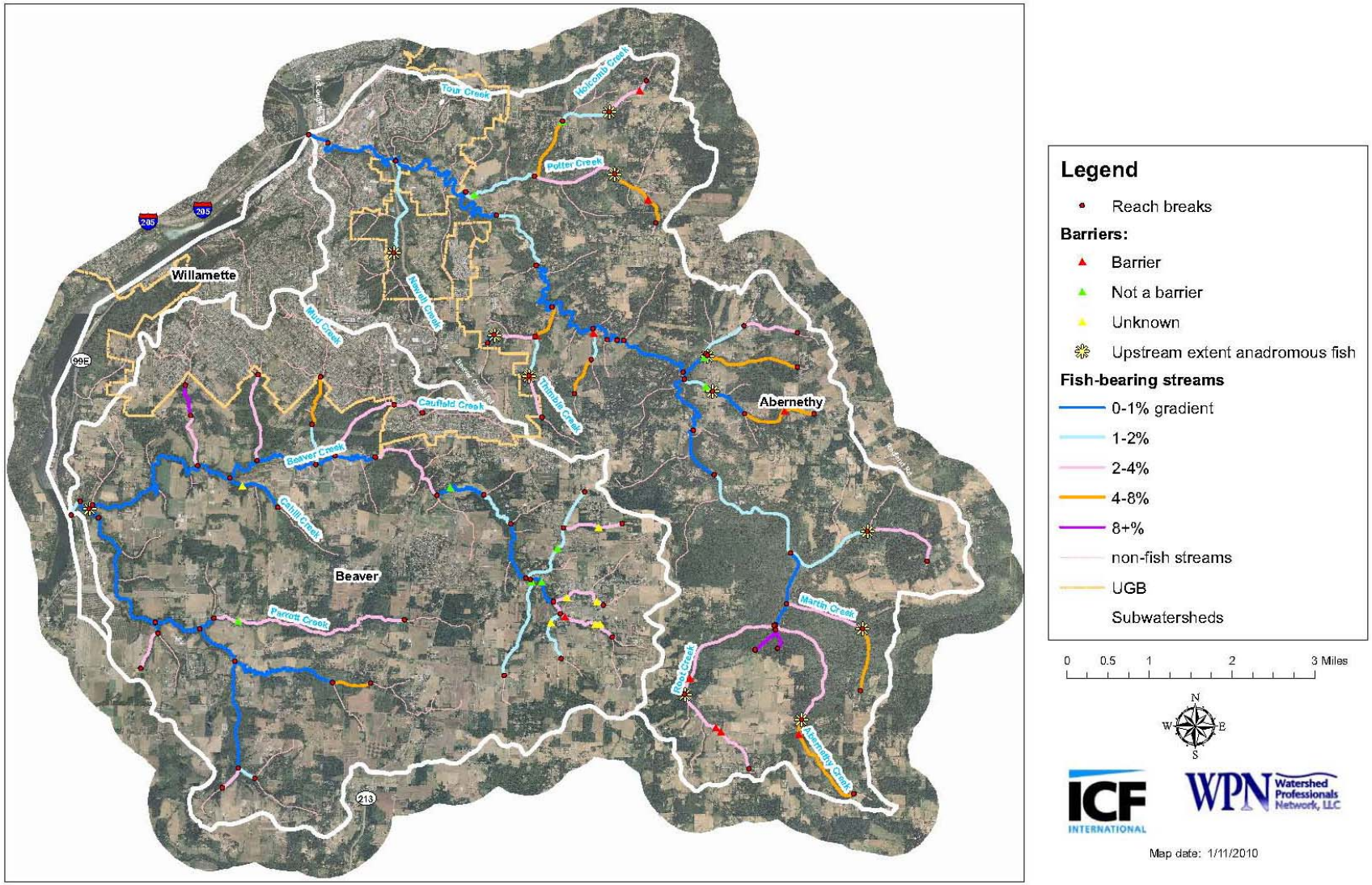
The watershed assessment area is within the Willamette River Basin in western Oregon. Abernethy and Beaver creeks begin at elevations of about 1200 feet above mean sea level and flow generally in a northwesterly direction to join the Willamette River. Because the entire watershed assessment area is within the low elevation portions of the Willamette Valley, there are no mountainous areas to capture winter snowpack. Consequently, most precipitation comes from rainfall. The largest quantities of rainfall occur between October and November; very little precipitation occurs during the summer and early fall, when stream flows are at their lowest.

The watershed assessment area encompasses 44,353 acres (Table 1). The Abernethy Creek and Beaver Creek subwatersheds are similar in size (21,573 and 20,083 acres, respectively); the Willamette subwatershed is the smallest (2,697 acres). The headwaters of Abernethy and Beaver creeks are largely in unincorporated Clackamas County. Approximately 17% of the watershed assessment area is within the Oregon City UGB). A significant portion of the Abernethy subwatershed, primarily the lower stream channel, is within the UGB (16%). A somewhat smaller portion of the Beaver Creek subwatershed is within the UGB (13%), primarily small streams that originate in Oregon City and flow north into Beaver Creek. Most of the Willamette River subwatershed is within the UGB (59%).

Table 1. Greater Oregon City Watershed Assessment Subwatershed Acreages and Proportions within the Oregon City Urban Growth Boundary

Subwatershed	Total Area Acres (Square Miles)	Oregon City UGB Acres (Square Miles)	Percentage within Urban Growth Boundary
Abernethy	21,573 (33.71)	3,471 (5.42)	16%
Beaver	20,083 (31.38)	2,562 (4.00)	13%
Willamette	2,697 (4.21)	1,596 (2.49)	59%
Total	44,353 (69.30)	7,629 (11.92)	17%

Figure 1. Watershed Assessment Area Base Map



Watershed Conditions, Limitations, and Opportunities

This section summarizes information from the *Greater Oregon City Watershed Assessment* that describes watershed conditions, factors limiting fish populations and water quality, and opportunities for restoration.

Conditions and Limitations

Urbanization, roads, and other land uses have modified stream habitat, riparian vegetation, fish populations, and water quality within the watershed assessment area. Table 2 summarizes the watershed conditions for the subwatersheds based on the watershed assessment.

The Abernethy Creek, Beaver Creek, and Willamette River subwatersheds have been dramatically altered over the years as a result of urbanization, agriculture, and other land uses. The greatest limitations to watershed health and fish populations within the three subwatersheds include:

- Water quality issues: temperature and sedimentation
- Stormwater from Oregon City headwater streams: modifications in water quality and flow patterns
- Stream habitat quality: channels incised and disconnected from floodplain; scarcity of wood in the channel limiting complex habitats
- Fish passage barriers on Abernethy Creek and Beaver Creek and tributaries
- Riparian areas: modified vegetation composition and narrowed corridor; weedy conditions prevail in many areas
- Water flow: water withdrawals probably reducing water flow during the late summer and early fall

Information is available on the general health of streams and riparian areas in the watershed assessment area; however, detailed, site-specific information for key watershed characteristics is limited, particularly for fish habitat and water quality. For example, no comprehensive inventory of fish habitat throughout the channel network exists; such an inventory would delineate the presence of pools and the quantity of large wood in the channel. Similarly, almost no water quality data exists for key parameters such as water temperature. Because of these data limitations, it is difficult to develop restoration actions that focus on the issues limiting fish populations and water quality for sections of the stream network or a specific landownership.

Collecting baseline information on stream habitat and water quality should be the GOCWC's first priority. Data collection efforts should use existing protocols, such as the Oregon Department of Fish and Wildlife (ODFW) Aquatic Habitat Inventory and the Oregon Department of Environmental Quality (ODEQ) stream temperature collection methods.

Opportunities

The GOCWC, in collaboration with landowners and other partners, should focus actions to improve watershed conditions on the following strategic areas and opportunities.

- During flood events the Willamette River creates a backwater area in Abernethy Creek as far upstream as Holcomb Creek, which creates a winter rearing area for Willamette Basin salmon and steelhead populations during floods.
- Abernethy Creek and key tributaries are important for coho, steelhead, and lamprey migration, rearing, and spawning.
- With the elimination of the fish passage issue at Sevick Pond, Beaver Creek is now accessible to Upper Willamette steelhead and lamprey.
- Habitat in the lower watershed within Oregon City and the surrounding areas, particularly in Newell Creek and Holcomb Creek, represents some of the highest quality salmon and steelhead habitat in the Portland area.
- The Metro property in the Newell Creek watershed and the Holcomb Creek area is a focus area for Metro's protection and restoration efforts.
- Oregon City is strategically located, with headwater streams within the city limits draining into all three subwatersheds and thus influencing water quality and fish habitat in downstream areas.

Table 2. A Summary of Watershed Conditions in the Watershed Assessment Area

Location	Condition Summary
Abernethy Creek Subwatershed	• Abernethy Creek and tributaries are important habitat for lower Willamette River populations of coho and steelhead and other native fish species • Riparian vegetation composition is modified and the corridor is narrowed; weedy conditions prevail in many areas • Fish passage barriers are present, with several on the mainstem • Stream habitat is simplified with limited wood • Most of lower Abernethy Creek is within Oregon City • During flood events, the Willamette River creates a backwater area in Abernethy Creek as far upstream as Holcomb Creek • Important migration corridor for coho, steelhead, and lamprey • Winter rearing area for Willamette Basin salmon and steelhead populations during floods • Water quality issues: temperature, sedimentation, and stormwater • The stream channel is incised and disconnected from the floodplain • The headwaters of Newell Creek are within Oregon City • Metro property in the Newell Creek watershed and Holcomb Creek is a focus area for protection and restoration • Newell and Holcomb creeks are important for coho, steelhead, and lamprey spawning and rearing and contain areas with high quality habitat
Oregon City Headwater Streams encompassing all subwatersheds	• Headwater streams originate in Oregon City and flow into all three subwatersheds • Large area of impervious surfaces • Water quality issues: sedimentation and stormwater • Streams within the Willamette Subwatershed do not have fish use, with the exception of the lower portions within the Willamette River Floodplain
Beaver Creek Subwatershed	• Beaver Creek, Parrott Creek, and tributaries are now accessible to steelhead and lamprey • Water quality issues: sedimentation (other conditions are unknown) • Water withdrawals are probably reducing water flow during the late summer and early fall • Riparian vegetation composition is modified and the corridor is narrowed; weedy conditions prevail in many areas • Fish passage barriers are present • Fish passage conditions are unknown at many road crossings • Stream habitat conditions are unknown • Sevick Dam washed out in the January 2, 2009, flood; upstream areas are now accessible to fish • A large quantity of sediment is exposed in the drained Sevick Pond area, which will become a weedy area • The channel is down-cutting through the sediments and may create fish passage issues

Watershed Restoration Strategy and Priorities

Roni et al. (2002) outlines an approach for prioritizing restoration projects. The strategy builds on key principles of watershed function and conservation biology. The first component is to focus efforts on protecting existing areas with high quality habitat. The second component is to indentify, based on the watershed assessment, the factors that are limiting water quality and fish populations. Combing these components creates an integrated watershed improvement strategy for the GOCWC, which focuses on activities that will protect and restore watershed processes that are essential for the creation and maintenance of fish habitat and water quality.

Based on this prioritization approach (Roni et al. 2002), the GOCWC watershed restoration strategy focuses on the following types of projects.

- **Protecting high quality habitats.** High quality habitats for salmon, trout and other species "anchor" the restoration effort and provide core areas that can be enhanced and then reconnected to the whole watershed through restoration actions. This strategy is centered on a key principal of conservation biology, which emphasizes the importance of protecting habitats that are better functioning while restoring degraded habitats.
- **Restoring fish passage.** Restoring fish passage is a high priority because it has a very high probability of success and it provides immediate access to historic habitat.
- **Restoring hydrologic and water quality processes because these actions help maintain and restore aquatic habitat.** Hydrologic processes include sediment delivery to stream channels, water flow regimes (low and high flows), and can be affected by stormwater management and water withdrawals. Riparian areas also affect hydrologic and water quality processes by providing floodplain connections, shading streams, and providing large wood that contributes to complex stream habitat.
- **Restoring instream flows.** Engaging in instream restoration projects, such as placement of instream large wood, which are best implemented in conjunction with reconnection of isolated high quality habitats and projects to restore watershed processes.
- **Educating landowners and other watershed stakeholders** on actions they can take to protect and restore the watershed.

The GOCWC will pursue this strategy through the following methods:

- Engaging in assessment and monitoring projects to better understand stream habitat quality, key areas for restoration (e.g., areas with riparian weeds), and water quality (e.g., water temperature patterns);
- Working with local jurisdictions, including Oregon City and Metro, to protect and restore key high quality habitat areas;
- Engaging landowners and jurisdictions in voluntary restoration projects;
- Educating landowners on best management practices and approaches for restoring habitat on their property; and
- Tracking trends in habitat, water quality, and stream flow as restoration proceeds.

GOCWC Restoration Project Accomplishments

The action plan will build on the GOCWC's restoration project accomplishments, described below, and expand efforts into new geographic areas and project types.

Abernethy Phase I

The GOCWC was awarded a $6,650 grant from the Oregon City/Metro Enhancement Fund for the Abernethy Phase I project. The project enhanced the riparian corridor along Abernethy Creek from Main Street to just east of the Washington Street Bridge. The project area covers four tax lots, which are owned by the Oregon Department of Transportation (ODOT), Oregon City, and Historic Properties LLC.

Two volunteer events were held (one in 2006 and one in 2007) to remove garbage, including debris remaining from the residence that was demolished on the Oregon City parcel, and nonnative invasive vegetation, including Himalayan blackberry, Clematis spp., English ivy, nightshade, laurel, English hawthorn, and holly.

Two planting events were held (one in 2006 and one in 2007) to revegetate the area with native riparian species. The long-term goal of the planting was to develop a structurally complex corridor that would provide habitat for wildlife and shade for Abernethy Creek. Subsequent volunteer events have been held to remove nonnative, invasive plants.

Abernethy Phase II

The GOCWC was awarded a $14,285 grant from the Oregon City/Metro Enhancement Fund for the Abernethy Phase II project. The project is located west of Washington Street on Oregon City park land. The GOCWC coordinated efforts to remove invasive species, plant natives, and mulch the ground along Abernethy Creek at Abernethy Park in Oregon City. This project supports the long-term goal of plant survival and successful establishment of a structurally complex corridor that will provide habitat for wildlife and shade for Abernethy Creek.

The bulk of the project was completed in 2008. Clackamas County Corrections' crews removed much of the invasive plants in the spring/summer. Students from Springwater Elementary Environmental Charter School and Oregon City High School Junior Reserve Officers' Training Corps (ROTC) planted 300 plants along the banks and slopes of the creek. The Junior ROTC volunteers also removed 40 cubic yards of invasive plants and 5 cubic yard of roofing material from the park. Echo Valley Natives nursery donated plants, Oregon City provided tools, and the National Guard provided a warming tent. The students had a lot of fun and learned about the value of riparian areas.

Tooze Pond

The GOCWC was awarded a $3,500 grant from the Oregon City/Metro Enhancement Fund for the Tooze Pond project. The project area includes two parcels. The northern perimeter of the pond is owned by Oregon City and the southeastern parcel is privately owned by City Councilmember Dan Tooze and contains a permitted dammed lake in Cauflield Creek just west of Highway 213. The majority of the project area lies beneath BPA power lines.

In 2008, 1 ton of garbage and nonnative, invasive vegetation, including Himalayan blackberry and Japanese knotweed, was removed from the site. Because of past harassment issues (e.g., garbage, rock throwing, BB guns directed at glass bottles and wildlife) associated with the residents of the apartment complex to the north, a strip of blackberries was left along the northern perimeter of the project area to limit human access from the north.

The site, which lies within an environmentally sensitive area, zoned by Oregon City as a Water Quality Resource Overlay, was degraded. Restoration of the riparian vegetation will support its ability to improve water quality and protect slope stability. Trees and shrubs improve water quality by reducing rapid stormwater runoff, increasing water infiltration, allowing groundwater recharge, and shading streams. Fish, such as cutthroat trout, and macroinvertebrates inhabiting Caufield Creek will benefit from any improvements to water quality. Waterfowl, wading birds, osprey, and wetland songbirds that frequent the pond will benefit from additional structure, cover, and prey base as the plants mature. In addition to providing wildlife habitat, the trees and tall shrubs will improve air quality and provide noise attenuation.

Coniferous trees and native dogwoods were planted along the northern perimeter of the project area, wherever possible, to buffer the pond from the adjacent development and to provide cover and shade for a remnant population of cutthroat trout. The property owner actively managed this project.

Younger Project

The Younger project was conducted by ODFW, the Younger family, and the GOCWC, with a $51,615 grant from Oregon Watershed Enhancement Board (OWEB). The project is on Potter Creek less that 0.33 mile upstream of the confluence of Holcomb and Potter creeks at 15822 Neibur Road near Oregon City. Potter Creek is a perennial tributary of Abernethy Creek that supports winter steelhead, Coho salmon, Pacific lamprey and cutthroat trout populations. Twin 48-inch culverts under the Younger's driveway were creating a barrier to upstream juvenile fish passage and hindering passage of adult salmon in the stream.

The grant application was submitted to OWEB, in 2008. In January 2009, rains washed out the culverts and the driveway, which provided the sole access to property owner's home.

The project, completed in 2009, replaced the twin culverts with a 13-foot-wide, 5-foot, 1-inch-tall, 46-foot-long bottomless arch pipe. Native plants and trees were planted on the slopes adjacent to the area of work. The OWEB grant covered engineering design, removal of the existing structure, purchase and installation of the crossing structure.

SOVL's Lower Abernethy Creek Project

The GOCWC is partnering with a local non-profit, SOLV, on a restoration project along lower Abernethy Creek. The project is currently in the planning stages. The project objectives center on floodplain modifications, weed control, and riparian restoration along a 0.13-mile length of Abernethy Creek and adjoining Park Place Creek. The project will reduce streambank erosion, improve the stream's access to the floodplain, and increase native vegetation and the riparian tree canopy.

Yodis Property: Potter Creek Fish Passage Project

The project replaced two culverts that were blocking fish passage, removed a small diversion dam, and created a wetland and side channel on the Potter Creek between stream miles (SM) 1.26 and 1.45. The project, completed in 2006, opened up 0.52 mile of fish spawning and rearing habitat; created riffles and pools in the area adjacent to where the diversion dam was removed; created 250 feet of stream-side channel area; and restored 0.5 acre wetland habitat. The following project partners provided funding or other support: the Yodis family, U.S. Fish and Wildlife Service (USFWS), Natural Resources Conservation Service (NRCS), OWEB, ODFW, and Clackamas Soil and Water Conservation District (SWCD). Total project cost was $131,500.

Saling Property: Potter Creek Fish Passage

The project replaced two side-by-side culverts that were blocking fish passage with a bridge on the Potter Creek at SM 0.85. The project, completed in 2006, opened up 0.4 mile of fish spawning and rearing habitat. The following project partners provided funding or other support: the Saling family, USFWS, NRCS, OWEB, ODFW, and Clackamas SWCD. Total project cost was $146,000.

Clackamas Soil and Water Conservation District's Holcomb Creek Fish Passage Project: Schmitz Property

The project replaced three side-by-side culverts that were blocking fish passage with a bridge on the Holcomb Creek at SM 0.82. The project, completed in 2009, opened up 1.9 miles of fish spawning and rearing habitat. Clackamas County SWCD wrote and administered the grant. The following project partners provided funding or other support: NRCS, OWEB, and ODFW. Total project cost was $75,600.

City of Oregon City's Redland Road Project

The City replaced a 6-by6-foot, concrete box culvert that was blocking fish passage with a 15-foot span metal arch pipe on Holcomb Creek at SM 0.22. The project, completed in 2003, opened up 0.6 mile of fish spawning and rearing habitat. The following project partners provided funding or other support: ODFW, USFWS, U.S. Forest Service, U.S. National Marine Fisheries Service, OWEB, Clackamas County, For the Sake of the Salmon, Portland General Electric Salmon Friendly Power Program, Northwest Resource Conservation and Development Board.

The following action plan priorities were determined based on the watershed assessment findings and the restoration strategy.

- Assess baseline conditions
- Protect and restore key tributary anchor habitats
- Enhance Oregon City stormwater quality and quantity
- Enhance habitat in the Beaver Creek–Parrott Creek confluence area
- Improve fish passage
- Improve habitat in the lower portions of Abernethy Creek
- Address water flows during the summer and early fall
- Educate watershed residents and stakeholders and conduct outreach to landowners
- Evaluate project success

These priorities provide a framework for selecting projects and the development of the GOCWC's annual work plan. The GOCWC should implement actions as much as possible within the geographic focus areas depicted in Figure 2 and described within each action plan priority. That said, the GOCWC should to continue to work with landowners who propose restoration projects, regardless of the location of the project, if the project is designed to address issues that are constraining fish habitat and water quality. The restoration strategy provides a framework for evaluating the merits of all projects, including those initiated for locations outside of the geographic focus areas.

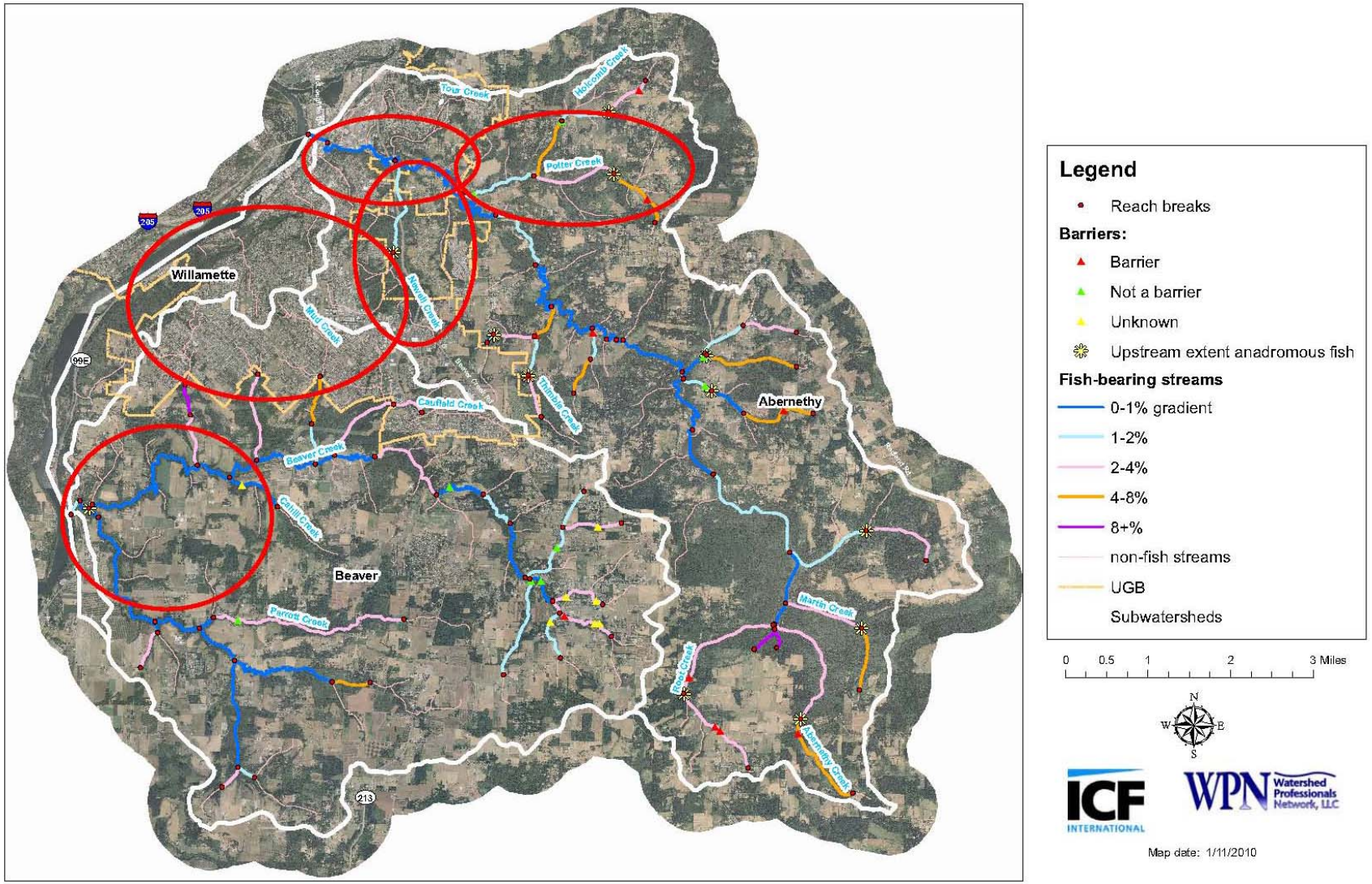
The following section describes the rationale, project categories, and geographic focus areas for each action plan priority.

Assess Baseline Conditions

Rationale

The *Greater Oregon City Watershed Assessment* provides information on the natural processes, current management practices, and land uses that influence stream habitat, fish populations, and water quality in the watershed assessment area. The assessment was based on limited information; key data were unavailable, particularly for stream habitat, water quality, and water quantity. Additional information on baseline conditions is necessary to identify specific locations and actions for restoration projects. Establishing this baseline data is the essential first step for the action plan. It will guide future project planning and provide the foundation for tracking changes in watershed conditions over time.

Figure 2. Geographic Focus Areas (circled) for Action Plan Implementation



Focus Areas

- Fish-bearing streams in the Abernethy and Beaver Creek subwatersheds.
- High quality habitat areas in lower Abernethy Creek that have not been inventoried, particularly the Holcomb Creek and Potter Creek systems.
- Fish passage barriers within the Beaver Creek subwatershed and on the mainstem of Abernethy Creek.
- Inventorying habitat conditions in the area within and below Sevick Pond (see section below for description).

Actions

- Conduct aquatic habitat inventories with according to ODFW protocols.
- After obtaining landowner cooperation, work with volunteers to monitor water temperatures according to ODEQ protocols.
- Work with the Oregon Water Resources Department (OWRD) to establish methods to assess streamflows during the late summer and early fall and to identify ways to restore them in key problem areas.
- With volunteers and landowner cooperation, work with Oregon City to monitor stormwater quality.

Partnerships

- ODFW
- ODEQ: 319 program grant funding
- OWRD
- OWEB: grant Funding
- Oregon City

Protect and Restore Key Tributary Anchor Habitats: Newell Creek and the Holcomb Potter Creek systems

Rationale

Newell Creek and the Holcomb Creek and Potter Creek systems, in the lower portions of the Abernethy Creek subwatershed (Figures 3 and 4), contain some of the highest quality stream and riparian habitat in the Abernethy Creek subwatershed. Historically, these tributary streams were important to the health of Abernethy Creek fish populations; the current presence, though at reduced population levels, of steelhead, coho, Pacific lamprey, and cutthroat trout in these stream means the streams could still support health populations. Opportunities exist in these systems to protect existing high quality aquatic and riparian habitat and to restore areas with poor habitat. It is also important to address issues in this area that are contributing to degraded habitat and water

quality, including stormwater runoff from Oregon City into Newell Creek and invasive weeds that are present and spreading throughout the system.

The reasons for focusing habitat protection and restoration on the Newell Creek and Holcomb/Potter Creek systems include:

- Within the context of the Portland metropolitan area and the lower Willamette river fish runs, Newell Creek and the Holcomb Creek/Potter Creek system provide important habitat for coho and steelhead spawning and rearing.
- Large portions of Newell Creek, particularly the middle portions, have high quality fish and riparian habitat.
- Metro manages over 300 acres in Newell Creek Canyon as open space, which offers opportunities for expanded protection and restoration. This acquisition is part of a larger strategy to protect natural corridors and uplands along the mainstem of Abernethy Creek and its major tributaries (particularly Holcomb and Potter creeks) to protect water quality and wildlife habitat.
- The presence of native fish and the relatively large size of the undeveloped land bordering the Newell Creek make the canyon area and Metro property biologically notable.
- Some sections of the Newell Creek aquatic and riparian habitat are degraded, particularly the lower and upper portions, providing opportunities to restore habitat and expand high quality habitat out from the middle sections.
- Water quality conditions in Newell Creek and the Holcomb Creek/Potter Creek system are unknown, but these streams appear to contribute cooler water to the system and provide areas of cold water were native fish can reside when water temperatures are elevated in Abernethy Creek.
- Stormwater from Oregon City appears to be contributing sediment to Newell Creek.
- Areas of Newell Creek and the Holcomb/Potter system contain degraded riparian vegetation and invasive weeds.

Focus Areas

- Newell Creek and tributaries (Figure 3): stream habitat restoration in the lower and upper fish-bearing sections and rectification of stormwater runoff issues in the headwater streams within Oregon City that affects downstream fish-bearing areas.
- Holcomb Creek, Potter Creek, and fish-bearing tributaries (Figure 4).

Actions

Newell Creek:

- Field inventory riparian weeds, particularly knotweed throughout system.
- Remove riparian weeds, plant native vegetation, and expand width of corridor.
- In the lower and upper sections of the creek, improve channel complexity by adding wood.
- Address stormwater issues through projects and outreach in headwater areas in collaboration with Oregon City.

- Monitor water temperature, sediment, and other water quality conditions.

Holcomb and Potter creeks (Figure 4):

- Remove riparian weeds, plant native vegetation, and expand the width of the corridor.
- Field inventory riparian weeds, particularly knotweed.
- In selected areas, improve channel complexity by adding wood.
- Monitor water temperatures.
- Address fish passage barriers.

Partnerships

- Metro: collaboration to restore habitat in the Newell Creek canyon area and to expand protection efforts into the Holcomb Creek/Potter Creek systems.
- Metro: grant funding
- Oregon City: coordinate stormwater management projects and public outreach activities.
- OWEB: grant funding

Figure 3. Newell Creek Action Area

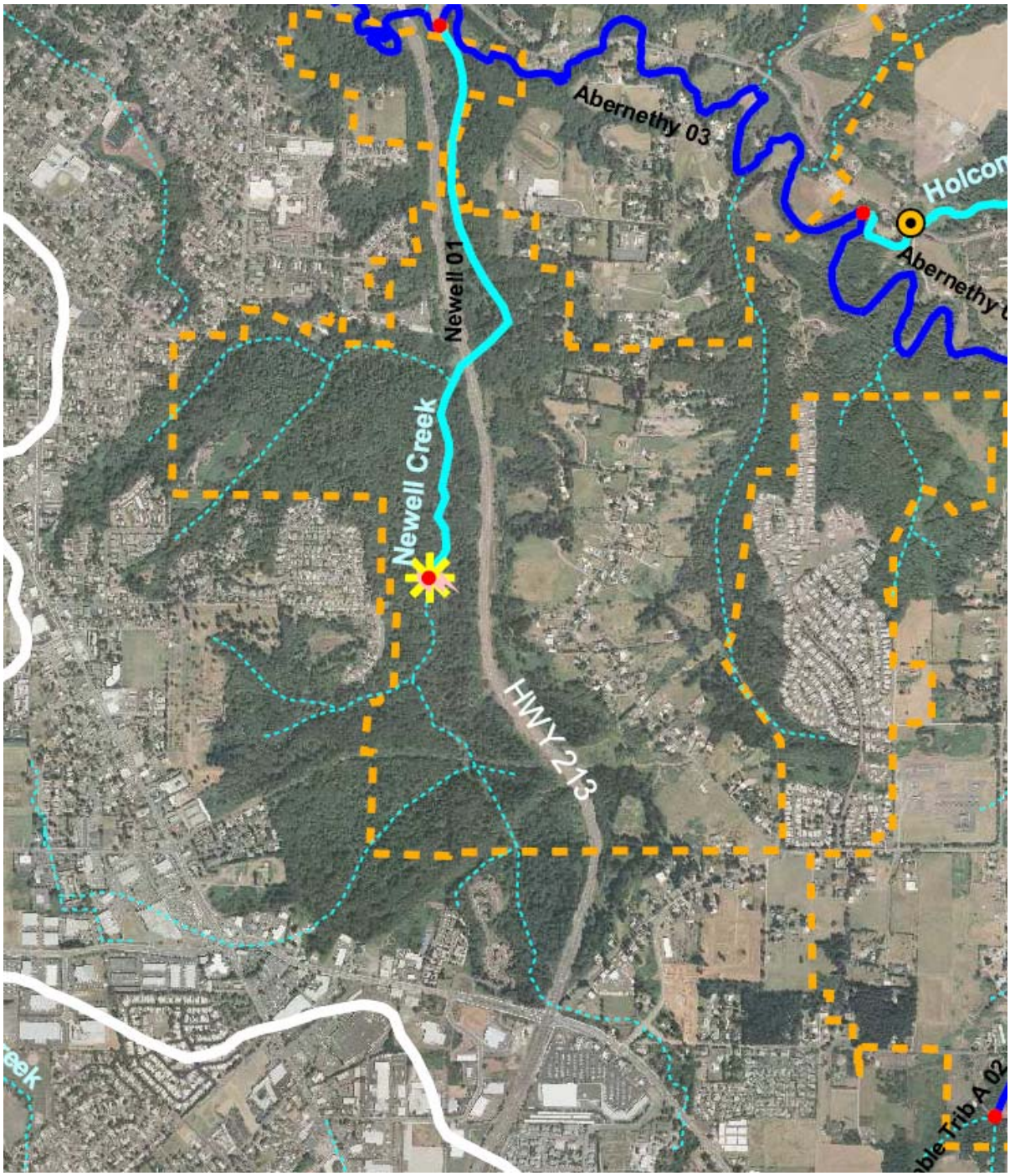
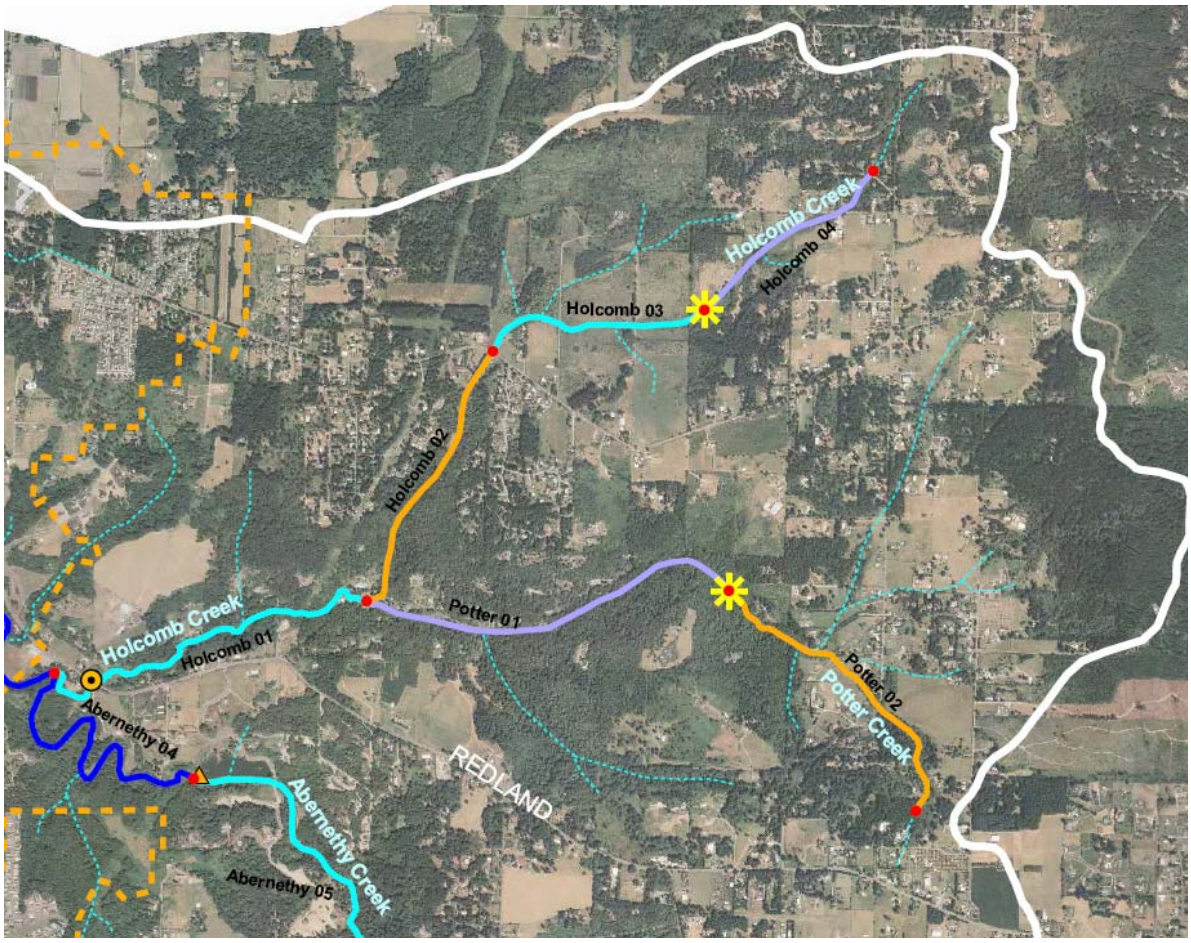


Figure 4. Holcomb and Potter Creek Action Area



Enhance Oregon City Stormwater Quality and Quantity

Rationale

Oregon City is strategically located, with headwater streams within its city limits that drain into all three subwatersheds: Abernethy, Beaver, and Willamette Tributaries (Figure 5). As a result, land use practices within the city strongly influence water quality and fish habitat in downstream areas.

A large area of the city is covered in impervious surfaces (roofs, pavement, and other areas that do not absorb rainfall). The amount and distribution of impervious surfaces has significant implications for watershed health. Unless steps are taken to control runoff, rainfall on in areas with impervious surfaces does not infiltrate into the ground. Instead, it rapidly runs off as stormwater into streams, negatively affecting streamflows, water quality, fish populations, and stream habitat. The Willamette subwatershed, which has the highest proportion of area within Oregon City, has the most impervious surfaces (22%). In addition, individual streams (e.g., Newell Creek, which has headwaters within Oregon City) can have a much greater proportion of the drainage area in impervious surfaces.

An impervious surface area of 5% of the watershed appears to be a threshold for negative effects on streams and fish populations. Negative effects can include increased flows during flood events, sedimentation, and other water quality concerns. The *Greater Oregon City Watershed Assessment* (ICF International 2010) classified reaches as follows by percent impervious surface in contributing area (Figure 6):

- 5% or less—good
- 5–10%—fair
- greater than 10%—poor

Based on these classifications, reaches that drain Oregon City are the most affected overall by impervious surfaces. This includes Newell Creek, a key tributary to Abernethy Creek that contains high quality habitat and significant steelhead and coho salmon populations.

Oregon City is taking active steps to control and monitor stormwater conditions. The City directs new developments to employ best management practices (BMPs) such as bioswales, wetland areas, and other facilities that retain stormwater and minimize water quality problems. In addition, the City has an ongoing monitoring program that assesses, evaluates, and reports on stormwater quality status and trends.

Focus Areas

- All areas within the Oregon City UGB (Figure 5).

Actions

- Work with Oregon City staff on public outreach efforts that educate landowners and other residents on actions they can take to minimize stormwater issues, including maintaining functioning riparian areas and taking steps to reduce erosion.
- Collaborate with Oregon City staff to identify and work with landowners on voluntary projects to improve stormwater conditions, including planting native riparian vegetation and efforts to reduce erosion.
- Work with Oregon City staff to identify, fund, and implement stormwater retention areas, including installing bioswales and creating wetland areas.
- Collaborate with Oregon City to monitor stormwater water quality conditions.

Partnerships

- Oregon City
- ODEQ: grant funding through the 319 program

Figure 5. Oregon City Headwater Streams Action Area

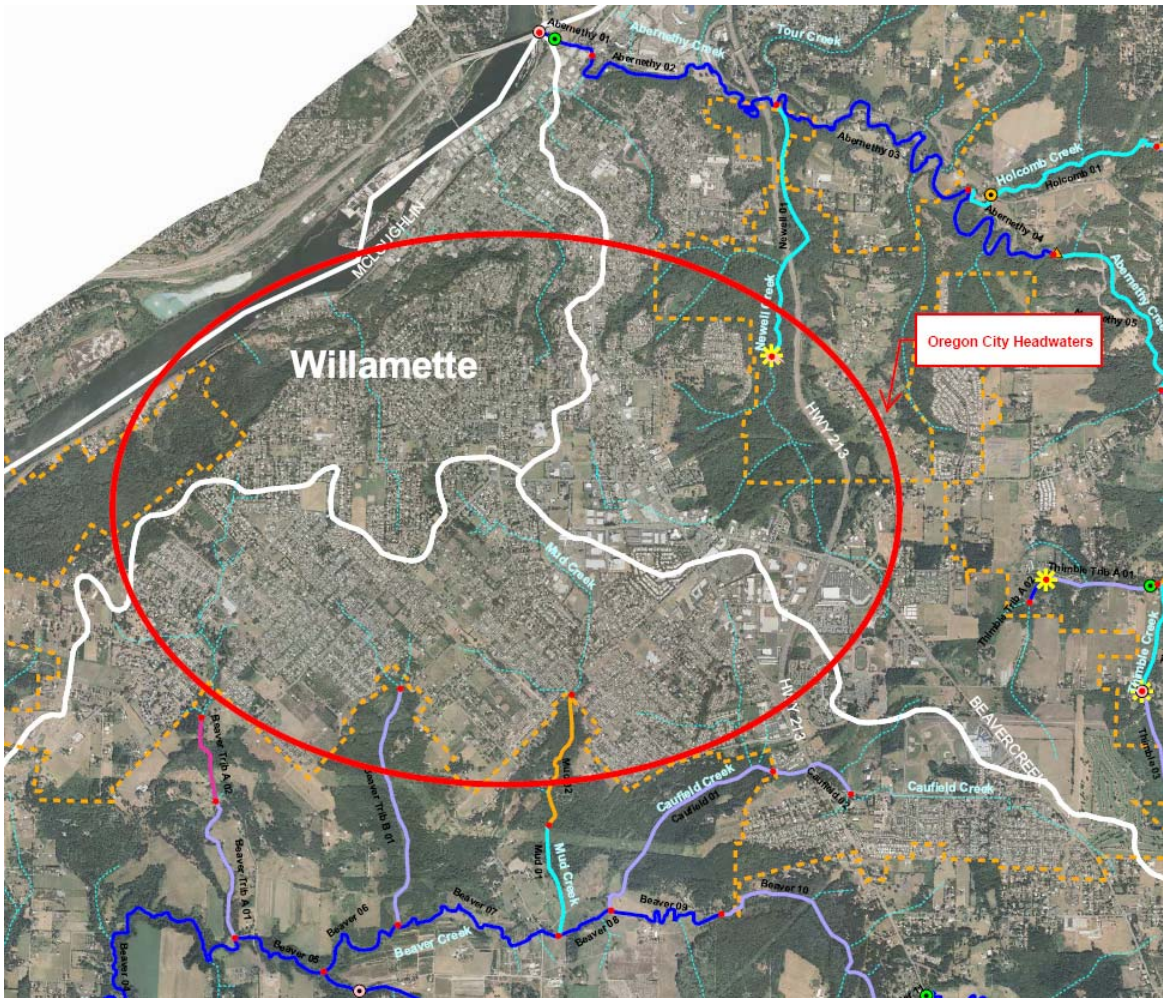
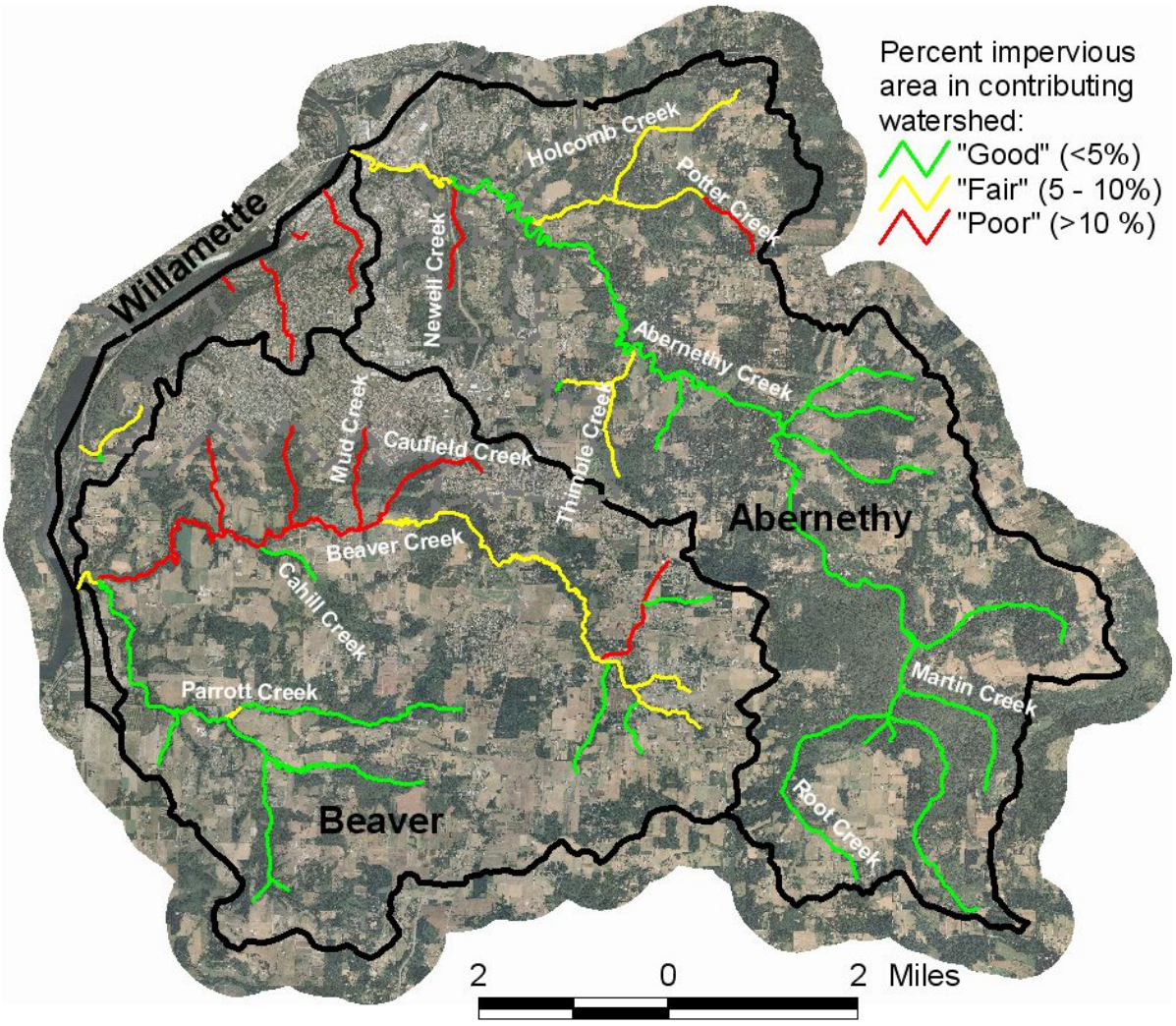


Figure 6. Percent Impervious Surface for the Contributing Watershed Area Upstream of the Midpoint of Each Stream Reach



Enhance Habitat in the Beaver Creek–Parrott Creek Confluence

Rationale

A dam near the confluence of Beaver and Parrott creeks created an impoundment, Sevick Pond, which backed up water in the area upstream and blocked fish access. Sevick Pond covered approximately 12 acres including the junction of Parrott and Beaver creeks. This dam remained in place until the January 2, 2009, flood. In this flood, Beaver Creek eroded the northern portion of dam, creating a channel that is passable to fish.

The Beaver Creek subwatershed is now accessible to steelhead and Pacific lamprey. Because steelhead will quickly move into new habitat, it is expected that that they will recolonize the system for spawning and juvenile rearing. Unfortunately, because no information is available on fish habitat

quality in the Beaver Creek subwatershed, it is not possible to predict the capability of the stream network to support steelhead or resident cutthroat trout populations.

Because Sevick Pond captured substantial sediments, the stream channel is now down-cutting through these sediments. As the stream erodes this large volume of sediment into the channel, a "headcut" in the deep sediments has developed. This headcut creates a steep fall over the sediments that could block upstream fish movement in the channel, but a field inventory would be necessary to confirm the ability of fish to pass through this area. In addition to the possible fish passage issue, the large quantity of sediment exposed in the drained Sevick Pond will evolve into a weed-infested area in the absence of efforts to control weeds and plant native vegetation.

The draining of Sevick pond and the new accessibility of the Beaver Creek subwatershed to anadromous fish presents an area for focused restoration actions in the Beaver Creek–Parrott Creek confluence area. Opportunities in this area to work with landowners to assess conditions and identify and pursue restoration projects include the following:

- Sedimentation is a water quality issue in the Sevick Pond area, but other water quality conditions (e.g., water temperature) are unknown.
- Water withdrawals are probably reducing water flow during the late summer and early fall; it is important to assess streamflow conditions during this period and work with landowners on voluntary mechanisms to reduce water withdrawals.
- Riparian vegetation composition is modified and the corridor is narrowed; weedy conditions prevail in many areas.
- Fish passage conditions are unknown at many road crossings.
- Stream habitat conditions are unknown.

Focus Areas

- The area surrounding the Beaver Creek–Parrott Creek confluence (Figure 7).
- Sevick pond area (Figure 8).

Actions

- Remove riparian weeds, plant native vegetation, and expand width of corridor.
- Field inventory riparian weeds, particularly knotweed.
- Address fish passage barriers and assess unknown barriers at road crossings.
- Educate landowners on riparian area management and sediment-reduction actions.
- Explore opportunities to increase streamflows through voluntary actions.
- Collaboration with the landowner to develop a plan to restore the drained Sevick pond area with native vegetation.
- Study the Sevick Pond sediment accumulation and develop a plan to control sedimentation, reduce weeds, plant native vegetation, and maintain fish passage.

Partnerships

- Clackamas County SWCD
- OWEB: grant funding

Figure 7. The Beaver and Parrott Creek Confluence Action Area

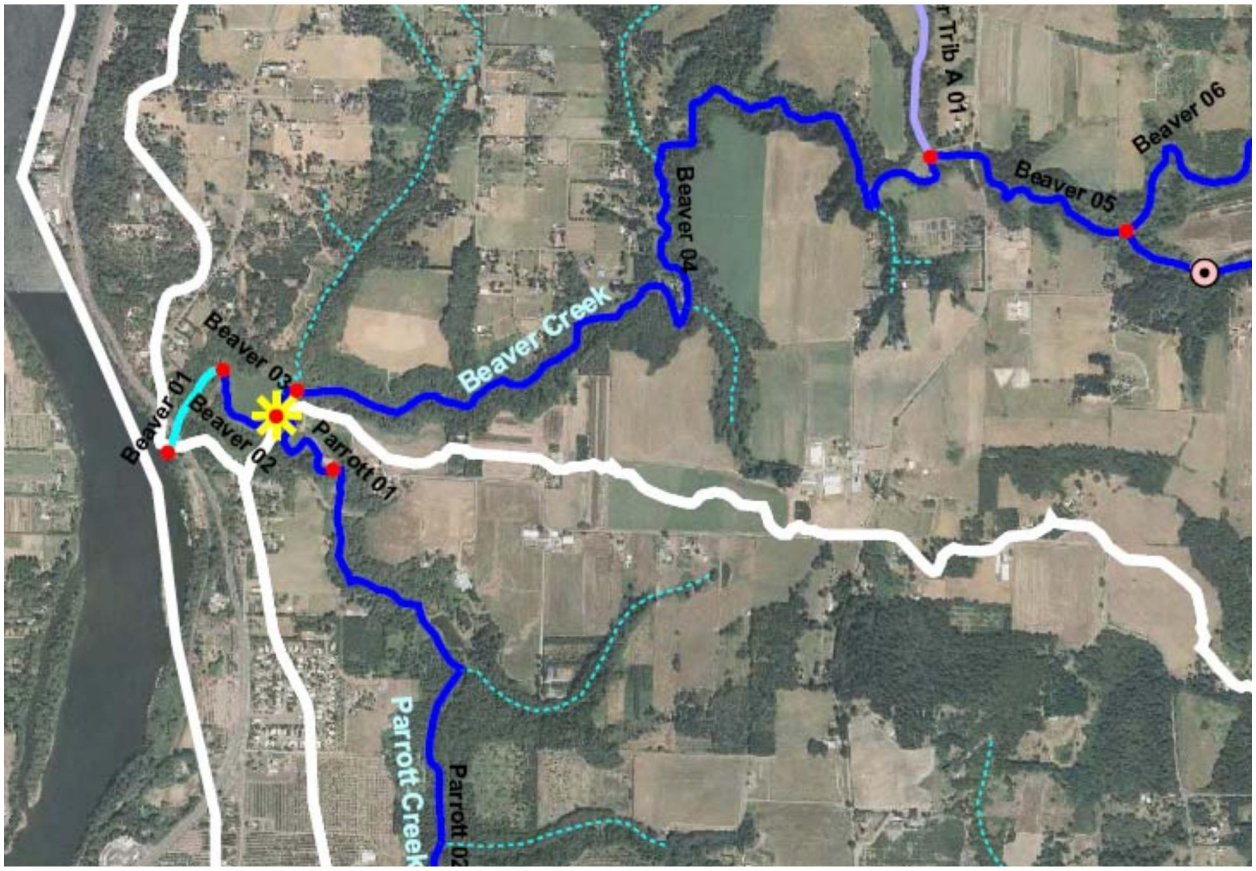
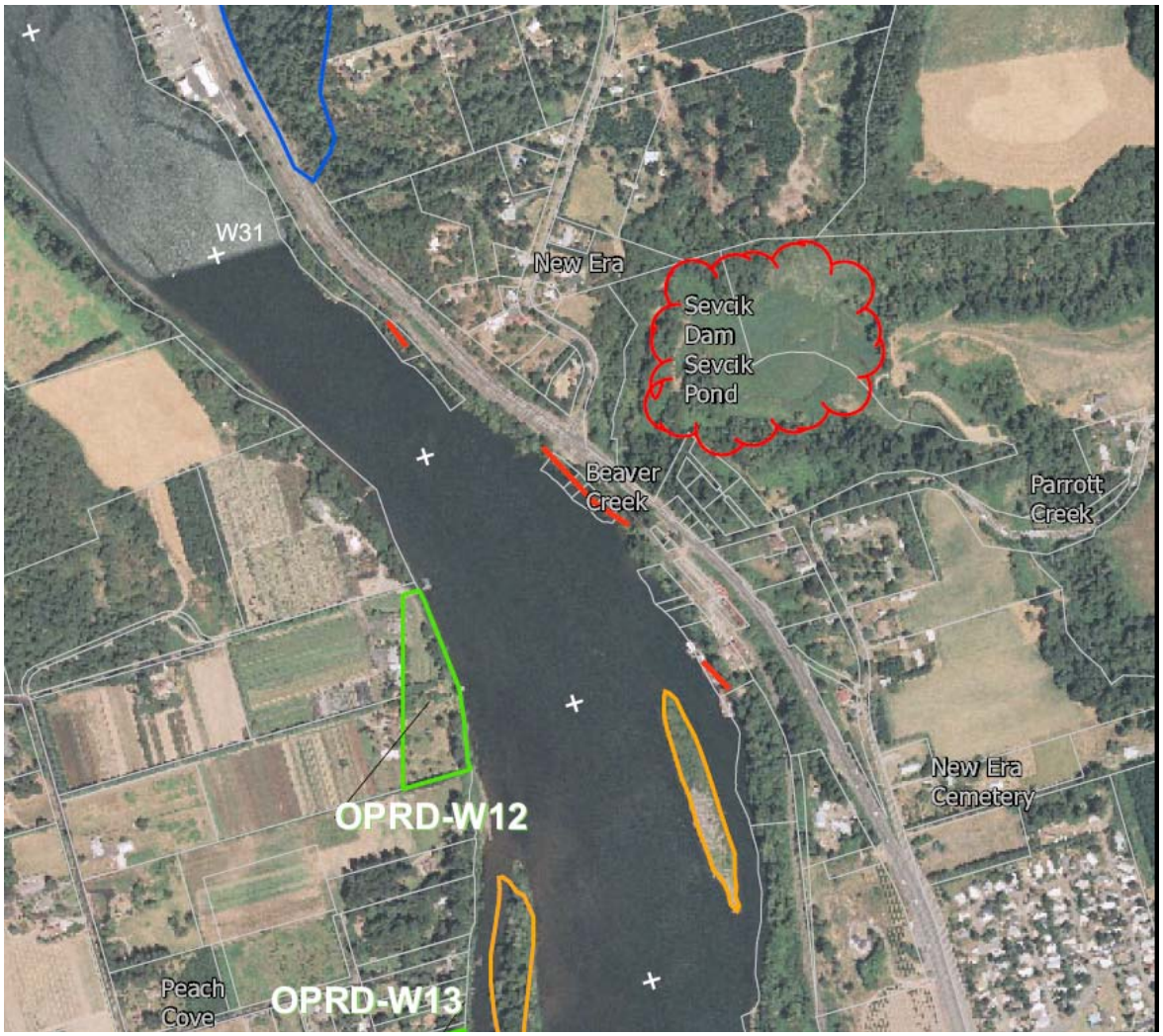


Figure 8. The Sevick Pond Site, Lower Beaver Creek Subwatershed



Source: Oregon State Parks and Oregon Watershed Enhancement Board 2008 (aerial photo), note that Sevick pond is spelled incorrectly in source map.

Improve Fish Passage

Rationale

Fish passage barriers on Abernethy Creek, Beaver Creek, and tributary streams can pose a significant problem for fish populations. Dams and road crossing culverts are examples of fish passage barriers in the watershed assessment area. Fish move around the stream network through the different phases of their life cycle and in response to changing conditions. Fish passage barriers, prevent fish from accessing important areas for spawning or from moving into cool tributary streams when Abernethy Creek or Beaver Creek warm during the summer months.

Fish passage barriers can totally block fish movement during all times or they can partially block movement during periods of high or low flows. Partial fish passage barriers can significantly slow the migration of coho and steelhead through the system. Fish will often hold in pools at the base of a

barrier waiting for conditions to change. This can delay migration and create problems such as stress on the fish, which provide opportunities for poaching and predation.

Dams, which are often constructed in streams to impound water for irrigation or recreation, can impede fish passage if fish ladders or other mechanisms are not in place. Several dams on Abernethy Creek may present obstacles to fish passage. The Hidden Lake water diversion dam just upstream from Holcomb Creek may be a fish passage barrier, but its status needs to be confirmed. The Beaver Lake dam on upper Abernethy Creek has a fish ladder in place. Although fish passage at this ladder has not been studied, some evidence shows that it impedes adult coho and steelhead movement into spawning and rearing streams above the lake.

The Sevick Pond dam on lower Beaver Creek washed out in the January 2, 2009, flood event. Because Sevick Pond captured substantial sediments, the stream channel is now down-cutting through these sediments. As the stream erodes this large volume of sediment into the channel, a "headcut" in the deep sediments has developed. This headcut creates a steep fall over the sediments that could block upstream fish movement in the channel, but a field inventory would be necessary to confirm the ability of fish to pass through this area.

Fish passage at many of the road crossings (primarily culverts) in the watershed assessment area has been evaluated using the ODFW criteria. Table 2 provides the fish passage status for 14 road crossings in the Abernethy Creek subwatershed and 13 road crossings in the Beaver Creek subwatershed. Most of the road crossings were inventoried by ODFW or Clackamas County, and their fish passage status is known. The road crossing inventory is comprehensive for Abernethy Creek subwatershed, but a number of crossings have not been assessed for fish passage (i.e., designated as unknown) in the Beaver Creek subwatershed.

With the absence of the Sevick Pond dam and its barrier to fish passage, upper Willamette steelhead and Pacific lamprey can now access the Beaver Creek subwatershed. Little is known about the status of fish passage in Beaver and Parrott creeks. Because it is now accessible to anadromous fish, this subwatershed should be the focus of fish passage assessments.

In addition to the road crossings identified below in Table 3, ICF evaluated fish passage for the Abernethy Creek culvert under Highway 99. This culvert is important because it is the first obstacle that salmon and steelhead encounter upon entering Abernethy Creek. The evaluation of fish passage through the Highway 99 culvert is based on the culvert diameter, length, and gradient, the characteristics of the weirs, and flow conditions in Abernethy Creek. The weirs appear to provide some fish passage at lower flows, though the jump height exceeds the 6-inch ODFW fish passage criterion and may impede juvenile fish. Adult salmon and steelhead do pass through the culvert, though they may have difficulty during very high-flow conditions when water velocities exceed fish swimming abilities. Upstream access does not appear to be severely limited, because fish have been observed.

Table 3. Fish Passage Status and Location for Road Crossings in the Watershed Assessment Area

Subwatershed	Stream and Reach Location	Responsible for Inventory and ID Number	Fish Passage Status/Notes
Abernethy			
	Holcomb 01a Holcomb 01b	County 01	Not a barrier
	Potter 02a Potter 02b	County 04	Barrier
	Holcomb 02 Holcomb 03	County 02	Not a barrier
	Holcomb 04a Holcomb 04b	County 03	Barrier
	Thimble 01a Thimble 01b	County 05	Barrier
	Thimble 02 Thimble 03	County 06	Barrier
	Abernethy Trib A 01a Abernethy Trib A 01b	County 07	Barrier
	Abernethy Trib B 01a Abernethy Trib B 01b	County 08	Not a barrier
	Abernethy Trib C 01a Abernethy Trib C 01b	County 09	Not a barrier
	Abernethy Trib C 03a Abernethy Trib C 03b	County 10	Barrier
	Root 02a Root 02b	County 11	Barrier
	Root 03a Root 03b	County 12	Barrier
	Root 03b Root 03C	County 13	Barrier
	Abernethy 16a Abernethy 16b	County 14	Barrier

Subwatershed	Stream and Reach Location	Responsible for Inventory and ID Number	Fish Passage Status/Notes
Beaver			
	Parrott 05a Parrott 05b	ODFW 01	Not a barrier
	Cahill 01a Cahill 01b	County 15	Unknown
	Beaver 11a Beaver 11b	ODFW 02	Not a barrier
	Beaver Trib C 01a Beaver Trib C 01b	ODFW 06	Not a barrier
	Beaver Trib C Trib A 01a Beaver Trib C Trib A 01b	County 16	Unknown
	Beaver Trib D 01a Beaver Trib D 01b	ODFW 03	Not a barrier
	Beaver 15a Beaver 15b	ODFW 04	Not a barrier
	Beaver Trib E 01a Beaver Trib E 01b	County 17	Unknown
	Beaver Trib E 01b Beaver Trib E 01c	County 18	Unknown
	Beaver Trib F 01a Beaver Trib F 01b	County 19	Unknown
	Beaver 17a Beaver 17b	ODFW 05	Barrier
	Beaver 17b Beaver 17c	County 20	Unknown
	Beaver 17c Beaver 17d	County 21	Unknown

Focus Areas

- Hidden Lake water diversion dam on Abernethy Creek.
- Sevick Pond, lower Beaver Creek.
- Beaver Creek subwatershed.

Actions

- Assess fish passage at the Hidden Lake water diversion dam and identify options for addressing any issues.
- Assess fish passage, in combination with a comprehensive habitat assessment, in the Sevick Pond area and upstream; identify options for addressing any fish passage issues.
- Assess fish passage throughout the Beaver Creek subwatershed and identify options for addressing any fish passage issues. The fish passage assessment could be combined with the aquatic habitat inventory.

Partnerships

- ODFW
- Clackamas County

Improve Habitat in the Lower Portions of Abernethy Creek

Rationale

Backwatering of Abernethy Creek during high flows adds to the limited availability of off-channel habitat in the lower Willamette River and contributes to the success of fish spawned in other areas of the Willamette River basin. The loss of shallow, complex, off-channel habitat is a major limiting factor for salmon in the lower Willamette River. Restoration of urban streams, including Abernethy, Kellogg, Tryon, and Johnson creeks, is one of the few opportunities to improve this kind of habitat in the lower Willamette River. Potential habitat improvements to the backwater areas in Abernethy Creek would contribute to the recovery of listed coho and steelhead by increasing the extent and diversity of productive stream habitats that flow into the lower Willamette River.

The incised channel, limited complex pools, and minimal large wood in lower Abernethy Creek constrain the quality of seasonal rearing habitat. The channel incision has reduced stream access to the floodplain during flood events. The limited quantities of large wood in the channel, particularly long pieces in complex accumulations, and minimal stream connection to the floodplain have severely degraded fish habitat quality. Key reasons why it is important to pursue restoration actions in the lower Abernethy Creek area include the following:

- Most of lower Abernethy Creek is within Oregon City.
- During flood events, the Willamette River creates a backwater area in Abernethy Creek as far upstream as Holcomb Creek.
- Provides an important migration corridor for coho, steelhead and Pacific lamprey.
- Provides winter rearing for Willamette Basin salmon and steelhead populations during floods.
- Water quality issues include temperature, sedimentation, and stormwater runoff.
- Riparian vegetation composition is modified and the corridor is narrowed; weedy conditions prevail in many areas.
- The stream channel is incised and disconnected from the floodplain.
- Stream habitat is simplified with limited wood.

Focus Areas

- Lower Abernethy Creek (Figure 9).

Actions

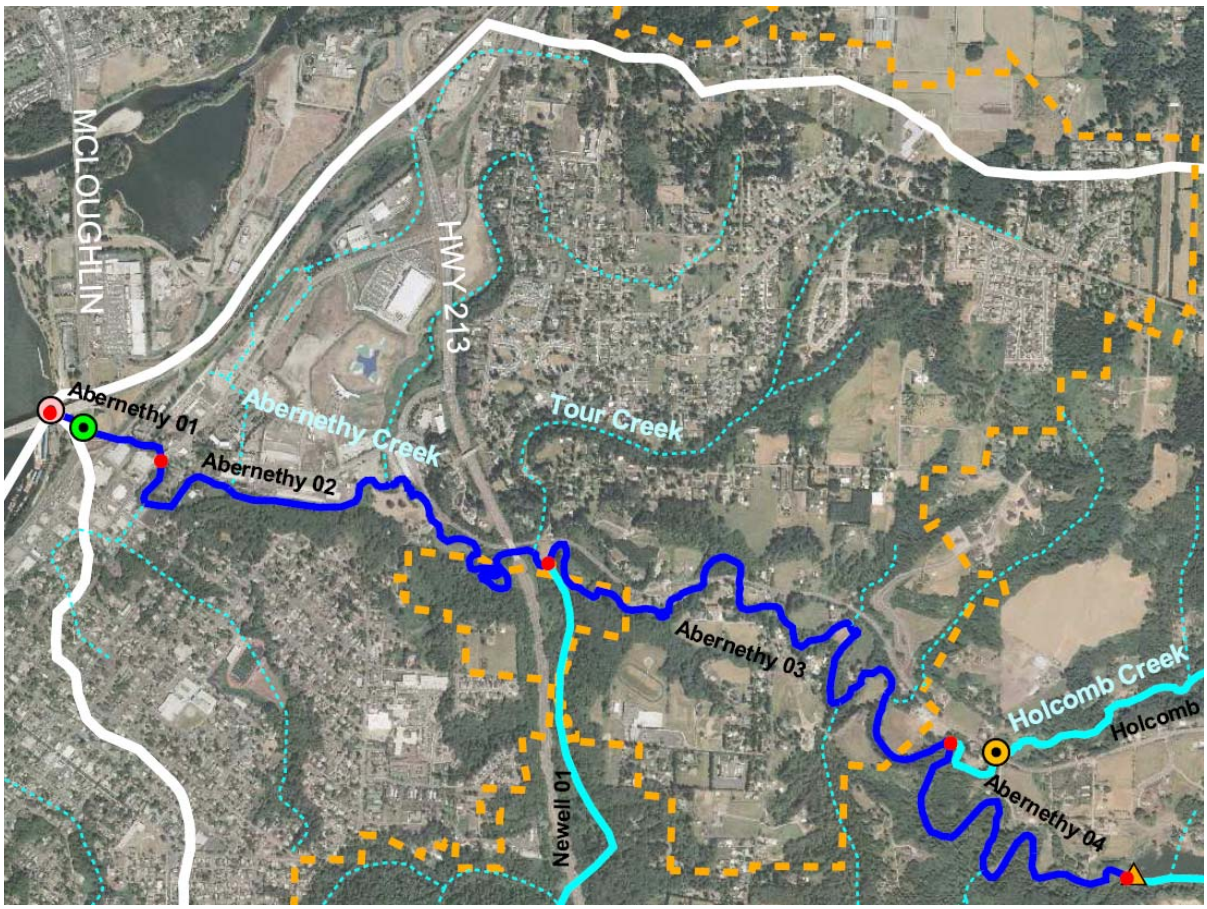
- Reconnect floodplain areas and add wood to the channel.
- Address stormwater issues in collaboration with Oregon City.

- Remove riparian weeds, plant native vegetation, and expand width of corridor.

Partnerships

- Oregon City

Figure 9. Lower Abernethy Creek Action Area.



Address Streamflows

Rationale

Withdrawing water from streams for agriculture, livestock, and other purposes can reduce streamflows and, in turn, affect the health of the aquatic environment. Reduced streamflows, particularly in the late summer and early fall when flows are naturally low, can increase water temperatures, reduce pool areas, and limit connectivity between stream habitats, all of which can adversely affect salmon, trout, and other aquatic organisms. The *Greater Oregon City Watershed Assessment* (ICF International 2010) found that water withdrawal activities were reducing low flows in Abernethy and Beaver creeks during the critical late summer and early fall period. It appears that the flow reductions are the greatest in Beaver Creek subwatershed, which includes Parrott Creek, although there is some uncertainty about the finding and it will need to be substantiated through

further assessment. With the recolonization of steelhead and Pacific lamprey in Beaver Creek, it is very important to understand and address the low flows in this system.

Voluntary incentives are in place to address water withdrawal issues, including temporary leasing of water rights. Water withdrawals, affected streamflows, and water rights are complex issues; the GOCWC should collaborate with OWRD to assess the water quantity issues in Beaver Creek subwatershed and develop a strategy for improving conditions during low-flow periods.

Focus Areas

- Beaver Creek subwatershed, including the Parrott Creek system (Figure 10).

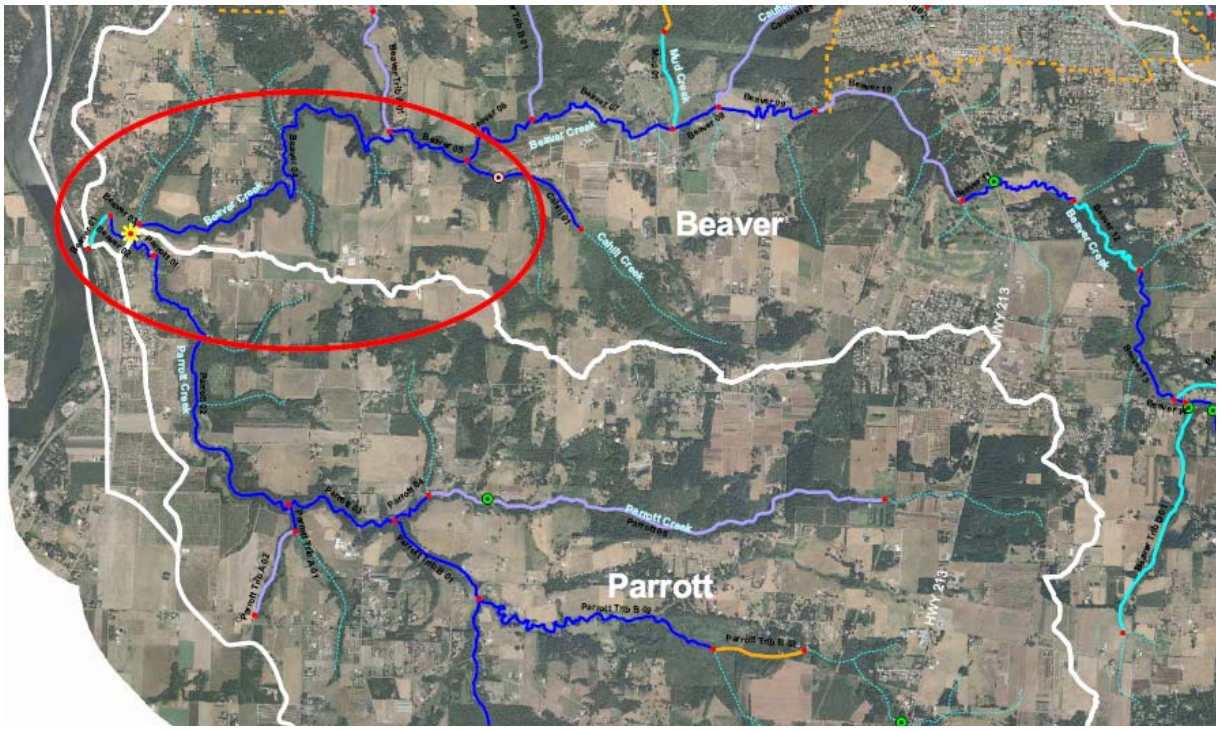
Actions

- Assess streamflow conditions and water right issues in collaboration with OWRD and ODFW.
- Develop a strategy, in collaboration with OWRD and ODFW, for addressing water withdrawals and maintaining adequate streamflows in.

Partnerships

- OWRD
- ODEQ
- Clackamas County Soil and Water Conservation District

Figure 10. The Beaver Creek Subwatershed and the Beaver and Parrott Creek Confluence Area



Education and Outreach to All Watershed Residents

Rationale

Successful restoration of the greater Oregon City watersheds depends on the goodwill, stewardship values, and participation of landowners and residents. Education and outreach builds community support and engages landowners and other residents in restoration projects. The watershed education and outreach effort complements all of the action plan strategies and actions, and serves as a tool for recruiting landowners and volunteers to participate in restoration projects.

The GOCWC can reach out to watershed residents through a variety of approaches including the following:

- Field tours of restoration activities
- Workshops and training on restoration activities and needs
- Speaking engagements with neighborhood groups and in other forums
- Printed and online informational materials to increase awareness on watershed issues and what individuals can do to improve the health of the watershed

Effective public education and outreach is a complex task. For that reason, it is recommended that the GOCWC develop a watershed education and outreach plan to guide its efforts. A number of Willamette Basin watershed councils have developed and implemented successful plans that can serve as examples. Development of the plan will take some time and in the interim, the GOCWC should continue to engage in outreach and education activities.

Focus areas

- Abernethy, Beaver, and Willamette Tributary subwatersheds.

Actions

- Engage in watershed outreach and education efforts in collaboration with partners.
- Develop an education and outreach plan and implement activities identified in the plan.

Partnerships

- Clackamas Soil and Water Conservation District
- Oregon City
- OWEB: grant funding
- SOLV

Project Phasing and Budgets

A number of factors control the GOCWC's capacity to plan and implement projects. It is anticipated that council staffing, project funding, and the ability to engage partner organizations and landowners will all increase over time. Figure 11 illustrates the proposed 10-year phasing of the action plan restoration strategies. Assessing baseline conditions and engaging landowners will help lay the foundation for future restoration actions.

Table 4 outlines year 1 action plan activities. The proposed activities will, by necessity, be modified based on grant funding levels, staffing, volunteer engagement, and landowner participation.

Figure 11. Restoration Action Plan Implementation Phasing

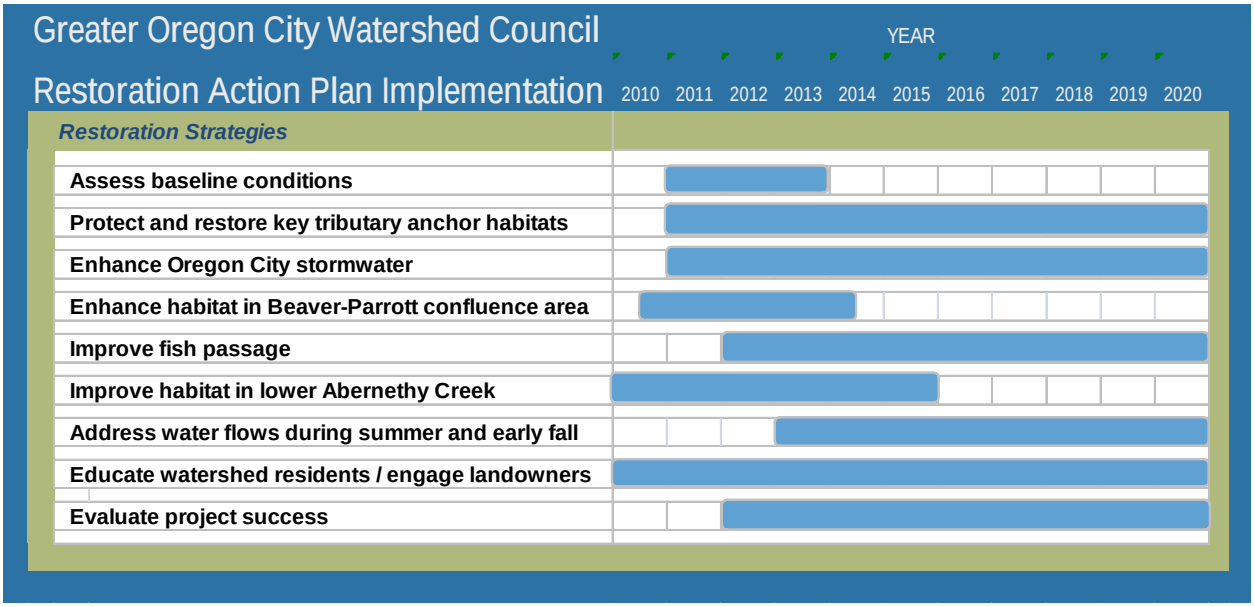


Table 4. Year 1 Restoration Action Plan Activities

Action Plan Component	Action	Estimated Cost	Notes
Protect and restore key tributary anchor habitats	Focus on Newell Creek and Holcomb Potter Creek systems		Work in partnership with Oregon City and Metro to identify restoration actions, volunteer activities, and public outreach approaches.
Assess baseline conditions	Aquatic habitat inventory (ODFW protocol)	$75,000	The Abernethy Creek subwatershed contains 38 miles of fish-bearing streams, 26 miles of which contain coho. The Beaver Creek subwatershed contains 32 miles of fish-bearing streams, though the extent of steelhead distribution is not known. The inventory will include assessing stream habitat, riparian conditions, and fish passage issues. ODFW aquatic habitat inventories cost approximately $1,500 per mile (Sanders pers. comm.). Estimated cost is for 50 miles of surveyed streams. Funding sources: OWEB; NOAA-Fisheries.
	Assess condition in the Sevick Pond Area	$50,000	Assess riparian conditions, sediment accumulation, and any potential fish passage barriers. Develop a channel, riparian and wetland restoration plan. Funding: DEQ EPA 319 program; OWEB; NOAA-Fisheries
	Assess fish passage at the Hidden Lake water diversion	$5,000	This dam should be examined by a fish passage specialist. If there is an issue, conceptual approaches to remedying the situation should be outlined. If a problem is identified, this assessment will lay the foundation for a grant to improve fish passage. Funding: OWEB; NOAA-Fisheries
Enhance habitat in Beaver-Parrott Confluence Area	Enhance habitat in the Sevick Pond Area	$60,000	Restore wetland, riparian, and channel habitats. Funding: OWEB
Improve habitat in lower Abernethy Creek	Cooperate with SOLV restoration project		Cooperate with SOLV on project implementation and public outreach. Plan landowner tours of the site.

Action Plan Component	Action	Estimated Cost	Notes
Watershed outreach & Education	Continue with ongoing outreach activities		Continue with current outreach activities, with an emphasis on geographic focus areas.
	Develop watershed outreach and education plan	$25,000	Develop a detailed public outreach and education plan in cooperation with Oregon City, Clackamas County SWCD and other partners. The plan should specify how outreach activities will help secure additional landowners to participate in restoration projects. Funding: DEQ EPA 319 program; OWEB.

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Appendix A: Grant Funding Sources

Table A-1. Grant Funding Sources

Grant	Agency	Amount		Deadline	Website and Contact	Type of Projects Funded							
		Funds Available	Grant Range			Fish Passage	Water Quantity	Water Quality	Stormwater	Fish & Wildlife Habitat	Stream Restoration	Outreach & Education	Wetland Restoration
2010 Open Rivers Initiative	U.S. Department Commerce/NOAA	$6 Million	$100,000 – 3 Million	Nov 16	Steve Drescher; steve.j.drescher@noaa.gov http://www.nmfs.noaa.gov/habitat/restoration/projects_programs/crp/partners_funding/callforprojects3.html Also via grants.gov	X							
Oregon Watershed Enhancement Board (OWEB): Technical Assistance, Outreach, Education grants	Oregon Watershed Enhancement Board	$20 Million	$10,000–500,000		http://www.oregon.gov/OWEB/GRANTS/index.shtml Willamette Bain: Wendy Hudson 503-986-0061 wendy.hudson@state.or.us	X				X	X	X	X
North American Wetlands Conservation Act	U.S. Department of the Interior/ U.S. Fish and Wildlife Service		$1 Million	Mar, Jul & Oct	703-358-1784 or dbhc@fws.gov								X
Clean Water Act Section 319 Nonpoint Source Grant Program	Oregon Department of Environmental Quality		Varies	Varies	Lower Willamette Area: Doug Drake 503-229-5350 http://www.deq.state.or.us/wq/nonpoint/grants.htm			X	X		X	X	
Partners for Fish and Wildlife Program	U.S. Department of the Interior/ U.S. Fish and Wildlife Service	$9 Million	Up to $25,000	Sep 30	David Gordon: 703-358-2025 http://www07.grants.gov/search/search.do?&mode=VIEW&flag2006=false&oppId=47672					X	X		X
Whole Watershed Restoration Initiative	U.S. Department Commerce/NOAA		$20,000–100,000	Nov 20	Polly Hicks, 206-526-4861; polly.hicks@noaa.gov	X				X	X	X	
NOAA/American Rivers Partnership Funding	U.S. Department Commerce/NOAA		Up to $100,000	Apr & Nov	Jason Lehto, 206-526-4670; Jason.a.lehto@noaa.gov	X				X	X	X	

Final Report

Highway 213 Corridor Alternative Mobility Targets

Oregon City, Oregon

Draft

December 2017

Final Report

Highway 213 Corridor Alternative Mobility Targets

Oregon City, Oregon

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Project No. 20651

December 2017

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Section 1
Executive Summary

EXECUTIVE SUMMARY

Oregon City's 2013 Transportation System Plan (TSP) determined that the Highway 213 (OR213) corridor from Redland Road to Molalla Avenue (including the intersection of Beavercreek Road) will exceed the current mobility target in 2035, resulting in more congestion than is allowed. The OR213 intersection with Molalla Avenue is anticipated to meet the target; however, Beavercreek Road and Redland Road are not anticipated to meet the target.

The existing mobility target at the OR213/Beavercreek Road intersection is a volume-to-capacity (v/c) ratio at or below 0.99 during the peak first and second hours. The existing mobility target at the OR213/Redland Road intersection is a v/c ratio at or below 1.1 during the peak first hour and 0.99 during the peak second hour, as this intersection is located in a regional center. The alternatives that would meet the existing mobility targets at the OR213/Beavercreek Road and OR213/Redland Road intersections are not cost feasible, given the financial constraints of the City and other agency partners. These alternatives can be further considered in the future if additional funding becomes available.

Lacking the financial capability of implementing major capacity-increasing projects at these locations, alternative mobility targets are necessary at each of these intersections; however, some improvements are feasible in the cost-constrained TSP to improve safety and minimize future congestion.

The following improvements are recommended for the intersection of OR213 and Beavercreek Road:

- Construct a westbound right-turn merge lane. High visibility pavement markings and signage are recommended for pedestrians and bicycles to cross the channelized lane safely, and consideration should be given to installing a rectangular rapid flash beacon (RRFB) for increased visibility.
- Infill sidewalk on Beavercreek Road from south of the Coltrane Path to north of Marjorie Lane.
- Install various safety improvements outlined on pages 33 and 35 of this report.

The above improvements will be added as projects in the TSP for future consideration.

For the intersection of OR213 and Beavercreek Road, the following mobility standards apply:

- During the first, second and third hours, a maximum v/c ratio of 1.00 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

For the intersection of OR213 and Redland Road, the following mobility standards apply:

- During the first and second hours, a maximum v/c ratio of 1.10 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.
- During the third hour, a maximum v/c ratio of 1.05 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

Changes to the TSP to incorporate these improvements and the alternative mobility targets will require a Legislative public review process before the City's Planning Commission and City Commission. The alternative mobility target and financially feasible improvements that are needed will need to be agreed upon by ODOT and approved by the Oregon Transportation Commission.

Section 2
Introduction

INTRODUCTION

Oregon City's 2013 Transportation System Plan (TSP) determined that the Highway 213 (OR213) corridor from Redland Road to Molalla Avenue (including the intersection of Beavercreek Road) will exceed the current mobility target in 2035, resulting in more congestion than is allowed. The TSP recommended a project be conducted to identify what improvements would be necessary to meet the current target or whether an alternative mobility target is justified. The OR213 intersection with Molalla Avenue is anticipated to meet the target; however, Beavercreek Road and Redland Road are not anticipated to meet the target.

This project provides an overview of these two intersections including safety, operations, and cost analysis of the potential improvements at these intersections and identifies potential alternative mobility targets that would be necessary in conjunction with financially feasible operational and safety improvements. If alternative mobility targets are not adopted for the corridor, Oregon City will not be able to approve zone changes consistent with the Beavercreek Concept Plan. Outright zoned development will also be hindered until funding can be secured for long-term improvements.

The intersection of OR213 and Beavercreek Road is shown in **Exhibit 1**, and the intersection of OR213 and Redland Road is shown in **Exhibit 2**.

Exhibit 1 – Highway 213 (OR213) and Beavercreek Road Intersection

Exhibit 2 – Highway 213 (OR213) and Redland Road Intersection

POLICY CONTEXT

Mobility targets are the measure by which the state assesses the existing or forecasted operational conditions of a facility. As such, they are a key component the Oregon Department of Transportation (ODOT) uses to determine the need for, or feasibility of providing highway, or other transportation system improvements. They impact local land use and transportation planning as well as development review. Recent years have seen notable changes to Oregon's transportation planning and land use policies and requirements. These changes reflect statewide policy to support transportation solutions that encourage economic development, contribute to public health, offer multi-modal choices for all users, and reflect the uncertain fiscal realities and limited transportation funding.

Oregon's Transportation Planning Rule (TPR)

Mobility targets for state highways, as established in this policy or as otherwise adopted by the Oregon Transportation Commission (OTC) as alternative mobility targets, are considered the highway system performance standards in compliance with the Transportation Planning Rule (TPR) (OAR 660-012), including applicability for actions that fall under Section -0060 of the TPR.

The TPR Section -0060 applies when cities or counties are considering zone changes or plan amendments that would allow for additional development that would significantly impact or worsen the performance of existing or planned transportation facilities. Currently, significant impacts are found to exist when levels of automobile traffic cause roadway facilities to exceed motorized vehicle standards, such as mobility targets. If there is a significant impact, jurisdictions are required to *"ensure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted Transportation System Plan."*

Oregon Highway Plan Policy 1F

The Oregon Highway Plan (OHP) defines polices and investment strategies for Oregon's state highway system for the next 20 years. The OHP gives policy and investment direction to corridor plans and transportation system plans that are being prepared around the state, but it leaves the responsibility for identifying specific projects and modal alternatives to those plans.

The OHP Policy 1F establishes mobility targets (as defined by motorized vehicle volume-to-capacity ratios) for state facilities that vary by region, facility classification, and whether or not the roadway is located inside an urban growth boundary (UGB). It states, *"It is the policy of the State of Oregon to maintain acceptable and reliable levels of mobility on the state highway system, consistent with expectation for each facility type, location and functional objectives. Highway mobility targets will be the initial tool to identify deficiencies and consider solutions for vehicular mobility on the state system. Specifically, mobility targets shall be used for:*

- *Identifying state highway mobility performance expectations for planning and plan implementation;*
- *Evaluating the impacts on state highways of amendments to transportation plans, acknowledged comprehensive plans and land use regulations pursuant to the Transportation Planning Rule (OAR 660-12-0060); and*
- *Guiding operations decisions such as managing access and traffic control systems to maintain acceptable highway performance."*

The OHP Policy 1F allows for development of alternative mobility targets in areas where it is "infeasible or impractical to meet the mobility targets". The policy allows for the use of alternative mobility targets to *"balance overall transportation system efficiency with multiple objectives of the area being addressed."* It requires that targets *"shall be clear and objective and shall provide standardized procedures to ensure consistent application of the selected measure. The alternative mobility target(s) shall be adopted by the Oregon Transportation Commission as an amendment to the OHP."* The OHP currently includes alternative mobility targets in many locations throughout the State; however, none have been adopted within the Portland Metro area to date.

EXISTING PERFORMANCE MEASURE AND TARGET

Mobility, or congestion, may be measured and regulated in a variety of ways. In the context of this project, mobility performance measures are methods to objectively measure the transportation system, such as travel time, or reliability. Mobility targets describe an acknowledged acceptable level of performance for a measure, such as a certain level of congestion.

The existing mobility targets for the OR213 corridor set forth in the Oregon Highway Plan (OHP) and the 2013 TSP are based on volume-to-capacity Ratio (v/c). The v/c ratio is a measure that reflects mobility and quality of travel. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). For example, a v/c of 1.00 indicates the roadway facility is operating at its capacity. An intersection can have an overall v/c ratio of 1.00 yet have v/c ratios greater than 1.00 for individual

movements where it may take more than one signal cycle to get through the intersection and queues build up. The following mobility target is set forth in the 2013 TSP for the two study intersections:

- OR213/Beavercreek Road intersection: required to operate at or below a v/c ratio of 0.99 during the peak first and second hours.
- OR213/Redland Road intersection: required to operate at or below a v/c ratio of 1.1 during the peak first hour and 0.99 during the peak second hour.

The Synchro model (a traffic model used to evaluate v/c ratios and other metrics) analysis completed for the 2013 TSP shows the OR213/Beavercreek Road intersection operating with an intersection v/c ratio of 0.83 for the p.m. peak hour under 2011 existing conditions. The TSP did not include an analysis of the intersection of OR213 and Redland Road. Under 2017 existing traffic volumes and conditions, the intersection operates with a v/c ratio of 0.91. The TSP analysis also indicates that by 2035, without improvement, the intersection will function beyond the current mobility target. Under 2035 Planned System Conditions (which includes planned, but potentially unfunded, roadway improvements), the intersection is expected to operate with a v/c ratio of 1.05, exceeding the existing mobility target (a maximum v/c ratio of 0.99). The southbound left-turn and eastbound left-turn movements exhibit higher than average v/c ratios, while the westbound left-turn and northbound left-turn movements exhibit lower than average v/c ratios.

Table 1 – OR213/Beavercreek Road Intersection Operations

Year	PM Peak Volume-to-Capacity Ratio (v/c)
2011 (2013 TSP Existing Conditions)	0.83
2017 Existing Conditions (May Counts)	0.91
2035 (2013 TSP Forecast)	1.05

The 2013 TSP did not include analysis of the OR213/Redland Road intersection. However, a long-term project to improve capacity at the OR213/Redland Road intersection is identified (project D79). The improvements identified in the TSP are part of Phase 2 of the "Jughandle" project, a project that focused on the intersection of OR213 and Washington Street that was implemented in 2013. The Phase 2 improvements, including improvements at OR213/Redland Road are already 90% designed. The improvements identified in Phase 2 future construction include an additional northbound and southbound through lane resulting in three northbound and three southbound lanes through the intersection. As this long-term solution has been identified, much of the analysis in the following sections of this report is focused on the OR213/Beavercreek Road intersection for the purpose of identifying a long-term improvement which will meet the existing mobility target for the corridor.

Section 3
Process

PROCESS

A Community Advisory Group (CAG) and Technical Advisory Group (TAG) were formed to help the City evaluate the feasibility and practicality of the alternatives set forth in this project. Three technical memorandums were produced and presented individually to the TAG and CAG. The following section outlines the contents of these memorandums and outcomes of the conversations with each group. All meeting notes and technical memorandums can be found in Appendix "A".

TECHNICAL MEMORANDUM #1/TAG AND CAG MEETING #1

Potential improvements for the intersection of Beavercreek Road and OR213 that focused on significantly increasing the intersection capacity to meet the current mobility target were presented to the TAG and CAG in December 2016 and January 2017. None of the alternatives were determined to be financially feasible, even by the 2035 horizon year of the TSP given the financial constraints of the city and other agency partners. In addition, some of the potential alternatives could have additional consequences including right-of-way impacts, environmental impacts, and could potentially complicate the provision of services for bicyclists, pedestrians, and transit users. Nonetheless, it is recommended that the alternatives be documented in the TSP for additional future consideration as part of the TSP's unconstrained plan. The unconstrained plan includes projects that are not currently anticipated to be financially feasible by 2035 but are projected to be needed and could be implemented if additional funding becomes available in the future.

TECHNICAL MEMORANDUM #2/TAG AND CAG MEETING #2

Because achieving the mobility target through a major capacity-expanding project at this intersection was determined to be beyond the financial capabilities of the city and its partner agencies, an alternative mobility target is necessary. A menu of potential alternative performance measures, reasonable target ranges, and a list of potentially feasible improvements to increase capacity and safety in the corridor was presented to the TAG and CAG in March 2017. The majority of TAG and CAG members agreed that an alternative mobility target allowing intersection volume-to-capacity ratios to exceed the current targets for no more than a specified number of hours per day would be appropriate for the corridor. The TAG and CAG were also in favor of further investigation of potential improvements to increase safety and capacity at the Beavercreek Road and OR213 intersection. Some improvements were identified that, while not allowing the mobility standard to be fully met, would increase the intersection capacity, improve safety, and are within the financial capabilities of the city and its partner agencies. The specific projects identified by the TAG and CAG for additional analysis were: 1) the provision of a merge lane for westbound right-turning vehicles at the OR213/Beavercreek Road intersection and 2) elimination of the second westbound left-turn lane at the OR213/Beavercreek Road intersection to increase left-turn storage on eastbound Beavercreek Road at Maple Lane Road. These improvements minimize future congestion and could be included in the cost-constrained TSP.

TECHNICAL MEMORANDUM #3/TAG AND CAG MEETING #3

The CAG and TAG reaffirmed support of an alternative mobility target allowing intersection volume-to-capacity ratios to exceed the existing targets for no more than a specified number of hours per day. In conjunction with alternative mobility targets, both groups were supportive of providing a merge lane for westbound right-turning vehicles at OR213/Beavercreek Road, but were not in favor of near-term or partial improvements at OR213/Redland Road, as it was determined that these would not be cost-feasible.

Section 4
Existing Conditions

EXISTING CONDITIONS

The existing conditions analysis identifies the transportation conditions and current operational and geometric characteristics of the roadways within the study area.

GEOMETRIC CHARACTERISTICS

At the OR213/Beavercreek Road intersection, OR213 has a 4-lane section and a speed limit of 55 mph and is classified as an Expressway to the north and a District Highway to the south. Beavercreek Road is classified as a Major Arterial with a 4/5-lane section and a speed limit of 35 mph. OR213 is under the jurisdiction of the Oregon Department of Transportation (ODOT), the west leg of Beavercreek Road is under the jurisdiction of Oregon City, and the east leg is under the jurisdiction of Clackamas County. OR 213 and Beavercreek Road are both designated as a Local Truck Routes in the City's TSP at the study intersection. The City designated truck routes in the TSP to ensure trucks can efficiently travel through and access major destinations in the City.

Sidewalks are provided along the north and south sides of Beavercreek Road, and a multi-use path is provided along OR213 south of Beavercreek Road along the east side of the highway. Bicycle lanes are provided along Beavercreek Road. TriMet operates Bus Route 32 between Clackamas Community College and Milwaukie City Hall. There are stops located on the west leg of Beavercreek Road at the intersection for both directions of travel (i.e. far-side for westbound and near-side for eastbound).

There is a stream running under the north leg of OR213 at the intersection, with corresponding wetlands. There are also geologic hazards in the vicinity of the intersection, with steep slopes and landslides primarily on the northwest corner. More details can be found in the Oregon City GIS maps in Appendix "B". The presence of these features increases the expense of any improvements requiring additional widening, as significant earthwork, culvert extensions, or wetland mitigation may be necessary.

PLANNED AREA IMPROVEMENTS

The City's TSP includes projects which may impact operations, safety, and travel patterns at the OR213/Beavercreek Road intersection. Many of the projects will increase connectivity in the vicinity of the OR213/Beavercreek Road intersection via parallel routes and roadway extensions between these parallel routes, providing alternate routes for those who do not need to pass through the intersection. All new roads and roadway upgrade projects will include facilities for bicycles and pedestrians. In addition, the TSP includes projects specifically to complete and enhance the bicycle and pedestrian networks. The roadway projects listed in the TSP which are likely to increase connectivity and impact safety and operations at the OR213/Beavercreek Road intersection are included in **Table 2** and **Figure 1.** **Figure 1** includes only those projects impacting vehicle travel and capacity.

Table 2 – 2013 Oregon City Transportation System Plan Projects located in the southeast part of the City

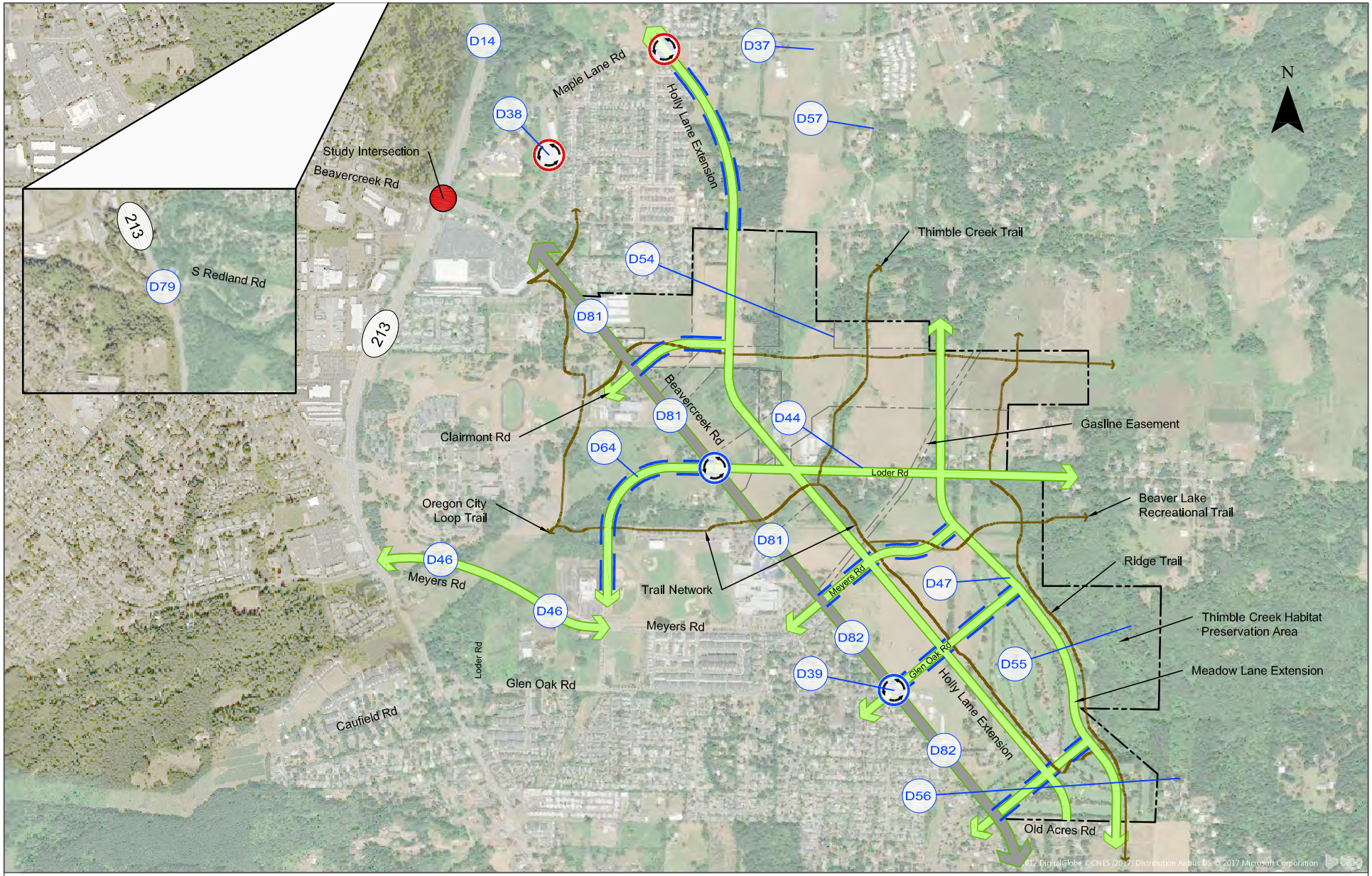
Project #	Project Description	Project Extent	Project Elements	Priority	Funded ?
D14	Southbound OR 213 Advanced Warning System	Southbound OR 213, north of the Beavercreek Road intersection	Install a queue warning system for southbound drivers on OR 213 to automatically detect queues and warn motorists in advance via a Variable Message Sign	Short-term	Likely
D37	Maple Lane Road/Holly Lane Operational Enhancement	Maple Lane Road/Holly Lane	Install a single-lane roundabout	Long-term	Unlikely
D38	Maple Lane Road/Walnut Grove Way Operational Enhancement	Maple Lane Road/Walnut Grove Way	Install a single-lane roundabout or realign Maple Lane Road in correlation with development	Long-term	Unlikely
D39	Beavercreek Road/Glen Oak Road Operational Enhancement	Beavercreek Road/Glen Oak Road	Install a roundabout	Long-term	Unlikely
D44	Beavercreek Road/Loder Road Extension Operational Enhancement	Beavercreek Road/Loder Road Extension	Install a roundabout	Medium-term	Likely
D46	Meyers Road West Extension	OR 213 to High School Avenue	Extend Meyers Road from OR 213 to High School Avenue as an Industrial Minor Arterial. Create a local street connection to Douglas Loop.	Short-term	Likely
D47	Meyers Road East extension	Beavercreek Road to the Meadow Lane Extension	Extend Meyers Road from Beavercreek Road to the Meadow Lane Extension as an Industrial Minor Arterial. Between the Holly Lane and Meadow Lane extensions, add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S19. Modify the existing traffic signal at Beavercreek Road	Medium-term	Likely
D54	Clairmont Drive extension	Beavercreek Road to Holly Lane South Extension	Extend Clairmont Drive from Beavercreek Road to the Holly Lane South extension as an Industrial Collector. Add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S17	Long-term	Likely
D55	Glen Oak Road extension	Beavercreek Road to the Meadow Lane Extension	Extend Glen Oak Road from Beavercreek Road to the Meadow Lane Extension as a Residential Collector. Install a roundabout at Beavercreek Road (per project D39)	Long-term	Likely
D56	Timbersky Way extension	Beavercreek Road to the Meadow Lane Extension	Extend Timbersky Way from Beavercreek Road to the Meadow Lane Extension as a Residential Collector. Add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S20	Long-term	Likely

Table 2 – 2013 Oregon City Transportation System Plan Projects located in the southeast part of the City

Project #	Project Description	Project Extent	Project Elements	Priority	Funded ?
D57	Holly Lane South extension	Maple Lane Road to Thayer Road	Extend Holly Lane from maple Lane Road to Thayer Road as a Residential Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S14. Install a roundabout at Maple Lane Road (per project D37)	Medium-term	Likely
D58		Thayer Road to Meyers Road	Extend Holly Lane from Thayer Road to the Meyers Road extension as an Industrial Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S15	Medium-term	Likely
D59		Meyers Road to the Meadow Lane Extension	Extend Holly Lane from the Meyers Road extension to the Meadow Lane Extension as a Mixed-Use Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S16	Long-term	Likely
D64	Loder Road Extension	Beavercreek Road to Glen Oak Road	Extend Loder Road from Beavercreek Road to High School Avenue as an Industrial Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S18. Create a local street connection to Douglas Loop.	Short-term	Likely
D79	OR 213/Redland Road Capacity Improvements	Redland Road to Redland Road undercrossing	Add a third northbound travel lane on OR 213 north of the Redland Road undercrossing. Extend the third southbound travel on OR 213 south of the Redland Road intersection and merge the third lane before the Redland Road undercrossing. Add a right-turn lane (southbound OR 213 to westbound Redland). Convert the Redland Road approach to OR 213 to 1 receiving lane, 2 left-turn approach lanes, and 1 right-turn lane.	Long-term	Unlikely
D81	Beavercreek Road Upgrade	Clairmont Drive (CCC Entrance) to Meyers Road	Improve to Industrial Major Arterial cross-section	Medium-term	Likely
D82		Meyers Road to UGB	Improve to Residential Major Arterial cross-section	Long-term	Likely
B20	Holly Lane Bike Lanes	Donovan Road to Maple Lane Road	Add a bike lane to the west side of the street. A shared-use path will be added on east side per project S13	Included with project D83	Unlikely
B21	Maple Lane Bike Lanes	Walnut Grove Way to UGB	Add bike lanes to both sides of the street	Included with project D84	Unlikely
B22	Thayer Road Bike Lanes	Elder Road to UGB	Add bike lanes to both sides of the street	Long-term Phase 3	Unlikely
B23	Loder Road Bike Lanes	Beavercreek Road and the Holly Lane Extension	Add a bike lane to the north side of the street. A shared-use path will be added on south side per project S18	Included with project D85	Unlikely

Table 2 – 2013 Oregon City Transportation System Plan Projects located in the southeast part of the City

Project #	Project Description	Project Extent	Project Elements	Priority	Funded ?
B24	Loder Road Bike Lanes	Holly Lane Extension to the UGB	Add bike lanes to both sides of the street	Included with project D85	Unlikely
B25	High School Avenue Shared Roadway	Meyers Road to Glen Oak Road	Add wayfinding and shared lane markings	Long-term Phase 4	Unlikely
B26	Glen Oak Road Bike Lanes	Coquille Drive to Augusta Drive	Add bike lanes to both sides of the street	Long-term Phase 3	Unlikely
B27	Coquille Drive Shared Roadway	Glen Oak Road to Turtle Bay Drive	Add wayfinding and shared lane markings	Long-term Phase 4	Unlikely
B29	Beavercreek Road Bike Lanes	Pebble Beach Drive to UGB	Add bike lanes to both sides of the street	Included with project D82	Likely
W22	Holly Lane Sidewalk Infill	Donovan Road to Maple Lane Road	Complete sidewalk gaps on west side of the street. A shared-use path will be added on east side per project S13	Included with project D83	Unlikely
W23	Maple Lane Road Sidewalk Infill	Beavercreek Road to UGB	Complete sidewalk gaps on both sides of the street	Included with project D84	Unlikely
W24	Thayer Road Sidewalk Infill	Maple Lane Road to UGB	Complete sidewalk gaps on both sides of the street	Long-term Phase 3	Unlikely
W25	Loder Road Sidewalk Infill	Beavercreek Road to the Holly Lane Extension	Complete sidewalk gaps on north side of the street. A shared-use path will be added on south side per project S18.	Included with project D85	Unlikely
W26	Loder Road Sidewalk Infill	Holly Lane Extension to the UGB	Complete sidewalk gaps on both sides of the street	Included with project D85	Unlikely
W27	High School Avenue Sidewalk Infill	Meyers Road to Glen Oak Road	Complete sidewalk gaps on the west side of the street	Long-term Phase 3	Unlikely
W28	Glen Oak Road Sidewalk Infill	OR 213 to High School Avenue	Complete sidewalk gaps on both sides of the street	Long-term Phase 2	Unlikely
W29		Coquille Drive to Augusta Drive	Complete sidewalk gaps on both sides of the street	Long-term Phase 3	Unlikely
W31	OR 213 Sidewalk Infill	Molalla Avenue to Conway Drive	Complete sidewalk gaps on both sides of the street	Included with project D77	Unlikely



Conceptual Planned Area Connectivity Improvements Oregon City

Figure 1

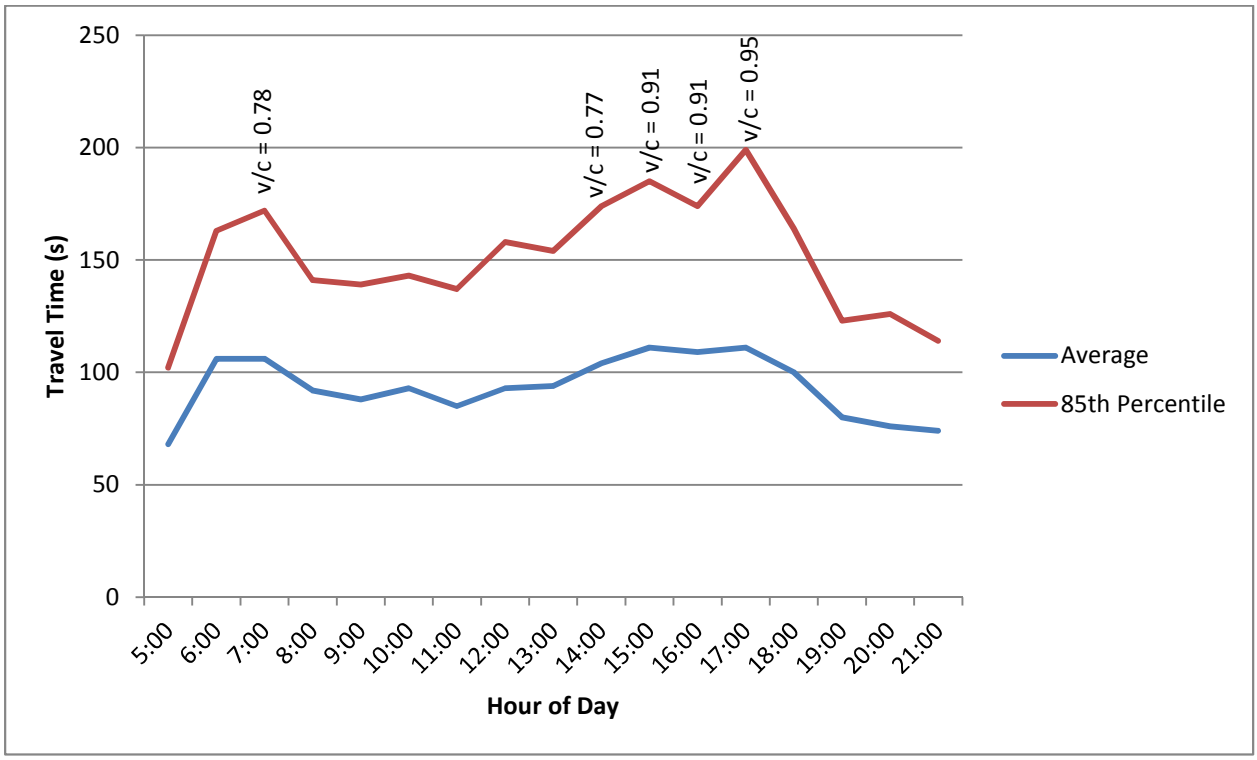
KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

\\kittelson.com\fs\H_Projects\20\20651 - Hwy 213 and Beavercreek Rd\dwgs\Figs\Beaver_Creek_Plans_(expanded).dwg Nov 27, 2017 - 9:28am - bcullimore Layout Tab: Layout1

OPERATIONS

A travel time study was conducted at the OR213/Beavercreek Road intersection in January 2017 to evaluate the variability of traffic conditions throughout the day. This study utilized Bluetooth data collection units (BlueMAC) at each leg of the intersection to identify the travel speed and travel time for each movement (northbound left, northbound through, northbound right, etc.) separately[1]. The data was collected 24-hours per day for 7 days, allowing comparison of results by time of day and day of week. Appendix "C" provides the differences in travel time by time of day for each movement at the intersection. The data in Appendix "C" reflects typical weekday conditions (Tuesday, Wednesday, and Thursday). **Exhibit 3** shows the travel time through the intersection averaged for all movements. Note that the graph provides the average travel time to traverse the intersection; some movements may experience higher travel times. The weekday PM peak hour represents the highest travel times of the day, with higher than average travel times extending from 3:00 to 6:00 PM. Above average travel times also occur during weekday midday and AM peak hours. There are approximately 5 hours per day currently experiencing high travel times compared to the rest of the day which could indicate congestion and possible cycle failure for some movements. This can be considered in evaluating the potential performances measures in the following section.

Exhibit 3 – Travel Time through OR213/Beavercreek Road Intersection



[1] Data was collected at a distance of approximately 1000' from the intersection on each leg, with the exception of the north leg, where data was collected approximately 2000' from the intersection.

The cycle length of the traffic signal at the OR213/Beavercreek intersection is approximately 120 seconds. **Exhibit 3** shows that during the a.m. and p.m. peak hour periods, the average time it takes to traverse the intersection is 110 seconds. Average travel time and v/c ratio are not directly linked; however, the average travel times increase and decrease with v/c ratio. **Table 3** provides volume-to-capacity ratios for the five highest volume hours of the day[2]. These v/c ratios are noted on **Exhibit 3** during their corresponding hour.

Table 3 – 2017 Existing Intersection Operations for the Five Highest Volume Hours (OR213/Beavercreek Road)

Highest Hour	Time of Day	Total Entering Volume	V/C
1st	4-5 PM	6052	0.91
2nd	5-6 PM	5983	0.95
3rd	3-4 PM	5808	0.91
4th	2-3 PM	4948	0.77
5th	7-8 AM	4626	1.07[3]

[2] 2017 30th highest hour volumes were estimated by adjusting May 2017 count data by a seasonal factor of 7% to summer peak volumes.

[3] The v/c ratio for the AM peak hour is 1.07 due the high volume of westbound right-turns. If the westbound right-turns are excluded the intersection v/c is 0.78.

Section 5
Alternatives Analysis

ALTERNATIVES ANALYSIS

ALTERNATIVES DEVELOPMENT – OR213 AND BEAVERCREEK ROAD

Alternatives to modify the existing intersection configuration and traffic control, which would bring the intersection into compliance with the current mobility standards in the year 2035, were identified and include:

- Addition of lanes to current configuration,
- Quadrant road in the southwest quadrant of the intersection,
- Variations of displaced left-turns (also referred to as continuous flow intersection), and
- Grade-separated interchange forms.

The potential operational impacts of each alternative are shown in **Table 4** and evaluated for a variety of additional considerations in **Table 5**.

Alternative 1: Triple Left-Turns

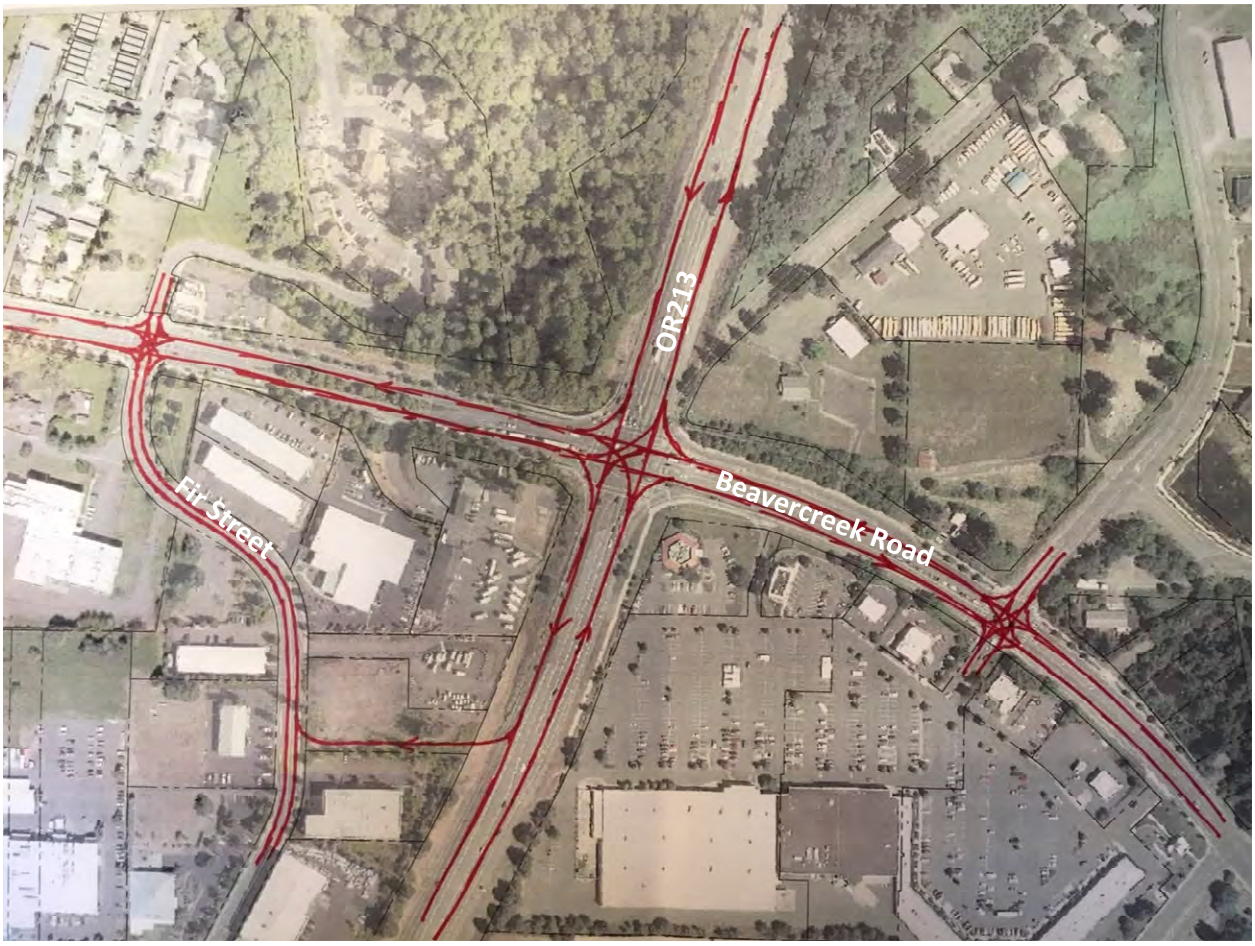
To maintain the current mobility standard with the existing intersection control, a third southbound left-turn lane and a third northbound through lane through the intersection would be required to bring the intersection back to a v/c ratio of 0.90. A conceptual sketch of Alternative 1 can be seen in **Exhibit 4**. The existing separate northbound right-turn lane (not reflected in **Exhibit 4**) would be maintained. The effectiveness of the additional northbound through lane is dependent on the planned extension of Meyers Road from Beavercreek Road to OR213 which would allow some eastbound right-turns at the intersection to be converted to northbound through movements based on the new network connectivity.

Exhibit 4 – Alternative 1: Triple Left-Turns

Alternative 2: Quadrant Road

A quadrant road, or indirect left, in the southwest corner of the intersection would allow southbound left-turns to be prohibited at the OR213/Beavercreek Road intersection. These vehicles would instead travel southbound through the intersection, turn right onto a new street to the south that would connect to Fir Street, and make a right-turn onto Beavercreek Road to continue east on their desired route. A third southbound through lane and third eastbound through lane would be necessary to accommodate the large volumes traveling through the intersection twice instead of once. This would reduce overall intersection delay but increase travel time for the southbound left-turn movement. The widening is likely to impact the culvert and retaining walls on the northwest and northeast corners of the intersection. The parcel where the connection to Fir Street shown in **Exhibit 5** is currently under development, making this connection infeasible. A quadrant road on the southeast corner was also considered, but the additional travel time incurred by circling the shopping center, or the impacts of cutting through the shopping center, made this alternative infeasible.

Exhibit 5 – Alternative 2: Quadrant Road Alternative



Alternatives 3 & 4: Displaced Left-Turns

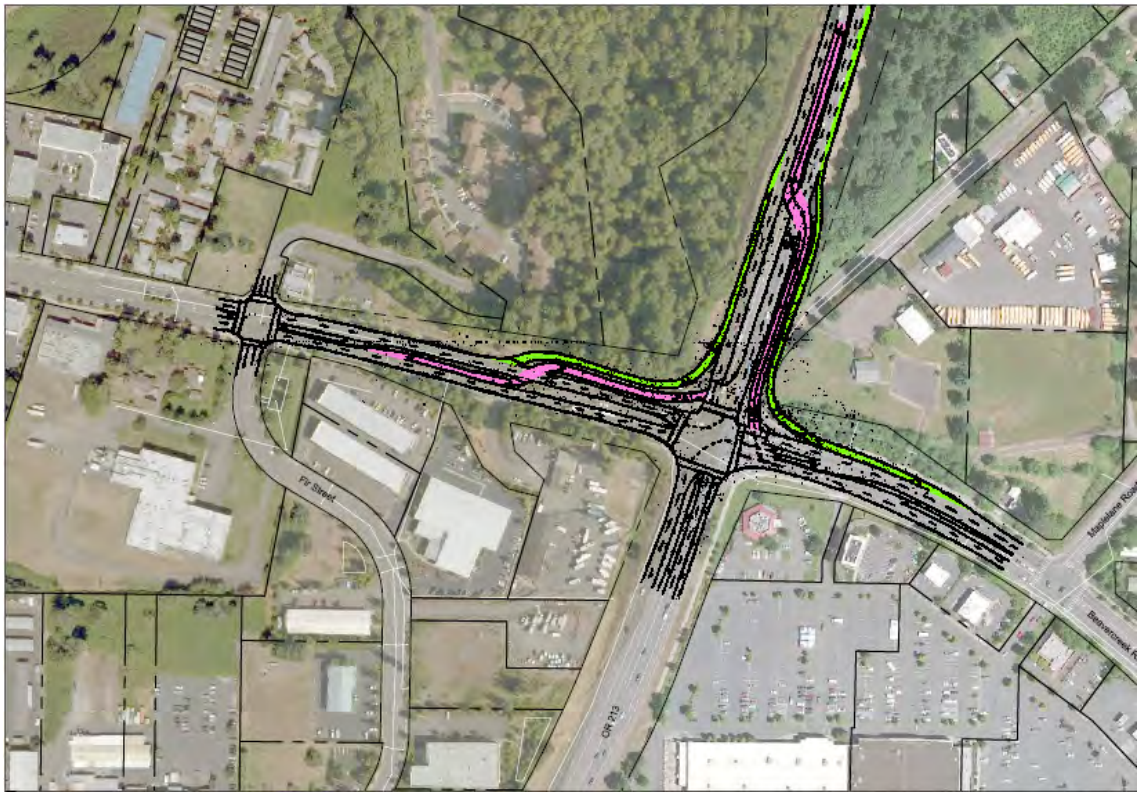
In a displaced left-turn[4], or continuous flow, intersection, left-turns are removed from the main intersection and relocated to a new upstream signal. With proper coordination, vehicles are able to make a left-turn simultaneously with opposing through traffic. Displaced left-turn intersection alternatives would reduce the number of signal phases and conflict points in the OR213/Beavercreek Road intersection, thereby improving capacity and safety, but would require coordinated partial signals on the approaches with displaced left-turns. The heaviest left-turn movements at the OR213/Beavercreek Road intersection are on the southbound and eastbound approaches. **Exhibit 6** shows a sketch of a displaced left-turn for the southbound approach only. **Exhibit 7** shows a sketch of displaced left-turns for both the southbound and eastbound approaches. In either case, the southbound approach requires dual left-turn lanes. Consideration could be given to prohibiting the northbound and westbound left-turn movements as these movements have minimal traffic volumes and have alternate routes; however, these restrictions are not mandatory. Additional analysis (microsimulation) is necessary to fully understand the benefits of these potential restrictions.

Alternative 3 includes impacts to the culvert and retaining walls in the northeast corner of the intersection. Alternative 4 includes culvert and retaining wall impacts to both the northwest and northeast corners of the intersection.

Exhibit 6 – Alternative 3: Displaced Southbound Left-Turns

[4] Steyn, H., Z. Bugg, B. Ray, and A. Daleiden. *Displaced Left-Turn Informational Guide.* FHWA, Washington, D.C., 2014. http://safety.fhwa.dot.gov/intersection/alter_design/pdf/fhwasa14068_dlt_infoguide.pdf

Exhibit 7 – Alternative 4: Displaced Southbound and Eastbound Left-Turns



Alternatives 5 – 7: Grade-Separated Interchange Alternatives

Several grade-separated interchange configurations were considered including full diamond, half diamond (i.e., southbound off-ramp and northbound on-ramp only) and single-point interchanges. A project to construct an interchange at this location was removed from the 2013 TSP Update. The interchange was eliminated due to livability, multi-modal access and funding constraints within the 2035 planning horizon. Additionally, at the request of ODOT as it was determined to be financially infeasible given other regional priorities. The construction of an interchange at the OR213/Beavercreek Road intersection would have many challenges and impacts on surrounding land uses as shown in **Exhibit 8** through **Exhibit 10**.

Exhibit 8 – Alternative 5: Half Diamond Interchange Alternative

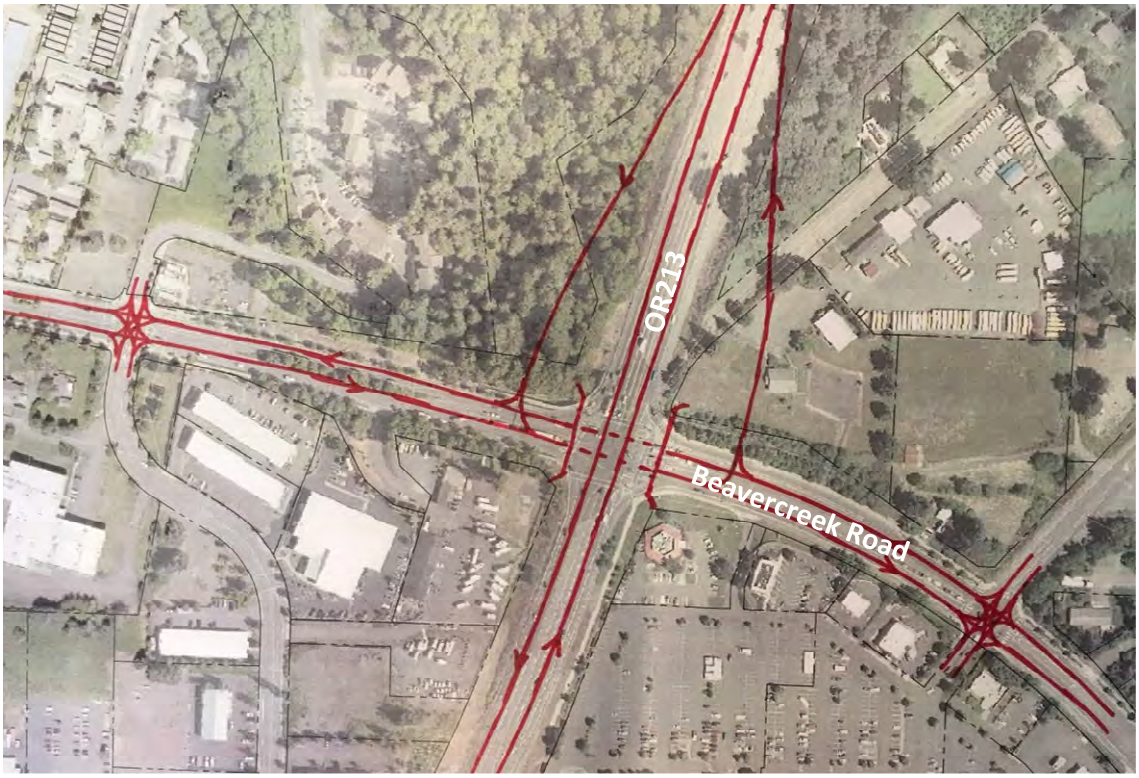


Exhibit 9 – Alternative 6: Full Diamond Interchange Alternative

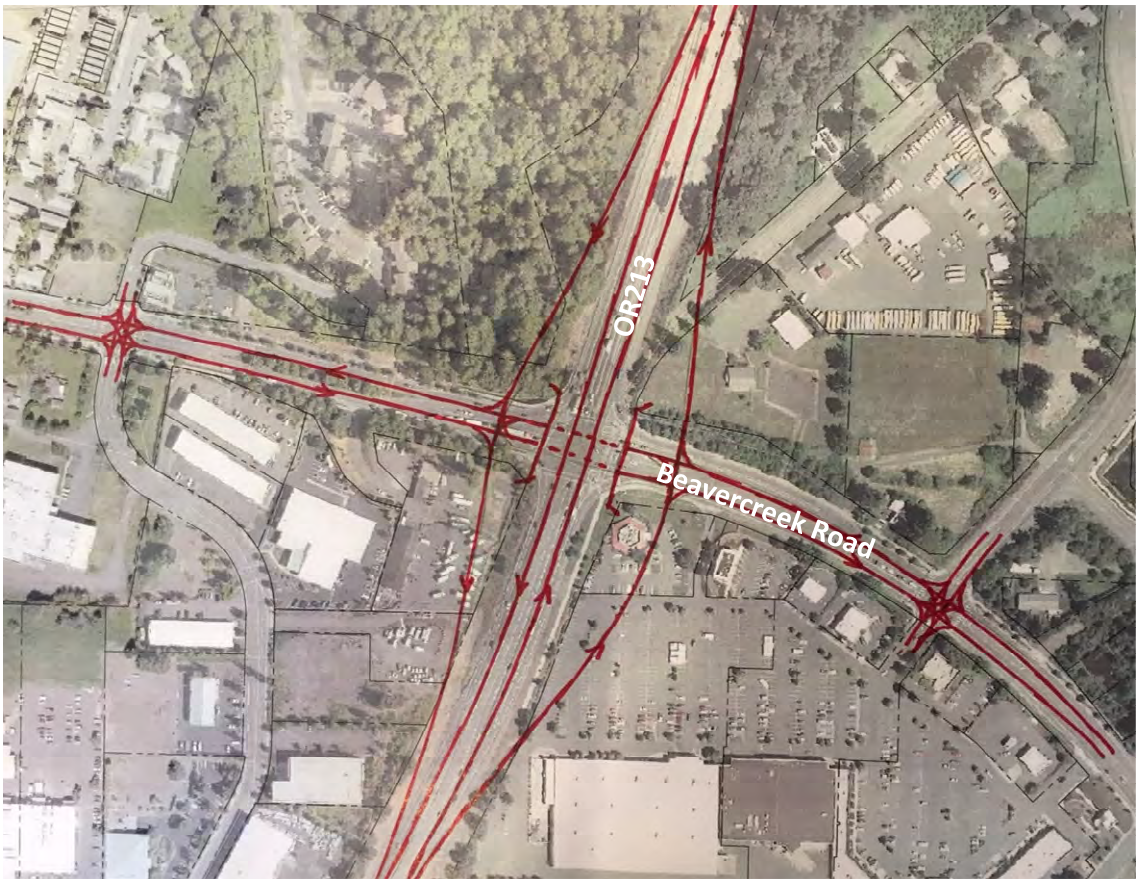
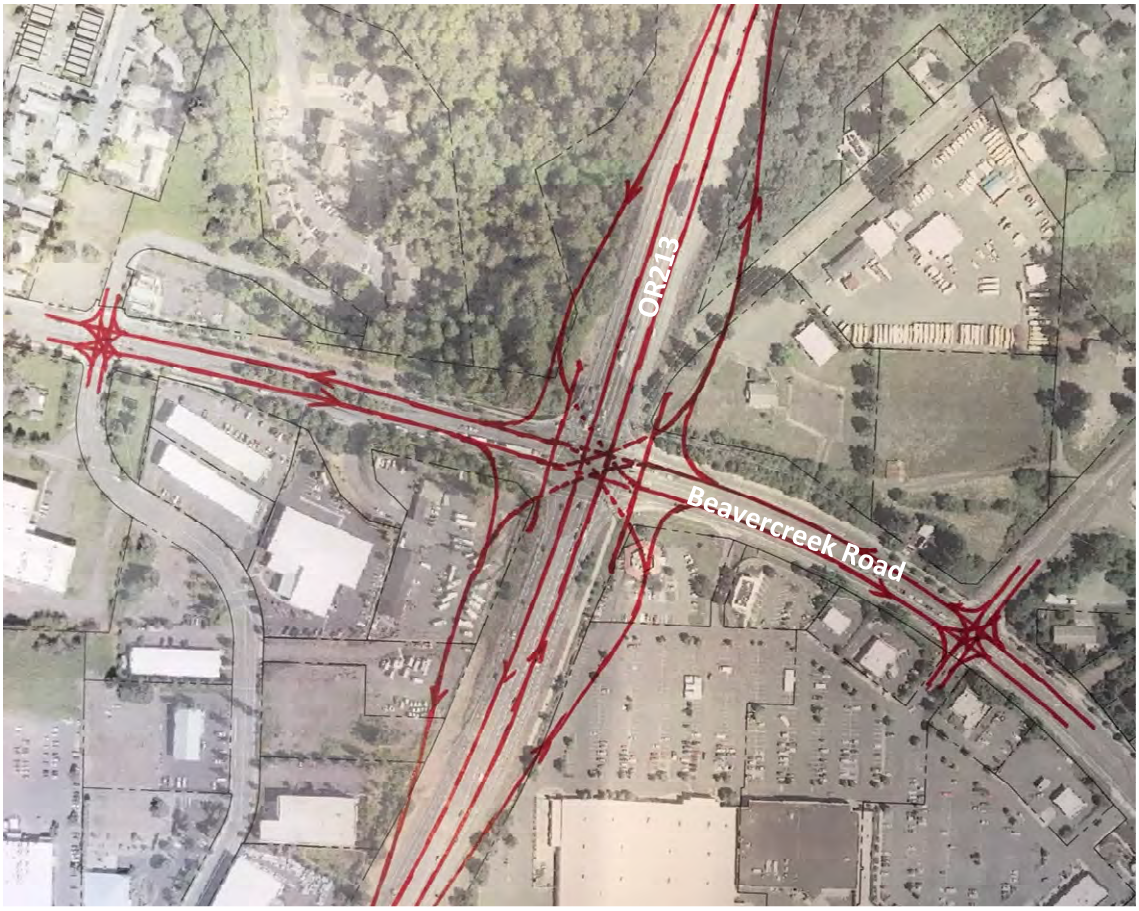


Exhibit 10 – Alternative 7: Single Point Interchange Alternative



ALTERNATIVES EVALUATION – OR213 AND BEAVERCREEK ROAD

The following provides an overview of operational analysis conducted on each alternative and summarizes the qualitative assessment for each alternative.

Operations Analysis

Planning level operational analysis was conducted using the CAP-X tool developed by FHWA[5], which can be used to evaluate alternative intersection forms and interchanges. The tool provides a total intersection (v/c) ratio. It was used for all alternatives to provide a consistent comparison of alternatives, but was found to be less conservative than Synchro in the base condition. **Table 4** summarizes the v/c ratios provided by CAP-X for each alternative. If one of these alternatives is identified as potential viable solution, it should be modeled in VISSIM to refine the forecast v/c ratio.

[5] Transportation Systems Institute (TSI). *Capacity Analysis for Planning of Junctions*. Version 1.2. 2011. http://tsi.cecs.ucf.edu/index.php/cap-x

Table 4 – CAP-X Alternatives Operations Analysis Summary (Year 2035[6])

Alternative		v/c	Exhibit
1	Lane Additions: Triple Southbound Left-Turn Lanes and Three Northbound Thru Lanes	0.90	Exhibit 4
2	Indirect Left (S/W Quadrant Road) with Three Southbound and Eastbound Thru Lanes	0.94	Exhibit 5
3	Southbound Displaced Left-Turn	0.86	Exhibit 6
4	Southbound and Eastbound Displaced Left-Turns	0.81	Exhibit 7
5	Full Diamond Interchange with Dual Eastbound and Westbound Left-Turn Lanes	0.82	Exhibit 8
6	Half Diamond Interchange with Dual Eastbound Left-Turn Lanes	0.79	Exhibit 9
7	Single Point Interchange with Dual Eastbound and Westbound Left-Turn Lanes	0.80	Exhibit 10

As shown, all alternatives meet the mobility target. Differences on their costs and impacts are provided in the following section.

Alternatives Assessment

Each of the alternatives was qualitatively evaluated for its impact to the intersection capacity, right-of-way impacts, environmental impact, bicycle and pedestrian impacts, cost, connectivity, and dependence on other projects. These factors are discussed below and summarized in **Table 5**.

Capacity

Each of the alternatives provides sufficient capacity to meet the current mobility standard in 2035. However, the triple left-turns and indirect left alternatives (Alternatives 1 and 2) still have an overall v/c ratio equal or greater than 0.90 and may represent a short-term fix rather than a long-term solution or may not provide benefit commensurate with the costs. The displaced left-turn alternatives (Alternatives 3 and 4) provide additional capacity nearly equal to the grade-separated interchange alternatives (Alternatives 5, 6 and 7) at a significantly lower cost.

Right-of-Way Impacts

Alternatives 1, 3, and 4 may be feasible within the existing right-of-way. Alternative 2 would require right-of-way through a vacant but developing parcel to connect OR213 to Fir Street. All of the grade separated interchange alternatives include large impacts to the right-of-way. The half diamond interchange reduces right-of-way takes as compared to the full diamond interchange without eliminating necessary movements through the intersection.

[6] 2035 30th highest hour volumes were estimated by adjusting winter count data by a seasonal factor of 8.5% to summer peak volumes. The count data, 2015 Base Year and 2040 Future Year volumes were post-processed using the NCHRP 255 methodology to produce 2035 turning movement volumes at each intersection.

Environmental Impacts

For all alternatives, any widening on the north side of Beavercreek Road, east or west of OR213 would impact the stream and wetlands and require mitigation. They would also require extending the existing culvert crossing under OR213 on the north side of Beavercreek Road and reconstruction of the retaining walls in the northwest and northeast corners of the intersection. Additional investigation is necessary to fully understand the costs of these potential impacts and to determine if the culvert can be extended or has to be upgraded or if the widening could be accommodated utilizing existing right-of-way on the south side of Beavercreek Road.

Alternative 1 is the only alternative with the potential to not impact the northwest and northeast corners. Alternative 3 may impact the northeast corner only. Alternatives 2 and 4 would impact the northwest and northeast corners and Alternatives 5, 6, and 7 would have significant impacts in the northwest and northeast quadrants.

Bicycle and Pedestrian Impacts

All alternatives can accommodate bicycles and pedestrians; however, Alternatives 1 and 2 include additional through lanes and would increase the intersection crossing distances which is an undesirable impact. Alternatives 3 and 4 reduce the crossing distances but result in two-stage crossing of some legs of the intersection. Alternatives 5, 6, and 7 increase and decrease crossing distances depending on the leg of the intersection and result in cyclists and pedestrians navigating two major intersections instead of one.

Cost

The costs of adding additional lanes, indirect lefts, or displaced left-turns are all of similar magnitude and may require extending or reconstructing the culvert and reconstructing retaining walls. Alternatives 3 and 4 also require the addition of partial signals on one or both of the southbound and eastbound legs of the intersection, respectively. Each of the interchange alternatives (Alternatives 5, 6 and 7) are assumed to be cost-prohibitive at a minimum cost of $25,000,000.

Connectivity

Turning movements to and from the south leg of OR213 are minimal due to the presence of parallel routes and/or other road network connections. The half diamond interchange alternative (Alternative 6) eliminates these movements, thereby improving capacity at the intersection. There is the potential to further improve the capacity of the displaced left-turn alternatives (Alternatives 3 and 4) by prohibiting the northbound and westbound left-turn movements as these movements have minimal traffic volumes; however, this is not a requirement of the alternatives. The connectivity improvements in the TSP are important to the flexibility and viability of these alternatives.

Dependence on Other Projects

As noted in the discussion of connectivity above, the half diamond interchange alternative (Alternative 6) is dependent on other projects in the area to provide the parallel routes necessary to accommodate the movements eliminated from the OR213/Beavercreek Road intersection. The practicality of the additional northbound through lane in the triple left-turns alternative (Alternative 1) is also dependent on the provision of road extensions, particularly the planned Meyers Road extension to OR213.

Table 5 – Alternatives Evaluation

Alternative		Additional Capacity	Right-of-Way Impacts	Environmental Impact	Bike/Ped Impacts	Cost	Eliminates Movements?
	Existing	None	None	None	No Improvement	NA	No
1	Triple Southbound Left / Three Northbound Thru	Some	None to Minimal	None to Minimal	Increased Crossing Distances	Medium ($5-$10M)	No
2A	Indirect Left (S/W Quadrant Road)	Some v/c=0.90	New Connection on Industrial Land	NW and NE Corners	Increased Crossing Distances	Medium ($5-$8M)	No
2B	Indirect Left (S/W and S/E Quadrant Roads)	Unknown	New Connection on Industrial Land and Shopping Center Impacts	NW and NE Corners	Increased Crossing Distances	Medium ($10-$15M)	No
3	Southbound Displaced Left-Turn	Significant v/c=0.86	None to Minimal	NE Corner	Reduced Crossing Distances	Medium ($5-$10M)	Would provide additional benefit
4	Southbound and Eastbound Displaced Left-Turns	Significant v/c=0.81	None to Minimal	NW and NE Corners	Reduced Crossing Distances	Medium ($8-$12M)	Would provide additional benefit
5	Full Diamond Interchange	Significant v/c=0.82	High	NW and NE Quadrants	Two intersections	High (>$25M)	Yes
6	Half Diamond Interchange	Significant v/c=0.79	High	NW and NE Quadrants	Two intersections	High (>$25M)	No
7	Single Point Interchange	Significant v/c=0.80	High	NW and NE Quadrants	Increased Crossing Distances	High (>$25M)	No

The following alternatives were identified for further review to determine physical and financial feasibility:

- Alternative 1: Triple Left-Turns
- Alternative 3: Displaced Southbound Left-Turns
- Alternatives 5 & 7: Full Diamond Interchange and Single Point Interchange

Table 6 lists these alternatives, as well as their relative benefits, constraints, opportunities, and risks.

Table 6 – Intersection Alternatives Considered

Alternative	Benefits	Opportunities	Constraints	Risks
Alternative 1: Triple Left-Turns	Meets current mobility target in 2035	North and east legs of intersection	Cost; vehicle navigation of three left-turn lanes	Increase sideswipe crashes through turn and downstream weave
Alternative 3: Displaced Southbound Left Turns	Meets current mobility target in 2035	North leg of intersection	Cost; impact to existing culvert and retaining walls	Driver confusion with new intersection type for Oregon
Alternative 5: Full Diamond Interchange	Meets current mobility target in 2035; greatly increases capacity for through traffic on OR213	All approaches of the intersection	Cost; right-of-way	Increased intersection exposure (i.e., two large ramp terminals) for pedestrians and bicyclists
Alternative 7: Single-Point Interchange	Meets current mobility target in 2035; greatly increases capacity for through traffic on OR213	All approaches of the intersection	Cost; right-of-way	

Potential improvements for the intersection of Beavercreek Road and OR213 that focused on significantly increasing the intersection capacity to meet the current mobility target were presented to the TAG and CAG in December 2016 and January 2017. None of the alternatives were determined to be financially feasible, even by the 2035 horizon year of the TSP given the financial constraints of the city and other agency partners. In addition, some of the potential alternatives could have additional consequences including right-of-way impacts, environmental impacts, and could potentially complicate the provision of services for bicyclists, pedestrians, and transit users. These alternatives can be further considered in the future if additional funding becomes available.

ALTERNATIVES – OR213 AND REDLAND ROAD

As Phase 2 of the "Jughandle" Project (D79 in the TSP) has already been identified to resolve capacity deficiencies at OR213/Redland Road, no additional alternatives were developed for the intersection.

Section 6
Alternative Mobility Target and Financially Feasible Improvements Assessment

ALTERNATIVE MOBILITY TARGET AND FINANCIALLY FEASIBLE IMPROVEMENTS ASSESSMENT

ALTERNATIVE MOBILITY TARGET

The OR213/Beavercreek Road and OR213/Redland Road intersections are currently experiencing deficiencies in capacity and safety for vehicular modes of travel. Mobility is currently measured by using v/c to measure the average level of congestion for motorists entering all legs of an intersection. Technical Memo #2 in Appendix "A" documents the menu of performance measure options that were discussed with the TAG and CAG to measure congestion both at an intersection and along the Highway 213 corridor, from Redland Road to Molalla Avenue.

The majority of TAG and CAG members agreed that an alternative mobility target allowing intersection volume-to-capacity ratios to exceed the existing targets for no more than a specified number of hours per day would be appropriate for the corridor based on a range of considerations including ease of application and applicability to development review. The following sections describe the safety and operational analysis that was used to recommend cost-feasible improvements and corresponding alternative mobility targets.

SAFETY AND CAPACITY ANALYSIS

The TSP does not identify a large capacity project at the intersection of OR213 and Beavercreek Road, but several smaller feasible projects are identified. The TSP identifies a large capacity project at the intersection of OR213 and Redland Road, but it is not likely to be funded. Because achieving the mobility standard through a major capacity-expanding project at these intersections has been determined to be beyond the financial capabilities of the city and its partner agencies, an alternative mobility target will be necessary. As a result of this study, some improvements were identified that, while not allowing the mobility standard to be fully met, would increase the intersection capacity, improve safety, and are within the financial capabilities of the city and its partner agencies. Safety and operational improvements are identified below that minimize future congestion and can be included in the cost-constrained TSP.

SAFETY AND CAPACITY IMPROVEMENTS

Safety and capacity improvements to OR213 from Redland Road to Molalla Avenue (including the Beavercreek Road intersection) could be implemented in tandem with the proposed alternative mobility targets. These approaches, while not providing adequate capacity to meet the current mobility target, would increase capacity and/or safety at the intersection, providing an overall improvement. **Table 7** lists these improvements, as well as their relative benefits, constraints, opportunities, and risks.

Table 7 – Intersection Improvement Approaches Considered

Improvement	Benefits	Opportunities	Constraints	Risks
Increase all-red time	Reduces red-light running crashes, particularly turning and angle crashes	All approaches of the intersection	Reduces intersection capacity and increases queueing. Helps reduce turning and angle crashes, which are not prevalent at this intersection.	Increase rear-end crashes, the most common type at signalized intersection
Install red-light cameras	Reduces red-light running crashes, particularly turning and angle crashes	All approaches of the intersection	Community Opposition. Helps reduce turning and angle crashes, which are not prevalent at this intersection.	Increase rear-end crashes, the most common type at signalized intersection
Increase shoulder width	Safer bicycle travel	North leg of intersection	Costs/Impacts to retaining wall	N/A
Improve lighting	Increase safety for all modes	North and south legs of intersection	N/A	N/A
Provide merge lane for WB to NB right turning vehicles	Reduce queuing between OR213 and Maple Lane, and increase capacity of westbound approach	North leg of intersection	Retaining wall in northeast corner of the intersection	Increase sideswipe crashes
Eliminate westbound left-turn lane and extend eastbound left turn storage onto Maple Lane	Reduce queuing and crashes related to queues on Beavercreek Road at Maple Lane	East leg of intersection	Rerouting of westbound lefts to Meyers Road and potential increased travel time	Confusion by drivers resulting in illegal maneuvers

The TAG and CAG were in favor of further investigation of potential improvements to increase safety and capacity at the Beavercreek Road and OR213 intersection. The specific projects identified by the TAG and CAG for additional analysis included: 1) the provision of a merge lane for westbound right-turning vehicles and 2) elimination of the second westbound left-turn lane to increase left-turn storage on eastbound Beavercreek Road at Maple Lane Road. The provision of a westbound right-turn merge lane is described in the following sections and shown in **Figure 2**. The elimination of the second westbound left-turn lane to increase left-turn storage on eastbound Beavercreek Road at Maple Lane Road was highly supported by the CAG and was found to be viable and not impact the intersection v/c ratio; however it is recommended that this be considered at a later date in combination with potential improvements at the Beavercreek Road/Maple Lane intersection.

Beavercreek Road - Right Turn Reconfiguration

Conceptual Design Subject to Change
Date: March 30, 2017

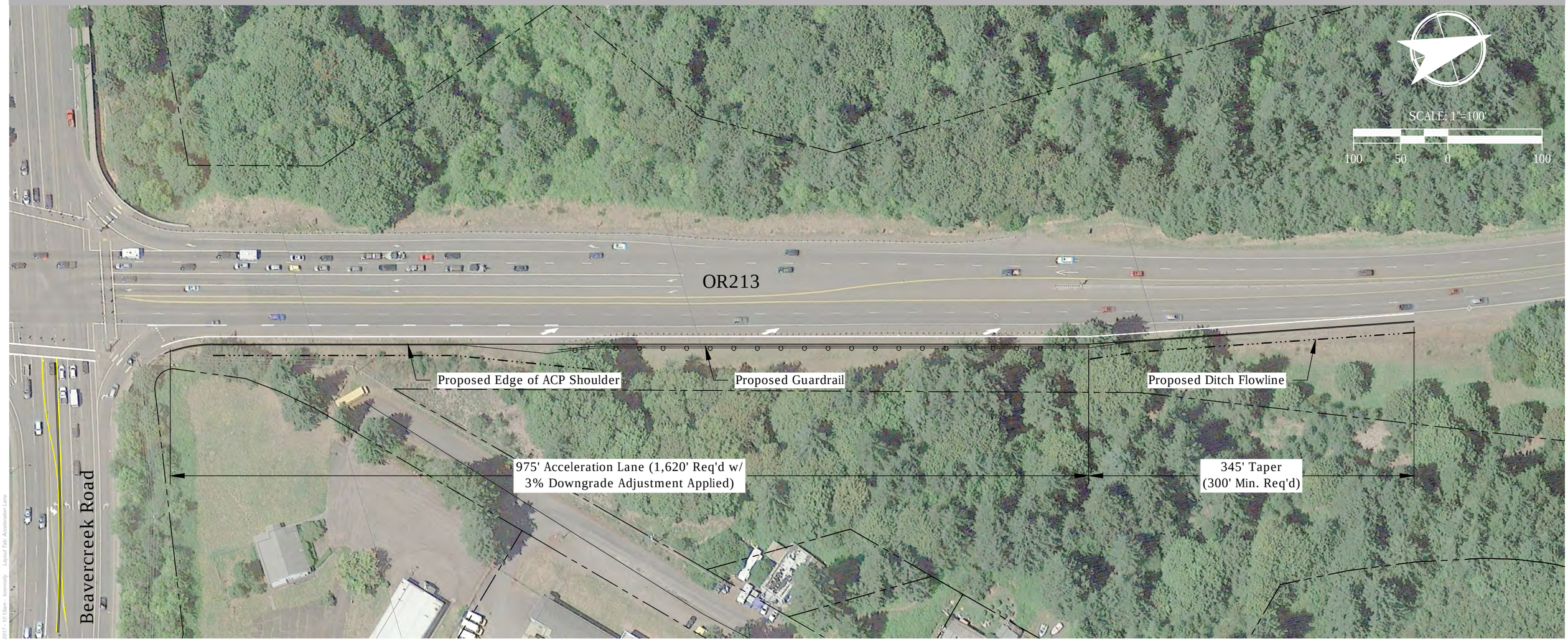


Figure 2

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Susan Wright or Hermanus Steyn

OR213 & Beavercreek Road
City of Oregon City

H:\20\20051 - Hwy 213 and Beavercreek Rd\dwg\design\RT Turn Lane Add\20051-ExhibRT Lane Add-2017-03-30.dwg Dec 05, 2017 - 12:13pm - kconnolly Layout Tab: Acceleration Lane

Additional safety improvements identified by the City for further investigation, or to be included as part of future projects in the area include:

- Install intersection enhancements including potential raised crosswalks, bike lane striping continuation, ladder-style crosswalks, and lane narrowing.
- Add wayfinding signage for people walking and biking.
- Enhance bike lanes on Beavercreek Road with additional markings and green striping in transition areas.
- Add buffers to bike lanes on Beavercreek Road where feasible.
- Add ADA curb ramps in the OR213/Beavercreek Road area where missing.
- Add pedestrian facilities to Maple Lane Road between Beavercreek Road and Thayer Road.
- Add transit stop amenities to existing stops in the area.

The following provides an overview of safety and operations at OR213/Beavercreek Road and OR213/Redland Road, and cost estimates of potential cost-feasible safety and operational improvements that could be implemented at the OR213/Beavercreek Road intersection in conjunction with alternative mobility targets.

Safety Analysis

The OR213/Beavercreek Road intersection was identified in the 2013 TSP as a high collision intersection. The Oregon Department of Transportation (ODOT) Crash Analysis and Reporting Unit provided crash records at the intersection for the 5-year period from January 2010 through December 2014. **Table 8** summarizes the reported crash data. The crash data is included in Appendix "D".

Table 8 - OR213/Beavercreek Road Intersection Crash Summary and Crash Rate Assessment (2010-2014)

Crash Type				Severity			Total	Critical Crash Rate by Intersection Type	Critical Crash Rate by Volume	Observed Crash Rate at Intersection	Observed Crash Rate>Critical Crash Rate?
Rear-End	Turning	Angle	Other	PDO	Injury	Fatal					
116	7	5	5	58	74	1	133	0.59	0.50	1.20	Yes

PDO = Property Damage Only
Crash Rate = crashes per million entering vehicles

The intersection was in the top 5% of the ODOT Safety Priority Index System (SPIS) List for the years 2012-2014. The SPIS List is maintained by ODOT and updated each year with the latest available year of crash records and traffic volumes. 2012-2014 is the most current SPIS list. The intersection also has a crash rate that exceeds the Critical Crash Rate meaning that it exceeds the crash rate of other comparable intersections.

As shown in **Table 8**, the most predominant crash type at the OR213/Beavercreek Road intersection is rear-end crashes. Beavercreek Road is the first at-grade intersection on OR213 for over two miles south of Redland Road, in a corridor that generally feels rural. A lack of driver expectation of southbound queues from the signal may contribute to the high number of reported rear-end crashes at the

intersection. The reported fatality occurred in 2011, and was an angle crash in which the driver ran a red light under dark and rainy conditions. The 2010-2014 crash rate of 1.20 is already lower than the crash rate of 2.05 identified in the 2013 TSP, indicating that safety and/or driver attentiveness have improved in recent years. Lengthening the dual eastbound left-turn lanes to provide additional storage (Project D27; funded) and an advanced queue warning system on southbound 213 will further improve safety at the intersection.

Crash data for the OR213/Redland Road intersection was obtained from the February 2017 Serres Farm Annexation Traffic Impact Study for the 3-year period from January 2013 through December 2015. **Table 9** summarizes the reported crash data. The crash data is included in Appendix "D".

Table 9 - OR213/Redland Road Intersection Crash Summary and Crash Rate Assessment (2013-2015)

Crash Type				Severity							
Rear-End	Turning	Angle	Other	PDO	Injury	Fatal	Total	Critical Crash Rate by Intersection Type	Critical Crash Rate by Volume	Observed Crash Rate at Intersection	Observed Crash Rate>Critical Crash Rate?
22	4	0	1	8	19	0	27	0.39	0.54	0.44	Yes

PDO = Property Damage Only
Crash Rate = crashes per million entering vehicles

Both the OR213/Beavercreek Road and OR213/Redland Road intersections have observed crash rates which exceed the Critical Crash Rate, meaning that they exceed the crash rate of other comparable intersections. For this reason, applicable TSP planned improvements and other potential improvements were analyzed at each intersection to determine their impact on the expected crash frequency at each intersection. **Table 10** summarizes the improvements in the TSP.

Table 10 – 2013 Oregon City Transportation System Plan Projects located in the southeast part of the City

Project #	Project Description	Project Extent	Project Elements	Priority	Funded?
D14	Southbound OR 213 Advanced Warning System	Southbound OR 213, north of the Beavercreek Road intersection	Install a queue warning system for southbound drivers on OR 213 to automatically detect queues and warn motorists in advance via a Variable Message Sign	Short-term	Likely
D79	OR 213/Redland Road Capacity Improvements	Redland Road to Redland Road Undercrossing	Add a third northbound travel lane on OR 213 north of the Redland Road undercrossing. Extend the third southbound travel on OR 213 south of the Redland Road intersection and merge the third lane before the Redland Road undercrossing. Add a right-turn lane (southbound OR 213 to westbound Redland). Convert the Redland Road approach to OR 213 to 1 receiving lane, 2 left-turn approach lanes, and 1 right-turn lane.	Long-term	Not Likely

In addition to these planned improvements, the impact of a westbound right-turn merge lane at OR213/Beavercreek Road and an additional southbound through lane (shared with the southbound right-turn lane) at OR213/Redland Road were analyzed. The intersections and improvements were

analyzed using HiSafe[7] software and crash modification factors (CMF) from the CMF Clearinghouse. **Tables 11 and 12** show the 2035 expected annual crashes with and without these improvements.

Table 11 – OR213/Beavercreek Road 2035 Expected Annual Crashes

Existing Configuration	With Westbound Right-Turn Merge Lane (CMF #295 applied to westbound rear-end crashes)	With Southbound Advanced Queue Warning System (CMF #76 applied to southbound rear-end injury crashes)	With Both Improvements
26.39	25.75	25.77	25.13
-	-2.4%	-2.3%	-4.8%

Table 12 – OR213/Redland Road 2035 Expected Annual Crashes

Existing Configuration	With 3rd Southbound Through/Right Lane (CMF #7924 applied to southbound crashes)	With 3 Northbound and 3 Southbound Through Lanes (CMF #7924 applied to northbound and southbound crashes)
8.82	8.24	7.92
-	-6.6%	-10.2%

As shown in **Tables 11 and 12**, the planned TSP and potential financially feasible improvements will reduce the number of expected annual crashes at the OR213/Beavercreek Road and OR213/Redland Road intersections. The potential financially feasible improvements at OR213/Beavercreek Road are predicted to reduce crashes at the intersection by almost 5%, and planned improvements at OR213/Redland Road are predicted to reduce crashes by more than 10%.

Operations Analysis

Count data for OR213 at Beavercreek Road and Redland Road was collected in May 2017. The five highest volume hours were collected for each intersection, based on historical count data at the OR213/Beavercreek Road intersection, under the assumption that they follow the same hourly volume profile. Due to the large amount of commuter traffic from outlying communities, a large portion of the traffic through each intersection is made up of the same vehicles a matter of seconds apart. The raw count data can be found in Appendix "E". The raw data represents annual average conditions and was adjusted to represent summer peak volumes[8]. The adjustment calculations can be found in Appendix "E".

[7] HiSafe companion software to the Highway Safety Manual (HSM) applies HSM Predicative Method for estimating the average number of expected annual crashes for quantitative assessment of safety performance.

[8] In order to calculate the 30th highest hour, the data was seasonally adjusted to summer peak volumes using the average of two representative Automatic Traffic Recorder (ATR) locations in Clackamas County (03-017 and 03-018). A factor of 7% was calculated using the procedures outlined in ODOT's Analysis Procedures Manual (APM) and applied to the May counts to adjust them to summer peak volumes.

Metro provided 2015 Base Year and 2040 Future Year hourly turn movement volumes for OR213/Beavercreek Road and OR213/Redland Road. These volumes reflect the most current land use assumptions and include full build-out of Oregon City's urban growth boundary areas in addition to growth in the rest of the region, including through traffic from outlying communities. These hourly plots can be found in Appendix "E". The count data, 2015 Base Year and 2040 Future Year volumes were post-processed using the NCHRP 255[9] methodology to produce 2040 turning movement volumes at each intersection under both the annual average and 30th highest hour conditions. The calculations for this process can be found in Appendix "E".

A Synchro (traffic model used to evaluate v/c ratios and other metrics) analysis was conducted for the five highest traffic volume hours at the OR213/Beavercreek Road and OR213/Redland Road intersections under both the annual average (typical May peak hours) and 30th highest hour (typical August peak hour) conditions. The results of this analysis are summarized in **Tables 13 and 14**. The full reports can be found in Appendix "F".

Table 13 – 2040 Synchro Volume-to-Capacity Analysis Summary: Annual Average Conditions

Scenario	Peak Hour 4:00 pm	2nd Highest Hour 5:00 pm	3rd Highest Hour 3:00 pm	4th Highest Hour 2:00 pm	5th Highest Hour 7:00 am
213/Beavercreek	1.11	1.11	1.10	0.96	1.34[1]
213/Beavercreek with Right-Turn Merge Lane	0.98	1.00	0.99	0.87	0.90
213/Redland	1.10	1.09	1.04	0.99	0.91

[1]The 5th highest overall volume hour at OR213/Beavercreek Road under the existing intersection configuration has a higher v/c because certain movements in this hour exhibit higher volumes than in the peak hour. For example, during the morning peak the westbound right-turn movement is significantly higher than during the afternoon peak, impacting v/c.

Table 14 – 2040 Synchro Volume-to-Capacity Analysis Summary: 30th Highest Hour Conditions

Scenario	Peak Hour 4:00 pm	2nd Highest Hour 5:00 pm	3rd Highest Hour 3:00 pm	4th Highest Hour 2:00 pm	5th Highest Hour 7:00 am
213/Beavercreek	1.15	1.15	1.14	1.00	1.39[1]
213/Beavercreek with Right-Turn Merge Lane	1.01	1.04	1.03	0.90	0.93
213/Redland	1.13	1.12	1.07	1.02	0.94

[1]The 5th highest overall volume hour at OR213/Beavercreek Road under the existing intersection configuration has a higher v/c because certain movements in this hour exhibit higher volumes than in the peak hour. For example, during the morning peak the westbound right-turn movement is significantly higher than during the afternoon peak, impacting v/c.

The analysis in **Tables 13 and 14** shows that, without improvements, the OR213/Beavercreek Road and OR213/Redland Road intersections will exceed current mobility targets in 2040 (shown in red). With potentially financially feasible improvements in place (i.e. a westbound right-turn merge lane at OR213/Beavercreek), the intersections will still exceed the existing mobility targets under 30th highest

[9] This document sets forth procedures to refine computerized traffic volume forecasts by comparing base year and future year volumes to count data.

hour traffic conditions. Therefore, it is recommended that alternative mobility targets be based on average annual conditions, allowing the v/c ratio to exceed 0.99 for one hour per day at the OR213/Beavercreek Road intersection (upper limit of 1.0) and three hours per day at the OR213/Redland Road intersection (upper limit of 1.1).

Merge Analysis

The intersection of OR213 and Beavercreek Road was evaluated to ensure that the segment north of Beavercreek Road on OR213 would provide acceptable traffic operations with the proposed merge lane. The evaluation was performed both for a merge length of 1,300' and 2,000'. A 1,300' merge meets ODOT standards based on a length reduction for grade. A 2,000' merge exceeds ODOT standards for the existing grade on OR213 and places the end of the merge within a horizontal curve. Additionally, the analysis below shows that the 2,000' merge has a negative impact on delay due to greater difficulty merging at higher speeds.

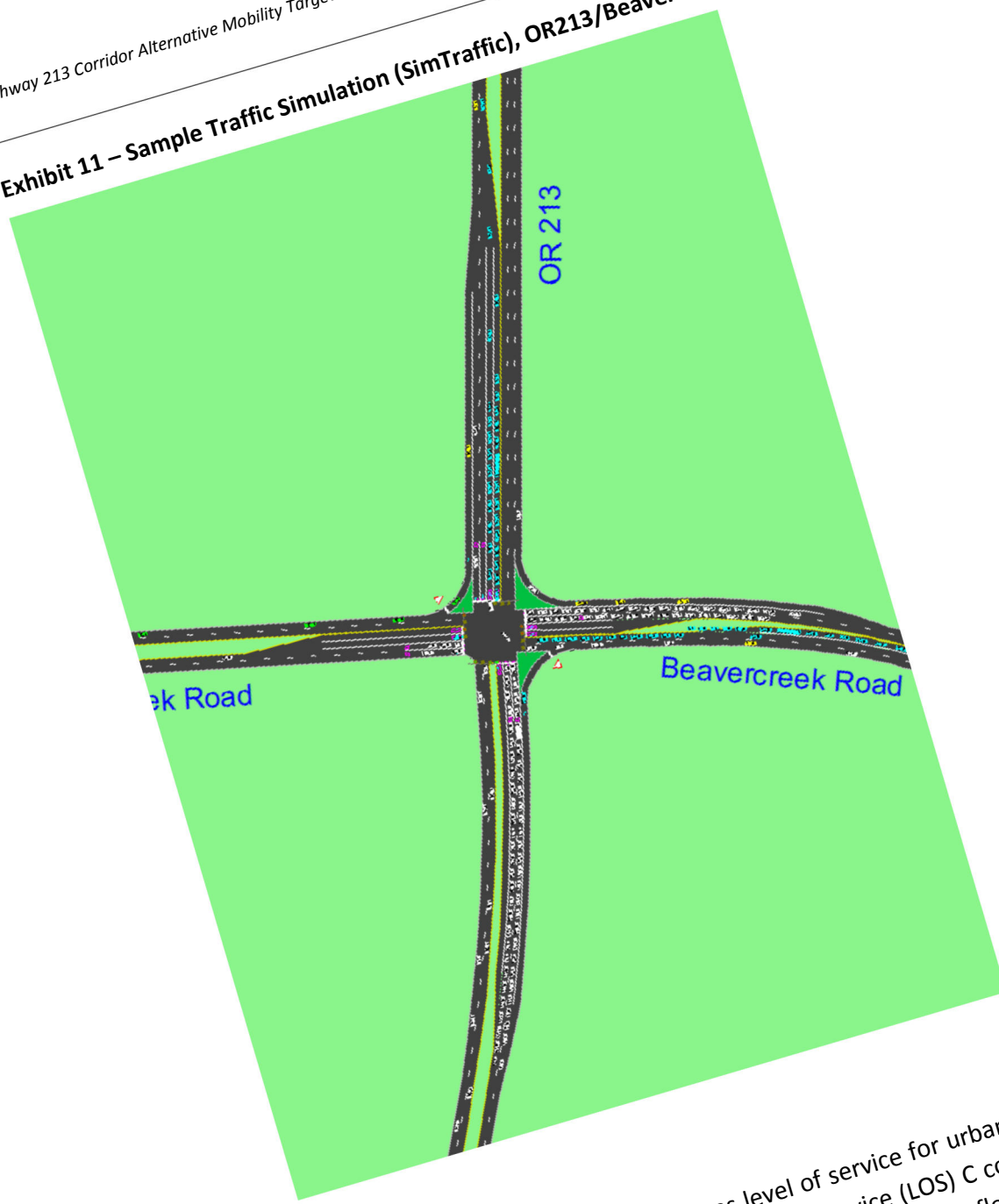
Segment Analysis Methodology

A traffic simulation analysis was conducted using the 2040 annual average traffic volumes and the proposed westbound right-turn merge lane. The simulation analysis used the SimTraffic software (sample graphic shown in **Exhibit 11**). The parameters were adjusted according to the ODOT Analysis and Procedures Manual (APM). The traffic simulation generates random patterns of vehicle movements consistent with the peak hour traffic volumes, so that no single simulation generates "the" answer. The AM and PM peak hour traffic volumes were each run through the SimTraffic simulation five times. The results of the five simulation runs were averaged to generate the final results. This is consistent with standard recommended methodologies for reporting results from traffic simulations. The outputs include:

- Average speeds and delays on the segment in the northbound direction.
- Average delays on the westbound right-turn movement.

The simulation is sensitive to delays caused by difficult merge or lane-change movements. If any of these movements are particularly difficult, the simulation would report slow speeds or queues on the affected segments.

Exhibit 11 – Sample Traffic Simulation (SimTraffic), OR213/Beavercreek Road Intersection



Segment Speeds

The Highway Capacity Manual defines level of service for urban street segments based on travel speed as a percentage of free-flow speed. Level of service (LOS) C corresponds to an average speed between 50 and 67 percent of free-flow speed. Assuming a free-flow speed of 55 mph on OR213 north of Beavercreek Road, LOS C operation would be an average speed between 27.5 and 36.9 mph.

The average speeds and delays for OR213 through the westbound to northbound merge from Beavercreek Road (north of the signal) based on the simulation analysis are reported in **Table** .

Table 15 – OR213 and Beavercreek Road Speeds and Delays, 2040 Annual Average Volumes

Scenario	Peak Hour	Average Speed (mph)	Average Delay per Vehicle (seconds)
1300' Merge	AM	34.0	9.8
	PM	36.0	8.1
2000' Merge	AM	39.0	10.1
	PM	41.0	8.3

Average speeds are within an acceptable (LOS C) range for the proposed 1,300' merge and even higher for the 2,000' merge. Keeping in mind that most vehicles are accelerating from a stop through the Beavercreek Road signal, and will not have to slow significantly during the merge, the difference in speeds is primarily attributed to the additional distance for vehicles already on OR213 to accelerate. Additionally, the average delay per vehicle is higher with the 2,000' merge, indicating that the merging maneuver actually creates more conflicts when there are higher speeds on OR213.

The segment merge analysis shows that acceptable levels of service can be maintained with a 1,300' merge lane for the westbound right-turn movement. A 2,000' merge would occur within a horizontal curve on OR213, increasing the risk of sideswipe and run-off-the-road crashes. Therefore, it is recommended that a 1,300' merge length be provided.

Westbound Right Turn Operations

The traffic simulation tested the operations of the proposed free-right turn lane from westbound Beavercreek Road to northbound OR213. The operational analysis considered the capacity of the right-turn lane as well as the capacity of the merge with northbound traffic on OR213, but does not reflect delay caused by pedestrian movements at the intersection.

Table 16 – OR213 and Beavercreek Road Westbound Right-Turn Delay, 2040 Annual Average Volumes

Scenario	Peak Hour	Average Delay per Vehicle (seconds)
1300' Merge	AM	13.6
	PM	16.6
2000' Merge	AM	13.9
	PM	16.5

The average delays on the right-turn movement are similar with either the 1300' or 2000' merge, as shown in **Table 16**. The longer merge does not significantly reduce delay, and in fact increases delay during the AM peak hour, which is the critical westbound right-turn movement volume.

Pedestrian Crossing

High visibility pavement markings and signage are recommended for pedestrians and bicycles to cross the channelized lane safely, and consideration should be given to installing enhanced pedestrian

improvements. This could include a rectangular rapid flash beacon (RRFB) for increased visibility. This type of treatment has been installed at similar locations in Boise, Idaho (see **Exhibit 12**).

Exhibit 12 – RRFB on the west leg of E Myrtle St and S Broadway Ave in Boise, Idaho

Queuing Analysis

The capacity improvements identified in Phase 2 of the "Jughandle" Project were evaluated to determine the impact of these improvements on queuing. **Table 17** provides a summary of Synchro queuing results in the southbound direction at OR213 and Redland Road under existing conditions and with the implementation of Phase 2 of the "Jughandle" Project.

Table 17 – 2040 Synchro Queuing Analysis Summary: 30th Highest Hour Conditions, Southbound Direction

Scenario	Peak Hour 4:00 pm	2nd Highest Hour 5:00 pm	3rd Highest Hour 3:00 pm	4th Highest Hour 2:00 pm	5th Highest Hour 7:00 am
213/Redland Existing Configuration	1947	1998	1701	1430	985
213/Redland with TSP Improvements	982	998	870	774	620

The results in **Table 17** show that the TSP improvements reduce the queues towards the I-205 interchange by approximately half. However, without the TSP improvements the southbound queues in Synchro are around 1800-1900 feet which is just past 213/Washington St/Clackamas River Drive.

Cost Estimates

The cost of adding an additional northbound and southbound through lane at OR213/Redland Road, consistent with TSP project D79, was recently estimated by OBEC to be almost $10 million.

The cost of the westbound right-turn merge lane at OR213/Beavercreek Road is estimated to be approximately $2.7 million based on the design shown in **Figure 2**. This estimate does not include right-of-way acquisition.

The KAI and OBEC cost estimates, as well as exhibits of the proposed financially feasible improvements at OR213/Beavercreek Road can be found in Appendix "G".

CONCLUSIONS

The intersection improvement alternatives that would meet the existing mobility target at the OR213/Beavercreek Road intersection are not cost feasible, given the financial constraints of the City and other agency partners. These alternatives can be further considered in the future if additional funding becomes available.

Phase 2 of the "Jughandle" project at the OR213/Redland Road intersection is not part of the financially constrained plan in the 2013 TSP. Like the OR213/Beavercreek Road intersection, major capacity-increasing improvements at this intersection were determined to be beyond the financial capabilities of the city and its partner agencies during the TSP development process. It is recommended that this planned improvement for three through lanes in the northbound and southbound directions remain in the unconstrained TSP project list.

Lacking the financial capability of implementing major capacity-increasing projects at these locations, alternative mobility targets are necessary at each of these intersections; however, some improvements may be feasible in the cost-constrained TSP to improve safety and minimize future congestion.

The following alternative mobility targets are recommended:

For the intersection of OR213 and Beavercreek Road, the following mobility standards apply:

- During the first, second and third hours, a maximum v/c ratio of 1.00 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

For the intersection of OR213 and Redland Road, the following mobility standards apply:

- During the first and second hours, a maximum v/c ratio of 1.10 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.
- During the third hour, a maximum v/c ratio of 1.05 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

In conjunction with these alternative mobility targets, the financially feasible improvement to construct a westbound right-turn merge lane at OR213/Beavercreek Road should be included in the City's financially unconstrained plan. The merge lane should have a length of approximately 1300', including the taper. High visibility pavement markings and signage are recommended for pedestrians and bicycles to cross the channelized lane safely, and consideration should be given to installing a rectangular rapid flash beacon (RRFB) for increased visibility.

Appendix A
CAG and TAG Meeting Notes and Technical Memorandums

Appendix B
Oregon City GIS Maps

Appendix C
BlueMAC Data

Appendix D
Crash Data

Appendix E
Traffic Volumes

Appendix F
Operations Analysis

Appendix G
Cost Estimates

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MEMORANDUM

Date: January 12, 2017

Project #: 20651

To: Dayna Webb
City of Oregon City
PO Box 3040
625 Center Street
Oregon City, OR 97045

From: Susan Wright, P.E., and Kristine Connolly

Project: Highway 213 and Beavercreek Road Alternative Mobility Targets

Subject: CAG Meeting #1 Minutes

On January 5, 2017, the first Citizens Advisory Group (CAG) Meeting for the Highway 213 and Beavercreek Road Alternative Mobility Targets project was held at the Oregon City's City Hall. *See Attachment 1 for the Meeting Agenda.*

The meeting began with introductions, and Susan presented the project. *See Attachment 2 for the presentation slides*. The advisory group provided comments throughout the presentation. These comments are summarized below.

- Damon suggested that it would be helpful to have a representative from ODOT at future CAG meetings.
- Laura introduced the background of the project
    - There are a few locations in the City where solutions present themselves but the City cannot afford to implement the solutions
    - This project was designed to set aside time with the community to collectively discuss solutions
    - In this case, there is a capacity problem and the solutions are not financially feasible
    - Development is stunted without a resolution to the problem, so we are looking at alternative mobility standards
    - Most trips through the intersection do not start or end in Oregon City, so the burden is unfairly placed on the city to resolve the capacity issue
- Susan pointed out that an interchange solution at the intersection was removed though the TSP update because it was determined not to be feasible
    - Accepting a higher level of congestion would allow the City to continue planning a solution

  - Note: Alternative 1 would require maintaining a northbound exclusive right turn deceleration lane. Corrections will be made to future exhibits.
- Comments on Alternative 1:
  - Mike: concern with left turns onto Maple overfilling the left turn lane.
    - The third receiving lane in this alternative would help alleviate that issue
  - Rick: seems like a short-term solution to a long-term mess
  - Dan: did you look into extending the existing southbound left turn lanes? Could the third receiving lane become a dual left onto Maple? What is the AM peak traffic impact? Do future conditions take into account ITS and connected vehicles?
  - Christine: fear that the capacity solution will be cancelled out by future development
    - Volume projections assume full buildout of development/redevelopment
  - Christine: need to take the cottages into account. Additionally, when there is a crash or landslide, there are no parallel routes available for people to avoid the congestion.
  - Damon: It would be beneficial to move the lane closer to 1st. The WB to NB right turn doesn't have any runout—extending the merge would improve flow. The 3rd receiving lane allows space for queuing, which will alleviate the issue with rear ends from people making the southbound left taking gaps without looking for vehicles stopped ahead. Perhaps the 3rd receiving lane alone would be beneficial without the 3rd southbound left.
    - Dan: a 1200' extension of the WB to NB merge has been studied. City to share drawings with Kittelson.
  - Bill: overall growth may be 2% but rural areas are experiencing higher levels. How many crashes were red light runs? Consider red light cameras.
    - John: cameras have been considered but they increase rear end crashes. Speed is more of the issue.
  - Henry: move the entry/exit to shopping center further south? Pay attention to pedestrian crossings. There was a recent fatality at the intersection. Contra-flow lane? Morton road should be extended.
  - Bob: this is a major intersection in the county, but it is outside of the urban growth boundary. This alternative will not keep up with growth. Need to spend more money to come up with a solution that solves the long-term problem.
    - Susan: Preferred solution will need to be adopted in the TSP before funding can be sought
    - John: $5-10M solutions seem obtainable and could be funded through SDC's. But larger project would have to be state-driven. Can we live with congestion for a longer portion of the day?
- Comments on Alternative 2:
  - Everyone agrees to discard this alternative
- Comments on Alternative 3:
  - Renate: it doesn't seem like there is enough space between signals

        - Susan: the distance would need to be fine-tuned to store the number of vehicles arriving each cycle. Kittelson to distribute a video of how this innovative intersection works. Other DOTs are implementing this solution in multiple locations along corridors.
    - Luke: this is better for pedestrians since it does not increase crossing distance as much as other alternatives. Is there an opportunity for looking into a shared use path on Beavercreek instead of the existing bike lanes?
    - Dan: eliminate pedestrian crossings on the north side and enhance them on the south side? Keep slope in mind for the displaced left turn crossover.
    - Christine: Morton Road has the 2nd largest landslide on 213.
    - Mike: is the propose storage for the displaced left turn signal within a curve? With this alternative, storage for the left turn onto Maple is reduced
- Comments on Alternative 4:
    - Henry: Beavercreek has a need for left turn stacking.
    - Michelle: Why didn't the TAG recommend this alternative?
        - Susan: this was mostly due to the cost of impacting the northwest corner
    - John: City is hesitant about both Alternatives 3 and 4
    - Dan: consider shifting the centerline of Beavercreek south to avoid geological hazards on north side.
        - Susan: this would require shifting east as well, which would impact developed land
    - Committee recommends continued analysis of Alternative 4
- Comments on Alternatives 5-7:
    - Susan: note the negatives in the comparison chart. Alternatives 5 and 6 create 2 intersections for vulnerable users to traverse instead of 1.
    - Damon: Alternative 6 is functionally useless—it directs people too far out of their way. Consider a solution somewhere between alternatives 5 and 7. Was a traffic circle considered?
        - Susan: since this is an ODOT facility, the footprint of the roundabout would be too large and impactful
    - Renate: suggest keeping an interchange on the table. Alternative 7 seems to have the least impact.
    - Christine: does Alternative 6 leave room in the future to have lower cost improvements?
        - Susan: other bottlenecks in the area make an interchange at this location less effective
    - Committee recommends keeping a full tight interchange on the table
    - Kelly: TSP has 2011 data. Have you looked at current 2016 v/c? Kittelson to run 2016 counts in Synchro. Why spend $25M to be back at the same LOS we were at in 2011?
    - Laura: asked ODOT and County if they had funding to support the project, and they responded in the negative.

- Susan: it is a risk for the City to put an expensive solution in the TSP without funding. There is potential for a hybrid between short-term and long-term strategies: implement alternative mobility target until there is regional support for a roadway improvement. The preferred alternative from this project could be a starting point.

- Rick: timeline for implementation?
- Bob: inefficient infrastructure costs businesses money—delay is a cost to industry

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MEMORANDUM

Date: January 3, 2017

Project #: 20651

To: Dayna Webb
City of Oregon City
PO Box 3040
625 Center Street
Oregon City, OR 97045

From: Susan Wright, P.E., and Kristine Connolly

Project: Highway 213 and Beavercreek Road Alternative Mobility Targets

Subject: TAG Meeting #1 Minutes

On December 14, 2016, the first Technical Advisory Group (TAG) Meeting for the Highway 213 and Beavercreek Road Alternative Mobility Targets project was held at the Oregon City's City Hall. *See Attachment 1 for the Meeting Agenda.*

The meeting began with introductions, and Susan presented the project. *See Attachment 2 for the presentation slides*. The advisory group provided comments throughout the presentation. These comments are summarized below.

- In addition to the intersection of Highway 213 and Beavercreek Road, Lidwien pointed out that the entire stretch of 213 from Beavercreek to I-205 did not meet standards. The intersection of Highway 213 and Redland Road was included in the jug handle project design but has not yet funded. Lidwien said the modeling assumed this project and still failed to meet standards. John Replinger suggested that the TSP be reviewed to determine what was concluded at Highway 213/Redland Road. John Lewis was unsure but thought SDC's were being collected for the Hwy 213/Redland Road project.
- Delay at Hwy 213/Beavercreek Road is affecting zone changes and development near the intersection, as well as larger projects farther away.
- Dayna asked whether the TAG would be open to an evening meeting on April 20th.
- The culvert outfalls on the northern leg have eroded and created concern. ODOT is working on a long-term solution. The cost of this solution would be considered in intersection alternatives.
- Oregon City sees the Holly Lane improvements as a significant benefit to congestion. However, the community is opposed to any changes to Holly Lane which would impact properties. The Holly connection would change travel patterns through the Hwy 213/Redland Road intersection.
- John Replinger to send 2040 volumes.

- There are TDM measures in place at Clackamas Community College. The regional travel model already takes regional TDM efforts into account in the forecast.
- The County did not adopt the Beavercreek Concept Plan. The City would need to take the lead on constructing/implementing the connections in this plan.
- Alternative 1
    - Avoid shifting the highway to the west where there is a landslide area
    - Would intersection improvements require ADA updates?
    - Third lane could enhance issues with weaving exiting the intersection, despite signage.
    - Safety concerns make this alternative unfavorable with ODOT
    - Would need to maintain an exclusive northbound right turn lane for safety
    - Vulnerable users have a tougher time traversing a wider intersection
    - The triple left turn would be a difficult maneuver if future bus service utilizes that movement.
    - Is there a way to make this alternative safe? Possible to limit the intersection to 2 turn lanes off-peak?
- Alternative 2
    - Avi interested in investigating a second quadrant road serving the eastbound left turn that would wrap around the shopping center.
    - A storage facility development was just approved where the quadrant road connection is shown for Alternative 2. If the connection is moved north, there is an issue with right turn safety. If moved south, travel time will further increase.
    - It would be difficult to make a left turn into businesses north of the connection due to the increase in oncoming traffic on the quadrant road.
    - The Fir/Beavercreek intersection has operational concerns, including bus stops.
    - Increase cost for retaining wall and right-of-way.
    - Clarify in memo why this alternative is infeasible.
- Alternative 3
    - ODOT concerned with close spacing of signals if the cross-over signal would be considered a new signal rather than part of one large signalized intersection.
    - Storage at the left-turn signal may require widening and earthwork, impacting the geologic hazard area.
    - KAI to distribute video simulation of Alternative 3 signal interaction and queueing, look into shifting east to utilize existing pavement, and provide some explanation of how other DOTs are implementing displaced left turns.
- Alternative 4
    - As drawn, Alternative 4 is impactful to the northwest corner of Hwy 213/Beavercreek Road
    - Would impact TriMet, as bus stop would have to be west of Fir Street
    - Need to provide a clear picture of the geologic hazards in northwest corner
- How would an alternative be funded? Is there a possibility of cost-share with ODOT?

- Eliminate discussion of connectivity since predicted failure of intersection already assumes a high level of connectivity planned in the TSP. State that the same amount of connectivity is assumed regardless of the Alternative.
- Include v/c results in comparison table. It would be helpful to have a column related to safety. Include column for issues that may make an alternative infeasible.

Direction from TAG:

- Further investigation of alternatives 1 and 3
- Move toward alternative mobility target

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MEMORANDUM

Date: April 12, 2017

Project #: 20651

To: Dayna Webb
City of Oregon City
PO Box 3040
625 Center Street
Oregon City, OR 97045

From: Susan Wright, P.E., and Kristine Connolly

Project: Highway 213 and Beavercreek Road Alternative Mobility Targets

Subject: CAG Meeting #2 Minutes

On March 2, 2017, the second Community Advisory Group (CAG) Meeting for the Highway 213 and Beavercreek Road Alternative Mobility Targets project was held at the Oregon City's City Hall. *See Attachment 1 for the Meeting Agenda.*

The meeting began with introductions. John Makler of ODOT and Mike Bezner of Clackamas County were also in attendance. Susan presented an overview of Technical Memorandum #2, including policy, the travel time study, performance measures, feasible improvements and funding. The advisory group provided comments after the presentation. These comments are summarized below.

- Bill: travel time data collected in January—how reliable? Susie: collected the last week, not during a snow event
- Henry: have not defined mobility. Also what is regional? Could you do a destination survey to see how many Molalla residents use the intersection?
- Susie: we know many northbound and southbound movements are regional, as well as some turning movements. We did not collect specific OD data. Traditional mobility measure is v/c, strictly based on vehicle. But we want to think about other modes. This project is to decide what measure to use to measure mobility and how we want to define mobility at the intersection.
- Damon: how accurate if there are a lot of older cars?
- Susie: Pickup rate was about 11%. Does data match what we think is happening in the intersection?
- Bill Avison: why was the north leg collector farther away? Susie: no physical pole to mount the equipment.
- Susie: main goal was to see the variability throughout the day.

- Henry: what is the cycle time? Susie: 120 seconds. Henry: so average person gets through in one cycle but 85th percentile takes two? Susie: Yes.
- Bill: 2035 v/c projection seems low. Susie: Intersection can only accommodate so much traffic. The peak hour will spread out. Kirstin: growth is incremental but small proportion of total volume. Laura: model takes into account growth as well as planned improvements. Damon: model only takes into account Oregon City's growth. If other areas grow, will this blow up? Laura: model accounts for all of the regions traffic growing. The City's growth is one portion of a larger area growth. John Replinger: Model assumes growth in all four counties. John Lewis: Metro model assumes widespread growth, not just in the region. Assumes growth at the rate those communities are planned. Jon: vouches for the models accounting for all growth.
- Rick Givens: what is advantage of v/c over LOS? Susie: for consistency with the measure currently in place and other ODOT intersections on the corridor. Rick: any studies to look at how LOS compares to v/c? Susie: no direct correlation. Can have D over capacity and F under capacity.
- Bob: knee deep in housing crisis. Keep in mind that all appeals to LUBA for zone changes and concept plans have to do with a lot of traffic . One of the elements in land use planning for the state. Need to coordinate the LUBA so they know what we're doing when we approve land use changes. Extends to state planning as well. Susie: City obligated to study since the TSP showed that there is a problem on the corridor. Still want the land use plans but need an exception at this intersection. Need exception to get concept plans approved and withstand an appeal to LUBA. Cannot solve every problem. This exception process allows the City to have control over where standards are exceeded. Laura: balancing many needs as a region.
- Eric Lee: is this intersection the biggest/worst bottleneck? John Lewis: for Oregon City, this is the most challenging because there isn't an affordable improvement to solve the capacity issue. Eric: why was v/c chosen instead of travel time? Susie: travel time is good for long-range planning, and requires costly data collection and tools for measurement. v/c is much more accessible and measurable.
- Damon: you would only need to eliminate one lane. Susie: will investigate eliminating one vs. both lanes.
- Mike: to get money for a $50M project, it would usually be part of a large transportation bill. Looking at I-205, I-5, Highway 217 and larger projects in the Portland region. Other grants like TIGER go to larger jurisdictions. Sunrise Phase 1 was $150M, 30 years in the making. Enacted by Oregon legislature. Opportunities to raise large sums of money. Jon: Washington County wants Highway 217 widened. Cornelius Pass widening is $1B. In Clackamas County ODOT is focusing on completing Sunrise and upgrading Abernethy Bridge. Not on ODOT's radar to put millions into this intersection. Mike: first ask is for maintenance. Jon: mobility for whom? What would it cost to provide commuters with desirable level of service? What would it cost to provide goods? That's 9-3. And the graph shows that this is fine here. There are places in the region where that is not true, and that is where ODOT is focusing. Tradeoff between goods movement during day and people movement during peak.

- Kristina: desirable communities like Sellwood have walkability. Live work and play within community. No need for commuting. One way to address these issues is to look at providing a livable community.
- Henry: because half of people using intersection aren't residents, why should the City have to pay for the entire cost. Kirstin: does not preclude funding agreement. Mike: no city would pay for this in entirety. Would have to come from a federal or regional pot.
- Redland Road: because improvement is not constrained, needs alternative mobility target in order to stand up to LUBA.

Question 1: Could you live with an alternative mobility standard?

- Kristina: could live with the delay. What if there was a camera/app to determine whether to leave at a certain time?
- Bill Merchant: can live with v/c ratio. Concerned with amount of time we allow the intersection to be gridlocked. May begin to impact the middle of the day. Jon: would set a limit to the number of hours.
- Damon: ditto
- Luke: could live with it
- Nathan: feasible to accept higher v/c for certain amount of hours, especially when new development would be impacted by SDCs. Regional capacity—other areas impacted along the corridor. Constraints from other signals and highway.
- Michelle: yes
- Rick Givens: have to accept something like that but hopes to limit the number of hours. Kirstin: look at next meeting at what does 3 hours or 4 hours solve
- Eric: would like a more quantitative look. OR213 is called a bypass. Bypass is not a vehicle for economic development. But yes open to alternative target.
- Bill Avison: in Molalla there is OR211 and OR213, and that's it. City is trying to grow—OR213 is a major route. The purpose of the ACT in Region 1 is to work for all four counties and look at rural and urban dollars. There will be some priorities for rural areas, not $50M but perhaps $5M. Don't give up on getting some money from ODOT. Feel like we have to develop alternative mobility target. Not opposed to looking at that.
- Mike: thinks this is the right way to measure, but we're kidding ourselves if we think it will only be 1.05. Thinks it will affect the worst peak hour just as much as other time of day. What happens when we exceed the allowed X hours? Important to get Damon's comment—only looking at removing ONE westbound left turn lane. Low-cost project. Do countdown ped signals save lives? Kicking can down the road. Need to do lower cost solutions now, but will be back to this in a few years. Kirstin: still possible to continue to advocate for long-term solution. Want to be realistic in the short term.
- Renata: if v/c is how ODOT looks at facilities, makes sense to look at that here. We're already almost at capacity. People are going to be upset about additional delay. Political issue.

- Henry: too easy to continue to move the line. Should keep the current standard and put a long-term solution in the TSP. dislikes v/c because you cannot define terms adequately. V is definable but c is not. Acknowledges that there is no viable solution.
- Bob: can get through the issue technically but not politically. How to justify approving the alternative mobility target? If we had the money, wouldn't be talking. Convince public that we will eventually solve the problem. Can't give up—this is the job of planners to find a solution. We have a choice. Deny applications because we don't have capacity to serve them.
- Luke: did you consider widening sidewalks to provide shared use paths? With increased vehicle traffic, less safe for peds and bikes. Susie: something to consider and bring back, but retaining walls have impact on cost. Luke: look at it along Beavercreek.
- Damon: change ped access to just southbound? Get people used to crossing at other intersections. Would be useful on average graph to see how long it would take you if you don't stop at all going 20mph through intersection. Question why there is a spike at 8pm for westbound left. v/c of 0.79 in morning ignores westbound rights. 1.04 is a failure. Where is the v/c failure happening? Jon: small sample size. Damon: smaller improvements could fix the movements experiencing delay. Why no roundabout? Solution is tollbooths. Susie: profile is different based on movement. Westbound left is one of the lowest movements. Southbound left is critical movement. We looked at that in the first memo. How to solve the capacity issues at critical movements. Certain amount of green time to those four movements. That's how we came up with triple left and displaced left alternatives. Roundabout would need 4 circulating lanes.
- Mike: westbound right is also critical movement. Takes 40 seconds to go through intersection without stopping.
- Bob: computerize state highway system? Get on cell and find out what congestion is occurring. Mike: already have apps like Waze.

Question 2: If we accept higher v/c ratio, How many hours do we accept? (to be addressed at the next CAG meeting)

Direction from CAG:

- Clear support for using alternative mobility target v/c.
- Preserve the right to advocate for longer-term solution.
- Determine when/where the v/c failure occurs.

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MEMORANDUM

Date: April 12, 2017

Project #: 20651

To: Dayna Webb
City of Oregon City
PO Box 3040
625 Center Street
Oregon City, OR 97045

From: Susan Wright, P.E., and Kristine Connolly

Project: OR213 and Beavercreek Road Alternative Mobility Targets

Subject: TAG Meeting #2 Minutes

On March 1, 2017, the second Technical Advisory Group (TAG) Meeting for the OR213 and Beavercreek Road Alternative Mobility Targets project was held at the Oregon City's City Hall. *See Attachment 1 for the Meeting Agenda.*

The meeting began with a summary of the first Community Advisory Group (CAG) meeting. The CAG requested that an interchange alternative be kept on the table. They also thought it was important to have a County and ODOT representative at CAG Meeting #2. The CAG was comfortable looking at alternative mobility standards but want to build regional support for a long-term improvement. Lidwien suggested recommending taking an improvement to the regional table and having someone else convey that it is not a priority for the State/Region. Alternatives 1 and 3 have not yet been refined. Several lower cost solutions were suggested, but they do not address the 2035 capacity issue. Alternatives refinement is on hold in order to talk about the travel time study and funding. Outcome of these meetings will make a decision on what alternatives to continue to pursue.

Susan presented an overview of Technical Memorandum #2, including policy, the travel time study, performance measures, feasible improvements and funding. The advisory group provided comments throughout the presentation. These comments are summarized below.

Travel Time Study

- Note that AM peak analysis does not take queuing at the westbound right turn into account.
- Cycle length consistent throughout the day?
- Christian: recent signal timing changes impacting EBL vs. WBL green times
- SBL and WBR in particular have some challenges.

- Aleta: add volumes to each graph (to explain some erratic high delay)
- Christian: what is the free-flow travel time?

Alternative Mobility Targets

- Lidwien: isn't current standard 2 hours? KAI to verify current standard (1 or 2 hours?)
- Laura: 1st highest hour cannot exceed 0.99 and 2nd highest hour cannot exceed 0.99
- Susie: no direct correlation between v/c and travel time. Cannot reliably draw a line on the graph indicating v/c = 1.
- Whatever performance measure we choose, leave room for potential zone changes which could increase trips
- Laura: will likely come back to the intersection before 2035 and reevaluate then
- Lidwien: not obligated to approve zone changes
- Laura: most zone changes are through annexations
- Laura: What is the split between local trips and outside trips through the intersection? Was that included in the TSP analysis?

Performance Measures

- Susie: How to develop a 4th highest hour in 2035?
- Includes morning and afternoon.
- Easy to measure and easy to replicate and review. Require a 10-hour count. What is the trip generation during the 4th highest hour? Off-peak trip generation. Will need to develop methodology.
- Kelly: burden of additional study falls on private developers and reviewers.
- Lidwien: As far as the State goes, ODOT standard only applies to plan amendments. Up to the City what to do with permitted uses (already accounted for in TSP). ODOT standard does not apply to permitted uses.
- Replinger: Require developers to conduct TIAs to identify needs in immediate vicinity. Also to assess proportional share. Assess whether to move an improvement from 'not likely to be funded' to 'financially constrained'.
- Replinger: concerned that calculation of v/c in the 4th hour is going to be higher than we estimated.
- Susie: we know peak to daily ratio today. What is the peak to daily ratio in the future model? What is the expected daily profile in 2035? Will determine as part of next steps.
- Replinger: pass-by percent off peak? Changes throughout the day.
- Lidwien: ODOT has not had an opportunity for traffic to look at the memo. Peak hour spreading is already anticipated in OHP. Lidwien would start with three hours instead of jumping to four. Consider supplementing with one of the safety measures—could even be measuring queuing.
- Kelly: first goal in the TSP is safety. Can easily tie safety measure to the TSP goals.

- Susie: from development standpoint, hard to get into predictive crash rates. Set threshold? Make sure everyone mitigates impact? Apply just to TPR, not outright zoned properties? What improvements are reasonable? Then we can get into crash rate. Make sure what we propose does not increase future crash rate. Increased trips=increased crashes no matter what. What is City's standard for this intersection when it comes to outright zoned properties? Do you want to impose standard for outright zoned development? Have a different measure?
- Laura: TSP applied ODOT standard to all development, not just zone changes. Helps to calculate proportional share. Self-imposed analysis for permitted uses.
- Lidwien: can require traffic analysis to calculate SDC's and not call it a standard.
- Replinger: can require that the applicant calculate the volume of traffic entering the State Highway, not actually require analysis. Then charge per car, for example.
- Susie: can have improvements in the TSP and still have alternative mobility target
- John Lewis: what safety standard would you recommend in conjunction with v/c?
- Susie: predict future crash rate with improvements and compare to what the crash rate would be without the improvement. Set as standard? Improvements do not come in small increments though.
- Kelly: why is average travel time not a better measure than v/c?
- Susie: ease of application of predicting future travel time and cost of data collection. Difficult to model and expensive data for calibrating.
- John Lewis: for community group, more robust explanation of recommendation.
- Lidwien: public will not want to go over each measure
- Aleta: could we have the same graph for v/c in 2035?
- Lidwien: explain that this is existing, and it is very difficult to forecast. Then when you explain the recommendation, say it is because it is so difficult to forecast travel time. Could do travel time for intersection or corridor. Corridor would be more appropriate than intersection.
- Susie: will come up with something illustrative to show future v/c.

Operations and Safety Improvements

- What to implement in tandem with alternative mobility targets? What to go in TSP? What to consider financially constrained? What to include in unconstrained plan?
- John Lewis: see a lot of cross traffic crashes. In favor of the lighting, pedestrian countdown display and medium cost improvements.
- Susie: removing left turns from the intersection will improve safety.
- Lidwien: look at critical movement v/c? only look at v/c on 213 but not on Beavercreek?
- Susie: would build queues on the side street.
- Christian: does this get adopted into OHP? Susie: Yes
- Christian: anything like this implemented? Susie: some have increased v/c.

Funding

- Check the math on the households (numbers don't add up and the number of houses doesn't seem right)
- Lidwien: mentioned extending from Redland to Molalla. But we do not have improvements at Redland. They would also have to be added to the SDC list.
- Susie: Redland Road has improvement in TSP but project is unfunded.
- Lidwien: Have to have a way to fund, and have to get onto financially constrained RTP
- Susie: Redland Road needs alternative mobility target as well. Demonstrate how a 2/3/4 year target looks today and how it would look in the future.
- Replinger: financial infeasibility would justify alternative mobility target at Redland Road as well.
- Lidwien: need to demonstrate to ODOT why project is infeasible. Show your work.
- Dayna: Redland Road project is in RTP unconstrained list, but needs to be in constrained list to qualify for TPR analysis
- Susie: no conflict with having project in TSP and having alternative mobility target. Would not preclude City from having alternative in the constrained TSP and still pursue alternative mobility target
- Lidwien: would keep from implementing anything that would preclude TSP project in the future.
- Laura: did we look at Molalla in 2035?
- Replinger: decision not to analyze 213/ Molalla was because it had been studied recently for the Clackamas College. We'll be ok there with Meyers Road extension.
- Can we come up with alternative to constantly measure travel time? How much would it cost to have the equipment out there all the time?
- Having alternatives on the list will help the public accept an alternative mobility standard. May be some support for lower to moderate cost alternatives.

Direction from TAG:

- Continue looking at v/c for certain # of hours recommendation
- Work with City on looking at what improvements are easy to financially constrain
- Determine whether additional meetings will be necessary.

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MEMORANDUM

Date: April 27, 2017

Project #: 20651

To: Dayna Webb
City of Oregon City
625 Center Street
Oregon City, OR 97045

From: Nicholas Gross and Susan Wright, P.E.
Project: Highway 213 and Beavercreek Road Alternative Mobility Targets
Subject: CAG Meeting #3

On April 20, 2017 the third Community Advisory Group (CAG) meeting for the Highway 213 and Beavercreek Road Alternative Mobility Targets project was held at the Oregon City's City Hall. *See Attachment 1 for the Meeting Agenda:*

WELCOME, MEETING PURPOSE AND AGENDA REVIEW

The meeting was kicked-off by John Lewis of Oregon City's Engineering Department who welcomed back the group and thanked those in attendance for their continued participation. Kirstin Greene of Cogan Owens Green provided an overview of the meeting's agenda and reminded CAG members that their comments and opinions regarding the mobility targets would be documented and used to help guide the process moving forward.

John Replinger of Replinger & Associates provided an overview of the hierarchy of transportation planning and how it translates to the development review process. John began with an overview of the City's approach to a refinement plan, highlighting that for this project, a refinement plan is being carried out by the City Oregon for the intersection of Highway 213. John also provided an overview of the development review process discussing land-use actions, rezoning, subdividing and how these actions require a develop to conduct a traffic impact study as well as mitigation measures in compliance with City standards.

OVERVIEW OF TECHNICAL MEMORANDUM #2

Susan Wright of Kittelson & Associates, Inc. provided a recap of the CAG meeting #2 and an overview of the existing mobility targets specific to the intersections of Highway 213/Beavercreek Road and

Highway 213/Redland Road. Susan discussed the projects currently in Oregon City's Transportation System Plan (TSP) and potential new projects for the Highway 213/Beavercreek Road including a west-bound right-turn acceleration lane and southbound advance warning system improvements predicted to reduce crashes by approximately 5%.

Susan then provided an overview of 2040 operations at both intersections highlighting the volume over capacity (V/C) ratios with and without the recommended improvements. The key takeaways were that the intersections of Highway 213/Beavercreek and Highway 213/Redland Road will exceed the current mobility target in the City's TSP for the horizon year of 2035 and that the alternatives that would meet the existing targets are not currently cost-feasible. The following recommendations for targets and improvements were provided:

Highway 213/Beavercreek Road

- Mobility Target – V/C not to exceed 0.99 for more than give hours of the day
- Improvements added to costs-constrained TSP
    - Westbound right-turn acceleration lane

Highway 213/Redland Road

- Mobility Target – V/C not to exceed 0.99 for more than three hours of the day
- Improvements added to TSP
    - Third southbound through lane (if const-feasible)

DISCUSSION

The following section provides a recap of the discussion points and questions/answer dialogue between the CAG and the project team:

Dan Fowler (DF): Have you considered using the Holcom Boulevard overpass as an exit point off of Highway 213?

Susan Wright (SW): No, I can say that we haven't looked into that.

Dan Fowler: I'm not saying it's feasible, it's just an idea.

Damon Mabee: Even if it were just an off-ramp for northbound traffic heading onto Holcom Boulevard it would eliminate all of the traffic using Redland Road to get onto Holcomb Boulevard from Highway 213.

Susan Wright: The good thing about the improvements in the TSP is that they mitigate the intersection to the current standards. I don't know think constructing an off-ramp at Holcom Boulevard would be any cheaper.

Dan Fowler: Is this area inside the urban renewable district of downtown? I ask because I'm curious of potential funding strategies.

John Lewis (JL): I don't know but I know it includes the driving range.

Damon Mabee: The concern about storage of the left-turn lane is irrelevant to me. The City has a plan to push Meyers Road through. The number of people the left-turn lane is going to affect is minimal compared to the queue to get into Maple Lane.

Eric Lee: Does your model factor in the concept of induced demand?

Susan Wright: The latest model from Metro considers the spreading of the peak hour. Because our system is constrained, it is considering the peak hour spreading.

Rick Givens: Did you run the numbers for the combined effect of the acceleration lane plus the left-turn lane?

Susan Wight: We did and it was negligible.

Luke Norman: It sounds like the free flow right-turn will affect the pedestrian movement at the intersection.

Susan Wright: Yes, assuming vehicles will not have to stop, they will still need to yield. We spoke with the technical advisory group (TAG) about this topic. Currently, pedestrian traffic is not high enough to warrant a pedestrian button. It will be an important design consideration.

Kristina Browning: I live in the adjacent neighborhood and there are a few areas of sidewalks that aren't connected to the rest of the network. My neighbors and I would do a lot more walking if they were connected. Pedestrian activity would increase if we were able to get to that intersection and if we could walk there safely.

Susan Wright: That's a great point and a topic that is addressed in the City's TSP.

John Replinger: The City's TSP did a great job at identifying network gaps throughout the city for bicycles and pedestrians. There are a substantial number of projects proposed to fill those gaps as well as a policy that any time a developer moves forward, they need to provide sidewalks at the frontage of the development.

Susan Wright: This will ultimately go to the Oregon Transportation Commission (OTC) and part of our findings will demonstrate other solutions for bicycles, pedestrians, and street connectivity.

Henry Mackenroth: Given that a pedestrian button is tied into the signal controller and there is already a controller operating, sending an additional $10k seems like pocket change to install a pedestrian

button. It should not be a consideration, it needs to be done. We should be thinking about bicycles and pedestrians for any improvement that is recommended to move forward.

Rick Givens: Do you have a sense of how many years out you are before getting to the 0.99?

Susan Wright: We looked at 2035 to see what the difference of that change would be and those five years helped. If you want to get technical we've included the 2035/2040 comparisons as an appendix online. We are still targeting the 2040 year which is consistent with the regional model.

Rick Givens: I have no sense of the differential between 0.99 and 1.02. Is that an incremental difference? Is there anything to do to bring those additional hours down to 0.99?

Susan Wright: Those were some of the improvements we first talked about such as a triple left-turn lane, etc. We received strong consensus that those were not viable solutions. We see the $1.5million right-turn lane providing significant benefit to the intersection operations.

Rick Givens: What does 0.99 compared to 1.02 feel like operationally?

Susan Wright: You wouldn't notice much of a different. This is more about setting up the methodology that we are going to use to set the rules for the future which everyone will follow.

Mike Mitchell: What is the most stressed movement at Highway213/Redland Road?

Susan Wright: The left turning movement from Highway 213 onto Redland Road. The morning is worse than the evening.

Bob Mahoney: Rick said it best. Nothing is cheaper to build than building now. It's only going to get more expensive the longer this gets pushed out. If we don't make improvements now, what is the cost the city will face? Including those facts and figures for your following presentations would be valuable.

Dan Fowler: For the Highway213/Beavercreek intersection, did you look at the most optimum signal sequence for the right-turn movement?

Susan Wright: Yes we did.

Eric Lee: Are the two operation tables dependent or independent from one another?

Susan Wright: There is some dependency but the analysis was treated separated for both.

Damond Mabee: My feeling is that money would be better spent putting in an intelligent signal system. I think it will reduce the V/C ratio. I also don't see the benefit between the red and yellow difference shown in the table for Highway213/Redland Road for the expense it is shown at.

Nathan McCarty: I want to revisit the alternative for the P.M. traffic heading southbound and turning left onto Beavercreek Road.

Dan Fowler: What does bullet point 2 mean? Document alternatives considered and add policy to TSP to recognize merits of a regional solution?

Susan Wright: Essentially this is referencing an interchange. ODOT also has interest in a jug-handle concept. We want to document everything to show that we've looked at the pros and cons of all options.

Henry Mackenroth: Bullet point 2 needs to be shown for Highway213/Redland Road in the future. That is also going to end up being a regional solution. You also can't put pedestrians and bicycles in a separate category from vehicles. We have to make sure all modes can get across the intersection(s) safely. They will do it whether there is a facility provided to them or not.

Bob Mohoney: We're being ushered into a digital age of technology. Technology is taking over our lives and its taking over our highways. We are losing V/C because our intersections are not smart. I think the solution to a lot of the V/C conversation is technology. If it cost $250k to upgrade to a smart signal and increase the efficiency by 10% that is money well spent.

Dan Fowler: I agree. A lot of the near-term solutions are going to end up being funded by developers.

Kristina Browning: I want to reemphasize the importance for walkability. We need to focus on connecting the existing sidewalks and encouraging bicycling. When this all gets built out it needs to accommodate everyone and what you've presented only seems to be focused on cars.

COMMENTS ON THE RECOMMENDED ALTERANTIVE MOBILTIY TARGET

Kristine Connelly: At this point the alternative mobility target recommendations have been through the TAG and they seem to be generally comfortable. I think we all recognize the benefits and drawbacks to each recommendation. Now we want to hear from everyone around the table on your thoughts about the Alternative Mobility Target.

Rick Givens: I agree with a lot of what Dan said regarding the smart signals. I have no problem with the proposed changes to the alternative mobility target. I also like the idea of doing something at the Holcom Boulevard overpass.

Mike Mitchell: I think it is extremely important to separate the two projects entirely when it comes to funding. Highway213/Beavercreek Road is a big bang for the buck. Highway213/Redland Road doesn't have nearly the same impact and it costs more. Let's get creative with development projects and where sidewalks are proposed. I'm comfortable with all the alternative mobility targets.

Eric Lee: Thank you for the presentation, I'm comfortable with the alternative mobility target recommendations. I think there needs to be additional recommendations to include pedestrian and bicycle accessibility. I don't think cutting pedestrian access off is ever a good thing. Let's focus on the safety of bicyclists and pedestrians and move forward with recommendations that help those modes.

Bill Merchant: I'm happy with the alternative mobility target you presented and I want to echo the point about intelligent signals. The existing signals can talk to each other and they can be smart.

Mike Mitchell: I think the acceleration lane is a great idea. I also think you diminish the benefit if you allow pedestrians to cross there. The sidewalk could be removed and used as a shoulder or an emergency lane.

Luke Norman: I'm comfortable with the alternative mobility target exceeding the times and V/C. Regarding the acceleration lane, I will not support anything that makes it less safe for pedestrians and bicyclists.

Damon Mabee: Incremental changes open up possibilities for technical changes. I agree we need to add the second bullet point to the Highway213/Redland Road discussion. I cannot support the alternative mobility target with additional time added to the V/C. I think we need to stay at our targets, look to technology, and get the funding to relieve the pressure.

Nathan McCarty: I can accept the three recommendations as they relate to the alternative mobility options. We need to continue to look at cost-effective solutions.

Kirstin Greene: It sounds like the majority of folks are comfortable with the proposed solution. Some additional high level thoughts I am hearing is the adopting of smart technology practices to optimize signal operations and the consideration of balancing pedestrian and bicycles.

Commission Renate Mengelberg: Seeing the V/C ratio over accepting levels for five hours a day makes me uncomfortable. It doesn't seem like a good policy. Let's get the most out of our existing system. Technology is going to help.

Kirstin Greene: Thank you everyone for coming out.

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MEMORANDUM

Date: December 8, 2016

Project #: 20651

To: Dayna Webb, P.E.
Public Works Department
City of Oregon City
PO Box 3040
625 Center Street
Oregon City, Oregon 97045

From: Susan Wright, P.E., Hermanus Steyn, P.E., and Kristine Connolly

Project: Highway 213 & Beavercreek Road Alternative Mobility Targets (PS 16-024)

Subject: Memorandum #1: Project Background and Preliminary Alternatives Evaluation

Oregon City's 2013 Transportation System Plan (TSP) determined that the intersection of Highway 213 (OR213) and Beavercreek Road will not meet mobility standards in 2035. The TSP recommended a project be conducted to identify what improvements may be necessary to meet current standards or whether an alternative mobility target is necessary. A Community Advisory Group (CAG) and Technical Advisory Group (TAG) have been formed to help the City evaluate the feasibility and practicality of the alternatives set forth in this project. This memorandum provides background information, operational and safety information, and identifies preliminary alternatives for the improvement of the OR213/Beavercreek Road intersection. These alternatives will be reviewed with the CAG and TAG to determine if any may be feasible and merit further exploration, or if an alternative mobility target needs to be pursued.

ALTERNATIVE MOBILITY TARGET BACKGROUND

The Oregon Highway Plan (OHP) defines polices and investment strategies for Oregon's state highway system for the next 20 years. The OHP gives policy and investment direction to corridor plans and transportation system plans that are being prepared around the state, but it leaves the responsibility for identifying specific projects and modal alternatives to those plans.

Policy 1F: Highway Mobility Policy states, "It is the policy of the State of Oregon to maintain acceptable and reliable levels of mobility on the state highway system, consistent with expectation for each facility type, location and functional objectives. Highway mobility targets will be the initial tool to identify deficiencies and consider solutions for vehicular mobility on the state system. Specifically, mobility targets shall be used for:

- Identifying state highway mobility performance expectations for planning and plan implementation;
- Evaluating the impacts on state highways of amendments to transportation plans, acknowledged comprehensive plans and land use regulations pursuant to the Transportation Planning Rule (OAR 660-12-060); and
- Guiding operations decisions such as managing access and traffic control systems to maintain acceptable highway performance."

Mobility targets for state highways, as established in this policy or as otherwise adopted by the Oregon Transportation Commission as alternative mobility targets, are considered the highway system performance standards in compliance with the Transportation Planning Rule (TPR) (OAR 660-012), including applicability for actions that fall under Section -0060 of the TPR.

Mobility targets are the measure by which the state assesses the existing or forecasted operational conditions of a facility and, as such, are a key component ODOT uses to determine the need for or feasibility of providing highway or other transportation system improvements; and therefore impact local land use and transportation planning as well as development review. The OHP currently includes alternative mobility targets in many locations throughout the State.

EXISTING CONDITIONS

The existing conditions analysis identifies the transportation conditions and current operational and geometric characteristics of the roadways within the study area. Exhibit 1 below provides an overview of the intersection.

Exhibit 1. Highway 213 (OR213) and Beavercreek Road Intersection

At the OR213/Beavercreek Road intersection, OR213 has a 4-lane section and a speed limit of 55 mph and is classified as an Expressway to the north and a District Highway to the south. Beavercreek Road is classified as a Major Arterial with a 4/5-lane section and a speed limit of 35 mph. OR213 is under the

jurisdiction of the Oregon Department of Transportation (ODOT), the west leg of Beavercreek Road is under the jurisdiction of Oregon City, and the east leg is under the jurisdiction of Clackamas County. OR 213 and Beavercreek Road are both designated as a Local Truck Routes in the City's TSP at the study intersection. The City designated truck routes in the TSP to ensure trucks can efficiently travel through and access major destinations in the City.

Sidewalks are provided along the north and south sides of Beavercreek Road, and a multi-use path is provided along OR213 south of Beavercreek Road along the east side of the highway. Bicycle lanes are provided along Beavercreek Road. TriMet operates Bus Route 32 between Clackamas Community College and Milwaukie City Hall. There are stops located on the west leg of Beavercreek Road at the intersection for both directions of travel (i.e. far-side for westbound and near-side for eastbound).

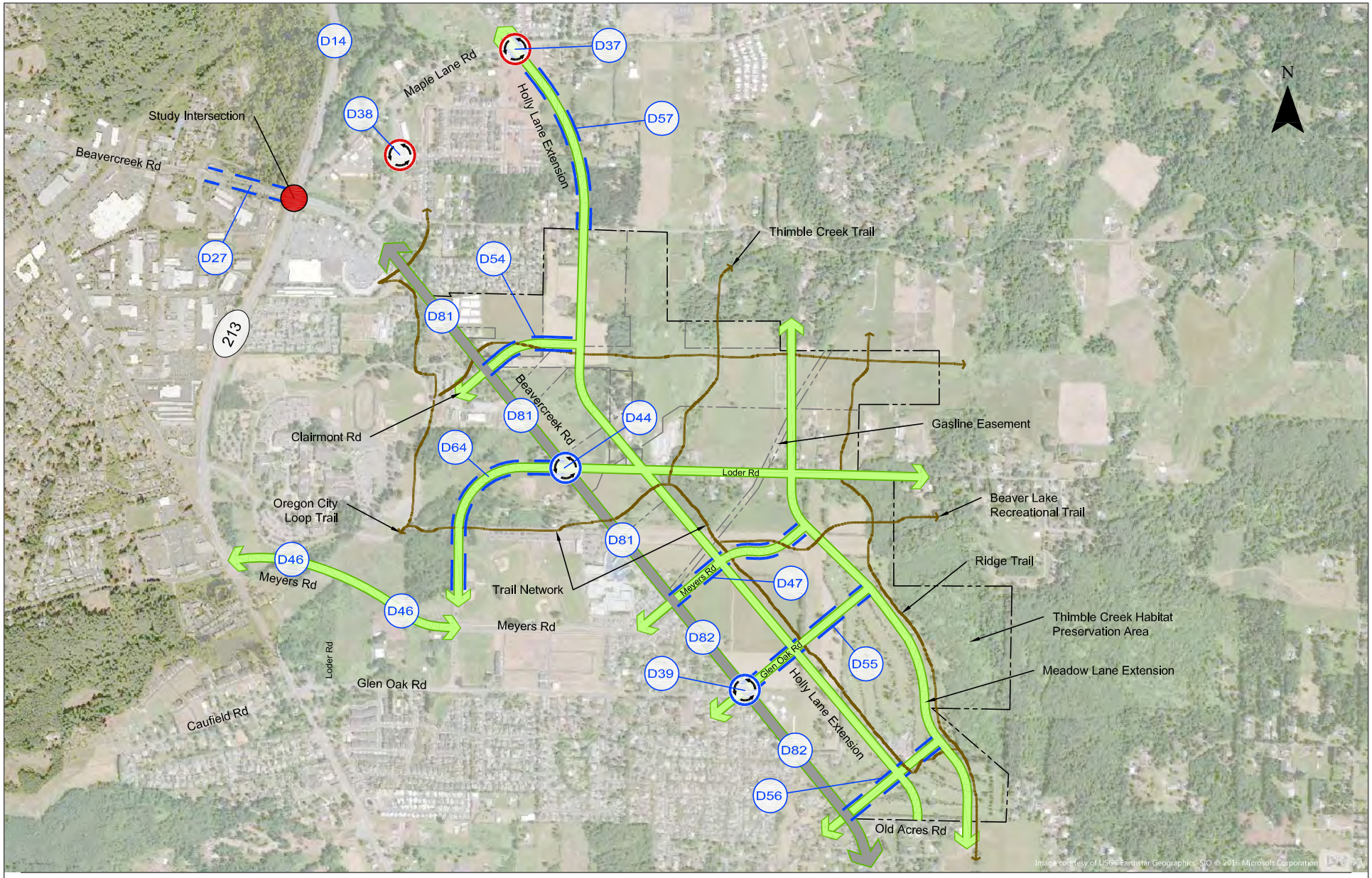
There is a stream running under the north leg of OR213 at the intersection, with corresponding wetlands. There are also geologic hazards in the vicinity of the intersection, with steep slopes and landslides primarily on the northwest corner. More details can be found in the Oregon City GIS maps in **Appendix A**. The presence of these features increases the expense of any improvements requiring additional widening, as significant earthwork, culvert extensions, or wetland mitigation may be necessary.

The City's TSP includes projects which may impact operations, safety, and travel patterns at the OR213/Beavercreek Road intersection. Many of the projects will increase connectivity in the vicinity of the OR213/Beavercreek Road intersection via parallel routes and roadway extensions between these parallel routes, providing alternate routes for those who do not need to pass through the intersection. All new roads and roadway upgrade projects will include facilities for bicycles and pedestrians. In addition, the TSP includes projects specifically to complete and enhance the bicycle and pedestrian networks. The roadway projects likely to increase connectivity and impact safety and operations at the OR213/Beavercreek Road intersection are included in **Table 1** and **Figure 1.**

Table 1 – 2013 Oregon City Transportation System Plan Projects located in the southeast part of the City

Project #	Project Description	Project Extent	Project Elements	Priority	Funded ?
D14	Southbound OR 213 Advanced Warning System	Southbound OR 213, north of the Beavercreek Road intersection	Install a queue warning system for southbound drivers on OR 213 to automatically detect queues and warn motorists in advance via a Variable Message Sign	Short-term	Likely
D27	OR 213/Beavercreek Road Operational Enhancement	OR 213/Beavercreek Road	Lengthen the dual left-turn lanes along Beavercreek Road to provide an additional 200 feet of storage for the eastbound approach	Short-term	Yes
D37	Maple Lane Road/Holly Lane Operational Enhancement	Maple Lane Road/Holly Lane	Install a single-lane roundabout	Long-term	Unlikely
D38	Maple Lane Road/Walnut Grove Way Operational Enhancement	Maple Lane Road/Walnut Grove Way	Install a single-lane roundabout or realign Maple Lane Road in correlation with development	Long-term	Unlikely

D39	Beavercreek Road/Glen Oak Road Operational Enhancement	Beavercreek Road/Glen Oak Road	Install a roundabout	Long-term	Unlikely
D44	Beavercreek Road/Loder Road Extension Operational Enhancement	Beavercreek Road/Loder Road Extension	Install a roundabout	Medium-term	Likely
D46	Meyers Road West Extension	OR 213 to High School Avenue	Extend Meyers Road from OR 213 to High School Avenue as an Industrial Minor Arterial. Create a local street connection to Douglas Loop.	Short-term	Likely
D47	Meyers Road East extension	Beavercreek Road to the Meadow Lane Extension	Extend Meyers Road from Beavercreek Road to the Meadow Lane Extension as an Industrial Minor Arterial. Between the Holly Lane and Meadow Lane extensions, add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S19. Modify the existing traffic signal at Beavercreek Road	Medium-term	Likely
D54	Clairmont Drive extension	Beavercreek Road to Holly Lane South Extension	Extend Clairmont Drive from Beavercreek Road to the Holly Lane South extension as an Industrial Collector. Add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S17	Long-term	Likely
D55	Glen Oak Road extension	Beavercreek Road to the Meadow Lane Extension	Extend Glen Oak Road from Beavercreek Road to the Meadow Lane Extension as a Residential Collector. Install a roundabout at Beavercreek Road (per project D39)	Long-term	Likely
D56	Timbersky Way extension	Beavercreek Road to the Meadow Lane Extension	Extend Timbersky Way from Beavercreek Road to the Meadow Lane Extension as a Residential Collector. Add a sidewalk and bike lane to the south side of the street, with a shared-use path to be added on north side per project S20	Long-term	Likely
D57	Holly Lane South extension	Maple Lane Road to Thayer Road	Extend Holly Lane from maple Lane Road to Thayer Road as a Residential Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S14. Install a roundabout at Maple Lane Road (per project D37)	Medium-term	Likely
D58		Thayer Road to Meyers Road	Extend Holly Lane from Thayer Road to the Meyers Road extension as an Industrial Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S15	Medium-term	Likely
D59		Meyers Road to the Meadow Lane Extension	Extend Holly Lane from the Meyers Road extension to the Meadow Lane Extension as a Mixed-Use Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S16	Long-term	Likely
D64	Loder Road Extension	Beavercreek Road to Glen Oak Road	Extend Loder Road from Beavercreek Road to High School Avenue as an Industrial Collector. Add a sidewalk and bike lane to the west side of the street, with a shared-use path to be added on east side per project S18. Create a local street connection to Douglas Loop.	Short-term	Likely
D81	Beavercreek Road Upgrade	Clairmont Drive (CCC Entrance) to Meyers Road	Improve to Industrial Major Arterial cross-section	Medium-term	Likely
D82		Meyers Road to UGB	Improve to Residential Major Arterial cross-section	Long-term	Likely



- TSP Improvements Likely to be Funded
- TSP Roundabout Likely to be Funded
- TSP Roundabout Not Likely to be Funded
- Beavercreek Road Upgrades
- Conceptual Road Network

Conceptual Planned Area Connectivity Improvements Oregon City

Figure 1

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Planning level operations and safety analyses were conducted at the OR213/Beavercreek Road intersection, and compared to the 2013 TSP. The (2011 base) volumes from the 2013 TSP were compared to 2016 weekday p.m. peak hour count data (see **Appendix B**) collected by the City at the following intersections:

- OR213 and Beavercreek Road
- OR213 and S Caufield Road/Glen Oak Road
- S Holly Lane and S Maple Lane Road

This comparison showed an overall 2% linear annual growth rate for the area from 2011 to 2016. Based on this calculation, the growth rate experienced during the last five years appears consistent with the long term growth trend predicted in the TSP.

It should be noted that there is larger than average growth for the southbound right-turn movement from Holly Lane to Maple Lane Road. This is likely due, in part, to S Holly Lane functioning as a parallel alternative route to OR213. Drivers may be using S Holly Lane to avoid making a southbound left-turn from OR213 to Beavercreek Road due to long queues and delays for this movement.

The existing mobility standard for the OR 213/Beavercreek Road intersection set forth in the 2013 TSP is based on volume-to-capacity Ratio (v/c). The v/c ratio is a measure that reflects mobility and quality of travel. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). For example, a v/c of 1.00 indicates the roadway facility is operating at its capacity. The following mobility standard is set forth in the 2013 TSP for the OR213/Beavercreek Road intersection:

- During the highest one-hour period of the day, a maximum volume-to-capacity (v/c) ratio of 0.99 shall be maintained.

The analysis completed for the 2013 TSP shows the intersection operating with a v/c ratio of 0.83 under 2011 existing conditions.

The OR213/Beavercreek Road intersection was identified in the 2013 TSP as a high collision intersection. The ODOT Crash Analysis and Reporting Unit provided crash records at the intersection for the 5-year period from January 2010 through December 2014. **Table 2** summarizes the reported crash data. The crash data is included in **Appendix C**.

Table 2 - OR213/Beavercreek Road Intersection Crash Summary and Crash Rate Assessment (2010-2014)

Crash Type				Severity			Total	Critical Crash Rate by Intersection Type	Critical Crash Rate by Volume	Observed Crash Rate at Intersection	Observed Crash Rate>Critical Crash Rate?
Rear-End	Turning	Angle	Other	PDO	Injury	Fatal					
116	7	5	5	58	74	1	133	0.59	0.50	1.20	Yes

PDO = Property Damage Only
Crash Rate = crashes per million entering vehicles

The intersection was in the top 5% of the ODOT Safety Priority Index System (SPIS) List for the years 2012-2014. The SPIS List is maintained by ODOT and updated each year with the latest available year of crash records and traffic volumes. 2012-2014 is the most current SPIS list. The intersection also has a crash rate that exceeds the Critical Crash Rate meaning that it exceeds the crash rate of other comparable intersections.

Beavercreek Road is the first at-grade intersection on OR213 for over two miles south of Redland Road, in a corridor that generally feels rural. A lack of driver expectation of southbound queues from the signal may contribute to the high number of reported rear-end crashes at the intersection. The reported fatality occurred in 2011, and was an angle crash in which the driver ran a red light under dark and rainy conditions. The 2010-2014 crash rate of 1.20 is already lower than the crash rate of 2.05 identified in the 2013 TSP, indicating that safety and/or driver attentiveness have improved in recent years. Lengthening the dual eastbound left-turn lanes to provide additional storage (Project D27; funded) and an advanced queue warning system on southbound 213 will further improve safety at the intersection.

ALTERNATIVES DEVELOPMENT

The Synchro analysis in the 2013 TSP indicates that by 2035, without a major improvement, the intersection will function beyond the current mobility standard. Under 2035 Planned System Conditions, the intersection is expected to operate with a v/c ratio of 1.05, exceeding the existing mobility standard of a maximum v/c ratio of 0.99.

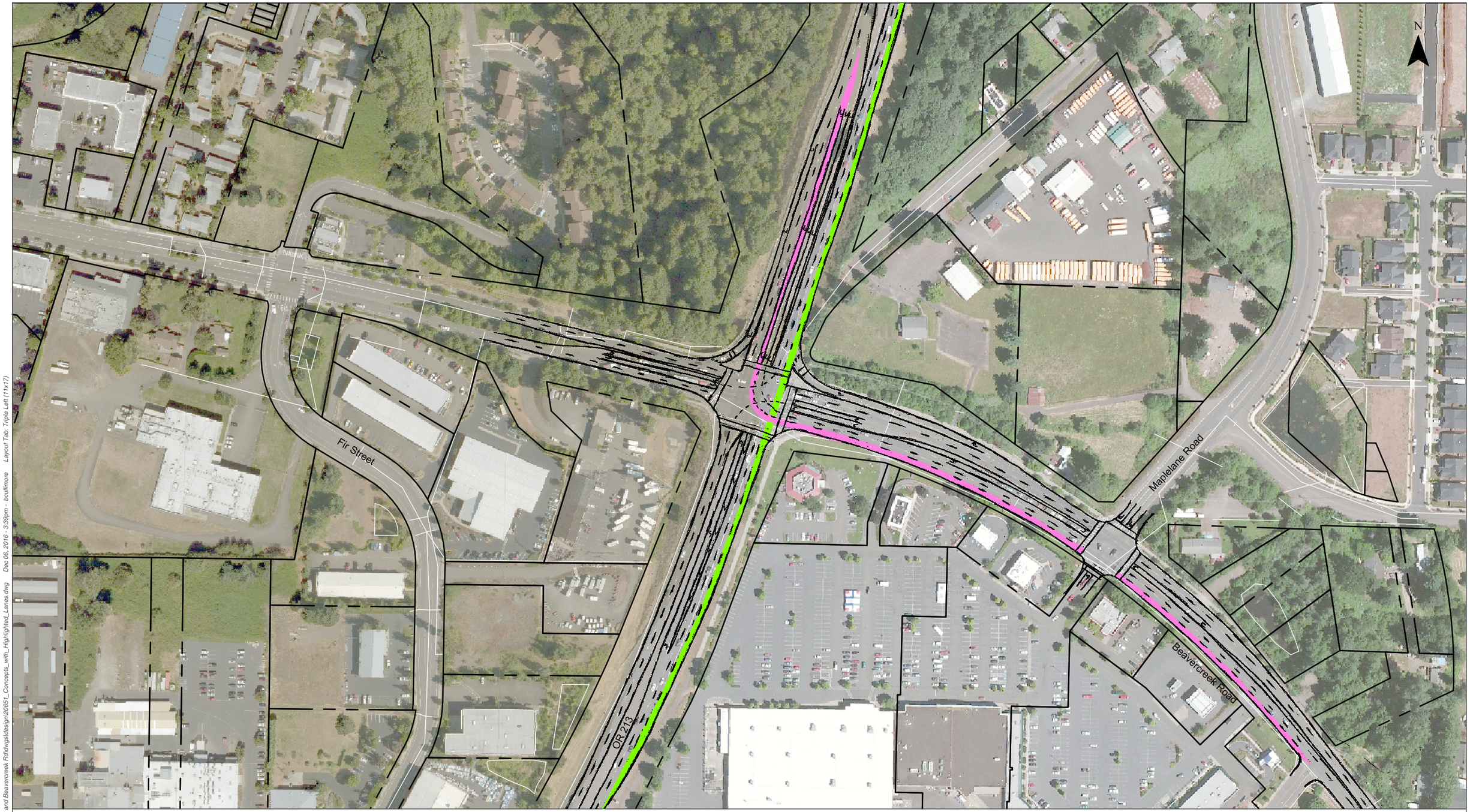
Alternatives to modify the existing intersection configuration and traffic control, which would bring the intersection into compliance with the current mobility standards in the year 2035, were identified and include:

- Addition of lanes to current configuration
- Quadrant road in the southwest quadrant of the intersection,
- Variations of displaced left-turns (also referred to as continuous flow intersection), and
- Grade-separated interchange forms.

The potential operational impacts of each alternative are shown in **Table 3** and evaluated for a variety of additional considerations in **Table 4**.

Alternative 1: Triple Left-Turns

To maintain the current mobility standard with the existing intersection control, a third southbound left-turn lane and a third northbound through lane through the intersection would be required to bring the intersection back to a v/c ratio of 0.90. The effectiveness of the additional northbound through lane is dependent on the planned extension of Meyers Road from Beavercreek Road to OR213 which would allow some eastbound right-turns at the intersection to be converted to northbound through movements based on the new network connectivity. **Figure 2** shows a sketch of these potential lane additions.



SCALE
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= New Lanes

Alternate 1: Triple Southbound Left Turn Lanes
& Three Northbound Through Lanes
Oregon City, Oregon

Figure
2

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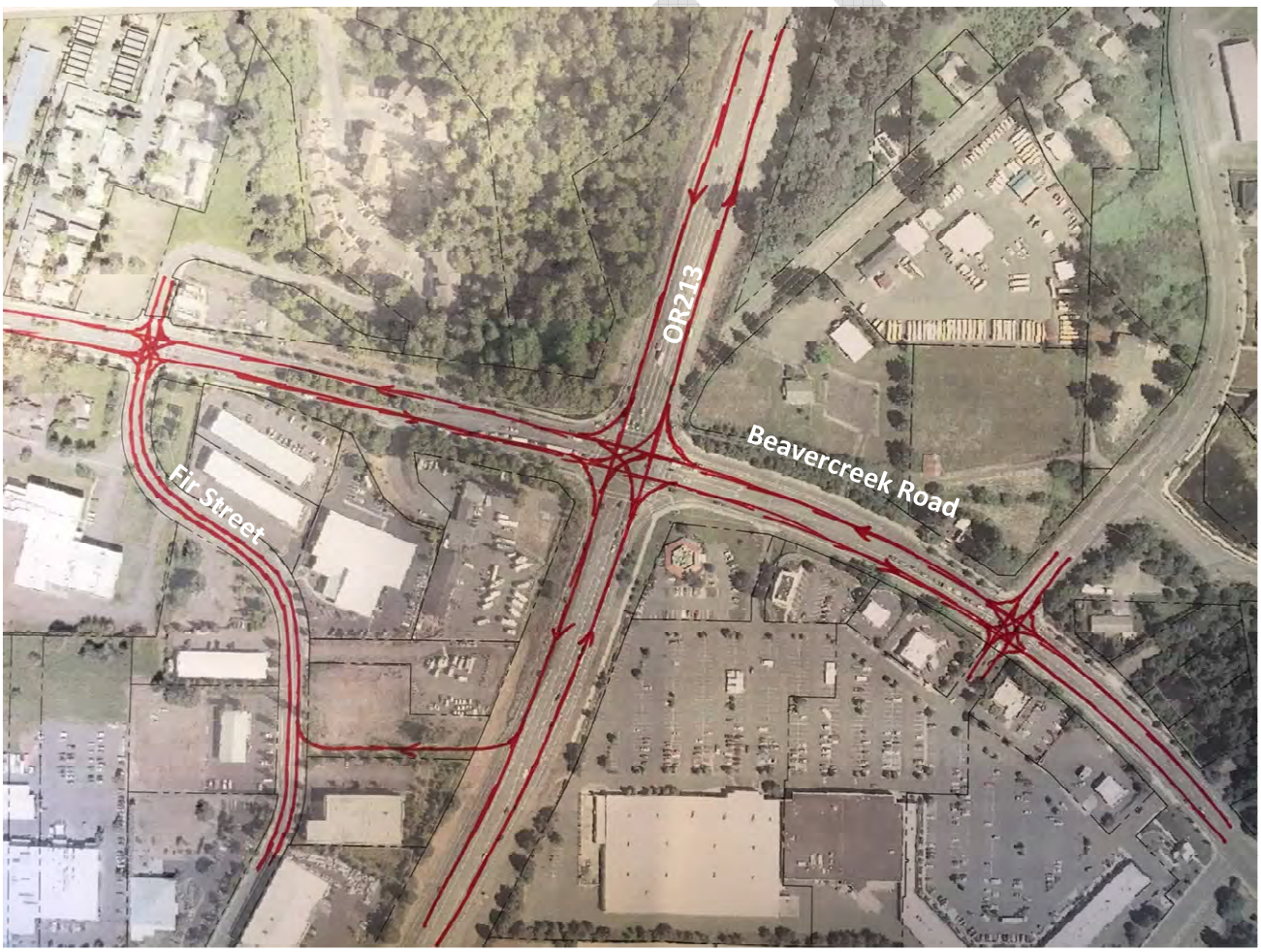
Alternative 2: Quadrant Road

A quadrant road, or indirect left, in the southwest corner of the intersection would allow southbound left-turns to be prohibited at the OR213/Beavercreek Road intersection. These vehicles would instead travel southbound through the intersection, turn right onto a new street to the south that would connect to Fir Street, and make a right-turn onto Beavercreek Road to continue east on their desired route. A third southbound through lane and third eastbound through lane would be necessary to accommodate the large volumes traveling through the intersection twice instead of once. This would reduce overall intersection delay but increase travel time for the southbound left-turn movement. The widening is likely to impact the culvert and retaining walls on the northwest and northeast corners of the intersection.

Exhibit 2. Quadrant Road Alternative



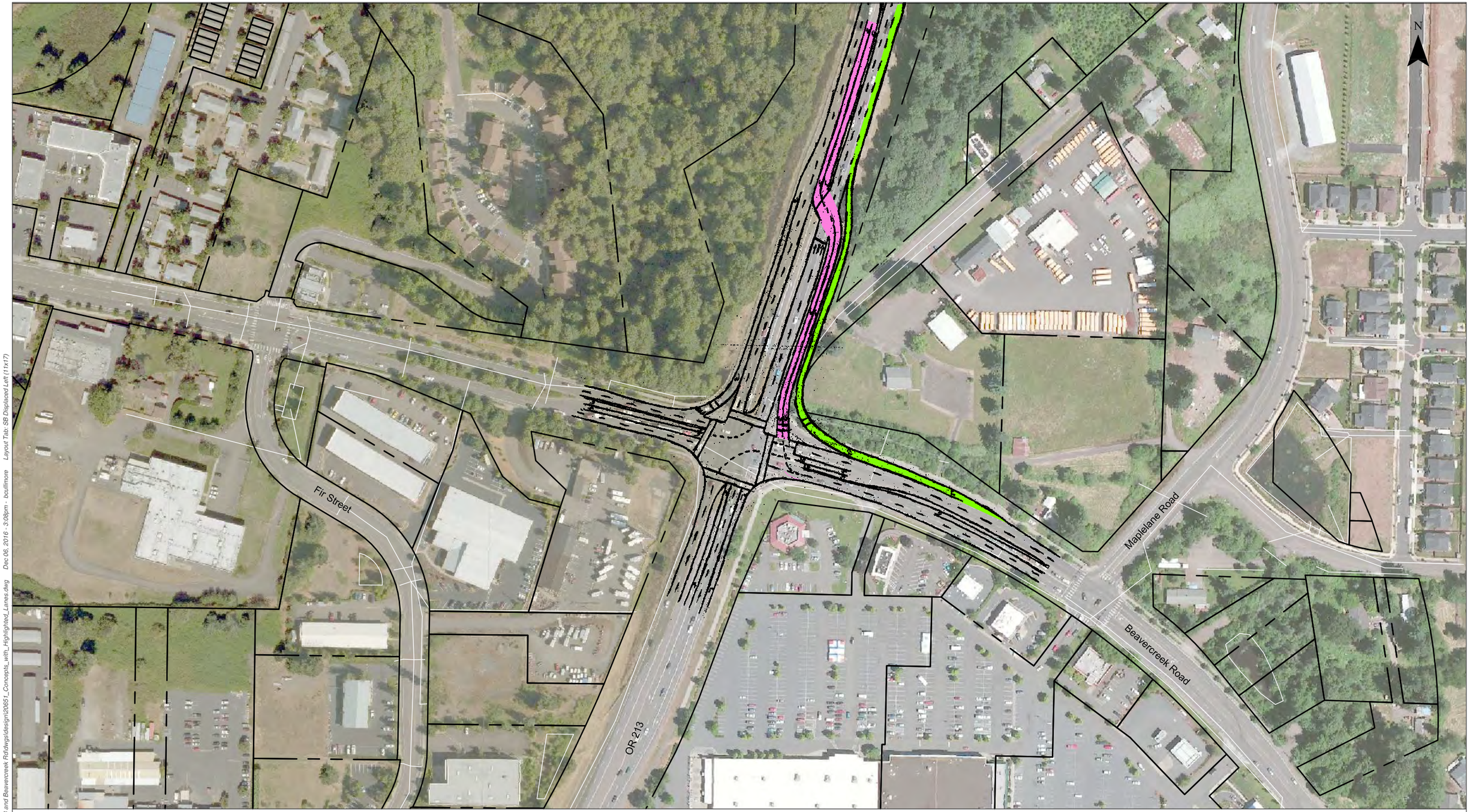
Alternatives 3 & 4: Displaced Left-Turns

In a displaced left-turn[1], or continuous flow, intersection, left-turns are removed from the main intersection and relocated to a new upstream signal. With proper coordination, vehicles are able to make a left-turn simultaneously with opposing through traffic. Displaced left-turn intersection alternatives would reduce the number of signal phases and conflict points in the OR213/Beavercreek Road intersection, thereby improving capacity and safety, but would require coordinated partial signals on the approaches with displaced left-turns. The heaviest left-turn movements at the OR213/Beavercreek Road intersection are on the southbound and eastbound approaches. **Figure 3** shows a sketch of a displaced left-turn for the southbound approach only. **Figure 4** shows a sketch of displaced left-turns for both the southbound and eastbound approaches. In either case, the southbound approach requires dual left-turn lanes. Consideration could be given to prohibiting the northbound and westbound left-turn movements as these movements have minimal traffic volumes and have alternate routes; however, these restrictions are not mandatory. Additional analysis (microsimulation) is necessary to fully understand the benefits of these potential restrictions.

Alternative 3 includes impacts to the culvert and retaining walls in the northeast corner of the intersection. Alternative 4 includes culvert and retaining wall impacts to both the northwest and northeast corners of the intersection.

DRAFT

[1] Steyn, H., Z. Bugg, B. Ray, and A. Daleiden. *Displaced Left-Turn Informational Guide.* FHWA, Washington, D.C., 2014. http://safety.fhwa.dot.gov/intersection/alter_design/pdf/fhwasa14068_dlt_infoguide.pdf



= New Lanes

SCALE
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Alternative 3: Southbound Displaced Left Turn
Oregon City, Oregon

Figure
3

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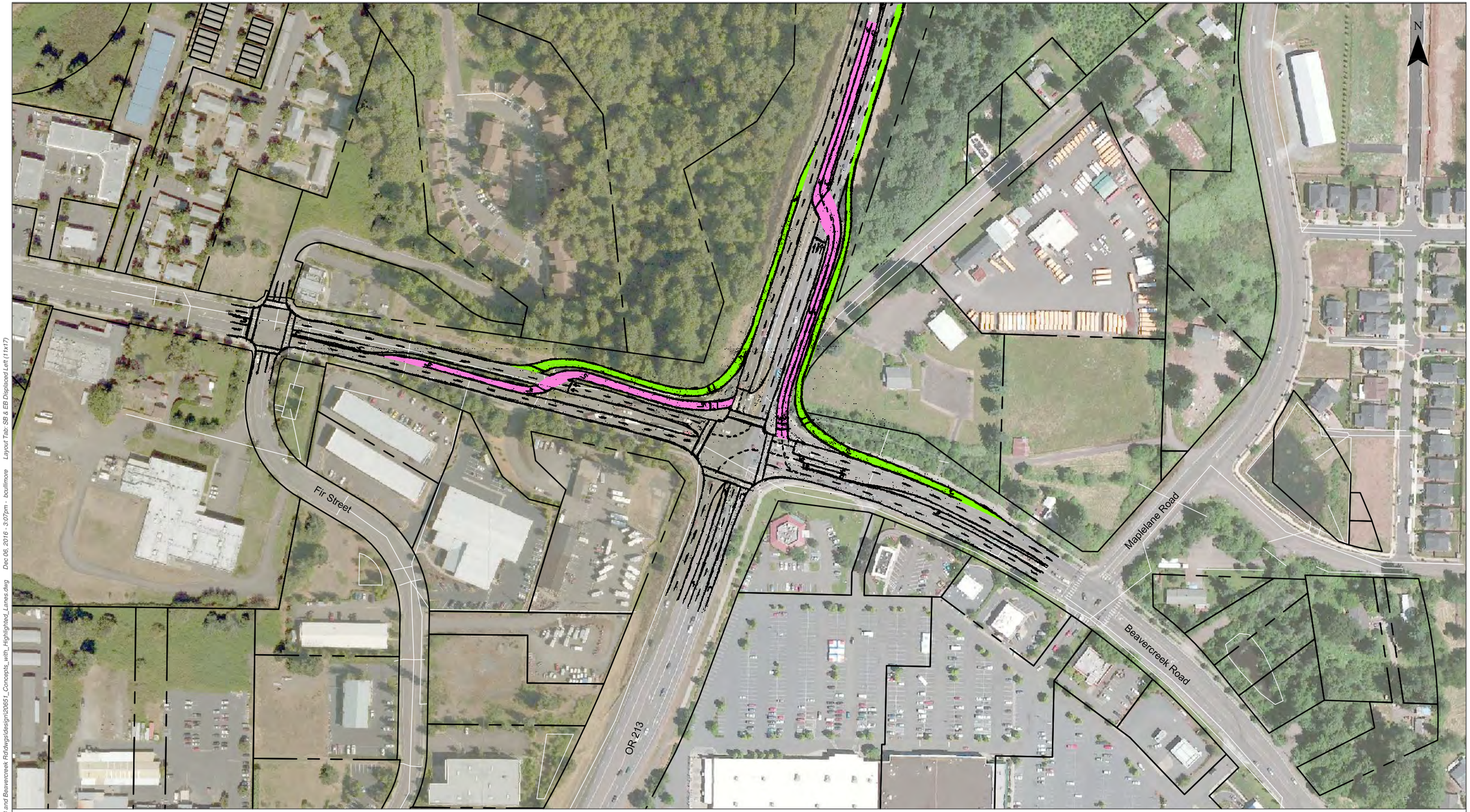

= New Lanes

SCALE
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Alternative 4: Southbound & Eastbound Displaced Left Turn
Oregon City, Oregon

Figure
4

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Alternatives 5 – 7: Grade-Separated Interchange Alternatives

Several grade-separated interchange configurations were considered including full diamond, half diamond (i.e., southbound off-ramp and northbound on-ramp only) and single-point interchanges. A project to constructing an interchange at this location was removed from the TSP in the 2013 Update at the request of ODOT as it was determined to be financially unfeasible given other regional priorities.

The construction of an interchange at the OR213/Beavercreek Road intersection would have many challenges and impacts on surrounding land uses as shown in Exhibits 3 through 5.

Exhibit 3. Half Diamond Interchange Alternative

Exhibit 4. Full Diamond Interchange Alternative

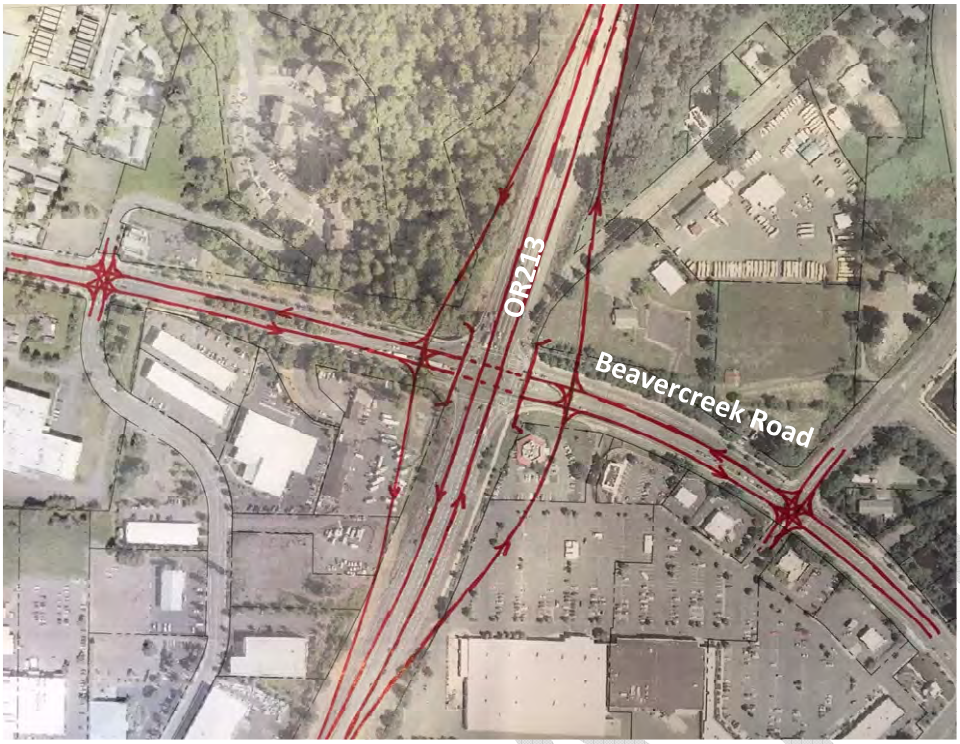
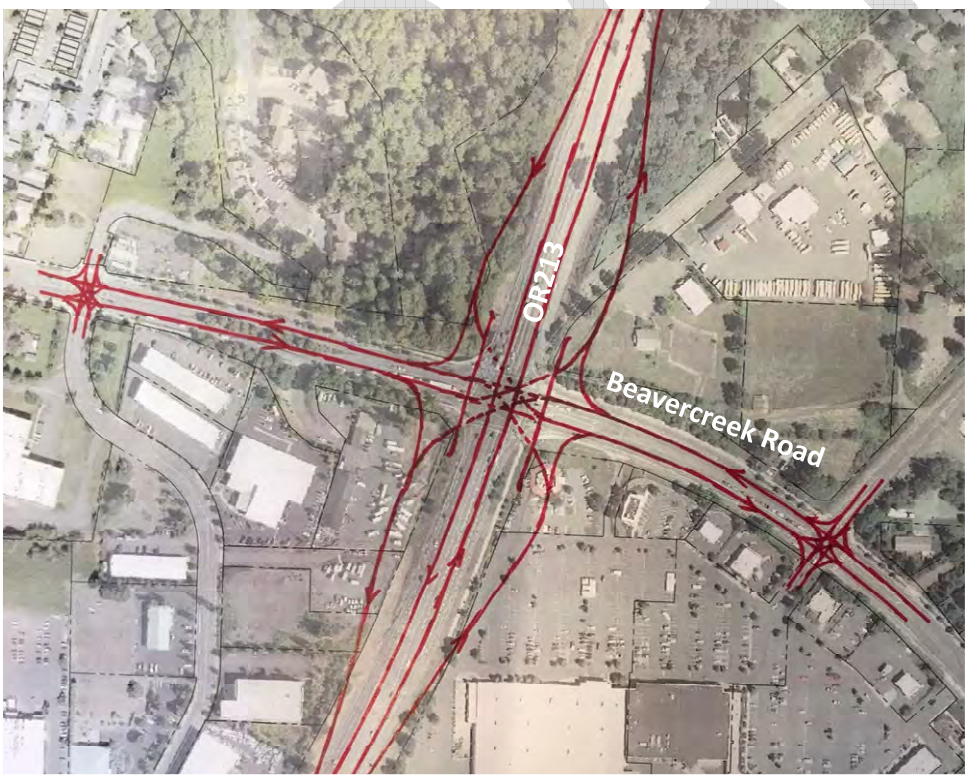


Exhibit 5. Single Point Interchange Alternative



ALTERNATIVES EVALUATION

The following provides an overview of operational analysis conducted on each alternative and summarizes the qualitative assessment for each alternative.

Operations Analysis

Planning level operational analysis was conducted using the CAP-X tool developed by FHWA[2], which can be used to evaluate alternative intersection forms and interchanges. The tool provides a total intersection (v/c) ratio. It was used for all alternatives to provide a consistent comparison of alternatives, but was found to be less conservative than Synchro in the base condition. **Table 2** summarizes the v/c ratios provided by CAP-X for each alternative. If one of these alternatives is identified as potential viable solution, it should be modeled in VISSIM to refine the forecast v/c ratio.

Table 3 – CAP-X Alternatives Operations Analysis Summary (Year 2035)

Alternative		v/c	Figure/Exhibit
1	Lane Additions: Triple Southbound Left-Turn Lanes and Three Northbound Thru Lanes	0.90	Figure 2
2	Indirect Left (S/W Quadrant Road) with Three Southbound and Eastbound Thru Lanes	0.94	Exhibit 2
3	Southbound Displaced Left-Turn	0.86	Figure 3
4	Southbound and Eastbound Displaced Left-Turns	0.81	Figure 4
5	Full Diamond Interchange with Dual Eastbound and Westbound Left-Turn Lanes	0.82	Exhibit 3
6	Half Diamond Interchange with Dual Eastbound Left-Turn Lanes	0.79	Exhibit 4
7	Single Point Interchange with Dual Eastbound and Westbound Left-Turn Lanes	0.80	Exhibit 5

As shown, all alternatives meet the mobility standard. Differences on their costs and impacts are provided in the following section.

Alternatives Assessment

Each of the alternatives was qualitatively evaluated for its impact to the intersection capacity, right-of-way impacts, environmental impact, bicycle and pedestrian impacts, cost, connectivity, and dependence on other projects. These factors are discussed below and summarized in **Table 4**.

[2] Transportation Systems Institute (TSI). *Capacity Analysis for Planning of Junctions*. Version 1.2. 2011. http://tsi.cecs.ucf.edu/index.php/cap-x

Capacity

Each of the alternatives provides sufficient capacity to meet the current mobility standard in 2035. However, the triple left-turns and indirect left alternatives (Alternatives 1 and 2) still have an overall v/c ratio equal or greater than 0.90 and may represent a short-term fix rather than a long-term solution or may not provide benefit commensurate with the costs. The displaced left-turn alternatives (Alternatives 3 and 4) provide additional capacity nearly equal to the grade-separated interchange alternatives (Alternatives 5, 6 and 7) at a significantly lower cost.

Right-of-Way Impacts

Alternatives 1, 3, and 4 may be feasible within the existing right-of-way. Alternative 2 would require right-of-way through a vacant parcel to connect OR213 to Fir Street. All of the grade separated interchange alternatives include large impacts to the right-of-way. The half diamond interchange reduces right-of-way takes as compared to the full diamond interchange without eliminating necessary movements through the intersection.

Environmental Impacts

For all alternatives, any widening on the north side of Beavercreek Road, east or west of OR213 would impact the stream and wetlands and require mitigation. They would also require extending the existing culvert crossing under OR213 on the north side of Beavercreek Road and reconstruction of the retaining walls in the northwest and northeast corners of the intersection. Additional investigation is necessary to fully understand the costs of these potential impacts and to determine if the culvert can be extended or has to be upgraded or if the widening could be accommodated utilizing existing right-of-way on the south side of Beavercreek Road.

Alternative 1 is the only alternative with the potential to not impact the northwest and northeast corners. Alternative 3 may impact the northeast corner only. Alternatives 2 and 4 would impact the northwest and northeast corners and Alternatives 5, 6, and 7 would have significant impacts in the northwest and northeast quadrants.

Bicycle and Pedestrian Impacts

All alternatives can accommodate bicycles and pedestrians; however, Alternatives 1 and 2 include additional through lanes and would increase the intersection crossing distances which is an undesirable impact. Alternatives 3 and 4 reduce the crossing distances but result in two-stage crossing of some legs of the intersection. Alternatives 5, 6, and 7 increase and decrease crossing distances depending on the leg of the intersection and result in cyclists and pedestrians navigating two major intersections instead of one.

Cost

The costs of adding additional lanes, indirect lefts, or displaced left-turns are all of similar magnitude and may require extending or reconstructing the culvert and reconstructing retaining walls.

DRAFT

Alternatives 3 and 4 also require the addition of partial signals on one or both of the southbound and eastbound legs of the intersection, respectively. Each of the interchange alternatives (Alternatives 5, 6 and 7) are assumed to be cost-prohibitive at a minimum cost of $25,000,000.

Connectivity

Turning movements to and from the south leg of OR213 are minimal due to the presence of parallel routes and/or other road network connections. The half diamond interchange alternative (Alternative 6) eliminates these movements, thereby improving capacity at the intersection. There is the potential to further improve the capacity of the displaced left-turn alternatives (Alternatives 3 and 4) by prohibiting the northbound and westbound left-turn movements as these movements have minimal traffic volumes; however, this is not a requirement of the alternatives. The connectivity improvements in the TSP are important to the flexibility and viability of these alternatives.

Dependence on Other Projects

As noted in the discussion of connectivity above, the half diamond interchange alternative (Alternative 6) is dependent on other projects in the area to provide the parallel routes necessary to accommodate the movements eliminated from the OR213/Beavercreek Road intersection. The practicality of the additional northbound through lane in the triple left-turns alternative (Alternative 1) is also dependent on the provision of road extensions, particularly the planned Meyers Road extension to OR213.

Table 4 – Alternatives Evaluation

Alternative		Additional Capacity	Right-of-Way Impacts	Environmental Impact	Bike/Ped Impacts	Cost	Eliminates Movements ?	Dependent on Connectivity Extensions?
	Existing	None	None	None	No Improvement	NA	No	Yes
1	Triple Southbound Left / Three Northbound Thru	Some	None to Minimal	None to Minimal	Increased Crossing Distances	Medium ($5-$10M)	No	Yes
2	Indirect Left (S/W Quadrant Road)	Some	New Connection on Industrial Land	NW and NE Corners	Increased Crossing Distances	Medium ($5-$8M)	No	No
3	Southbound Displaced Left-Turn	Significant	None to Minimal	NE Corner	Reduced Crossing Distances	Medium ($5-$10M)	Would provide additional benefit	No
4	Southbound and Eastbound Displaced Left-Turns	Significant	None to Minimal	NW and NE Corners	Reduced Crossing Distances	Medium ($8-$12M)	Would provide additional benefit	No
5	Full Diamond Interchange	Significant	High	NW and NE Quadrants	Two intersections	High (>$25M)	No	No
6	Half Diamond Interchange	Significant	High	NW and NE Quadrants	Two intersections	High (>$25M)	Yes	Yes
7	Single Point Interchange	Significant	High	NW and NE Quadrants	Two intersections	High (>$25M)	No	No

Consistency with Policies

The City will continue to assess if any of the alternatives are in conflict with regional land use or transportation policy frameworks or with state or locally adopted policies. Input from the Technical Advisory Group will be collected on this issue.

SUMMARY

The OR213/Beavercreek Road intersection is forecast to not meet the current mobility standard by 2035. Each of the alternatives identified above provides sufficient capacity to meet the current standard in 2035; however, the additional capacity is provided at varying degrees and each alternative has cost and other impacts to consider in determining if they are feasible solutions for the City. If none of the alternatives is found to be feasible, an alternative mobility target approach needs to be pursued.

NEXT STEPS

Alternatives will be reviewed with the TAG and CAG to determine if any should be further explored in more detail and/or if an alternative mobility target should be pursued.

Future meetings with the TAC and CAG are planned to discuss potential alternative mobility targets and ultimately select an alternative mobility target and/or preferred improvement(s) to be adopted into the city's TSP by the Planning Commission and City Council. Alternative mobility targets will also need to be agreed upon by ODOT and approved by the Oregon Transportation Commission.

DRAFT

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MEMORANDUM #2

Date: February 24, 2017

Project #: 20651

To: Dayna Webb, P.E.
Public Works Department
City of Oregon City
625 Center Street
Oregon City, Oregon 97045

From: Susan Wright, P.E. and Kristine Connolly

Project: Highway 213 & Beavercreek Road Alternative Mobility Targets (PS 16-024)

Subject: Alternative Mobility Target Methodology and Feasible Improvements

DRAFT

Oregon City's 2013 Transportation System Plan (TSP) determined that the Highway 213 (OR213) corridor from Redland to Molalla Avenue (including the intersection of Beavercreek Road) will exceed the current mobility target in 2035, resulting in more congestion than is allowed. The TSP recommended a project be conducted to identify what improvements may be necessary to meet the current target or whether an alternative mobility target is necessary. Potential improvements for the intersection of Beavercreek Road and Highway 213 were presented to the Technical Advisory Group (TAG) and Community Advisory Group (CAG) in December 2016 and January 2017, respectively. The feasibility of these alternatives is still under review; however, it is likely that none of the alternatives will be found to be cost-feasible in the near-term and although portions of the improvements may be implemented, an alternative mobility target will be necessary. This memorandum provides a menu of potential measures that could be used for establishing an alternative mobility target, reasonable target ranges, and a list of potentially feasible improvements to increase capacity and safety in the corridor. If mobility cannot be achieved, these measures and improvements will be reviewed and discussed with the TAG and CAG to select a target methodology and appropriate range, as well as recommend improvements.

POLICY CONTEXT

Mobility targets are the measure by which the state assesses the existing or forecasted operational conditions of a facility. As such, they are a key component the Oregon Department of Transportation (ODOT) uses to determine the need for, or feasibility of providing highway, or other transportation system improvements. They impact local land use and transportation planning as well as development review. Recent years have seen notable changes to Oregon's transportation planning and land use

policies and requirements. These changes reflect statewide policy to support transportation solutions that encourage economic development, contribute to public health, offer multi-modal choices for all users, and reflect the uncertain fiscal realities and limited transportation funding.

Oregon's Transportation Planning Rule (TPR)

Mobility targets for state highways, as established in this policy or as otherwise adopted by the Oregon Transportation Commission (OTC) as alternative mobility targets, are considered the highway system performance standards in compliance with the Transportation Planning Rule (TPR) (OAR 660-012), including applicability for actions that fall under Section -0060 of the TPR.

The TPR Section -0060 applies when cities or counties are considering zone changes or plan amendments that would allow for additional development that would significantly impact or worsen the performance of existing or planned transportation facilities. Currently, significant impacts are found to exist when levels of automobile traffic cause roadway facilities to exceed motorized vehicle standards, such as mobility targets. If there is a significant impact, jurisdictions are required to *"ensure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted Transportation System Plan."*

EXISTING PERFORMANCE MEASURE AND TARGET

Mobility, or congestion, may be measured and regulated in a variety of ways. In the context of this project, mobility performance measures are methods to objectively measure the transportation system, such as travel time, or reliability. Mobility targets describe an acknowledged acceptable level of performance for a measure, such as a certain level of congestion.

The existing mobility target for the OR213/Beavercreek Road intersection set forth in the Oregon Highway Plan (OHP) and the 2013 TSP is based on volume-to-capacity Ratio (v/c). The v/c ratio is a measure that reflects mobility and quality of travel. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). For example, a v/c of 1.00 indicates the roadway facility is operating at its capacity. An intersection can have an overall v/c ration of 1.00 yet have v/c ratios greater than 1.00 for individual movements where it may take more than one signal cycle to get through the intersection and queues build up. The following mobility target is set forth in the 2013 TSP for the OR213/Beavercreek Road intersection:

- During the highest one-hour period of the day, a maximum volume-to-capacity (v/c) ratio of 0.99 shall be maintained.

The Synchro model (a traffic model used to evaluate v/c ratios and other metrics) analysis completed for the 2013 TSP shows the intersection operating with an intersection v/c ratio of 0.83 for the p.m. peak hour under 2011 existing conditions. The TSP analysis also indicates that by 2035, without improvement, the intersection will function beyond the current mobility target. Under 2035 Planned

System Conditions (which includes planned, but potentially unfunded, roadway improvements), the intersection is expected to operate with a v/c ratio of 1.05, exceeding the existing mobility target (a maximum v/c ratio of 0.99). Under 2016 traffic volumes, the intersection operates with a v/c ratio of 0.97, just below the existing mobility target. The southbound left-turn and eastbound left-turn movements exhibit higher than average v/c ratios, while the westbound left-turn and northbound left-turn movements exhibit lower than average v/c ratios.

Table 1 – OR213/Beavercreek Road Intersection Operations

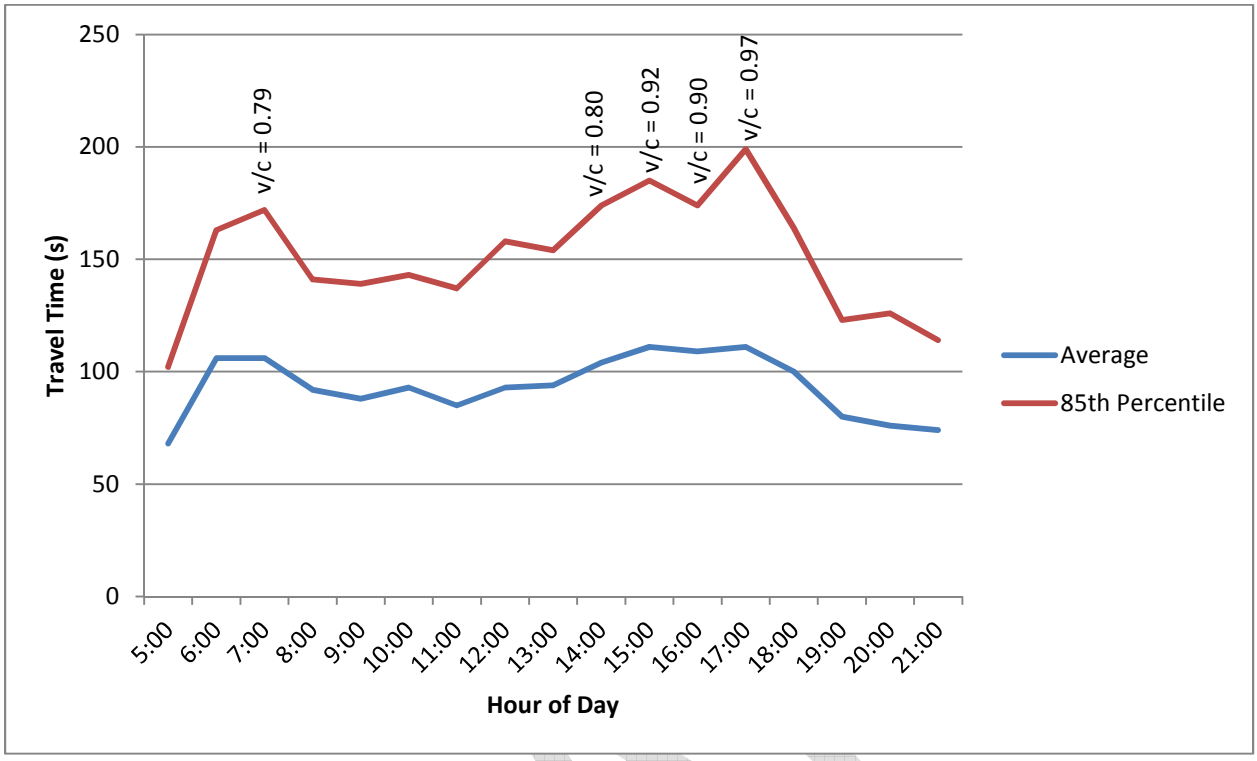
Year	PM Peak Volume-to-Capacity Ratio (v/c)
2011 (2013 TSP Existing Conditions)	0.83
2016 Traffic Volumes	0.97
2035 (2013 TSP Forecast)	1.05

Peak Hours

A travel time study was conducted at the OR213/Beavercreek Road intersection in January 2017 to evaluate the variability of traffic conditions throughout the day. This study utilized BlueTooth data collection units (BlueMAC) at each leg of the intersection to identify the travel speed and travel time for each movement (northbound left, northbound through, northbound right, etc.) separately[1]. The data was collected 24-hours per day for 7 days, allowing comparison of results by time of day and day of week. Attachment "A" provides the differences in travel time by time of day for each movement at the intersection. The data in Attachment "A" reflects typical weekday conditions (Tuesday, Wednesday, and Thursday). Exhibit 1 shows the travel time through the intersection averaged for all movements. Note that the graph provides the average travel time to traverse the intersection; some movements may experience higher travel times. The weekday PM peak hour represents the highest travel times of the day, with higher than average travel times extending from 3:00 to 6:00 PM. Above average travel times also occur during weekday midday and AM peak hours. There are approximately 5 hours per day currently experiencing high travel times compared to the rest of the day which could indicate congestion and possible cycle failure for some movements. This can be considered in evaluating the potential performances measures in the following section.

[1] Data was collected at a distance of approximately 1000' from the intersection on each leg, with the exception of the north leg, where data was collected approximately 2000' from the intersection.

Exhibit 1 –Travel Time through OR213/Beavercreek Road Intersection



The cycle length of the traffic signal at the OR213/Beavercreek intersection is approximately 120 seconds. Exhibit 1 shows that during the a.m. and p.m. peak hour periods, the average time it takes to traverse the intersection is 110 seconds. Average travel time and v/c ratio are not directly linked; however, the average travel times increase and decrease with v/c ratio. Table 2 provides volume-to-capacity ratios for the five highest volume hours of the day. These v/c ratios are noted on Exhibit 1 during their corresponding hour.

Table 2 – 2016 Existing Intersection Operations for the Five Highest Volume Hours (OR213/Beavercreek Road)

Highest Hour	Time of Day	Total Entering Volume	V/C
1st	5-6 PM	6059	0.97
2nd	4-5 PM	5858	0.90
3rd	3-4 PM	5623	0.92
4th	2-3 PM	4972	0.80
5th	7-8 AM	4619	1.04[2]

[2] The v/c ratio for the AM peak hour is 1.04 due the high volume of westbound right-turns. If the westbound right-turns are excluded the intersection v/c is 0.79. This is under further review.

Oregon Highway Plan Policy 1F

The Oregon Highway Plan (OHP) defines polices and investment strategies for Oregon's state highway system for the next 20 years. The OHP gives policy and investment direction to corridor plans and transportation system plans that are being prepared around the state, but it leaves the responsibility for identifying specific projects and modal alternatives to those plans.

The OHP Policy 1F establishes mobility targets (as defined by motorized vehicle volume-to-capacity ratios) for state facilities that vary by region, facility classification, and whether or not the roadway is located inside an urban growth boundary (UGB). It states, *"It is the policy of the State of Oregon to maintain acceptable and reliable levels of mobility on the state highway system, consistent with expectation for each facility type, location and functional objectives. Highway mobility targets will be the initial tool to identify deficiencies and consider solutions for vehicular mobility on the state system. Specifically, mobility targets shall be used for:*

- *Identifying state highway mobility performance expectations for planning and plan implementation;*
- *Evaluating the impacts on state highways of amendments to transportation plans, acknowledged comprehensive plans and land use regulations pursuant to the Transportation Planning Rule (OAR 660-12-0060); and*
- *Guiding operations decisions such as managing access and traffic control systems to maintain acceptable highway performance."*

The OHP Policy 1F allows for development of alternative mobility targets in areas where it is "infeasible or impractical to meet the mobility targets". The policy allows for the use of alternative mobility targets to *"balance overall transportation system efficiency with multiple objectives of the area being addressed."* It requires that targets *"shall be clear and objective and shall provide standardized procedures to ensure consistent application of the selected measure. The alternative mobility target(s) shall be adopted by the Oregon Transportation Commission as an amendment to the OHP."* The OHP currently includes alternative mobility targets in many locations throughout the State; however, none have been adopted within the Portland Metro area to date.

MAJOR IMPROVEMENT ALTERNATIVES (MEMORANDUM #1)

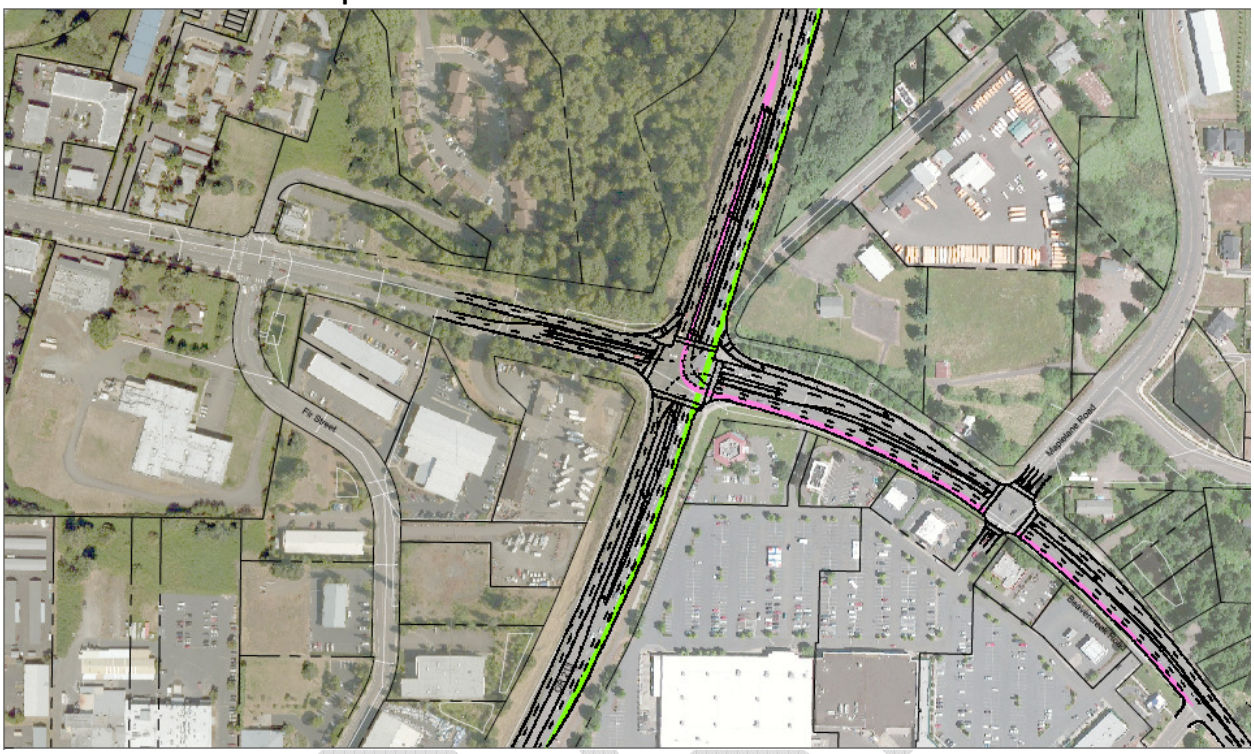
The following alternatives from Technical Memorandum #1 are still under review to determine physical and financial feasibility. This additional work will discussed at the next set of advisory committee meetings. Table 5 lists these alternatives, as well as their relative benefits, constraints, opportunities, and risks.

Alternative 1: Triple Left-Turns

Add a third southbound left-turn lane and a third northbound through lane through the intersection while continuing to maintain a separate northbound right-turn lane (not reflected in Exhibit 2). This is

projected to operate at a v/c ratio of 0.90 in the 2035 TSP horizon year. A conceptual sketch of Alternative 1 can be seen in Exhibit 2.

Exhibit 2 – Alternative 1: Triple Left-Turns

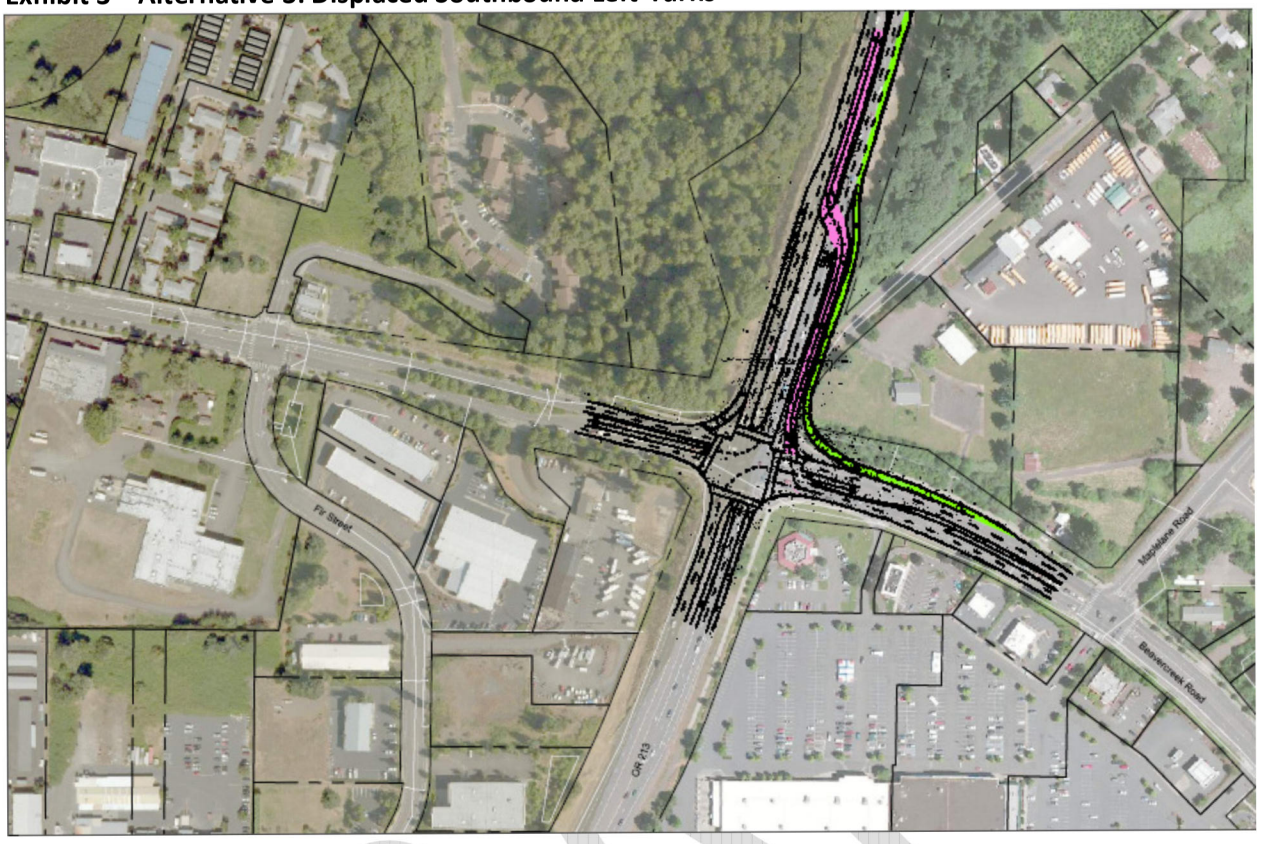


Alternative 3: Displaced Southbound Left-Turns

Construct a southbound displaced left-turn[3] (or continuous flow) intersection. Displaced left-turns reduce the number of signal phases and conflict points at the intersection, thereby improving capacity and safety, but require coordinated partial signals on the approaches with displaced left-turns. Alternative 3 likely includes impacts to the culvert and retaining walls in the northeast corner of the intersection. A conceptual sketch of Alternative 3 can be seen in Exhibit 3.

[3] Steyn, H., Z. Bugg, B. Ray, and A. Daleiden. *Displaced Left-Turn Informational Guide.* FHWA, Washington, D.C., 2014. http://safety.fhwa.dot.gov/intersection/alter_design/pdf/fhwasa14068_dlt_infoguide.pdf

Exhibit 3 – Alternative 3: Displaced Southbound Left-Turns



Alternatives 5 and 7

A project to construct an interchange at this location was removed from the 2013 TSP Update. The interchange was eliminated due to livability, multi-modal access and funding constraints within the 2035 planning horizon. Additionally, at the request of ODOT as it was determined to be financially infeasible given other regional priorities. Conceptual sketches of Alternatives 5 and 7 can be seen in Exhibits 4 and 5, respectively.

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Exhibit 4 – Full Diamond Interchange

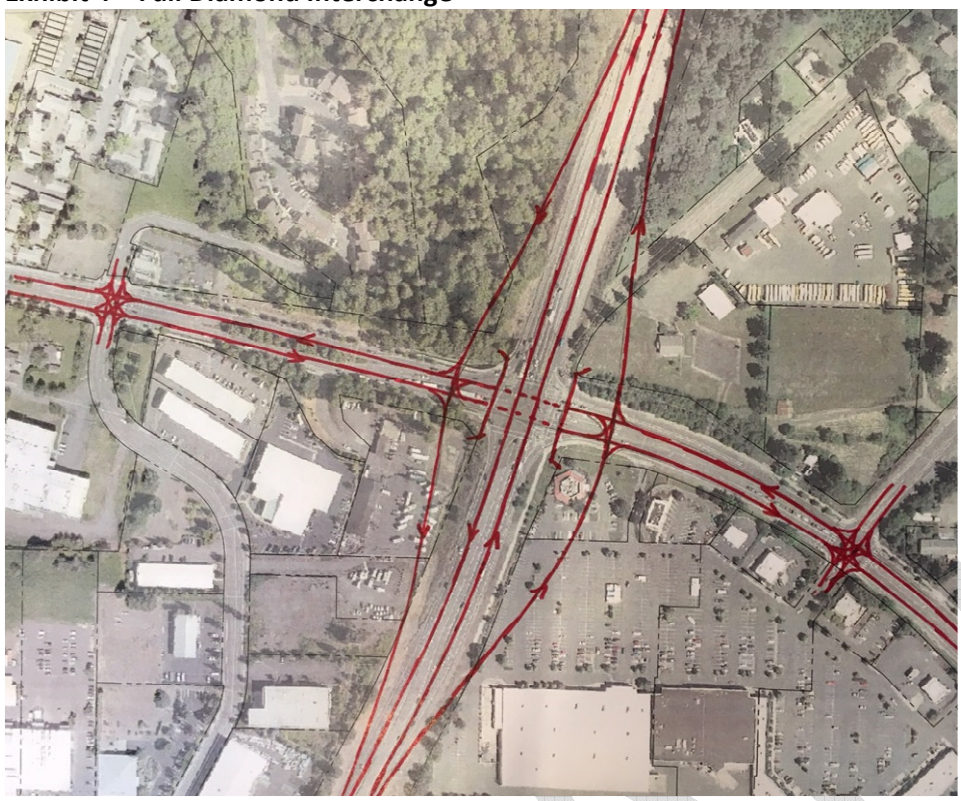

Exhibit 5 – Single Point Interchange

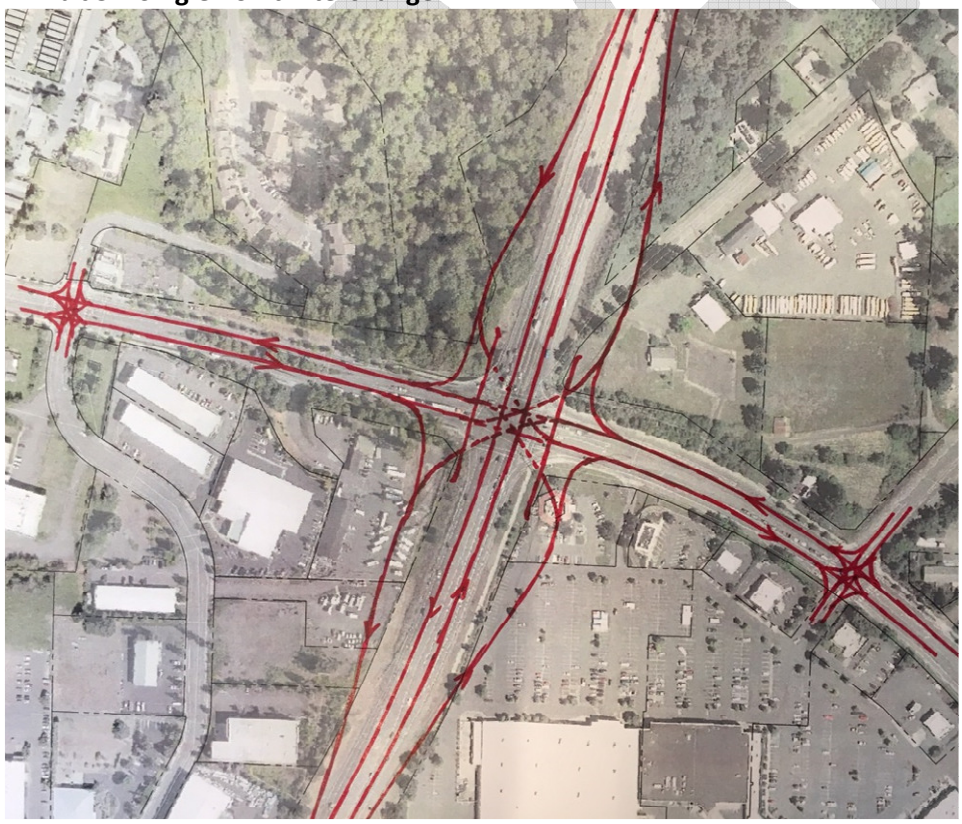

Table 3 – Intersection Alternatives Considered

Alternative	Benefits	Opportunities	Constraints	Risks
Alternative 1: Triple Left-Turns	Meets current mobility target in 2035	North and east legs of intersection	Cost; vehicle navigation of three left-turn lanes	Increase sideswipe crashes through turn and downstream weave
Alternative 3: Displaced Southbound Left Turns	Meets current mobility target in 2035	North leg of intersection	Cost; impact to existing culvert and retaining walls	Driver confusion with uncommon intersection type
Alternative 5: Full Diamond Interchange	Meets current mobility target in 2035; greatly increases capacity for through traffic on OR213	All approaches of the intersection	Cost; right-of-way	Increased intersection exposure (i.e., two large ramp terminals) for pedestrians and bicyclists
Alternative 7: Single-Point Interchange	Meets current mobility target in 2035; greatly increases capacity for through traffic on OR213	All approaches of the intersection	Cost; right-of-way	

POTENTIAL PERFORMANCE MEASURES

The OR213/Beavercreek Road intersection is currently experiencing deficiencies in capacity and safety for vehicular modes of travel. Mobility is currently measured by using v/c to measure the average level of congestion for motorists entering all legs of an intersection. With this project, we will explore the menu of options available to measure congestion both at an intersection and along the Highway 213 corridor, from Redland Road to Molalla Avenue. While it is important that the intersection be complete and accessible by all modes, the potential performance measures set forth in this memorandum primarily address vehicle mobility. Table 3 provides a menu of potential alternative mobility measures and reasonable target ranges which can be used in development review. The menu was developed based on a performance measure literature review of published engineering manuals, rating systems, and academic sources conducted by Kittelson & Associates, Inc.

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Table 4 – Potential Performance Measures and Alternative Mobility Target Ranges

Measure	Definition	Potential Target	Ease of Application
Mobility			
Volume to Capacity (v/c) Ratio	This is the current performance measure, measured as an average of all potential movements through an intersection. V/C ratio is a measure that reflects mobility and quality of travel. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). For example, a v/c of 1.00 indicates the roadway facility is operating at capacity. *Existing and Forecast v/c ratios:* Year 2011: 0.83 Year 2016: 0.97 Year 2035: 1.05	Maintain current target of 0.99, but allow intersection to exceed this ratio for no more than a specified number of hours per day. OR Increase current target to a higher ratio, such as 1.1, not to be exceeded during the peak hour of the day.	Could be applied with existing analysis tools used in Traffic Impact Studies. May require additional hours of traffic count data collection.
Intersection Delay	The average total vehicle delay of all movements through an intersection. Vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. *Existing and Forecast Intersection Delay:* 2011: 40.7s 2016: 56.8s 2035: 73.4s	Average intersection delay shall not exceed "X" seconds during the peak hour of the day. OR Average intersection delay shall not exceed "X" seconds for more than a specified number of hours per day.	Could be applied with existing analysis tools used in Traffic Impact Studies. May require additional hours of traffic count data collection.
Intersection Level of Service (LOS)	A quantitative stratification on an A through F scale that represents a traveler's perceptions of quality of service by a facility. For autos, level of service is based on the average delay. *Existing and Forecast Intersection LOS:* 2011: D 2016: E 2035: E	Maintain overall intersection LOS of "X" or better during the peak hour of the day. Individual movements may exceed this LOS. OR Maintain overall intersection LOS of "X" or better for more than a specified number of hours per day.	Could be applied with existing analysis tools used in Traffic Impact Studies. May require additional hours of traffic count data collection.
Critical Movement Delay	A measure of delay at an intersection for the critical movement. *Existing and Forecast Critical Movement Delay:* 2011: EBL 60s 2016: EBL 112s 2035: EBL 123s	Critical movements (southbound left turn, northbound through, eastbound left turn and westbound through) may not exceed a delay of "X" seconds per vehicle during the peak hour of the day. OR Critical movement delay may not exceed "X" seconds per vehicle for more than a specified number of hours per day.	Could be applied with existing analysis tools used in Traffic Impact Studies. May require additional hours of traffic count data collection.

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Average Travel Time	A measure of the time it takes, on average, for a vehicle to navigate the intersection, including queued time for red light or congestion.	Average travel time through the intersection or corridor may not exceed "X" minutes for any movement. OR Average travel time through the intersection or corridor may not exceed "X" minutes for any movement for more than a specified number of hours per day.	Would require travel time data collection and additional tools to predict future travel time.
Travel Time Reliability	Travel time reliability measures the variability in the expected travel time vs. the actual travel time experienced due to demand fluctuations, traffic control devices, traffic incidents, weather, work zones, and physical capacity. ▪ Buffer Index – compares the 95th percentile travel time to the average travel time. 95th percentile travel time is the time you would plan for your trip in order to be on-time 95% of the time. A buffer index of 45% means the 95th percentile travel time is 45% longer than the average travel time and you must plan 45% more time for your trip to be on time 95% of the time. ▪ Planning Time Index –compares the 95th percentile travel time to the free flow travel time. For example, 2.25 means the 95th percentile travel time is 2.25 times as long as when conditions are free-flowing. Can be measured by comparing peak hour travel time to off-peak travel time through the intersection.	Buffer Index shall not exceed "X"%. OR Planning Time Index shall not exceed "X".	Would require travel time data collection and use of Dynamic Travel Assignment model to predict future travel time reliability.
Average Speed	The average speed (including stopped time) at which a vehicle is able to navigate through the intersection. This is typically slower for turning vehicles than for through vehicles.	Average speed through the intersection or corridor shall be within a specified range during the peak hour of the day.	Would require speed data collection and additional tools to predict future travel speeds.
Congestion Duration	The proportion of the day, in hours, that an intersection experiences congestion.	Allow the intersection to exceed one of the above targets for a specified number of hours per day.	Could be applied with existing analysis tools used in Traffic Impact Studies. May require additional hours of traffic count data collection.

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Intersection Completeness	Percent of facilities that are constructed. May consider whether facilities are built to current standards.	Intersection shall include: ▪ Complete bicycle facilities up to stop bar ▪ Bicycle boxes and bicycle pavement markings to serve designated bicycle routes ▪ Detection and actuation for bicycles ▪ Countdown signal displays for pedestrians ▪ Lighting	No new data or analysis required.
Safety			
Crash Rate	The rate of crashes occurring at an intersection or on a segment, often measured in crashes per million entering vehicles or crashes per million VMT.	Lower predicted crash rate than existing condition ▪ Total crashes by mode per million entering vehicles ▪ Total fatal and serious injury crashes by mode per million entering vehicles	Easy to calculate. Any increase in trips from development would have an impact on the measure. These could be difficult to mitigate once all identified safety improvements at a location are complete but could result in implementation of systemic safety countermeasures.
Crash Frequency	The number of crashes occurring at a site, facility, or network in a one year period. Can be differentiated by severity.	Lower predicted crash frequency than existing condition ▪ Total crashes by mode ▪ Total fatal and serious injury crashes by mode	
Excess Proportions of Specific Crash Types	This is the difference between the observed proportion of a specific crash type for a site and the threshold proportion (such as a statewide average) for the reference population.	Specific crash type rates shall not exceed average statewide crash rates by more than ”X%”.	

In the context of long-term planning, safety measures and intersection completeness can be used to determine whether planned improvements are adequate to accommodate growth. However, in development review they can only be used to make sure that the appropriate improvements or proportionate share of improvements have been provided.

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SAFETY AND CAPACITY IMPROVEMENTS

Safety and capacity improvements to OR213 from Redland Road to Molalla Avenue (including the Beavercreek Road intersection) could be implemented in tandem with the proposed alternative mobility target. These approaches, while not providing adequate capacity to meet the current mobility target, would increase capacity and/or safety at the intersection, providing an overall improvement. Table 4 lists these improvements, as well as their relative benefits, constraints, opportunities, and risks.

Table 5 – Intersection Improvement Approaches Considered

Improvement	Benefits	Opportunities	Constraints	Risks
Increase all-red time	Reduces red-light running crashes, particularly turning and angle crashes	All approaches of the intersection	Reduces intersection capacity and increases queueing. Helps reduce turning and angle crashes, which are not prevalent at this intersection.	Increase rear-end crashes, the most common type at signalized intersection
Install red-light cameras	Reduces red-light running crashes, particularly turning and angle crashes	All approaches of the intersection	Community Opposition. Helps reduce turning and angle crashes, which are not prevalent at this intersection.	Increase rear-end crashes, the most common type at signalized intersection
Increase shoulder width	Safer bicycle travel	North leg of intersection	Costs/Impacts to retaining wall	N/A
Install pedestrian countdown signal displays	Increase safety and ease for pedestrians	All approaches of the intersection	N/A	May require costly improvements to comply with the Americans with Disabilities Act (ADA)
Improve lighting	Increase safety for all modes	North and south legs of intersection	N/A	N/A
Provide acceleration lane for WB to NB right turning vehicles	Reduce queuing between OR213 and Maple Lane, and increase capacity of westbound approach	North leg of intersection	Retaining wall in northeast corner of the intersection	Increase sideswipe crashes
Eliminate westbound left-turn lane and extend eastbound left turn storage onto Maple Lane	Reduce queuing and crashes related to queues on Beavercreek Road at Maple Lane	East leg of intersection	Rerouting of westbound lefts to Meyers Road and potential increased travel time	Confusion by drivers resulting in illegal maneuvers

SUMMARY

The OR213 corridor from Redland Road to Molalla Avenue (including the Beavercreek Road intersection) is forecasted to exceed the current mobility target by 2035. Each of the alternatives identified in the Technical Memorandum #1 provides sufficient capacity to meet the current standard

in 2035; however, the additional capacity is provided at varying degrees and each alternative has cost and other impacts to consider in determining if they are feasible solutions for the City. If none of the alternatives is found to be feasible, an alternative mobility target approach needs to be pursued.

This memorandum provided the policy context for intersection performance measures, a menu of potential measures that could be used for establishing an alternative mobility target, reasonable target ranges, and a list of potentially feasible low-cost improvements to improve operations and increase safety at the intersection.

NEXT STEPS

Potential measures and alternative mobility target ranges will be reviewed with the TAG and CAG. Future meetings with the TAG and CAG are planned to discuss the feasibility of intersection improvements and potential alternative mobility measures and targets. Any changes will likely require a Legislative public review process before the City's Planning Commission and City Commission. If the project concludes that alternative mobility targets and measures will be needed, they will need to be agreed upon by ODOT and approved by the Oregon Transportation Commission.

DRAFT

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MEMORANDUM

Date: April 14, 2017

Project #: 20651

To: Dayna Webb, P.E.
Public Works Department
City of Oregon City
PO Box 3040
625 Center Street
Oregon City, Oregon 97045

From: Susan Wright, P.E., and Kristine Connolly

Project: Highway 213 Corridor Alternative Mobility Targets (PS 16-024)

Subject: Memorandum #3: Financially Feasible Improvements and Alternative Mobility Target Assessment

Oregon City's 2013 Transportation System Plan (TSP) determined that the Highway 213 (OR213) corridor from Redland Road to Molalla Avenue (including the intersection of Beavercreek Road) will exceed the current mobility target in 2035, resulting in more congestion than is allowed. The TSP recommended a project be conducted to identify what improvements would be necessary to meet the current target or whether an alternative mobility target is justified. The OR213 intersection with Molalla Avenue is anticipated to meet the target; however, Beavercreek Road and Redland Road are not anticipated to meet the target. The following memorandum provides an overview of these two intersections including safety, operations, and cost analysis of the potential improvements at these intersections and identifies potential alternative mobility targets that would be necessary in conjunction with financially feasible operational and safety improvements.

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OR213/Beavercreek Road

Exhibit 1 below provides an overview of the intersection.

Exhibit 1. Highway 213 (OR213) and Beavercreek Road Intersection

Potential improvements for the intersection of Beavercreek Road and OR213 that focused on significantly increasing the intersection capacity to meet the current mobility target were presented to the Technical Advisory Group (TAG) and Community Advisory Group (CAG) in December 2016 and January 2017. None of the alternatives were determined to be financially feasible, even by the 2035 horizon year of the TSP given the financial constraints of the city and other agency partners. In addition, some of the potential alternatives could have additional consequences including right-of-way impacts, environmental impacts, and could potentially complicate the provision of services for bicyclists, pedestrians, and transit users. Nonetheless, it is recommended that the alternatives be documented in the TSP for additional future consideration as part of the TSP's unconstrained plan. The unconstrained plan includes projects that are not currently anticipated to be financially feasible by 2035 but are projected to be needed and could be implemented if additional funding becomes available in the future.

Because achieving the mobility standard through a major capacity-expanding project at this intersection has been determined to be beyond the financial capabilities of the city and its partner agencies, an alternative mobility target will be necessary. As a result of this study, some improvements were identified that, while not allowing the mobility standard to be fully met, would increase the intersection capacity, improve safety, and are within the financial capabilities of the city and its partner agencies. Safety and operational improvements are identified below that minimize future congestion and can be included in the cost-constrained TSP.

The existing mobility standard for the OR 213/Beavercreek Road intersection set forth in the 2013 TSP is based on volume-to-capacity ratio (v/c). The v/c ratio is a measure that reflects mobility and quality of travel. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). For example, a v/c of 1.00 indicates the roadway facility is operating at its capacity. The following mobility

standard is set forth in the 2013 TSP for the OR213/Beavercreek Road intersection: a maximum volume-to-capacity (v/c) ratio of 0.99 shall be maintained during the peak first and second hours.

A menu of potential alternative performance measures, reasonable target ranges, and a list of potentially feasible improvements to increase capacity and safety in the corridor was presented to the TAG and CAG in March 2017. The majority of TAG and CAG members agreed that an alternative mobility target allowing intersection volume-to-capacity ratios to exceed the existing target of 0.99 for no more than a specified number of hours per day would be appropriate for the corridor. The TAG and CAG were also in favor of further investigation of potential improvements to increase safety and capacity at the Beavercreek Road and OR213 intersection. The specific projects identified by the TAG and CAG for additional analysis were: 1) the provision of an acceleration lane for westbound right-turning vehicles and 2) elimination of the second westbound left-turn lane to increase left-turn storage on eastbound Beavercreek Road at Maple Lane Road.

The following sections provide an assessment of the alternative mobility target and potential financially feasible improvements identified by the TAG and CAG for further consideration at the intersection of OR213 and Beavercreek Road.

OR213/Redland Road

Exhibit 2 below provides an overview of the intersection.

Exhibit 2. Highway 213 (OR213) and Redland Road Intersection

The TSP includes a project to improve capacity at the OR213/Redland Road intersection (identified as project D79). The improvements identified in the TSP are part of Phase 2 of the "Jughandle" project, a project that focused on the intersection of OR213 and Washington Street that was implemented in 2013. The Phase 2 improvements, including improvements at OR213/Redland Road are already 90% designed. The improvements identified in Phase 2 future construction include an additional northbound and southbound through lane resulting in three northbound and three southbound lanes through the intersection. However, these improvements are not part of the financially constrained

plan. Like the OR213/Beavercreek Road intersection, major capacity-increasing improvements at this intersection were determined to be beyond the financial capabilities of the city and its partner agencies during the TSP development process. Lacking the financial capability to implement the identified project, this intersection also requires an alternative mobility target. The target for this intersection should use a similar measure to that of OR213/Beavercreek Road but may have a different number of hours that are expected to exceed the target.

As the intersection of OR213/Redland Road is within the corridor, the scope of this study has been extended to include assessment of financially viable projects that provide safety and operational benefits at the OR213/Redland Road intersection. The specific project identified for additional analysis includes converting the southbound right-turn lane to a shared through/right-turn lane.

The following sections provide an assessment of the alternative mobility target and potential financially feasible improvements for further consideration at the intersection of OR213 and Redland Road.

ALTERNATIVE MOBILITY TARGET AND FINANCIALLY FEASIBLE IMPROVEMENTS ASSESSMENT

The following provides an overview of safety analysis, operations analysis, and cost estimates of potential cost-feasible safety and operational improvements that could be implemented at the OR213/Beavercreek Road and OR213/Redland Road intersections in conjunction with an alternative mobility target.

Safety Analysis

The OR213/Beavercreek Road intersection was identified in the 2013 TSP as a high collision intersection. The Oregon Department of Transportation (ODOT) Crash Analysis and Reporting Unit provided crash records at the intersection for the 5-year period from January 2010 through December 2014. **Table 1** summarizes the reported crash data. The crash data is included in **Appendix A**.

Table 1 - OR213/Beavercreek Road Intersection Crash Summary and Crash Rate Assessment (2010-2014)

Crash Type				Severity							
Rear-End	Turning	Angle	Other	PDO	Injury	Fatal	Total	Critical Crash Rate by Intersection Type	Critical Crash Rate by Volume	Observed Crash Rate at Intersection	Observed Crash Rate>Critical Crash Rate?
116	7	5	5	58	74	1	133	0.59	0.50	1.20	Yes

PDO = Property Damage Only
Crash Rate = crashes per million entering vehicles

As shown in Table 1, the most predominant crash type at the OR213/Beavercreek Road intersection is rear-end crashes. The TSP includes a project to implement an advance warning system to help mitigate these types of crashes for the southbound approach.

Crash data for the OR213/Redland Road intersection was obtained from the February 2017 Serres Farm Annexation Traffic Impact Study for the 3-year period from January 2013 through December 2015. **Table 2** summarizes the reported crash data. The crash data is included in **Appendix A**.

Table 2 - OR213/Redland Road Intersection Crash Summary and Crash Rate Assessment (2013-2015)

Crash Type				Severity			Total	Critical Crash Rate by Intersection Type	Critical Crash Rate by Volume	Observed Crash Rate at Intersection	Observed Crash Rate>Critical Crash Rate?
Rear-End	Turning	Angle	Other	PDO	Injury	Fatal					
22	4	0	1	8	19	0	27	0.39	0.54	0.44	Yes

PDO = Property Damage Only
Crash Rate = crashes per million entering vehicles

Both the OR213/Beavercreek Road and OR213/Redland Road intersections have observed crash rates which exceed the Critical Crash Rate, meaning that they exceed the crash rate of other comparable intersections. For this reason, applicable TSP planned improvements and other potential improvements were analyzed at each intersection to determine their impact on the expected crash frequency at each intersection. **Table 3** summarizes the improvements in the TSP.

Table 3 – 2013 Oregon City Transportation System Plan Projects located in the southeast part of the City

Project #	Project Description	Project Extent	Project Elements	Priority	Funded?
D14	Southbound OR 213 Advanced Warning System	Southbound OR 213, north of the Beavercreek Road intersection	Install a queue warning system for southbound drivers on OR 213 to automatically detect queues and warn motorists in advance via a Variable Message Sign	Short-term	Likely
D79	OR 213/Redland Road Capacity Improvements	Redland Road to Redland Road Undercrossing	Add a third northbound travel lane on OR 213 north of the Redland Road undercrossing. Extend the third southbound travel on OR 213 south of the Redland Road intersection and merge the third lane before the Redland Road undercrossing. Add a right-turn lane (southbound OR 213 to westbound Redland). Convert the Redland Road approach to OR 213 to 1 receiving lane, 2 left-turn approach lanes, and 1 right-turn lane.	Long-term	Not Likely

In addition to these planned improvements, the impact of a westbound right-turn acceleration lane at OR213/Beavercreek Road and an additional southbound through lane (shared with the southbound right-turn lane) at OR213/Redland Road were analyzed. The intersections and improvements were analyzed using HiSafe[1] software and crash modification factors (CMF) from the CMF Clearinghouse. **Tables 4 and 5** show the 2035 expected annual crashes with and without these improvements.

[1] HiSafe companion software to the Highway Safety Manual (HSM) applies HSM Predicative Method for estimating the average number of expected annual crashes for quantitative assessment of safety performance.

Table 4 – OR213/Beavercreek Road 2035 Expected Annual Crashes

Existing Configuration	With Westbound Right-Turn Acceleration Lane (CMF #295 applied to westbound rear-end crashes)	With Southbound Advanced Queue Warning System (CMF #76 applied to southbound rear-end injury crashes)	With Both Improvements
26.39	25.75	25.77	25.13
-	-2.4%	-2.3%	-4.8%

Table 5 – OR213/Redland Road 2035 Expected Annual Crashes

Existing Configuration	With 3rd Southbound Through/Right Lane (CMF #7924 applied to southbound crashes)	With 3 Northbound and 3 Southbound Through Lanes (CMF #7924 applied to northbound and southbound crashes)
8.82	8.24	7.92
-	-6.6%	-10.2%

As shown in **Tables 4 and 5**, the planned TSP and proposed financially feasible improvements will reduce the number of expected annual crashes at the OR213/Beavercreek Road and OR213/Redland Road intersections. The proposed financially feasible improvements at OR213/Beavercreek Road are predicted to reduce crashes at the intersection by almost 5%, and planned improvements at OR213/Redland Road are predicted to reduce crashes by more than10%.

Operations Analysis

Count data for the intersection of OR213 and Beavercreek Road collected in February 2016 and for the intersection of OR213 and Redland Road collected in January 2017 was provided by Oregon City. The raw count data can be found in **Appendix B**. This winter data was seasonally adjusted to summer peak volumes using the average of two representative Automatic Traffic Recorder (ATR) locations in Clackamas County (03-017 and 03-018). A factor of 8.5% was calculated using the procedures outlined in ODOT's Analysis Procedures Manual (APM) and applied to the winter counts to adjust them to summer peak volumes. These calculations can be found in **Appendix B**.

Metro provided 2015 Base Year and 2040 Future Year hourly turn movement volumes for OR213/Beavercreek Road and OR213/Redland Road. These volumes reflect the most current land use assumptions and include full build-out of Oregon City's urban growth boundary areas in addition to growth in the rest of the region, including through traffic from outlying communities. These hourly plots can be found in **Appendix B**. The count data, 2015 Base Year and 2040 Future Year volumes were post-processed using the NCHRP 255[2] methodology and interpolated to produce 2035 turning movement volumes at each intersection. Only four hours of count data were provided for Redland Road. The remaining hours were estimated under the assumption that OR213/Redland Road follows

[2] This document sets forth procedures to refine computerized traffic volume forecasts by comparing base year and future year volumes to count data.

the same hourly volume profile as OR213/Beavercreek Road. Due to the large amount of commuter traffic from outlying communities, a large portion of the traffic through each intersection is made up of the same vehicles a matter of seconds apart. Finally, volumes were adjusted to provide balanced counts between the two intersections. The calculations for this process can be found in **Appendix B**.

A Synchro[3] analysis was conducted for the six highest traffic volume hours at the OR213/Beavercreek Road intersection and for the five highest traffic volume hours at the OR213/Redland Road intersection. The analysis was conducted with and without proposed improvements at the intersections. The results of this analysis are summarized in **Tables 6 and 7**. The full reports can be found in **Appendix C**. The TSP analysis is for year 2035 but the most recent Metro model is for year 2040. Therefore, the analysis presented in this summary is for year 2040. Analysis was also conducted for year 2035, and is included in **Appendix B**.

Table 6 – 2040 Synchro Volume-to-Capacity Analysis Summary: OR213/Beavercreek Road

OR213/Beavercreek Road Scenario	Peak Hour 4:00 pm	2nd Highest Hour 5:00 pm	3rd Highest Hour 3:00 pm	4th Highest Hour 2:00 pm	5th Highest Hour 7:00 am	6th Highest Hour 12:00 pm
Total Entering Volume	8,201	8,017	7,855	6,881	6,705	6,589
Without Improvements	1.29	1.31[1]	1.33[1]	1.12	1.49[1]	1.12
With Westbound Right-Turn Acceleration Lane	1.13	1.13	1.10	1.01	1.02	0.96

[1]The 2nd, 3rd and 5th highest overall volume hours at OR213/Beavercreek Road under the existing intersection configuration have a higher v/c because certain movements in these hours exhibit higher volumes than in the peak hour. For example, during the morning peak the westbound right-turn movement is significantly higher than during the afternoon peak, impacting v/c.

Table 7 – 2040 Synchro Volume-to-Capacity Analysis Summary: OR213/Redland Road

OR213/Redland Road Scenario	Peak Hour 4:00 pm	2nd Highest Hour 5:00 pm	3rd Highest Hour 3:00 pm	4th Highest Hour 2:00 pm	5th Highest Hour 7:00 am
Total Entering Volume	7,054	6,920	6,764	6,085	5,933
Without Improvements	1.19	1.19	1.08	0.98	0.96
With Southbound Through/Right Lane	1.10	1.08	1.02	0.92	0.96
With Six Lanes	0.91	0.90	0.83	0.75	0.73

The analysis in **Tables 6 and 7** shows that, without improvements, the OR213/Beavercreek Road and OR213/Redland Road intersections will exceed current mobility target of a v/c ratio of 0.99 in 2040 (shown in red). With financially feasible improvements in place (i.e. a westbound right-turn acceleration lane at OR213/Beavercreek and a southbound through/right lane at OR213/Redland), the intersections will still exceed 0.99 for five hours and three hours (shown in yellow) per day, respectively. As shown in **Appendix B**, in the year 2035, the OR213/Beavercreek Road and OR213/Redland Road intersections will only exceed 0.99 for three hours and two hours, respectively.

[3] Traffic model used to evaluate v/c ratios and other metrics

It should be noted that the analysis of OR213/Beavercreek Road was also conducted with a single westbound left-turn lane, instead of the existing dual lanes. This change did not significantly affect the intersection v/c ratio, but did have the effect of double westbound left-turning queues beyond the available storage. The full reports for this analysis can also be found in **Appendix C**. This potential improvement can be evaluated further in tandem with potential future improvements at the Beavercreek Road/Maple Lane Road intersection.

Cost Estimates

The cost of the proposed financially feasible improvements at OR213/Beavercreek Road was estimated by Kittelson & Associates, Inc. (KAI) to be approximately $1.5 million based on the design shown below in **Exhibit 3**. The principal elements of this are 1) the provision of an acceleration lane for westbound right-turning vehicles and 2) elimination of the second westbound left-turn lane to increase left-turn storage on eastbound Beavercreek Road at Maple Lane Road.

Exhibit 3. Highway 213 (OR213) and Redland Road Westbound Right-turn Acceleration Lane

The cost of adding an additional northbound and southbound through lane at OR213/Redland Road, consistent with TSP project D79, was recently estimated by OBEC to be almost $10 million. The potential lower cost improvement proposed based on this study, converting the southbound right-turn lane to a through/right lane, is expected to cost approximately $3-4 million.

The KAI and OBEC cost estimates, as well as exhibits of the proposed financially feasible improvements at OR213/Beavercreek Road can be found in **Appendix D**.

SUMMARY

Oregon City's 2013 Transportation System Plan (TSP) determined that the Highway 213 (OR213) corridor from Redland Road to Molalla Avenue (including the intersection of Beavercreek Road) will exceed the current mobility target in 2035, resulting in more congestion than is allowed. The OR213

intersection with Molalla Avenue is anticipated to meet the target; however, Beavercreek Road and Redland Road are not anticipated to meet the target.

The alternatives that would meet the existing mobility target of a v/c ratio of 0.99 at the OR213/Beavercreek Road and OR213/Redland Road intersections are not cost feasible, given the financial constraints of the City and other agency partners. Nonetheless, it is recommended that the alternatives at OR213/Beavercreek Road be documented in the TSP for additional future consideration as part of the TSP's unconstrained plan and that the existing planned improvement at OR213/Redland Road for three through lanes in the northbound and southbound directions remain in the unconstrained TSP project list.

Lacking the financial capability of implementing major capacity-increasing projects at these locations, alternative mobility targets will be necessary at each of these intersections; however, some improvements may be feasible in the cost-constrained TSP to improve safety and minimize future congestion.

OR213/Beavercreek Road

In conjunction with an alternative mobility target allowing intersection v/c to exceed 0.99 for up to five hours of the day, financially feasible improvements to increase safety and capacity in the near-term could include a westbound right-turn acceleration lane at OR213/Beavercreek Road.

OR213/Redland Road

In conjunction with an alternative mobility target allowing intersection v/c to exceed 0.99 for up to three hours of the day, financially feasible improvements to increase capacity in the near-term could include a third southbound through lane (shared with the right-turn lane).

NEXT STEPS

Potential financially feasible improvements to improve capacity and safety at OR213/Redland Road and OR 213/Beavercreek Road, as well as an alternative mobility target to allow intersection v/c to exceed 0.99 for up to five hours of the day at Beavercreek Road and three hours of the day at Redland Road, will be reviewed with the TAG and CAG. Changes to the TSP to incorporate these improvements and the alternative mobility target will require a Legislative public review process before the City's Planning Commission and City Commission. The alternative mobility target and financially feasible improvements that are needed will need to be agreed upon by ODOT and approved by the Oregon Transportation Commission.

DRAFT

Oregon City GIS Map

Legend

All Streets (labels only) - 4800

Landslides (SLIDO) - Historic L

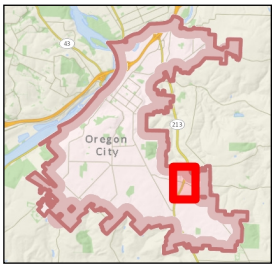
Slope Categories

- 0 - 10%
- 10 - 25%
- 25 - 35%
- > 35%

Basemap

Notes

Overview Map



The City of Oregon City makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, surveying or navigation purposes. Notification of any errors is appreciated.

N

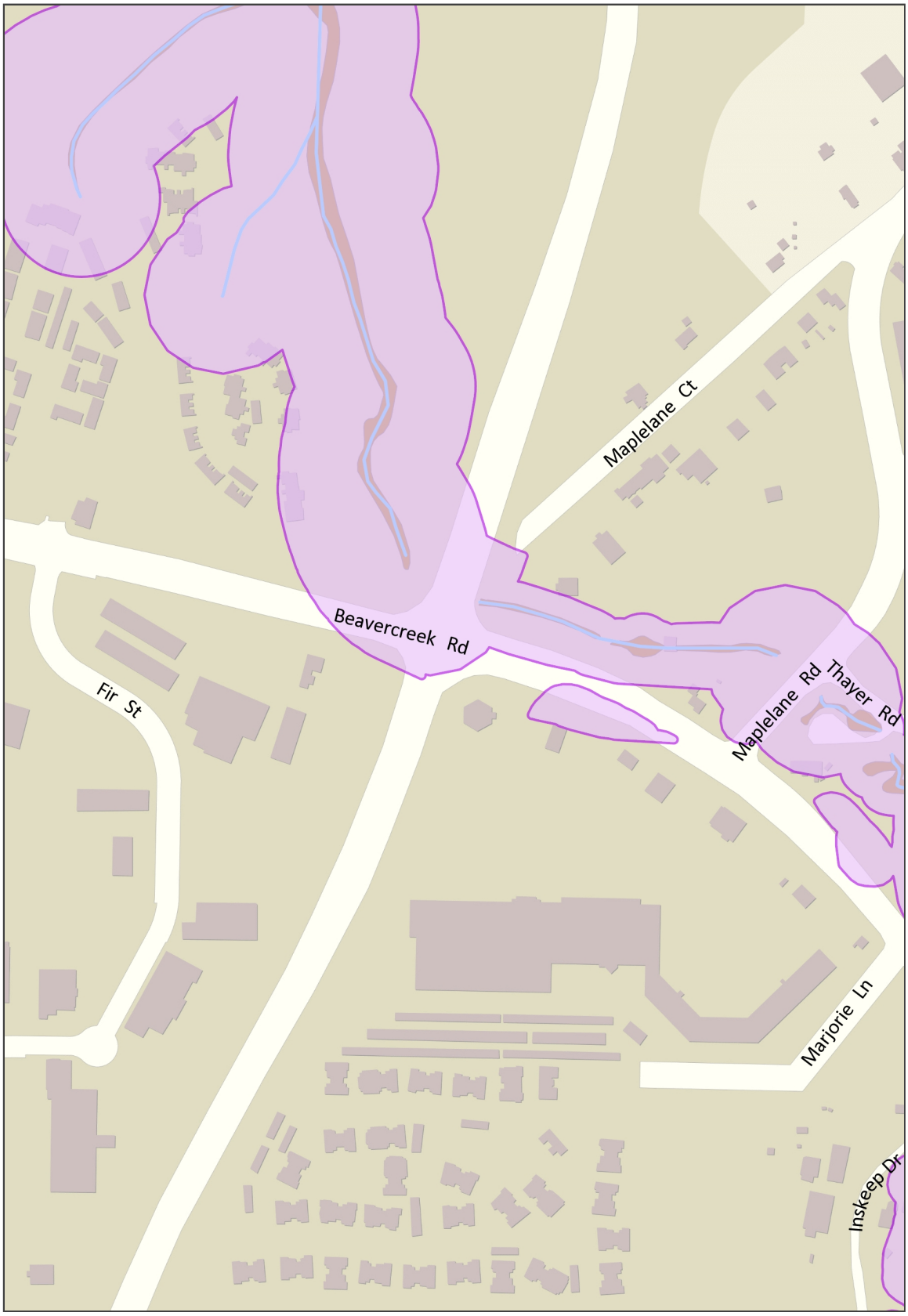
0 400 Feet

1: 4,800

City of Oregon City
PO Box 3040
625 Center St
Oregon City
OR 97045
(503) 657-0891
www.orcity.org

Map created 11/16/2016

Oregon City GIS Map

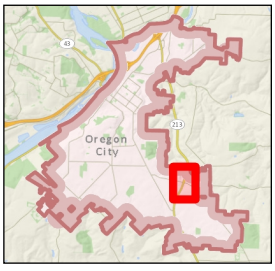


Legend

- All Streets (labels only) - 4800
- NROD - Natural Resource Ove
- Title 3 - Streams
- Title 3 - Wetlands
- Basemap

Notes

Overview Map



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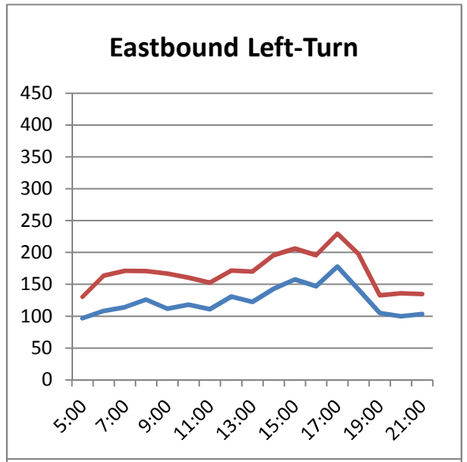
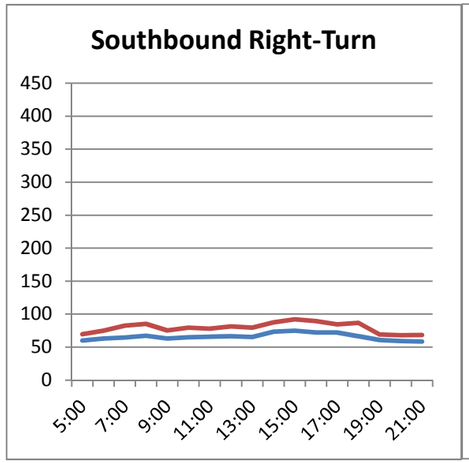
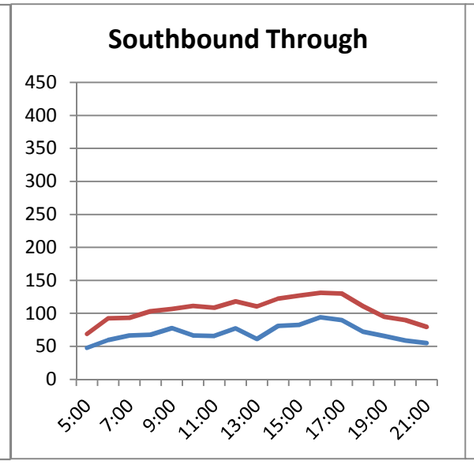
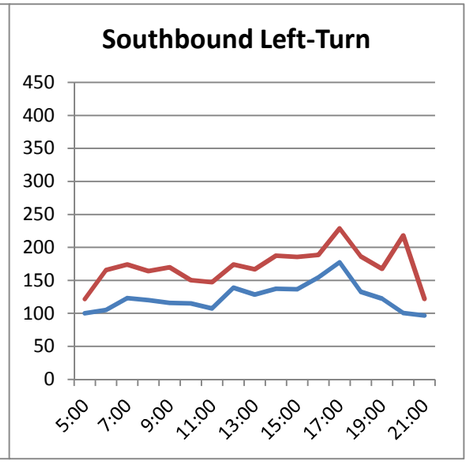
Map created 11/16/2016

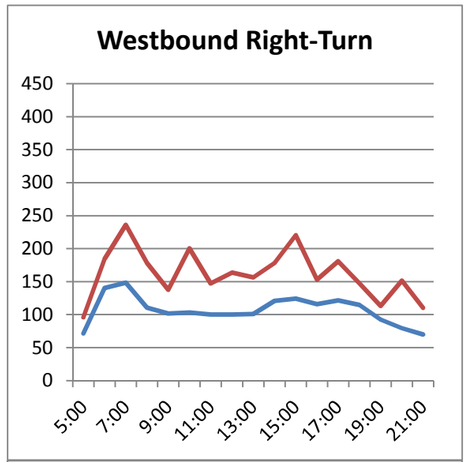
Attachment A: OR213/Beavercreek Road Intersection Travel Times (2017)

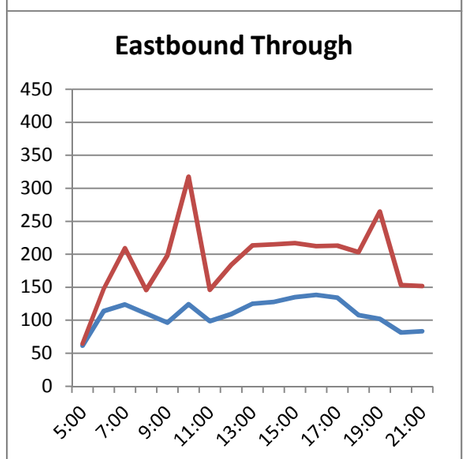


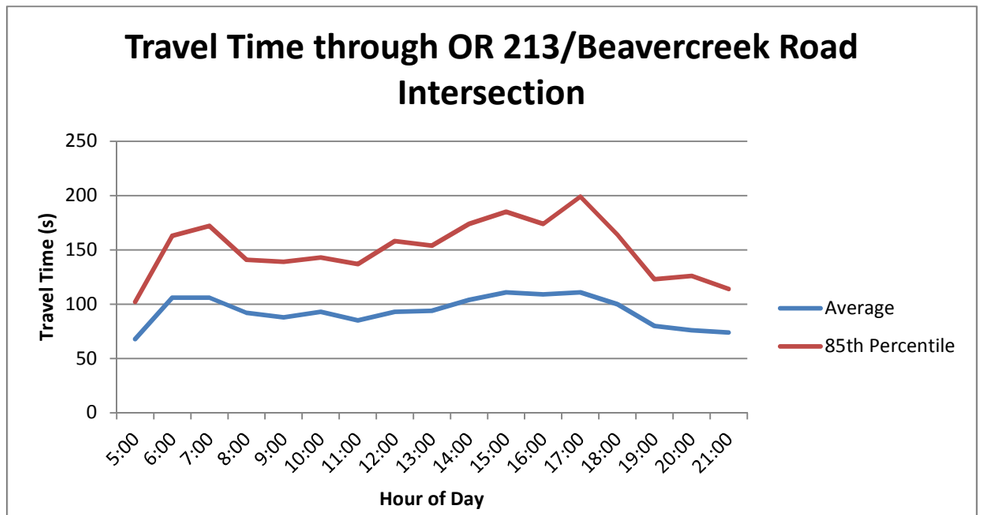


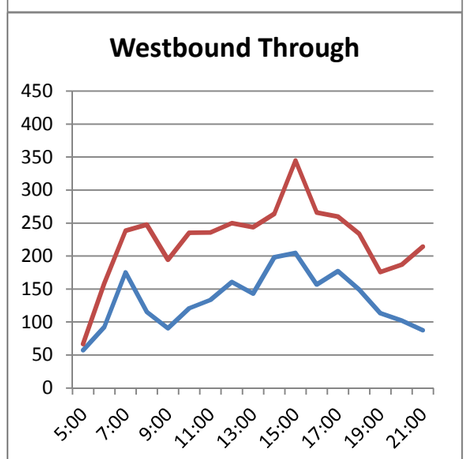


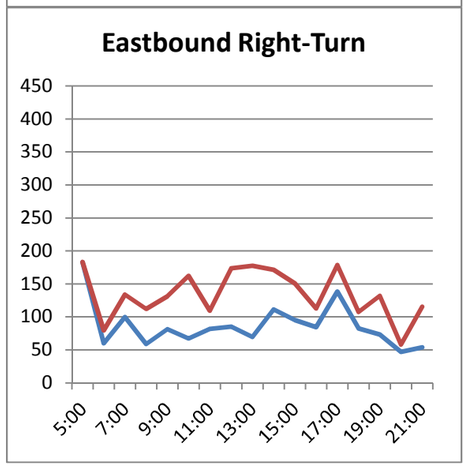


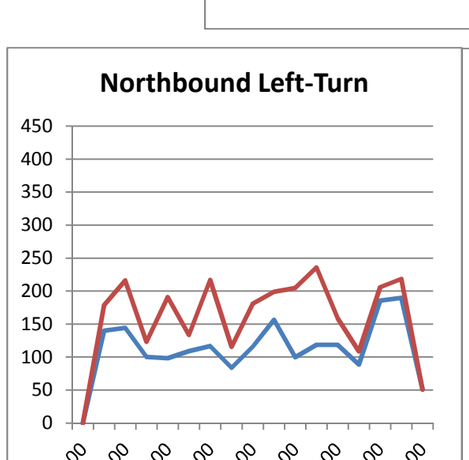


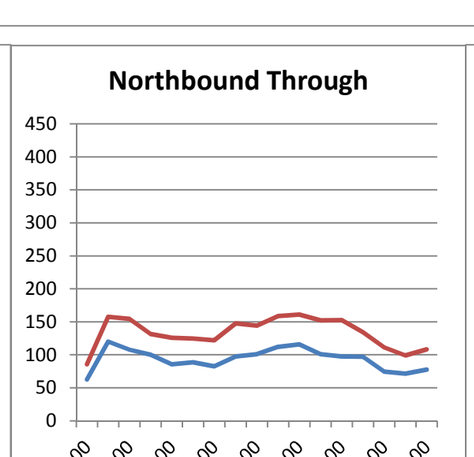


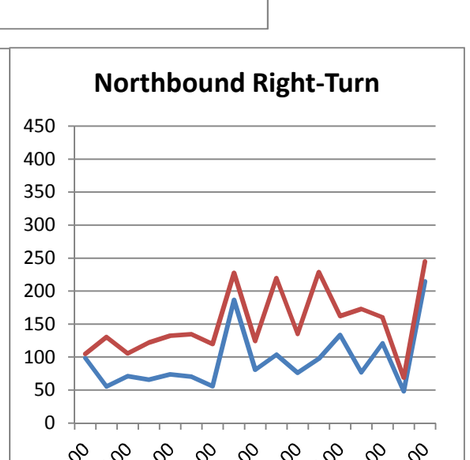


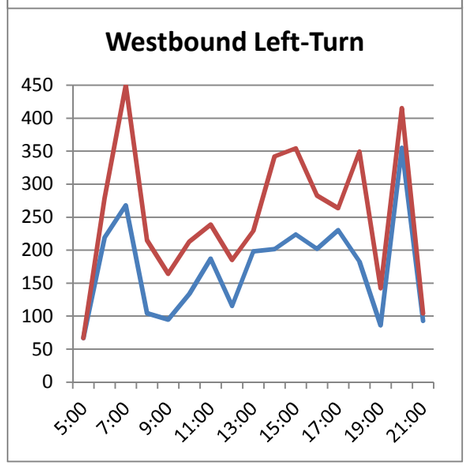












TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 213 Cascade Highway (160) & Beavercreek Road

January 1, 2010 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2014														
REAR-END	0	9	10	19	0	11	0	16	2	11	7	19	0	0
SIDESWIPE - OVERTAKING	0	0	1	1	0	0	0	0	1	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2014 TOTAL	0	9	12	21	0	11	0	16	4	12	8	21	0	0
YEAR: 2013														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	1	0	0
BACKING	0	0	1	1	0	0	0	0	1	0	0	1	0	0
REAR-END	0	17	11	28	0	18	0	22	5	20	8	28	0	0
SIDESWIPE - OVERTAKING	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	2	0	2	0	3	1	2	0	1	1	2	0	0
2013 TOTAL	0	19	14	33	0	21	1	25	7	22	10	33	0	0
YEAR: 2012														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FIXED / OTHER OBJECT	0	1	0	1	0	1	0	1	0	1	0	1	0	1
PEDESTRIAN	0	1	0	1	0	1	0	1	0	1	0	1	0	0
REAR-END	0	18	6	24	0	24	0	16	6	16	8	24	0	0
TURNING MOVEMENTS	0	2	0	2	0	3	0	2	0	0	2	2	0	0
2012 TOTAL	0	22	7	29	0	29	0	21	6	19	10	29	0	1
YEAR: 2011														
ANGLE	1	0	2	3	1	2	1	1	2	2	1	3	0	0
REAR-END	0	12	13	25	0	13	0	19	6	18	7	25	0	0
TURNING MOVEMENTS	0	2	0	2	0	3	0	0	2	0	2	2	0	0
2011 TOTAL	1	14	15	30	1	18	1	20	10	20	10	30	0	0
YEAR: 2010														
REAR-END	0	10	10	20	0	13	0	13	7	17	3	20	0	0
2010 TOTAL	0	10	10	20	0	13	0	13	7	17	3	20	0	0
FINAL TOTAL	1	74	58	133	1	92	2	95	34	90	41	133	0	1

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
02085	N	N	N			06/12/2013	CLACKAMAS	1 14		INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 0	STRGHT											07
NONE						Wed 10A	OREGON CITY	MN 0	S BEAVERCREEK RD	N		TRF SIGNAL	N	UNK	REAR		PRVTE	N S									000		00
							PORTLAND UA	2.96	CASCADE HY SOUTH	06	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	39	F	OR-Y		026	000		07
No						*45 19 55.86 -122 34 29.95*		016000100S00	1									OR<25										
																02	NONE 0	STOP										
																	PUBLC	N S								011		00
																	PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																		UNK										
04839	N	N	N			11/29/2014	CLACKAMAS	1 14		INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 0	STRGHT											29
NO RPT						Sat UNK	OREGON CITY	MN 0	S BEAVERCREEK RD	UN		TRF SIGNAL	N	UNK	REAR		PRVTE	UN UN									000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	06	3		N	UNK	PDO		PSNGR CAR		01	DRVR	NONE	39	F	OR-Y		026	000		29
No						*45 19 54.97 -122 34 30.30*		016000100S00	1									OR<25										
																02	NONE 0	STOP										
																	PRVTE	UN UN								011		00
																	PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		000	000		00
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01828	N	N	N			05/25/2011	CLACKAMAS	1 14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	07
NONE						Wed 2P	OREGON CITY	MN 0	S BEAVERCREEK RD	N		TRF SIGNAL	N	WET	REAR		PRVTE	N S									000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	76	M	OR-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1									OR<25										
																02	NONE 0	STOP										
																	PRVTE	N S								011	013	00
																	PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																		UNK										
																03	NONE 0	STOP										
																	PRVTE	N S								022		00
																	PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
																		UNK										
02674	N	N	N			07/27/2011	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Wed 7P	OREGON CITY	MN 0	S BEAVERCREEK RD	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	M	OR-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1									OR<25										
																02	NONE 0	STOP										
																	PRVTE	N S								011		00
																	PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		000	000		00
																								OR<25				
																			02	PSNG	INJC	05	F			000	000		00
01982	N	N	N	N	N	05/30/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	PED	01	NONE 0	STRGHT											18,14
STATE						Wed 4P	OREGON CITY	MN 0	S BEAVERCREEK RD	N		TRF SIGNAL	N	DRY	PED		PRVTE	N S									000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y		000	000	082	00
No						*45 19 54.97 -122 34 30.30*		016000100S00	1									OR<25										
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																		E W										

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCOHL	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / LRS	FC / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	CONN #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00662	N	N	N	N	N	02/25/2013	CLACKAMAS	1 14			INTER	CROSS	N	N	CLR	O-1STOP	01	NONE 0	BACK											10
CITY						Mon 6P	OREGON CITY	MN 0	S BEAVERCREEK RD		N		TRF SIGNAL	N	SNO	BACK		PRVTE	S N									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		06	3		N	UNK	PDO		PSNGR CAR		01	DRVR	NONE	34	F	SUSP		011	000	10
No						*45 19 54.96 -122 34 30.30*		016000100	S00	1															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N S									011	00
																		PSNGR CAR		01	DRVR	NONE	31	F	OR-Y		000	000	00
																									OR<25				
02051	N	N	N			06/10/2013	CLACKAMAS	1 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											10
NONE						Mon 12P	OREGON CITY	MN 0	S BEAVERCREEK RD		N		TRF SIGNAL	N	DRY	SS-O		PRVTE	N S									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		06	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		080	000	10
No						*45 19 54.96 -122 34 30.30*		016000100	S00	1															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N S									011	00
																		PSNGR CAR		01	DRVR	NONE	87	F	OR-Y		000	000	00
																									OR<25				
03700	N	N	N			10/01/2013	CLACKAMAS	1 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Tue 1P	OREGON CITY	MN 0	S BEAVERCREEK RD		N		TRF SIGNAL	N	DRY	REAR		UNKN	N S									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		06	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000	07
No						*45 19 54.96 -122 34 30.30*		016000100	S00	1															UNK				
																	02	NONE 0	STOP										
																		PRVTE	N S									011	00
																		PSNGR CAR		01	DRVR	NONE	52	M	OR-Y		000	000	00
																									OR<25				
04798	N	Y	N			12/11/2013	CLACKAMAS	1 14			INTER	CROSS	N	N	FOG	S-1STOP	01	NONE 0	STRGHT											07
CITY						Wed 8P	OREGON CITY	MN 0	S BEAVERCREEK RD		N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		06	3		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	64	M	OR-Y		026	000	07
No						*45 19 54.96 -122 34 30.30*		016000100	S00	1															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N S									011	00
																		PSNGR CAR		01	DRVR	INJC	58	M	OR-Y		000	000	00
																									OR<25				
01637	N	N	N			04/29/2014	CLACKAMAS	1 14			INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NO RPT						Tue 2P	OREGON CITY	MN 0	S BEAVERCREEK RD		N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		06	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100	S00	1															OR<25				
																	02	NONE 0	STOP										
																		PRVTE	N S									011	00
																		PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		000	000	00
																									OR<25				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
03308	N	N	N			08/25/2014	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE						Mon 4P	OREGON CITY	MN 0	S BEAVERCREEK RD	N		TRF SIGNAL	N	DRY	REAR		PRVTE	S N										000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	06	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		026	000		29
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25					
																02	NONE 0	STOP											
																	PRVTE	S N									011		00
																	PSNGR CAR		01	DRVR	NONE	28	F	OR-Y		000	000		00
																								OR<25					
04757	N	N	N			11/22/2014	CLACKAMAS	1 14		INTER	CROSS	N	N	UNK	S-STRGHT	01	NONE 0	STRGHT											13
NO RPT						Sat 1P	OREGON CITY	MN 0	S BEAVERCREEK RD	N		TRF SIGNAL	N	WET	SS-O		UNKN	N S									000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	06	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		045	000		13
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															UNK					
																02	NONE 0	STRGHT											
																	PRVTE	N S									000		00
																	PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		000	000		00
																								OR<25					
00766	N	N	N			03/10/2010	CLACKAMAS	1 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										013	07
NO RPT						Wed 4P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25					
																02	NONE 0	STOP											
																	PRVTE	NE SW									011	013	00
																	PSNGR CAR		01	DRVR	INJC	25	M	OR-Y		000	000		00
																								OR<25					
																03	NONE 0	STOP											
																	PRVTE	NE SW									022		00
																	PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		000	000		00
																								OR<25					
00115	N	N	N			01/10/2011	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NO RPT						Mon 5P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW									000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	06	2		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25					
																02	NONE 0	STOP											
																	PRVTE	NE SW									011		00
																	PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		000	000		00
																								OR<25					
00222	N	N	N			01/18/2010	CLACKAMAS	1 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07
NONE						Mon 6A	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	DRY	REAR		PRVTE	SE NW									000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	2		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	62	F	OR-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25					

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHL BUS	WORK ZONE	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																02	NONE 0 PRVTE	STOP SE NW									011	00
																	PSNGR CAR		01	DRVR	NONE	53	M	OR-Y OR<25		000	000	00
01346	N	N	N			04/22/2010 Thu 3P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 2	N YIELD	N N N	CLR DRY DAY	S-STRGHT REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW												07 00 07
NONE																											000	00
No						*45 19 54.97 -122 34 30.30*		016000100S00	1								PSNGR CAR		01	DRVR	NONE	62	M	OR-Y OR<25		026	000	
																02	NONE 0 PRVTE	STRGHT SE NW									006	00
																	PSNGR CAR		01	DRVR	INJC	24	F	OR-Y OR<25		000	000	00
03556	N	N	N			10/01/2010 Fri 7A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 2	N YIELD	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT SE NW												07 00 07
NO RPT																											000	00
No						*45 19 54.97 -122 34 30.30*		016000100S00	1								PSNGR CAR		01	DRVR	NONE	70	F	OR-Y OR<25		026	000	
																02	NONE 0 PRVTE	STOP SE NW									011	00
																	PSNGR CAR		01	DRVR	NONE	72	F	OR-Y OR<25		000	000	00
04388	N	N	N			11/20/2010 Sat 12P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT S N												07 00 07
NONE																											000	00
No						*45 19 54.97 -122 34 30.30*		016000100S00	1								PSNGR CAR		01	DRVR	NONE	30	F	OR-Y OR<25		026	000	
																			02	PSNG	NO<5	03	M			000	000	00
																02	NONE 0 PRVTE	STOP S N									011	00
																	PSNGR CAR		01	DRVR	NONE	00	M	UNK OR<25		000	000	00
00158	N	N	N			01/13/2011 Thu 4A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 2	N YIELD	N N N	CLR DRY DLIT	S-STRGHT REAR INJ	01	NONE 0 PRVTE	STRGHT NE SW												07 00 07
NONE																											000	00
No						*45 19 54.97 -122 34 30.30*		016000100S00	1								PSNGR CAR		01	DRVR	INJC	36	F	OR-Y OR<25		042	000	
																02	NONE 0 PRVTE	STRGHT NE SW									000	00
																	PSNGR CAR		01	DRVR	NONE	55	F	OR-Y OR>25		000	000	00
00268	N	N	N			01/22/2011 Sat 1P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 2	N YIELD	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW												07 00 07
NONE																											000	00
No						*45 19 54.97 -122 34 30.30*		016000100S00	1								PSNGR CAR		01	DRVR	NONE	48	F	OR-Y OR<25		026	000	

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V# / SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																02 NONE 0	STOP										
																PRVTE	SE NW									011	00
																PSNGR CAR		01	DRVR	INJC	47	M	OR-Y		000	000	00
																							OR<25				
00504	N	N	N			02/10/2011	CLACKAMAS	1	14		INTER	CROSS	N		N CLR	S-1STOP	01 NONE 0	STRGHT										07
NONE						Thu 3P	OREGON CITY	MN 0	S BEAVERCREEK RD		NE		YIELD		N DRY	REAR	PRVTE	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		09	2			N DAY	PDO	PSNGR CAR		01	DRVR	NONE	35	M	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100	S00	1													OR<25				
																02 NONE 0	STOP										
																PRVTE	SE NW									011	00
																PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		000	000	00
																							OR<25				
00807	N	N	N			03/07/2011	CLACKAMAS	1	14		INTER	CROSS	N		N CLR	S-1STOP	01 NONE 0	STRGHT										07
NO RPT						Mon 6A	OREGON CITY	MN 0	S BEAVERCREEK RD		NE		YIELD		N DRY	REAR	PRVTE	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		09	3			N DAWN	PDO	PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100	S00	1													OR>25				
																02 NONE 0	STOP										
																PRVTE	SE NW									011	00
																PSNGR CAR		01	DRVR	NONE	53	M	OR-Y		000	000	00
																							OR<25				
81746	N	N	N			04/04/2011	CLACKAMAS	1	14		INTER	CROSS	N		N RAIN	S-1STOP	01 NONE 0	STRGHT										07
NONE						Mon 10A	OREGON CITY	MN 0	S BEAVERCREEK RD		NE		YIELD		N WET	REAR	PRVTE	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		09	3			N DAY	PDO	PSNGR CAR		01	DRVR	NONE	44	M	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100	S00	1													OR<25				
																02 NONE 0	STOP										
																PRVTE	SE NW									011	00
																PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		000	000	00
																							OR<25				
02297	N	N	N			06/30/2011	CLACKAMAS	1	14		INTER	CROSS	N		N CLR	S-1STOP	01 NONE 0	STRGHT										07
NONE						Thu 12P	OREGON CITY	MN 0	S BEAVERCREEK RD		NE		YIELD		N DRY	REAR	PRVTE	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		09	3			N DAY	INJ	PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100	S00	1													OR<25				
																02 NONE 0	STOP										
																PRVTE	SE NW									011	00
																PSNGR CAR		01	DRVR	INJC	48	M	OR-Y		000	000	00
																							OR<25				
03876	N	N	N			10/15/2011	CLACKAMAS	1	14		INTER	CROSS	N		N CLR	S-1STOP	01 NONE 0	STRGHT										07
NONE						Sat 12A	OREGON CITY	MN 0	S BEAVERCREEK RD		NE		YIELD		N DRY	REAR	UNKN	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH		09	3			N DLIT	PDO	PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100	S00	1													UNK				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCOHL	DRUGS	SCHL WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	CONN #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																02	NONE 0 PRVTE	STOP SE NW									011		00
																	PSNGR CAR		01	DRVR	NONE	22	F	OR-Y OR<25		000	000		00
03993	N	N	N		10/25/2011 Tue 6P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	 S BEAVERCREEK RD CASCADE HY SOUTH		INTER NE 09	CROSS 2	N YIELD	N	N FOG N WET N DARK	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT SE NW	01	DRVR	NONE	00	F	OTH-Y OR<25		026	000 000		07 00 07
NO RPT																													
No					*45 19 54.97 -122 34 30.30*		016000100	S00 1																					
																02	NONE 0 PRVTE	STOP SE NW									011		00
																	PSNGR CAR		01	DRVR	NONE	64	M	OR-Y OR<25		000	000		00
04755	N	N	N		12/09/2011 Fri 8A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	 S BEAVERCREEK RD CASCADE HY SOUTH		INTER NE 09	CROSS 2	N YIELD	N	N CLR N DRY N DAY	S-1STOP REAR PDO	01	UNKN 0 UNKN UNKNOWN	STRGHT SE NW	01	DRVR	NONE	00	U	UNK UNK		026	000	013	07 00 07
NONE																													
No					*45 19 54.97 -122 34 30.30*		016000100	S00 1																					
																02	NONE 0 PRVTE	STOP SE NW									011	013	00
																	PSNGR CAR		01	DRVR	NONE	25	F	OR-Y OR<25		000	000		00
																03	NONE 0 PRVTE	STOP SE NW									022		00
																	PSNGR CAR		01	DRVR	NONE	00	F	UNK UNK		000	000		00
00376	N	N	N	N	N 01/28/2012 Sat 7P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	 S BEAVERCREEK RD CASCADE HY SOUTH		INTER NE 09	CROSS 2	N YIELD	N	N CLR N DRY N DLIT	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SE NW	01	DRVR	NONE	45	F	OR-Y OR<25		026	000 000		07 00 07
STATE																													
No					*45 19 54.97 -122 34 30.30*		016000100	S00 1																					
																02	NONE 0 PRVTE	STOP SE NW									011		00
																	PSNGR CAR		01	DRVR	INJC	19	F	OR-Y OR<25		000	000		00
																			02	PSNG	INJC	20	F			000	000		00
00436	N	N	N		02/02/2012 Thu 4P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	 S BEAVERCREEK RD CASCADE HY SOUTH		INTER NE 09	CROSS 2	N YIELD	N	N CLR N DRY N DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT SE NW	01	DRVR	NONE	85	M	OR-Y OR<25		026	000 000		07 00 07
NONE																													
No					*45 19 54.97 -122 34 30.30*		016000100	S00 1																					
																02	NONE 0 UNKN	STOP SE NW									011		00
																	PSNGR CAR		01	DRVR	NONE	00	M	UNK UNK		000	000		00

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALC	DRUG	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00485	N	N	N	N	N	02/06/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY						Mon 6P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		TRF SIGNAL	N	DRY	REAR		PRVTE	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	65	M	OTH-Y		043,026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															N-RES				
																02	NONE 0	STOP										
																	PRVTE	SE NW									011	00
																	PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		000	000	00
																								OR>25				
00679	N	N	N			02/22/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						Wed 1P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	DRY	REAR		UNKN	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	2		N	DAY	INJ		UNKNOWN		01	DRVR	NONE	00	M	UNK		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															UNK				
																02	NONE 0	STOP										
																	PRVTE	SE NW									011	00
																	PSNGR CAR		01	DRVR	INJC	23	F	OR-Y		000	000	00
																								OR<25				
																			02	PSNG	INJC	28	F			000	000	00
																			03	PSNG	INJC	55	F			000	000	00
00763	N	N	N			02/29/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
NONE						Wed 7P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	WET	REAR		PRVTE	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25				
																02	NONE 0	STOP										
																	PRVTE	SE NW									011	00
																	PSNGR CAR		01	DRVR	INJC	17	F	OR-Y		000	000	00
																								OR<25				
00972	N	N	N			03/15/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
NONE						Thu 6A	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	WET	REAR		PRVTE	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	59	F	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25				
																02	NONE 0	STOP										
																	PRVTE	SE NW									011	00
																	PSNGR CAR		01	DRVR	INJC	56	F	OR-Y		000	000	00
																								OR<25				
01301	N	N	N			04/07/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NO RPT						Sat 9A	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	DRY	REAR		PRVTE	SE NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	2		N	DAY	INJ		MTRCYCLE		01	DRVR	INJC	33	M	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25				
																02	NONE 0	STOP										
																	PRVTE	SE NW									011	00
																	PSNGR CAR		01	DRVR	NONE	28	M	OR-Y		000	000	00
																								OR<25				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHL BUS	WORK ZONE	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD RNDBT / DRVWY	WTHR / SURF	LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
01649	N	N	N			05/05/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE						Sat 2P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	DRY	REAR		PRVTE	SE NW											000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	35	M	OR-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1																OR<25					
																			02	PSNG	NO<5	01	F			000	000		00
																02	NONE 0	STOP											
																	PRVTE	SE NW									011		00
																	PSNGR CAR		01	DRVR	NONE	53	M	OR-Y		000	000		00
																								OR<25					
																			02	PSNG	INJC	49	F			000	000		00
01694	N	N	N			05/08/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE						Tue 8P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	DRY	REAR		PRVTE	SE NW											000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	72	M	OR-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1																OR<25					
																02	NONE 0	STOP											
																	PRVTE	SE NW									011		00
																	PSNGR CAR		01	DRVR	NONE	00	M	UNK		000	000		00
																								OR<25					
02190	N	N	N			06/18/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 1	STRGHT												07
NONE						Mon 12P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	DRY	REAR		PRVTE	SE NW											000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	70	M	OTH-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1																OR<25					
																02	NONE 0	STOP											
																	PRVTE	SE NW									011		00
																	PSNGR CAR		01	DRVR	INJC	43	F	OR-Y		000	000		00
																								OR<25					
																			02	PSNG	INJC	07	M			000	000		00
																			03	PSNG	INJC	09	F			000	000		00
02429	N	N	N			07/06/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE						Fri 2P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	DRY	REAR		PRVTE	SE NW											000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1																OR<25					
																02	NONE 0	STOP											
																	PRVTE	SE NW									011		00
																	PSNGR CAR		01	DRVR	INJC	54	M	OTH-Y		000	000		00
																								N-RES					
02909	N	N	N			08/07/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE						Tue 3P	OREGON CITY	MN 0	S BEAVERCREEK RD	NE		YIELD	N	DRY	REAR		PRVTE	SE NW											000		00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		026	000		07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1																OR<25					

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALC	DRUG	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																	02	NONE 0 PRVTE	STOP SE NW									011	00
																		PSNGR CAR		01	DRVR	INJC	70	M	OR-Y OR<25		000	000	00
04569 NONE	N	N	N			11/26/2012 Mon 3P	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N	CLD DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW									000	27,07 00 27,07
No						*45 19 54.97 -122 34 30.30*		016000100S00		1								PSNGR CAR		01	DRVR	NONE	66	F	OR-Y OR<25		016,026	000	
																	02	NONE 0 PRVTE	STOP SE NW									011	00
																		PSNGR CAR		01	DRVR	INJB	27	F	OR-Y OR<25		000	000	00
																				02	PSNG	NO<5	02	M			000	000	00
00193 NONE	N	N	N			01/17/2013 Thu 10A	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT SE NW									000	07 00 07
No						*45 19 54.96 -122 34 30.30*		016000100S00		1								PSNGR CAR		01	DRVR	NONE	00	U	UNK OR<25		026	000	
																	02	NONE 0 PRVTE	STOP SE NW									011	00
																		PSNGR CAR		01	DRVR	NONE	29	F	OR-Y OR<25		000	000	00
00296 NONE	N	N	N			01/25/2013 Fri 7A	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N	UNK WET DLIT	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW									000	07 00 07
No						*45 19 54.96 -122 34 30.30*		016000100S00		1								PSNGR CAR		01	DRVR	NONE	25	F	OR-Y OR<25		026	000	
																	02	NONE 0 PRVTE	STOP SE NW									011	00
																		PSNGR CAR		01	DRVR	INJC	24	F	OR-Y OR<25		000	000	00
																				02	PSNG	NO<5	03	M			000	000	00
03686 NONE	N	N	N			03/27/2013 Wed 9A	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW									000	07 00 07
No						*45 19 54.96 -122 34 30.30*		016000100S00		1								PSNGR CAR		01	DRVR	NONE	00	F	OR-Y OR<25		026	000	
																	02	NONE 0 PRVTE	STOP SE NW									011	00
																		PSNGR CAR		01	DRVR	INJC	59	M	OR-Y OR<25		000	000	00
01343 NONE	N	N	N			04/10/2013 Wed 5P	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW									000	07 00 07
No						*45 19 54.96 -122 34 30.30*		016000100S00		1								PSNGR CAR		01	DRVR	NONE	00	F	OR-Y OR<25		026	000	

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
														02	NONE 0 PRVTE	STOP SE NW									011	00
															PSNGR CAR		01	DRVR	INJC	41	F	OR-Y OR<25		000	000	00
01405 CITY	N	N	N	N	N 04/24/2013 Wed 1P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N CLR N DRY N DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW										000	27,07 00 27,07
No	*45 19 54.96*		*-122 34 30.30*				016000100S00	1														OR<25				
														02	NONE 0 PRVTE	STOP SE NW									011	00
															PSNGR CAR		01	DRVR	INJC	27	F	OTH-Y OR<25		000	000	00
01782 NONE	N	N	N		05/21/2013 Tue 7A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N CLR N DRY N DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT SE NW										000	07 00 07
No	*45 19 54.96*		*-122 34 30.30*				016000100S00	1														OR<25				
														02	NONE 0 PRVTE	STOP SE NW									011	00
															PSNGR CAR		01	DRVR	NONE	62	F	OR-Y OR<25		000	000	00
02276 NONE	N	N	N		06/27/2013 Thu 10A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N CLR N DRY N DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW										000	07 00 07
No	*45 19 54.96*		*-122 34 30.30*				016000100S00	1														OR<25				
														02	NONE 0 PRVTE	STOP SE NW									011	00
															PSNGR CAR		01	DRVR	INJC	63	F	OR-Y OR<25		000	000	00
																	02	PSNG	NO<5	01	F			000	000	00
03212 CITY	N	N	N		08/29/2013 Thu 11A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N TRF SIGNAL	N RAIN N WET N DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW										000	07 00 07
No	*45 19 54.96*		*-122 34 30.30*				016000100S00	1														OR<25				
														02	NONE 0 PRVTE	STOP SE NW									011	00
															PSNGR CAR		01	DRVR	INJC	24	F	OR-Y OR<25		000	000	00
03276 CITY	N	N	N	N	N 09/01/2013 Sun 12P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N CLR N DRY N DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT SE NW										000	07 00 07
No	*45 19 54.96*		*-122 34 30.30*				016000100S00	1														OR<25				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL WRK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / WTHR / SURF / LIGHT / CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
													02	NONE 0 PRVTE	STOP SE NW									011	00
														PSNGR CAR		01	DRVR	INJC	48	F	OR-Y OR>25		000	000	00
																02	PSNG	INJC	49	F			000	000	00
03531 NONE	N	N	N		09/21/2013 Sat 9A	CLACKAMAS OREGON CITY	1 14 MN 0	S BEAVERCREEK RD	INTER NE	CROSS 2	N YIELD	N CLR S-1STOP N DRY REAR	01	NONE 0 PRVTE	STRGHT SE NW										000	07 00
						PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N DAY INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000	07
No					*45 19 54.96 -122 34 30.30*		016000100S00	1													N-RES				
													02	NONE 0 PRVTE	STOP SE NW									011	00
														PSNGR CAR		01	DRVR	INJC	44	F	OR-Y OR<25		000	000	00
04072 NONE	N	N	N		10/24/2013 Thu 7A	CLACKAMAS OREGON CITY	1 14 MN 0	S BEAVERCREEK RD	INTER NE	CROSS 2	N YIELD	N FOG S-1STOP N DRY REAR	01	NONE 0 UNKN	STRGHT SE NW										000	07 00
						PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N DLIT PDO		UNKNOWN		01	DRVR	NONE	00	U	UNK		026	000	07
No					*45 19 54.96 -122 34 30.30*		016000100S00	1													OR<25				
													02	NONE 0 PRVTE	STOP SE NW									011	00
														PSNGR CAR		01	DRVR	NONE	69	M	OR-Y OR<25		000	000	00
00987 NONE	N	N	N		03/11/2014 Tue 6P	CLACKAMAS OREGON CITY	1 14 MN 0	S BEAVERCREEK RD	INTER NE	CROSS 2	N YIELD	N CLR S-1STOP N DRY REAR	01	NONE 0 PRVTE	STRGHT SE NW										000	07 00
						PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N DUSK INJ		PSNGR CAR		01	DRVR	INJB	38	F	OR-Y		026	000	07
No					*45 19 54.97 -122 34 30.30*		016000100S00	1													OR<25				
													02	NONE 0 PRVTE	STOP SE NW									011	00
														PSNGR CAR		01	DRVR	NONE	36	M	OR-Y OR<25		000	000	00
00120 NONE	N	N	N		01/09/2014 Thu 5P	CLACKAMAS OREGON CITY	1 14 MN 0	S BEAVERCREEK RD	INTER E	CROSS 3	N TRF SIGNAL	N RAIN ANGL-OTH N WET TURN	01	NONE 0 PRVTE	TURN-R W S										016	02 00
						PORTLAND UA	2.98	CASCADE HY SOUTH	03	3		N DUSK PDO		PSNGR CAR		01	DRVR	NONE	56	F	OR-Y OR<25		028	000	02
No					*45 19 54.97 -122 34 30.30*		016000100S00	1																	
													02	NONE 0 PRVTE	STRGHT N S									000	00
														PSNGR CAR		01	DRVR	NONE	63	M	UNK OR>25		000	000	00
03359 NONE	N	N	N		09/17/2010 Fri 1P	CLACKAMAS OREGON CITY	1 14 MN 0	S BEAVERCREEK RD	INTER E	CROSS 2	N TRF SIGNAL	N RAIN S-1STOP N WET REAR	01	NONE 0 PRVTE	STRGHT E W										000	07 00
						PORTLAND UA	2.98	CASCADE HY SOUTH	06	2		N DAY PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000	07
No					*45 19 54.47 -122 34 30.52*		016000100S00	1													UNK				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	DRUG	ALC	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																	02	NONE 0 PRVTE	STOP E W									011		00
																		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		000	000		00
04643 STATE	N	N	Y	N	N	12/06/2010 Mon 10P	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER E 06	CROSS 2	N TRF SIGNAL	N N N	CLD DRY DLIT	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	NONE	40	F	OR-Y OR<25		026	000 000	093	07 00 07
No	*45 19 54.97*		*-122 34 30.30*					016000100S00		1																				
																	02	NONE 0 PRVTE	STOP E W									011		00
																		PSNGR CAR		01	DRVR	NONE	55	F	OR-Y OR<25		000	000		00
01893 CITY	N	N	N			05/30/2013 Thu 2P	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER E 06	CROSS 3	N TRF SIGNAL	N N N	CLD DRY DAY	ANGL-STP TURN INJ	01	NONE 1 PRVTE SEMI TOW	TURN-R S E	01	DRVR	NONE	29	M	OR-Y OR<25		017	000 017		22 22 00
No	*45 19 54.96*		*-122 34 30.30*					016000100S00		1																				
																	02	NONE 0 PRVTE	STOP E W									012		00
																		PSNGR CAR		01	DRVR	INJC	48	F	OR-Y OR<25		000	000		00
00353 NONE	N	N	N			01/25/2012 Wed 7P	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER SE 09	CROSS 2	N YIELD	N N N	RAIN WET DLIT	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW NE	01	DRVR	NONE	18	M	OR-Y OR<25		026	000 000		07 00 07
No	*45 19 54.97*		*-122 34 30.30*					016000100S00		1																				
																	02	NONE 0 PRVTE	STOP SW NE									011		00
																		PSNGR CAR		01	DRVR	INJC	50	F	OR-Y OR<25		000	000		00
02025 NONE	N	N	N			06/03/2012 Sun 5P	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER SE 09	CROSS 3	N YIELD	N N N	UNK UNK DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW NE	01	DRVR	NONE	00	M	OR-Y OR<25		026	000 000		07 00 07
No	*45 19 54.97*		*-122 34 30.30*					016000100S00		1																				
																	02	NONE 0 PRVTE	STOP SW NE									011		00
																		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y OR<25		000	000		00
03609 NO RPT	N	N	N			09/29/2012 Sat 8A	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER SE 09	CROSS 3	N YIELD	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SW NE	01	DRVR	NONE	38	M	OR-Y OR<25		026	000 000		07 00 07
No	*45 19 54.97*		*-122 34 30.30*					016000100S00		1																				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL WRK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
														02	NONE 0 PRVTE	STOP SW NE									011		00
															PSNGR CAR		01	DRVR	INJC	24	M	OR-Y OR<25		000	000		00
																	02	PSNG	INJC	24	F			000	000		00
00303	N	N	N		01/25/2013	CLACKAMAS	1 14		INTER	CROSS	N	N CLD	S-1STOP	01	NONE 0	STRGHT											004	07
NONE					Fri 11A	OREGON CITY	MN 0	S BEAVERCREEK RD	SE		YIELD	N DRY	REAR		PRVTE	SW NE									000		00
						PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y OR<25		026	000		07
No					*45 19 54.96 -122 34 30.30*		016000100S00	1																			
														02	NONE 0 PRVTE	STOP SW NE									011	004	00
															PSNGR CAR		01	DRVR	NONE	73	M	OR-Y OR<25		000	000		00
01066	N	N	N		03/29/2013	CLACKAMAS	1 14		INTER	CROSS	N	N CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE					Fri 5P	OREGON CITY	MN 0	S BEAVERCREEK RD	SE		YIELD	N DRY	REAR		PRVTE	SW NE									000		00
						PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N DAY	INJ		PSNGR CAR		01	DRVR	NONE	53	M	OR-Y OR<25		026	000		07
No					*45 19 54.96 -122 34 30.30*		016000100S00	1																			
														02	NONE 0 PRVTE	STOP SW NE									011		00
															PSNGR CAR		01	DRVR	INJC	32	F	OR-Y OR<25		000	000		00
03374	N	N	N		09/11/2013	CLACKAMAS	1 14		INTER	CROSS	N	N CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE					Wed 8A	OREGON CITY	MN 0	S BEAVERCREEK RD	SE		YIELD	N DRY	REAR		PRVTE	SW NE									000		00
						PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N DAY	INJ		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y OR<25		026	000		07
No					*45 19 54.96 -122 34 30.30*		016000100S00	1																			
														02	NONE 0 PRVTE	STOP SW NE									011		00
															PSNGR CAR		01	DRVR	INJC	74	M	OR-Y OR<25		000	000		00
04298	N	N	N		11/05/2013	CLACKAMAS	1 14		INTER	CROSS	N	N RAIN	S-1STOP	01	NONE 0	STRGHT												07
NONE					Tue 5P	OREGON CITY	MN 0	S BEAVERCREEK RD	SE		YIELD	N WET	REAR		PRVTE	SW NE									000		00
						PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N DLIT	PDO		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y OR<25		026	000		07
No					*45 19 54.96 -122 34 30.30*		016000100S00	1																			
														02	NONE 0 PRVTE	STOP SW NE									011		00
															PSNGR CAR		01	DRVR	NONE	59	F	OR-Y OR<25		000	000		00
00483	N	N	N		02/06/2014	CLACKAMAS	1 14		INTER	CROSS	N	N SNOW	S-STRGHT	01	NONE 0	STRGHT											124	07
CITY					Thu 10P	OREGON CITY	MN 0	S BEAVERCREEK RD	SE		YIELD	N SNO	REAR		UNKN	SW NE									000	124	00
						PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK UNK		042	000		07
No					*45 19 54.97 -122 34 30.30*		016000100S00	1																			

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
															02	NONE 0 PRVTE	STRGHT SW NE									006	00
																PSNGR CAR		01	DRVR	NONE	18	M	OR-Y OR<25		000	000	00
01591	N	N	N		04/26/2014	CLACKAMAS	1 14		INTER	CROSS	N		N CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE					Sat 4P	OREGON CITY	MN 0	S BEAVERCREEK RD	SE		YIELD		N DRY	REAR		PRVTE	SW NE									000	00
						PORTLAND UA	2.98	CASCADE HY SOUTH	09	3			N DAY	PDO		PSNGR CAR		01	DRVR	NONE	28	M	OR-Y OR<25		026	000	29
No					*45 19 54.97 -122 34 30.30*		016000100S00	1																			
															02	NONE 0 PRVTE	STOP SW NE									011	00
																PSNGR CAR		01	DRVR	NONE	69	M	OR-Y OR<25		000	000	00
00146	N	N	N		01/12/2011	CLACKAMAS	1 14		INTER	CROSS	N		N CLD	S-1STOP	01	NONE 0	STRGHT											07
CITY					Wed 4P	OREGON CITY	MN 0	S BEAVERCREEK RD	S		TRF SIGNAL		N WET	REAR		PRVTE	S N									000	00
						PORTLAND UA	2.98	CASCADE HY SOUTH	06	2			N DUSK	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y OR<25		026	000	07
No					*45 19 54.97 -122 34 30.30*		016000100S00	1																			
															02	NONE 0 PRVTE	STOP S N									011	00
																PSNGR CAR		01	DRVR	INJC	24	F	OR-Y OR<25		000	000	00
																		02	PSNG	INJC	24	F			000	000	00
00864	N	N	N		03/11/2011	CLACKAMAS	1 14		INTER	CROSS	N		N CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE					Fri 1P	OREGON CITY	MN 0	S BEAVERCREEK RD	S		L-GRN-SIG		N DRY	REAR		PRVTE	S N									000	00
						PORTLAND UA	2.98	CASCADE HY SOUTH	06	2			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y OR<25		026	000	07
No					*45 19 54.97 -122 34 30.30*		016000100S00	1																			
															02	NONE 0 PRVTE	STOP S N									012	00
																PSNGR CAR		01	DRVR	INJB	51	M	OR-Y OR<25		000	000	00
01684	N	N	N		05/16/2011	CLACKAMAS	1 14		INTER	CROSS	N		N CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE					Mon 8A	OREGON CITY	MN 0	S BEAVERCREEK RD	S		TRF SIGNAL		N DRY	REAR		PRVTE	S N									000	00
						PORTLAND UA	2.98	CASCADE HY SOUTH	06	0			N DAY	INJ		PSNGR CAR		01	DRVR	INJC	24	F	OR-Y OR<25		026	000	07
No					*45 19 54.97 -122 34 30.30*		016000100S00	1																			
															02	NONE 0 PRVTE	STOP S N									011	00
																PSNGR CAR		01	DRVR	NONE	39	M	OR-Y OR>25		000	000	00
03992	N	N	N		10/25/2011	CLACKAMAS	1 14		INTER	CROSS	N		N CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE					Tue 10A	OREGON CITY	MN 0	S BEAVERCREEK RD	S		TRF SIGNAL		N DRY	REAR		PRVTE	S N									000	00
						PORTLAND UA	2.98	CASCADE HY SOUTH	06	2			N DAY	PDO		PSNGR CAR		01	DRVR	NONE	57	M	OR-Y OR<25		026	000	07
No					*45 19 54.97 -122 34 30.30*		016000100S00	1																			

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	DRUG	ALC	SCH	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																	02	NONE 0 PRVTE	STOP S N									011	00
																		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y OR<25		000	000		00
04652 NONE	N	N	N	N	N	12/03/2011 Sat 9A	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER S 06	CROSS 2	N TRF SIGNAL	N N N	FOG DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT S N									000		27,07 00 27,07
No	*45 19 54.97*		*-122 34 30.30*					016000100	S00	1								PSNGR CAR		01	DRVR	NONE	45	M	OR-Y OR<25		016,026	000		
																	02	NONE 0 PRVTE	STOP S N									011	00
																		PSNGR CAR		01	DRVR	INJC	73	M	OR-Y OR<25		000	000		00
00069 STATE	N	N	N	N	N	01/06/2012 Fri 2P	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER S 06	CROSS 3	N TRF SIGNAL	N N N	RAIN WET DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT S N									000	004	07 00 07
No	*45 19 54.97*		*-122 34 30.30*					016000100	S00	1								PSNGR CAR		01	DRVR	NONE	16	F	OR-Y OR<25		043,026	000		
																	02	NONE 0 PRVTE	STOP S N									011	004	00
																		PSNGR CAR		01	DRVR	INJC	55	F	OR-Y OR<25		000	000		00
02327 UNK	N	N	N	N	N	06/29/2012 Fri 7A	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER S 06	CROSS 2	N TRF SIGNAL	N N N	CLD DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT S N									000		07,27 00 07,27
No	*45 19 54.97*		*-122 34 30.30*					016000100	S00	1								PSNGR CAR		01	DRVR	NONE	53	M	OR-Y OR<25		026,016	038		
																	02	NONE 0 PRVTE	STOP S N									011		00
																		PSNGR CAR		01	DRVR	INJC	44	F	OR-Y OR<25		000	000		00
03411 NONE	N	N	N			09/13/2013 Fri 11A	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER S 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT S N									000		07 00 07
No	*45 19 54.96*		*-122 34 30.30*					016000100	S00	1								PSNGR CAR		01	DRVR	NONE	63	F	OR-Y OR<25		026	000		
																	02	NONE 0 PRVTE	STOP S N									011		00
																		PSNGR CAR		01	DRVR	NONE	00	M	UNK UNK		000	000		00
03520 NONE	N	N	N			09/20/2013 Fri 6A	CLACKAMAS OREGON CITY PORTLAND UA	1 MN 0 2.98	14	 S BEAVERCREEK RD CASCADE HY SOUTH	INTER S 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DAWN	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT S N									000		07 00 07
No	*45 19 54.96*		*-122 34 30.30*					016000100	S00	1								PSNGR CAR		01	DRVR	NONE	37	M	OR-Y OR<25		026	000		

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHL BUS	WORK ZONE	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	CONN #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																	02	NONE 0 PRVTE	STOP S N									011	00
																		PSNGR CAR		01	DRVR	INJC	29	M	OR-Y OR<25		000	000	00
03630 NONE	N	N	N			09/27/2013 Fri 5A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER S 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DAWN	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	34	F	OR-Y OR<25		026	000 000	07 00 07
No						*45 19 54.96 -122 34 30.30*		016000100S00	1																				
																	02	NONE 0 PRVTE	STOP S N									011	00
																		PSNGR CAR		01	DRVR	NONE	49	F	OR-Y OR<25		000	000	00
00463 COUNTY	Y	N	N	N	N	02/05/2014 Wed 5A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER S 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DLIT	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	19	M	OTH-Y N-RES		026,047	000 000	07,01 00 07,01
No						*45 19 54.97 -122 34 30.30*		016000100S00	1																				
																	02	NONE 0 PRVTE	STOP S N									011	00
																		PSNGR CAR		01	DRVR	INJC	44	F	OR-Y OR<25		000	000	00
00709 NONE	N	N	N			02/17/2014 Mon 5A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER S 06	CROSS 3	N TRF SIGNAL	N N N	RAIN WET DLIT	S-1STOP REAR INJ	01	NONE 0 UNKN PSNGR CAR	STRGHT S N	01	DRVR	NONE	00	M	UNK UNK		026	000 000	07 00 07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1																				
																	02	NONE 0 PRVTE	STOP S N									011	00
																		PSNGR CAR		01	DRVR	INJC	55	M	OR-Y OR<25		000	000	00
01295 NONE	N	N	N			04/03/2014 Thu 9A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER S 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	20	F	OR-Y OR<25		026	000 000	07 00 07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1																				
																	02	NONE 0 UNKN	STOP S N									011	00
																		PSNGR CAR		01	DRVR	NONE	00	M	UNK UNK		000	000	00
02651 NO RPT	N	N	N			06/26/2014 Thu 2P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER S 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	00	F	UNK OR<25		026	000 000	29 00 29
No						*45 19 54.97 -122 34 30.30*		016000100S00	1																				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	DRUG	ALC	SCH	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																	02	NONE 0 PRVTE	STOP S N								011	00
																		PSNGR CAR		01	DRVR	NONE	22	M	OR-Y OR<25		000	000	00
02801 NONE	N	N	N			07/21/2014 Mon 11A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98		S BEAVERCREEK RD CASCADE HY SOUTH	INTER S 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT S N									000	00 29
No	*45 19 54.97*		*-122 34 30.30*					016000100S00		1								PSNGR CAR		01	DRVR	NONE	25	F	OR-Y OR<25		026	000	29
																	02	NONE 0 PRVTE	STOP S N								011	00
																		PSNGR CAR		01	DRVR	INJC	20	F	OR-Y OR<25		000	000	00
03583 NO RPT	N	N	N			10/04/2010 Mon 3P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98		S BEAVERCREEK RD CASCADE HY SOUTH	INTER W 06	CROSS 2	N TRF SIGNAL	N N N	RAIN WET DAY	S-1STOP REAR INJ	01	NONE 1 PRVTE	STRGHT W E									000	07 00 07
No	*45 19 54.47*		*-122 34 30.52*					016000100S00		1								PSNGR CAR		01	DRVR	NONE	61	M	OR-Y OR<25		026	000	07
																	02	NONE 0 PRVTE	STOP W E								011	00
																		PSNGR CAR		01	DRVR	INJC	21	M	OR-Y OR<25		000	000	00
01378 NONE	N	N	N			01/12/2011 Wed 12P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98		S BEAVERCREEK RD CASCADE HY SOUTH	INTER W 06	CROSS 2	N TRF SIGNAL	N N N	RAIN WET DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT W E									000	07 00 07
No	*45 19 54.97*		*-122 34 30.30*					016000100S00		1								PSNGR CAR		01	DRVR	NONE	23	F	OR-Y OR<25		026	000	07
																	02	NONE 0 PRVTE	STOP W E								011	00
																		PSNGR CAR		01	DRVR	NONE	54	M	OR-Y OR<25		000	000	00
03959 NONE	N	N	N			10/07/2014 Tue 7A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98		S BEAVERCREEK RD CASCADE HY SOUTH	INTER W 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT W E									000	29 00 29
No	*45 19 54.97*		*-122 34 30.30*					016000100S00		1								PSNGR CAR		01	DRVR	NONE	18	M	OR-Y OR<25		026	026	29
																	02	NONE 0 PRVTE	STOP W E								011	00
																		PSNGR CAR		01	DRVR	NONE	28	M	OR-Y OR<25		000	000	00
03636 NONE	N	N	N			10/08/2010 Fri 6A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98		S BEAVERCREEK RD CASCADE HY SOUTH	INTER NW 09	CROSS 2	N YIELD	N N N	CLR DRY DAWN	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT NE SW									000	07 00 07
No	*45 19 54.97*		*-122 34 30.30*					016000100S00		1								PSNGR CAR		01	DRVR	NONE	45	M	OR-Y OR<25		026	000	07

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																02	NONE 0 PRVTE	STOP NE SW									011	00
																	PSNGR CAR		01	DRVR	NONE	00	M	OTH-Y UNK		000	000	00
03710 NONE	N	N	N			10/11/2010 Mon 7A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NW 09	CROSS 2	N YIELD	N N N	CLR WET DAY	S-1STOP REAR INJ	01	POLCE 0 UNKN	STRGHT NE SW										07 00
No	*45 19 54.97*		*-122 34 30.30*					016000100S00	1								PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		026	000	07
																02	NONE 0 PRVTE	STOP NE SW									011	00
																	PSNGR CAR		01	DRVR	INJC	56	F	OR-Y OR<25		000	000	00
01141 NONE	N	N	N			04/04/2011 Mon 11A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NW 09	CROSS 2	N YIELD	N N N	RAIN WET DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT NE SW										07 00
No	*45 19 54.97*		*-122 34 30.30*					016000100S00	1								PSNGR CAR		01	DRVR	NONE	00	F	OR-Y UNK		026	000	07
																02	NONE 0 PRVTE	STOP NE SW									011	00
																	PSNGR CAR		01	DRVR	NONE	44	M	OR-Y OR<25		000	000	00
04735 NONE	N	N	N			12/08/2011 Thu 1P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NW 09	CROSS 3	N YIELD	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT NE SW										07 00
No	*45 19 54.97*		*-122 34 30.30*					016000100S00	1								PSNGR CAR		01	DRVR	NONE	70	M	OR-Y OR<25		026	000	07
																02	NONE 0 PRVTE	STOP NE SW									011	00
																	PSNGR CAR		01	DRVR	NONE	64	F	OR-Y OR<25		000	000	00
03846 NONE	N	N	N			10/15/2012 Mon 5P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NW 09	CROSS 3	N YIELD	N N N	RAIN WET DUSK	S-1STOP REAR PDO	01	NONE 0 PRVTE	STRGHT NE SW										07 00
No	*45 19 54.97*		*-122 34 30.30*					016000100S00	1								PSNGR CAR		01	DRVR	NONE	46	M	OR-Y OR<25		026	000	07
																02	NONE 0 PRVTE	STOP NE SW									011	00
																	PSNGR CAR		01	DRVR	NONE	00	F	OR-Y OR<25		000	000	00
04066 NONE	N	N	N			10/29/2012 Mon 12P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NW 09	CROSS 3	N YIELD	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT NE SW										07 00
No	*45 19 54.97*		*-122 34 30.30*					016000100S00	1								PSNGR CAR		01	DRVR	NONE	24	M	OR-Y OR<25		026	000	07

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHL BUS	WORK ZONE	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / LRS	FC / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	CONN #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																	02	NONE 0 PRVTE	STOP NE SW										011		00
																		PSNGR CAR		01	DRVR	INJC	52	F	OR-Y OR<25		000	000		00
04076 NONE	N	N	N			10/29/2012 Mon 4P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER NW 09	CROSS 3	N YIELD	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT NE SW										000		07 00 07
No	*45 19 54.97*		*-122 34 30.30*					016000100	S00 1									PSNGR CAR		01	DRVR	NONE	50	M	OR-Y OR<25		026	000		
																	02	NONE 0 PRVTE	STOP NE SW										011		00
																		PSNGR CAR		01	DRVR	INJB	46	M	OR-Y OR<25		000	000		00
04216 CITY	Y	N	N			11/08/2012 Thu 2P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER NW 09	CROSS 3	N YIELD	Y N	CLD DRY DAY	FIX OBJ FIX INJ	01	NONE 0 PRVTE	STRGHT NE SW										000	055 055	01 00 01
No	*45 19 54.97*		*-122 34 30.30*					016000100	S00 1									PSNGR CAR		01	DRVR	INJC	51	F	OR-Y OR<25		047,081	000		
02430 NONE	N	N	N			07/07/2013 Sun 12P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER NW 09	CROSS 3	N YIELD	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT NE SW										000		07 00 07
No	*45 19 54.96*		*-122 34 30.30*					016000100	S00 1									PSNGR CAR		01	DRVR	NONE	00	F	UNK OR<25		026	000		
																	02	NONE 0 PRVTE	STOP NE SW										011		00
																		PSNGR CAR		01	DRVR	INJC	36	M	OR-Y OR<25		000	000		00
03349 CITY	N	N	N	N	N	09/10/2013 Tue 1P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER NW 09	CROSS 3	N YIELD	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT NE SW										000		07 00 07
No	*45 19 54.96*		*-122 34 30.30*					016000100	S00 1									PSNGR CAR		01	DRVR	NONE	60	F	OR-Y OR<25		043,026	000		
																	02	NONE 0 PRVTE	STOP NE SW										011		00
																		PSNGR CAR		01	DRVR	INJC	30	F	OR-Y OR<25		000	000		00
04790 NONE	N	N	N			12/12/2013 Thu 2P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH		INTER NW 09	CROSS 3	N YIELD	N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE	STRGHT NE SW										000		07 00 07
No	*45 19 54.96*		*-122 34 30.30*					016000100	S00 1									PSNGR CAR		01	DRVR	NONE	54	M	OR-Y OR<25		026	000		
																	02	NONE 0 PRVTE	STOP NE SW										011		00
																		PSNGR CAR		01	DRVR	INJC	56	F	OR-Y OR<25		000	000		00

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALC	DRUGS	SCH	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00348	N	N	N			01/26/2014	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						Sun 4P	OREGON CITY	MN 0	S BEAVERCREEK RD	NW		YIELD	N	DRY	REAR		PRVTE	NE SW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25				
																02	NONE 0	STOP										
																	PRVTE	NE SW									011	00
																	PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		000	000	00
																								OR<25				
00768	N	N	N			02/21/2014	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						Fri 7A	OREGON CITY	MN 0	S BEAVERCREEK RD	NW		YIELD	N	DRY	REAR		PRVTE	NE SW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25				
																02	NONE 0	STOP										
																	PRVTE	NE SW									011	00
																	PSNGR CAR		01	DRVR	NONE	49	F	OR-Y		000	000	00
																								OR<25				
01784	N	N	N			05/09/2014	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						Fri 10A	OREGON CITY	MN 0	S BEAVERCREEK RD	NW		YIELD	N	DRY	REAR		PRVTE	NE SW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		026	000	07
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25				
																02	NONE 0	STOP										
																	PRVTE	NE SW									011	00
																	PSNGR CAR		01	DRVR	INJC	41	M	OR-Y		000	000	00
																								OR<25				
02955	N	N	N			08/01/2014	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE						Fri 9P	OREGON CITY	MN 0	S BEAVERCREEK RD	NW		YIELD	N	DRY	REAR		PRVTE	NE SW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	29	F	OR-Y		026	000	29
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25				
																02	NONE 0	STOP										
																	PRVTE	NE SW									011	00
																	PSNGR CAR		01	DRVR	INJC	34	M	OR-Y		000	000	00
																								OR<25				
																			02	PSNG	INJC	36	F			000	000	00
04683	N	N	N			11/18/2014	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NO RPT						Tue 5P	OREGON CITY	MN 0	S BEAVERCREEK RD	NW		YIELD	N	DRY	REAR		PRVTE	NE SW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	09	3		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	50	M	OR-Y		026	000	29
No						*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25				
																02	NONE 0	STOP										
																	PRVTE	NE SW									011	00
																	PSNGR CAR		01	DRVR	INJB	35	M	OR-Y		000	000	00
																								OR<25				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCOHOL	DRUGS	SCHOOL BUS	WORK ZONE	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MILEPNT / LRS	FC / CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00825	N	Y	N			03/09/2011	CLACKAMAS	1 14		INTER	CROSS	N	N	RAIN	O-OTHER	01	NONE 0	TURN-L										08
CITY						Wed 9P	OREGON CITY	MN 0	S BEAVERCREEK RD	CN		TRF SIGNAL	N	WET	TURN		PRVTE	N E									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	01	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	46	M	OR-Y		001	000	08
No	*45 19 54.97*	*-122 34 30.30*						016000100S00	1															OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	S W									000	00
																	PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		000	000	00
																								OR<25				
																			02	PSNG	INJC	21	M			000	000	00
03642	N	N	N			10/01/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
NO RPT						Mon 6A	OREGON CITY	MN 0	S BEAVERCREEK RD	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N S									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	01	3		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		020	000	04
No	*45 19 54.97*	*-122 34 30.30*						016000100S00	1															OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	S W									000	00
																	PSNGR CAR		01	DRVR	NONE	28	F	OR-Y		000	000	00
																								OR<25				
																			02	PSNG	NO<5	01	M			000	000	00
																			03	PSNG	INJC	03	F			000	000	00
00286	N	N	N	N	N	01/23/2011	CLACKAMAS	1 14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	TURN-L										02,04
STATE						Sun 6A	OREGON CITY	MN 0	S BEAVERCREEK RD	CN		TRF SIGNAL	N	WET	TURN		PRVTE	SW NW									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	02	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		028,003	000	02,04
No	*45 19 54.97*	*-122 34 30.30*						016000100S00	1															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	NE SW									000	00
																	PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		000	000	00
																								OR<25				
																			02	PSNG	INJC	27	F			000	000	00
04463	N	N	N			11/22/2011	CLACKAMAS	1 14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 1	STRGHT										04
NONE						Tue 10A	OREGON CITY	MN 0	S BEAVERCREEK RD	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	S N									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	02	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	44	M	OR-Y		097	000	00
No	*45 19 54.97*	*-122 34 30.30*						016000100S00	1															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	E W									000	00
																	PSNGR CAR		01	DRVR	NONE	77	F	OR-Y		097	000	00
																								OR<25				
00857	N	N	N	N	N	03/06/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT										04
CITY						Tue 9P	OREGON CITY	MN 0	S BEAVERCREEK RD	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S N									000	00
							PORTLAND UA	2.98	CASCADE HY SOUTH	02	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		020	000	04
No	*45 19 54.97*	*-122 34 30.30*						016000100S00	1															OR<25				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / LRS	FC	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																02	NONE 0 PRVTE	TURN-L N E									000	00
																	PSNGR CAR		01	DRVR	INJC	45	M	OR-Y OR<25		000	000	00
																			02	PSNG	INJA	39	F			000	000	00
00083 NONE	N	N	N		01/08/2013 Tue 7A	CLACKAMAS OREGON CITY	1 MN 0	14	S BEAVERCREEK RD	INTER CN	CROSS	N TRF SIGNAL	N	RAIN WET	S-1STOP REAR	01	NONE 0 PRVTE	TURN-L W N									000	07 00
						PORTLAND UA	2.98		CASCADE HY SOUTH	02	3		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	35	F	OR-Y OR<25		026	000	07
No					*45 19 54.96 -122 34 30.30*		016000100S00		1																				
																02	NONE 0 PRVTE	STOP W N									013	00
																	PSNGR CAR		01	DRVR	NONE	38	M	OR-Y OR<25		000	000	00
05036 NONE	N	N	N		12/26/2013 Thu 7A	CLACKAMAS OREGON CITY	1 MN 0	14	S BEAVERCREEK RD	INTER CN	CROSS	N TRF SIGNAL	N	UNK WET	ANGL-OTH ANGL	01	NONE 0 PRVTE	STRGHT S N									000	04 00
						PORTLAND UA	2.98		CASCADE HY SOUTH	02	3		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y OR<25		020	000	04
No					*45 19 54.96 -122 34 30.30*		016000100S00		1																				
																02	NONE 0 PRVTE	STRGHT E W									000	00
																	PSNGR CAR		01	DRVR	NONE	57	F	OR-Y OR<25		000	000	00
03843 STATE	N	Y	N	N	09/18/2011 Sun 1A	CLACKAMAS OREGON CITY	1 MN 0	14	S BEAVERCREEK RD	INTER CN	CROSS	N TRF SIGNAL	N	RAIN WET	ANGL-OTH ANGL	01	NONE 0 PRVTE	STRGHT N S									000	04 00
						PORTLAND UA	2.98		CASCADE HY SOUTH	03	2		N	DLIT	FAT		PSNGR CAR		01	DRVR	INJC	58	M	OR-Y OR<25		000	000	00
No					*45 19 54.97 -122 34 30.30*		016000100S00		1																				
																02	NONE 0 PRVTE	STRGHT W E									000	00
																	PSNGR CAR		01	DRVR	KILL	29	F	OR-Y OR<25		020	000	04
																			02	PSNG	INJB	26	M			000	000	00
02536 STATE	N	N	N	N	07/13/2012 Fri 7P	CLACKAMAS OREGON CITY	1 MN 0	14	S BEAVERCREEK RD	INTER CN	CROSS	N TRF SIGNAL	N	CLR DRY	ANGL-OTH ANGL	01	NONE 0 PRVTE	STRGHT W E									000	02,14 00
						PORTLAND UA	2.98		CASCADE HY SOUTH	03	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	28	M	OR-Y OR<25		028,024	000	02,14
No					*45 19 54.97 -122 34 30.30*		016000100S00		1																				
																02	POLCE 0 PUBLC	STRGHT N S									000	00
																	PSNGR CAR		01	DRVR	NONE	45	M	OR-Y OR<25		000	000	00
04829 NONE	N	N	N		12/13/2012 Thu 7A	CLACKAMAS OREGON CITY	1 MN 0	14	S BEAVERCREEK RD	INTER CN	CROSS	N TRF SIGNAL	N	UNK UNK	S-1STOP REAR	01	NONE 0 PRVTE	STRGHT W E									000	07 00
						PORTLAND UA	2.98		CASCADE HY SOUTH	03	3		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	35	M	OR-Y OR<25		026	000	07
No					*45 19 54.97 -122 34 30.30*		016000100S00		1																				

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
															02	NONE 0 PRVTE	STOP W E									011	00
																PSNGR CAR		01	DRVR	NONE	00	F	UNK OR<25		000	000	00
04601 STATE	N	N	N		12/03/2010 Fri 1P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER CN 04	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	S-OTHER REAR INJ	01	NONE 0 PRVTE PSNGR CAR	TURN-R S E	01	DRVR	NONE	19	M	OR-Y OR<25		026	000	07 00 07
No					*45 19 56.31 -122 34 29.78*		016000100S00	1																			
															02	NONE 0 PRVTE	STOP S E									013	00
																PSNGR CAR		01	DRVR	NONE	81	M	OR-Y OR<25		000	000	00
																		02	PSNG	INJC	77	F			000	000	00
00804 NONE	N	N	N		03/07/2011 Mon 10A	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER CN 04	CROSS 2	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH ANGL PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	00	F	UNK OR<25		020	000	04 00 04
No					*45 19 54.97 -122 34 30.30*		016000100S00	1																			
															02	NONE 0 PRVTE	STRGHT W E									000	00
																PSNGR CAR		01	DRVR	NONE	67	M	OR-Y OR<25		000	000	00
03336 CITY	N	N	N	N	N 09/09/2013 Mon 11P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.98	S BEAVERCREEK RD CASCADE HY SOUTH	INTER CN 04	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DLIT	O-1 L-TURN TURN INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N	01	DRVR	INJC	29	M	OR-Y OR<25		000	000	04 00 00
No					*45 19 54.96 -122 34 30.30*		016000100S00	1																			
																		02	PSNG	INJB	21	F			000	000	00
															02	NONE 0 PRVTE	TURN-L N E									000	00
																PSNGR CAR		01	DRVR	NONE	42	F	OR-Y OR<25		003	000	04
01847 NONE	N	N	N		05/26/2010 Wed 1P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.99	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 2	N YIELD	N N N	RAIN WET DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT SE NW	01	DRVR	NONE	00	M	OR-Y OR<25		016,026	000	27,07 00 27,07
No					*45 19 54.47 -122 34 30.52*		016000100S00	1																			
															02	NONE 0 PRVTE	STOP SE NW									011	00
																PSNGR CAR		01	DRVR	NONE	20	M	OR-Y OR<25		000	000	00
03021 NONE	N	N	N		08/27/2010 Fri 2P	CLACKAMAS OREGON CITY PORTLAND UA	1 14 MN 0 2.99	S BEAVERCREEK RD CASCADE HY SOUTH	INTER NE 09	CROSS 3	N YIELD	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT SE NW	01	DRVR	NONE	29	M	OR-Y OR<25		026	000	07 00 07
No					*45 19 54.47 -122 34 30.52*		016000100S00	1																			
																		02	PSNG	NO<5	01	M			000	000	00

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# / CMPT/MLG / LRS	FC	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR / QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																02	NONE 0 PRVTE	STOP SE NW									011	00
																	PSNGR CAR		01	DRVR	INJC	30	F	OR-Y OR<25		000	000	00
																			02	PSNG	NO<5	02	M			000	000	00
03164	N	N	N			09/05/2010	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR S-1STOP	01	NONE 0 PRVTE	STRGHT SE NW										07
NONE						Sun 2P	OREGON CITY	MN 0		S BEAVERCREEK RD	NE		YIELD	N	DRY REAR		PRVTE	SE NW									000	00
							PORTLAND UA	2.99		CASCADE HY SOUTH	09	3		N	DAY INJ		PSNGR CAR		01	DRVR	NONE	41	M	OR-Y OR<25		026	000	07
No	*45 19 54.47*	*-122 34 30.52*						016000100S00		1																		
																02	NONE 0 PRVTE	STOP SE NW									011	00
																	PSNGR CAR		01	DRVR	INJC	20	M	OR-Y OR<25		000	000	00
03715	N	N	N			10/13/2010	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR S-1STOP	01	NONE 0 PRVTE	STRGHT SE NW										07
NONE						Wed 3P	OREGON CITY	MN 0		S BEAVERCREEK RD	NE		YIELD	N	DRY REAR		PRVTE	SE NW									000	00
							PORTLAND UA	2.99		CASCADE HY SOUTH	09	2		N	DAY INJ		PSNGR CAR		01	DRVR	NONE	20	F	OR-Y OR<25		026	000	07
No	*45 19 54.47*	*-122 34 30.52*						016000100S00		1																		
																02	NONE 0 PRVTE	STOP SE NW									011	00
																	PSNGR CAR		01	DRVR	INJC	27	F	OR-Y OR<25		000	000	00
03163	N	N	N			09/05/2010	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR S-1STOP	01	NONE 0 PRVTE	STRGHT NE SW										07
NONE						Sun 4P	OREGON CITY	MN 0		S BEAVERCREEK RD	NW		YIELD	N	DRY REAR		PRVTE	NE SW									000	00
							PORTLAND UA	2.99		CASCADE HY SOUTH	09	3		N	DAY INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		026	000	07
No	*45 19 54.47*	*-122 34 30.52*						016000100S00		1																		
																02	NONE 0 PRVTE	STOP NE SW									011	00
																	PSNGR CAR		01	DRVR	INJC	17	M	OR-Y OR<25		000	000	00

CITY OF OREGON CITY, CLACKAMAS COUNTY — OR 213 Cascade Highway (160) & Beavercreek Road

January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
04472	N	N	N			11/25/2010	19	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07
NONE						Thu 12P	0	CASCADE HY SOUTH	NE		YIELD	N	DRY	REAR		PRVTE	SE NW									000		00
No	*45 19 54.97*					*-122 34 30.30*		1	09	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y OR<25		026	038		07
															02	NONE	STOP											
																PRVTE	SE NW									011		00
																PSNGR CAR		01	DRVR	NONE	57	M	OR-Y OR<25		000	000		00
00577	N	N	N	N	N	02/19/2013	16	S BEAVERCREEK RD	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
CITY						Tue 6A	0	CASCADE HY SOUTH	NE		YIELD	N	WET	REAR		PRVTE	SE NW									000		00
No	*45 19 54.97*					*-122 34 30.30*		1	09	3		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	53	M	OR-Y OR<25		043,026	000		07
															02	NONE 0	STOP											
																PRVTE	SE NW									011		00
																PSNGR CAR		01	DRVR	INJB	57	M	OR-Y OR<25		000	000		00
00942	N	N	N			03/21/2010	16	S BEAVERCREEK RD	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
NONE						Sun 10A	0	CASCADE HY SOUTH	E		YIELD	N	WET	REAR		PRVTE	E W									000		00
No	*45 19 54.97*					*-122 34 30.30*		1	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	65	M	OR-Y OR<25		026	000		07
															02	NONE 0	STOP											
																PRVTE	E W									011		00
																PSNGR CAR		01	DRVR	NONE	56	M	OR-Y OR<25		000	000		00
04125	N	N	N			11/07/2010	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07
NONE						Sun 9A	0	CASCADE HY SOUTH	E		YIELD	N	WET	REAR		PRVTE	E W									000		00
No	*45 19 54.97*					*-122 34 30.30*		1	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y OR<25		026	000		07
															02	NONE 0	STOP											
																PRVTE	E W									011		00
																PSNGR CAR		01	DRVR	NONE	00	F	UNK UNK		000	000		00
04322	N	N	N			11/17/2010	16	S BEAVERCREEK RD	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	07
NONE						Wed 4P	0	CASCADE HY SOUTH	E		TRF SIGNAL	N	WET	REAR		PRVTE	E W									000		00
No	*45 19 54.97*					*-122 34 30.30*		1	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	27	M	OR-Y OR<25		026	000		07
															02	NONE 0	STOP											
																PRVTE	E W									011	013	00
																PSNGR CAR		01	DRVR	INJB	83	F	OR-Y OR<25		000	000		00
															03	NONE 0	STOP											
																PRVTE	E W									022		00
																PSNGR CAR		01	DRVR	INJC	47	M	OR-Y OR<25		000	000		00
																		02	PSNG	INJC	24	F			000	000		00
																		03	PSNG	NO<5	04	M			000	000		00

CITY OF OREGON CITY, CLACKAMAS COUNTY — OR 213 Cascade Highway (160) & Beavercreek Road

January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	SPED	ALC	DRUGS	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																		04	PSNG	NO<5	02	F			000	000		00
00355	Y	N	Y	N	N	01/30/2011	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT												16,32
CITY						Sun 3P	0	CASCADE HY SOUTH	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E W									000		00
Yes	*45 19 54.98*					*-122 34 30.29*		1	06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	72	F	OR-Y OR<25		053,026,011	025		16,32
															02	NONE 0	STOP											
																PRVTE	E W									011		00
																PSNGR CAR		01	DRVR	INJB	51	F	OR-Y OR<25		000	000		00
															03	NONE 0	STOP											
																PRVTE	E W									022		00
																PSNGR CAR		01	DRVR	NONE	54	M	OR-Y OR<25		000	000		00
01217	N	N	N			04/11/2011	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-OTHER	01	NONE 0	STRGHT												07
NONE						Mon 8P	0	CASCADE HY SOUTH	E		UNKNOWN	N	DRY	REAR		PRVTE	E W									000		00
Yes	*45 19 54.98*					*-122 34 30.29*		1	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	47	F	OTH-Y N-RES		042	000		07
															02	NONE 0	STRGHT											
																PRVTE	E W									006		00
																PSNGR CAR		01	DRVR	NONE	56	F	OR-Y OR<25		000	000		00
																		02	PSNG	INJC	18	F			000	000		00
01368	Y	N	N	N	N	04/22/2011	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013		01
STATE						Fri 2P	0	CASCADE HY SOUTH	E		TRF SIGNAL	N	DRY	REAR		PRVTE	S N									000		00
Yes	*45 19 54.98*					*-122 34 30.29*		1	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	41	F	OR-Y OR<25		047,026	000		01
															02	NONE 0	STOP											
																PRVTE	S N									011	013	00
																PSNGR CAR		01	DRVR	NONE	17	F	OR-Y OR<25		000	000		00
															03	NONE 0	STOP											
																PRVTE	S N									022		00
																PSNGR CAR		01	DRVR	NONE	22	M	OR-Y OR<25		000	000		00
04115	N	N	N			11/03/2011	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE						Thu 11A	0	CASCADE HY SOUTH	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E W									000		00
Yes	*45 19 54.98*					*-122 34 30.29*		1	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK UNK		026	000		07
															02	NONE 0	STOP											
																PRVTE	E W									011		00
																PSNGR CAR		01	DRVR	INJC	25	F	OR-Y OR>25		000	000		00
00750	N	N	N			02/27/2012	16	S BEAVERCREEK RD	INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 0	STRGHT												07
NONE						Mon 2P	0	CASCADE HY SOUTH	E		TRF SIGNAL	N	WET	REAR		PRVTE	E W									000		00
No	*45 19 54.97*					*-122 34 30.30*		1	06	3		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		026	000		07

CITY OF OREGON CITY, CLACKAMAS COUNTY — OR 213 Cascade Highway (160) & Beavercreek Road

January 1, 2010 through December 31, 2014

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															02	NONE 0 PRVTE PSNGR CAR	STOP E W										011 000	00 00
05319	N	N	N			12/31/2014 Wed 9P *45 19 54.97 -122 34 30.30*	16 0	S BEAVERCREEK RD CASCADE HY SOUTH 1	INTER E 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DLIT	S-1STOP REAR INJ	01	NONE 0 UNKN PSNGR CAR	STRGHT UN UN	01	DRVR	NONE	00	U	UNK UNK		026	000 000		29 00 29
NONE No																												
															02	NONE 0 PRVTE PSNGR CAR	STOP UN UN	01	DRVR	INJC	16	F	OR-Y OR<25		000	011 000		00 00
																		02	PSNG	INJC	18	F			000	000		00
04873	N	N	N			12/19/2011 Mon 2P *45 19 54.96 -122 34 30.29*	16 0	S BEAVERCREEK RD CASCADE HY SOUTH 1	INTER W 06	CROSS 1	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	00	M	OR-Y OR<25		026	000 000		07 00 07
NONE No																												
															02	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	NONE	30	F	OR-Y OR<25		000	011 000		00 00
02778	N	N	N			07/29/2012 Sun 10A *45 19 54.97 -122 34 30.30*	16 0	S BEAVERCREEK RD CASCADE HY SOUTH 1	INTER W 06	CROSS 2	N L-TURN REF	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	37	F	OR-Y OR<25		026	000 000		07 00 07
NONE No																												
															02	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	NONE	51	F	OR-Y OR<25		000	012 000		00 00
02536	N	N	N			07/15/2013 Mon 6P *45 19 54.97 -122 34 30.30*	16 0	S BEAVERCREEK RD CASCADE HY SOUTH 1	INTER W 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	44	M	OR-Y OR<25		026	000 000		07 00 07
NONE No																												
															02	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	NONE	60	F	OR-Y OR<25		000	011 000		00 00
04147	N	N	N			10/29/2013 Tue 3P *45 19 54.97 -122 34 30.30*	16 0	S BEAVERCREEK RD CASCADE HY SOUTH 1	INTER W 06	CROSS 3	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT W E	01	DRVR	NONE	20	F	OR-Y OR>25		026	000 000		07 00 07
NONE No																												
															02	NONE 0 PRVTE PSNGR CAR	STOP W E	01	DRVR	INJC	34	F	OR-Y OR<25		000	011 000		00 00

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00273	N	N	N	N	N	01/01/2014	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
CITY						Wed 9A	0	CASCADE HY SOUTH	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E										000		00
No						*45 19 54.97 -122 34 30.30*		1	06	3		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	65	F	SUSP OR<25		026	000		07
															02	NONE 0	STOP											
																PRVTE	W E										011		00
																PSNGR CAR		01	DRVR	INJC	21	F	OR-Y OR<25		000	000		00

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED OR DISABLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING
055	SPRAY	BLINDED BY WATER SPRAY
088	OTHER	OTHER ACTION

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD; STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RO
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST NOT VISIBLE; NON-REFLECTIVE CLOTHIN
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1 L-TURN	FROM OPPOSITE DIRECTION-ONE LEFT TURN,ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TOO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WORK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAY ON RD	STANDING OR LYING IN ROADWAY
071	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
073	ELUDING	ELUDING / ATTEMPT TO ELUDE
079	F NEG CURV	FAILED TO NEGOTIATE A CURVE
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER-CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED/PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHIC
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMNT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FALLEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
074	OVERHD OBJ	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL WTNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	DSTRCT OTH	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN MAJOR COLLECTOR
18	URBAN MINOR COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY

PEDESTRIAN LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH OR PARKING LANE
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
13	AT INTERSECTION - IN BIKE LANE
14	NOT AT INTERSECTION - IN BIKE LANE
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
16	NOT AT INTERSECTION - IN PARKING LANE

ROAD CHARACTER CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING

095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS
099	UNKNOWN	UNKNOWN OR NOT DEFINITE

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

CITY OF OREGON CITY, CLACKAMAS COUNTY **REDLAND RD at CASCADE HY SOUTH, City of Oregon City, Clackamas County, 01/01/2013 to 12/31/2015**

Total crash records: 27

SER# / INVEST	SPEED	ALCOHOL	DRUGS	SCHL ZONE	WORK ZONE	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL / TRAF-CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
01593	N	N	N			05/08/2013	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										27,07
NO RPT						WE		REDLAND RD	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S									000	00
						12P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y OR<25		016,026	000	27,07
															02	NONE 0	STOP										
																PRVTE	N -S									011	00
																PSNGR CAR		01	DRVR	INJC	63	F	OR-Y OR<25		000	000	00
04034	Y	N	N			10/22/2013	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										01,07
CITY						TU		REDLAND RD	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S									000	00
						8P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	57	F	OR-Y OR<25		047,043,026	000	01,07
															02	NONE 0	STOP										
																PRVTE	N -S									011	00
																PSNGR CAR		01	DRVR	NONE	16	M	OR-Y OR<25		000	000	00
04654	N	N	N			11/17/2014	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE						MO		REDLAND RD	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S									000	00
						12P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	60	M	OTH-Y N-RES		026	000	29
															02	NONE 0	STOP										
																PRVTE	N -S									011	00
																PSNGR CAR		01	DRVR	NONE	66	F	OR-Y OR>25		000	000	00
															02	NONE 0	STOP										
																PRVTE	N -S									011	00
																PSNGR CAR		02	PSNG	INJC	61	F			000	000	00
01056	N	N	N			03/26/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE						TH		REDLAND RD	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S									000	00
						2P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	53	F	OR-Y OR<25		026	000	29
															02	NONE 0	STOP										
																PRVTE	N -S									011	00
																PSNGR CAR		01	DRVR	NONE	44	F	OR-Y OR<25		000	000	00
02925	N	N	N			07/20/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE						MO		REDLAND RD	N		TRF SIGNAL	N	DRY	REAR		PRVTE	N -S									000	00
						3P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	35	F	OR-Y OR<25		026	000	29
															02	NONE 0	STOP										
																PRVTE	N -S									011	00
																PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		000	000	00
00947	N	N	N			03/19/2013	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
NONE						TU		REDLAND RD	S		TRF SIGNAL	N	WET	REAR		UNKN	S -N									000	00
						1P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y UNK		026	000	07
															02	NONE 0	STOP										
																PRVTE	S -N									011	00
																PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		000	000	00

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CITY OF OREGON CITY, CLACKAMAS COUNTY

REDLAND RD at CASCADE HY SOUTH, City of Oregon City, Clackamas County, 01/01/2013 to 12/31/2015

Total crash records: 27

SER# / INVEST	S P E D	A L C	D R S L	S W H K	O R	DATE / DAY / TIME	CLASS / DIST / FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																							OR<25					
02451	N	N	N	N N		07/09/2013	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	27,07
CITY						TU		REDLAND RD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N								000		00
						3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		016,026	038		27,07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S -N									011	013	00
																PSNGR CAR		01	DRVR	NONE	46	F	OR-Y		000	000		00
																							OR<25					
															03	NONE 0	STOP											
																PRVTE	S -N									022		00
																PSNGR CAR		01	DRVR	INJC	35	M	OR-Y		000	000		00
																							OR<25					
															03	NONE 0	STOP											
																PRVTE	S -N									022		00
																PSNGR CAR		02	PSNG	NO<5	04	M			000	000		00
03817	N	N	N			09/29/2014	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT												29
NO RPT						MO		REDLAND RD	S		TRF SIGNAL	N	WET	REAR		PRVTE	S -N									000		00
						3P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	35	M	OR-Y		026	000		29
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S -N									011		00
																PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		000	000		00
																							OR<25					
04185	N	N	N			10/21/2014	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												29
NONE						TU		REDLAND RD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									000		00
						UNK			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	M	OTH-Y		026	000		29
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S -N									011		00
																PSNGR CAR		01	DRVR	INJC	44	M	OR-Y		000	000		00
																							OR<25					
01123	N	N	N			03/31/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	UNK	S-1STOP	01	NONE 0	STRGHT												29
NONE						TU		REDLAND RD	S		TRF SIGNAL	N	WET	REAR		PRVTE	S -N									000		00
						6A			06	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	44	F	OR-Y		026	000		29
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S -N									011		00
																PSNGR CAR		01	DRVR	INJC	35	M	OR-Y		000	000		00
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S -N									011		00
																PSNGR CAR		02	PSNG	INJC	34	F			000	000		00
02150	N	N	N			06/04/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												29
NO RPT						TH		REDLAND RD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									000		00
						10A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	55	M	OR-Y		026	000		29
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	S -N									011		00

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CITY OF OREGON CITY, CLACKAMAS COUNTY

REDLAND RD at CASCADE HY SOUTH, City of Oregon City, Clackamas County, 01/01/2013 to 12/31/2015

Total crash records: 27

SER# / INVEST	S P E D	A L C	U G S	C H L	O R K	W	DATE / DAY / TIME	CLASS / DIST / FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																	PSNGR CAR		01	DRVR	INJC	62	F	OR-Y OR<25		000	000		00
04080	N	N	N				10/04/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											013	29
NONE							SU		REDLAND RD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									000		00
							1P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	18	F	OR-Y OR<25		026	000		29
																02	NONE 0	STOP									011	013	
																	PRVTE	S -N											00
																	PSNGR CAR		01	DRVR	NONE	18	F	OR-Y OR<25		000	000		00
																03	NONE 0	STOP											
																	PRVTE	S -N									022		00
																	PSNGR CAR		01	DRVR	INJC	77	F	OR-Y OR<25		000	000		00
04189	N	N	N				10/11/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												29
NONE							SU		REDLAND RD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									000		00
							7P			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	29	F	OR-Y OR<25		026	000		29
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		000	000		00
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		02	PSNG	INJC	26	F			000	000		00
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		03	PSNG	INJC	48	M			000	000		00
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		04	PSNG	INJC	45	F			000	000		00
04343	N	N	N				10/21/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	FOG	S-1STOP	01	NONE 0	STRGHT												29
NONE							WE		REDLAND RD	S		TRF SIGNAL	N	DRY	REAR		PRVTE	S -N									001		00
							7A			06	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y OR<25		026	000		29
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	INJC	52	M	OR-Y OR<25		000	000		00
05452	N	N	N				12/18/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT												29
NONE							FR		REDLAND RD	S		TRF SIGNAL	N	WET	REAR		PRVTE	S -N									000		00
							6A			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	42	F	OR-Y OR<25		026	000		29
																02	NONE 0	STOP											
																	PRVTE	S -N									011		00
																	PSNGR CAR		01	DRVR	INJC	51	M	OR-Y OR<25		000	000		00
00828	N	N	N				02/25/2014	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	ANGL-STP	01	NONE 0	TURN-R												08

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CITY OF OREGON CITY, CLACKAMAS COUNTY

REDLAND RD at CASCADE HY SOUTH, City of Oregon City, Clackamas County, 01/01/2013 to 12/31/2015

Total crash records: 27

SER# / INVEST	S P E D	A L C	U G S	C H L	O R K	W	DATE / DAY / TIME	CLASS / DIST / FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
NONE							TU		REDLAND RD	W		TRF SIGNAL	N	DRY	TURN		PRVTE	N -W									000		00
							2P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y OR<25		001	000		08
																02	NONE 0	STOP											
																	PRVTE	W -E									012		00
																	PSNGR CAR		01	DRVR	NONE	50	M	OR-Y OR<25		000	000		00
02177	N	N	N				06/06/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	ANGL-STP	01	NONE 0	TURN-R											08
NO RPT							SA		REDLAND RD	W		TRF SIGNAL	N	DRY	TURN		PRVTE	N -W									000		00
							5P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	32	M	OR-Y OR<25		001	000		08
																02	NONE 0	STOP											
																	PRVTE	W -E									012		00
																	TRUCK		01	DRVR	NONE	35	M	OR-Y OR<25		000	000		00
																02	NONE 0	STOP											
																	PRVTE	W -E									012		00
																	TRUCK		02	PSNG	INJC	42	M			000	000		00
00301	N	N	N				01/25/2013	16	CASCADE HY SOUTH	INTER	3-LEG	N	N	UNK	S-1STOP	01	NONE 0	TURN-R											08
NONE							FR	0	REDLAND RD	W		R-GRN-SIG	N	WET	REAR		PRVTE	W -S									000		00
							11A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	59	M	OR-Y OR<25		006	000		08
																02	NONE 0	TURN-R											
																	PRVTE	W -S									000		00
																	PSNGR CAR		01	DRVR	NONE	40	F	OR-Y OR<25		000	000		00
00847	N	N	N				03/12/2013	16	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE							TU	0	REDLAND RD	W		L-GRN-SIG	N	DRY	REAR		PRVTE	W -E									000		00
							10A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	F	UNK OR<25		026	000		07
																02	NONE 0	STOP											
																	PRVTE	W -E									012		00
																	PSNGR CAR		01	DRVR	INJC	74	F	OR-Y OR<25		000	000		00
																02	NONE 0	STOP											
																	PRVTE	W -E									012		00
																	PSNGR CAR		02	PSNG	INJC	56	F			000	000		00
02290	N	N	N				06/28/2013	16	CASCADE HY SOUTH	INTER		N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	07
NONE							FR	0	REDLAND RD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000		00
							8A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	74	M	OR-Y OR<25		026	000		07
																02	NONE 0	STOP											
																	PRVTE	W -E									011	013	00
																	PSNGR CAR		01	DRVR	INJC	43	M	OR-Y OR<25		000	000		00
																03	NONE 0	STOP											
																	PRVTE	W -E									022		00
																	PSNGR CAR		01	DRVR	NONE	46	F	OR-Y OR<25		000	000		00

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CITY OF OREGON CITY, CLACKAMAS COUNTY **REDLAND RD at CASCADE HY SOUTH, City of Oregon City, Clackamas County, 01/01/2013 to 12/31/2015**

Total crash records: 27

SER# / INVEST	S P E D	A L C	U G S	C H L	O R K	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AG E	A S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03843	N	N	N			10/09/2013	16	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						WE	0	REDLAND RD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	E -W									000	00
						9A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	22	M	OR-Y OR<25		026	000	07
															02	NONE 0	STOP										
																PRVTE	E -W									012	00
																PSNGR CAR		01	DRVR	NONE	56	F	OR-Y OR<25		000	000	00
04583	N	N	N			11/25/2013	16	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						MO	0	REDLAND RD	W		TRF SIGNAL	N	UNK	REAR		PRVTE	W -E									000	00
						4P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	M	OTH-Y N-RES		026	000	07
															02	NONE 0	STOP										
																PRVTE	W -E									012	00
																PSNGR CAR		01	DRVR	INJC	51	F	OR-Y OR<25		000	000	00
00188	N	N	N			01/14/2014	16	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						TU	0	REDLAND RD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000	00
						4P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y OR<25		026	000	07
															02	NONE 0	STOP										
																PRVTE	W -E									011	00
																PSNGR CAR		01	DRVR	NONE	37	F	OR-Y OR<25		000	000	00
															02	NONE 0	STOP										
																PRVTE	W -E									011	00
																PSNGR CAR		02	PSNG	NO<5	01	M			000	000	00
04409	N	N	N			11/02/2014	16	CASCADE HY SOUTH	INTER	3-LEG	N	N	UNK	S-1STOP	01	NONE 0	STRGHT										29
NONE						SU	0	REDLAND RD	W		TRF SIGNAL	N	WET	REAR		PRVTE	W -E									000	00
						9A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	61	M	OR-Y OR<25		026	000	29
															02	NONE 0	STOP										
																PRVTE	W -E									011	00
																PSNGR CAR		01	DRVR	INJC	35	M	OR-Y OR<25		000	000	00
															02	NONE 0	STOP										
																PRVTE	W -E									011	00
																PSNGR CAR		02	PSNG	INJC	12	F			000	000	00
04081	Y	N	N	N	Y	10/25/2013	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLD	S-STRGHT	01	NONE 0	STRGHT										13,01,07
STATE						FR		REDLAND RD	CN		TRF SIGNAL	N	WET	SS-O		PRVTE	S -N									007	00
						7A			04	0		N	DAWN	PDO		TRUCK		01	DRVR	NONE	54	M	OR-Y OR<25		045,047,026	000	13,01,07
															02	LOG 0	STRGHT										
																PRVTE	S -N									006	00
																BOBTAIL		01	DRVR	NONE	60	M	OTH-Y N-RES		000	000	00
															03	NONE 0	STOP										
																PRVTE	S -N									011	00
																PSNGR CAR		01	DRVR	NONE	58	F	OR-Y		000	000	00

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

CITY OF OREGON CITY, CLACKAMAS COUNTY

REDLAND RD at CASCADE HY SOUTH, City of Oregon City, Clackamas County, 01/01/2013 to 12/31/2015

Total crash records: 27

SER# / INVEST	S P E D	A L C	U G S	C H L	O R K	W	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04321	Y	N	N				11/07/2013	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT						OR-Y				124	04,01
NO RPT							TH		REDLAND RD	CN		TRF SIGNAL	N	WET	TURN		PRVTE	N -S						OR<25			000		00
							2P			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	44	M	OR-Y		000	000		00
																								OR<25					
																02	NONE 0	TURN-L											
																	PRVTE	W -N									001		00
																	PSNGR CAR		01	DRVR	INJC	59	F	OR-Y		047,020	000		04,01
																								OR<25					
05054	N	N	N				11/29/2015	14	CASCADE HY SOUTH	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
NO RPT							SU		REDLAND RD	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S									000		00
							10A			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	80	F	OR-Y		020	038		04
																								OR<25					
																02	NONE 0	TURN-L											
																	PRVTE	W -N									000		00
																	PSNGR CAR		01	DRVR	NONE	64	F	OR-Y		000	000		00
																								OR<25					

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Type of peak hour being reported: Intersection Peak

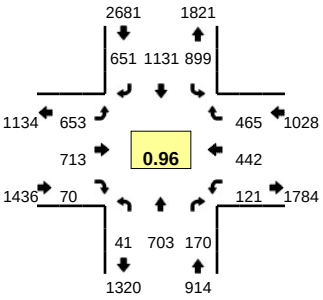
Method for determining peak hour: Total Entering Volume

LOCATION: Cascade Hwy -- Beavercreek Rd

CITY/STATE: Oregon City, OR

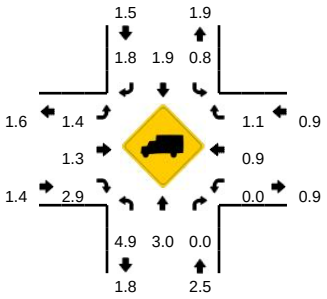
QC JOB #: 13715401

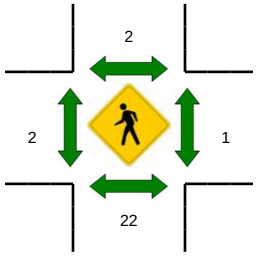
DATE: Tue, Feb 23 2016

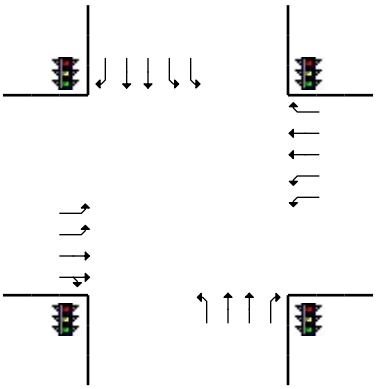


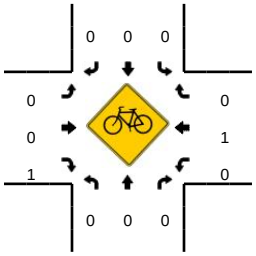
Peak-Hour: 4:55 PM -- 5:55 PM

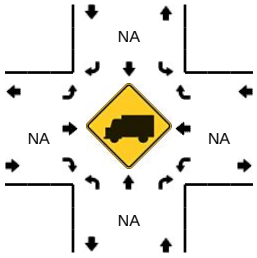
Peak 15-Min: 5:15 PM -- 5:30 PM

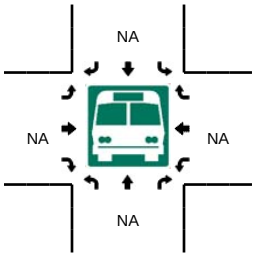












5-Min Count Period Beginning At	Cascade Hwy (Northbound)				Cascade Hwy (Southbound)				Beavercreek Rd (Eastbound)				Beavercreek Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:25 PM	5	62	14	0	63	76	60	0	47	60	5	0	14	50	30	0	486	5909
4:30 PM	1	64	14	0	59	96	59	0	34	53	5	0	17	34	25	0	461	5936
4:35 PM	3	71	13	0	78	99	55	0	38	51	15	0	11	24	35	0	493	5947
4:40 PM	2	37	8	0	65	78	54	0	60	66	11	0	6	53	30	0	470	5947
4:45 PM	7	33	13	0	53	77	60	0	70	66	1	0	11	29	28	0	448	5919
4:50 PM	4	44	13	0	82	123	51	0	39	46	7	0	6	29	38	0	482	5886
4:55 PM	3	65	15	0	53	81	63	0	55	52	3	0	11	37	45	0	483	5858
5:00 PM	2	84	10	0	73	68	50	0	41	55	6	0	7	42	37	0	475	5830
5:05 PM	7	51	12	0	72	76	60	0	72	70	10	0	9	32	31	1	503	5818
5:10 PM	4	79	25	0	57	104	49	0	66	54	7	0	11	34	34	0	524	5835
5:15 PM	5	47	15	0	80	94	58	0	64	63	6	0	8	35	38	0	513	5823
5:20 PM	0	61	21	0	75	98	60	0	66	60	6	0	15	32	36	0	530	5868
5:25 PM	6	58	12	0	81	102	50	0	58	64	6	0	14	41	36	0	528	5910
5:30 PM	0	49	15	0	72	108	54	0	39	55	3	0	6	36	35	0	472	5921
5:35 PM	1	48	9	0	88	100	52	0	69	50	7	0	6	33	43	0	506	5934
5:40 PM	4	77	14	0	87	99	53	0	36	50	1	0	11	40	44	0	516	5980
5:45 PM	5	44	8	0	81	115	48	0	46	63	7	0	13	39	48	1	518	6050
5:50 PM	4	40	14	0	80	86	54	0	41	77	8	0	8	41	38	0	491	6059
5:55 PM	5	47	10	0	69	76	39	0	45	68	9	0	12	36	36	0	452	6028
6:00 PM	2	59	11	0	69	92	41	0	45	50	4	0	11	41	38	0	463	6016
6:05 PM	2	41	8	0	46	55	31	0	73	63	6	0	14	35	40	0	414	5927
6:10 PM	1	72	9	0	48	85	34	0	53	48	6	0	9	28	29	0	422	5825
6:15 PM	1	39	15	0	78	80	43	0	38	45	4	0	5	20	27	0	395	5707
6:20 PM	0	42	19	0	47	57	51	0	35	57	4	0	11	38	26	0	387	5564

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	44	664	192	0	944	1176	672	0	752	748	72	0	148	432	440	0	6284
Heavy Trucks	4	24	0		12	20	20		20	4	0		0	4	0		108
Pedestrians		32				0				0				0			32
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

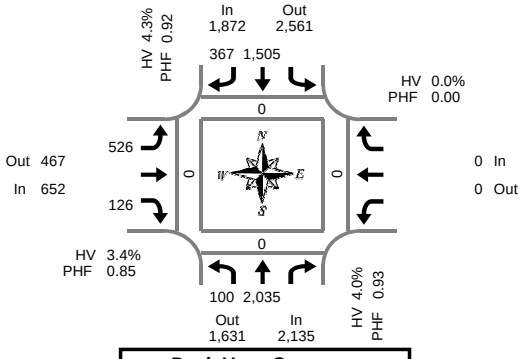
Comments:

Report generated on 3/1/2016 11:30 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:20 AM to 8:20 AM

Hwy 213 & Redland Rd

Wednesday, January 25, 2017
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R		Bikes	L		R	Bikes				Bikes		North	South	East	West
7:00 AM	8	139		0	75	17		0	55		18	0				0	312	0	0	0	0
7:05 AM	7	183		0	100	24		0	49		6	0				0	369	0	0	0	0
7:10 AM	0	164		0	93	16		0	43		17	0				0	333	0	0	0	0
7:15 AM	7	154		0	105	26		0	67		15	0				0	374	0	0	0	0
7:20 AM	10	197		0	125	40		0	34		12	0				0	418	0	0	0	0
7:25 AM	4	189		0	116	35		0	40		18	0				0	402	0	0	0	0
7:30 AM	4	172		0	109	29		0	58		16	0				0	388	0	0	0	0
7:35 AM	14	179		0	112	31		0	48		12	0				0	396	0	0	0	0
7:40 AM	10	178		0	168	35		0	33		9	0				0	433	0	0	0	0
7:45 AM	7	169		0	116	32		0	50		10	0				0	384	0	0	0	0
7:50 AM	13	149		0	132	26		0	45		13	0				0	378	0	0	0	0
7:55 AM	8	160		0	149	25		0	32		4	0				0	378	0	0	0	0
8:00 AM	6	148		0	121	30		0	35		9	0				0	349	0	0	0	0
8:05 AM	7	154		0	90	31		0	62		10	0				0	354	0	0	0	0
8:10 AM	8	181		0	119	31		0	41		4	0				0	384	0	0	0	0
8:15 AM	9	159		0	148	22		0	48		9	0				0	395	0	0	0	0
8:20 AM	6	132		0	89	41		0	58		13	0				0	339	0	0	0	0
8:25 AM	3	137		0	112	25		0	32		4	0				0	313	0	0	0	0
8:30 AM	6	141		0	148	33		0	40		14	0				0	382	0	0	0	0
8:35 AM	5	142		0	106	15		0	40		8	0				0	316	0	0	0	0
8:40 AM	11	154		0	128	33		0	53		9	0				0	388	0	0	0	0
8:45 AM	9	129		0	147	21		0	41		8	0				0	355	0	0	0	0
8:50 AM	4	143		0	118	26		0	43		4	0				0	338	0	0	0	0
8:55 AM	12	123		0	124	18		0	49		11	0				0	337	0	0	0	0
Total Survey	178	3,776		0	2,850	662		0	1,096		253	0				0	8,815	0	0	0	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R		Bikes	L		R	Bikes				Bikes		North	South	East	West
7:00 AM	15	486		0	268	57		0	147		41	0				0	1,014	0	0	0	0
7:15 AM	21	540		0	346	101		0	141		45	0				0	1,194	0	0	0	0
7:30 AM	28	529		0	389	95		0	139		37	0				0	1,217	0	0	0	0
7:45 AM	28	478		0	397	83		0	127		27	0				0	1,140	0	0	0	0
8:00 AM	21	483		0	330	92		0	138		23	0				0	1,087	0	0	0	0
8:15 AM	18	428		0	349	88		0	138		26	0				0	1,047	0	0	0	0
8:30 AM	22	437		0	382	81		0	133		31	0				0	1,086	0	0	0	0
8:45 AM	25	395		0	389	65		0	133		23	0				0	1,030	0	0	0	0
Total Survey	178	3,776		0	2,850	662		0	1,096		253	0				0	8,815	0	0	0	0

Peak Hour Summary
7:20 AM to 8:20 AM

By Approach	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	2,135	1,631	3,766	0	1,872	2,561	4,433	0	652	467	1,119	0	0	0	0	0	4,659	0	0	0	0
%HV	4.0%				4.3%				3.4%				0.0%				4.1%				
PHF	0.93				0.92				0.85				0.00				0.96				

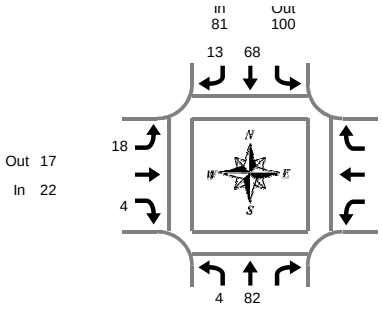
By Movement	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Total
	L	T		Total		T	R	Total	L		R	Total				Total	
Volume	100	2,035		2,135		1,505	367	1,872	526		126	652				0	4,659
%HV	4.0%	4.0%	NA	4.0%	NA	4.5%	3.5%	4.3%	3.4%	NA	3.2%	3.4%	NA	NA	NA	0.0%	4.1%
PHF	0.81	0.91		0.93		0.90	0.88	0.92	0.87		0.68	0.85				0.00	0.96

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R		Bikes	L		R	Bikes				Bikes		North	South	East	West
7:00 AM	92	2,033		0	1,400	336		0	554		150	0				0	4,565	0	0	0	0
7:15 AM	98	2,030		0	1,462	371		0	545		132	0				0	4,638	0	0	0	0
7:30 AM	95	1,918		0	1,465	358		0	542		113	0				0	4,491	0	0	0	0
7:45 AM	89	1,826		0	1,458	344		0	536		107	0				0	4,360	0	0	0	0
8:00 AM	86	1,743		0	1,450	326		0	542		103	0				0	4,250	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Hwy 213 & Redland Rd

Wednesday, January 25, 2017
7:00 AM to 9:00 AM

Peak Hour Summary
7:20 AM to 8:20 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
7:00 AM	1	5		6	9	2	11		1		1	2				0	19
7:05 AM	1	5		6	1	0	1		3		2	5				0	12
7:10 AM	0	10		10	3	0	3		4		0	4				0	17
7:15 AM	2	7		9	8	2	10		4		1	5				0	24
7:20 AM	1	6		7	4	0	4		1		0	1				0	12
7:25 AM	0	8		8	10	0	10		3		0	3				0	21
7:30 AM	0	3		3	5	0	5		1		1	2				0	10
7:35 AM	0	5		5	0	2	2		2		0	2				0	9
7:40 AM	0	2		2	8	0	8		2		0	2				0	12
7:45 AM	1	12		13	7	2	9		4		0	4				0	26
7:50 AM	0	9		9	4	2	6		1		0	1				0	16
7:55 AM	0	11		11	3	2	5		1		1	2				0	18
8:00 AM	1	10		11	4	1	5		0		2	2				0	18
8:05 AM	0	3		3	6	0	6		1		0	1				0	10
8:10 AM	0	6		6	8	4	12		1		0	1				0	19
8:15 AM	1	7		8	9	0	9		1		0	1				0	18
8:20 AM	0	5		5	8	2	10		2		2	4				0	19
8:25 AM	0	5		5	12	3	15		5		0	5				0	25
8:30 AM	0	7		7	3	4	7		3		1	4				0	18
8:35 AM	1	13		14	4	4	8		2		0	2				0	24
8:40 AM	0	8		8	9	0	9		2		0	2				0	19
8:45 AM	0	6		6	4	1	5		1		1	2				0	13
8:50 AM	0	7		7	15	2	17		0		0	0				0	24
8:55 AM	0	5		5	9	3	12		1		0	1				0	18
Total Survey	9	165		174	153	36	189		46		12	58				0	421

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
7:00 AM	2	20		22	13	2	15		8		3	11				0	48
7:15 AM	3	21		24	22	2	24		8		1	9				0	57
7:30 AM	0	10		10	13	2	15		5		1	6				0	31
7:45 AM	1	32		33	14	6	20		6		1	7				0	60
8:00 AM	1	19		20	18	5	23		2		2	4				0	47
8:15 AM	1	17		18	29	5	34		8		2	10				0	62
8:30 AM	1	28		29	16	8	24		7		1	8				0	61
8:45 AM	0	18		18	28	6	34		2		1	3				0	55
Total Survey	9	165		174	153	36	189		46		12	58				0	421

Heavy Vehicle Peak Hour Summary
7:20 AM to 8:20 AM

By Approach	Northbound Hwy 213			Southbound Hwy 213			Eastbound Redland Rd			Westbound Redland Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	86	72	158	81	100	181	22	17	39	0	0	0	189
PHF	0.65			0.75			0.69			0.00			0.79

By Movement	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Total
	L	T		Total	T	R	Total		L		R	Total				Total	
Volume	4	82		86	68	13	81		18		4	22				0	189
PHF	1.00	0.64		0.65	0.74	0.54	0.75		0.56		0.33	0.69				0.00	0.79

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

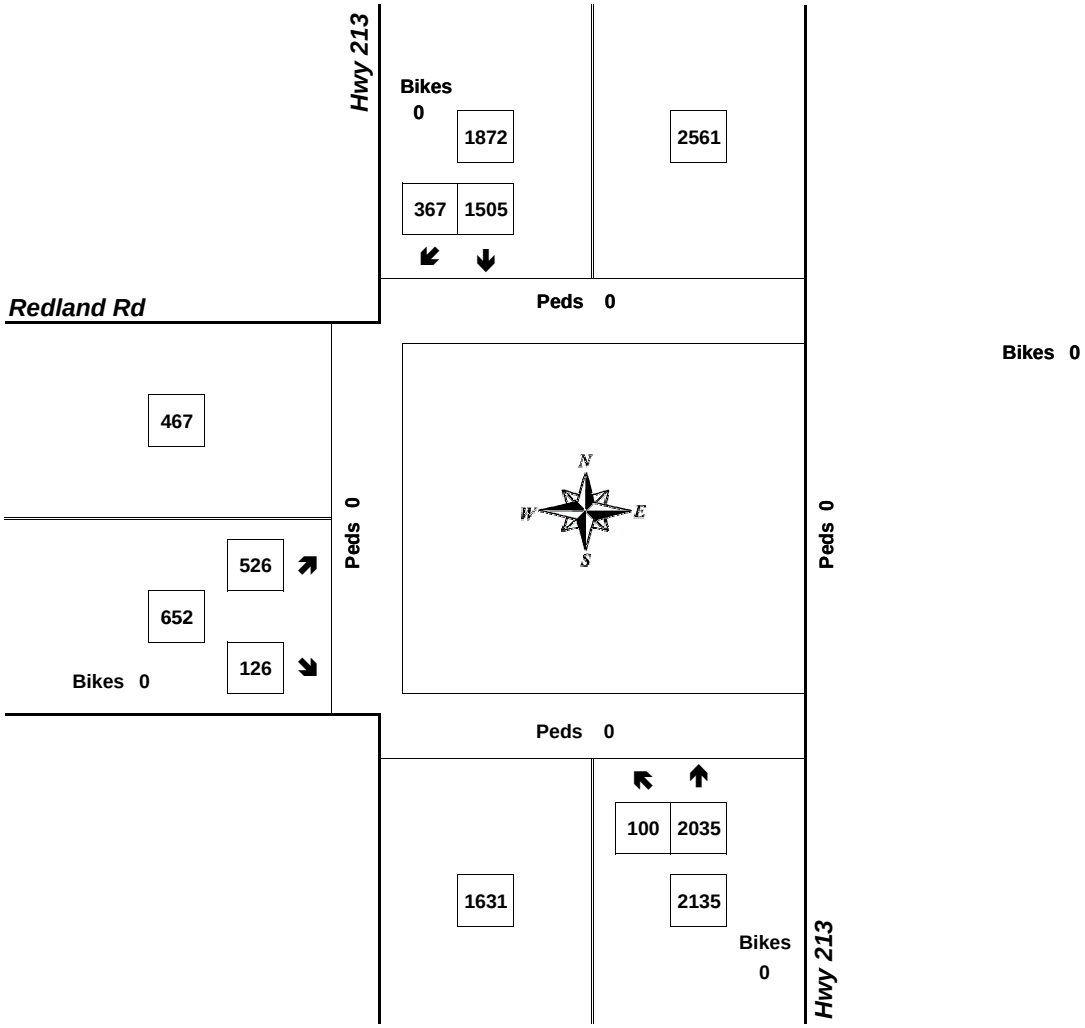
Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
7:00 AM	6	83		89	62	12	74		27		6	33				0	196
7:15 AM	5	82		87	67	15	82		21		5	26				0	195
7:30 AM	3	78		81	74	18	92		21		6	27				0	200
7:45 AM	4	96		100	77	24	101		23		6	29				0	230
8:00 AM	3	82		85	91	24	115		19		6	25				0	225

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Hwy 213 & Redland Rd

7:20 AM to 8:20 AM
Wednesday, January 25, 2017

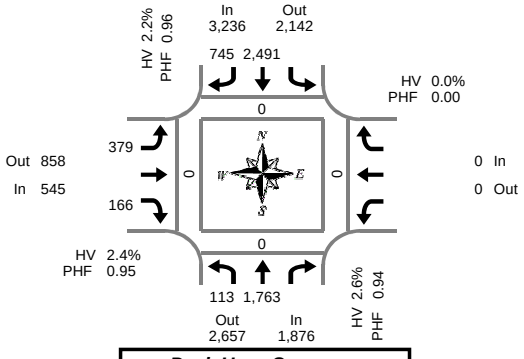


Approach	PHF	HV%	Volume
EB	0.85	3.4%	652
WB	0.00	0.0%	0
NB	0.93	4.0%	2,135
SB	0.92	4.3%	1,872
Intersection	0.96	4.1%	4,659

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:10 PM to 5:10 PM

Hwy 213 & Redland Rd

Tuesday, January 24, 2017
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R		Bikes	L		R	Bikes				Bikes		North	South	East	West
4:00 PM	11	148		0	204	67		0	26		6	0				0	462	0	0	0	0
4:05 PM	7	140		0	216	54		0	28		12	0				0	457	0	0	0	0
4:10 PM	9	160		0	187	58		0	42		15	0				0	471	0	0	0	0
4:15 PM	14	153		0	202	63		0	26		12	0				0	470	0	0	0	0
4:20 PM	11	151		0	207	65		0	32		13	0				0	479	0	0	0	0
4:25 PM	6	113		0	216	57		0	34		10	0				0	436	0	0	0	0
4:30 PM	14	128		0	194	60		0	34		15	0				0	445	0	0	0	0
4:35 PM	8	140		0	232	74		0	29		15	0				0	498	0	0	0	0
4:40 PM	3	157		0	228	51		0	30		9	0				0	478	0	0	0	0
4:45 PM	12	147		1	181	61		0	42		18	0				0	461	0	0	0	0
4:50 PM	8	144		0	221	71		0	24		10	0				0	478	0	0	0	0
4:55 PM	8	169		0	223	68		0	30		10	0				0	508	0	0	0	0
5:00 PM	15	148		0	178	54		0	31		20	0				0	446	0	0	0	0
5:05 PM	5	153		0	222	63		0	25		19	0				0	487	0	0	0	0
5:10 PM	11	144		0	226	46		0	32		11	0				0	470	0	0	0	0
5:15 PM	11	130		0	198	56		0	44		8	0				0	447	0	0	0	0
5:20 PM	17	148		0	194	44		0	28		4	0				0	435	0	0	0	0
5:25 PM	6	127		0	229	69		0	26		6	0				0	463	0	0	0	0
5:30 PM	6	114		0	205	58		0	25		17	0				0	425	0	0	0	0
5:35 PM	14	137		0	177	58		0	32		9	0				0	427	0	0	0	0
5:40 PM	8	134		0	217	63		0	21		4	0				0	447	0	0	0	0
5:45 PM	7	148		0	220	60		0	18		8	0				0	461	0	0	0	0
5:50 PM	8	129		0	177	62		0	32		6	0				0	414	0	0	0	0
5:55 PM	9	115		0	197	40		0	19		9	0				0	389	0	0	0	0
Total Survey	228	3,377		1	4,951	1,422		0	710		266	0				0	10,954	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R		Bikes	L		R	Bikes				Bikes		North	South	East	West
4:00 PM	27	448		0	607	179		0	96		33	0				0	1,390	0	0	0	0
4:15 PM	31	417		0	625	185		0	92		35	0				0	1,385	0	0	0	0
4:30 PM	25	425		0	654	185		0	93		39	0				0	1,421	0	0	0	0
4:45 PM	28	460		1	625	200		0	96		38	0				0	1,447	0	0	0	0
5:00 PM	31	445		0	626	163		0	88		50	0				0	1,403	0	0	0	0
5:15 PM	34	405		0	621	169		0	98		18	0				0	1,345	0	0	0	0
5:30 PM	28	385		0	599	179		0	78		30	0				0	1,299	0	0	0	0
5:45 PM	24	392		0	594	162		0	69		23	0				0	1,264	0	0	0	0
Total Survey	228	3,377		1	4,951	1,422		0	710		266	0				0	10,954	0	0	0	0

Peak Hour Summary
4:10 PM to 5:10 PM

By Approach	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	1,876	2,657	4,533	1	3,236	2,142	5,378	0	545	858	1,403	0	0	0	0	0	5,657	0	0	0	0
%HV	2.6%				2.2%				2.4%				0.0%				2.4%				
PHF	0.94				0.96				0.95				0.00				0.98				

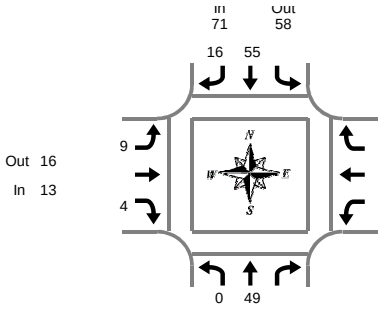
By Movement	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Total
	L	T		Total	T	R		Total	L		R	Total				Total	
Volume	113	1,763		1,876	2,491	745		3,236	379		166	545				0	5,657
%HV	0.0%	2.8%	NA	2.6%	2.2%	2.1%		2.2%	2.4%	NA	2.4%	2.4%	NA	NA	NA	0.0%	2.4%
PHF	0.83	0.94		0.94	0.95	0.93		0.96	0.94		0.85	0.95				0.00	0.98

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total	Pedestrians Crosswalk			
	L	T		Bikes	T	R		Bikes	L		R	Bikes				Bikes		North	South	East	West
4:00 PM	111	1,750		1	2,511	749		0	377		145	0				0	5,643	0	0	0	0
4:15 PM	115	1,747		1	2,530	733		0	369		162	0				0	5,656	0	0	0	0
4:30 PM	118	1,735		1	2,526	717		0	375		145	0				0	5,616	0	0	0	0
4:45 PM	121	1,695		1	2,471	711		0	360		136	0				0	5,494	0	0	0	0
5:00 PM	117	1,627		0	2,440	673		0	333		121	0				0	5,311	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Hwy 213 & Redland Rd

Tuesday, January 24, 2017
4:00 PM to 6:00 PM

Peak Hour Summary
4:10 PM to 5:10 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
4:00 PM	0	4		4	4	3	7		1		0	1				0	12
4:05 PM	1	8		9	8	0	8		1		3	4				0	21
4:10 PM	0	7		7	5	0	5		1		1	2				0	14
4:15 PM	0	4		4	9	1	10		1		0	1				0	15
4:20 PM	0	5		5	8	1	9		0		0	0				0	14
4:25 PM	0	4		4	4	3	7		0		0	0				0	11
4:30 PM	0	4		4	2	1	3		2		0	2				0	9
4:35 PM	0	3		3	11	2	13		2		0	2				0	18
4:40 PM	0	6		6	0	1	1		0		1	1				0	8
4:45 PM	0	3		3	4	1	5		0		1	1				0	9
4:50 PM	0	2		2	4	4	8		0		0	0				0	10
4:55 PM	0	3		3	4	1	5		1		0	1				0	9
5:00 PM	0	4		4	2	1	3		1		0	1				0	8
5:05 PM	0	4		4	2	0	2		1		1	2				0	8
5:10 PM	0	4		4	4	1	5		0		0	0				0	9
5:15 PM	0	1		1	6	0	6		1		0	1				0	8
5:20 PM	1	3		4	3	0	3		1		0	1				0	8
5:25 PM	0	2		2	3	1	4		0		1	1				0	7
5:30 PM	0	2		2	3	2	5		1		0	1				0	8
5:35 PM	0	3		3	5	0	5		1		0	1				0	9
5:40 PM	0	3		3	2	1	3		0		0	0				0	6
5:45 PM	0	3		3	6	0	6		0		1	1				0	10
5:50 PM	0	1		1	5	1	6		2		0	2				0	9
5:55 PM	0	2		2	1	2	3		0		0	0				0	5
Total Survey	2	85		87	105	27	132		17		9	26				0	245

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
4:00 PM	1	19		20	17	3	20		3		4	7				0	47
4:15 PM	0	13		13	21	5	26		1		0	1				0	40
4:30 PM	0	13		13	13	4	17		4		1	5				0	35
4:45 PM	0	8		8	12	6	18		1		1	2				0	28
5:00 PM	0	12		12	8	2	10		2		1	3				0	25
5:15 PM	1	6		7	12	1	13		2		1	3				0	23
5:30 PM	0	8		8	10	3	13		2		0	2				0	23
5:45 PM	0	6		6	12	3	15		2		1	3				0	24
Total Survey	2	85		87	105	27	132		17		9	26				0	245

Heavy Vehicle Peak Hour Summary
4:10 PM to 5:10 PM

By Approach	Northbound Hwy 213			Southbound Hwy 213			Eastbound Redland Rd			Westbound Redland Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	49	59	108	71	58	129	13	16	29	0	0	0	133
PHF	0.77			0.68			0.65			0.00			0.77

By Movement	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Total
	L	T		Total	T	R	Total		L		R	Total				Total	
Volume	0	49		49	55	16	71		9		4	13				0	133
PHF	0.00	0.77		0.77	0.63	0.67	0.68		0.56		0.50	0.65				0.00	0.77

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

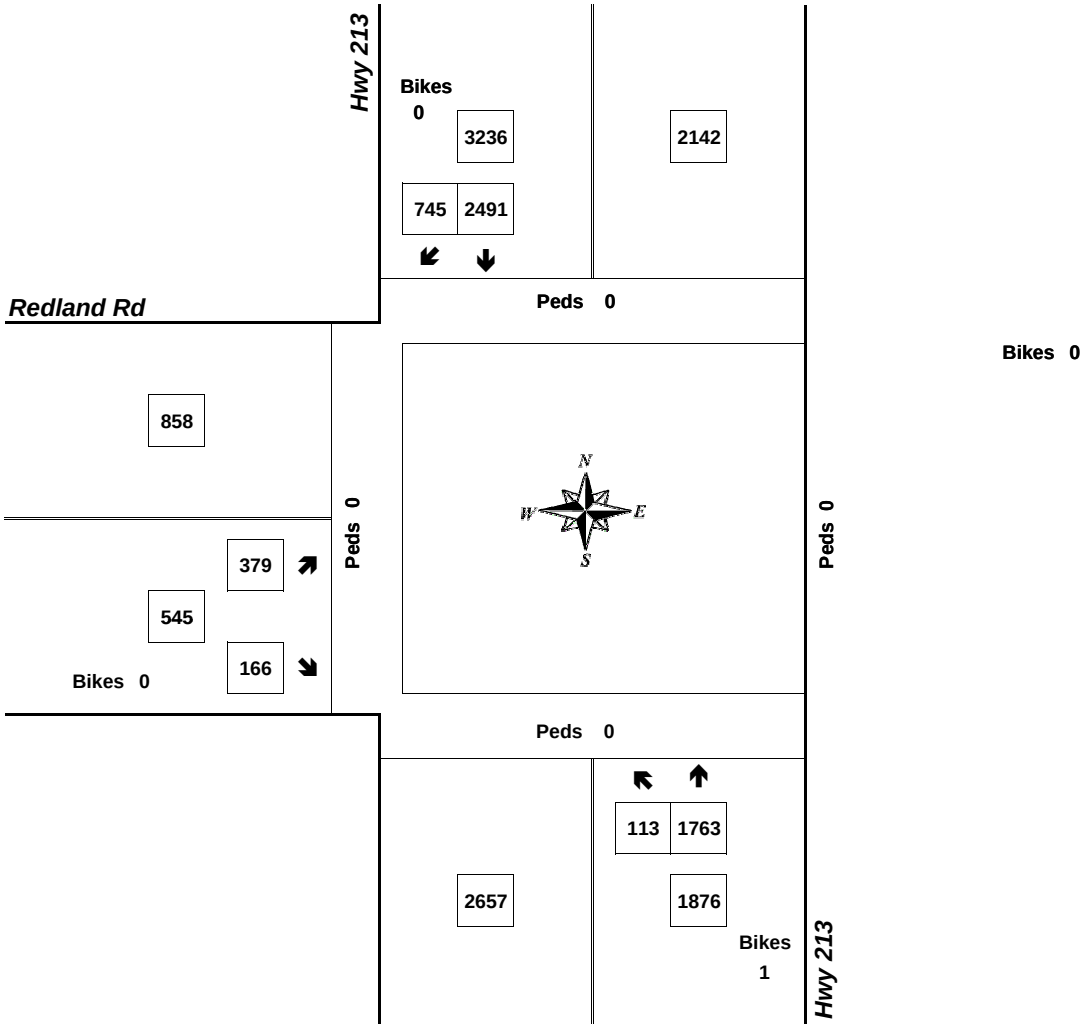
Interval Start Time	Northbound Hwy 213				Southbound Hwy 213				Eastbound Redland Rd				Westbound Redland Rd				Interval Total
	L	T		Total	T	R	Total		L		R	Total				Total	
4:00 PM	1	53		54	63	18	81		9		6	15				0	150
4:15 PM	0	46		46	54	17	71		8		3	11				0	128
4:30 PM	1	39		40	45	13	58		9		4	13				0	111
4:45 PM	1	34		35	42	12	54		7		3	10				0	99
5:00 PM	1	32		33	42	9	51		8		3	11				0	95

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Hwy 213 & Redland Rd

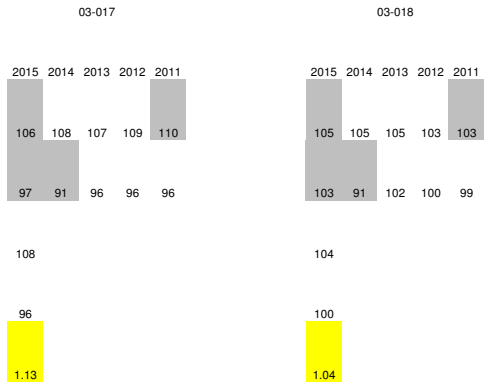
4:10 PM to 5:10 PM
Tuesday, January 24, 2017



Approach	PHF	HV%	Volume
EB	0.95	2.4%	545
WB	0.00	0.0%	0
NB	0.94	2.6%	1,876
SB	0.96	2.2%	3,236
Intersection	0.98	2.4%	5,657

Count Period: 4:00 PM to 6:00 PM

ATR CHARACTERISTIC TABLE (Printed: 9/30/2016)										
2015 SEASONAL TRAFFIC TREND	AREA TYPE	# OF LANES	WEEKLY TRAFFIC TREND	2016 AADT	OHP CLASSIFICATION	2015 ATR	COUNTY	HIGHWAY ROUTE, NAME, & LOCATION	MP	STATE HWY NUMBER
COM	URBANIZED	4	WEEKDAY	112800	STATEWIDE HWY	34-010	WASHINGTON	US26, 0.73 MILE EAST OF 185TH AVENUE OVERCROSSING	65.02	47
COM	URBANIZED	4	WEEKDAY	46200	STATEWIDE HWY	09-009	DESCHUTES	US97, THE DALLES-CALIFORNIA HIGHWAY, 0.23 MILE SOUTH OF REVERE AVENUE	137.36	4
COM	URBANIZED	4	WEEKDAY	35600	STATEWIDE HWY	03-018	CLACKAMAS	OR224, CLACKAMAS HIGHWAY, 0.13 MILE WEST OF JOHNSON ROAD	3.60	171
COM	URBANIZED	4	WEEKDAY	34200	STATEWIDE HWY	03-017	CLACKAMAS	OR212, CLACKAMAS HIGHWAY, 0.14 MILE WEST OF S.E.130TH AVENUE	6.80	171
COM	URBANIZED	4	WEEKDAY	33900	STATEWIDE HWY	34-009	WASHINGTON	OR8, TUALATIN VALLEY HIGHWAY, 0.28 MILE WEST OF N.W. 334TH AVENUE	14.84	29
COM	URBANIZED	4	WEEKDAY	32100	STATEWIDE HWY	26-003	MULTNOMAH	US26, MT. HOOD HIGHWAY, 0.18 MILE SOUTHEAST OF S.E. POWELL VALLEY ROAD	14.36	26
COM	URBANIZED	4	WEEKDAY	27000	STATEWIDE HWY	20-028	LANE	OR569, BELTLINE HIGHWAY, 0.42 MILE SOUTH OF BARGER DRIVE INTERCHANGE	5.20	69
SUM	URBANIZED	4	WEEKDAY	24300	STATEWIDE HWY	09-003	DESCHUTES	US97, THE DALLES-CALIFORNIA HIGHWAY, 0.17 MILE SOUTH OF CHINA HAT ROAD	142.41	4
COM	URBANIZED	4	WEEKDAY	24100	STATEWIDE HWY	30-008	UMATILLA	US395, PENDLETON-JOHN DAY HIGHWAY, 0.09 MILE SOUTH OF OLD OREGON TRAIL	1.77	28



2016 Count Data - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00														
1:00														
2:00														
3:00														
4:00														
5:00	48	108	155	12	74	452	9	720	18	150	45	4	1,795	16
6:00	168	338	422	39	239	818	17	1,071	58	294	136	7	3,607	12
7:00	423	538	552	99	425	791	21	1,006	97	286	367	14	4,619	5
8:00	350	604	512	100	363	601	42	802	106	312	227	27	4,046	10
9:00	271	541	388	82	347	444	43	706	79	378	277	39	3,595	13
10:00	371	650	567	96	362	402	38	576	80	462	369	46	4,019	11
11:00	306	589	550	107	384	431	58	659	107	472	391	71	4,125	9
12:00	412	739	591	117	383	408	72	717	116	489	474	83	4,601	6
13:00	366	567	615	122	395	404	52	617	124	474	453	64	4,253	8
14:00	528	903	602	97	374	440	34	791	101	510	525	67	4,972	4
15:00	602	968	662	133	446	524	83	777	135	624	579	90	5,623	3
16:00	790	1,124	713	130	448	405	50	680	166	594	676	81	5,857	2
17:00	915	1,126	627	120	441	456	43	685	165	643	729	76	6,026	1
18:00	590	749	418	103	334	376	23	535	119	481	552	55	4,335	7
19:00	353	467	277	93	220	283	15	360	93	282	370	47	2,860	14
20:00	298	425	191	53	131	255	7	285	47	155	211	31	2,089	15
21:00														
22:00														
23:00														
Total												AADT	68,477	
												Major	46,624	
												Minor	21,854	

2016 Count Data - Seasonally Adjusted - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00														
1:00														
2:00														
3:00														
4:00														
5:00	52	117	168	13	80	490	10	781	20	163	49	4	1,948	16
6:00	182	367	458	42	259	888	18	1,162	63	319	148	8	3,914	12
7:00	459	584	599	107	461	858	23	1,092	105	310	398	15	5,012	5
8:00	380	655	556	109	394	652	46	870	115	339	246	29	4,390	10
9:00	294	587	421	89	376	482	47	766	86	410	301	42	3,901	13
10:00	403	705	615	104	393	436	41	625	87	501	400	50	4,361	11
11:00	332	639	597	116	417	468	63	715	116	512	424	77	4,476	9
12:00	447	802	641	127	416	443	78	778	126	531	514	90	4,992	6
13:00	397	615	667	132	429	438	56	669	135	514	492	69	4,615	8
14:00	573	980	653	105	406	477	37	858	110	553	570	73	5,395	4
15:00	653	1,050	718	144	484	569	90	843	146	677	628	98	6,101	3
16:00	857	1,220	774	141	486	439	54	738	180	644	733	88	6,355	2
17:00	993	1,222	680	130	478	495	47	743	179	698	791	82	6,538	1
18:00	640	813	454	112	362	408	25	580	129	522	599	60	4,703	7
19:00	383	507	301	101	239	307	16	391	101	306	401	51	3,103	14
20:00	323	461	207	58	142	277	8	309	51	168	229	34	2,267	15
21:00														
22:00														
23:00														
Total												AADT	74,298	
												Major	50,587	
												Minor	23,711	

2015 Base Model - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00	96	211	28	3	9	47		100	4	59	14		571	
1:00	70	159	15	2	6	23		50	3	40	11		379	
2:00	71	165	16	2	5	24		49	2	42	10		386	
3:00	45	95	54	3	16	99		203	2	31	7		555	
4:00	70	138	105	7	28	186		422	6	41	14		1,017	
5:00	180	346	245	18	79	454		941	15	100	39		2,417	16
6:00	344	502	435	43	171	757		1,325	38	132	96		3,843	8
7:00	551	599	491	46	196	781		1,305	46	178	216		4,409	3
8:00	607	624	466	41	187	674		1,134	38	217	214		4,202	5
9:00	607	596	354	32	176	625		977	25	244	190		3,826	9
10:00	619	621	314	27	118	504		859	24	277	188		3,551	12
11:00	475	715	328	28	112	473		814	27	345	119		3,436	13
12:00	555	778	349	29	137	524		790	26	375	141		3,704	10
13:00	475	800	356	32	136	516		827	28	362	105		3,637	11
14:00	583	918	311	35	166	568		823	34	392	175		4,005	6
15:00	635	997	299	40	185	583		834	42	429	215		4,259	4
16:00	709	1,072	271	45	184	578		833	45	465	250		4,452	2
17:00	783	1,119	229	47	203	625		780	46	448	239		4,519	1
18:00	610	1,008	255	38	142	504		815	37	366	173		3,948	7
19:00	483	779	171	23	116	418		520	25	252	111		2,898	14
20:00	412	703	109	17	121	392		358	20	194	103		2,429	15
21:00	335	661	87	14	123	380		259	17	178	73		2,127	
22:00	237	478	68	10	31	119		222	12	130	47		1,354	
23:00	182	398	41	6	16	72		142	7	102	31		997	
Total	9,734	14,482	5,397	588	2,663	9,926	0	15,382	569	5,399	2,781	0	66,921	
		29,613			13,177			15,951			8,180			
								68%			32%			

2040 Model - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00	123	234	32	4	24	107		125	5	69	28		751	
1:00	85	177	17	3	16	61		66	4	47	20		496	
2:00	86	183	19	3	16	67		66	4	50	18		512	
3:00	106	118	64	4	30	130		225	3	35	22		737	
4:00	185	176	123	10	49	224		463	8	46	43		1,327	
5:00	435	415	284	27	141	572		1,092	21	112	110		3,209	15
6:00	779	581	507	52	344	1,005		1,477	46	169	251		5,211	7
7:00	1,052	694	585	59	384	1,099		1,431	43	193	397		5,937	2
8:00	1,036	714	513	54	320	982		1,273	45	256	410		5,603	5
9:00	883	684	407	44	301	892		1,064	37	319	373		5,004	9
10:00	863	705	367	40	257	790		921	34	322	366		4,665	12
11:00	709	807	372	41	255	763		922	39	391	272		4,571	13
12:00	835	844	392	45	302	853		903	38	431	297		4,940	10
13:00	801	879	396	61	324	818		942	41	413	258		4,933	11
14:00	929	969	377	67	355	905		926	49	429	303		5,309	6
15:00	933	1,138	311	66	369	985		932	64	463	347		5,608	4
16:00	961	1,248	293	55	369	1,055		927	67	501	410		5,886	3
17:00	1,000	1,321	276	49	360	1,077		881	63	512	424		5,963	1
18:00	834	1,108	283	59	304	821		923	52	407	282		5,073	8
19:00	636	852	196	33	246	654		621	36	292	219		3,785	14
20:00	521	780	122	24	231	590		432	29	223	182		3,134	16
21:00	417	724	99	19	195	576		320	25	206	130		2,711	
22:00	306	541	78	14	70	237		270	17	150	87		1,770	
23:00	223	438	46	9	43	175		179	11	119	55		1,298	
Total	14,738	16,330	6,159	842	5,305	15,438	0	17,381	781	6,155	5,304	0	88,433	
		37,227			21,585			18,162			11,459			
								63%			37%			

2040 Post-Processed - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	208	161	200	20	139	608	13	913	26	178	123	6	2,596	16	32%
6:00	496	432	529	51	463	1,144	25	1,299	73	379	329	10	5,231	12	65%
7:00	893	673	699	128	756	1,176	31	1,202	101	330	640	20	6,649	5	83%
8:00	711	744	605	131	588	940	61	988	122	386	445	39	5,760	9	72%
9:00	490	671	476	111	561	707	61	840	97	506	522	55	5,097	13	63%
10:00	595	791	690	117	526	690	54	676	96	562	661	66	5,524	11	69%
11:00	521	722	656	129	554	741	84	812	128	567	571	102	5,587	10	69%
12:00	688	866	700	142	724	731	104	885	137	595	664	120	6,356	6	79%
13:00	681	682	722	160	788	704	77	769	147	573	638	94	6,036	7	75%
14:00	898	1,030	751	165	709	772	49	959	124	596	693	96	6,842	4	85%
15:00	941	1,189	738	169	794	945	119	937	168	719	872	129	7,720	3	96%
16:00	1,122	1,400	814	151	800	837	72	823	201	686	1,030	116	8,051	2	100%
17:00	1,228	1,424	769	134	726	879	62	838	195	776	969	109	8,108	1	101%
18:00	859	899	491	151	630	680	32	669	144	570	704	77	5,905	8	73%
19:00	514	564	334	111	424	502	21	475	111	348	505	67	3,976	14	49%
20:00	416	522	225	64	255	437	10	375	66	194	349	43	2,957	15	37%
21:00															
22:00															
23:00															
Total												AADT	92,134		
												Major	57,707		
												Minor	34,427		

2040 Balanced - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	273	212	262	20	139	493	13	741	26	144	123	6	2,453	16	30%
6:00	566	493	603	51	463	1,005	25	1,140	73	333	329	10	5,092	13	62%
7:00	914	690	716	128	756	1,177	31	1,203	101	330	640	20	6,705	5	82%
8:00	743	777	632	131	588	959	61	1,007	122	394	445	39	5,898	9	72%
9:00	542	742	527	111	561	720	61	856	97	515	522	55	5,309	12	65%
10:00	606	806	703	117	526	758	54	743	96	617	661	66	5,753	11	70%
11:00	559	775	704	129	554	779	84	853	128	595	571	102	5,832	10	71%
12:00	737	929	750	142	724	754	104	913	137	614	664	120	6,589	6	80%
13:00	756	757	802	160	788	686	77	749	147	559	638	94	6,214	7	76%
14:00	933	1,070	779	165	709	751	49	933	124	580	693	96	6,881	4	84%
15:00	1,004	1,269	788	169	794	923	119	916	168	703	872	129	7,855	3	96%
16:00	1,132	1,412	821	151	800	880	72	865	201	721	1,030	116	8,201	1	100%
17:00	1,202	1,394	753	134	726	872	62	831	195	770	969	109	8,017	2	98%
18:00	885	927	506	151	630	657	32	646	144	550	704	77	5,908	8	72%
19:00	550	604	357	111	424	479	21	453	111	332	505	67	4,014	14	49%
20:00	422	529	228	64	255	413	10	354	66	183	349	43	2,916	15	36%
21:00															
22:00															
23:00															
Total												AADT	93,196		
												Major	58,372		
												Minor	34,824		

2035 - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	176	152	193	19	127	583	12	886	25	175	107	6	2,461	16	32%
6:00	431	419	514	49	421	1,091	24	1,270	71	367	292	9	4,957	12	64%
7:00	802	655	678	124	694	1,110	29	1,179	101	326	590	19	6,308	5	81%
8:00	642	725	595	126	548	880	58	963	120	376	403	37	5,475	9	70%
9:00	449	653	465	106	523	660	58	825	95	486	476	52	4,848	13	62%
10:00	555	773	675	114	498	637	51	666	94	549	607	63	5,282	11	68%
11:00	482	705	644	126	525	684	80	792	125	555	541	97	5,356	10	69%
12:00	637	853	687	139	660	671	99	863	135	582	633	114	6,072	6	78%
13:00	622	668	711	154	713	648	73	748	144	561	608	89	5,740	7	74%
14:00	831	1,020	730	153	646	711	46	938	121	587	667	91	6,540	4	84%
15:00	881	1,160	734	164	730	866	113	918	163	710	821	122	7,383	3	95%
16:00	1,067	1,362	806	149	735	754	68	805	197	677	968	110	7,698	2	99%
17:00	1,179	1,382	751	133	675	799	59	818	192	760	932	103	7,781	1	100%
18:00	813	881	483	143	574	624	31	651	141	560	682	73	5,654	8	73%
19:00	487	552	327	109	385	461	20	458	109	340	484	64	3,794	14	49%
20:00	397	509	222	63	231	404	9	361	63	189	324	41	2,813	15	36%
21:00															
22:00															
23:00															
Total												AADT	88,418		
												Major	55,380		
												Minor	33,038		

2035 Balanced - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	234	203	257	19	127	473	12	719	25	142	107	6	2,324	16	30%
6:00	492	478	586	49	421	958	24	1,115	71	322	292	9	4,817	13	61%
7:00	819	668	692	124	694	1,112	29	1,181	101	326	590	19	6,356	5	81%
8:00	668	755	619	126	548	899	58	984	120	384	403	37	5,602	9	71%
9:00	494	718	511	106	523	673	58	841	95	496	476	52	5,043	12	64%
10:00	561	782	682	114	498	702	51	734	94	606	607	63	5,495	11	70%
11:00	514	753	687	126	525	723	80	837	125	587	541	97	5,594	10	71%
12:00	681	910	734	139	660	693	99	892	135	601	633	114	6,290	6	80%
13:00	691	743	790	154	713	629	73	725	144	544	608	89	5,904	7	75%
14:00	864	1,061	760	153	646	688	46	908	121	569	667	91	6,574	4	84%
15:00	940	1,238	783	164	730	844	113	894	163	692	821	122	7,505	3	96%
16:00	1,075	1,372	812	149	735	793	68	846	197	712	968	110	7,837	1	100%
17:00	1,153	1,352	735	133	675	791	59	810	192	753	932	103	7,687	2	98%
18:00	837	907	497	143	574	600	31	626	141	538	682	73	5,648	8	72%
19:00	519	589	348	109	385	439	20	436	109	323	484	64	3,824	14	49%
20:00	400	514	223	63	231	380	9	340	63	178	324	41	2,766	15	35%
21:00															
22:00															
23:00															
Total												AADT	89,057		
												Major	55,780		
												Minor	33,277		

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total
0:00													
1:00													
2:00													
3:00													
4:00													
5:00													
6:00													
7:00		1,400	336				92	2,033		554		150	4,565
8:00		1,450	326				86	1,743		542		103	4,250
9:00													
10:00													
11:00													
12:00													
13:00													
14:00													
15:00													
16:00		2,511	749				111	1,750		377		145	5,643
17:00		2,440	673				117	1,627		333		121	5,311
18:00													
19:00													
20:00													
21:00													
22:00													
23:00													
Total												AADT	64,125
												Major	57,229
												Minor	6,896

2017 Count Data - Seasonally Adjusted - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	
0:00														
1:00														
2:00														
3:00														
4:00														
5:00														
6:00														
7:00		1,519	365				100	2,206		601		163	4,953	3
8:00		1,573	354				93	1,891		588		112	4,611	4
9:00														
10:00														
11:00														
12:00														
13:00														
14:00														
15:00														
16:00		2,724	813				120	1,899		409		157	6,123	1
17:00		2,647	730				127	1,765		361		131	5,762	2
18:00														
19:00														
20:00														
21:00														
22:00														
23:00														
Total												AADT	69,576	
												Major	62,094	
												Minor	7,482	

2015 Base Model - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00		324	77				13	193		48		12	667	
1:00		234	56				8	105		27		9	439	
2:00		244	55				8	106		28		8	449	
3:00		190	39				20	313		62		5	629	
4:00		304	63				45	604		127		9	1,152	
5:00		748	162				97	1,399		222		22	2,650	15
6:00		1,199	259				125	2,088		618		82	4,371	6
7:00		1,579	212				154	2,110		674		62	4,791	3
8:00		1,651	195				150	1,875		623		46	4,540	5
9:00		1,499	210				102	1,745		356		58	3,970	10
10:00		1,494	207				103	1,536		299		60	3,699	13
11:00		1,465	271				114	1,519		312		54	3,735	12
12:00		1,612	265				122	1,567		308		70	3,944	11
13:00		1,568	313				120	1,585		329		64	3,979	9
14:00		1,746	356				97	1,687		332		65	4,283	7
15:00		1,850	462				152	1,694		415		81	4,654	4
16:00		1,972	472				171	1,704		443		81	4,843	2
17:00		2,050	493				168	1,685		411		80	4,887	1
18:00		1,798	371				108	1,576		352		74	4,279	8
19:00		1,382	307				119	1,072		221		51	3,152	14
20:00		1,180	309				93	851		157		44	2,634	16
21:00		1,034	279				81	736		131		49	2,310	
22:00		749	195				40	431		111		34	1,560	
23:00		598	146				22	294		77		23	1,160	
Total	0	28,470	5,774	0	0	0	2,232	28,475	0	6,683	0	1,143	72,777	
		34,244			0			30,707			7,826			
								89%			11%			

2040 Model - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00		369	91				22	279		66		20	847	
1:00		264	67				13	161		39		15	559	
2:00		273	66				14	170		41		14	578	
3:00		278	48				31	359		80		10	806	
4:00		468	81				68	665		164		17	1,463	
5:00		1,091	199				121	1,655		332		44	3,442	15
6:00		1,723	176				204	2,447		560		144	5,254	7
7:00		2,138	202				268	2,455		597		193	5,853	3
8:00		2,108	211				280	2,232		601		156	5,588	5
9:00		1,832	233				220	2,056		491		142	4,974	10
10:00		1,806	207				240	1,793		400		130	4,576	13
11:00		1,753	305				240	1,836		394		135	4,663	12
12:00		1,917	311				258	1,929		387		154	4,956	11
13:00		1,924	364				265	1,908		400		152	5,013	9
14:00		2,063	392				290	1,970		437		212	5,364	6
15:00		2,125	455				259	2,121		430		256	5,646	4
16:00		2,244	482				253	2,231		431		258	5,899	2
17:00		2,374	493				255	2,215		421		223	5,981	1
18:00		2,054	437				257	1,893		421		172	5,234	8
19:00		1,576	311				172	1,395		228		108	3,790	14
20:00		1,330	301				131	1,114		162		93	3,131	16
21:00		1,157	319				111	992		138		83	2,800	
22:00		866	232				63	594		139		58	1,952	
23:00		668	173				35	439		102		39	1,456	
Total	0	34,401	6,156	0	0	0	4,070	34,909	0	7,461	0	2,828	89,825	
		40,557			0			38,979			10,289			
								89%			11%			

2040 Post-Processed - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total		
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		787	137				72	987		208		140	2,332		32%
6:00		1,587	277				145	1,989		420		282	4,700		65%
7:00		2,017	352				184	2,528		534		358	5,973	3	83%
8:00		1,979	374				188	2,219		568		266	5,594	4	72%
9:00		1,752	331				166	1,963		503		235	4,950		63%
10:00		1,898	359				180	2,128		545		255	5,365		69%
11:00		1,920	363				182	2,152		551		258	5,426		69%
12:00		2,284	532				176	2,173		471		294	5,931		79%
13:00		2,265	619				138	1,803		299		280	5,402		75%
14:00		2,567	701				156	2,043		339		317	6,123		85%
15:00		2,896	791				176	2,306		382		358	6,909		96%
16:00		3,021	825				184	2,405		398		373	7,206	1	100%
17:00		2,987	730				196	2,258		370		292	6,832	2	101%
18:00		2,175	532				143	1,645		269		212	4,976		73%
19:00		1,465	358				96	1,108		181		143	3,351		49%
20:00		1,089	266				71	824		135		106	2,492		37%
21:00															
22:00															
23:00															
Total												AADT	81,886		
												Major	72,507		
												Minor	9,380		

2040 Balanced - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	From Beavercreek
0:00															
1:00															
2:00															
3:00															
4:00															
5:00		634	138				94	1,284		214		113	2,478	16	32%
6:00		1,411	279				168	2,310		431		251	4,851	12	65%
7:00		1,970	355				184	2,526		548		350	5,933	5	83%
8:00		1,897	370				184	2,176		573		255	5,455	7	72%
9:00		1,597	327				163	1,928		507		214	4,827	13	63%
10:00		1,865	355				165	1,953		549		250	5,137	10	69%
11:00		1,797	359				174	2,053		555		241	5,179	9	69%
12:00		2,141	529				171	2,110		474		275	5,700	6	79%
13:00		2,060	617				141	1,853		300		255	5,226	8	75%
14:00		2,476	699				161	2,103		341		306	6,085	4	85%
15:00		2,724	789				180	2,362		384		337	6,764	3	96%
16:00		2,995	822				175	2,291		401		370	7,054	1	100%
17:00		3,051	730				198	2,275		368		298	6,920	2	101%
18:00		2,112	532				148	1,705		268		206	4,971	11	73%
19:00		1,377	358				101	1,163		181		134	3,314	14	49%
20:00		1,074	266				76	874		134		105	2,530	15	37%
21:00															
22:00															
23:00															
Total															

AADT	78,639
Major	69,632
Minor	9,008

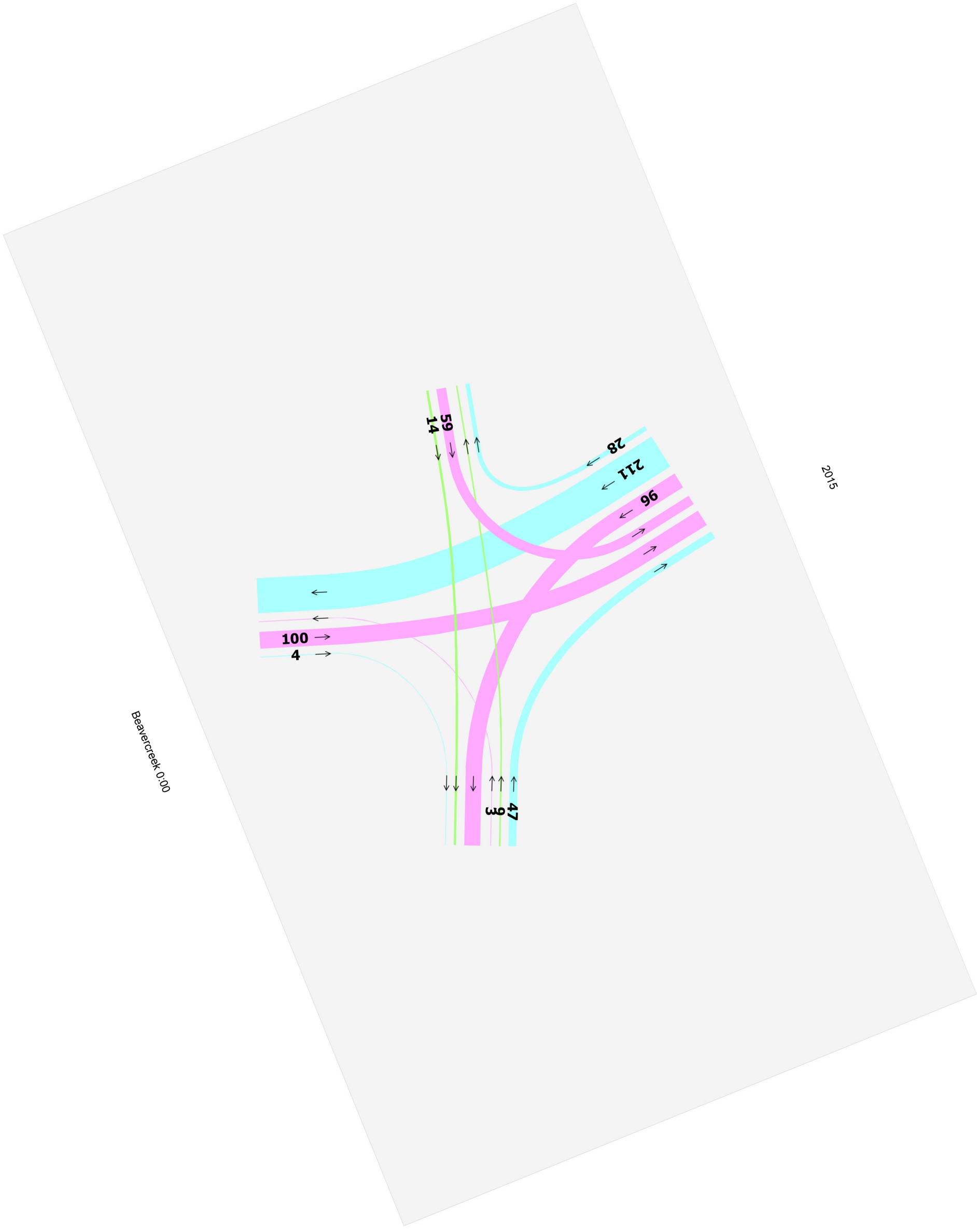
2035 - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		745	138				65	959		214		123	2,244	16	32%
6:00		1,500	279				130	1,932		431		248	4,520	13	64%
7:00		1,909	355				166	2,458		548		316	5,752	5	81%
8:00		1,891	370				167	2,147		573		232	5,380	7	70%
9:00		1,675	328				148	1,902		507		206	4,765	12	62%
10:00		1,824	357				161	2,072		552		224	5,191	10	68%
11:00		1,850	362				164	2,101		560		227	5,264	8	69%
12:00		2,215	529				160	2,096		476		257	5,733	6	78%
13:00		2,204	613				127	1,711		299		243	5,198	9	74%
14:00		2,512	699				144	1,950		340		277	5,922	4	84%
15:00		2,835	789				163	2,201		384		313	6,685	2	95%
16:00		2,956	822				170	2,295		401		326	6,970	1	99%
17:00		2,913	730				181	2,151		368		257	6,600	3	100%
18:00		2,117	531				132	1,563		267		187	4,796	11	73%
19:00		1,420	356				88	1,049		179		125	3,218	14	49%
20:00		1,053	264				65	778		133		93	2,386	15	36%
21:00															
22:00															
23:00															
Total												AADT	74,998		
												Major	66,407		
												Minor	8,591		

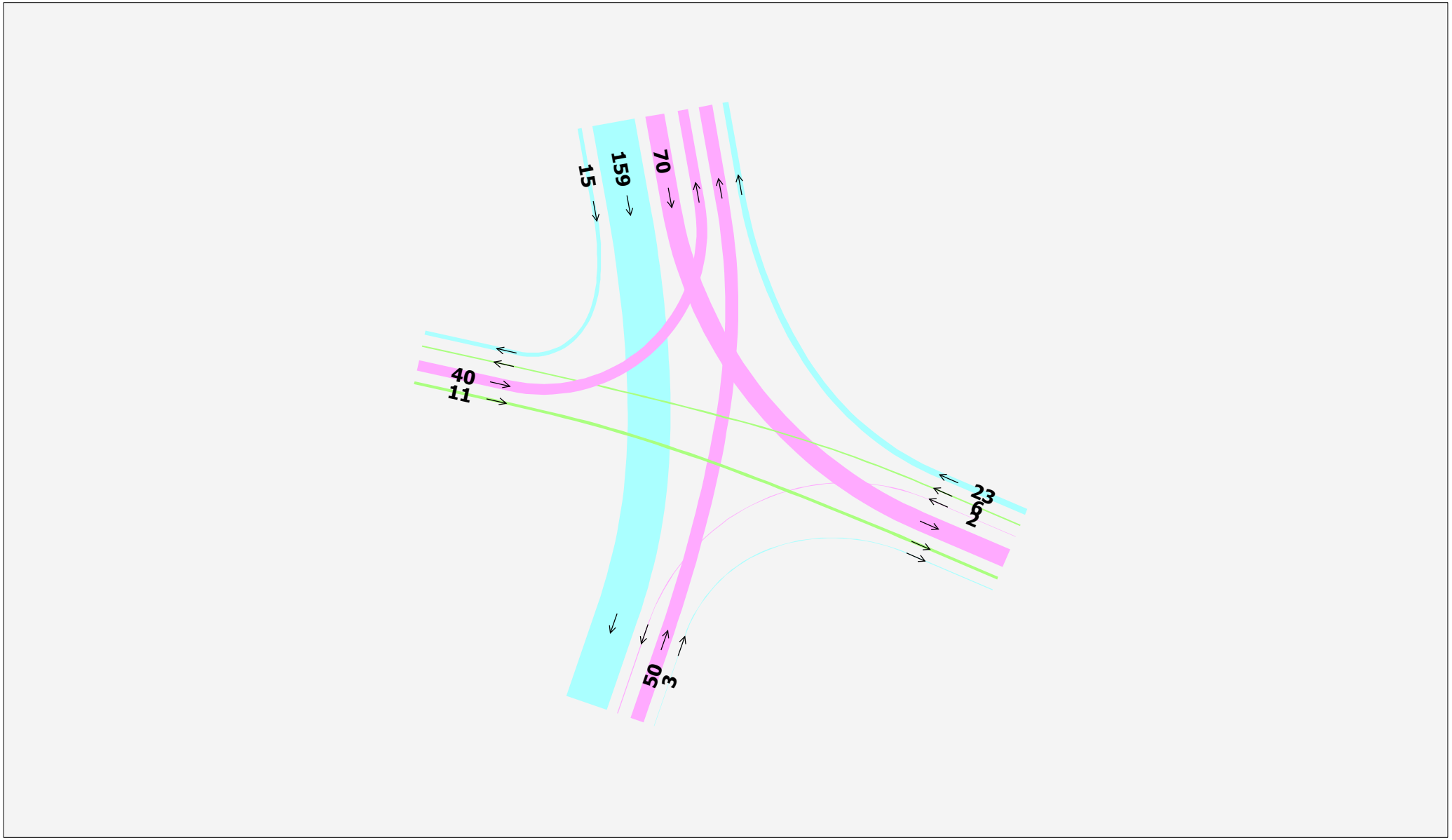
2035 Balanced - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		595	138				84	1,250		214		99	2,380	16	32%
6:00		1,335	279				151	2,244		431		221	4,661	12	64%
7:00		1,870	355				166	2,453		548		309	5,701	5	81%
8:00		1,819	370				164	2,103		573		223	5,252	7	70%
9:00		1,535	328				145	1,865		507		188	4,650	13	62%
10:00		1,804	357				148	1,894		552		221	4,976	10	68%
11:00		1,740	362				155	1,992		560		214	5,023	9	69%
12:00		2,085	529				155	2,030		476		242	5,517	6	78%
13:00		2,003	613				131	1,767		299		221	5,034	8	74%
14:00		2,418	699				149	2,017		340		267	5,890	4	84%
15:00		2,667	789				168	2,261		384		294	6,553	3	95%
16:00		2,935	822				162	2,189		401		324	6,833	1	99%
17:00		2,978	730				183	2,171		368		262	6,692	2	100%
18:00		2,060	531				137	1,627		267		181	4,803	11	73%
19:00		1,338	356				93	1,105		179		118	3,190	14	49%
20:00		1,045	264				70	828		133		92	2,432	15	36%
21:00															
22:00															
23:00															
Total															

AADT	76,049
Major	67,338
Minor	8,711


59
14
28
211
96
100
4
47
Beavercreek 0:00
2015

2015



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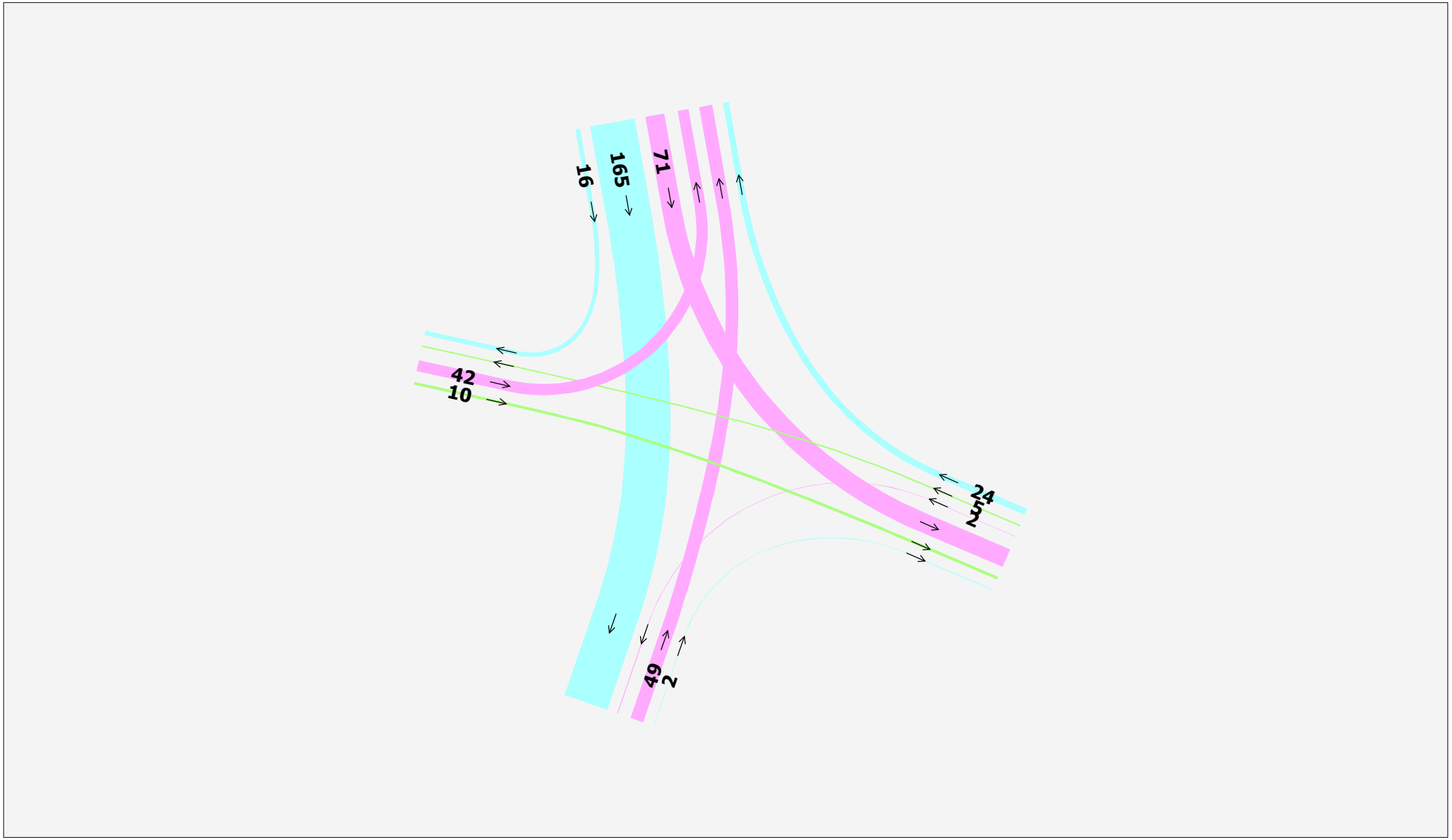
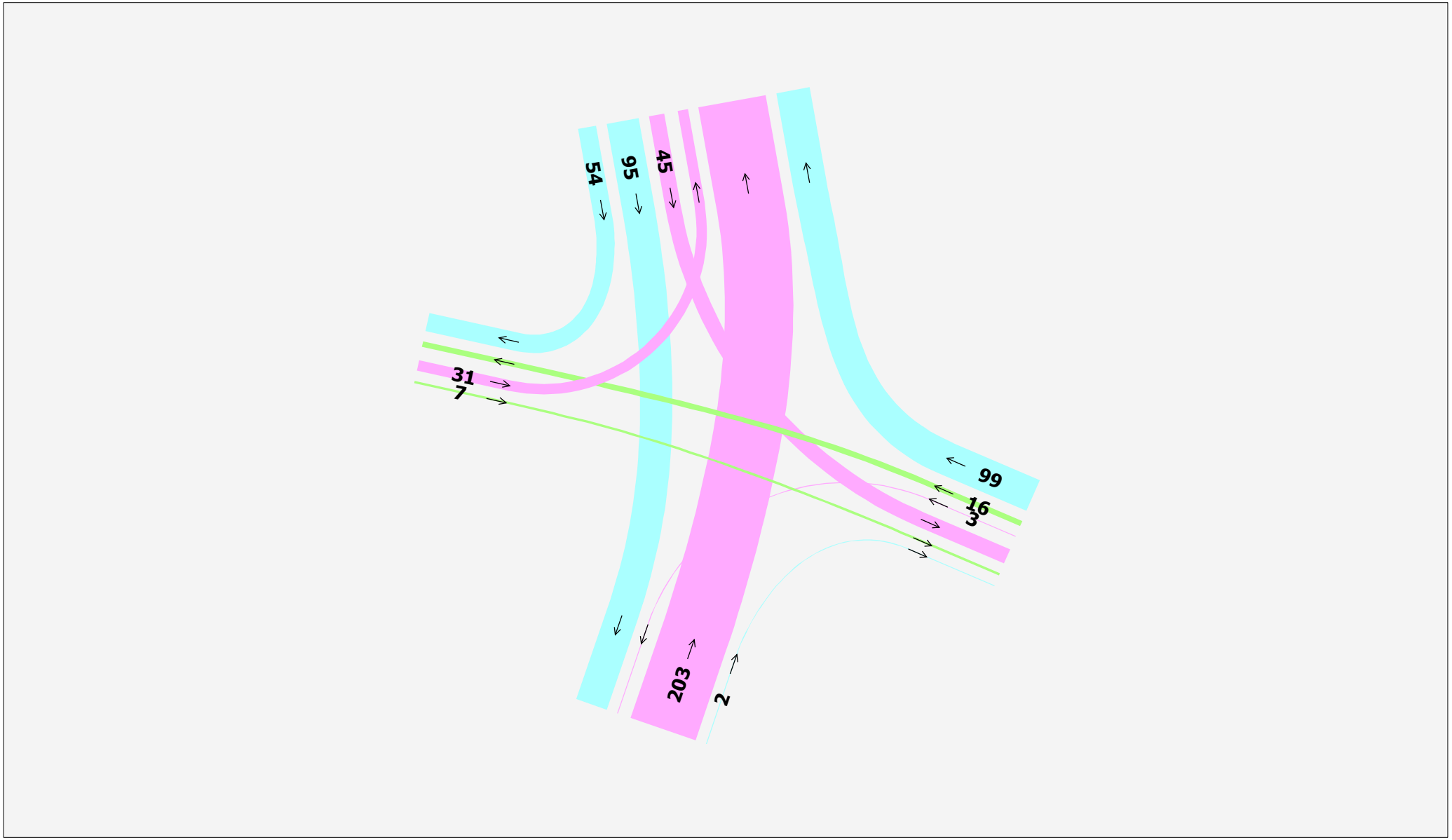


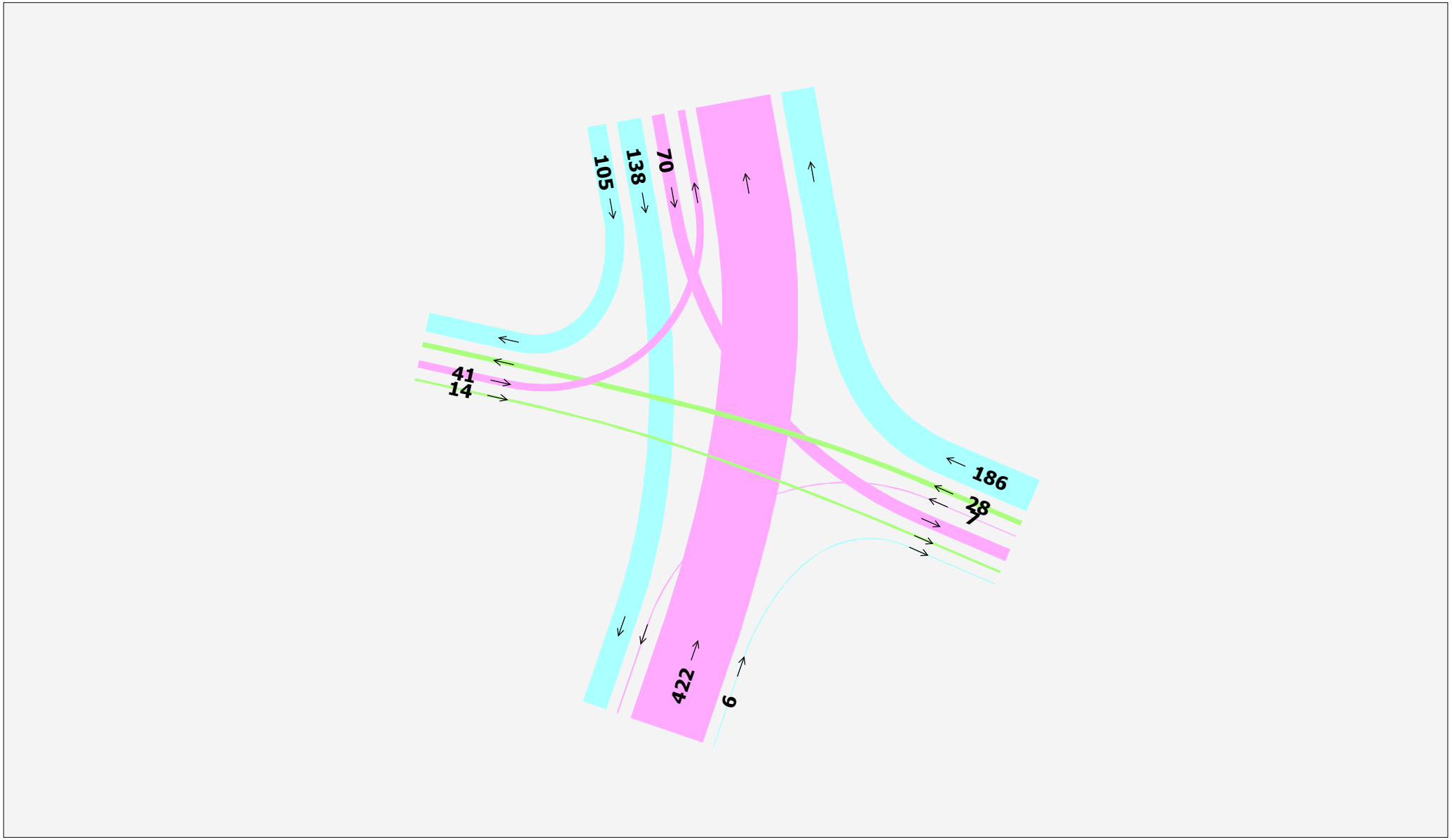
Beavercreek 2:00

2015



Beavercreek 3:00

2015



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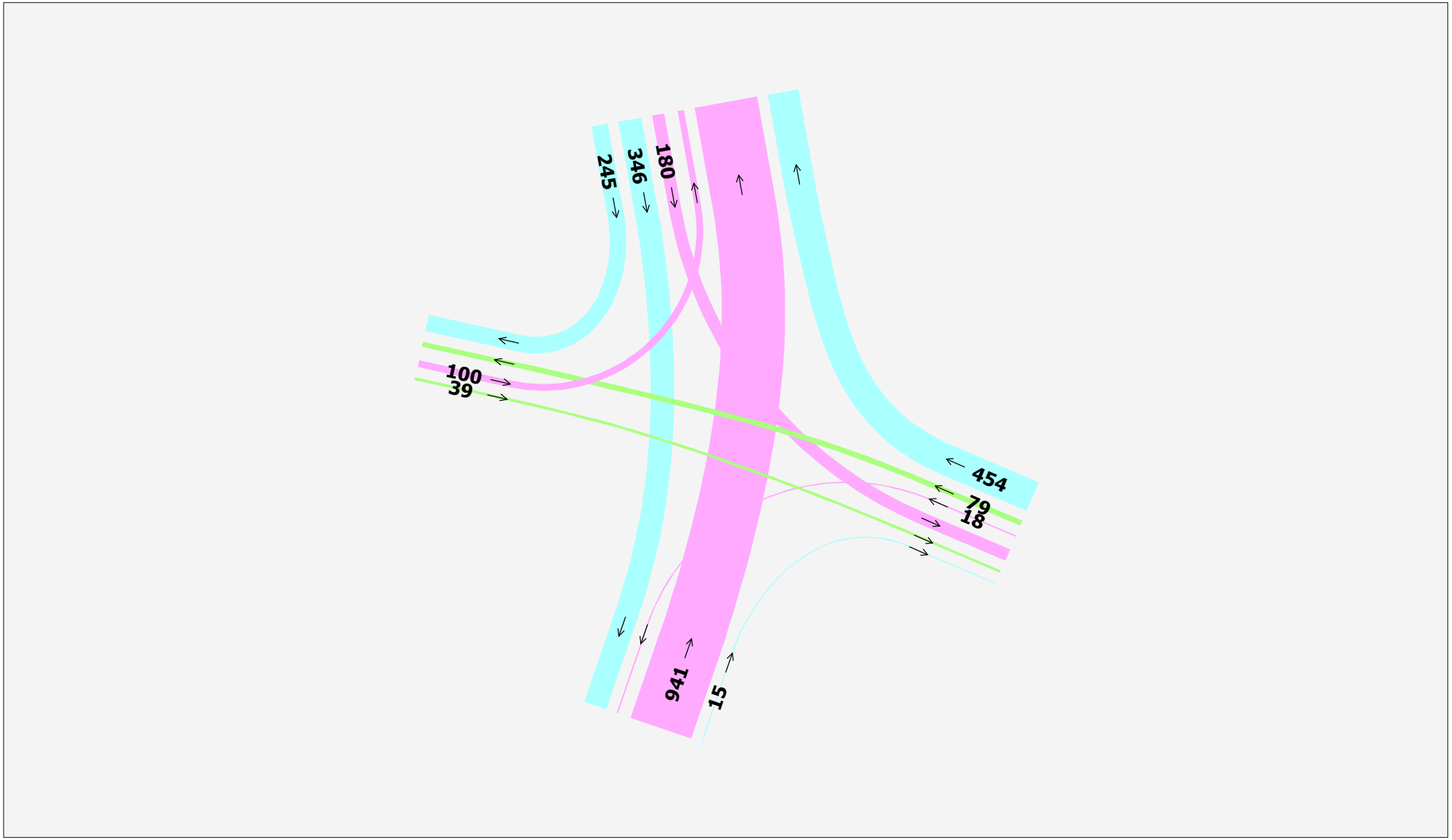
2015



Beavercreek 5:00

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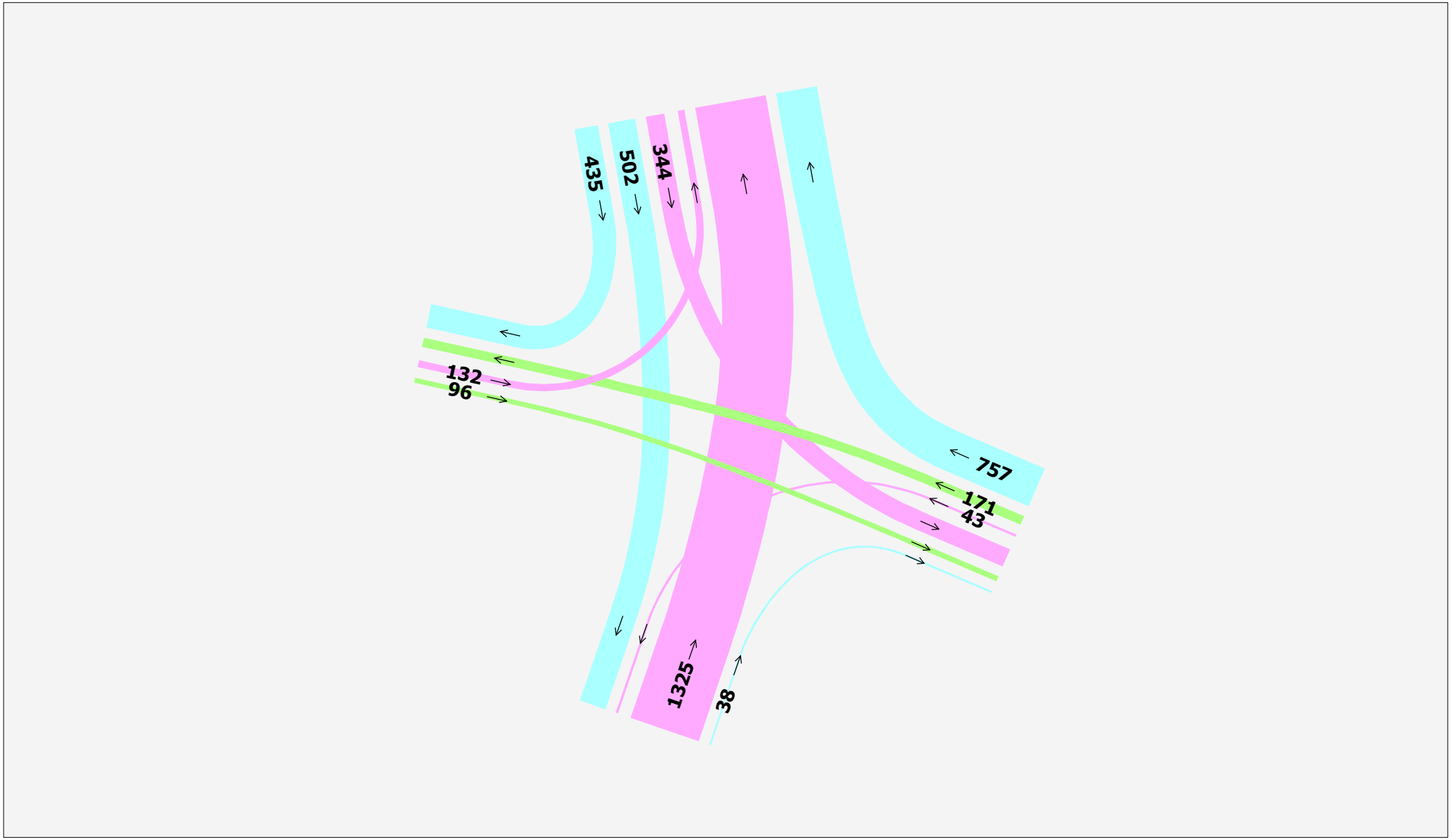

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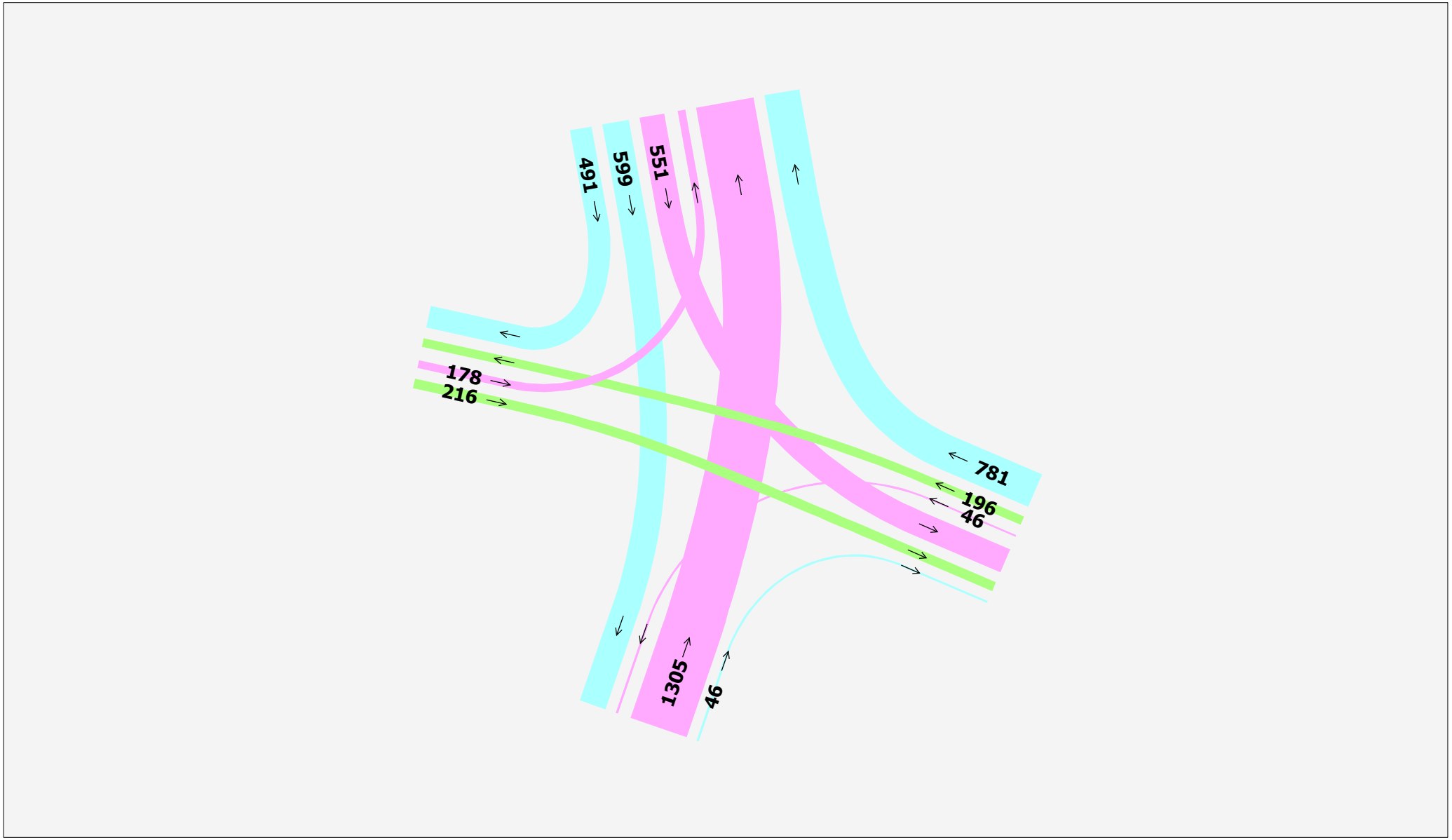

Beavercreek 7:00

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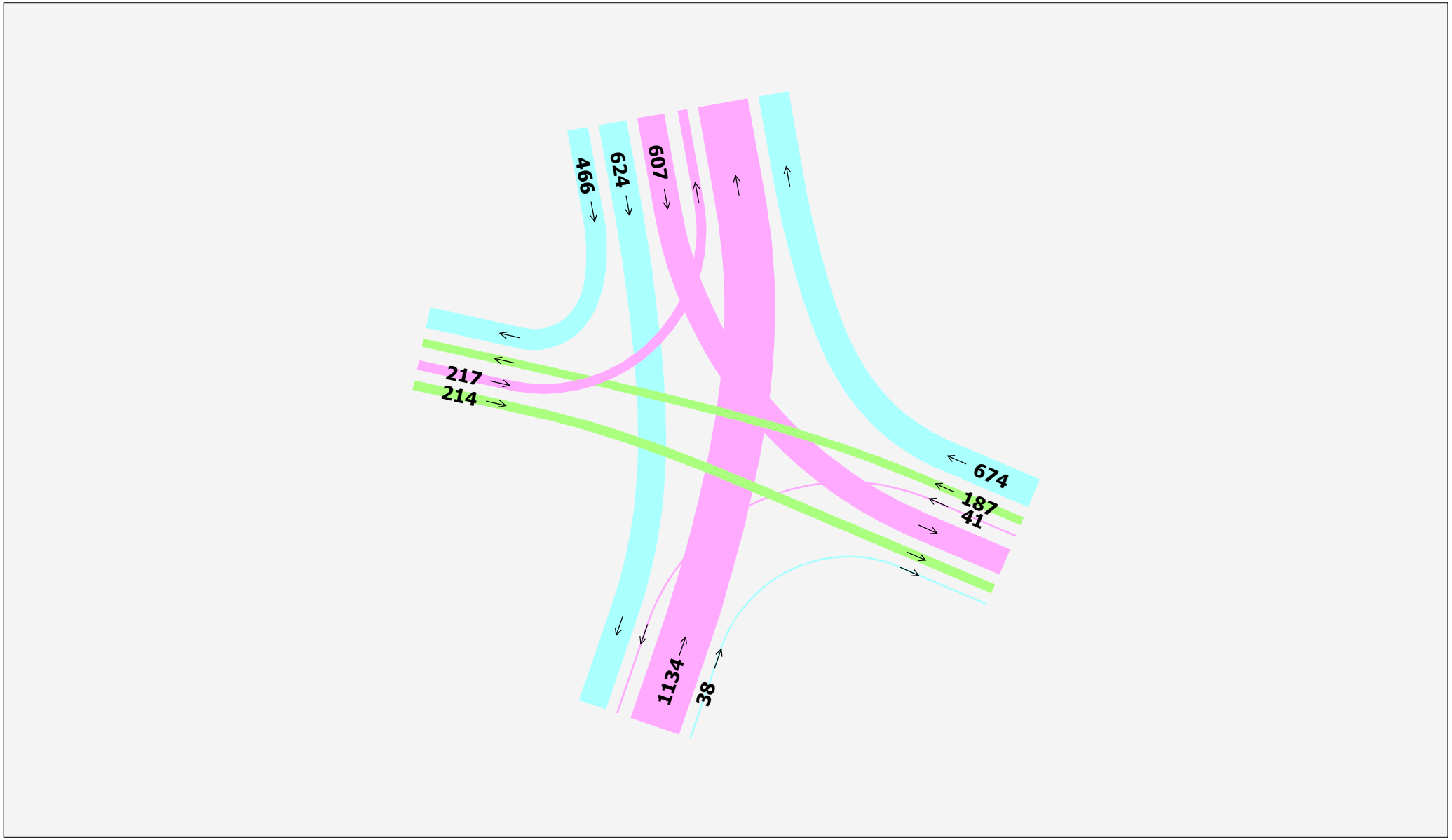

Beavercreek 8:00

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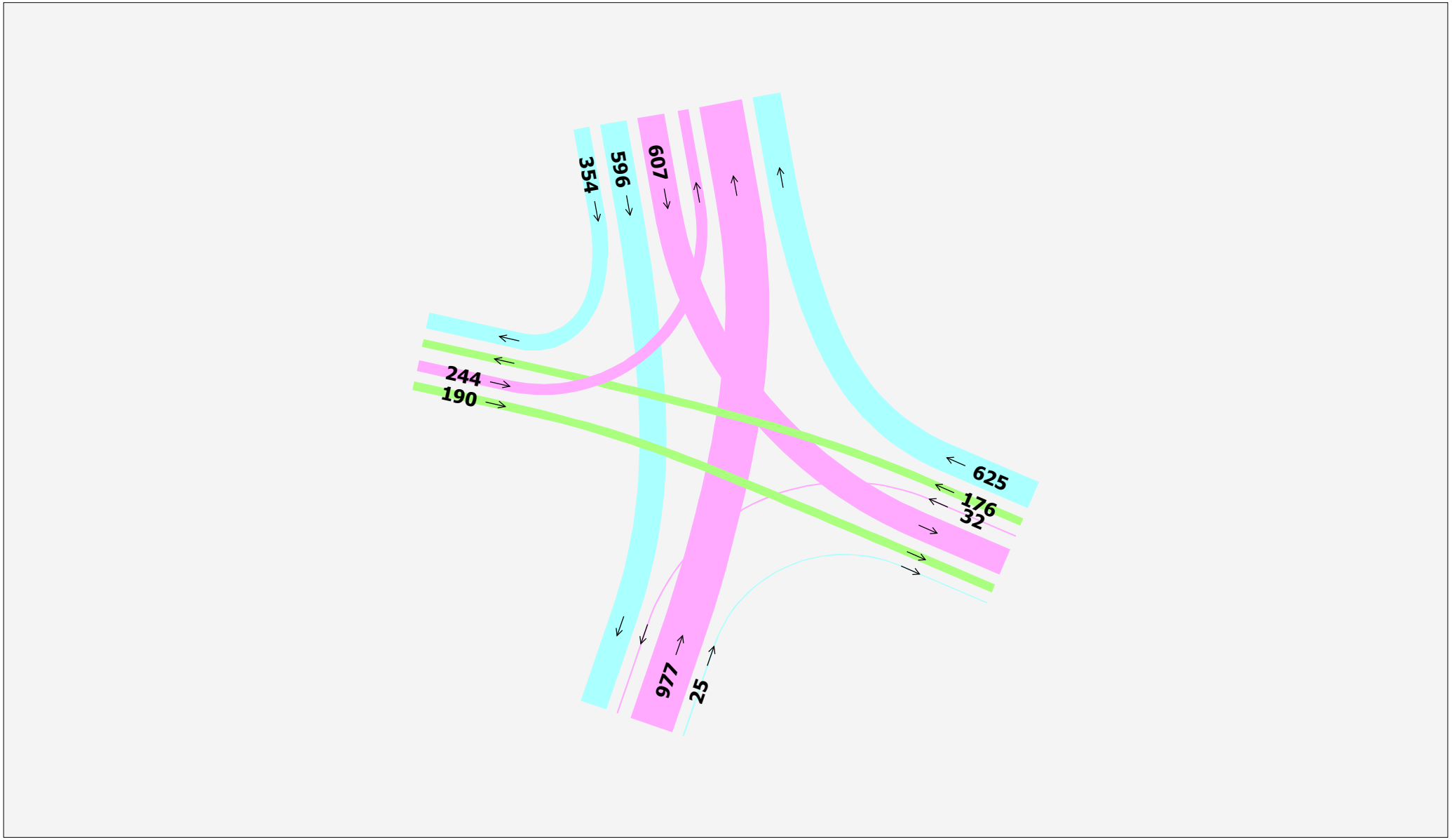

Beavercreek 9:00

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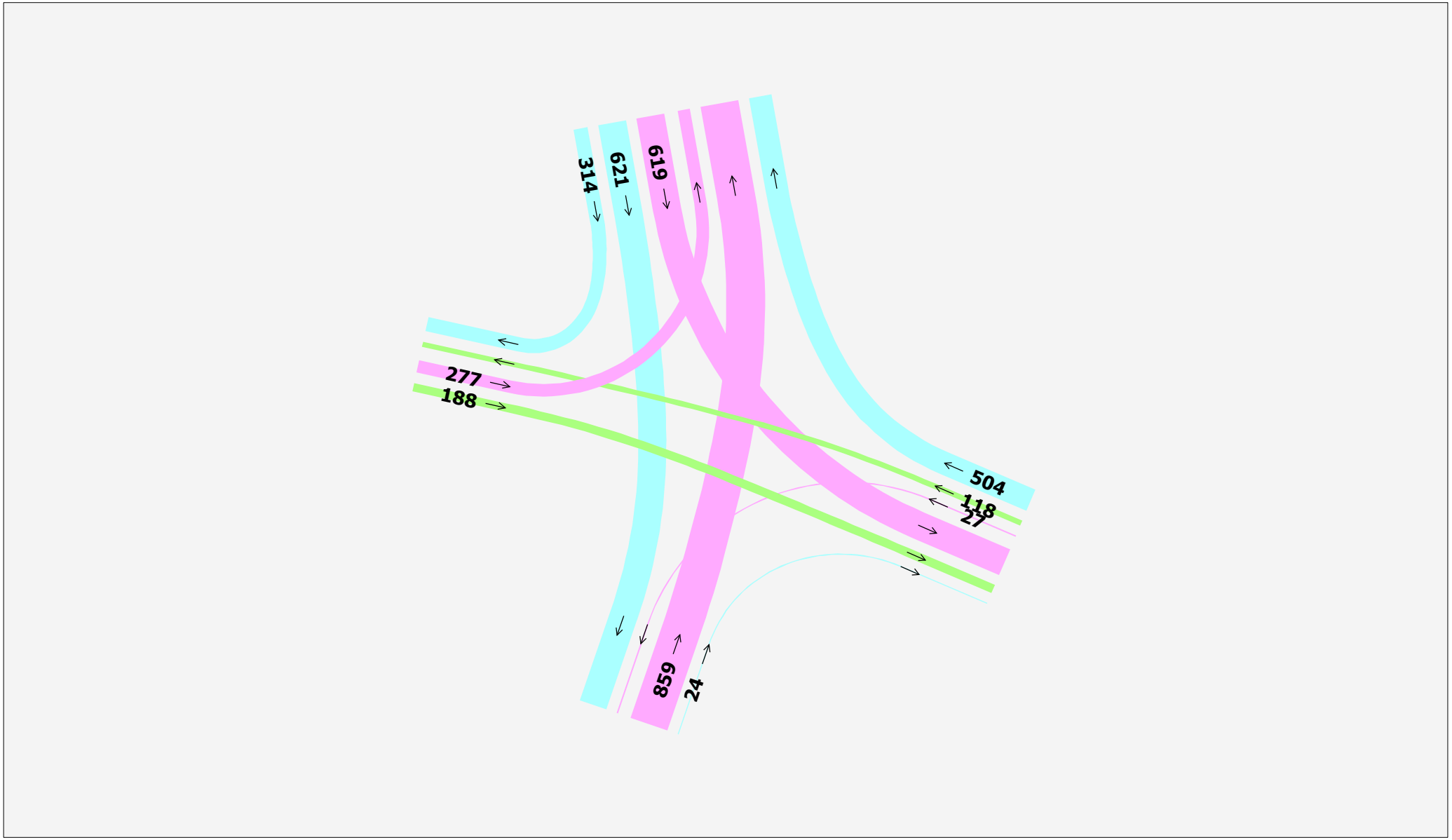

Beavercreek 10:00

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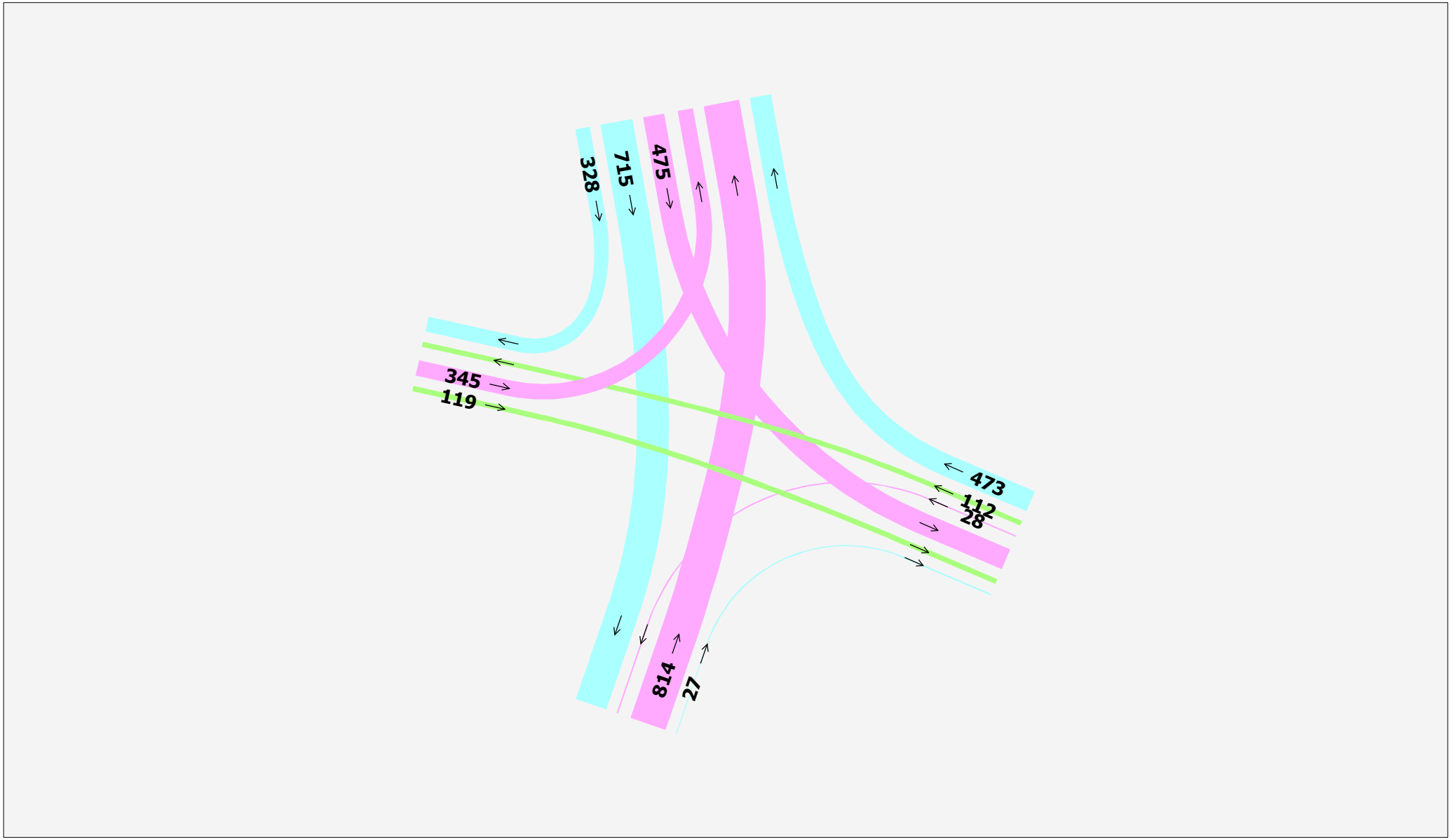

Beavercreek 11:00

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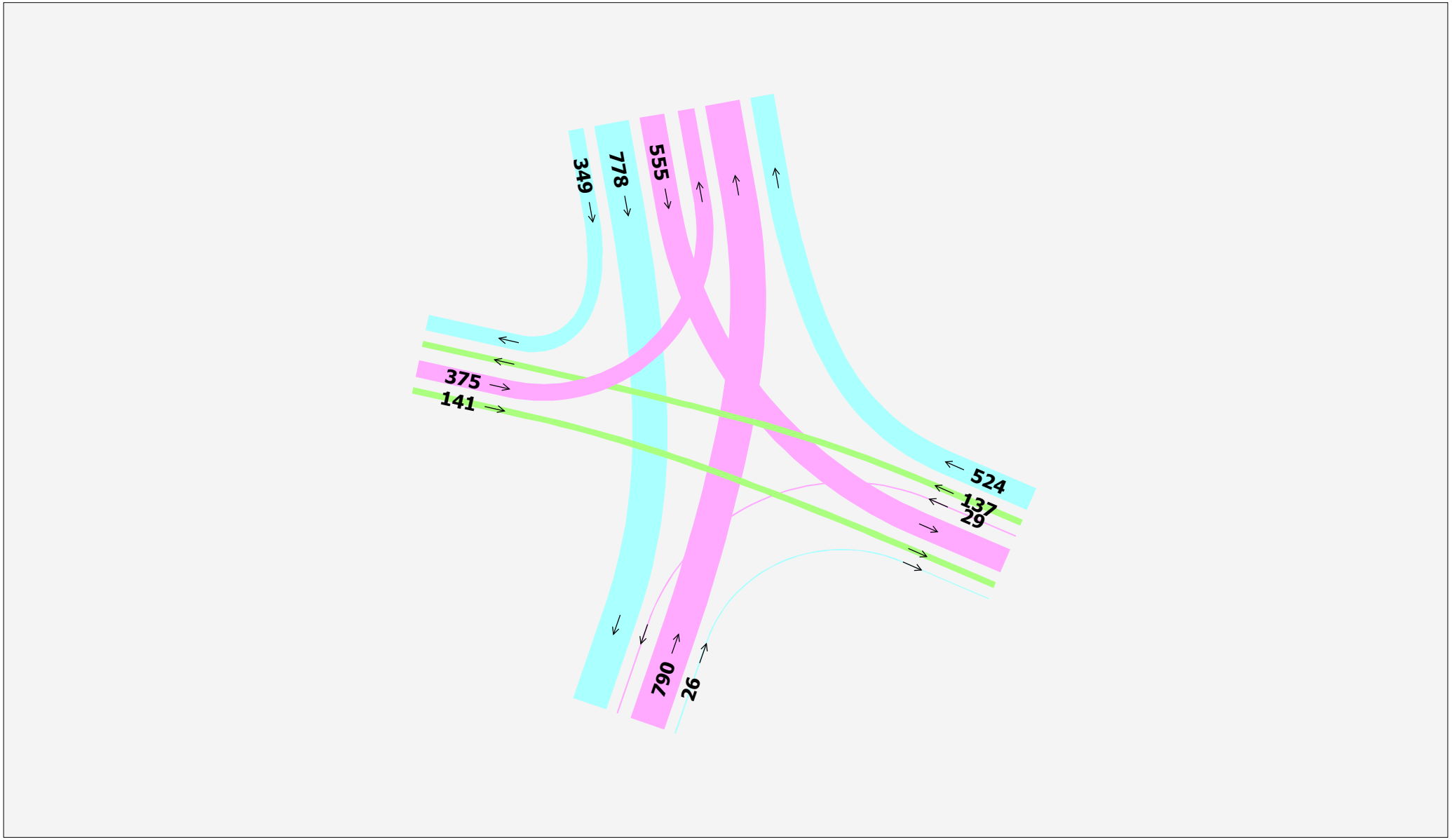

Beavercreek 12:00

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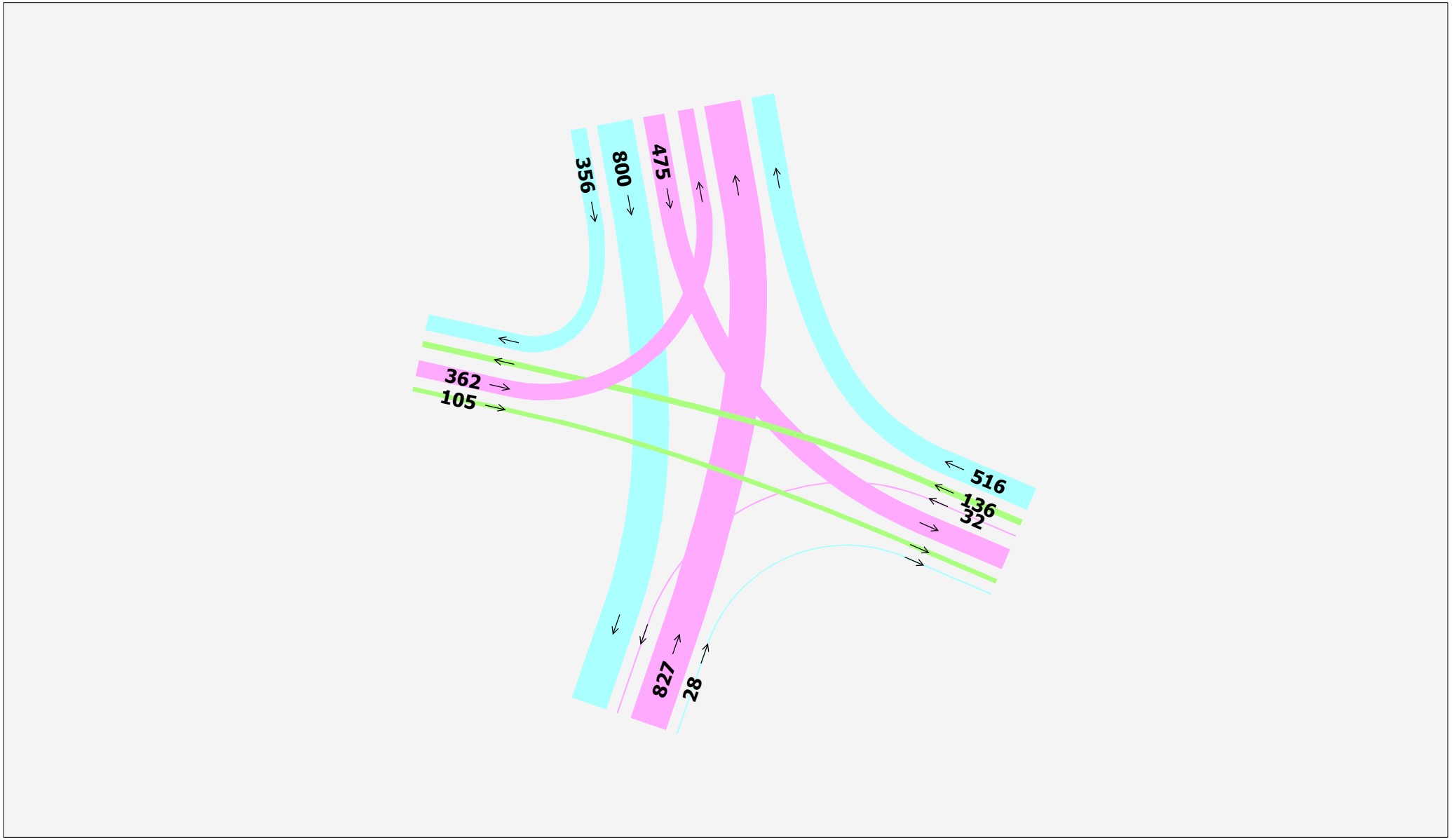

Beavercreek 13:00

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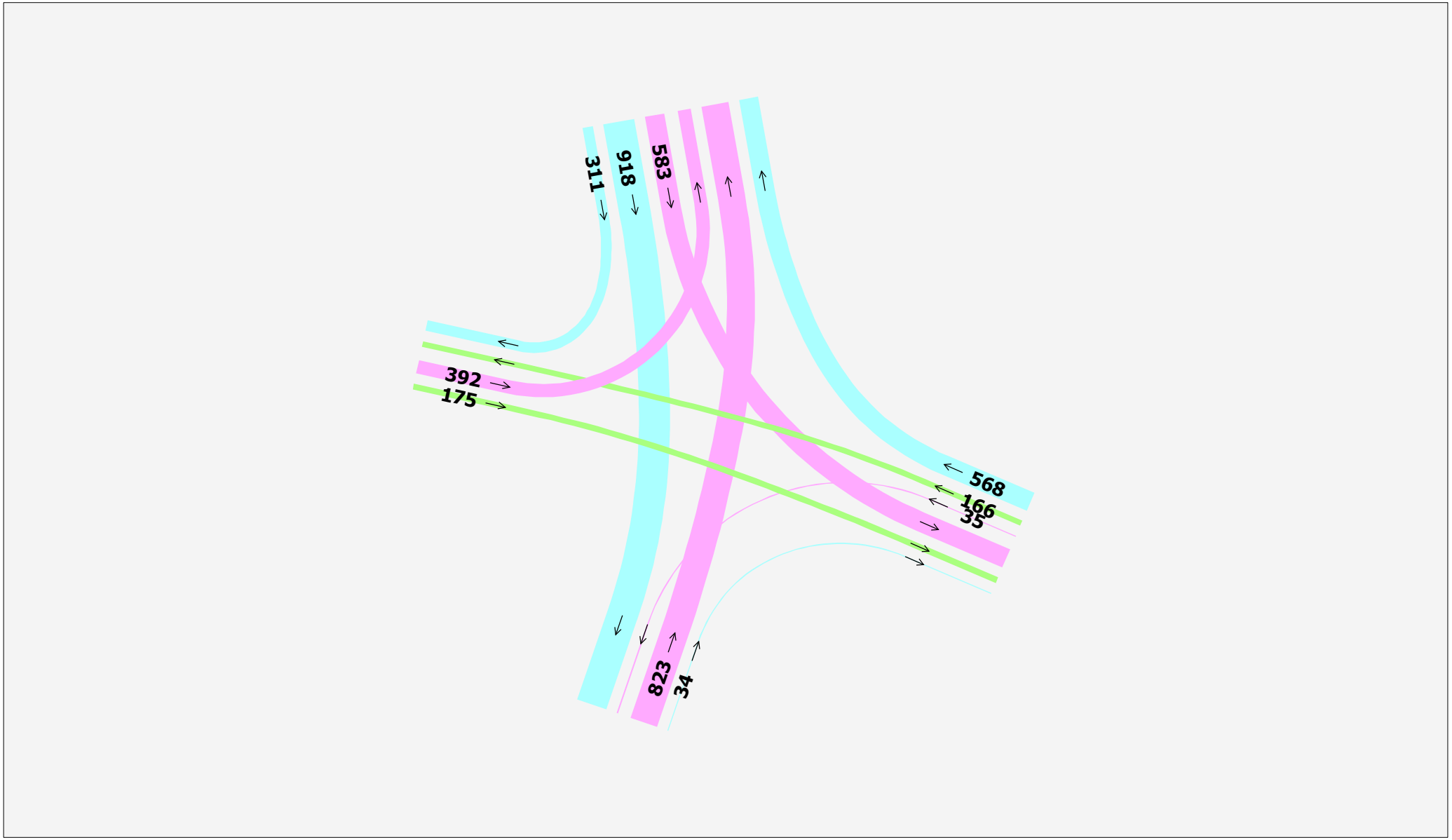
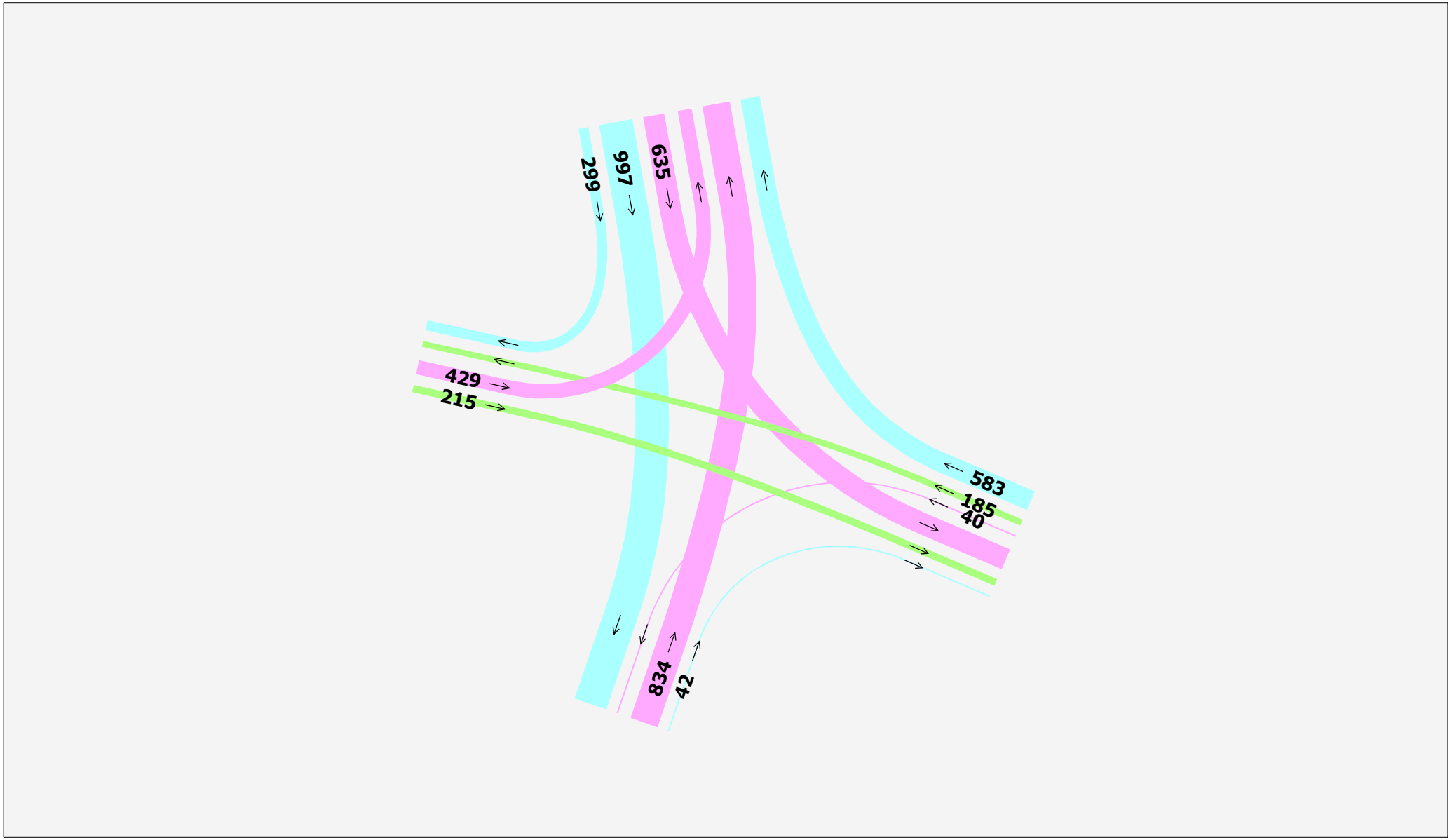


Beavercreek 14:00

2015



Beavercreek 15:00

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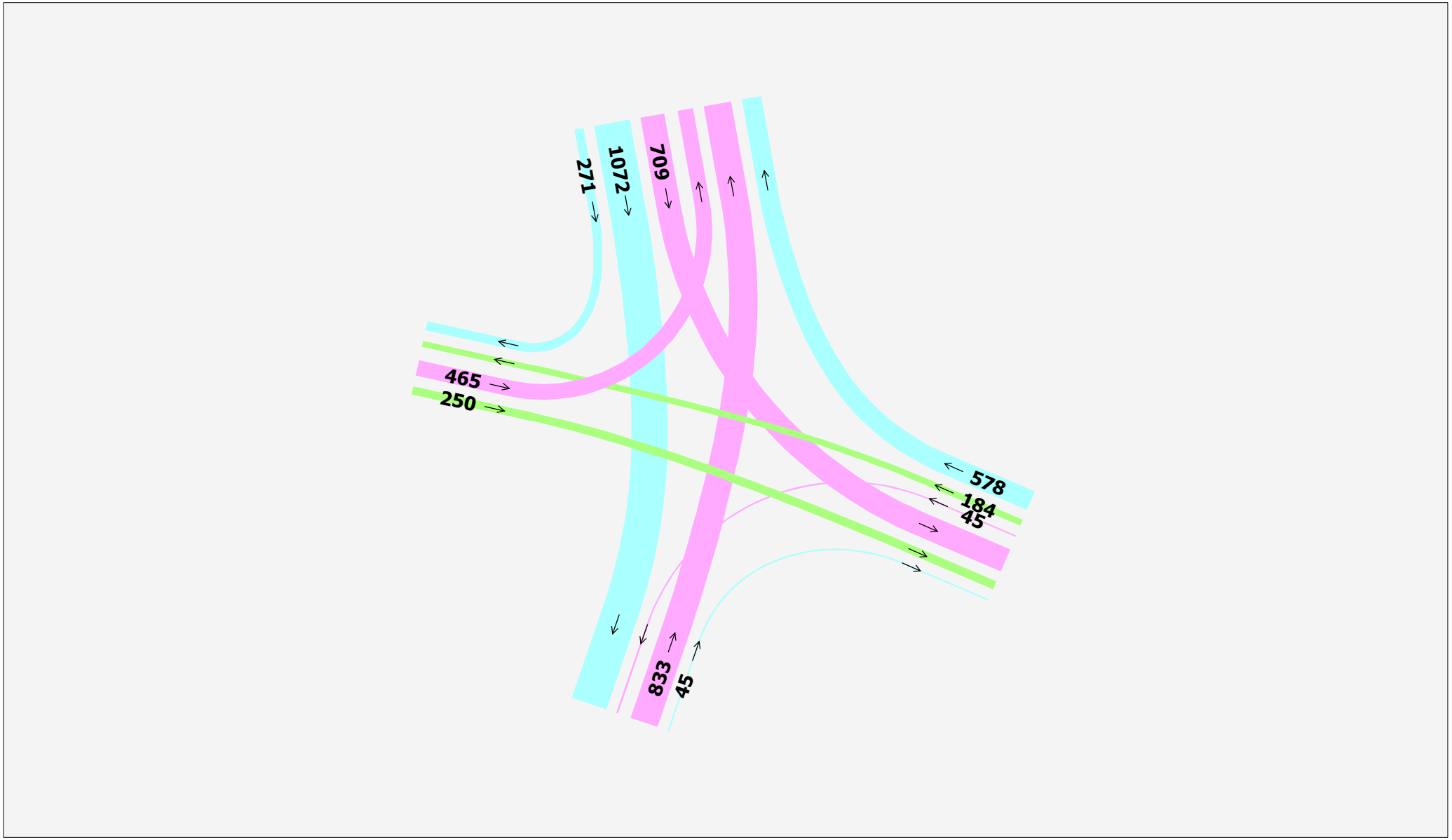

Beavercreek 16:00

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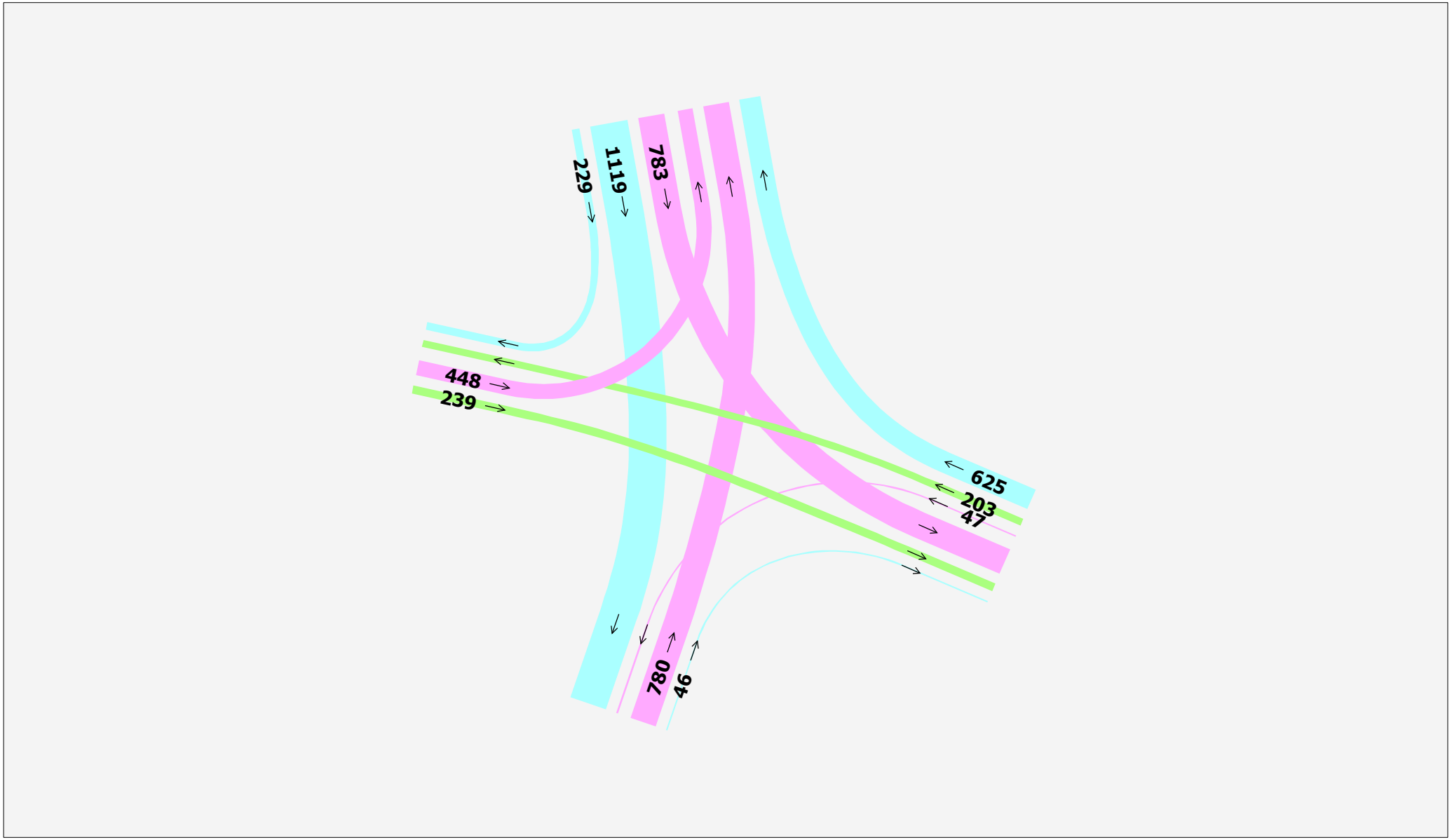

Beavercreek 17:00

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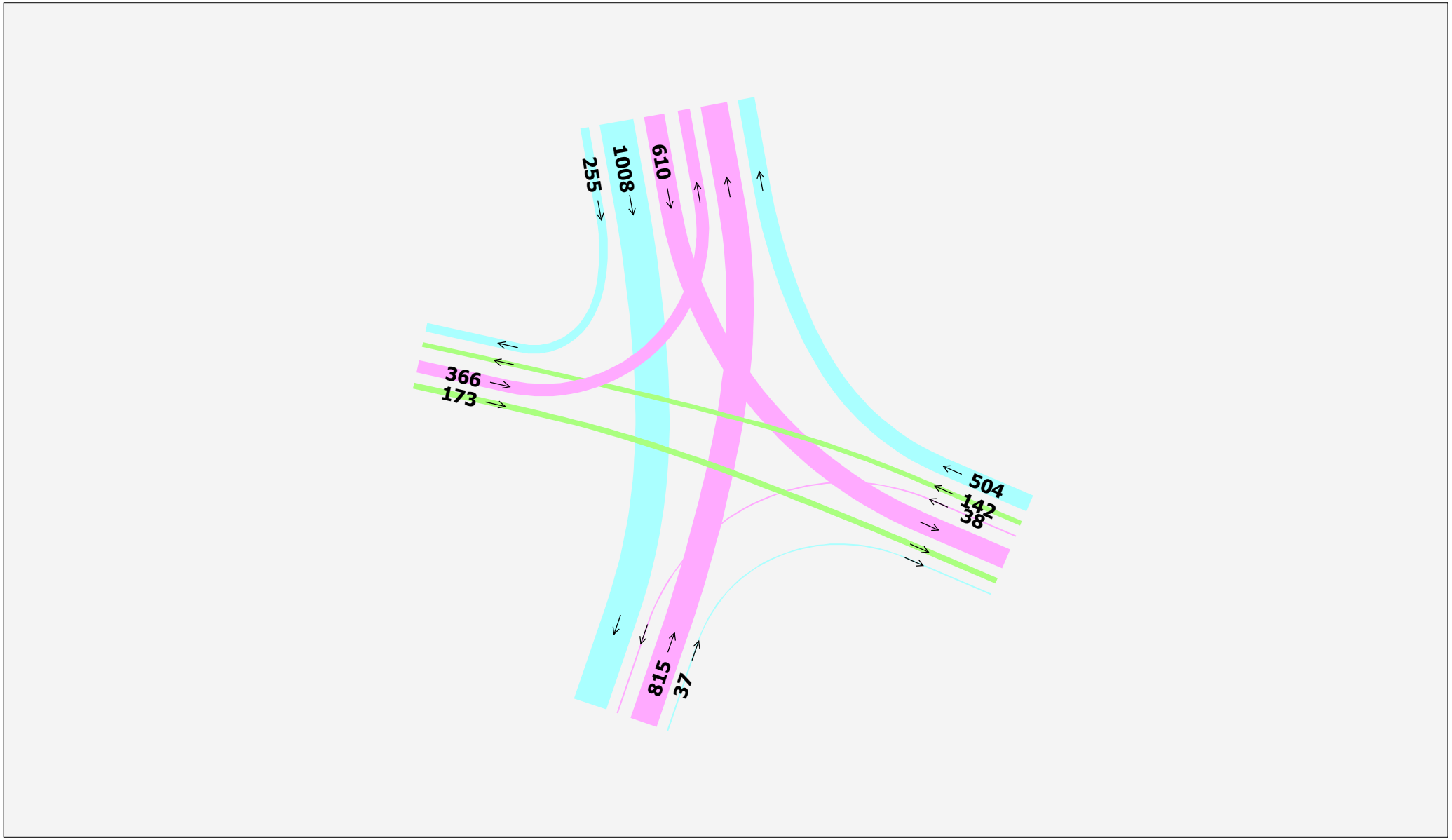

Beavercreek 18:00

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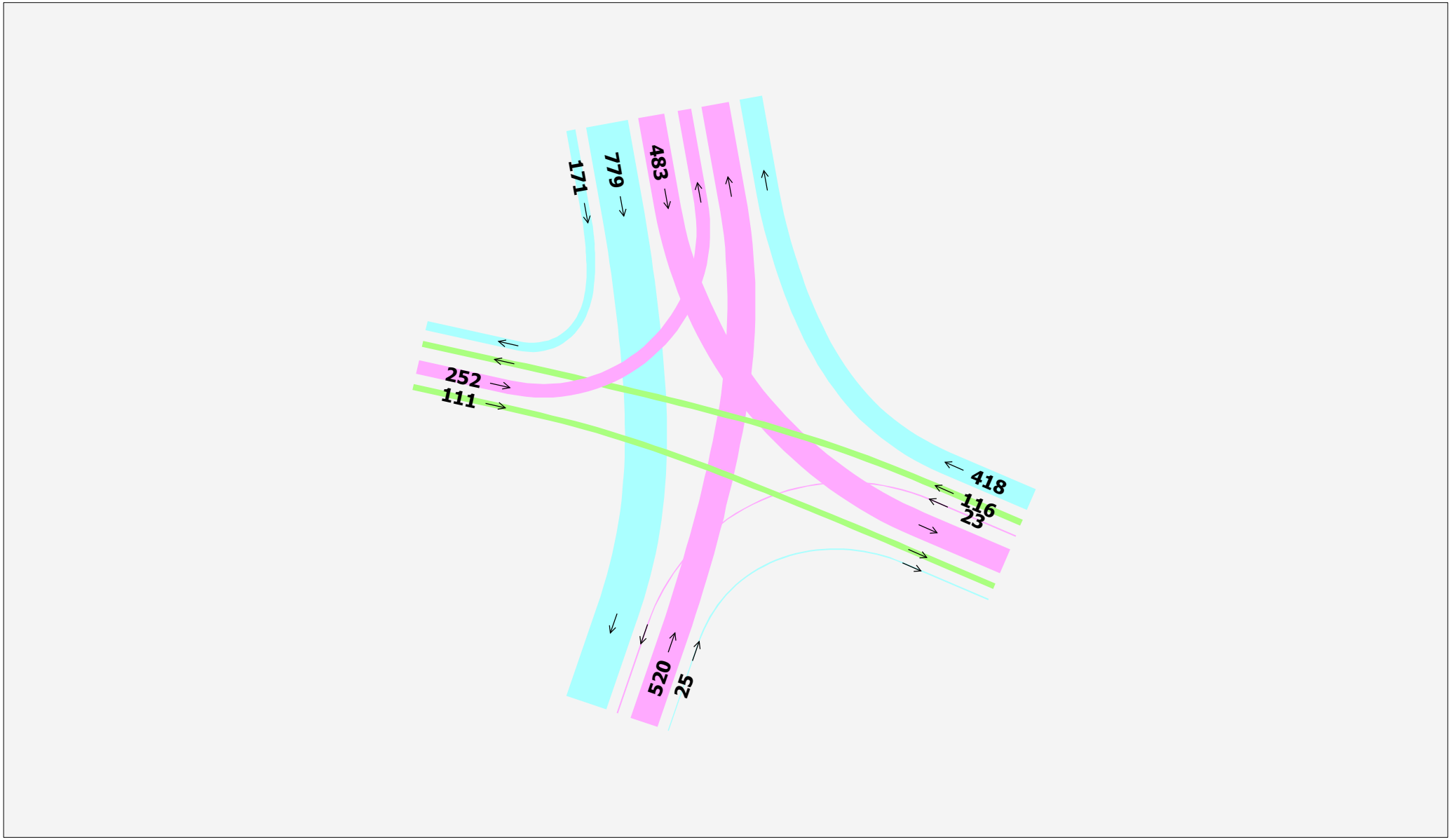

Beavercreek 19:00

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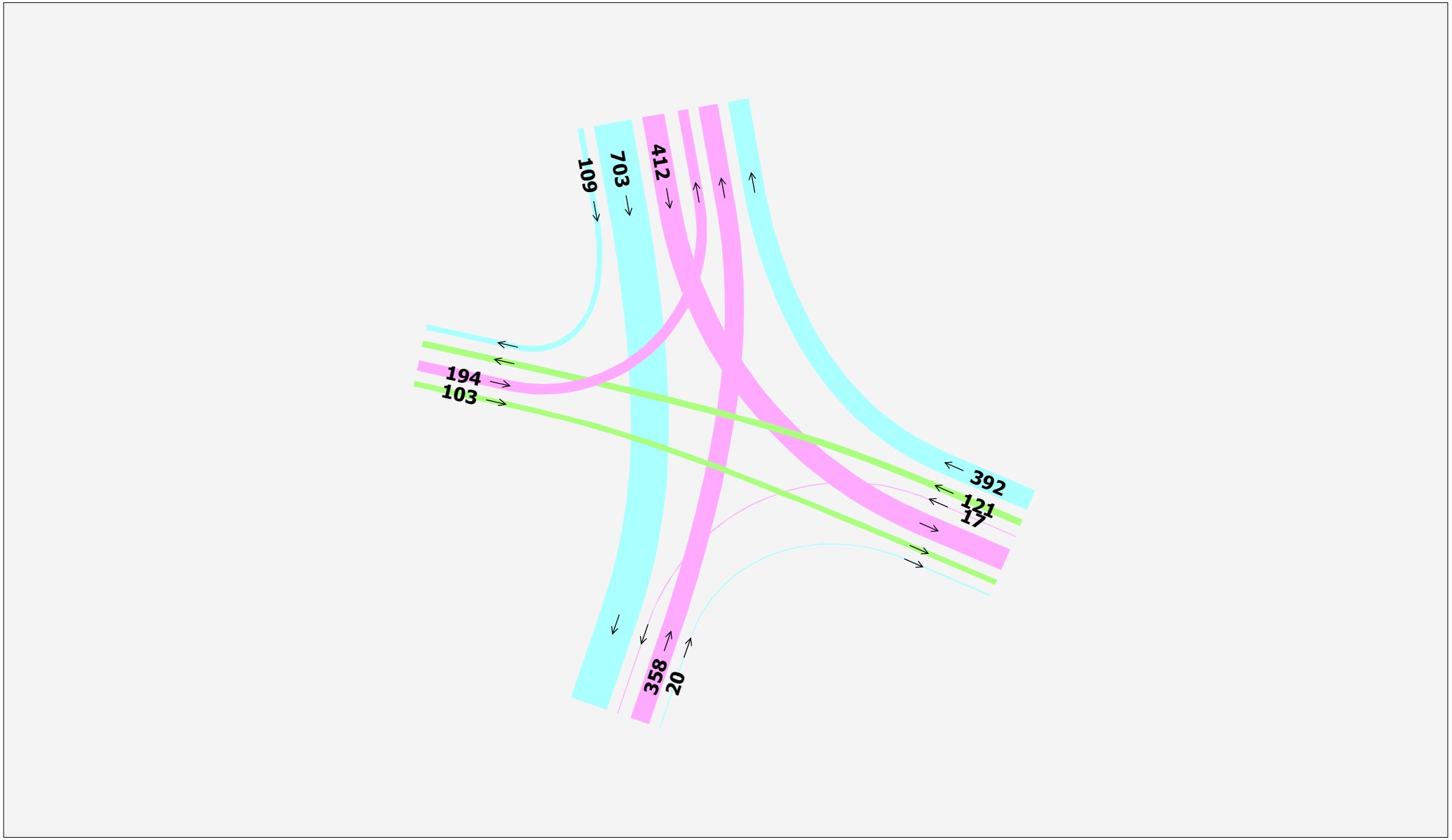
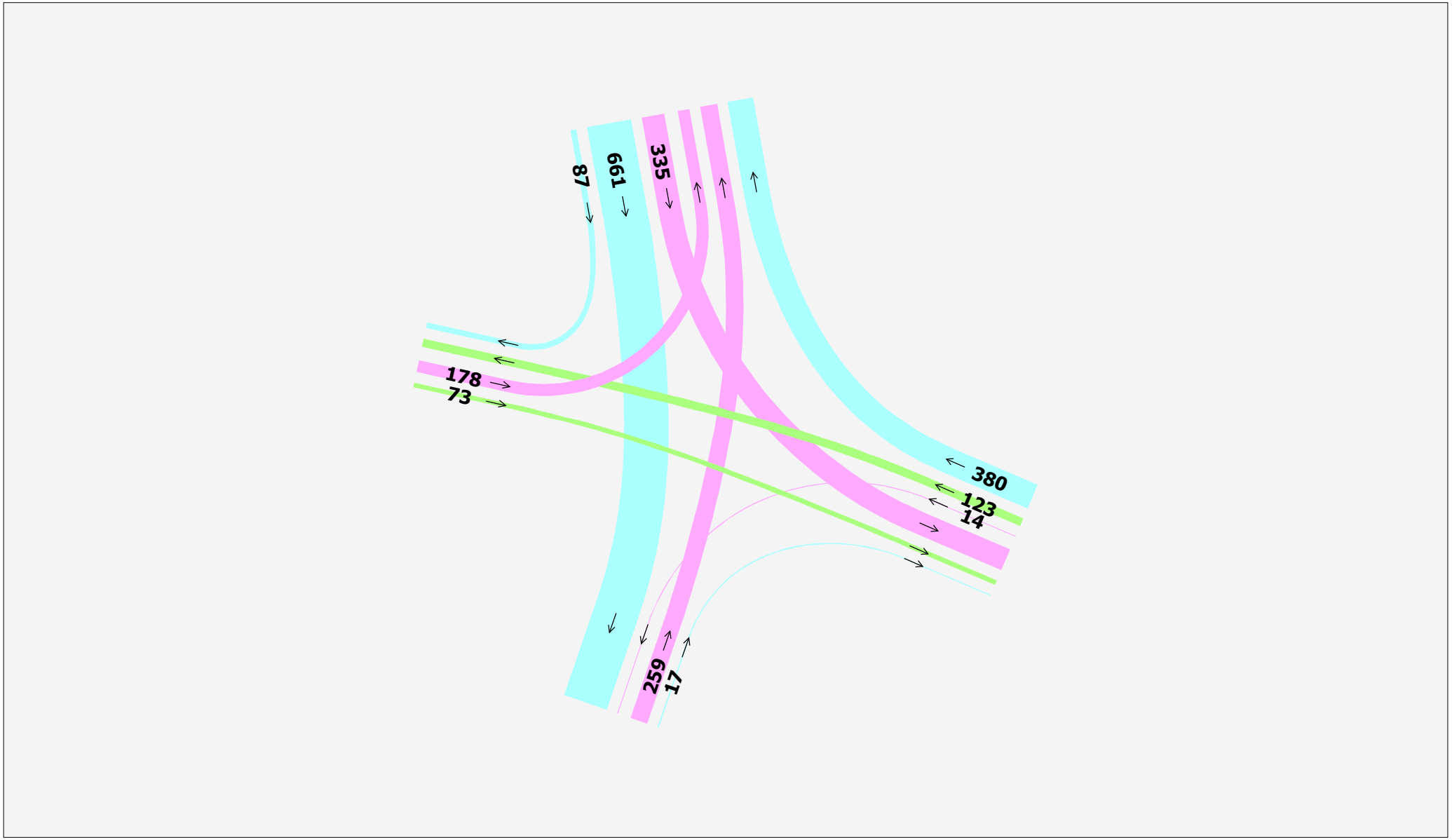


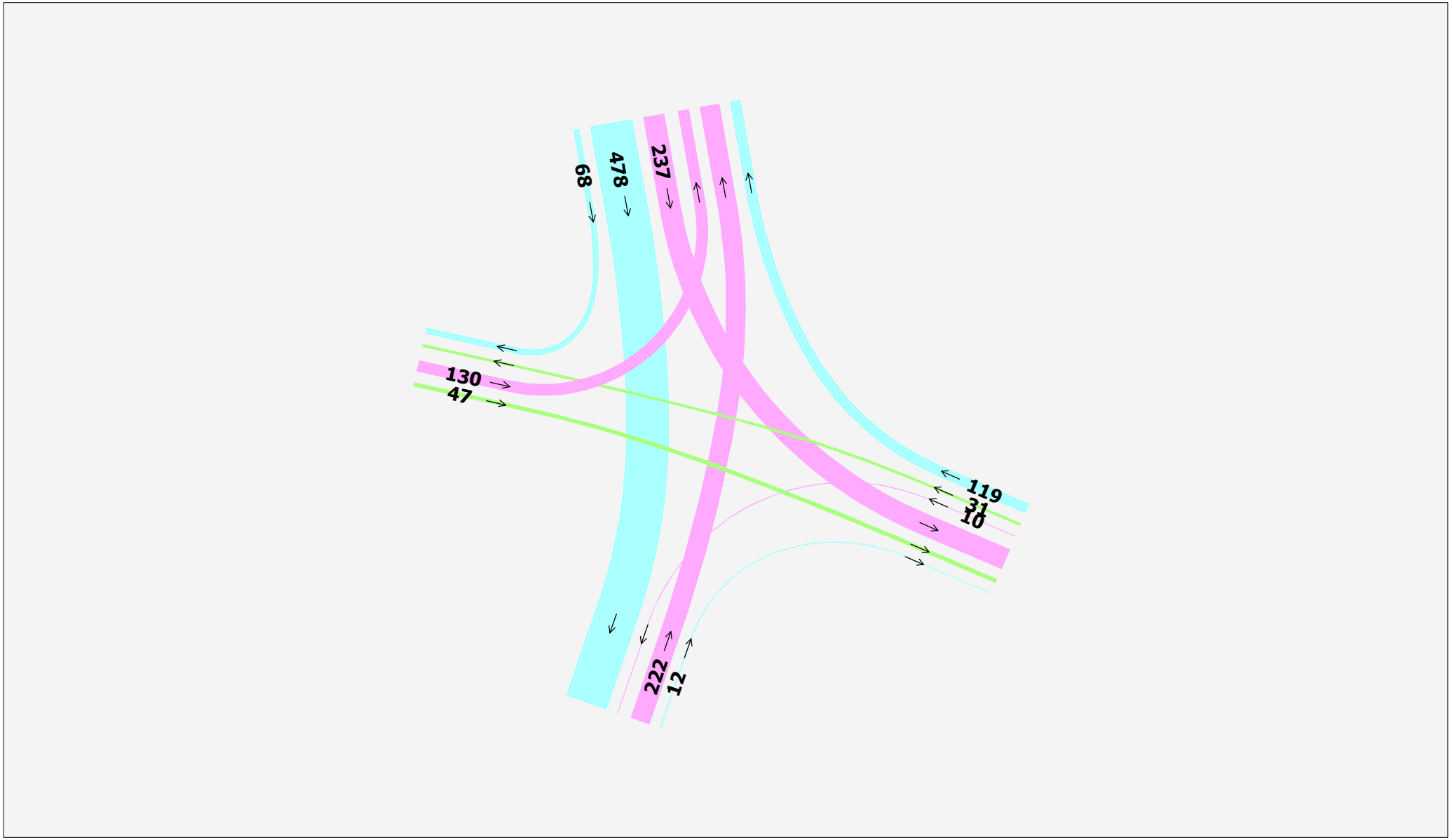
Beavercreek 20:00

2015



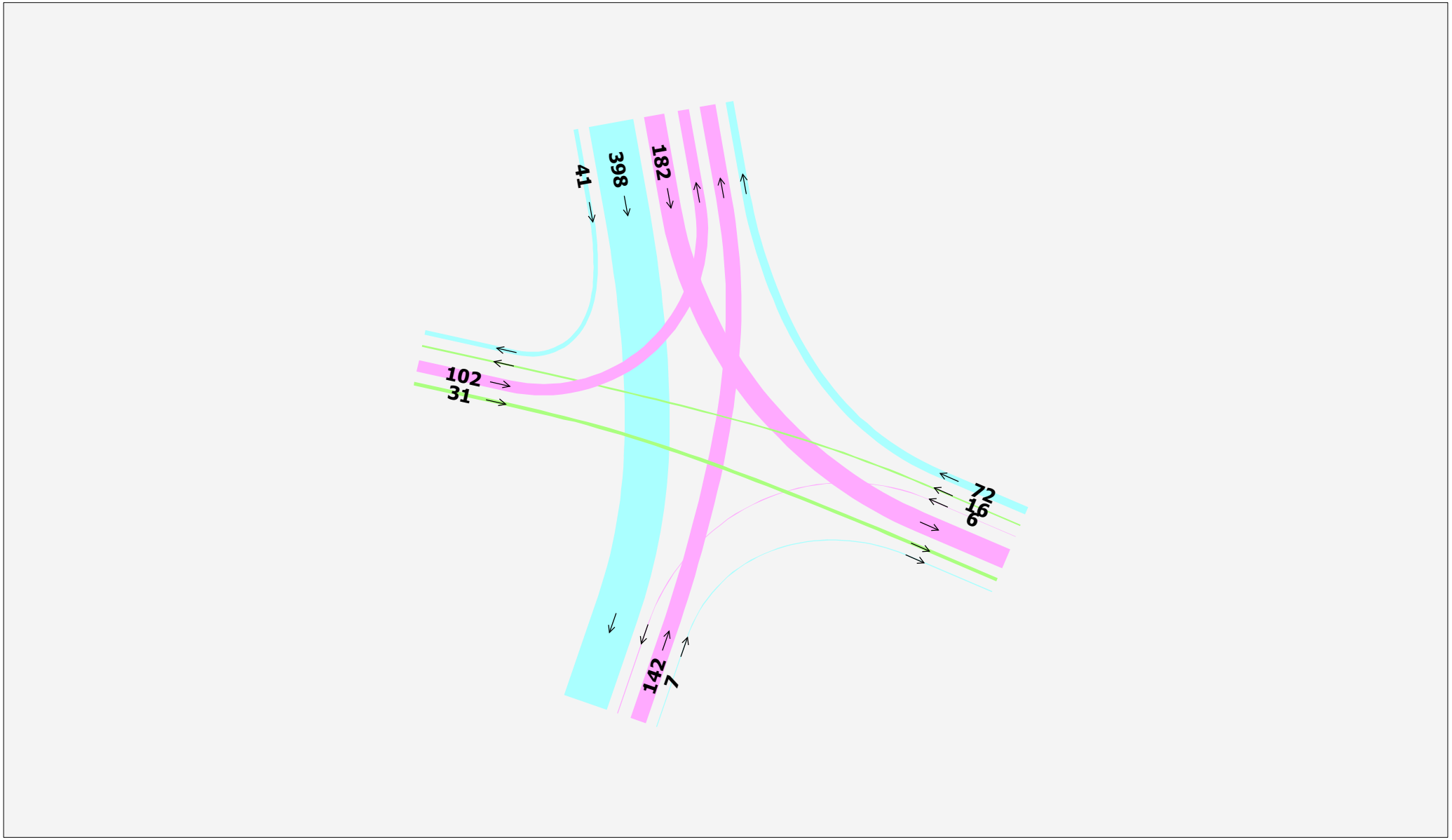
Beavercreek 21:00

2015



Beavercreek 22:00

2015



Beavercreek 23:00

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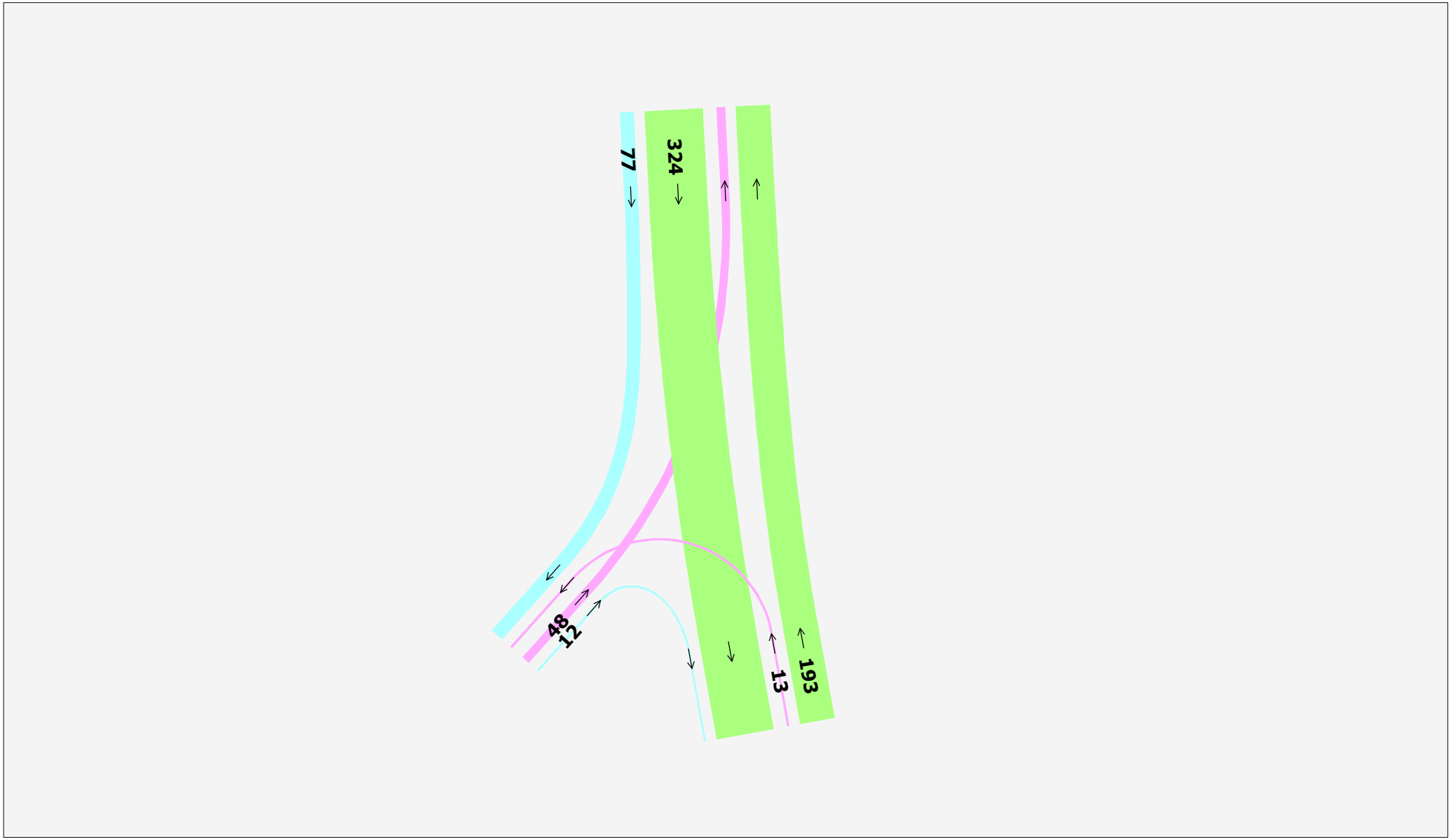
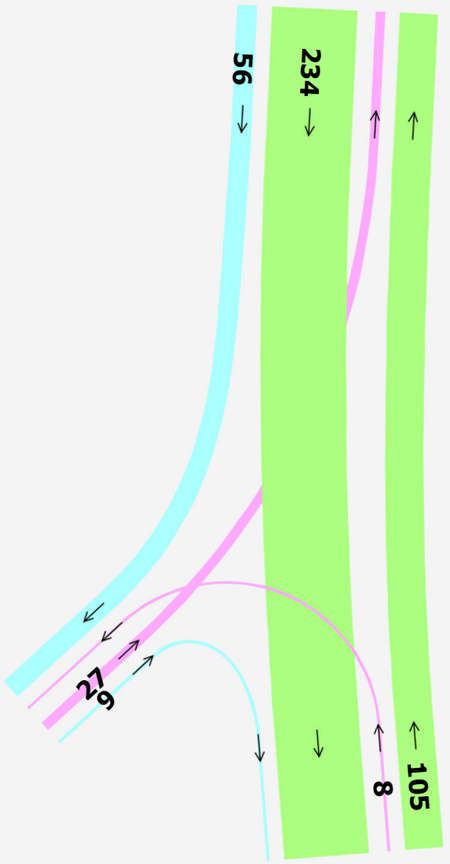


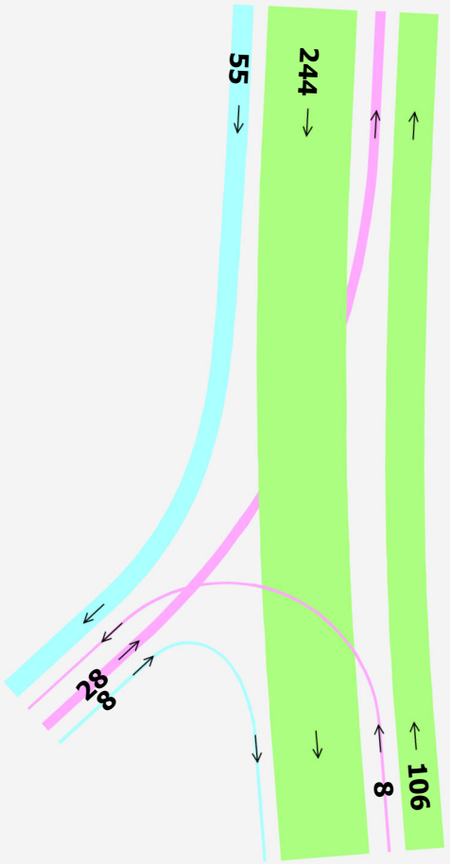
Redland 0:00

2015



Redland 1:00

2015



Redland 2:00

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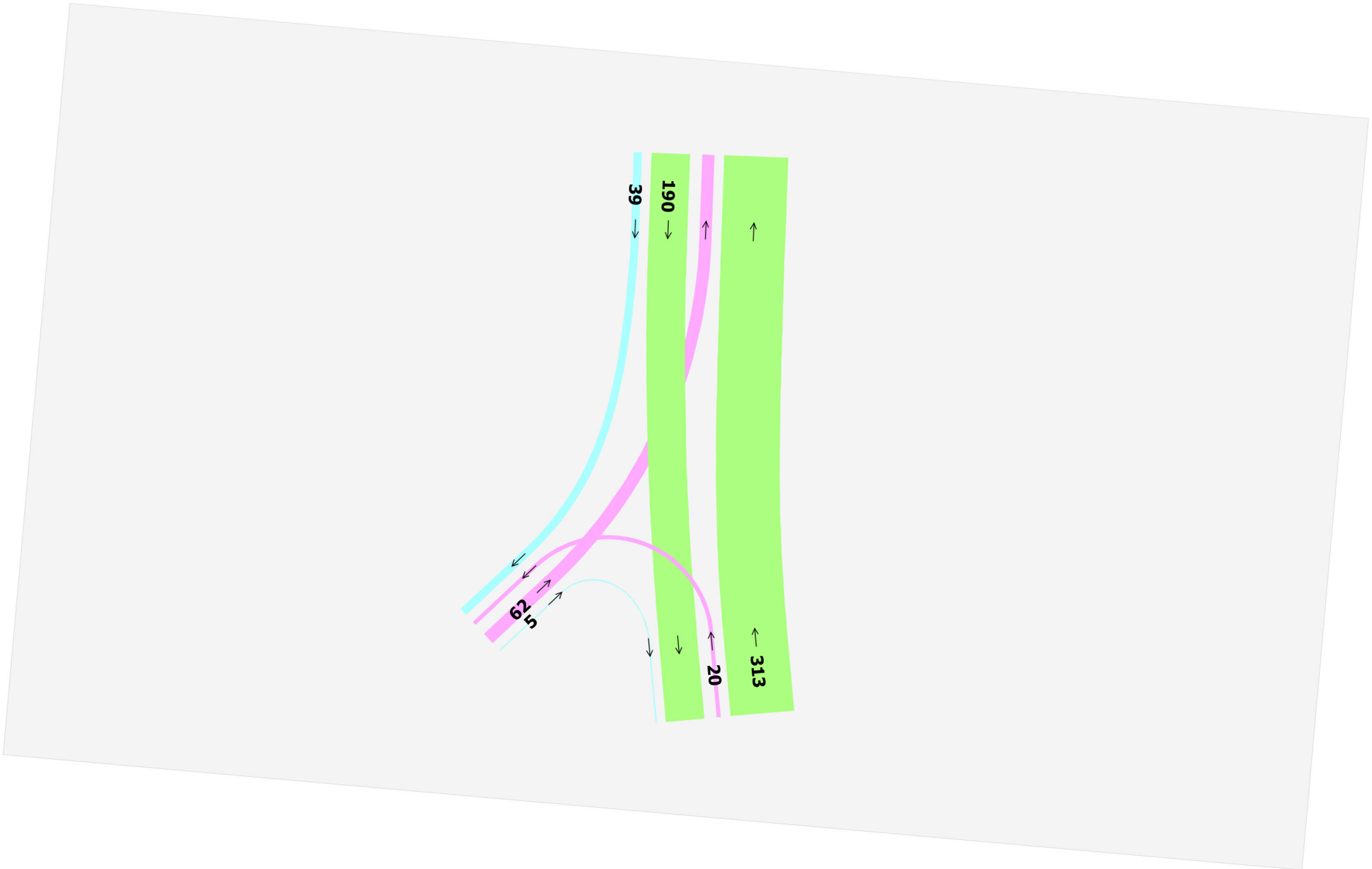
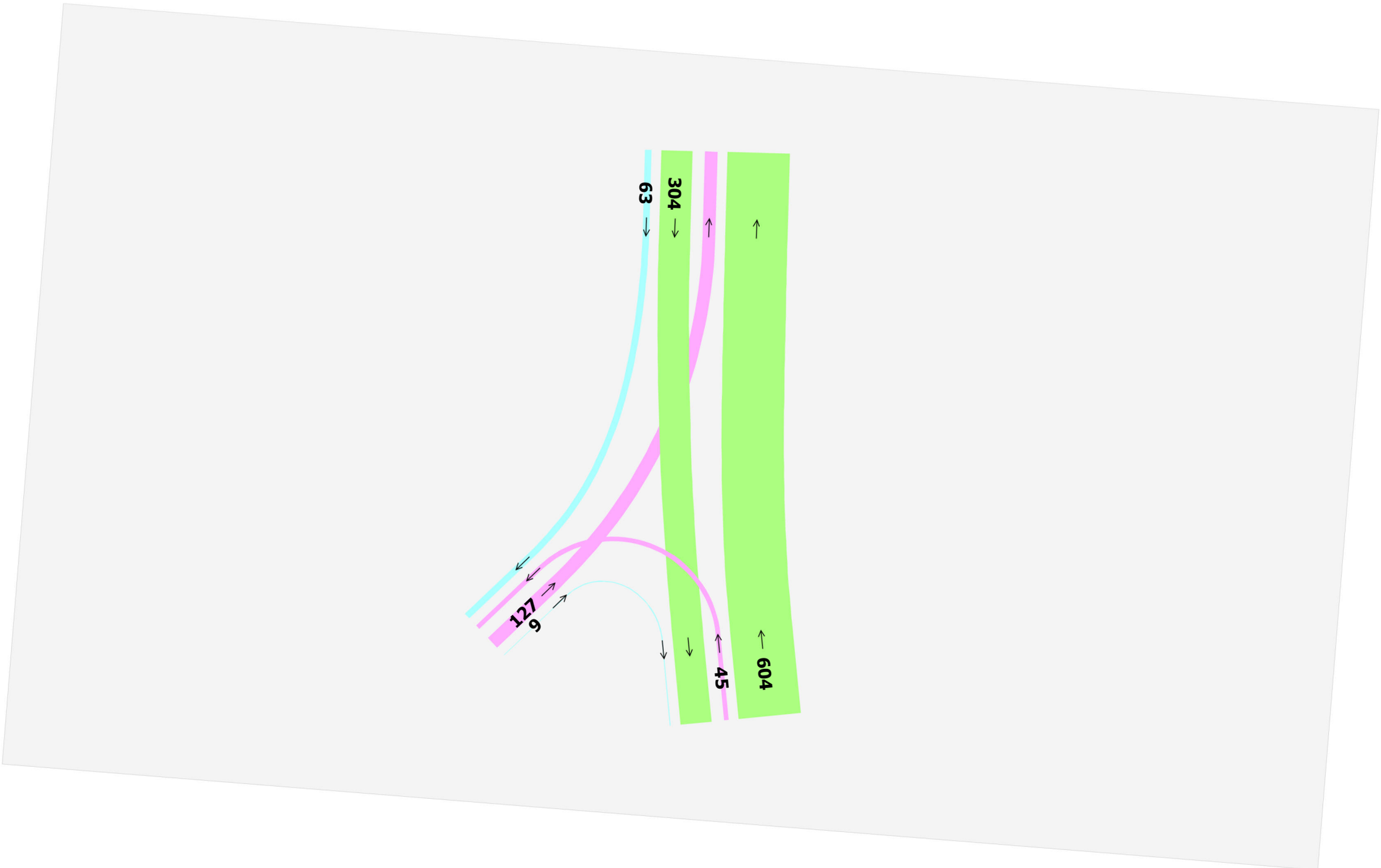


Redland 3:00

2015



Redland 4:00

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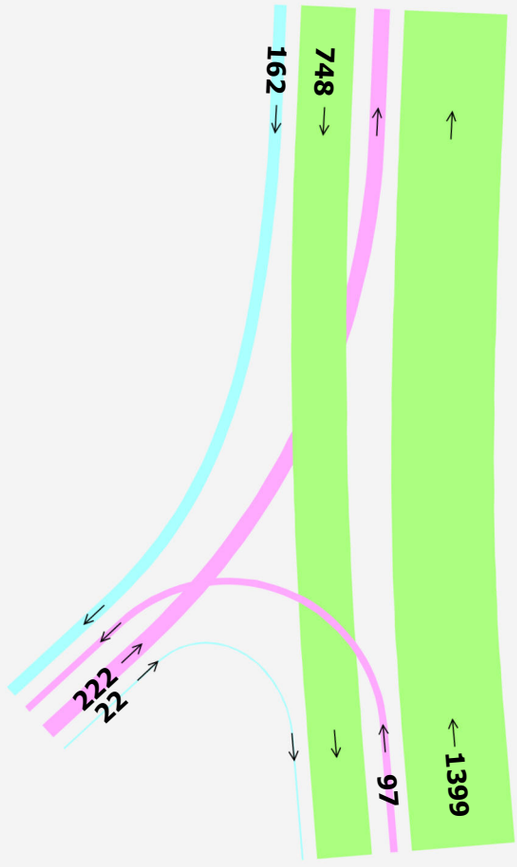
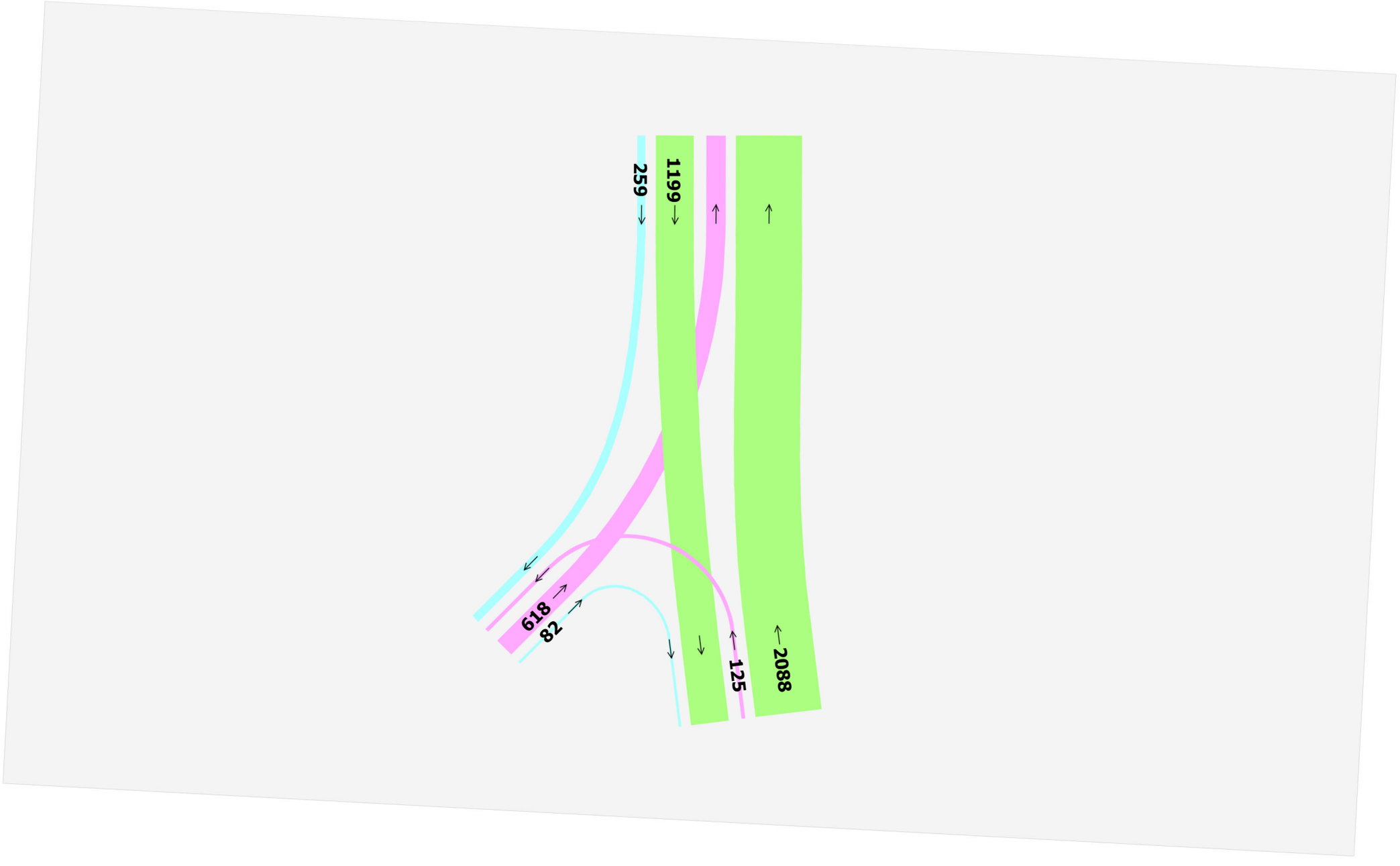


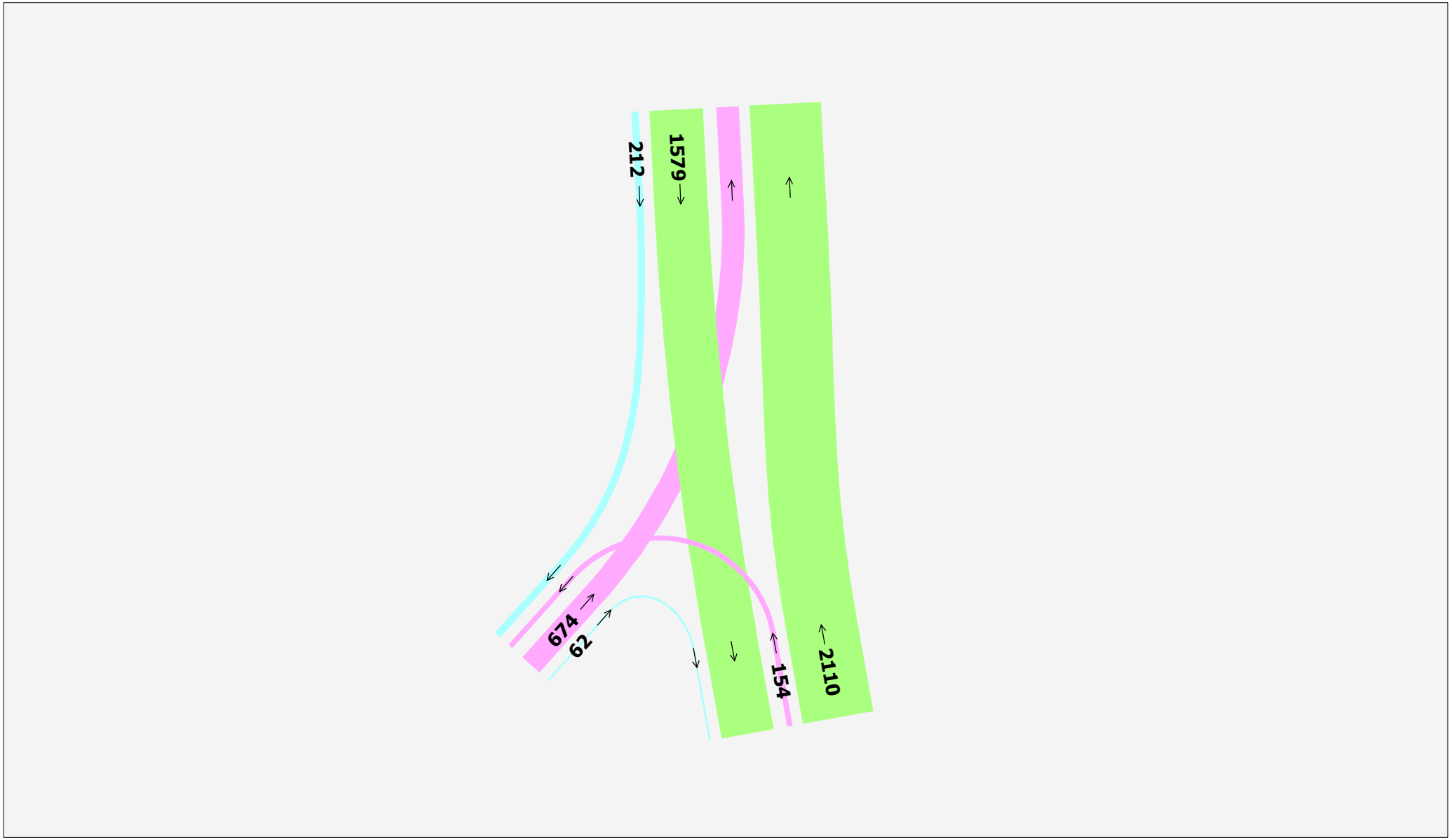
Redland 5:00

2015



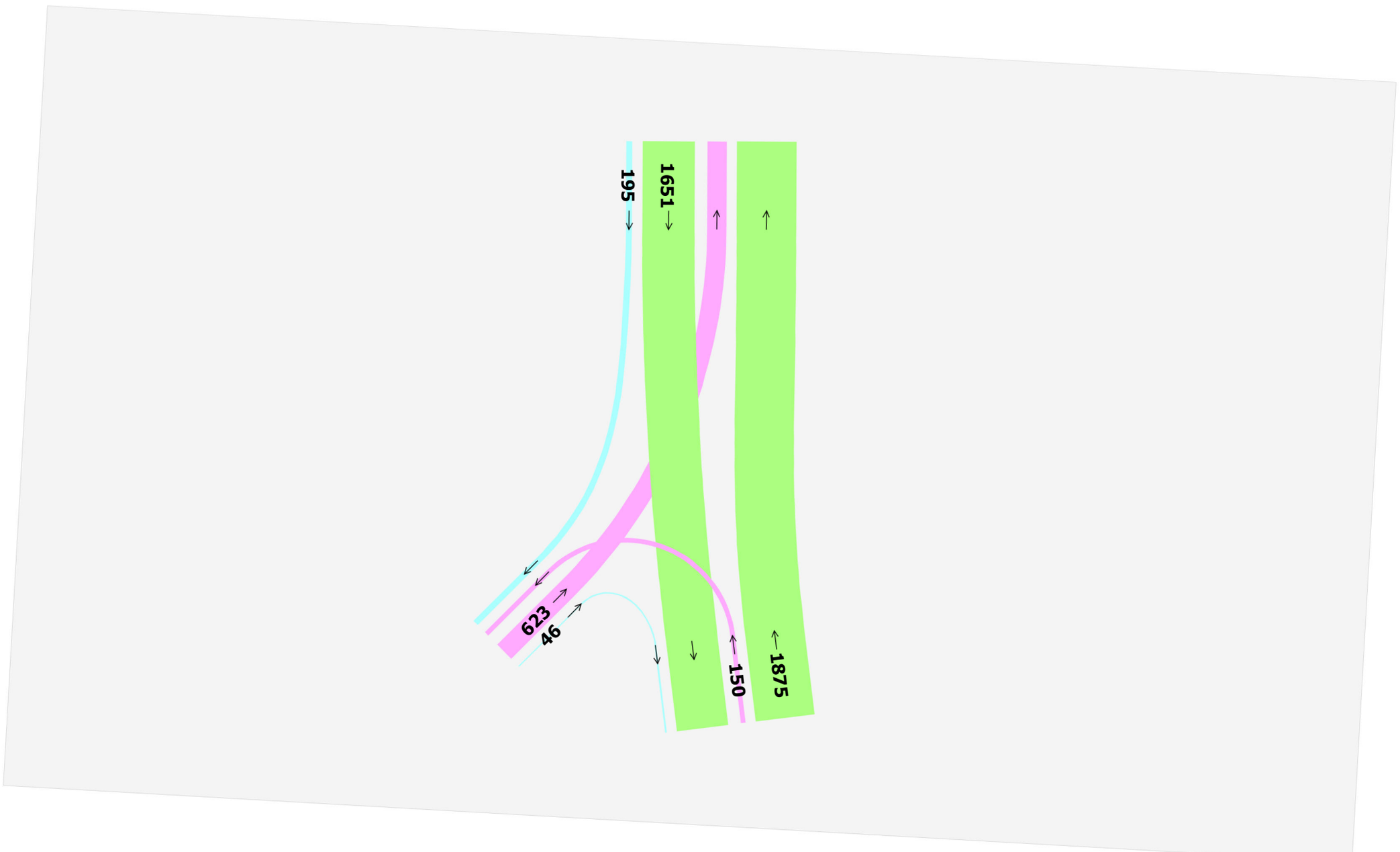
Redland 6:00

2015



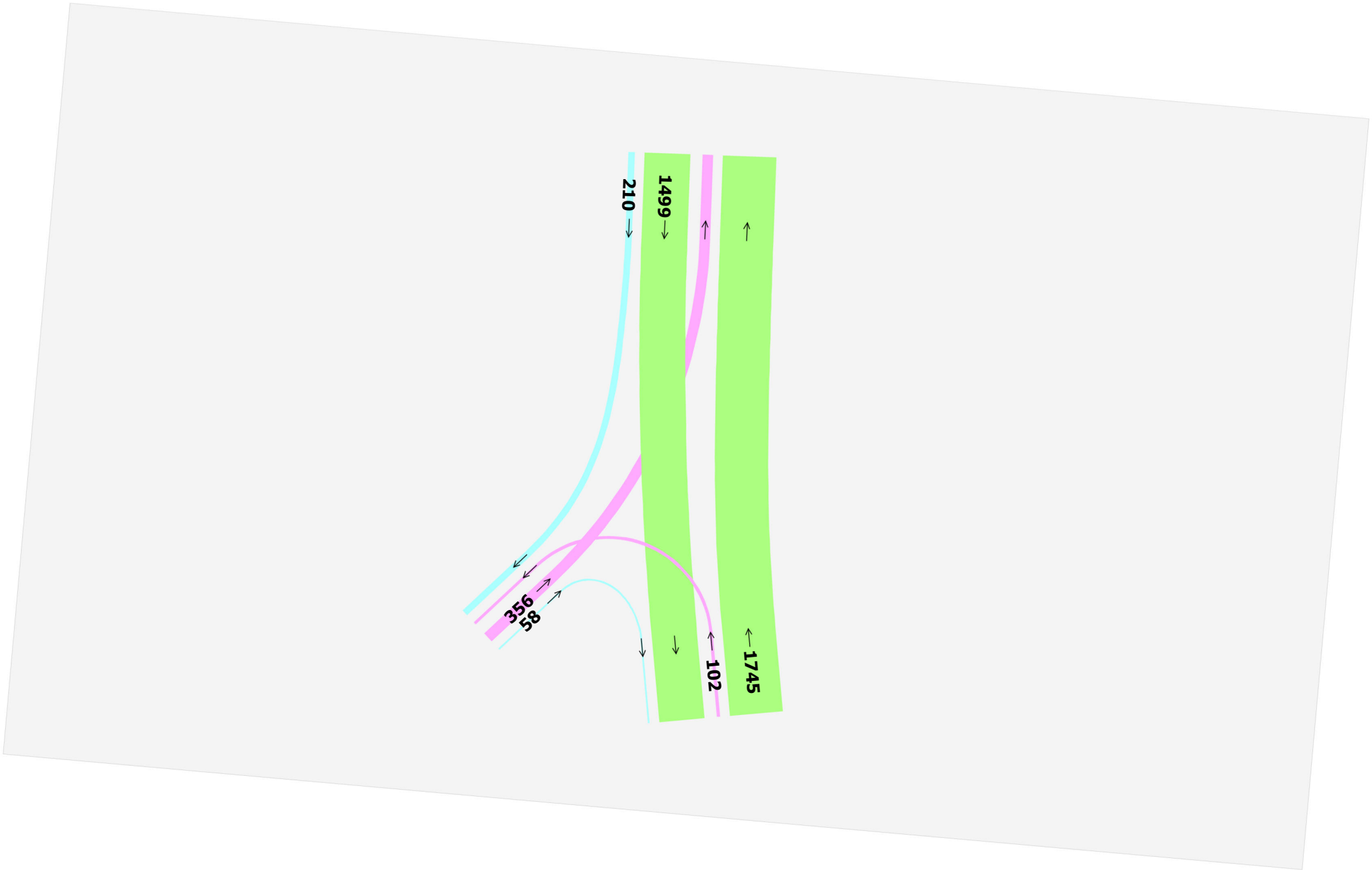
Redland 7:00

2015



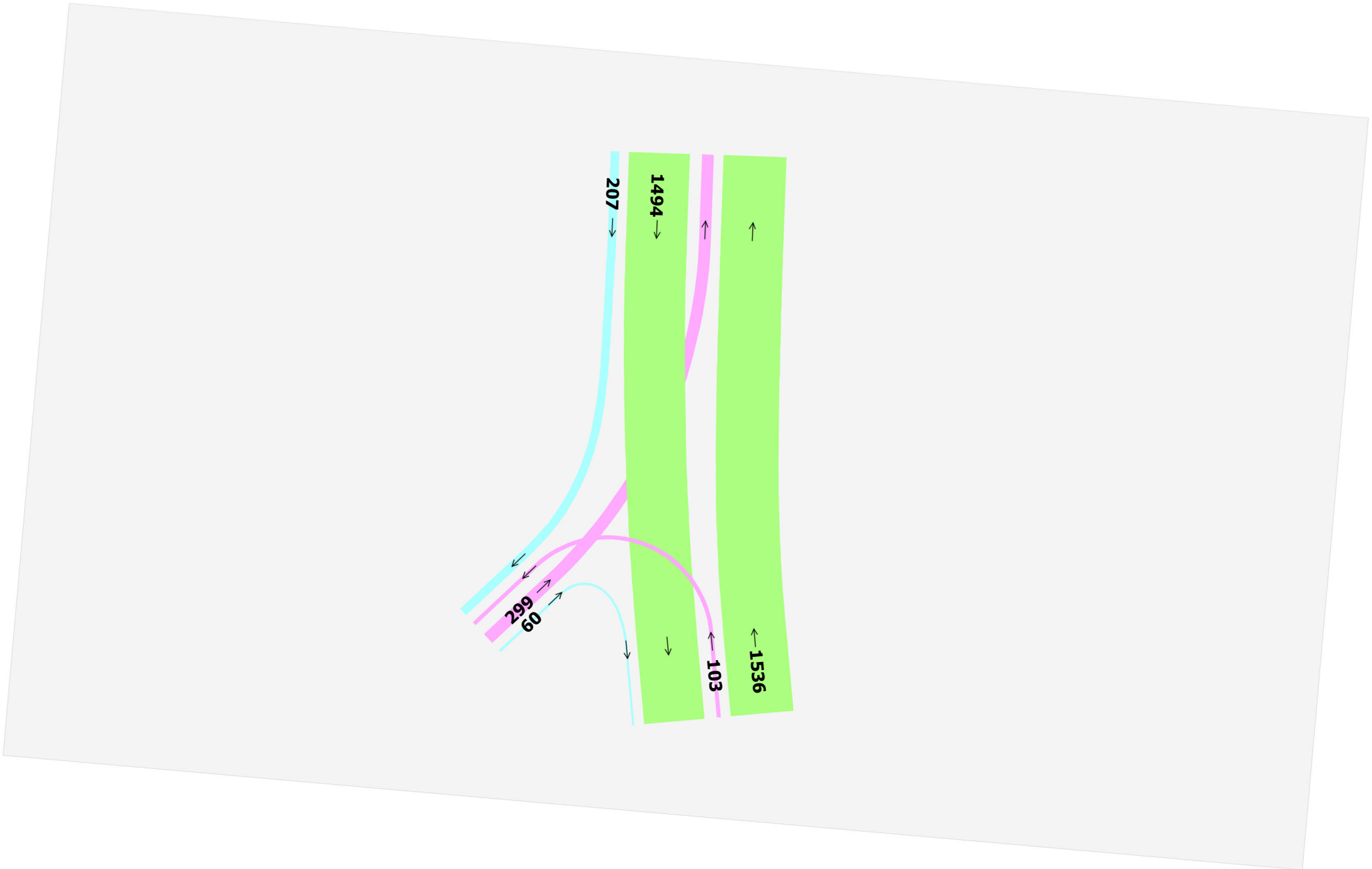
Redland 8:00

2015



Redland 9:00

2015



Redland 10:00

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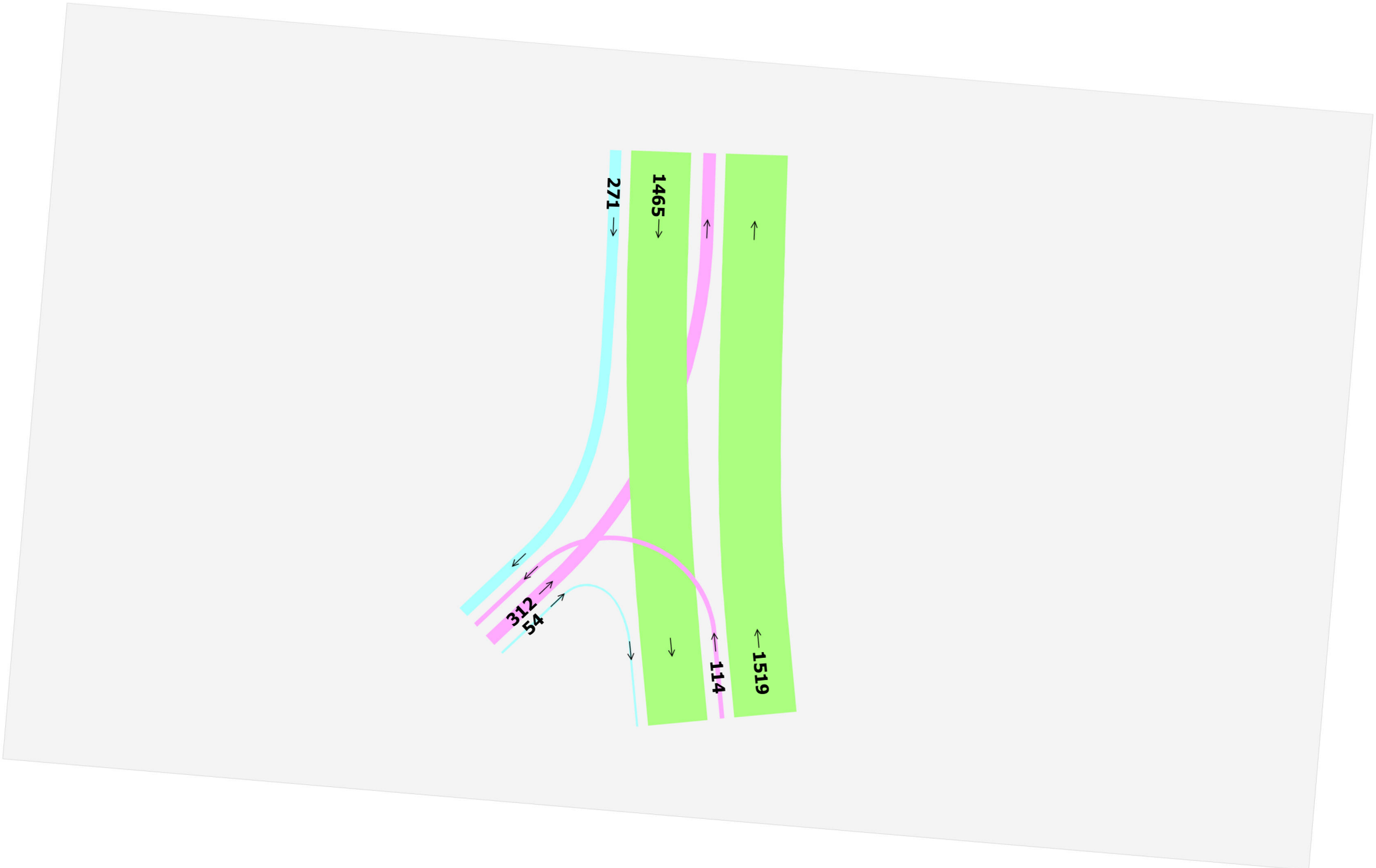

Redland 11:00

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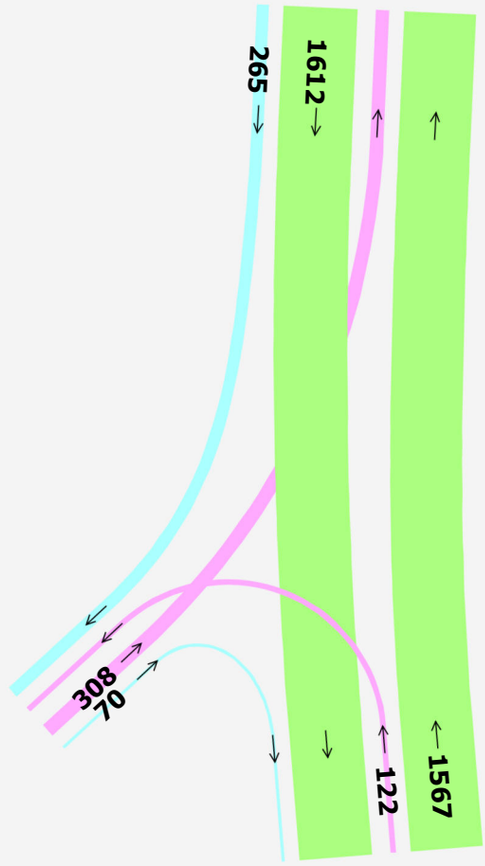
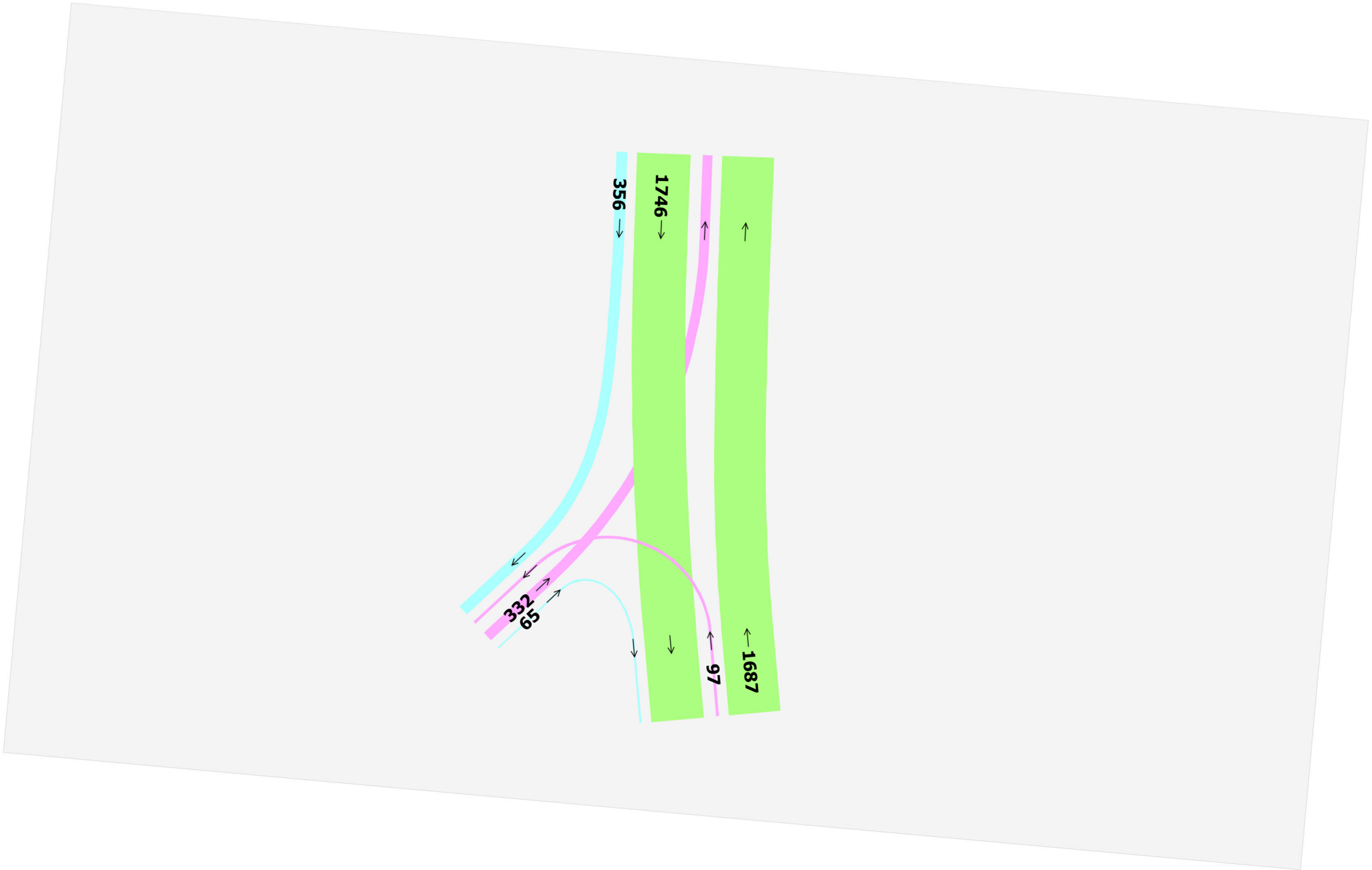


Redland 12:00

2015

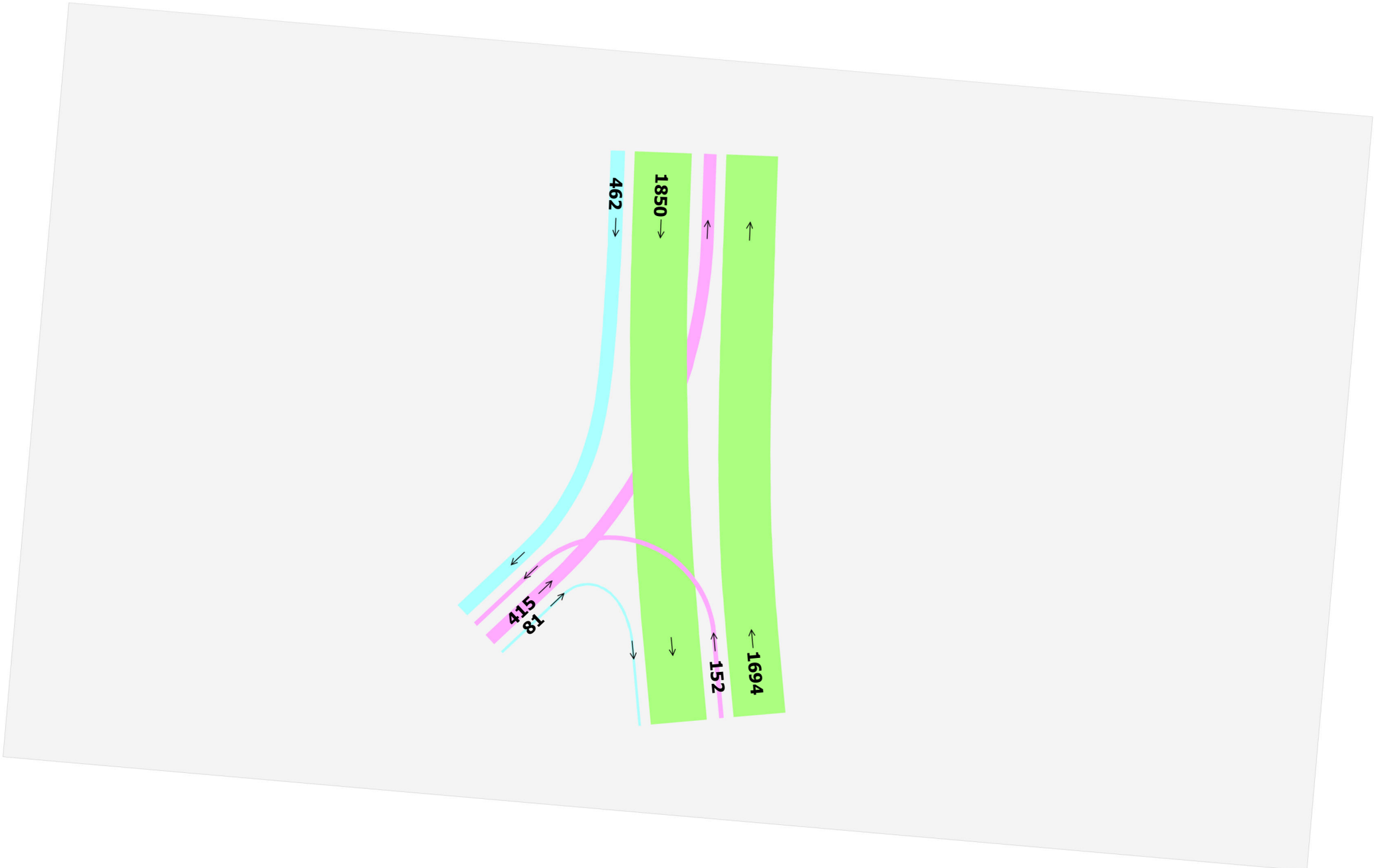
Redland 13:00

2015



Redland 14:00

2015



Redland 15:00

2015

Redland 16:00

2015

Redland 17:00

2015

Redland 18:00

2015

Redland 19:00

2015

Redland 20:00

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Redland 21:00

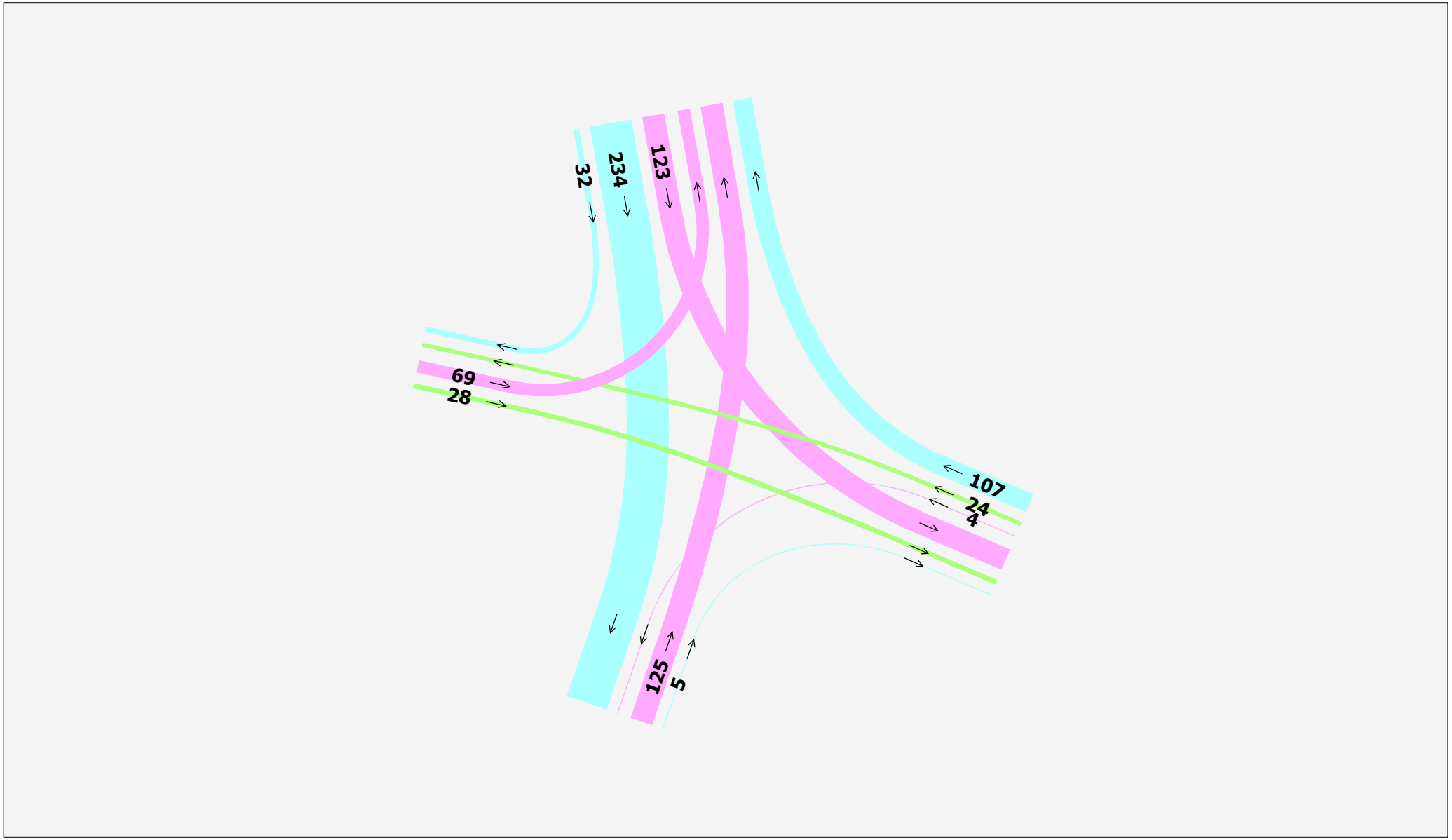
2015

Redland 22:00

2015

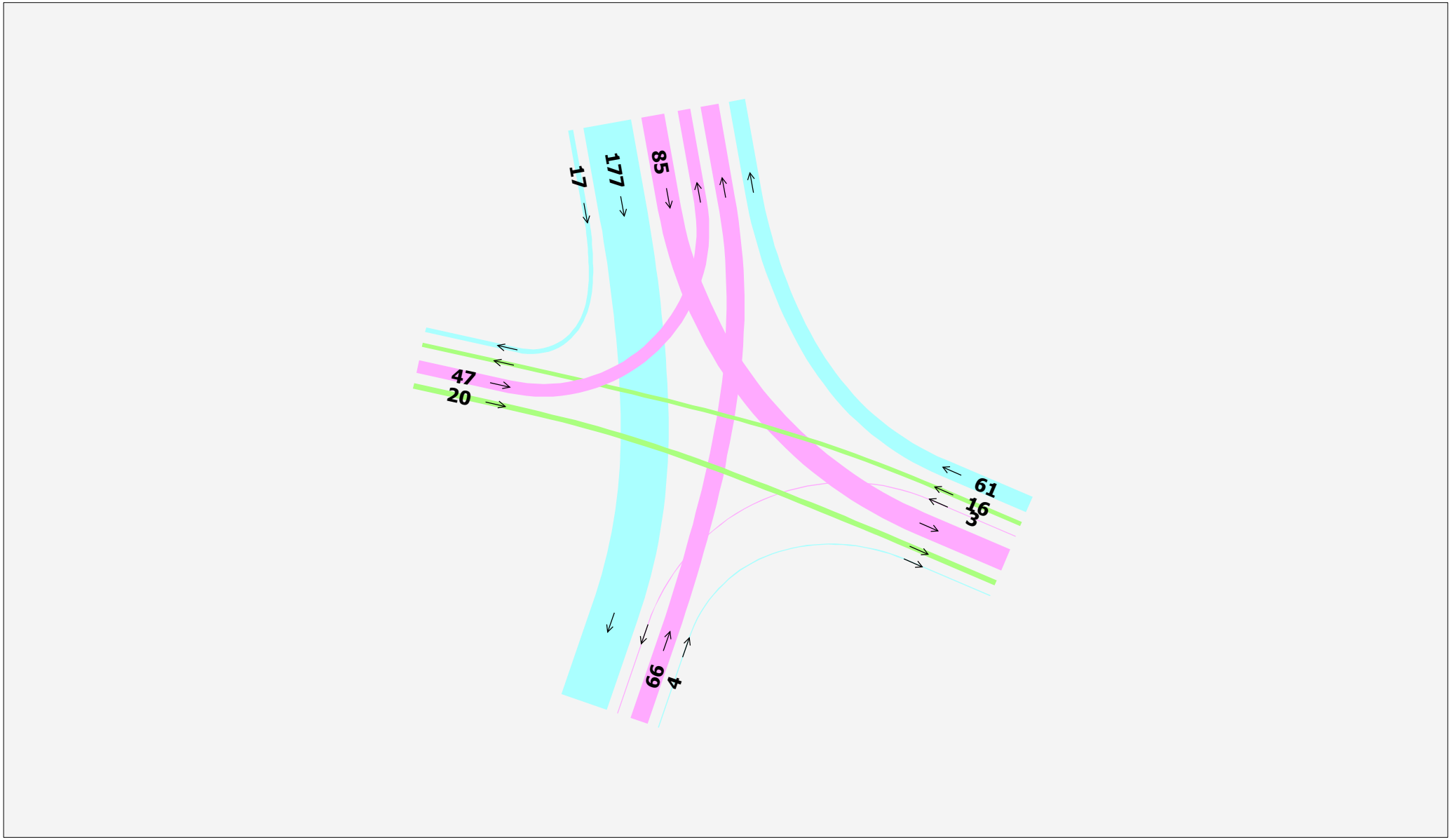
Redland 23:00

2040



Beavercreek 0:00

2040



Beavercreek 1:00

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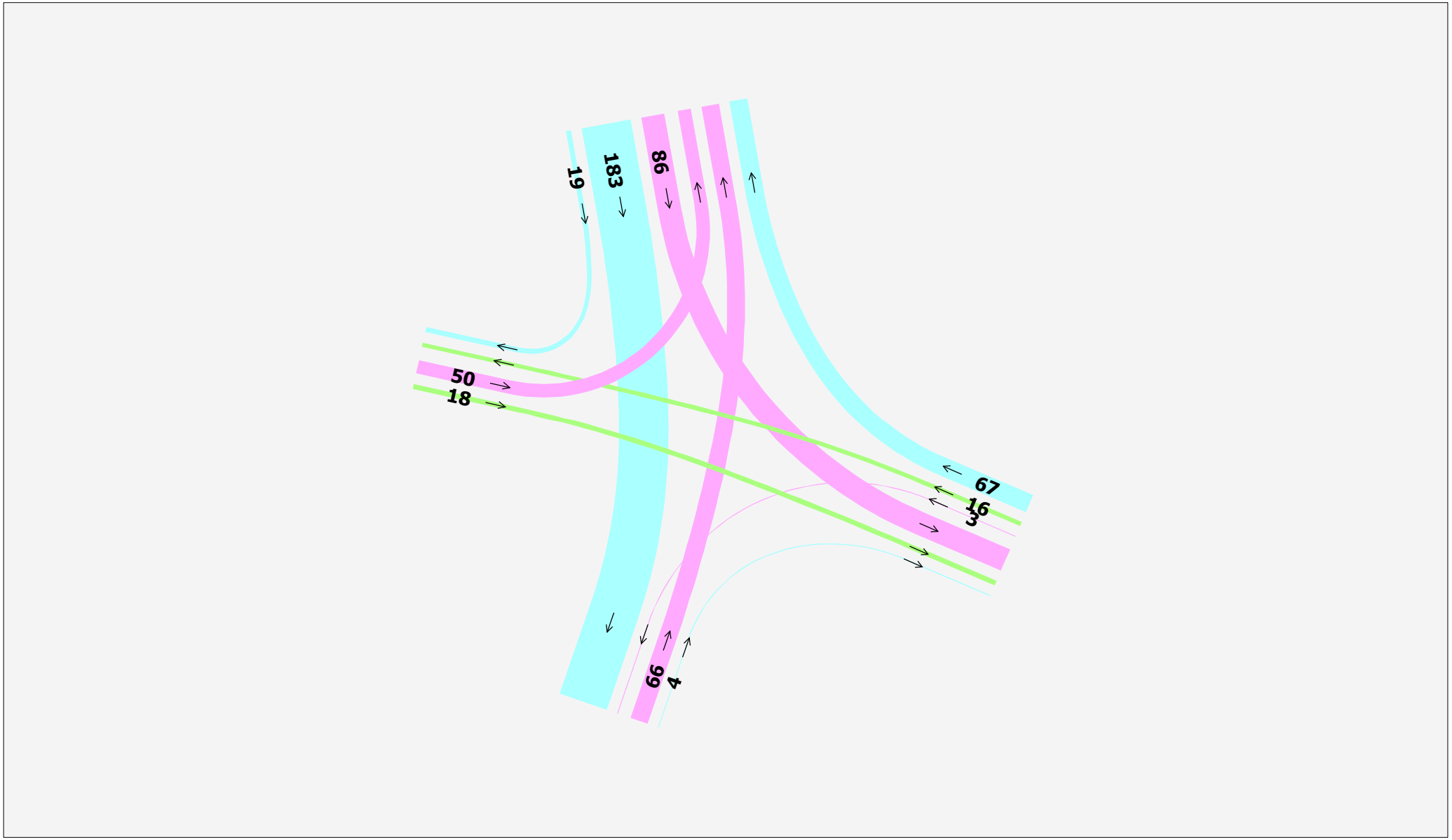

Beavercreek 2:00

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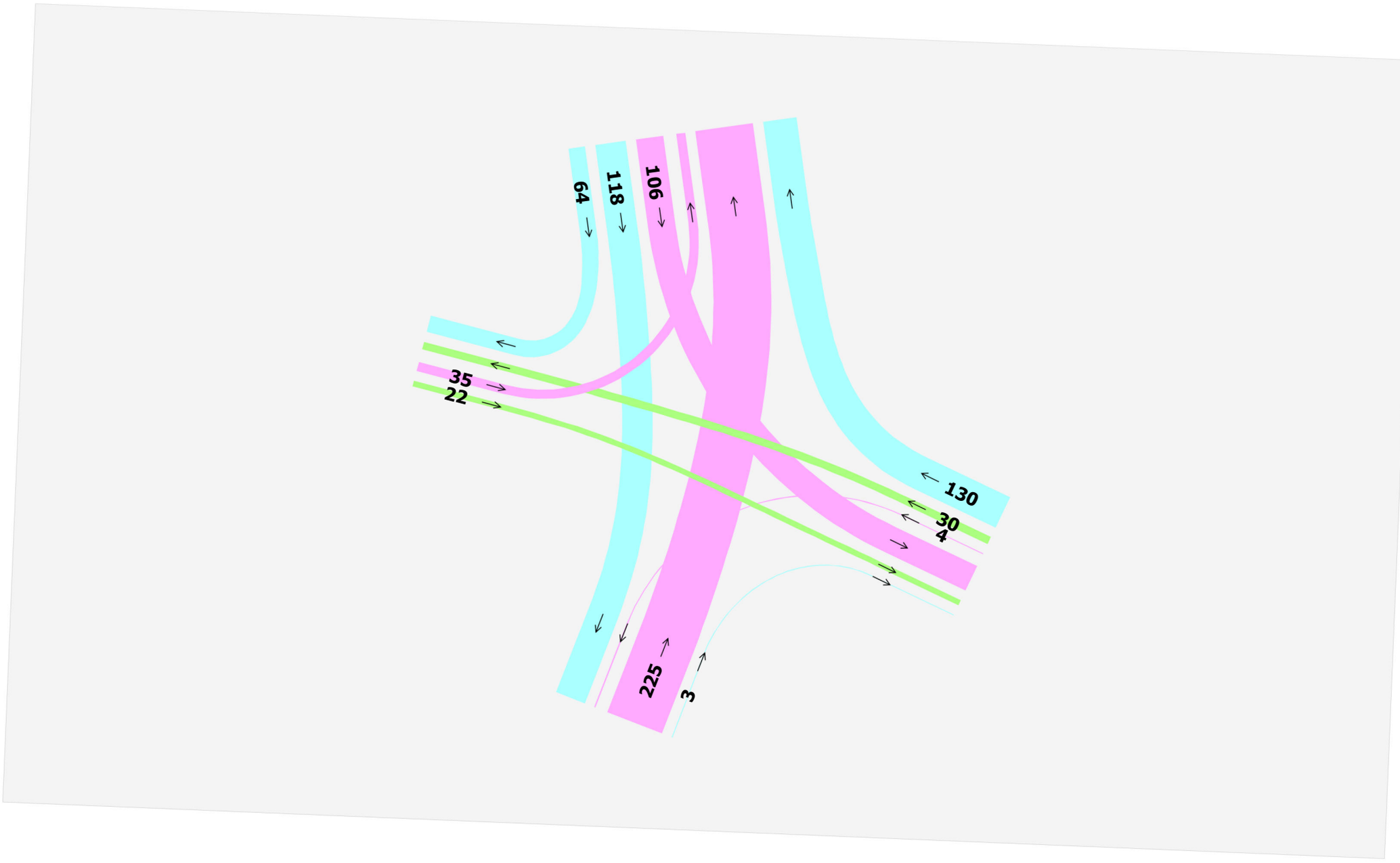

Beavercreek 3:00

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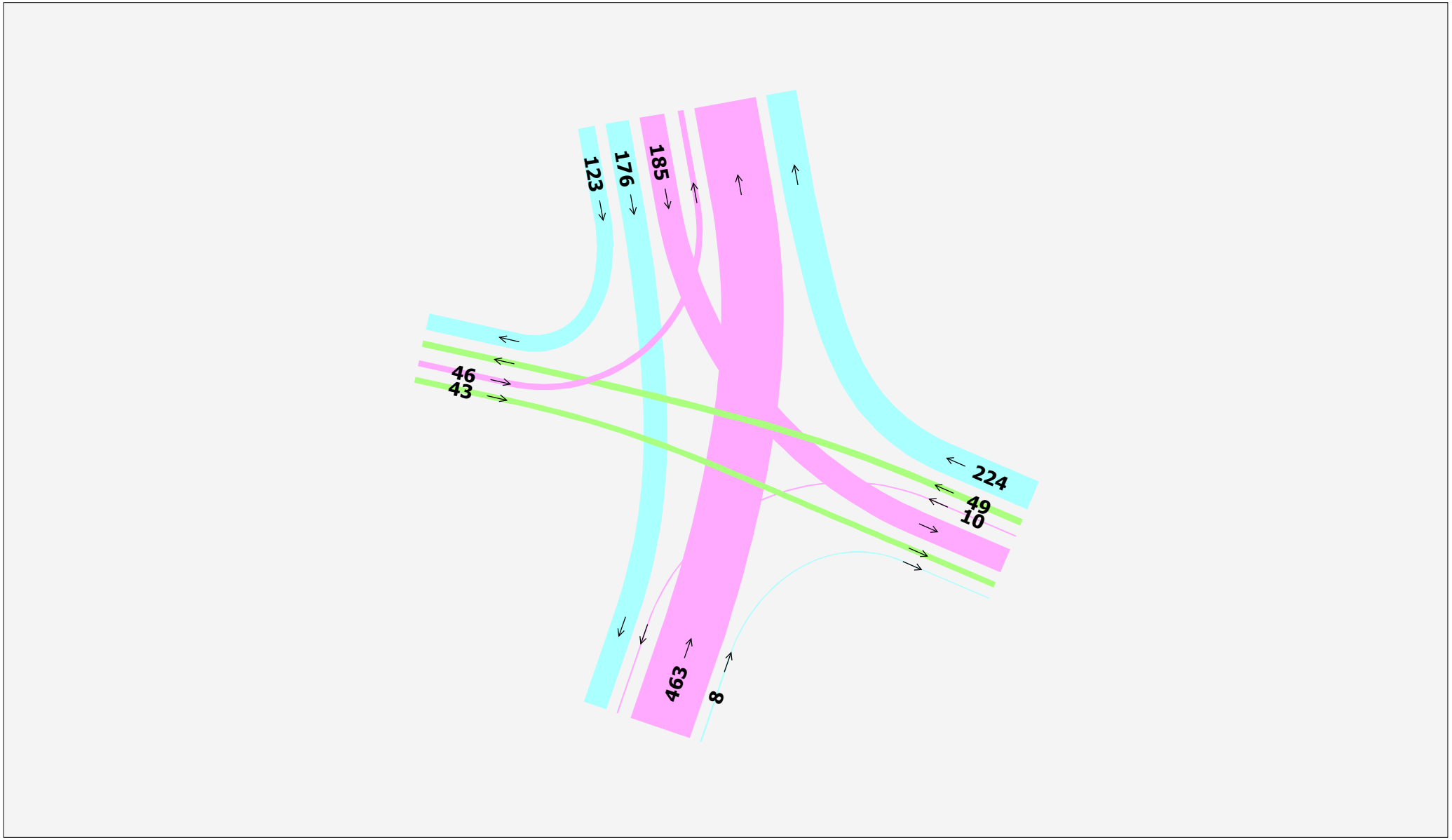

Beavercreek 4:00

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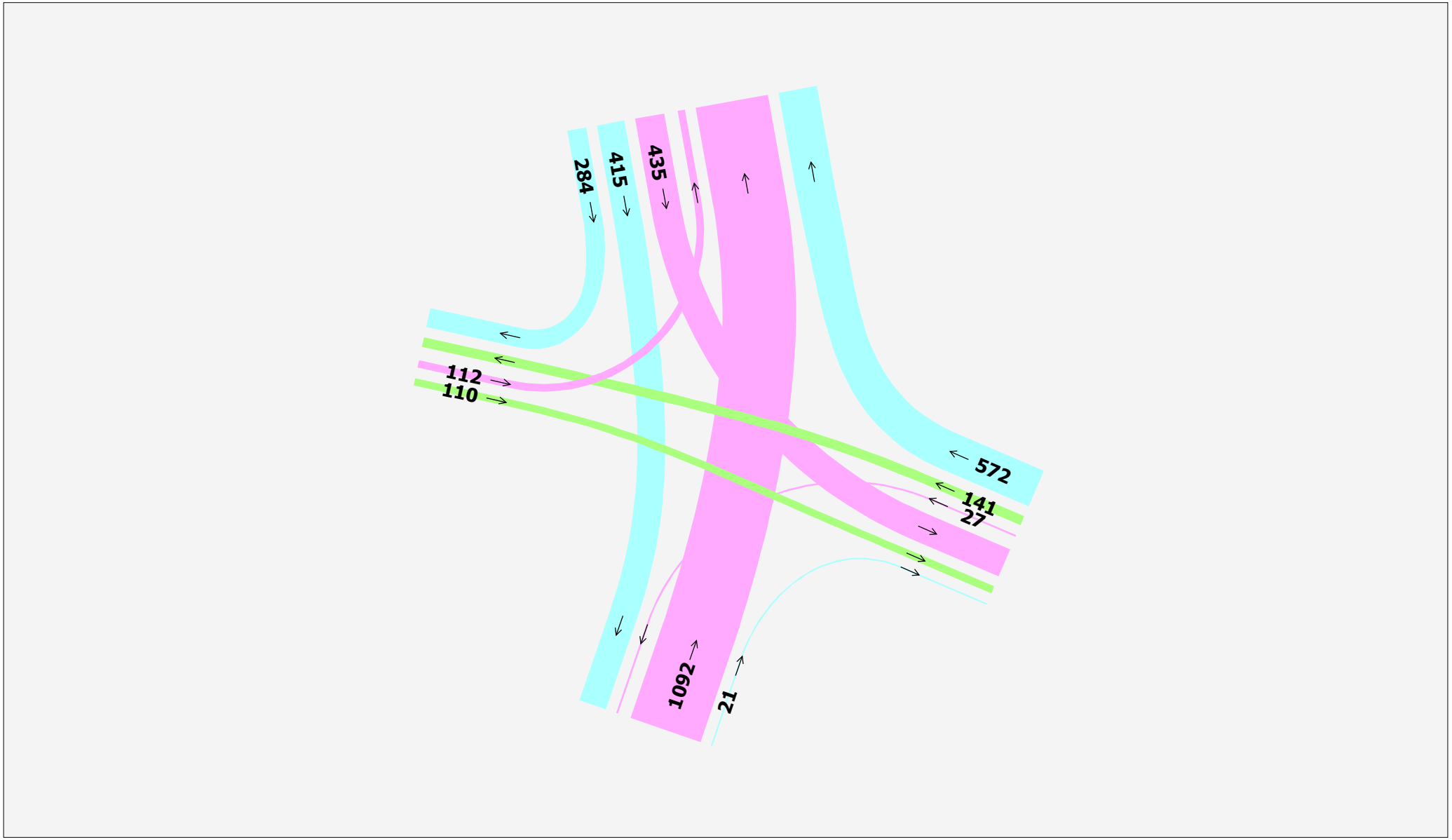

Beavercreek 5:00

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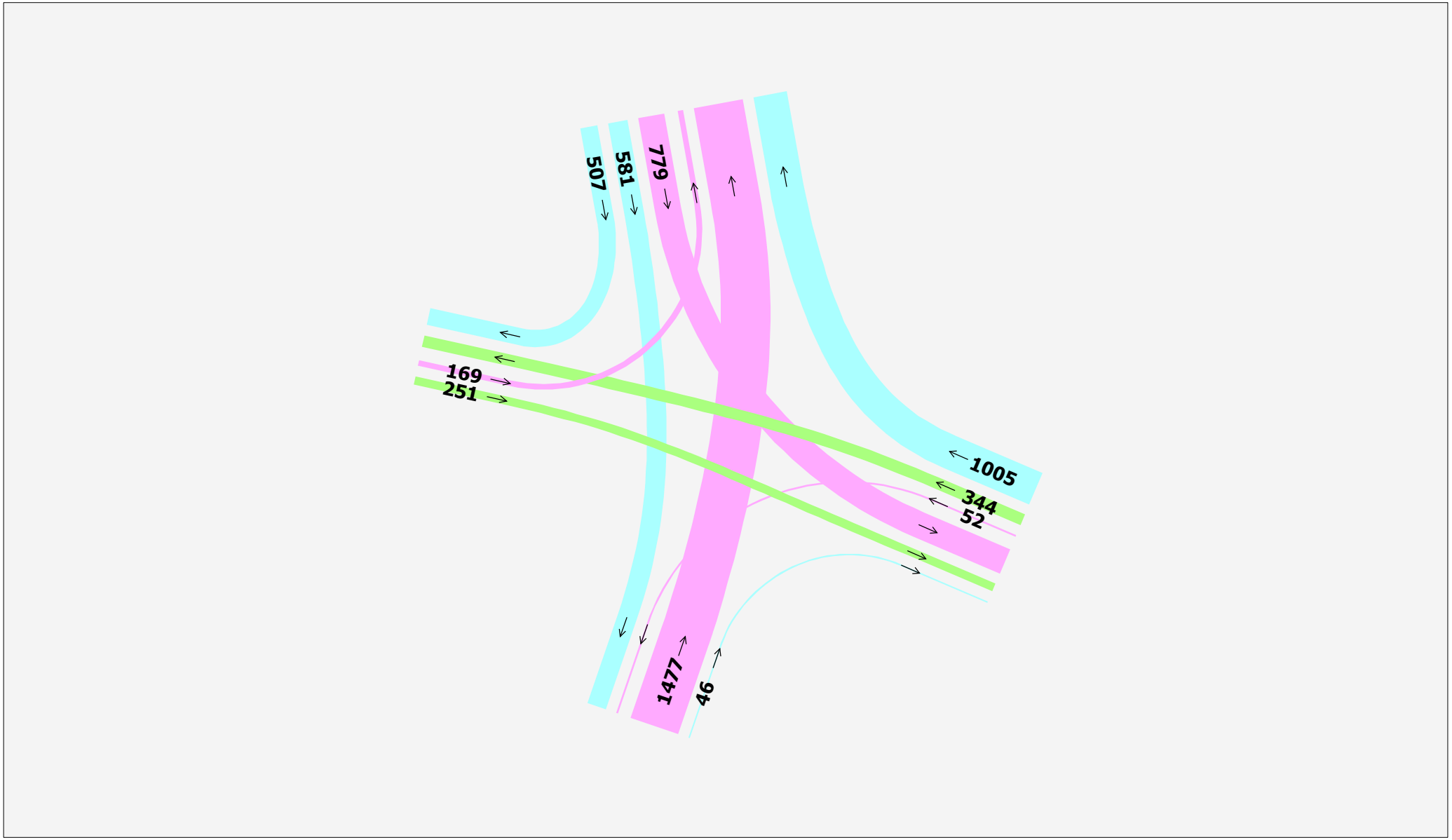

Beavercreek 6:00

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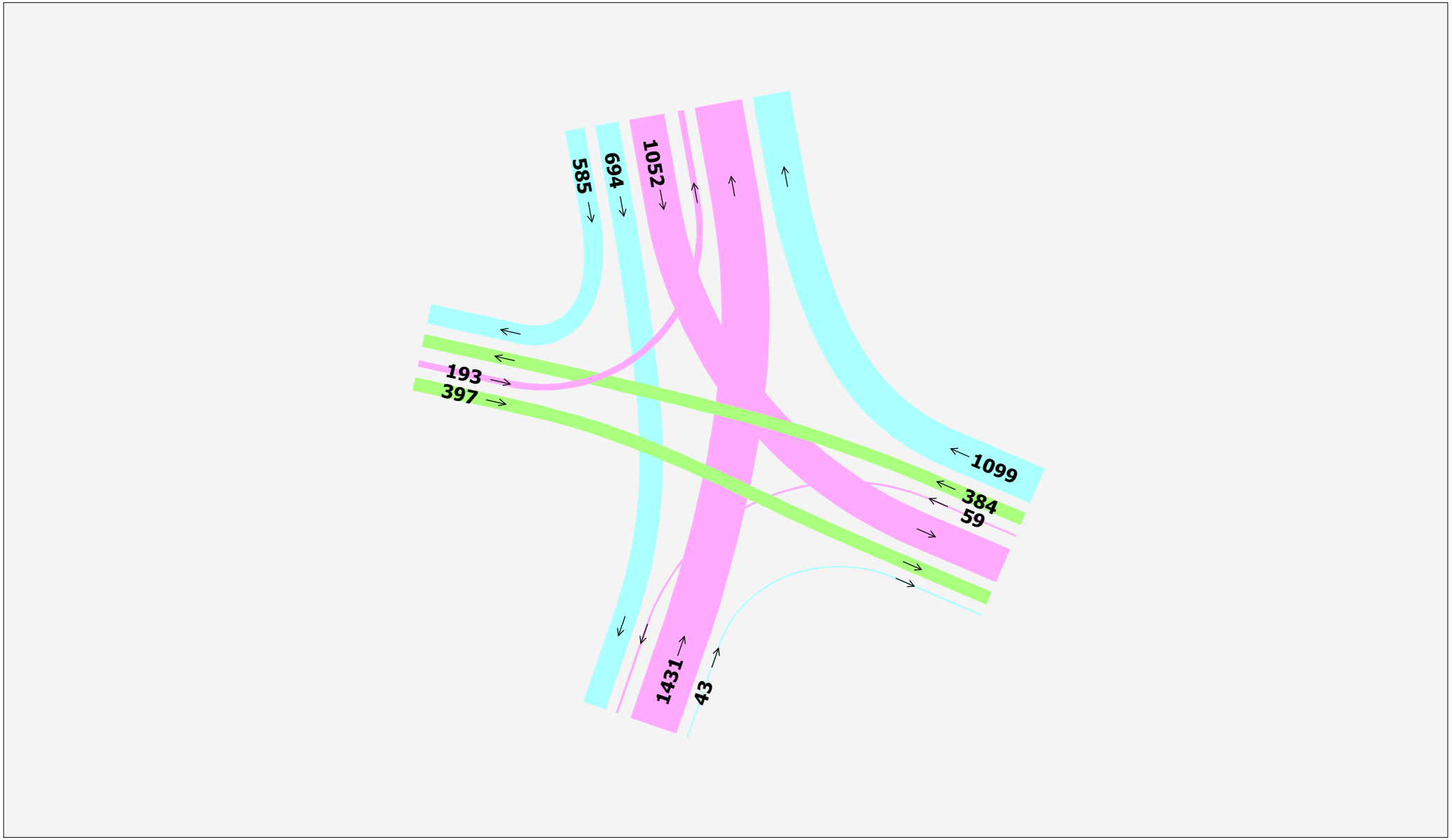

Beavercreek 7:00

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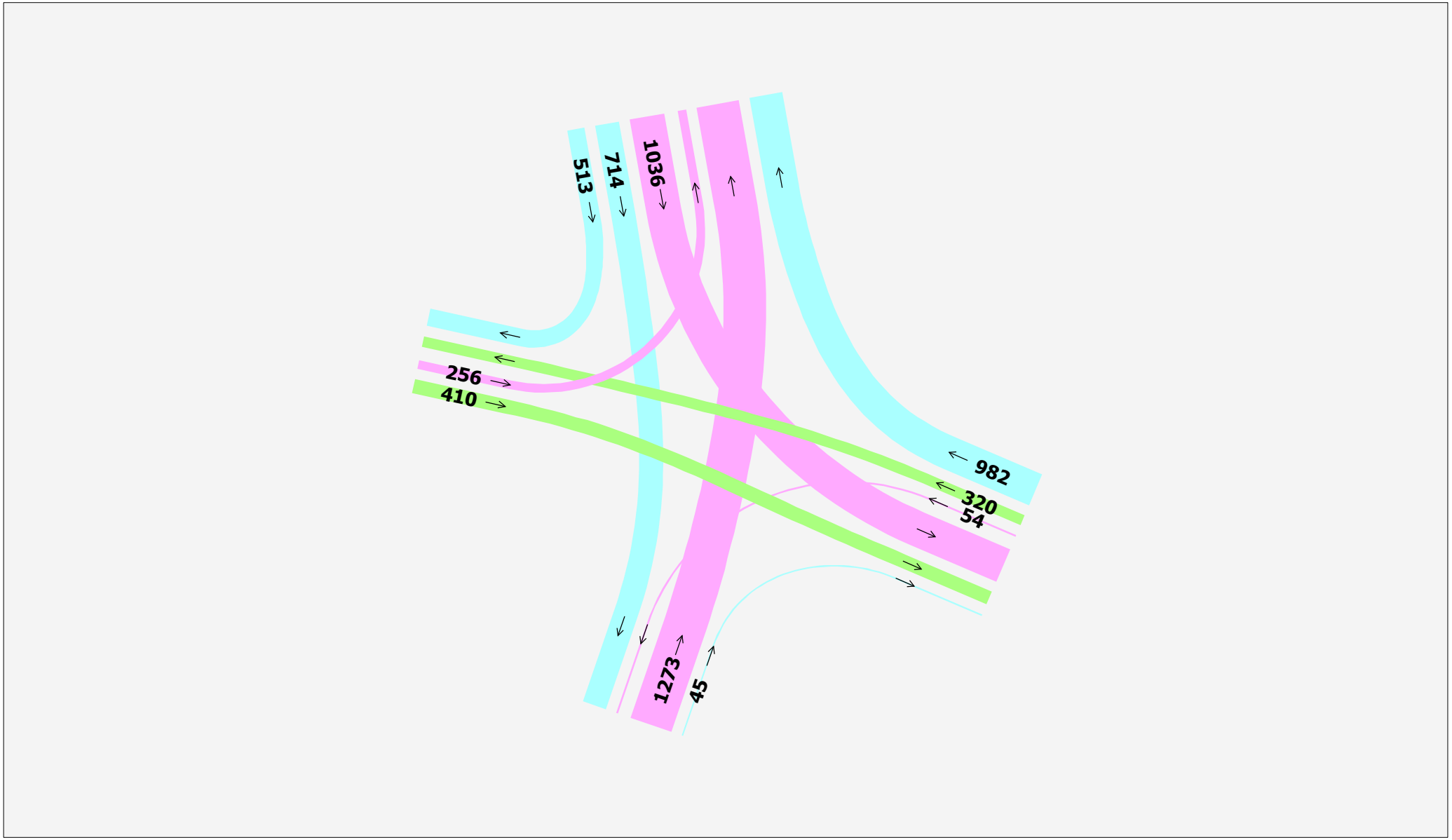
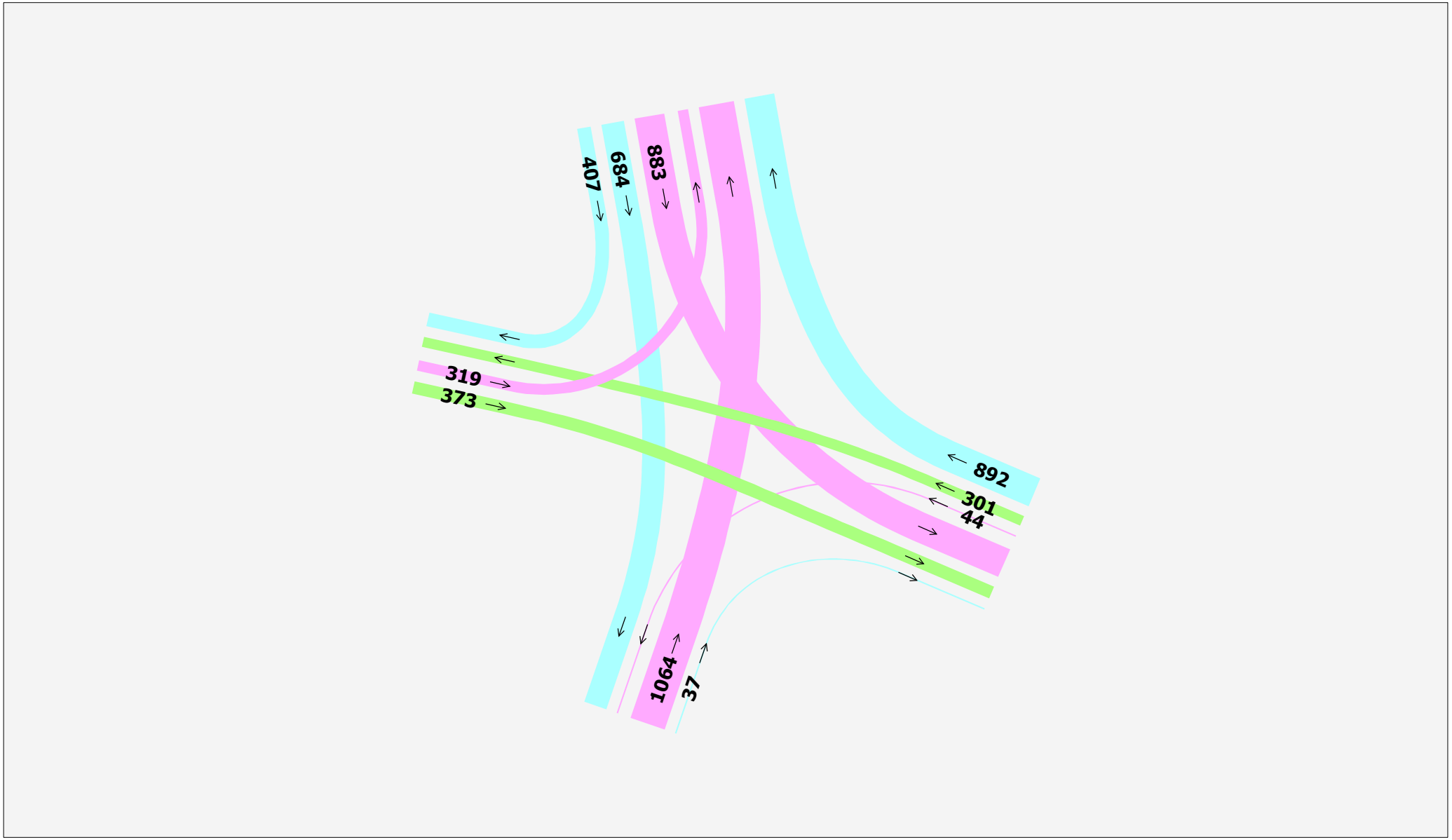


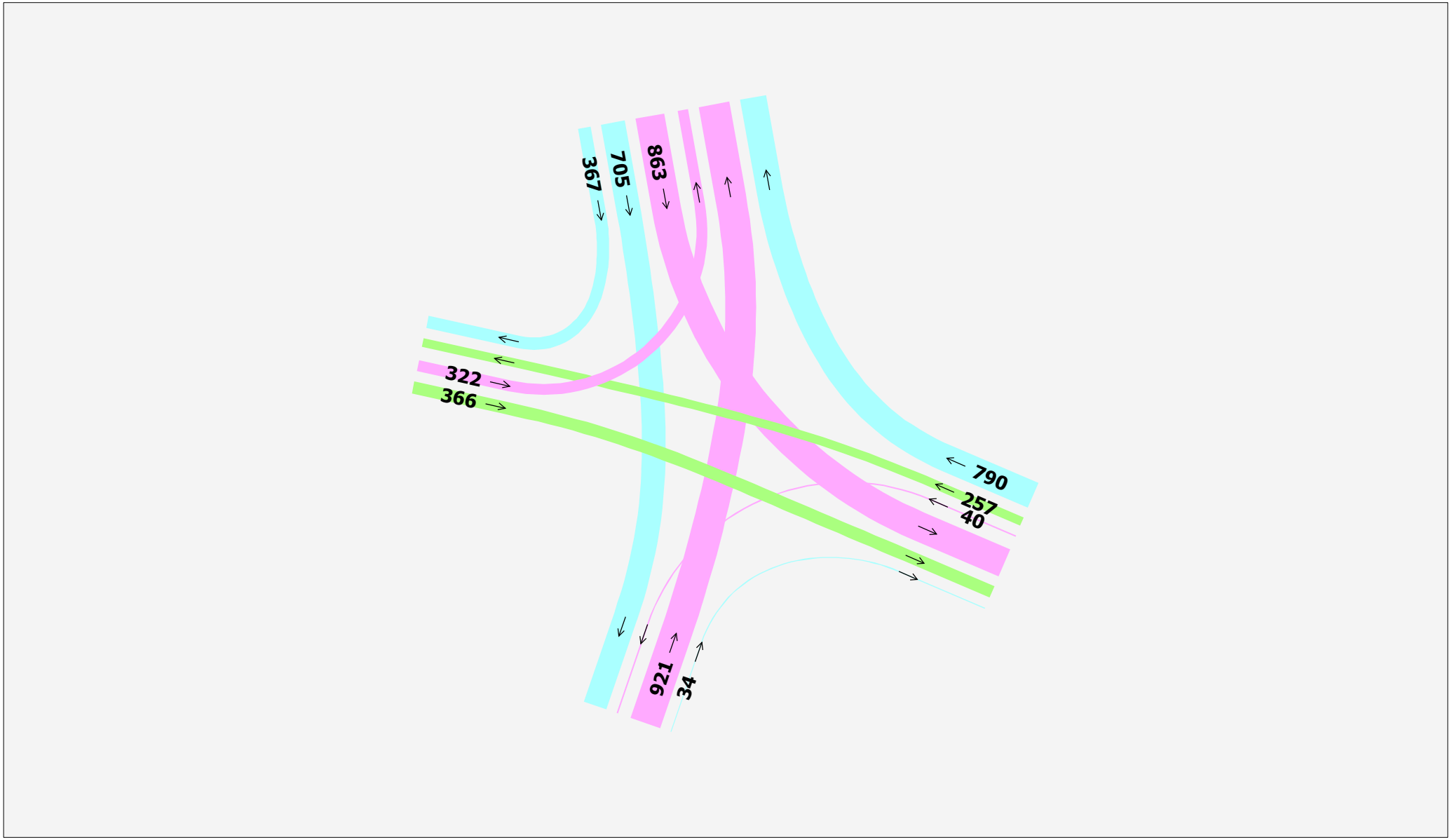
Beavercreek 8:00

2040



Beavercreek 9:00

2040



Beavercreek 10:00

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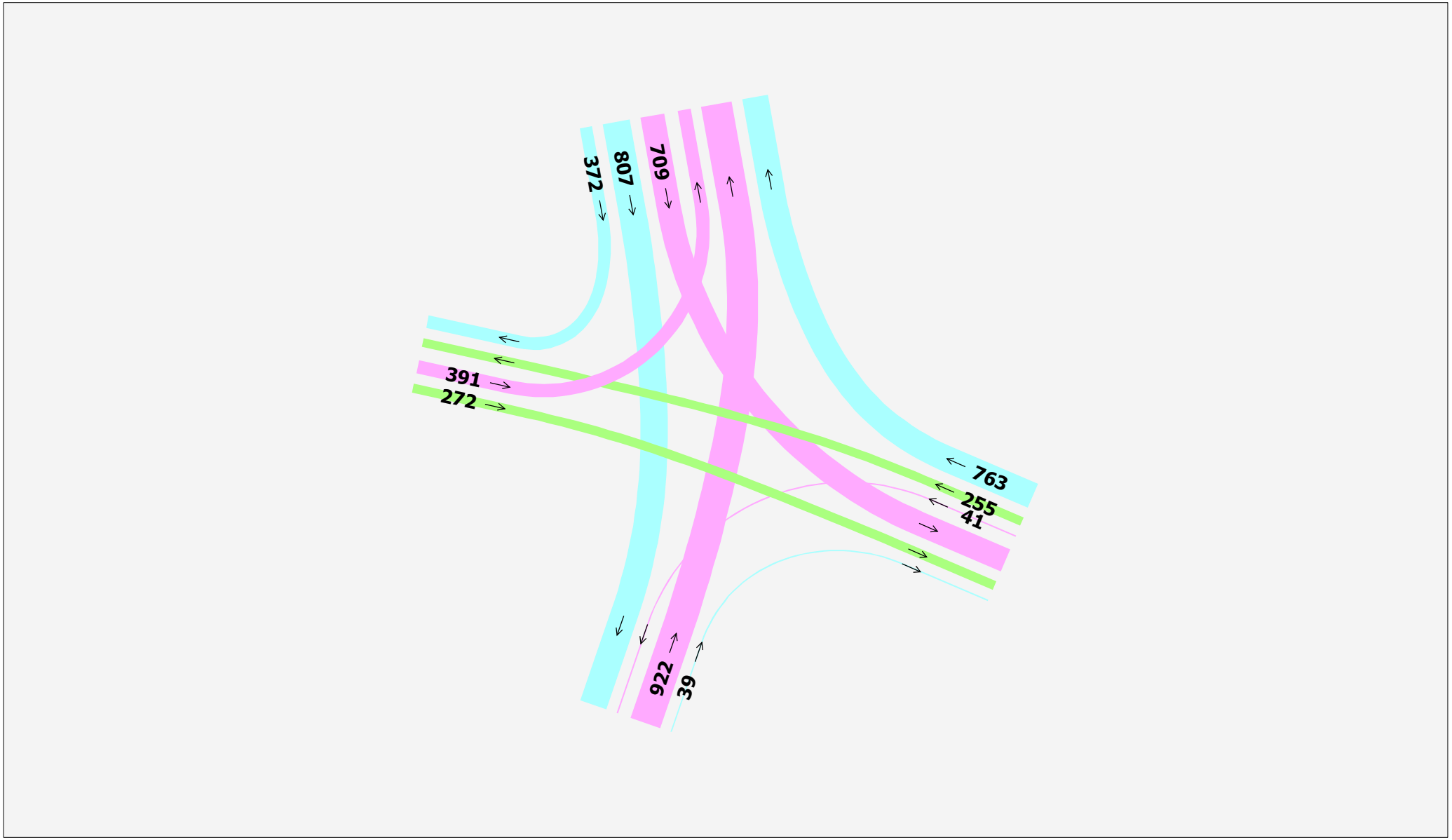

Beavercreek 11:00

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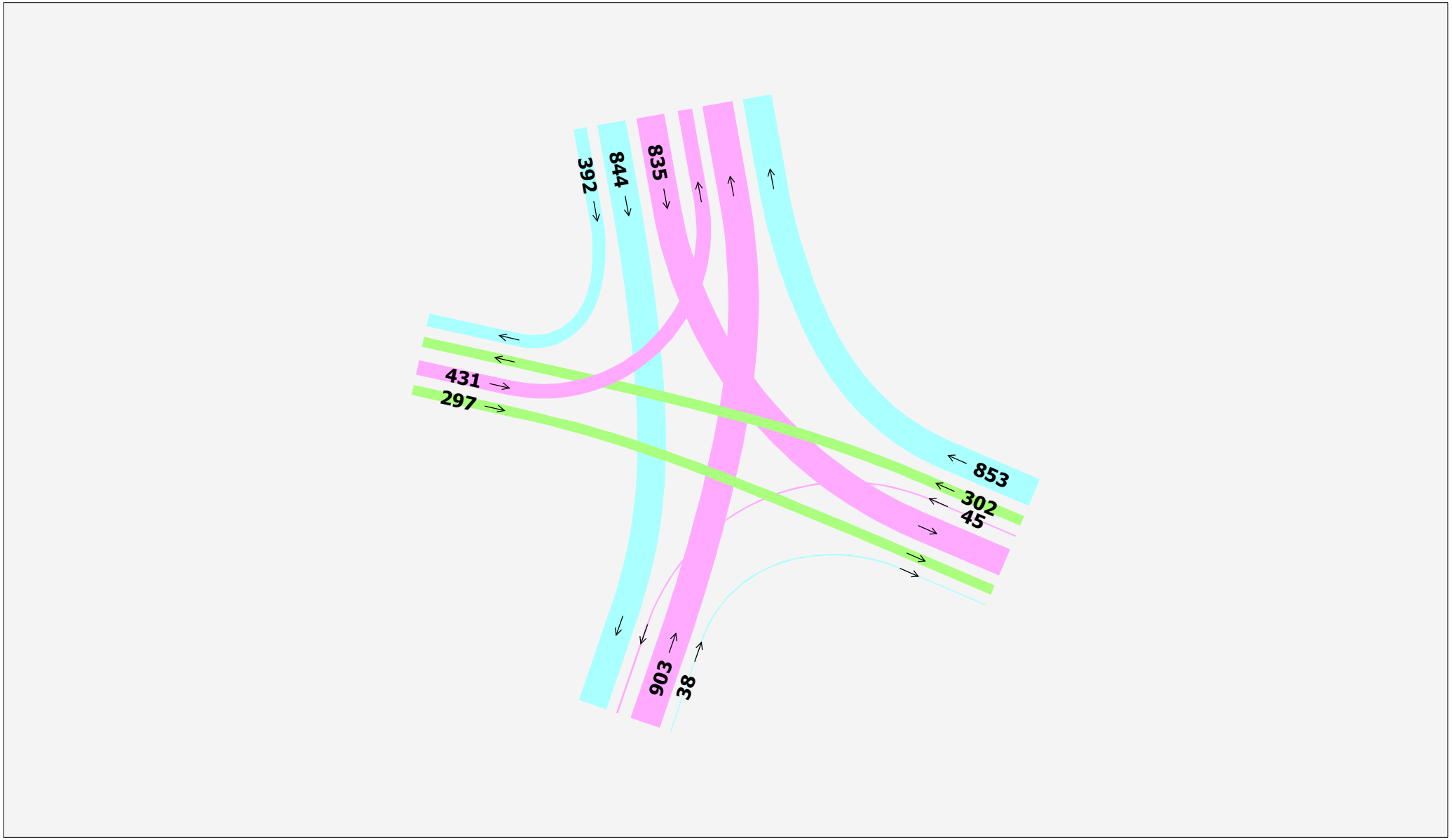

Beavercreek 12:00

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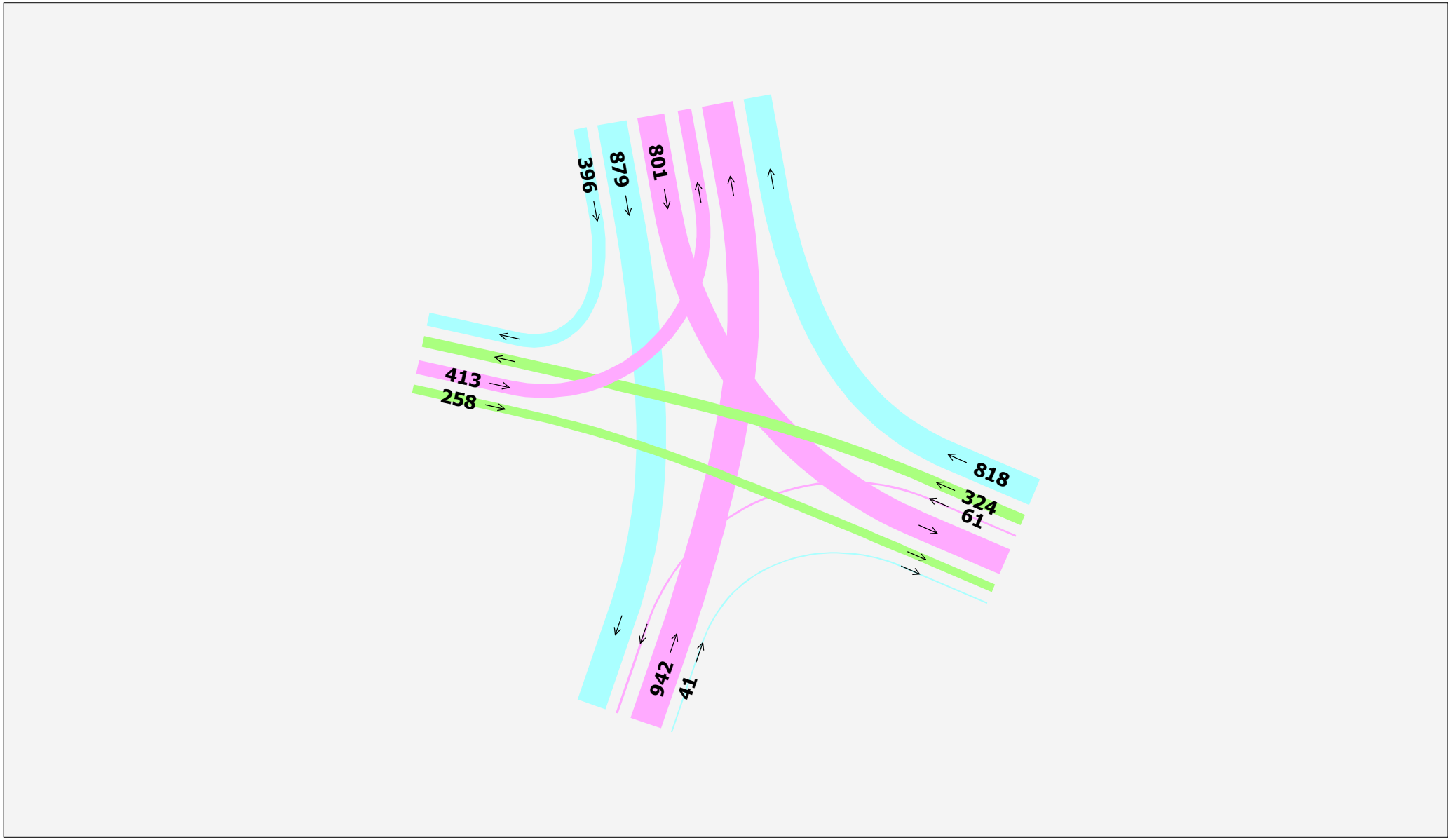

Beavercreek 13:00

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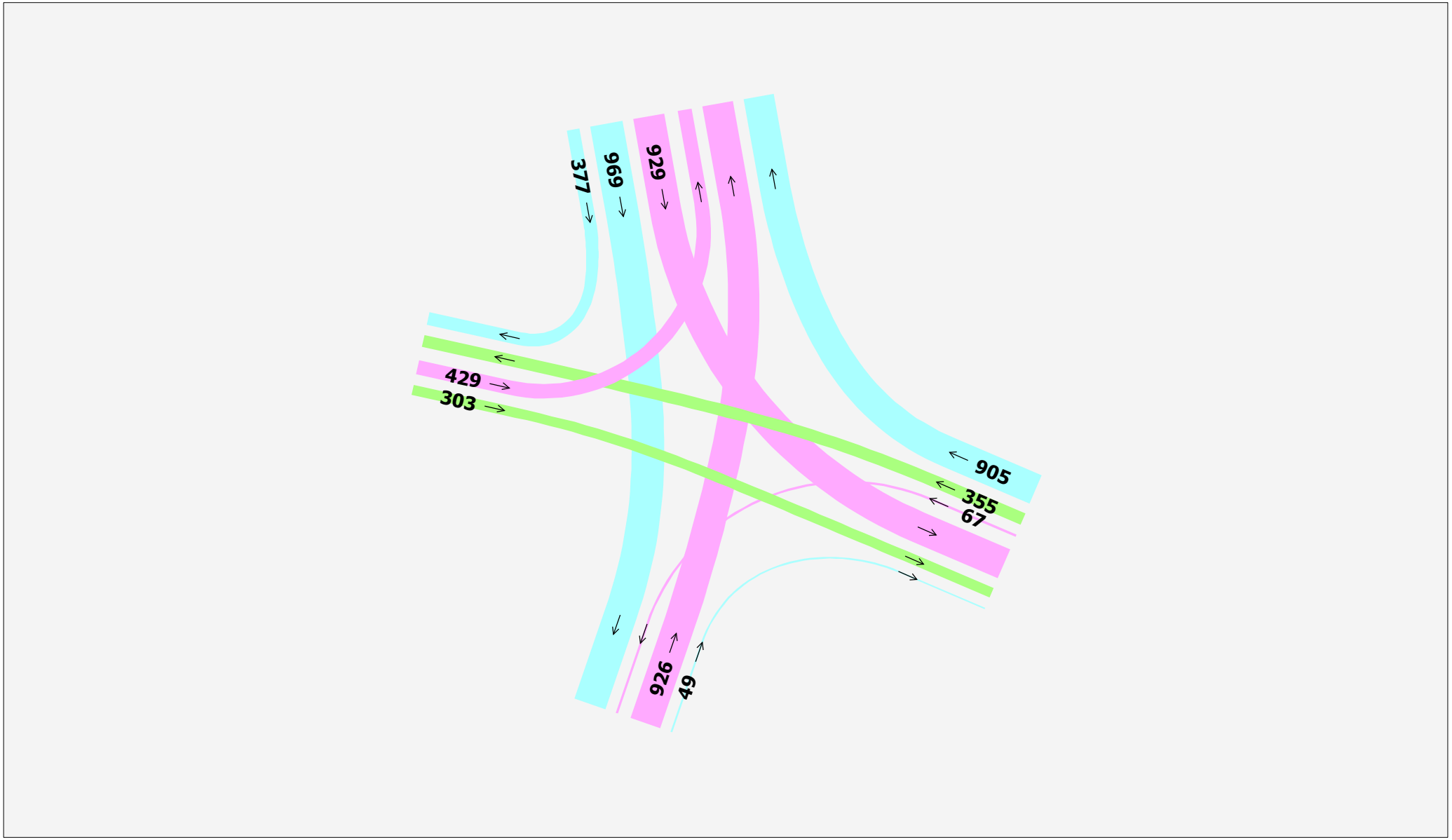

Beavercreek 14:00

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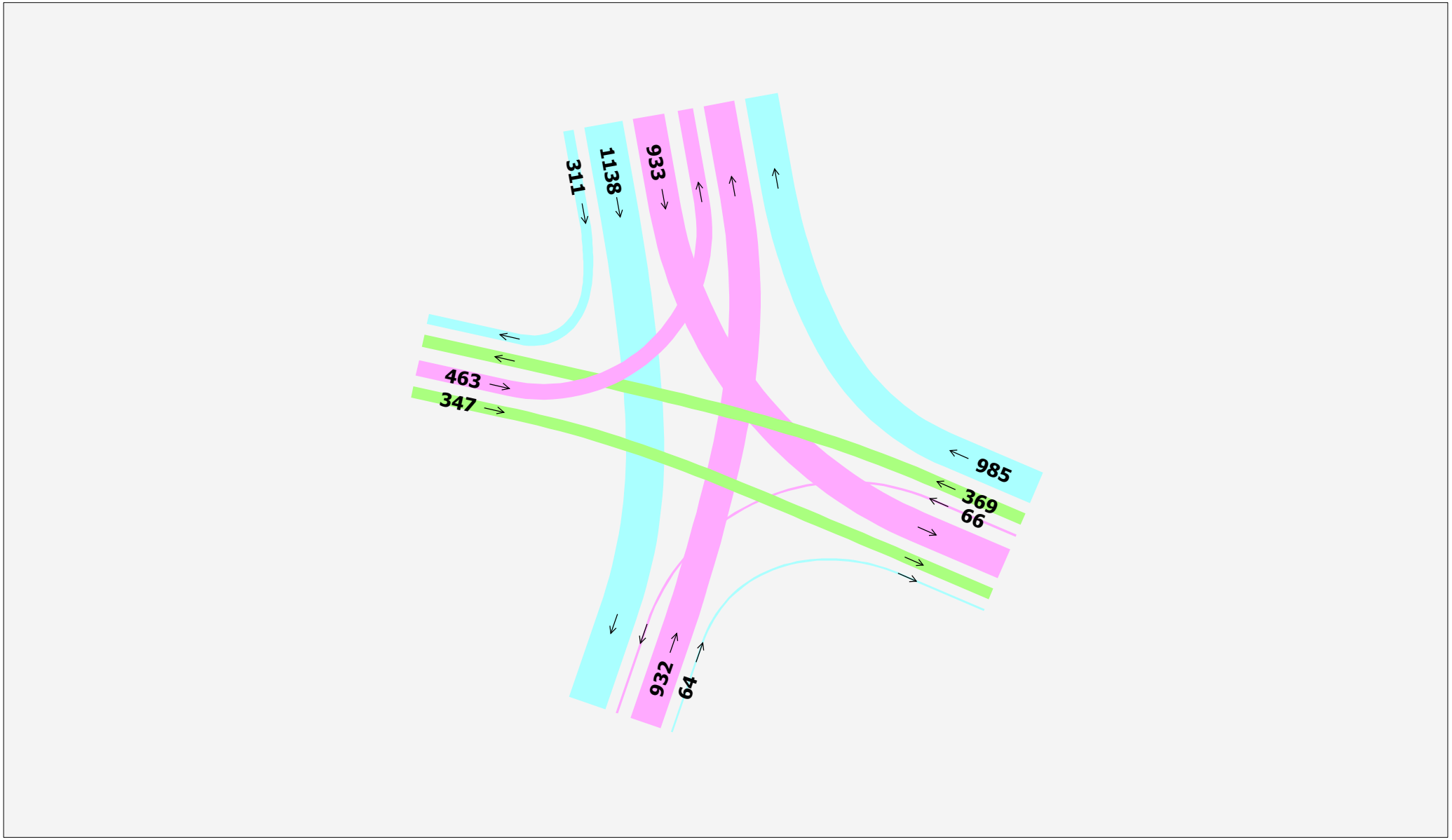

Beavercreek 15:00

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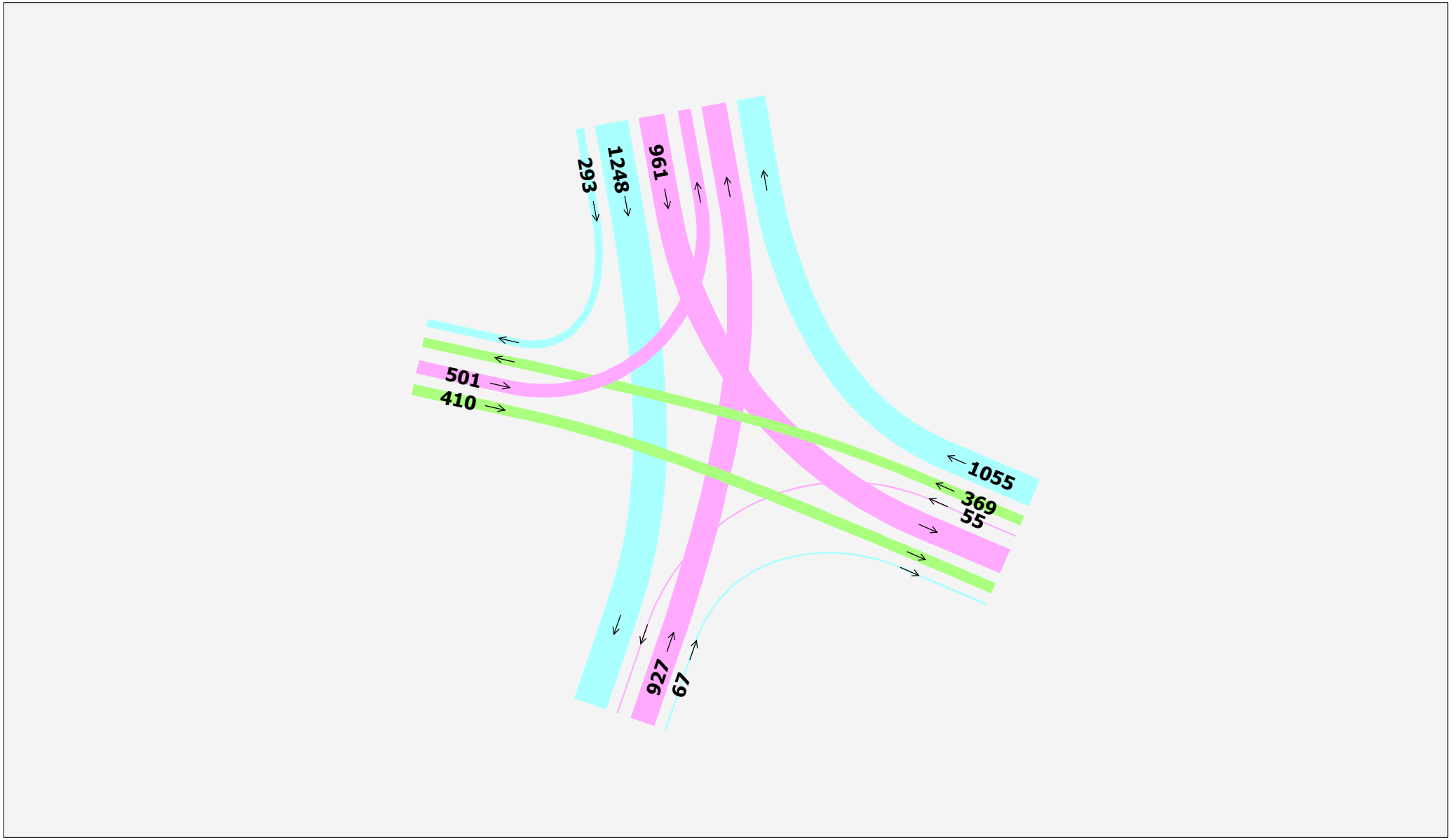

Beavercreek 16:00

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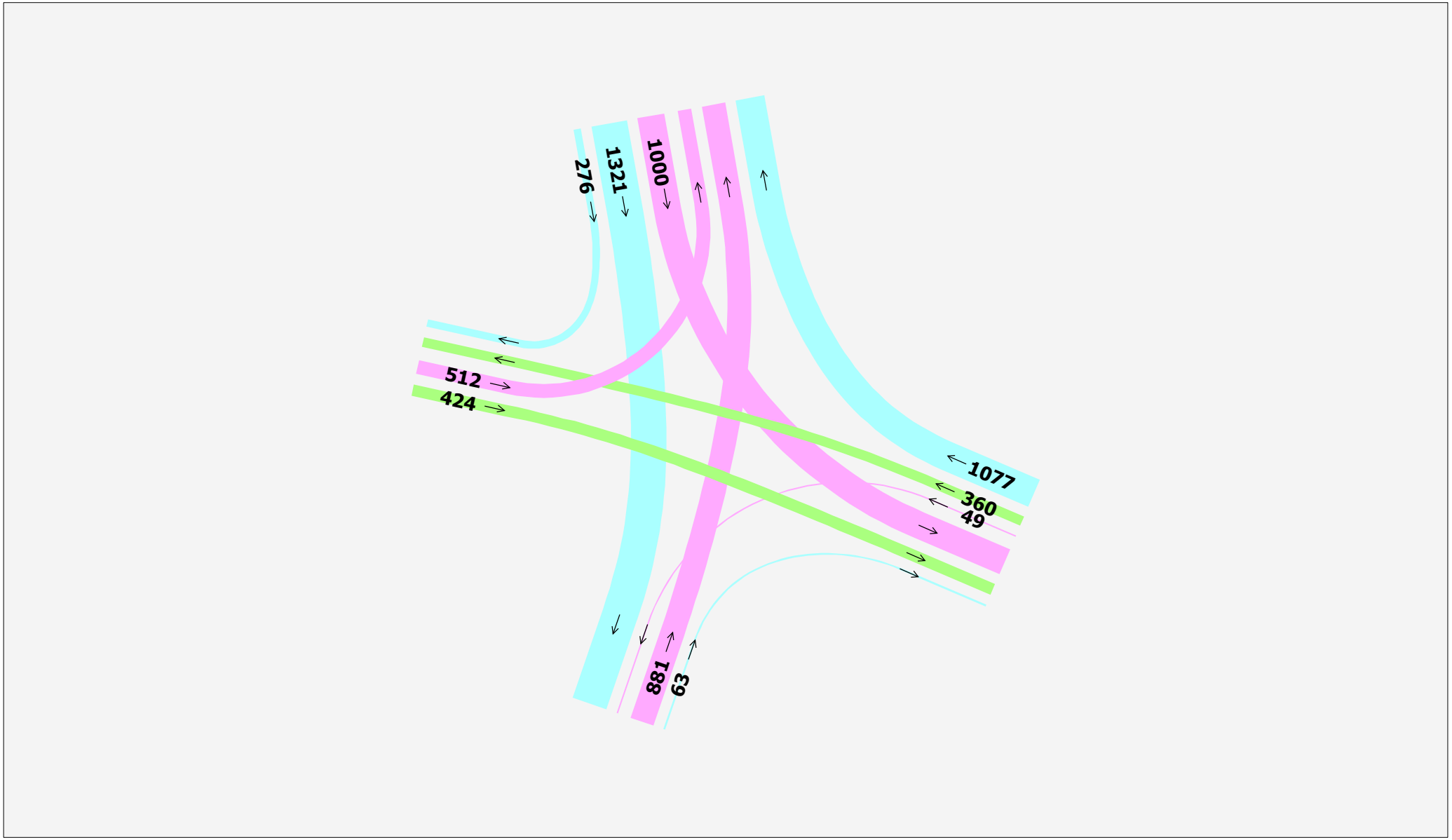

Beavercreek 17:00

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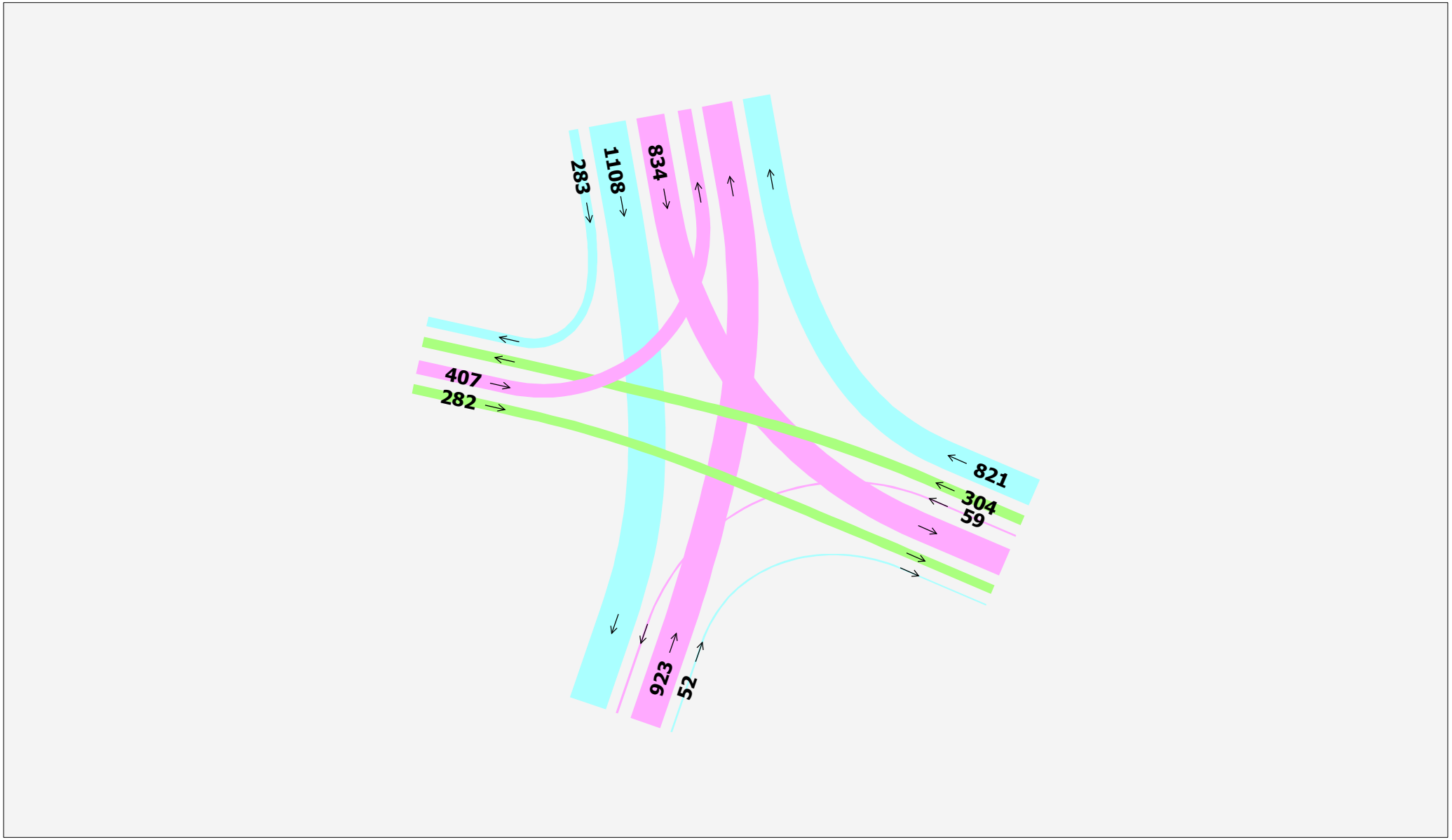

Beavercreek 18:00

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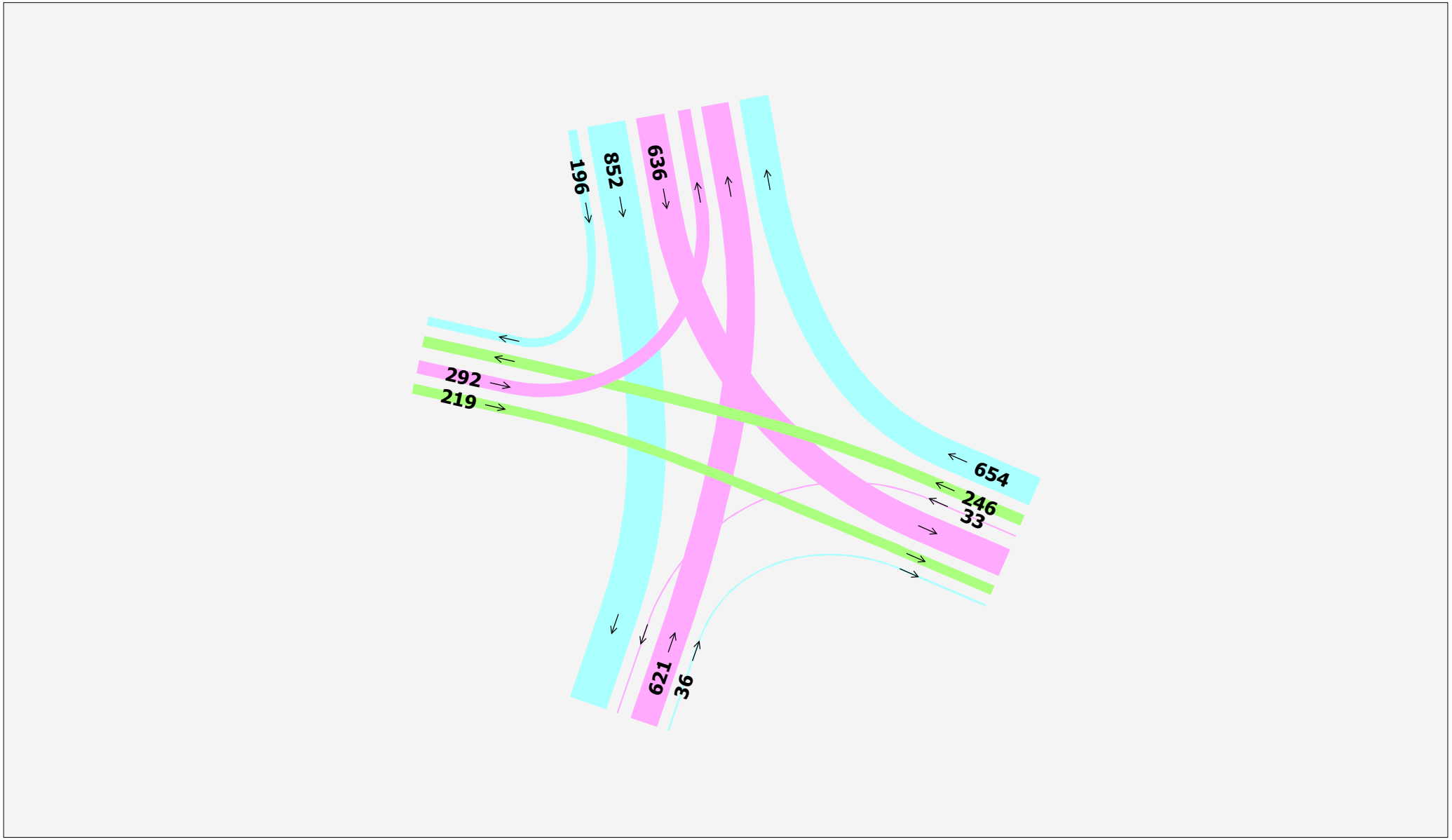

Beavercreek 19:00

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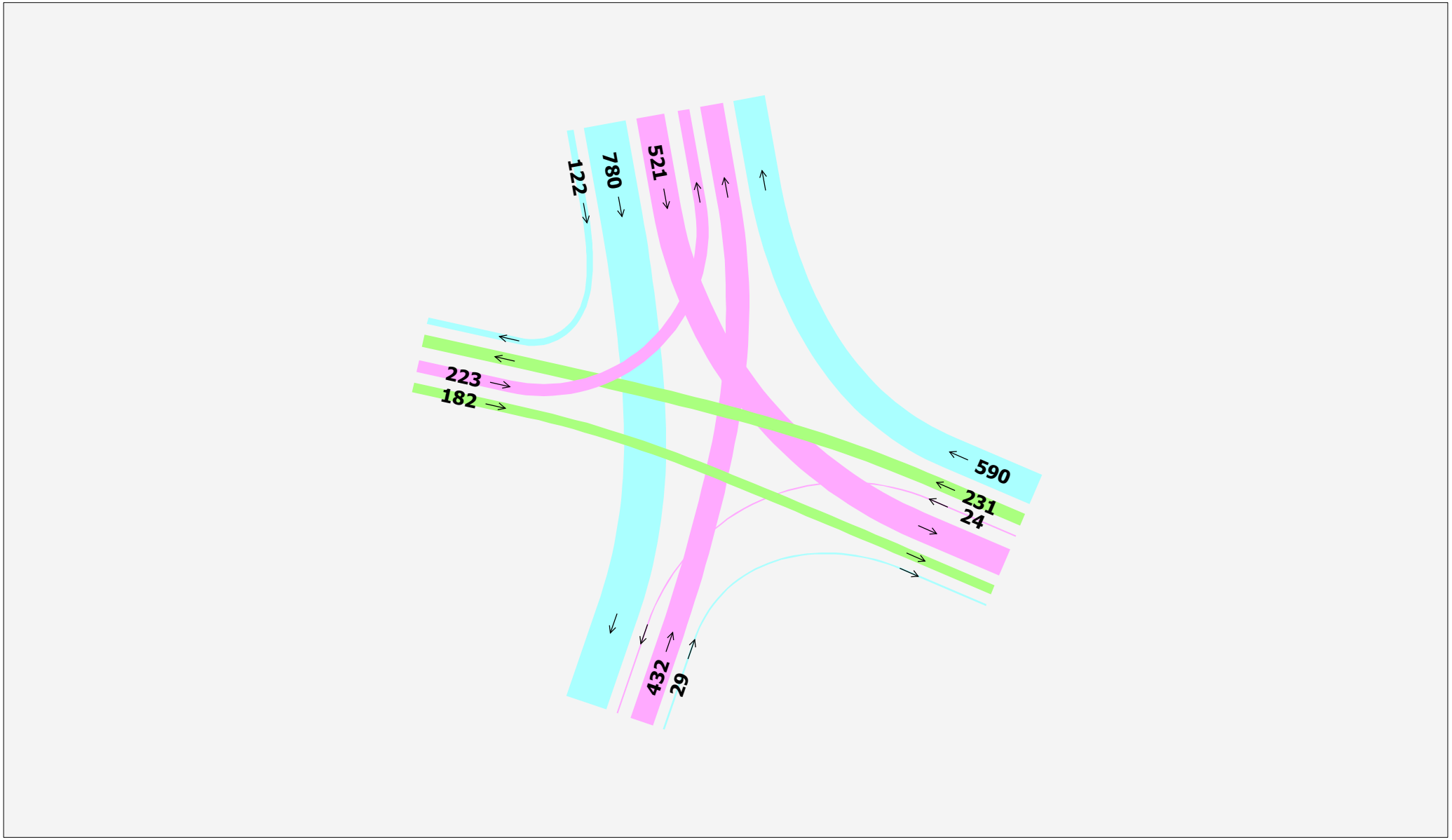

Beavercreek 20:00

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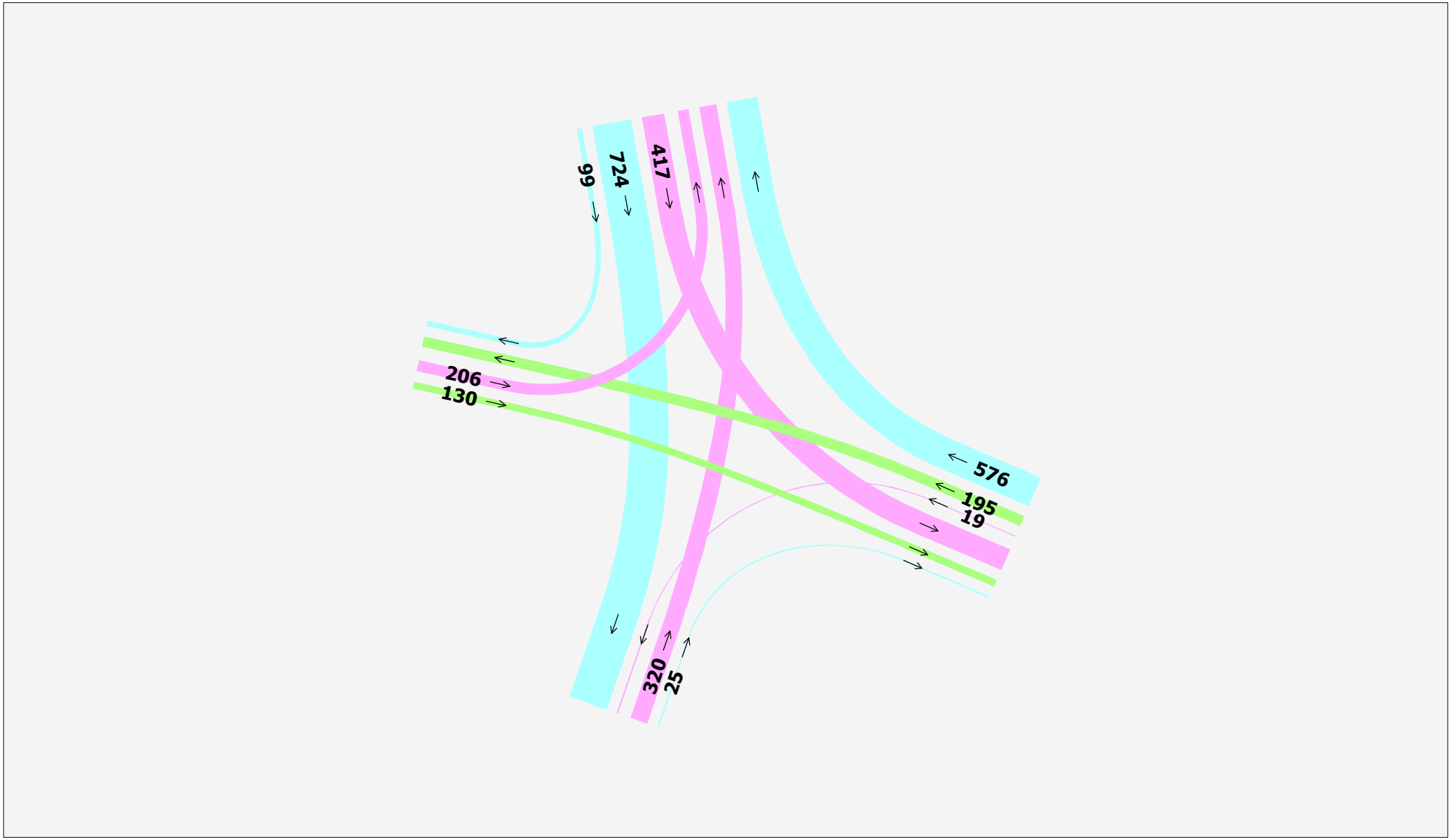

Beavercreek 21:00

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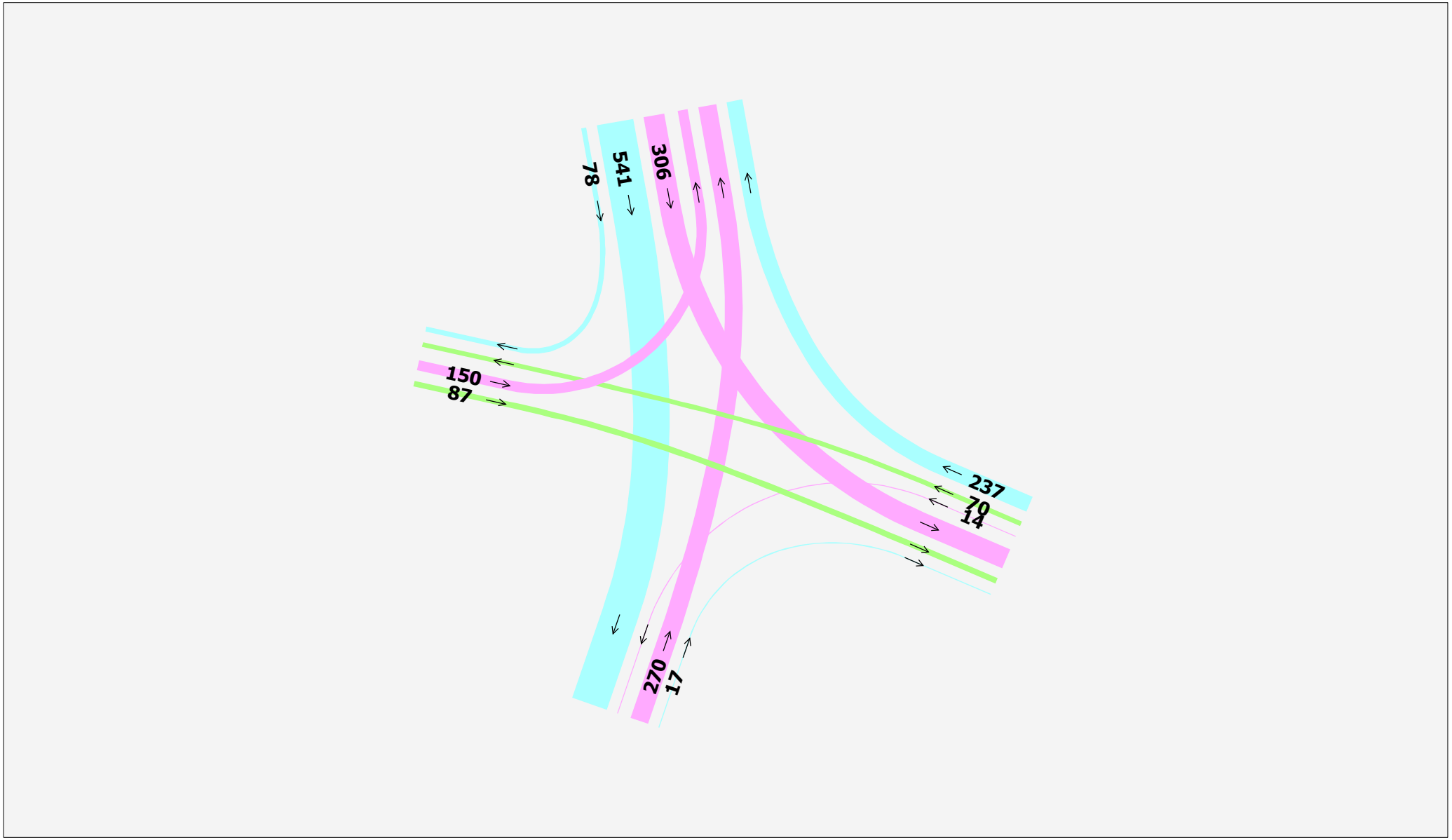

Beavercreek 22:00

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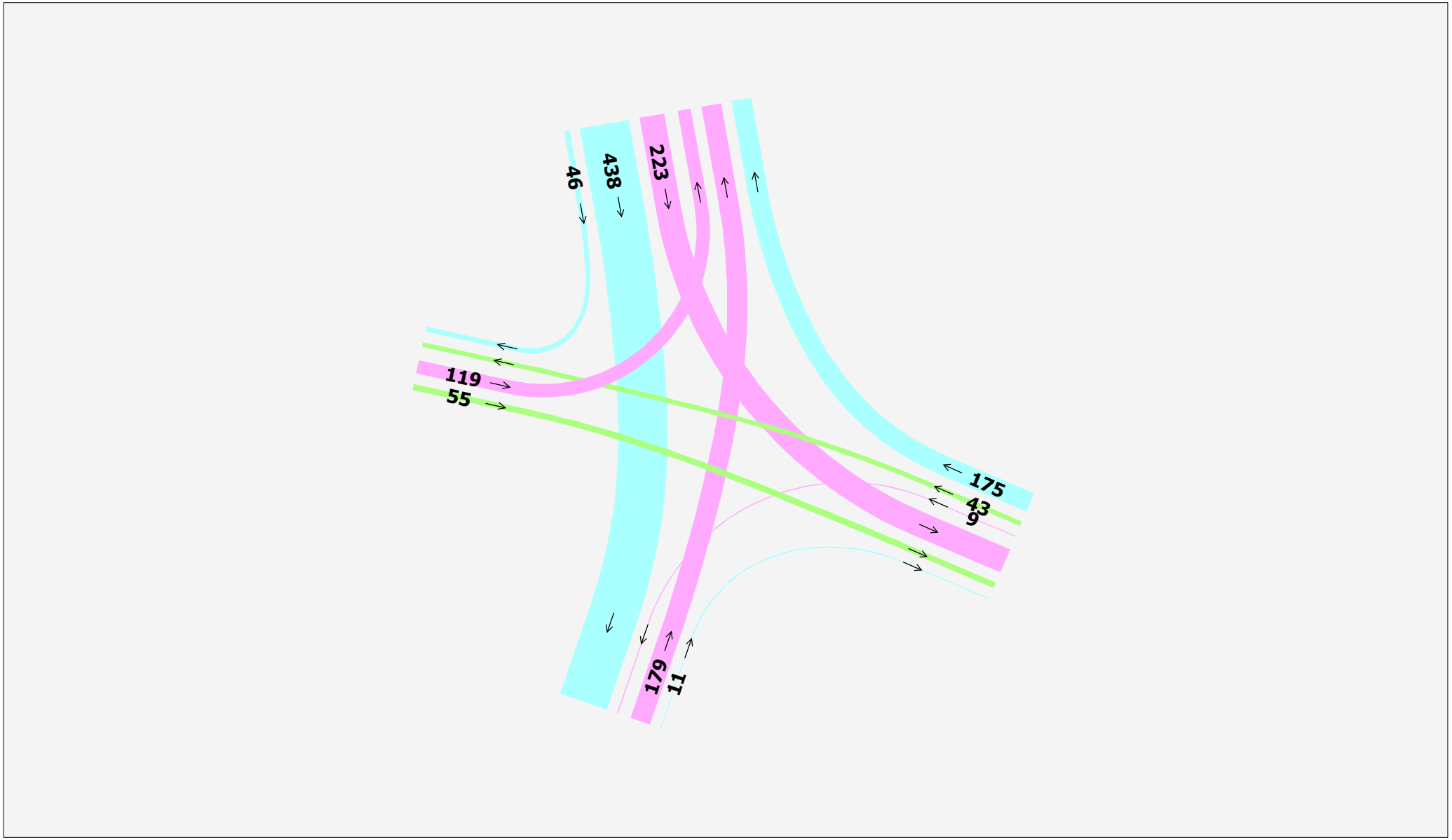


Beavercreek 23:00

2040

Redland 0:00

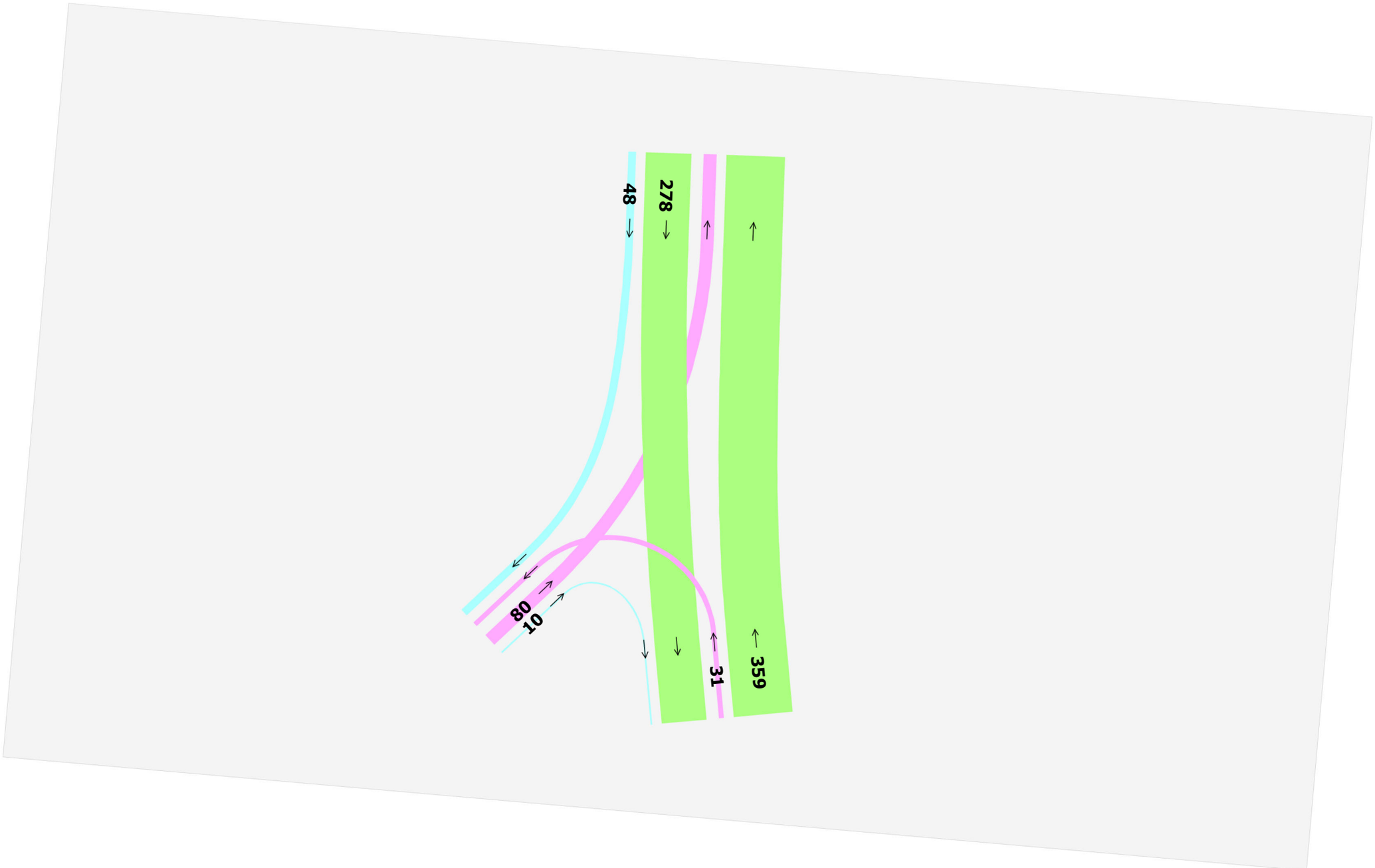
2040

Redland 1:00

2040

Redland 2:00

2040



Redland 3:00

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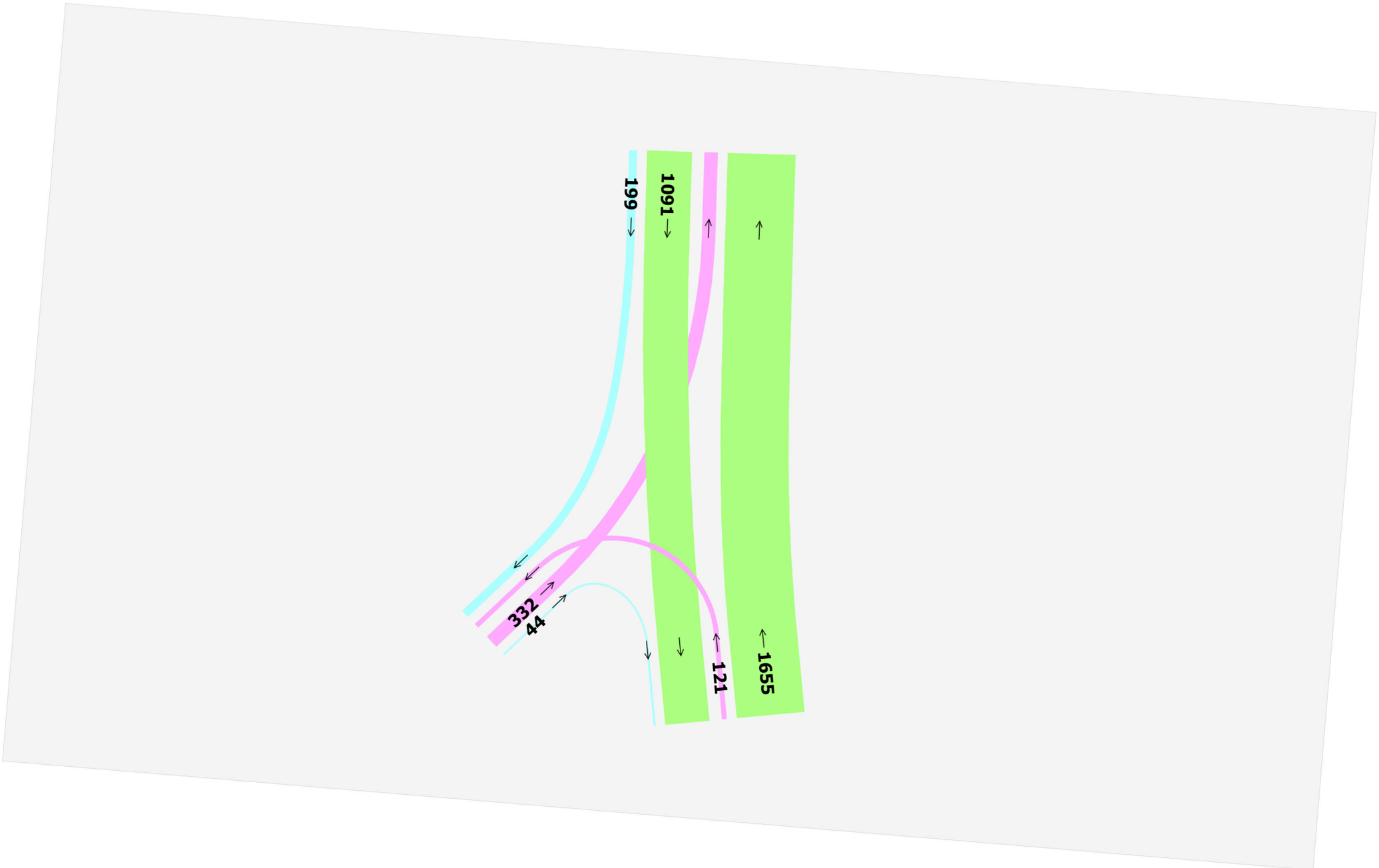
Redland 4:00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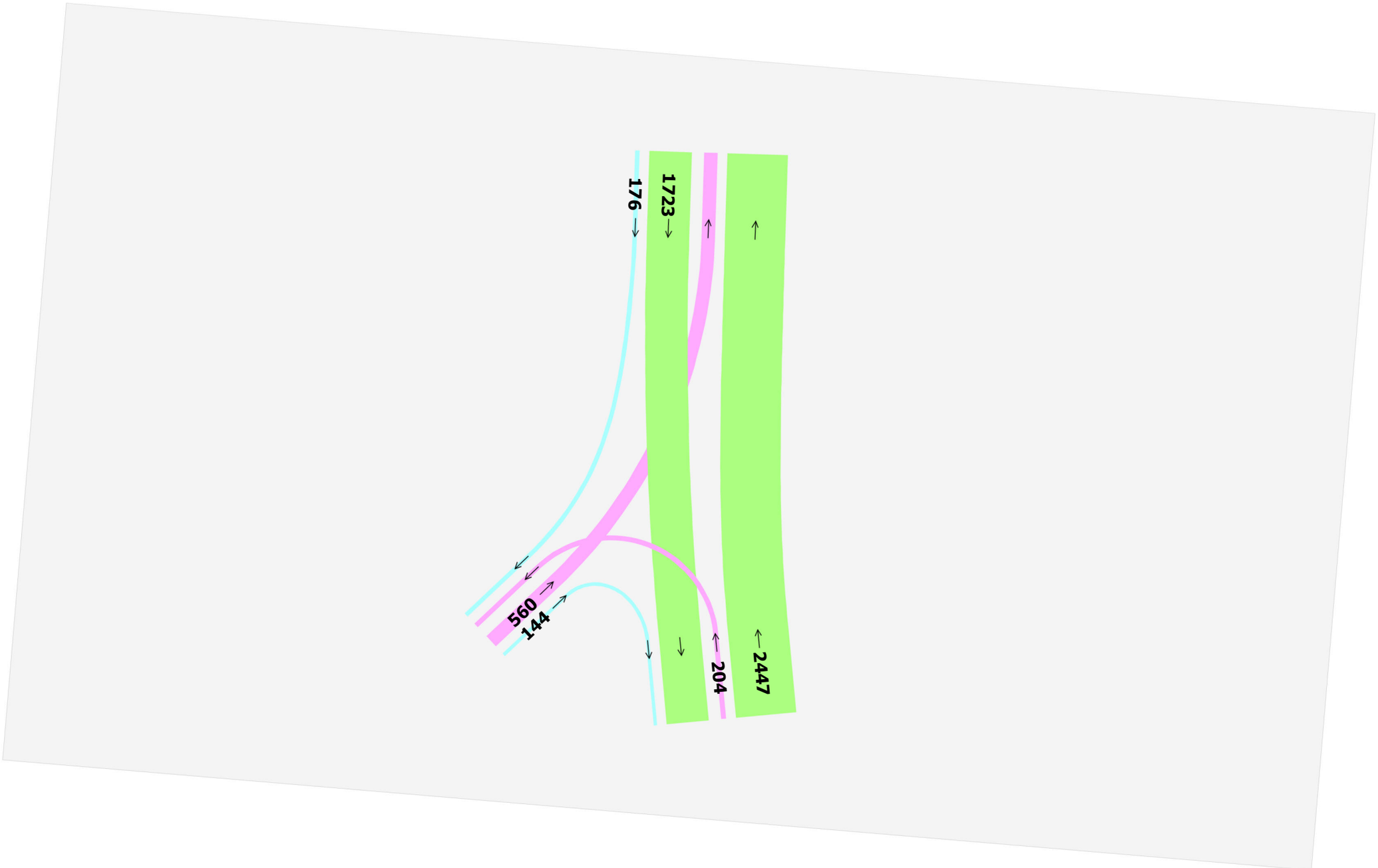

Redland 6:00

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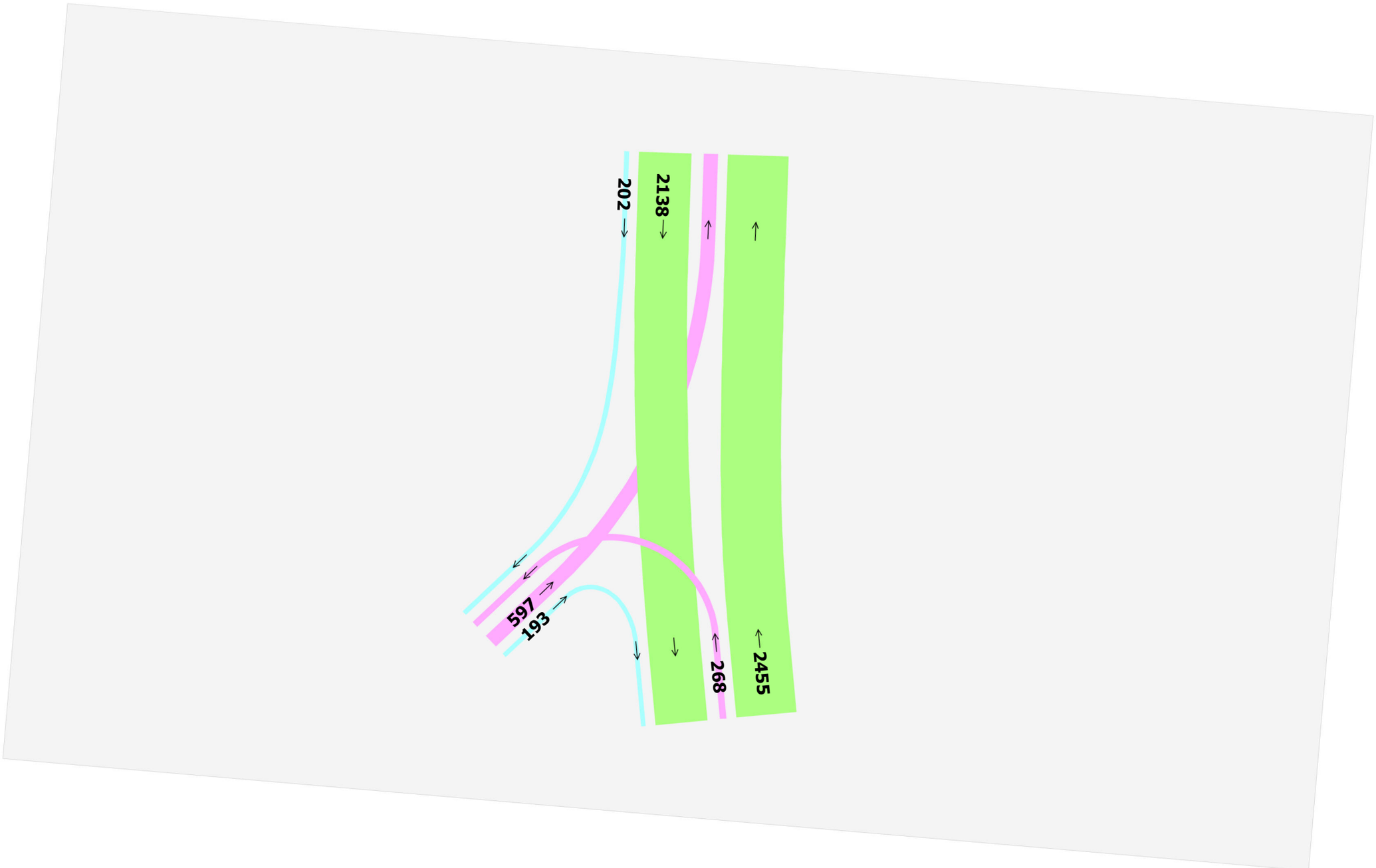

Redland 7:00

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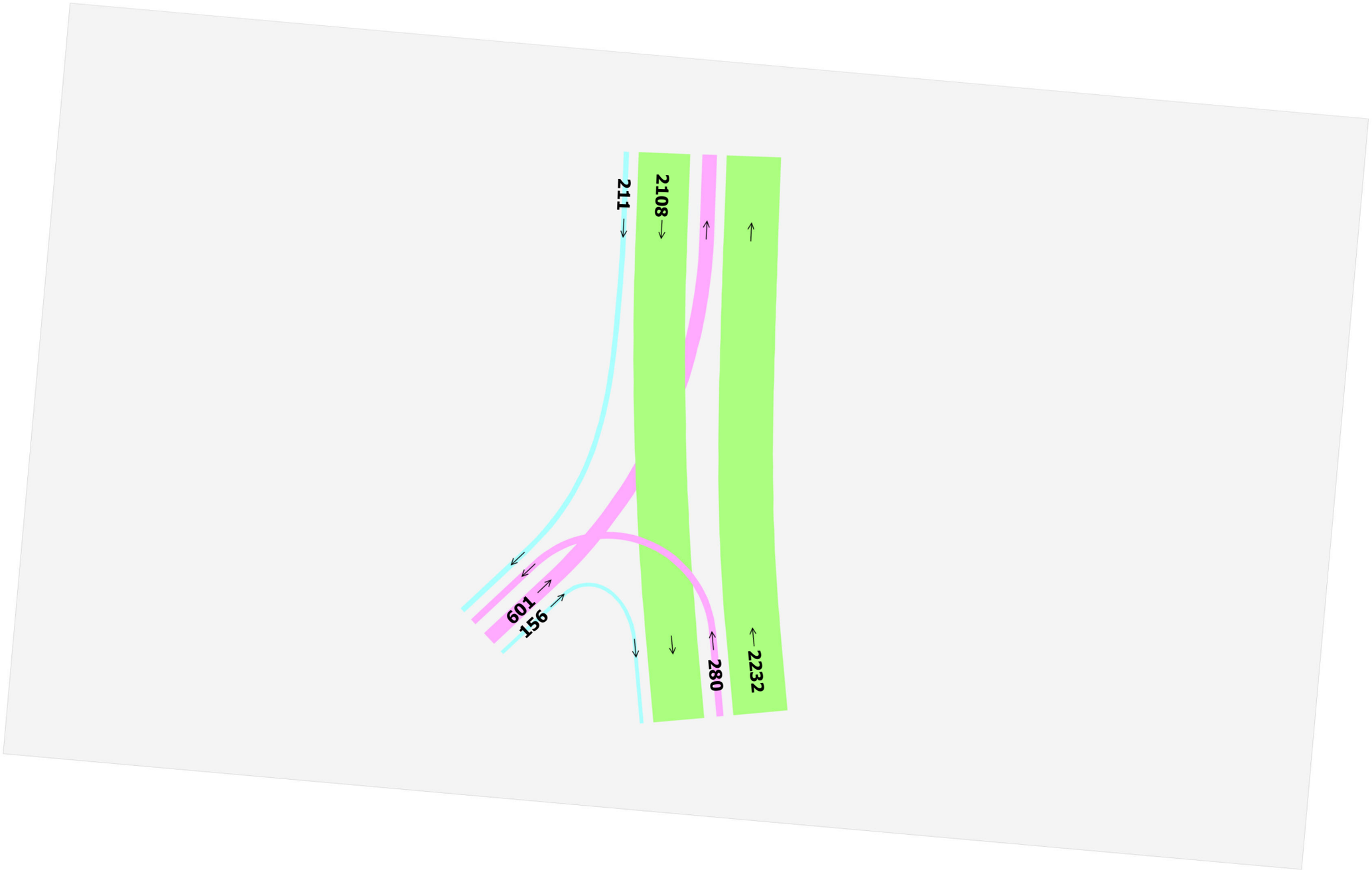

Redland 8:00

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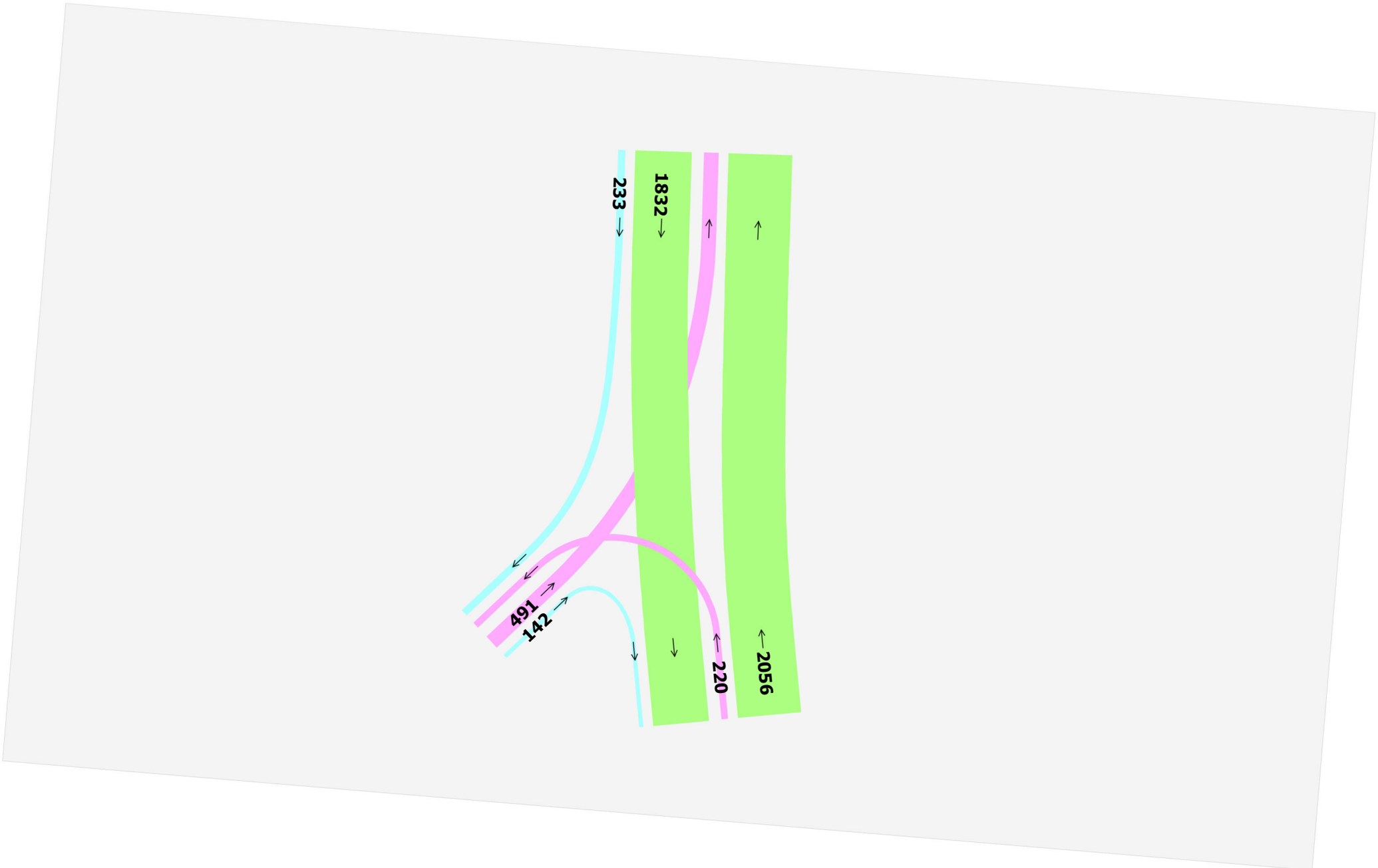

Redland 9:00

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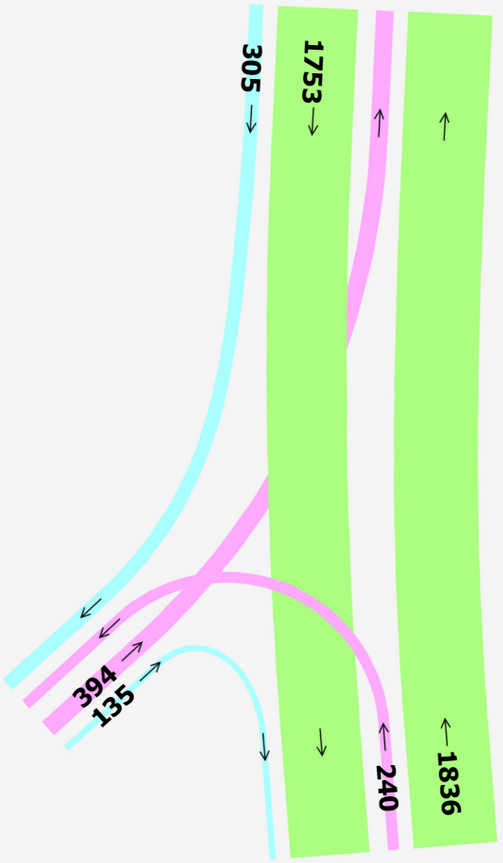

Redland 11:00

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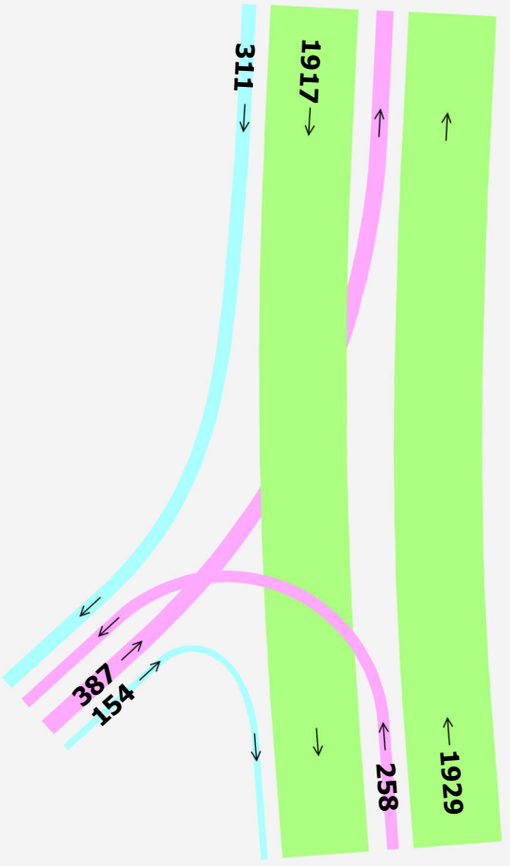

Redland 12:00

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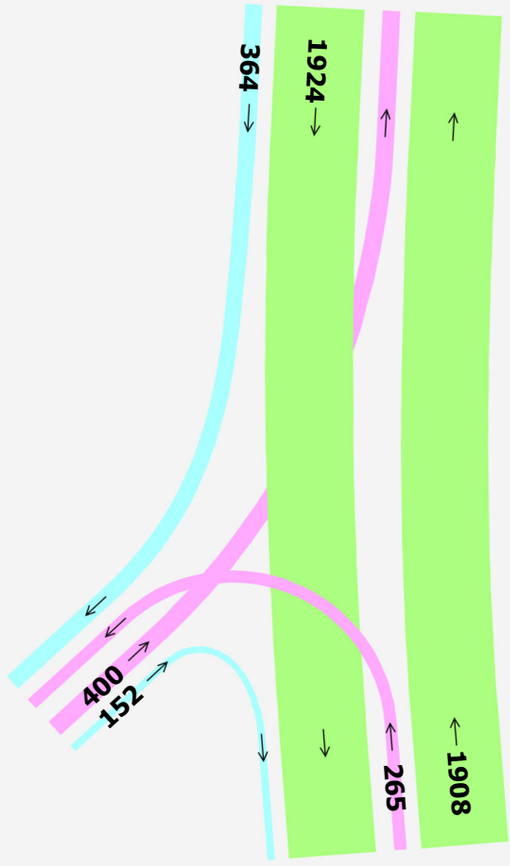

Redland 13:00

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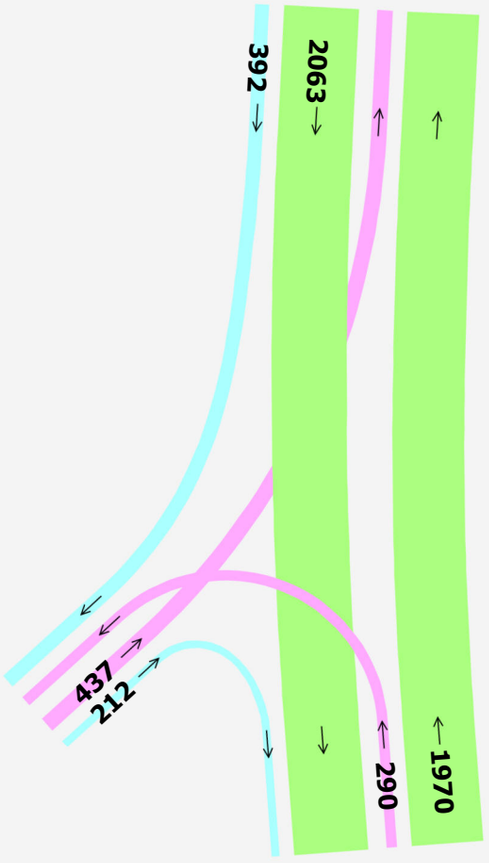

Redland 14:00

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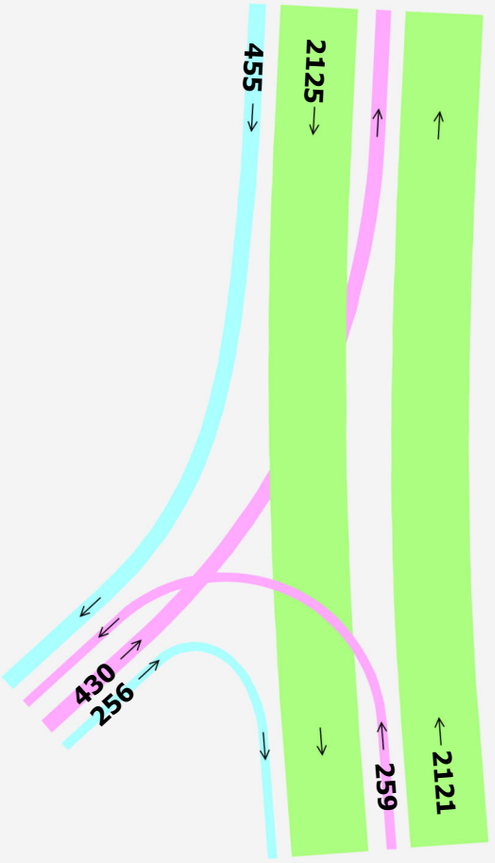

Redland 15:00

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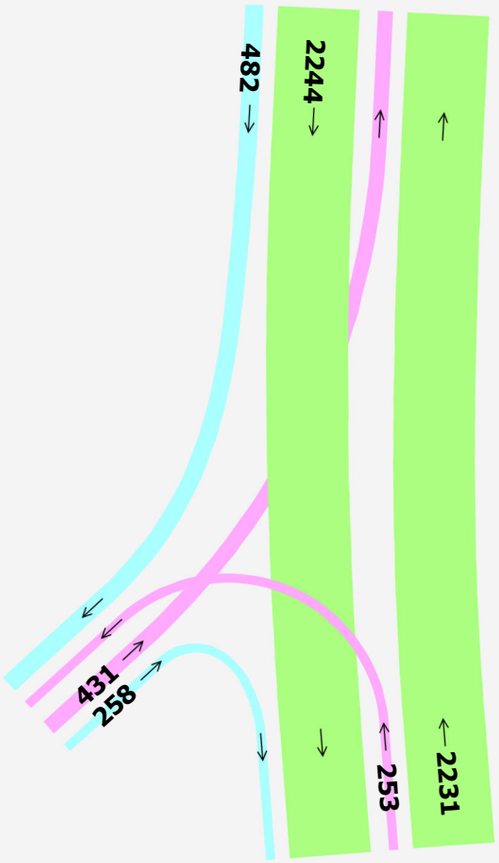

Redland 16:00

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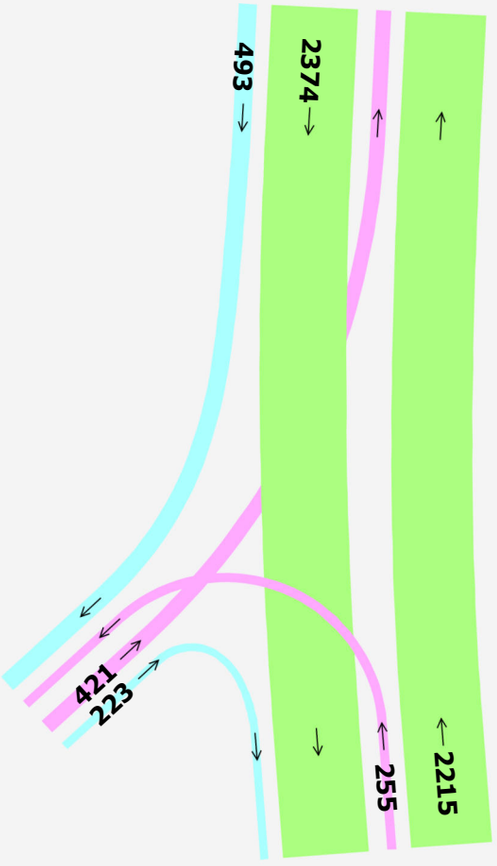

Redland 17:00

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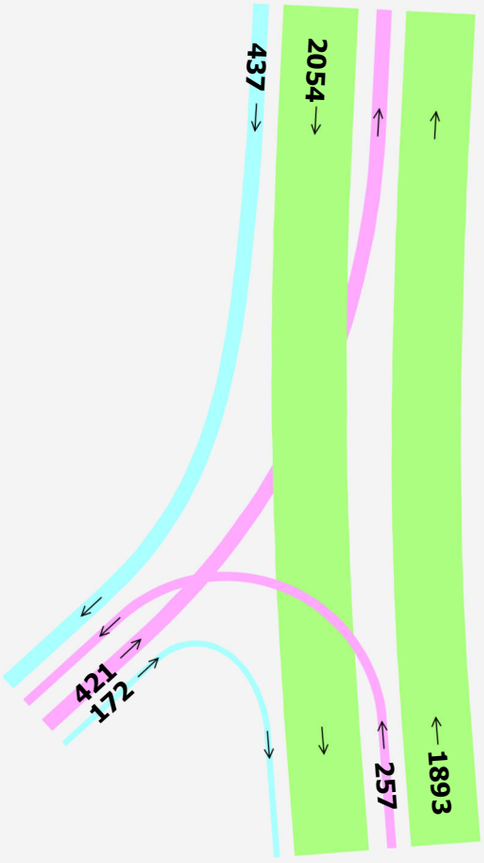

Redland 18:00

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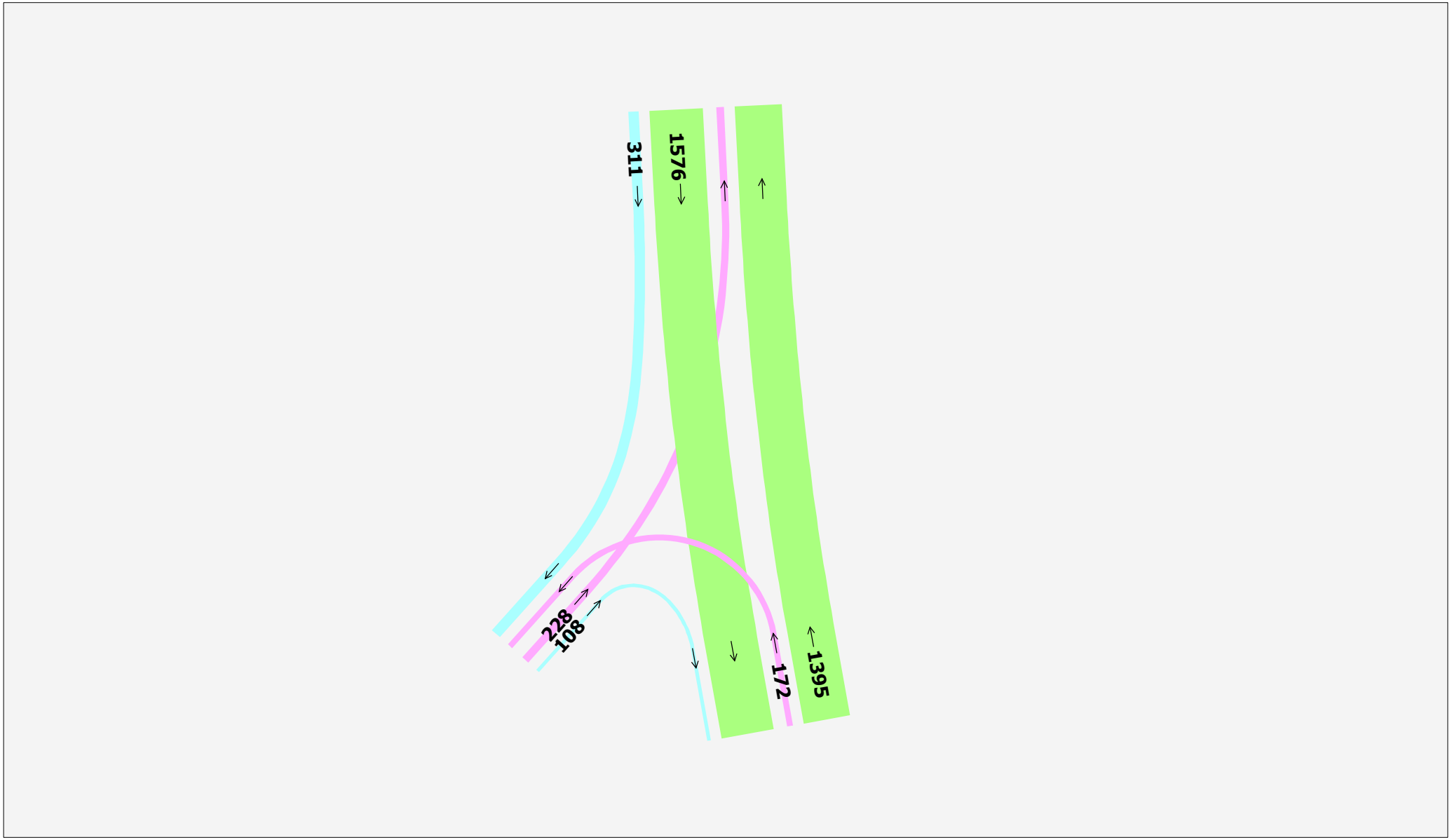


Redland 19:00

2040

Redland 20:00

2040

Redland 21:00

2040

Redland 22:00

2040

Redland 23:00

Type of peak hour being reported: Intersection Peak

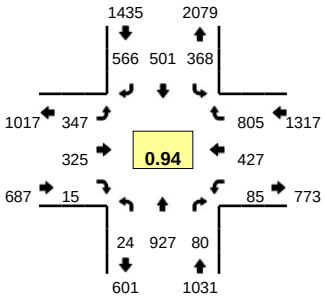
Method for determining peak hour: Total Entering Volume

LOCATION: Cascade Hwy -- S Beavercreek Rd

CITY/STATE: Oregon City, OR

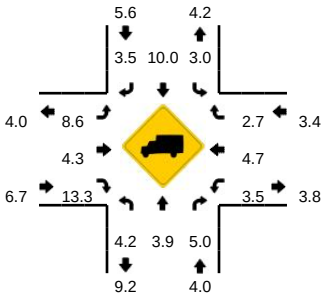
QC JOB #: 14414701

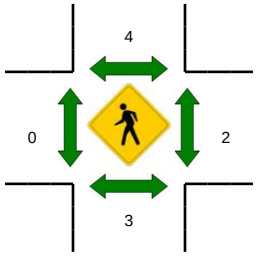
DATE: Tue, May 16 2017

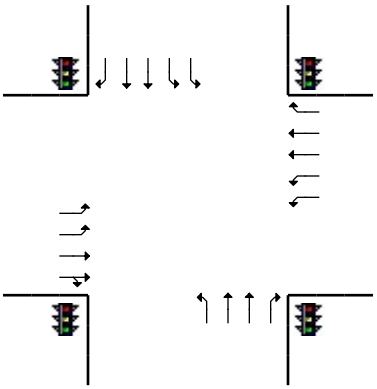


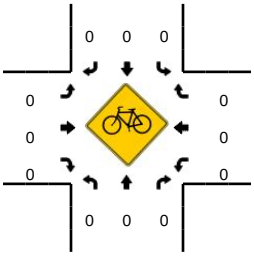
Peak-Hour: 7:00 AM -- 8:00 AM

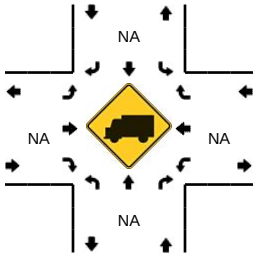
Peak 15-Min: 7:45 AM -- 8:00 AM

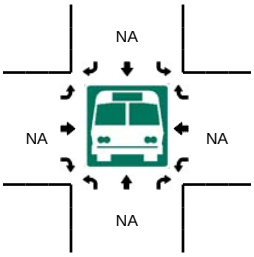












5-Min Count Period Beginning At	Cascade Hwy (Northbound)				Cascade Hwy (Southbound)				S Beavercreek Rd (Eastbound)				S Beavercreek Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	75	7	0	25	28	42	0	29	19	2	0	4	27	67	0	325	
7:05 AM	0	82	3	0	23	39	47	0	32	21	1	0	9	30	71	0	358	
7:10 AM	2	86	10	0	19	30	41	0	21	28	4	0	2	22	77	0	342	
7:15 AM	0	81	6	0	38	36	38	0	29	37	0	0	7	38	73	0	383	
7:20 AM	5	85	11	0	29	31	45	0	26	44	3	0	8	36	69	0	392	
7:25 AM	3	84	3	0	42	42	41	0	43	46	0	0	5	35	65	0	409	
7:30 AM	2	74	11	0	32	34	41	0	34	33	1	0	9	39	49	0	359	
7:35 AM	1	74	7	0	37	45	53	0	34	19	1	0	4	33	73	0	381	
7:40 AM	3	55	4	0	24	48	39	0	26	22	1	0	8	34	70	0	334	
7:45 AM	3	65	7	0	41	48	50	0	32	22	0	0	15	45	66	0	394	
7:50 AM	3	82	4	0	31	34	68	0	21	21	1	0	10	50	68	0	393	
7:55 AM	2	84	7	0	27	86	61	0	20	13	1	0	4	38	57	0	400	4470
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4145
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3787
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3445
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3062
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2670
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2261
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1902
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1521
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1187
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	793
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	32	924	72	0	396	672	716	0	292	224	8	0	116	532	764	0	4748
Heavy Trucks	0	20	4		8	56	8		12	4	0		0	16	16		144
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/22/2017 3:28 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

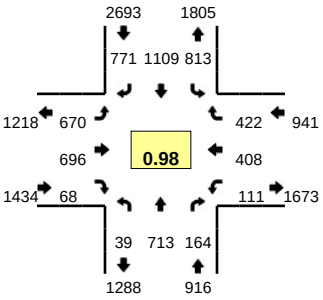
LOCATION: Cascade Hwy -- S Beavercreek Rd

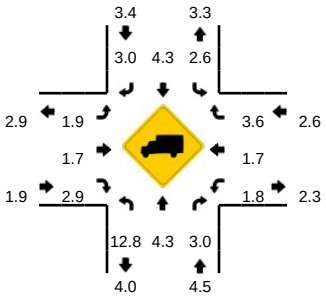
QC JOB #: 14414702

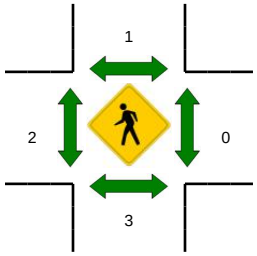
CITY/STATE: Oregon City, OR

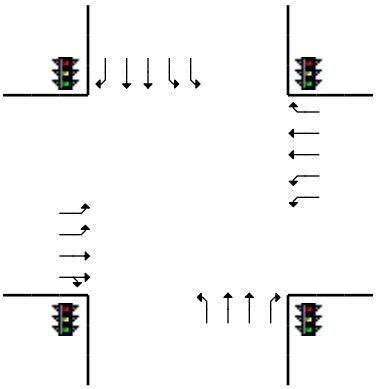
DATE: Tue, May 16 2017

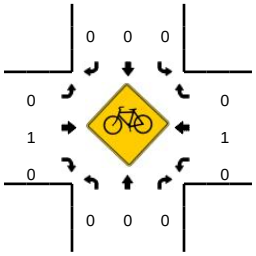
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

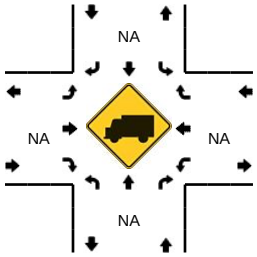


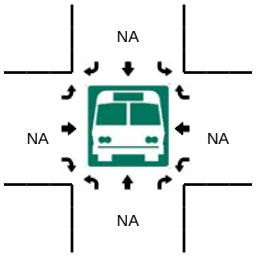












5-Min Count Period Beginning At	Cascade Hwy (Northbound)				Cascade Hwy (Southbound)				S Beavercreek Rd (Eastbound)				S Beavercreek Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	63	14	0	45	74	63	0	59	55	8	0	9	41	33	0	467	5599
4:05 PM	3	45	12	0	63	83	76	0	54	63	10	0	6	32	34	0	481	5635
4:10 PM	3	70	11	0	46	104	66	0	52	52	8	1	4	33	40	0	490	5692
4:15 PM	1	58	10	0	58	86	56	1	61	53	3	0	21	26	29	0	463	5702
4:20 PM	2	44	12	0	57	87	65	0	44	56	7	0	17	51	36	0	478	5719
4:25 PM	4	46	14	0	71	78	68	0	44	72	7	0	16	27	36	0	483	5724
4:30 PM	5	62	19	0	65	79	63	0	49	62	4	0	7	32	25	0	472	5735
4:35 PM	2	58	11	0	66	118	60	0	49	55	7	0	7	32	41	0	506	5801
4:40 PM	6	54	17	0	63	70	64	0	61	64	4	0	15	35	35	0	488	5761
4:45 PM	3	59	14	0	68	102	69	0	68	61	7	0	12	26	46	0	535	5842
4:50 PM	4	51	16	0	59	97	58	0	55	58	6	0	10	45	31	0	490	5856
4:55 PM	5	67	9	0	56	112	63	0	47	56	10	0	14	33	24	0	496	5849
5:00 PM	5	52	13	0	88	81	62	0	48	65	8	0	6	35	27	0	490	5872
5:05 PM	0	67	17	0	55	59	78	0	78	61	4	0	7	34	29	0	489	5880
5:10 PM	2	57	8	0	76	102	67	0	62	63	6	0	9	30	50	0	532	5922
5:15 PM	4	56	18	0	74	91	48	0	57	61	3	0	10	41	48	0	511	5970
5:20 PM	3	64	12	0	68	95	68	0	45	51	7	0	4	33	36	0	486	5978
5:25 PM	0	66	10	0	75	103	71	0	51	39	2	0	10	32	30	0	489	5984
5:30 PM	3	48	12	0	70	84	44	0	50	54	10	0	6	30	33	0	444	5956
5:35 PM	1	70	8	0	64	102	72	0	56	49	8	0	11	29	32	0	502	5952
5:40 PM	6	36	14	0	76	73	55	0	62	70	2	0	11	40	44	0	489	5953
5:45 PM	3	59	20	0	66	97	53	0	52	65	2	0	15	33	19	0	484	5902
5:50 PM	4	71	15	0	56	93	57	0	35	53	5	0	6	28	27	0	450	5862
5:55 PM	6	45	11	0	61	70	51	0	47	54	5	0	11	30	24	0	415	5781

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	720	172	0	820	1008	772	0	788	740	52	0	104	420	508	0	6128
Heavy Trucks	0	36	4		24	60	20		0	8	0		4	12	12		180
Pedestrians		8				0				4				0			12
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/22/2017 3:28 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

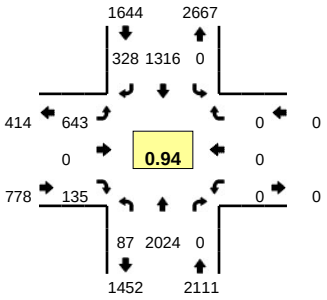
Method for determining peak hour: Total Entering Volume

LOCATION: Cascade Hwy -- Redland Rd

QC JOB #: 14414703

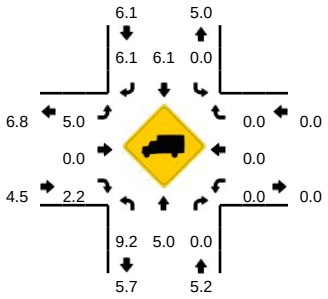
CITY/STATE: Oregon City, OR

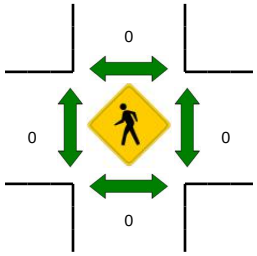
DATE: Tue, May 16 2017

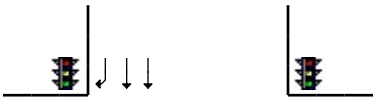


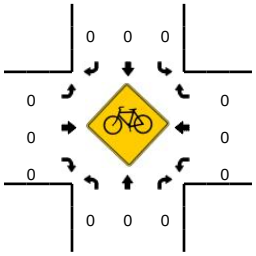
Peak-Hour: 7:00 AM -- 8:00 AM

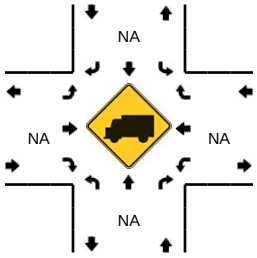
Peak 15-Min: 7:20 AM -- 7:35 AM

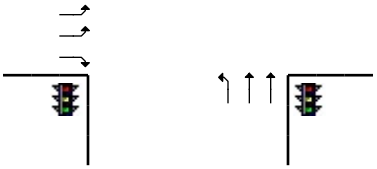


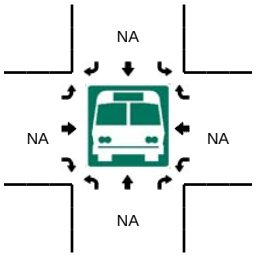












5-Min Count Period Beginning At	Cascade Hwy (Northbound)				Cascade Hwy (Southbound)				Redland Rd (Eastbound)				Redland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	5	163	0	0	0	77	32	0	52	0	8	0	0	0	0	0	337	
7:05 AM	0	162	0	0	0	86	18	0	64	0	11	0	0	0	0	0	341	
7:10 AM	10	197	0	0	0	103	25	0	50	0	8	0	0	0	0	0	393	
7:15 AM	9	182	0	0	0	90	33	0	39	0	8	0	0	0	0	0	361	
7:20 AM	8	160	0	0	0	104	29	0	70	0	22	0	0	0	0	0	393	
7:25 AM	4	192	0	1	0	110	29	0	57	0	12	0	0	0	0	0	405	
7:30 AM	12	176	0	0	0	113	27	0	62	0	12	0	0	0	0	0	402	
7:35 AM	1	168	0	0	0	112	26	0	47	0	13	0	0	0	0	0	367	
7:40 AM	12	156	0	0	0	108	21	0	59	0	8	0	0	0	0	0	364	
7:45 AM	5	151	0	0	0	100	27	0	57	0	6	0	0	0	0	0	346	
7:50 AM	5	169	0	0	0	144	25	0	47	0	14	0	0	0	0	0	404	
7:55 AM	15	148	0	0	0	169	36	0	39	0	13	0	0	0	0	0	420	4533
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4196
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3855
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3462
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3101
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2708
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2303
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1901
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1534
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1170
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	824
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	420
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	96	2112	0	4	0	1308	340	0	756	0	184	0	0	0	0	0	4800
Heavy Trucks	0	104	0		0	80	16		56	0	0		0	0	0		256
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/22/2017 3:28 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

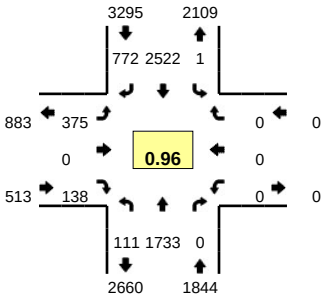
Method for determining peak hour: Total Entering Volume

LOCATION: Cascade Hwy -- Redland Rd

QC JOB #: 14414704

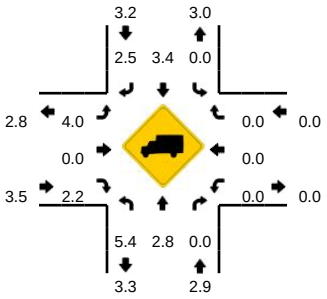
CITY/STATE: Oregon City, OR

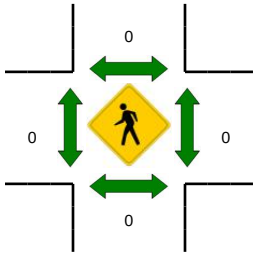
DATE: Tue, May 16 2017

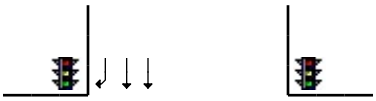


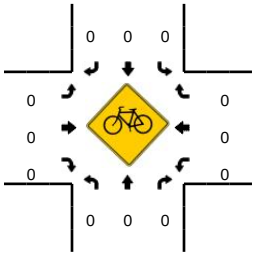
Peak-Hour: 4:35 PM -- 5:35 PM

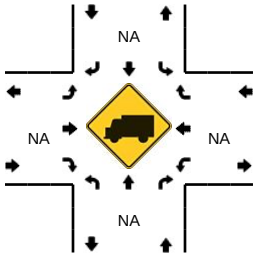
Peak 15-Min: 5:10 PM -- 5:25 PM

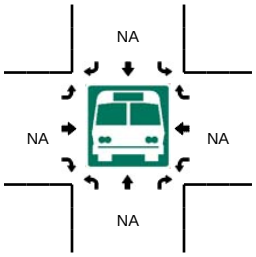












5-Min Count Period Beginning At	Cascade Hwy (Northbound)				Cascade Hwy (Southbound)				Redland Rd (Eastbound)				Redland Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	12	118	0	0	0	177	64	0	41	0	13	0	0	0	0	0	425	5212
4:05 PM	20	137	0	0	0	200	51	0	29	0	11	0	0	0	0	0	448	5260
4:10 PM	10	135	0	0	0	207	73	0	30	0	19	0	0	0	0	0	474	5307
4:15 PM	5	150	0	0	0	217	53	0	34	0	10	0	0	0	0	0	469	5378
4:20 PM	11	143	0	0	0	187	52	0	34	0	11	0	0	0	0	0	438	5412
4:25 PM	9	109	0	0	0	199	67	0	28	0	19	0	0	0	0	0	431	5377
4:30 PM	9	126	0	0	0	203	51	0	30	0	6	0	0	0	0	0	425	5415
4:35 PM	15	123	0	0	0	175	71	0	45	0	18	0	0	0	0	0	447	5360
4:40 PM	11	153	0	0	0	232	80	0	30	0	10	0	0	0	0	0	516	5431
4:45 PM	9	160	0	0	0	223	55	0	27	0	11	0	0	0	0	0	485	5444
4:50 PM	15	114	0	0	0	191	58	0	32	0	12	0	0	0	0	0	422	5406
4:55 PM	12	144	0	0	0	214	65	0	29	0	10	0	0	0	0	0	474	5454
5:00 PM	6	130	0	0	0	227	61	0	26	0	13	0	0	0	0	0	463	5492
5:05 PM	6	123	0	0	0	198	49	0	42	0	11	0	0	0	0	0	429	5473
5:10 PM	8	181	0	0	0	208	62	0	27	0	14	0	0	0	0	0	500	5499
5:15 PM	8	172	0	0	0	219	62	0	26	0	9	0	0	0	0	0	496	5526
5:20 PM	3	136	0	0	0	213	68	1	36	0	20	0	0	0	0	0	477	5565
5:25 PM	11	151	0	0	0	204	69	0	29	0	2	0	0	0	0	0	466	5600
5:30 PM	7	146	0	0	0	218	72	0	26	0	8	0	0	0	0	0	477	5652
5:35 PM	5	119	0	1	0	215	50	0	27	0	9	0	0	0	0	0	426	5631
5:40 PM	16	153	0	0	0	175	56	0	39	0	15	0	0	0	0	0	454	5569
5:45 PM	13	132	0	0	0	210	79	0	29	0	11	0	0	0	0	0	474	5558
5:50 PM	12	100	0	0	0	200	58	0	26	0	19	0	0	0	0	0	415	5551
5:55 PM	18	119	0	0	0	170	41	0	41	0	12	0	0	0	0	0	401	5478

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	76	1956	0	0	0	2560	768	4	356	0	172	0	0	0	0	0	5892
Heavy Trucks	0	52	0		0	84	20		8	0	0		0	0	0		164
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 5/22/2017 3:28 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

ATR CHARACTERISTIC TABLE (Printed: 9/30/2016)										
2015 SEASONAL TRAFFIC TREND	AREA TYPE	# OF LANES	WEEKLY TRAFFIC TREND	2016 AADT	OHP CLASSIFICATION	2015 ATR	COUNTY	HIGHWAY ROUTE, NAME, & LOCATION	MP	STATE HWY NUMBER
COM	URBANIZED	4	WEEKDAY	112800	STATEWIDE HWY	34-010	WASHINGTON	US26, 0.73 MILE EAST OF 185TH AVENUE OVERCROSSING	65.02	47
COM	URBANIZED	4	WEEKDAY	46200	STATEWIDE HWY	09-009	DESCHUTES	US97, THE DALLES-CALIFORNIA HIGHWAY, 0.23 MILE SOUTH OF REVERE AVENUE	137.36	4
COM	URBANIZED	4	WEEKDAY	35600	STATEWIDE HWY	03-018	CLACKAMAS	OR224, CLACKAMAS HIGHWAY, 0.13 MILE WEST OF JOHNSON ROAD	3.60	171
COM	URBANIZED	4	WEEKDAY	34200	STATEWIDE HWY	03-017	CLACKAMAS	OR212, CLACKAMAS HIGHWAY, 0.14 MILE WEST OF S.E.130TH AVENUE	6.80	171
COM	URBANIZED	4	WEEKDAY	33900	STATEWIDE HWY	34-009	WASHINGTON	OR8, TUALATIN VALLEY HIGHWAY, 0.28 MILE WEST OF N.W. 334TH AVENUE	14.84	29
COM	URBANIZED	4	WEEKDAY	32100	STATEWIDE HWY	26-003	MULTNOMAH	US26, MT. HOOD HIGHWAY, 0.18 MILE SOUTHEAST OF S.E. POWELL VALLEY ROAD	14.36	26
COM	URBANIZED	4	WEEKDAY	27000	STATEWIDE HWY	20-028	LANE	OR569, BELTLINE HIGHWAY, 0.42 MILE SOUTH OF BARGER DRIVE INTERCHANGE	5.20	69
SUM	URBANIZED	4	WEEKDAY	24300	STATEWIDE HWY	09-003	DESCHUTES	US97, THE DALLES-CALIFORNIA HIGHWAY, 0.17 MILE SOUTH OF CHINA HAT ROAD	142.41	4
COM	URBANIZED	4	WEEKDAY	24100	STATEWIDE HWY	30-008	UMATILLA	US395, PENDLETON-JOHN DAY HIGHWAY, 0.09 MILE SOUTH OF OLD OREGON TRAIL	1.77	28

03-017

	2015	2014	2013	2012	2011		
Jan	93	95	91	92	94	93	0.97
Feb	97	91	96	96	96	96	1.00
March	99	99	98	96	98	98	1.02
April	101	103	100	100	101	101	1.05
May	102	103	100	101	100	101	1.05
June	108	105	108	104	106	106	1.11
July	105	107	109	108	107	107	1.12
Aug	106	108	107	109	110	108	1.13
Sept	101	103	101	105	102	102	1.06
Oct	99	99	101	99	98	99	1.03
Nov	93	92	95	94	93	93	0.97
Dec	96	95	95	96	96	96	1.00

03-018

	2015	2014	2013	2012	2011			Avg	
Jan	97	94	96	95	96	96	0.95	94	0.96
Feb	103	91	102	100	99	100	1.00	98	1.00
March	103	100	102	98	102	101	1.01	100	1.02
April	104	104	105	103	103	104	1.03	102	1.04
May	102	102	103	102	101	102	1.02	102	1.03
June	105	105	105	103	103	104	1.04	105	1.07
July	99	101	99	100	99	99	0.99	103	1.05
Aug	101	103	101	102	102	102	1.01	105	1.07
Sept	99	103	98	102	99	100	1.00	101	1.03
Oct	101	104	100	101	101	101	1.01	100	1.02
Nov	93	96	95	96	96	96	0.95	95	0.96
Dec	93	98	94	96	98	96	0.96	96	0.98

2017 Count Data - Seasonally Adjusted - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00														
1:00														
2:00														
3:00														
4:00														
5:00														
6:00														
7:00	368	501	566	85	427	805	24	927	80	347	325	15	4,470	5
8:00														
9:00														
10:00														
11:00														
12:00														
13:00														
14:00	451	823	682	100	368	402	42	693	124	531	502	63	4,781	4
15:00	625	1,041	681	155	454	434	88	762	143	595	543	91	5,612	3
16:00	717	1,090	771	138	413	410	41	677	159	643	707	81	5,847	1
17:00	829	1,050	726	106	395	399	37	691	158	643	685	62	5,781	2
18:00														
19:00														
20:00														
21:00														
22:00														
23:00														
Total												AADT	65,693	
												Major	44,728	
												Minor	20,965	

2015 Base Model - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00	96	211	28	3	9	47		100	4	59	14		571	
1:00	70	159	15	2	6	23		50	3	40	11		379	
2:00	71	165	16	2	5	24		49	2	42	10		386	
3:00	45	95	54	3	16	99		203	2	31	7		555	
4:00	70	138	105	7	28	186		422	6	41	14		1,017	
5:00	180	346	245	18	79	454		941	15	100	39		2,417	16
6:00	344	502	435	43	171	757		1,325	38	132	96		3,843	8
7:00	551	599	491	46	196	781		1,305	46	178	216		4,409	3
8:00	607	624	466	41	187	674		1,134	38	217	214		4,202	5
9:00	607	596	354	32	176	625		977	25	244	190		3,826	9
10:00	619	621	314	27	118	504		859	24	277	188		3,551	12
11:00	475	715	328	28	112	473		814	27	345	119		3,436	13
12:00	555	778	349	29	137	524		790	26	375	141		3,704	10
13:00	475	800	356	32	136	516		827	28	362	105		3,637	11
14:00	583	918	311	35	166	568		823	34	392	175		4,005	6
15:00	635	997	299	40	185	583		834	42	429	215		4,259	4
16:00	709	1,072	271	45	184	578		833	45	465	250		4,452	2
17:00	783	1,119	229	47	203	625		780	46	448	239		4,519	1
18:00	610	1,008	255	38	142	504		815	37	366	173		3,948	7
19:00	483	779	171	23	116	418		520	25	252	111		2,898	14
20:00	412	703	109	17	121	392		358	20	194	103		2,429	15
21:00	335	661	87	14	123	380		259	17	178	73		2,127	
22:00	237	478	68	10	31	119		222	12	130	47		1,354	
23:00	182	398	41	6	16	72		142	7	102	31		997	
Total	9,734	14,482	5,397	588	2,663	9,926	0	15,382	569	5,399	2,781	0	66,921	
		29,613			13,177			15,951			8,180			
								68%			32%			

2040 Model - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00	123	234	32	4	24	107		125	5	69	28		751	
1:00	85	177	17	3	16	61		66	4	47	20		496	
2:00	86	183	19	3	16	67		66	4	50	18		512	
3:00	106	118	64	4	30	130		225	3	35	22		737	
4:00	185	176	123	10	49	224		463	8	46	43		1,327	
5:00	435	415	284	27	141	572		1,092	21	112	110		3,209	15
6:00	779	581	507	52	344	1,005		1,477	46	169	251		5,211	7
7:00	1,052	694	585	59	384	1,099		1,431	43	193	397		5,937	2
8:00	1,036	714	513	54	320	982		1,273	45	256	410		5,603	5
9:00	883	684	407	44	301	892		1,064	37	319	373		5,004	9
10:00	863	705	367	40	257	790		921	34	322	366		4,665	12
11:00	709	807	372	41	255	763		922	39	391	272		4,571	13
12:00	835	844	392	45	302	853		903	38	431	297		4,940	10
13:00	801	879	396	61	324	818		942	41	413	258		4,933	11
14:00	929	969	377	67	355	905		926	49	429	303		5,309	6
15:00	933	1,138	311	66	369	985		932	64	463	347		5,608	4
16:00	961	1,248	293	55	369	1,055		927	67	501	410		5,886	3
17:00	1,000	1,321	276	49	360	1,077		881	63	512	424		5,963	1
18:00	834	1,108	283	59	304	821		923	52	407	282		5,073	8
19:00	636	852	196	33	246	654		621	36	292	219		3,785	14
20:00	521	780	122	24	231	590		432	29	223	182		3,134	16
21:00	417	724	99	19	195	576		320	25	206	130		2,711	
22:00	306	541	78	14	70	237		270	17	150	87		1,770	
23:00	223	438	46	9	43	175		179	11	119	55		1,298	
Total	14,738	16,330	6,159	842	5,305	15,438	0	17,381	781	6,155	5,304	0	88,433	
		37,227			21,585			18,162			11,459			
								63%			37%			

2040 Post-Processed - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															Should this
5:00															
6:00															
7:00	742	581	658	102	688	1,097	32	1,026	76	367	526	20	5,916	5	80%
8:00															
9:00															
10:00															
11:00															
12:00															
13:00															
14:00	728	867	778	154	632	662	56	780	138	571	720	84	6,169	4	84%
15:00	892	1,173	699	179	731	749	116	848	163	632	750	120	7,053	3	96%
16:00	947	1,252	810	147	675	775	54	755	179	682	979	107	7,363	1	100%
17:00	1,032	1,229	769	109	600	732	49	778	174	714	1,000	82	7,268	2	99%
18:00															
19:00															
20:00															
21:00															
22:00															
23:00															
Total												AADT	82,592		
												Major	51,731		
												Minor	30,861		

2017 Count Data - Seasonally Adjusted - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	
0:00														
1:00														
2:00														
3:00														
4:00														
5:00														
6:00														
7:00		1,316	328				87	2,024		643		135	4,533	4
8:00														
9:00														
10:00														
11:00														
12:00														
13:00														
14:00		1,864	532				94	1,499		380		131	4,500	5
15:00		2,233	666				135	1,692		357		142	5,225	3
16:00		2,425	740				138	1,612		389		150	5,454	2
17:00		2,457	727				113	1,662		374		143	5,476	1
18:00														
19:00														
20:00														
21:00														
22:00														
23:00														
Total												AADT	61,977	
												Major	55,313	
												Minor	6,665	

2015 Base Model - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00		324	77				13	193		48		12	667	
1:00		234	56				8	105		27		9	439	
2:00		244	55				8	106		28		8	449	
3:00		190	39				20	313		62		5	629	
4:00		304	63				45	604		127		9	1,152	
5:00		748	162				97	1,399		222		22	2,650	15
6:00		1,199	259				125	2,088		618		82	4,371	6
7:00		1,579	212				154	2,110		674		62	4,791	3
8:00		1,651	195				150	1,875		623		46	4,540	5
9:00		1,499	210				102	1,745		356		58	3,970	10
10:00		1,494	207				103	1,536		299		60	3,699	13
11:00		1,465	271				114	1,519		312		54	3,735	12
12:00		1,612	265				122	1,567		308		70	3,944	11
13:00		1,568	313				120	1,585		329		64	3,979	9
14:00		1,746	356				97	1,687		332		65	4,283	7
15:00		1,850	462				152	1,694		415		81	4,654	4
16:00		1,972	472				171	1,704		443		81	4,843	2
17:00		2,050	493				168	1,685		411		80	4,887	1
18:00		1,798	371				108	1,576		352		74	4,279	8
19:00		1,382	307				119	1,072		221		51	3,152	14
20:00		1,180	309				93	851		157		44	2,634	16
21:00		1,034	279				81	736		131		49	2,310	
22:00		749	195				40	431		111		34	1,560	
23:00		598	146				22	294		77		23	1,160	
Total	0	28,470	5,774	0	0	0	2,232	28,475	0	6,683	0	1,143	72,777	
		34,244			0			30,707			7,826			
								89%			11%			

2040 Model - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00		369	91				22	279		66		20	847	
1:00		264	67				13	161		39		15	559	
2:00		273	66				14	170		41		14	578	
3:00		278	48				31	359		80		10	806	
4:00		468	81				68	665		164		17	1,463	
5:00		1,091	199				121	1,655		332		44	3,442	15
6:00		1,723	176				204	2,447		560		144	5,254	7
7:00		2,138	202				268	2,455		597		193	5,853	3
8:00		2,108	211				280	2,232		601		156	5,588	5
9:00		1,832	233				220	2,056		491		142	4,974	10
10:00		1,806	207				240	1,793		400		130	4,576	13
11:00		1,753	305				240	1,836		394		135	4,663	12
12:00		1,917	311				258	1,929		387		154	4,956	11
13:00		1,924	364				265	1,908		400		152	5,013	9
14:00		2,063	392				290	1,970		437		212	5,364	6
15:00		2,125	455				259	2,121		430		256	5,646	4
16:00		2,244	482				253	2,231		431		258	5,899	2
17:00		2,374	493				255	2,215		421		223	5,981	1
18:00		2,054	437				257	1,893		421		172	5,234	8
19:00		1,576	311				172	1,395		228		108	3,790	14
20:00		1,330	301				131	1,114		162		93	3,131	16
21:00		1,157	319				111	992		138		83	2,800	
22:00		866	232				63	594		139		58	1,952	
23:00		668	173				35	439		102		39	1,456	
Total	0	34,401	6,156	0	0	0	4,070	34,909	0	7,461	0	2,828	89,825	
		40,557			0			38,979			10,289			
								89%			11%			

2040 Post-Processed - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total		
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00															
6:00															
7:00		1,782	316				167	2,333		573		307	5,479	5	80%
8:00															
9:00															
10:00															
11:00															
12:00															
13:00															
14:00		2,163	573				257	1,743		482		314	5,533	4	84%
15:00		2,510	658				226	2,081		370		343	6,188	3	96%
16:00		2,702	752				205	2,078		379		360	6,476	2	100%
17:00		2,782	727				179	2,140		383		312	6,523	1	99%
18:00															
19:00															
20:00															
21:00															
22:00															
23:00															
Total												AADT	73,588		
												Major	65,159		
												Minor	8,429		

2040 Balanced - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
6:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
7:00	762	597	676	102	688	1,100	32	1,028	76	368	526	20	5,975	#DIV/0!	80%
8:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
9:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
10:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
11:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
12:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
13:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
14:00	744	886	795	154	632	660	56	778	138	569	720	84	6,216	#DIV/0!	84%
15:00	907	1,192	710	179	731	762	116	863	163	643	750	120	7,136	#DIV/0!	96%
16:00	955	1,263	817	147	675	788	54	767	179	693	979	107	7,424	#DIV/0!	100%
17:00	1,043	1,242	777	109	600	748	49	795	174	729	1,000	82	7,347	#DIV/0!	99%
18:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
19:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
20:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
21:00															
22:00															
23:00															
Total												AADT	84,363		
												Major	52,840		
												Minor	31,523		

2035 - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
7:00	664	564	639	98	634	1,036	30	1,005	77	363	484	19	5,614	5	81%
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
14:00	670	858	758	143	577	608	53	762	135	563	675	80	5,880	4	85%
15:00	836	1,145	695	174	673	684	110	830	159	624	707	114	6,752	3	97%
16:00	899	1,218	802	145	620	699	51	739	175	674	922	102	7,047	1	101%
17:00	990	1,192	760	108	557	663	47	760	170	699	934	78	6,958	2	100%
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
21:00															
22:00															
23:00															
Total												AADT	79,071		
												Major	49,526		
												Minor	29,546		

2035 Balanced - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
6:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
7:00	679	577	653	98	634	1,039	30	1,008	77	364	484	19	5,662	#DIV/0!	80%
8:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
9:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
10:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
11:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
12:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
13:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
14:00	697	892	788	143	577	588	53	737	135	545	675	80	5,909	#DIV/0!	83%
15:00	861	1,179	715	174	673	674	110	818	159	615	707	114	6,799	#DIV/0!	96%
16:00	905	1,226	807	145	620	708	51	748	175	683	922	102	7,093	#DIV/0!	100%
17:00	997	1,201	766	108	557	675	47	774	170	712	934	78	7,019	#DIV/0!	99%
18:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
19:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
20:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
21:00															
22:00															
23:00															
Total												AADT	80,597		
												Major	50,481		
												Minor	30,116		

2040 Balanced - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
6:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
7:00		1,736	319				167	2,328		589		300	5,438	#DIV/0!	80%
8:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
9:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
10:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
11:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
12:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
13:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
14:00		2,118	628				258	1,749		319		307	5,379	#DIV/0!	84%
15:00		2,471	718				222	2,047		365		337	6,143	#DIV/0!	96%
16:00		2,679	749				202	2,045		381		357	6,413	#DIV/0!	100%
17:00		2,754	727				175	2,096		381		308	6,441	#DIV/0!	99%
18:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
19:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
20:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
21:00															
22:00															
23:00															
Total												AADT	73,192		
												Major	64,808		
												Minor	8,384		

2035 - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
6:00		0	0				0	0		0		0	0	#DIV/0!	0%
7:00		1,680	319				150	2,266		589		270	5,273	#DIV/0!	81%
8:00		0	0				0	0		0		0	0	#DIV/0!	0%
9:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
10:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
11:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
12:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
13:00		0	0				0	0		0		0	0	#DIV/0!	0%
14:00		2,205	625				159	1,650		318		262	5,218	#DIV/0!	85%
15:00		2,532	718				183	1,894		365		301	5,992	#DIV/0!	97%
16:00		2,642	749				190	1,977		381		314	6,254	#DIV/0!	101%
17:00		2,712	727				165	2,036		381		275	6,295	#DIV/0!	100%
18:00		0	0				0	0		0		0	0	#DIV/0!	0%
19:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
20:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
21:00															
22:00															
23:00															
Total												AADT	71,539		
												Major	63,345		
												Minor	8,194		

2035 Balanced - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
6:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
7:00		1,645	319				150	2,260		589		264	5,226	#DIV/0!	81%
8:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
9:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
10:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
11:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
12:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
13:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
14:00		2,124	625				164	1,707		318		253	5,191	#DIV/0!	85%
15:00		2,462	718				185	1,921		365		293	5,949	#DIV/0!	97%
16:00		2,625	749				188	1,953		381		312	6,208	#DIV/0!	101%
17:00		2,691	727				162	2,000		381		273	6,234	#DIV/0!	100%
18:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
19:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
20:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
21:00															
22:00															
23:00															
Total												AADT	70,839		
												Major	62,725		
												Minor	8,114		

2017 Count Data - Seasonally Adjusted - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00														
1:00														
2:00														
3:00														
4:00														
5:00														
6:00														
7:00	381	519	586	88	442	833	25	959	83	359	336	16	4,626	5
8:00														
9:00														
10:00														
11:00														
12:00														
13:00														
14:00	467	852	706	104	381	416	43	717	128	550	520	65	4,948	4
15:00	647	1,077	705	160	470	449	91	789	148	616	562	94	5,808	3
16:00	742	1,128	798	143	427	424	42	701	165	666	732	84	6,052	1
17:00	858	1,087	751	110	409	413	38	715	164	666	709	64	5,983	2
18:00														
19:00														
20:00														
21:00														
22:00														
23:00														
Total												AADT	67,992	
												Major	46,294	
												Minor	21,699	

2015 Base Model - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00	96	211	28	3	9	47		100	4	59	14		571	
1:00	70	159	15	2	6	23		50	3	40	11		379	
2:00	71	165	16	2	5	24		49	2	42	10		386	
3:00	45	95	54	3	16	99		203	2	31	7		555	
4:00	70	138	105	7	28	186		422	6	41	14		1,017	
5:00	180	346	245	18	79	454		941	15	100	39		2,417	16
6:00	344	502	435	43	171	757		1,325	38	132	96		3,843	8
7:00	551	599	491	46	196	781		1,305	46	178	216		4,409	3
8:00	607	624	466	41	187	674		1,134	38	217	214		4,202	5
9:00	607	596	354	32	176	625		977	25	244	190		3,826	9
10:00	619	621	314	27	118	504		859	24	277	188		3,551	12
11:00	475	715	328	28	112	473		814	27	345	119		3,436	13
12:00	555	778	349	29	137	524		790	26	375	141		3,704	10
13:00	475	800	356	32	136	516		827	28	362	105		3,637	11
14:00	583	918	311	35	166	568		823	34	392	175		4,005	6
15:00	635	997	299	40	185	583		834	42	429	215		4,259	4
16:00	709	1,072	271	45	184	578		833	45	465	250		4,452	2
17:00	783	1,119	229	47	203	625		780	46	448	239		4,519	1
18:00	610	1,008	255	38	142	504		815	37	366	173		3,948	7
19:00	483	779	171	23	116	418		520	25	252	111		2,898	14
20:00	412	703	109	17	121	392		358	20	194	103		2,429	15
21:00	335	661	87	14	123	380		259	17	178	73		2,127	
22:00	237	478	68	10	31	119		222	12	130	47		1,354	
23:00	182	398	41	6	16	72		142	7	102	31		997	
Total	9,734	14,482	5,397	588	2,663	9,926	0	15,382	569	5,399	2,781	0	66,921	
		29,613			13,177			15,951			8,180			
								68%			32%			

2040 Model - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00	123	234	32	4	24	107		125	5	69	28		751	
1:00	85	177	17	3	16	61		66	4	47	20		496	
2:00	86	183	19	3	16	67		66	4	50	18		512	
3:00	106	118	64	4	30	130		225	3	35	22		737	
4:00	185	176	123	10	49	224		463	8	46	43		1,327	
5:00	435	415	284	27	141	572		1,092	21	112	110		3,209	15
6:00	779	581	507	52	344	1,005		1,477	46	169	251		5,211	7
7:00	1,052	694	585	59	384	1,099		1,431	43	193	397		5,937	2
8:00	1,036	714	513	54	320	982		1,273	45	256	410		5,603	5
9:00	883	684	407	44	301	892		1,064	37	319	373		5,004	9
10:00	863	705	367	40	257	790		921	34	322	366		4,665	12
11:00	709	807	372	41	255	763		922	39	391	272		4,571	13
12:00	835	844	392	45	302	853		903	38	431	297		4,940	10
13:00	801	879	396	61	324	818		942	41	413	258		4,933	11
14:00	929	969	377	67	355	905		926	49	429	303		5,309	6
15:00	933	1,138	311	66	369	985		932	64	463	347		5,608	4
16:00	961	1,248	293	55	369	1,055		927	67	501	410		5,886	3
17:00	1,000	1,321	276	49	360	1,077		881	63	512	424		5,963	1
18:00	834	1,108	283	59	304	821		923	52	407	282		5,073	8
19:00	636	852	196	33	246	654		621	36	292	219		3,785	14
20:00	521	780	122	24	231	590		432	29	223	182		3,134	16
21:00	417	724	99	19	195	576		320	25	206	130		2,711	
22:00	306	541	78	14	70	237		270	17	150	87		1,770	
23:00	223	438	46	9	43	175		179	11	119	55		1,298	
Total	14,738	16,330	6,159	842	5,305	15,438	0	17,381	781	6,155	5,304	0	88,433	
		37,227			21,585			18,162			11,459			
								63%			37%			

2040 Post-Processed - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00															
6:00															
7:00	760	600	680	105	710	1,131	33	1,060	79	380	541	21	6,098	5	80%
8:00															
9:00															
10:00															
11:00															
12:00															
13:00															
14:00	748	897	804	159	651	679	58	806	142	590	744	86	6,363	4	84%
15:00	919	1,212	723	184	754	769	120	876	168	654	774	124	7,277	3	96%
16:00	976	1,293	838	152	696	795	56	780	185	706	1,010	111	7,597	1	100%
17:00	1,065	1,269	795	113	618	751	51	804	179	738	1,032	85	7,499	2	99%
18:00															
19:00															
20:00															
21:00															
22:00															
23:00															
Total												AADT	85,212		
												Major	53,371		
												Minor	31,840		

2017 Count Data - Seasonally Adjusted - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	
0:00														
1:00														
2:00														
3:00														
4:00														
5:00														
6:00														
7:00		1,362	339				90	2,095		666		140	4,692	4
8:00														
9:00														
10:00														
11:00														
12:00														
13:00														
14:00		1,929	551				97	1,551		393		136	4,658	5
15:00		2,311	689				140	1,751		369		147	5,408	3
16:00		2,510	766				143	1,668		403		155	5,645	2
17:00		2,543	752				117	1,720		387		148	5,668	1
18:00														
19:00														
20:00														
21:00														
22:00														
23:00														
Total												AADT	64,146	
												Major	57,249	
												Minor	6,898	

2015 Base Model - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00		324	77				13	193		48		12	667	
1:00		234	56				8	105		27		9	439	
2:00		244	55				8	106		28		8	449	
3:00		190	39				20	313		62		5	629	
4:00		304	63				45	604		127		9	1,152	
5:00		748	162				97	1,399		222		22	2,650	15
6:00		1,199	259				125	2,088		618		82	4,371	6
7:00		1,579	212				154	2,110		674		62	4,791	3
8:00		1,651	195				150	1,875		623		46	4,540	5
9:00		1,499	210				102	1,745		356		58	3,970	10
10:00		1,494	207				103	1,536		299		60	3,699	13
11:00		1,465	271				114	1,519		312		54	3,735	12
12:00		1,612	265				122	1,567		308		70	3,944	11
13:00		1,568	313				120	1,585		329		64	3,979	9
14:00		1,746	356				97	1,687		332		65	4,283	7
15:00		1,850	462				152	1,694		415		81	4,654	4
16:00		1,972	472				171	1,704		443		81	4,843	2
17:00		2,050	493				168	1,685		411		80	4,887	1
18:00		1,798	371				108	1,576		352		74	4,279	8
19:00		1,382	307				119	1,072		221		51	3,152	14
20:00		1,180	309				93	851		157		44	2,634	16
21:00		1,034	279				81	736		131		49	2,310	
22:00		749	195				40	431		111		34	1,560	
23:00		598	146				22	294		77		23	1,160	
Total	0	28,470	5,774	0	0	0	2,232	28,475	0	6,683	0	1,143	72,777	
		34,244			0			30,707			7,826			
								89%			11%			

2040 Model - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank
0:00		369	91				22	279		66		20	847	
1:00		264	67				13	161		39		15	559	
2:00		273	66				14	170		41		14	578	
3:00		278	48				31	359		80		10	806	
4:00		468	81				68	665		164		17	1,463	
5:00		1,091	199				121	1,655		332		44	3,442	15
6:00		1,723	176				204	2,447		560		144	5,254	7
7:00		2,138	202				268	2,455		597		193	5,853	3
8:00		2,108	211				280	2,232		601		156	5,588	5
9:00		1,832	233				220	2,056		491		142	4,974	10
10:00		1,806	207				240	1,793		400		130	4,576	13
11:00		1,753	305				240	1,836		394		135	4,663	12
12:00		1,917	311				258	1,929		387		154	4,956	11
13:00		1,924	364				265	1,908		400		152	5,013	9
14:00		2,063	392				290	1,970		437		212	5,364	6
15:00		2,125	455				259	2,121		430		256	5,646	4
16:00		2,244	482				253	2,231		431		258	5,899	2
17:00		2,374	493				255	2,215		421		223	5,981	1
18:00		2,054	437				257	1,893		421		172	5,234	8
19:00		1,576	311				172	1,395		228		108	3,790	14
20:00		1,330	301				131	1,114		162		93	3,131	16
21:00		1,157	319				111	992		138		83	2,800	
22:00		866	232				63	594		139		58	1,952	
23:00		668	173				35	439		102		39	1,456	
Total	0	34,401	6,156	0	0	0	4,070	34,909	0	7,461	0	2,828	89,825	
		40,557			0			38,979			10,289			
								89%			11%			

2040 Post-Processed - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total		
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00															
6:00															
7:00		1,835	327				171	2,409		595		316	5,654	5	80%
8:00															
9:00															
10:00															
11:00															
12:00															
13:00															
14:00		2,234	593				263	1,800		497		323	5,709	4	84%
15:00		2,594	681				232	2,147		383		352	6,388	3	96%
16:00		2,793	778				211	2,142		392		370	6,685	2	100%
17:00		2,875	752				184	2,207		396		320	6,734	1	99%
18:00															
19:00															
20:00															
21:00															
22:00															
23:00															
Total												AADT	75,970		
												Major	67,268		
												Minor	8,702		

2040 Balanced - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
6:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
7:00	781	616	698	105	710	1,133	33	1,062	79	381	541	21	6,160	#DIV/0!	80%
8:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
9:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
10:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
11:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
12:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
13:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
14:00	764	917	822	159	651	677	58	803	142	588	744	86	6,410	#DIV/0!	84%
15:00	933	1,231	735	184	754	782	120	891	168	665	774	124	7,361	#DIV/0!	96%
16:00	985	1,305	845	152	696	808	56	792	185	717	1,010	111	7,662	#DIV/0!	100%
17:00	1,076	1,282	803	113	618	767	51	821	179	754	1,032	85	7,581	#DIV/0!	99%
18:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
19:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
20:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
21:00															
22:00															
23:00															
Total												AADT	87,064		
												Major	54,532		
												Minor	32,533		

2035 - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
7:00	681	583	660	102	654	1,069	31	1,039	80	376	498	20	5,792	5	81%
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
14:00	689	888	784	147	594	625	55	787	139	582	697	82	6,068	4	84%
15:00	862	1,184	719	179	695	702	114	858	164	646	730	118	6,971	3	97%
16:00	927	1,259	829	150	640	718	53	763	181	697	952	105	7,275	1	101%
17:00	1,022	1,231	786	112	574	680	48	785	176	723	965	81	7,183	2	100%
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0%
21:00															
22:00															
23:00															
Total												AADT	81,624		
												Major	51,124		
												Minor	30,500		

2035 Balanced - OR213/Beavercreek Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															
5:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
6:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
7:00	696	596	675	102	654	1,071	31	1,041	80	376	498	20	5,840	#DIV/0!	80%
8:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
9:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
10:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
11:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
12:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
13:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
14:00	716	923	815	147	594	604	55	762	139	563	697	82	6,098	#DIV/0!	83%
15:00	887	1,218	740	179	695	692	114	845	164	636	730	118	7,018	#DIV/0!	96%
16:00	933	1,267	835	150	640	727	53	773	181	706	952	105	7,322	#DIV/0!	100%
17:00	1,030	1,240	792	112	574	693	48	800	176	736	965	81	7,247	#DIV/0!	99%
18:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
19:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
20:00	#DIV/0!	#DIV/0!	#DIV/0!	0	0	#DIV/0!	0	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	#DIV/0!
21:00															
22:00															
23:00															
Total												AADT	83,206		
												Major	52,115		
												Minor	31,091		

2040 Balanced - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
6:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
7:00		1,787	330				171	2,404		610		308	5,610	#DIV/0!	80%
8:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
9:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
10:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
11:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
12:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
13:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
14:00		2,187	649				264	1,805		330		316	5,552	#DIV/0!	84%
15:00		2,553	743				228	2,112		378		346	6,341	#DIV/0!	96%
16:00		2,768	775				208	2,108		394		366	6,620	#DIV/0!	100%
17:00		2,845	752				180	2,161		394		317	6,650	#DIV/0!	99%
18:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
19:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
20:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
21:00															
22:00															
23:00															
Total												AADT	75,563		
												Major	66,907		
												Minor	8,655		

2035 - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
6:00		0	0				0	0		0		0	0	#DIV/0!	0%
7:00		1,732	330				154	2,341		610		278	5,445	#DIV/0!	81%
8:00		0	0				0	0		0		0	0	#DIV/0!	0%
9:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
10:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
11:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
12:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
13:00		0	0				0	0		0		0	0	#DIV/0!	0%
14:00		2,278	647				164	1,701		329		269	5,388	#DIV/0!	84%
15:00		2,617	743				188	1,954		378		309	6,189	#DIV/0!	97%
16:00		2,731	775				196	2,039		394		323	6,459	#DIV/0!	101%
17:00		2,803	752				169	2,101		394		283	6,502	#DIV/0!	100%
18:00		0	0				0	0		0		0	0	#DIV/0!	0%
19:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
20:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
21:00															
22:00															
23:00															
Total												AADT	73,887		
												Major	65,423		
												Minor	8,463		

2035 Balanced - OR213/Redland Road

Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
6:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
7:00		1,695	330				153	2,334		610		272	5,394	#DIV/0!	81%
8:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
9:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
10:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
11:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
12:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
13:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
14:00		2,194	647				169	1,761		329		259	5,359	#DIV/0!	84%
15:00		2,545	743				191	1,982		378		301	6,144	#DIV/0!	97%
16:00		2,714	775				194	2,014		394		321	6,413	#DIV/0!	101%
17:00		2,781	752				166	2,063		394		281	6,438	#DIV/0!	100%
18:00		#DIV/0!	0				#DIV/0!	#DIV/0!		0		#DIV/0!	#DIV/0!	#DIV/0!	0%
19:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
20:00		#DIV/0!	#DIV/0!				#DIV/0!	#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!	0%
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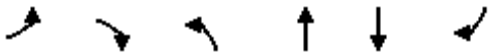
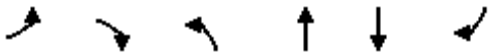


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	595	316	171	2409	1835	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	595	316	171	2409	1835	327
RTOR Reduction (vph)	0	10	0	0	0	37
Lane Group Flow (vph)	595	306	171	2409	1835	290
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	29.1	46.4	17.3	110.5	88.7	117.8
Effective Green, g (s)	29.1	46.4	17.3	110.5	88.7	117.8
Actuated g/C Ratio	0.20	0.31	0.12	0.74	0.60	0.79
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	665	537	206	2631	2112	1302
v/s Ratio Prot	c0.18	0.07	0.10	c0.68	0.52	0.04
v/s Ratio Perm		0.13				0.14
v/c Ratio	0.89	0.57	0.83	0.92	0.87	0.22
Uniform Delay, d1	58.3	42.7	64.2	15.3	25.1	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.5	1.4	23.7	6.4	5.2	0.1
Delay (s)	72.8	44.1	87.9	21.7	30.3	4.0
Level of Service	E	D	F	C	C	A
Approach Delay (s)	62.8			26.1	26.3	
Approach LOS	E			C	C	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	148.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

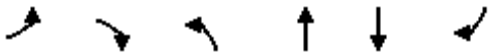
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	573	307	167	2333	1782	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	573	307	167	2333	1782	316
RTOR Reduction (vph)	0	11	0	0	0	42
Lane Group Flow (vph)	573	296	167	2333	1782	274
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	28.6	46.1	17.5	110.5	88.5	117.1
Effective Green, g (s)	28.6	46.1	17.5	110.5	88.5	117.1
Actuated g/C Ratio	0.19	0.31	0.12	0.75	0.60	0.79
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	656	535	209	2640	2114	1299
v/s Ratio Prot	c0.17	0.07	0.09	c0.66	0.50	0.04
v/s Ratio Perm		0.12				0.13
v/c Ratio	0.87	0.55	0.80	0.88	0.84	0.21
Uniform Delay, d1	58.0	42.4	63.6	14.0	24.2	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.3	1.2	18.9	4.8	4.3	0.1
Delay (s)	70.3	43.7	82.5	18.8	28.5	4.0
Level of Service	E	D	F	B	C	A
Approach Delay (s)	61.0			23.0	24.8	
Approach LOS	E			C	C	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	148.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		

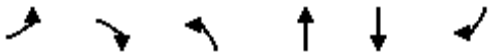
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	497	323	263	1800	2234	593
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	497	323	263	1800	2234	593
RTOR Reduction (vph)	0	5	0	0	0	24
Lane Group Flow (vph)	497	318	263	1800	2234	569
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	22.1	44.2	22.1	118.9	92.3	114.4
Effective Green, g (s)	22.1	44.2	22.1	118.9	92.3	114.4
Actuated g/C Ratio	0.15	0.29	0.15	0.79	0.62	0.76
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	500	509	260	2805	2177	1254
v/s Ratio Prot	c0.15	0.09	c0.15	0.51	c0.63	0.07
v/s Ratio Perm		0.11				0.29
v/c Ratio	0.99	0.62	1.01	0.64	1.03	0.45
Uniform Delay, d1	63.9	45.7	63.9	6.6	28.9	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	38.5	2.4	58.8	1.1	26.3	0.3
Delay (s)	102.4	48.1	122.7	7.7	55.1	6.7
Level of Service	F	D	F	A	E	A
Approach Delay (s)	81.0			22.4	45.0	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	101.8%	ICU Level of Service	G
Analysis Period (min)	15		

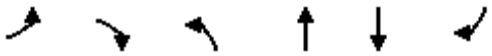
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	482	314	257	1743	2163	573
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	482	314	257	1743	2163	573
RTOR Reduction (vph)	0	6	0	0	0	24
Lane Group Flow (vph)	482	308	257	1743	2163	549
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	21.5	43.2	21.7	119.5	93.3	114.8
Effective Green, g (s)	21.5	43.2	21.7	119.5	93.3	114.8
Actuated g/C Ratio	0.14	0.29	0.14	0.80	0.62	0.77
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	487	498	256	2819	2201	1259
v/s Ratio Prot	c0.14	0.09	c0.15	0.49	c0.61	0.06
v/s Ratio Perm		0.11				0.28
v/c Ratio	0.99	0.62	1.00	0.62	0.98	0.44
Uniform Delay, d1	64.1	46.2	64.2	6.1	27.6	6.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.7	2.3	57.2	1.0	15.5	0.2
Delay (s)	101.8	48.5	121.4	7.1	43.1	6.4
Level of Service	F	D	F	A	D	A
Approach Delay (s)	80.8			21.8	35.4	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	99.0%	ICU Level of Service	F
Analysis Period (min)	15		

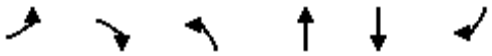
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	383	352	232	2147	2594	681
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	383	352	232	2147	2594	681
RTOR Reduction (vph)	0	4	0	0	0	19
Lane Group Flow (vph)	383	348	232	2147	2594	662
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	16.9	35.5	18.6	124.1	101.0	117.9
Effective Green, g (s)	16.9	35.5	18.6	124.1	101.0	117.9
Actuated g/C Ratio	0.11	0.24	0.12	0.83	0.67	0.79
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	383	418	219	2927	2382	1291
v/s Ratio Prot	c0.11	0.10	c0.13	0.61	c0.73	0.06
v/s Ratio Perm		0.12				0.36
v/c Ratio	1.00	0.83	1.06	0.73	1.09	0.51
Uniform Delay, d1	66.5	54.4	65.7	5.7	24.5	5.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	46.0	13.3	77.4	1.7	47.8	0.3
Delay (s)	112.5	67.7	143.1	7.4	72.3	6.1
Level of Service	F	E	F	A	E	A
Approach Delay (s)	91.1			20.6	58.5	
Approach LOS	F			C	E	

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	106.7%	ICU Level of Service	G
Analysis Period (min)	15		

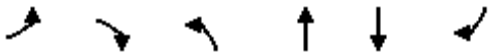
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	370	343	226	2081	2510	658
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	370	343	226	2081	2510	658
RTOR Reduction (vph)	0	5	0	0	0	20
Lane Group Flow (vph)	370	338	226	2081	2510	638
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	16.6	35.1	18.5	124.4	101.4	118.0
Effective Green, g (s)	16.6	35.1	18.5	124.4	101.4	118.0
Actuated g/C Ratio	0.11	0.23	0.12	0.83	0.68	0.79
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	376	413	218	2935	2392	1292
v/s Ratio Prot	c0.11	0.10	c0.13	0.59	c0.71	0.05
v/s Ratio Perm		0.11				0.35
v/c Ratio	0.98	0.82	1.04	0.71	1.05	0.49
Uniform Delay, d1	66.6	54.4	65.8	5.3	24.3	5.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	41.9	12.0	70.9	1.5	33.0	0.3
Delay (s)	108.4	66.4	136.6	6.8	57.3	5.9
Level of Service	F	E	F	A	E	A
Approach Delay (s)	88.2			19.5	46.6	
Approach LOS	F			B	D	

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		

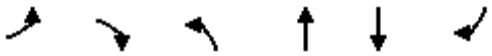
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	392	370	211	2142	2793	778
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	392	370	211	2142	2793	778
RTOR Reduction (vph)	0	3	0	0	0	14
Lane Group Flow (vph)	392	367	211	2142	2793	764
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	15.5	31.0	15.5	125.5	105.5	121.0
Effective Green, g (s)	15.5	31.0	15.5	125.5	105.5	121.0
Actuated g/C Ratio	0.10	0.21	0.10	0.84	0.70	0.81
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	351	371	182	2960	2489	1324
v/s Ratio Prot	0.12	c0.10	c0.12	0.61	c0.79	0.06
v/s Ratio Perm		0.13				0.42
v/c Ratio	1.12	0.99	1.16	0.72	1.12	0.58
Uniform Delay, d1	67.2	59.3	67.2	5.1	22.2	5.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	83.4	43.3	116.1	1.6	61.0	0.6
Delay (s)	150.7	102.6	183.4	6.6	83.2	5.9
Level of Service	F	F	F	A	F	A
Approach Delay (s)	127.3			22.5	66.4	
Approach LOS	F			C	E	

Intersection Summary			
HCM 2000 Control Delay	57.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	111.3%	ICU Level of Service	H
Analysis Period (min)	15		

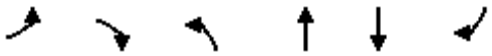
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	379	360	205	2078	2702	752
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	379	360	205	2078	2702	752
RTOR Reduction (vph)	0	4	0	0	0	15
Lane Group Flow (vph)	379	356	205	2078	2702	737
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	15.5	31.0	15.5	125.5	105.5	121.0
Effective Green, g (s)	15.5	31.0	15.5	125.5	105.5	121.0
Actuated g/C Ratio	0.10	0.21	0.10	0.84	0.70	0.81
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	351	371	182	2960	2489	1324
v/s Ratio Prot	0.11	c0.10	c0.12	0.59	c0.76	0.06
v/s Ratio Perm		0.13				0.41
v/c Ratio	1.08	0.96	1.13	0.70	1.09	0.56
Uniform Delay, d1	67.2	58.9	67.2	4.8	22.2	5.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	71.0	35.8	104.7	1.4	46.2	0.5
Delay (s)	138.2	94.6	172.0	6.3	68.4	5.6
Level of Service	F	F	F	A	E	A
Approach Delay (s)	117.0			21.1	54.7	
Approach LOS	F			C	D	

Intersection Summary			
HCM 2000 Control Delay	50.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		

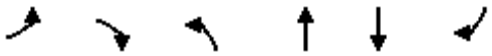
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	396	320	184	2207	2875	752
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	396	320	184	2207	2875	752
RTOR Reduction (vph)	0	3	0	0	0	10
Lane Group Flow (vph)	396	317	184	2207	2875	742
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	16.5	29.0	12.5	124.5	107.5	124.0
Effective Green, g (s)	16.5	29.0	12.5	124.5	107.5	124.0
Actuated g/C Ratio	0.11	0.19	0.08	0.83	0.72	0.83
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	374	350	147	2937	2536	1356
v/s Ratio Prot	c0.12	0.08	c0.10	0.62	c0.81	0.06
v/s Ratio Perm		0.13				0.41
v/c Ratio	1.06	0.91	1.25	0.75	1.13	0.55
Uniform Delay, d1	66.8	59.2	68.8	5.8	21.2	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	62.9	25.7	157.2	1.8	65.7	0.5
Delay (s)	129.7	84.9	225.9	7.6	86.9	4.6
Level of Service	F	F	F	A	F	A
Approach Delay (s)	109.6			24.4	69.8	
Approach LOS	F			C	E	

Intersection Summary			
HCM 2000 Control Delay	57.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	112.2%	ICU Level of Service	H
Analysis Period (min)	15		

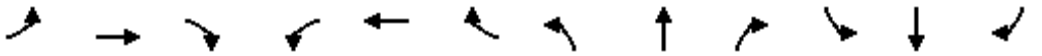
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	383	312	179	2140	2782	727
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1770	3539	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	383	312	179	2140	2782	727
RTOR Reduction (vph)	0	4	0	0	0	14
Lane Group Flow (vph)	383	308	179	2140	2782	713
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	15.5	29.0	13.5	125.5	107.5	123.0
Effective Green, g (s)	15.5	29.0	13.5	125.5	107.5	123.0
Actuated g/C Ratio	0.10	0.19	0.09	0.84	0.72	0.82
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	351	350	159	2960	2536	1345
v/s Ratio Prot	c0.11	0.08	c0.10	0.60	c0.79	0.05
v/s Ratio Perm		0.12				0.40
v/c Ratio	1.09	0.88	1.13	0.72	1.10	0.53
Uniform Delay, d1	67.2	58.8	68.2	5.1	21.2	4.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	74.7	21.4	109.1	1.6	50.6	0.4
Delay (s)	142.0	80.2	177.4	6.6	71.8	4.7
Level of Service	F	F	F	A	E	A
Approach Delay (s)	114.2			19.8	57.9	
Approach LOS	F			B	E	

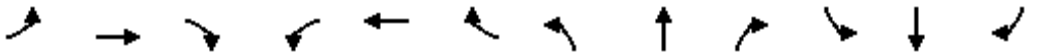
Intersection Summary			
HCM 2000 Control Delay	50.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	109.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



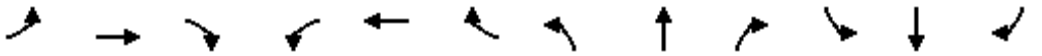
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	541	21	105	710	0	33	1060	79	760	600	680
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3544		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3544		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	380	541	21	105	710	0	33	1060	79	760	600	680
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	52	0	0	212
Lane Group Flow (vph)	380	560	0	105	710	0	33	1060	27	760	600	468
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	16.5	38.8		7.1	29.4		4.6	47.8	47.8	33.2	76.4	76.4
Effective Green, g (s)	18.0	40.3		8.6	30.9		6.1	50.8	50.8	34.7	79.4	79.4
Actuated g/C Ratio	0.12	0.27		0.06	0.21		0.04	0.34	0.34	0.23	0.53	0.53
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	410	949		200	741		69	1183	531	792	1850	819
v/s Ratio Prot	c0.11	0.16		0.03	c0.20		0.02	c0.30		c0.22	0.17	
v/s Ratio Perm									0.02			0.30
v/c Ratio	0.93	0.59		0.53	0.96		0.48	0.90	0.05	0.96	0.32	0.57
Uniform Delay, d1	65.5	47.9		68.9	59.1		70.6	47.3	33.5	57.2	20.2	24.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.6	0.7		1.6	23.0		3.0	9.5	0.1	22.2	0.2	1.4
Delay (s)	92.2	48.6		70.5	82.1		73.6	56.8	33.6	79.4	20.4	25.4
Level of Service	F	D		E	F		E	E	C	E	C	C
Approach Delay (s)		66.2			80.6			55.7			44.1	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	57.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	150.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



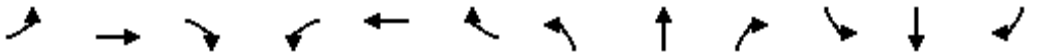
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	367	526	20	102	688	0	32	1026	76	742	581	658
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3545		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3545		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	367	526	20	102	688	0	32	1026	76	742	581	658
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	50	0	0	209
Lane Group Flow (vph)	367	545	0	102	688	0	32	1026	26	742	581	449
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	16.4	38.3		7.0	28.9		3.4	48.2	48.2	32.7	77.5	77.5
Effective Green, g (s)	17.9	39.8		8.5	30.4		4.9	51.2	51.2	34.2	80.5	80.5
Actuated g/C Ratio	0.12	0.27		0.06	0.20		0.03	0.34	0.34	0.23	0.54	0.54
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	410	942		198	733		55	1198	537	784	1884	834
v/s Ratio Prot	c0.11	0.15		0.03	c0.19		0.02	c0.29		c0.22	0.17	
v/s Ratio Perm									0.02			0.29
v/c Ratio	0.90	0.58		0.52	0.94		0.58	0.86	0.05	0.95	0.31	0.54
Uniform Delay, d1	65.0	47.7		68.6	58.7		71.4	45.8	33.0	56.8	19.2	22.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.1	0.6		1.4	19.4		11.3	6.7	0.1	20.0	0.2	1.1
Delay (s)	86.1	48.3		70.0	78.2		82.7	52.6	33.0	76.8	19.3	23.6
Level of Service	F	D		E	E		F	D	C	E	B	C
Approach Delay (s)		63.5			77.1			52.1			42.3	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	54.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	149.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



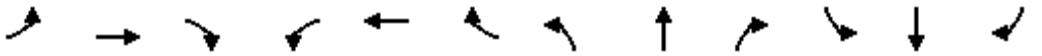
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	541	21	105	710	1131	33	1060	79	760	600	680
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3544		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3544		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	380	541	21	105	710	1131	33	1060	79	760	600	680
RTOR Reduction (vph)	0	2	0	0	0	190	0	0	59	0	0	173
Lane Group Flow (vph)	380	560	0	105	710	941	33	1060	20	760	600	507
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	11.5	61.9		7.1	57.5	57.5	3.3	35.1	35.1	23.5	55.3	55.3
Effective Green, g (s)	13.0	63.4		8.6	59.0	59.0	4.8	38.1	38.1	25.0	58.3	58.3
Actuated g/C Ratio	0.09	0.42		0.06	0.39	0.39	0.03	0.25	0.25	0.17	0.39	0.39
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	295	1487		199	1409	606	54	883	396	568	1352	598
v/s Ratio Prot	c0.11	0.16		0.03	0.20		0.02	c0.30		c0.22	0.17	
v/s Ratio Perm						c0.61			0.01			0.33
v/c Ratio	1.29	0.38		0.53	0.50	1.55	0.61	1.20	0.05	1.34	0.44	0.85
Uniform Delay, d1	69.0	30.2		69.3	34.9	46.0	72.2	56.5	42.8	63.0	34.4	42.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	152.8	0.1		1.6	0.2	257.2	15.1	101.1	0.1	163.8	0.4	11.7
Delay (s)	221.9	30.3		70.9	35.1	303.2	87.4	157.6	42.9	226.8	34.8	54.0
Level of Service	F	C		E	D	F	F	F	D	F	C	D
Approach Delay (s)		107.6			192.9			147.9			112.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	144.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	151.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	120.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



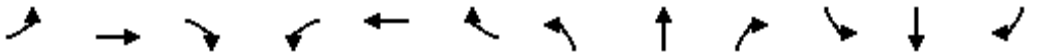
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	367	526	20	102	688	1097	32	1026	76	742	581	658
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3545		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3545		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	367	526	20	102	688	1097	32	1026	76	742	581	658
RTOR Reduction (vph)	0	2	0	0	0	190	0	0	57	0	0	177
Lane Group Flow (vph)	367	544	0	102	688	907	32	1026	19	742	581	481
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	11.5	62.0		7.0	57.5	57.5	3.3	35.1	35.1	23.5	55.3	55.3
Effective Green, g (s)	13.0	63.5		8.5	59.0	59.0	4.8	38.1	38.1	25.0	58.3	58.3
Actuated g/C Ratio	0.09	0.42		0.06	0.39	0.39	0.03	0.25	0.25	0.17	0.39	0.39
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	295	1489		197	1409	606	54	883	396	568	1352	598
v/s Ratio Prot	c0.11	0.15		0.03	0.19		0.02	c0.29		c0.22	0.17	
v/s Ratio Perm						c0.58			0.01			0.31
v/c Ratio	1.24	0.37		0.52	0.49	1.50	0.59	1.16	0.05	1.31	0.43	0.80
Uniform Delay, d1	69.0	30.0		69.3	34.7	46.0	72.2	56.5	42.8	63.0	34.2	41.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	135.1	0.1		1.4	0.2	232.4	12.7	85.4	0.1	150.3	0.4	8.6
Delay (s)	204.2	30.1		70.7	34.8	278.5	84.8	141.9	42.9	213.3	34.6	49.9
Level of Service	F	C		E	C	F	F	F	D	F	C	D
Approach Delay (s)		100.1			178.4			133.6			106.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	133.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	151.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	117.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



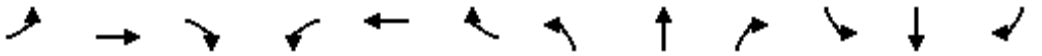
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	347	325	15	85	427	805	24	927	80	368	501	566
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539		3502	3610	1553	1703	3505	1573	3433	3505	1551
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539		3502	3610	1553	1703	3505	1573	3433	3505	1551
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	347	325	15	85	427	805	24	927	80	368	501	566
RTOR Reduction (vph)	0	2	0	0	0	107	0	0	58	0	0	291
Lane Group Flow (vph)	347	338	0	85	427	698	24	927	22	368	501	275
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	14.2	69.0		6.3	61.1	61.1	2.5	38.3	38.3	15.1	50.9	50.9
Effective Green, g (s)	15.7	70.5		7.8	62.6	62.6	4.0	41.3	41.3	16.6	53.9	53.9
Actuated g/C Ratio	0.10	0.46		0.05	0.41	0.41	0.03	0.27	0.27	0.11	0.35	0.35
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	354	1639		179	1484	638	44	951	426	374	1241	549
v/s Ratio Prot	c0.10	0.10		0.02	0.12		0.01	c0.26		c0.11	0.14	
v/s Ratio Perm						c0.45			0.01			0.18
v/c Ratio	0.98	0.21		0.47	0.29	1.09	0.55	0.97	0.05	0.98	0.40	0.50
Uniform Delay, d1	68.1	24.2		70.2	29.9	44.8	73.2	54.9	41.0	67.7	37.0	38.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.3	0.0		1.2	0.1	63.9	9.2	23.2	0.1	41.9	0.4	1.4
Delay (s)	110.4	24.3		71.4	30.0	108.7	82.4	78.1	41.1	109.6	37.4	40.0
Level of Service	F	C		E	C	F	F	E	D	F	D	D
Approach Delay (s)		67.8			80.8			75.4			56.9	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	69.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	152.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



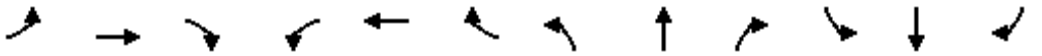
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	590	744	86	159	651	0	58	806	142	748	897	804
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3491		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3491		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	590	744	86	159	651	0	58	806	142	748	897	804
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	104	0	0	303
Lane Group Flow (vph)	590	824	0	159	651	0	58	806	38	748	897	501
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	26.6	44.3		9.9	27.6		5.1	36.7	36.7	33.3	64.9	64.9
Effective Green, g (s)	28.1	45.8		11.4	29.1		6.6	39.7	39.7	34.8	67.9	67.9
Actuated g/C Ratio	0.19	0.31		0.08	0.20		0.04	0.27	0.27	0.24	0.46	0.46
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	653	1082		270	711		76	942	422	808	1611	713
v/s Ratio Prot	c0.17	0.24		0.05	c0.18		0.03	c0.23		c0.22	0.26	
v/s Ratio Perm									0.02			0.32
v/c Ratio	0.90	0.76		0.59	0.92		0.76	0.86	0.09	0.93	0.56	0.70
Uniform Delay, d1	58.5	46.0		65.9	58.1		69.8	51.3	40.5	55.2	29.0	31.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.8	3.0		2.5	16.3		33.7	8.3	0.2	16.2	0.7	3.7
Delay (s)	74.2	49.0		68.4	74.4		103.5	59.6	40.6	71.4	29.6	35.6
Level of Service	E	D		E	E		F	E	D	E	C	D
Approach Delay (s)		59.5			73.2			59.4			44.3	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	54.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	147.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



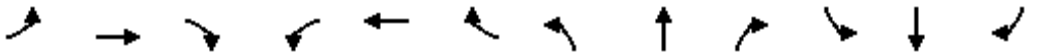
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	571	720	84	154	632	0	56	780	138	728	867	778
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3491		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3491		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	571	720	84	154	632	0	56	780	138	728	867	778
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	101	0	0	305
Lane Group Flow (vph)	571	798	0	154	632	0	56	780	37	728	867	473
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	26.2	44.0		9.5	27.3		4.9	35.6	35.6	32.8	63.5	63.5
Effective Green, g (s)	27.7	45.5		11.0	28.8		6.4	38.6	38.6	34.3	66.5	66.5
Actuated g/C Ratio	0.19	0.31		0.08	0.20		0.04	0.27	0.27	0.24	0.46	0.46
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	654	1092		264	715		74	930	417	809	1603	709
v/s Ratio Prot	c0.17	0.23		0.04	c0.18		0.03	c0.22		c0.21	0.25	
v/s Ratio Perm									0.02			0.30
v/c Ratio	0.87	0.73		0.58	0.88		0.76	0.84	0.09	0.90	0.54	0.67
Uniform Delay, d1	57.1	44.5		65.0	56.7		68.7	50.5	40.2	53.9	28.4	30.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.1	2.3		2.5	12.3		32.8	7.3	0.2	12.7	0.6	3.0
Delay (s)	69.3	46.8		67.5	69.0		101.6	57.8	40.3	66.6	29.0	33.8
Level of Service	E	D		E	E		F	E	D	E	C	C
Approach Delay (s)		56.1			68.7			57.8			42.1	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	52.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	145.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



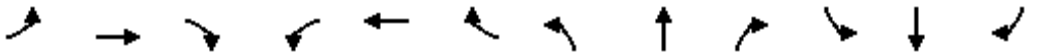
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	590	744	86	159	651	679	58	806	142	748	897	804
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3491		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3491		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	590	744	86	159	651	679	58	806	142	748	897	804
RTOR Reduction (vph)	0	6	0	0	0	257	0	0	108	0	0	275
Lane Group Flow (vph)	590	824	0	159	651	422	58	806	34	748	897	529
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	24.5	52.0		10.0	37.5	37.5	5.3	33.0	33.0	31.5	59.2	59.2
Effective Green, g (s)	26.0	53.5		11.5	39.0	39.0	6.8	36.0	36.0	33.0	62.2	62.2
Actuated g/C Ratio	0.17	0.36		0.08	0.26	0.26	0.05	0.24	0.24	0.22	0.41	0.41
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	595	1245		268	938	403	77	841	377	755	1453	643
v/s Ratio Prot	c0.17	0.24		0.05	0.18		0.03	c0.23		c0.22	0.26	
v/s Ratio Perm						c0.27			0.02			0.34
v/c Ratio	0.99	0.66		0.59	0.69	1.05	0.75	0.96	0.09	0.99	0.62	0.82
Uniform Delay, d1	61.9	40.6		67.0	50.1	55.5	70.8	56.3	44.3	58.3	34.5	39.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.6	1.1		2.7	2.0	57.9	31.4	21.6	0.2	30.3	1.1	9.3
Delay (s)	96.5	41.8		69.7	52.1	113.4	102.2	77.9	44.5	88.7	35.6	48.3
Level of Service	F	D		E	D	F	F	E	D	F	D	D
Approach Delay (s)		64.5			81.9			74.6			56.0	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	66.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



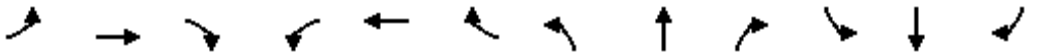
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	571	720	84	154	632	662	56	780	138	728	867	778
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3490		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3490		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	571	720	84	154	632	662	56	780	138	728	867	778
RTOR Reduction (vph)	0	6	0	0	0	258	0	0	105	0	0	275
Lane Group Flow (vph)	571	798	0	154	632	404	56	780	33	728	867	503
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	24.5	52.9		9.6	38.0	38.0	4.9	32.5	32.5	31.5	59.1	59.1
Effective Green, g (s)	26.0	54.4		11.1	39.5	39.5	6.4	35.5	35.5	33.0	62.1	62.1
Actuated g/C Ratio	0.17	0.36		0.07	0.26	0.26	0.04	0.24	0.24	0.22	0.41	0.41
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	595	1265		259	950	408	72	829	372	755	1451	642
v/s Ratio Prot	c0.17	0.23		0.04	0.18		0.03	c0.22		c0.21	0.25	
v/s Ratio Perm						c0.26			0.02			0.32
v/c Ratio	0.96	0.63		0.59	0.67	0.99	0.78	0.94	0.09	0.96	0.60	0.78
Uniform Delay, d1	61.5	39.5		67.3	49.3	55.1	71.1	56.2	44.6	57.9	34.2	38.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.7	0.8		2.8	1.5	41.9	38.0	18.9	0.2	24.0	0.9	7.0
Delay (s)	88.2	40.4		70.1	50.9	97.0	109.1	75.1	44.8	82.0	35.2	45.2
Level of Service	F	D		E	D	F	F	E	D	F	D	D
Approach Delay (s)		60.2			74.0			72.8			52.8	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	62.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



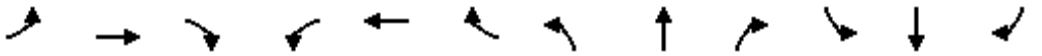
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	654	774	124	184	754	0	120	876	168	919	1212	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3464		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3464		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	654	774	124	184	754	0	120	876	168	919	1212	723
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	128	0	0	298
Lane Group Flow (vph)	654	889	0	184	754	0	120	876	40	919	1212	425
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	26.6	46.6		9.3	29.3		12.3	33.0	33.0	37.6	58.3	58.3
Effective Green, g (s)	28.1	48.1		10.8	30.8		13.8	36.0	36.0	39.1	61.3	61.3
Actuated g/C Ratio	0.19	0.32		0.07	0.21		0.09	0.24	0.24	0.26	0.41	0.41
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	643	1110		252	741		156	841	377	894	1432	634
v/s Ratio Prot	c0.19	0.26		0.05	c0.21		0.07	c0.25		c0.27	0.35	
v/s Ratio Perm									0.03			0.27
v/c Ratio	1.02	0.80		0.73	1.02		0.77	1.04	0.11	1.03	0.85	0.67
Uniform Delay, d1	61.0	46.6		68.2	59.6		66.5	57.0	44.5	55.4	40.1	36.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	39.9	4.1		9.5	37.5		18.9	42.4	0.2	37.5	5.3	3.4
Delay (s)	100.8	50.6		77.7	97.1		85.5	99.4	44.7	92.9	45.3	39.5
Level of Service	F	D		E	F		F	F	D	F	D	D
Approach Delay (s)		71.8			93.3			90.1			59.2	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	72.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



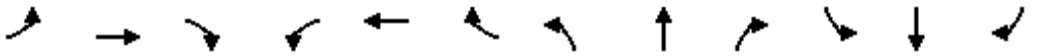
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	632	750	120	179	731	0	116	848	163	892	1173	699
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3464		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3464		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	632	750	120	179	731	0	116	848	163	892	1173	699
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	122	0	0	291
Lane Group Flow (vph)	632	862	0	179	731	0	116	848	41	892	1173	408
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	25.7	45.3		8.9	28.5		11.9	34.8	34.8	37.5	60.4	60.4
Effective Green, g (s)	27.2	46.8		10.4	30.0		13.4	37.8	37.8	39.0	63.4	63.4
Actuated g/C Ratio	0.18	0.31		0.07	0.20		0.09	0.25	0.25	0.26	0.42	0.42
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	622	1080		242	722		152	883	396	892	1481	655
v/s Ratio Prot	c0.18	0.25		0.05	c0.20		0.07	c0.24		c0.26	0.33	
v/s Ratio Perm									0.03			0.26
v/c Ratio	1.02	0.80		0.74	1.01		0.76	0.96	0.10	1.00	0.79	0.62
Uniform Delay, d1	61.4	47.3		68.5	60.0		66.7	55.4	43.1	55.5	37.6	33.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.2	4.0		10.3	36.6		18.9	21.4	0.2	30.1	3.4	2.5
Delay (s)	101.6	51.3		78.7	96.6		85.6	76.8	43.3	85.6	41.0	36.4
Level of Service	F	D		E	F		F	E	D	F	D	D
Approach Delay (s)		72.4			93.1			72.9			54.2	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	67.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



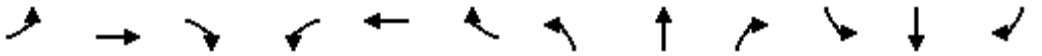
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	654	774	124	184	754	769	120	876	168	919	1212	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3464		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3464		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	654	774	124	184	754	769	120	876	168	919	1212	723
RTOR Reduction (vph)	0	9	0	0	0	282	0	0	129	0	0	268
Lane Group Flow (vph)	654	889	0	184	754	487	120	876	39	919	1212	455
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	24.5	50.2		9.8	35.5	35.5	10.1	32.0	32.0	34.5	56.4	56.4
Effective Green, g (s)	26.0	51.7		11.3	37.0	37.0	11.6	35.0	35.0	36.0	59.4	59.4
Actuated g/C Ratio	0.17	0.34		0.08	0.25	0.25	0.08	0.23	0.23	0.24	0.40	0.40
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	595	1193		263	890	383	131	817	367	823	1387	614
v/s Ratio Prot	c0.19	0.26		0.05	0.21		0.07	c0.25		c0.27	0.35	
v/s Ratio Perm						c0.31			0.02			0.29
v/c Ratio	1.10	0.75		0.70	0.85	1.27	0.92	1.07	0.11	1.12	0.87	0.74
Uniform Delay, d1	62.0	43.3		67.7	53.8	56.5	68.7	57.5	45.2	57.0	41.8	38.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	67.0	2.4		6.9	7.3	141.5	53.0	52.7	0.2	68.5	6.8	5.6
Delay (s)	129.0	45.7		74.6	61.1	198.0	121.7	110.2	45.5	125.5	48.7	44.3
Level of Service	F	D		E	E	F	F	F	D	F	D	D
Approach Delay (s)		80.8			124.3			102.0			72.3	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	91.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



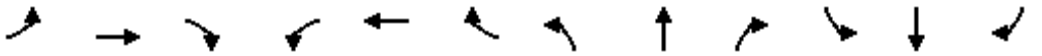
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	632	750	120	179	731	749	116	848	163	892	1173	699
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3464		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3464		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	632	750	120	179	731	749	116	848	163	892	1173	699
RTOR Reduction (vph)	0	9	0	0	0	284	0	0	126	0	0	273
Lane Group Flow (vph)	632	861	0	179	731	465	116	848	37	892	1173	426
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	24.5	50.0		10.8	36.3	36.3	11.2	31.0	31.0	34.7	54.5	54.5
Effective Green, g (s)	26.0	51.5		12.3	37.8	37.8	12.7	34.0	34.0	36.2	57.5	57.5
Actuated g/C Ratio	0.17	0.34		0.08	0.25	0.25	0.08	0.23	0.23	0.24	0.38	0.38
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	595	1189		287	909	391	144	794	356	828	1343	594
v/s Ratio Prot	c0.18	0.25		0.05	0.20		0.07	c0.24		c0.26	0.33	
v/s Ratio Perm						c0.30			0.02			0.27
v/c Ratio	1.06	0.72		0.62	0.80	1.19	0.81	1.07	0.10	1.08	0.87	0.72
Uniform Delay, d1	62.0	43.0		66.6	52.6	56.1	67.4	58.0	45.9	56.9	42.9	39.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	54.5	2.0		3.4	5.0	107.7	26.0	51.7	0.2	54.2	7.0	4.9
Delay (s)	116.5	45.1		70.0	57.6	163.8	93.5	109.7	46.2	111.1	49.9	44.2
Level of Service	F	D		E	E	F	F	F	D	F	D	D
Approach Delay (s)		75.1			106.9			98.8			68.2	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	83.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



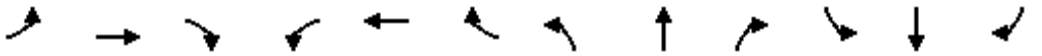
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	738	1032	85	113	618	0	51	804	179	1065	1269	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3513		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3513		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	738	1032	85	113	618	0	51	804	179	1065	1269	795
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	137	0	0	329
Lane Group Flow (vph)	738	1113	0	113	618	0	51	804	42	1065	1269	466
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	29.5	48.5		4.5	23.5		4.6	32.1	32.1	42.5	70.0	70.0
Effective Green, g (s)	31.0	50.0		6.0	25.0		6.1	35.1	35.1	44.0	73.0	73.0
Actuated g/C Ratio	0.21	0.33		0.04	0.17		0.04	0.23	0.23	0.29	0.48	0.48
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	704	1162		139	597		68	814	365	999	1693	749
v/s Ratio Prot	c0.21	0.32		0.03	c0.17		0.03	c0.23		c0.31	0.36	
v/s Ratio Perm									0.03			0.30
v/c Ratio	1.05	0.96		0.81	1.04		0.75	0.99	0.12	1.07	0.75	0.62
Uniform Delay, d1	60.0	49.5		72.0	63.0		71.7	57.8	45.8	53.5	31.6	28.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	47.3	17.0		28.2	46.2		34.3	28.4	0.3	47.8	2.2	2.1
Delay (s)	107.3	66.5		100.2	109.3		106.1	86.1	46.0	101.4	33.8	31.0
Level of Service	F	E		F	F		F	F	D	F	C	C
Approach Delay (s)		82.7			107.9			80.2			56.1	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	151.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



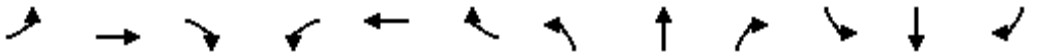
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	714	1000	82	109	600	0	49	778	174	1032	1229	769
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3513		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3513		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	714	1000	82	109	600	0	49	778	174	1032	1229	769
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	134	0	0	330
Lane Group Flow (vph)	714	1078	0	109	600	0	49	778	40	1032	1229	439
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	29.5	48.5		4.5	23.5		4.6	32.1	32.1	42.5	70.0	70.0
Effective Green, g (s)	31.0	50.0		6.0	25.0		6.1	35.1	35.1	44.0	73.0	73.0
Actuated g/C Ratio	0.21	0.33		0.04	0.17		0.04	0.23	0.23	0.29	0.48	0.48
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	704	1162		139	597		68	814	365	999	1693	749
v/s Ratio Prot	c0.21	0.31		0.03	c0.17		0.03	c0.22		c0.30	0.35	
v/s Ratio Perm									0.03			0.28
v/c Ratio	1.01	0.93		0.78	1.01		0.72	0.96	0.11	1.03	0.73	0.59
Uniform Delay, d1	60.0	48.8		71.9	63.0		71.7	57.2	45.7	53.5	31.1	28.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.5	12.4		23.4	38.1		28.5	21.6	0.3	37.3	1.9	1.7
Delay (s)	97.6	61.2		95.3	101.1		100.1	78.9	46.0	90.9	32.9	29.9
Level of Service	F	E		F	F		F	E	D	F	C	C
Approach Delay (s)		75.7			100.2			74.2			51.9	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	67.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	151.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



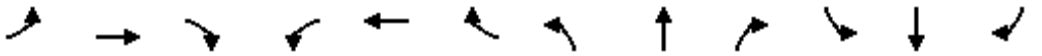
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	738	1032	85	113	618	751	51	804	179	1065	1269	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3513		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3513		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	738	1032	85	113	618	751	51	804	179	1065	1269	795
RTOR Reduction (vph)	0	4	0	0	0	326	0	0	138	0	0	294
Lane Group Flow (vph)	738	1113	0	113	618	425	51	804	41	1065	1269	501
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	26.5	51.1		5.9	30.5	30.5	4.6	31.1	31.1	39.5	66.0	66.0
Effective Green, g (s)	28.0	52.6		7.4	32.0	32.0	6.1	34.1	34.1	41.0	69.0	69.0
Actuated g/C Ratio	0.19	0.35		0.05	0.21	0.21	0.04	0.23	0.23	0.27	0.46	0.46
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	636	1222		171	764	328	68	791	354	931	1600	708
v/s Ratio Prot	c0.21	0.32		0.03	0.17		0.03	c0.23		c0.31	0.36	
v/s Ratio Perm						c0.27			0.03			0.32
v/c Ratio	1.16	0.91		0.66	0.81	1.30	0.75	1.02	0.12	1.14	0.79	0.71
Uniform Delay, d1	61.5	47.0		70.6	56.6	59.5	71.7	58.5	46.5	55.0	35.0	33.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	88.8	10.2		7.9	6.1	154.5	34.3	36.2	0.3	77.6	3.2	3.9
Delay (s)	150.4	57.2		78.5	62.7	214.0	106.1	94.7	46.8	132.6	38.1	36.8
Level of Service	F	E		E	E	F	F	F	D	F	D	D
Approach Delay (s)		94.3			140.6			86.9			70.0	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	92.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	151.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



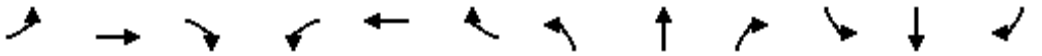
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	714	1000	82	109	600	732	49	778	174	1032	1229	769
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3513		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3513		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	714	1000	82	109	600	732	49	778	174	1032	1229	769
RTOR Reduction (vph)	0	4	0	0	0	326	0	0	135	0	0	295
Lane Group Flow (vph)	714	1078	0	109	600	406	49	778	39	1032	1229	474
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	26.5	51.3		5.7	30.5	30.5	4.5	31.1	31.1	39.5	66.1	66.1
Effective Green, g (s)	28.0	52.8		7.2	32.0	32.0	6.0	34.1	34.1	41.0	69.1	69.1
Actuated g/C Ratio	0.19	0.35		0.05	0.21	0.21	0.04	0.23	0.23	0.27	0.46	0.46
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	636	1227		166	764	328	67	791	354	931	1602	709
v/s Ratio Prot	c0.21	0.31		0.03	0.17		0.03	c0.22		c0.30	0.35	
v/s Ratio Perm						c0.26			0.02			0.31
v/c Ratio	1.12	0.88		0.66	0.79	1.24	0.73	0.98	0.11	1.11	0.77	0.67
Uniform Delay, d1	61.5	46.1		70.7	56.3	59.5	71.8	58.2	46.5	55.0	34.3	32.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	74.4	7.3		7.6	5.1	130.1	30.8	27.9	0.3	63.9	2.6	3.0
Delay (s)	136.0	53.4		78.4	61.4	189.6	102.6	86.1	46.7	119.0	36.9	35.0
Level of Service	F	D		E	E	F	F	F	D	F	D	D
Approach Delay (s)		86.2			127.8			80.1			64.4	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	84.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	151.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



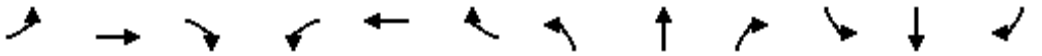
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	706	1010	111	152	696	0	56	780	185	976	1293	838
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3495		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3495		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	706	1010	111	152	696	0	56	780	185	976	1293	838
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	137	0	0	316
Lane Group Flow (vph)	706	1116	0	152	696	0	56	780	48	976	1293	522
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	28.8	49.5		6.3	27.0		5.0	31.7	31.7	40.1	66.8	66.8
Effective Green, g (s)	30.3	51.0		7.8	28.5		6.5	34.7	34.7	41.6	69.8	69.8
Actuated g/C Ratio	0.20	0.34		0.05	0.19		0.04	0.23	0.23	0.28	0.46	0.46
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	688	1179		180	680		73	804	361	945	1619	716
v/s Ratio Prot	c0.21	0.32		0.04	c0.19		0.03	c0.22		c0.28	0.37	
v/s Ratio Perm									0.03			0.34
v/c Ratio	1.03	0.95		0.84	1.02		0.77	0.97	0.13	1.03	0.80	0.73
Uniform Delay, d1	60.4	48.7		71.0	61.3		71.6	57.7	46.2	54.8	34.7	33.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	41.1	14.9		28.1	40.6		35.3	24.7	0.3	38.0	3.2	4.4
Delay (s)	101.5	63.7		99.1	101.9		106.9	82.4	46.6	92.8	37.9	37.4
Level of Service	F	E		F	F		F	F	D	F	D	D
Approach Delay (s)		78.3			101.4			77.3			55.0	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	70.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	151.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	102.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



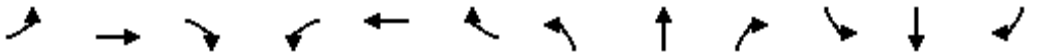
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	682	979	107	147	675	0	54	755	179	947	1252	810
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3495		3502	3610		1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3495		3502	3610		1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	682	979	107	147	675	0	54	755	179	947	1252	810
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	137	0	0	315
Lane Group Flow (vph)	682	1081	0	147	675	0	54	755	42	947	1252	495
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	28.5	48.9		6.1	26.5		4.8	32.1	32.1	40.5	67.8	67.8
Effective Green, g (s)	30.0	50.4		7.6	28.0		6.3	35.1	35.1	42.0	70.8	70.8
Actuated g/C Ratio	0.20	0.33		0.05	0.19		0.04	0.23	0.23	0.28	0.47	0.47
Clearance Time (s)	5.5	5.5		5.5	5.5		5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3		2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	681	1165		176	668		71	814	365	954	1642	727
v/s Ratio Prot	0.20	c0.31		0.04	c0.19		0.03	c0.22		c0.28	0.36	
v/s Ratio Perm									0.03			0.32
v/c Ratio	1.00	0.93		0.84	1.01		0.76	0.93	0.12	0.99	0.76	0.68
Uniform Delay, d1	60.5	48.6		71.1	61.5		71.7	56.8	45.8	54.4	33.2	31.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.8	12.4		26.9	37.4		35.3	17.0	0.3	27.2	2.5	3.2
Delay (s)	95.4	61.0		98.0	99.0		106.9	73.7	46.0	81.6	35.7	34.6
Level of Service	F	E		F	F		F	E	D	F	D	C
Approach Delay (s)		74.3			98.8			70.5			49.8	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	65.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	151.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



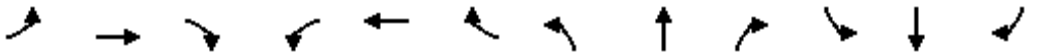
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	706	1010	111	152	696	795	56	780	185	976	1293	838
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3495		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3495		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	706	1010	111	152	696	795	56	780	185	976	1293	838
RTOR Reduction (vph)	0	6	0	0	0	301	0	0	140	0	0	280
Lane Group Flow (vph)	706	1115	0	152	696	494	56	780	45	976	1293	558
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	25.5	53.3		7.7	35.5	35.5	4.5	29.0	29.0	36.5	61.0	61.0
Effective Green, g (s)	27.0	54.8		9.2	37.0	37.0	6.0	32.0	32.0	38.0	64.0	64.0
Actuated g/C Ratio	0.18	0.37		0.06	0.25	0.25	0.04	0.21	0.21	0.25	0.43	0.43
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	617	1276		214	890	383	68	747	335	869	1495	662
v/s Ratio Prot	c0.21	0.32		0.04	0.19		0.03	c0.22		c0.28	0.37	
v/s Ratio Perm						c0.32			0.03			0.36
v/c Ratio	1.14	0.87		0.71	0.78	1.29	0.82	1.04	0.13	1.12	0.86	0.84
Uniform Delay, d1	61.5	44.4		69.1	52.7	56.5	71.5	59.0	47.8	56.0	39.1	38.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	83.0	6.8		9.5	4.3	149.2	51.5	45.0	0.3	70.3	5.9	10.4
Delay (s)	144.5	51.2		78.6	57.0	205.7	123.0	104.0	48.1	126.3	45.0	48.9
Level of Service	F	D		E	E	F	F	F	D	F	D	D
Approach Delay (s)		87.2			131.0			94.9			71.6	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	91.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	102.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	682	979	107	147	675	775	54	755	179	947	1252	810
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3495		3502	3610	1553	1703	3505	1573	3433	3505	1552
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3495		3502	3610	1553	1703	3505	1573	3433	3505	1552
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	682	979	107	147	675	775	54	755	179	947	1252	810
RTOR Reduction (vph)	0	6	0	0	0	302	0	0	141	0	0	281
Lane Group Flow (vph)	682	1080	0	147	675	473	54	755	38	947	1252	529
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	25.5	54.5		7.5	36.5	36.5	4.5	28.0	28.0	36.5	60.0	60.0
Effective Green, g (s)	27.0	56.0		9.0	38.0	38.0	6.0	31.0	31.0	38.0	63.0	63.0
Actuated g/C Ratio	0.18	0.37		0.06	0.25	0.25	0.04	0.21	0.21	0.25	0.42	0.42
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	617	1304		210	914	393	68	724	325	869	1472	651
v/s Ratio Prot	c0.20	0.31		0.04	0.19		0.03	c0.22		c0.28	0.36	
v/s Ratio Perm						c0.30			0.02			0.34
v/c Ratio	1.11	0.83		0.70	0.74	1.20	0.79	1.04	0.12	1.09	0.85	0.81
Uniform Delay, d1	61.5	42.6		69.2	51.4	56.0	71.4	59.5	48.4	56.0	39.3	38.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	68.6	4.3		8.6	2.9	113.8	43.9	45.1	0.3	57.9	5.3	8.5
Delay (s)	130.1	47.0		77.8	54.3	169.8	115.3	104.6	48.7	113.9	44.6	46.8
Level of Service	F	D		E	D	F	F	F	D	F	D	D
Approach Delay (s)		79.0			112.5			95.1			67.0	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	83.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	643	707	81	138	413	410	41	677	159	717	1090	771
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3493		3502	3610	1554	1703	3505	1573	3433	3505	1553
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3493		3502	3610	1554	1703	3505	1573	3433	3505	1553
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	643	707	81	138	413	410	41	677	159	717	1090	771
RTOR Reduction (vph)	0	6	0	0	0	300	0	0	117	0	0	360
Lane Group Flow (vph)	643	782	0	138	413	110	41	677	42	717	1090	411
Confl. Peds. (#/hr)	2		11	11		2	2		1	1		2
Heavy Vehicles (%)	2%	1%	3%	0%	0%	2%	6%	3%	1%	2%	3%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8			6			2
Actuated Green, G (s)	29.0	40.5		8.8	20.3	20.3	4.2	33.1	33.1	31.9	60.8	60.8
Effective Green, g (s)	30.5	42.0		10.3	21.8	21.8	5.7	36.1	36.1	33.4	63.8	63.8
Actuated g/C Ratio	0.22	0.30		0.07	0.16	0.16	0.04	0.26	0.26	0.24	0.46	0.46
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	7.0	7.0	5.5	7.0	7.0
Vehicle Extension (s)	2.3	2.3		2.3	2.3	2.3	2.3	4.7	4.7	2.3	4.7	4.7
Lane Grp Cap (vph)	759	1064		261	571	245	70	918	412	832	1622	719
v/s Ratio Prot	c0.19	0.22		0.04	c0.11		0.02	c0.19		c0.21	0.31	
v/s Ratio Perm						0.07			0.03			0.26
v/c Ratio	0.85	0.73		0.53	0.72	0.45	0.59	0.74	0.10	0.86	0.67	0.57
Uniform Delay, d1	51.4	42.9		61.4	55.1	52.6	64.9	46.5	38.5	50.0	28.8	27.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	2.4		1.2	4.1	0.8	9.1	3.6	0.2	9.0	1.4	1.6
Delay (s)	59.9	45.3		62.7	59.2	53.3	74.0	50.2	38.8	59.0	30.2	28.7
Level of Service	E	D		E	E	D	E	D	D	E	C	C
Approach Delay (s)		51.9			57.2			49.2			37.7	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	137.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

OR213 & Beavercreek Road Improvements

Right Turn Acceleration Lane & Left Turn Queue

City of Oregon City

KITTELSON & ASSOCIATES

Engineer's Conceptual Estimate

Prepared By: Fred Wismer, PE		*Date: December 4, 2017*		
	This Estimate has a Rating of:	**3C**	*(See rating scale guide below.)*	
ITEM	**UNIT**	**TOTAL QUANTITY**	**UNIT PRICE**	**TOTAL COST**
Mobilization	LS	ALL	$131,000.00	$131,000.00
Traffic Control	LS	ALL	$107,000.00	$107,000.00
Erosion Control	LS	ALL	$114,000.00	$114,000.00
Removal of Structures and Obstructions	LS	ALL	$29,000.00	$29,000.00
Clearing and Grubbing	LS	ALL	$25,000.00	$25,000.00
General Earthworks	CY	30,150	$25.00	$753,750.00
Asphalt Roadway - Full Depth	SF	37,950	$6.70	$254,265.00
Pedestrian Ramp Rebuild	EA	4	$10,000.00	$40,000.00
Roadway - Shoulder	SF	7,640	$3.40	$25,976.00
Concrete Curbs - Traffic Separator	LF	285	$20.00	$5,700.00
Guardrail Barrier, Complete	LF	790	$40.00	$31,600.00
Guardrail Terminal, Complete	EA	2	$3,000.00	$6,000.00
Permanent Landscaping	SF	81,000	$1.10	$89,100.00
Pavement Markings, Complete	LS	ALL	$5,200.00	$5,200.00
Signage, Complete	LS	ALL	$12,350.00	$12,350.00
Traffic Signal Modifications, Complete	LS	ALL	$25,000.00	$25,000.00
TOTAL CONSTRUCTION COST				**$ 1,654,941**
ENGINEERING SUPPORT				
Engineering & Construction Management	LS	25%	$1,654,941.00	$413,800.00
ENGINEERING SUPPORT SUBTOTAL				**$ 413,800**
TOTAL PROJECT SUBTOTAL				**$ 2,068,741**
30% Contingency				**$ 620,630**
TOTAL ESTIMATED PROJECT COST				**$ 2,689,371**

Scope Accuracy:

Level 1: Project scope well understood and well defined.

Level 2: Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Level A: Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

Level B: Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

Level C: No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 50%.

Spec. No.	Item No.	Item	Bid Unit	Est. Unit	Quantity	2016 Unit Price	2016 Price
		TEMPORARY FEATURES AND APPURTENANCES					
00210	10	Mobilization	Lump Sum	Lump Sum	1	$ 689,700.00	$ 689,700.00
00225	20	Temporary Protection and Direction of Traffic	Lump Sum	Lump Sum	1	$ 72,200.00	$ 72,200.00
00225	30	Temporary Signs	Sq Ft	Sq Ft	755	$ 16.00	$ 12,080.00
00225	40	Temporary Barricades, Type III	Each	Each	6	$ 120.00	$ 720.00
00225	50	Temporary Impact Attenuators, Truck Mounted	Each	Each	2	$ 11,400.00	$ 22,800.00
00225	60	Temporary Plastic Drums	Each	Each	194	$ 60.00	$ 11,640.00
00225	70	Portable Changeable Message Signs	Each	Each	3	$ 8,300.00	$ 24,900.00
00225	80	Flaggers	Hour	Hour	2000	$ 50.00	$ 100,000.00
00270	90	Temporary Fence	Ft	Ft	1,400.0	$ 3.00	$ 4,200.00
00280	100	Erosion Control	Lump Sum	Lump Sum	1	$ 58,700.00	$ 58,700.00
00280	110	Compost Erosion Blanket	Cu Yd	Cu Yd	400.0	$ 40.00	$ 16,000.00
00280	120	Check Dam	Each	Each	5	$ 140.00	$ 700.00
00280	130	Compost Filter Berm	Cu Yd	Cu Yd	240.0	$ 30.00	$ 7,200.00
00280	140	Construction Entrance	Each	Each	3	$ 1,100.00	$ 3,300.00
00280	150	Sediment Fence, Unsupported	Ft	Ft	280.0	$ 4.00	$ 1,120.00
00280	160	Inlet Protection	Each	Each	24	$ 90.00	$ 2,160.00
00290	170	Pollution Control Plan	Lump Sum	Lump Sum	1	$ 3,100.00	$ 3,100.00
		ROADWORK					
00310	180	Removal of Structures and Obstructions	Lump Sum	Lump Sum	1	$ 11,000.00	$ 11,000.00
00310	190	Removal of Pipes	Ft	Ft	591.0	$ 20.00	$ 11,820.00
00310	200	Removal of Inlets	Each	Each	3	$ 340.00	$ 1,020.00
00310	210	Removal of Guardrail	Ft	Ft	1,928.0	$ 3.70	$ 7,133.60
00310	220	Removal of Barrier	Ft	Ft	1,059.0	$ 9.00	$ 9,531.00
00320	230	Clearing and Grubbing	Lump Sum	Acre	4.0	$ 11,000.00	$ 44,000.00
00330	240	Ditch Excavation	Cu Yd	Cu Yd	664.0	$ 15.00	$ 9,960.00
00330	250	General Excavation	Cu Yd	Cu Yd	13,000	$ 12.00	$ 156,000.00
00350	260	Drainage Geotextile, Type 2	Sq Yd	Sq Yd	185	$ 7.00	$ 1,295.00
00350	270	Subgrade Geotextile	Sq Yd	Sq Yd	14,335	$ 2.00	$ 28,670.00
00350	280	Riprap Geotextile, Type 2	Sq Yd	Sq Yd	59.0	$ 7.00	$ 413.00
00350	290	Waterproofing Membrane	Sq Yd	Sq Yd	198.0	$ 42.00	$ 8,316.00
00390	300	Loose Riprap, Class 50	Cu Yd	Cu Yd	14.0	$ 57.00	$ 798.00
		DRAINAGE AND SEWERS					
00406	310	Tunneling, Boring, and Jacking	Lump Sum	Lump Sum	1	$ 11,000.00	$ 11,000.00
00430	320	8 Inch Drain Pipe	Ft	Ft	50.0	$ 21.00	$ 1,050.00
00445	330	12 Inch Storm Sewer Pipe, 5 Ft Depth	Ft	Ft	1,244.0	$ 47.00	$ 58,468.00
00445	340	12 Inch Storm Sewer Pipe, 10 Ft Depth	Ft	Ft	277.0	$ 73.00	$ 20,221.00
00445	350	18 Inch Storm Sewer Pipe, 5 Ft Depth	Ft	Ft	67.0	$ 62.00	$ 4,154.00
00445	360	18 Inch Storm Sewer Pipe, 10 Ft Depth	Ft	Ft	435.0	$ 73.00	$ 31,755.00
00445	370	12 Inch Slotted Drain Pipe, 5 Ft Depth	Ft	Ft	497.0	$ 140.00	$ 69,580.00
00445	380	18 Inch Slotted Drain Pipe, 5 Ft Depth	Ft	Ft	728.0	$ 150.00	$ 109,200.00
00445	390	Sloped End Sections, 12 Inch	Each	Each	2	$ 370.00	$ 740.00
00445	400	Sloped End Sections, 18 Inch	Each	Each	1	$ 420.00	$ 420.00
00445	410	Concrete In Blocks	Cu Yd	Cu Yd	101.0	$ 140.00	$ 14,140.00
00460	420	Paved Culvert End Slopes	Sq Ft	Sq Ft	84.0	$ 21.00	$ 1,764.00
00470	430	Concrete Storm Sewer Manholes	Ea	Ea	3	$ 6,700.00	$ 20,100.00
00470	440	Concrete Manholes, Split Flow	Ea	Ea	1	$ 7,300.00	$ 7,300.00
00470	450	Concrete Inlets, Type D	Ea	Ea	2	$ 1,600.00	$ 3,200.00
00470	460	Concrete Inlets, Type D Modified	Ea	Ea	2	$ 1,900.00	$ 3,800.00
00470	470	Concrete Inlets, Type G-2	Ea	Ea	14	$ 1,300.00	$ 18,200.00
00480	480	Drainage Curbs	Ft	Ft	128.0	$ 9.00	$ 1,152.00
00490	490	Adjusting Inlets	Each	Each	1	$ 670.00	$ 670.00
00490	500	Manholes Over Existing Sewers	Each	Each	1	$ 1,600.00	$ 1,600.00
00490	510	Connection to Existing Structures	Each	Each	5	$ 930.00	$ 4,650.00
00490	520	Cap Inlet	Each	Each	1	$ 900.00	$ 900.00
00490	530	Reconstruct Inlet	Each	Each	1	$ 1,100.00	$ 1,100.00
00495	540	Trench Resurfacing	Sq Yd	Sq Yd	66.0	$ 100.00	$ 6,600.00
00495	550	Trench Resurfacing - Grass/Misc. Landscaping	Sq Yd	Sq Yd	92.0	$ 110.00	$ 10,120.00
		RETAINING WALL No. 21424 "Holcomb"					
00596	560	Anchored Soldier Pile Wall	Sq Ft	Sq Ft	10,300.0	$ 250.00	$ 2,575,000.00
01050	570	Ornamental Protective Fence, 6 Ft	Ft	Ft	808.0	$ 170.00	$ 137,360.00
		BASES					
00620	580	Cold Plane Pavement Removal, 2 Inch Deep	Sq Yd	Sq Yd	26,952.0	$ 2.60	$ 70,075.20
00620	590	Cold Plane Pavement Removal, 4 Inch Deep	Sq Yd	Sq Yd	1,315.0	$ 4.70	$ 6,180.50
00641	600	Aggregate Base	Ton	Ton	10,300.0	$ 20.00	$ 206,000.00

00641	610	Free Draining Aggregate Base	Ton	Ton	29,730.0	$	20.00	$ 594,600.00
		WEARING SURFACES						
00730	620	Emulsified Asphalt for Tack Coat	Ton	Ton	19.0	$	700.00	$ 13,300.00
00745	630	Level 3, 1/2 Inch Dense HMAC	Ton	Ton	8,700.0	$	70.00	$ 609,000.00
00745	640	PG 70-22 Asphalt in HMAC	Ton	Ton	500.0	$	619.00	$ 309,500.00
		PERMANENT TRAFFIC SAFETY AND GUIDANCE DEVICES						
00810	650	Guardrail, Type 2A	Ft	Ft	1,050.0	$	20.00	$ 21,000.00
00810	660	Guardrail, Type 3	Ft	Ft	25.0	$	30.00	$ 750.00
00810	670	Guardrail Anchors, Type 1 Modified	Each	Each	2	$	570.00	$ 1,140.00
00810	680	Guardrail End Pieces, Type C	Each	Each	2	$	130.00	$ 260.00
00810	690	Guardrail Transitions	Each	Each	2	$	2,600.00	$ 5,200.00
00810	700	Guardrail Connections	Each	Each	2	$	600.00	$ 1,200.00
00810	710	Guardrail Terminals, Non-Flared, Test Level 3	Each	Each	1	$	2,100.00	$ 2,100.00
00820	720	Concrete Barrier	Ft	Ft	4,116.0	$	60.00	$ 246,960.00
00830	730	Impact Attenuator, Type L	Each	Each	1	$	28,900.00	$ 28,900.00
00830	740	Remove and Reinstall Impact Attenuator	Each	Each	1	$	5,200.00	$ 5,200.00
00865	750	Methyl Methacrylate, Profile, 120 Mils, Extruded	Ft	Ft	19,500.0	$	2.40	$ 46,800.00
00867	760	Pavement Legend, Type B: Elongated Arrows	Each	Each	20	$	400.00	$ 8,000.00
00867	770	Pavement Legend, Type B: Wrong Way Arrows	Each	Each	6	$	500.00	$ 3,000.00
00867	780	Pavement Legend, Type B-HS: Bicycle Lane Stencil	Each	Each	3	$	300.00	$ 900.00
00867	790	Pavement Bar, Type B	Sq Ft	Sq Ft	590.0	$	7.80	$ 4,602.00
		PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS						
00902	800	Crosswalk Closure Barricades	Each	Each	2	$	600.00	$ 1,200.00
00905	810	Remove Existing Signs	Lump Sum	Lump Sum	1	$	6,000.00	$ 6,000.00
00905	820	Remove and Reinstall Existing Signs	Lump Sum	Lump Sum	1	$	6,000.00	$ 6,000.00
00910	830	Wood Sign Posts	FBM	FBM	950	$	7.80	$ 7,410.00
00920	840	Sign Support Footings	Lump Sum	Lump Sum	1	$	8,800.00	$ 8,800.00
00930	850	Bridge Structure Mounts	Lump Sum	Lump Sum	1	$	1,600.00	$ 1,600.00
00930	860	Multi-post Breakaway Sign Supports	Lump Sum	Lump Sum	1	$	13,000.00	$ 13,000.00
00930	870	Triangular Base Breakaway Sign Supports	Lump Sum	Lump Sum	1	$	7,000.00	$ 7,000.00
00930	880	Perforated Steel Square Tube Sign Supports	Lump Sum	Lump Sum	1	$	600.00	$ 600.00
00940	890	Type "F1" Signs In Place	Sq Ft	Sq Ft	23.0	$	23.20	$ 533.60
00940	900	Type "G" Signs In Place	Sq Ft	Sq Ft	170.0	$	23.20	$ 3,944.00
00940	910	Type "R" Signs In Place	Sq Ft	Sq Ft	50.0	$	21.00	$ 1,050.00
00940	920	Type "W1" Signs In Place	Sq Ft	Sq Ft	84.0	$	20.00	$ 1,680.00
00940	930	Type "W7" Signs In Place	Sq Ft	Sq Ft	12.0	$	25.00	$ 300.00
00940	940	Type "Y1" Signs In Place	Sq Ft	Sq Ft	32.0	$	21.00	$ 672.00
00940	950	Type "Y2" Signs In Place	Sq Ft	Sq Ft	25.0	$	21.00	$ 525.00
00963	960	42 Inch Diameter Signal Support Drilled Shaft	Ft	Ft	16.0	$	700.00	$ 11,200.00
00990	970	Traffic Signal Installation, OR213/Redland Road	Lump Sum	Lump Sum	1	$	93,000.00	$ 93,000.00
00990	980	Loop Detector Installation	Lump Sum	Lump Sum	1	$	52,000.00	$ 52,000.00
		RIGHT OF WAY DEVELOPMENT AND CONTROL						
01030	990	Weed Control	Acre	Acre	1.25	$	11,000.00	$ 13,750.00
01030	1000	Seeding Mobilization	Each	Each	1	$	500.00	$ 500.00
01030	1010	Permanent Seeding, Mix No. 1	Acre	Acre	3.50	$	1,900.00	$ 6,650.00
01030	1020	Restoration Seeding, Mix No. 1	Acre	Acre	0.10	$	4,700.00	$ 470.00
01040	1030	Soil Testing	Each	Each	1	$	410.00	$ 410.00
01030	1040	Topsoil	Cu Yd	Cu Yd	1,300.0	$	16.00	$ 20,800.00
01092	1050	Water Quality Basin "SW12"	Lump Sum	Lump Sum	1	$	24,400.00	$ 24,400.00

SUB-TOTAL OF ITEMS	$	6,902,890.00
Contingencies @ 15%	$	1,035,500.00
Preliminary Engineering @ 8%	$	635,100.00
Construction Engineering @ 15%	$	1,190,800.00
TOTAL CONSTRUCTION ESTIMATE (PHASE 2):	**$**	**9,764,290.00**

12.04.205 - Mobility standards.

Development shall demonstrate compliance with intersection mobility standards. When evaluating the performance of the transportation system, the City of Oregon City requires all intersections, except for the facilities identified in subsection ~~E~~F~~D~~ below, to be maintained at or below the following mobility standards during the two-hour peak operating conditions. The first hour has the highest weekday traffic volumes and the second hour is the next highest hour before or after the first hour. Except as provided otherwise below, this may require the installation of mobility improvements as set forth in the transportation system plan or as otherwise identified by the city transportation engineer.

A. For intersections within the regional center, the following mobility standards apply:

1. During the first hour, a maximum v/c ratio of 1.10 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

2. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

3. Intersections located on the Regional Center boundary shall be considered within the Regional Center.

B. For intersections outside of the Regional Center but designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:

1. During the first hour, a maximum v/c ratio of 0.99 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

2. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.

C. For intersections outside the boundaries of the Regional Center and not designated on the Arterial and Throughway Network, as defined in the Regional Transportation Plan, the following mobility standards apply:

1. For signalized intersections:

a. During the first hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.

b. During the second hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.

2. For unsignalized intersections outside of the boundaries of the Regional Center:

a. For unsignalized intersections, during the peak hour, all movements serving more than twenty vehicles shall be maintained at LOS "E" or better. LOS "F" will be tolerated at movements serving no more than twenty vehicles during the peak hour.

D. For the intersection of OR 213 & Beavercreek Road, the following mobility standards apply:

1. During the first, second & third hours, a maximum v/c ratio of 1.00 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

~~E. For the intersection of OR 213 & Redland Road, the following mobility standards apply:~~

~~1. During the first & second hours, a maximum v/c ratio of 1.10 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.~~

~~2. During the third hour, a maximum v/c ratio of 1.05 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.~~

~~D~~F~~E~~. Until the city adopts new performance measures that identify alternative mobility targets, the city shall exempt proposed development that is permitted, either conditionally, outright, or through detailed development master plan approval, from compliance with the above-referenced mobility standards for the following state-owned facilities:

I-205/OR 99E Interchange

~~I-205/OR 213 Interchange~~

~~OR 213/Beavercreek Road~~

State intersections located within or on the Regional Center Boundaries

1. In the case of conceptual development approval for a master plan that impacts the above references intersections:
   a. The form of mitigation will be determined at the time of the detailed development plan review for subsequent phases utilizing the Code in place at the time the detailed development plan is submitted; and
   b. Only those trips approved by a detailed development plan review are vested.
2. Development which does not comply with the mobility standards for the intersections identified in [Section] 12.04.205.E~~F~~D shall provide for the improvements identified in the Transportation System Plan (TSP) in an effort to improve intersection mobility as necessary to offset the impact caused by development. Where required by other provisions of the Code, the applicant shall provide a traffic impact study that includes an assessment of the development's impact on the intersections identified in this exemption and shall construct the intersection improvements listed in the TSP or required by the Code.

(Ord. No. 10-1003, § 1(Exh. 1), 7-7-2010; Ord. No. 13-1003, § 1(Exh. 1), 7-17-2013)

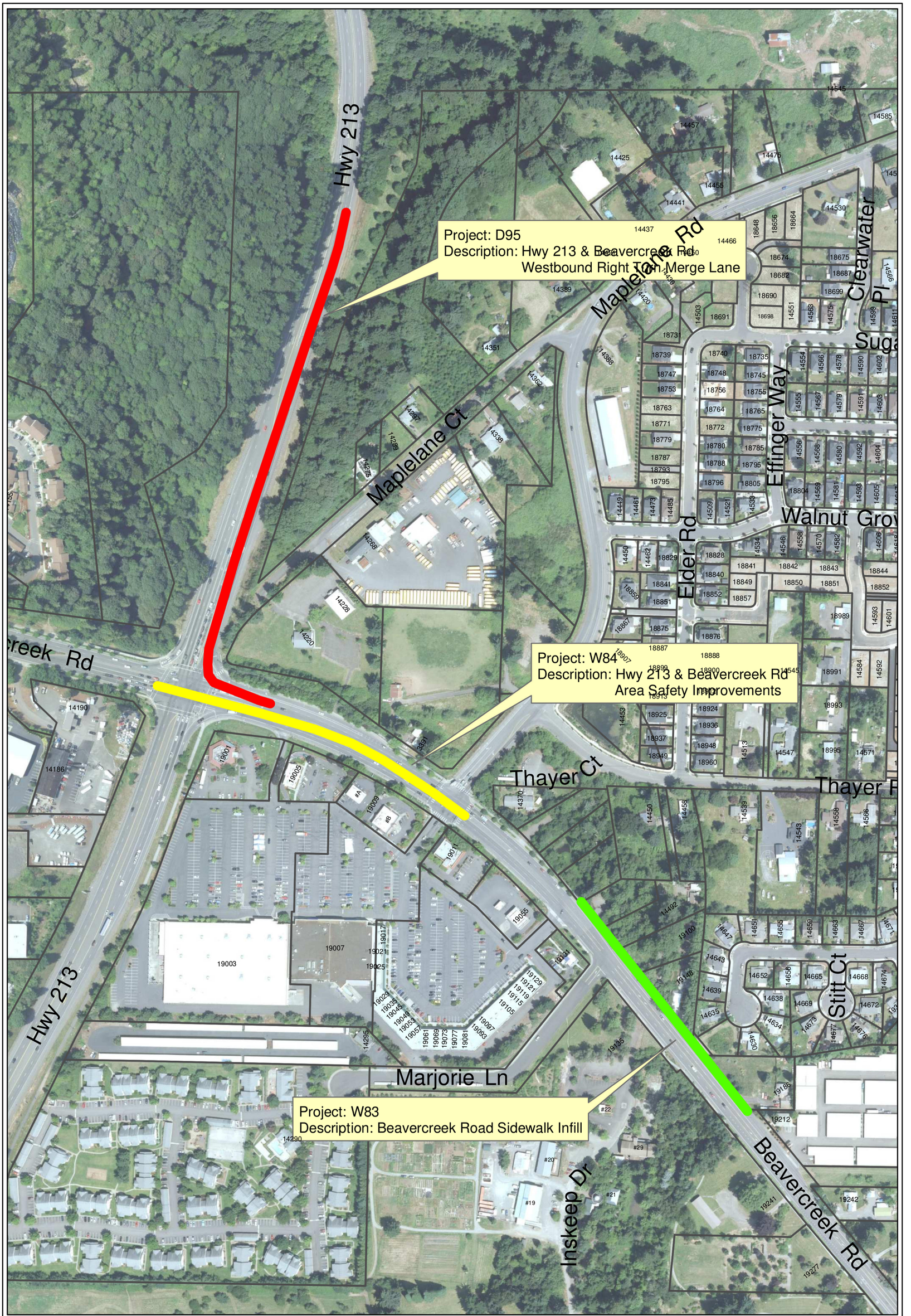
Editor's note— Ord. No. 13-1003, § 1, Exhibit 1, adopted July 17, 2013, retitled § 12.04.205 from "Intersection level of service standards" to "Mobility standards."

Hwy 213 Corridor Alternative Mobility Targets

Transportation System Plan (TSP) Amendments

Add/revise the following projects to the TSP:

Project #	Project Description	Project Extent	Project Elements	Priority	Cost Estimate
D95	Hwy 213 & Beavercreek Road Westbound Right Turn Merge Lane	Hwy 213 & Beavercreek Road to the north	Addition of a free flow right turn lane from Beavercreek Road to Hwy 213 Northbound and associated merge lane on Hwy 213 northbound	Short-Term	$2,700,000
W83	Beavercreek Road Sidewalk Infill	South of the Coltrane Path to North of Marjorie Lane	Sidewalk Infill	Medium Term	$330,000
W84	Hwy 213 & Beavercreek Road Area Safety Improvements	Hwy 213 & Beavercreek Road Intersection to Beavercreek Road & Maple Lane Intersection	Implement feasible Safety Improvements as identified in the Hwy 213 Corridor Alternative Mobility Targets Final Report	Medium-Term	$275,000
S13	Newell Creek Canyon/ Holly Lane Shared Use Path	Donovan Road to Beavercreek Rd	Add a shared use path between Holly Lane and HWY 213 to Maplelane Ct and beyond, connecting to the Oregon City Loop Trail at Beavercreek Road. (RTP project 10147)	Long Term Phase 2	$1,515,000



Transportation System Plan Amendments

The City of Oregon City makes no representations, express or implied, as to the accuracy, completeness and timeliness of the information displayed. This map is not suitable for legal, engineering, or surveying purposes. Notification of any errors is appreciated.

N W E S

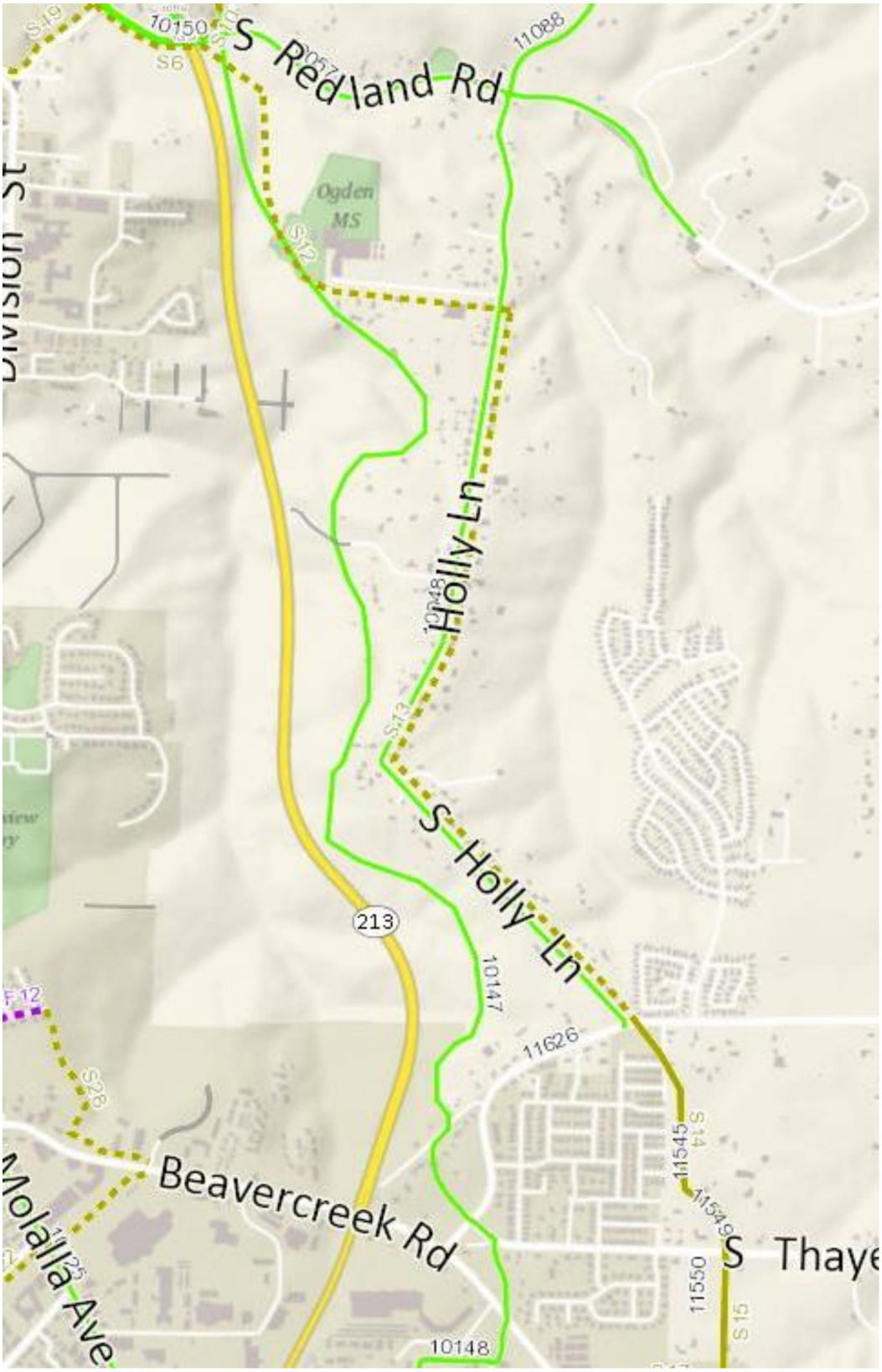
0 500 1,000 Feet

City of Oregon City
P.O. Box 3040
625 Center St
Oregon City, OR 97045
503-657-0891 phone
503-657-6629 fax
www.orcity.org

OREGON CITY

Plot date: 12/15/2017; Map name: Alternative Mobility Projects D95 W83 W84 - 36x48P.mxd; Plot name: Alternative Mobility Projects D95 W83 W84 - 36x48P - 20171215.pdf

Existing TSP/RTP Map of Newell Creek/Holly Lane Shared Use Path



Cathy Behrendt

12674 Swallowtail Place, Oregon City, OR 97045
Ph: (503) 476-9825 / Fx: (503) 476-9864
Email: cmbehrendt@gmail.com

January 22, 2018

Sent via email to dwebb@orcity.org
Dayna Webb
Sr. Project Engineer

Sent via email to lterway@orcity.org
Laura Terway
Community Development Director
City of Oregon City
625 Center St
Oregon City OR 97045

Re: Projects ps-16-024, L 17-03, 1-17-04

I am unable to attend tonight's hearing, but would like to state my opinion on the proposed changes involving areas surrounding Highway 213 and Beavercreek Road.

It seems this project is focused on "refinements" that have been labeled as an "Alternative Mobility Target" project. The only real improvement for our entire area will be to put money into NEW ROADS or bring light rail all the way out to Molalla. These little improvement projects that are proposed get us nowhere. I can deal with growth and expanding boundaries when done properly and efficiently, but I've seen our city spend thousands on sidewalks and landscaped dividers only to tear them up a couple of years later. I've seen over the years the changes made to the intersection of Highway 213 and Beavercreek Road, and it still is not sufficient. We can't allow an increase in population without the roads to support the growth. Why are the new home developments allowed prior to an increase in infrastructure? It seems logical to me that if 100 homes go in to a field, there will be at least 100 more drivers on the roads surrounding. Light rail isn't here in OC, and most citizens will not ride Trimet buses. Therefore, we need new roads to support the traffic since City and County has allowed the growth. It should not be up to the current citizens to fund it though.

The funds should already be in the basket of our local government. I've seen many pieces of acreage go from a large parcel paying $2500/yr in property taxes that later develops into hundreds of homes now paying $4000/yr in property taxes *per lot*. That should be putting the bankroll into the black. Citizens are told that there is no money for improvements on infrastructure nor new schools. Go explore the newest area of Happy Valley out towards Foster Road and Damascus and then come back to the OC. It's quite eye-opening that they have new roads/bi-ways and schools that were mostly implemented prior to the builds. Come back to the

OC and the clogged-up streets are full of cars and potholes. Aren't the two cities within the same county??

Since 1987 I have lived here and have seen NO improvements to this city. None. Yes, we get new restaurants and some new stores now and then, but the overall *health* of the city has not improved at all. I am disgusted and saddened at the officiates in County & City for allowing the traffic issue to explode and then leave it to the citizens to try and figure out how to survive in it. All of this should be taken care of prior to new developments coming into our city. We now have more pot shops than schools. This city of ours pays a higher salary for a community events coordinator than a police officer.

I feel that Clackamas County should bear a lot of the responsibility of the costs for any new improvements in the areas that your proposals direct. We have hundreds of County employees that now work on the hill in those large new buildings on Kaen Road that contribute to most of the traffic in the morning coming into Oregon City off Highway 213 and then again in the evenings leaving Oregon City. And then you have the guest traffic to Jail, Juvenile, etc. Clackamas County needs to fund the fix, in my opinion. And I know that someday that vacant field on between Kaen Road and Warner-Milne Road will also be County campus. Oregon City can't handle any more traffic up here on the hill.

In the meantime, I'm all for roundabouts to keep traffic flowing and HOV lanes up and down Highway 213 to encourage less traffic. I think that commercial truck traffic should be limited on Highway 213. Too much of it is traveling on our backroads in order to avoid I205 traffic. The trucks are then cutting through town and country backroads to connect with other outlying areas.

Until a new high school in a different location is built, the traffic on Beavercreek Road coming in and out of the high school needs to be rerouted with a direct pass off Highway 213 by expanding Meyers Road. If that cannot be done, expand the number of lanes on Beavercreek Road to include a "school lane" and start charging a toll for it. There are too many parents driving their kids to and from school and too many kids driving solo to and from school. Why should residents of those neighborhoods be stuck in that school traffic?

Thank you for your courtesies.

Sincerely,

Cathy Behrendt

Cathy Behrendt

From:	Laura Terway
To:	Kelly Reid; Dayna Webb; John M. Lewis
Subject:	Fwd: Ref: Highway 213 Corridor Alternative Mobility Targets
Date:	Sunday, January 21, 2018 6:35:56 AM

-Laura Terway

Begin forwarded message:

From: Steve Callistini <steve@cascadejets.com>
Date: January 20, 2018 at 11:26:13 PM PST
To: "lterway@orcity.org" <lterway@orcity.org>
Subject: Ref: Highway 213 Corridor Alternative Mobility Targets

Attn: Laura Terway

Ref: Highway 213 Corridor Alternative Mobility Targets
January 22, 2018 Meeting

In reviewing agenda items for the Monday, Jan 22, 2018 Oregon City Planning Meeting, I would like to make a couple of comments regarding the proposed changes to the Oregon City Municipal Code, specifically the proposed change to the Mobility Targets, and about increasing the VC index of .99 to a VC index of 1.10.

I am strongly against increasing the target index above the .99 threshold. I live almost 2 miles from the OR213/Beavercreek Rd intersection next to the golf course on Beavercreek Rd. Between the traffic from generated from the schools and the outer lying towns, I often see 15 minute travel times to navigate that 1.8 miles to my home from this intersection. Traveling through this intersection and on Beavercreek Rd is a bumper to bumper stop and go stream starting 6am for about 3 hrs and again around 3pm for 3-4 hours and should be an embarrassment to the City of Oregon City. I moved from Gladstone/Milwaukie to get away from traffic, and it appears that I misjudged the huge traffic and congestion that Oregon City offers its membership and guests.

I understand the financial dilemma that the city has found itself in, but I would suggest that the City work on budgeting in the monies over the next ten years for this OR213/Beavercreek Rd intersection, and work closer with ODOT in elevating this as a priority, and maybe hope for some matching funds from the State in the future. I realize this would put a hold on development on Beavercreek Rd and elsewhere, but out of control development is what got us into this predicament.

I would agree with adding a proposed RH merge lane on west bound Beavercreek Rd to OR213 northbound. I've seen plenty of rear end collisions because there is no acceleration ramp and this makes good sense.

Also, I would suggest not putting any traffic sign boards up on Northbound OR213. These only cause rear end collisions caused from drivers stopping to read them. Seen it for years on 205 after ODOT installed the sign board at Mall 205.

The biggest recommendation I have for this dangerous intersection is for ODOT to reduce the speed limit from 55MPH to 45 MPH! Often, traffic is traveling at up to 65MPH or more through this intersection, and it's too dangerous even at 55 MPH with the amount of traffic in this 4 way intersection. This would reduce the amount of collisions exponentially and make it safer for bicycle and foot traffic crossing!

Ultimately, I feel a full diamond design should be the target design and best solution for this intersection.

Please include this letter in the file for this topic at your Monday evening meeting and circulate a copy among the committee members. Thank you!

With kind regards,

Steve Callistini
Homeowner
Oregon City, OR 97045
T: (971)223-2905

From:	Paul Edgar
To:	Laura Terway; Kelly Reid
Cc:	Bob La Salle
Subject:	Seaside Transportation System Plan & Alternative Mobility Targets, Oregon Consensus
Date:	Sunday, January 14, 2018 1:55:59 PM
Attachments:	Seaside TSP_OTC AMS Rec-Attachment D.doc

Please attach this email and referenced attachments and Word Doc to the record on the hearing scheduled to go before the Oregon City Planning Commission on "Alternate Mobility Targets for Hwy 213 Corridor.

I would like to recommend to the Oregon City Transportation Committee and the Oregon City Planning Commission, a continuance of the up-coming hearing, where an effort can be made to assess the:

Results of the 2011 Seaside Oregon - TSP consensus process can be now reviewed some 6+ years later, with what were the Wins and Losses, have the problems been solved and the needs addressed?

With ever increasing Incidents of Travel within within the Metro Region, also reflected with the State Hwy 213 Corridor and at the intersection of Hwy 213 and Beavercreek Road, at levels of approximately 5% per year compounded, do we truly know the consequences. There are limited effective opportunities to incrementally to mitigate the consequences of forecasted growth in congestion through the strategies and tools associated with the implementations of "Alternative Mobility Targets & Standards".

If congestion is allowed to grow/increase to where it becomes quickly unacceptable, it can have major long term negative impacts on these strategic "Urban Freight Routes" and decrease values of properties, businesses, economic development potential and job creation and all of this needs greater assessments made, as to the impending potential consequences.

Oregon City needs to have these same conversations with all constituencies (inside and out side of Oregon City) gaining the perspective developers, property owners, businesses and users of the corridors of Beavercreek Road and State Hwy 213. This just has not happened!!

Now we have a just published article from the Pamplin Media Group on the growing transportation problem: http://pamplinmediagroup.com/cr/24-news/383297-270709-metro-evaluates-regional-transportation-needs

Paul Edgar, Oregon City Resident, was a member of the Clackamas County Transportation Committee that developed the Clackamas County - Regional TSP

Alternative Mobility Targets was to have been a cornerstone of the Seaside Oregon TSP, with the creation of Alternative Mobility Standards to guide future improvements on Highway 101.

http://oregonconsensus.org/wp-content/uploads/2013/12/09-022one-pagehandout_003.pdf

City residents advocated for a bypass since the 1980's. In 2000, an ODOT created a plan for improvements without a bypass and it grew to become very controversial during the final

design stages.

Seaside successfully sued ODOT for the right to vote on the project. The project was voted down by a narrow margin, and millions of federal and state funds were withdrawn from the community.

Neighbors were divided and relationships damaged between Seaside and ODOT.

After two years of community dialogue and development, the Seaside Transportation System Plan (TSP) was adopted in by the Seaside City Council on June 27, 2011.

Through out their plan development, the City of Seaside and the State agreed on the need of the TSP to be reasonable and implementable.

Direct conversations were held with stakeholders and community members about the constraints surrounding larger capital projects; such as a highway bypass, major widening efforts and grade-separated over-crossing.

These conversations were well-received with the end result being a prioritized set of recommendations for each implementing agency. See word attachment: Seaside TSP_OTC AMS Rec-Attachment D.doc

Attachment E

Seaside Alternative Mobility Standards
Executive Summary and Recommendation

ODOT Region 2 Recommendation to the Oregon Transportation Commission August 12, 2011

Executive Summary

After more than two years of community dialogue and development, the Seaside Transportation System Plan (TSP) was adopted by the Seaside City Council on June 27, 2011. The adopted TSP recommends a variety of projects that improve access, safety, and connectivity throughout the city while maintaining the community fabric and minimizing congestion and impacts to the environment. **One central element of the TSP requires Oregon Transportation Commission (OTC) approval** – the highway recommendations depend on OTC adoption of alternate mobility standards along US 101 through Seaside (between Lewis and Clark Road and Avenue U).

With a year-round population of 6,200 residents, Seaside's residency swells on summer weekends. The City is deemed the official end of the Lewis and Clark Trail, has been a vacation resort on the Oregon Coast for over a century, and is host to several high profile events and attractions, including:

- Miss Oregon Scholarship Pageant
- Hood to Coast (location of race finale)
- Beach Volleyball Tournament
- Seaside Aquarium
- Pearl Harbor Memorial Bridge

In May 2005, residents of Seaside voted down a project to widen US 101 to five lanes throughout Seaside. Following this vote on the Pacific Way to Dooley Bridge (Pac-Dooley) project, ODOT funds to construct the project were used elsewhere in the state. Provisions were stated at that time that before a different project could be considered for funding, the community would need to develop a TSP in accordance with Oregon Administrative Rules (OAR) 660-012. Projects identified in the TSP would need to compete for funding. The adopted TSP meets those requirements.

In many ways, the Seaside TSP followed a typical TSP process – gather information, identify needs, brainstorm ideas, evaluate ideas, and develop recommendations. However, certain elements of the TSP have been unique:

- ***Seaside is a coastal community with high seasonal traffic.*** Seaside's traffic congestion is seasonal in nature, which results in a wide variance of traffic volumes between summer and winter months. Average daily traffic (ADT) is approximately 14,000 vehicles with July and August daily volumes around 18,000 vehicles and January and December ADT around 11,000 vehicles. The difference between summer and winter traffic volumes is 60 percent. Concerns exist about building a roadway to meet 30th highest hour conditions which occur only during the summer weekend peak. Building to meet the summer peak demand results in a bigger highway footprint than the community of Seaside is willing to support.
- ***Early TSP efforts experienced high levels of community distrust.*** Many individuals within the community of Seaside voiced a distrust of the state and the City as a result of the Pac-Dooley process. Through outreach efforts which focused on full disclosure and transparency, and featured a website updated at least once a week; regular meetings with community leaders; and earned trust through listening and responding to community concerns, community opinion of the TSP slowly became positive. Similarly, the City of Seaside also started with a strained working relationship with ODOT. Through the TSP process and ultimately through ODOT's willingness to consider smaller highway footprints and, as a result, lower alternate mobility standards, this relationship has grown into one of mutual respect and trust.
- ***Focus on implementation.*** Throughout the plan development, the City of Seaside and the state have agreed on the need for the TSP to be *reasonable and implementable.* Direct conversations were held with stakeholders and community members about the constraints surrounding larger capital projects such as a

highway bypass, major widening efforts, and grade-separated overcrossings. These conversations were well-received with the end result being a prioritized set of recommendations for each implementing agency.

The Seaside TSP team explored, evaluated, and is now recommending Alternative Oregon Highway Plan (OHP) Mobility Standards for US 101. The specifics of these standards are that (1) operational analysis would be for average annual weekday peak hour conditions instead of the 30th Highest Hour, and (2) the mobility standard for four intersections with US 101 would change to 1.0, for the durations shown in the table below.

Intersection	Current OHP Mobility Standard	Proposed Mobility Standard	Future (2030) Projected Average Annual Conditions*	Expected Duration of Delay
US 101 / Lewis and Clark Road	0.80	1.0	1.10	2 hours (3-5pm)
US 101 / 12th Avenue	0.85	1.0	1.05	1 hour (4-5pm)
US 101 / Broadway	0.85	1.0	1.10	3 hours (3-6pm)
US 101 / Avenue U	0.85	1.0	0.95	<1 hour (does not exceed 1.0)

*assumes the construction of several improvements on both the local and state system consistent with TSP recommendations.

These standards are predicated on the following four tenets:

1. ***Investment in the local street network –*** the City has committed to investing in improvements to alternate, parallel routes to US 101 (namely Wahanna Road) and major collectors that connect the highway to the local street network (namely 12th Avenue, Broadway, Avenue F/G, and Avenue U), to encourage local users to reduce their use of the highway.
2. ***Investment in alternative modes –*** the City of Seaside and the Sunset Empire Transportation District (SETD) have both committed to investing in infrastructure and service to support bicycling, walking, and transit use. In fact, the vast majority of the City- or SETD-led TSP projects focus on bicycle, pedestrian, or transit improvements.
3. ***Strong access management measures –*** a short-term recommendation of the Seaside TSP is to develop a detailed access management plan for US 101. In the meantime, the City of Seaside and ODOT have included access management measures in the Seaside TSP to improve safety and reduce congestion along US 101 by looking for opportunities through new development, redevelopment, or construction projects to: relocate driveways onto local streets; provide alternate access along the local street network to discourage left-turns onto the highway; consolidate multiple accesses; share accesses; and restrict side street access to right-in/right-out if dictated by safety or congestion problems.
4. ***Strong consideration of land use / future development along the highway –*** the fourth tenet of the alternate mobility standards material calls for a land use overlay for parcels directly adjacent to US 101. The purpose of the overlay zone is to promote walking and bicycling to uses along the highway. The overlay zone features review and check in with the Seaside Planning Commission for uses that attract more than 50 trips in the peak hour, and encourages development to the sidewalk with parking in the rear or side of the building. No Comprehensive Land Use Plan changes are contemplated with the adoption of the TSP and the TSP is based on implementation of the existing adopted Land Use Plan over the 20-year planning horizon.

ODOT staff recommends approval of the Alternate OHP Mobility Standard of 1.0 on US 101 in Seaside at the identified intersections using the average annual weekday peak hour traffic volumes instead of 30th highest hour conditions as the primary analysis period. This recommendation is backed by the project partners, including the City of Seaside City Council, Planning Commission, and staff; the Department of Land Conservation and Development, and Clatsop County.

From:	Laura Terway
To:	Kelly Reid; Dayna Webb; John M. Lewis
Subject:	Fwd: Oregon City congestion/ Mon 22nd meeting
Date:	Sunday, January 21, 2018 4:28:41 PM

-Laura Terway

Begin forwarded message:

From: Janine Offuttt <j9hypnoziz@yahoo.com>
Date: January 21, 2018 at 3:04:14 PM PST
To: "Lterway@orcity.org" <Lterway@orcity.org>
Subject: Oregon City congestion/ Mon 22nd meeting
Reply-To: Janine Offuttt <j9hypnoziz@yahoo.com>

Dear Laura Terway - Community Development Director City of Oregon City -
I hear the city is considering upping the current limits to allow for more traffic on our roads. It's easy to see how this will multiply our traffic problems and create more congestion.

I think the city should cap development for a few years, and wait to see how recent developments effect our roads and communities. For instance, when the Cove project is completed, it will add more burden to current traffic issues where 205 meets up with routes 99 and 213 and 43.

A sane planning policy would encourage citizens to drive far less. Driving fewer miles is one of the most important things we can do to mitigate climate change.

Please listen to your concerned citizens ... not just to developers looking to turn a profit. thanks, D. Janine Offutt

OREGON CITY GOLF CLUB
20124 S BEAVERCREEK RD.
OREGON CITY, OR 97045

503-518-2846

City of Oregon City
625 Center St.
Oregon City, OR 97045

January 22, 2018

RE: Support for Alternative Mobility Standards Adoption

Dear City Commissions:

The city identified a need for refinement plans due to at intersections along the 213 corridor while updating its Transportation System Plan in 2012. In 2017, the city formed Advisory Groups to identify the type of transportation improvements necessary to meet Oregon Highway Plan mobility targets at intersections along Highway 213. Specifically the intersections at Beavercreek and Redland Roads are projected to exceed current mobility standard in 2035.

If Alternative Mobility targets are not adopted for this area, the Beavercreek Road Concept Plan cannot be implemented. At this time, many projects that could be assisting the city with needed revenue are hindered, stalled, and delayed. Other projects are currently in an indeterminate state while the issue of finding meaningful and financially feasible mobility or congestion targets can be resolved. Some developers have been discouraged with the length of time this this process has taken and chose to build in other cities where the development path is clear and concise.

The city is unable to provide the necessary required funding for necessary solutions on its own and will need the assistance from others, such as new businesses locating in the Beavercreek Employment Lands area and developers building workforce housing and small commercial centers to support the economic development the Beavercreek Concept Plan was designed to provide.

The benefit to our city of adopting these mobility targets is improved future mobility and safety, reduced bottleneck, and additional economic stability for our city and its citizens.

I support the adoption of the Alternative Mobility Standards and urge you to support them as well.

Thank you for your consideration.

Sincerely,

Rose Holden

Rose Holden
Oregon City Golf Club,, INC

From:	Laura Terway
To:	Kelly Reid; Dayna Webb; John M. Lewis
Subject:	Fwd: Oregon City congestion/ Mon 22nd meeting
Date:	Sunday, January 21, 2018 4:28:41 PM

-Laura Terway

Begin forwarded message:

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Date: January 21, 2018 at 3:04:14 PM PST
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A sane planning policy would encourage citizens to drive far less. Driving fewer miles is one of the most important things we can do to mitigate climate change.

Please listen to your concerned citizens ... not just to developers looking to turn a profit. thanks, D. Janine Offutt

From:	Laura Terway
To:	Kelly Reid
Subject:	Fwd: Ordinances 18-1004 and 18-1005
Date:	Saturday, January 20, 2018 6:24:53 PM

-Laura Terway

Begin forwarded message:

> **From:** Roseann Sheeon <rsheeon@yahoo.com>
> **Date:** January 20, 2018 at 6:06:45 PM PST
> **To:** lterway@orcity.org
> **Subject: Ordinances 18-1004 and 18-1005**
>
> We are new to Oregon City. Over the last two years the growth with no consideration for the overcrowded schools and traffic patterns is unconscionable! My grandson has 33 students in his 5th grade classroom. As a retired teacher...that is an impossible number for the teacher and the children. Please DO NOT pass these two items until the infrastructure is addressed and fixed.
>
> Carl and Roseann Sheeon
> 20257 Quinalt Dr
> 503.722.3890
>
> Sent from my iPad

Exhibit 1-4. Four-legged DLT intersection with major street displaced lefts and channelized right turns (Baton Rouge, LA).[1]

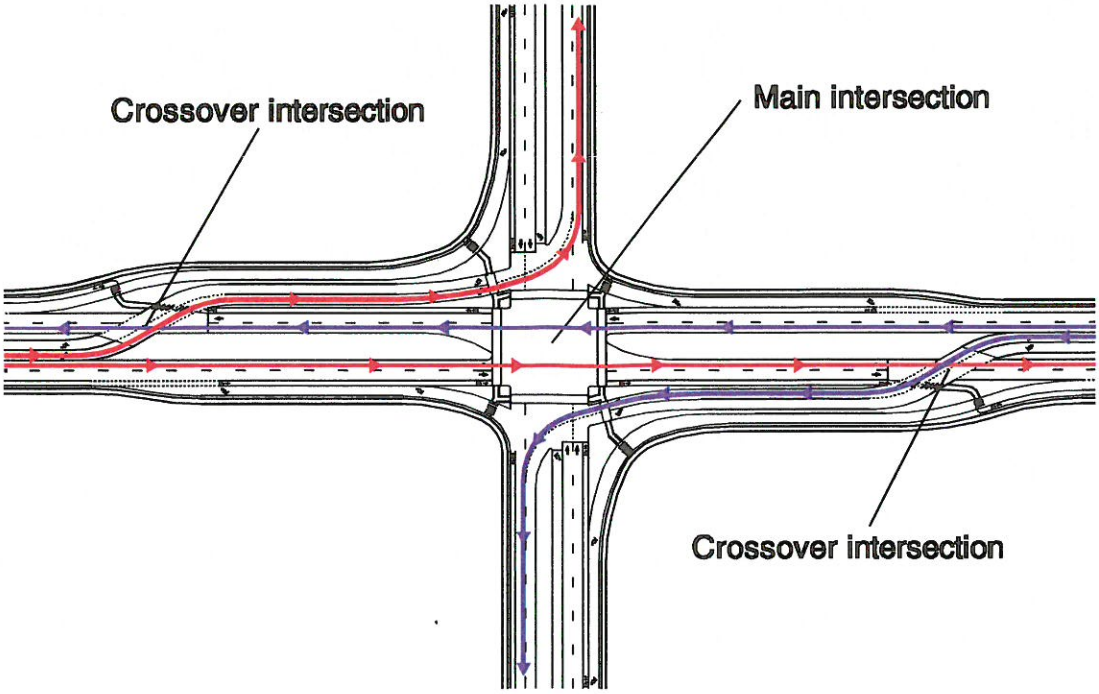

Exhibit 1-1. Four-legged DLT with displaced lefts on a major street.

Exhibit 1-1 shows a DLT intersection where the displaced left-turn movement has been implemented on two legs on the major street. In some cases, the displaced left turns are on the minor street instead of the major street. The left-turn movements for the minor road continue to take place at the main intersection. There are five junctions with traffic signal control at a four-leg DLT intersection: the main intersection and the four left-turn crossover intersections.

APPLICATION

Several DLT intersections have been installed throughout the United States, and each location is documented in the Appendix. Exhibit 1-2 shows the location of existing DLT intersections in the United States, as of the publication of this guide.

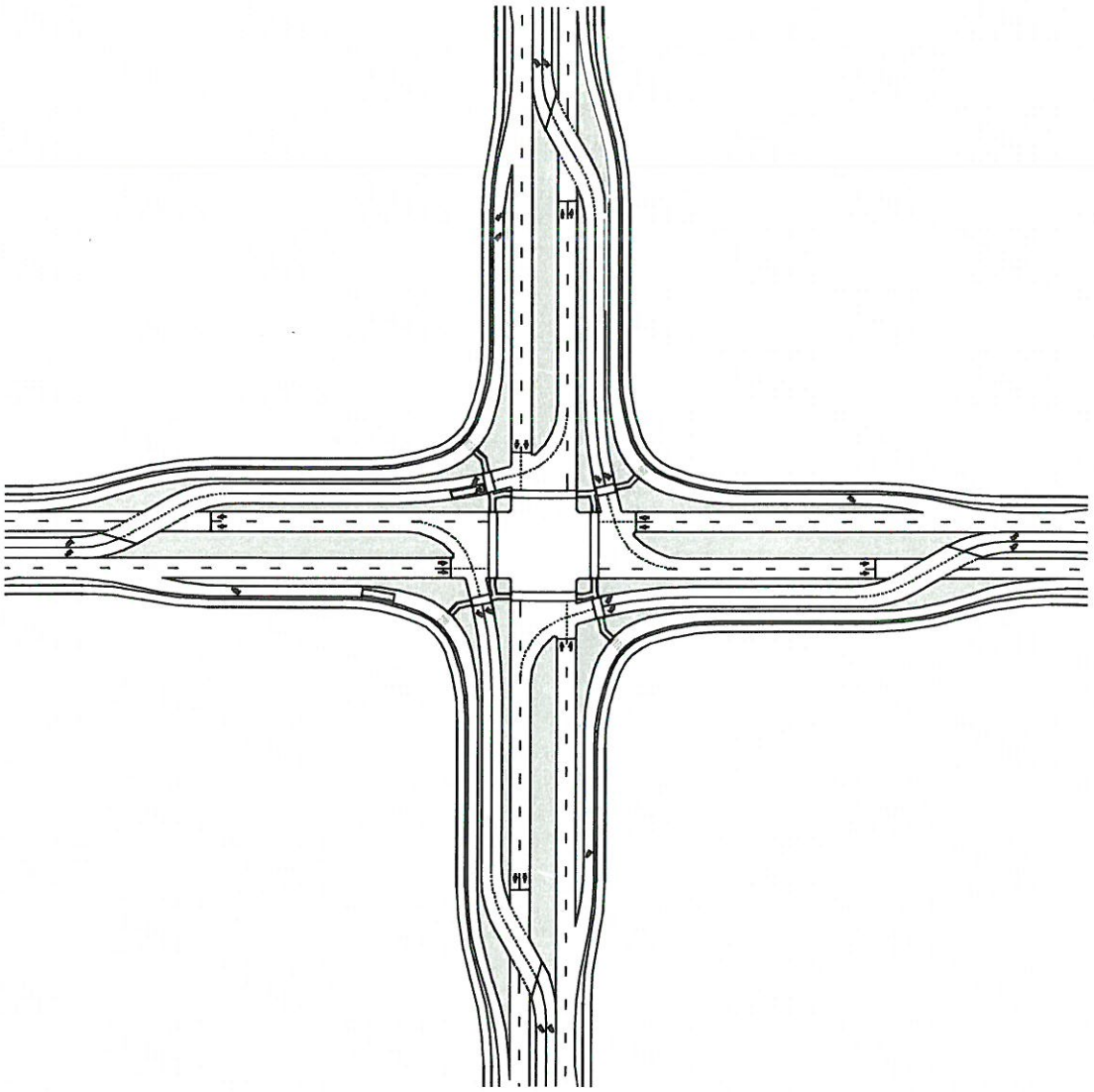

Exhibit 1-12. DLT intersection with displaced left turns on all approaches.

City of Oregon City Planning Commission
Meeting of January 22nd, 2018

RE: Agenda Item 3a – L17-03 Alternative Mobility Standards

Testimony of: Christine Kosinski, Unincorporated Clackamas County

To me, the Alternative Mobility Targets have been all smoke and mirrors. Yes, the City recognizes there is a huge capacity issue at Beavercreek Rd and Hwy 213, but you have gone through a process, that frankly, has failed to bring any real solutions, but you want the citizens to buy into it.

The addition of another Right Hand turn lane on Beavercreek Rd for motorists turning North on Hwy 213, I feel will be of little help. You have already recognized that many Rear End accidents happen here, but adding another lane will just create even more rear end accidents as motorists try to merge onto the highway while some motorists will be reluctant to let them in, slowing traffic down. Where was "Citizen Safety" in all of your meetings? To use a bandaid to fix this problem and then to put the citizens in harm's way from rear end crashes is NO solution.

What Oregon City is experiencing is the result of developing too fast at any cost and without the Grade Separated Intersection and infrastructure needed to support this large build-out.

My suggestions to the City would be, don't add the Right Hand turn lane, save your money, spare the people and stop more rear end crashes. Asking the people to jeopardize their lives while traveling this corridor is wrong, the people should never have to pay for mistakes of the City. Your key to growth is by building the Grade Separated Intersection, until you do this, your current traffic problems at this intersection will just become disastrous. I've had several phone calls from people both inside and outside of the City. Many of them are making plans to leave the City, some have already bought homes elsewhere and they say it is due to the heavy, fast and unsafe traffic conditions that the City has created.

No bandaids, I vote for real change that will make a difference in the years ahead. Do as the City of Seaside did, they put the Alternative Mobility Targets to a vote of the people, and through the process of listening to their people, they found solutions they can all live with.

FAX TRANSMISSION

COPY

John C. Spencer
SPENCER & KUPPER

555 NW Park Avenue, #231
Portland, Oregon 97209
Tel/Fax: 503/226-1067 282-9853

Date: September 10, 1993

To: Ron Weinman, Clackamas County

From: John Spencer, OCURA

Subject: HWY. 213/BEAVERCREEK ROAD INTERSECTION (Revised from 9/9/93)

Message: Please find attached proposed draft amendments to the MOU of Feb. 92, and proposed comprehensive plan policies to be added to OC's transportation plan. We are reviewing these proposals with the city attorney, and would like your comments. Please contact me at 226-1067.

John

Number of pages including this one: 8.

containing Memo of Understanding signed by OR City

September 10, 1993

MEMORANDUM

TO: Charlie Leeson, Henry Mackenroth, Denyse McGriff, City of Oregon City
Mark Greenfield

FROM: John Spencer, Oregon City Urban Renewal Agency

RE: HWY. 213/BEAVERCREEK ROAD INTERSECTION (Revised from 9/9/93)

As a follow-up to the meeting on June 24 with Clackamas County and ODOT officials, I agreed to summarize our discussions which will be the basis for a revised Memorandum of Understanding between the City, County, and ODOT.

Overall Intent

It is the intent of all parties to provide for and implement the various transportation projects called for in the Draft Warner-Parrott Rd.-Oregon City Bypass Environmental Assessment. These projects include an at-grade interchange improvement of the Highway 213/Beavercreek Road intersection, and the future construction of a grade-separated interchange. All parties agree that existing traffic congestion at this intersection is at unacceptable levels. Until intersection and other improvements have been constructed, any new development permitted in the vicinity of this intersection should not increase the congestion problems beyond current levels. It is also agreed that if the sponsors of new development can prove that proposed development will not increase the congestion problems, then development will be allowed only when in compliance with adopted plans for an at-grade interchange at the Highway 213/Beavercreek Road intersection.

Proposed Modifications to the Draft MOU of 2/92

The Draft Memorandum of Understanding is attached. The following changes are proposed:

Paragraph 4.a., add the following:

The State, County and City consider the interchange project as high priority.

Delete paragraph 4.b.

Delete paragraph 7 and add the following:

The County and City agree that grade-separated interchange improvements for Highway 213/Beavercreek Road are adopted as part of their Comprehenstve Plans. The County and City also agree that their respective Comprehensive Plans require that major intersections operate at Level of Service (LOS) D or better. The County

and City agree that when new developments are proposed for properties along Beavercreek Road prior to construction of grade-separated interchange improvements, a professional traffic analysis shall be required prior to the issuance of any land use permits. Land use permits shall not be approved unless the traffic analysis demonstrates that the Highway 213/Beavercreek Road intersection and other nearby intersections will operate at Level of Service D or better with the proposed development. If the traffic analysis demonstrates that the Highway 213/Beavercreek Road intersection will operate at LOS D or better with the proposed development, the development plan, including access to Beavercreek Road, will not interfere with, impede the implementation of, or substantially increase the cost of the adopted grade-separated interchange improvements for Highway 213/Beavercreek Road.

First Draft Comprehensive Plan Amendments

In order to meet the obligations outlined in the paragraph above, Oregon City will need to amend the transportation element of its Comprehensive Plan. The first obligation is to adopt the interchange plan. That has been done with Ordinance 92-1002 attached. Following are draft policies to meet the other obligations outlined above.

a. *All intersections requiring full signals as shown on Figure 2, Traffic Signal Locations, Oregon City Transportation Master Plan, 1989, and any other intersections where full traffic signals are warranted, shall operate at Level of Service D or better. Level of Service (LOS) is defined in Appendix B of the Oregon City Transportation Master Plan, 1989.*

b. *A professional traffic analysis shall be required prior to the issuance of any land use permits when new developments are proposed for properties in the vicinity of fully signaled intersections. Land use permits shall be approved only when the traffic analysis demonstrates that the signalized intersection will operate at Level of Service D or better with the proposed development, and that the development plan will not interfere with, impede the implementation of, or substantially increase the cost of any adopted transportation improvements identified in the City's Comprehensive Plan*

c. *Right-of-way shall be required as a condition of approval when developments are proposed near adopted transportation improvements identified in the City's Comprehensive Plan.*

Please provide comments on these proposed plan amendments to me by the end of next week. Thanks,

John

MEMORANDUM OF UNDERSTANDING
Between the
STATE OF OREGON,
CLACKAMAS COUNTY,
And
CITY OF OREGON CITY

(1) The Oregon Department of Transportation, Highway Division, hereinafter referred to as "State"; CLACKAMAS COUNTY, a political subdivision of the State of Oregon, acting by and through its Board of Commissioners, hereinafter referred to as "County"; CITY OF OREGON CITY, a municipal corporation of the State of Oregon, acting by and through its City Officials, hereinafter referred to as "City"; enter into this Memo of Understanding to set forth the principles of mutual commitment to the proposed Cascade Highway South at Beavercreek Road Interchange.

(2) State and County previously entered into a construction finance agreement No. 8119, on June 21, 1984 for the Warner-Parrott Rd. - Oregon City Bypass project.

(3) When the Warner-Parrott Rd. - Oregon City Bypass project is constructed, State, County, and City agree the increased traffic flow will cause congestion at the Cascade Highway South / Beavercreek Rd. intersection, and all parties agree that improvements may be necessary. Proposed at this time is an at-grade interchange at Cascade Hwy. South / Beavercreek Rd.

(4) State, County, and City agree to the following conditions in preparation for the proposed interchange agreement:

(a) State will support County and City in seeking the necessary funds from Metro to construct the interchange project.

(b) The County and/or City will be responsible for the survey, writing the descriptions, and the acquisition of any necessary right-of-way for construction of at-grade interchange.

(c) The County will have the lead role in project engineering and construction management.

(d) Prior to construction of the Cascade Hwy. South / Beavercreek Rd. Interchange, State, County, and City shall enter into a cooperative improvement agreement for construction and maintenance responsibilities for the at-grade interchange.

⑤ The State, County, and City agree to consider a joint project for a future "grade-separated" interchange at the Cascade Hwy. South / Beavercreek Rd. location. The determination of financial participation will occur as part of the State's Six-year Transportation Improvement Program update process when future project becomes necessary.

⑥ Any cost of right-of-way and other improvements incurred in constructing the previously proposed at-grade project shall be considered in determining the shares of the cost of the grade-separated project.

⑦ The County and City agree to prevent additional development in areas identified as needed for constructing the Cascade Hwy. South / Beavercreek Rd. grade-separated interchange and prevent additional access that would conflict with the public's need for access control to the extent identified in the attached State drawing.

⑧ Terms of this Memorandum of Understanding can be terminated by any of the parties with 30 day, written notice.

⑨ Upon receipt of a signed copy of this Memo of Understanding, County and City shall start the process for acquiring the necessary funds for the construction of the proposed at-grade project and State shall review and release the Environmental Assessment document.

OREGON DEPT. OF TRANSPORTATION

Region Manager

Date_____

CLACKAMAS COUNTY
Board of Commissioners

_____
Chair

_____
Commissioner

_____
Commissioner

Date_____

CITY OF OREGON CITY

Mayor

City Recorder

Date 2-17-92

B3193001

CITY OF OREGON CITY

Incorporated 1844

DEVELOPMENT SERVICES DEPARTMENT
Planning, Building, Engineering
320 Warner-Milne Road
Oregon City, OR 97045
(503) 657-0895
FAX (503) 657-3339

May 27, 1993

Ron Weinman
Clackamas County
902 Abernethey Road
Oregon City, Oregon, 97045-1100

Mr. Weinman:

The Oregon City Commission, at its May 19th meeting, rescinded its approval given on February 17th, of the Memorandum of Understanding between the State of Oregon, Clackamas County and the City regarding the proposed interchange on Cascade Highway South at Beavercreek Road, effective immediately.

The Commission is concerned about the provisions and implications of the paragraph addressing the prevention of development on private lands. They further understood that the agreement was in it's final form when they originally authorized signing.

The City Commission has directed staff to reopen negotiations regarding this agreement. An identical letter is being transmitted to Ted Keasy at Region 1, of Oregon State Highway Division.

Please contact me to arrange further discussions on this matter.

Charles Leeson
City Manager

cc: City Commission
Ed Sullivan, City Attorney
Henry Mackenroth, Project Manager

COPY

ORDINANCE 92-1002

AN ORDINANCE AMENDING THE TRANSPORTATION MASTER PLAN AND THE TRANSPORTATION ELEMENT PLAN OF THE COMPREHENSIVE PLAN TO ADD TWO FUTURE ROAD PROJECTS AND A POLICY FOR COLLECTOR STREETS.

WHEREAS, the State Highway Division has requested that a proposed road project at Highway 213 and Beavercreek Road be included in the Oregon City Comprehensive Plan, and

WHEREAS, based on development patterns a future collector street needs to be designated outside of the City limits, but in the Urban Growth Boundary, and

WHEREAS, a policy on access management is needed to guide development along collector streets, and

WHEREAS, the Oregon City Planning Commission, on December 12, 1991, conducted a public hearing to consider the adoption of these proposals, and

WHEREAS, the proposed amendments to the Transportation Master Plan and Transportation Element of the Comprehensive Plan is designed to best meet the land use planning needs of the City.

OREGON CITY ORDAINS AS FOLLOWS:

Section 1. That the Transportation Master Plan and the Transportation Element of the Comprehensive Plan are hereby amended to add the following to read as follows:

I. Add the grade separation of Highway 213/Beavercreek Road.

a. The State Highway Division has forwarded a request to add the grade separation at Highway 213/Beavercreek Road. The proposal would include maps of the proposed Phase 1 and 2 project to page 63 of the Transportation Master Plan as an addition to the roadway laneage and access control map.

b. Roadway Laneage/Access Control Plan, page 64 of the Transportation Master Plan - Widen Highway 213 to six lanes between Beavercreek Road and I-205, with a grade separation at Beavercreek Road (to include Phase 1 and Phase 2 roadway and laneage needs).

2. Add S. Caufield Road as a future collector street - (For approximately 500 feet from Highway 213 to a proposed street that would be located berween S. Caufield Road and S. Canyon Ridge Drive; added to page 60 of the Transportation Master Plan.

3. Add a policy - Regarding access management on collector streets to Policy 4 on page L-35 of the Transportation Element of the Comprehensive Plan:

New subdivision/residential development shall minimize access on collector streets unless infeasible. If feasible, lots shall be oriented to have frontage on local streets with back yards to the collector street.

Read first time at a regular meeting of the City Commission held on the 5th day of February, 1992, and the foregoing ordinance was finally enacted by the City Commission this 5th day of February, 1992.

Jean K. Elliott

JEAN K. ELLIOTT, City Recorder

ATTESTED this 5th day of February, 1992.

Daniel W. Fowler

DANIEL W. FOWLER, Mayor

ORDINANCE NO. 92-1002

Effective: March 6, 1992

January 22, 2018

Testimony to the Oregon City Planning Commission

Subject: L 17-03 Legislative Amendment to amend Chapter 12.04.205 of the OCMC for Alternative Mobility Standards on Highway 213

From: Paul Edgar, Oregon City

I would like to ask all of you an aspirational question, as to what responsibility we all have to make sure our children are given the chance to reach their Full Potential.

Please think about this!

What is being asked, is about placing limits on the future and to me that is not the American Way. We want to allow the cream to rise to the top, we want to do whatever is reasonable to allow for excellence. We do not want to crib anyone, as to their future. We want to try as hard as we can to make sure the next generation, our children and our children's - children will not have unreasonable limits placed on them.

None of us have a Crystal Ball that allows us to look into the future. But we know that the next generation needs every opportunity and the best education possible to meet, whatever challenge they may face.

Well "L 17-03: Legislative Amendment to amend to Chapter 12.04.205 of the Oregon City Municipal Code for alternative mobility standards for Highway 213 intersections at Beavercreek and Redland Roads, and to amend the Transportation System Plan project list", puts unreasonable limits on our region's Transportation system - economic future.

This Code being proposed is to allow for congestion to increase, which can only restrict the free movement of freight and all the people that will have to travel the Hwy 213 corridor and through the Intersection of Hwy. 213 and Beavercreek Road.

Many of us find that to be inconsolable, where critical Freight Movement will be allowed to experience, an ever increasing high levels of degradation, which we all know increases the Cost of Freight Movement and which will stagnate all business development and job creation, over a period of time.

We need to make our area and Clackamas County is as inviting to investment as possible. When the families and business people alike experience a stupid level of congestion in Oregon City and Clackamas County they will question as to why they would move to a place that.

In the core of the Portland Metropolitan Area, "incidents of travel are increasing at unprecedented levels of greater than 5% per year compounded" and people and businesses are looking for a place to go. Where can they go that is not just a "Me To Alternative", with the same intolerable conditions and costs?

We need a long term solutions and what is being proposed is less than "just kick the can down the road!". Volume over Capacity = V/C.1 says we have a failing thoroughfare, which is a full glass of water and we are going to give everyone the ability to pour more water into the glass and you will just have to deal with it.

There are so many undeveloped Properties on Beavercreek Road and others on Highway 213/Meyers Rd., these changes will decrease all opportunities into the future, because this unchecked ability to increase congestion, thus increase the cost of doing business, will affect the decision making with all potential buyers - developers and businesses, thus making your property investments worth less.

ODOT, Metro - JPAC, TriMet, PBOT, Multnomah County, and Washington County all have priority over Transportation Funding and that leaves Clackamas County "Sucking the Hind Tit", as we are the weakest piglet. With these proposed Code Changes, we are providing those entities with the ability to take all of the available Transportation Funding and implement their strategy, and this allows them to get away with it.

To me we have to make a stand. We have to get everyone with Common Since, all of the business community, the Chamber of Commerce and citizens inside and outside of Oregon City to think through this, because what is being asked for, has never been done before in our Metro Region – ODOT Region One.

"Is it smart of put a permanent throttle that adds to congestion and restricts on all future movement of people and commerce that needs Highway 213 Corridor and its arterial's of Beavercreek and Redland Roads".

We don't have a lot of options to move people and commerce to the Hilltop of Oregon City and those areas east, west and south. To me, we just have to protect this critical transportation Corridor of Highway 213 and Beavercreek Road that carries the status of being a strategic Urban Freight Routes, within the City, Clackamas County and the State of Oregon, in their TSP's and Comprehensive Plans.

I don't know how anyone could live with limiting the promise of the future, for short term gains.

Thanks,

301

Oregon

Department of Transportation
Region 1 Headquarters
123 NW Flanders Street
Portland, Oregon 97209
(503) 731.8200
FAX (503) 731.8531

January 22, 2018

Planning Commission
City of Oregon City
PO Box 3040
Oregon City, OR 97045

The Oregon Department of Transportation (ODOT) is pleased to offer our support for the City of Oregon City's proposed alternative mobility targets in the vicinity of Highway 213 and Beavercreek Road. ODOT staff participated in the development of the City's Transportation System Plan which included direction to perform a refinement plan to develop alternative mobility targets. ODOT staff also participated in the Technical Advisory Group and Community Advisory Group for the Highway 213 Corridor Alternative Mobility Targets effort.

ODOT supports the proposed alternative mobility targets at OR 213 and Beavercreek Road based on inclusion of the westbound right turn merge lane project at OR213/Beavercreek Road in the City's TSP *and* in the Financially Constrained RTP project list, as well as the addition of the Beavercreek Road sidewalk infill and Hwy 213 and Beavercreek Road safety Improvement projects into the City's TSP. The length of the merge lane is to be determined during project development, must be approved by ODOT, and should not be specified in the project description. ODOT supports the proposed performance measurement methodology based on average annual weekday peak hour performance.

ODOT advises the City that alternative mobility targets are not needed at Redland Road based on inclusion of a proposed project (TSP project D79, RTP project 10119) in the Financially Constrained RTP project list. With this project in place, the intersection meets current Oregon Highway Plan mobility targets. The project may be assumed to be in place for purposes of future plan amendments based on the Transportation Planning Rule (TPR), OAR 660-0012-0060(4)(b)(C). Any one of the options under section -0060(4) are sufficient for projects to be considered planned improvements that jurisdictions and applicants are able to rely on for purposes of compliance with section -0060 of the TPR.

ODOT requests that the City state its intent to pursue actual funding of both the Beavercreek and Redland Road projects (as described in the City's TSP and Financially Constrained RTP) as opportunities arise, including the proposed regional transportation funding bond measure.

Upon local adoption of the proposed alternative mobility targets, ODOT staff will work with the City to take the proposed targets to the Oregon Transportation Commission for adoption. Let us know if we can be of any more assistance,

Jon Makler

Jon Makler
Planning Manager
ODOT Region 1

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

LAND USE APPLICATION FORM

Type I (OCMC 17.50.030.A)	Type II (OCMC 17.50.030.B)	Type III / IV (OCMC 17.50.030.C)
❑ Compatibility Review	❑ Extension	❑ Annexation
❑ Lot Line Adjustment	❑ Detailed Development Review	❑ Code Interpretation / Similar Use
❑ Non-Conforming Use Review	❑ Geotechnical Hazards	❑ Concept Development Plan
❑ Natural Resource (NROD) Verification	❑ Minor Partition (<4 lots)	❑ Conditional Use
❑ Site Plan and Design Review	❑ Minor Site Plan & Design Review	❑ Comprehensive Plan Amendment (Text/Map)
	❑ Non-Conforming Use Review	❑ Detailed Development Plan
	❑ Site Plan and Design Review	❑ Historic Review
	❑ Subdivision (4+ lots)	☒ Municipal Code Amendment
	❑ Minor Variance	❑ Variance
	❑ Natural Resource (NROD) Review	❑ Zone Change

File Number(s): LE 17-03

Proposed Land Use or Activity: Adoption of Alternative Mobility Targets for OR213 at Beavercreek Road and Redland Road, Amendments to the TSP

Project Name: Alternative Mobility Targets Number of Lots Proposed (If Applicable): N/A

Physical Address of Site: Hwy 213 Corridor: Redland Road to Beavercreek Road

Clackamas County Map and Tax Lot Number(s): _____

Applicant(s):

Applicant(s) Signature: _____

Applicant(s) Name Printed: Tony Konkol, City Manager Date: 12/13/17

Mailing Address: PO Box 3040, Oregon City, OR 97045

Phone: 503-657-0891 Fax: _____ Email: tkonkol@orcity.org

Property Owner(s):

Property Owner(s) Signature: _____

Property Owner(s) Name Printed: _____ Date: _____

Mailing Address: _____

Phone: _____ Fax: _____ Email: _____

Representative(s):

Representative(s) Signature: _____

Representative (s) Name Printed: _____ Date: _____

Mailing Address: _____

Phone: _____ Fax: _____ Email: _____

All signatures represented must have the full legal capacity and hereby authorize the filing of this application and certify that the information and exhibits herewith are correct and indicate the parties willingness to comply with all code requirements.

L 17-03 – Alternate Mobility Standards

Applicant Narrative:

Oregon City's 2013 Transportation System Plan (TSP) determined that the Highway 213 (OR213) corridor from Redland Road to Molalla Avenue (including the intersection of Beavercreek Road) will exceed the current mobility target in 2035, resulting in more congestion than is allowed. The OR213 intersection with Molalla Avenue is anticipated to meet the target; however, Beavercreek Road and Redland Road are not anticipated to meet the target.

The existing mobility target at the OR213/Beavercreek Road intersection is a volume-to-capacity (v/c) ratio at or below 0.99 during the peak first and second hours. The existing mobility target at the OR213/Redland Road intersection is a v/c ratio at or below 1.1 during the peak first hour and 0.99 during the peak second hour, as this intersection is located in a regional center. The alternatives that would meet the existing mobility targets at the OR213/Beavercreek Road and OR213/Redland Road intersections are not cost feasible, given the financial constraints of the City and other agency partners.

These alternatives can be further considered in the future if additional funding becomes available.

Lacking the financial capability of implementing major capacity-increasing projects at these locations, alternative mobility targets are necessary at each of these intersections; however, some improvements are feasible in the cost-constrained TSP to improve safety and minimize future congestion.

The following improvements are recommended for the intersection of OR213 and Beavercreek Road:

- Construct a westbound right-turn merge lane. High visibility pavement markings and signage are recommended for pedestrians and bicycles to cross the channelized lane safely, and consideration should be given to installing a rectangular rapid flash beacon (RRFB) for increased visibility.
- Infill sidewalk on Beavercreek Road from south of the Coltrane Path to north of Marjorie Lane.
- Install various safety improvements outlined on pages 33 and 35 of the final report.

The above improvements will be added as projects in the TSP for future consideration.

For the intersection of OR213 and Beavercreek Road, the following mobility standards apply:

- During the first, second and third hours, a maximum v/c ratio of 1.00 shall be maintained.

Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

For the intersection of OR213 and Redland Road, the following mobility standards apply:

- During the first and second hours, a maximum v/c ratio of 1.10 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.
- During the third hour, a maximum v/c ratio of 1.05 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

Changes to the TSP to incorporate these improvements and the alternative mobility targets are part of this Legislative application to City's Planning Commission and City Commission. The alternative mobility target and financially feasible improvements that are needed will need to be agreed upon by ODOT and approved by the Oregon Transportation Commission.

The attached full report discusses the process and proposal in greater detail.

This application is being submitted as a legislative amendment to amend the municipal code and the Transportation System Plan project list. The Transportation System Plan is an ancillary document to the Comprehensive Plan.

1. PLANNING CRITERIA

- ❑ ***17.50 Processes***
- ❑ ***Comprehensive Plan – Goals and Policies***
- ❑ ***RTP***
- ❑ ***Oregon Highway Plan***
- ❑ ***Oregon Transportation Plan***
- ❑ ***TPR***

Oregon City Comprehensive Plan

Regular Updates to *Ancillary Documents* Assure Consistency with the Oregon City Comprehensive Plan

Chapter O of the 2004 Oregon City Comprehensive Plan, Comprehensive Plan Maintenance and Update, contains criteria for approving changes to the comprehensive plan and plan map. Review of the comprehensive plan should consider:

1. *Plan implementation process.*
2. *Adequacy of the Plan to guide land use actions, including an examination of trends.*
3. *Whether the Plan still reflects community needs, desires, attitudes and conditions. This shall include changing demographic patterns and economics.*
4. *Addition of updated factual information including that made available to the City of regional, state and federal governmental agencies.*

The Oregon City Comprehensive Plan is implemented through City Codes, **ancillary plans**, concept plans, and master plans.
Ancillary plans are adopted by the City Commission for such things as parks and recreation, transportation systems, water facilities, and sewer facilities. Usually prepared by City departments through a public process, ancillary plans are approved by the City Planning Commission and adopted by the City Commission to provide operational guidance to city departments in planning for and carrying out city services. These plans are updated more frequently than the comprehensive plan."

Relevant Comp Plan and Statewide Planning Goals

Relevant Comprehensive Plan Goals and Policies to Address

Section 1 Citizen Involvement
Goal 1.2 Community and Comprehensive Planning
Ensure that citizens, neighborhood groups, and affected property owners are involved in all phases of the comprehensive planning program.
Policy 1.2.1 - Encourage citizens to participate in appropriate government functions and land-use planning.
Goal 1.4 Community Involvement - Provide complete information for individuals, groups, and communities to participate in public policy planning and implementation of policies.
Policy 1.4.1 - Notify citizens about community involvement opportunities when they occur.
Goal 1.5 Government/Community Relations -Provide a framework for facilitating open, two-way communication between City representatives and individuals, groups, and communities.

RESPONSE: A Community Advisory Group (CAG) and Technical Advisory Group (TAG) were formed to help the City evaluate the feasibility and practicality of the alternatives set forth in this project. The Community Advisory Group (CAG) purpose was to provide meaningful advice and guidance to inform staff, Planning Commission and City Commission concerning Alternative Mobility Targets along the Hwy 213 Corridor. Representatives of these groups included:

Community Advisory Group (CAG)

- Planning Commission representative
- City Commission representative
- Citizen Involvement Committee representative
- Transportation Advisory Committee representative
- Resident/Property Owner:
    - Maple Lane/Thayer Road area
    - Forest Edge area
    - City wide
- Advocate for:
    - Accessibility
    - Transit

    - Cycling
- Business/Property Owner: Commercial/Industrial
- Community Development Department Stakeholder Group representative
- Oregon City Chamber of Commerce representative
- Oregon City Business Alliance representative
- Clackamas Community College representative
- Hamlet of Beavercreek representative

Technical Advisory Group (TAG)

- Oregon Department of Transportation (ODOT)
    - Traffic
    - Transportation Planning
- Metro
- Oregon Department of Land Conservation and Development (DLCD)
- Clackamas County
    - Traffic
    - Transportation Planning
- TriMet
- City of Oregon City
    - Planning
    - Economic Development
    - Engineering
    - Traffic Consultant

The City advertised widely and broadly for representatives to serve on the Community Advisory group. The City held three meetings of the Community Advisory Group during the planning process. In addition, the City created a project webpage and posted all meeting materials and drafts as they became available, and held an open house and work session on December 12, 2017. Attendance at the open house was approximately 20 people. The City's notice process for this Legislative amendment will also include a Citywide mailed notice and multiple public hearings.

Section 6: Quality of Air, Water and Land Resources

Goal 6.1 Air Quality -Promote the conservation, protection and improvement of the quality of the air in Oregon City.

Goal 6.2: Water Quality

Control erosion and sedimentation associated with construction and development activities to protect water quality.

RESPONSE: The proposed amendment adds a TSP project for a right turn acceleration land that adds a limited amount of capacity to the intersection. The Advisory Groups considered, among the alternatives, infrastructure upgrades that would alleviate more congestion but that would also have an impact on nearby natural resources such as Newell Creek and associated wetlands and vegetated corridors. The proposed changes would not have an impact on water quality because they do not require widening of the roadways.

The adoption of alternate mobility standards will result in the City's ability to accept greater levels of traffic congestion at these intersections during peak congestion times. This recommendation balances

various goals, including the provision of public facilities, traffic safety, protection of natural resources, economic development, and livability.

Goal 11.1 Provision of Public Facilities
Serve the health, safety, education, welfare, and recreational needs of all Oregon City residents through the planning and provision of adequate public facilities.
Policy 11.1.1
Ensure adequate public funding for the following public facilities and services, if feasible:
• Transportation infrastructure

RESPONSE: The City does not have funding to complete large infrastructure projects at these intersections to fully alleviate congestion. Thus, the Advisory Groups evaluated various alternatives, considering the costs and benefits of each. The proposed project for HWY 213 and Beavercreek is estimated to cost $2.7M, which is achievable with the City's current and project resources.

Goal 11.6 Transportation Infrastructure
Optimize the City's investment in transportation infrastructure.
Policy 11.6.1
Make investments to accommodate multi-modal traffic as much as possible to include bike lanes, bus turnouts and shelters, sidewalks, etc., especially on major and minor arterial roads, and in regional and employment centers.
Goal 12.1 Land Use-Transportation Connection
Ensure that the mutually supportive nature of land use and transportation is recognized in planning for the future of Oregon City.
Policy 12.1.1 - Maintain and enhance citywide transportation functionality by emphasizing multi-modal travel options for all types of land uses.
Goal 12.3 Multi-Modal Travel Options
Develop and maintain a transportation system that provides and encourages a variety of multi-modal travel options to meet the mobility needs of all Oregon City residents.
Policy 12.3.1 -Provide an interconnected and accessible street system that minimizes vehicle miles traveled and inappropriate neighborhood cut through traffic.
Policy 12.3.2 -Provide an interconnected and accessible pedestrian system that links residential areas with major pedestrian generators such as employment centers, public facilities, and recreational areas.
Policy 12.3.3 - Provide a well-defined and accessible bicycle network that links residential areas, major bicycle generators, employment centers, recreational areas, and the arterial and collector roadway network.
Policy 12.3.4 -Ensure the adequacy of pedestrian and bicycle connections to local, county, and regional trails.
Policy 12.3.5 -Promote and encourage a public transit system that ensures efficient accessibility, mobility, and interconnectivity between travel modes for all residents of Oregon City.
Policy 12.3.6 -Establish a truck route network that ensures efficient access and mobility to commercial and industrial areas while minimizing adverse residential impacts.
Policy 12.3.8 -Ensure that the multi-modal transportation system preserves, protects, and sup- ports the environmental integrity of the Oregon City community.
Policy 12.3.9 -Ensure that the city's transportation system is coordinated with regional transportation facility plans and policies of partnering and affected agencies.

RESPONSE: Beavercreek Rd currently includes bicycle lanes and sidewalks, except for a gap between Maplelane Road and the Coltrane pedestrian path. This proposal includes an additional TSP project to fill the sidewalk gap in the project area on Beavercreek Road. Highway 213 does not include bicycle and pedestrian infrastructure as a state highway.
Safety improvements identified by the City for further investigation, or to be included as part of future projects in the area include:

- Install intersection enhancements including potential raised crosswalks, bike lane striping continuation, ladder-style crosswalks, and lane narrowing.
- Add wayfinding signage for people walking and biking.
- Enhance bike lanes on Beavercreek Road with additional markings and green striping in transition areas.
- Add buffers to bike lanes on Beavercreek Road where feasible.
- Add ADA curb ramps in the OR213/Beavercreek Road area where missing.
- Add pedestrian facilities to Maple Lane Road between Beavercreek Road and Thayer Road.
- Add transit stop amenities to existing stops in the area.

These projects will contribute to the multi-modal goals of the Oregon City transportation system.

Goal 12.5 Safety

Develop and maintain a transportation system that is safe.

Policy 12.5.1 -Identify improvements that are needed to increase the safety of the transportation system for all users.

Policy 12.5.2 -Identify and implement ways to minimize conflict points between different modes of travel.

Policy 12.5.3 -Improve the safety of vehicular, rail, bicycle, and pedestrian crossings.

RESPONSE: The OR213/Beavercreek Road intersection was identified in the 2013 TSP as a high collision intersection. The intersection was in the top 5% of the ODOT Safety Priority Index System (SPIS) List for the years
2012-2014. The SPIS List is maintained by ODOT and updated each year with the latest available year of crash records and traffic volumes. 2012-2014 is the most current SPIS list. The intersection also has a crash rate that exceeds the Critical Crash Rate meaning that it exceeds the crash rate of other comparable intersections.
As shown in the final report, the most predominant crash type at the OR213/Beavercreek Road intersection is rear-end crashes. Beavercreek Road is the first at-grade intersection on OR213 for over two miles south of Redland Road, in a corridor that generally feels rural. A lack of driver expectation of southbound queues from the signal may contribute to the high number of reported rear-end crashes at the intersection. The reported fatality occurred in 2011, and was an angle crash in which the driver ran a red light under dark and rainy conditions. The 2010-2014 crash rate of 1.20 is already lower than the crash rate of 2.05 identified in the 2013 TSP, indicating that safety and/or driver attentiveness have improved in recent years. Lengthening the dual eastbound left-turn lanes to provide additional storage (Project D27; funded) and an advanced queue warning system on southbound 213 will further improve safety at the intersection.
As shown in Tables 11 and 12, the planned TSP and proposed improvements will reduce the number of expected annual crashes at the OR213/Beavercreek Road and OR213/Redland Road intersections. The potential financially feasible improvements at OR213/Beavercreek Road are predicted to reduce crashes

at the intersection by almost 5%, and planned improvements at OR213/Redland Road are predicted to reduce crashes by more than 10%.

Goal 12.6 Capacity

Develop and maintain a transportation system that has enough capacity to meet users' needs.

Policy 12.6.1 - Provide a transportation system that serves existing and projected travel demand.

Policy 12.6.2 - Identify transportation system improvements that mitigate existing and projected areas of congestion.

Policy 12.6.3 - Ensure the adequacy of travel mode options and travel routes (parallel systems) in areas of congestion.

Policy 12.6.4 - Identify and prioritize improved connectivity throughout the city street system.

RESPONSE: The analysis in Tables 13 and 14 shows that, without improvements, the OR213/Beavercreek Road and OR213/Redland Road intersections will exceed current mobility targets in 2040 (shown in red). With potentially financially feasible improvements in place (i.e. a westbound right-turn merge lane at OR213/Beavercreek), the intersections will still exceed the existing mobility targets under 30th highest hour traffic conditions. Therefore, it is recommended that alternative mobility targets be based on average annual conditions, allowing the v/c ratio to exceed 0.99 for one hour per day at the OR213/Beavercreek Road intersection (upper limit of 1.0) and three hours per day at the OR213/Redland Road intersection (upper limit of 1.1).

Goal 12.8 Implementation/Funding

Identify and implement needed transportation system improvements using available funding.

Policy 12.8.1 - Maximize the efficiency of the Oregon City transportation system, thus minimizing the required financial investment in transportation improvements, wit out adversely impacting neighboring jurisdictions and facilities.

RESPONSE: The cost of adding an additional northbound and southbound through lane at OR213/Redland Road, consistent with TSP project D79, was recently estimated by OBEC to be almost $10 million.

The cost of the westbound right-turn merge lane at OR213/Beavercreek Road is estimated to be approximately $2.7 million based on the design shown in Figure 2. This estimate does not include right of- way acquisition.

The KAI and OBEC cost estimates, as well as exhibits of the proposed financially feasible improvements at OR213/Beavercreek Road can be found in Appendix "G".

CONSISTENCY WITH STATEWIDE PLANNING GOALS

STATEWIDE PLANNING GOAL 1:

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

See responses above.

STATEWIDE PLANNING GOAL 5:

To protect natural resources and conserve scenic and historic areas and open spaces.

RESPONSE: No scenic, historic areas, or open spaces are identified in the project area. Natural resources include Newell Creek. The proposed changes avoid creek and wetland impacts.

STATEWIDE PLANNING GOAL 6:
To maintain and improve the quality of the air, water and land resources of the state.

See responses above.

STATEWIDE PLANNING GOAL 9:
To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.

RESPONSE: The adoption of these standards will allow the City to approve new development in the area that contributes to economic vitality.

STATEWIDE PLANNING GOAL 11:
To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.

RESPONSE: The proposal includes upgrades to public facilities that balances costs, environmental impacts, livability, safety, and traffic congestion.

STATEWIDE PLANNING GOAL 12:
To provide and encourage a safe, convenient and economic transportation system.

RESPONSE: The proposal will result in fewer crashes and will increase the capacity of the intersection.

Oregon Transportation Plan (2006)
The Oregon Transportation Plan (OTP) is the state's long-range multimodal transportation plan. The OTP is the overarching policy document among a series of plans that together form the state transportation system plan (TSP). A TSP must be consistent with applicable OTP goals and policies. Findings of compatibility will be part of the basis for TSP approval. The most pertinent OTP goals and policies for city transportation system planning are provided below.
POLICY 1.2 – Equity, Efficiency and Travel Choices
It is the policy of the State of Oregon to promote a transportation system with multiple travel choices that are easy to use, reliable, cost-effective and accessible to all potential users, including the transportation disadvantaged.
POLICY 2.1 - Capacity and Operational Efficiency
It is the policy of the State of Oregon to manage the transportation system to improve its capacity and operational efficiency for the long term benefit of people and goods movement.
POLICY 2.2 – Management of Assets
It is the policy of the State of Oregon to manage transportation assets to extend their life and reduce maintenance costs.
POLICY 3.1 – An Integrated and Efficient Freight System
It is the policy of the State of Oregon to promote an integrated, efficient and reliable freight system involving air, barges, pipelines, rail, ships and trucks to provide Oregon a competitive advantage by moving goods faster and more reliably to regional, national and international markets.
POLICY 3.2 – Moving People to Support Economic Vitality

It is the policy of the State of Oregon to develop an integrated system of transportation facilities, services and information so that intrastate, interstate and international travelers can travel easily for business and recreation.

POLICY 4.1 - Environmentally Responsible Transportation System

It is the policy of the State of Oregon to provide a transportation system that is environmentally responsible and encourages conservation and protection of natural resources.

POLICY 5.1 – Safety

It is the policy of the State of Oregon to continually improve the safety and security of all modes and transportation facilities for system users including operators, passengers, pedestrians, recipients of goods and services, and property owners.

POLICY 7.1 – A Coordinated Transportation System

It is the policy of the State of Oregon to work collaboratively with other jurisdictions and agencies with the objective of removing barriers so the transportation system can function as one system.

POLICY 7.3 – Public Involvement and Consultation

It is the policy of the State of Oregon to involve Oregonians to the fullest practical extent in transportation planning and implementation in order to deliver a transportation system that meets the diverse needs of the state.

POLICY 7.4 – Environmental Justice

It is the policy of the State of Oregon to provide all Oregonians, regardless of race, culture or income, equal access to transportation decision-making so all Oregonians may fairly share in benefits and burdens and enjoy the same degree of protection from disproportionate adverse impacts.

RESPONSE: The proposal was developed with Advisory Groups including multiple ODOT staff. The proposal will go before the Oregon Transportation Commission for final approval.

Oregon Highway Plan

The 1999 Oregon Highway Plan (OHP) establishes policies and investment strategies for Oregon's state highway system over a 20-year period and refines the goals and policies found in the OTP. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems. The policies applicable to the Oregon City TSP are addressed below.

Policy 1A *(Highway Classification) defines the function of state highways to serve different types of traffic that should be incorporated into and specified through IAMPs.*

Policy 1C *(State Highway Freight System) states the need to balance the movement of goods and services with other uses.*

Policy 1B *(Land Use and Transportation) recognizes the need for coordination between state and local jurisdictions.*

Policy 1F *(Highway Mobility Standards) sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system by identifying necessary improvements that would allow the interchange to function in a manner consistent with OHP mobility standards.*

Policy 1G *(Major Improvements) requires maintaining performance and improving safety by improving efficiency and management before adding capacity. ODOT works with regional and local governments to address highway performance and safety.*
Policy 2F *(Traffic Safety) improves the safety of the highway system.*

RESPONSE: The OHP Policy 1F establishes mobility targets (as defined by motorized vehicle volume-to-capacity ratios) for state facilities that vary by region, facility classification, and whether or not the roadway is located inside an urban growth boundary (UGB). It states, "It is the policy of the State of Oregon to maintain acceptable and reliable levels of mobility on the state highway system, consistent with expectation for each facility type, location and functional objectives. Highway mobility targets will be the initial tool to identify deficiencies and consider solutions for vehicular mobility on the state system.

Specifically, mobility targets shall be used for:
• Identifying state highway mobility performance expectations for planning and plan implementation;
• Evaluating the impacts on state highways of amendments to transportation plans, acknowledged comprehensive plans and land use regulations pursuant to the Transportation Planning Rule (OAR 660-12-0060); and
• Guiding operations decisions such as managing access and traffic control systems to maintain acceptable highway performance."

The OHP Policy 1F allows for development of alternative mobility targets in areas where it is "infeasible or impractical to meet the mobility targets". The policy allows for the use of alternative mobility targets to "balance overall transportation system efficiency with multiple objectives of the area being addressed." It requires that targets "shall be clear and objective and shall provide standardized procedures to ensure consistent application of the selected measure. The alternative mobility target(s) shall be adopted by the Oregon Transportation Commission as an amendment to the OHP." The OHP currently includes alternative mobility targets in many locations throughout the State; however, none have been adopted within the Portland Metro area to date.

OAR 660 Division 12 Transportation Planning Rule (TPR)
The purpose of the TPR is "to implement Statewide Planning Goal 12 (Transportation) and promote the development of safe, convenient and economic transportation systems that are designed to reduce reliance on the automobile so that the air pollution, traffic and other livability problems faced by urban areas in other parts of the country might be avoided." A major purpose of the Transportation Planning Rule (TPR) is to promote more careful coordination of land use and transportation planning, to ensure that planned land uses are supported by and consistent with planned transportation facilities and improvements.

RESPONSE: Mobility targets for state highways, as established in this policy or as otherwise adopted by the Oregon Transportation Commission (OTC) as alternative mobility targets, are considered the highway system performance standards in compliance with the Transportation Planning Rule (TPR) (OAR 660-012), including applicability for actions that fall under Section -0060 of the TPR.

The TPR Section -0060 applies when cities or counties are considering zone changes or plan amendments that would allow for additional development that would significantly impact or worsen the performance of existing or planned transportation facilities. Currently, significant impacts are found to exist when levels of automobile traffic cause roadway facilities to exceed motorized vehicle standards, such as mobility targets. If there is a significant impact, jurisdictions are required to "ensure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility measured at the end of the planning period identified in the adopted Transportation System Plan."

Regional Transportation Plan

The Regional Transportation Functional Plan (RTFP) directs how Oregon City should implement the RTP through the TSP and other land use regulations. The RTFP codifies existing and new requirements which local plans must comply with to be consistent with the RTP. If a TSP is consistent with the RTFP, Metro will find it to be consistent with the RTP.

RESPONSE: The RTP includes a project in the area for Southbound OR 213 Advanced Warning System. This project is retained in the existing proposal.

Caufield Neighborhood Association Meeting Minutes Sept. 26th, 2017

Attendance: 15 neighbors, 3 guests

Pledge of Allegiance (at 6:48PM)

Co-Chair Browning reminded us that we can follow the Caufield NA Facebook page, which can be found at: www.Facebook.com/CaufieldNeighborhoodAssociation

Business meeting and Community Announcements

Meeting minutes from May 23rd, 2017 were approved by unanimous voice vote.

Explanation of Oregon City Parks Foundation drop-in fund-raising program (bottle and can deposits) and distribution of blue bags. - Kristina Browning

Chairman Malchow reported on letter he wrote for Oregon City to get a grant.

Announcement of search for filling CNA Secretary position and police chief advisory board position.

Police Report & News report *by Officer Michael Villanti*
Ballot measure for Bond for the new building passed by 80%; he also reported on traffic enforcement and other events.
Oregon City has three times the number of crashes that it should because of the number of people driving through the city. He has been hired as a new traffic officer hoping to make an impact on the crash numbers.
The "Shred It" event will be held September 30th from 9-12.
October 31st, they are handing out candy at the police station from 4-6pm.
In November, a **women's self-defense class** will be held.
New annual report is on the website for your review.
Next Sunday (Oct. 1) is the start of the new distracted driver law…no cell phones in your hand…hands free, hands off. Mounting the phone is ok on your dash so long as you don't hold it.

Update on Newell Creek Canyon *by Tannen Printz (Metro - landscape engineer involved with Newell creek park development)*
METRO has been working with a consultant to prepare a land use plan to the city. It was submitted last month and was accepted yesterday (9-27-17). The city has 90 days to determine compatibility for proposed uses for site based on zoning and code. 233 acres have been broken down into three major use areas: day-use, trail network and conservation. The trail network will be for hiking, off-road cycling and multi-use, with portions of the trail available for both uses. The site entrance is off Fox Lane (turn east at the light at Molalla Ave and Warner-Milne Rd.). Restrooms and an information kiosk will be near entrance with parking for 20-25 cars + a Tri-Met bus stop. The center of the day-use site is focused on meadow restoration. They have been working with their ecologist on staff to improve the ecological health of the site. The park will include some picnic tables and a viewing overlook. A nature play area is on the future plan but is not currently funded (However, those numbers would be easily found as his project manager is working on a similar play area in Sandy currently - so a local group could spearhead funding this if they wanted to). Trail construction is slated for Winter 2017-2018 and Spring/Summer 2018 with opening slated for Fall 2018.

Oregon City Planning Dept. Report - *Kelly Reid, OC Planning Dept. Liaison*

Glen Oak Park – The city is working on requests for proposal for construction drawings and schedules, and is anticipating construction to be completed by the summer of 2019.

Beavercreek Concept Plan – All appeals to the Plan have been resolved [see website: https://www.orcity.org/publicworks/beavercreek-road-concept-plan]. The plan stands, and the city will take the next step, which is implementation of that plan through zoning codes. We have a grant from ODOT to move forward with plans to eventually widen Beavercreek Road. Evergreen Housing Development Group has building permits and is currently working on plans for 100 - 200 "live/work" units to be built across from the high school (ideal for CCC college students). The entrance to the site is being worked out with the city. The CNA neighbors hope it will be at the Meyers Road intersection.

Oregon City Golf Course site update: The owner applied for annexation and it was approved. There are two pieces of property totaling 115 acres which is now part of the city limits. There has been no further action on that property; awaiting zoning to be adopted for the Beavercreek master plan. The city got a grant or loan for design work for a sewer extension to bring the sewer line further down Beavercreek Rd. (from Marjorie Lane past Loder Road to near the high school).

Meyers Road Extension completion: The city is working on getting engineering and permits in place and for having the Meyers road development paid for chiefly through fees from developers. They are also working with the current property owners to gain right of way. For the past ten years, it has been zoned campus industrial/light manufacturing in order to bring jobs to the area. There is a long list of industrial uses that this zoning is used for – zoning is similar to the warehouses along Fir Street (area between Fred Meyer and Wilco Farm Store).

Riverwalk update: The concept plan for the full $60 million project is done and approved. The city/county/METRO consortium will build the first $20 million phase this coming year, which includes construction of a place to view the falls, some demolition and clean up along with some wildlife habitat restoration.

Trees: There have been some questions in the past from CNA members about street trees that are removed or dead. Kelly responded that by city ordinance, it is the responsibility of the homeowner to have the tree removed after getting a permit, then they can choose a species of tree from a city-approved list that will do well in this environment. If a tree is watered properly when it's young, its roots should not destroy the sidewalk as it grows. It is case by case. It's best to check with the city. First check online since they have a long list of documents about trees at https://www.orcity.org/forms . OCRequest online can handle code enforcement… https://www.orcity.org/community/oc-request-faqs-and-requests

The Beavercreek/Hwy 213 intersection and mobility standards program is adopting new mobility standards for that intersection after careful study and multi-week meetings by a special committee. The intersection gets congested during rush hour and models show that by 2035 with new development in Oregon City and Molalla, this intersection is going to be over-capacity. They looked at solutions that OC can afford since the solutions we currently have on the books don't pencil out because of lack of funding for them. The committee recommended a new mobility target and some improvements. One of the improvements you will see: If you are driving North toward 213 and you want to turn right to go to 205, the right turn lane will be expanded so you don't have to stop and look in order to merge. An early warning system will also be installed to let people know there is slow traffic approaching to reduce rear-end accidents. We will also be enhancing other modes of transportation; to encourage walking, biking and transit. Study data can be viewed here: https://www.orcity.org/publicworks/project/ps-16-024

Citizen Concerns – none voiced

Meeting Adjourned at 8:30pm

Next Meeting - Nov 28th, 2017 at OCDS Facilities & Maintenance Center

OREGON CITY

SEPT. 26, 2017
Meeting Date

Caufield Neighborhood Association

	NAME	ADDRESS
	ROBERT MALCHOW	20153 WOODGLEN WAY
	~~GRETA~~ SCALES	20243 HERRWERTHER DR
	VONNIE COWAN	20231 " "
	Marcella Styles	20226 " "
	Dwight & Karen Dunning	14429 S. ANDREW LYNN TER.
NEW	Daren & Lindy Bennett	15084 Persimmon Way
NEW	Ann Fisher	14671 Thayer Rd
CHANGE	Mary Jo Tyler	20006 Mossy Meadows
	Maggie ~~GRANT~~	14946 Coquille Ct
	Robert Cook	14477 Andrea Lynn Ter
	Dee Dee + Joe Watson	20196 Quinalt Dr.
	KRISTINA BROWNING	18913 WYNTON DR.
NEW	CAMIAN LARSON (WAS NOT ~~ABLE TO ATTEND~~)	15025 ST. ANDREWS DR
	TANNEN PRINTZ	METRO
	KELLY REID	O.C. PLANNING DEPT.
	OFF. MICHAEL VILLANTI	O.C. POLICE DEPT.

~~TANNEN PRINTZ~~ ~~METRO~~

Gaffney Lane Neighborhood Association

Minutes of the General Meeting
July 13, 2017

1. Call to Order – Amy Willhite – 7:05 p.m.
2. **In Attendance**:

- Amy Willhite - chair
- Angela Wright - Secretary/Treasurer
- Joan Schultze
- Pamalyn Richardson
- Jack Wright
- Ed Turpin
- Michelle Don – Citizens Bank
- Cynthia Gates OCPD
- Dayna Webb – OC Public Works
- Larry Stopper
- Jay Russell
- Sharon Mora
- Joseph Scharlau
- Shirley Maxcy

3. **Old Business** - Minutes of the Meeting held on April 27, 2017 were approved unanimously.

4. **New Business**

- **Dayna Webb,** Oregon City Pubic Works, Project Engineer. Alternative mobility target for 213/Beavercreek Road and 213/Redland Road both of which are estimated to have more congestion than they can effectively handle by 2035. Additional turn lanes from Beavercreek and continuing on to 213 - cost $2.5-$3 million - will relieve morning congestion. (visuals on file)
  Redland Road/213 interchange – extension of 2 lanes north and south bound to 3 lanes past the underpass – cost $9.8 million. Looking for grant opportunities as ODOT says does not have the necessary funds.
  Meyers Road extension project (visuals on file) from bus barn to 213. Concern raised of additional traffic on residential Meyers Road. Construction to possibly start late Spring 2018.

Molalla Avenue Grant Project runs from Beavercreek to 213. The City was awarded a $3.8 million Federal grant, which the City will match with an additional $4 million. (visuals on file). Full replacement of traffic signals at Clairmont and Gaffney. Propose installing three flashing light beacons (similar to the one by the Library) at Adrian Way, Garden Meadow and Char Diaz with median resting spots. All ADA ramps to be replaced. Entire roadway to be resurfaced. Federal funds available in October 2018. Hope to start project in summer of 2019.
Concern was raised about access from Char Diaz for vehicles turning left on to Molalla. Also the Fire Station will be involved in the restructuring of Molalla.
OC Request to report any problem with tree root growth on sidewalks, etc.

- **OCPD Officer Cynthia Gates** presented the current call statistics. (on file)
Bond for the new Public Safety Building will be voted on in September. Present property is not big enough or seismic ready and any new building needs to be by 2020. No privacy in present facility. Current $6.50 per month on the utility bill is ONLY for this project and will cease on completion. Design concept available on Oregon City web site. Historically Police Station has never had it's own building!
New officer dedicated for transient population – Mike Day. Oregon City has approximately 11% of the population of Clackamas County but it has 17% of the homeless. Increase in numbers possibly result of "Father's Heart" being just a day facility for the homeless. Also prison discharges.
August 1 - National Night Out 5:30 to 8:30 pm at Mount Pleasant School.
Local thefts and car vandalizing discussed.
Tell your neighbors when you are going to away for any length of time. Neighborhood Watch program details available from Chris Wadsworth at OCPD.
September 30 - Shred event at the Police Station 9:00 to midday
August 26 – child car seat check at Police Station 1:00 – 3:00 pm.
July 24-28 - OCPD Kids Summer Camp - 3rd, 4th, 5th graders – at Gaffney Lane Elementary School.
Citizens Academy - Wednesday evenings September to November to learn about all aspects of the police department. Applications being accepted now.
Drop off for old medicines in the lobby of the police station.
Chickens in neighborhood – no roosters allowed. Rats attracted by feed.
Compliment paid to OCPD.
Feel free to contact Cynthia Gates with any questions or neighborhood issues.

- **Amy** reported on CIC meetings. **ODOT** replaced rock wall after City replaced a water pipe by the tunnel. Tunnel illumination project next year replace lighting. From tunnel going north with right turn on to Railroad, pedestrian walkway dangerous so turn will be changed. Electrical sign system proposed. Obsolete railroad track to possibly be removed.
Trimet - HOP pass – like a debit card for travel. Daily and monthly passes.
Concerts in the Park – at the End of the Oregon Trail.
August – movies in the park – Friday at Wesley Lynn Park.
Rose Farm – Holmes Lane – a little gem!
Fire on 213 South caused by muffler causing sparks. Detour necessary.
Fire Station 16 replacement building going ahead.
Steering Committee Meeting for new by-laws for meetings every other month. Will report at next meeting.

- **Meeting adjourned at 8:38 pm** Next meeting on September 14, 2017.

7/13/

GAFFI LANE
NEIGHBORHOOD ASSOCIATION

PLEASE PRINT ARLY

NAME	HOME ADDRESS	EMAIL ADDRESS
CHRISTINE CORE	14052 Conway Dr	quilting7@centurylink.net
Dayna Webb - Oregon city PW		dwebb@orcity.org
Larry Stopper	Pioneer Ridge	KROYALTEN@OUTLOOK.COM
JAY RUSSELL	13017 S ~~Beverly~~ Circle OC	jayrussell@johnl nat.com
Cynthia Gates	OCPD	cgates@orcity.org
Ed Turpin	13911 So. Caufield Rd OC.	edandjuby@hotmail.com
Michelle DOb - Citizens Bank	19245 Molalla Ave OC	mdon@citizensebank.com
Shaun Mora	19857 Rattlebery Lp	
Joseph Schaflau Schaflau	19856 Castleberry	joe[redacted]fs@comcast.net
Joan Chalos	19213 Cokeronder	
Jack Wright	13718 Char Diaz Dr. - O.C.	
Joan Schultz	Stillmeadow	
Penelope Richardson	Meadows Courtyard	
Starkey Madey		
Amy		

Angela.

16

7:05

8:38

Hillendale Neighborhood Association

General membership meeting – July 11, 2017, 7:00 PM Hillendale Park Picnic

Attendees: Georgia Reagan, William Gifford, Joyce Gifford, Donna Johnson, Vern Johnson, Anna Harris, Roy Harris, Nick Shamp, Kim Shamp, Shawn Karns, Josh Kayser, Merry Goodner

Guests:, John Fetzer, Spencer Rohde, Tony Konkol, Dayne Webb

1. Call to order: Self-introductions
2. OCPD HNA Report: Officer John Fetzer and Spencer Rohde
   a) Sept special election on bond measure
   b) National Night Out, August 1st
   c) August 26th Child Safety Seat check OCPD 1-3PM
   d) Shred event Sept 30th 9-noon
   e) June stats provided
   f) New facility plans include public meeting room, Planning Dept moving to Annex @Mt Pleasant site April 2018. Kim Shamp asked if there will be an opportunity for OC residents to purchase a brick from old school.
   g) Reminder that traffic accidents increase during warmer weather and kids playing during summer.
   h) Cell-Phone Law fines are increasing. "Evade Class", driving refresher course given by traffic officers for 1st time offenders
   i) Homeless Liaison Officer Day receiving positive press
   j) OCPD will be hiring an officer to serve CCC campus

   Dayne Web, OC Public Works:
   a) Alternative Mobility Targets on three major OC intersections: Hwy 213/Bvk, 99E/14 St, Hwy 213/Redland Rd
      - Hwy 213/Beavercreek Rd – Community Group explored options
        - Full rebuild $40 million+ w/impact on Newal Creek Canyon
        - W Bvk to N Hwy 213 additional merging lane, $2.5 million (Right acceleration lane)
        - 3 Thru Lanes entire intersection
      - Molalla Completion Project designing starts Oct 2017 with construction planned Summer 2019
      - Meyers Rd Extension, construction Summer 2018

Park Place Neighborhood Association

January 18, 2018

Steering Committee Meeting

Notes regarding discussion of L 17-03 Alternate Mobility Targets:

Kelly Reid, Planner with Oregon City, attended the meeting to present the City's proposed code amendments to Chapter 12.04 of the Municipal Code. These amendments would adopt the proposed mobility standards for Highway 213 and Beavercreek Road and Highway 213 and Redland Road.

Kelly described the project to the meeting attendees, including the predicted future congestion levels, existing and proposed code changes and the improvement projects at Beavercreek and Redland intersections. She gave a more detailed description of the HWY 213 and Redland Rd project, which is within the Park Place neighborhood. Additional through lanes on HWY 213 would provide a total of three northbound and three southbound lanes, including extension of the left turn lane onto Redland. The project is already designed and engineered, so construction could begin fairly soon after funding is obtained. Funding is uncertain due to only a small portion of the project eligible for System Development Charges (SDCs), meaning the City has to rely on ODOT and County funding to supplement, or find other outside sources. Until funding can be obtained, the City is proposing to raise the mobility standards slightly, which would allow for peak hour congestion for a longer period of time per day (2 hours rather than one hour).

Members of the neighborhood association then discussed the following:

Alternative improvements to the Redland intersection – were other designs considered? What about on ramps from Holcomb? Topography issues make that difficult. The project was developed and designed as part of the jughandle project, and alternatives were considered.

With more traffic congestion at that intersection, people will take alternate routes, including Forsythe to Clackamas River Drive. The City should look at the potential need for a traffic signal at Forsythe and Clackamas River Drive.

The project could speed up traffic through Redland only to see the same or worse congestion at the I-205 onramp. There are improvements to I-205 planned as well. Kelly will follow up with more information on what is planned for I-205.

Emergency routes are needed if HWY 213 is closed due to rock falls or other reasons. In Mulino, it was recently closed for a rock fall. Kelly can follow up after asking ODOT what the emergency route is.

The city collects SDCs from new development to fund expansions of the transportation system. How do Oregon City's rates compare to other jurisdictions? Do we need to raise our rates so we can afford more improvements? Kelly explained that our rates for new residences are among the highest in the region, and for commercial we are somewhere in the middle. She will follow up by sending the most recent rate study to the NA chair.

The group discussed the information used to predict traffic growth and that the model assumes growth throughout the region (background growth) as well as growth within Oregon City through development

of vacant land and underdeveloped land, based on adopted land uses. The model assumes full buildout of the City's concept plan areas by 2040.

The group discussed funding sources for transportation including gas tax and tolls, and noted that Clackamas County does not charge its own gas tax. Kelly explained that a portion of state gas taxes are distributed to jurisdictions based on population. The funding issues and congestion issues are not unique to Oregon City – they are happening throughout the region and the state. Other jurisdictions have also adopted alternate mobility standards, including Seaside, OR.

Last, the group discussed the idea of just halting development in the City for a time until the transportation projects can be built. The impacts of that would be that the City would not be collecting SDCs to fund the projects during that time, and that background growth would continue.

Kelly invited the group to attend the public hearing at Planning Commission on January 22nd and explained that the next hearing date would be determined at the meeting. The code amendment approval process requires City Commission approval, and then the Oregon Transportation Commission will review the proposal from Oregon City before it can be officially adopted.

JANUARY 18, 2018

PARK PLACE NEIGHBOORHOOD ASSOCIATION

SIGN IN SHEET

NAME	ADDRESS	PHONE	E-MAIL
LISA NOVAK	HOLCOMB		novak0929@gmail
Stephen Vanhaverbeke	16477 Oak Tree Terr		
Linda Vanhaverbeke	16477 " " "		
Dave Larson	14911 S. Armel Dr		uncledaddy2@msn.com
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Kelly Reid	city staff	503 496 1540	kreid@orcity.org
JAN Grady	15021 Journey	503-260-6765	mjg1976@msn.com
Barbara Ponken	15090 Dyer Dr.	—	—
Ray Ponken			
CATHERINE & John Brunscheon	14303 Bonn St. Oregon City	503-974-9891	zzfisher@aol.com
Martie & Gary Moody	16551 Oaktree Terr	503-305-8010	MARTIL97223@gMail.com
Marie D. Roberts	16285 Front St OC	5038881860	

3. Tony Konkol, City Manager: extensive report re: Accomplishments and Goals of OC
    - Finance Dept Award
    - Safety Record
    - Waterfront Award
    - OCPD, increased number of officers and assigned roles w/on-call mental health worker
    - Library completion and increased usage
    - Cove Development
    - Parks (over 30): Concerts, Movies, Pool
    - River Walk
    - Economic Enterprise Zone
    - Grant ($100,000) to explore affordable housing options
    - Public Works facility

Round-Table:

- Merry Goodner mentioned the house on Roseberry Ave that appears to be a group home for disabled that concerns neighbors re: noise and treatment of residents. Possible actions were discussed
- High weeds are a fire hazard on Metro Property for Newell Creek Canyon

Adjourn with door prizes for families and children who attended picnic

Next meeting – HNA/TVNA Board meet at NNO

City of Oregon City

625 Center Street
Oregon City, OR 97045
503-657-0891

Staff Report

File Number: PC 18-024

Agenda Date: 2/26/2018

Status: Draft

To: Planning Commission

Agenda #: 3c.

From: Community Development Director Laura Terway

File Type: Planning Item

SUBJECT:
L 17-04: Proposed Amendments to the Development Sections of the Oregon City Municipal Code (Including Lot Averaging)

RECOMMENDED ACTION (Motion):
Staff recommends that the Planning Commission choose an option for Lot Averaging Amendments and recommend approval to the City Commission.

BACKGROUND:
Staff has proposed a variety of minor amendments to the Oregon City Municipal Code. Although a majority of the amendments provide clarity, improve processes, or remove code conflicts, the more substantial changes include:
1. Amending language for lot averaging
2. Removing the ability to reconsider a final decision
3. Clarify how dates are calculated
4. Remove light bulb requirements
5. Allow 10% parking reduction adjacent to transit routes

Staff has added a variety of options for the lot averaging amendments for the Planning Commission to consider.

Notice of all code amendments was mailed to every property owner in the City limits and within the Urban Growth Boundary in late December. The Development Stakeholders Group reviewed the amendments on January 4, 2018 and the City Commission heard the amendments for the first time at their work session on January 9, 2018. The Planning Commission held their first work session on the amendments on January 22, 2018 and second work session on February 12, 2018.

OREGON CITY

Community Development – Planning

221 Molalla Ave. Suite 200 | Oregon City OR 97045
Ph (503) 722-3789 | Fax (503) 722-3880

STAFF REPORT AND RECOMMENDATION
February 16, 2017

FILE NO.:	L-17-04
APPLICATION TYPE:	Legislative
HEARING DATES:	Planning Commission 7:00 p.m., February 26, 2017 Commission Chambers, 625 Center St, Oregon City, OR 97045
APPLICANT:	Oregon City Community Development Department
REQUEST:	Proposed amendments to the Oregon City Municipal Code. Minimum Improvements and Design Standards for Land Divisions in Chapter 16.12, Definitions in Chapter 17.04, Mixed Use Corridor District in Chapter 17.29, Site Plan and Design Review in Chapter 17.62, Administration and Procedures in Chapter 17.50, Natural Resources Overlay District in Chapter 17.49, Nonconforming Uses, Structures, and Lots in Chapter 17.58, and Communication Facilities in Chapter 17.80.
LOCATION:	City-Wide
REVIEWER:	Kelly Reid, AICP, Planner
RECOMMENDATION:	Staff recommends approval of this application based on the satisfaction of all required criteria for a Legislative action.

PROCESS: OCMC 17.50.170.

A. *Purpose. Legislative actions involve the adoption or amendment of the city's land use regulations, comprehensive plan, maps, inventories and other policy documents that affect the entire city or large portions of it. Legislative actions which affect land use must begin with a public hearing before the planning commission.*
B. *Planning Commission Review.*
    1. *Hearing Required. The planning commission shall hold at least one public hearing before recommending action on a legislative proposal. Any interested person may appear and provide written or oral testimony on the proposal at or prior to the hearing. The community development director shall notify the Oregon Department of Land Conservation and Development (DLCD) as required by the post-acknowledgment procedures of ORS 197.610 to 197.625, as applicable.*
    2. *The community development director's Report. Once the planning commission hearing has been scheduled and noticed in accordance with Section 17.50.090(C) and any other applicable laws, the community development director shall prepare and make available a report on the legislative proposal at least seven days prior to the hearing.*
    3. *Planning Commission Recommendation. At the conclusion of the hearing, the planning commission shall adopt a recommendation on the proposal to the city commission. The planning commission shall make a report and recommendation to the city commission on all legislative*

proposals. If the planning commission recommends adoption of some form of the proposal, the planning commission shall prepare and forward to the city commission a report and recommendation to that effect.

C. City Commission Review.

1. City Commission Action. Upon a recommendation from the planning commission on a legislative action, the city commission shall hold at least one public hearing on the proposal. Any interested person may provide written or oral testimony on the proposal at or prior to the hearing. At the conclusion of the hearing, the city commission may adopt, modify or reject the legislative proposal, or it may remand the matter to the planning commission for further consideration. If the decision is to adopt at least some form of the proposal, and thereby amend the city's land use regulations, comprehensive plan, official zoning maps or some component of any of these documents, the city commission decision shall be enacted as an ordinance.

2. Notice of Final Decision. Not later than five days following the city commission final decision, the community development director shall mail notice of the decision to DLCD in accordance with ORS 197.615(2).

IF YOU HAVE ANY QUESTIONS ABOUT THIS APPLICATION, PLEASE CONTACT KELLY REID IN THE PLANNING DIVISION OFFICE AT 503-722-3789.

A. PROPOSAL

The proposal is for a variety of amendments to the Oregon City Municipal Code. Although a majority of the amendments provide clarity, improve processes, or remove code conflicts, the more substantial changes include:

1. Amendment of standards for lot averaging within subdivisions
2. Addition and revision of selected definitions
3. Clarification of how dates are calculated
4. Allowance for 10% parking reduction adjacent to transit routes
5. Removal of specific light bulb and fixture requirements for outdoor lighting
6. Amendment to landscaping plan requirements
7. Amendment to standards for communication facilities to comply with recent legal decisions

A majority of the amendments are proposed to bring greater clarity or transparency to existing development standards. The complete drafted code amendments can be found in the attached Exhibits and a summary and rationale for each code amendment is found in table 1 below.

Table 1. Summary of Code Amendments.

Oregon City Municipal Code Section	**Summary of Change**	**Explanation**
16.12.050	{STAFF REPORT TO BE UPDATED WITH PLANNING COMMISSION'S PREFERRED LOT AVERAGING AMENDMENTS HERE}	Concerns that the provision allowed for too many lots to be below the zoning minimum and the sizes could be too small.
17.04.154	Add definition of Building.	Clarify the definition of "building" should be directed to the definition of "structure".
17.04.420	Increase the number of children a family daycare provider may care for from 13 to 16.	Per ORS 329A.440(4), a family daycare provider can have up to 16 children, not 13.
17.04.812	Create definition of "net leasable area".	Net leasable area is used to calculate parking requirements.

17.29.020	Clarify that single and two-family units are permitted when in conjunction with and located in the same building as another permitted use in the zone. This applies to NC, C, MUC-1, MUC-2 and MUD.	Clarifies the intent of the code.
17.49.080	Clarify minimal temporary disturbances.	Clarification of temporary minor disturbance areas.
17.50.030.B 17.50.030.C 17.50.030.D 17.50.030.F	Clarify noticing for Type II-IV processes. Specify that decisions, completeness reviews, appeals, and notices in this Chapter shall be calculated according to OCMC Chapter 1.04.070 and shall be based on calendar days, not business days. Amends Table 17.50.030 to match code language for reconsiderations, Historic Review, Extensions, and Natural Resource Overlay District Review.	Provides clarification and amends Table 17.50.030 to match code language.
17.50.30.B 17.50.120 17.50.190	Clarify who has standing to file an appeal as those who participated orally or in writing in the initial decision.	Clarifies who has standing to appeal, removes reference to state statute, and eliminates inconsistencies in code.
17.52.020.C.4	Allow reduction of minimum parking by 10% if adjacent to a transit route.	A similar reduction was inadvertently removed from the code.
17.58.040 17.58.040.C 17.58.040.C.2	Clarified that nonconforming upgrades are required for increases to the square footage of a building and/or site improvements which include installation of an additional off-street parking stall.	Clarify when nonconforming upgrades are required.
17.62.035.A.2.a 17.62.035.A.2.b 17.62.035.A.2.u	Clarify that any size demolition qualifies as a Type I Minor Site Plan and Design Review.	Corrects an unintended provision of previous code amendments.
17.62.035.A.2.v	Clarify tree removal as a Type I Minor Site Plan and Design Review.	Applicants could not clearly tell that tree removal was included in landscaping which was already a Type I review.
17.62.050.A.1.c	Exempt landscaping tree removal and/or replacement from submitting a plan by a landscape architect if the new species is on an approved tree list. Allow certified landscape designer, arborist, or nurseryman to approve of projects less than 500 sq. ft. rather than a landscape architect.	Streamline tree and landscape review.
17.62.050.A.1.d	Remove requirement for 10% landscaping for major remodeling.	The code and specific zoning designations provide a landscaping minimums more appropriate to zoning designations.
17.62.050.A.20.d	Remove requirement which conflicts with code section requiring all commercial mechanical changes to be a Type I Site Plan and Design Review.	Remove section which was corrected with the adoption of Type I Site Plan and Design Review.

17.62.050.A.23	Clarify connection between development and nonconforming upgrades.	Clarify code requirements.
17.62.065.D	Remove redundant sections and conflicting standards. Remove bulb requirements. Remove standard related to fixture requirements.	Streamline and clarify language, remove blub requirements to allow emerging technologies.
17.80	Update Communication Facilities chapter to allow a quicker review for some projects.	Amend code to comply with 2012 ruling

Background on Lot Averaging Changes

The City's current code requires that proposed subdivisions (land divisions involving four or more lots) have an average lot size that is at or over the zoning designation – for example, in the R-8 Single Family Dwelling zone the minimum lot size is 8,000 square feet; and the average for each subdivision is required to be at or greater than 8,000 square feet. Lots within a subdivision are permitted to vary from this size by as much as 20% less than the minimum, with no limit to the maximum size.

The changes to lot averaging are the most significant change proposed. The changes stem from citizen comments on proposed subdivision developments in which lot averaging was utilized. Neighbors of the proposed subdivision brought concerns that the existing lot averaging provisions allowed for too many lots within a subdivision to be below the average minimum size, and that the 20% reduction allowance resulted in lots that were significantly smaller than the average for the zone. The subdivisions in question had large powerline easements on some of the lots, which resulted in a few large lots that allowed the subdivision to meet the average zoning minimum.

Chapter 16.12.050 contains the standards in question:

16.12.050 - Calculations of lot area.

A subdivision in the R-10, R-8, R-6, R-5, or R-3.5 dwelling district may include lots that are up to twenty percent less than the required minimum lot area of the applicable zoning designation provided the entire subdivision on average meets the minimum site area requirement of the underlying zone. The average lot area is determined by calculating the total site area devoted to dwelling units and dividing that figure by the proposed number of dwelling lots.

Accessory dwelling units are not included in this determination nor are tracts created for non-dwelling unit purposes such as open space, stormwater tracts, or access ways.

A lot that was created pursuant to this section may not be further divided unless the average lot size requirements are still met for the entire subdivision.

Other standards that affect lot sizes include the minimum density requirement – that subdivisions meet at least 80% of the density allowed by the zone. All cities within the Metro region are required to have a code provision that requires at least 80% minimum density as part of compliance with Title 1. The intent of the standard is to ensure that each jurisdiction provides housing supply for the region at predictable rates in accordance with their planned land uses. Jurisdictions are required to maintain or increase housing capacity by Title 1 of the Metro code, which is also supported and reinforced by Statewide Planning Goals and the City's own Comprehensive Plan.

The City also has minimum lot widths and depths, along with minimum setbacks and maximum lot coverage standards which provide uniformity and levels of certainty for city residents.

Other provisions of the City's code that affect subdivision layout and density are street connectivity requirements along with maximum block lengths. As required in the Regional Transportation Plan, the City requires public street connections every 530 feet maximum in order to provide connectivity in its street network.

These requirements create layout challenges for developers to lay out development sites in an efficient manner. Allowing lot sizes to vary within subdivisions provides flexibility to allow developers of property to meet minimum density requirements and fit lots which meet dimensional requirements of the zoning designation within the physical constraints of the development boundaries, streets, and environmentally sensitive areas. Throughout the region, local jurisdiction have various standards related to lot averaging. Some do not appear to allow lot averaging, while others have standards similar to Oregon City's. Below is a summary of what several other local jurisdictions allow:

Happy Valley: Allows lot reduction up to 10 percent of lot area when the overall subdivision meets the required average.
Flexible Lot Size. To allow creativity and flexibility in subdivision design and to address physical constraints, such as topography, existing development, significant trees and other natural and built features, the approval body may grant a ten (10) percent modification to the lot area and/or lot dimension (width/depth) standards in Chapter 16.22, provided that: the overall density of the subdivision does not exceed the allowable density of the district; the minimum lot size for single-family detached lots is not less than five thousand (5,000) square feet within eighty (80) percent of the net developable area of the subject development (and within the twenty (20) percent remainder area, lot sizes may decrease by a maximum of ten (10) percent); and the approval body finds that granting the modification allows for a greater variety of housing types or it improves development compatibility with natural features or adjacent land uses. In addition, the approval body may require that standard size lots be placed at the perimeter of the development where the abutting lots are standard size or larger; except that this provision shall not apply where the abutting lots are larger than twenty thousand (20,000) square feet.

Hillsboro: Allows lot size reductions for up to 20% of the lots in a subdivision, and lots can be reduced by up to 75% of the minimum required size.
Variations to reduce lot dimensions below the applicable base zone standard may be requested on up to 20% of the lots in a subdivision. Variations may be requested to reduce dimensions up to 75% of the minimum dimension of the applicable base zone. In the case of lot area, variations for "compact lots" must also include provision of "oversized" lots to the extent that the average of areas for all lots meets or exceeds the minimum lot size of the applicable base zone. Lot dimension variations below 75% of the applicable base zone standard shall be approved only through a Variance process.

West Linn: Offers lot averaging only in Planned Unit Developments.

Tigard: Standards are same as existing Oregon City standards – 20% reduction in size permitted.
Lot size may be averaged to allow lots less than the minimum lot size allowed in the applicable base zone provided the average lot area for all lots is not less than allowed by the applicable base zone. No lot created under this provision shall be less than 80 percent of the minimum lot size allowed in applicable base zone.

Beaverton: Allows outright lot reduction of up to ten percent on parcels 2 acres or less. Allows Type II adjustment process for reduction of lot size up to ten percent on parcels greater than 2 acres.

Sherwood: Allows reductions of up to 10% for any number of lots. Also limits maximum sizes (10% greater than underlying zone)

Lot size may be averaged to allow lots less than the minimum lot size allowed in the underlying zoning district subject to the following regulations:

1. *The average lot area for all lots is not less than allowed by the underlying zoning district.*
2. *No lot created under this provision shall be less than 90 % of the minimum lot size allowed in the underlying zoning district.*
3. *The maximum lot size cannot be greater than 10 % of the minimum lot size.*

Lake Oswego: Lots may be reduced in area up to 20% only when land in development is dedicated as open space.

{STAFF REPORT TO BE UPDATED WITH PLANNING COMMISSION'S PREFERRED LOT AVERAGING AMENDMENTS HERE}

B. PUBLIC NOTICE

Public Notice was provided more than 20 days prior to the first evidentiary hearing via email to affected agencies, neighborhood associations and Oregon City boards and committees, and published. Notice of the proposed amendment was provided to a variety of groups and government agencies including, Metro and the Department of the Land Conservation and Development. A Measure 56 Notice sent to all properties within the Urban Growth Boundary in December of 2017 after multiple work sessions with the City Commission. The Planning Division held a meeting with the Citizen Involvement Committee on April 3, 2017, a meeting with the Development Stakeholders Group on May 4, 2017, and a Work Session with the Planning Commission on April 10, 2017 to discuss the proposal and how the proposed changes would affect properties. Comments regarding the proposal are attached.

C. DECISION-MAKING CRITERIA:

OREGON CITY MUNICIPAL CODE (OCMC)

Chapter 17.68 Zoning Changes and Amendments

17.68.010 Initiation of the amendment.

A text amendment to this title or the comprehensive plan, or an amendment to the zoning map or the comprehensive plan map, may be initiated by:
A. A resolution by the commission;
B. An official proposal by the planning commission;
C. An application to the planning division presented on forms and accompanied by information prescribed by the planning commission.
All requests for amendment or change in this title shall be referred to the planning commission.

Response: This request is for text amendments to the Oregon City Municipal Code and was initiated by the Planning Division on behalf of a request by the City Commission.

17.68.020 Criteria.

The criteria for a zone change are set forth as follows:

A. The proposal shall be consistent with the goals and policies of the comprehensive plan.

Statewide Planning Goals are also shown to indicate how the Oregon City Comprehensive Plan (OCCP) Goals and Policies implement the applicable Statewide Planning Goal.

STATEWIDE PLANNING GOAL 1 – CITIZEN INVOLVEMENT
To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.
OCCP Goal 1.1 Citizen Involvement Program

Implement a Citizen Involvement Program that will provide an active and systematic process for citizen participation in all phases of the land-use decision making process to enable citizens to consider and act upon a broad range of issues affecting the livability, community sustainability, and quality of neighborhoods and the community as a whole.
OCCP Policy 1.1.1
Utilize neighborhood associations as the vehicle for neighborhood-based input to meet the requirements of the Land Conservation and Development Commission (LCDC) Statewide Planning Goal 1, Citizen Involvement. The Citizen Involvement Committee (CIC) shall serve as the officially recognized citizen committee needed to meet LCDC Statewide Planning Goal 1.
OCCP Goal 1.2 Community and Comprehensive Planning
Ensure that citizens, neighborhood groups, and affected property owners are involved in all phases of the comprehensive planning program.
OCCP Policy 1.2.1
Encourage citizens to participate in appropriate government functions and land-use planning.
OCCP Policy 1.2.1
Encourage development and refinement of CIC and neighborhood association bylaws that will govern the groups' formation and operations.
OCCP Goal 1.3 Community Education
Provide education for individuals, groups, and communities to ensure effective participation in decision-making processes that affect the livability of neighborhoods.
OCCP Goal 1.4 Community Involvement
Provide complete information for individuals, groups, and communities to participate in public policy planning and implementation of policies.
OCCP Policy 1.4.1
Notify citizens about community involvement opportunities when they occur.
Finding: Complies as Proposed. The proposed code amendments to Lot Averaging were first identified by citizens whom came before the City Commission. The City Commission met to discuss this topic multiple times before providing direction to staff regarding these changes. The other proposed amendments were identified by staff as corrections and clarifications, and changes to processes to eliminate areas of conflict.

The amendments were presented to the Citizen Involvement Committee and the Development Stakeholders Group as well as in a work session with the Planning Commission prior to the first public hearing. In addition, the application will be posted on the City website, emailed to various entities including neighborhood associations and the Citizen Involvement Committee, and posted in a general circulation newspaper.

STATEWIDE PLANNING GOAL 2 – LAND USE PLANNING
To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.
OCCP Goal 2.1 Efficient Use of Land
Ensure that property planned for residential, commercial, office, and industrial uses is used efficiently and that land is developed following principles of sustainable development.
Finding: The proposed code amendments include clarifications that give applicants more certainty and clarity about city codes. {FINDINGS REFLECTING FINAL PLANNING COMMISSION RECOMMENDATION REGARDING LOT AVERAGING TO BE INSERTED HERE}

OCCP Goal 2.4 Neighborhood Livability
Provide a sense of place and identity for residents and visitors by protecting and maintaining neighborhoods as the basic unit of community life in Oregon City while implementing the goals and policies of the other sections of the Comprehensive Plan.

Finding: {FINDINGS REFLECTING FINAL PLANNING COMMISSION RECOMMENDATION REGARDING LOT AVERAGING TO BE INSERTED HERE}

STATEWIDE PLANNING GOAL 3: AGRICULTURAL LANDS
Finding: Complies as Proposed. The proposed amendments would not preclude the use of agricultural lands.

STATEWIDE PLANNING GOAL 4: FOREST LANDS
Finding: Complies as Proposed. The proposed amendments would not preclude the use of forest lands.

STATEWIDE PLANNING GOAL 5: NATURAL RESOURCES, SCENIC AND HISTORIC AREAS, AND OPEN SPACES
Statewide Planning Goal 5 requires that open spaces and natural, scenic, and historic resources be protected.
OCCP Goal 5.3 Historic Resources
Encourage the preservation and rehabilitation of homes and other buildings of historic or architectural significance in Oregon City.
Finding: Complies as Proposed. The proposed amendments would not preclude the preservation and rehabilitation of homes and other buildings of historic or architectural significance in Oregon City.

Goal 5.4 Natural Resources
Identify and seek strategies to conserve and restore Oregon City's natural resources, including air, surface and subsurface water, geologic features, soils, vegetation, and fish and wildlife, in order to sustain quality of life for current and future citizens and visitors, and the long-term viability of the ecological systems.
Finding: Complies as Proposed. The proposed amendments include an amendment to exemptions in the Natural Resources Overlay Zone, clarifying how temporary disturbance areas should be treated. No material changes to how the overlay zone is regulated are proposed.

STATEWIDE PLANNING GOAL 6: AREAS SUBJECT TO NATURAL HAZARDS
To protect people and property from natural hazards.
Finding: Complies as Proposed. The overlay districts, such as the Natural Resource Overlay District, Flood Management Overlay, and Geologic Hazards Overlay will apply regardless of the proposed changes.

STATEWIDE PLANNING GOAL 7: AREAS SUBJECT TO NATURAL HAZARDS
To protect people and property from natural hazards.
OCCP Goal 7.1 Natural Hazards
Protect life and reduce property loss from the destruction associated with natural hazards
Finding: Complies as Proposed. The proposed amendments will not affect natural hazards overlay districts. The overlay districts, such as the Flood Management Overlay, and Geologic Hazards Overlay will apply regardless of the proposed changes.

STATEWIDE PLANNING GOAL 8: RECREATIONAL NEEDS
To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.
Finding: Complies as Proposed. The proposed amendments do not impact parks and recreation.

STATEWIDE GOAL 9: ECONOMIC DEVELOPMENT
To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.
OCCP Policy 9.2.1
Seek input from local businesses when making decisions that will have a significant economic impact on them.

Finding: Complies as Proposed. The proposal was sent to the Chamber of Commerce, Oregon City Business Alliance, as well as the Development Stakeholder Group for comments.

OCCP Policy 9.2.2
Carefully consider the economic impacts of proposed programs and regulations in the process of implementing the City's Comprehensive Plan.
Finding: Complies as Proposed. The proposal includes clarifications that will provide greater levels of certainty for developers of property. The amendments also streamline some aspects of the development review process.

OCCP Policy 9.2.3
Simplify, streamline, and continuously improve the permitting and development review process.
Finding: Complies as Proposed. The proposal includes clarifications that will provide greater levels of certainty for developers of property. The amendments also streamline some aspects of the development review process.

STATEWIDE PLANNING GOAL 10: HOUSING
To provide for the housing needs of citizens of the state.
OCCP Policy 10.1.4
Aim to reduce the isolation of income groups within communities by encouraging diversity in housing types within neighborhoods consistent with the Clackamas County Consolidated Plan, while ensuring that needed affordable housing is provided.
OCCP Policy 10.1.7
Use a combination of incentives and development standards to promote and encourage well-designed single-family subdivisions and multi-family developments that result in neighborhood livability and stability.
OCCP Goal 10.1 Diverse Housing Opportunities
Provide for the planning, development and preservation of a variety of housing types and lot sizes.
Finding: The proposed code amendments limit lot averaging in subdivisions. The lot averaging provisions apply to new subdivisions within the R-10, R-8, R-6, R-5 and R-3.5 zones. Currently, lot sizes are permitted to vary and be less than the minimum zone average by 20%. {FINDINGS REFLECTING FINAL PLANNING COMMISSION RECOMMENDATION REGARDING LOT AVERAGING TO BE INSERTED HERE}

STATEWIDE PLANNING GOAL 11: PUBLIC FACILITIES AND SERVICES
To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.
Finding: Complies as Proposed. The proposed amendments have no impact on public facilities.

STATEWIDE PLANNING GOAL 12: TRANSPORTATION
To provide and encourage a safe, convenient and economic transportation system.
Finding: Complies as Proposed. The proposed amendments have no impact on transportation.

B. That public facilities and services (water, sewer, storm drainage, transportation, schools, police and fire protection) are presently capable of supporting the uses allowed by the zone, or can be made available prior to issuing a certificate of occupancy. Service shall be sufficient to support the range of uses and development allowed by the zone.
Finding: Complies as Proposed. The proposal does not change uses allowed in any zoning districts or the ability of services and facilities.

C. The land uses authorized by the proposal are consistent with the existing or planned function, capacity and level of service of the transportation system serving the proposed zoning district.

Response: {FINDINGS REFLECTING FINAL PLANNING COMMISSION RECOMMENDATION REGARDING LOT AVERAGING TO BE INSERTED HERE}

D. Statewide planning goals shall by addressed if the comprehensive plan does not contain specific policies or provisions which control the amendment.
Finding: See responses above. The Oregon City Comprehensive Plan addresses the Statewide Planning Goals, as shown above under the findings in this staff report.

D. RECOMMENDATION

{FINDINGS REFLECTING FINAL PLANNING COMMISSION RECOMMENDATION REGARDING LOT AVERAGING TO BE INSERTED HERE}

E. EXHIBITS

1. Narrative and Code Responses
2. Presentation from February 12, 2018
3. Proposed Amendments to the Oregon City Municipal Code
4. Public Comments

OREGON CITY

Community Development – Planning

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L 17-04 Code Amendments

Narrative and Code Responses

Proposed Project

Staff has proposed a variety of minor amendments to the Oregon City Municipal Code. Although a majority of the amendments provide clarity, improve processes, or remove code conflicts, the more substantial changes include:

1. Amending language for lot averaging
2. Removing the ability to reconsider a final decision
3. Clarify how dates are calculated
4. Remove light bulb requirements
5. Allow 10% parking reduction adjacent to transit routes

The complete drafted code amendments can be found in the attached Exhibits.

Code responses

Chapter 17.68 Zoning Changes and Amendments

17.68.010 Initiation of the amendment.

A text amendment to this title or the comprehensive plan, or an amendment to the zoning map or the comprehensive plan map, may be initiated by:

A. A resolution by the commission;

B. An official proposal by the planning commission;

C. An application to the planning division presented on forms and accompanied by information prescribed by the planning commission.

All requests for amendment or change in this title shall be referred to the planning commission.

Response: This request is for text amendments to the Oregon City Municipal Code and was initiated by the Planning Division on behalf of a request by the City Commission.

17.68.020 Criteria.

The criteria for a zone change are set forth as follows:

A. The proposal shall be consistent with the goals and policies of the comprehensive plan.

Statewide Planning Goals are also shown to indicate how the Oregon City Comprehensive Plan (OCCP) Goals and Policies implement the applicable Statewide Planning Goal.

STATEWIDE PLANNING GOAL 1 – CITIZEN INVOLVEMENT

To develop a citizen involvement program that insures the opportunity for citizens to be involved in all phases of the planning process.

OCCP Goal 1.1 Citizen Involvement Program

Implement a Citizen Involvement Program that will provide an active and systematic process for citizen participation in all phases of the land-use decision making process to enable citizens to consider and act upon a broad range of issues affecting the livability, community sustainability, and quality of neighborhoods and the community as a whole.

OCCP Policy 1.1.1
Utilize neighborhood associations as the vehicle for neighborhood-based input to meet the requirements of the Land Conservation and Development Commission (LCDC) Statewide Planning Goal 1, Citizen Involvement. The Citizen Involvement Committee (CIC) shall serve as the officially recognized citizen committee needed to meet LCDC Statewide Planning Goal 1.
OCCP Goal 1.2 Community and Comprehensive Planning
Ensure that citizens, neighborhood groups, and affected property owners are involved in all phases of the comprehensive planning program.
OCCP Policy 1.2.1
Encourage citizens to participate in appropriate government functions and land-use planning.
OCCP Policy 1.2.1
Encourage development and refinement of CIC and neighborhood association bylaws that will govern the groups' formation and operations.
OCCP Goal 1.3 Community Education
Provide education for individuals, groups, and communities to ensure effective participation in decision-making processes that affect the livability of neighborhoods.
OCCP Goal 1.4 Community Involvement
Provide complete information for individuals, groups, and communities to participate in public policy planning and implementation of policies.
OCCP Policy 1.4.1
Notify citizens about community involvement opportunities when they occur.
Response: The proposed code amendments to Lot Averaging were first identified by citizens whom came before the City Commission. The City Commission met to discuss this topic multiple times before providing direction to staff regarding these changes. The other proposed amendments were identified by staff as corrections and clarifications, and changes to processes to eliminate areas of conflict.

The amendments will be presented to the Citizen Involvement Committee as well as in a work session with the Planning Commission prior to the first public hearing. In addition, the application will be posted on the City website, emailed to various entities including neighborhood associations and the Citizen Involvement Committee, and posted in a general circulation newspaper.

STATEWIDE PLANNING GOAL 2 – LAND USE PLANNING
To establish a land use planning process and policy framework as a basis for all decision and actions related to use of land and to assure an adequate factual base for such decisions and actions.
OCCP Goal 2.1 Efficient Use of Land
Ensure that property planned for residential, commercial, office, and industrial uses is used efficiently and that land is developed following principles of sustainable development.
Response: The proposed code amendments include clarifications that give applicants more certainty and clarity about city codes. Limiting the ability for lot size averaging in subdivisions may reduce the ability to use land as efficiently as was previously permitted.

OCCP Goal 2.4 Neighborhood Livability
Provide a sense of place and identity for residents and visitors by protecting and maintaining neighborhoods as the basic unit of community life in Oregon City while implementing the goals and policies of the other sections of the Comprehensive Plan.
Response: The proposed code amendments include limits to lot averaging for subdivisions, which will lead to more uniform lot sizes within subdivisions.

STATEWIDE PLANNING GOAL 3: AGRICULTURAL LANDS
Response: The proposed amendments would not preclude the use of agricultural lands.

STATEWIDE PLANNING GOAL 4: FOREST LANDS
Response: The proposed amendments would not preclude the use of forest lands.

STATEWIDE PLANNING GOAL 5: NATURAL RESOURCES, SCENIC AND HISTORIC AREAS, AND OPEN SPACES
Statewide Planning Goal 5 requires that open spaces and natural, scenic, and historic resources be protected.
OCCP Goal 5.3 Historic Resources
Encourage the preservation and rehabilitation of homes and other buildings of historic or architectural significance in Oregon City.
Response: The proposed amendments would not preclude the preservation and rehabilitation of homes and other buildings of historic or architectural significance in Oregon City.

Goal 5.4 Natural Resources
Identify and seek strategies to conserve and restore Oregon City's natural resources, including air, surface and subsurface water, geologic features, soils, vegetation, and fish and wildlife, in order to sustain quality of life for current and future citizens and visitors, and the long-term viability of the ecological systems.
Response: The proposed amendments include an amendment to exemptions in the Natural Resources Overlay Zone, clarifying that fences within the NROD are exempt from review. The impact of fence posts is not significant and is similar to other activities that are exempt.

STATEWIDE PLANNING GOAL 6: AREAS SUBJECT TO NATURAL HAZARDS
To protect people and property from natural hazards.
Response: The overlay districts, such as the Natural Resource Overlay District, Flood Management Overlay, and Geologic Hazards Overlay will apply regardless of the proposed changes.

STATEWIDE PLANNING GOAL 7: AREAS SUBJECT TO NATURAL HAZARDS
To protect people and property from natural hazards.
OCCP Goal 7.1 Natural Hazards
Protect life and reduce property loss from the destruction associated with natural hazards
Response: The proposed amendments will not affect natural hazards overlay districts. The overlay districts, such as the Flood Management Overlay, and Geologic Hazards Overlay will apply regardless of the proposed changes.

STATEWIDE PLANNING GOAL 8: RECREATIONAL NEEDS
To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities including destination resorts.
Response: The proposed amendments do not impact parks and recreation.

STATEWIDE GOAL 9: ECONOMIC DEVELOPMENT
To provide adequate opportunities throughout the state for a variety of economic activities vital to the health, welfare, and prosperity of Oregon's citizens.
OCCP Policy 9.2.1

Seek input from local businesses when making decisions that will have a significant economic impact on them.
Response: The proposal will be sent to the Chamber of Commerce, Oregon City Business Alliance, as well as the Development Stakeholder Group for comments.

OCCP Policy 9.2.2
Carefully consider the economic impacts of proposed programs and regulations in the process of implementing the City's Comprehensive Plan.
Response: The proposal includes clarifications that will provide greater levels of certainty for developers of property. The amendments also streamline some aspects of the development review process.

OCCP Policy 9.2.3
Simplify, streamline, and continuously improve the permitting and development review process.
Response: The proposal includes clarifications that will provide greater levels of certainty for developers of property. The amendments also streamline some aspects of the development review process.

STATEWIDE PLANNING GOAL 10: HOUSING
To provide for the housing needs of citizens of the state.
OCCP Policy 10.1.4
Aim to reduce the isolation of income groups within communities by encouraging diversity in housing types within neighborhoods consistent with the Clackamas County Consolidated Plan, while ensuring that needed affordable
housing is provided.
OCCP Policy 10.1.7
Use a combination of incentives and development standards to promote and encourage well-designed single-family subdivisions and multi-family developments that result in neighborhood livability and stability.
OCCP Goal 10.1 Diverse Housing Opportunities
Provide for the planning, development and preservation of a variety of housing types and lot sizes.
Response: The proposed code amendments limit lot averaging in subdivisions. This could have an impact on diversity of housing and limit the variety of housing types and sizes. The lot averaging provisions apply to new subdivisions within the R-10, R-8, R-6, R-5 and R-3.5 zones. Currently, lot sizes are permitted to vary and be less than the minimum zone average by 20%. The amendments would limit the size reduction to 10% and only allow a quarter of all lots in any one subdivision to be below the minimum. While this would provide uniformity, it also could lead to reductions in the total number of lots that are created due to constraints of subdivision layouts.

STATEWIDE PLANNING GOAL 11: PUBLIC FACILITIES AND SERVICES
To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development.
Response: The proposed amendments have no impact on public facilities.

STATEWIDE PLANNING GOAL 12: TRANSPORTATION
To provide and encourage a safe, convenient and economic transportation system.
Response: The proposed amendments have no impact on transportation.

B. That public facilities and services (water, sewer, storm drainage, transportation, schools, police and fire protection) are presently capable of supporting the uses allowed by the zone, or can be made available prior to issuing a certificate of occupancy. Service shall be sufficient to support the range of uses and development allowed by the zone.
Response: The proposal does not change uses allowed in any zoning districts.

C. The land uses authorized by the proposal are consistent with the existing or planned function, capacity and level of service of the transportation system serving the proposed zoning district.
Response: No land use changes are proposed.

D. Statewide planning goals shall by addressed if the comprehensive plan does not contain specific policies or provisions which control the amendment.
Response: See responses above. The Oregon City Comprehensive Plan addresses the Statewide Planning Goals, as shown above under the findings for Criterion A.

Draft Code Amendments

February 12, 2018 Planning Commission Work Session

Purpose:

Explanation of code amendments on:

- Revisions to Lot Averaging
- Minor Code Clean Up
- Efficiencies

Please identify big picture concerns. Comments on minor spelling/wording/redlines are encouraged to be provided to staff.

Process

Notice of code amendments

Review by Development Stakeholders Group

Work Session with Planning Commission January 22nd

Citizen Involvement Committee February 5th

Continue Work Session with Planning Commission February 12th

Planning Commission Hearing February 26th

Definitions

- Revise “Family Day Care” definition to comply with ORS
- Add definition of “building”
- Add definition of “Net Leasable Area:” Actual square-footage of a building or outdoor area that may be leased or rented to tenants, which excludes parking lots, common areas, shared hallways, elevator shafts, stairways, and space devoted to cooling, heating, or other equipment.

Single Family and Duplex Uses in Mixed Use zones

- Clarify that single and two-family units are permitted when in conjunction with and located in the same building as another permitted use in the zone. This applies to NC, C, MUC-1, MUC-2 and MUD.

Natural Resource Overlay District Exemptions

- Clarify exemption for temporary minor disturbance areas

Clarify Decision Making Processes

- Update summary chart
- Update explanation language
- Clarify how to calculate days in a land use review process
- ~~Remove reconsideration process~~

Parking Reduction

- Minimum parking reduced by up to 10% when adjacent to a transit route or within 1,000 feet of a stop
- This was inadvertently removed from the code in 2014 during TSP update

Clarification of Applicability of Nonconforming Upgrades

- Nonconforming upgrades are required when a nonconforming site is being “expanded”
- Clarify that expansion in this case means increases in the square footage of a building and/or site improvements which include installation of any additional off-street parking stalls

Type I Site Plan

- Allow demolitions of any size
- Clarify tree removal applicability

Landscaping

- Exempt landscaping from submitting a plan by a landscape architect when species is on an approved tree list
- Allow certified landscape designer, arborist, or nurseryman to design projects less than 500 sq. ft. rather than a landscape architect.
- Remove requirement for 10% landscaping for major remodeling. (Instead, use landscaping minimums in specific zoning designations)

Site Plan & Design Review Standards

- Remove requirement which conflicts with code section requiring all commercial mechanical changes to be a Type I Site Plan and Design Review.
- Allow chain link fence around stormwater facilities
- Clarify connection between development and nonconforming upgrades.
- Remove redundant sections and conflicting standards.
- Remove light bulb type requirements.
- Remove standard related to light fixture requirements.

Communication Facilities

- All modifications and expansions to existing wireless communication facilities are permitted in every zone, subject to the requirements of this Section. Certain modifications are deemed minor in nature and are deemed “eligible modifications” These modifications include the addition, removal, and/or replacement of transmission equipment that do not make a substantial change to the physical dimensions (height, mass, width) of the existing tower, support structure, or base station. Replacement of an existing tower may also be considered an eligible modification.
- Complies with 2012 court ruling

Amendment to Lot Averaging Standards

Current Standards:

Lot sizes may be up to 20% less than the zoning designation if the subdivision as a whole averages the zoning minimum.

Draft Proposal:

- Lot sizes allowed to be 10% smaller than zone average rather than 20%.
- Cap the total number of lots that can be smaller than the zone minimum to less than 25%.

Amendment to Lot Averaging Standards

Other Subdivision lot standards - not proposed to change:

- Minimum lot width
- Minimum lot depth
- Maximum lot coverage of buildings (40% in most cases)
- Minimum Setbacks
- Minimum required density (80%)
- Maximum block length

Example: Central Point Crossing (2013 Subdivision)

"R-8" Single-Family Dwelling District
Minimum Average Lot size: 8000 sf

Example: Central Point Crossing (2013 Subdivision)

Net Developable area: 221,625 sf

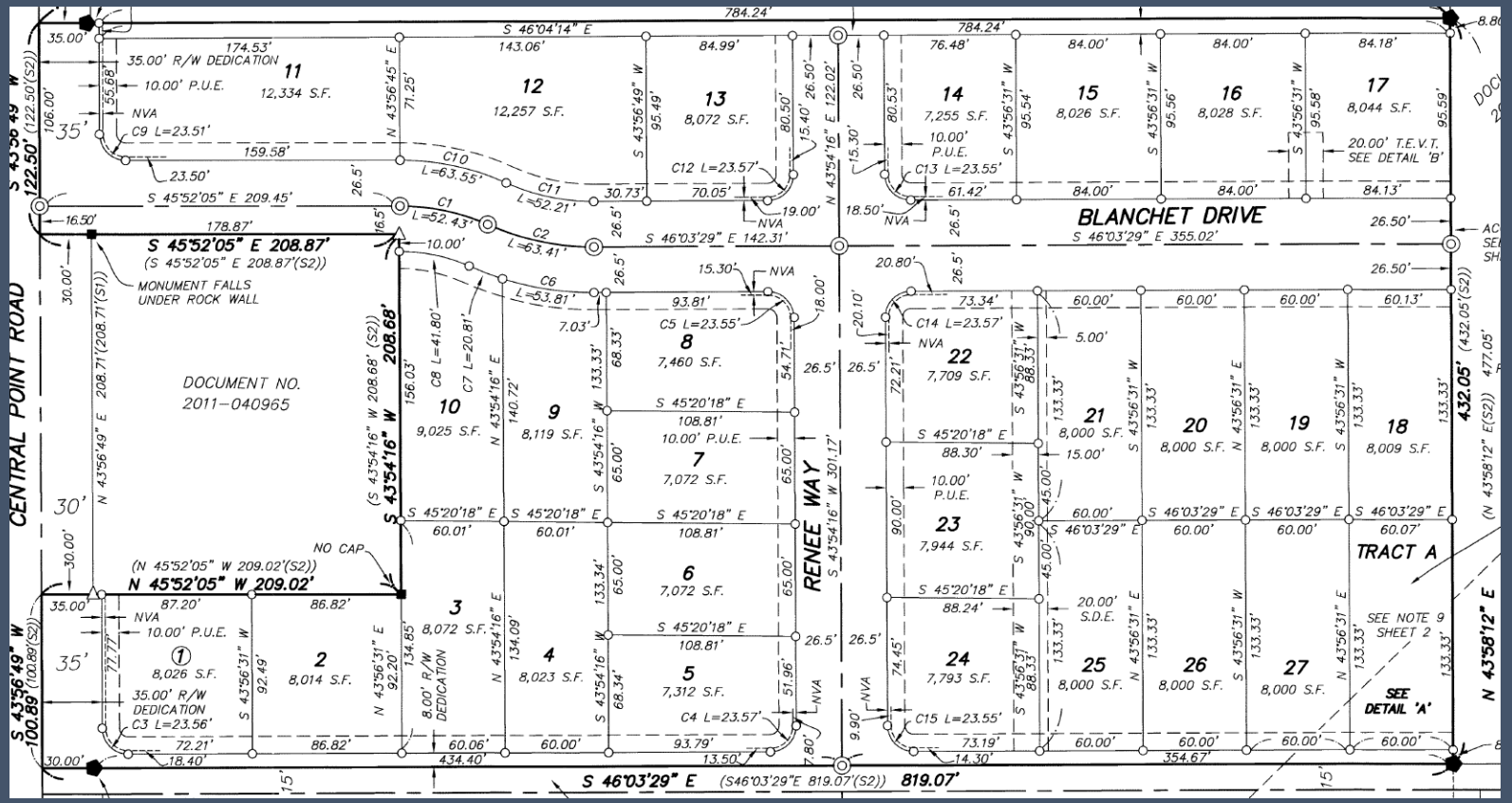
221,625 divided by 8,000 = 27

Maximum 27 lots

Proposed: 27 lots
Average lot size: 8,208 sf

Example: Central Point Crossing (2013 Subdivision)

Lot	Lot Area (Sq. Ft. Min.)
1	8,019
2	8,014
3	8,003
4	8,000
5	7,370
6	7,059
7	7,062
8	7,378
9	8,142
10	9,093
11	12,333
12	12,257
13	8,069
14	7,976
15	7,740
16	7,741
17	7,881
18	8,000
19	8,000
20	8,000
21	8,000
22	7,764
23	7,960
24	7,764
25	8,000
26	8,000
27	8,000



*Final plat shown varies from original lot sizes shown in table to right, but the statistics on this slide are the same for each

Proposed: 27 lots
Average lot size: 8,208 sf

Number of lots less than 8,000 sf: eight (30%)

Smallest Lot: 7,072 sf (11.6% smaller than minimum average

Number of lots more than 10% under the minimum average: two (7%)

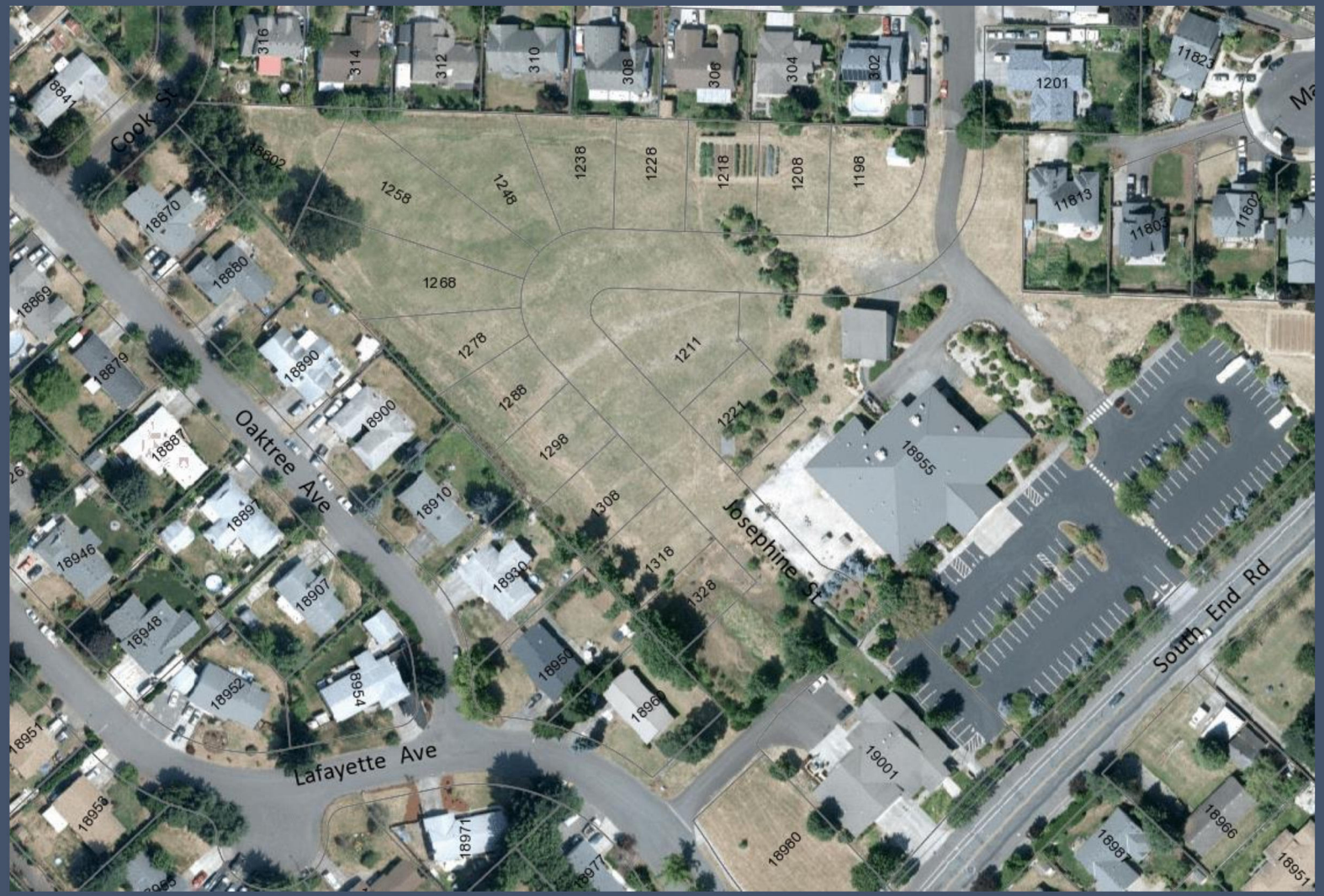
Example: Adeline Acres (2014 Subdivision)

Total area: 191,000 square feet

“R-8” Single-Family Dwelling District

Average Lot size: 8000 sf

Example: Adeline Acres (2014 Subdivision)



Total area: 191,000 square feet

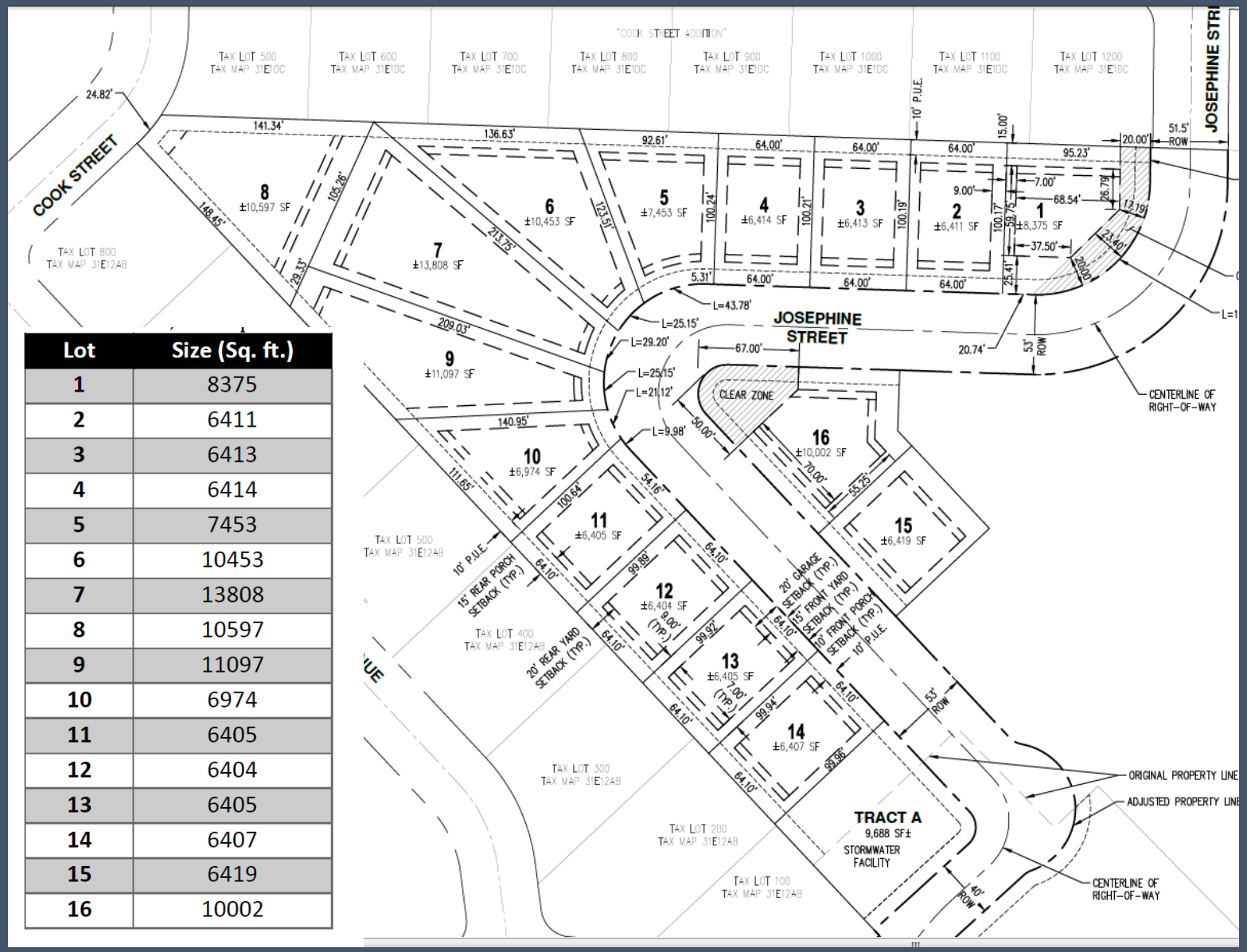
Net Developable area: 140,257 sf

140,257 divided by 8,000 = 17

Maximum 17 lots

Proposed: 16 lots
Average lot size: 8,127 sf

Example: Adeline Acres (2014 Subdivision)



Lot	Size (Sq. ft.)
1	8375
2	6411
3	6413
4	6414
5	7453
6	10453
7	13808
8	10597
9	11097
10	6974
11	6405
12	6404
13	6405
14	6407
15	6419
16	10002

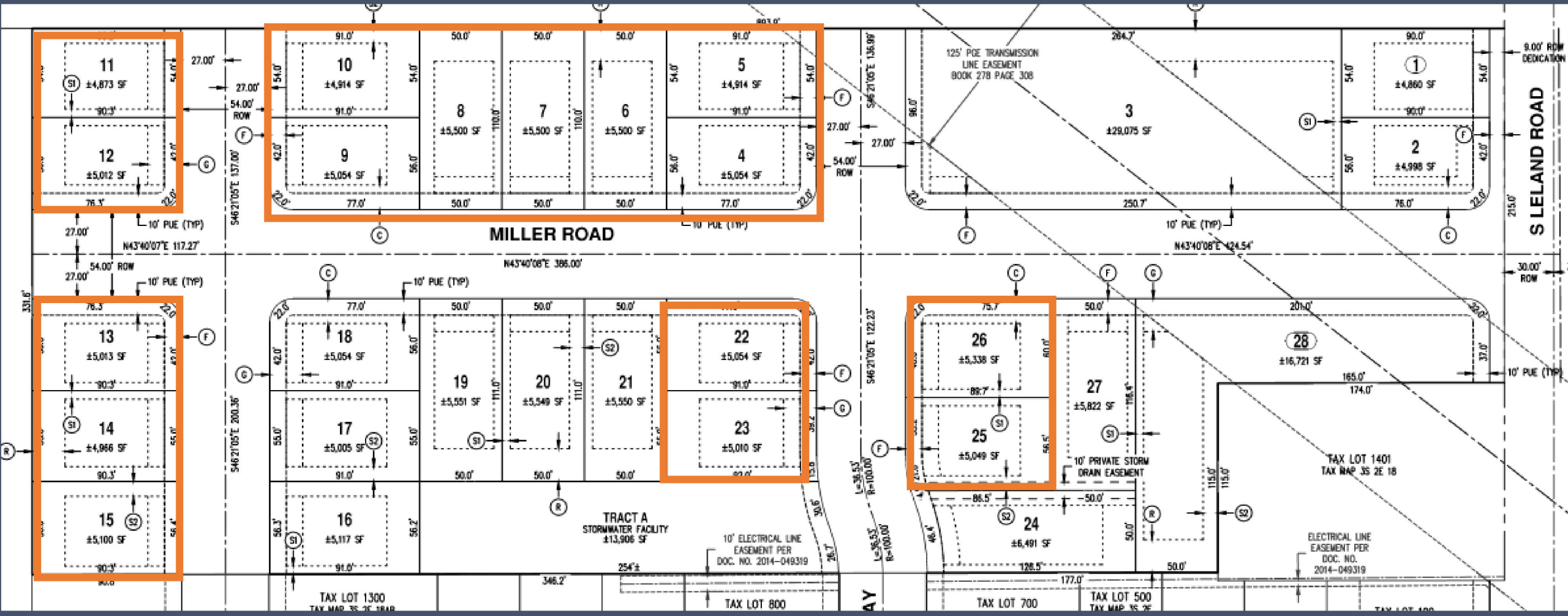
Proposed: 16 lots
Average lot size: 8,127 sf

Number of lots less than 8,000 sf: ten (63%)

Smallest Lot: 6,404 sf (20% smaller than minimum average)

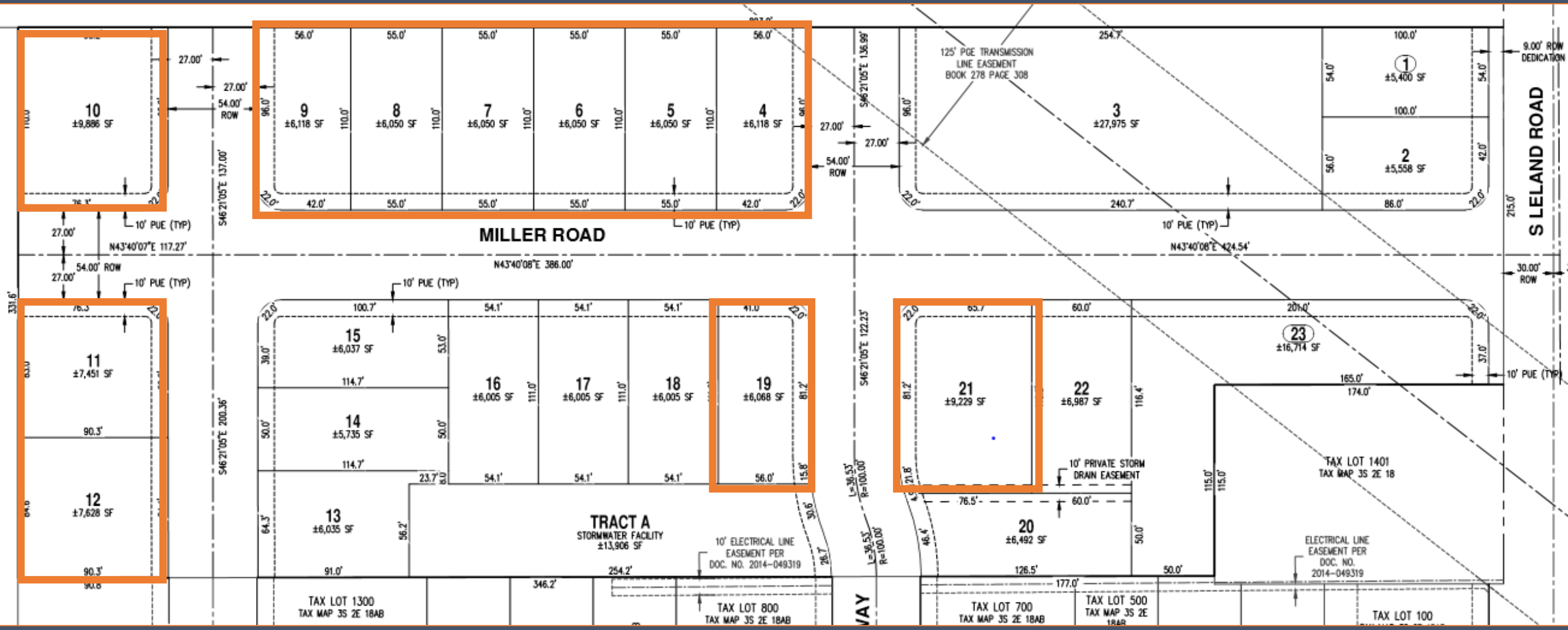
Number of lots more than 10% under the minimum average: nine (56%)

Lindsay Anne Too: Original



Maximum lots: 30 Minimum Lots: 24 Proposed lots: 28

Lindsay Anne Too: Under Proposed Code



23 lots (less than minimum of 24)

Design limited by pre-existing road connections to the south and PGE easement

Questions?

Proposed Changes to the Oregon City Municipal Code

Note language subject to change throughout the review process.

Code additions have underlines, extractions have ~~strike through~~. Changes from the last draft are identified in red.

Draft Dated February 26, 2018

Oregon City Municipal Code Section	Summary of Change	Explanation
16.12.050	See Multiple Options below ~~Amend lot averaging provisions in subdivisions for the following:~~ • ~~Lot sizes allowed to be 10% smaller than zone average rather than 20%~~ • ~~Cap the total number of lots that can be smaller than the zone average to 25%.~~	Concerns that the provision allowed for too many lots to be below the zoning minimum and the sizes could be too small.
17.04.154	Add definition of Building.	Clarify the definition of "building" should be directed to the definition of "structure".
17.04.420	Increase the number of children a family daycare provider may care for from 13 to 16.	Per ORS 329A.440(4), a family daycare provider can have up to 16 children, not 13.
17.04.812	Create definition of "net leasable area".	Net leasable area is used to calculate parking requirements.
17.29.020	Clarify that single and two-family units are permitted when in conjunction with and located in the same building as another permitted use in the zone. This applies to NC, C, MUC-1, MUC-2 and MUD.	Clarifies the intent of the code.
17.49.080	Clarify minimal temporary disturbances.	Clarification of temporary minor disturbance areas.
17.50.030.B 17.50.030.C 17.50.030.D 17.50.030.F	Clarify noticing for Type II-IV processes. Specify that decisions, completeness reviews, appeals, and notices in this Chapter shall be calculated according to OCMC Chapter 1.04.070 and shall be based on calendar days, not business days. Amends Table 17.50.030 to match code language for reconsiderations, Historic Review, Extensions, and Natural Resource Overlay District Review.	Provides clarification and amends Table 17.50.030 to match code language.
17.50.30.B 17.50.120 17.50.190	Clarify who has standing to file an appeal as those who participated orally or in writing in the initial decision.	Clarifies who has standing to appeal, removes reference to state statute, and eliminates inconsistencies in code.
~~17.50.260~~	~~Remove reconsideration of a final decision.~~	~~Decisions may be reconsidered with an appeal.~~
17.52.020.C.4	Allow reduction of minimum parking by 10% if adjacent to a transit route.	A similar reduction was inadvertently removed from the code.

17.58.040 17.58.040.C 17.58.040.C.2	Clarified that nonconforming upgrades are required for increases to the square footage of a building and/or site improvements which include installation of an additional off-street parking stall.	Clarify when nonconforming upgrades are required.
17.62.035.A.2.a 17.62.035.A.2.b 17.62.035.A.2.u	Clarify that any size demolition qualifies as a Type I Minor Site Plan and Design Review.	Corrects an unintended provision of previous code amendments.
17.62.035.A.2.v	Clarify tree removal as a Type I Minor Site Plan and Design Review.	Applicants could not clearly tell that tree removal was included in landscaping which was already a Type I review.
17.62.050.A.1.c	Exempt landscaping tree removal and/or replacement from submitting a plan by a landscape architect if the new species is on an approved tree list. Allow certified landscape designer, arborist, or nurseryman to approve of projects less than 500 sq. ft. rather than a landscape architect.	Streamline tree and landscape review.
17.62.050.A.1.d	Remove requirement for 10% landscaping for major remodeling.	The code and specific zoning designations provide a landscaping minimums more appropriate to zoning designations.
17.62.050.A.20.d	Remove requirement which conflicts with code section requiring all commercial mechanical changes to be a Type I Site Plan and Design Review.	Remove section which was corrected with the adoption of Type I Site Plan and Design Review.
17.62.050.A.23	Clarify connection between development and nonconforming upgrades.	Clarify code requirements.
17.62.065.D	Remove redundant sections and conflicting standards. Remove bulb requirements. Remove standard related to fixture requirements.	Streamline and clarify language, remove blub requirements to allow emerging technologies.
17.80	Update Communication Facilities chapter to allow a quicker review for some projects.	Amend code to comply with 2012 ruling

LOT AVERAGING AMENDMENT OPTIONS

Option #1: Original Amendment

16.12.050 ~~- Calculations of lot area~~ Lot Size Reduction.

Up to 25% of the lots in a~~A~~ subdivision in the R-10, R-8, R-6, R-5, or R-3.5 dwelling district may ~~include lots that are~~be up to ~~twenty~~ ten percent less than the required minimum lot area of the applicable zoning designation provided the lots within the entire subdivision on average meet~~s~~ the minimum site area requirement of the underlying zone.

The average lot area is determined by calculating the total site area devoted to dwelling units and dividing that figure by the proposed number of dwelling lots.

Accessory dwelling units are not included in this determination nor are tracts created for non-dwelling unit purposes such as open space, stormwater tracts, or access ways.

A lot that was created pursuant to this section may not be further divided unless the average lot size requirements are still met for the entire subdivision.

When a lot abuts a public alley, an area equal to the length of the alley frontage along the lot times the width of the alley right-of-way measured from the alley centerline may be added to the area of the abutting lot in order to satisfy the lot area requirement for the abutting lot. It may also be used in calculating the average lot area.

Option #2: Allow 20% size reduction for only 25% of total lots

16.12.050 ~~- Calculations of lot area~~ Lot Size Reduction.

Up to 25% of the lots in a~~A~~ subdivision in the R-10, R-8, R-6, R-5, or R-3.5 dwelling district may ~~include lots that are~~be up to twenty percent less than the required minimum lot area of the applicable zoning designation provided the lots within the entire subdivision on average meet~~s~~ the minimum site area requirement of the underlying zone.

The average lot area is determined by calculating the total site area devoted to dwelling units and dividing that figure by the proposed number of dwelling lots.

Accessory dwelling units are not included in this determination nor are tracts created for non-dwelling unit purposes such as open space, stormwater tracts, or access ways.

A lot that was created pursuant to this section may not be further divided unless the average lot size requirements are still met for the entire subdivision.

When a lot abuts a public alley, an area equal to the length of the alley frontage along the lot times the width of the alley right-of-way measured from the alley centerline may be added to the area of the abutting lot in order to satisfy the lot area requirement for the abutting lot. It may also be used in calculating the average lot area.

Option #3: Limit reduction to ten percent rather than twenty percent

16.12.050 ~~- Calculations of lot area~~ Lot Size Reduction.

A subdivision in the R-10, R-8, R-6, R-5, or R-3.5 dwelling district may include lots that are up to ~~twenty~~ ten percent less than the required minimum lot area of the applicable zoning designation provided the entire subdivision on average meet~~s~~ the minimum site area requirement of the underlying zone.

The average lot area is determined by calculating the total site area devoted to dwelling units and dividing that figure by the proposed number of dwelling lots.

Accessory dwelling units are not included in this determination nor are tracts created for non-dwelling unit purposes such as open space, stormwater tracts, or access ways.

A lot that was created pursuant to this section may not be further divided unless the average lot size requirements are still met for the entire subdivision.

When a lot abuts a public alley, an area equal to the length of the alley frontage along the lot times the width of the alley right-of-way measured from the alley centerline may be added to the area of the abutting lot in

order to satisfy the lot area requirement for the abutting lot. It may also be used in calculating the average lot area.

Option #4: Exclude Powerline Easement Areas

16.12.050 ~~- Calculations of lot area~~ Lot Size Reduction.

A subdivision in the R-10, R-8, R-6, R-5, or R-3.5 dwelling district may include lots that are up to twenty percent less than the required minimum lot area of the applicable zoning designation provided the entire subdivision on average meet~~s~~ the minimum site area requirement of the underlying zone. Any area within a powerline easement on a lot shall not count towards the lot area for that lot.

The average lot area is determined by first calculating the total site area devoted to dwelling units, subtracting the powerline easement areas, and dividing that figure by the proposed number of dwelling lots.

Accessory dwelling units are not included in this determination nor are tracts created for non-dwelling unit purposes such as open space, stormwater tracts, or access ways.

A lot that was created pursuant to this section may not be further divided unless the average lot size requirements are still met for the entire subdivision.

When a lot abuts a public alley, an area equal to the length of the alley frontage along the lot times the width of the alley right-of-way measured from the alley centerline may be added to the area of the abutting lot in order to satisfy the lot area requirement for the abutting lot. It may also be used in calculating the average lot area.

Option #5: Perimeter Lots May Not be Smaller Than 10% Below the Underlying Zone

16.12.050 ~~- Calculations of lot area~~ Lot Size Reduction.

A subdivision in the R-10, R-8, R-6, R-5, or R-3.5 dwelling district may include lots that are up to twenty percent less than the required minimum lot area of the applicable zoning designation provided the entire subdivision on average meet~~s~~ the minimum site area requirement of the underlying zone. Lots on the perimeter of the development may not be more than 10% less than the underlying zone.

The average lot area is determined by calculating the total site area devoted to dwelling units, and dividing that figure by the proposed number of dwelling lots.

Accessory dwelling units are not included in this determination nor are tracts created for non-dwelling unit purposes such as open space, stormwater tracts, or access ways.

A lot that was created pursuant to this section may not be further divided unless the average lot size requirements are still met for the entire subdivision.

When a lot abuts a public alley, an area equal to the length of the alley frontage along the lot times the width of the alley right-of-way measured from the alley centerline may be added to the area of the abutting lot in order to satisfy the lot area requirement for the abutting lot. It may also be used in calculating the average lot area.

Option #6: Limiting Size of Large Lots

16.12.050 ~~- Calculations of lot area~~ Lot Size Reduction.

A subdivision in the R-10, R-8, R-6, R-5, or R-3.5 dwelling district may include lots that are up to twenty percent less than the required minimum lot area of the applicable zoning designation provided the entire

subdivision on average meets the minimum site area requirement of the underlying zone. The largest lot size may be no more than three times the underlying zone.

The average lot area is determined by calculating the total site area devoted to dwelling units, and dividing that figure by the proposed number of dwelling lots.

Accessory dwelling units are not included in this determination nor are tracts created for non-dwelling unit purposes such as open space, stormwater tracts, or access ways.

A lot that was created pursuant to this section may not be further divided unless the average lot size requirements are still met for the entire subdivision.

When a lot abuts a public alley, an area equal to the length of the alley frontage along the lot times the width of the alley right-of-way measured from the alley centerline may be added to the area of the abutting lot in order to satisfy the lot area requirement for the abutting lot. It may also be used in calculating the average lot area.

Summary of options #1-6.

Option	New Standard	Impact
1	Limit reduction to 10% AND limit to 25% of total lots	May significantly reduce flexibility and may result in conflicts with minimum density requirements. Will result in less variation of lot sizes.
2	Limit reductions to 25% of total lots (reduction of up to 20% of lot area remains)	Will result in fewer lots that are below the underlying zone minimum. Likely more flexible than options 1 and 3.
3	Limit size reduction to 10% of underlying zone (for any number of lots)	Less likely to result in conflicts with minimum density. Lot sizes will be more uniform.
4	Remove powerline easement from net developable area	Will reduce density in areas with powerline easements, will disallow the use of greatly oversized lots to be averaged with numerous smaller lots. Will not impact subdivisions in areas with no powerline easements.
5	Exclude properties on the perimeter of the subdivision from being less than 10% below the underlying zone.	Likely to allow less lots in smaller developments.
6	Limit the largest lot size to three times the underlying zone minimum.	Reduce the variation in lot size, and impact of the powerline easement.

REMAINING CODE AMENDMENTS

17.04.154 – Building. “Building” means structure.

17.04.420 - Family day care provider. "Family day care provider" means a day care provider who regularly provides day care to fewer than ~~thirteen~~ sixteen children, including the children of the provider, regardless of full-time or part-time status, in the provider's home in the family living quarters. Provisions of day care to ~~thirteen~~ sixteen or more children in the home of the provider shall constitute the operations of a "day care facility," as defined in this chapter, and shall be subject to the requirements of this title for day care facilities.

A family day care provider ~~to ten or more children~~ shall satisfy the certification requirements of the ~~children's services division~~ Office of Child Care.

17.04.812 Net Leasable Area.

Actual square-footage of a building or outdoor area that may be leased or rented to tenants, which excludes parking lots, common areas, shared hallways, elevator shafts, stairways, and space devoted to cooling, heating, or other equipment.

17.29.020 - Permitted uses—MUC-1 and MUC-2.

A. Banquet, conference facilities and meeting rooms;
B. Bed and breakfast and other lodging facilities for up to ten guests per night;
C. Child care centers and/or nursery schools;
D. Indoor entertainment centers and arcades;
E. Health and fitness clubs;
F. Medical and dental clinics, outpatient; infirmary services;
G. Museums, libraries and cultural facilities;
H. Offices, including finance, insurance, real estate and government;
I. Outdoor markets, such as produce stands, craft markets and farmers markets that are operated on the weekends and after six p.m. during the weekday;
J. Postal services;
K. Parks, playgrounds, play fields and community or neighborhood centers;
L. Repair shops, for radio and television, office equipment, bicycles, electronic equipment, shoes and small appliances and equipment;
M. Residential units, multi-family;
N. Residential units, single and two-family in the same building as another permitted use in the zone;
O~~N~~. Restaurants, eating and drinking establishments without a drive through;
P~~O~~. Services, including personal, professional, educational and financial services; laundry and dry-cleaning;
Q~~P~~. Retail trade, including grocery, hardware and gift shops, bakeries, delicatessens, florists, pharmacies, specialty stores, marijuana pursuant to Section 17.54.110, and similar, provided the maximum footprint for a stand-alone building with a single store or multiple buildings with the same business does not exceed sixty thousand square feet;
R~~Q~~. Seasonal sales, subject to OCMC Section 17.54.060;
S~~R~~. Assisted living facilities; nursing homes and group homes for over fifteen patients;
T~~S~~. Studios and galleries, including dance, art, photography, music and other arts;
U~~T~~. Utilities: Basic and linear facilities, such as water, sewer, power, telephone, cable, electrical and natural gas lines, not including major facilities such as sewage and water treatment plants, pump stations, water tanks, telephone exchanges and cell towers;
V~~U~~. Veterinary clinics or pet hospitals, pet day care;
W~~V~~. Home occupations;
X~~W~~. Research and development activities;
Y~~X~~. Temporary real estate offices in model dwellings located on and limited to sales of real estate on a single piece of platted property upon which new residential buildings are being constructed;
Z~~Y~~. Residential care facility;
AA~~Z~~. Transportation facilities;
AB~~AA~~. Live/work units, pursuant to Section 17.54.105—Live/work units.

17.49.[0]80 - Uses allowed outright (exempted).

The following uses are allowed within the NROD and do not require the issuance of an NROD permit:

A. Stream, wetland, riparian, and upland restoration or enhancement projects as authorized by the city.

B. Farming practices as defined in ORS 215.203 and farm uses, excluding buildings and structures, as defined in ORS 215.203.

C. Utility service using a single utility pole ~~or where no more than one hundred square feet of ground surface is disturbed outside of the top-of-bank of water bodies and where the disturbed area is restored to the pre-construction conditions.~~

D. Boundary and topographic surveys leaving no cut scars greater than three inches in diameter on live parts of native plants listed in the Oregon City Native Plant List.

E. Soil tests, borings, test pits, monitor well installations, and other minor excavations necessary for geotechnical, geological or environmental investigation, provided that disturbed areas are restored to pre-existing conditions as approved by the community development director.

F. Trails meeting all of the following:
   1. Construction shall take place between May 1 and October 30 with hand held equipment;
   2. Widths shall not exceed forty-eight inches and trail grade shall not exceed twenty percent;
   3. Construction shall leave no scars greater than three inches in diameter on live parts of native plants;
   4. Located no closer than twenty-five feet to a wetland or the top of banks of a perennial stream or ten feet of an intermittent stream;
   5. No impervious surfaces; and
   6. No native trees greater than one-inch in diameter may be removed or cut, unless replaced with an equal number of native trees of at least two-inch diameter and planted within ten feet of the trail.

G. Land divisions provided they meet the following standards, and indicate the following on the final plat:
   1. Lots shall have their building sites (or buildable areas) entirely located at least five feet from the NROD boundary shown on the city's adopted NROD map. For the purpose of this subparagraph, "building site" means an area of at least three thousand five hundred square feet with minimum dimensions of forty feet wide by forty feet deep;
   2. All public and private utilities (including water lines, sewer lines or drain fields, and stormwater disposal facilities) are located outside the NROD;
   3. Streets, driveways and parking areas where all pavement shall be located at least ten feet from the NROD; and
   4. The NROD portions of all lots are protected by:
   a. A conservation easement; or
   b. A lot or tract created and dedicated solely for unimproved open space or conservation purposes.

H. Site Plan and Design Review applications where all new construction is located outside of the NROD boundary shown on the city's adopted NROD map, and the NROD area is protected by a conservation easement approved in form by the city.

I. Routine repair and maintenance of existing structures, roadways, driveways and utilities.

J. Replacement, additions, alterations and rehabilitation of existing structures, roadways, utilities, etc., where the ground level impervious surface area is not increased.

K. Measures mandated by the City of Oregon City to remove or abate nuisances or hazardous conditions.

L. Planting of native vegetation and the removal of non-native, invasive vegetation (as identified on the Oregon City Native Plant List), and removal of refuse and fill, provided that:
   1. All work is done using hand-held equipment;
   2. No existing native vegetation is disturbed or removed; and
   3. All work occurs outside of wetlands and the top-of-bank of streams.

~~M. Fences in which posts disturb no more than one hundred square feet of ground surface outside of the top of bank of water bodies~~

M~~N~~. Activities in which no more than one hundred square feet of ground surface is disturbed outside of the bankfull stage of water bodies and where the disturbed area is restored to the pre-construction conditions, notwithstanding that disturbed areas that are predominantly covered with invasive species shall be required to remove the invasive species from the disturbance area and plant trees and native plants pursuant to this Chapter.

17.50.030 - Summary of the city's decision-making processes.

The following decision-making processes chart shall control the city's review of the indicated permits:

Table 17.50.030

PERMIT APPROVAL PROCESS

PERMIT TYPE	I	II	III	IV	Expedited Land Division
Annexation With or Without a Zone Change				X	
Compatibility Review	X				
Code Interpretation			X		
General Development Plan			X		
Conditional Use			X		
Detailed Development Plan [1]	X	X	X		
Extension	X	~~X~~			
Final Plat	X				
Geologic Hazards		X			
Historic Review	X		X		
Lot Line Adjustment and Abandonment	X				
Major Modification to a Prior Approval [2]	X	X	X	X	X
Minor Modification to a Prior Approval	X				
Minor Partition		X			
Nonconforming Use, Structure and Lots Review	X	X			
~~Reconsideration~~ Plan or Code Amendment	~~X~~			X	
Revocation				X	
Site Plan and Design Review	X	X			
Subdivision		X			X
Variance		X	X		
Zone Change ~~and Plan Amendment~~				X	
~~Zone Change Upon Annexation with No Discretion~~	~~X~~			~~X~~	
~~Zone Change Upon Annexation with Discretion~~				~~X~~	
Natural Resource Overlay District Exemption	X				
Natural Resource Overlay District Review		X	X		

[1] If any provision or element of the master plan requires a deferred Type III procedure, the detailed development plan shall be processed through a Type III procedure.

[2] A major modification to a prior approval shall be considered using the same process as would be applicable to the initial approval.

A. Type I decisions do not require interpretation or the exercise of policy or legal judgment in evaluating approval criteria. Because no discretion is involved, Type I decisions do not qualify as a land use, or limited land use, decision. The decision-making process requires no notice to any party other than the applicant. The community development director's decision is final and not appealable by any party through the normal city land use process.

B. Type II decisions involve the exercise of limited interpretation and discretion in evaluating approval criteria, similar to the limited land use decision-making process under state law. Applications evaluated through this process are assumed to be allowable in the underlying zone, and the inquiry typically focuses on what form the use will take or how it will look. Notice of application and an invitation to comment is mailed to the applicant, recognized active neighborhood association(s) and property owners within three hundred feet. The community development director accepts comments for a minimum of fourteen days and renders a decision. The community development director's decision is appealable to the city commission ~~with notice to the planning commission~~, by any party ~~with standing~~ who submitted comments in writing before the expiration of the comment period. Review by the City Commission shall be on the record pursuant to Section 17.50.190. ~~(i.e., applicant and any party who submitted comments during the comment period)~~under ORS 227.175.10(a)(~~c~~C). ~~Review of the development director's decision will be de novo.~~ The city commission decision is the city's final decision and is ~~appealable~~ subject to review by ~~to~~ the Land Use Board of Appeals (LUBA) within twenty-one days of when it becomes final.

C. Type III decisions involve the greatest amount of discretion and evaluation of subjective approval standards, yet are not ~~required to be~~ heard by the city commission, except upon appeal. In the event that any decision is not classified, it shall be treated as a Type III decision. The process for these land use decisions is controlled by ORS 197.763. Notice of the application and the planning commission or the historic review board hearing is published and mailed to the applicant, recognized neighborhood association(s) and property owners within three hundred feet. Notice must be issued at least twenty days pre-hearing, and the staff report must be available at least seven days pre-hearing. At the evidentiary hearing held before the planning commission or the historic review board, all issues are addressed. The decision of the planning commission or historic review board is appealable to the city commission, on the record pursuant to Section 17.50.190. The city commission decision on appeal ~~from the historic review board or the planning commission~~ is the city's final decision and is ~~appealable to~~ subject to review by LUBA within twenty-one days of when it becomes final, unless otherwise provided by state law.

D. Type IV decisions include only quasi-judicial plan amendments and zone changes. These applications involve the greatest amount of discretion and evaluation of subjective approval standards and must be heard by the city commission for final action. The process for these land use decisions is controlled by ORS 197.763. Notice of the application and planning commission hearing is published and mailed to the applicant, recognized neighborhood association(s) and property owners within three hundred feet. Notice must be issued at least twenty days pre-hearing, and the staff report must be available at least seven days pre-hearing. At the evidentiary hearing held before the planning commission, all issues are addressed. If the planning commission denies the application, any party with standing (i.e., anyone who appeared before the planning commission either in person or in writing within the comment period) may appeal the planning commission denial to the city commission. If the planning commission denies the application and no appeal has been received within ~~ten~~ fourteen days of the issuance of the final decision then the action of the planning commission becomes the final decision of the city. If the planning commission votes to approve the application, that decision is forwarded as a recommendation to the city commission for final consideration. In either case, any review by the city commission is on the record and only issues raised before the planning commission may be raised before the city commission. The city commission decision is the city's final decision and is ~~appealable to~~ subject to review by the land use board of appeals (LUBA) within twenty-one days of when it becomes final.

E. The expedited land division (ELD) process is set forth in ORS 197.360 to 197.380. To qualify for this type of process, the development must meet the basic criteria in ORS 197.360(1)(a) or (b). While the decision-making process is controlled by state law, the approval criteria are found in this code. The community development director has twenty-one days within which to determine whether an application is complete. Once deemed complete, the community development director has sixty-three days within which to issue a decision. Notice of application and opportunity to comment is mailed to the applicant, recognized neighborhood association and property owners within one hundred feet of the subject site. The community development director will accept written comments on the application for fourteen days and then issues a decision. State law prohibits a hearing. Any party who submitted comments may call for an appeal of the community development director's decision before a hearings referee. The referee need not hold a hearing; the only requirement is that the determination be based on the evidentiary record established by the community development director and that the process be "fair." The referee applies the city's approval standards, and has forty-two days within which to issue a decision on the appeal. The referee is charged with the general objective to identify means by which the application can satisfy the applicable requirements without reducing density. The referee's decision is appealable only to the court of appeals pursuant to ORS 197.375(8) and 36.355(1).

F. Decisions, completeness reviews, appeals, and notices in this Chapter shall be calculated according to OCMC Chapter 1.04.070 and shall be based on calendar days, not business days.

17.50.120 - Quasi-judicial hearing process.

All public hearings pertaining to quasi-judicial permits, whether before the planning commission, historic review board, or city commission, shall comply with the procedures of this section. In addition, all public hearings held pursuant to this chapter shall comply with the Oregon Public Meetings Law, the applicable provisions of ORS 197.763 and any other applicable law.

A. Once the community development director determines that an application for a Type III or IV decision is complete, the planning division shall schedule a hearing before the planning commission or historic review board, as applicable. Once the community development director determines that an appeal of a Type II, Type III or Type IV decision has been properly filed under Section 17.50.190, the planning division shall schedule a hearing pursuant to Section 17.50.190.

B. Notice of the Type III or IV hearing shall be issued at least twenty days prior to the hearing in accordance with Section 17.50.090B.

C. Written notice of an appeal hearing shall be sent by regular mail no later than fourteen days prior to the date of the hearing to the appellant, the applicant if different from the appellant, the property owner(s) of the subject site, all persons who testified either orally or in writing before the hearing body and all persons that requested in writing to be notified.

D. The community development director shall prepare a staff report on the application which lists the applicable approval criteria, describes the application and the applicant's development proposal, summarizes all relevant city department, agency and public comments, describes all other pertinent facts as they relate to the application and the approval criteria and makes a recommendation as to whether each of the approval criteria are met. E. At the beginning of the initial public hearing at which any quasi-judicial application or appeal is reviewed, a statement describing the following shall be announced to those in attendance:

1. That the hearing will proceed in the following general order: staff report, applicant's presentation, testimony in favor of the application, testimony in opposition to the application, rebuttal, record closes, commission deliberation and decision;

2. That all testimony and evidence submitted, orally or in writing, must be directed toward the applicable approval criteria. If any person believes that other criteria apply in addition to those addressed in the staff report, those criteria must be listed and discussed on the record. The meeting chairperson may reasonably limit oral presentations in length or content depending upon time constraints. Any party may submit written materials of any length while the public record is open;
3. Failure to raise an issue on the record with sufficient specificity and accompanied by statements or evidence sufficient to afford the city and all parties to respond to the issue, will preclude appeal on that issue to the state land use board of appeals;
4. Any party wishing a continuance or to keep open the record must make that request while the record is still open; and
5. That the commission chair shall call for any ex-parte contacts, conflicts of interest or bias before the beginning of each hearing item.
6. For appeal hearings, only those persons who participated either orally or in writing in the decision or review ~~or who have standing pursuant to ORS 197.175(10)(a)(C)~~ will be allowed to participate either orally or in writing in the appeal.

F. Requests for continuance and to keep open the record: The hearing may be continued to allow the submission of additional information or for deliberation without additional information. New notice of a continued hearing need not be given so long as a time-certain and location is established for the continued hearing. Similarly, hearing may be closed but the record kept open for the submission of additional written material or other documents and exhibits. The chairperson may limit the factual and legal issues that may be addressed in any continued hearing or open record period.

17.50.190 - Appeals.

Appeals of any non-final decisions by the city must comply with the requirements of this section.

A. Type I decisions by the planning manager are not appealable to any other decision-maker within the city.
B. A notice of appeal of any Type II, III or IV decision must be received in writing by the planning division within fourteen calendar days from the date notice of the challenged decision is provided to those entitled to notice. Late filing of any appeal shall be deemed a jurisdictional defect and will result in the automatic rejection of any appeal so filed.
C. The following must be included as part of the notice of appeal:
    1. The city planning file number and date the decision to be appealed was rendered;
    2. The name, mailing address and daytime telephone number for each appellant;
    3. A statement of how each appellant has an interest in the matter and standing to appeal;
    4. A statement of the specific grounds for the appeal;
    5. The appropriate appeal fee. Failure to include the appeal fee within appeal period is deemed to be a jurisdictional defect and will result in the automatic rejection of any appeal so filed. If a city-recognized neighborhood association with standing to appeal has voted to request a fee waiver pursuant to Section 17.50.290C., no appeal fee shall be required for an appeal filed by that association. In lieu of the appeal fee, the neighborhood association shall provide a duly adopted resolution of the general membership or board approving the request for fee waiver.
D. Standing to Appeal. The following rules prescribe who has standing to appeal:
    1. For Type II decisions, only those persons or recognized neighborhood associations who submitted comments in writing before the expiration of the comment period have standing to appeal a planning manager decision. Review by the city

commission shall be on the record, limited to the issues raised in the comments and no new evidence shall be considered. ~~who submitted comments have standing pursuant to ORS 197.175(10)(a)(C) may appeal a planning manager decision. The city commission shall hold a de novo hearing on the appeal. New evidence and new issues be raised at the hearing before the city commission.~~

2. For Type III and IV decisions, only those persons or recognized neighborhood associations who have participated either orally or in writing have standing to appeal the decision of the planning commission or historic review board, as applicable. Grounds for appeal are limited to those issues raised either orally or in writing before the close of the public record. No new evidence shall be allowed.

E. Notice of the Appeal Hearing. The planning division shall issue notice of the appeal hearing to all parties who participated either orally or in writing before the close of the public record in accordance with Section 17.50.090B. Notice of the appeal hearing shall contain the following information:

1. The file number and date of the decision being appealed;
2. The time, date and location of the public hearing;
3. The name of the applicant, owner and appellant (if different);
4. The street address or other easily understood location of the subject property;
5. A description of the permit requested and the applicant's development proposal;
6. A brief summary of the decision being appealed and the grounds for appeal listed in the notice of appeal;
7. A statement that the appeal hearing is confined to the issues raised in the notice of appeal;
8. A general explanation of the requirements for participation and the city's hearing procedures.

F. Appeal Hearing—Scope of Review. Appeal hearings shall comply with the procedural requirements of Section 17.50.120. Appeal hearings shall be conducted by the city commission, ~~planning commission or historic review board, as applicable~~. The decision shall be on the record and the issues under consideration shall be limited to those listed in the notice of appeal.

17.50.260 - Reconsideration of a final decision.

Under this section, parties with standing may seek reconsideration of a final decision rendered pursuant to a Type II, Type III, or Type IV process. Reconsideration is warranted where the city's decision indicates the decision-maker failed to understand or consider certain relevant facts in the record or misinterpreted the application in some material way. Any request for reconsideration must be received by the planning division within ten days of when the decision in question was rendered and must specifically describe the alleged misunderstanding or misinterpretation. A request for reconsideration shall not stay the effectiveness of the city's final decision, nor shall it affect any applicable appeal deadlines to the land use board of appeals. If the request is granted, the community development director shall notify all affected parties that the decision will be reconsidered. Any request for reconsideration by the applicant shall be deemed a waiver of the one hundred-twenty-day deadline under Section 17.50.070.

17.52.020 - Number of automobile spaces required.

A. The number of parking spaces shall comply with the minimum and maximum standards listed in Table 17.52.020. The parking requirements are based on spaces per one thousand square feet net leasable area unless otherwise stated.

Table 17.52.020	
LAND USE	PARKING REQUIREMENTS

	MINIMUM	MAXIMUM
Multi-Family: Studio	1.00 per unit	1.5 per unit
Multi-Family: 1 bedroom	1.25 per unit	2.00 per unit
Multi-Family: 2 bedroom	1.5 per unit	2.00 per unit
Multi-Family: 3 bedroom	1.75 per unit	2.50 per unit
Hotel, Motel	1.0 per guest room	1.25 per guest room
Correctional Institution	1 per 7 beds	1 per 5 beds
Senior housing, including congregate care, residential care and assisted living facilities; nursing homes and other types of group homes	1 per 7 beds	1 per 5 beds
Hospital	2.00	4.00
Preschool Nursery/Kindergarten	2.00	3.00
Elementary/Middle School	1 per classroom	1 per classroom + 1 per administrative employee + 0.25 per seat in auditorium/assembly room/stadium
High School, College, Commercial School for Adults	0.20 per # staff and students	0.30 per # staff and students
Auditorium, Meeting Room, Stadium, Religious Assembly Building, movie theater,	.25 per seat	0.5 per seat
Retail Store, Shopping Center, Restaurants	4.10	5.00
Office	2.70	3.33
Medical or Dental Clinic	2.70	3.33
Sports Club, Recreation Facilities	Case Specific	5.40
Storage Warehouse, Freight Terminal	0.30	0.40
Manufacturing, Wholesale Establishment	1.60	1.67
Light Industrial, Industrial Park	1.3	1.60

1. Multiple Uses. In the event several uses occupy a single structure or parcel of land, the total requirements for off-street parking shall be the sum of the requirements of the several uses computed separately.
2. Requirements for types of buildings and uses not specifically listed herein shall be determined by the community development director, based upon the requirements of comparable uses listed.
3. Where calculation in accordance with the above list results in a fractional space, any fraction less than one-half shall be disregarded and any fraction of one-half or more shall require one space.
4. The minimum required parking spaces shall be available for the parking of operable passenger automobiles of residents, customers, patrons and employees only, and shall not be used for storage of vehicles or materials or for the parking of vehicles used in conducting the business or use.
5. A change in use within an existing habitable building located in the MUD Design District or the Willamette Falls Downtown District is exempt from additional parking requirements. Additions to an

existing building and new construction are required to meet the minimum parking requirements for the areas as specified in Table 17.52.020 for the increased square footage.

B. Parking requirements can be met either onsite, or offsite by meeting the following conditions:
   1. Mixed Uses. If more than one type of land use occupies a single structure or parcel of land, the total requirements for off-street automobile parking shall be the sum of the requirements for all uses, unless it can be shown that the peak parking demands are actually less (e.g. the uses operate on different days or at different times of the day). In that case, the total requirements shall be reduced accordingly, up to a maximum reduction of fifty percent, as determined by the community development director.
   2. Shared Parking. Required parking facilities for two or more uses, structures, or parcels of land may be satisfied by the same parking facilities used jointly, to the extent that the owners or operators show that the need for parking facilities does not materially overlay (e.g., uses primarily of a daytime versus nighttime nature), that the shared parking facility is within one thousand feet of the potential uses, and provided that the right of joint use is evidenced by a recorded deed, lease, contract, or similar written instrument authorizing the joint use.
   3. On-Street Parking. On-street parking may be counted toward the minimum standards when it is on the street face abutting the subject land use. An on-street parking space must not obstruct a required clear vision area and it shall not violate any law or street standard. On-street parking for commercial uses shall conform to the following standards:
      a. Dimensions. The following constitutes one on-street parking space:
   1. Parallel parking, each [twenty-two] feet of uninterrupted and available curb;
   2. [Forty-five/sixty] degree diagonal, each with [fifteen] feet of curb;
   3. Ninety degree (perpendicular) parking, each with [twelve] feet of curb.
   4. Public Use Required for Credit. On-street parking spaces counted toward meeting the parking requirements of a specific use may not be used exclusively by that use, but shall be available for general public use at all times. Signs or other actions that limit general public use of on-street spaces are prohibited.

C. Reduction of the Number of Automobile Spaces Required. The required number of parking stalls may be reduced in the Downtown Parking Overlay District: Fifty percent reduction in the minimum number of spaces required is allowed prior to seeking further reductions in [sub]sections 2. and 3. below:
   1. Transit Oriented Development. For projects not located within the Downtown Parking Overlay District, the community development director may reduce the required number of parking stalls up to twenty-five percent when it is determined that a project in a commercial center (sixty thousand square feet or greater of retail or office use measured cumulatively within a five hundred-foot radius) or multi-family development with over eighty units, is adjacent to or within one thousand three hundred twenty feet of an existing or planned public transit street and is within one thousand three hundred twenty feet of the opposite use (commercial center or multi-family development with over eighty units).
   2. Reduction in Parking for Tree Preservation. The community development director may grant an adjustment to any standard of this requirement provided that the adjustment preserves a regulated tree or grove so that the reduction in the amount of required pavement can help preserve existing healthy trees in an undisturbed, natural condition. The amount of reduction must take into consideration any unique site conditions and the impact of the reduction on parking needs for the use, and must be approved by the community development director. This reduction is discretionary.
   3. Transportation Demand Management. The community development director may reduce the required number of parking stalls up to twenty-five percent when a parking-traffic study prepared by a traffic engineer demonstrates:
      a. Alternative modes of transportation, including transit, bicycles, and walking, and/or special characteristics of the customer, client, employee or resident population will reduce expected vehicle use and parking space demand for this development, as compared to standard Institute

of Transportation Engineers vehicle trip generation rates and further that the transportation demand management program promotes or achieves parking utilization lower than minimum city parking requirements.

b. Transportation demand management (TDM) program has been developed for approval by, and is approved by the city engineer. The plan will contain strategies for reducing vehicle use and parking demand generated by the development and will be measured annually. If, at the annual assessment, the city determines the plan is not successful, the plan may be revised. If the city determines that no good-faith effort has been made to implement the plan, the city may take enforcement actions.

4. The minimum required number of stalls may be reduced by up to 10% when the subject property is adjacent to an existing or planned fixed public transit route or within 1,000 feet of an existing or planned transit stop.

17.58.040 - Lawful nonconforming structure or site.

A structure or site that was lawfully established but no longer conforms to all development standards of this land use code (such as setbacks) shall be considered ~~a~~ lawfully nonconforming ~~structure~~. Notwithstanding development standard requirements in this Code, minor repairs and routine maintenance of a lawful nonconforming structure are permitted. The continuation of a lawful nonconforming structure or site is subject to the following:

A. Accidental Destruction. When a nonconforming structure is damaged by fire or other causes, the structure may be rebuilt using the same structure footprint.

B. Intentional Destruction. When a nonconforming structure is removed or intentionally damaged by fire or other causes within the control of the owner, the replacement structure shall comply with the development standards of this title.

C. Expansion. An expansion of a lawful nonconforming structure or site may be approved, conditionally approved or denied in accordance with the standards and procedures of this section.

1. In making a determination on such applications, the decision maker shall weigh the proposal's positive and negative features and the public convenience or necessity to be served against any adverse conditions that would result from authorizing the particular development at the location proposed, and, to approve such expansion, it must be found that the criteria identified in Section 17.58.060 have either been met, can be met by observance of conditions, or are not applicable.
2. ~~An expansion of a nonconforming structure with alterations~~ Increases in the square footage of a building and/or site improvements which include installation of any additional off-street parking stalls that exceed the threshold of subparagraph C.2.a. below shall comply with the development standards listed in subparagraph C.2.b. The value of the alterations and improvements is based on the entire project and not individual building permits.
    a. Thresholds triggering compliance. The standards of subparagraph C.2.b. below shall be met when the value of the increase in square footage of a building and/or increase in off-street parking stalls ~~the proposed exterior alterations or additions to the site~~, as determined by the community development director, is more thaen seventy-five thousand dollars. The following alterations and improvements shall not be included in the threshold calculation:
        1. Proposed alterations to meet approved fire and life safety agreements;
        2. Alterations related to the removal of existing architectural barriers, as required by the Americans with Disabilities Act, or as specified in Section 1113 of the Oregon Structural Specialty Code;
        3. Alterations required to meet Seismic Design Requirements; and
        4. Improvements to on-site stormwater management facilities in conformance with Oregon City Stormwater Design Standards.
    b. Standards that shall be met. Developments not complying with the development standards listed below shall be brought into conformance.

1. Pedestrian circulation systems, as set out in the pedestrian standards that apply to the sites;
2. Minimum perimeter parking lot landscaping;
3. Minimum interior parking lot landscaping;
4. Minimum site landscaping requirements;
5. Bicycle parking by upgrading existing racks and providing additional spaces in order to comply with Chapter 17.52—Off-Street Parking and Loading;
6. Screening; and
7. Paving of surface parking and exterior storage and display areas.

c. Area of required improvements.
   1. Generally. Except as provided in C.2.c.2. below, required improvements shall be made for the entire site.
   2. Exception for sites with ground leases. Required improvements may be limited to a smaller area if there is a ground lease for the portion of the site where the alterations are proposed. If all of the following are met, the area of the ground lease will be considered as a separate site for purposes of required improvements. The applicant shall meet the following:
      i. The signed ground lease — or excerpts from the lease document satisfactory to the city attorney — shall be submitted to the community development director. The portions of the lease shall include the following:
         •The term of the lease. In all cases, there must be at least one year remaining on the ground lease; and
         •A legal description of the boundaries of the lease.
      ii. The boundaries of the ground lease shall be shown on the site plan submitted with the application. The area of the lease shall include all existing and any proposed development that is required for, or is used exclusively by, those uses within the area of the lease; and
      iii. Screening shall not be required along the boundaries of ground leases that are interior to the site.

d. Timing and cost of required improvements. The applicant may choose one of the two following options for making the required improvements:
   1. Option 1. Required improvements may be made as part of the alteration that triggers the required improvements. The cost of the standards that shall be met, identified in subparagraph C.2.b. above, is limited to ten percent of the value of the proposed alterations. It is the responsibility of the applicant to document to the community development director the value of the required improvements. Additional costs may be required to comply with other applicable requirements associated with the proposal. When all required improvements are not being made, the priority for the improvements shall be as listed in subparagraph C.2.b. above.
   2. Option 2. Required improvements may be made over several years, based on the compliance period identified in Table 17.58—1 below. However, by the end of the compliance period, the site shall be brought fully into compliance with the standards listed in subparagraph C.2.b. Where this option is chosen, the following must be met:
      i. Before a building permit is issued, the applicant shall submit the following to the community development director:
         •A Nonconforming Development Assessment, which identifies in writing and on a site plan, all development that does not meet the standards listed in Subparagraph C.2.b.
         •A covenant, in a form approved by the city attorney, executed by the property owner that meets the requirements of 17.50.150. The covenant shall identify development on the site that does not meet the standards listed in Subparagraph C.2.b., and require the owner to bring that development fully into compliance with this title.

The covenant shall also specify the date by which the owner will be in conformance. The date must be within the compliance periods set out in Table 17.58 — 1.

ii. The nonconforming development identified in the Nonconforming Development Assessment shall be brought into full compliance with the requirements of this Title within the following compliance periods. The compliance period begins when a building permit is issued for alterations to the site of more than seventy-five thousand dollars. The compliance periods are based on the size of the site (see Table 17.58—1 below).

iii. By the end of the compliance period, the applicant or owner shall request that the site by certified by the community development director as in compliance. If the request is not received within that time, or if the site is not fully in conformance, no additional building permits will be issued.

iv. If the regulations referred to by subparagraph C.2.b. are amended after the Nonconforming Development Assessment is received by the community development director, and those amendments result in development on the site that was not addressed by the Assessment becoming nonconforming, the applicant shall address the new nonconforming development using Option 1 or 2. If the applicant chooses Option 2, a separate Nonconforming Development Assessment, covenant and compliance period will be required for the new nonconforming development.

Table 17.58—1
Compliance Periods for Option 2

Square footage of site	Compliance Period
Less than 150,000 sq. ft.	2 years
150,000 sq. ft. or more, up to 300,000 sq. ft.	3 years
300,000 sq. ft. or more, up to 500,000 sq. ft.	4 years
More than 500,000 sq. ft.	5 years

17.62.035 - Minor site plan and design review.

This section provides for a minor site plan and design review process. Minor Site Plan Review is a Type I or Type II decision, as described in OCMC Section 17.62.035(A), subject to administrative proceedings described in OCMC Section 17.50 and may be utilized as the appropriate review process only when authorized by the community development director. The purpose of this type of review is to expedite design review standards for uses and activities that require only a minimal amount of review, typical of minor modifications and/or changes to existing uses or buildings.

A. Type I Minor Site Plan and Design Review.

1. Applicability. Type I applications involve no discretion. The Type I process is not applicable for:
   a. Any activity which is included with or initiates actions that require Type II-IV review.
   b. Any use which is not permitted outright, unless otherwise noted.
   c. Any proposal in which nonconforming upgrades are required under Chapter 17.58.
   d. Any proposal in which modifications are proposed under Section 17.62.015.
2. The following projects may be processed as a Type I application.
   a. Addition ~~or removal~~ of up to two hundred square feet to a commercial, institutional, or multifamily structure in which no increases are required to off-street parking. This includes a new ancillary structure, addition to an existing structure, or new interior space (excluding

new drive thru). Increases of more than two hundred square feet in a twelve-month period shall be processed as Type II.

b. Addition ~~or removal~~ of up to one thousand square feet to an industrial use in which no increases are required to off-street parking. This includes a new ancillary structure, addition to an existing structure, or new interior space (excluding ancillary retail and office). Increases of more than one thousand square feet in a twelve-month period shall be processed as Type II.

c. Replacement of exterior building materials.

d. Addition of windows and doors, relocation of windows and doors in which transparency levels remain unchanged, or removal of windows and doors provided minimum transparency requirements are still met.

e. Addition or alteration of parapets or rooflines.

f. Removal, replacement or addition of awnings, or architectural projections to existing structures.

g. Modification of building entrances.

h. Addition to or alteration of a legal nonconforming single or two-family dwelling.

i. Repaving of previously approved parking lots with no change to striping.

j. Change to parking lot circulation or layout, excluding driveway modifications.

k. Removal or relocation of vehicle parking stalls provided total parking remains between approved minimum and maximum with no new reductions other than through the downtown parking district.

l. Adoption of shared parking agreements.

m. Changes to amount, location, or design of bicycle parking.

n. Changes to landscaping that do not require stormwater quality and quantity treatment under OCMC Chapter 13.12.

o. New or changes to existing pedestrian accessways, walkways or plazas.

p. Installation of mechanical equipment.

q. Installation of or alterations to ADA accessibility site elements.

r. Modification of a fence, hedge, or wall, or addition of a fence, hedge or wall at least twenty feet away from a public right-of-way.

s. Addition of or alterations to outdoor lighting.

t. Addition, modification, or relocation of refuse enclosure.

u. Demolition of any structure or portion of a structure

v. Tree removal

3. Submittal requirements. A Type I application shall include:

a. A narrative describing the project.

b. Site plan drawings showing existing conditions/uses and proposed conditions/uses.

c. Architectural drawings, including building elevations and envelopes, if architectural work is proposed.

d. A completed application form.

e. Any other information determined necessary by the Community Development Director.

B. Type II Minor Site Plan and Design Review.

1. Type II Minor site plan and design review applies to the following uses and activities unless those uses and activities qualify for Type I review per Section 17.62.035(A):

a. Modification of an office, commercial, industrial, institutional, public or multi-family structure for the purpose of enhancing the aesthetics of the building and not increasing the interior usable space (for example covered walkways or entryways, addition of unoccupied features such as clock tower, etc.).

b. Modification to parking lot layout and landscaping, or the addition of up to five parking spaces.

c. A maximum addition of up to one thousand square feet to a commercial, office, institutional, public, multi-family, or industrial building provided that the addition is not more than thirty-five percent of the original building square footage.

d. Other land uses and activities may be added if the community development director makes written findings that the activity/use will not increase off-site impacts and is consistent with the type and/or scale of activities/uses listed above.

2. Application. The application for the Type II minor site plan and design review shall contain the following elements:

a. The submittal requirements of Chapter 17.50.

b. A narrative explaining all aspects of the proposal in detail and addressing each of the criteria listed in Section 17.62.035(C) below.

c. Site plan drawings showing existing conditions/uses and proposed conditions/uses.

d. Architectural drawings, including building elevations and envelopes, if architectural work is proposed.

e. Additional submittal material may be required by the community development director on a case-by-case basis.

3. Development Standards for Type II Minor Site Plan and Design Review.

a. All development shall comply with Section 17.62.050(1—7 and 8—15 and 20—22) when deemed applicable by the community development director. Other sections may apply, as directed by the community development director when applicable, in order to show compliance with this chapter, such as the commercial and institutional standards of Section 17.62.055.

17.62.050 - Standards.

A. All development shall comply with the following standards:

1. Landscaping, A minimum of fifteen percent of the lot shall be landscaped. Existing native vegetation shall be retained to the maximum extent practicable. All plants listed on the Oregon City Nuisance Plant List shall be removed from the site prior to issuance of a final occupancy permit for the building.

a. Except as allowed elsewhere in the zoning and land division chapters of this Code, all areas to be credited towards landscaping must be installed with growing plant materials. A reduction of up to twenty-five percent of the overall required landscaping may be approved by the community development director if the same or greater amount of pervious material is incorporated in the non-parking lot portion of the site plan (pervious material within parking lots are regulated in OCMC 17.52.070).

b. Pursuant to Chapter 17.49, landscaping requirements within the Natural Resource Overlay District, other than landscaping required for parking lots, may be met by preserving, restoring and permanently protecting native vegetation and habitat on development sites.

c. ~~The~~ A landscaping plan shall be prepared by a registered landscape architect for new or revised landscaped areas. Landscape architect approval is not required for tree removal and/or installation if the species are chosen from an approved street tree list. A certified landscape designer, arborist, or nurseryman shall be acceptable in lieu of a landscape architect for projects with less than 500 square feet of landscaping. All landscape plans shall ~~and~~ include a mix of vertical (trees and shrubs) and horizontal elements (grass, groundcover, etc.) that within three years will cover one hundred percent of the Landscape area. No mulch, bark chips, or similar materials shall be allowed at the time of landscape installation except under the canopy of shrubs and within two feet of the base of trees. The community development department shall maintain a list of trees, shrubs and vegetation acceptable for landscaping.

d. For properties within the Downtown Design District~~, or for major remodeling in all zones subject to this chapter,~~ landscaping shall be required to the extent practicable up to the ten percent requirement.

e. Landscaping shall be visible from public thoroughfares to the extent practicable.

f. Interior parking lot landscaping shall not be counted toward the fifteen percent minimum, unless otherwise permitted by the dimensional standards of the underlying zone district.

2. Vehicular Access and Connectivity.
   a. Parking areas shall be located behind buildings, below buildings, or on one or both sides of buildings.
   b. Ingress and egress locations on thoroughfares shall be located in the interest of public safety. Access for emergency services (fire and police) shall be provided.
   c. Alleys or vehicular access easements shall be provided in the following Districts: R-2, MUC-1, MUC-2, MUD and NC zones unless other permanent provisions for access to off-street parking and loading facilities are approved by the decision-maker. The corners of alley intersections shall have a radius of not less than ten feet.
   d. Sites abutting an alley shall be required to gain vehicular access from the alley unless deemed impracticable by the community development director.
   e. Where no alley access is available, the development shall be configured to allow only one driveway per frontage. On corner lots, the driveway(s) shall be located off of the side street (unless the side street is an arterial) and away from the street intersection. Shared driveways shall be required as needed to accomplish the requirements of this section. The location and design of pedestrian access from the sidewalk shall be emphasized so as to be clearly visible and distinguishable from the vehicular access to the site. Special landscaping, paving, lighting, and architectural treatments may be required to accomplish this requirement.
   f. Driveways that are at least twenty-four feet wide shall align with existing or planned streets on adjacent sites.
   g. Development shall be required to provide existing or future connections to adjacent sites through the use of vehicular and pedestrian access easements where applicable. Such easements shall be required in addition to applicable street dedications as required in Chapter 12.04.
   h. Vehicle and pedestrian access easements may serve in lieu of streets when approved by the decision maker only where dedication of a street is deemed impracticable by the city.
   i. Vehicular and pedestrian easements shall allow for public access and shall comply with all applicable pedestrian access requirements.
   j. In the case of dead-end stub streets that will connect to streets on adjacent sites in the future, notification that the street is planned for future extension shall be posted on the stub street until the street is extended and shall inform the public that the dead-end street may be extended in the future.
   k. Parcels larger than three acres shall provide streets as required in Chapter 12.04. The streets shall connect with existing or planned streets adjacent to the site.
   l. Parking garage entries shall not dominate the streetscape. They shall be designed and situated to be ancillary to the use and architecture of the ground floor. This standard applies to both public garages and any individual private garages, whether they front on a street or private interior access road.
   m. Buildings containing above-grade structured parking shall screen such parking areas with landscaping or landscaped berms, or incorporate contextual architectural elements that complement adjacent buildings or buildings in the area. Upper level parking garages shall use articulation or fenestration treatments that break up the massing of the garage and/or add visual interest.

3. Building structures shall be complimentary to the surrounding area. All exterior surfaces shall present a finished appearance. All sides of the building shall include materials and design characteristics consistent with those on the front. Use of inferior or lesser quality materials for side or rear facades or decking shall be prohibited.

a. Alterations, additions and new construction located within the McLoughlin Conservation District, Canemah National Register District, and the Downtown Design District and when abutting a designated Historic Landmark shall utilize materials and a design that incorporates the architecture of the subject building as well as the surrounding district or abutting Historic Landmark. Historic materials such as doors, windows and siding shall be retained or replaced with in kind materials unless the community development director determines that the materials cannot be retained and the new design and materials are compatible with the subject building, and District or Landmark. The community development director may utilize the Historic Review Board's Guidelines for New Constriction (2006) to develop findings to show compliance with this section.

b. In historic areas and where development could have a significant visual impact, the review authority may request the advisory opinions of appropriate experts designated by the community development director from the design fields of architecture, landscaping and urban planning. The applicant shall pay the costs associated with obtaining such independent professional advice; provided, however, that the review authority shall seek to minimize those costs to the extent practicable.

4. Grading shall be in accordance with the requirements of Chapter 15.48 and the public works stormwater and grading design standards.
5. Development subject to the requirements of the Geologic Hazard overlay district shall comply with the requirements of that district.
6. Drainage shall be provided in accordance with city's drainage master plan, Chapter 13.12, and the public works stormwater and grading design standards.
7. Parking, including carpool, vanpool and bicycle parking, shall comply with city off-street parking standards, Chapter 17.52.
8. Sidewalks and curbs shall be provided in accordance with the city's transportation master plan and street design standards. Upon application, the community development director may waive this requirement in whole or in part in those locations where there is no probable need, or comparable alternative location provisions for pedestrians are made.
9. A well-marked, continuous and protected on-site pedestrian circulation system meeting the following standards shall be provided:
    a. Pathways between all building entrances and the street are required. Pathways between the street and buildings fronting on the street shall be direct. Exceptions may be allowed by the director where steep slopes or protected natural resources prevent a direct connection or where an indirect route would enhance the design and/or use of a common open space.
    b. The pedestrian circulation system shall connect all main entrances on the site. For buildings fronting on the street, the sidewalk may be used to meet this standard. Pedestrian connections to other areas of the site, such as parking areas, recreational areas, common outdoor areas, and any pedestrian amenities shall be required.
    c. Elevated external stairways or walkways, that provide pedestrian access to multiple dwelling units located above the ground floor of any building are prohibited. The community development director may allow exceptions for external stairways or walkways located in, or facing interior courtyard areas provided they do not compromise visual access from dwelling units into the courtyard.
    d. The pedestrian circulation system shall connect the main entrances of adjacent buildings on the same site.
    e. The pedestrian circulation system shall connect the principal building entrance to those of buildings on adjacent commercial and residential sites where practicable. Walkway linkages to adjacent developments shall not be required within industrial developments or to industrial developments or to vacant industrially-zoned land.

f. On-site pedestrian walkways shall be hard surfaced, well drained and at least five feet wide. Surface material shall contrast visually to adjoining surfaces. When bordering parking spaces other than spaces for parallel parking, pedestrian walkways shall be a minimum of seven feet in width unless curb stops are provided. When the pedestrian circulation system is parallel and adjacent to an auto travel lane, the walkway shall be raised or separated from the auto travel lane by a raised curb, bollards, landscaping or other physical barrier. If a raised walkway is used, the ends of the raised portions shall be equipped with curb ramps for each direction of travel. Pedestrian walkways that cross drive isles or other vehicular circulation areas shall utilize a change in textual material or height to alert the driver of the pedestrian crossing area.

10. There shall be provided adequate means to ensure continued maintenance and necessary normal replacement of private common facilities and areas, drainage ditches, streets and other ways, structures, recreational facilities, landscaping, fill and excavation areas, screening and fencing, groundcover, garbage storage areas and other facilities not subject to periodic maintenance by the city or other public agency.
11. Site planning shall conform to the requirements of OCMC Chapter 17.41 Tree Protection.
12. Development shall be planned, designed, constructed and maintained to protect water resources and habitat conservation areas in accordance with the requirements of the city's Natural Resources Overlay District, Chapter 17.49, as applicable.
13. All development shall maintain continuous compliance with applicable federal, state, and city standards pertaining to air and water quality, odor, heat, glare, noise and vibrations, outdoor storage, radioactive materials, toxic or noxious matter, and electromagnetic interference. Prior to issuance of a building permit, the community development director or building official may require submission of evidence demonstrating compliance with such standards and receipt of necessary permits. The review authority may regulate the hours of construction or operation to minimize adverse impacts on adjoining residences, businesses or neighborhoods. The emission of odorous gases or other matter in such quantity as to be readily detectable at any point beyond the property line of the use creating the odors or matter is prohibited.
14. Adequate public water and sanitary sewer facilities sufficient to serve the proposed or permitted level of development shall be provided. The applicant shall demonstrate that adequate facilities and services are presently available or can be made available concurrent with development. Service providers shall be presumed correct in the evidence, which they submit. All facilities shall be designated to city standards as set out in the city's facility master plans and public works design standards. A development may be required to modify or replace existing offsite systems if necessary to provide adequate public facilities. The city may require over sizing of facilities where necessary to meet standards in the city's facility master plan or to allow for the orderly and efficient provision of public facilities and services. Where over sizing is required, the developer may request reimbursement from the city for over sizing based on the city's reimbursement policy and fund availability, or provide for recovery of costs from intervening properties as they develop.
15. Adequate right-of-way and improvements to streets, pedestrian ways, bike routes and bikeways, and transit facilities shall be provided and be consistent with the city's transportation master plan and design standards and this title. Consideration shall be given to the need for street widening and other improvements in the area of the proposed development impacted by traffic generated by the proposed development. This shall include, but not be limited to, improvements to the right-of-way, such as installation of lighting, signalization, turn lanes, median and parking strips, traffic islands, paving, curbs and gutters, sidewalks, bikeways, street drainage facilities and other facilities needed because of anticipated vehicular and pedestrian traffic generation. Compliance with [Chapter] 12.04, Streets, Sidewalks and Public Places shall be sufficient to achieve right-of-way and improvement adequacy.
16. If a transit agency, upon review of an application for an industrial, institutional, retail or office development, recommends that a bus stop, bus turnout lane, bus shelter, accessible bus landing pad,

lighting, or transit stop connection be constructed, or that an easement or dedication be provided for one of these uses, consistent with an agency adopted or approved plan at the time of development, the review authority shall require such improvement, using designs supportive of transit use. Improvements at a major transit stop may include intersection or mid-block traffic management improvements to allow for crossings at major transit stops, as identified in the transportation system plan.

17. All utility lines shall be placed underground.
18. Access and facilities for physically handicapped people shall be incorporated into the site and building design consistent with applicable federal and state requirements, with particular attention to providing continuous, uninterrupted access routes.
19. For a residential development, site layout shall achieve at least eighty percent of the maximum density of the base zone for the net developable area. Net developable area excludes all areas for required right-of-way dedication, land protected from development through Natural Resource or Geologic Hazards protection, and required open space or park dedication.
20. Screening of Mechanical Equipment:
    a. Rooftop mechanical equipment, including HVAC equipment and utility equipment that serves the structure, shall be screened. Screening shall be accomplished through the use of parapet walls or a sight-obscuring enclosure around the equipment constructed of one of the primary materials used on the primary facades of the structure, and that is an integral part of the building's architectural design. The parapet or screen shall completely surround the rooftop mechanical equipment to an elevation equal to or greater than the highest portion of the rooftop mechanical equipment being screened. In the event such parapet wall does not fully screen all rooftop equipment, then the rooftop equipment shall be enclosed by a screen constructed of one of the primary materials used on the primary facade of the building so as to achieve complete screening.
    b. Wall-mounted mechanical equipment shall not be placed on the front facade of a building or on a facade that faces a right-of-way. Wall-mounted mechanical equipment, including air conditioning or HVAC equipment and groups of multiple utility meters, that extends six inches or more from the outer building wall shall be screened from view from streets; from residential, public, and institutional properties; and from public areas of the site or adjacent sites through the use of (a) sight-obscuring enclosures constructed of one of the primary materials used on the primary facade of the structure, (b) sight-obscuring fences, or (c) trees or shrubs that block at least eighty percent of the equipment from view or (d) painting the units to match the building. Wall-mounted mechanical equipment that extends six inches or less from the outer building wall shall be designed to blend in with the color and architectural design of the subject building.
    c. Ground-mounted above-grade mechanical equipment shall be screened by ornamental fences, screening enclosures, trees, or shrubs that block at least eighty percent of the view. Placement and type of screening shall be determined by the community development director.
    ~~d. All mechanical equipment shall comply with the standards in this section. If mechanical equipment is installed outside of the site plan and design review process, planning staff shall review the plans to determine if additional screening is required. If the proposed screening meets this section, no additional planning review is required.~~
    d~~e~~. This section shall not apply to the installation of solar energy panels, photovoltaic equipment or wind power generating equipment.
21. Building Materials.
    a. Preferred building materials. Building exteriors shall be constructed from high quality, durable materials. Preferred exterior building materials that reflect the city's desired traditional character are as follows:
        i. Brick.

ii. Basalt stone or basalt veneer.
iii. Narrow horizontal wood or composite siding (generally five inches wide or less); wider siding will be considered where there is a historic precedent.
iv. Board and ~~baton~~ batten siding.
v. Other materials subject to approval by the community development director.
vi. Plywood with battens or fiber/composite panels with concealed fasteners and ~~contagious~~ contiguous aluminum sections at each joint that are either horizontally or vertically aligned.
vii. Stucco shall be trimmed in wood, masonry, or other approved materials and shall be sheltered from extreme weather by roof overhangs or other methods.

b. Prohibited materials. The following materials shall be prohibited in visible locations unless an exception is granted by the community development director based on the integration of the material into the overall design of the structure.
i. Vinyl or plywood siding (including T-111 or similar plywood).
ii. Glass block or highly tinted, reflected, translucent or mirrored glass (except stained glass) as more than ten percent of the building facade.
iii. Corrugated fiberglass.
iv. Chain link fencing (except for temporary purposes such as a construction site, ~~or as a~~ gates for a refuse enclosure, or associated with stormwater facilities).
[v.] Crushed colored rock/crushed tumbled glass.
[vi.] Non-corrugated and highly reflective sheet metal.

c. Special material standards: The following materials are allowed if they comply with the requirements found below:
1. Concrete block. When used for the front facade of any building, concrete blocks shall be split, rock- or ground-faced and shall not be the prominent material of the elevation. Plain concrete block or plain concrete may be used as foundation material if the foundation material is not revealed more than three feet above the finished grade level adjacent to the foundation wall.
2. Metal siding. Metal siding shall have visible corner moldings and trim and incorporate masonry or other similar durable/permanent material near the ground level (first two feet above ground level).
3. Exterior Insulation and Finish System (EIFS) and similar ~~toweled~~ troweled finishes shall be trimmed in wood, masonry, or other approved materials and shall be sheltered from extreme weather by roof overhangs or other methods.
4. Building surfaces shall be maintained in a clean condition and painted surfaces shall be maintained to prevent or repair peeling, blistered or cracking paint.

22. Conditions of Approval. The review authority may impose such conditions as it deems necessary to ensure compliance with these standards and other applicable review criteria, including standards set out in city overlay districts, the city's master plans, and city public works design standards. Such conditions shall apply as described in Sections 17.50.310, 17.50.320 and 17.50.330. The review authority may require a property owner to sign a waiver of remonstrance against the formation of and participation in a local improvement district where it deems such a waiver necessary to provide needed improvements reasonably related to the impacts created by the proposed development. To ensure compliance with this chapter, the review authority may require an applicant to sign or accept a legal and enforceable covenant, contract, dedication, easement, performance guarantee, or other document, which shall be approved in form by the city attorney.

23. Development shall conform to the requirements of OCMC Chapter 17.58 Nonconforming Uses, Structures, and Lots.

17.62.065 - Outdoor lighting.

A. Purpose. The general purpose of this section is to require outdoor lighting that is adequate for safety and convenience; in scale with the activity to be illuminated and its surroundings; directed to the surface or activity to be illuminated; and designed to clearly render people and objects and contribute to a pleasant nighttime environment. Additional specific purposes are to:

1. Provide safety and personal security as well as convenience and utility in areas of public use or traverse, for uses where there is outdoor public activity during hours of darkness;
2. Control glare and excessive brightness to improve visual performance, allow better visibility with relatively less light, and protect residents from nuisance and discomfort;
3. Control trespass light onto neighboring properties to protect inhabitants from the consequences of stray light shining in inhabitants' eyes or onto neighboring properties;
4. Result in cost and energy savings to establishments by carefully directing light at the surface area or activity to be illuminated, using only the amount of light necessary; and
5. Control light pollution to minimize the negative effects of misdirected light and recapture views to the night sky.

B. Applicability.

1. General.

a. All exterior lighting for any type of commercial, mixed-use, industrial or multi-family development shall comply with the standards of this section, unless excepted in subsection B.3.

b. The city engineer/public works director shall have the authority to enforce these regulations on private property if any outdoor illumination is determined to present an immediate threat to the public health, safety and welfare.

2. Lighting Plan Requirement.

All commercial, industrial, mixed-use, cottage housing and multi-family developments shall submit a proposed exterior lighting plan. The plan must be submitted concurrently with the site plan. The exterior lighting plan shall include plans and specifications for streetlights, parking lot lights, and exterior building lights. The specifications shall include details of the pole, fixture height and design, lamp type, wattage, and spacing of lights.

3. Excepted Lighting.

The following types of lighting are excepted from the requirements of this section.

a. Residential lighting for single-family attached and detached homes, and duplexes.

b. Public street and right-of-way lighting.

c. Temporary decorative seasonal lighting provided that individual lamps have a light output of sixty watts or less.

d. Temporary lighting for emergency or nighttime work and construction.

e. Temporary lighting for theatrical, television, and performance areas, or for special public events.

f. Lighting for a special district, street, or building that, according to an adopted municipal plan or ordinance, is determined to require special lighting aesthetics as part of its physical character.

g. Lighting required and regulated by the Federal Aviation Administration.

C. General Review Standard. If installed, all exterior lighting shall meet the functional security needs of the proposed land use without adversely affecting adjacent properties or the community. For purposes of this section, properties that comply with the design standards of subsection D. below shall be deemed to not adversely affect adjacent properties or the community.

D. Design and Illumination Standards.

General Outdoor Lighting Standard and Glare Prohibition.

~~1. Outdoor lighting, if provided, shall be provided in a manner that enhances security, is appropriate for the use, avoids adverse impacts on surrounding properties, and the night sky through appropriate shielding as defined in this section. Glare shall not cause illumination on other properties in excess of a measurement of 0.5 footcandles of light as measured at the property line. In no case shall exterior lighting add more than 0.5 footcandle to illumination levels at any point off-site. Exterior lighting is~~

~~not required except for purposes of public safety. However, if installed, all exterior lighting shall meet the following design standards:~~

1~~2~~. Any light source or lamp that emits more than nine hundred lumens (thirteen watt compact fluorescent or sixty watt incandescent) shall be concealed or shielded with a full cut-off style fixture in order to minimize the potential for glare and unnecessary diffusion on adjacent property. ~~All fixtures shall utilize one of the following bulb types: metal halide, induction lamp, compact fluorescent, incandescent (including tungsten-halogen), or high pressure sodium with a color rendering index above seventy.~~

2~~3~~. The maximum height of any lighting pole serving a multi-family residential use shall be twenty feet. The maximum height serving any other type of use shall be twenty-five feet, except in parking lots larger than five acres, the maximum height shall be thirty-five feet if the pole is located at least one hundred feet from any residential use.

3~~4~~. Lighting levels:

Table 1-17.62.065. Foot-candle Levels

Location	Min	Max	Avg
~~Pedestrian Walkways~~	~~0.5~~	~~7:1 max/min ratio~~	~~1.5~~
Pedestrian Walkways in Parking Lots		10:1 max/min ratio	0.5
Pedestrian Accessways/Walkways	0.5	7:1 max/min ratio	1.5
Building Entrances	3		
Bicycle Parking Areas	3		
Abutting property	N/A	~~.05~~ 0.5	

~~5. Parking lots and other background spaces shall be illuminated as unobtrusively as possible while meeting the functional needs of safe circulation and protection of people and property. Foreground spaces, such as building entrances and outside seating areas, shall utilize pedestrian scale lighting that defines the space without glare.~~

~~6. Any on-site pedestrian circulation system shall be lighted to enhance pedestrian safety and allow employees, residents, customers or the public to use the walkways at night. Pedestrian walkway lighting through parking lots shall be lighted to light the walkway and enhance pedestrian safety pursuant to Table 1.~~

4~~7~~. Pedestrian Accessways. To enhance pedestrian and bicycle safety, pedestrian accessways required pursuant to OCMC 12.28 shall be lighted with pedestrian-scale lighting. Accessway lighting shall be to a minimum level of one-half foot-candles, a one and one-half foot-candle average, and a maximum to minimum ratio of seven-to-one and shall be oriented not to shine upon adjacent properties. Street lighting shall be provided at both entrances. ~~Lamps shall include a high-pressure sodium bulb with an unbreakable lens.~~

5~~8~~. Floodlights shall not be utilized to light all or any portion of a building facade between ten p.m. and six a.m.

6~~9~~. Lighting on ~~automobile service station, convenience store, and other~~ outdoor canopies shall be fully recessed into the canopy and shall not protrude downward beyond the ceiling of the canopy.

~~10. The style of light standards and fixtures shall be consistent with the style and character of architecture proposed on the site.~~

~~11. In no case shall exterior lighting add more than one foot-candle to illumination levels at any point off-site.~~

7~~12~~. All outdoor light not necessary for security purposes shall be reduced, activated by motion sensor detectors, or turned off during non-operating hours.

8~~13~~. Light fixtures used to illuminate flags, statues, or any other objects mounted on a pole, pedestal, or platform shall use a narrow cone beam of light that will not extend beyond the illuminated object.

9~~14~~. For upward-directed architectural, landscape, and decorative lighting, direct light emissions shall not be visible above the building roofline.

10~~15~~. No flickering or flashing lights shall be permitted, except for temporary decorative seasonal lighting.

11~~16~~. Wireless Sites. Unless required by the Federal Aviation Administration or the Oregon Aeronautics Division, artificial lighting of wireless communication towers and antennas shall be prohibited. Strobe lighting of wireless communication facilities is prohibited unless required by the Federal Aviation Administration. Security lighting for equipment shelters or cabinets and other on-the-ground auxiliary equipment on wireless communication facilities shall be initiated by motion detecting lighting.

12~~17~~. Lighting for outdoor recreational uses such as ball fields, playing fields, tennis courts, and similar uses, provided that such uses comply with the following standards:

i. Maximum permitted light post height: eighty feet.

~~ii. Maximum permitted illumination at the property line: 0.5 foot-candles.~~

17.80.035 Modifications to Existing Facilities.

All modifications and expansions to existing wireless communication facilities are permitted in every zone, subject to the requirements of this Section. Certain modifications are deemed minor in nature and are deemed "eligible modifications" These modifications include the addition, removal, and/or replacement of transmission equipment that do not make a substantial change to the physical dimensions (height, mass, width) of the existing tower, support structure, or base station. Replacement of an existing tower may also be considered an eligible modification if such replacement meets the standards in paragraph 4 below.

1. For the purpose of this Section, "substantial change" means the following:
   a. The mounting of the proposed antenna on the tower would increase the existing height of the tower by more than 10%, or by the height of 1 additional antenna array with separation from the nearest existing antenna not to exceed 20 feet, whichever is greater, except that the mounting of the proposed antenna may exceed the size limits set forth in this subsection by up to an additional 5% if necessary to avoid interference with existing antennas; or
   b. The mounting of the proposed antenna would involve the installation of more than the standard number of new equipment cabinets for the technology involved (not to exceed 4) or more than 1 new equipment shelter; or
   c. The mounting of the proposed antenna would involve adding an appurtenance to the body of the tower that would protrude from the edge of the tower more than 20 feet, or more than the width of the tower structure at the level of the appurtenance, whichever is greater, except that the mounting of the proposed antenna may exceed the size limits set forth in this subsection to the extent necessary to shelter the antenna from inclement weather or to connect the antenna to the tower via cable; or
   d. The mounting of the proposed antenna would involve excavation outside the current tower site, defined as the current boundaries of the leased or owned property surrounding the tower and any access or utility easements currently related to the site.

2. Increases to height allowed by this subsection above the existing tower shall be based on the existing height of the tower, excluding any tower lighting required in the original land use approval or in the proposed modification request.
3. To the extent feasible, additional equipment shall maintain the appearance intended by the original facility, including, but not limited to, color, screening, landscaping, mounting configuration, or architectural treatment.
4. To be considered an eligible modification, a replacement tower shall not exceed the height of the original tower by more than 10%, or the diameter of the original tower by more than 25% at any given point.

17.80.040 - Collocation of additional antenna(s) on existing support towers.

Except for "eligible modifications" authorized in Section 17.80.035, the following standards shall apply for the placement of antenna(s) and auxiliary support equipment on an existing wireless communication facility support tower.

A. Compatibility Review. Required for property zoned GI, CI, I, C, HC, MUC-1, MUC-2, MUE, MUD or NC.
B. Site Plan and Design Review. Required for all cases other than those identified in Section 17.80.040.A.

17.80.050 - Collocation of additional antenna(s) on support structures.

Except for "eligible modifications" authorized in Section 17.80.035, the following standards shall apply for the placement of antenna(s) and auxiliary support equipment on a support structure.

A. Compatibility Review. Required if the following exist:
   1. Property is zoned GI, CI, I, C, HC, MUC-1, MUC-2, MUE, MUD or NC; and
   2. Property is not located in the McLoughlin or Canemah Historical Conservation Districts; and
   3. Antenna(s) and auxiliary support equipment are setback a minimum of ten feet from each edge of the support structure and do not exceed a total height of twelve feet or a total width of eight feet, unless the antenna(s) is less than four inches in diameter and does not exceed a total height of twenty feet.
B. Site Plan and Design Review. Required if the property is zoned GI, CI, I, C, MUC-1, MUC-2, MUE, MUD or NC and does not meet all the criteria of Section 17.80.050.A.
C. Conditional Use Review. Required for all cases other than those identified in Sections 17.08.050.A and 17.08.050.B.

17.80.070 - Construction or modification of a support tower.

Except for "eligible modifications" authorized in OCMC 17.80.035:

A. Site Plan and Design Review. Required if the following exists:
   1. Property is zoned GI, CI, I, C, MUC-2 or MUE; and
   2. No adjacent parcel is zoned for residential use.
B. Conditional Use Review. Required for all cases other than those identified in Section 17.80.070.A.
C. Prohibited Zoning Districts and Locations. No new support towers shall be permitted within the Canemah Historic Neighborhood, McLoughlin Conservation District, The Oregon Trail-Barlow Road Historic Corridor, five hundred feet of the Willamette Greenway Corridor, or any new Historic Districts unless the applicant can demonstrate that failure to allow the support tower would effectively prevent the provision of communication services in that area. If the applicant makes such a demonstration, the minimum height required to allow that service shall be the maximum height allowed for the tower.

17.80.080 - Site review process.

No wireless communications facilities, as defined in Section 17.80.020, may be constructed, collocated, modified to increase height, installed, or otherwise located within the city except as provided in this section or unless otherwise authorized by Section 17.80.035. Depending on the type and location of the wireless communication facility, the facility shall be subject to the following review unless collocation or an increase in height was granted through a prior land use process. A Conditional Use Review shall require Site Plan and Design Review to occur concurrently with the Conditional Use Review process.

A. Compatibility Review. A wireless communication facility that, pursuant to Sections 17.80.030—17.80.050, is subject to a compatibility review shall be processed in accordance with Standards of Section 17.80.110. The criteria contained in Section 17.80.110 shall govern approval or denial of the compatibility review application. No building permit shall be issued prior to completion of the compatibility review process.

B. Site Plan and Design Review. A wireless communication facility that, pursuant to Sections 17.80.040—17.80.070, is subject to site plan and design review shall be processed in accordance with the standards of Section 17.80.110 and Chapter 17.62, as applicable. The criteria contained in Section 17.80.110 and Chapter 17.62 shall govern approval or denial of the site plan and design review application. In the event of a conflict in criteria, the criteria contained in this chapter shall govern. No building permit shall be issued prior to completion of the site plan and design review process, including any local appeal.

C. Conditional Use Review. A wireless communication facility that, pursuant to Sections 17.80.050—17.80.070, is subject to conditional use review, shall be processed in accordance with the Standards of Section 17.80.110 and Chapter 17.56, as applicable. The criteria contained in Section 17.80.110 and Chapter 17.56 shall govern approval or denial of the conditional use review application. In the event of a conflict in criteria, the criteria contained in this chapter shall govern. No building permit shall be issued prior to completion of the Conditional Use Review process, including any local appeal.

17.80.090 - Permit application requirements.

A. Eligible Modification Requirements – For an application under Section 17.80.035, the following information is required:
   1. Application fee;
   2. Planning Division land use application form;
   3. Description of the project design and dimensions;
   4. A written response demonstrating compliance with each criterion listed in OCMC Chapter 17.80.035;
   5. Signature of the property owner(s) on the application form or a statement from the property owner(s) granting authorization to proceed with building permit and land use process; and
   6. Elevations showing all improvements and connections to utilities.

B. Compatibility Review Requirements — For an application under Sections 17.80.030.B.7, 17.80.040.A or 17.80.050.A, the following information is required:
   1. Application fee(s).
   2. Planning Division land use application form;
   3. A narrative of the proposed project that includes a description of the following:
      i. Need for the project;
      ii. Rationale and supporting evidence for the location; and
      iii. Description of the project design and dimensions.
      iv. A written response demonstrating compliance with each criterion listed in OCMC Chapter 17.80.110

4. Documentation demonstrating compliance with non-ionizing electromagnetic radiation (NIER) emissions standards as set forth by the Federal Communications Commission (FCC) particularly with respect to any habitable areas within the structure on which the antenna(s) are collocated on or in structures directly across from or adjacent to the antenna(s);
5. Documentation that the auxiliary support equipment shall not produce sound levels in excess of standards contained in Section 17.80.110G., or designs showing how the sound is to be effectively muffled to meet those standards;
6. Signature of the property owner(s) on the application form or a statement from the property owner(s) granting authorization to proceed with building permit and land use process;
7. Documentation of the integrity of the support tower, support structure, utility pole, light standard, or light pole to safely handle the load created by the collocation;
8. Elevations showing all improvements and connections to utilities; and
9. Color simulations of the site after construction demonstrating compatibility.

CB. Site Plan and Design Review. For an application under Sections 17.80.040.B, 17.80.050B., 17.80.060A., or 17.80.070A. the following information is required:

1. The information required in OCMC Chapter 17.80.90.AB;
2. Pre-application notes;
3. A written response demonstrating compliance with each criterion listed in the Site Plan and Design Review Standards of Chapter 17.62.050 and all other applicable criterion as defined by the community development director; and
4. Supplemental requirements listed in OCMC Chapter 17.80.90DE. as needed.

DC. Conditional Use Review. For an application under Sections 17.80.050C., 17.80.060B., or 17.80.070B. the following information is required:

The information required in OCMC Chapter 17.80.90.AB;

1. Pre-application notes;
2. A written response demonstrating compliance with each criterion listed in the Site Plan and Design Review Standards of Chapter 17.62.050, 17.56, and all other applicable criterion as defined by the community development director as applicable
3. For an application under Section 17.80.070. Construction of Modification of a Support Tower, the requirements listed under Section 17.80.090.ED. Supplemental Information are required;
4. Responses to conditional use review criteria under Chapter 17.56.010;
5. For an application under Section 17.80.050C. Collocation of Additional Antenna(s) on Support Structures, rationale for being unable to collocate in areas identified in Sections 17.80.050A. and 17.80.050B. shall be provided;
6. For an application under Section 17.80.060B. Collocation of Additional Antenna(s) on Utility Poles, Light Standards, and Light Poles, rationale for being unable to collocate in areas identified in Section 17.80.060A. shall be provided; and
7. For an application under Section 17.80.070B. Construction or Modification of a Support Tower, rationale for being unable to collocate in areas identified in Section 17.80.070A. shall be provided.
8. Supplemental information listed in OCMC Chapter 17.80.90ED.

ED. Supplemental Information. The applicant shall submit the following information for all applications subject to conditional use and site plan and design review:

1. The capacity of the support tower in terms of the number and type of antennas it is designed to accommodate;
2. A signed agreement, as supplied by the city, stating that the applicant shall allow collocation with other users, provided all safety, structural, technological, and monetary requirements are met.

This agreement shall also state that any future owners or operators will allow collocation on the tower.

3. Documentation demonstrating that the Federal Aviation Administration has reviewed and approved the proposal, and Oregon Aeronautics Division has reviewed the proposal. Alternatively, a statement documenting that notice of the proposal has been submitted to the Federal Aviation Administration and Oregon Aeronautics Division may be submitted. The review process may proceed and approval may be granted for the proposal as submitted, subject to Federal Aviation Administration approval. If Federal Aviation Administration approval requires any changes to the proposal as initially approved, then that initial approval shall be void. A new application will need to be submitted, reviewed, and approved through an additional site plan and design review or conditional use review process. No building permit application shall be submitted without documentation demonstrating Federal Aviation Administration review and approval and Oregon Aeronautics Division review.
4. A visual study containing, at a minimum, a graphic simulation showing the appearance of the proposed tower, antennas, and auxiliary support equipment from at least five points within a one-mile radius. Such points shall be chosen by the provider with a review and approval by the community development director to ensure that various potential views are represented.
5. Documentation that one or more wireless communications service providers will be using the support tower within sixty days of construction completion.
6. A site plan, drawn to scale, that includes:
   a. Existing and proposed improvements;
   b. Adjacent roads;
   c. Parking, circulation, and access;
   d. Connections to utilities, right-of-way cuts required, and easements required;
   e. A landscape plan describing the maintenance plan and showing areas of existing and proposed vegetation to be added, retained, replaced, or removed; and
   f. Setbacks from property lines or support structure edges of all existing and proposed structures. Plans that have been reduced, but have not had their scale adjusted, will not be accepted as satisfying this requirement.
7. An alternatives analysis for new support towers demonstrating compliance with the Support Tower Location Requirements of Chapter 17.80.100.

17.80.110 - Design standards.

Installation, collocation, construction, or modification of all support towers, structures, and antennas shall comply with the following standards, unless it qualifies as an "eligible modification" under Section 17.80.035 or an adjustment is obtained pursuant to the provisions of Section 17.80.120.

A. Support Tower. The support tower shall be self-supporting.
B. Height Limitation. Support tower and antenna heights shall not exceed the maximum heights provided below.
   1. If the property is zoned GI, CI or I; and no adjacent parcel is zoned residential the maximum height of a support tower, including antennas, is one hundred twenty feet.
   2. If the property is zoned: a. GI, CI or I, and an adjacent parcel is zoned residential; or b. C, MUC-2 or MUE; the maximum height of a support tower, including antennas, is one hundred feet.
   3. If the property is zoned MUC-1, MUD or NC; the maximum height of a support tower, including antennas, is seventy-five feet.
   4. For all cases other than those identified in Section 17.80.110.B.1-3 above, the maximum height of a support tower, including antennas, is seventy-five feet.

C. Collocation. New support towers shall be designed to accommodate collocation of additional providers.
   1. New support towers of a height greater than seventy-five feet shall be designed to accommodate collocation of a minimum of two additional providers either outright or through future modification of the tower.
   2. New support towers of a height between sixty feet and seventy-five feet shall be designed to accommodate collocation of a minimum of one additional provider either outright or through future modification of the tower.

D. Setbacks. The following setbacks shall be required from property lines, not the lease area, for support towers, auxiliary support equipment, and perimeter fencing.
   1. Support towers not designed to collapse within themselves shall be setback from all property lines a distance equal to the proposed height of the support tower.
   2. Support towers designed to collapse within themselves shall be setback from the property line a distance equal to the following:
      a. If the property is zoned GI, CI, I, C, MUC-2 or MUE; and no adjacent parcel is zoned for a residential use the underlying zone setback shall apply;
      b. If the property is zoned:
         i. GI, CI, I, C, MUC-2 or MUE and an adjacent parcel is zoned residential; or
         ii. MUC-1, MUD or NC; the setback shall be a minimum of twenty-five feet from all adjacent residentially zoned property lines and the underlying zoning setback for all other adjacent property lines; or
      c. For all cases other than those identified in Section 17.80.110.D.2.a. and b. above, the setback shall be a minimum of twenty-five feet from all adjacent property lines.

E. Auxiliary Support Equipment. The following standards shall be required.
   1. If the property is zoned:
      a. For GI, CI, I, MUC-1, MUC-2, C, MUD, MUE or NC, the auxiliary support equipment footprint shall not exceed an area of three hundred forty square feet and fifteen feet in height at the peak;
      b. For all cases other than those identified in Section 17.80.110.E.1.a. above, the auxiliary support equipment shall be:
         i. Located underground or completely screened by landscaping or an architecturally significant masonry wall. The wall shall be finished with brick, stone, or stucco. The community development director may approve an alternate screening material if it is compatible with adjacent development and is architecturally significant. No exposed CMU is allowed on the exterior of the wall.
   2. Only one auxiliary accessory cabinet shall be allowed per service provider located on a support structure.

F. Landscaping. In all zoning districts, existing vegetation shall be preserved to the maximum extent practicable. Screening of a site is mandatory.
   1. If the property is zoned:
      a. GI or CI, and no adjacent parcel is zoned residential, landscaping may not be required if water quality issues are addressed and appropriate screening around the facility is proposed;
      b. For all cases other than those identified in Section 17.80.110.F.1.a. above, landscaping shall be placed completely around the perimeter of the wireless communication facility, except as required to gain access. The minimum planting height shall be a minimum of six feet at the time of planting, densely placed so as to screen the facility. The landscaping shall be compatible with vegetation in the surrounding area, and shall be kept healthy and well

maintained as long as the facility is in operation. Failure to maintain the site will be grounds to revoke the ability to operate the facility.

c. The community development director may approve an alternative landscaping plan that visually screens the facility and is consistent with the intent of this standard.

G. Noise Reduction. Noise generating equipment shall be baffled to reduce sound level measured at the property line to the following levels except during short durations for testing and operation of generators in emergency situations:

1. For any property where no adjacent parcel is zoned residential, the sound level at the property line shall not be greater than fifty dB;
2. For all other cases, the sound level shall not be greater than forty dB when measured at the nearest residential parcel's property line.

H. Lighting.

1. Unless required by the Federal Aviation Administration or the Oregon Aeronautics Division, artificial lighting of wireless communication towers and antennas shall be prohibited.
2. Strobe lighting is prohibited unless required by the Federal Aviation Administration.
3. Security lighting for equipment shelters or cabinets and other on-the-ground auxiliary equipment shall be initiated by motion detecting lighting. The lighting shall be the minimal necessary to secure the site, shall not cause illumination on adjacent properties in excess of a measurement of 0.5 footcandles at the property line, and shall be shielded to keep direct light within the site boundaries.

I. Color.

Unless otherwise required by the Federal Aviation Administration, all support towers and antennas shall have a non-glare finish and blend with the natural background.

J. Signage.

Support towers and antenna(s) shall not be used for signage, symbols, flags, banners, or other devices or objects attached to or painted on any portion of a wireless communication facility.

K. Access Drives.

1. On a site with an existing use, access shall be achieved through use of the existing drives to the greatest extent practicable. If adequate intersection sight distance is unavailable at the existing access intersection with a city street, an analysis of alternate access sites shall be required.
2. Site shall be serviced by an access adequate to ensure fire protection of the site.
3. New access drives shall be paved a minimum of twenty feet deep from the edge of the right-of-way (though the use of pervious paving materials such as F-mix asphalt, pavers, or geotech webbing is encouraged) and designed with material to be as pervious as practicable to minimize stormwater runoff.
4. New access drives shall be reviewed for adequate intersection sight distances.

L. Informing the city. All service providers with facilities within the city of Oregon City shall be required to report in writing to the community development director any changes in the status of their operation.

1. An annual written statement shall be filed with the Planning Manager verifying continued use of each of their facilities in the city's jurisdiction as well as continued compliance with all state and federal agency regulations.
2. The report shall include any of the following changes:
   a. Changes in or loss of Federal Communication Commission license from the Federal Communication Commission to operate;
   b. Receipt of notice of failure to comply with the regulations of any other authority over the business or facility;

c. Change in ownership of the company that owns wireless communication facility or provides telecommunications services; or
d. Loss or termination of lease with the telecommunications facility for a period of six months or longer.

Laura Terway

From: Nathan McCarty <McCartyN@aks-eng.com>
Sent: Friday, January 05, 2018 8:23 AM
To: Laura Terway
Cc: Chris Goodell; Monty Hurley
Subject: Lot Reductions Proposed Code Revisions
Attachments: 5837 20170807 Lindsay Anne Estates Too - Preliminary Land Use Subdivision Plan.pdf; 5837 20180102 Prelim Plat with New Code.pdf

Laura,

To summarize what was discussed at the stakeholder's meeting yesterday morning, if the draft code language was adopted by the City and effective and we didn't already have the Lindsay Anne Estates Too application in/approved, it would have reduced the density by 5 lots. See attached. It wouldn't meet the City's minimum density requirement unless the PGE easement was taken out of the site's net developable area for the calculation.

We also discussed looking at other potential layouts of Lindsay Anne Estates Too. After looking into it, changing the "Up to 25% of the lots in a subdivision…" to 50% or all (100%) would not have affected this layout as only two of the lots were less than 6,000 S.F.

If the 125' wide PGE easement was taken out of the site's net developable area for the calculation (and considered unbuildable), lots 3 and 28 would be negatively affected.

It is the change of the code from twenty percent less than the required minimum lot area to ten percent less that would have reduced the number of lots on this project by 5 lots.

If you have further questions, or want to discuss other effects of the code changes to this project, please contact Chris Goodell in our office (copied on this email).

Regards,
Nathan McCarty - EI

AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100 | Tualatin, OR 97062
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Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

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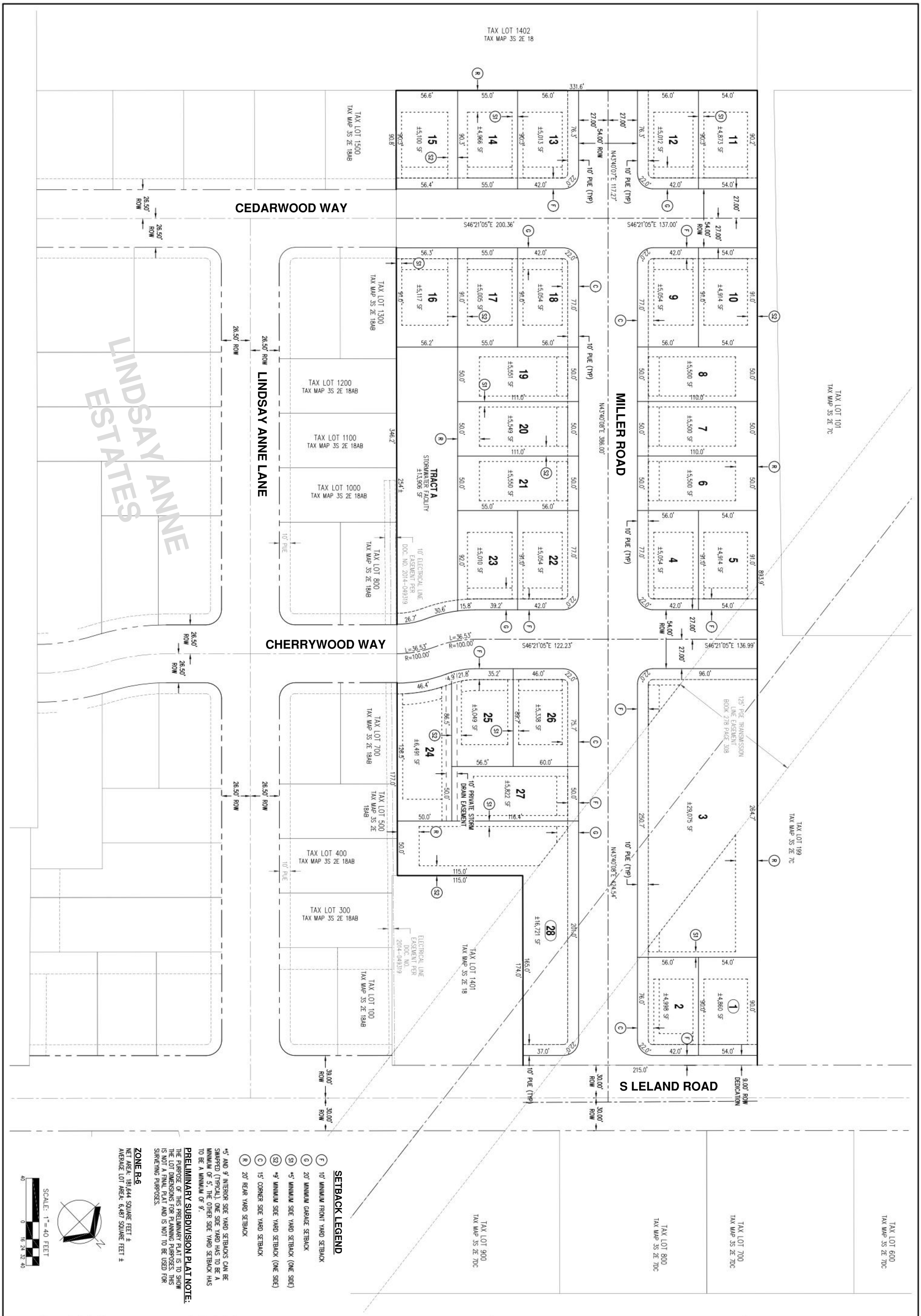

SETBACK LEGEND

- (F) 10' MINIMUM FRONT YARD SETBACK
- (G) 20' MINIMUM GARAGE SETBACK
- (S1) *5' MINIMUM SIDE YARD SETBACK (ONE SIDE)
- (S2) *9' MINIMUM SIDE YARD SETBACK (ONE SIDE)
- (C) 15' CORNER SIDE YARD SETBACK
- (R) 20' REAR YARD SETBACK

*5' AND 9' INTERIOR SIDE YARD SETBACKS CAN BE SWAPPED (TYPICAL), ONE SIDE YARD HAS TO BE A MINIMUM OF 5', THE OTHER SIDE YARD SETBACK HAS TO BE A MINIMUM OF 9'.

PRELIMINARY SUBDIVISION PLAT NOTE:

THE PURPOSE OF THIS PRELIMINARY PLAT IS TO SHOW THE LOT DIMENSIONS FOR PLANNING PURPOSES. THIS IS NOT A FINAL PLAT AND IS NOT TO BE USED FOR SURVEYING PURPOSES.

ZONE R-6

NET AREA: 181,644 SQUARE FEET ±
AVERAGE LOT AREA: 6,487 SQUARE FEET ±

SCALE: 1"= 40 FEET

40 0 16 24 32 40

PRELIMINARY SUBDIVISION PLAT WITH BUILDING SETBACKS

LINDSAY ANNE ESTATES TOO

OREGON CITY OREGON

TAX LOT 1400 CLACKAMAS COUNTY TAX MAP 3-2E-18

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD STE 100
TUALATIN, OR 97062
P: 503.563.6151
F: 503.563.6152
aks-eng.com

ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

DESIGNED BY: VHN
DRAWN BY: NMC
CHECKED BY: MBH
SCALE: AS NOTED
DATE: 08/07/2017

REGISTERED PROFESSIONAL ENGINEER OREGON JULY 12, 2005 CHRISTOPHER B. HURLEY RENEWAL DATE: 6/30/19

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 5837

SHEET P1-03

TAX LOT 101
TAX MAP 3S 2E 7C

TAX LOT 199
TAX MAP 3S 2E 7C

TAX LOT 600
TAX MAP 3S 2E 7C

TAX LOT 700
TAX MAP 3S 2E 7C

TAX LOT 800
TAX MAP 3S 2E 7C

TAX LOT 900
TAX MAP 3S 2E 7C

TAX LOT 1402
TAX MAP 3S 2E 18

TAX LOT 1401
TAX MAP 3S 2E 18

TAX LOT 1500
TAX MAP 3S 2E 18AB

TAX LOT 1300
TAX MAP 3S 2E 18AB

TAX LOT 1200
TAX MAP 3S 2E 18AB

TAX LOT 1100
TAX MAP 3S 2E 18AB

TAX LOT 1000
TAX MAP 3S 2E 18AB

TAX LOT 800
TAX MAP 3S 2E 18AB

TAX LOT 700
TAX MAP 3S 2E 18AB

TAX LOT 500
TAX MAP 3S 2E 18AB

TAX LOT 400
TAX MAP 3S 2E 18AB

TAX LOT 300
TAX MAP 3S 2E 18AB

TAX LOT 100
TAX MAP 3S 2E 18AB

MILLER ROAD

S LELAND ROAD

LINDSAY ANNE LANE

CEDARWOOD WAY

CHERRYWOOD WAY

TRACT A
STORMWATER FACILITY
±13,906 SF

125' PGE TRANSMISSION LINE EASEMENT
BOOK 278 PAGE 308

ELECTRICAL LINE EASEMENT PER DOC. NO. 2014-049319

10' PRIVATE STORM DRAIN EASEMENT

10 ±9,886 SF
9 ±6,118 SF
8 ±6,050 SF
7 ±6,050 SF
6 ±6,050 SF
5 ±6,050 SF
4 ±6,118 SF
3 ±27,975 SF
1 ±5,400 SF
2 ±5,558 SF
11 ±7,451 SF
12 ±7,628 SF
13 ±6,035 SF
14 ±5,735 SF
15 ±6,037 SF
16 ±6,005 SF
17 ±6,005 SF
18 ±6,005 SF
19 ±6,068 SF
20 ±6,492 SF
21 ±9,229 SF
22 ±6,987 SF
23 ±16,714 SF

LINDSAY ANNE ESTATES

PRELIMINARY SUBDIVISION PLAT NOTE:
THE PURPOSE OF THIS PRELIMINARY PLAT IS TO SHOW THE LOT DIMENSIONS FOR PLANNING PURPOSES. THIS IS NOT A FINAL PLAT AND IS NOT TO BE USED FOR SURVEYING PURPOSES.

ZONE R-6
NET AREA: 181,644 SQUARE FEET ±
AVERAGE LOT AREA: 7,897 SQUARE FEET ±
MAXIMUM DENSITY: 30 LOTS
MINIMUM DENSITY: 24 LOTS

SCALE: 1"= 40 FEET
40 0 16 24 32 40

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FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

LINDSAY ANNE ESTATES TOO

OREGON
CLACKAMAS COUNTY TAX MAP 3-2E-18
OREGON CITY
TAX LOT 1400

PRELIMINARY SUBDIVISION PLAT (PER PROPOSED CODE CHANGES)

DESIGNED BY:	VHN
DRAWN BY:	NMC
CHECKED BY:	MBH
SCALE:	AS NOTED

DATE: 01/02/2018

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 9, 2002
MONTGOMERY B. PURLEY
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/19

REVISIONS

JOB NUMBER
5837

SHEET
1

AKS DRAWING FILE: 5837 PLAT WITH NEW CODE.DWG | LAYOUT: P1-03

From:	Mike Mitchell
To:	Kelly Reid
Subject:	Re: code revisions - typos, etc
Date:	Friday, January 19, 2018 8:36:08 AM
Attachments:	OCMC Code Revisions redline version typos, etc. V2.docx

Kelly,
Thanks for walking me through this. Here is the corrected version for the record.

Have a great weekend!
Mike

On Thu, Jan 18, 2018 at 5:23 PM, Kelly Reid <kreid@orcity.org> wrote:

> Mike,
>
> Good catches - thanks for combing through it all!
>
> It's probably best if you send me a corrected version yourself. I will at it to the official record for this item. And yes, you can absolutely comment in person as well. Monday is a work session and the Planning Commission typically does allow for public comment at work sessions, although it is not part of the legal process.
>
> Thanks,
>
> Kelly Reid, AICP, Planner
>
> Oregon City Planning Division
>
> 221 Molalla Ave, Ste. 200
>
> Oregon City, OR 97045
>
> (503) 496-1540
>
> kreid@orcity.org
>
> City Website: www.orcity.org/planning
>
> Mapping Tools: https://maps.orcity.org

From: Mike Mitchell [mailto:mike.k.mitchell@gmail.com]
Sent: Thursday, January 18, 2018 4:25 PM
To: Kelly Reid <kreid@orcity.org>
Subject: RE: code revisions - typos, etc

Can you correct my typo, or should I send you a correct version? I would like this to be submitted as public comment, as long as as I can also comment in person at Monday's meeting.

Mike

On Jan 18, 2018 3:28 PM, "Kelly Reid" <kreid@orcity.org> wrote:

> Thanks Mike. Would you like this to be added to the record as a public comment?
>
> Kelly Reid, AICP, Planner
>
> Oregon City Planning Division
>
> 221 Molalla Ave, Ste. 200
>
> Oregon City, OR 97045
>
> (503) 496-1540
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> kreid@orcity.org
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> City Website: www.orcity.org/planning
>
> Mapping Tools: https://maps.orcity.org

From: Mike Mitchell [mailto:mike.k.mitchell@gmail.com]
Sent: Thursday, January 18, 2018 3:03 PM
To: Kelly Reid <kreid@orcity.org>
Subject: code revisions - typos, etc

Kelly,

Rather than spend time at the Planning Commission meeting on little stuff, please take a look at these typos, etc that I found and think should be corrected.

I plan to attend the meeting Monday night to bring up some other items that I think need to be re-visited.

Thanks,

Mike Mitchell

OCMC Code Revisions red-lined version - typos, etc.

#1: 17.04.420: the first sentence revises "thirteen" to "sixteen". The second sentence still says "thirteen".

#2: 17.58.40 section C.2.a: Second sentence as redlined reads: "The standards of subparagraph C.2.b. below shall be met when the value of , as determined by the community development director….". That sentence doesn't seem to make sense… value of what?

#3: 17.62.050 section A.21.a.iv: should be "batten", not "baton".

#4: 17.62.050 section A.21.c.3.: should be "troweled", not "toweled".

#5: Table 1-17.62.65: The abutting property/maximum number should be ".5", not ".05".

#6: 17.62.065 section D.4 Pedestrian Accessways: the words "a high pressure sodium bulb with" should be removed (since the intent is to make this section technology agnostic).

Submitted by Mike Mitchell

1/18/2018

From: Paul Edgar
To: Laura Terway
Cc: Christina Robertson-Gardiner; Kelly Reid
Subject: OCMC 17.49.[0]80 Draft Code Amendments
Date: Wednesday, January 24, 2018 3:36:04 PM

I am looking at the Planning Commission Work Session Document with Draft Code Amendments. dated 1/22/2018

file:///C:/Users/Paul/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/TempState/Downloads/Draft%20Code%20Amendments.pdf

In RED, it lists new changes to be brought before the Planning Commission.

The following uses are allowed within the NROD and do not require the issuance of an NROD permit:

OCMC 17.49.(O)80, You are asking for what is currently in City Code to be changed to this.

D: Fences in which posts disturb no more than one hundred square feet of ground surface outside of the top of bank of water bodies.

What is currently in OCMC code for Fence Post, within NROD, currently in OCMC Code, that requires this change?

Fence Posts that are "**pressure treated, with toxic chemicals**", in NROD Overlay and within 50 feet of a creek or body of water, what are all of the current OCMC codes that regulate this environment?

When you are also in the Canemah National Register Historic District Overlay, what additional OCMC Codes, need to be considered?

When a Fence is built or planned to be built or re-built into the Platted ROW, what is required to allow that to happen, what are the OCMC Codes and requirements that applies to this?

I am also looking at a letter dated September 27, 2017 From: Christina Robertson-Gardiner, To: Laura Terway, RE: 302 3rd Avenue - Ervin Carothors House, CODE REVIEW

Page 2.

OCMC 17.49.(O)70 Prohibited uses, C. Utility service using a single utility pole or where no more than one hundred square feet of ground surface is disturbed outside of the top-of-bank of water bodies and where the disturbed area is restored to pre-construction conditions.

From reading this it appears, that this OCMC 17.49.(O)70 did not apply and that is the reason for this Code Amendment being requested in these Draft Code Amendments: OCMC 17.49.(O)80.D ??

Additionally on page 4. we need greater clarity where you spell out HRB Policy #6 (First Adopted 9/88; Revised 6/91) - Policy on Construction of Fences and Walls and the paragraph "Fence or Wall Height".

*Front yard fences or walls and **corner side yard fences or walls should be no more than 42 inches in height and shall not create a traffic site obstruction** (as defined in Chapter 10.32 of the Oregon City Municipal Code). Along rear yards and interior side yards (beyond the front yard setback, fences or walls may be up to six (6) feet in height.*

Please help provide a better clarity - understanding of what the Legal Interpretation is of a "corner side yard"?

The house at 302 3rd Avenue, has a corner side on Ganong Street and there appears to be a fence that is built to a height of approximately six (6) feet in height and it also appears to be approximately eight (8) to ten (10) feet into the Ganong Street ROW. And in addition it blinds the view of motor vehicles and pedestrians that are driving or walking on the 3rd & 4th Avenues and Ganong Streets. The obstructed view is very dangerous as this route is the primary access road for maybe 50 residents, that can generate over 500 incidents of travel daily. It has also been identified as a primary designated route for the proposed McLoughlin to Canemah Trail and a walking route used by many within the Canemah neighborhood. In the winter time this area of Ganong Street is especially dangerous (I have had a car accident here), with more darkness, wet and slippery streets, it grade of incline/decline and the speed of motor vehicles allowed to drive at 25 MPH. Important to this speed that motor vehicles are allowed at 25 MPH is the feet per second that they can be traveling and what that represents in adding to the danger contingencies, with this street obstruction of view.

Paul Edgar, Friends of Canemah

From: Paul Edgar
To: Laura Terway
Subject: Re: OCMC 17.49.[0]80 Draft Code Amendments
Date: Wednesday, January 24, 2018 4:24:08 PM

Laura, we need some answers and clarity to these questions that are in this email, not just including them in the record. Where we have ? question marks, it was our hope that everyone can get clarity.

The lack of clarity, creates problems and contention, but worse is the division in the Canemah Historic District and other neighborhoods. The faster we get clarity, the City positions/answers questions, long term resolution can follow. Building and re-building a six (6') high fence out in to the Right-of-Way of Ganong Street, that makes it more dangerous to public safety, needs clarification. What is the Legal answer to what is a side on a corner lot? The questions on NROD need answers.

Please help, Paul

On 1/24/2018 3:48 PM, Laura Terway wrote:

> Paul, Thank you for the comments, we will include them in the record.
>
> Laura Terway, AICP, Community Development Director
> City of Oregon City
> 503.496.1553

From: Paul Edgar [mailto:pauloedgar@q.com]
Sent: Wednesday, January 24, 2018 3:36 PM
To: Laura Terway
Cc: Christina Robertson-Gardiner; Kelly Reid
Subject: OCMC 17.49.[0]80 Draft Code Amendments

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Paul Edgar, Friends of Canemah

From: replinger-associates@comcast.net
To: Kelly Reid
Subject: Re: Land Use Application Transmittal L 17-04
Date: Tuesday, January 02, 2018 10:17:31 AM

Kelly:

I don't think there is any transportation impact from these changes.

Let me know if you think there's something I missed.

John

John Replinger, PE
Replinger & Associates LLC
6330 SE 36th Avenue
Portland, OR 97202
503-719-3383
replinger-associates@comcast.net

From: "Kelly Reid" <kreid@orcity.org>
Cc: "Laura Terway" <lterway@orcity.org>
Sent: Friday, December 22, 2017 5:02:24 PM
Subject: Land Use Application Transmittal L 17-04

Good Evening,

The following application for code amendments and changes to the City's Development code has been submitted. The application materials may be found here:
https://www.orcity.org/planning/project/l-17-04-development-code-updates

Any interested party may testify at the public hearing or submit written testimony at or prior to the hearing. **Written comments must be received at City Hall by January 11, 2018 to be included in the Planning Commission staff report.**

PLANNING COMMISSION HEARING DATE:
On **January 22, 2018** the ***City of Oregon City - Planning Commission*** will conduct a public hearing at 7:00 p.m. in the City Hall Commission Chambers at City Hall, 625 Center Street, Oregon City 97045 to consider the following Type IV application:

FILE NUMBER:	LE-17-04
APPLICANT:	City of Oregon City Planning Division 625 Center Street Oregon City, OR 97045
REQUEST:	Amendments to various Chapters of the Oregon City Municipal Code to update and correct development codes. Includes changes to regulations that govern property development and land use processes.
LOCATION:	City-wide
CONTACT PERSON:	Kelly Reid, AICP, Planner (503) 722-3789
NEIGHBORHOOD ASSN:	City-wide
CRITERIA:	Administration and Procedures set forth in Chapter 17.50 and Zoning Changes and Amendments in Chapter 17.68 of the Oregon City Municipal Code. An electronic version of the proposed amendments is available on the city's website www.orcity.org

Kelly Reid, AICP
Planner, City of Oregon City
(503) 496-1540
kreid@orcity.org

From:	Laura Terway
To:	Kelly Reid
Subject:	Fwd: Ordinances 18-1004 and 18-1005
Date:	Saturday, January 20, 2018 6:24:53 PM

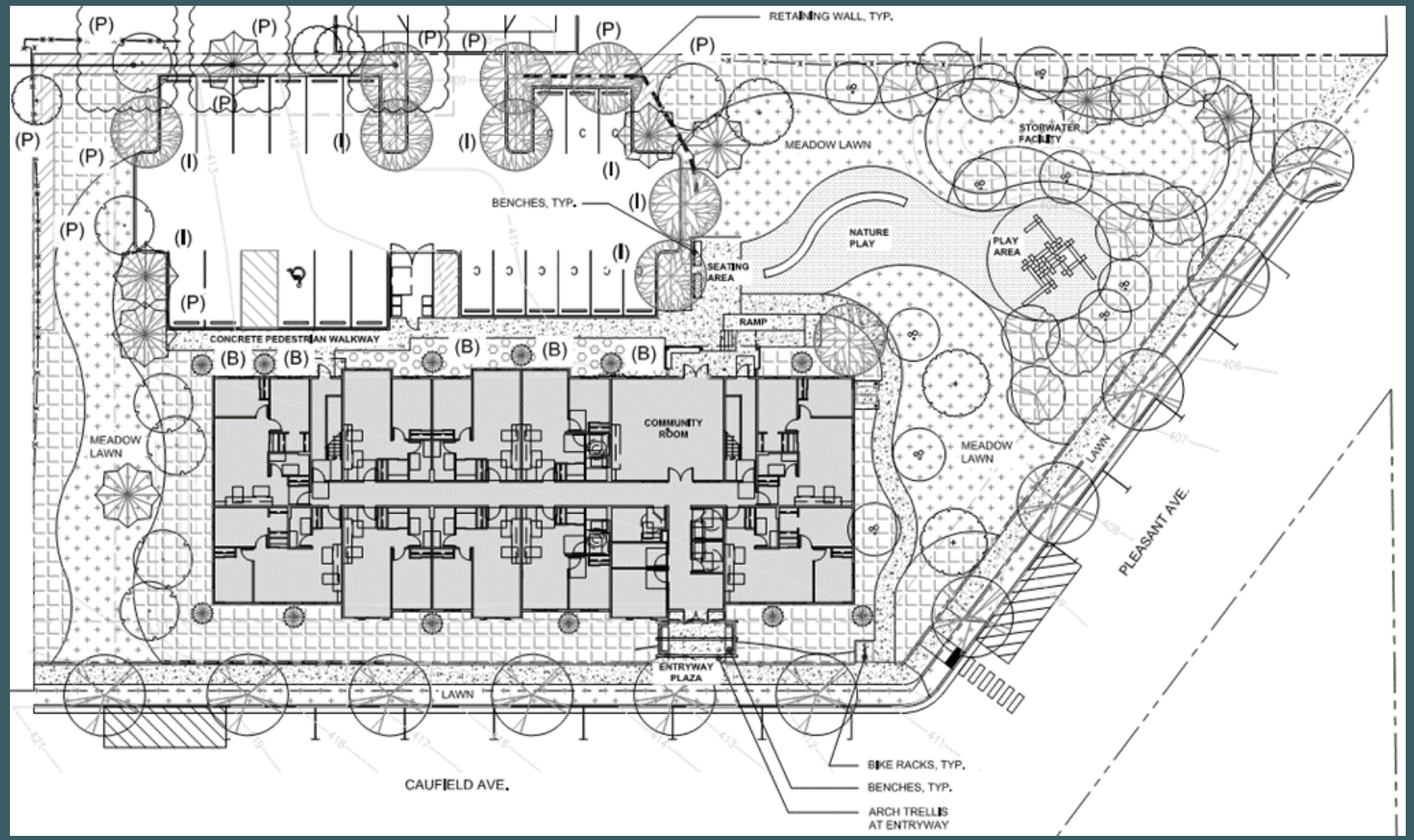
-Laura Terway

Begin forwarded message:

> **From:** Roseann Sheeon <rsheeon@yahoo.com>
> **Date:** January 20, 2018 at 6:06:45 PM PST
> **To:** lterway@orcity.org
> **Subject: Ordinances 18-1004 and 18-1005**
>
> We are new to Oregon City. Over the last two years the growth with no consideration for the overcrowded schools and traffic patterns is unconscionable! My grandson has 33 students in his 5th grade classroom. As a retired teacher...that is an impossible number for the teacher and the children. Please DO NOT pass these two items until the infrastructure is addressed and fixed.
>
> Carl and Roseann Sheeon
> 20257 Quinalt Dr
> 503.722.3890
>
> Sent from my iPad

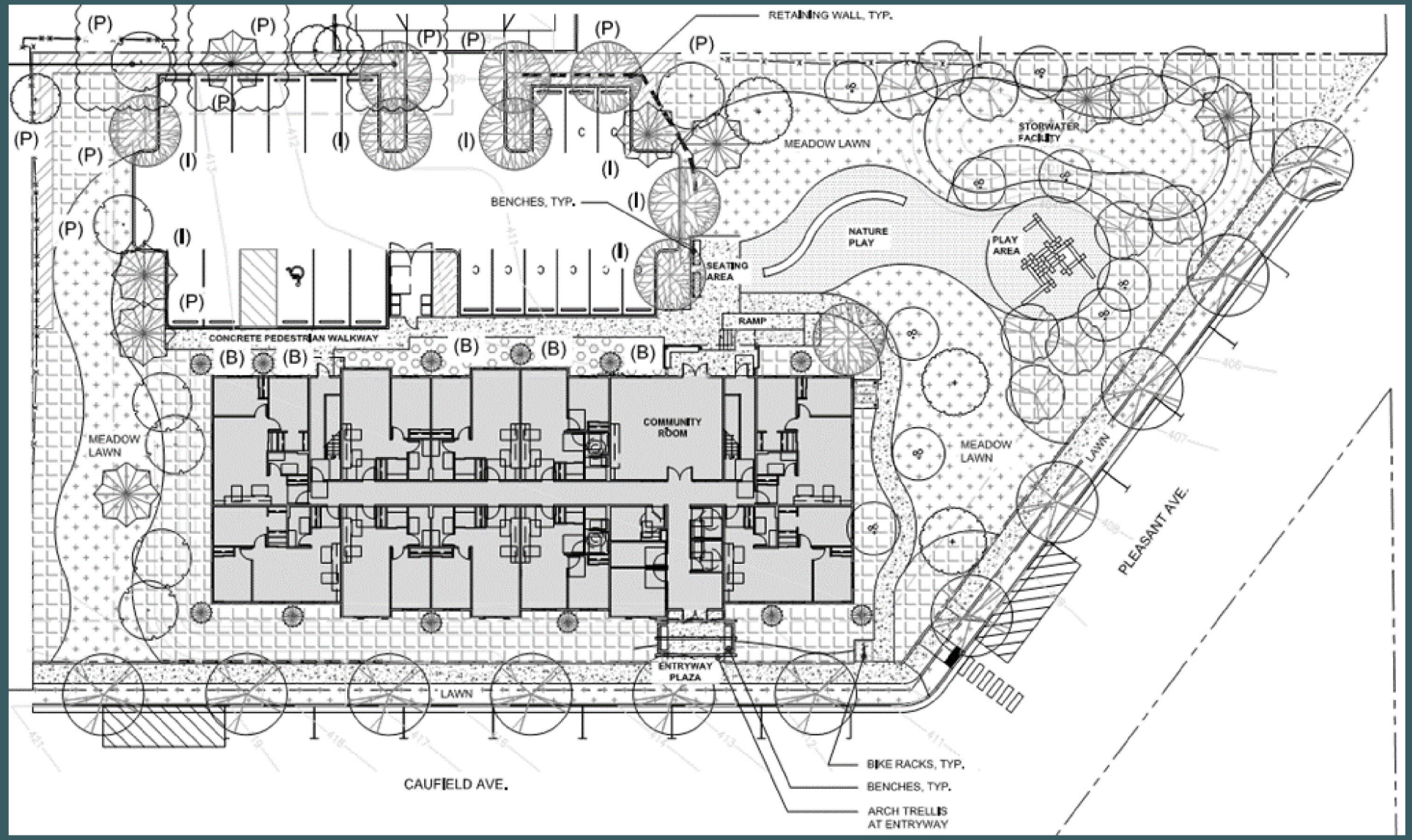
SP 17-0119 and VR 17-0011

24 Unit Multi-Family Located at Pleasant Avenue and Caufield Avenue

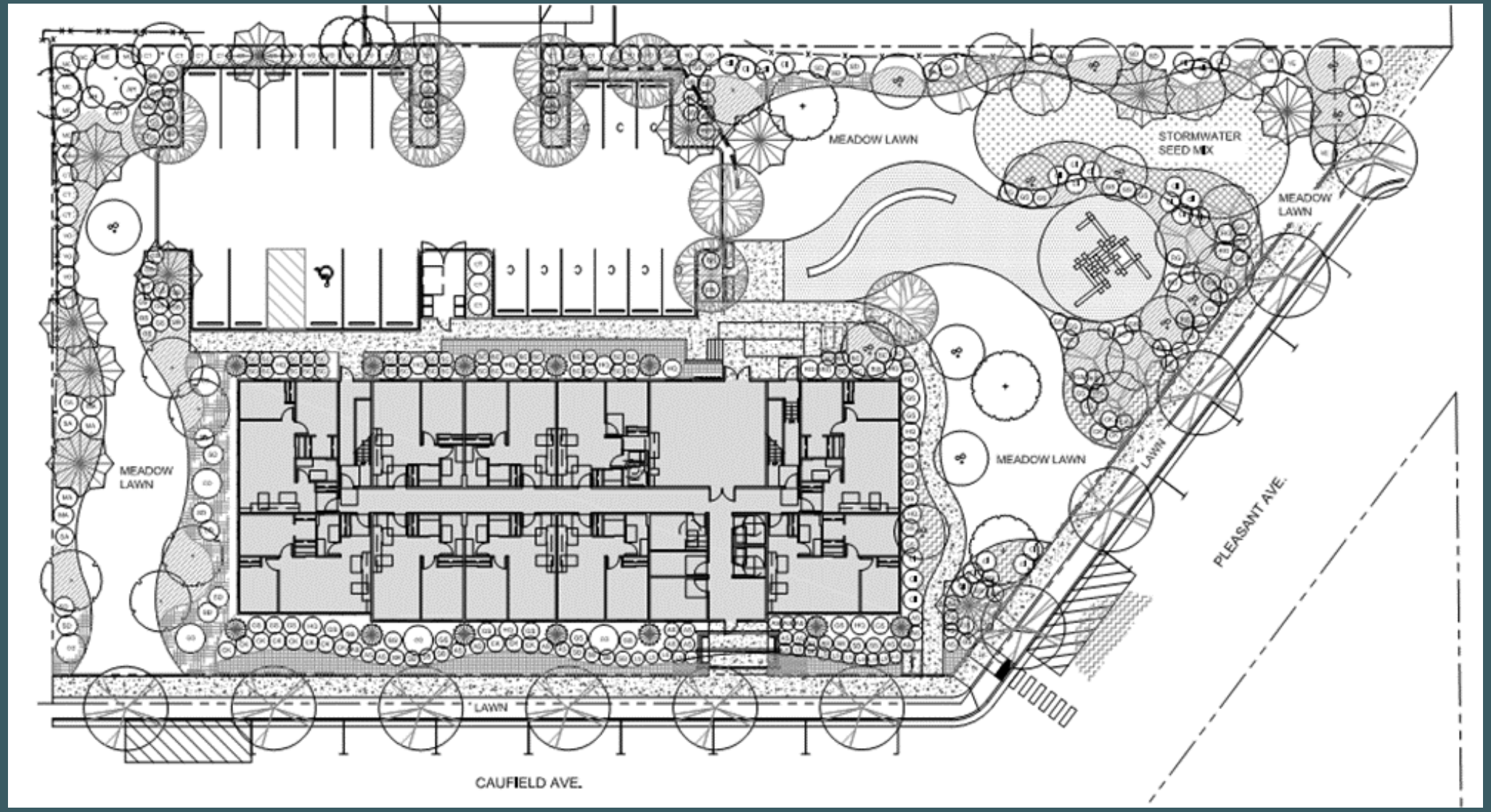


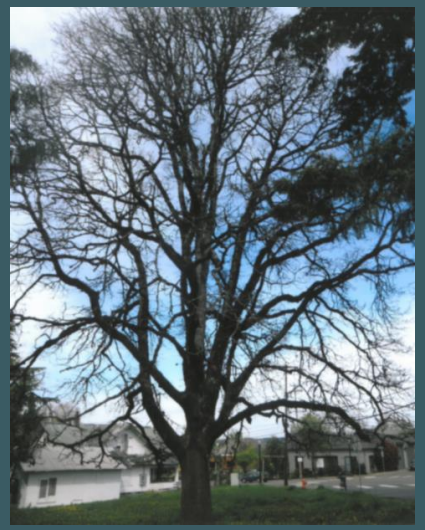
Subject Site

Site Plan

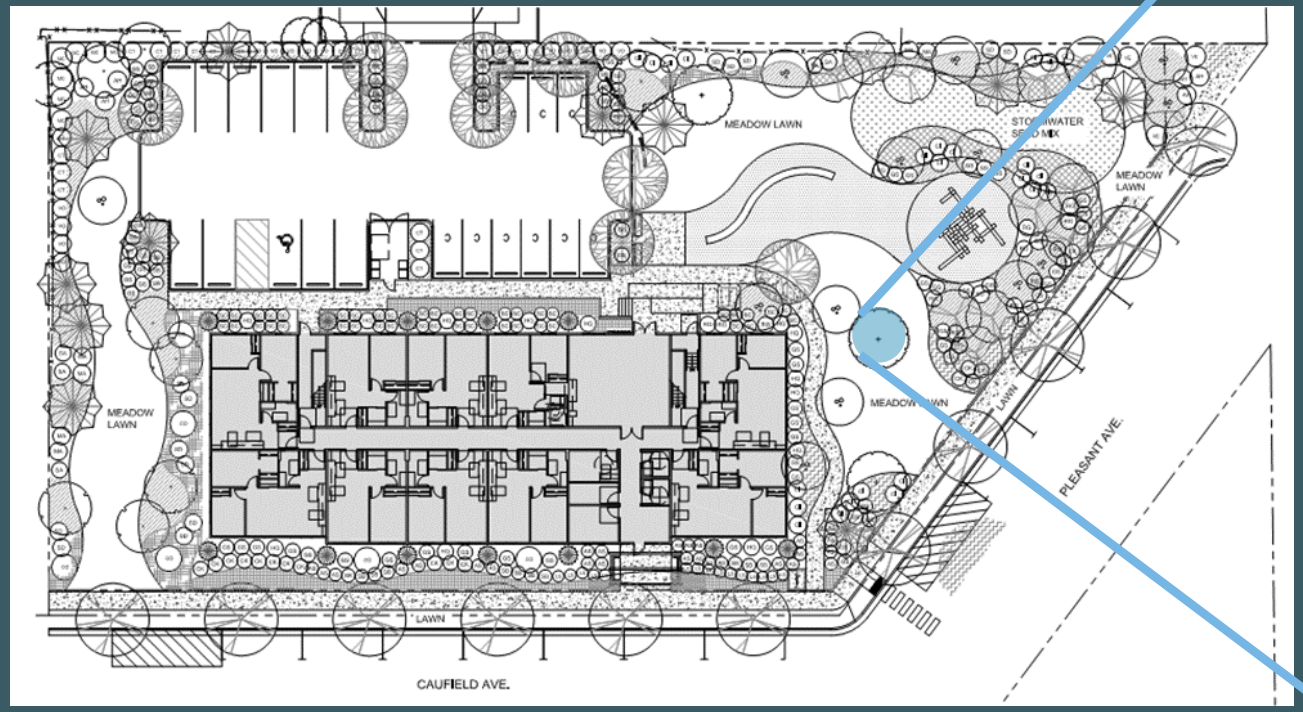

RETAINING WALL, TYP.
MEADOW LAWN
STORMWATER FACILITY
BENCHES, TYP.
NATURE PLAY
PLAY AREA
SEATING AREA
RAMP
CONCRETE PEDESTRIAN WALKWAY
COMMUNITY ROOM
MEADOW LAWN
MEADOW LAWN
LAWN
PLEASANT AVE.
ENTRYWAY PLAZA
LAWN
CAUFIELD AVE.
BIKE RACKS, TYP.
BENCHES, TYP.
ARCH TRELLIS AT ENTRYWAY

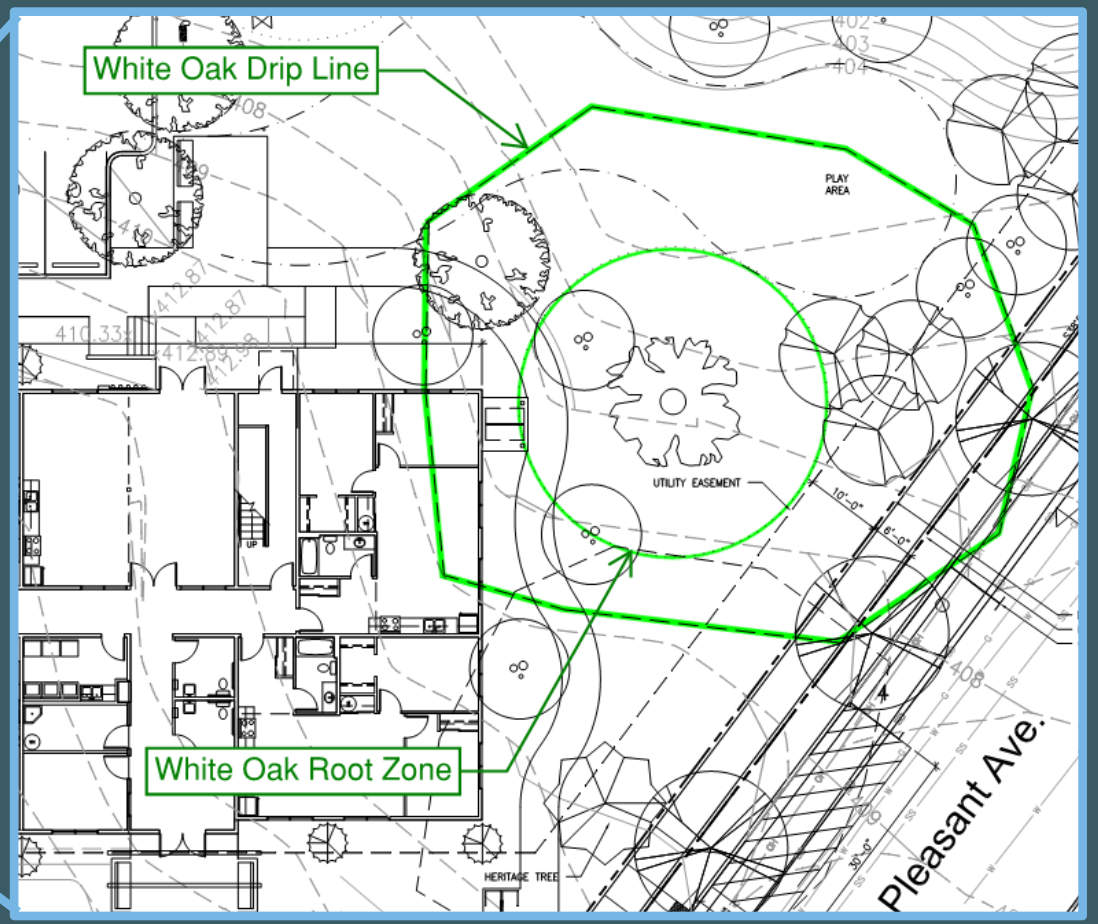
Landscaping Plan



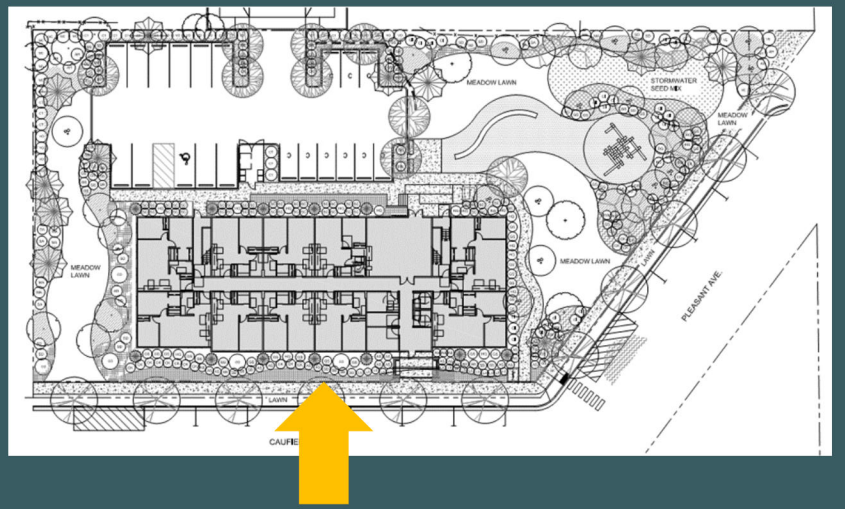


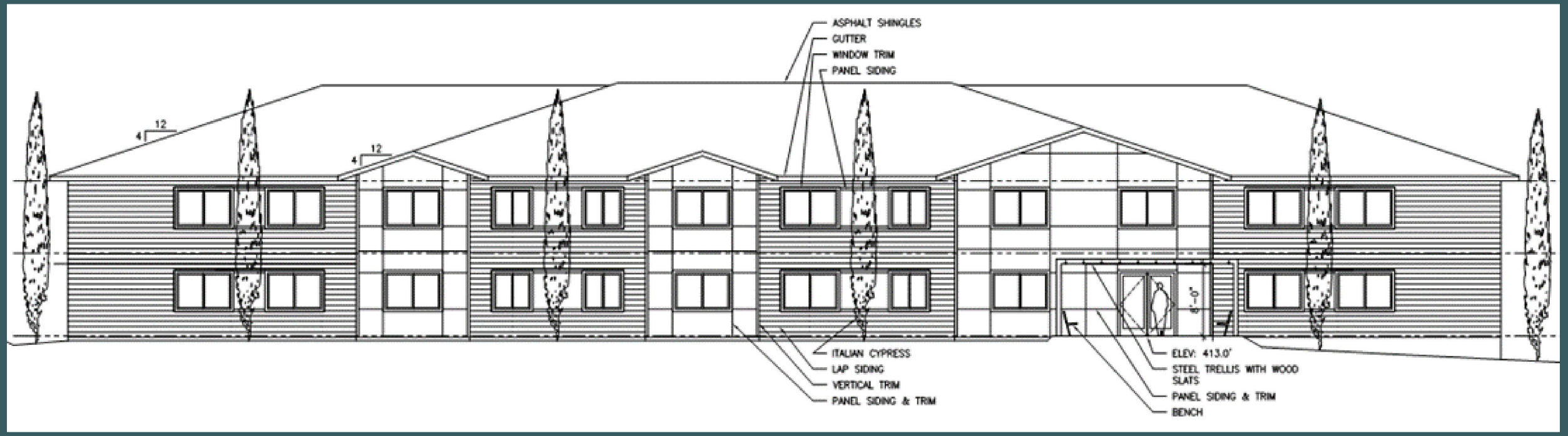
Preservation of 39” caliper White Oak Heritage Tree



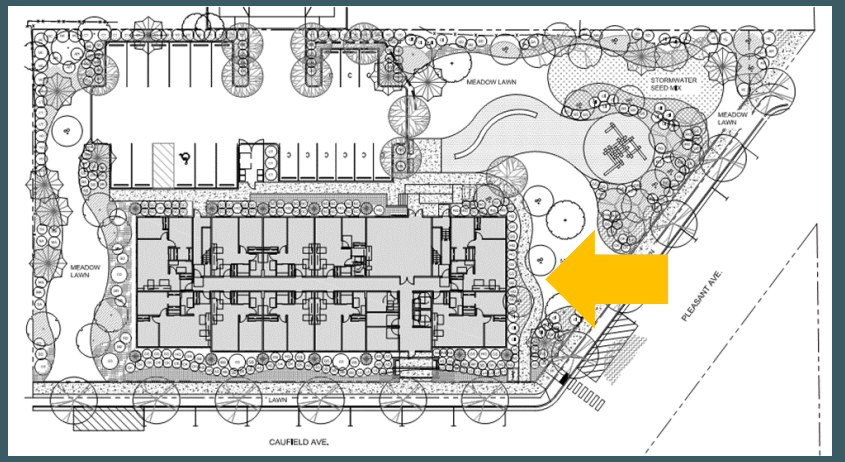


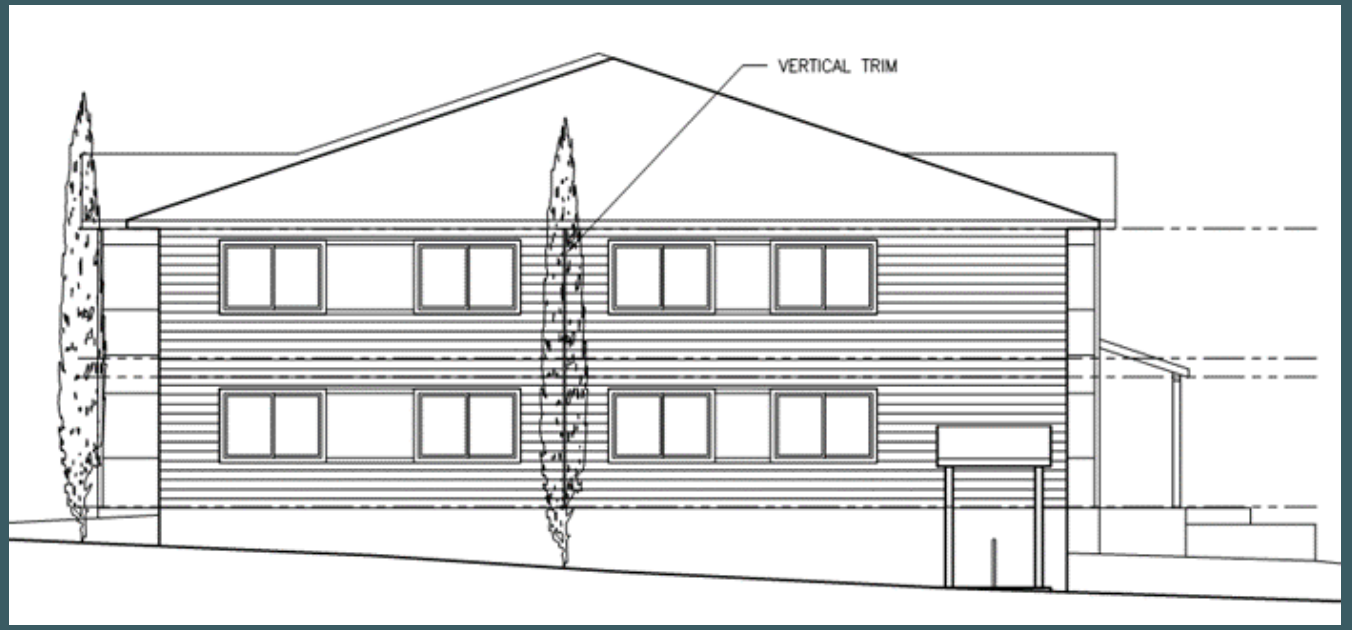
South (Caufield Avenue) Elevation



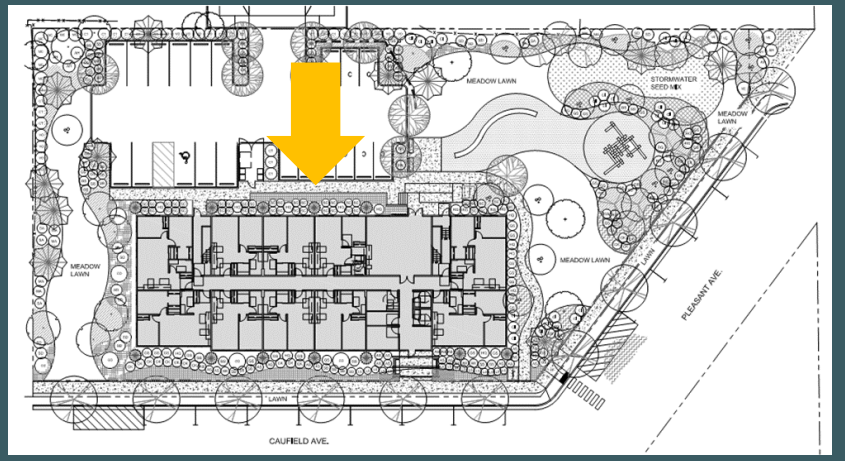


East (Pleasant Avenue) Elevation

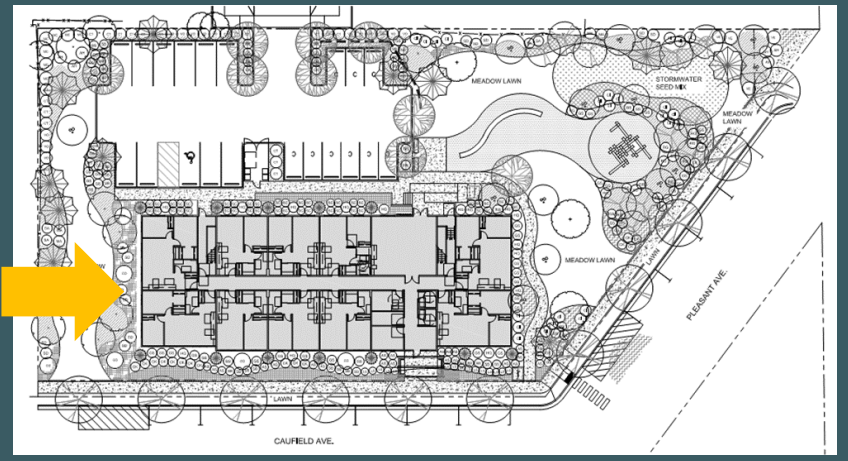


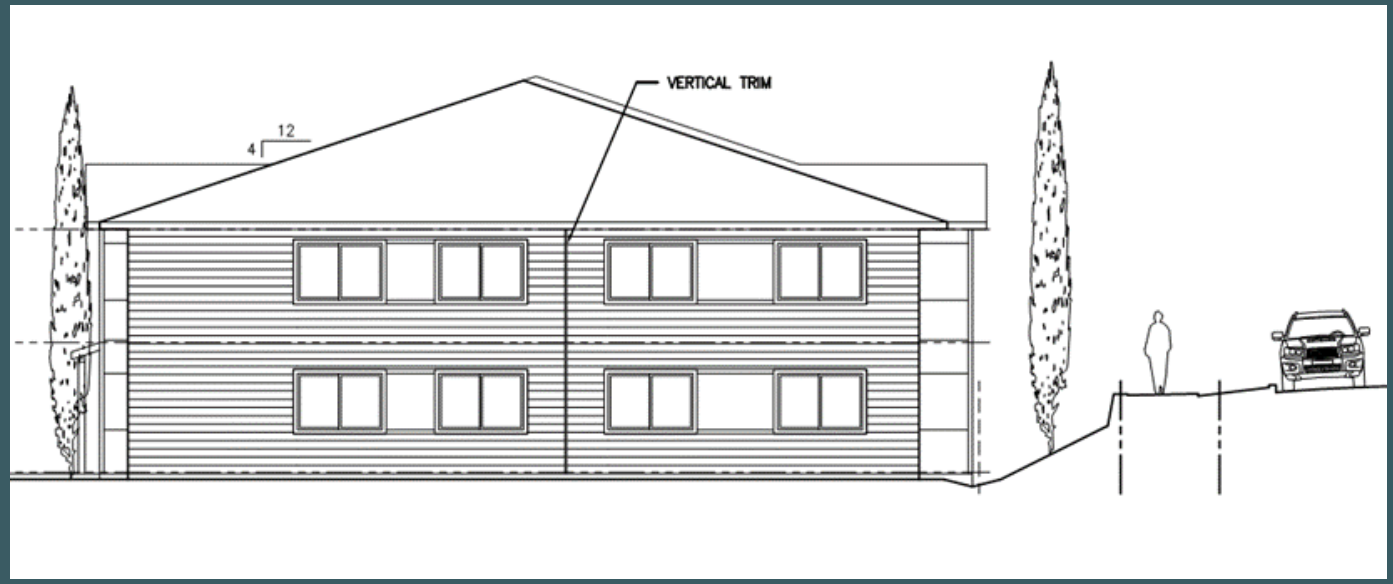


North (Parking Lot) Elevation

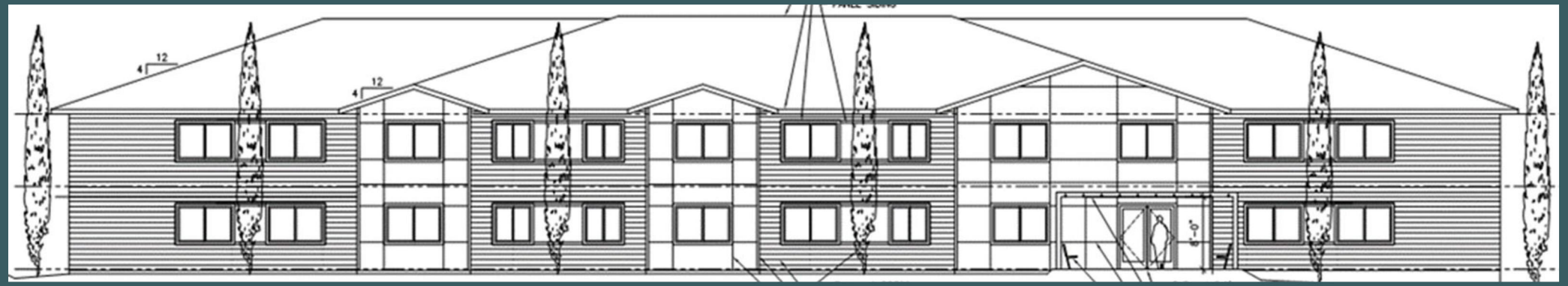


West Elevation



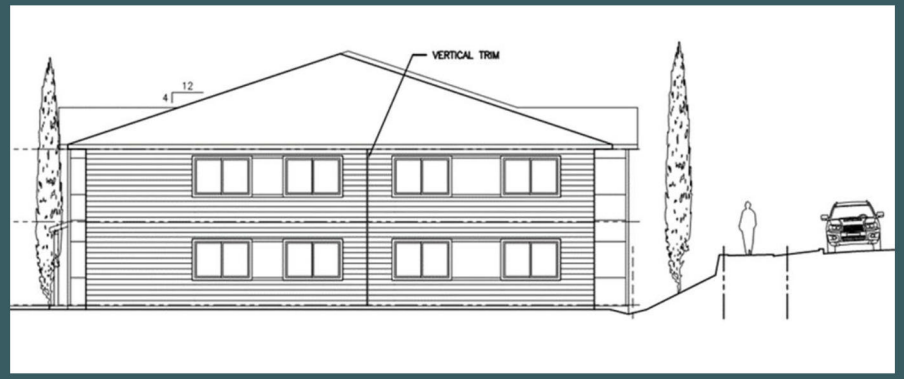


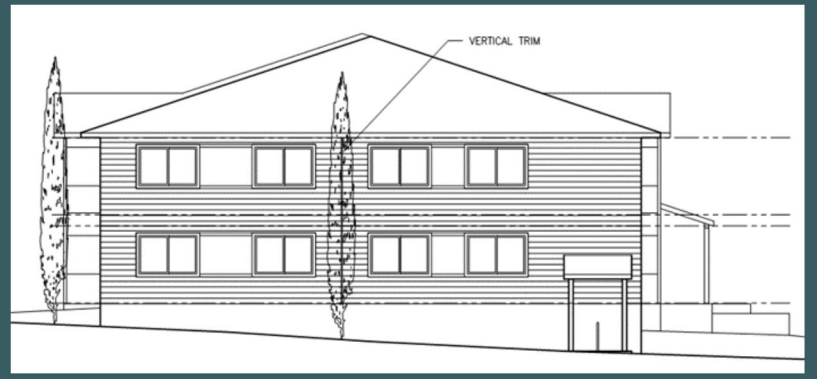
South (Caufield Ave) Elevation



North (Parking Lot) Elevation

West Elevation





East Elevation

Oregon City Municipal Code

12.04 - Streets, Sidewalks, and Public Places
12.08 - Public and Street Trees
13.12 - Stormwater Management
15.48 - Grading, Filling and Excavating
17.29 – “MUC” Mixed Use Corridor District
17.41 – Tree Protection
17.47 - Erosion and Sediment Control
17.50 - Administration and Procedures
17.62 - Site Plan and Design Review
17.52 - Off Street Parking and Loading
17.54.100 – Fences
17.60 - Variances

Variance for Building Design

17.62.057.G.1: Building Articulation and Modulation

17.62.057.G.2: Modulation

17.62.057.J: Minimum Ground Floor Height

Variance Criteria

A. That the variance from the requirements is not likely to cause substantial damage to adjacent properties by reducing light, air, safe access or other desirable or necessary qualities otherwise protected by this title
B. That the request is the minimum variance that would alleviate the hardship
C. Granting the variance will equal or exceed the purpose of the regulation to be modified.
D. Any impacts resulting from the adjustment are mitigated.
E. No practical alternatives have been identified which would accomplish the same purpose and not require a variance.
F. The variance conforms to the comprehensive plan and the intent of the ordinance being varied.

Variances

17.62.057.G.1: Requires 3 of the following for building articulation & modulation

- Repeating windows at intervals less than 30’
- Articulation of the building's top, middle, & bottom

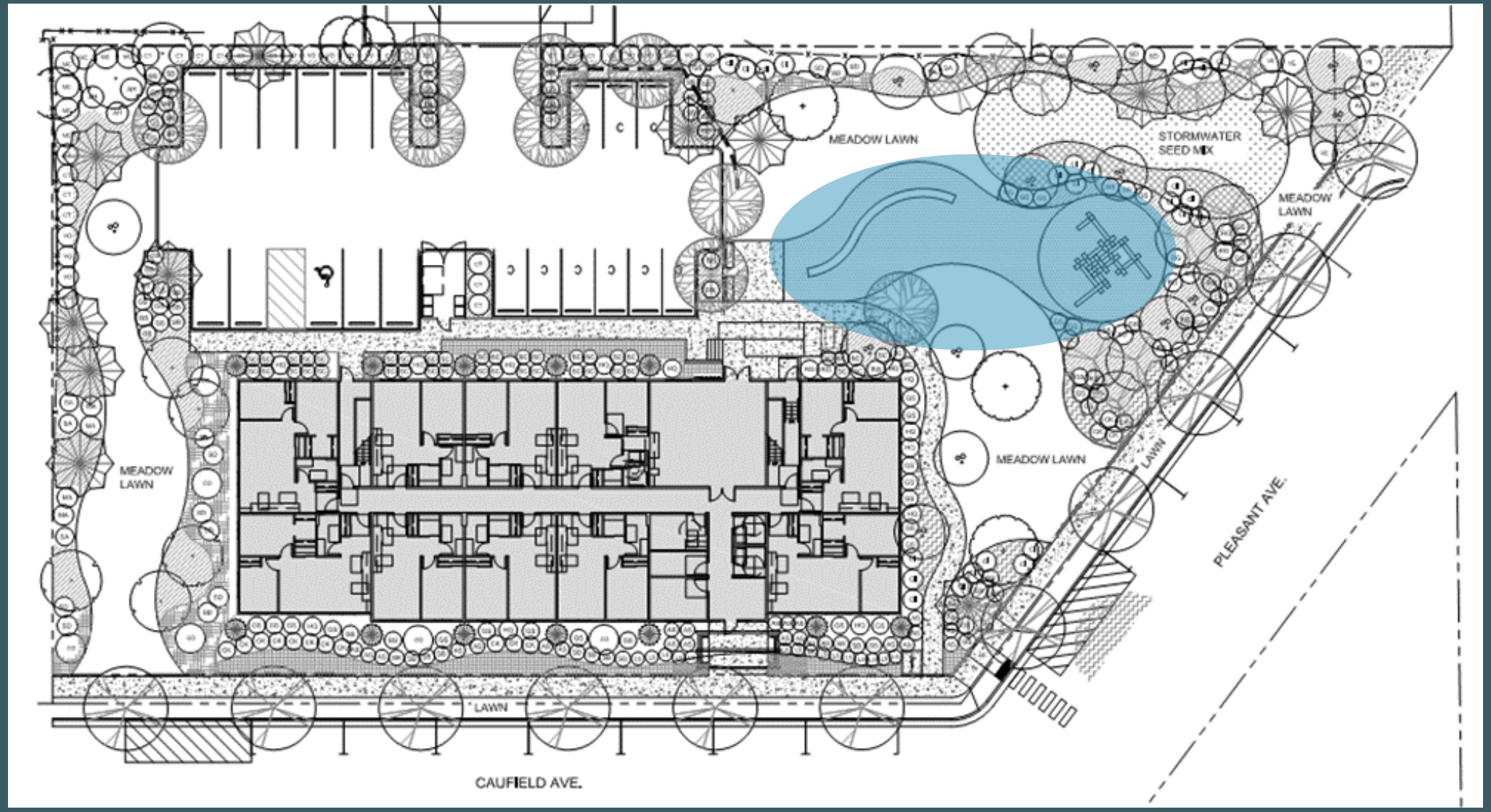
Variance for one of the following:

- Vertical building modulation
  - Min of 36” deep & 4’ wide if tied change in color, building material, or roofline modulation
  - Min 10’ deep and 15’ wide if not
- Min. of 5’ horizontal modulation

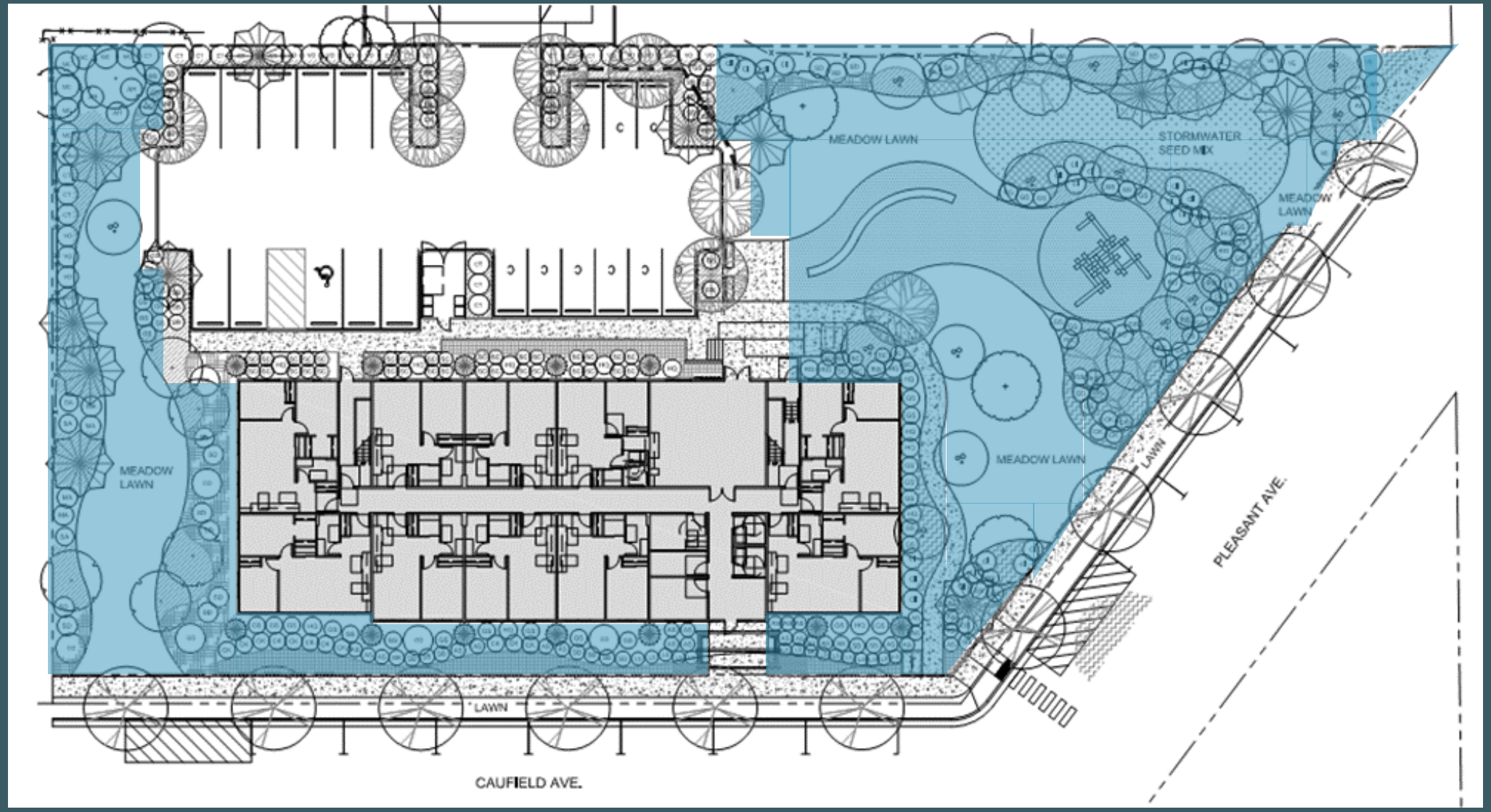
17.62.057.G.2: Requires a 30’ wide and 20’ deep modulation on the north and south facades

17.62.057.J: Requires the ground floor height to be 13’

Mitigation: Large Play Area

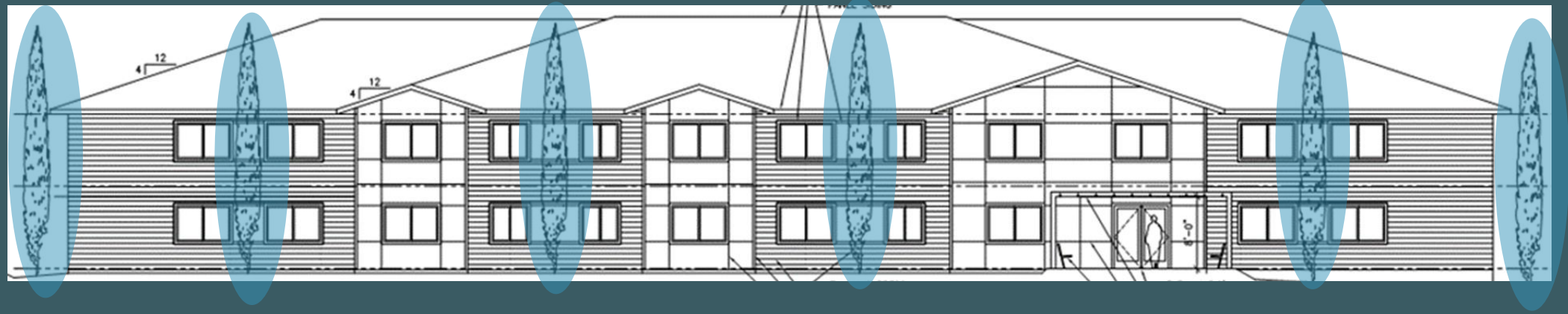


Mitigation: Landscaping

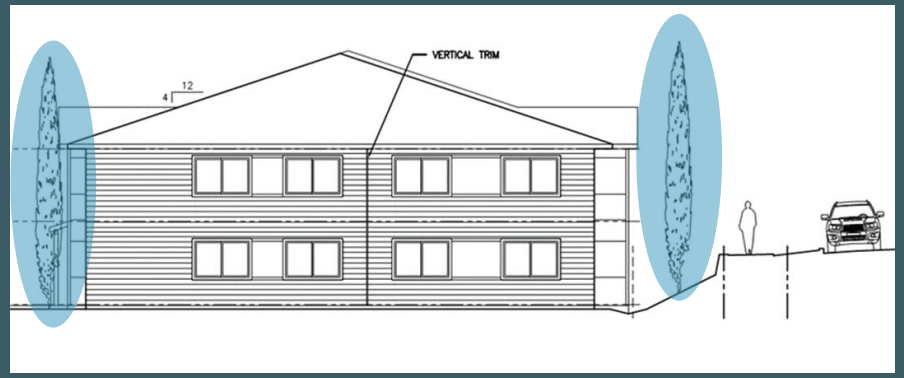


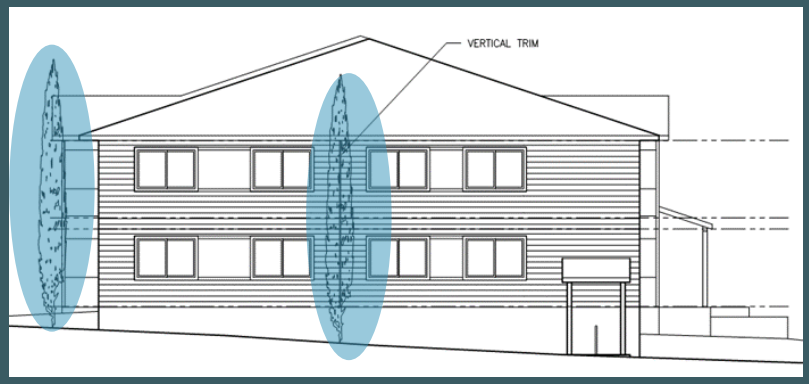
Mitigation: Trees Adjacent to the Building

South (Caufield Ave) Elevation



West Elevation



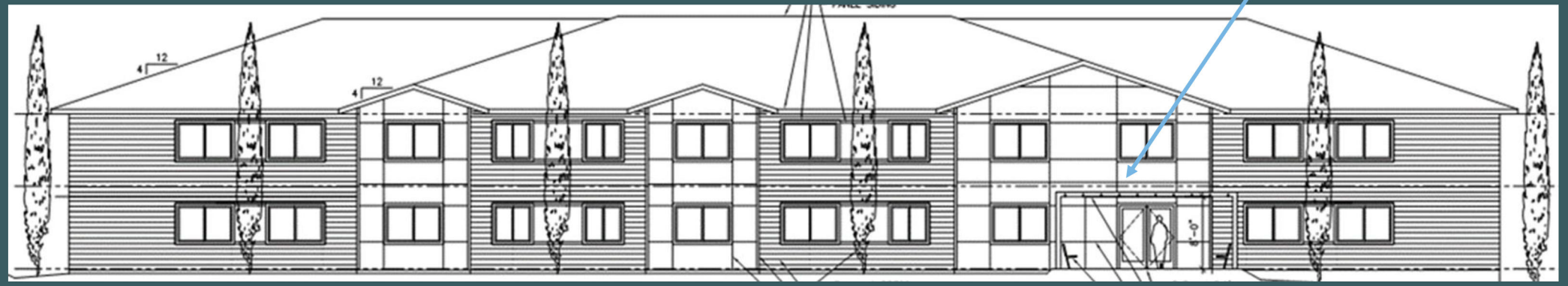


East Elevation

Mitigation: Pedestrian Amenities

Decorative Arch with Seating

South (Caufield Ave) Elevation



Bench with Seating

North (Parking Lot) Elevation

Variance Criteria

A. That the variance from the requirements is not likely to cause substantial damage to adjacent properties by reducing light, air, safe access or other desirable or necessary qualities otherwise protected by this title
B. That the request is the minimum variance that would alleviate the hardship
C. Granting the variance will equal or exceed the purpose of the regulation to be modified.
D. Any impacts resulting from the adjustment are mitigated.
E. No practical alternatives have been identified which would accomplish the same purpose and not require a variance.
F. The variance conforms to the comprehensive plan and the intent of the ordinance being varied.

Questions?