City of Oregon City

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

Meeting Agenda

Planning Commission

Monday, January 22, 2018 | **7:00 PM** | **Commission Chambers**

1. Call to Order

2. Public Comments

3. Public Hearing

3a. 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.

Sponsors: John Lewis

Attachments: Commission Report
L 17-03 Staff report
Exhibit 1. Alternative Mobility Targets Final Report
Exhibit 1. Final Report Appendices
Exhibit 2. 12.04.205 Proposed Changes
Exhibit 3. TSP Project List Amendments
Exhibit 4. TSP Project Map
Land Use Application Form
Applicant's Narrative and Code Responses
Combined Neighborhood Meeting Materials

3b. Continuance of Planning files SP 17-0119: Site Plan and Design Review and VR 17-0011: Variance for a 24 Unit Multi-Family Development at 31 Pleasant Avenue until February 26, 2018.

Sponsors: Community Development Director Laura Terway

Attachments: Commission Report

3c. Continuance of Planning file L 17-04 Legislative Amendment to adopt various development code changes until February 26, 2018.

Sponsors: Community Development Director Laura Terway

Attachments: Commission Report 1.22.18

4. Work Session

Work Session for Proposed Amendments to the Development Sections of the Oregon City Municipal Code (Including Lot Averaging)

Sponsors: Community Development Director Laura Terway

Attachments: Commission Report

Draft Code Amendments

5. Communications

6. 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 18-006

Agenda Date: 1/22/2018

Status: Draft

To: Planning Commission

Agenda #:

From: 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 Highway 213 intersections at Beavercreek and Redland Roads, 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. 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.

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 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 and Redland Roads. 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.

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

- 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.

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:

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

STAFF REPORT AND RECOMMENDATION
January 12, 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 two intersections in Oregon City: Highway 213 and Beavercreek Road and Highway 213 and Redland Road. 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.

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.

Figure 1. Highway 213 and Beavercreek Road intersection

Figure 2. Highway 213 and Redland 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 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.

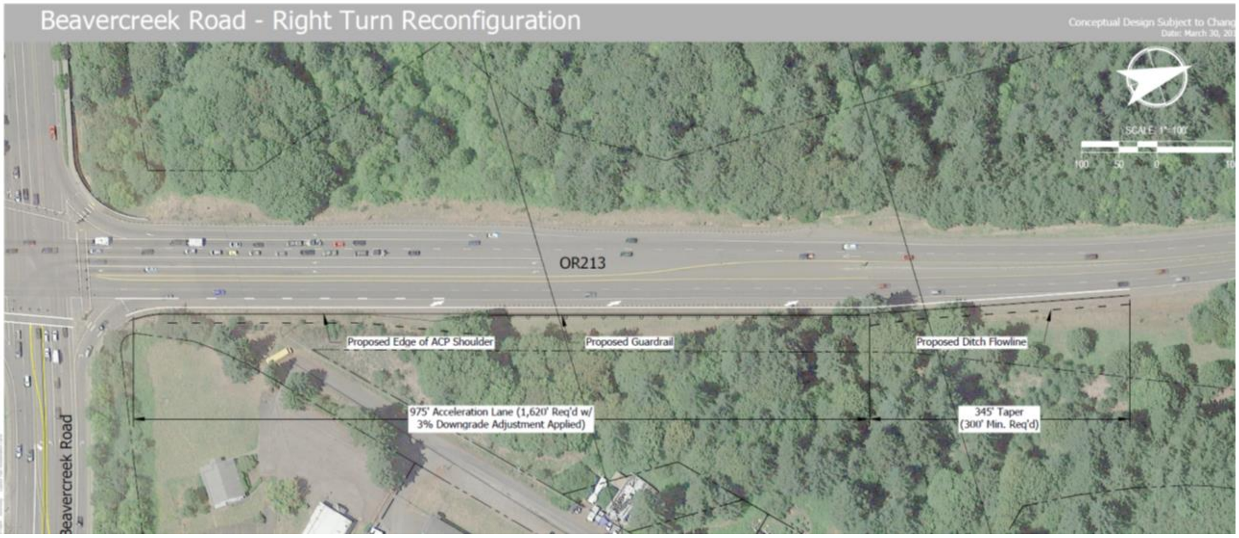

Figure 3. Depiction of right turn lane project at Beavercreek and Highway 213

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

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.

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

- 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 (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. Exhibit 4 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

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 (Exhibits X).

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

No public comments have been received as of the publication of the staff report.

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).

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 two HWY 213 intersections.

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

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 also hosted an open house in December 2017. A project webpage was available throughout the process to share project materials.
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 neighborhood development patterns. The result of the proposed change will be a relatively small increase in congestion at the Highway 213 intersections, 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.

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 process 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 more 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 the overlay area. 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. The appropriate reviews will occur during and after the project is designed and engineered, and before construction.

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 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. While it is not anticipated, any applicable land use review for Natural Resource Overlay District and Geologic Hazard Overlay District will be required prior to construction of the improvements.

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. 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. The appropriate reviews will occur during and after the project is designed and engineered, and before construction.

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 intersections of HWY 213 and Beavercreek and Redland Roads, 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 to meet transportation requirements.

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 to meet transportation requirements.

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 these intersections 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.

For 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.

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 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.
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.
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.

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: Not Applicable. This proposal does not change public transit service in the area.

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.

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: Not Applicable. This proposal does not change public transit service in the area.

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 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.

Finding: Complies as Proposed. The analysis in the final report shows that, without improvements, the OR213/Beavercreek Road and OR213/Redland Road intersections 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 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).

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. 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.

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 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" of the final report.

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.
The City finds these 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. 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.
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.

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 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

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) Alternate Mobility Targets Final Report and Appendices
2) Proposed code amendments
3) Proposed TSP Project List amendments
4) Proposed TSP Project List Map

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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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

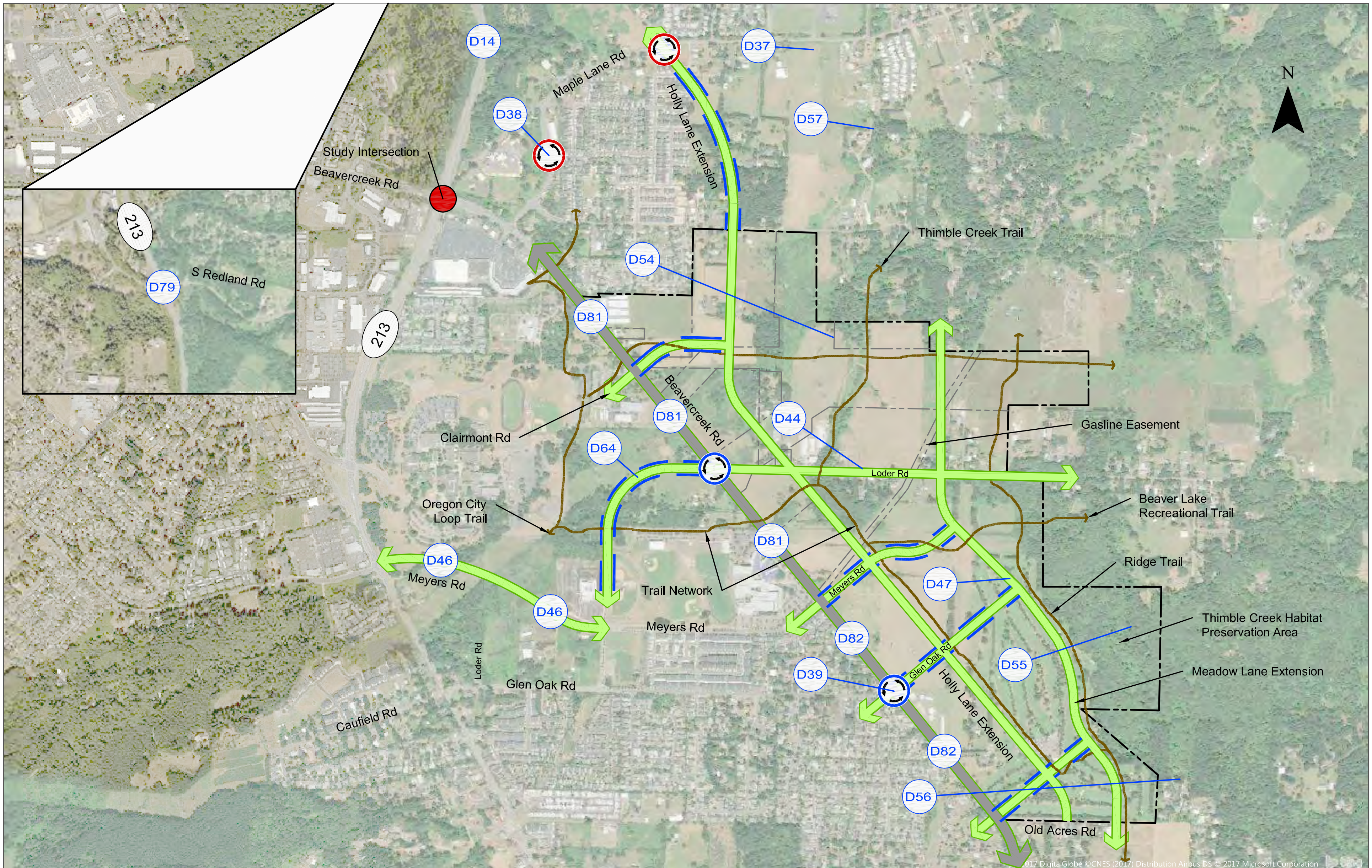
Project #	Project Description	Project Extent	Project Elements	Priority	Funded ?
D14	Southbound OR 213 Advanced Warning System	Southbound OR 213, north of the Beavercreek Road intersection	Install a queue warning system for southbound drivers on OR 213 to automatically detect queues and warn motorists 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



- 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

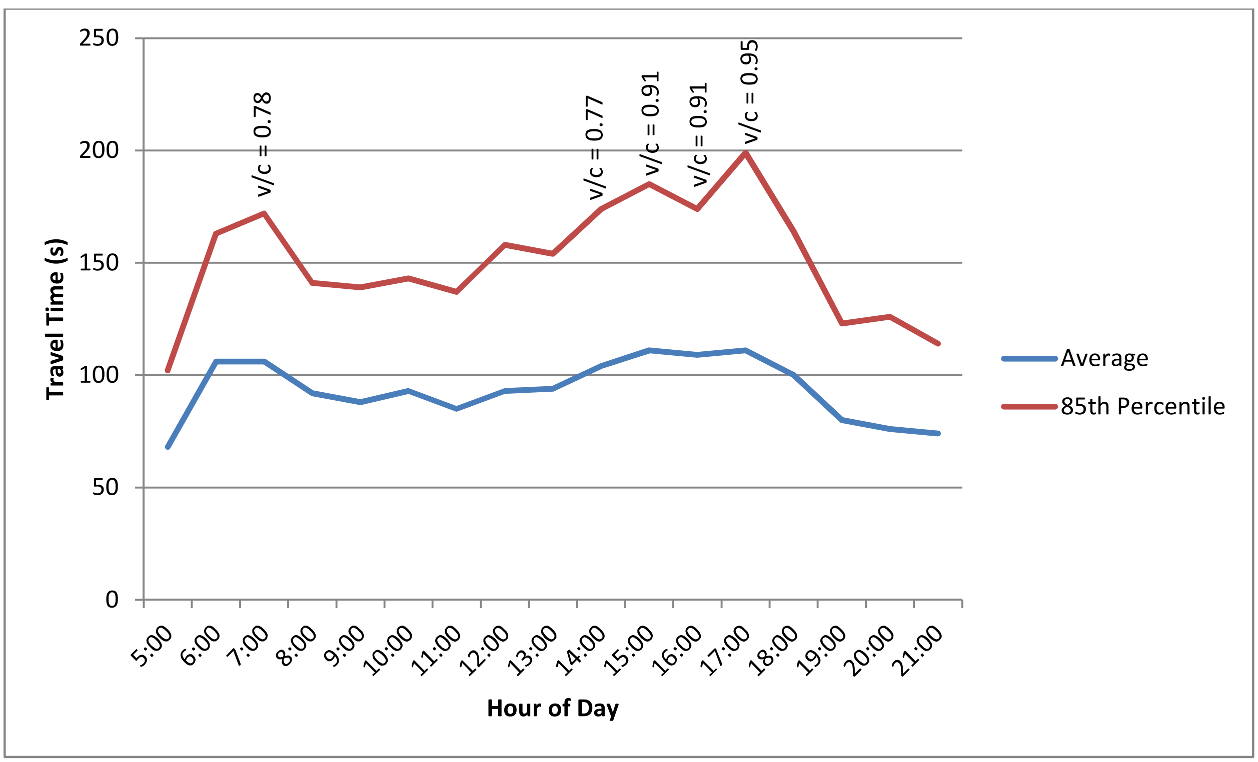
Figure 1

\\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

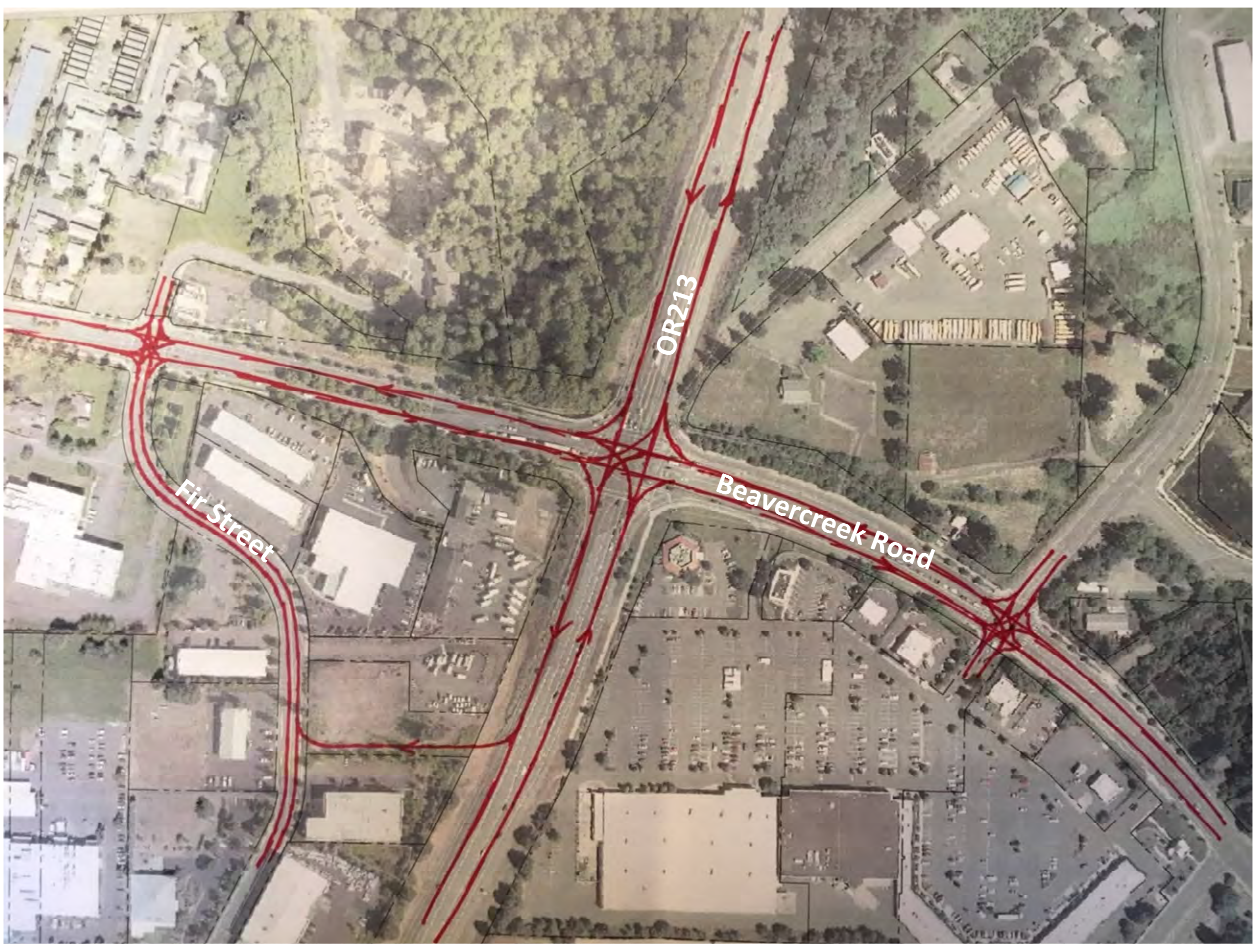
To maintain the current mobility standard with the existing intersection control, a third southbound left-turn lane and a third northbound through lane through the intersection would be required to bring the intersection back to a v/c ratio of 0.90. A conceptual sketch of Alternative 1 can be seen in **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

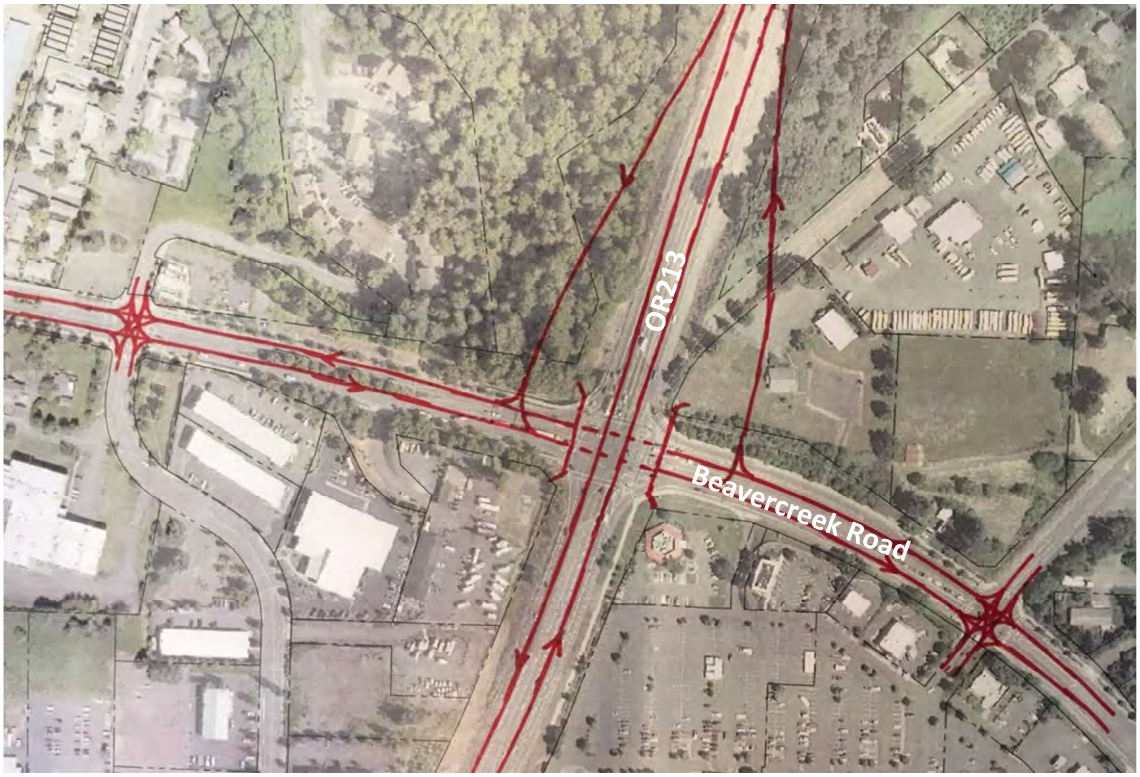


Exhibit 9 – Alternative 6: Full Diamond Interchange Alternative

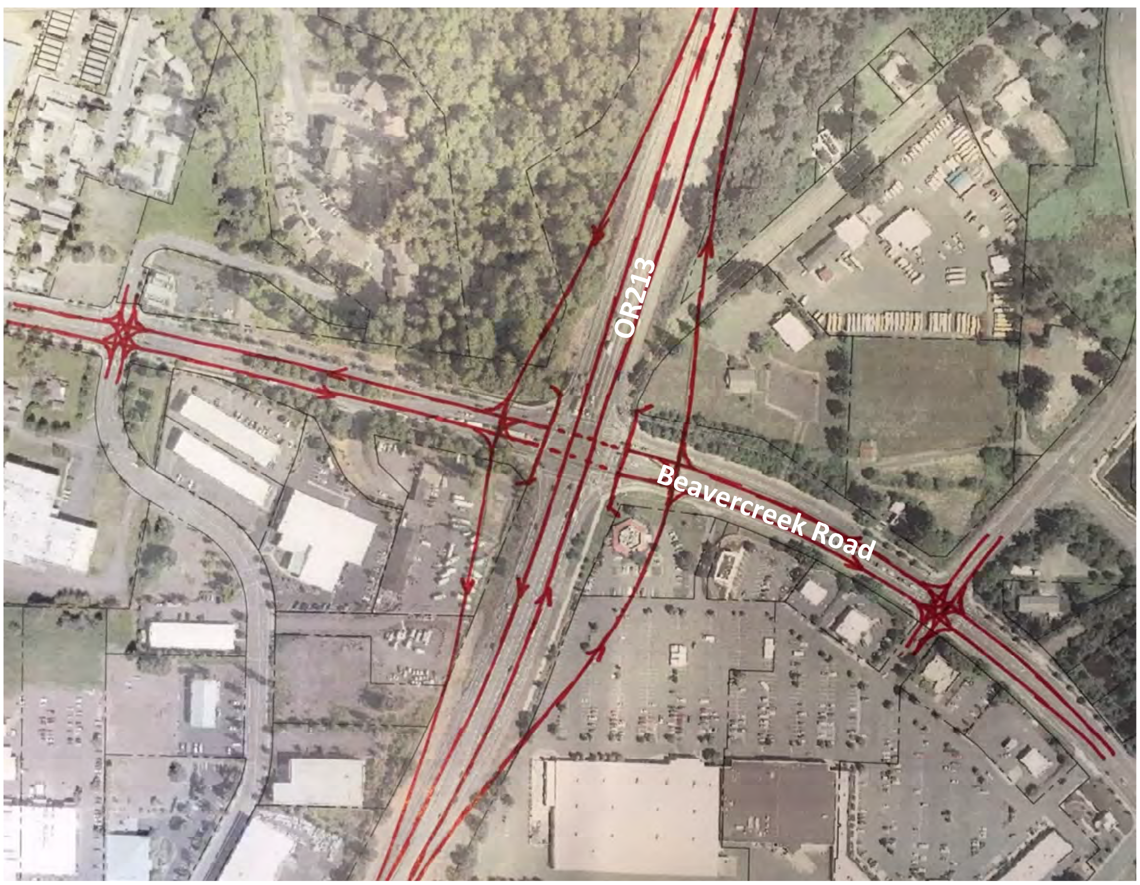
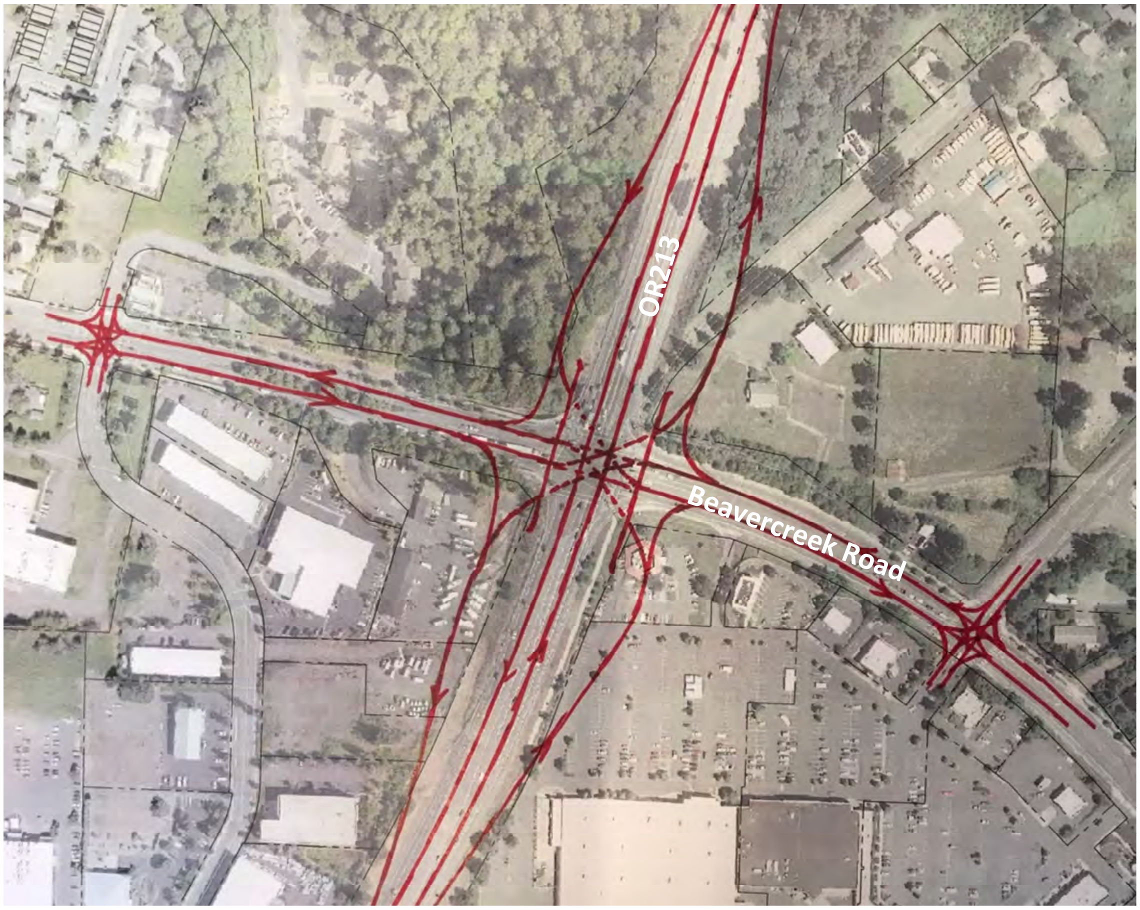


Exhibit 10 – Alternative 7: Single Point Interchange Alternative



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

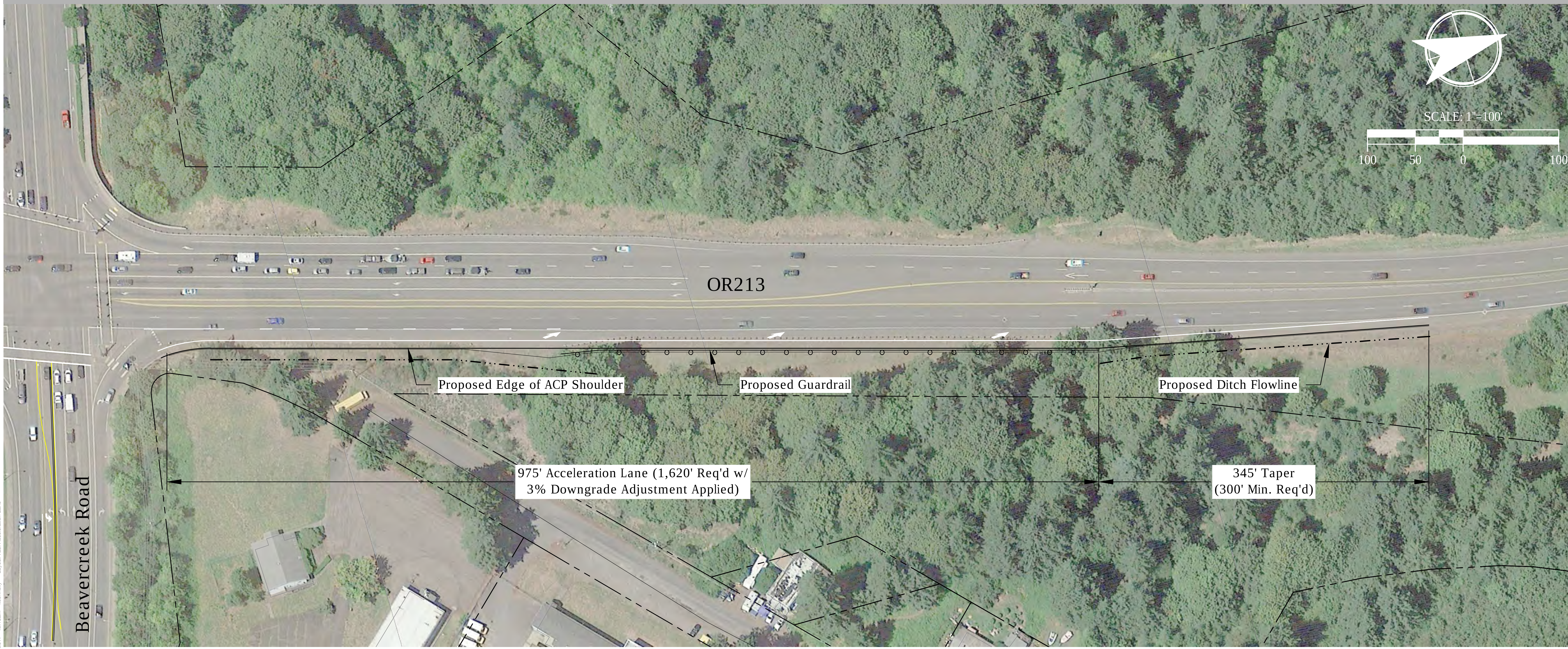


Figure 2

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

OR213 & Beavercreek Road
City of Oregon City

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			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 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.

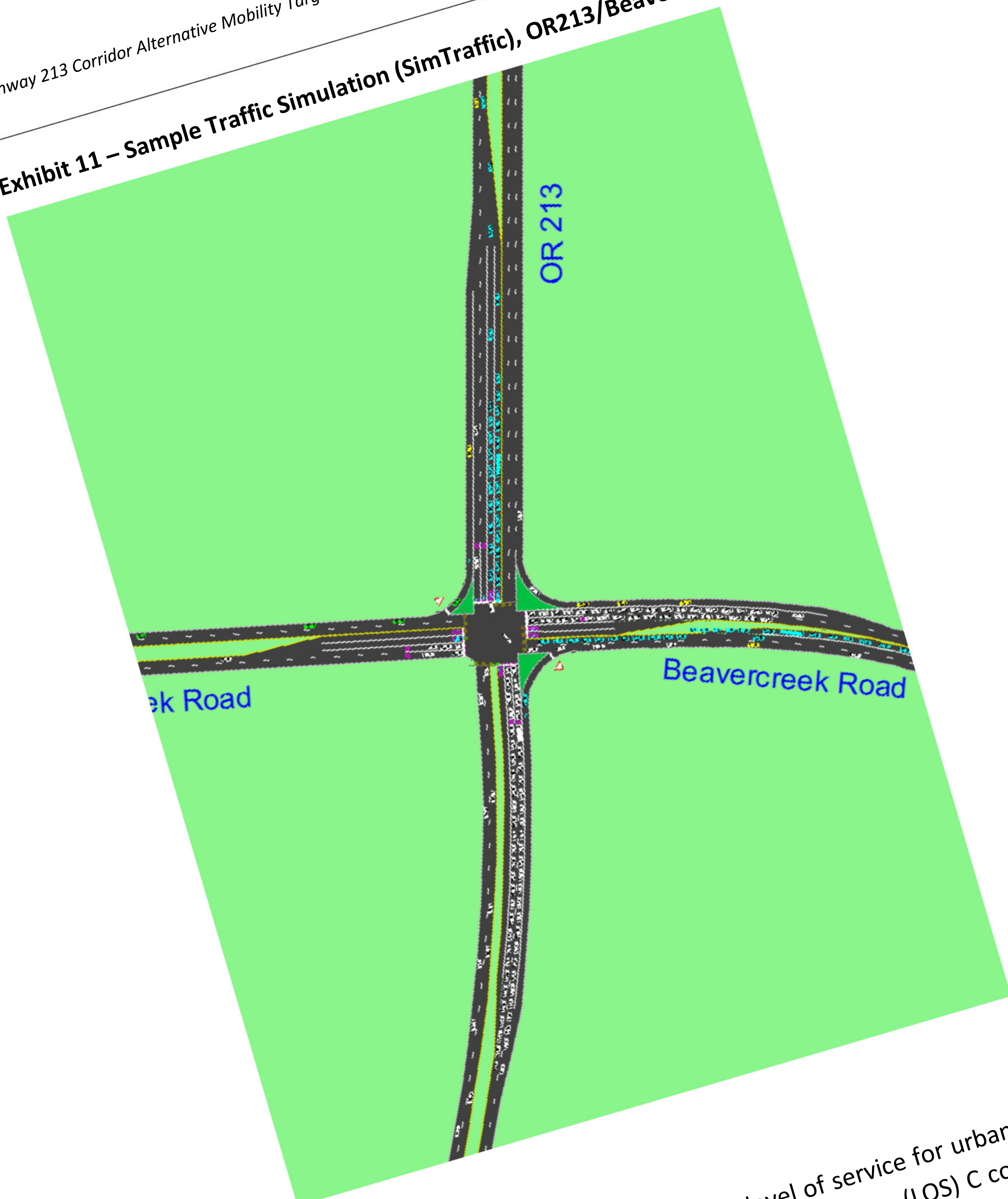
Segment Analysis Methodology

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 2^{nd} 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).

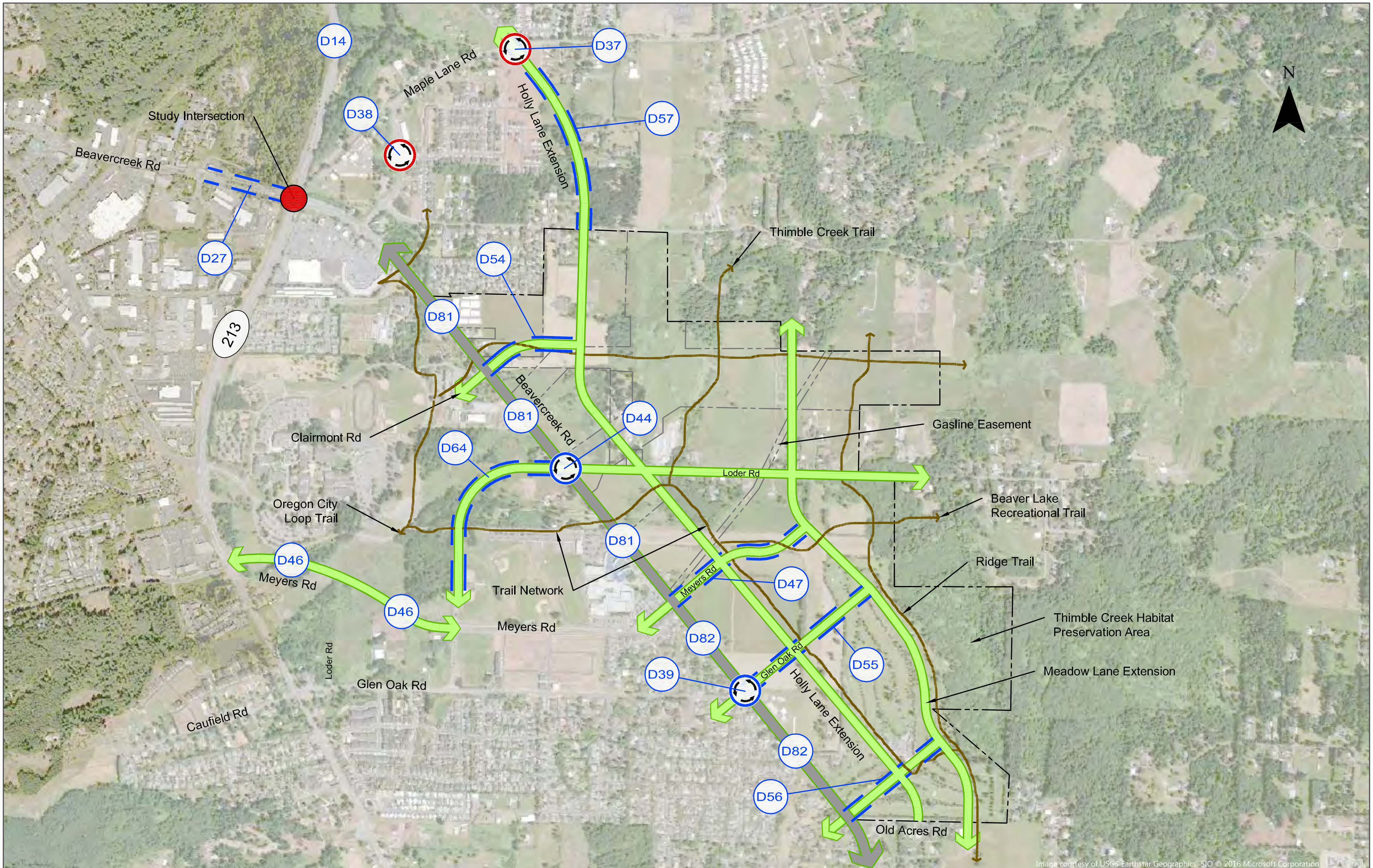
There is a stream running under the north leg of OR213 at the intersection, with corresponding wetlands. There are also geologic hazards in the vicinity of the intersection, with steep slopes and landslides primarily on the northwest corner. More details can be found in the Oregon City GIS maps in **Appendix 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

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.

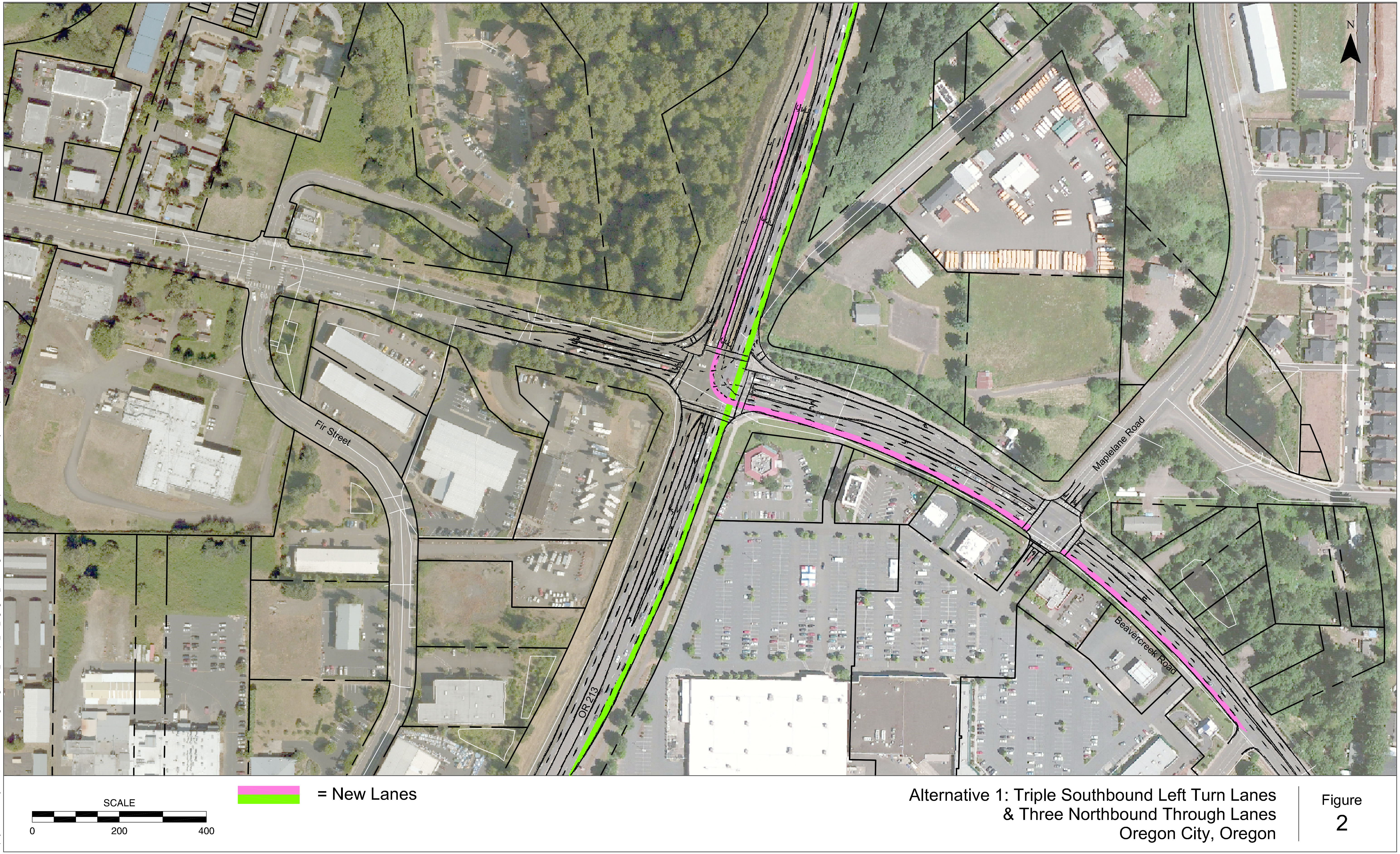
Alternatives to modify the existing intersection configuration and traffic control, which would bring the intersection into compliance with the current mobility standards in the year 2035, were identified and include:

- 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.



Alternative 1: Triple Southbound Left Turn Lanes
& Three Northbound Through Lanes
Oregon City, Oregon

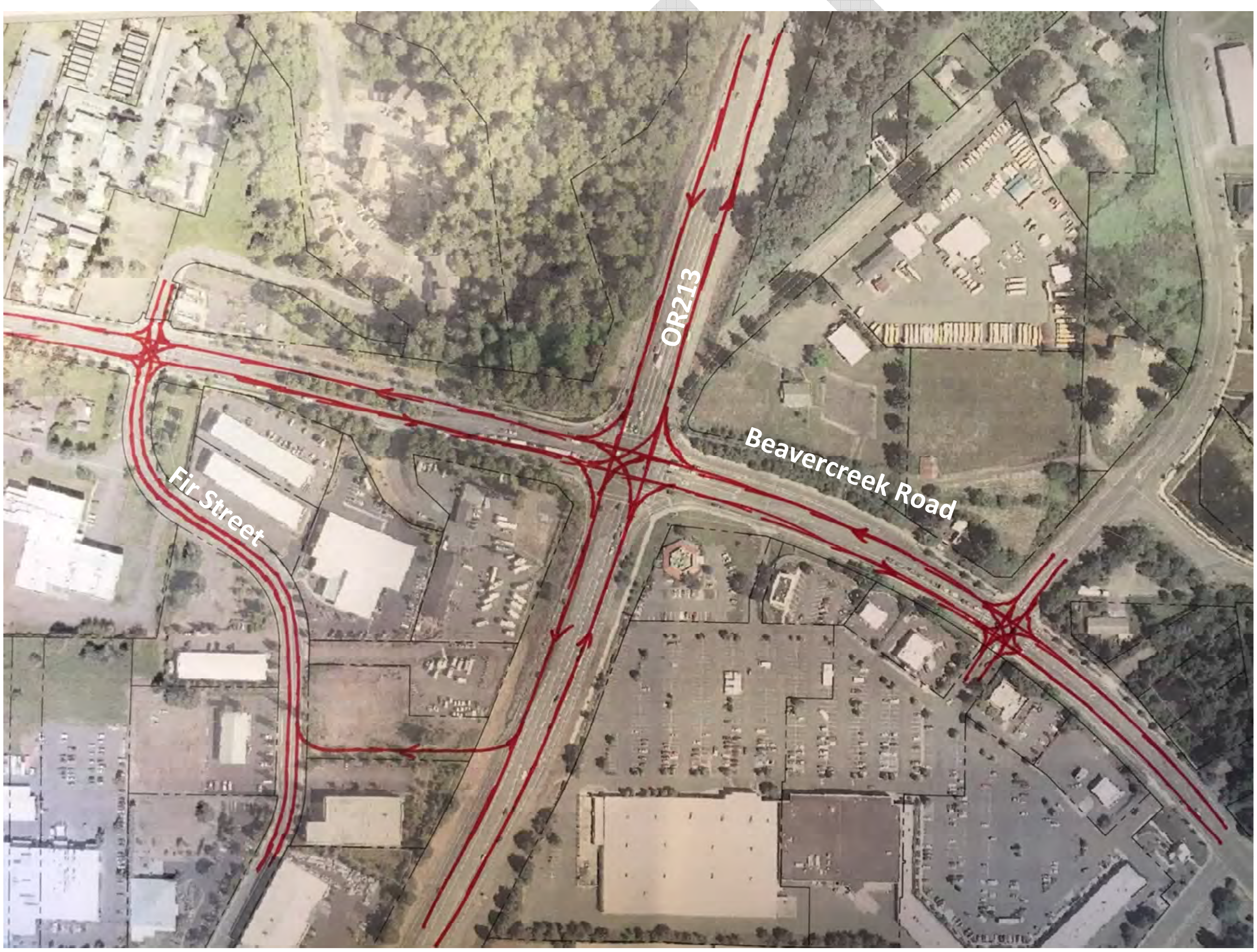
Figure 2

H:\projfile\20651 - Hwy 213 and Beavercreek Rd\dwgs\design\20651_Concepts_with_Highlighted_Lanes.dwg Dec 06, 2016 - 3:39pm - bcullimore Layout Tab: Triple Left (11x17)

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

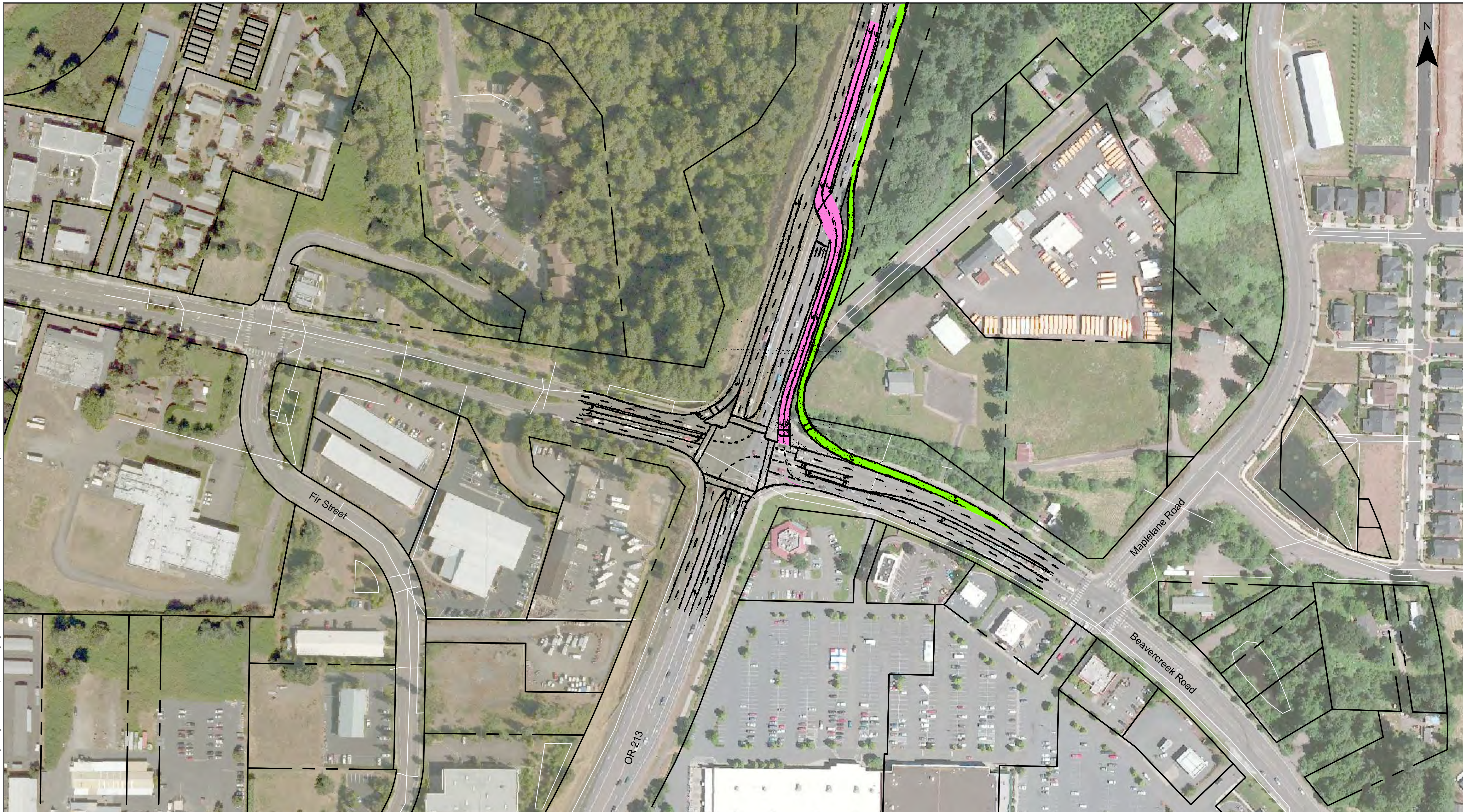


Alternatives 3 & 4: Displaced Left-Turns

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.

[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



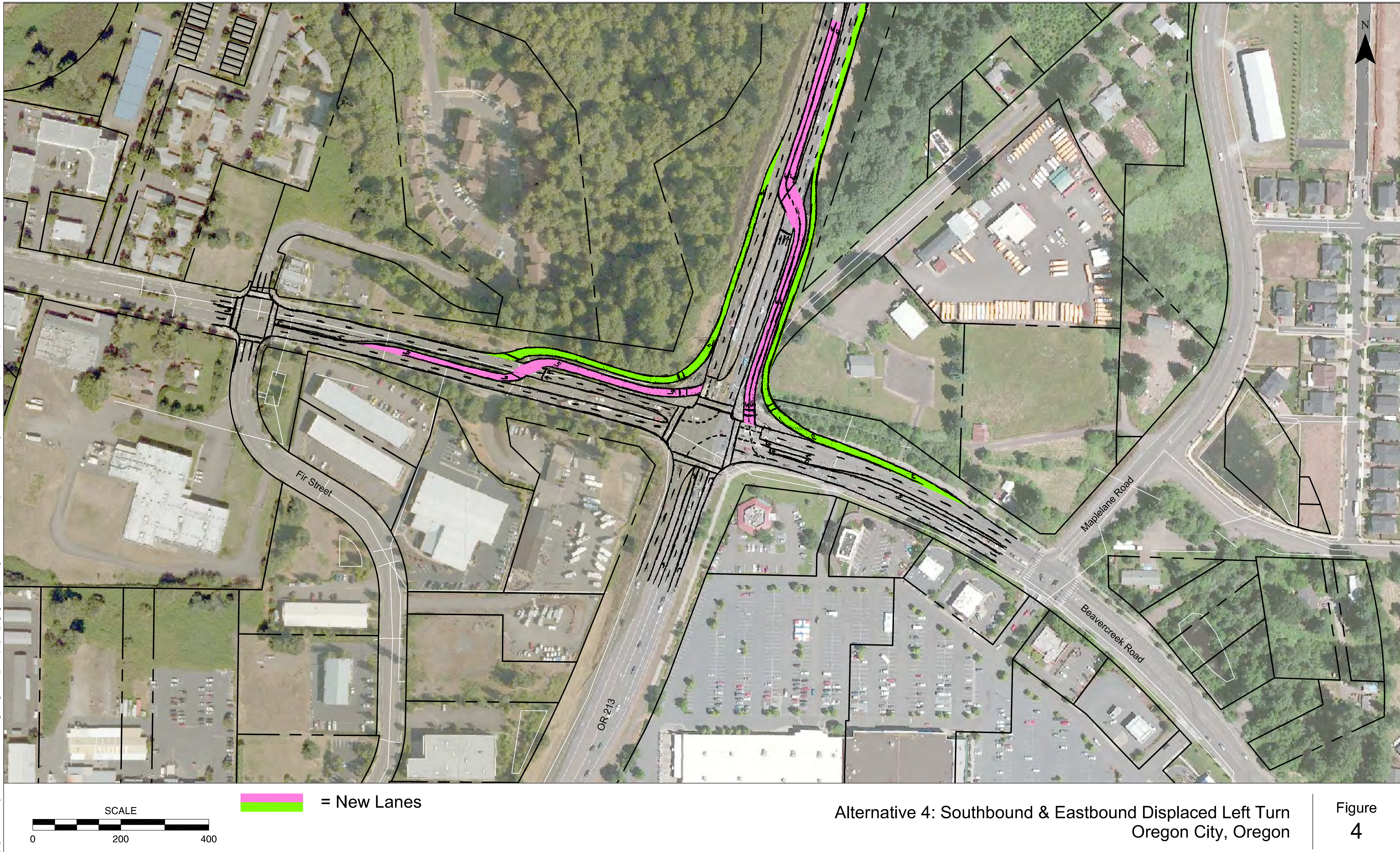
SCALE
0 200 400

= New Lanes

Alternative 3: Southbound Displaced Left Turn
Oregon City, Oregon

Figure
3

Kittelson & Associates, Inc.
Transportation Engineering/Planning



Alternative 4: Southbound & Eastbound Displaced Left Turn
Oregon City, Oregon

Figure
4

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

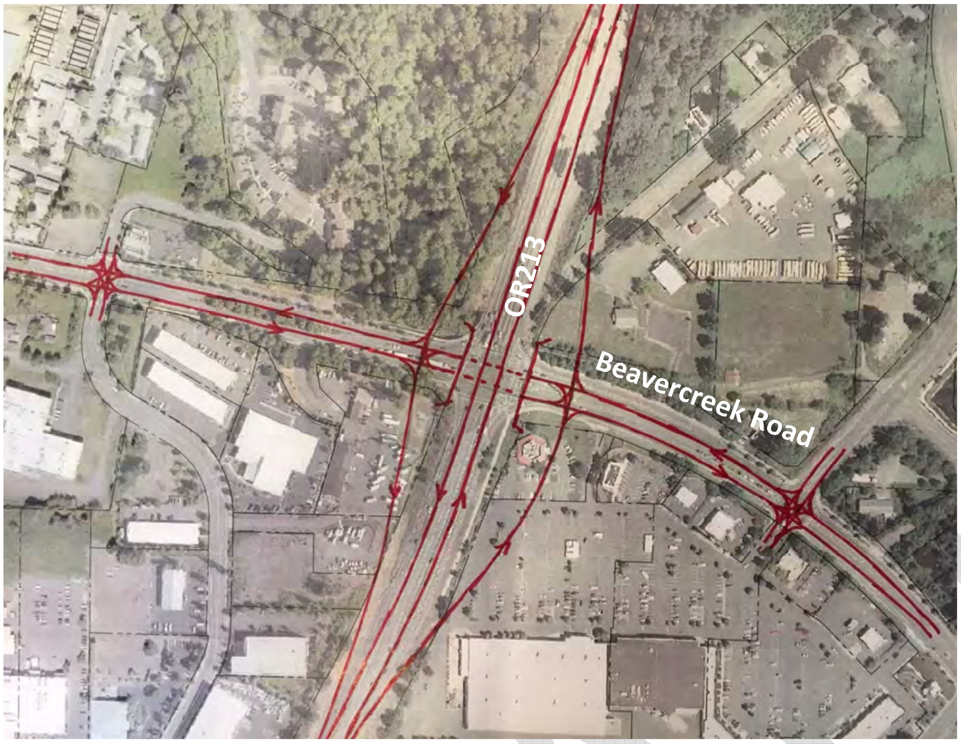
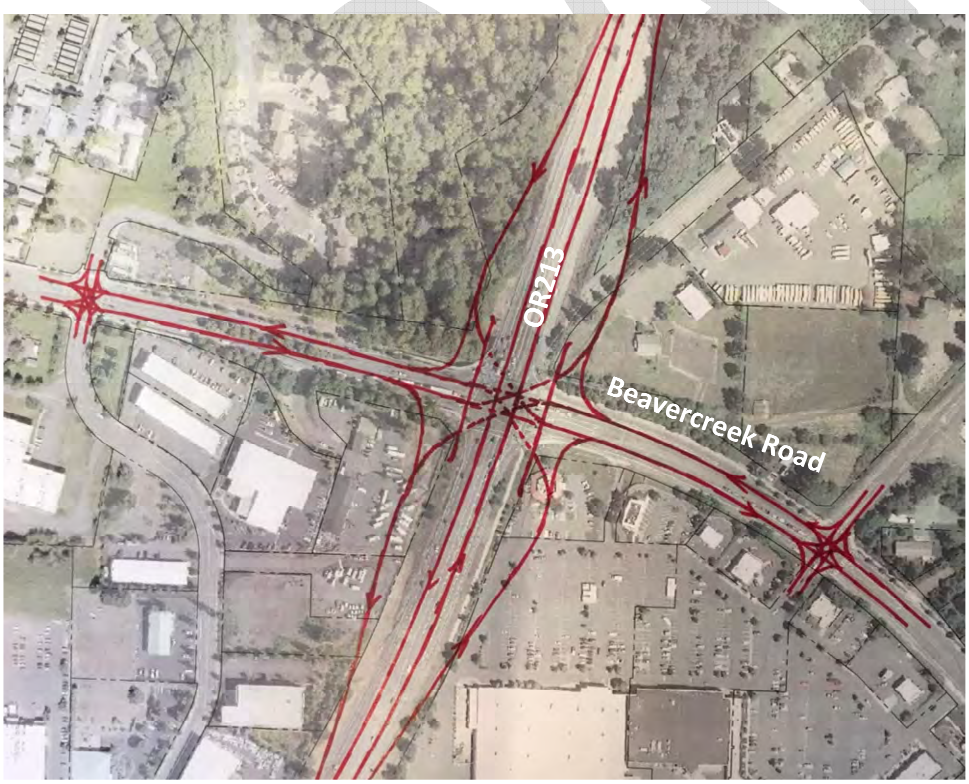


Exhibit 5. Single Point Interchange Alternative



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.

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.

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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

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

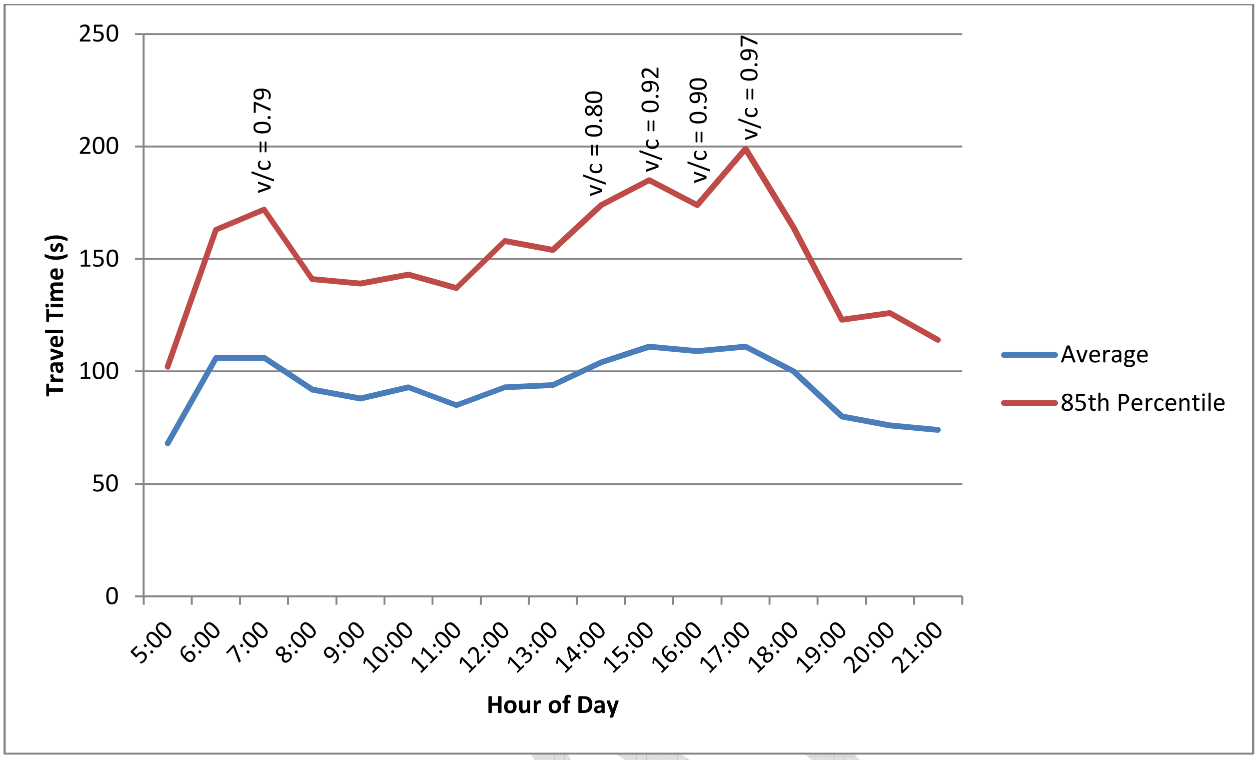
Year	PM Peak Volume-to-Capacity Ratio (v/c)
2011 (2013 TSP Existing Conditions)	0.83
2016 Traffic Volumes	0.97
2035 (2013 TSP Forecast)	1.05

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.

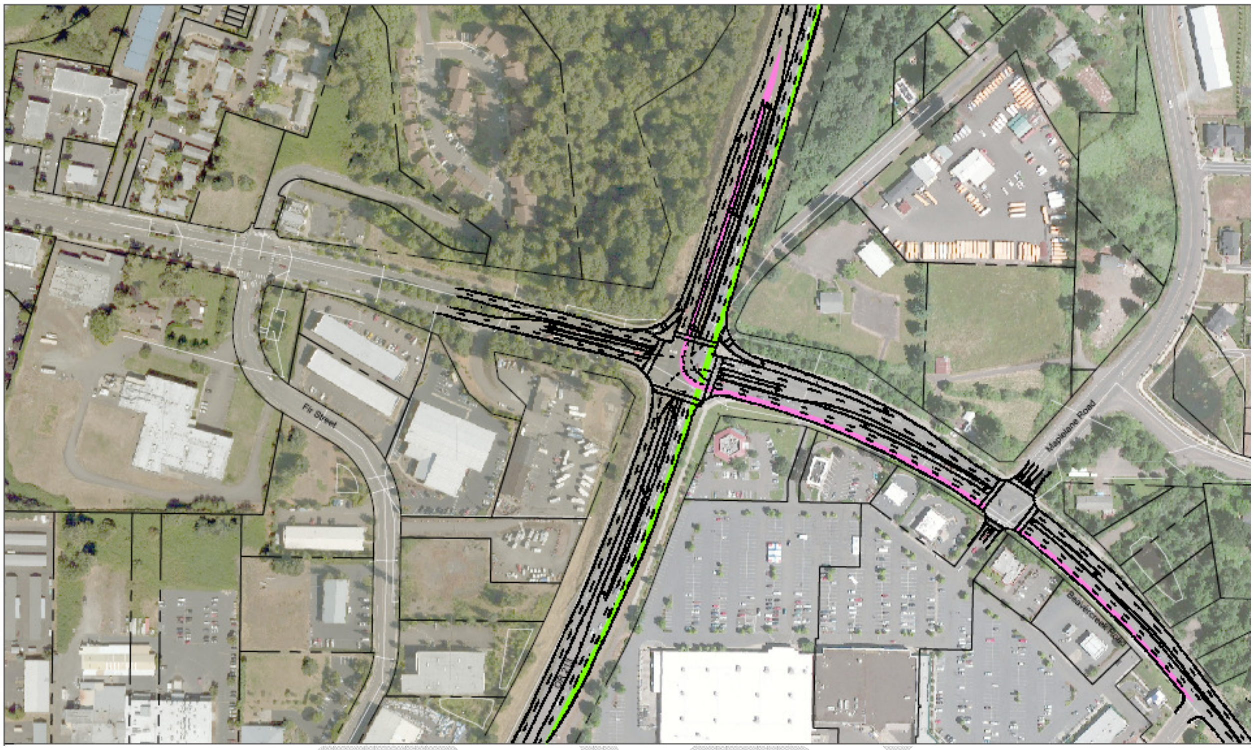
MAJOR IMPROVEMENT ALTERNATIVES (MEMORANDUM #1)

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

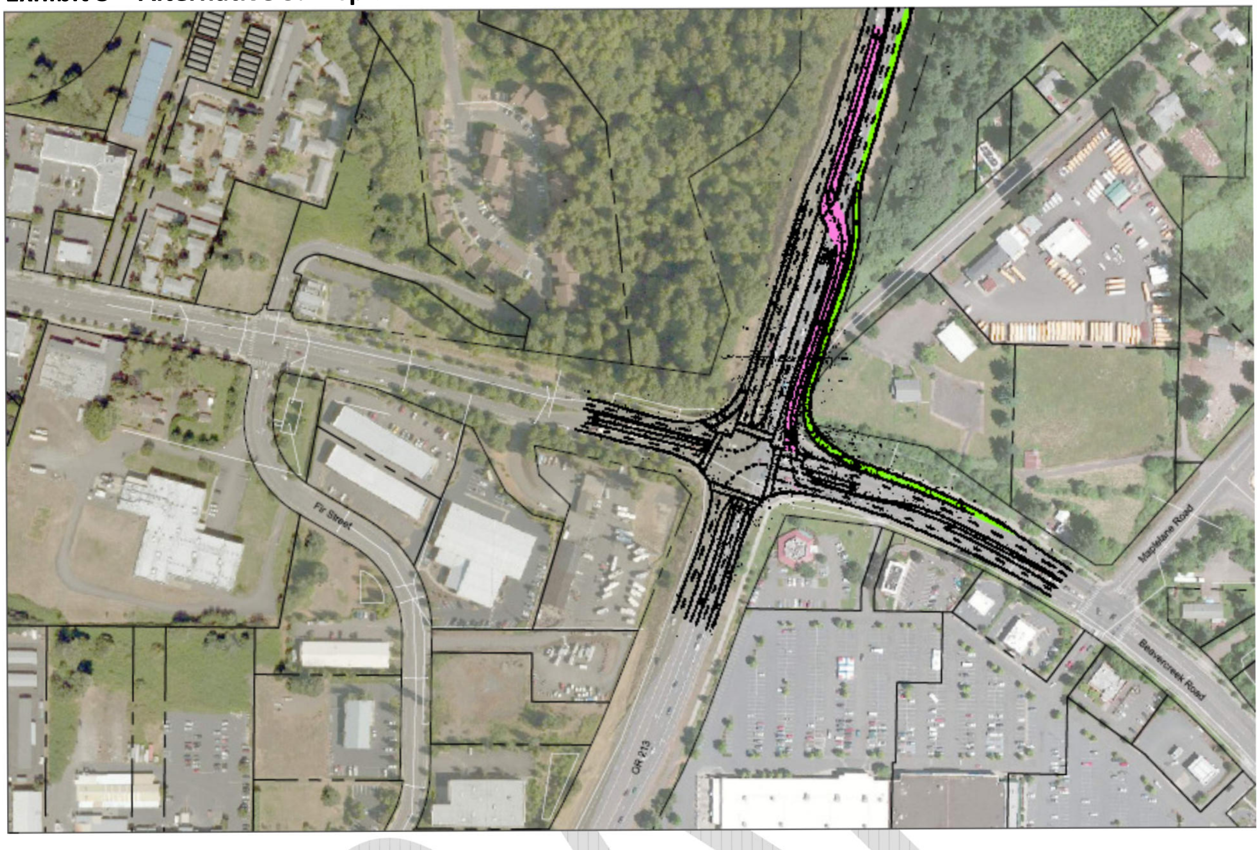


Alternative 3: Displaced Southbound Left-Turns

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.

Exhibit 4 – Full Diamond Interchange

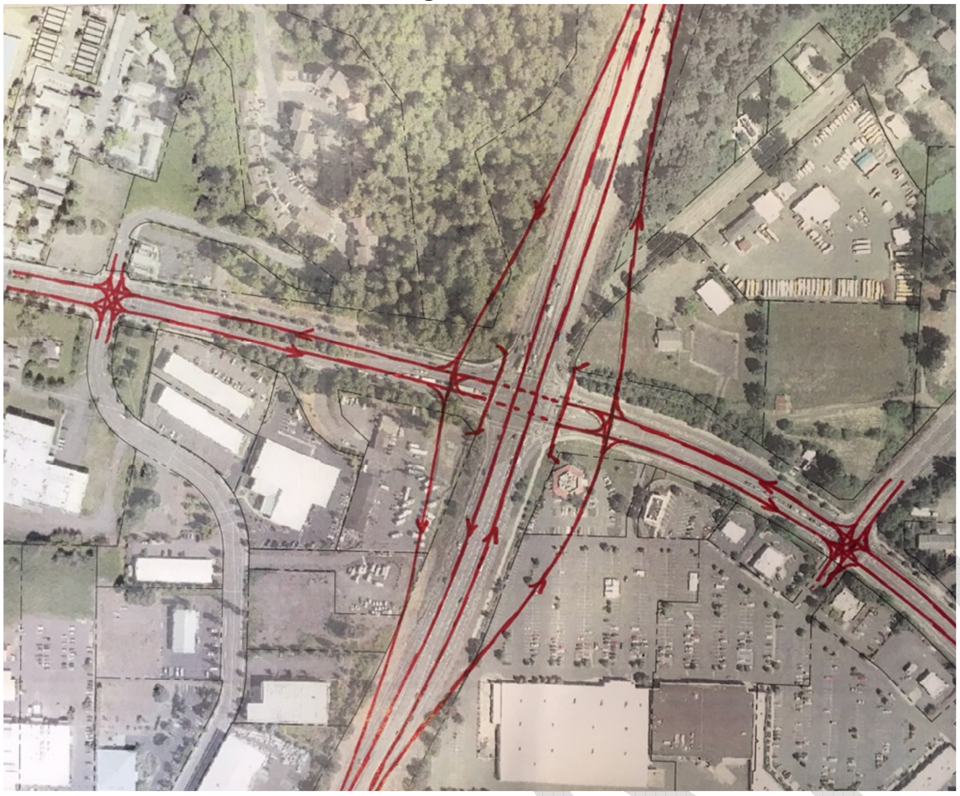


Exhibit 5 – Single Point Interchange

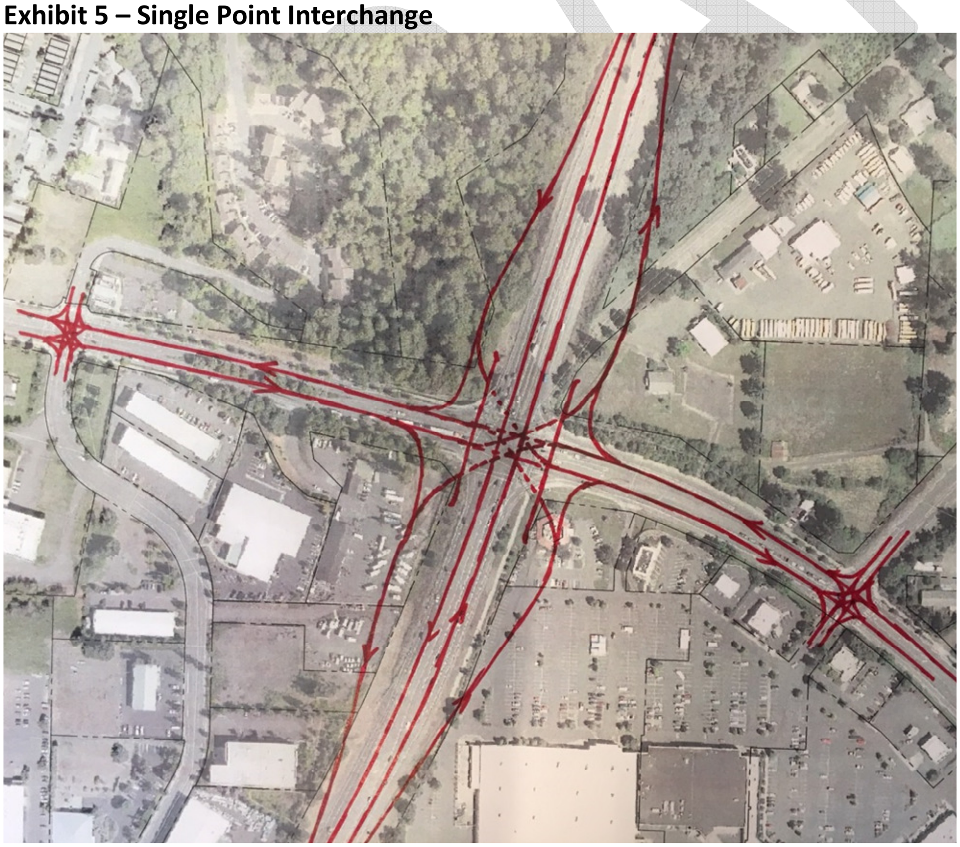


Table 3 – Intersection Alternatives Considered

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.

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.

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.

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.

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.

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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.

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			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

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.

Oregon City GIS Map

Legend

All Streets (labels only) - 4800

Landslides (SLIDO) - Historic L

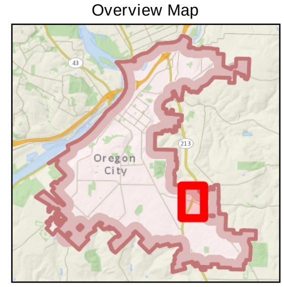
Slope Categories

- 0 - 10%
- 10 - 25%
- 25 - 35%
- > 35%

Basemap

Notes

Overview Map



N

0 400 Feet

1: 4,800

City of Oregon City
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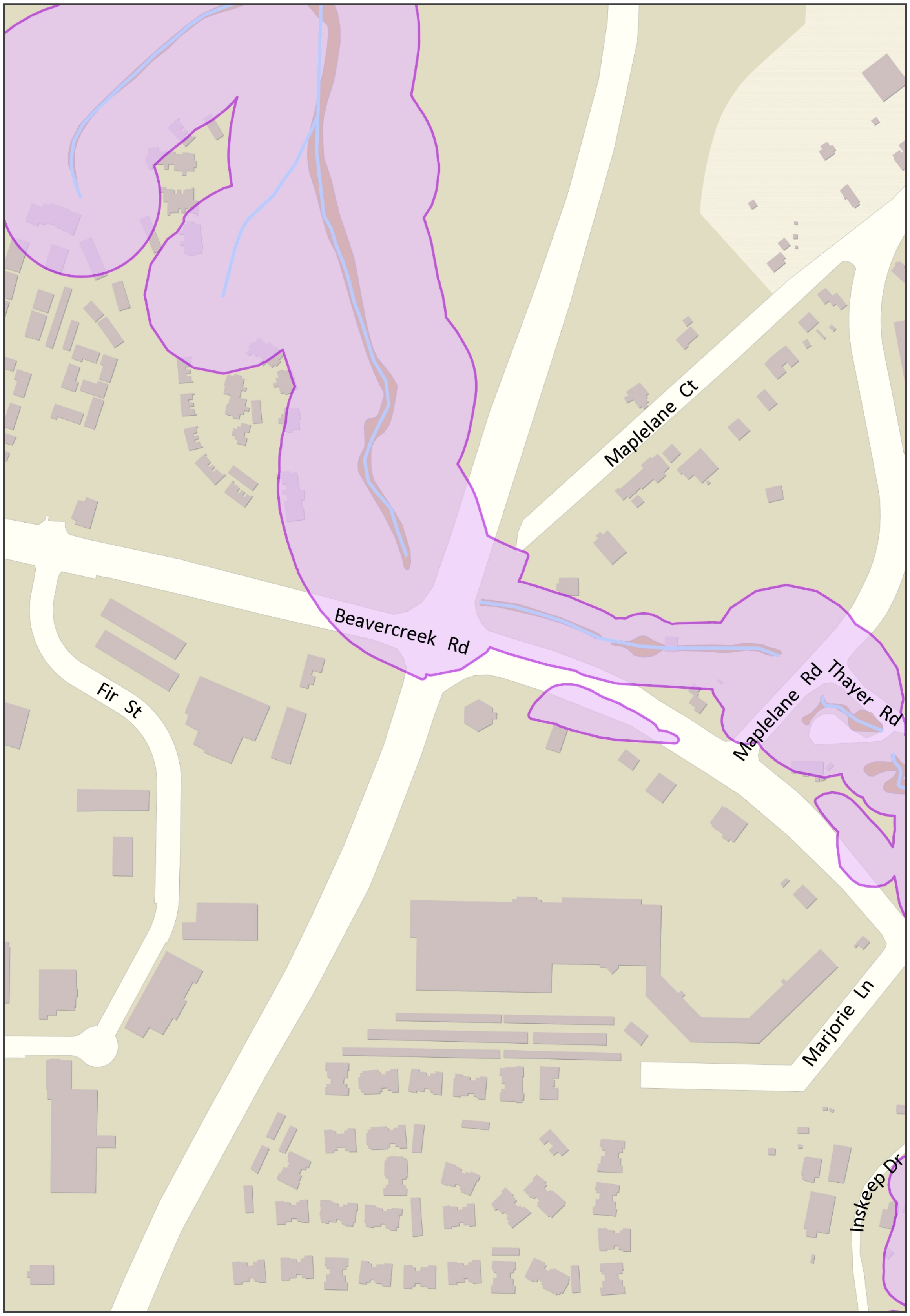
www.orcity.org

OREGON CITY

Map created 11/16/2016

Oregon City GIS Map



Legend

All Streets (labels only) - 4800

NROD - Natural Resource Ove

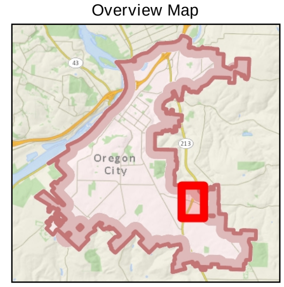
Title 3 - Streams

Title 3 - Wetlands

Basemap

Notes

Overview Map



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0 400 Feet

1: 4,800

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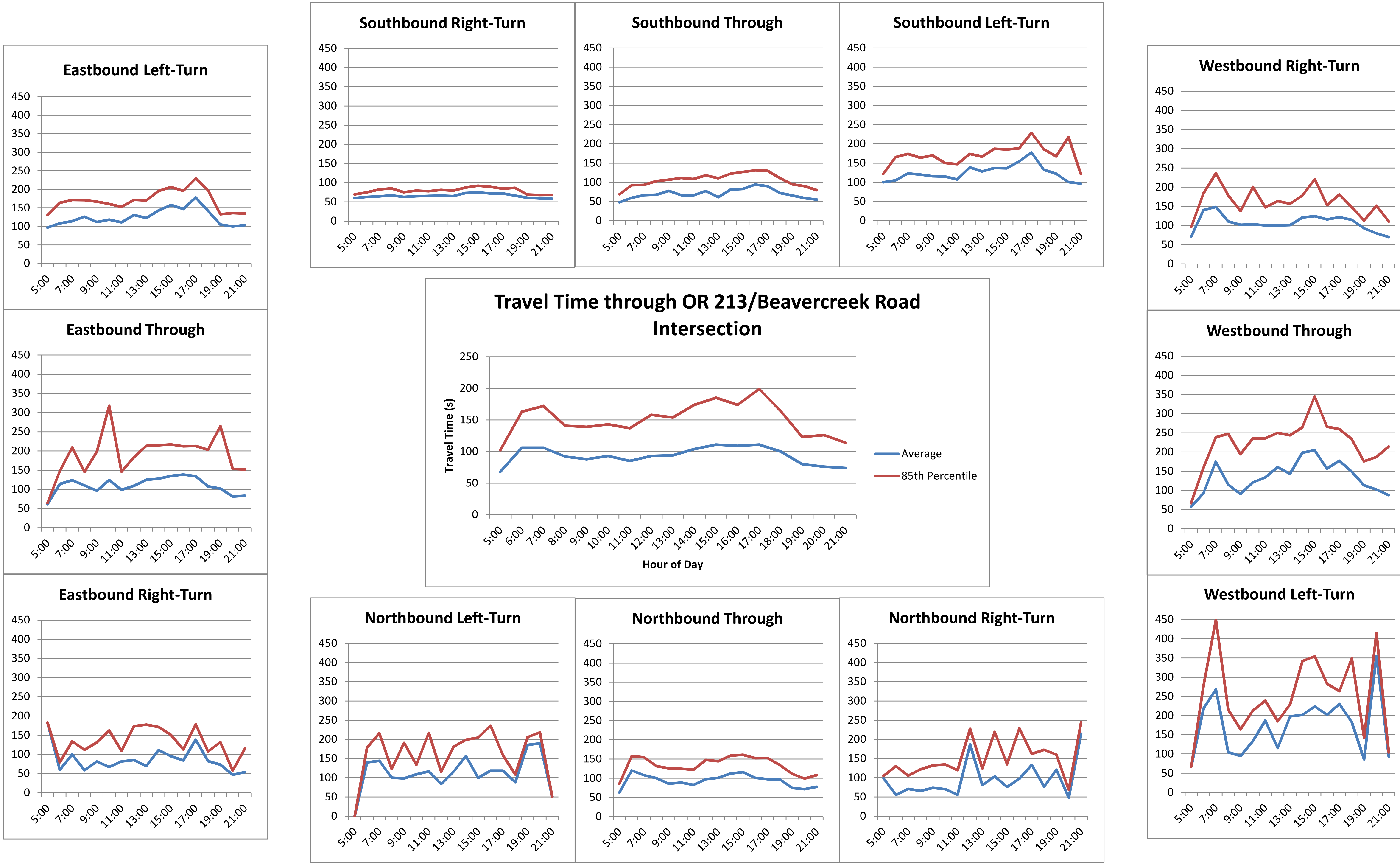
Attachment A: OR213/Beavercreek Road Intersection Travel Times (2017)



OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
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

```
      S  D
      P  R S W                                    RD#  FC   CONN #                          INT-TYP                                        SPCL USE
SER#   E A U C O  DATE        COUNTY              CMPT/MLG  FIRST  STREET         RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                       A  S
INVEST E L G H R  DAY/TIME    CITY                MILEPNT   SECOND STREET         DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP     OWNER     FROM       PRTC INJ        G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA          LRS       INTERSECTION SEQ#     LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY     V# VEH TYPE  TO      P# TYPE SVRTY    E  X  RES   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
                                                                                                                                                                                OR<25

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
                                                                                                                                                STRGHT  01 PED  INJB  14  M         01  028,020    035            18,14
                                                                                                                                                E  W
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160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

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       S  D
       P  R S W                                 RD#  FC   CONN #                          INT-TYP                                        SPCL USE
SER#   E A U C O  DATE         COUNTY           CMPT/MLG  FIRST  STREET        RD CHAR  (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP      TRLR QTY  MOVE                   A  S
INVEST E L G H R  DAY/TIME     CITY             MILEPNT   SECOND STREET        DIRECT     LEGS    TRAF-    RNDBT SURF  COLL TYP       OWNER     FROM      PRTC INJ     G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG     URBAN AREA       LRS       INTERSECTION SEQ#    LOCTN    (#LANES)  CNTL     DRVWY LIGHT SVRTY       V# VEH TYPE  TO     P# TYPE SVRTY  E  X  RES   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               016000100S00               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               016000100S00               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               016000100S00               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               016000100S00               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               016000100S00               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
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160 CASCADE HWY SOUTH   OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

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      S  D
      P  R S W                               RD#  FC   CONN #                          INT-TYP                                  SPCL USE
SER#   E A U C O DATE        COUNTY           CMPT/MLG FIRST  STREET        RD CHAR (MEDIAN)  INT-REL OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                 A S
INVEST E L G H R DAY/TIME    CITY             MILEPNT  SECOND STREET        DIRECT    LEGS    TRAF-   RNDBT SURF  COLL TYP     OWNER     FROM       PRTC INJ  G E LICNS PED
UNLOC? D C S L K LAT/LONG    URBAN AREA       LRS      INTERSECTION SEQ#    LOCTN   (#LANES)  CNTL    DRVWY LIGHT SVRTY    V# VEH TYPE  TO      P# TYPE SVRTY E X RES   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
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      S  D
      P  R S W                              RD#  FC   CONN #                          INT-TYP                                      SPCL USE
SER#   E A U C O DATE       COUNTY          CMPT/MLG FIRST  STREET      RD CHAR (MEDIAN)  INT-REL OFFRD WTHR  CRASH TYP  TRLR QTY  MOVE                     A  S
INVEST E L G H R DAY/TIME   CITY            MILEPNT  SECOND STREET      DIRECT    LEGS    TRAF-   RNDBT SURF  COLL TYP   OWNER     FROM      PRTC INJ       G  E LICNS PED
UNLOC? D C S L K LAT/LONG   URBAN AREA      LRS      INTERSECTION SEQ#  LOCTN   (#LANES) CNTL    DRVWY LIGHT SVRTY   V# VEH TYPE  TO     P# TYPE SVRTY  E  X RES   LOC ERROR      ACTN EVENT      CAUSE

                                                                                                                      02 NONE   0 STOP
                                                                                                                         PRVTE     SE NW                                                   011             00
                                                                                                                        PSNGR CAR          01 DRVR NONE  53 M OR-Y        000             000             00
                                                                                                                                                             OR<25

01346  N N N     04/22/2010 CLACKAMAS        1    14                      INTER     CROSS  N         N CLR   S-STRGHT  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   INJ         PSNGR CAR          01 DRVR NONE  62 M OR-Y        026             000             07
No     45 19 54.97  -122 34 30.30           016000100S00             1                                                                                       OR<25

                                                                                                                      02 NONE   0 STRGHT
                                                                                                                         PRVTE     SE NW                                                   006             00
                                                                                                                        PSNGR CAR          01 DRVR INJC  24 F OR-Y        000             000             00
                                                                                                                                                             OR<25

03556  N N N     10/01/2010 CLACKAMAS        1    14                      INTER     CROSS  N         N CLR   S-1STOP   01 NONE   0 STRGHT                                                                  07
NO RPT           Fri    7A  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  70 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 NONE  72 F OR-Y        000             000             00
                                                                                                                                                             OR<25

04388  N N N     11/20/2010 CLACKAMAS        1    14                      INTER     CROSS  N         N CLR   S-1STOP   01 NONE   0 STRGHT                                                                  07
NONE             Sat   12P  OREGON CITY      MN    0   S BEAVERCREEK RD  NE                YIELD     N DRY   REAR         PRVTE     S  N                                                    000             00
                            PORTLAND UA       2.98   CASCADE HY SOUTH   09          3               N DAY   PDO         PSNGR CAR          01 DRVR NONE  30 F OR-Y        026             000             07
No     45 19 54.97  -122 34 30.30           016000100S00             1                                                                                       OR<25
                                                                                                                                           02 PSNG NO<5  03 M             000             000             00

                                                                                                                      02 NONE   0 STOP
                                                                                                                         PRVTE     S  N                                                    011             00
                                                                                                                        PSNGR CAR          01 DRVR NONE  00 M UNK         000             000             00
                                                                                                                                                             OR<25

00158  N N N     01/13/2011 CLACKAMAS        1    14                      INTER     CROSS  N         N CLR   S-STRGHT  01 NONE   0 STRGHT                                                                  07
NONE             Thu    4A  OREGON CITY      MN    0   S BEAVERCREEK RD  NE                YIELD     N DRY   REAR         PRVTE     NE SW                                                   000             00
                            PORTLAND UA       2.98   CASCADE HY SOUTH   09          2               N DLIT  INJ         PSNGR CAR          01 DRVR INJC  36 F OR-Y        042             000             07
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  55 F OR-Y        000             000             00
                                                                                                                                                             OR>25

00268  N N N     01/22/2011 CLACKAMAS        1    14                      INTER     CROSS  N         N CLR   S-1STOP   01 NONE   0 STRGHT                                                                  07
NONE             Sat    1P  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  48 F OR-Y        026             000             07
No     45 19 54.97  -122 34 30.30           016000100S00             1                                                                                       OR<25
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160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

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      S   D
      P   R S W                              RD#  FC   CONN #                           INT-TYP                                     SPCL USE
SER#   E A U C O DATE        COUNTY          CMPT/MLG FIRST  STREET      RD CHAR (MEDIAN)  INT-REL OFFRD WTHR  CRASH TYP     TRLR QTY  MOVE                   A  S
INVEST E L G H R DAY/TIME    CITY            MILEPNT  SECOND STREET      DIRECT    LEGS    TRAF-   RNDBT SURF  COLL TYP      OWNER     FROM      PRTC INJ     G  E LICNS PED
UNLOC? D C S L K LAT/LONG    URBAN AREA      LRS      INTERSECTION SEQ#  LOCTN   (#LANES)  CNTL    DRVWY LIGHT SVRTY     V# VEH TYPE  TO     P# TYPE SVRTY E  X RES   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          016000100S00               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          016000100S00               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          016000100S00               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          016000100S00               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          016000100S00               1                                                                                  UNK
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160 CASCADE HWY SOUTH   OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

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       S   D
       P   R S W                                   RD#  FC    CONN #                                  INT-TYP                                        SPCL USE
SER#   E A U C O  DATE           COUNTY            CMPT/MLG  FIRST  STREET       RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP    TRLR QTY   MOVE                       A  S
INVEST E L G H R  DAY/TIME       CITY              MILEPNT   SECOND STREET       DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP     OWNER      FROM       PRTC INJ    G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG       URBAN AREA        LRS       INTERSECTION SEQ#   LOCTN    (#LANES) CNTL     DRVWY LIGHT SVRTY    V#  VEH TYPE   TO      P# TYPE SVRTY  E  X  RES   LOC  ERROR        ACTN EVENT     CAUSE

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     SE NW                                                  011            00
                                                                                                                                PSNGR CAR          01 DRVR NONE  22  F  OR-Y        000          000            00
                                                                                                                                                                        OR<25

03993  N N N      10/25/2011 CLACKAMAS         1    14                           INTER     CROSS   N             N FOG   S-1STOP  01 NONE    0 STRGHT                                                                07
NO RPT            Tue     6P 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 DARK  PDO        PSNGR CAR          01 DRVR NONE  00  F  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 NONE  64  M  OR-Y        000          000            00
                                                                                                                                                                        OR<25

04755  N N N      12/09/2011 CLACKAMAS         1    14                           INTER     CROSS   N             N CLR   S-1STOP  01 UNKN    0 STRGHT                                                       013      07
NONE              Fri     8A 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   PDO         UNKNOWN           01 DRVR NONE  00  U  UNK         026          000            07
No     45 19 54.97  -122 34 30.30              016000100S00                 1                                                                                           UNK

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     SE NW                                                  011  013       00
                                                                                                                                PSNGR CAR          01 DRVR NONE  25  F  OR-Y        000          000            00
                                                                                                                                                                        OR<25

                                                                                                                              03 NONE    0 STOP
                                                                                                                                 PRVTE     SE NW                                                  022            00
                                                                                                                                PSNGR CAR          01 DRVR NONE  00  F  UNK         000          000            00
                                                                                                                                                                        UNK

00376  N N N N N  01/28/2012 CLACKAMAS         1    14                           INTER     CROSS   N             N CLR   S-1STOP  01 NONE    0 STRGHT                                                                07
STATE             Sat     7P 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 DLIT  INJ        PSNGR CAR          01 DRVR NONE  45  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  19  F  OR-Y        000          000            00
                                                                                                                                                                        OR<25
                                                                                                                                                   02 PSNG INJC  20  F              000          000            00

00436  N N N      02/02/2012 CLACKAMAS         1    14                           INTER     CROSS   N             N CLR   S-1STOP  01 NONE    0 STRGHT                                                                07
NONE              Thu     4P 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  85  M  OR-Y        026          000            07
No     45 19 54.97  -122 34 30.30              016000100S00                 1                                                                                           OR<25

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 UNKN      SE NW                                                  011            00
                                                                                                                                PSNGR CAR          01 DRVR NONE  00  M  UNK         000          000            00
                                                                                                                                                                        UNK
```

160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	S P E D / E A U C O / E L G H R / D C S L K (S D R S W)	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	A G E	S E X	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?	S D / P R S W / E A U C O / E L G H R / D C S L K	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	A G E	S E X	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				

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      S   D
      P   R S W                                           RD#  FC   CONN #                                     INT-TYP                                         SPCL USE
SER#  E A U C O  DATE          COUNTY                     CMPT/MLG  FIRST  STREET       RD CHAR  (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP       TRLR QTY  MOVE                  A  S
INVEST E L G H R DAY/TIME      CITY                       MILEPNT   SECOND STREET       DIRECT    LEGS     TRAF-    RNDBT SURF  COLL TYP        OWNER     FROM      PRTC INJ    G  E  LICNS PED
UNLOC? D C S L K LAT/LONG      URBAN AREA                 LRS       INTERSECTION SEQ#   LOCTN    (#LANES)  CNTL     DRVWY LIGHT SVRTY      V#  VEH TYPE  TO     P#  TYPE SVRTY  E  X  RES   LOC ERROR       ACTN EVENT   CAUSE

                                                                                                                                            02 NONE   0  STOP
                                                                                                                                               PRVTE     SE NW                                                  011          00
                                                                                                                                               PSNGR CAR         01 DRVR INJC  70 M OR-Y      000           000          00
                                                                                                                                                                                   OR<25

04569  N N N    11/26/2012 CLACKAMAS               1    14                         INTER     CROSS   N          N CLD   S-1STOP    01 NONE   0  STRGHT                                                              27,07
NONE            Mon    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  66 F OR-Y      016,026       000          27,07
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 INJB  27 F OR-Y      000           000          00
                                                                                                                                                                                   OR<25
                                                                                                                                                                 02 PSNG NO<5  02 M           000           000          00

00193  N N N    01/17/2013 CLACKAMAS               1    14                         INTER     CROSS   N          N CLR   S-1STOP    01 NONE   0  STRGHT                                                              07
NONE            Thu   10A  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   PDO           PSNGR CAR         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  STOP
                                                                                                                                               PRVTE     SE NW                                                  011          00
                                                                                                                                               PSNGR CAR         01 DRVR NONE  29 F OR-Y      000           000          00
                                                                                                                                                                                   OR<25

00296  N N N    01/25/2013 CLACKAMAS               1    14                         INTER     CROSS   N          N UNK   S-1STOP    01 NONE   0  STRGHT                                                              07
NONE            Fri    7A  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  25 F OR-Y      026           000          07
No      45 19 54.96  -122 34 30.30                 016000100S00               1                                                                                     OR<25

                                                                                                                                            02 NONE   0  STOP
                                                                                                                                               PRVTE     SE NW                                                  011          00
                                                                                                                                               PSNGR CAR         01 DRVR INJC  24 F OR-Y      000           000          00
                                                                                                                                                                                   OR<25
                                                                                                                                                                 02 PSNG NO<5  03 M           000           000          00

03686  N N N    03/27/2013 CLACKAMAS               1    14                         INTER     CROSS   N          N CLR   S-1STOP    01 NONE   0  STRGHT                                                              07
NONE            Wed    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          3                N DAY   INJ           PSNGR CAR         01 DRVR NONE  00 F OR-Y      026           000          07
No      45 19 54.96  -122 34 30.30                 016000100S00               1                                                                                     OR<25

                                                                                                                                            02 NONE   0  STOP
                                                                                                                                               PRVTE     SE NW                                                  011          00
                                                                                                                                               PSNGR CAR         01 DRVR INJC  59 M OR-Y      000           000          00
                                                                                                                                                                                   OR<25

01343  N N N    04/10/2013 CLACKAMAS               1    14                         INTER     CROSS   N          N CLR   S-1STOP    01 NONE   0  STRGHT                                                              07
NONE            Wed    5P  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  00 F OR-Y      026           000          07
No      45 19 54.96  -122 34 30.30                 016000100S00               1                                                                                     OR<25
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160 CASCADE HWY SOUTH   OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

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      S   D
      P   R S W                                         RD#  FC   CONN #                          INT-TYP                                       SPCL USE
SER#  E A U C O  DATE         COUNTY                    CMPT/MLG  FIRST  STREET      RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                  A  S
INVEST E L G H R DAY/TIME     CITY                      MILEPNT   SECOND STREET      DIRECT   LEGS     TRAF-    RNDBT SURF  COLL TYP    OWNER     FROM     PRTC  INJ    G  E  LICNS  PED
UNLOC? D C S L K LAT/LONG     URBAN AREA                LRS       INTERSECTION SEQ#  LOCTN    (#LANES) CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE  TO    P# TYPE  SVRTY  E  X  RES    LOC  ERROR        ACTN EVENT      CAUSE

                                                                                                                                      02 NONE    0 STOP
                                                                                                                                         PRVTE     SE NW                                                     011             00
                                                                                                                                        PSNGR CAR         01 DRVR INJC  41  F  OR-Y        000              000             00
                                                                                                                                                                             OR<25

01405  N N N N N 04/24/2013  CLACKAMAS                  1    14                      INTER    CROSS    N           N CLR   S-1STOP    01 NONE    0 STRGHT                                                                    27,07
CITY             Wed    1P   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  23  F  OR-Y        016,043,026      000             27,07
No     45 19 54.96  -122 34 30.30                       016000100S00              1                                                                                          OR<25

                                                                                                                                      02 NONE    0 STOP
                                                                                                                                         PRVTE     SE NW                                                     011             00
                                                                                                                                        PSNGR CAR         01 DRVR INJC  27  F  OTH-Y       000              000             00
                                                                                                                                                                             OR<25

01782  N N N     05/21/2013  CLACKAMAS                  1    14                      INTER    CROSS    N           N CLR   S-1STOP    01 NONE    0 STRGHT                                                                    07
NONE             Tue    7A   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   PDO          PSNGR CAR         01 DRVR NONE  50  F  OR-Y        026              000             07
No     45 19 54.96  -122 34 30.30                       016000100S00              1                                                                                          OR<25

                                                                                                                                      02 NONE    0 STOP
                                                                                                                                         PRVTE     SE NW                                                     011             00
                                                                                                                                        PSNGR CAR         01 DRVR NONE  62  F  OR-Y        000              000             00
                                                                                                                                                                             OR<25

02276  N N N     06/27/2013  CLACKAMAS                  1    14                      INTER    CROSS    N           N CLR   S-1STOP    01 NONE    0 STRGHT                                                                    07
NONE             Thu   10A   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  00  M  UNK         026              000             07
No     45 19 54.96  -122 34 30.30                       016000100S00              1                                                                                          OR<25

                                                                                                                                      02 NONE    0 STOP
                                                                                                                                         PRVTE     SE NW                                                     011             00
                                                                                                                                        PSNGR CAR         01 DRVR INJC  63  F  OR-Y        000              000             00
                                                                                                                                                                             OR<25
                                                                                                                                                          02 PSNG NO<5  01  F              000              000             00

03212  N N N     08/29/2013  CLACKAMAS                  1    14                      INTER    CROSS    N           N RAIN  S-1STOP    01 NONE    0 STRGHT                                                                    07
CITY             Thu   11A   OREGON CITY                MN    0   S BEAVERCREEK RD   NE                TRF SIGNAL  N WET   REAR          PRVTE     SE NW                                                     000             00
                             PORTLAND UA                 2.98     CASCADE HY SOUTH   09           3                N DAY   INJ          PSNGR CAR         01 DRVR NONE  19  M  OR-Y        026              000             07
No     45 19 54.96  -122 34 30.30                       016000100S00              1                                                                                          OR<25

                                                                                                                                      02 NONE    0 STOP
                                                                                                                                         PRVTE     SE NW                                                     011             00
                                                                                                                                        PSNGR CAR         01 DRVR INJC  24  F  OR-Y        000              000             00
                                                                                                                                                                             OR<25

03276  N N N N N 09/01/2013  CLACKAMAS                  1    14                      INTER    CROSS    N           N CLR   S-1STOP    01 NONE    0 STRGHT                                                                    07
CITY             Sun   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  62  M  OR-Y        043,026          000             07
No     45 19 54.96  -122 34 30.30                       016000100S00              1                                                                                          OR<25
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160 CASCADE HWY SOUTH   OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

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       S   D
       P   R S W                                          RD#  FC    CONN #                            INT-TYP                                            SPCL USE
SER#   E A U C O  DATE            COUNTY                  CMPT/MLG  FIRST  STREET        RD CHAR  (MEDIAN)   INT-REL  OFFRD WTHR  CRASH TYP      TRLR QTY  MOVE                      A  S
INVEST E L G H R  DAY/TIME        CITY                    MILEPNT   SECOND STREET        DIRECT     LEGS     TRAF-    RNDBT SURF  COLL TYP       OWNER     FROM      PRTC  INJ     G  E  LICNS  PED
UNLOC? D C S L K  LAT/LONG        URBAN AREA              LRS       INTERSECTION SEQ#    LOCTN    (#LANES)   CNTL     DRVWY LIGHT SVRTY      V#  VEH TYPE  TO     P#  TYPE  SVRTY  E  X  RES    LOC  ERROR          ACTN EVENT        CAUSE

                                                                                                                                            02 NONE   0  STOP
                                                                                                                                                PRVTE     SE NW                                                          011               00
                                                                                                                                               PSNGR CAR          01 DRVR INJC  48 F OR-Y        000            000               00
                                                                                                                                                                                 OR>25
                                                                                                                                                                  02 PSNG INJC  49 F             000            000               00

03531  N N N      09/21/2013 CLACKAMAS            1    14                               INTER      CROSS  N            N CLR  S-1STOP   01 NONE   0  STRGHT                                                                       07
NONE              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            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  STOP
                                                                                                                                                PRVTE     SE NW                                                          011               00
                                                                                                                                               PSNGR CAR          01 DRVR INJC  44 F OR-Y        000            000               00
                                                                                                                                                                                 OR<25

04072  N N N      10/24/2013 CLACKAMAS            1    14                               INTER      CROSS  N            N FOG  S-1STOP   01 NONE   0  STRGHT                                                                       07
NONE              Thu     7A 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            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  STOP
                                                                                                                                                PRVTE     SE NW                                                          011               00
                                                                                                                                               PSNGR CAR          01 DRVR NONE  69 M OR-Y        000            000               00
                                                                                                                                                                                 OR<25

00987  N N N      03/11/2014 CLACKAMAS            1    14                               INTER      CROSS  N            N CLR  S-1STOP   01 NONE   0  STRGHT                                                                       07
NONE              Tue     6P 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 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  STOP
                                                                                                                                                PRVTE     SE NW                                                          011               00
                                                                                                                                               PSNGR CAR          01 DRVR NONE  36 M OR-Y        000            000               00
                                                                                                                                                                                 OR<25

00120  N N N      01/09/2014 CLACKAMAS            1    14                               INTER      CROSS  N            N RAIN ANGL-OTH  01 NONE   0  TURN-R                                                                       02
NONE              Thu     5P OREGON CITY          MN    0   S BEAVERCREEK RD            E                 TRF SIGNAL   N WET  TURN          PRVTE     W  S                                                           016               00
                             PORTLAND UA           2.98    CASCADE HY SOUTH             03            3                N DUSK PDO          PSNGR CAR          01 DRVR NONE  56 F OR-Y        028            000               02
No      45 19 54.97  -122 34 30.30                016000100S00                1                                                                                                  OR<25

                                                                                                                                            02 NONE   0  STRGHT
                                                                                                                                                PRVTE     N  S                                                           000               00
                                                                                                                                               PSNGR CAR          01 DRVR NONE  63 M UNK         000            000               00
                                                                                                                                                                                 OR>25

03359  N N N      09/17/2010 CLACKAMAS            1    14                               INTER      CROSS  N            N RAIN S-1STOP   01 NONE   0  STRGHT                                                                       07
NONE              Fri     1P OREGON CITY          MN    0   S BEAVERCREEK RD            E                 TRF SIGNAL   N WET  REAR          PRVTE     E  W                                                           000               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
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      S   D
      P   R S W                             RD#  FC   CONN #                              INT-TYP                                     SPCL USE
SER#   E A U C O  DATE        COUNTY        CMPT/MLG  FIRST  STREET       RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE               A  S
INVEST E L G H R  DAY/TIME    CITY          MILEPNT   SECOND STREET       DIRECT    LEGS     TRAF-    RNDBT SURF  COLL TYP    OWNER     FROM        PRTC INJ    G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA    LRS       INTERSECTION SEQ#   LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE  TO       P# TYPE SVRTY  E  X  RES   LOC ERROR         ACTN EVENT     CAUSE

                                                                                                                          02 NONE    0 STOP
                                                                                                                             PRVTE     E  W                                                  011              00
                                                                                                                             PSNGR CAR          01 DRVR NONE  19 M OR-Y        000          000              00
                                                                                                                                                                   OR<25

04643  N N Y N N 12/06/2010 CLACKAMAS     1    14                   INTER     CROSS  N           N CLD   S-1STOP    01 NONE    0 STRGHT                                                          093     07
STATE            Mon   10P  OREGON CITY   MN    0   S BEAVERCREEK RD    E                TRF SIGNAL  N DRY   REAR          PRVTE     E  W                                                  000              00
                            PORTLAND UA     2.98    CASCADE HY SOUTH    06          2                N DLIT  PDO           PSNGR CAR          01 DRVR NONE  40 F OR-Y        026          000  093         07
No     45 19 54.97  -122 34 30.30          016000100S00             1                                                                                       OR<25

                                                                                                                          02 NONE    0 STOP
                                                                                                                             PRVTE     E  W                                                  011              00
                                                                                                                             PSNGR CAR          01 DRVR NONE  55 F OR-Y        000          000              00
                                                                                                                                                                   OR<25

01893  N N N     05/30/2013 CLACKAMAS     1    14                   INTER     CROSS  N           N CLD   ANGL-STP   01 NONE    1 TURN-R                                                                   22
CITY             Thu    2P  OREGON CITY   MN    0   S BEAVERCREEK RD    E                TRF SIGNAL  N DRY   TURN          PRVTE     S  E                                                  000              22
                            PORTLAND UA     2.98    CASCADE HY SOUTH    06          3                N DAY   INJ           SEMI TOW           01 DRVR NONE  29 M OR-Y        017          017              00
No     45 19 54.96  -122 34 30.30          016000100S00             1                                                                                       OR<25

                                                                                                                          02 NONE    0 STOP
                                                                                                                             PRVTE     E  W                                                  012              00
                                                                                                                             PSNGR CAR          01 DRVR INJC  48 F OR-Y        000          000              00
                                                                                                                                                                   OR<25

00353  N N N     01/25/2012 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    SE               YIELD       N WET   REAR          PRVTE     SW NE                                                 000              00
                            PORTLAND UA     2.98    CASCADE HY SOUTH    09          2                N DLIT  INJ           PSNGR CAR          01 DRVR NONE  18 M OR-Y        026          000              07
No     45 19 54.97  -122 34 30.30          016000100S00             1                                                                                       OR<25

                                                                                                                          02 NONE    0 STOP
                                                                                                                             PRVTE     SW NE                                                 011              00
                                                                                                                             PSNGR CAR          01 DRVR INJC  50 F OR-Y        000          000              00
                                                                                                                                                                   OR<25

02025  N N N     06/03/2012 CLACKAMAS     1    14                   INTER     CROSS  N           N UNK   S-1STOP    01 NONE    0 STRGHT                                                                   07
NONE             Sun    5P  OREGON CITY   MN    0   S BEAVERCREEK RD    SE               YIELD       N UNK   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        026          000              07
No     45 19 54.97  -122 34 30.30          016000100S00             1                                                                                       OR<25

                                                                                                                          02 NONE    0 STOP
                                                                                                                             PRVTE     SW NE                                                 011              00
                                                                                                                             PSNGR CAR          01 DRVR NONE  46 M OR-Y        000          000              00
                                                                                                                                                                   OR<25

03609  N N N     09/29/2012 CLACKAMAS     1    14                   INTER     CROSS  N           N CLR   S-1STOP    01 NONE    0 STRGHT                                                                   07
NO RPT           Sat    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  38 M OR-Y        026          000              07
No     45 19 54.97  -122 34 30.30          016000100S00             1                                                                                       OR<25
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160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

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      S  D
      P  R S W                                   RD#  FC    CONN #                          INT-TYP                                        SPCL USE
SER#  E A U C O  DATE         COUNTY             CMPT/MLG  FIRST  STREET         RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY   MOVE                       A  S
INVEST E L G H R  DAY/TIME    CITY               MILEPNT   SECOND STREET         DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP    OWNER      FROM       PRTC INJ        G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA         LRS       INTERSECTION SEQ#     LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE   TO      P# TYPE SVRTY   E  X  RES   LOC ERROR       ACTN EVENT      CAUSE

                                                                                                                                 02 NONE    0 STOP
                                                                                                                                    PRVTE      SW NE                                                   011                 00
                                                                                                                                    PSNGR CAR              01 DRVR INJC  24 M OR-Y        000          000                 00
                                                                                                                                                                                 OR<25
                                                                                                                                                           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        026          000                 07
No      45 19 54.96  -122 34 30.30             016000100S00               1                                                                                                      OR<25

                                                                                                                                 02 NONE    0 STOP
                                                                                                                                    PRVTE      SW NE                                                   011  004            00
                                                                                                                                    PSNGR CAR              01 DRVR NONE  73 M OR-Y        000          000                 00
                                                                                                                                                                                 OR<25

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        026          000                 07
No      45 19 54.96  -122 34 30.30             016000100S00               1                                                                                                      OR<25

                                                                                                                                 02 NONE    0 STOP
                                                                                                                                    PRVTE      SW NE                                                   011                 00
                                                                                                                                    PSNGR CAR              01 DRVR INJC  32 F OR-Y        000          000                 00
                                                                                                                                                                                 OR<25

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        026          000                 07
No      45 19 54.96  -122 34 30.30             016000100S00               1                                                                                                      OR<25

                                                                                                                                 02 NONE    0 STOP
                                                                                                                                    PRVTE      SW NE                                                   011                 00
                                                                                                                                    PSNGR CAR              01 DRVR INJC  74 M OR-Y        000          000                 00
                                                                                                                                                                                 OR<25

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        026          000                 07
No      45 19 54.96  -122 34 30.30             016000100S00               1                                                                                                      OR<25

                                                                                                                                 02 NONE    0 STOP
                                                                                                                                    PRVTE      SW NE                                                   011                 00
                                                                                                                                    PSNGR CAR              01 DRVR NONE  59 F OR-Y        000          000                 00
                                                                                                                                                                                 OR<25

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         042          000                 07
No      45 19 54.97  -122 34 30.30             016000100S00               1                                                                                                      UNK
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160 CASCADE HWY SOUTH OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

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       S  D
       P  R S W                               RD#  FC   CONN #                         INT-TYP                                         SPCL USE
SER#   E A U C O  DATE         COUNTY         CMPT/MLG  FIRST  STREET      RD CHAR  (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                    A  S
INVEST E L G H R  DAY/TIME     CITY           MILEPNT   SECOND STREET      DIRECT     LEGS    TRAF-    RNDBT SURF  COLL TYP     OWNER     FROM     PRTC INJ       G  E  LICNS  PED
UNLOC? D C S L K  LAT/LONG     URBAN AREA     LRS       INTERSECTION SEQ#  LOCTN    (#LANES)  CNTL     DRVWY LIGHT SVRTY     V# VEH TYPE  TO    P# TYPE SVRTY    E  X  RES    LOC ERROR      ACTN EVENT     CAUSE

                                                                                                                          02 NONE    0 STRGHT
                                                                                                                             PRVTE     SW NE                                                   006            00
                                                                                                                             PSNGR CAR          01 DRVR NONE  18 M OR-Y      000           000            00
                                                                                                                                                                   OR<25

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      026           000            29
No     45 19 54.97  -122 34 30.30         016000100S00              1                                                                                              OR<25

                                                                                                                          02 NONE    0 STOP
                                                                                                                             PRVTE     SW NE                                                   011            00
                                                                                                                             PSNGR CAR          01 DRVR NONE  69 M OR-Y      000           000            00
                                                                                                                                                                   OR<25

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      026           000            07
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 INJC  24 F OR-Y      000           000            00
                                                                                                                                                                   OR<25
                                                                                                                                                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      026           000            07
No     45 19 54.97  -122 34 30.30         016000100S00              1                                                                                              OR<25

                                                                                                                          02 NONE    0 STOP
                                                                                                                             PRVTE     S  N                                                    012            00
                                                                                                                             PSNGR CAR          01 DRVR INJB  51 M OR-Y      000           000            00
                                                                                                                                                                   OR<25

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      026           000            07
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  39 M OR-Y      000           000            00
                                                                                                                                                                   OR>25

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      026           000            07
No     45 19 54.97  -122 34 30.30         016000100S00              1                                                                                              OR<25
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SER# / INVEST / UNLOC?	S P / D / E A U C O / R S W / E L G H R / D C S L K	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	A / G / E	S / E / X	LICNS / RES	PED / LOC	ERROR	ACTN	EVENT	CAUSE
												02	NONE 0	STOP											
													PRVTE	S N									011		00
													PSNGR CAR		01	DRVR	NONE	32	F	OR-Y		000	000		00
																				OR<25					
04652	N N N N N	12/03/2011	CLACKAMAS	1 14		INTER	CROSS	N	N	FOG	S-1STOP	01	NONE 0	STRGHT											27,07
NONE		Sat 9A	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	INJ		PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		016,026	000		27,07
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	INJC	73	M	OR-Y		000	000		00
																				OR<25					
00069	N N N N N	01/06/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										004	07
STATE		Fri 2P	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	3		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	16	F	OR-Y		043,026	000		07
No		*45 19 54.97 -122 34 30.30*		016000100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	S N									011	004	00
													PSNGR CAR		01	DRVR	INJC	55	F	OR-Y		000	000		00
																				OR<25					
02327	N N N N N	06/29/2012	CLACKAMAS	1 14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07,27
UNK		Fri 7A	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	INJ		PSNGR CAR		01	DRVR	NONE	53	M	OR-Y		026,016	038		07,27
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	INJC	44	F	OR-Y		000	000		00
																				OR<25					
03411	N N N	09/13/2013	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Fri 11A	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	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	63	F	OR-Y		026	000		07
No		*45 19 54.96 -122 34 30.30*		016000100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	S N									011		00
													PSNGR CAR		01	DRVR	NONE	00	M	UNK		000	000		00
																				UNK					
03520	N N N	09/20/2013	CLACKAMAS	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Fri 6A	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	3		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		026	000		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

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      S   D
      P   R S W                                  RD#  FC   CONN #                                INT-TYP                                      SPCL USE
SER#  E A U C O DATE        COUNTY               CMPT/MLG  FIRST  STREET      RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY   MOVE                  A  S
INVEST E L G H R DAY/TIME   CITY                 MILEPNT   SECOND STREET      DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP    OWNER      FROM       PRTC INJ   G  E  LICNS PED
UNLOC? D C S L K LAT/LONG   URBAN AREA           LRS       INTERSECTION SEQ#  LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE TO      P# TYPE SVRTY E  X  RES   LOC  ERROR          ACTN EVENT          CAUSE

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     S  N                                                       011                 00
                                                                                                                                PSNGR CAR          01 DRVR INJC  29 M OR-Y       000            000                 00
                                                                                                                                                                      OR<25

03630  N N N    09/27/2013 CLACKAMAS         1    14                          INTER     CROSS  N          N CLR   S-1STOP   01 NONE    0 STRGHT                                                                         07
NONE           Fri     5A  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          3               N DAWN  PDO         PSNGR CAR          01 DRVR NONE  34 F OR-Y       026            000                 07
No      45 19 54.96  -122 34 30.30           016000100S00             1                                                                                               OR<25

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     S  N                                                       011                 00
                                                                                                                                PSNGR CAR          01 DRVR NONE  49 F OR-Y       000            000                 00
                                                                                                                                                                      OR<25

00463  Y N N N N 02/05/2014 CLACKAMAS        1    14                          INTER     CROSS  N          N CLR   S-1STOP   01 NONE    0 STRGHT                                                                         07,01
COUNTY         Wed     5A  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          3               N DLIT  INJ         PSNGR CAR          01 DRVR NONE  19 M OTH-Y      026,047        000                 07,01
No      45 19 54.97  -122 34 30.30           016000100S00             1                                                                                               N-RES

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     S  N                                                       011                 00
                                                                                                                                PSNGR CAR          01 DRVR INJC  44 F OR-Y       000            000                 00
                                                                                                                                                                      OR<25

00709  N N N    02/17/2014 CLACKAMAS         1    14                          INTER     CROSS  N          N RAIN  S-1STOP   01 NONE    0 STRGHT                                                                         07
NONE           Mon     5A  OREGON CITY       MN    0   S BEAVERCREEK RD       S                TRF SIGNAL N WET   REAR         UNKN      S  N                                                       000                 00
                           PORTLAND UA        2.98     CASCADE HY SOUTH       06          3               N DLIT  INJ         PSNGR CAR          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     S  N                                                       011                 00
                                                                                                                                PSNGR CAR          01 DRVR INJC  55 M OR-Y       000            000                 00
                                                                                                                                                                      OR<25

01295  N N N    04/03/2014 CLACKAMAS         1    14                          INTER     CROSS  N          N CLR   S-1STOP   01 NONE    0 STRGHT                                                                         07
NONE           Thu     9A  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          3               N DAY   PDO         PSNGR CAR          01 DRVR NONE  20 F OR-Y       026            000                 07
No      45 19 54.97  -122 34 30.30           016000100S00             1                                                                                               OR<25

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 UNKN      S  N                                                       011                 00
                                                                                                                                PSNGR CAR          01 DRVR NONE  00 M UNK        000            000                 00
                                                                                                                                                                      UNK

02651  N N N    06/26/2014 CLACKAMAS         1    14                          INTER     CROSS  N          N CLR   S-1STOP   01 NONE    0 STRGHT                                                                         29
NO RPT         Thu     2P  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          3               N DAY   PDO         PSNGR CAR          01 DRVR NONE  00 F UNK        026            000                 29
No      45 19 54.97  -122 34 30.30           016000100S00             1                                                                                               OR<25
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SER# INVEST UNLOC?	S P E A U C O / D R S W / E L G H R / D C S L K	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	S N									011		00
														PSNGR CAR		01	DRVR	NONE	22	M	OR-Y		000	000		00
																					OR<25					
02801	N N N	07/21/2014	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE		Mon 11A	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	3		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	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	INJC	20	F	OR-Y		000	000		00
																					OR<25					
03583	N N N	10/04/2010	CLACKAMAS	1	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 1	STRGHT											07
NO RPT		Mon 3P	OREGON CITY	MN 0		S BEAVERCREEK RD	W		TRF SIGNAL	N	WET	REAR		PRVTE	W E									000		00
			PORTLAND UA	2.98		CASCADE HY SOUTH	06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		026	000		07
No		*45 19 54.47 -122 34 30.52*		016000100S00		1															OR<25					
													02	NONE 0	STOP										
														PRVTE	W E									011		00
														PSNGR CAR		01	DRVR	INJC	21	M	OR-Y		000	000		00
																					OR<25					
01378	N N N	01/12/2011	CLACKAMAS	1	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
NONE		Wed 12P	OREGON CITY	MN 0		S BEAVERCREEK RD	W		TRF SIGNAL	N	WET	REAR		PRVTE	W E									000		00
			PORTLAND UA	2.98		CASCADE HY SOUTH	06	2		N	DAY	PDO		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	W E									011		00
														PSNGR CAR		01	DRVR	NONE	54	M	OR-Y		000	000		00
																					OR<25					
03959	N N N	10/07/2014	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE		Tue 7A	OREGON CITY	MN 0		S BEAVERCREEK RD	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000		00
			PORTLAND UA	2.98		CASCADE HY SOUTH	06	3		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		026	026		29
No		*45 19 54.97 -122 34 30.30*		016000100S00		1															OR<25					
													02	NONE 0	STOP										
														PRVTE	W E									011		00
														PSNGR CAR		01	DRVR	NONE	28	M	OR-Y		000	000		00
																					OR<25					
03636	N N N	10/08/2010	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Fri 6A	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	2		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		026	000		07
No		*45 19 54.97 -122 34 30.30*		016000100S00		1															OR<25					

SER# INVEST UNLOC?	S P E A U C O / D E L G H R / R S W D C S L K	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	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
													02	NONE 0	STOP										
														PRVTE	NE SW									011	00
														PSNGR CAR		01	DRVR	NONE	00	M	OTH-Y		000	000	00
																					UNK				
03710	N N N	10/11/2010	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	POLCE 0	STRGHT										07
NONE		Mon 7A	OREGON CITY	MN	0	S BEAVERCREEK RD	NW		YIELD	N	WET	REAR		UNKN	NE SW									000	00
			PORTLAND UA	2.98		CASCADE HY SOUTH	09	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	U	UNK		026	000	07
No		*45 19 54.97 -122 34 30.30*		016000100S00		1															UNK				
													02	NONE 0	STOP										
														PRVTE	NE SW									011	00
														PSNGR CAR		01	DRVR	INJC	56	F	OR-Y		000	000	00
																					OR<25				
01141	N N N	04/04/2011	CLACKAMAS	1	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
NONE		Mon 11A	OREGON CITY	MN	0	S BEAVERCREEK RD	NW		YIELD	N	WET	REAR		PRVTE	NE SW									000	00
			PORTLAND UA	2.98		CASCADE HY SOUTH	09	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		026	000	07
No		*45 19 54.97 -122 34 30.30*		016000100S00		1															UNK				
													02	NONE 0	STOP										
														PRVTE	NE SW									011	00
														PSNGR CAR		01	DRVR	NONE	44	M	OR-Y		000	000	00
																					OR<25				
04735	N N N	12/08/2011	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE		Thu 1P	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	70	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	64	F	OR-Y		000	000	00
																					OR<25				
03846	N N N	10/15/2012	CLACKAMAS	1	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										07
NONE		Mon 5P	OREGON CITY	MN	0	S BEAVERCREEK RD	NW		YIELD	N	WET	REAR		PRVTE	NE SW									000	00
			PORTLAND UA	2.98		CASCADE HY SOUTH	09	3		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	46	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	00	F	OR-Y		000	000	00
																					OR<25				
04066	N N N	10/29/2012	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE		Mon 12P	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	24	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

```
      S  D
      P  R S W                                   RD#  FC   CONN #                         INT-TYP                                     SPCL USE
SER#  E A U C O  DATE         COUNTY             CMPT/MLG FIRST  STREET     RD CHAR (MEDIAN)  INT-REL OFFRD WTHR  CRASH TYP     TRLR QTY  MOVE                   A  S
INVEST E L G H R DAY/TIME     CITY               MILEPNT  SECOND STREET     DIRECT    LEGS    TRAF-   RNDBT SURF  COLL TYP      OWNER     FROM     PRTC INJ    G  E LICNS PED
UNLOC? D C S L K LAT/LONG     URBAN AREA         LRS      INTERSECTION SEQ# LOCTN   (#LANES)  CNTL    DRVWY LIGHT SVRTY     V# VEH TYPE  TO     P# TYPE SVRTY E  X RES   LOC ERROR      ACTN EVENT   CAUSE

                                                                                                                       02 NONE    0 STOP
                                                                                                                          PRVTE     NE SW                                               011           00
                                                                                                                          PSNGR CAR          01 DRVR INJC  52 F OR-Y       000          000           00
                                                                                                                                                               OR<25

04076  N N N     10/29/2012 CLACKAMAS          1    14                      INTER     CROSS   N           N CLR  S-1STOP   01 NONE    0 STRGHT                                                            07
NONE             Mon    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  INJ          PSNGR CAR          01 DRVR NONE  50 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 INJB  46 M OR-Y       000          000           00
                                                                                                                                                               OR<25

04216  Y N N     11/08/2012 CLACKAMAS          1    14                      INTER     CROSS   N           Y CLD  FIX OBJ   01 NONE    0 STRGHT                                                   055      01
CITY             Thu    2P  OREGON CITY        MN    0   S BEAVERCREEK RD   NW                YIELD       N DRY  FIX          PRVTE     NE SW                                               000 055       00
                            PORTLAND UA          2.98    CASCADE HY SOUTH   09          3                 N DAY  INJ          PSNGR CAR          01 DRVR INJC  51 F OR-Y       047,081      000           01
No     45 19 54.97  -122 34 30.30              016000100S00             1                                                                                      OR<25

02430  N N N     07/07/2013 CLACKAMAS          1    14                      INTER     CROSS   N           N CLR  S-1STOP   01 NONE    0 STRGHT                                                            07
NONE             Sun   12P  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  00 F UNK        026          000           07
No     45 19 54.96  -122 34 30.30              016000100S00             1                                                                                      OR<25

                                                                                                                       02 NONE    0 STOP
                                                                                                                          PRVTE     NE SW                                               011           00
                                                                                                                          PSNGR CAR          01 DRVR INJC  36 M OR-Y       000          000           00
                                                                                                                                                               OR<25

03349  N N N N N 09/10/2013 CLACKAMAS          1    14                      INTER     CROSS   N           N CLR  S-1STOP   01 NONE    0 STRGHT                                                            07
CITY             Tue    1P  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  60 F OR-Y       043,026      000           07
No     45 19 54.96  -122 34 30.30              016000100S00             1                                                                                      OR<25

                                                                                                                       02 NONE    0 STOP
                                                                                                                          PRVTE     NE SW                                               011           00
                                                                                                                          PSNGR CAR          01 DRVR INJC  30 F OR-Y       000          000           00
                                                                                                                                                               OR<25

04790  N N N     12/12/2013 CLACKAMAS          1    14                      INTER     CROSS   N           N CLR  S-1STOP   01 NONE    0 STRGHT                                                            07
NONE             Thu    2P  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  54 M OR-Y       026          000           07
No     45 19 54.96  -122 34 30.30              016000100S00             1                                                                                      OR<25

                                                                                                                       02 NONE    0 STOP
                                                                                                                          PRVTE     NE SW                                               011           00
                                                                                                                          PSNGR CAR          01 DRVR INJC  56 F OR-Y       000          000           00
                                                                                                                                                               OR<25
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160 CASCADE HWY SOUTH OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

S D
P R S W
SER# E A U C O DATE COUNTY RD# FC CONN # INT-TYP SPCL USE
INVEST E L G H R DAY/TIME CITY CMPT/MLG FIRST STREET RD CHAR (MEDIAN) INT-REL OFFRD WTHR CRASH TYP TRLR QTY MOVE A S
UNLOC? D C S L K *LAT/LONG* URBAN AREA MILEPNT SECOND STREET DIRECT LEGS TRAF- RNDBT SURF COLL TYP OWNER FROM PRTC INJ G E LICNS PED
LRS INTERSECTION SEQ# LOCTN (#LANES) CNTL DRVWY LIGHT SVRTY V# VEH TYPE TO P# TYPE SVRTY E X RES 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

SER# INVEST UNLOC?	S P E E D / E A U C O / E L G H R / D C S L K (S D R S W)	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	A G E	S E X	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

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      S   D
      P   R S W                                RD#  FC   CONN #                              INT-TYP                                        SPCL USE
SER#  E A U C O  DATE          COUNTY          CMPT/MLG  FIRST  STREET       RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP       TRLR QTY   MOVE                      A  S
INVEST E L G H R DAY/TIME      CITY            MILEPNT   SECOND STREET       DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP        OWNER      FROM      PRTC INJ       G  E  LICNS PED
UNLOC? D C S L K LAT/LONG      URBAN AREA      LRS       INTERSECTION SEQ#   LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY       V#  VEH TYPE   TO     P# TYPE SVRTY   E  X  RES   LOC ERROR          ACTN EVENT        CAUSE

                                                                                                                                02 NONE    0 TURN-L
                                                                                                                                   PRVTE     N  E                                                      000               00
                                                                                                                                   PSNGR CAR          01 DRVR INJC  45  M  OR-Y        000             000               00
                                                                                                                                                                           OR<25
                                                                                                                                                      02 PSNG INJA  39  F              000             000               00

00083  N N N     01/08/2013 CLACKAMAS        1    14                         INTER     CROSS  N            N RAIN  S-1STOP     01 NONE    0 TURN-L                                                                       07
NONE             Tue     7A OREGON CITY      MN    0   S BEAVERCREEK RD      CN               TRF SIGNAL   N WET   REAR           PRVTE     W  N                                                      000               00
                            PORTLAND UA        2.98    CASCADE HY SOUTH      02          3                 N DARK  PDO            PSNGR CAR          01 DRVR NONE  35  F  OR-Y        026             000               07
No      45 19 54.96  -122 34 30.30           016000100S00              1                                                                                                 OR<25

                                                                                                                                02 NONE    0 STOP
                                                                                                                                   PRVTE     W  N                                                      013               00
                                                                                                                                   PSNGR CAR          01 DRVR NONE  38  M  OR-Y        000             000               00
                                                                                                                                                                           OR<25

05036  N N N     12/26/2013 CLACKAMAS        1    14                         INTER     CROSS  N            N UNK   ANGL-OTH    01 NONE    0 STRGHT                                                                       04
NONE             Thu     7A 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          3                 N DLIT  PDO            PSNGR CAR          01 DRVR NONE  30  M  OR-Y        020             000               04
No      45 19 54.96  -122 34 30.30           016000100S00              1                                                                                                 OR<25

                                                                                                                                02 NONE    0 STRGHT
                                                                                                                                   PRVTE     E  W                                                      000               00
                                                                                                                                   PSNGR CAR          01 DRVR NONE  57  F  OR-Y        000             000               00
                                                                                                                                                                           OR<25

03843  N Y N N N 09/18/2011 CLACKAMAS        1    14                         INTER     CROSS  N            N RAIN  ANGL-OTH    01 NONE    0 STRGHT                                                                       04
STATE            Sun     1A OREGON CITY      MN    0   S BEAVERCREEK RD      CN               TRF SIGNAL   N WET   ANGL           PRVTE     N  S                                                      000               00
                            PORTLAND UA        2.98    CASCADE HY SOUTH      03          2                 N DLIT  FAT            PSNGR CAR          01 DRVR INJC  58  M  OR-Y        000             000               00
No      45 19 54.97  -122 34 30.30           016000100S00              1                                                                                                 OR<25

                                                                                                                                02 NONE    0 STRGHT
                                                                                                                                   PRVTE     W  E                                                      000               00
                                                                                                                                   PSNGR CAR          01 DRVR KILL  29  F  OR-Y        020             000               04
                                                                                                                                                                           OR<25
                                                                                                                                                      02 PSNG INJB  26  M              000             000               00

02536  N N N N N 07/13/2012 CLACKAMAS        1    14                         INTER     CROSS  N            N CLR   ANGL-OTH    01 NONE    0 STRGHT                                                                       02,14
STATE            Fri     7P OREGON CITY      MN    0   S BEAVERCREEK RD      CN               TRF SIGNAL   N DRY   ANGL           PRVTE     W  E                                                      000               00
                            PORTLAND UA        2.98    CASCADE HY SOUTH      03          2                 N DAY   PDO            PSNGR CAR          01 DRVR NONE  28  M  OR-Y        028,024         000               02,14
No      45 19 54.97  -122 34 30.30           016000100S00              1                                                                                                 OR<25

                                                                                                                                02 POLCE   0 STRGHT
                                                                                                                                   PUBLC     N  S                                                      000               00
                                                                                                                                   PSNGR CAR          01 DRVR NONE  45  M  OR-Y        000             000               00
                                                                                                                                                                           OR<25

04829  N N N     12/13/2012 CLACKAMAS        1    14                         INTER     CROSS  N            N UNK   S-1STOP     01 NONE    0 STRGHT                                                                       07
NONE             Thu     7A OREGON CITY      MN    0   S BEAVERCREEK RD      CN               TRF SIGNAL   N UNK   REAR           PRVTE     W  E                                                      000               00
                            PORTLAND UA        2.98    CASCADE HY SOUTH      03          3                 N DAWN  PDO            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
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160 CASCADE HWY SOUTH

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	S P E A U C O / D R S W / E L G H R / D C S L K	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	W E									011	00
														PSNGR CAR		01	DRVR	NONE	00	F	UNK		000	000	00
																					OR<25				
04601	N N N	12/03/2010	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	S-OTHER	01	NONE 0	TURN-R										07
STATE		Fri 1P	OREGON CITY	MN	0	S BEAVERCREEK RD	CN		TRF SIGNAL	N	DRY	REAR		PRVTE	S E									000	00
			PORTLAND UA	2.98		CASCADE HY SOUTH	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		026	000	07
No		45 19 56.31 -122 34 29.78		016000100S00		1															OR<25				
													02	NONE 0	STOP										
														PRVTE	S E									013	00
														PSNGR CAR		01	DRVR	NONE	81	M	OR-Y		000	000	00
																					OR<25				
																02	PSNG	INJC	77	F			000	000	00
00804	N N N	03/07/2011	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
NONE		Mon 10A	OREGON CITY	MN	0	S BEAVERCREEK RD	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	S N									000	00
			PORTLAND UA	2.98		CASCADE HY SOUTH	04	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK		020	000	04
No		45 19 54.97 -122 34 30.30		016000100S00		1															OR<25				
													02	NONE 0	STRGHT										
														PRVTE	W E									000	00
														PSNGR CAR		01	DRVR	NONE	67	M	OR-Y		000	000	00
																					OR<25				
03336	N N N N N	09/09/2013	CLACKAMAS	1	14		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										04
CITY		Mon 11P	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	04	3		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	29	M	OR-Y		000	000	00
No		45 19 54.96 -122 34 30.30		016000100S00		1															OR<25				
																02	PSNG	INJB	21	F			000	000	00
													02	NONE 0	TURN-L										
														PRVTE	N E									000	00
														PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		003	000	04
																					OR<25				
01847	N N N	05/26/2010	CLACKAMAS	1	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										27,07
NONE		Wed 1P	OREGON CITY	MN	0	S BEAVERCREEK RD	NE		YIELD	N	WET	REAR		PRVTE	SE NW									000	00
			PORTLAND UA	2.99		CASCADE HY SOUTH	09	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		016,026	000	27,07
No		45 19 54.47 -122 34 30.52		016000100S00		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				
03021	N N N	08/27/2010	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	2.99		CASCADE HY SOUTH	09	3		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	M	OR-Y		026	000	07
No		45 19 54.47 -122 34 30.52		016000100S00		1															OR<25				
																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

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      S   D
      P   R S W                                  RD#  FC   CONN #                          INT-TYP                                              SPCL USE
SER#   E A U C O  DATE        COUNTY             CMPT/MLG  FIRST  STREET        RD CHAR (MEDIAN)   INT-REL  OFFRD WTHR  CRASH TYP     TRLR QTY   MOVE                    A  S
INVEST E L G H R  DAY/TIME    CITY               MILEPNT   SECOND STREET        DIRECT    LEGS     TRAF-    RNDBT SURF  COLL TYP      OWNER      FROM       PRTC INJ     G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA         LRS       INTERSECTION SEQ#    LOCTN   (#LANES)   CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE   TO     P# TYPE SVRTY  E  X  RES   LOC ERROR     ACTN EVENT     CAUSE

                                                                                                                                  02 NONE    0 STOP
                                                                                                                                     PRVTE     SE NW                                                  011            00
                                                                                                                                    PSNGR CAR         01 DRVR INJC  30 F OR-Y       000           000            00
                                                                                                                                                                          OR<25
                                                                                                                                                      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 STRGHT                                                                 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       026           000            07
No      45 19 54.47  -122 34 30.52              016000100S00               1                                                                                        OR<25

                                                                                                                                  02 NONE    0 STOP
                                                                                                                                     PRVTE     SE NW                                                  011            00
                                                                                                                                    PSNGR CAR         01 DRVR INJC  20 M OR-Y       000           000            00
                                                                                                                                                                          OR<25

03715  N N N      10/13/2010 CLACKAMAS          1    14                          INTER     CROSS  N              N CLR   S-1STOP  01 NONE    0 STRGHT                                                                 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       026           000            07
No      45 19 54.47  -122 34 30.52              016000100S00               1                                                                                        OR<25

                                                                                                                                  02 NONE    0 STOP
                                                                                                                                     PRVTE     SE NW                                                  011            00
                                                                                                                                    PSNGR CAR         01 DRVR INJC  27 F OR-Y       000           000            00
                                                                                                                                                                          OR<25

03163  N N N      09/05/2010 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          2.99    CASCADE HY SOUTH     09          3                    N DAY   INJ        PSNGR CAR         01 DRVR NONE  19 M OR-Y       026           000            07
No      45 19 54.47  -122 34 30.52              016000100S00               1                                                                                        OR<25

                                                                                                                                  02 NONE    0 STOP
                                                                                                                                     PRVTE     NE SW                                                  011            00
                                                                                                                                    PSNGR CAR         01 DRVR INJC  17 M OR-Y       000           000            00
                                                                                                                                                                          OR<25
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CITY OF OREGON CITY, CLACKAMAS COUNTY

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# INVEST UNLOC?	S P E E D	A L C	D R U G S	S C H L	W O R K	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	A G E	S E X	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		026	038		07
																							OR<25					
															02	NONE	STOP											
																PRVTE	SE NW									011		00
																PSNGR CAR		01	DRVR	NONE	57	M	OR-Y		000	000		00
																							OR<25					
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		043,026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	SE NW									011		00
																PSNGR CAR		01	DRVR	INJB	57	M	OR-Y		000	000		00
																							OR<25					
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		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	E W									011		00
																PSNGR CAR		01	DRVR	NONE	56	M	OR-Y		000	000		00
																							OR<25					
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		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	E W									011		00
																PSNGR CAR		01	DRVR	NONE	00	F	UNK		000	000		00
																							UNK					
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		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	E W									011	013	00
																PSNGR CAR		01	DRVR	INJB	83	F	OR-Y		000	000		00
																							OR<25					
															03	NONE 0	STOP											
																PRVTE	E W									022		00
																PSNGR CAR		01	DRVR	INJC	47	M	OR-Y		000	000		00
																							OR<25					
																		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?	S D P R S W E A U C O E L G H R D C S L K	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	A G E	S E X	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		053,026,011	025		16,32
																			OR<25					
											02	NONE 0	STOP											
												PRVTE	E W									011		00
												PSNGR CAR		01	DRVR	INJB	51	F	OR-Y		000	000		00
																			OR<25					
											03	NONE 0	STOP											
												PRVTE	E W									022		00
												PSNGR CAR		01	DRVR	NONE	54	M	OR-Y		000	000		00
																			OR<25					
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		042	000		07
																			N-RES					
											02	NONE 0	STRGHT											
												PRVTE	E W									006		00
												PSNGR CAR		01	DRVR	NONE	56	F	OR-Y		000	000		00
																			OR<25					
														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		047,026	000		01
																			OR<25					
											02	NONE 0	STOP											
												PRVTE	S N									011	013	00
												PSNGR CAR		01	DRVR	NONE	17	F	OR-Y		000	000		00
																			OR<25					
											03	NONE 0	STOP											
												PRVTE	S N									022		00
												PSNGR CAR		01	DRVR	NONE	22	M	OR-Y		000	000		00
																			OR<25					
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		026	000		07
																			UNK					
											02	NONE 0	STOP											
												PRVTE	E W									011		00
												PSNGR CAR		01	DRVR	INJC	25	F	OR-Y		000	000		00
																			OR>25					
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		026	000		07
																			OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF OREGON CITY, CLACKAMAS COUNTY

OR 213 Cascade Highway (160) & Beavercreek Road
January 1, 2010 through December 31, 2014

SER# / INVEST / UNLOC?	S P E D / A L C / D R U G / S C H L / W O R K	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
											02	NONE 0	STOP											
												PRVTE	E W									011		00
												PSNGR CAR		01	DRVR	INJC	33	M	OR-Y		000	000		00
																			OR<25					
05319	N N N	12/31/2014	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE		Wed 9P	0	CASCADE HY SOUTH	E		TRF SIGNAL	N	DRY	REAR		UNKN	UN UN									000		00
No		*45 19 54.97 -122 34 30.30*		1	06	3		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	00	U	UNK		026	000		29
																			UNK					
											02	NONE 0	STOP											
												PRVTE	UN UN									011		00
												PSNGR CAR		01	DRVR	INJC	16	F	OR-Y		000	000		00
																			OR<25					
														02	PSNG	INJC	18	F			000	000		00
04873	N N N	12/19/2011	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Mon 2P	0	CASCADE HY SOUTH	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000		00
No		*45 19 54.96 -122 34 30.29*		1	06	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		026	000		07
																			OR<25					
											02	NONE 0	STOP											
												PRVTE	W E									011		00
												PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		000	000		00
																			OR<25					
02778	N N N	07/29/2012	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Sun 10A	0	CASCADE HY SOUTH	W		L-TURN REF	N	DRY	REAR		PRVTE	W E									000		00
No		*45 19 54.97 -122 34 30.30*		1	06	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	37	F	OR-Y		026	000		07
																			OR<25					
											02	NONE 0	STOP											
												PRVTE	W E									012		00
												PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		000	000		00
																			OR<25					
02536	N N N	07/15/2013	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Mon 6P	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	PDO		PSNGR CAR		01	DRVR	NONE	44	M	OR-Y		026	000		07
																			OR<25					
											02	NONE 0	STOP											
												PRVTE	W E									011		00
												PSNGR CAR		01	DRVR	NONE	60	F	OR-Y		000	000		00
																			OR<25					
04147	N N N	10/29/2013	16	S BEAVERCREEK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Tue 3P	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	20	F	OR-Y		026	000		07
																			OR>25					
											02	NONE 0	STOP											
												PRVTE	W E									011		00
												PSNGR CAR		01	DRVR	INJC	34	F	OR-Y		000	000		00
																			OR<25					

CITY OF OREGON CITY, CLACKAMAS COUNTY

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*	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
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		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	INJC	21	F	OR-Y		000	000		00
																							OR<25					

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/ VEHI
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	S D / P R S W / E A U C O / E L G H R / D C S L 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	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	PRTC P# 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		016,026	000	27,07
																	OR<25				
											02 NONE 0	STOP									
											PRVTE	N -S								011	00
											PSNGR CAR		01 DRVR	INJC	63	F	OR-Y		000	000	00
																	OR<25				
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		047,043,026	000	01,07
																	OR<25				
											02 NONE 0	STOP									
											PRVTE	N -S								011	00
											PSNGR CAR		01 DRVR	NONE	16	M	OR-Y		000	000	00
																	OR<25				
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		026	000	29
																	N-RES				
											02 NONE 0	STOP									
											PRVTE	N -S								011	00
											PSNGR CAR		01 DRVR	NONE	66	F	OR-Y		000	000	00
																	OR>25				
											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		026	000	29
																	OR<25				
											02 NONE 0	STOP									
											PRVTE	N -S								011	00
											PSNGR CAR		01 DRVR	NONE	44	F	OR-Y		000	000	00
																	OR<25				
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		026	000	29
																	OR<25				
											02 NONE 0	STOP									
											PRVTE	N -S								011	00
											PSNGR CAR		01 DRVR	NONE	19	M	OR-Y		000	000	00
																	OR<25				
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		026	000	07
																	UNK				
											02 NONE 0	STOP									
											PRVTE	S -N								011	00
											PSNGR CAR		01 DRVR	NONE	18	F	OR-Y		000	000	00

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

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 (E A U C O / E L G H R / D C S L K) D R S 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	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	P# PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES OR<25	PED LOC	ERROR	ACT	EVENT	CAUSE
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

SER# INVEST	S P E E D	A L C	D R U G S	S C H L	W 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 TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
															PSNGR CAR		01 DRVR	INJC	62	F	OR-Y		000	000		00
																					OR<25					
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		026	000		29
																					OR<25					
															02 NONE 0	STOP										
															PRVTE	S -N								011	013	00
															PSNGR CAR		01 DRVR	NONE	18	F	OR-Y		000	000		00
																					OR<25					
															03 NONE 0	STOP										
															PRVTE	S -N								022		00
															PSNGR CAR		01 DRVR	INJC	77	F	OR-Y		000	000		00
																					OR<25					
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		026	000		29
																					OR<25					
															02 NONE 0	STOP										
															PRVTE	S -N								011		00
															PSNGR CAR		01 DRVR	NONE	19	M	OR-Y		000	000		00
																					OR<25					
															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		026	000		29
																					OR<25					
															02 NONE 0	STOP										
															PRVTE	S -N								011		00
															PSNGR CAR		01 DRVR	INJC	52	M	OR-Y		000	000		00
																					OR<25					
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		026	000		29
																					OR<25					
															02 NONE 0	STOP										
															PRVTE	S -N								011		00
															PSNGR CAR		01 DRVR	INJC	51	M	OR-Y		000	000		00
																					OR<25					
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

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 D P R S W E A U C O E L G H R D C S L 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 TYPE	MOVE FROM TO	P# PRTC TYPE	INJ SVRTY	AGE	SEX	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		001	000		08
																	OR<25					
											02 NONE 0	STOP										
											PRVTE	W -E								012		00
											PSNGR CAR		01 DRVR	NONE	50	M	OR-Y		000	000		00
																	OR<25					
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		001	000		08
																	OR<25					
											02 NONE 0	STOP										
											PRVTE	W -E								012		00
											TRUCK		01 DRVR	NONE	35	M	OR-Y		000	000		00
																	OR<25					
											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		006	000		08
																	OR<25					
											02 NONE 0	TURN-R										
											PRVTE	W -S								000		00
											PSNGR CAR		01 DRVR	NONE	40	F	OR-Y		000	000		00
																	OR<25					
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		026	000		07
																	OR<25					
											02 NONE 0	STOP										
											PRVTE	W -E								012		00
											PSNGR CAR		01 DRVR	INJC	74	F	OR-Y		000	000		00
																	OR<25					
											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		026	000		07
																	OR<25					
											02 NONE 0	STOP										
											PRVTE	W -E								011	013	00
											PSNGR CAR		01 DRVR	INJC	43	M	OR-Y		000	000		00
																	OR<25					
											03 NONE 0	STOP										
											PRVTE	W -E								022		00
											PSNGR CAR		01 DRVR	NONE	46	F	OR-Y		000	000		00
																	OR<25					

URBAN NON-SYSTEM CRASH LISTING

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

	S D																				
	P R S W					INT-TYPE					SPCL USE										
	E A U C O	DATE	CLASS	CITY STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE			A	S					
SER#	E L G H R	DAY	DIST	FIRST STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED			
INVEST	D C S L K	TIME	FROM	SECOND STREET	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V# TYPE	TO	P# TYPE	SVRTY	E	X	RES	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		026	000	07
																	OR<25				
											02 NONE 0	STOP									
											PRVTE	E -W								012	00
											PSNGR CAR		01 DRVR	NONE	56	F	OR-Y		000	000	00
																	OR<25				
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		026	000	07
																	N-RES				
											02 NONE 0	STOP									
											PRVTE	W -E								012	00
											PSNGR CAR		01 DRVR	INJC	51	F	OR-Y		000	000	00
																	OR<25				
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		026	000	07
																	OR<25				
											02 NONE 0	STOP									
											PRVTE	W -E								011	00
											PSNGR CAR		01 DRVR	NONE	37	F	OR-Y		000	000	00
																	OR<25				
											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		026	000	29
																	OR<25				
											02 NONE 0	STOP									
											PRVTE	W -E								011	00
											PSNGR CAR		01 DRVR	INJC	35	M	OR-Y		000	000	00
																	OR<25				
											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		045,047,026	000	13,01,07
																	OR<25				
											02 LOG 0	STRGHT									
											PRVTE	S -N								006	00
											BOBTAIL		01 DRVR	NONE	60	M	OTH-Y		000	000	00
																	N-RES				
											03 NONE 0	STOP									
											PRVTE	S -N								011	00
											PSNGR CAR		01 DRVR	NONE	58	F	OR-Y		000	000	00

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

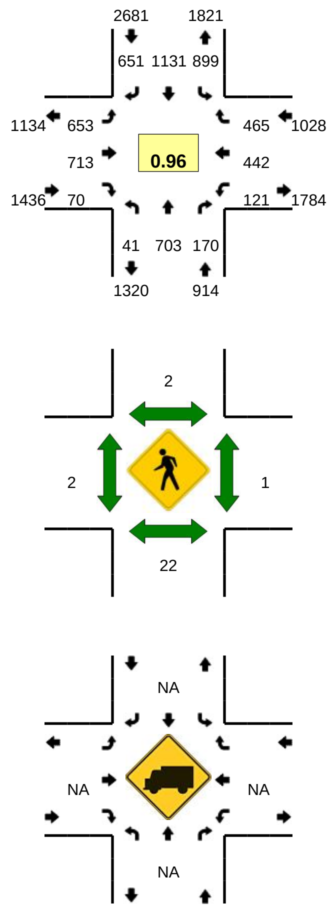
Total crash records: 27

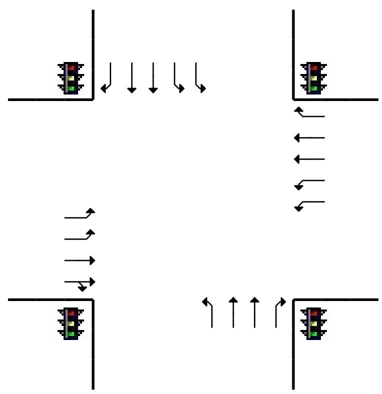
SER# INVEST	S P E E D	A L C	D R U G S	S C H L	W O R K	DATE DAY TIME	CLASS DIST FROM	CITY STREET FIRST STREET SECOND STREET	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V#	SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES OR<25	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										124	04,01
NO RPT						TH		REDLAND RD	CN		TRF SIGNAL	N	WET	TURN		PRVTE	N -S									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					

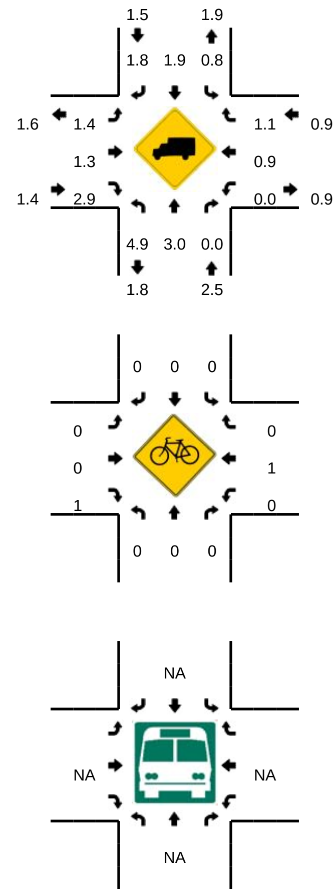
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

LOCATION: Cascade Hwy -- Beavercreek Rd | **QC JOB #:** 13715401
CITY/STATE: Oregon City, OR | **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) Left	Thru	Right	U	Cascade Hwy (Southbound) Left	Thru	Right	U	Beavercreek Rd (Eastbound) Left	Thru	Right	U	Beavercreek Rd (Westbound) Left	Thru	Right	U	Total	Hourly Totals
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

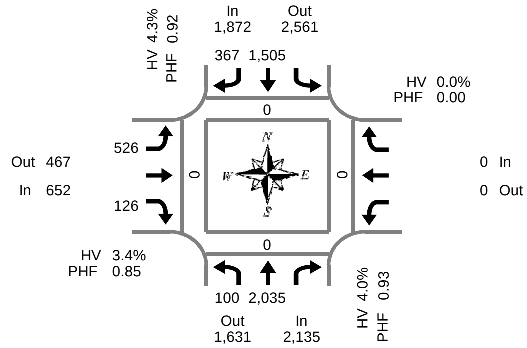
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	44	664	192	0	944	1176	672	0	752	748	72	0	148	432	440	0	6284
Heavy Trucks	4	24	0		12	20	20		20	4	0		0	4	0		108
Pedestrians		32				0				0				0			32
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Total Vehicle Summary

All Traffic Data
Services Inc.

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

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 213 L	Northbound Hwy 213 T	Northbound Hwy 213 Bikes	Southbound Hwy 213 T	Southbound Hwy 213 R	Southbound Hwy 213 Bikes	Eastbound Redland Rd L	Eastbound Redland Rd R	Eastbound Redland Rd Bikes	Westbound Redland Rd Bikes	Interval Total	Pedestrians Crosswalk 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 L	Northbound Hwy 213 T	Northbound Hwy 213 Bikes	Southbound Hwy 213 T	Southbound Hwy 213 R	Southbound Hwy 213 Bikes	Eastbound Redland Rd L	Eastbound Redland Rd R	Eastbound Redland Rd Bikes	Westbound Redland Rd Bikes	Interval Total	Pedestrians Crosswalk 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 In	Out	Total	Bikes	Southbound Hwy 213 In	Out	Total	Bikes	Eastbound Redland Rd In	Out	Total	Bikes	Westbound Redland Rd In	Out	Total	Bikes	Total	Pedestrians Crosswalk 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				

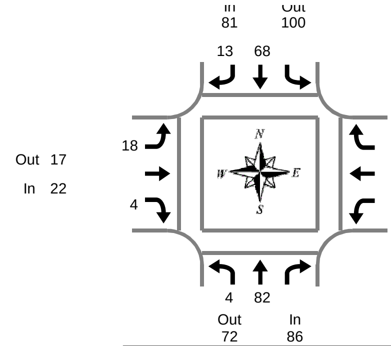
By Movement	Northbound Hwy 213 L	T		Total	Southbound Hwy 213	T	R	Total	Eastbound Redland Rd L		R	Total	Westbound Redland Rd			Total	Total
Volume	100	2,035		2,135		1,505	367	1,872	526		126	652				0	4,659
%HV	4.0%	4.0%	NA	4.0%	NA	4.5%	3.5%	4.3%	3.4%	NA	3.2%	3.4%	NA	NA	NA	0.0%	4.1%
PHF	0.81	0.91		0.93		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 L	Northbound Hwy 213 T	Northbound Hwy 213 Bikes	Southbound Hwy 213 T	Southbound Hwy 213 R	Southbound Hwy 213 Bikes	Eastbound Redland Rd L	Eastbound Redland Rd R	Eastbound Redland Rd Bikes	Westbound Redland Rd Bikes	Interval Total	Pedestrians Crosswalk 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



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

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	**Northbound** Hwy 213 L	T		Total	**Southbound** Hwy 213	T	R	Total	**Eastbound** Redland Rd L		R	Total	**Westbound** Redland Rd			Total	**Interval 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 L	T		Total	**Southbound** Hwy 213	T	R	Total	**Eastbound** Redland Rd L		R	Total	**Westbound** Redland Rd			Total	**Interval 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 In	Out	Total	**Southbound** Hwy 213 In	Out	Total	**Eastbound** Redland Rd In	Out	Total	**Westbound** Redland Rd In	Out	Total	**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 L	T		Total	**Southbound** Hwy 213	T	R	Total	**Eastbound** Redland Rd L		R	Total	**Westbound** Redland Rd			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

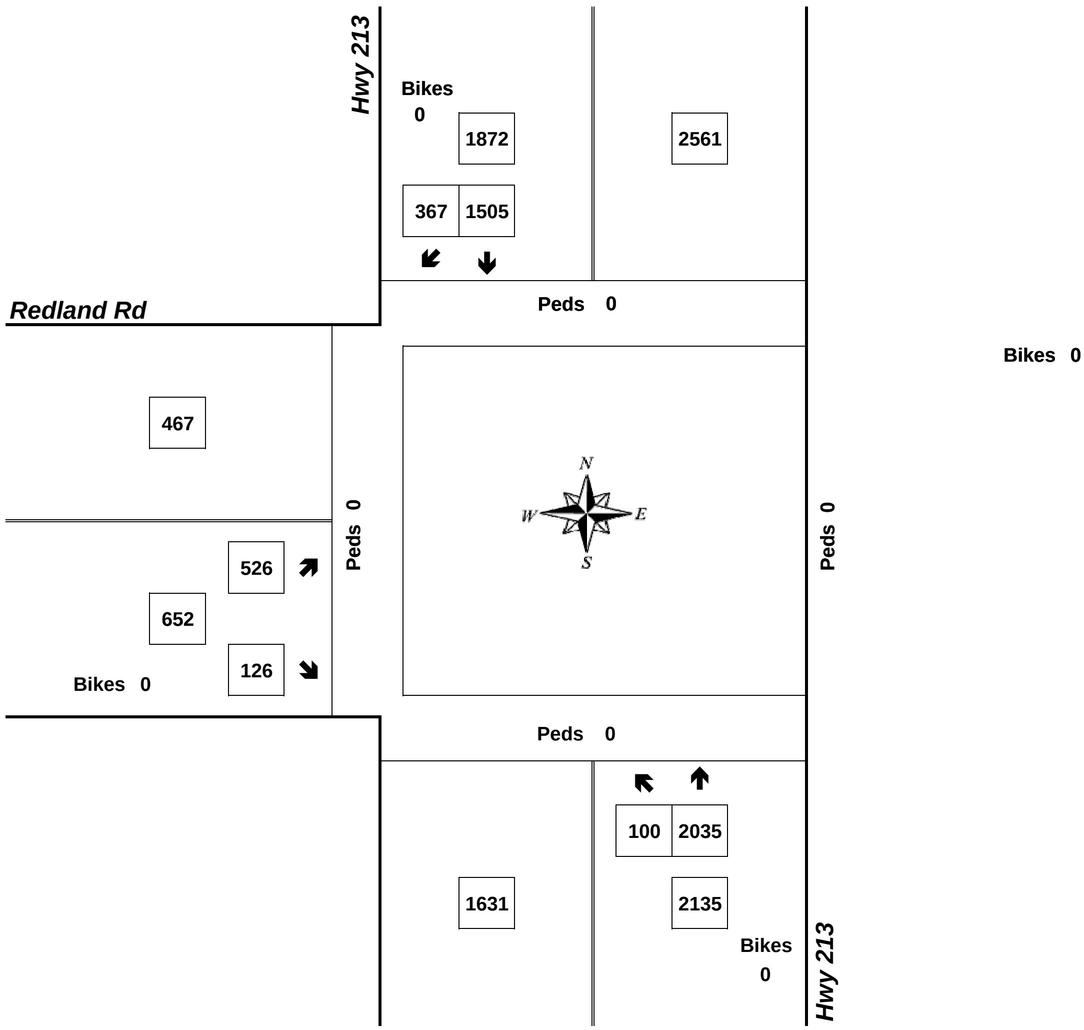
Interval Start Time	**Northbound** Hwy 213 L	T		Total	**Southbound** Hwy 213	T	R	Total	**Eastbound** Redland Rd L		R	Total	**Westbound** Redland Rd			Total	**Interval Total**
7:00 AM	6	83		89		62	12	74	27		6	33				0	196
7:15 AM	5	82		87		67	15	82	21		5	26				0	195
7:30 AM	3	78		81		74	18	92	21		6	27				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



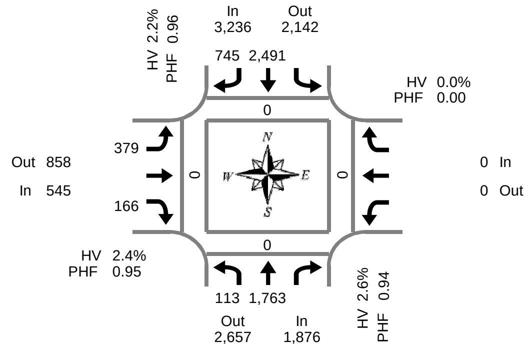
Approach	PHF	HV%	Volume
EB	0.85	3.4%	652
WB	0.00	0.0%	0
NB	0.93	4.0%	2,135
SB	0.92	4.3%	1,872
Intersection	0.96	4.1%	4,659

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 L	T		Bikes	Southbound Hwy 213	T	R	Bikes	Eastbound Redland Rd L		R	Bikes	Westbound Redland Rd			Bikes	Interval Total	Pedestrians Crosswalk 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 L	T		Bikes	Southbound Hwy 213	T	R	Bikes	Eastbound Redland Rd L		R	Bikes	Westbound Redland Rd			Bikes	Interval Total	Pedestrians Crosswalk 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 In	Out	Total	Bikes	Southbound Hwy 213 In	Out	Total	Bikes	Eastbound Redland Rd In	Out	Total	Bikes	Westbound Redland Rd In	Out	Total	Bikes	Total
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
%HV	2.6%				2.2%				2.4%				0.0%				2.4%
PHF	0.94				0.96				0.95				0.00				0.98

Pedestrians Crosswalk North	South	East	West
0	0	0	0

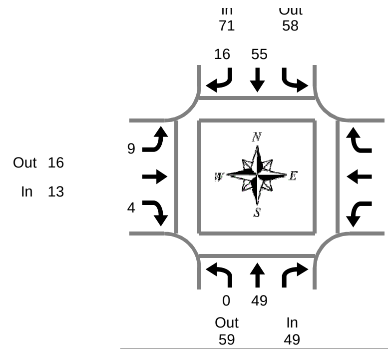
By Movement	Northbound Hwy 213 L	T		Total	Southbound Hwy 213	T	R	Total	Eastbound Redland Rd L		R	Total	Westbound Redland Rd			Total	Total
Volume	113	1,763		1,876		2,491	745	3,236	379		166	545				0	5,657
%HV	0.0%	2.8%	NA	2.6%	NA	2.2%	2.1%	2.2%	2.4%	NA	2.4%	2.4%	NA	NA	NA	0.0%	2.4%
PHF	0.83	0.94		0.94		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 L	T		Bikes	Southbound Hwy 213	T	R	Bikes	Eastbound Redland Rd L		R	Bikes	Westbound Redland Rd			Bikes	Interval Total	Pedestrians Crosswalk 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



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

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 213 L	T		Total	Southbound Hwy 213	T	R	Total	Eastbound Redland Rd L		R	Total	Westbound Redland Rd			Total	Interval 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 L	T		Total	Southbound Hwy 213	T	R	Total	Eastbound Redland Rd L		R	Total	Westbound Redland Rd			Total	Interval 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 In	Out	Total	Southbound Hwy 213 In	Out	Total	Eastbound Redland Rd In	Out	Total	Westbound Redland Rd In	Out	Total	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 L	T		Total	Southbound Hwy 213	T	R	Total	Eastbound Redland Rd L		R	Total	Westbound Redland Rd			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

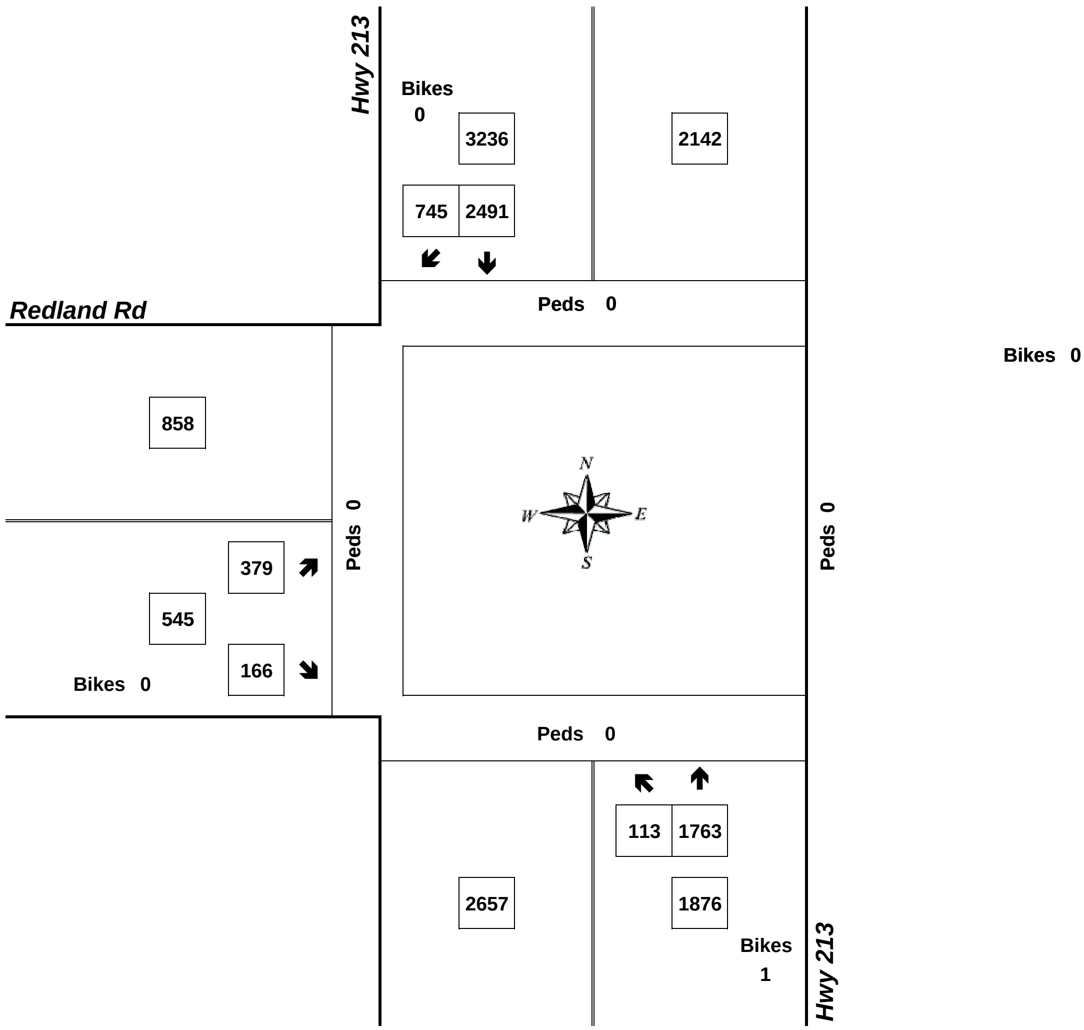
Interval Start Time	Northbound Hwy 213 L	T		Total	Southbound Hwy 213	T	R	Total	Eastbound Redland Rd L		R	Total	Westbound Redland Rd			Total	Interval Total
4:00 PM	1	53		54		63	18	81	9		6	15				0	150
4:15 PM	0	46		46		54	17	71	8		3	11				0	128
4:30 PM	1	39		40		45	13	58	9		4	13				0	111
4:45 PM	1	34		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

03-017

2015	2014	2013	2012	2011
106	108	107	109	110
97	91	96	96	96
108				
96				
1.13				

03-018

2015	2014	2013	2012	2011
105	105	105	103	103
103	91	102	100	99
104				
100				
1.04				

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	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
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

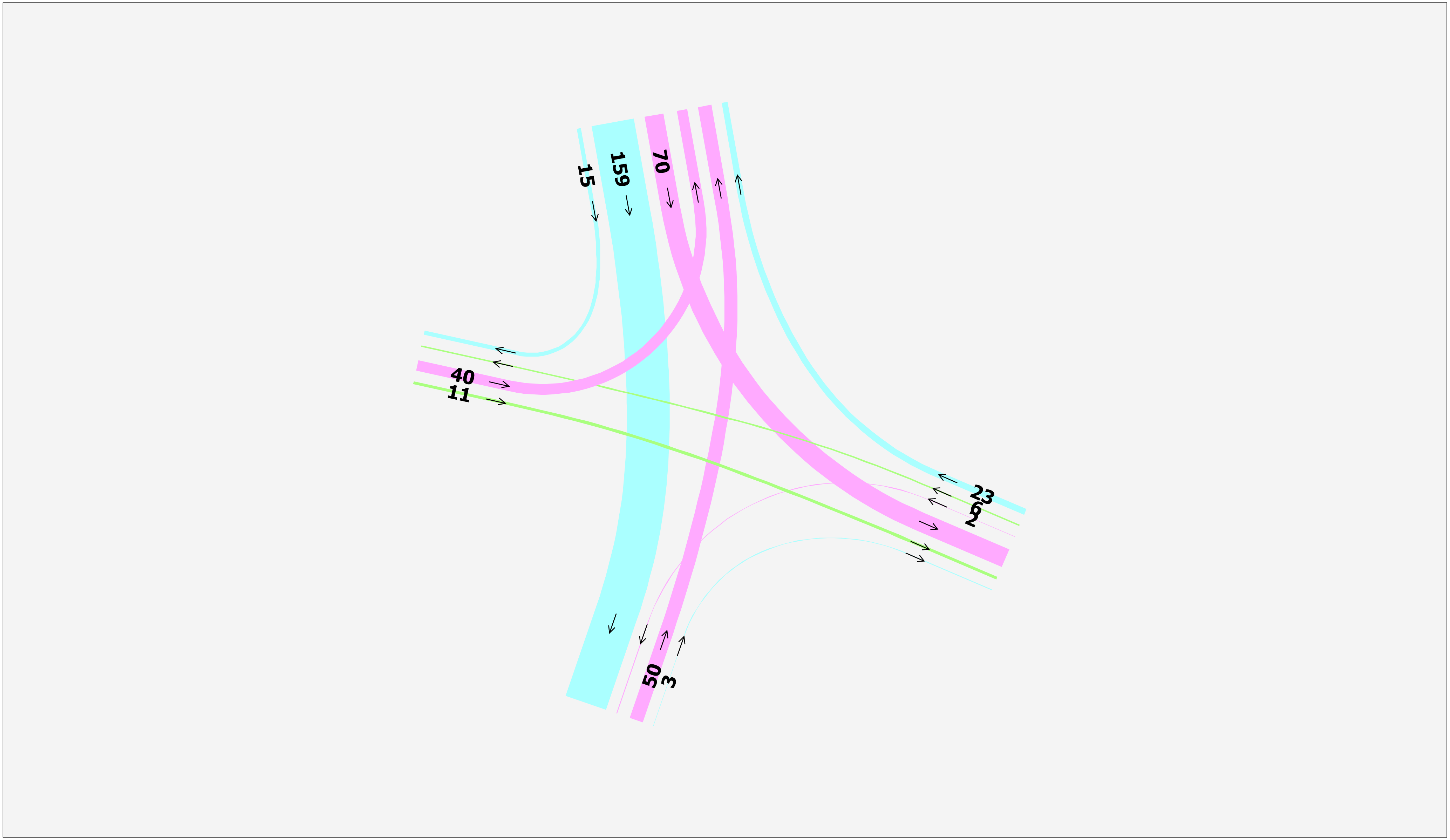
Time	SBL	SBT	SBR	WBL	WBT	WBR	NBL	NBT	NBR	EBL	EBT	EBR	Total	Rank	
0:00															
1:00															
2:00															
3:00															
4:00															From Beavercreek
5:00		745	138				65	959		214		123	2,244	16	32%
6:00		1,500	279				130	1,932		431		248	4,520	13	64%
7:00		1,909	355				166	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		

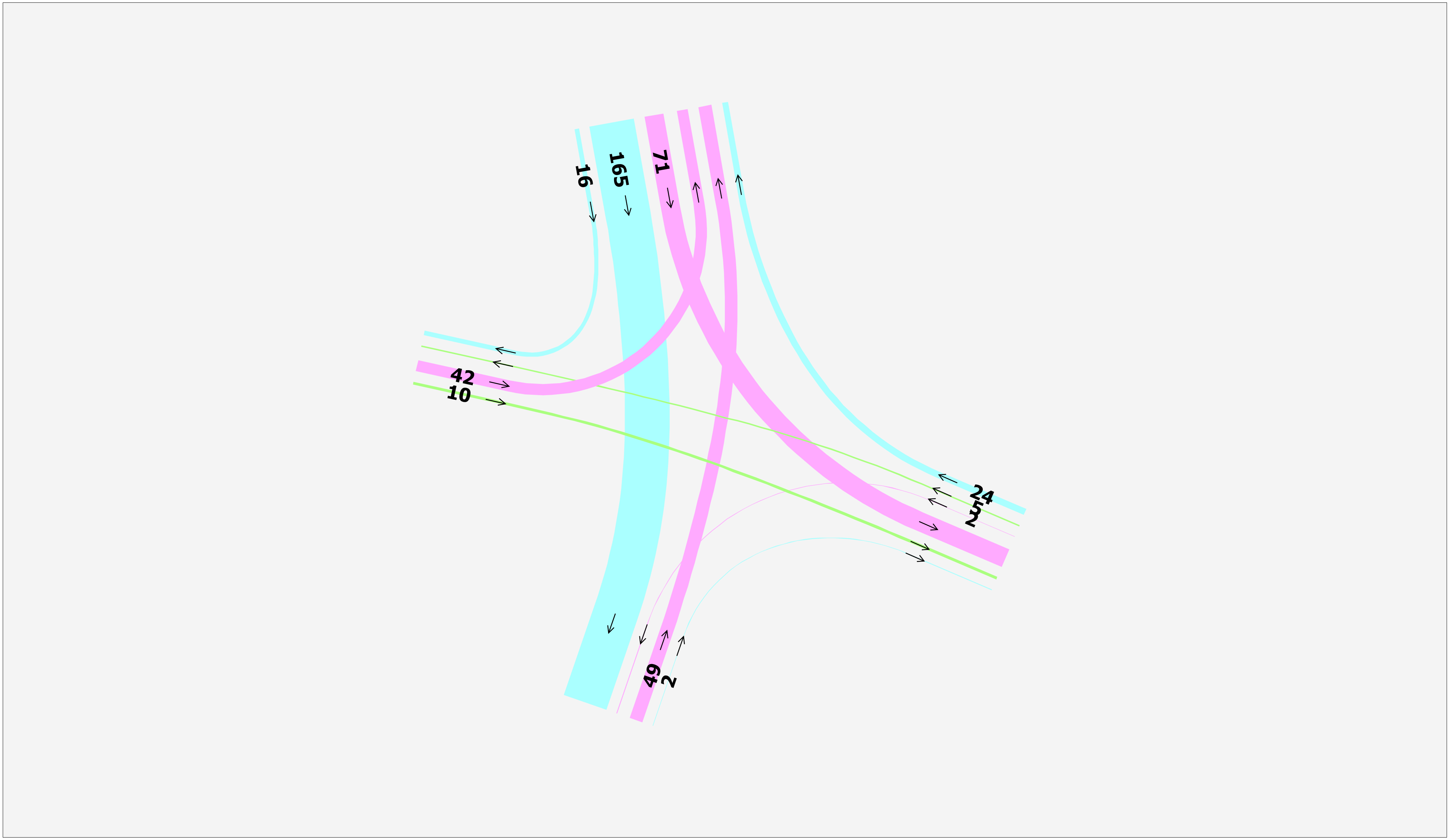

2015
28
211
96
47
9
3
59
14
100
4
Beavercreek 0:00

2015



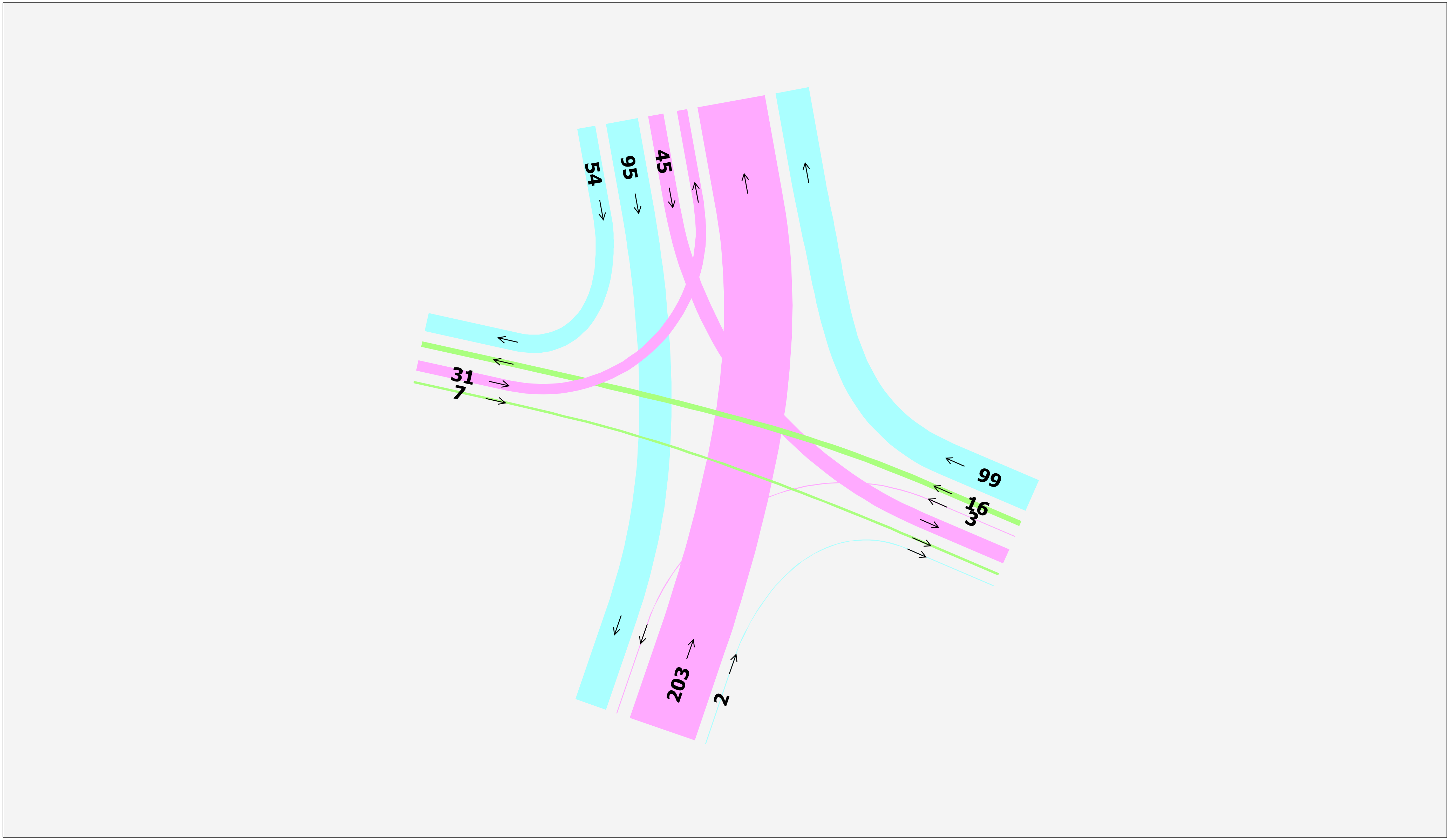
Beavercreek 1:00

2015



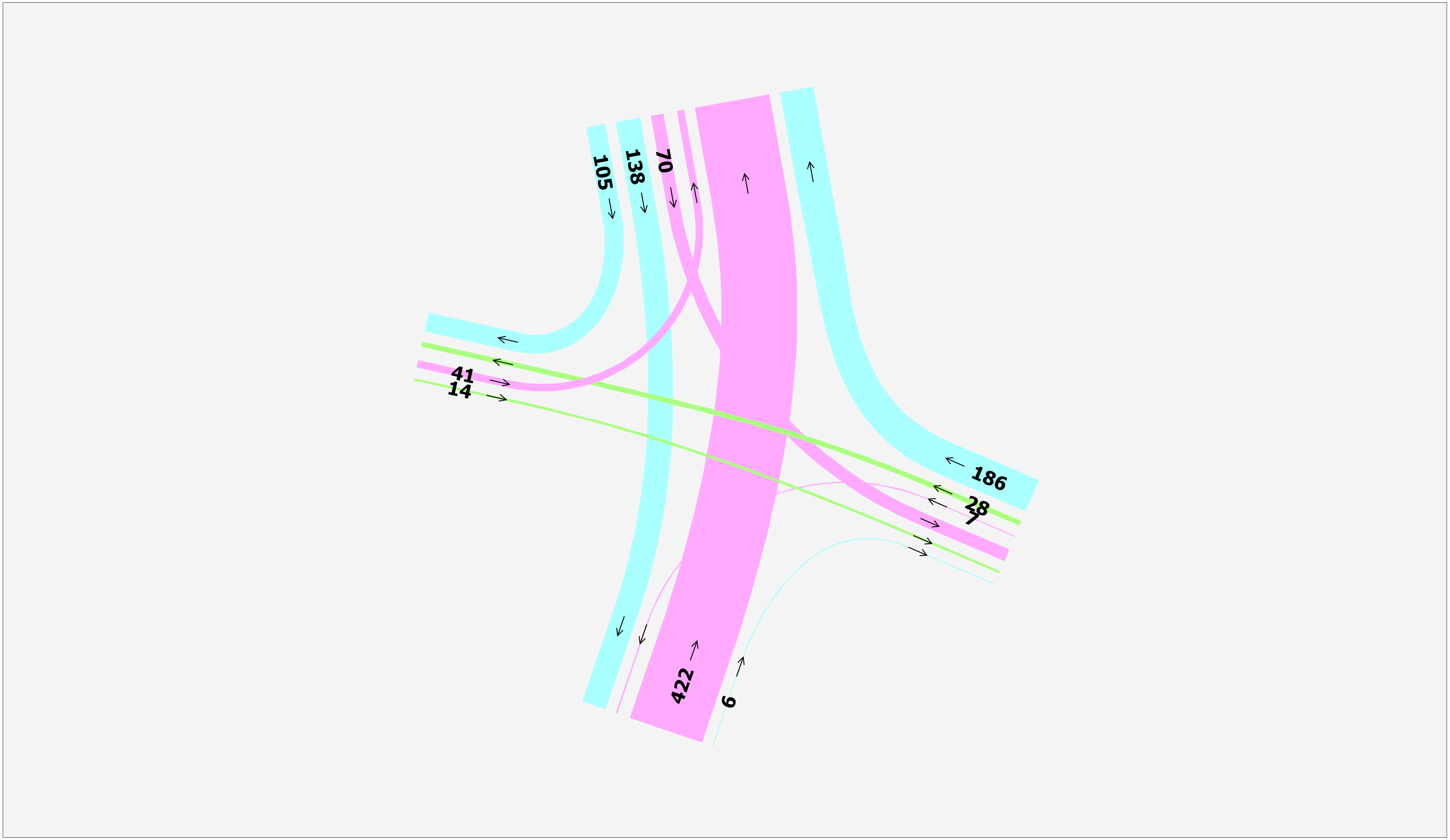
Beavercreek 2:00

2015



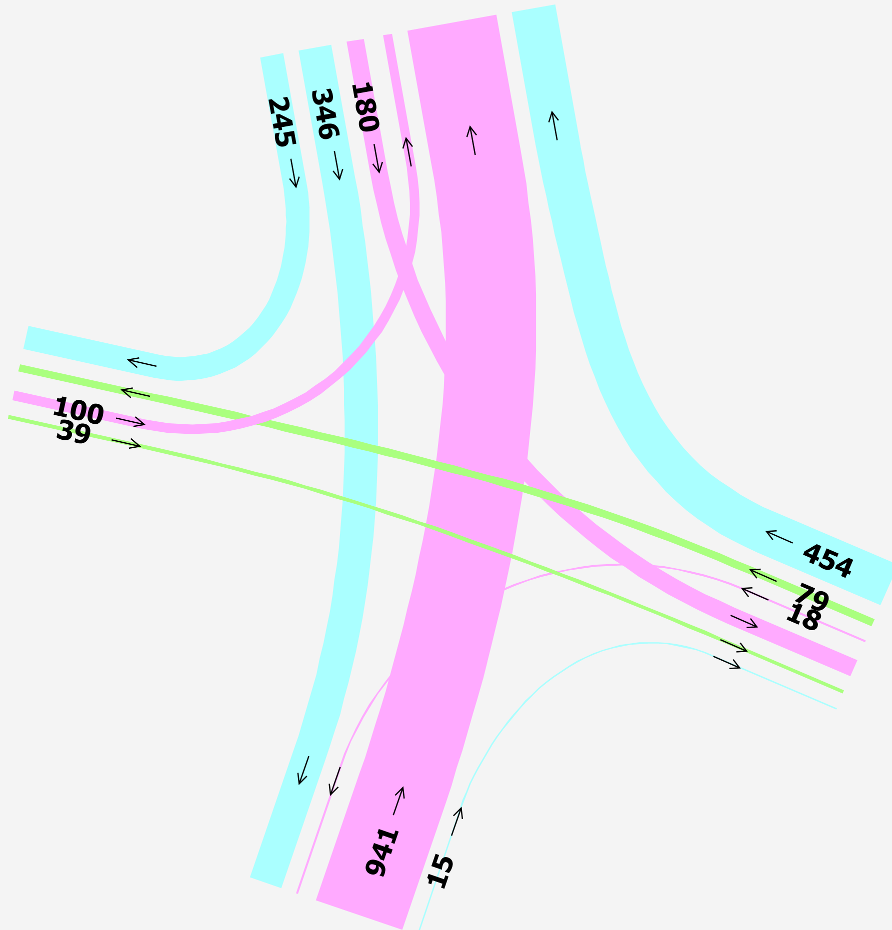
Beavercreek 3:00

2015



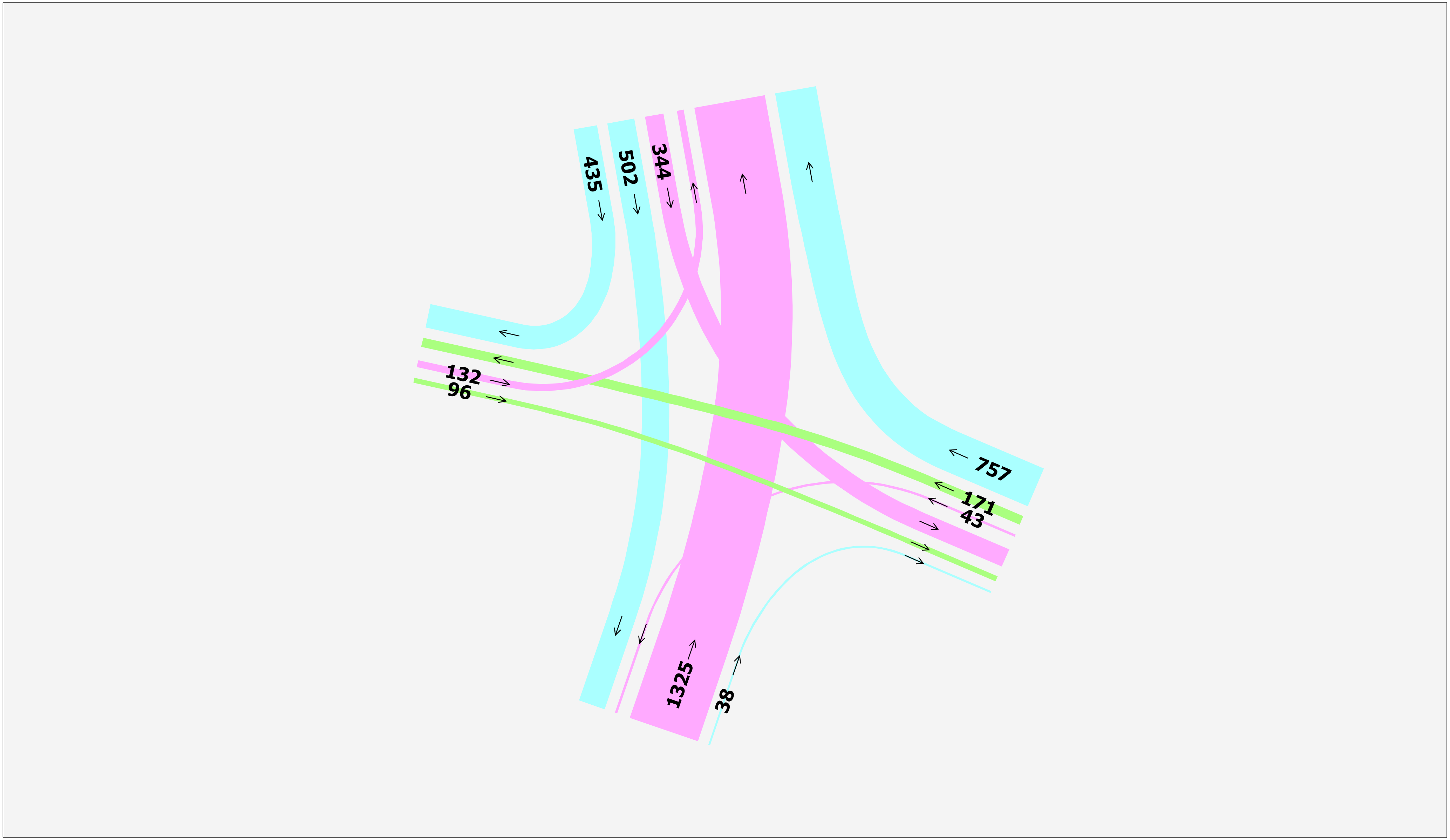
Beavercreek 4:00

2015



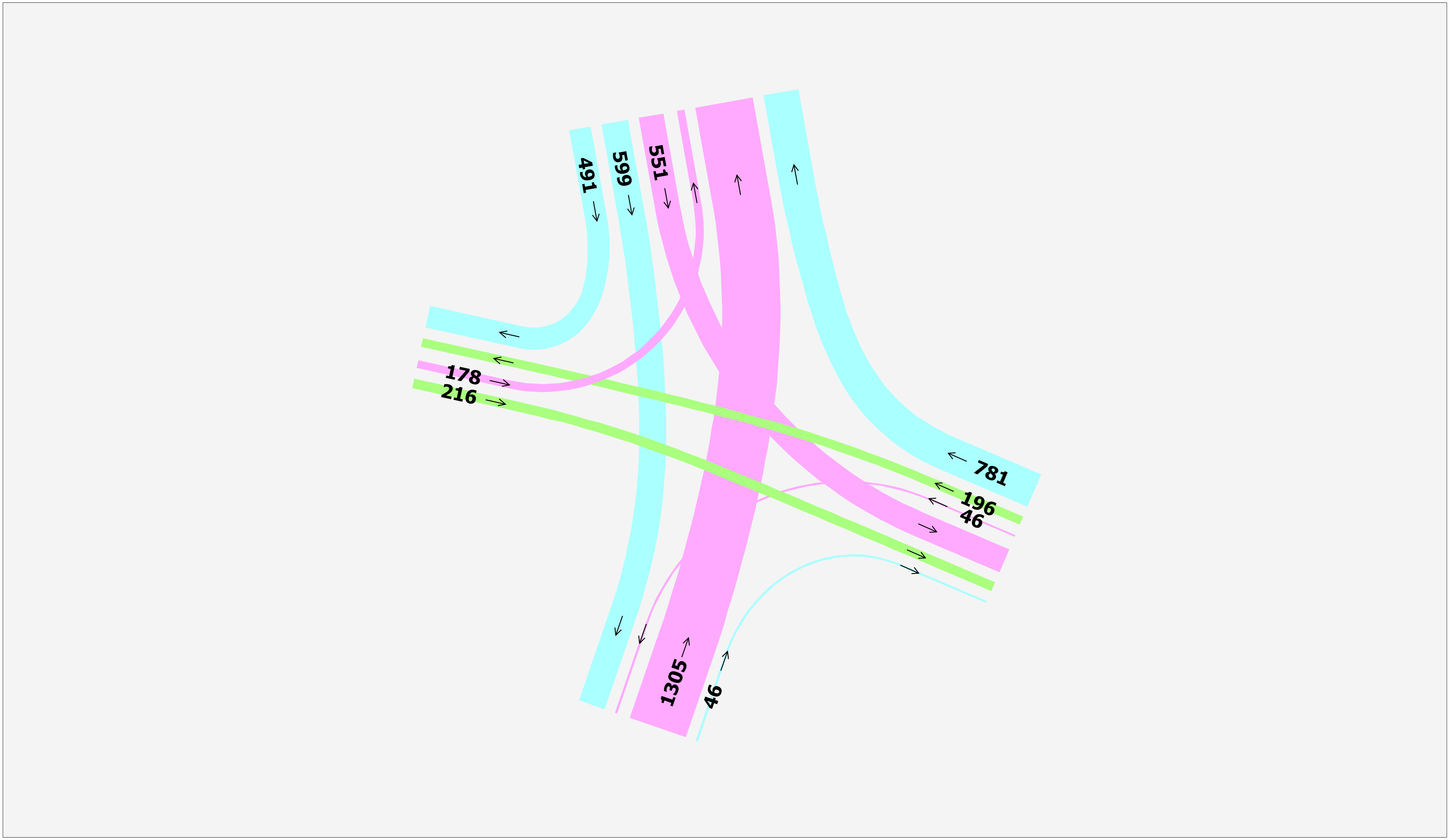
Beavercreek 5:00

2015



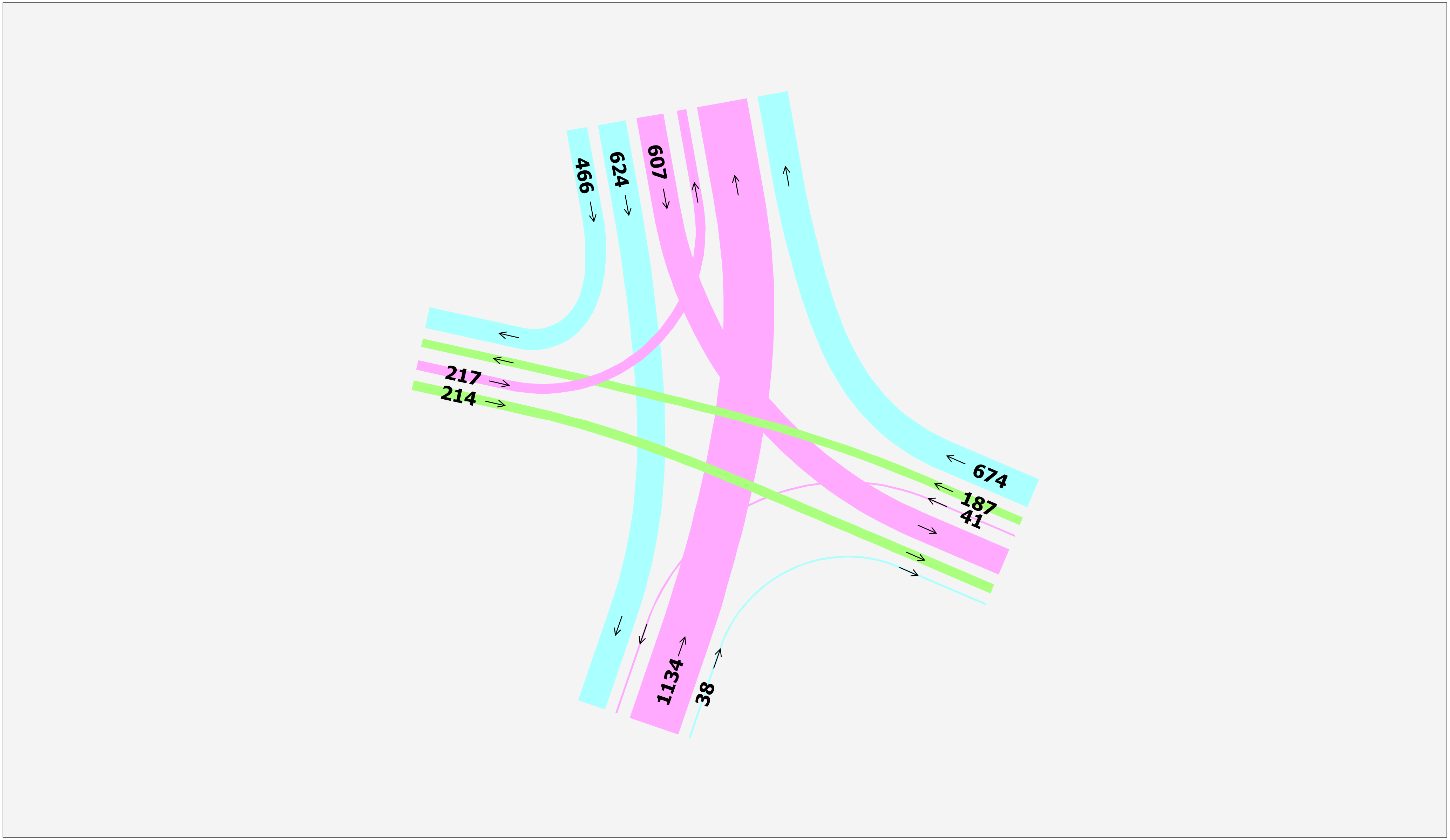
Beavercreek 6:00

2015



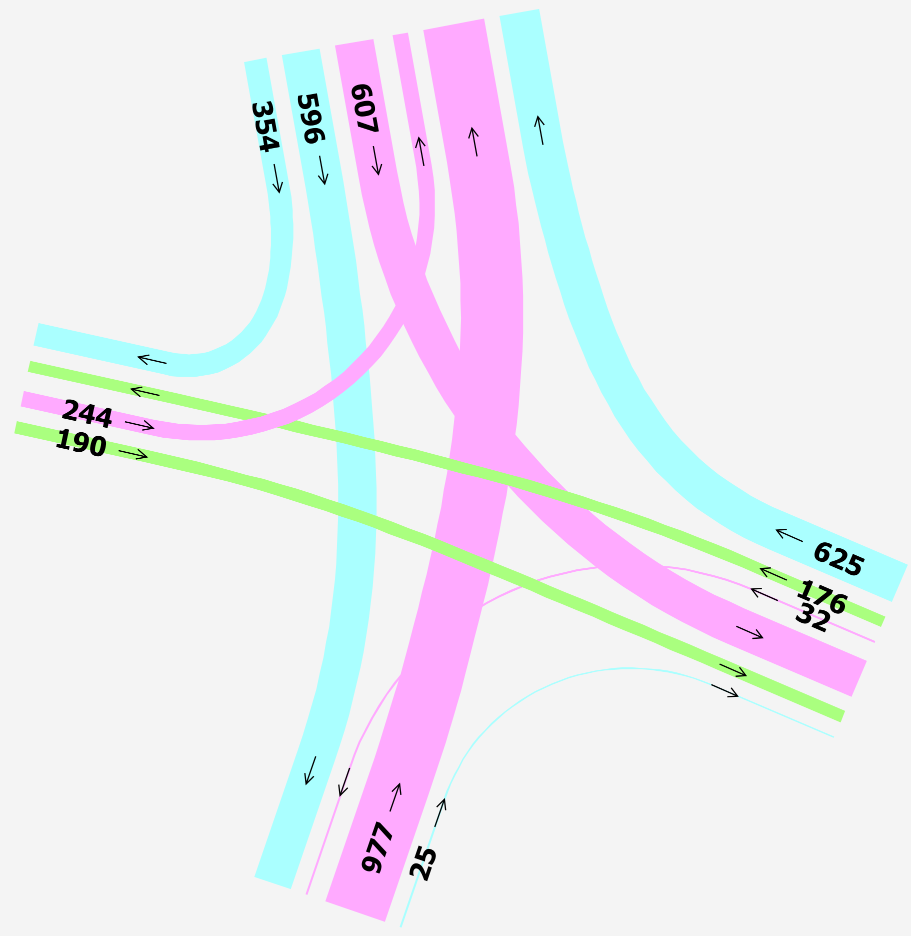
Beavercreek 7:00

2015



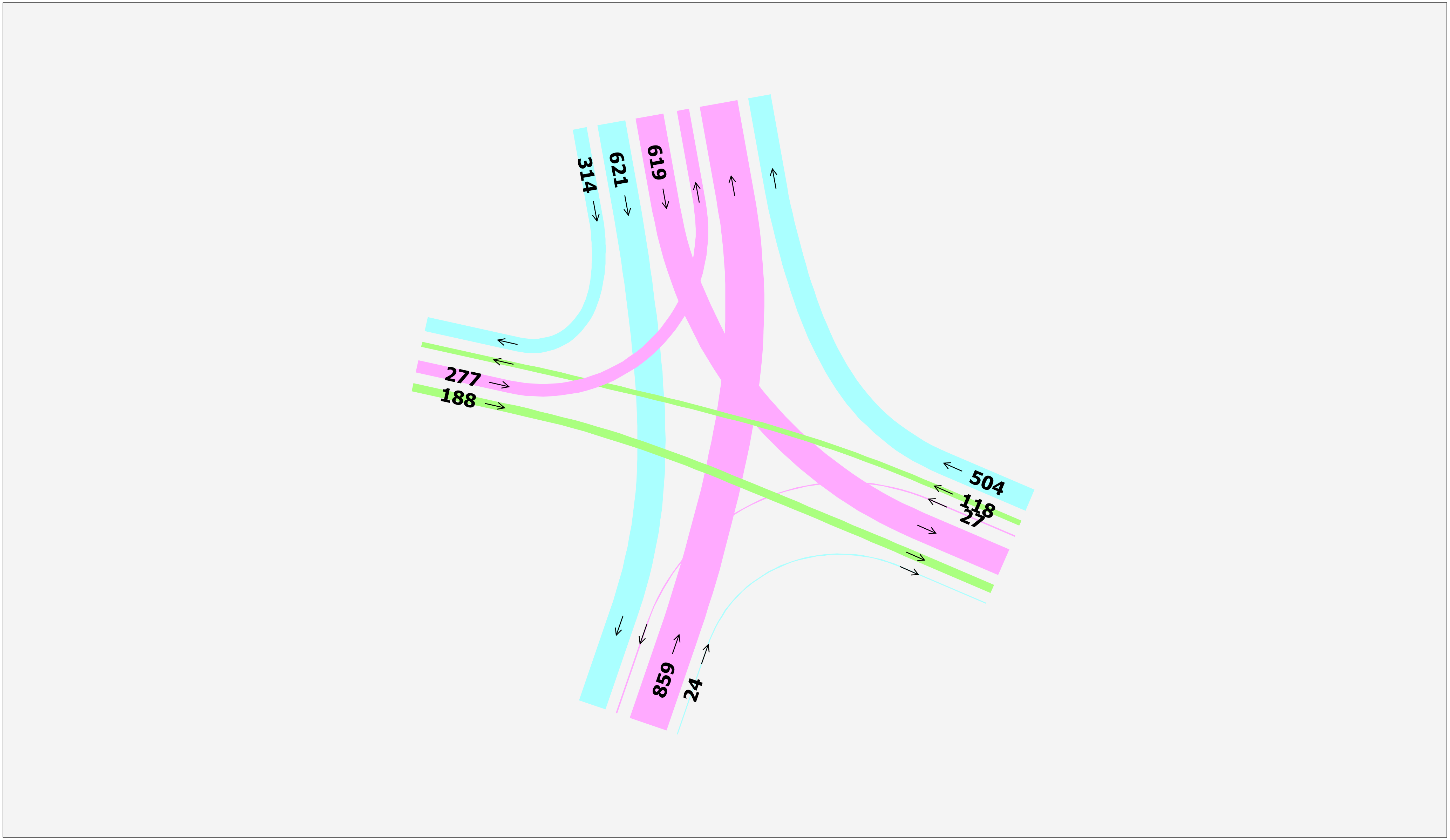
Beavercreek 8:00

2015



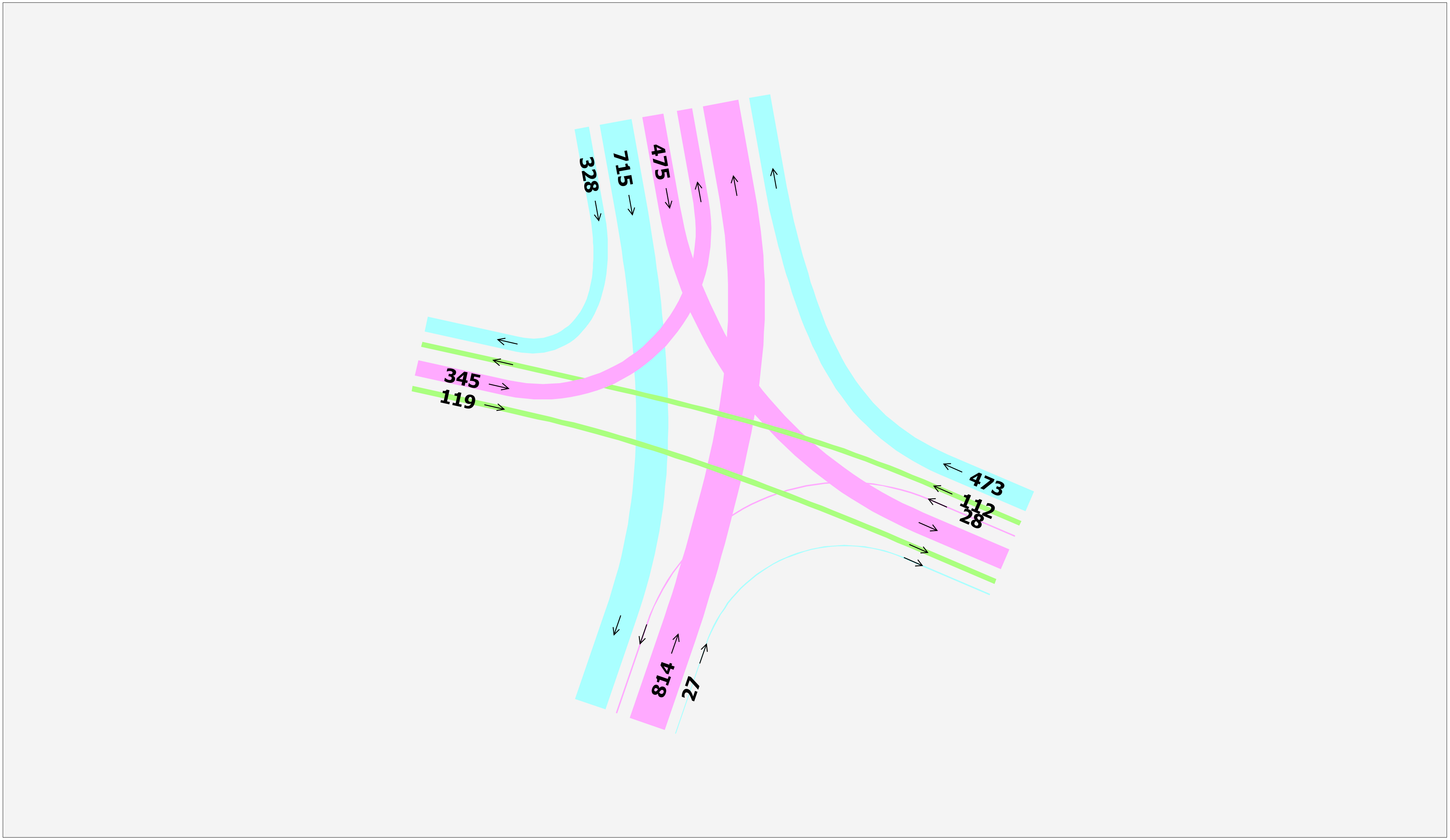
Beavercreek 9:00

2015



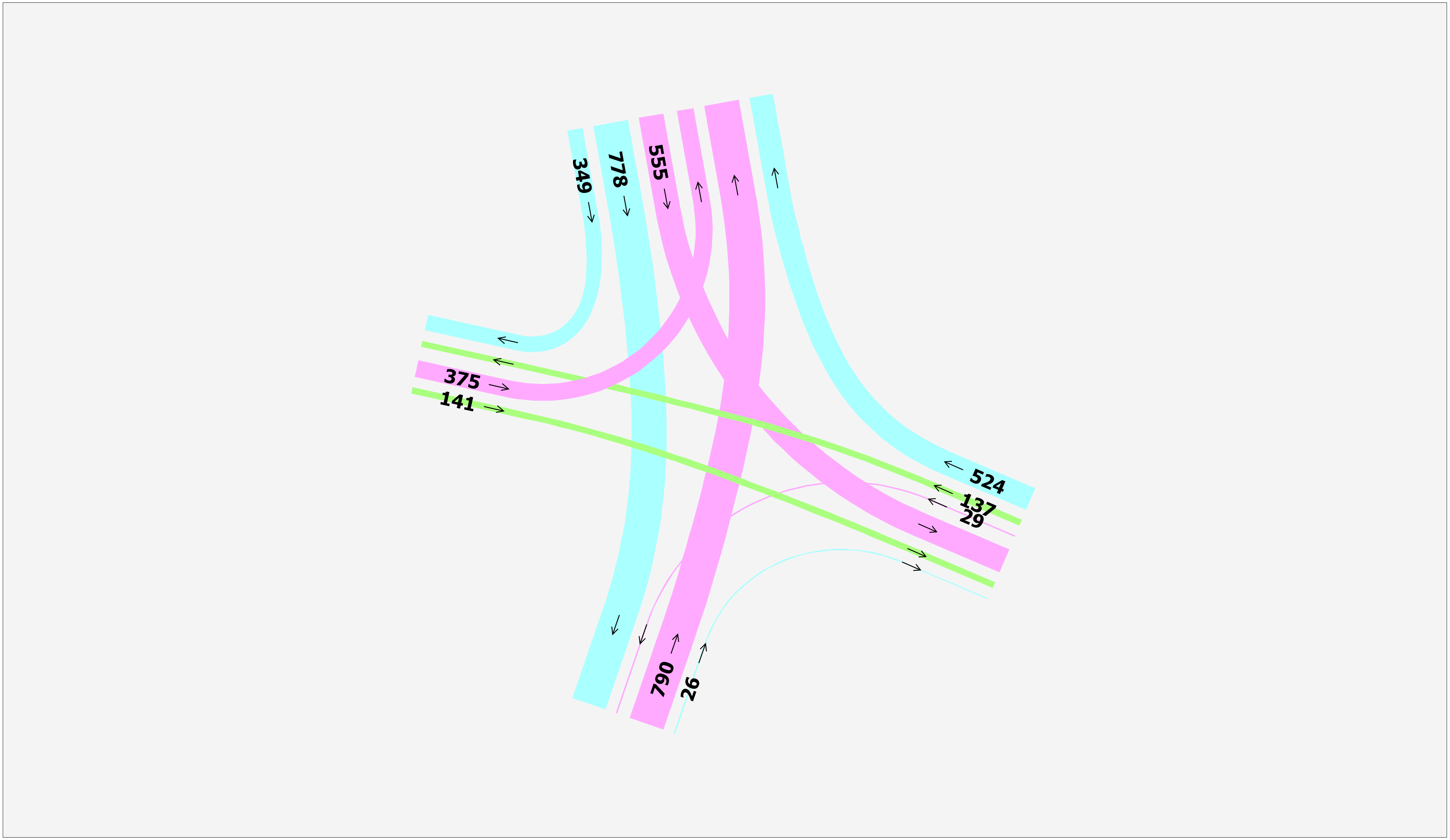
Beavercreek 10:00

2015



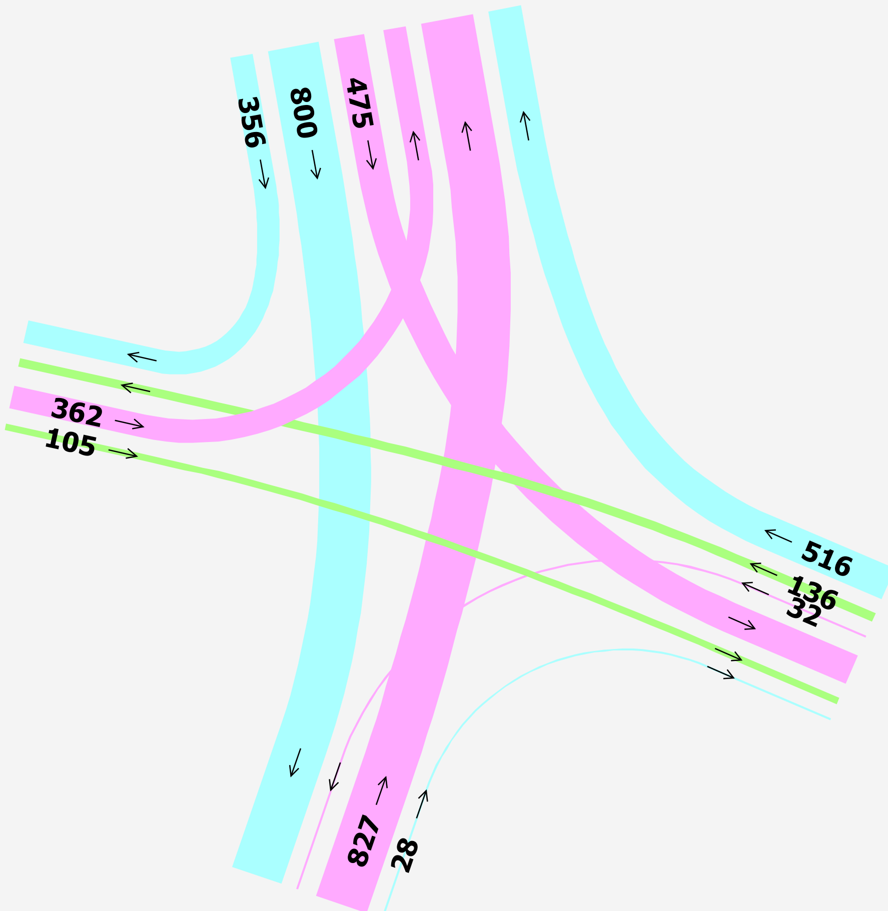
Beavercreek 11:00

2015



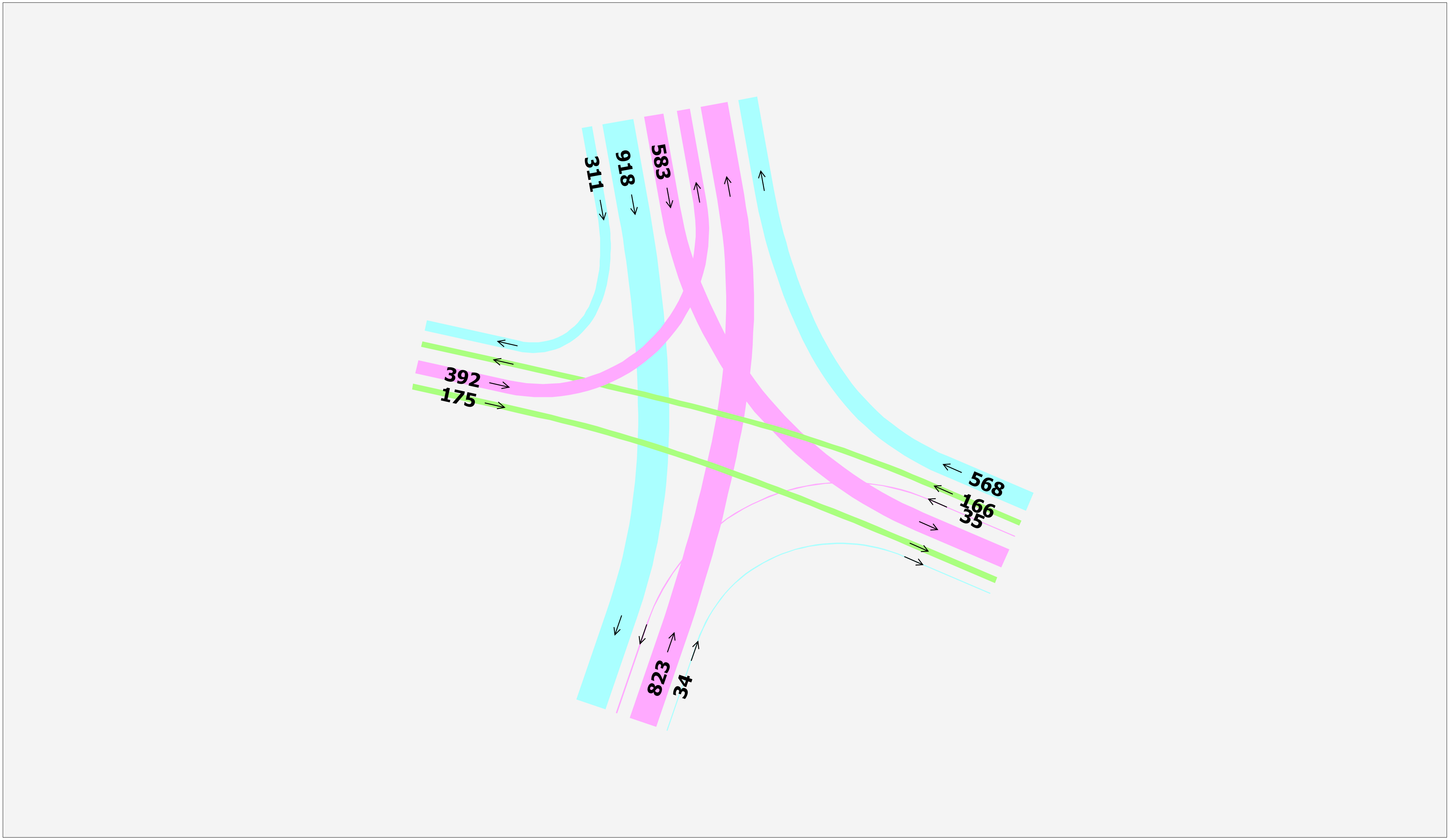
Beavercreek 12:00

2015



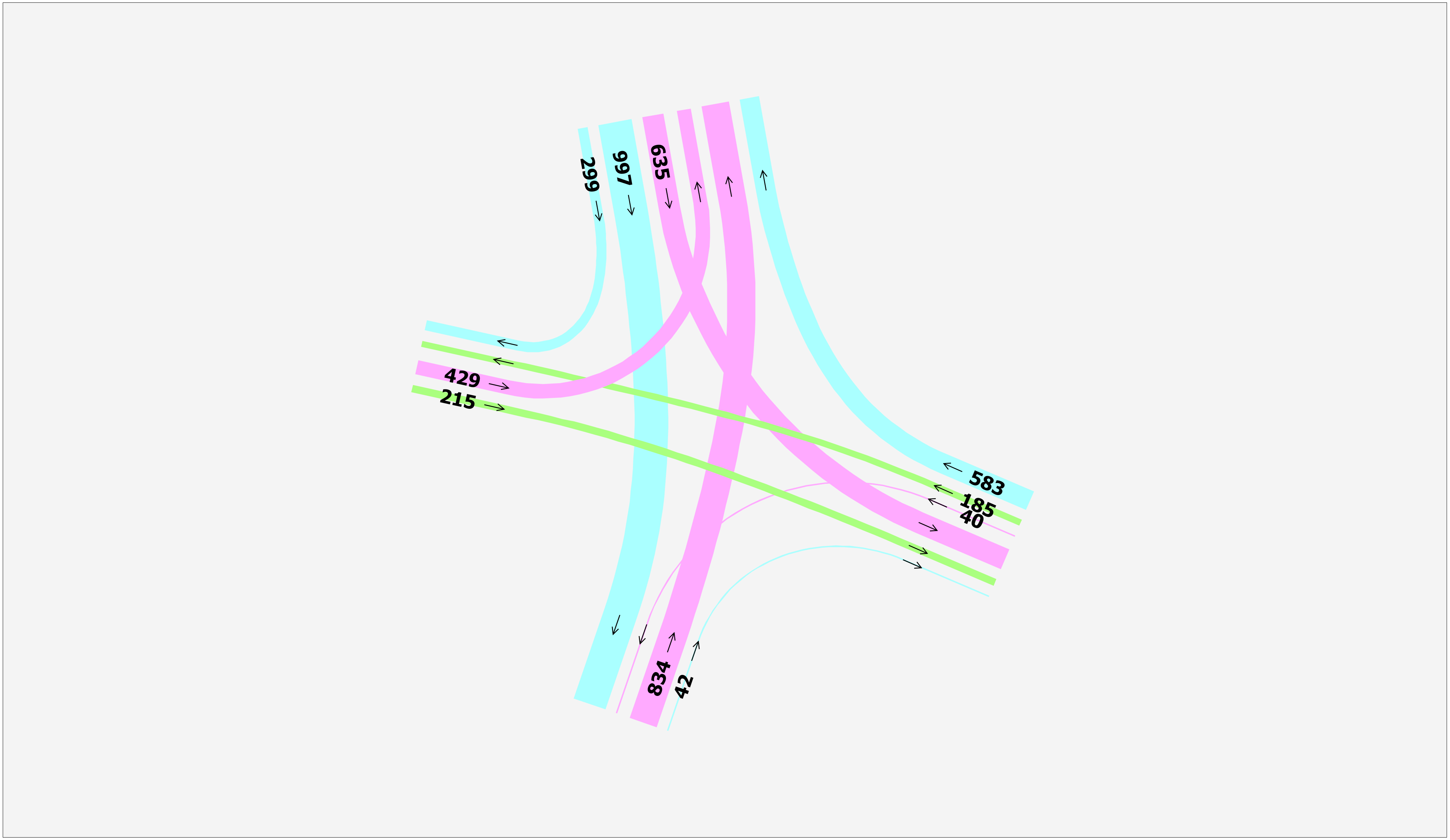
Beavercreek 13:00

2015



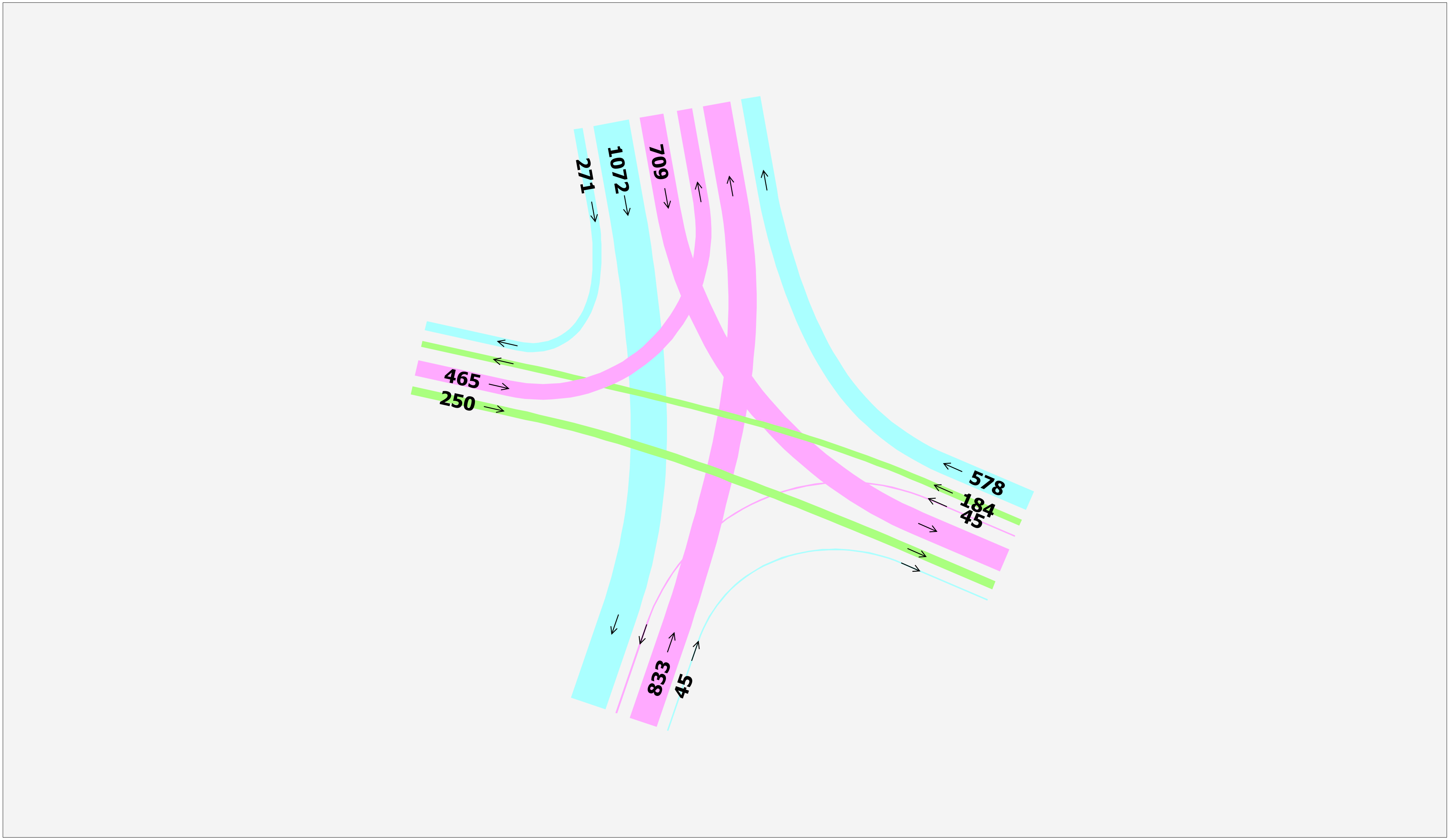
Beavercreek 14:00

2015



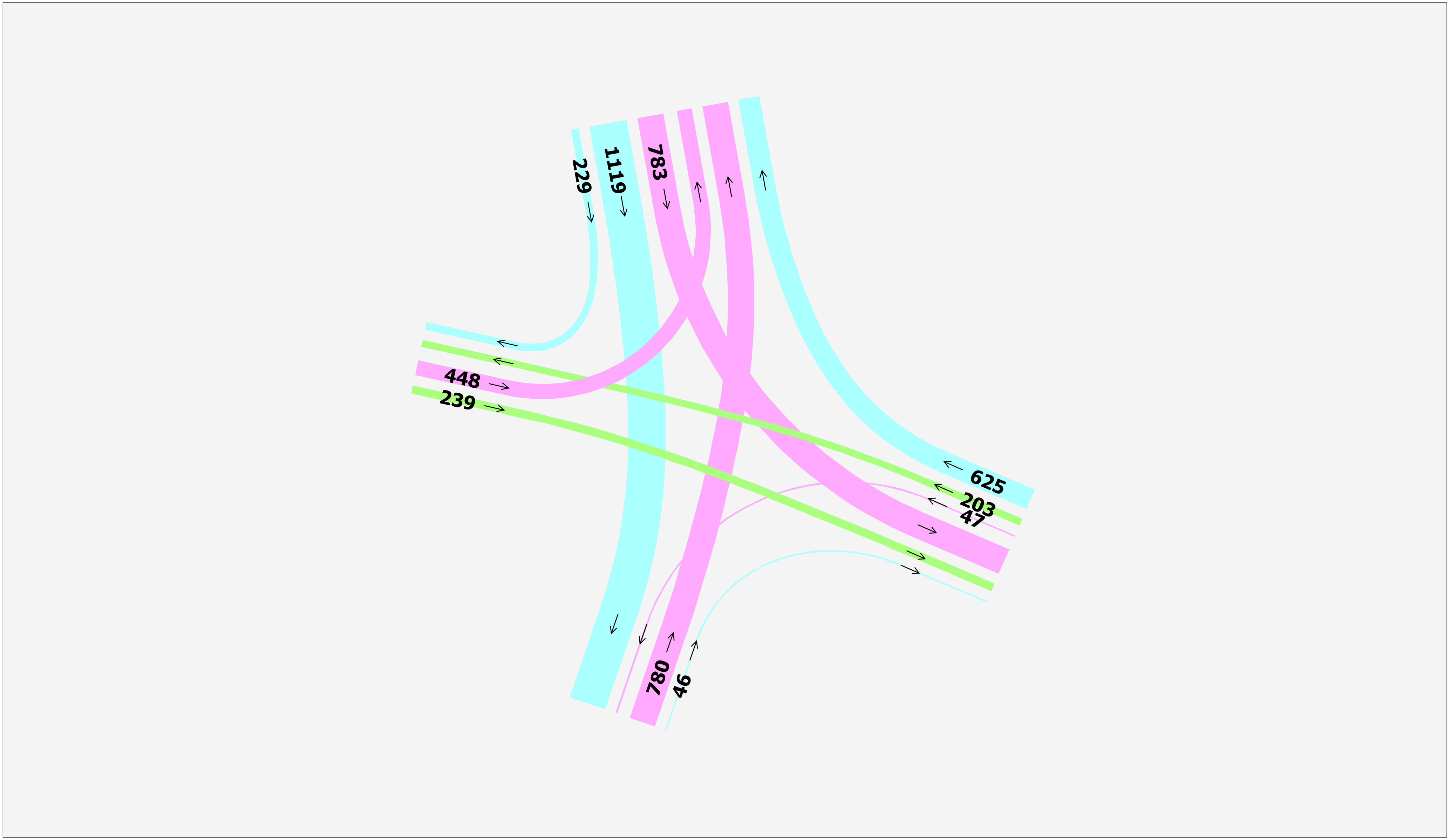
Beavercreek 15:00

2015



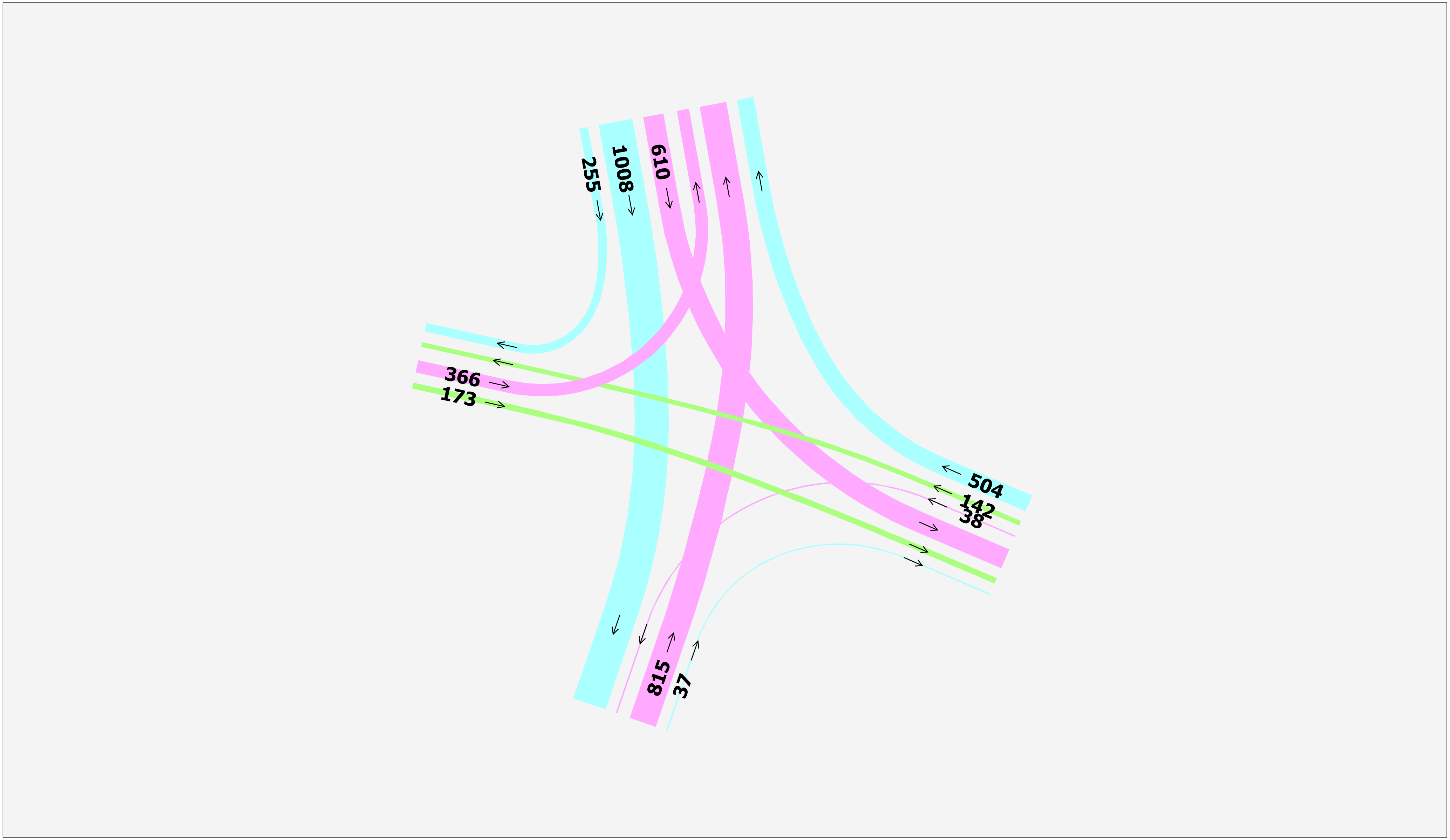
Beavercreek 16:00

2015



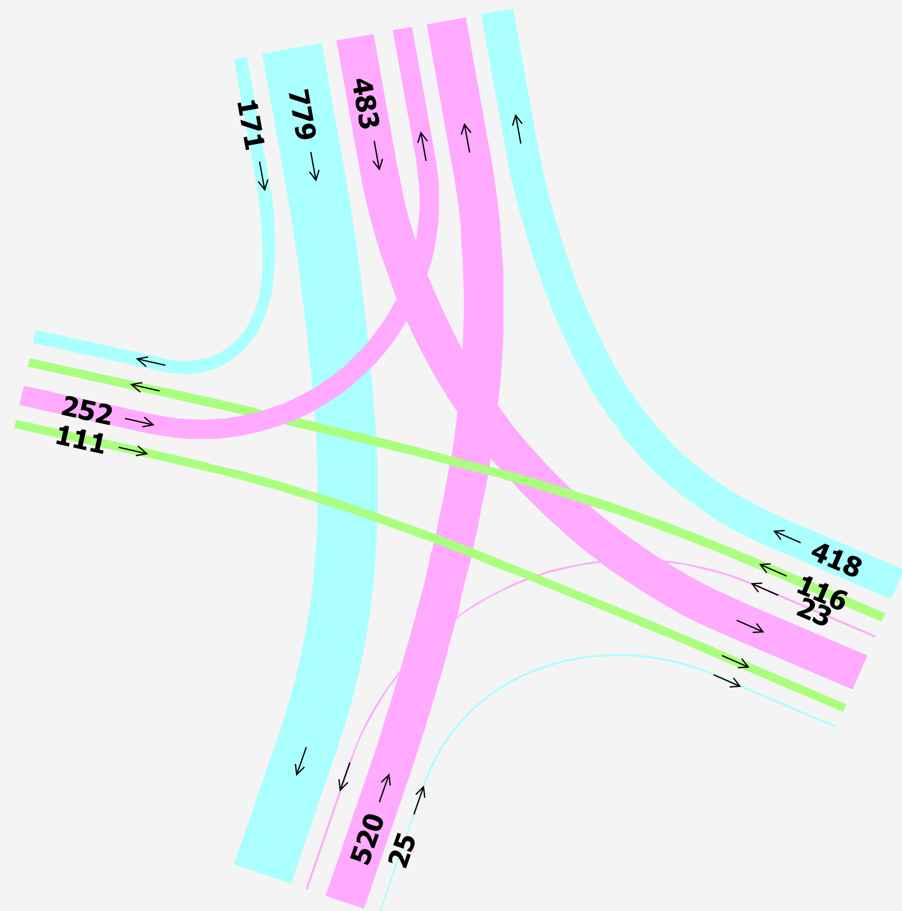
Beavercreek 17:00

2015



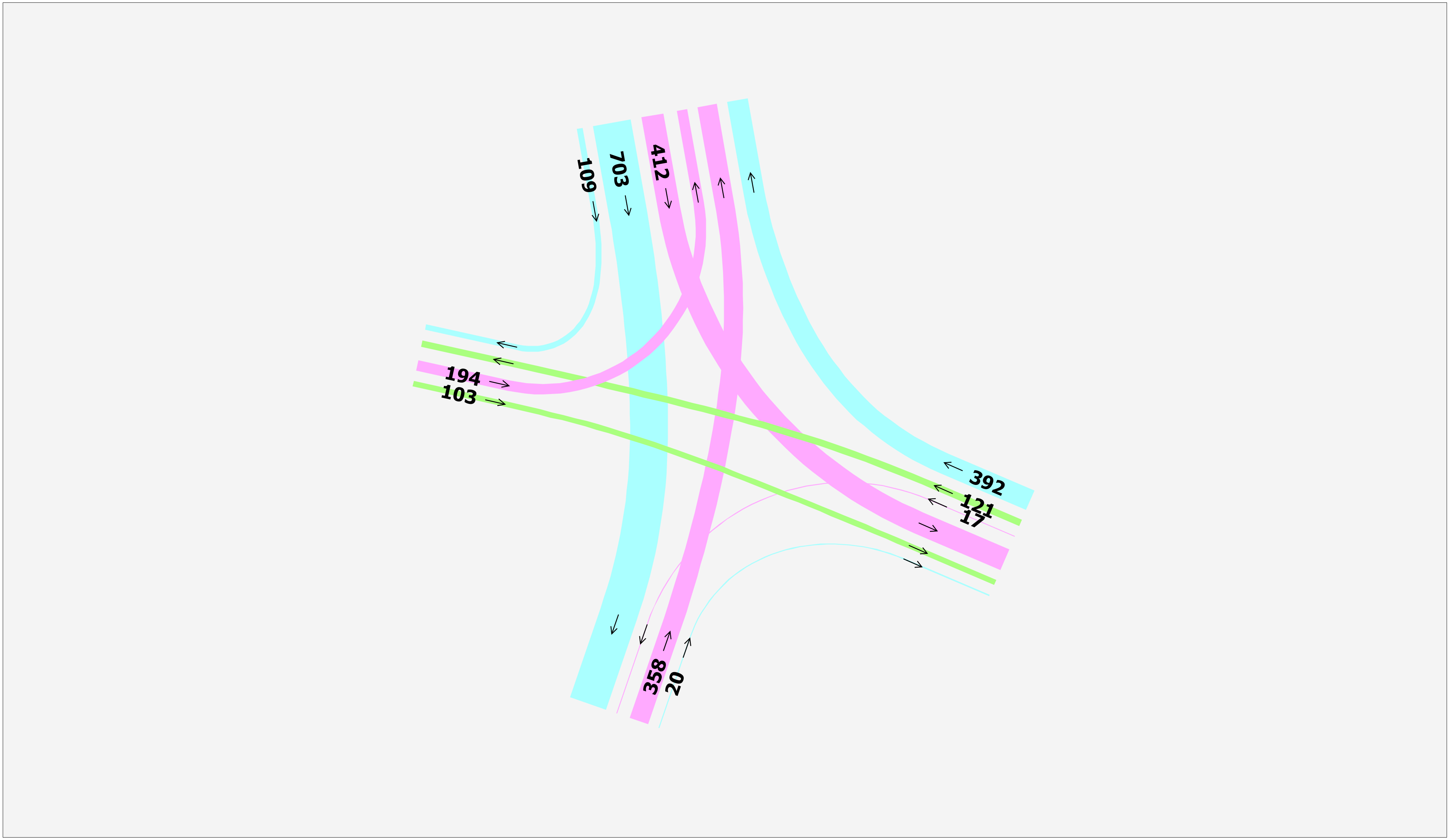
Beavercreek 18:00

2015



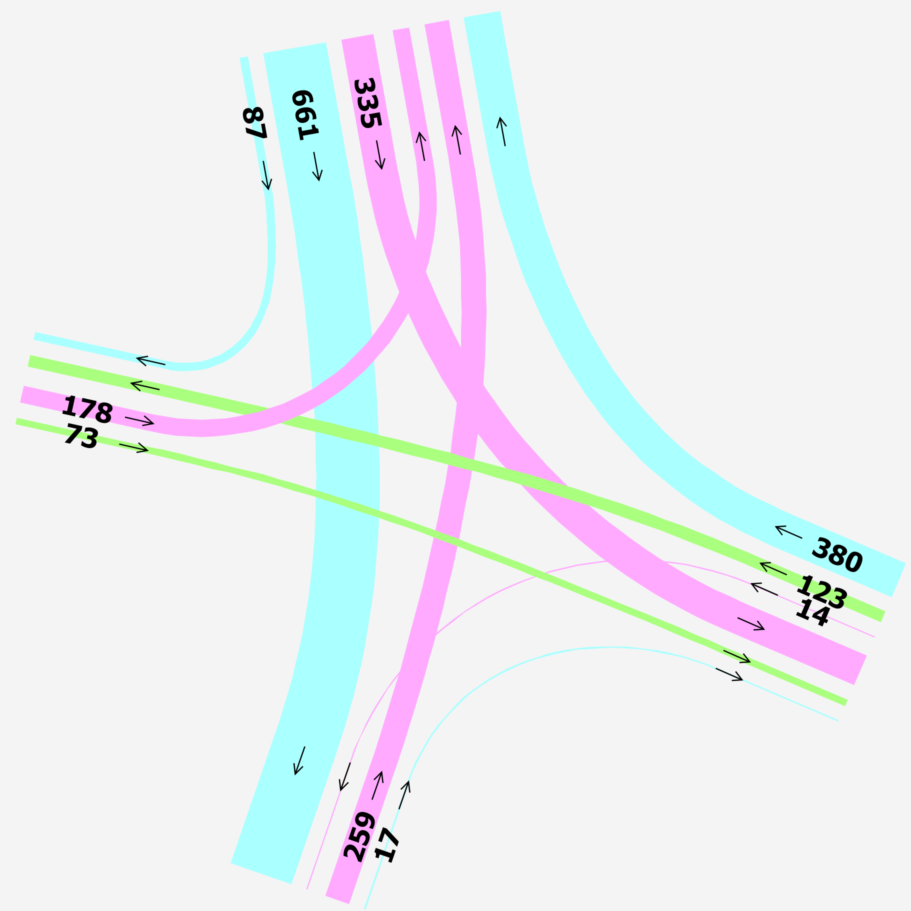
Beavercreek 19:00

2015



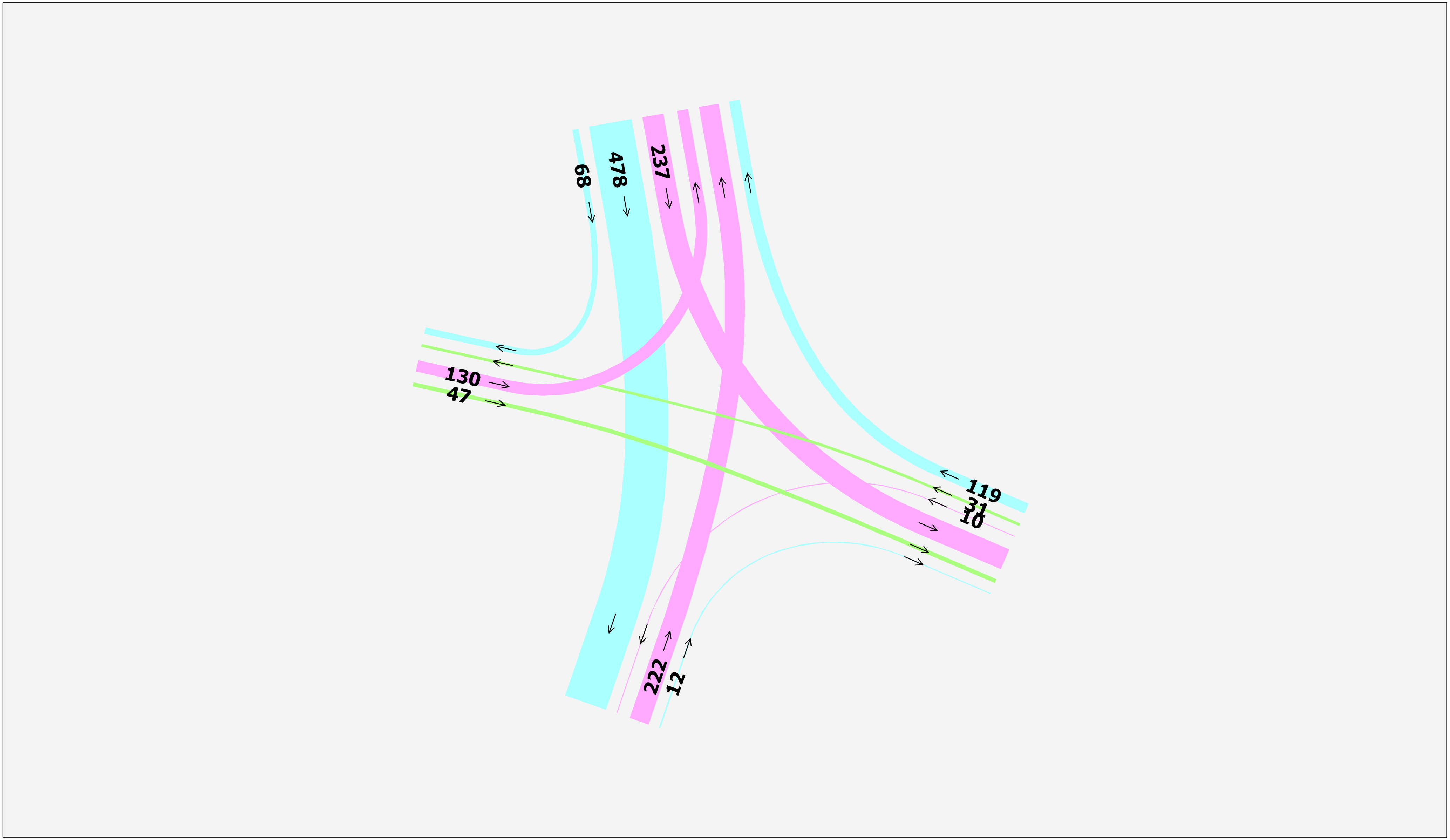
Beavercreek 20:00

2015



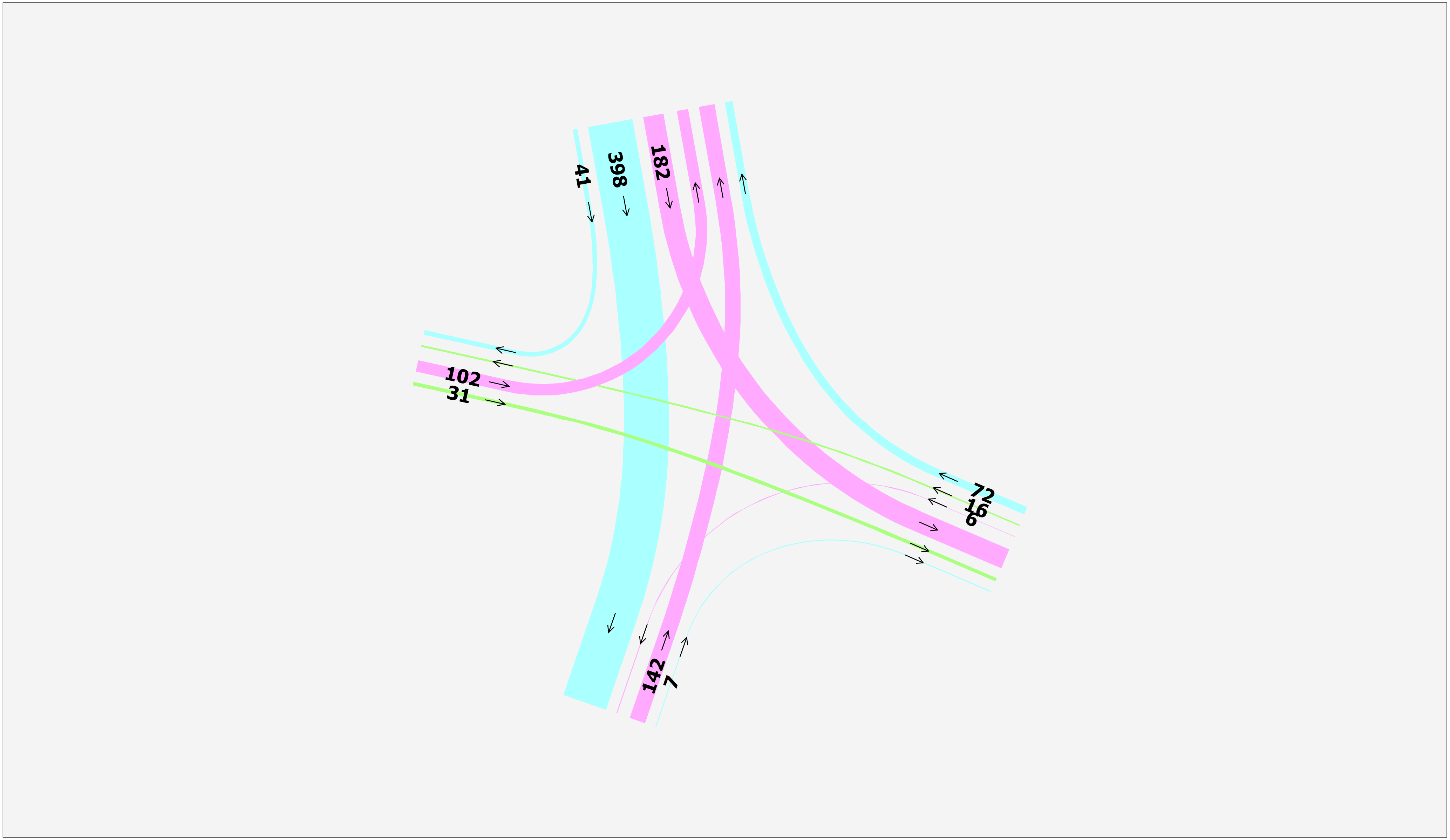
Beavercreek 21:00

2015



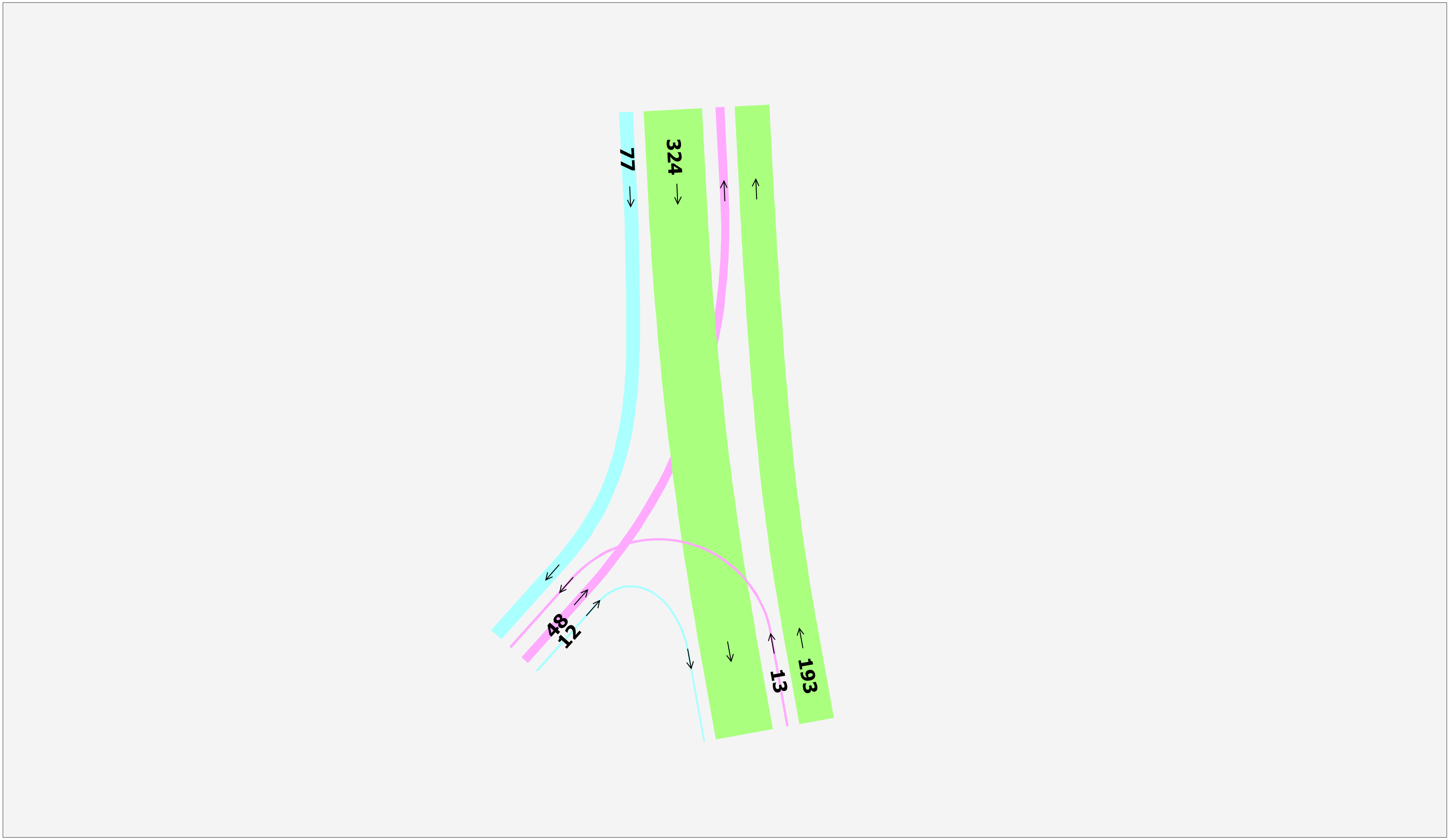
Beavercreek 22:00

2015



Beavercreek 23:00

2015



Redland 0:00

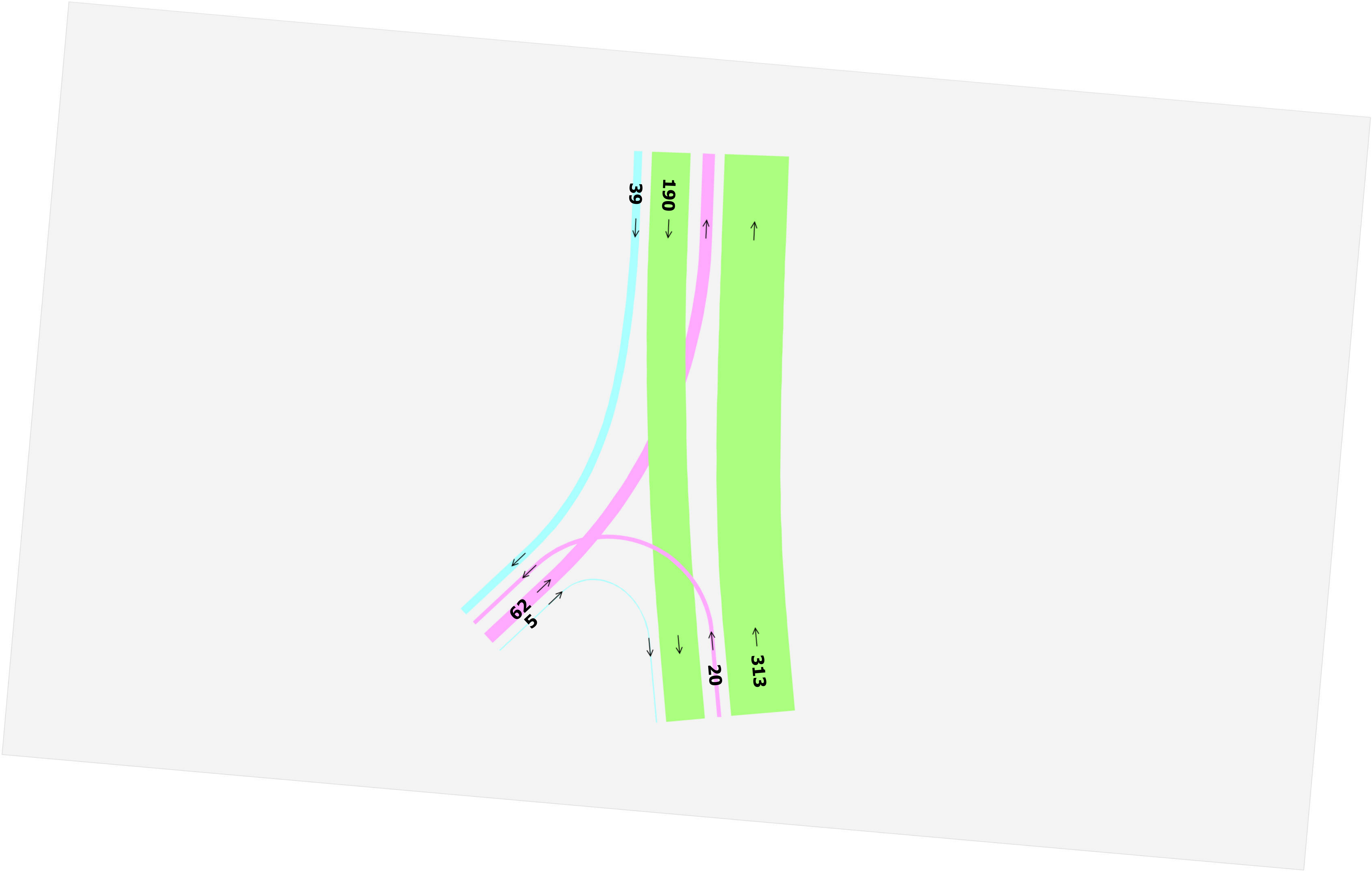
2015

Redland 1:00

2015

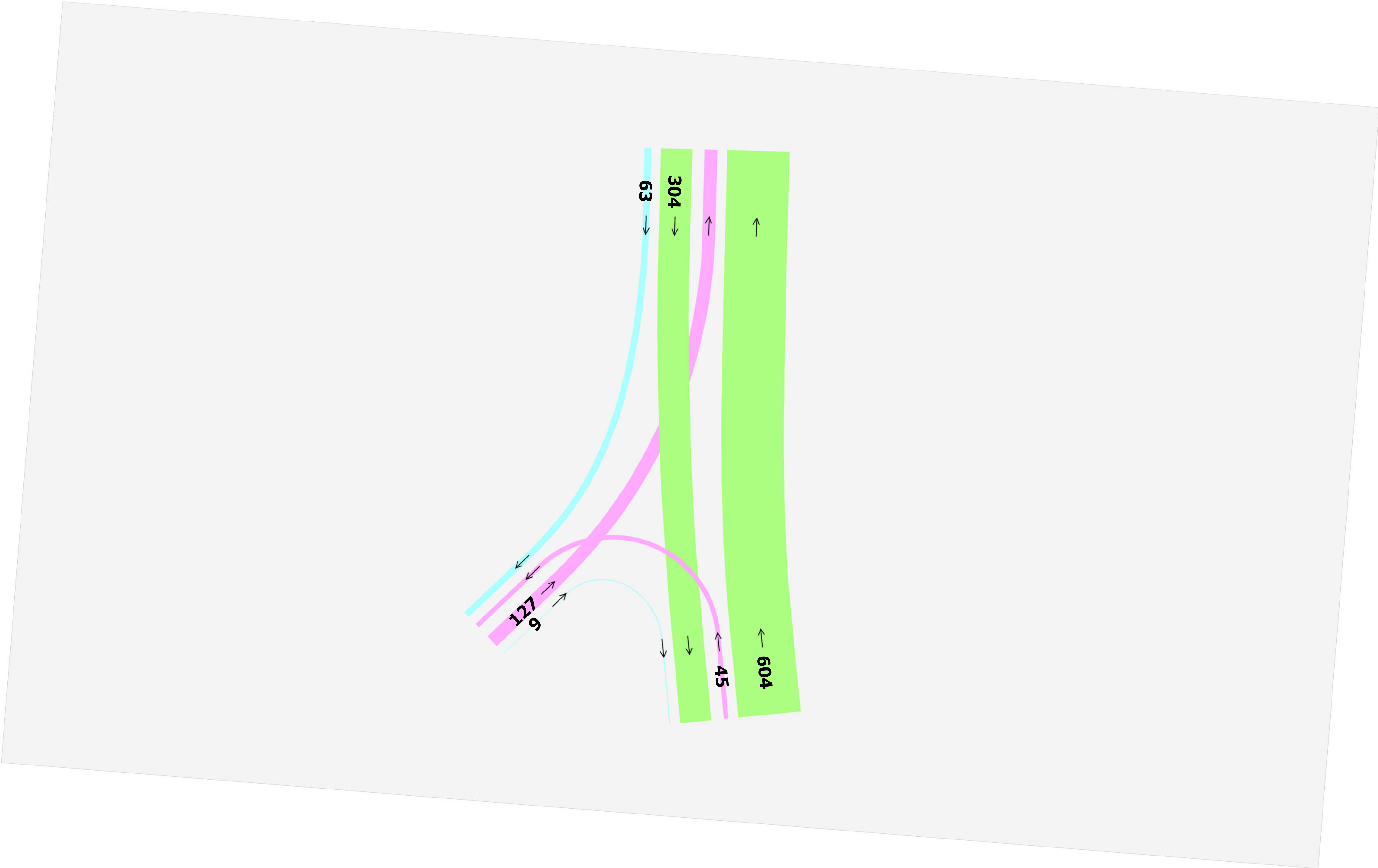
Redland 2:00

2015



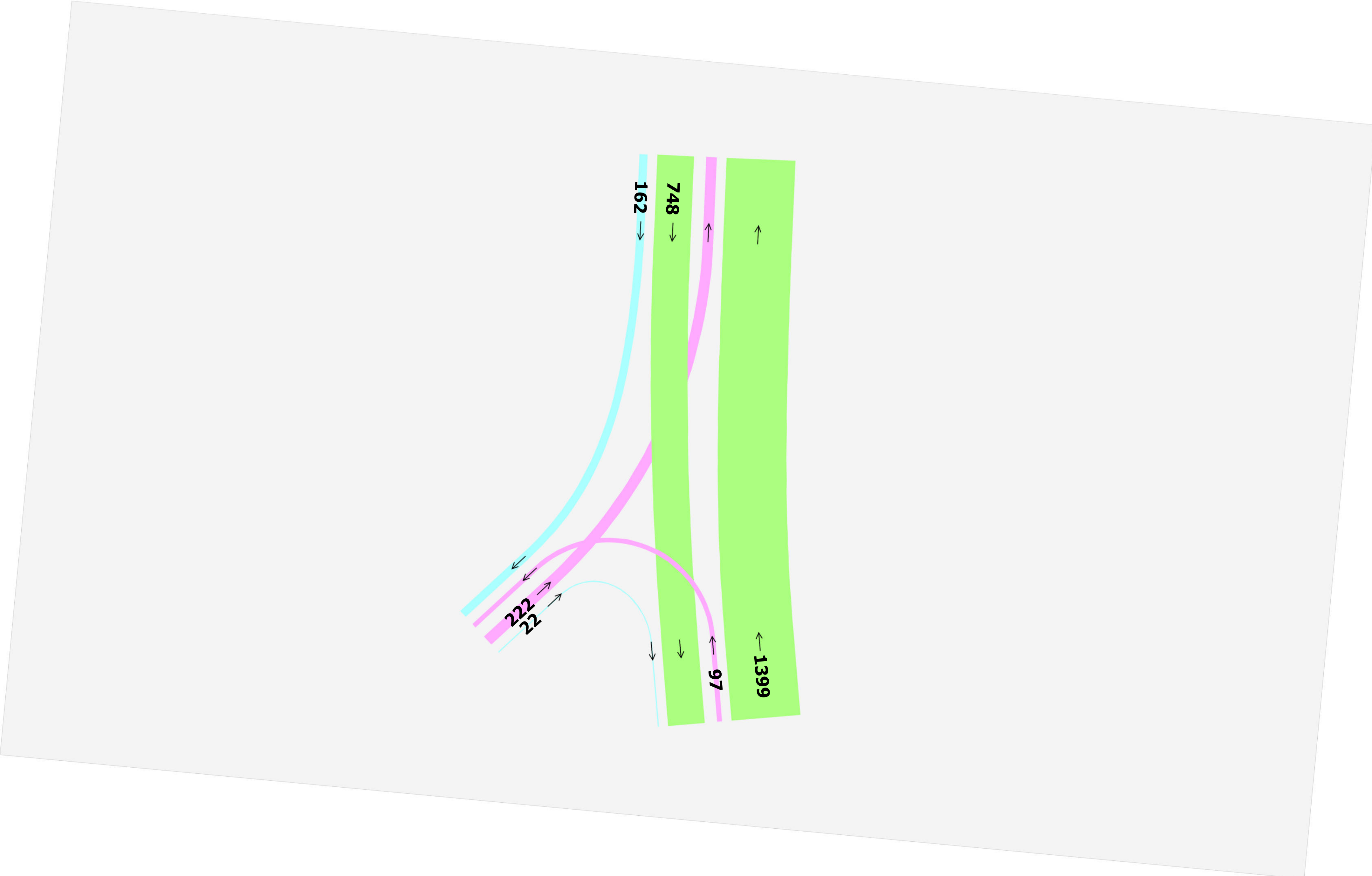
Redland 3:00

2015



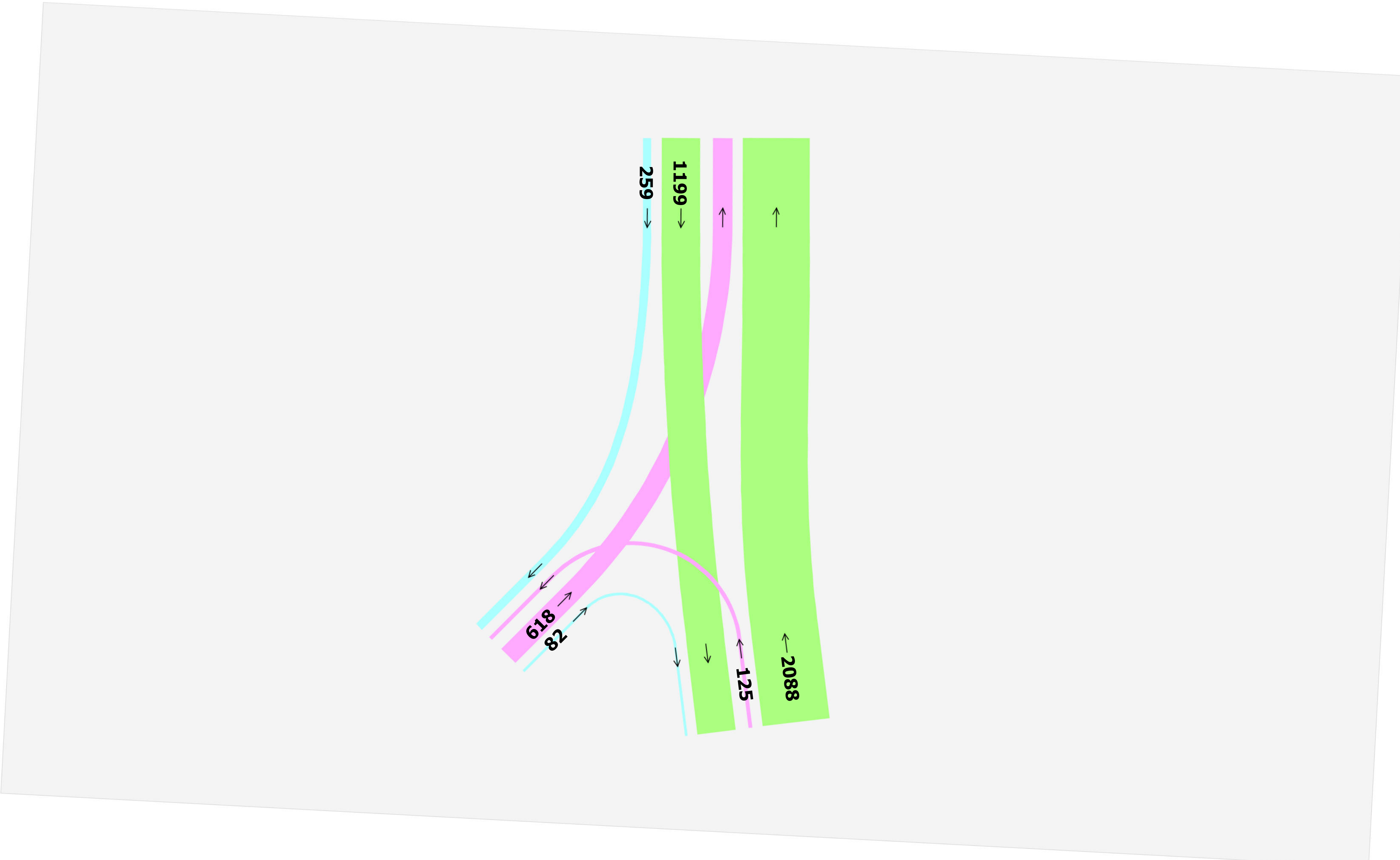
Redland 4:00

2015



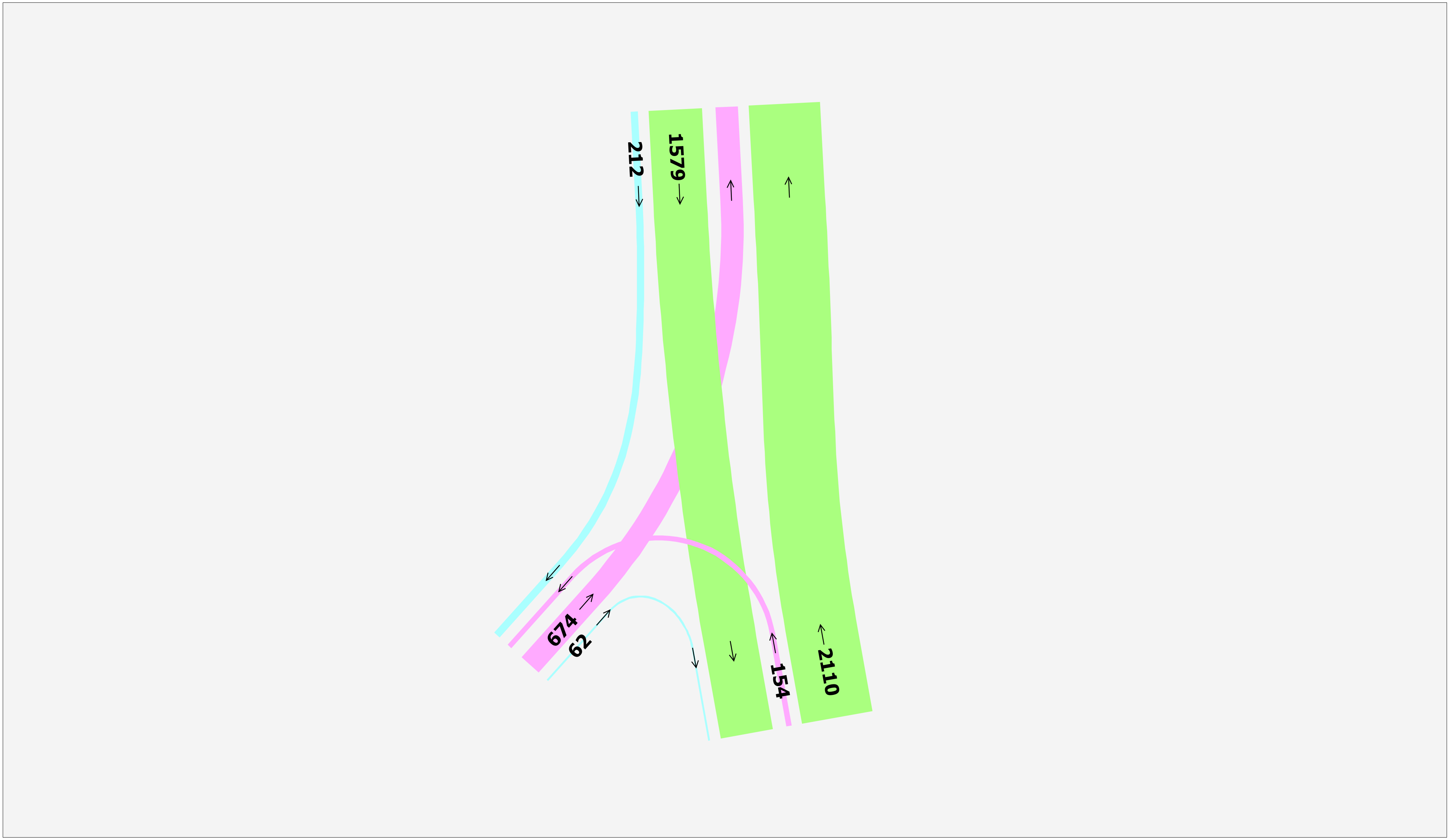
Redland 5:00

2015



Redland 6:00

2015



Redland 7:00

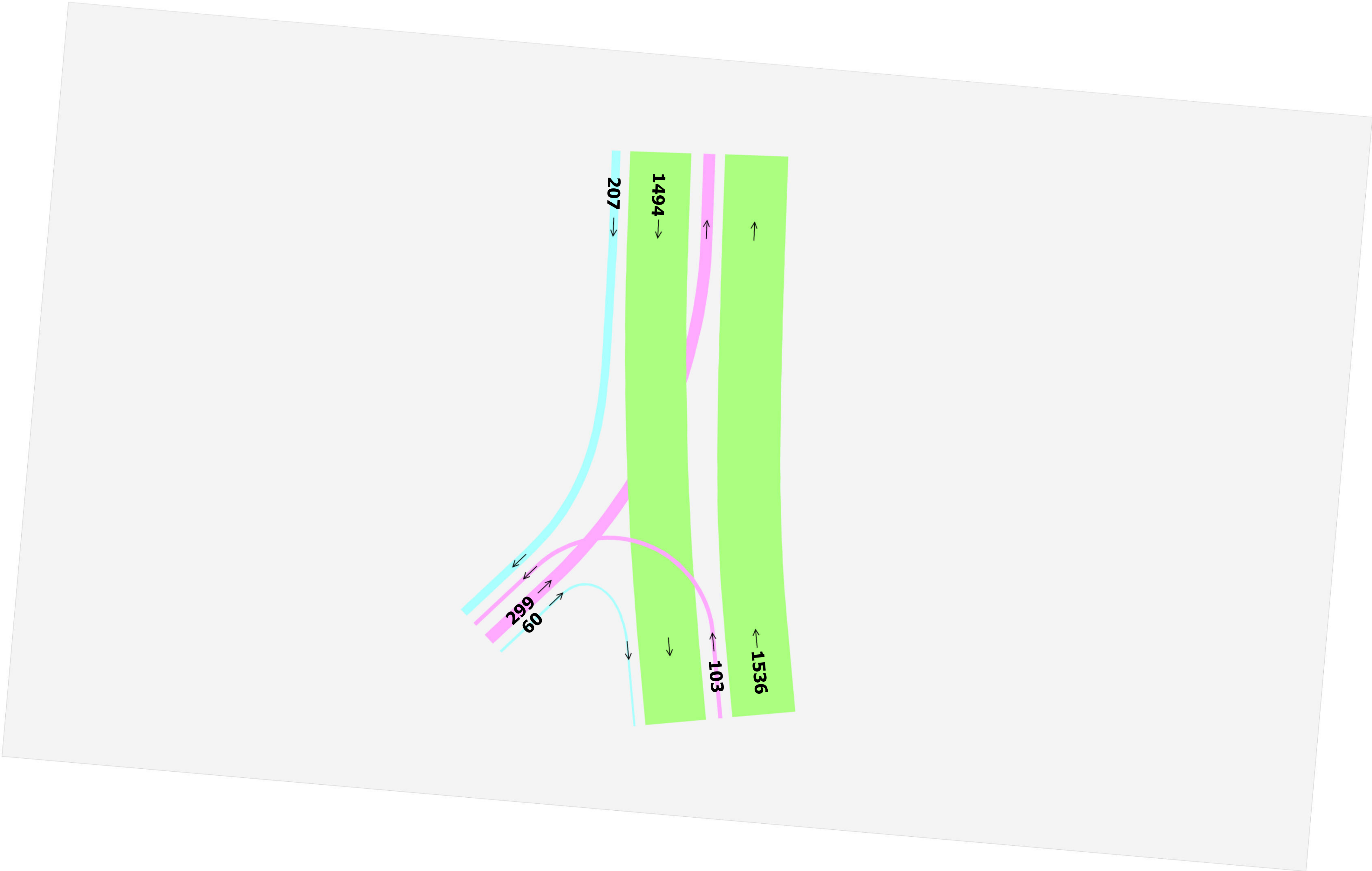
2015

Redland 8:00

2015

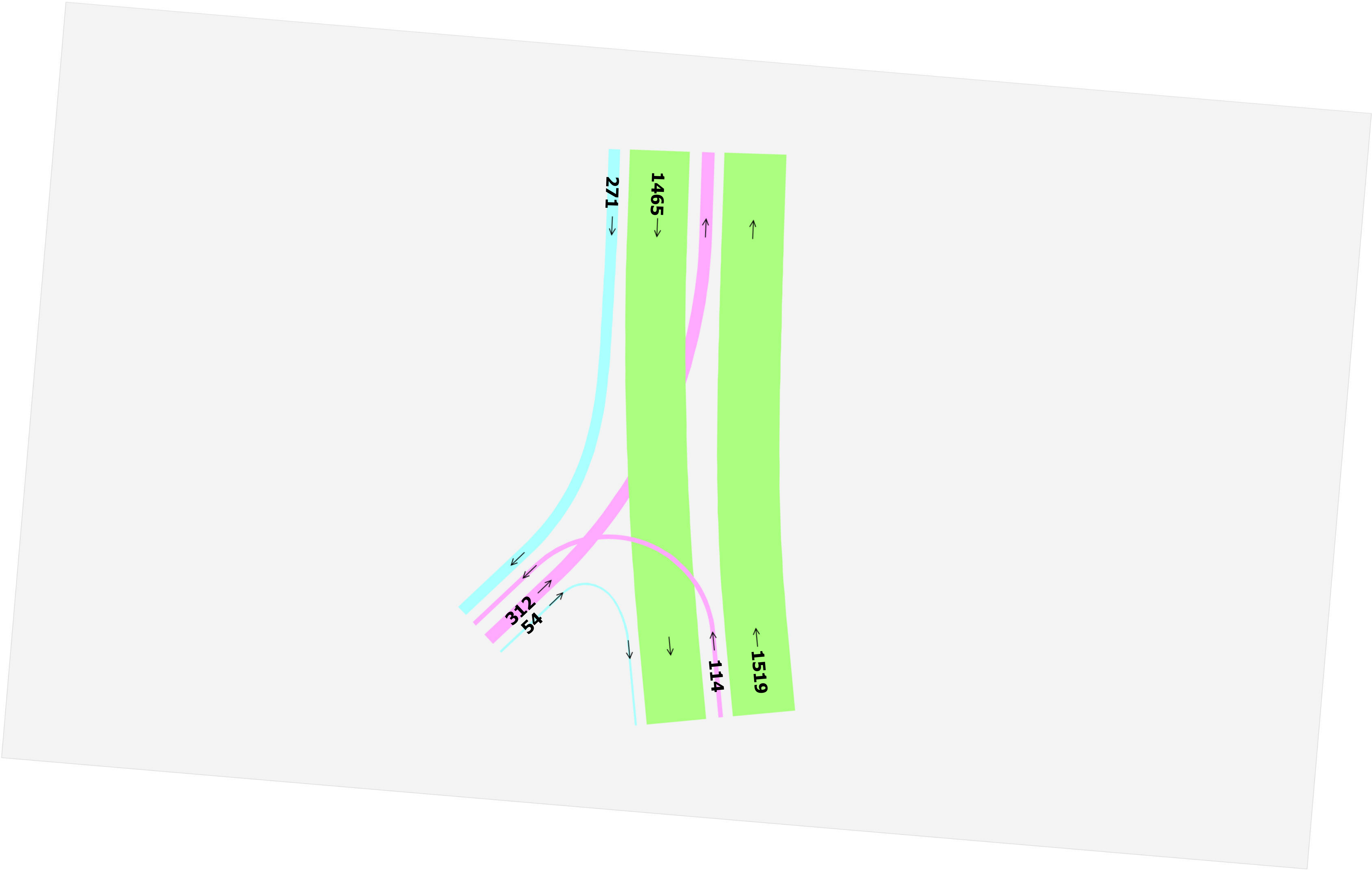
Redland 9:00

2015



Redland 10:00

2015

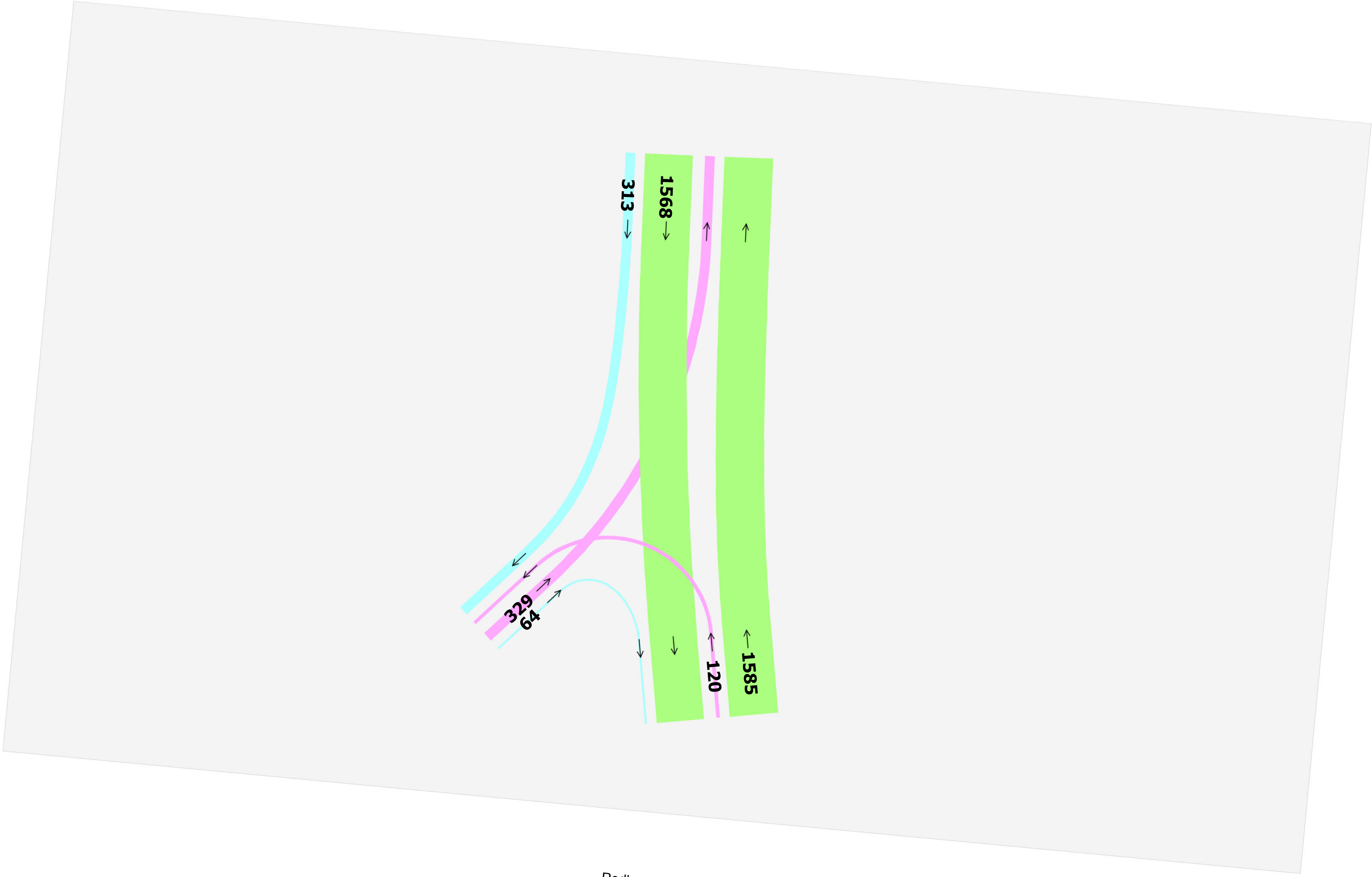


Redland 11:00

2015

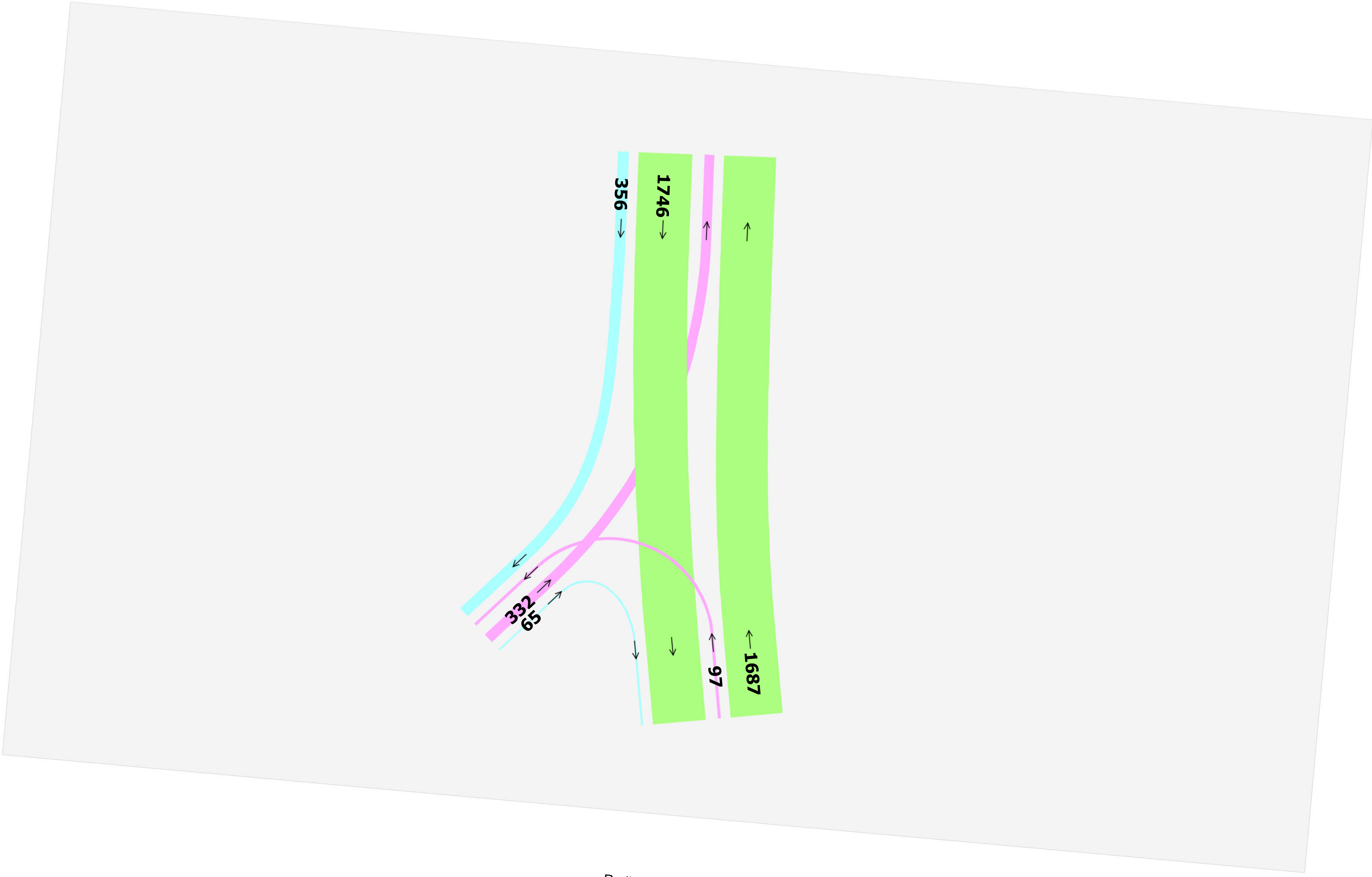
Redland 12:00

2015



Redland 13:00

2015



Redland 14:00

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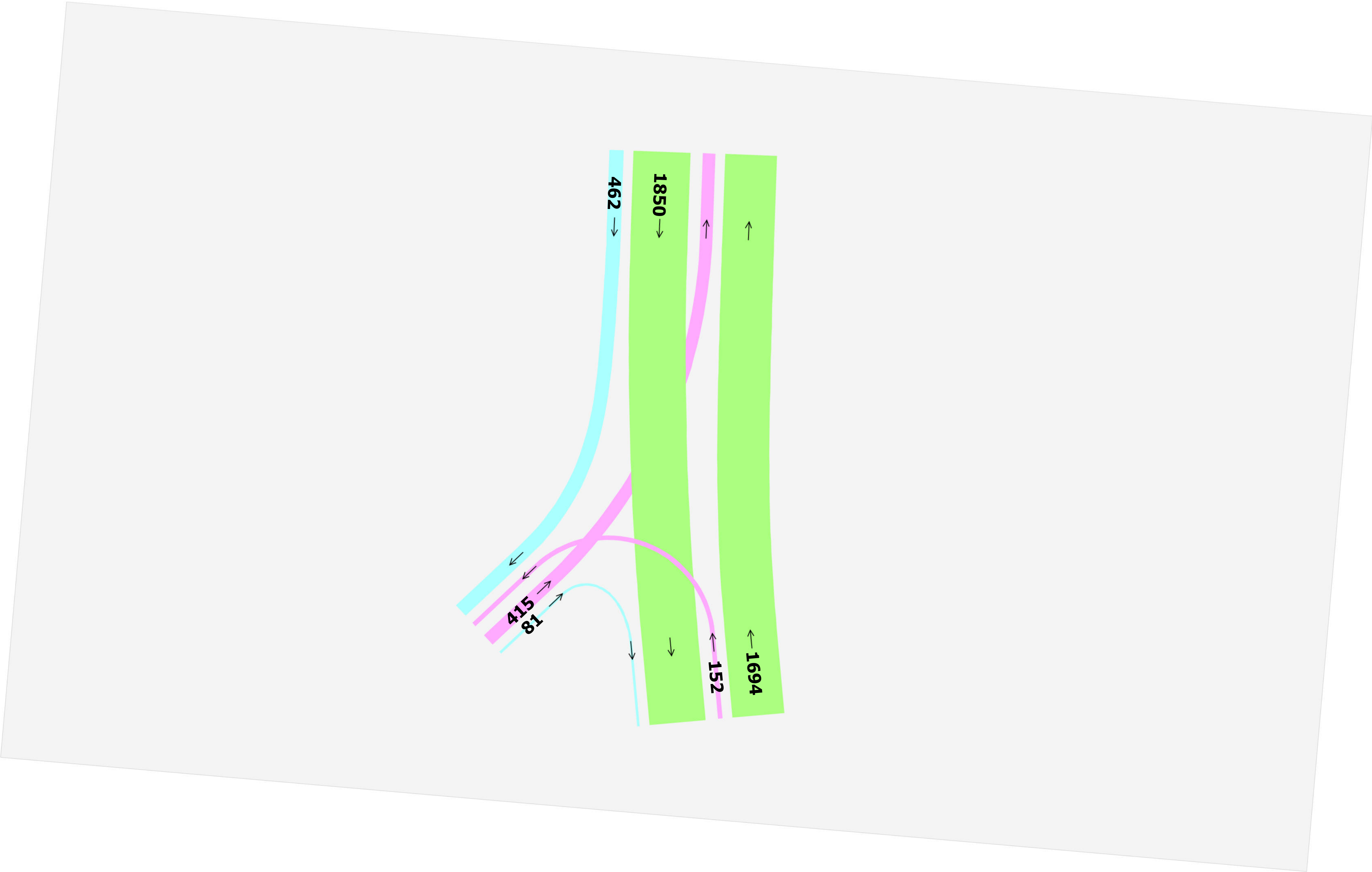
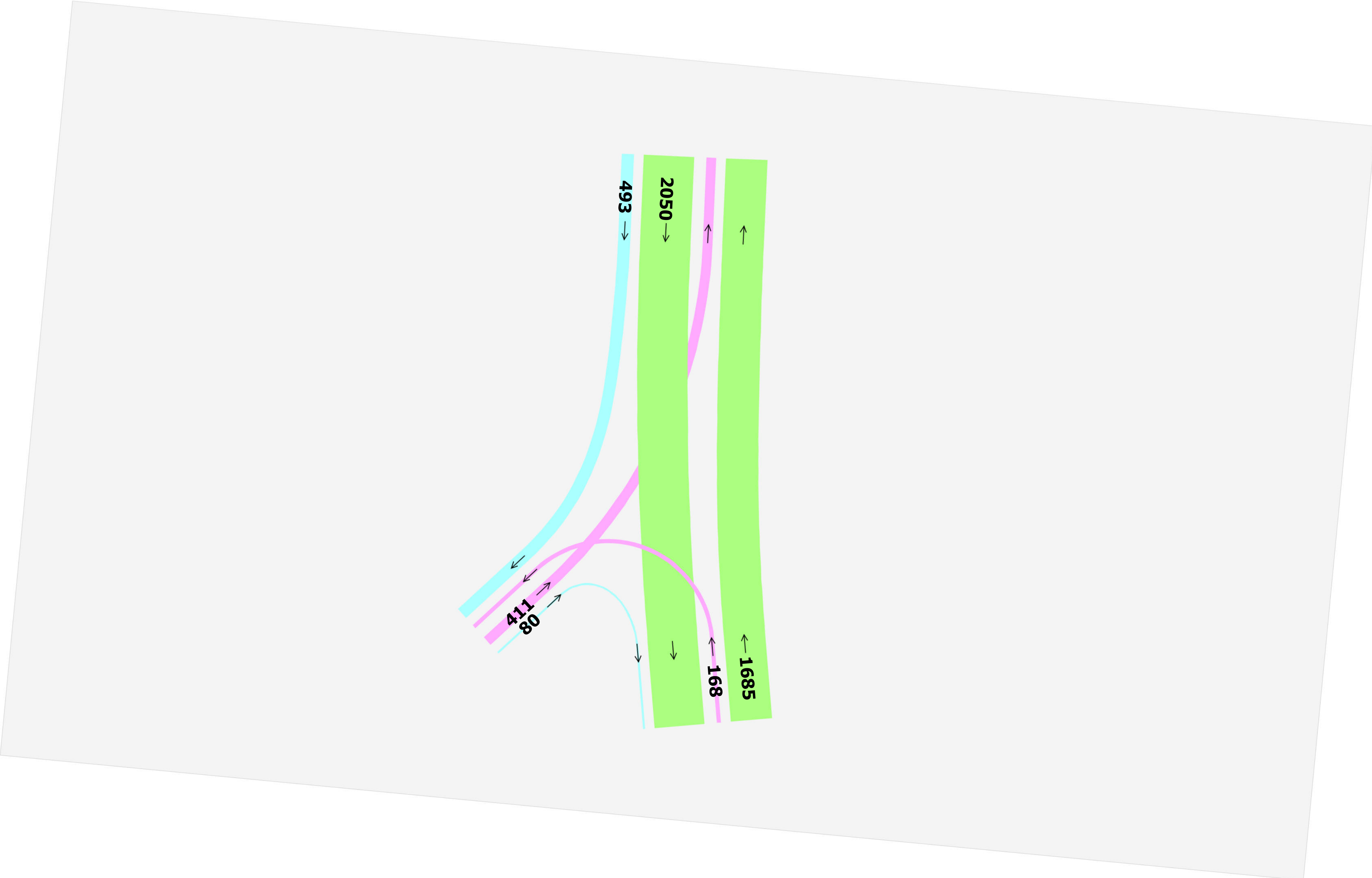


Redland 15:00

2015

Redland 16:00

2015



Redland 17:00

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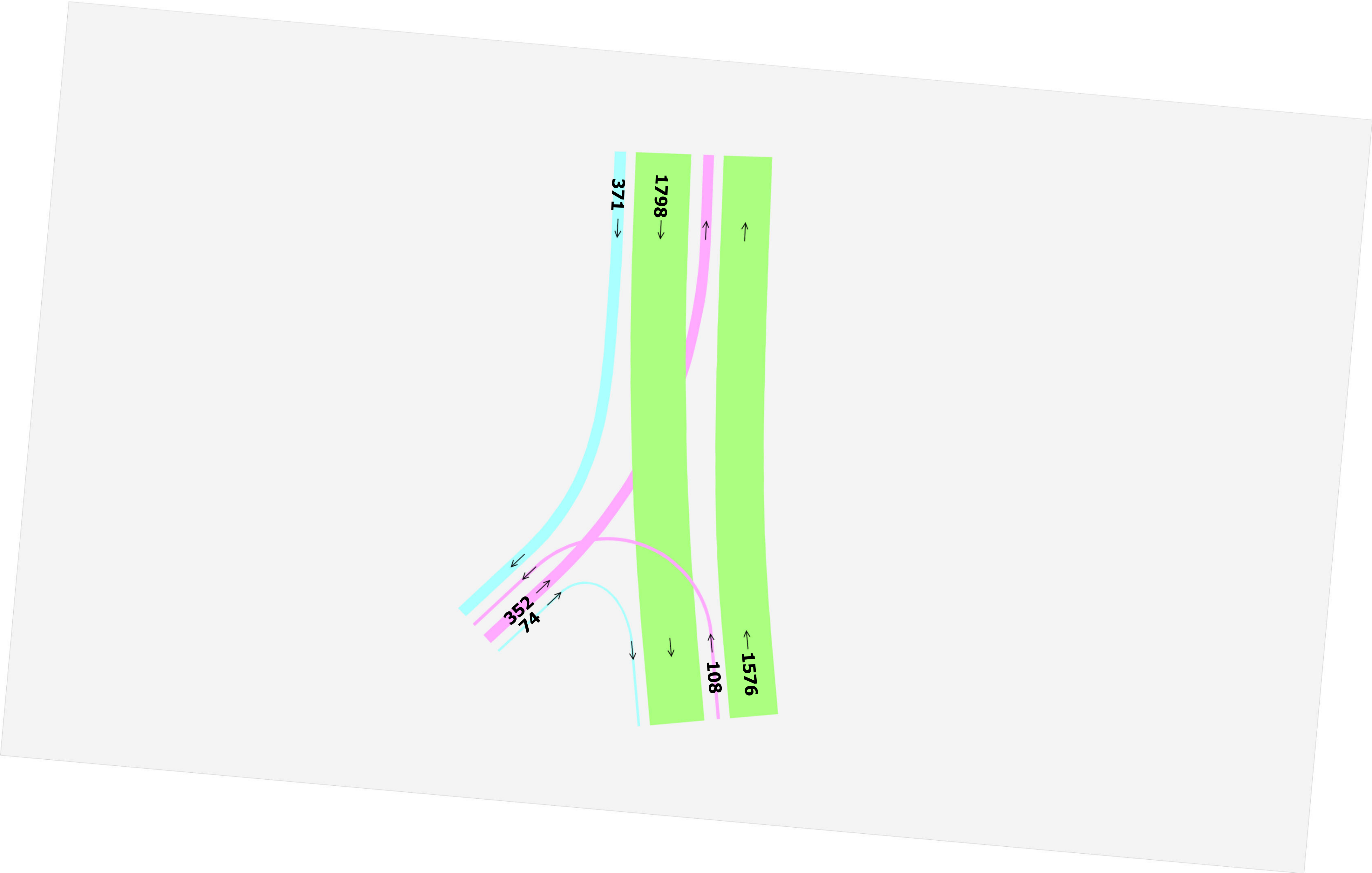


Redland 18:00

2015

Redland 19:00

2015

Redland 20:00

2015

Redland 21:00

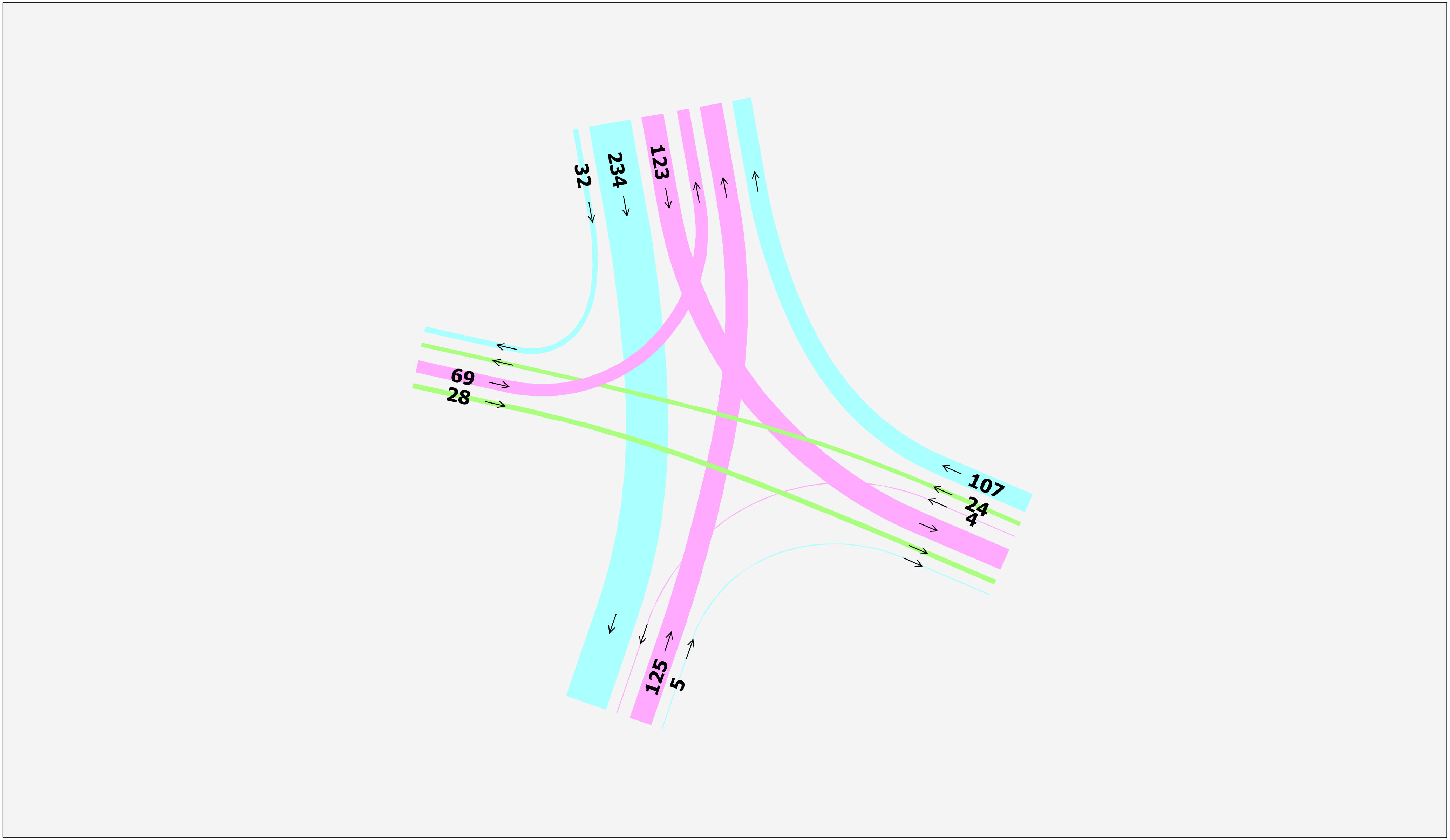
2015

Redland 22:00

2015

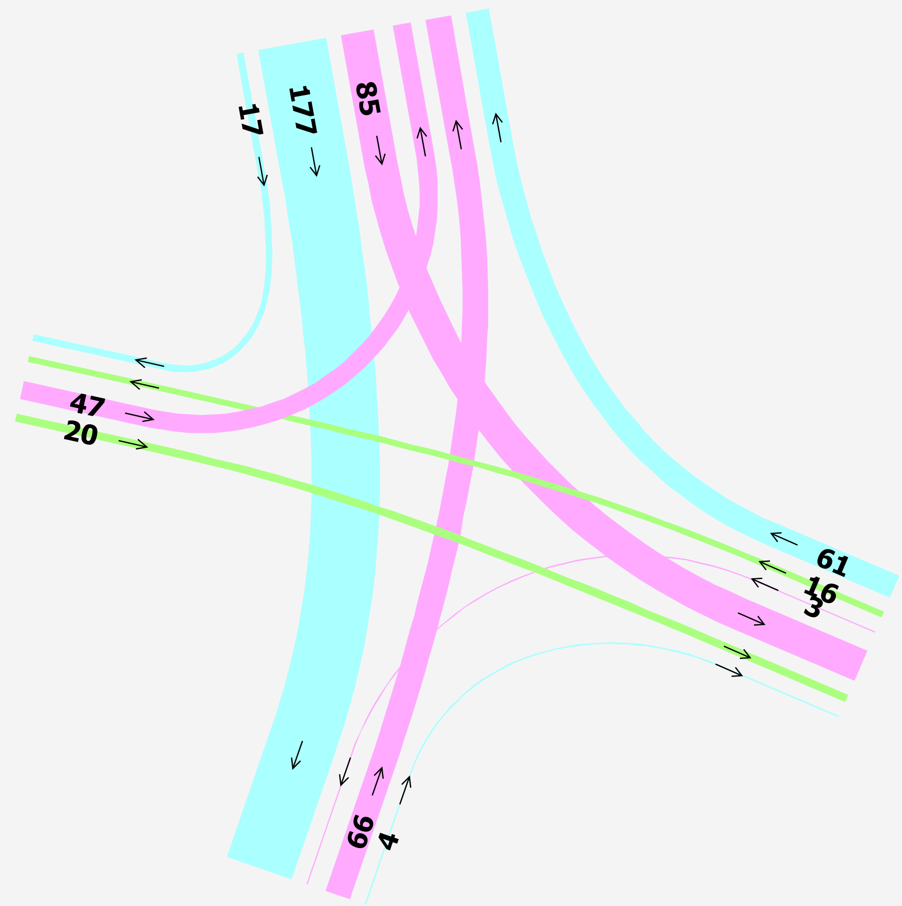
Redland 23:00

2040



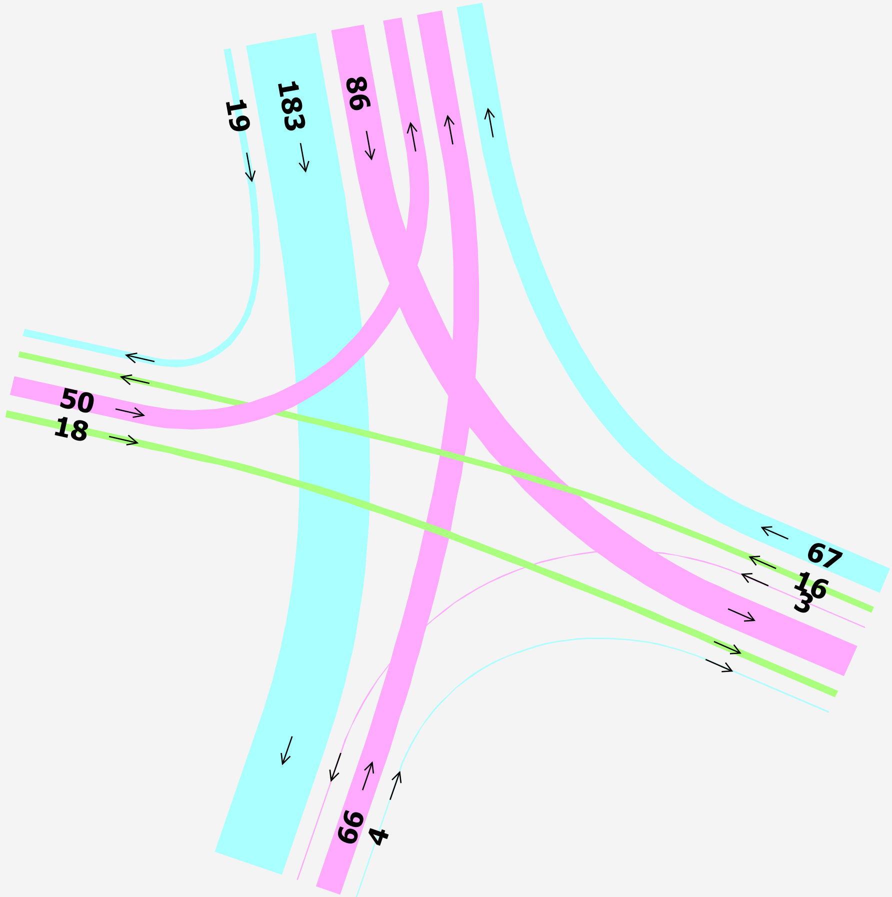
Beavercreek 0:00

2040



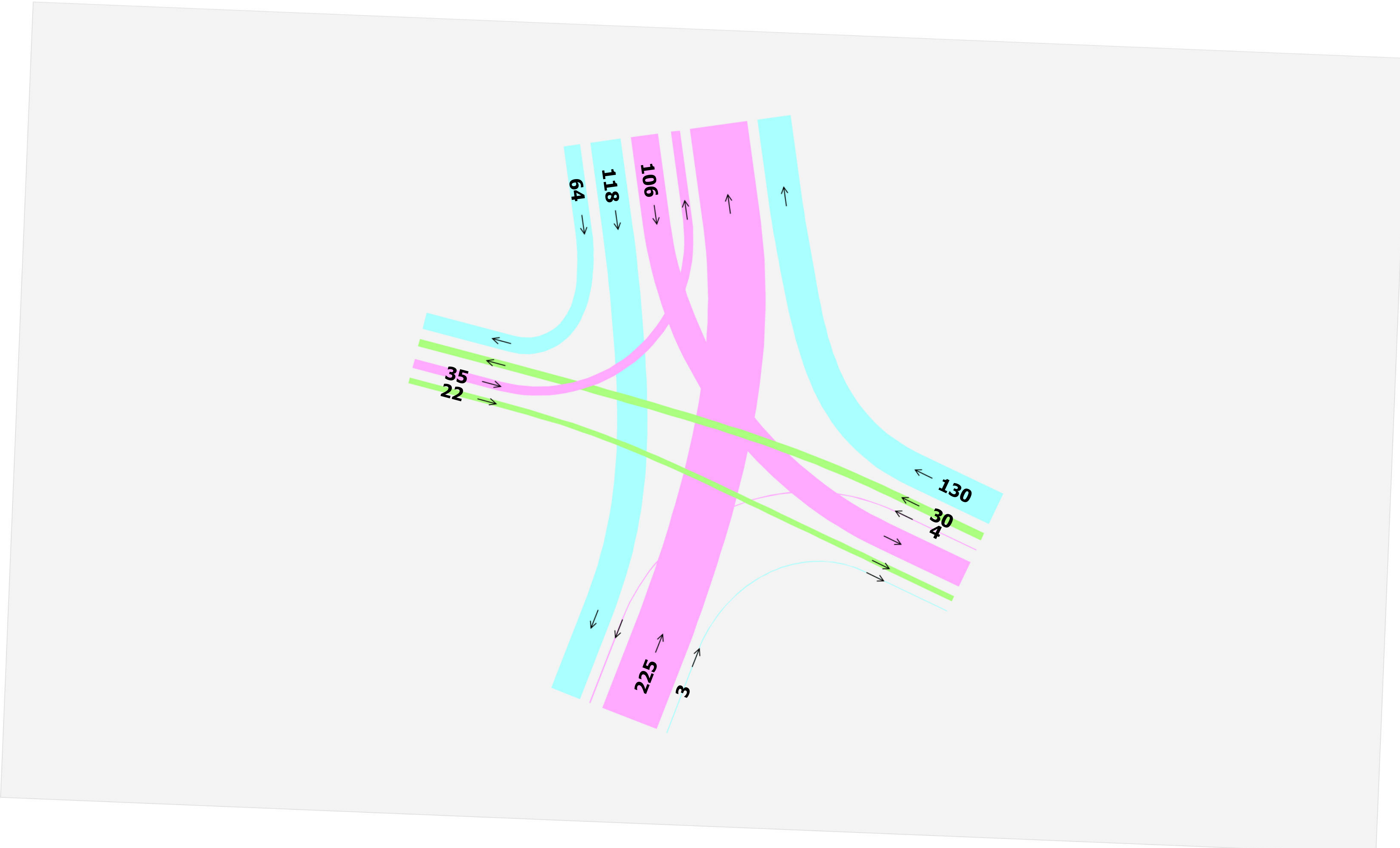
Beavercreek 1:00

2040



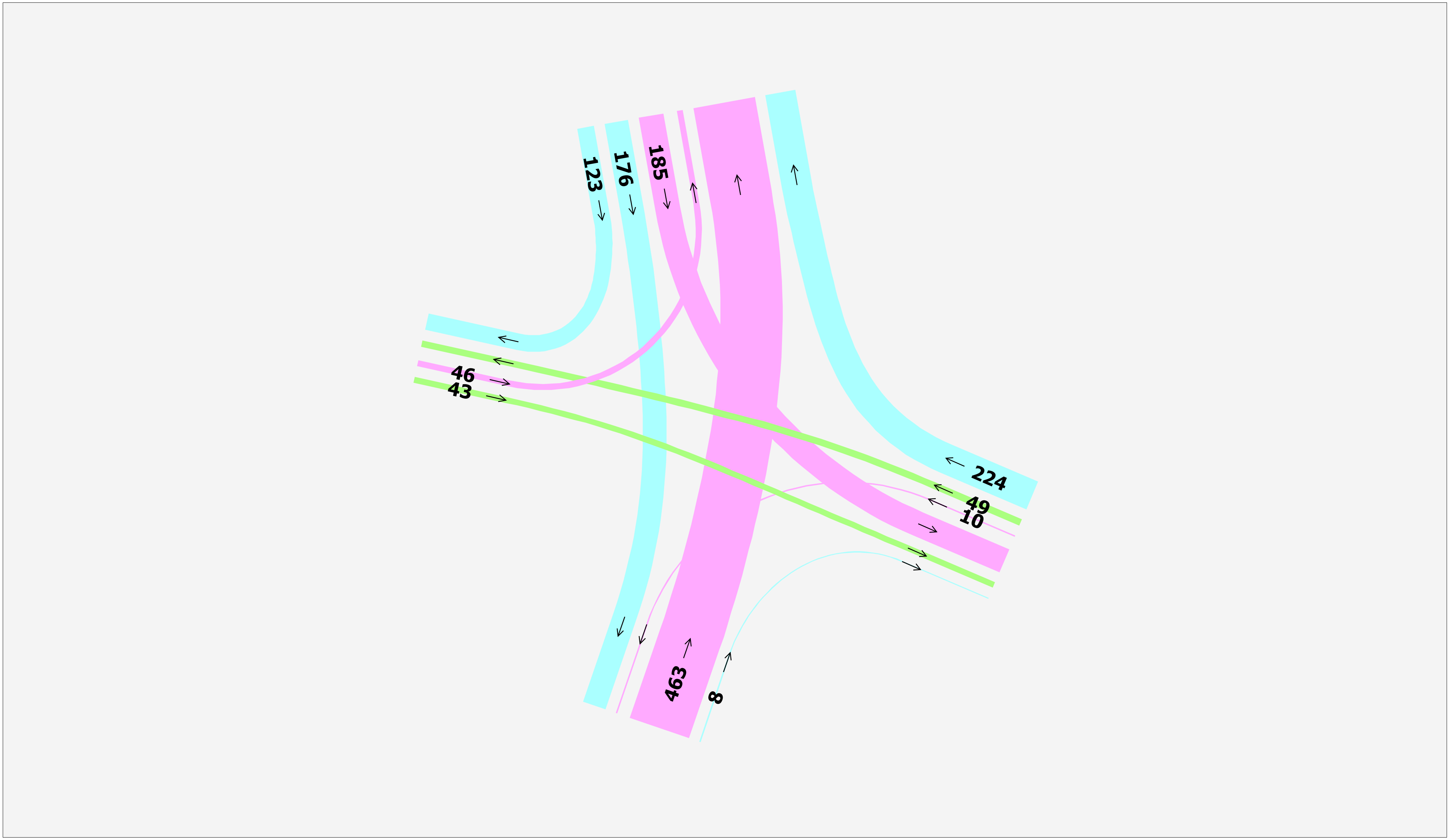
Beavercreek 2:00

2040



Beavercreek 3:00

2040



Beavercreek 4:00

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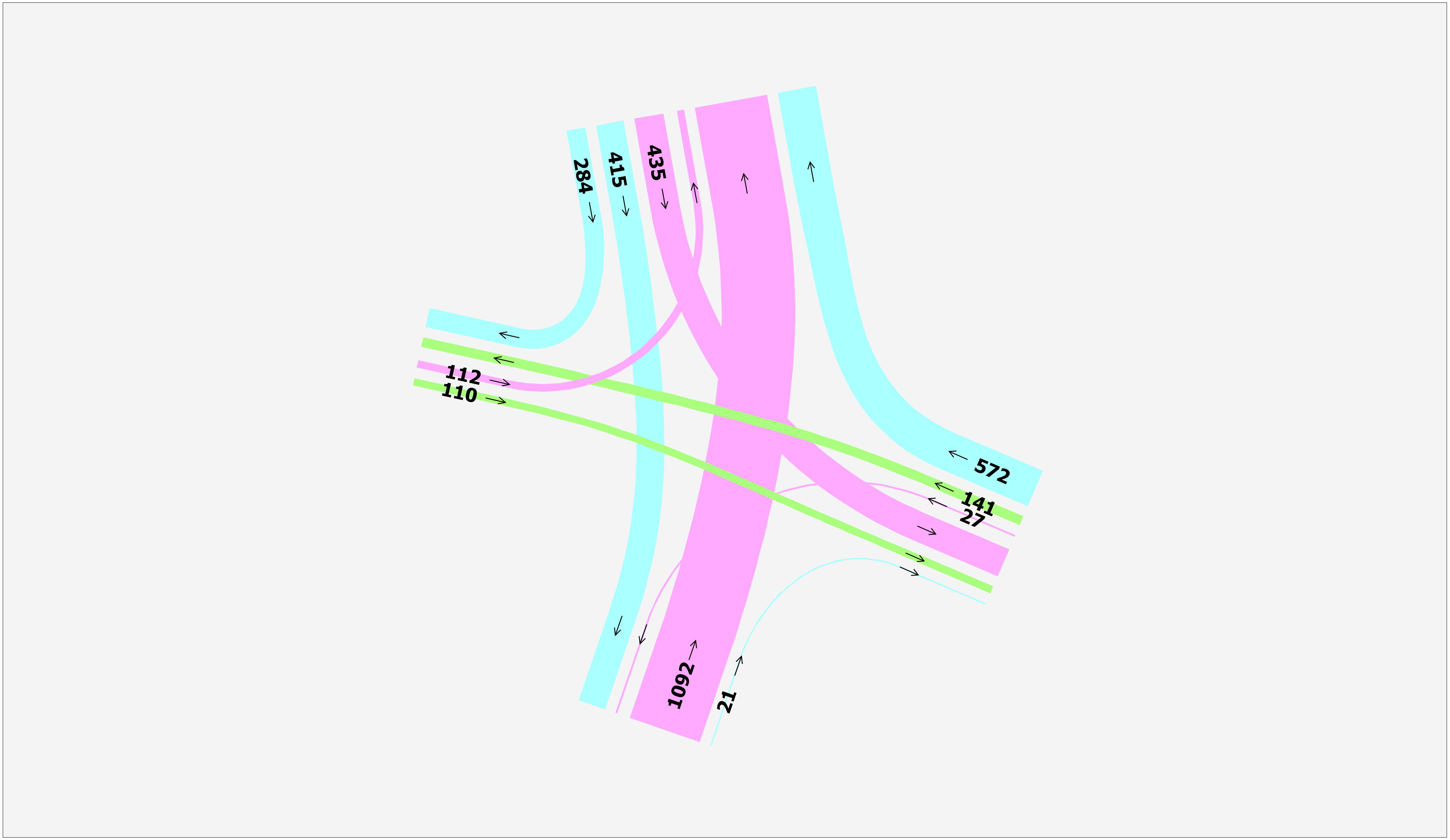
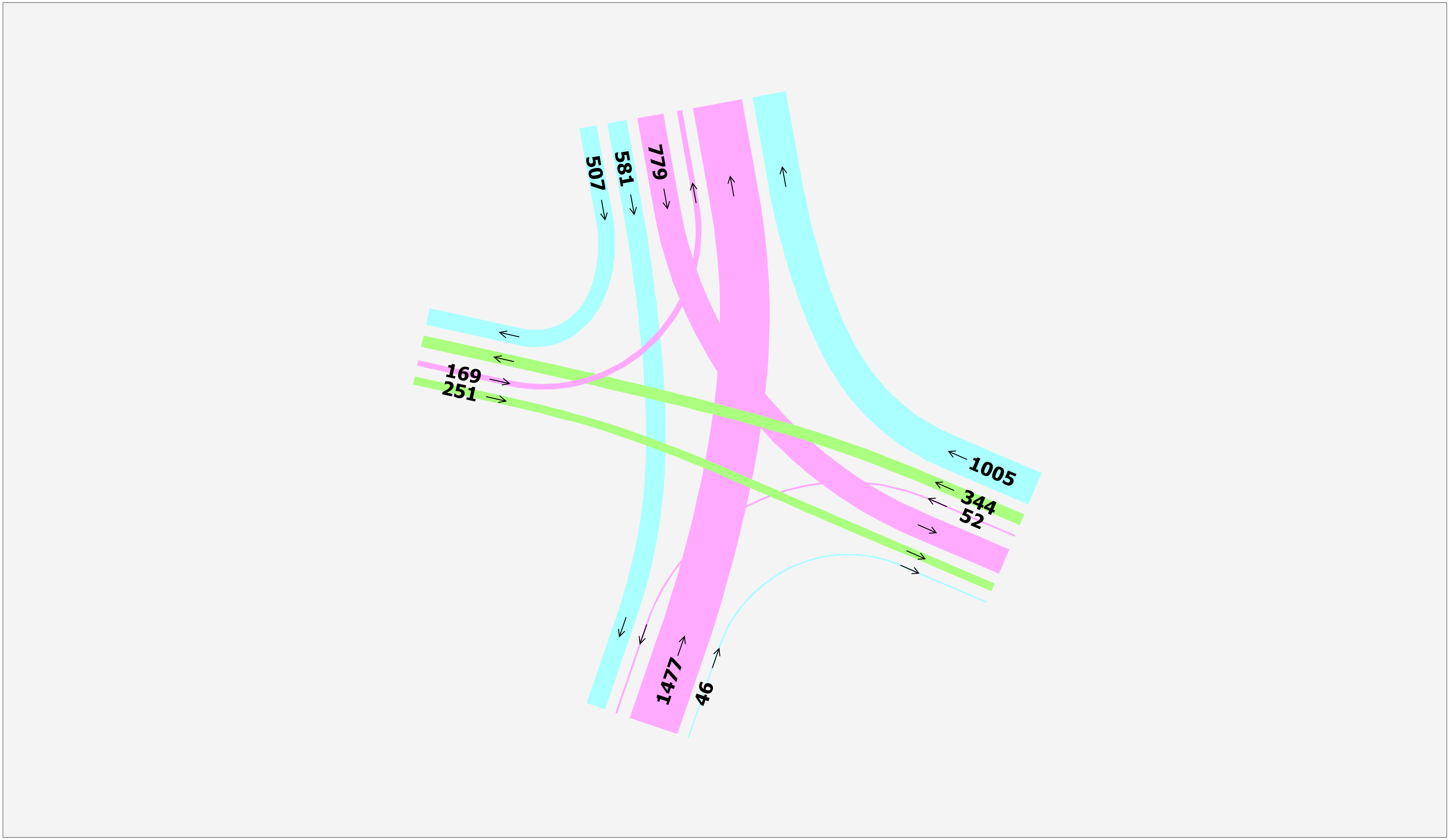


Beavercreek 5:00

2040



Beavercreek 6:00

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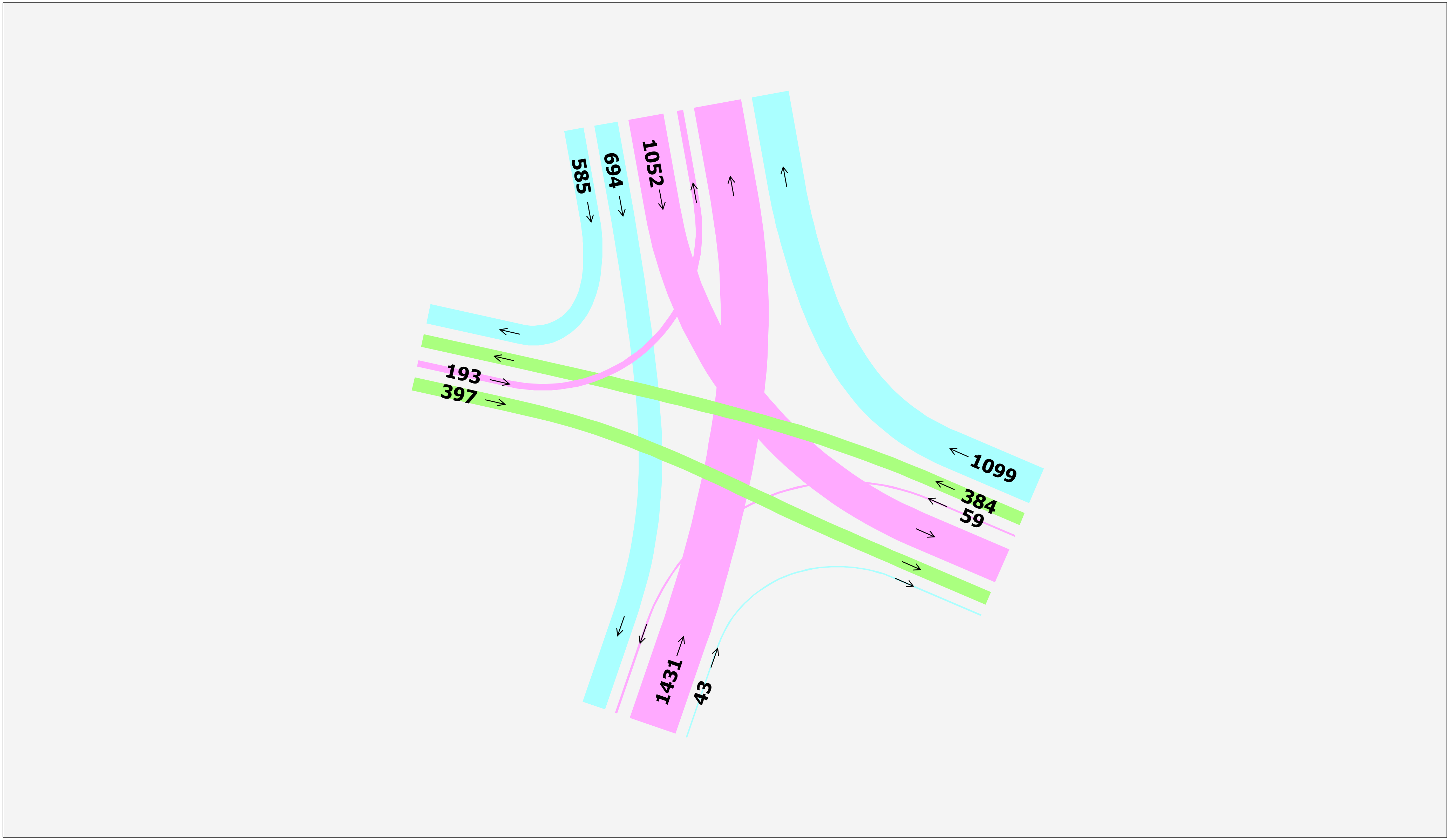
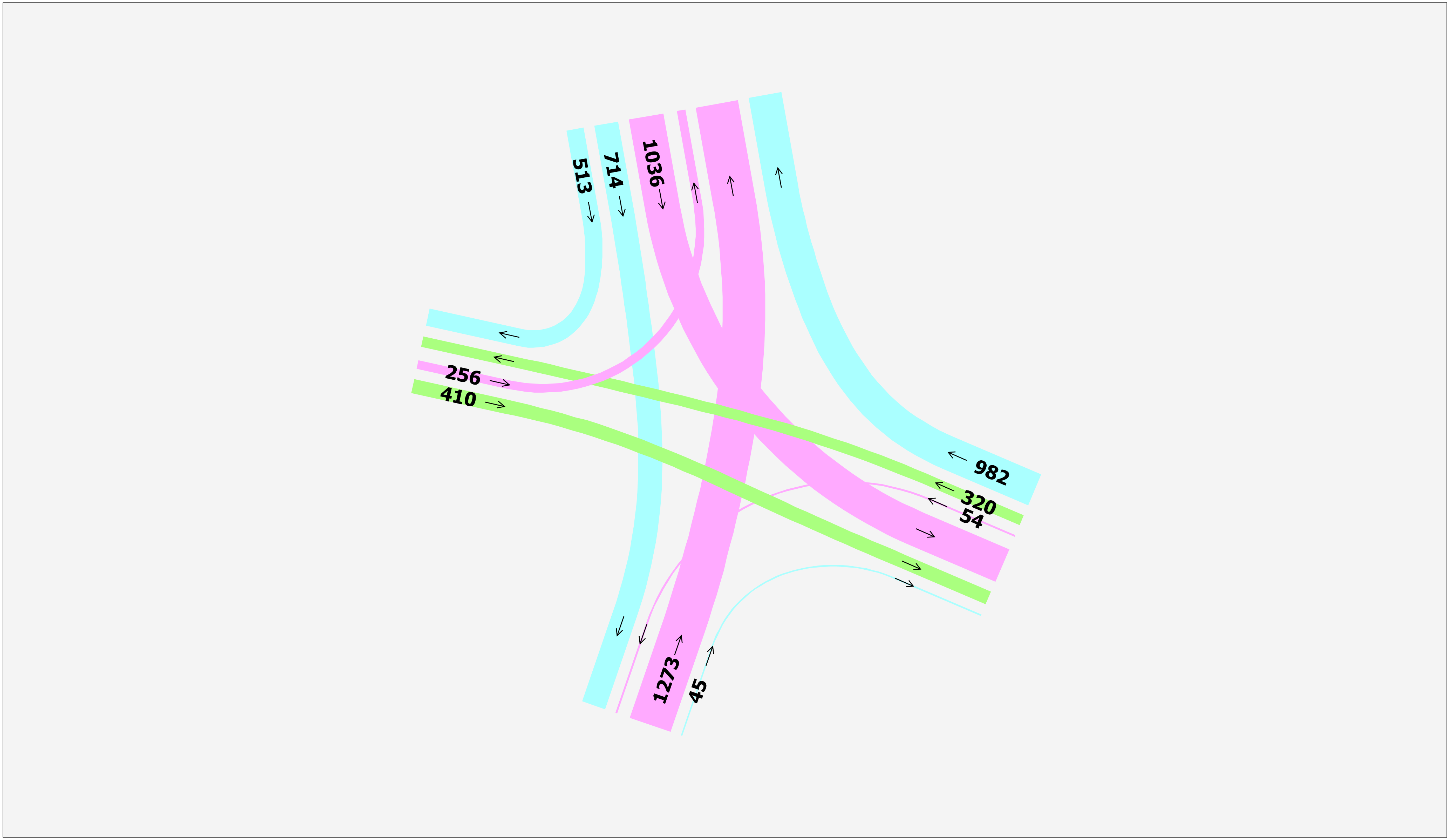


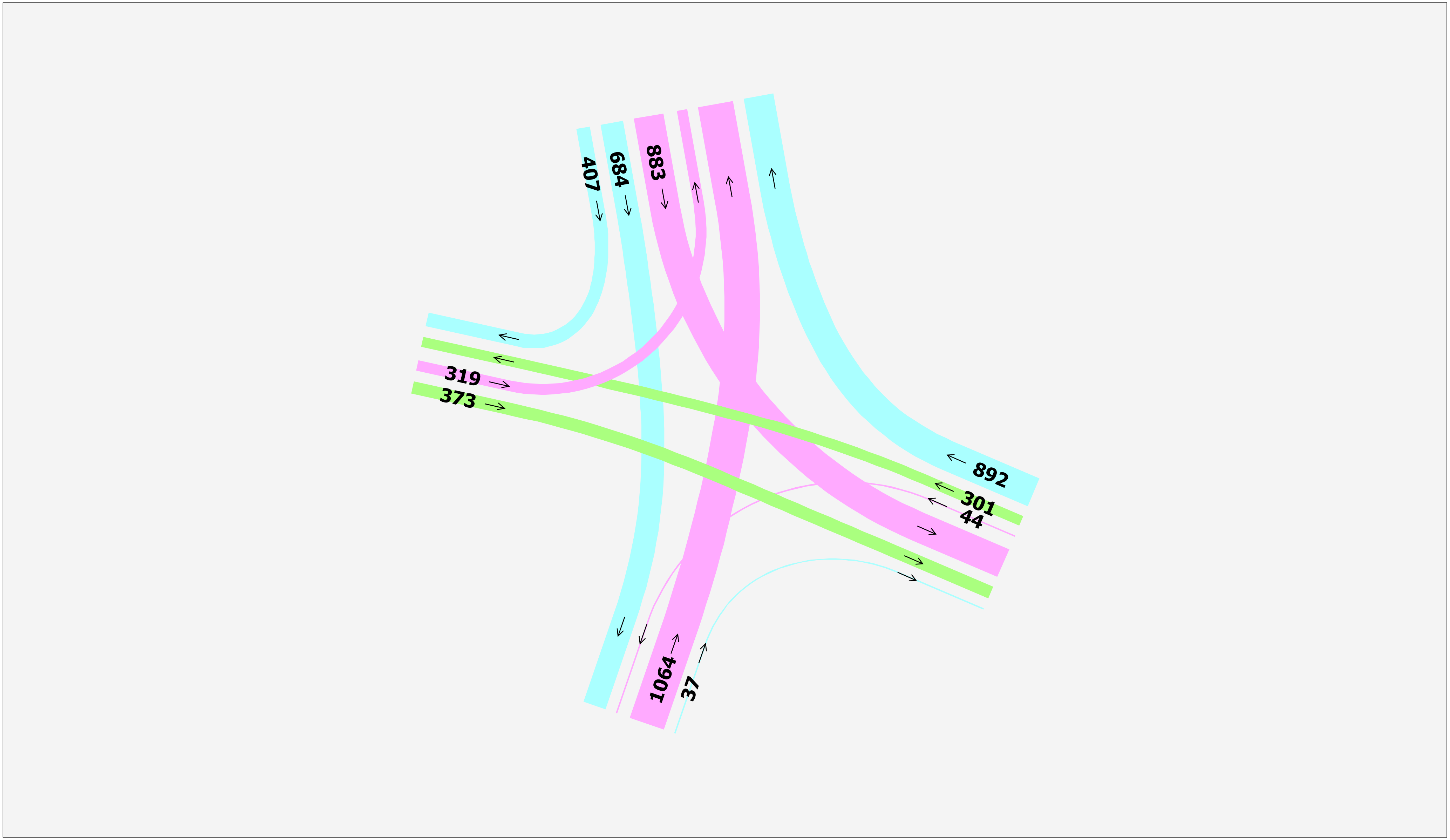
Beavercreek 7:00

2040



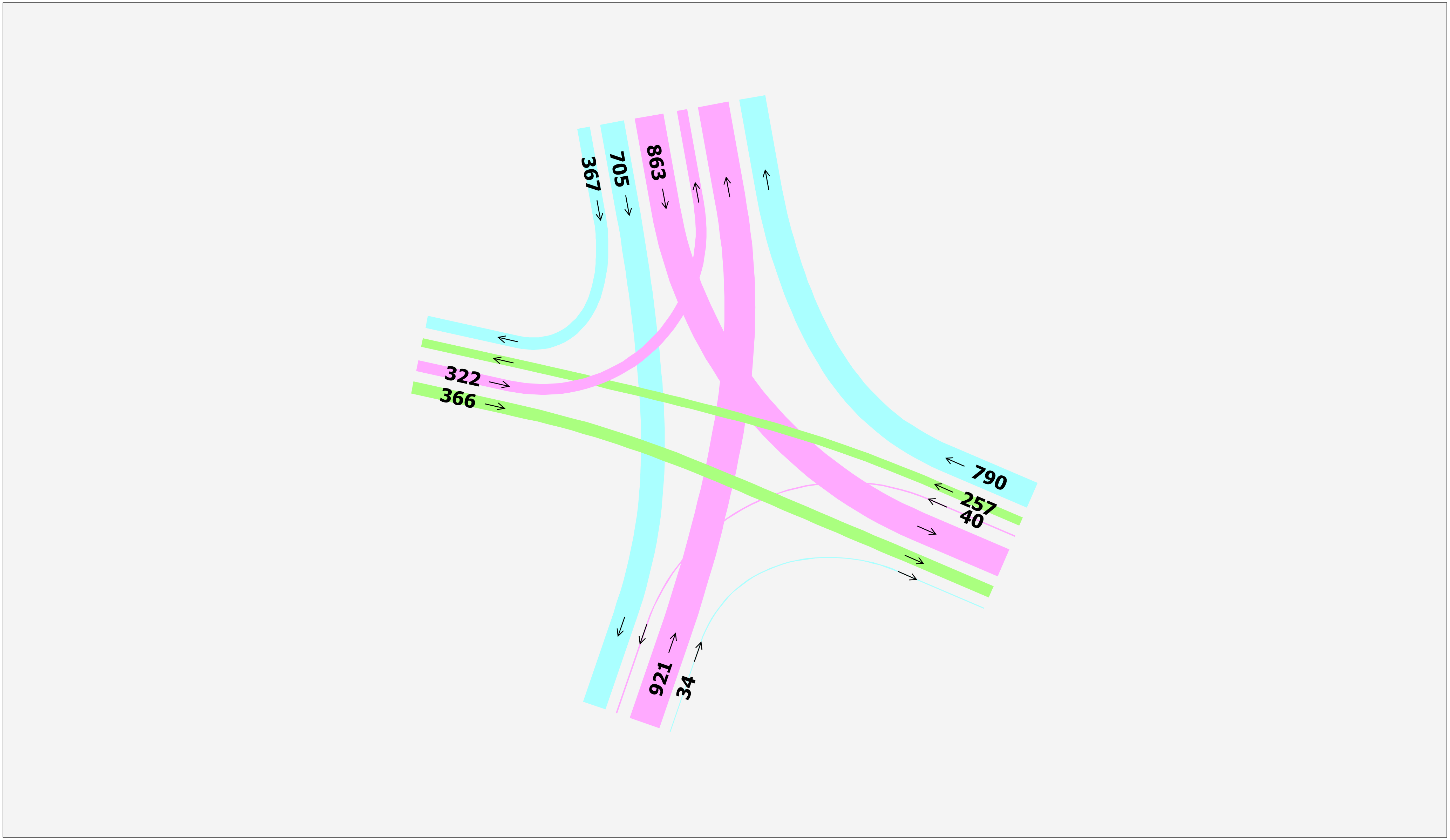
Beavercreek 8:00

2040



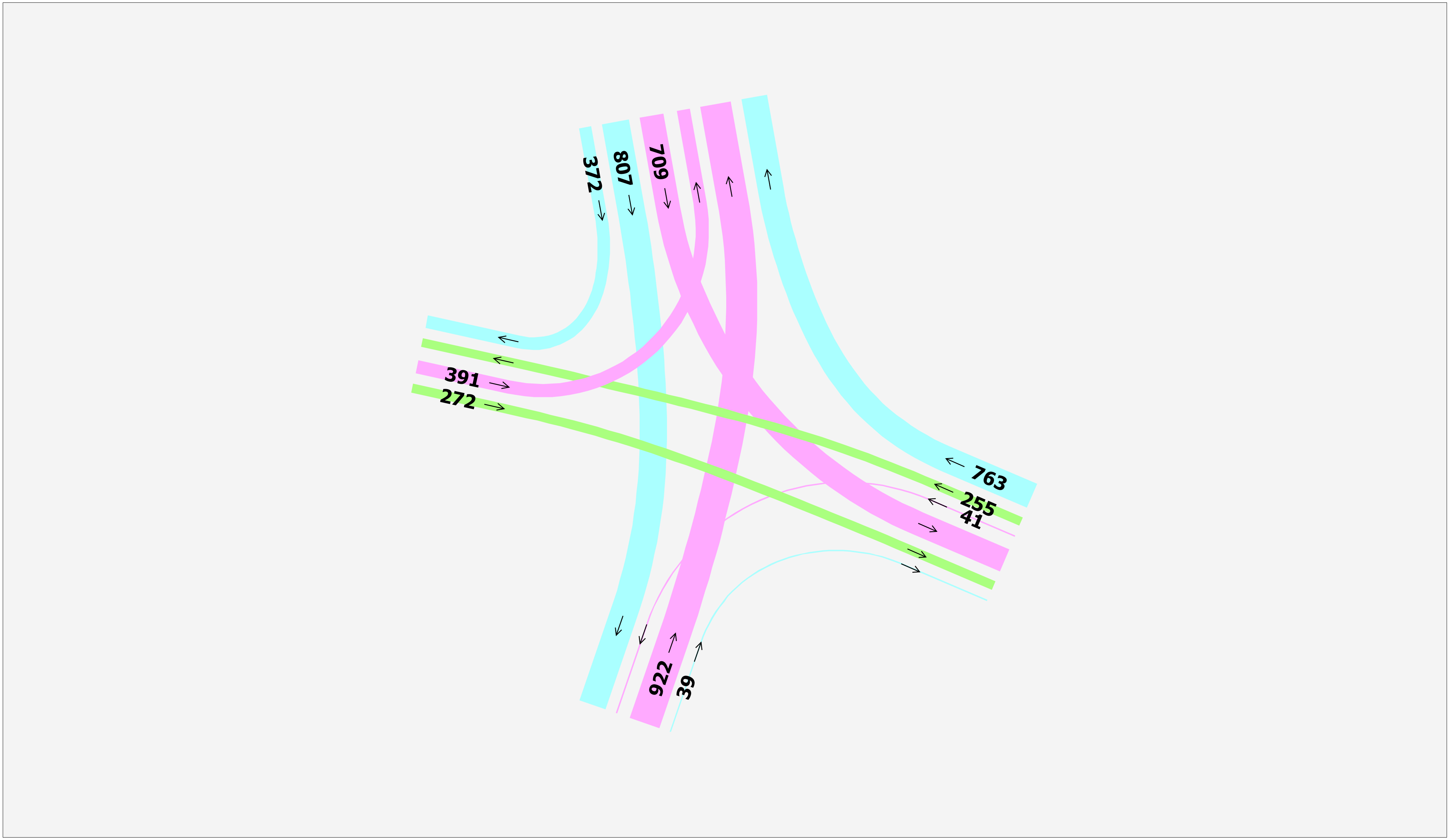
Beavercreek 9:00

2040



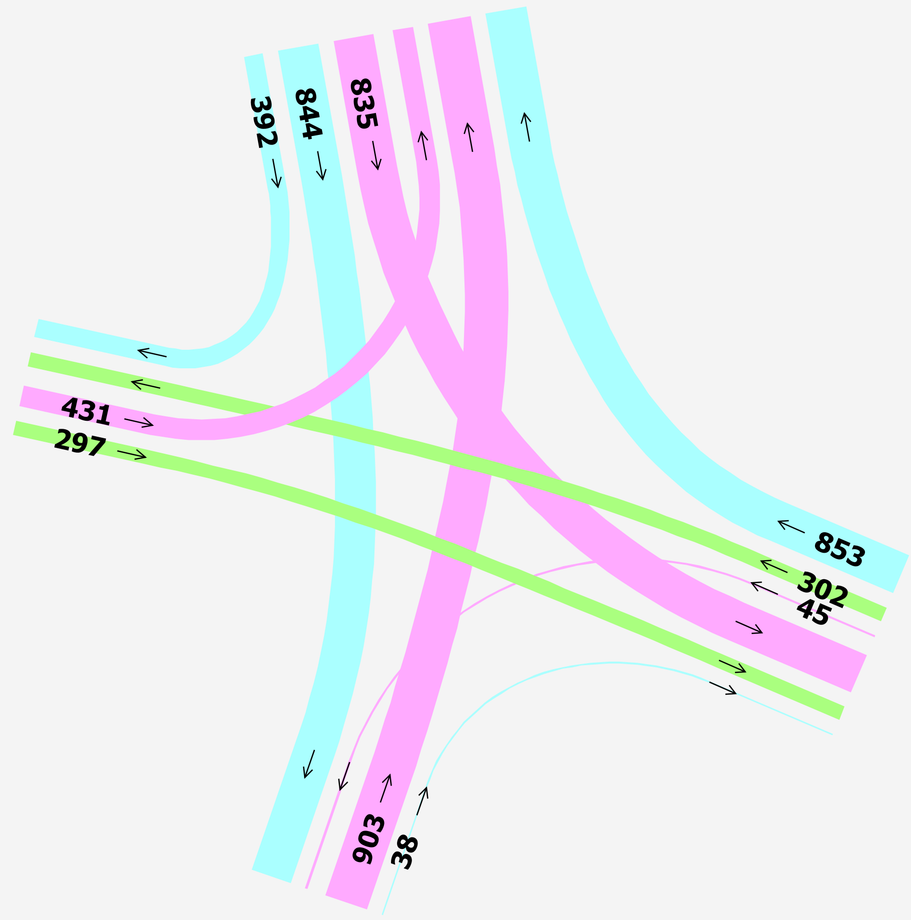
Beavercreek 10:00

2040



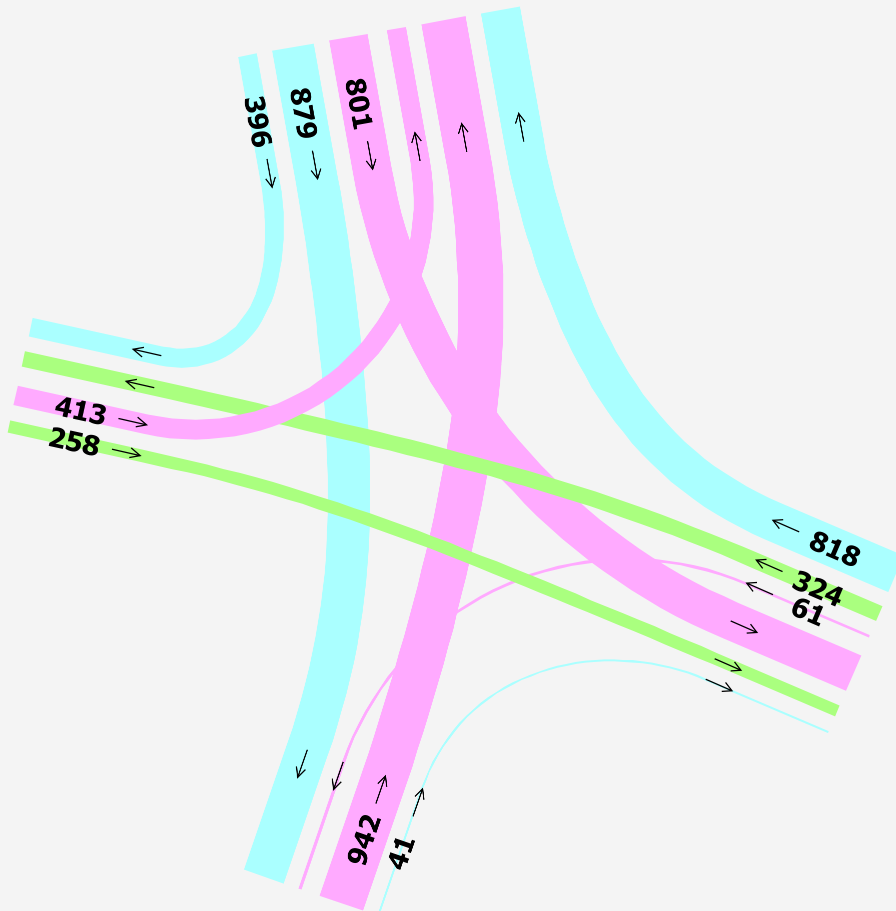
Beavercreek 11:00

2040



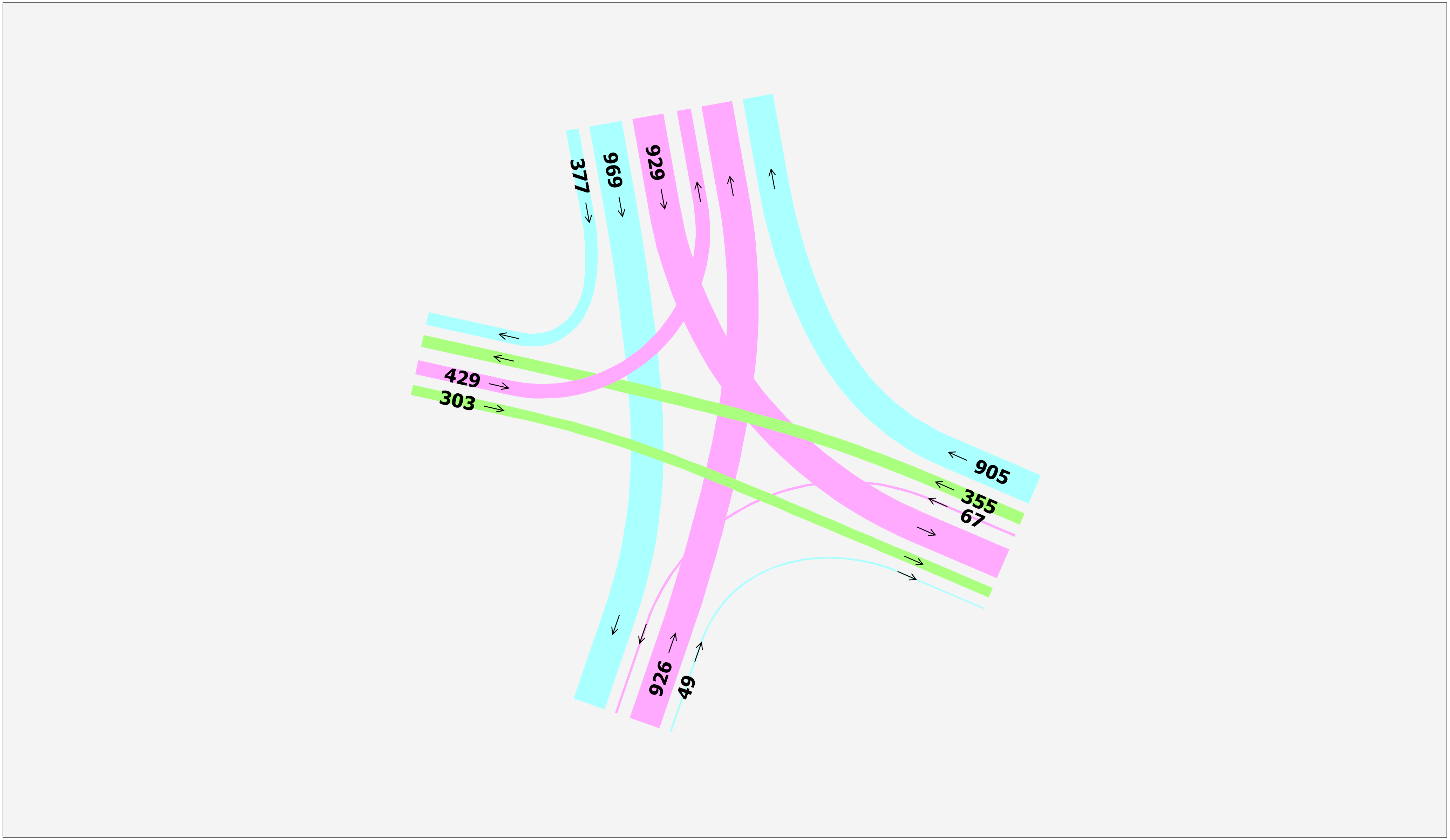
Beavercreek 12:00

2040



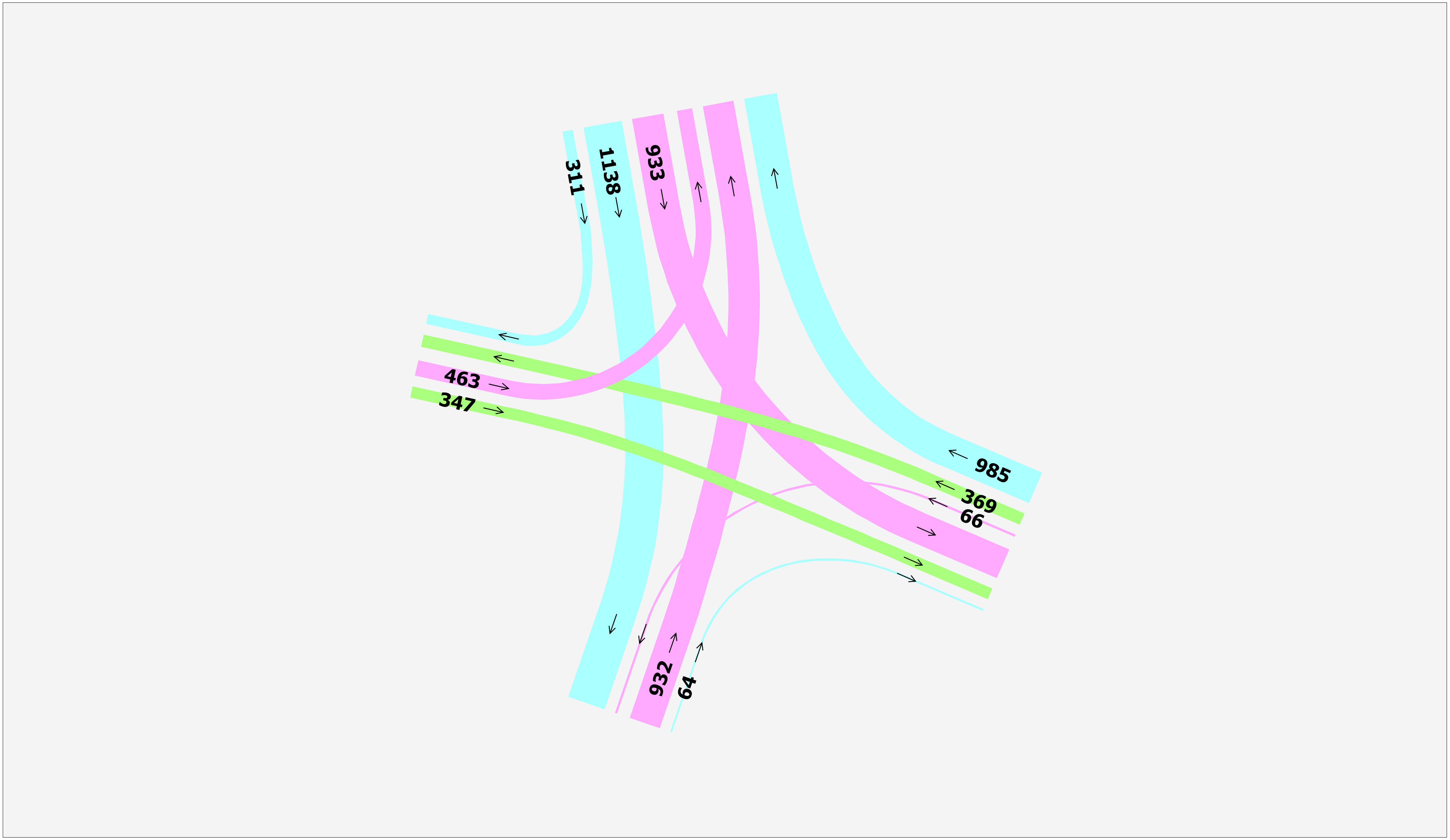
Beavercreek 13:00

2040



Beavercreek 14:00

2040



Beavercreek 15:00

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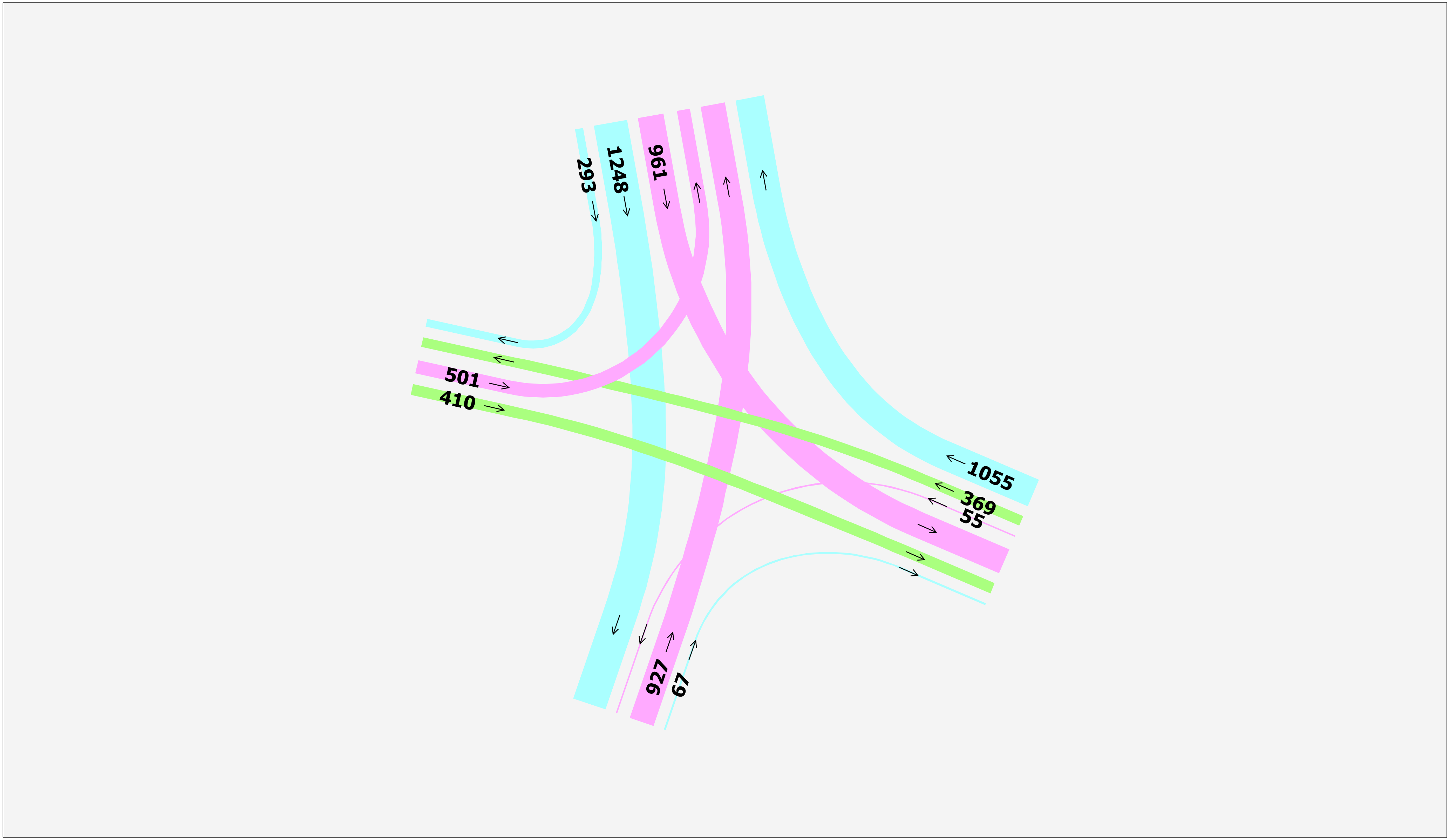
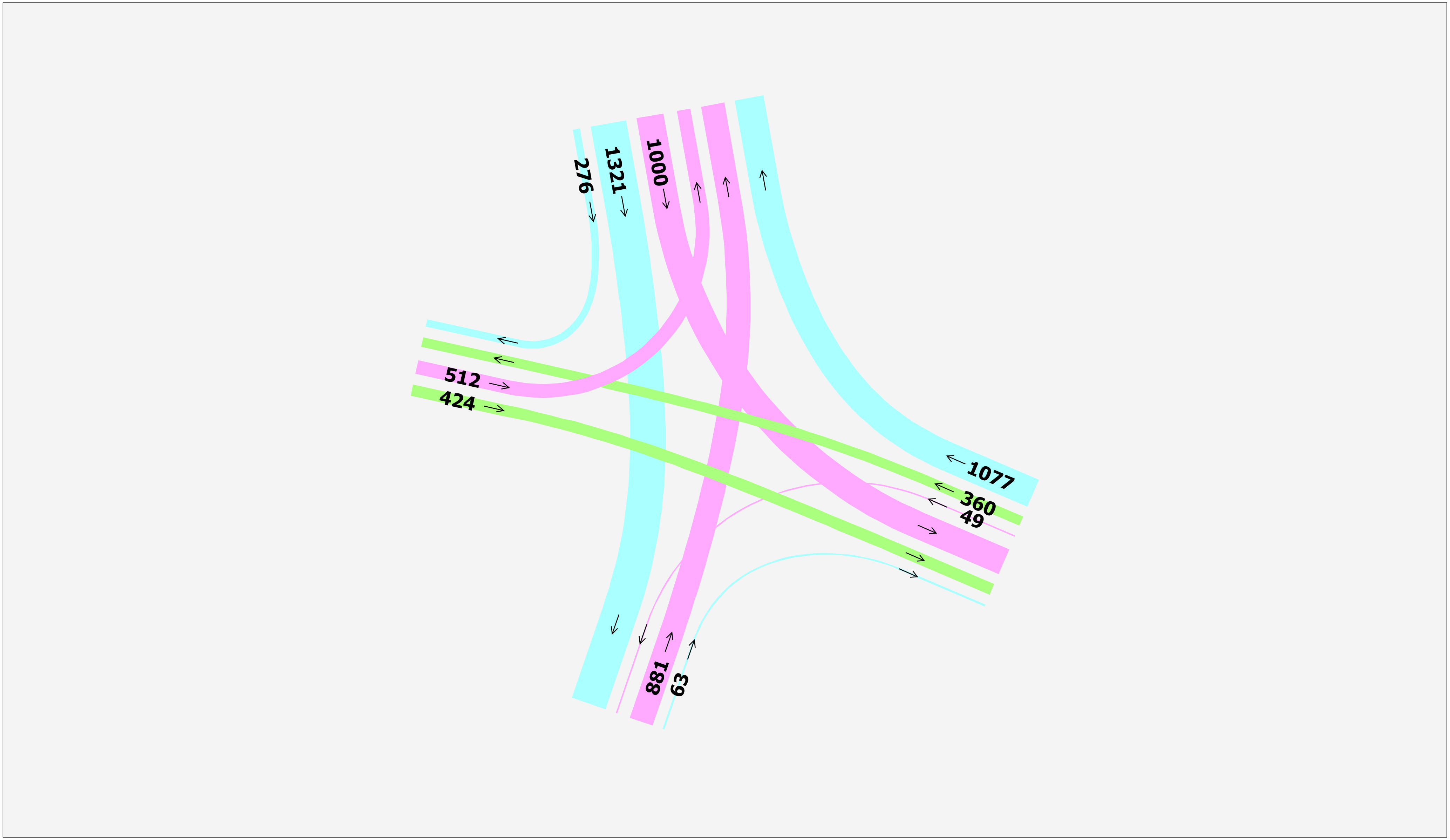


Beavercreek 16:00

2040



Beavercreek 17:00

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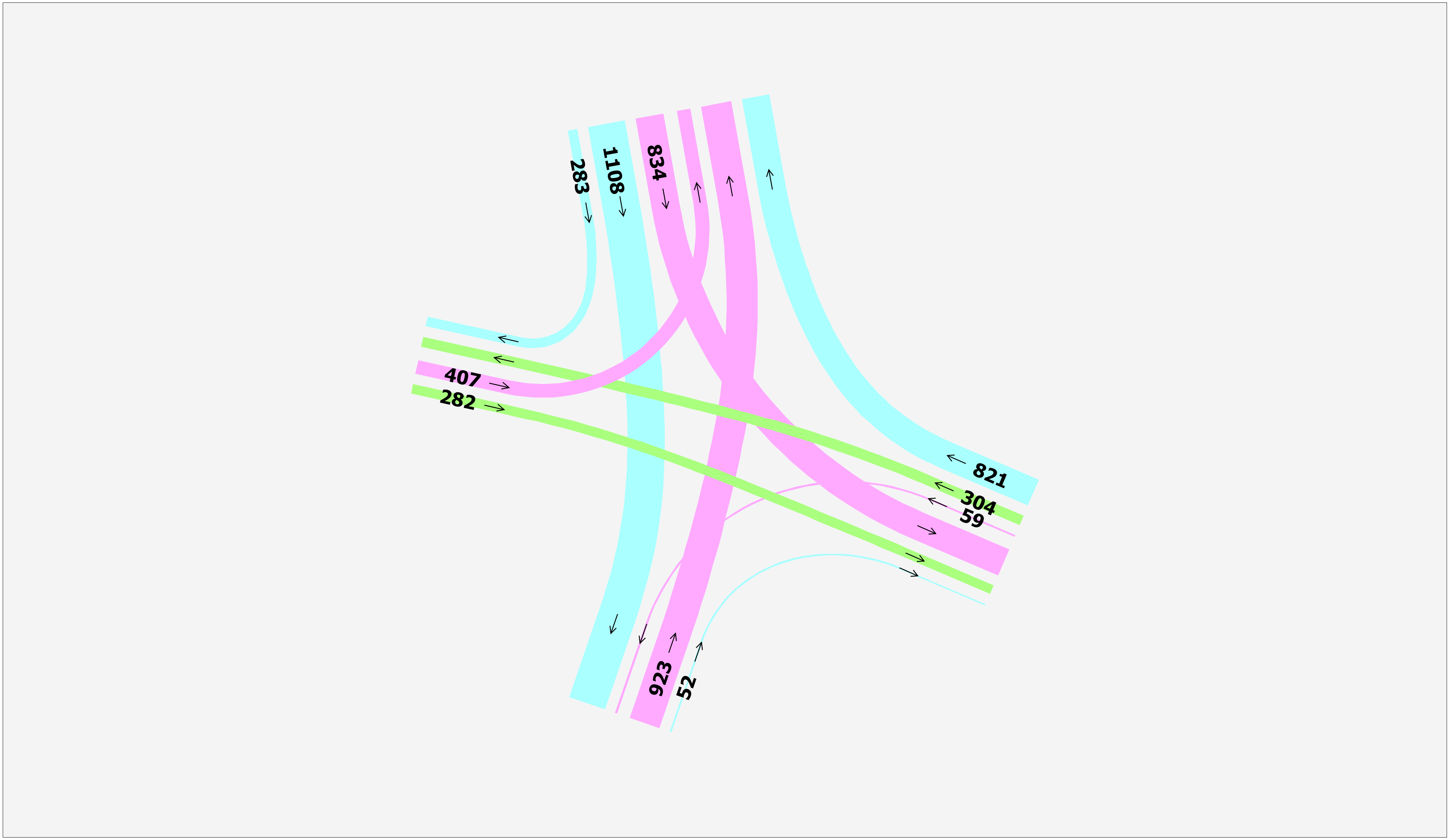

Beavercreek 18:00

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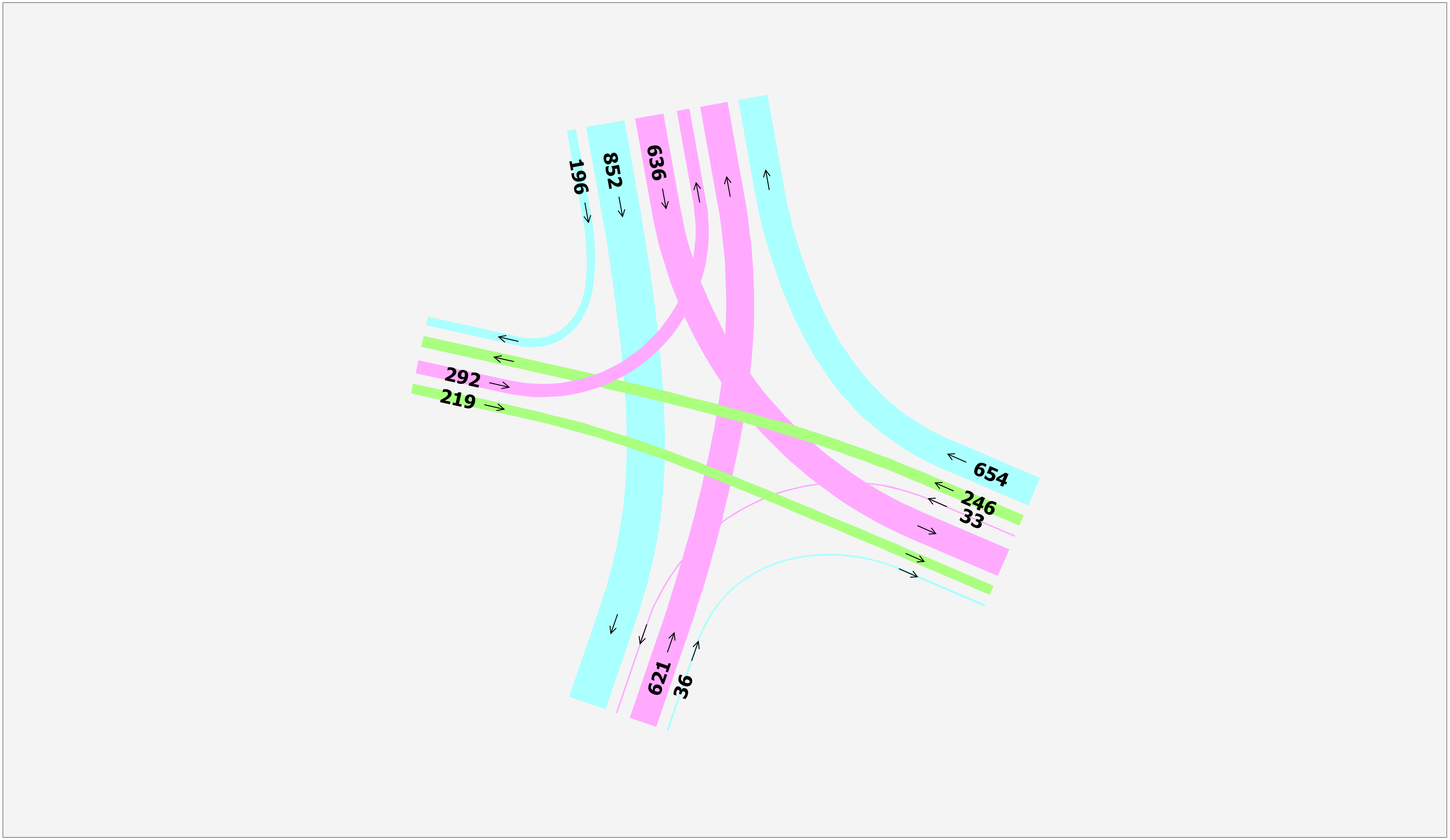

Beavercreek 19:00

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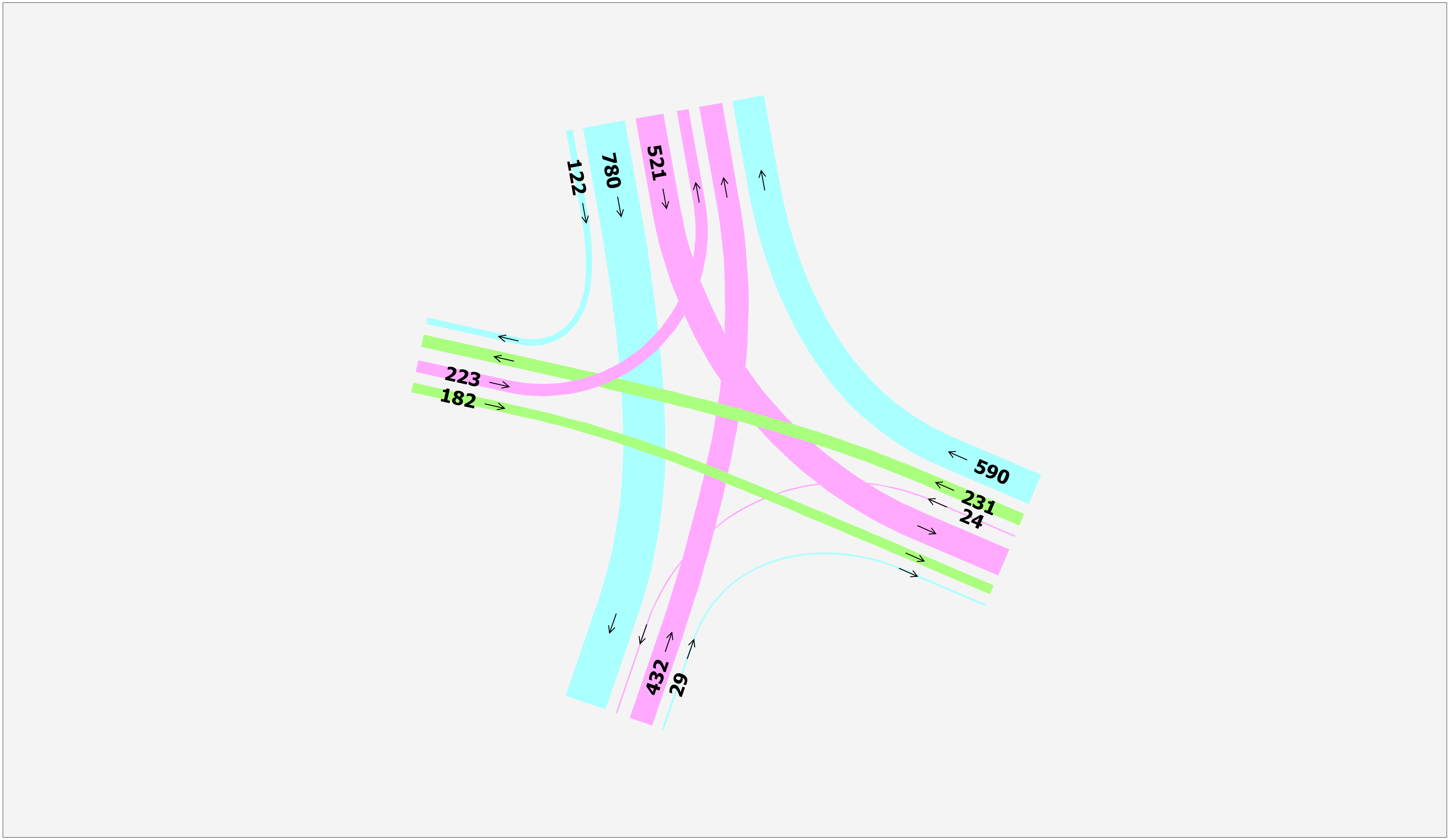

Beavercreek 20:00

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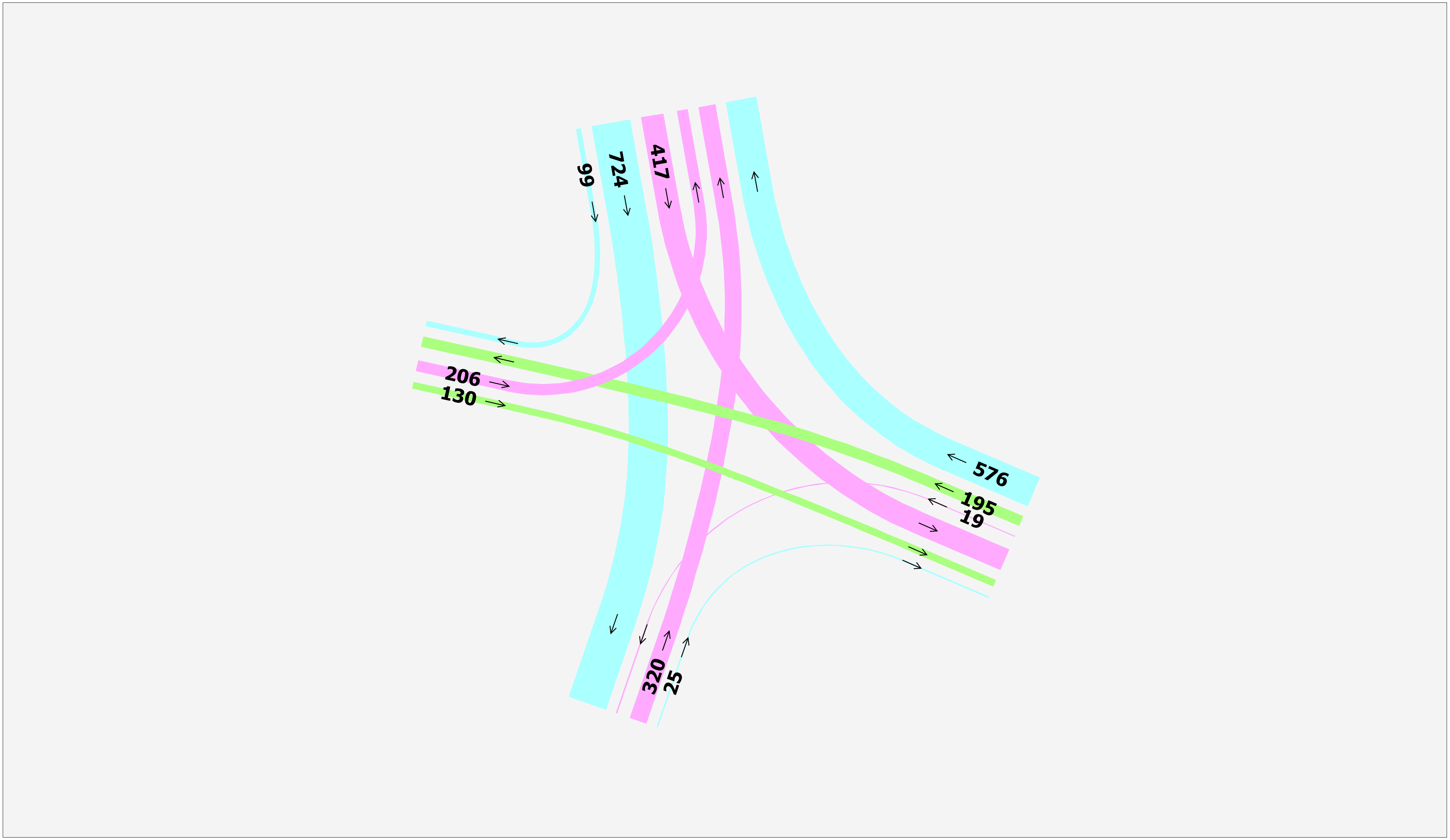

Beavercreek 21:00

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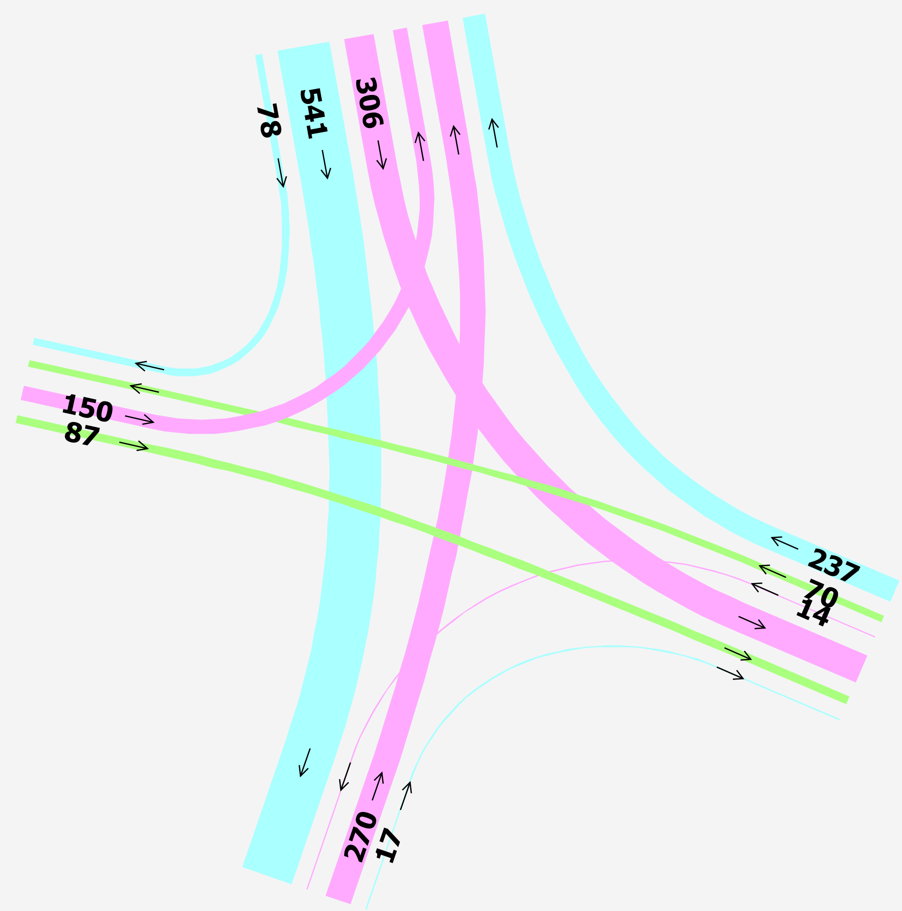
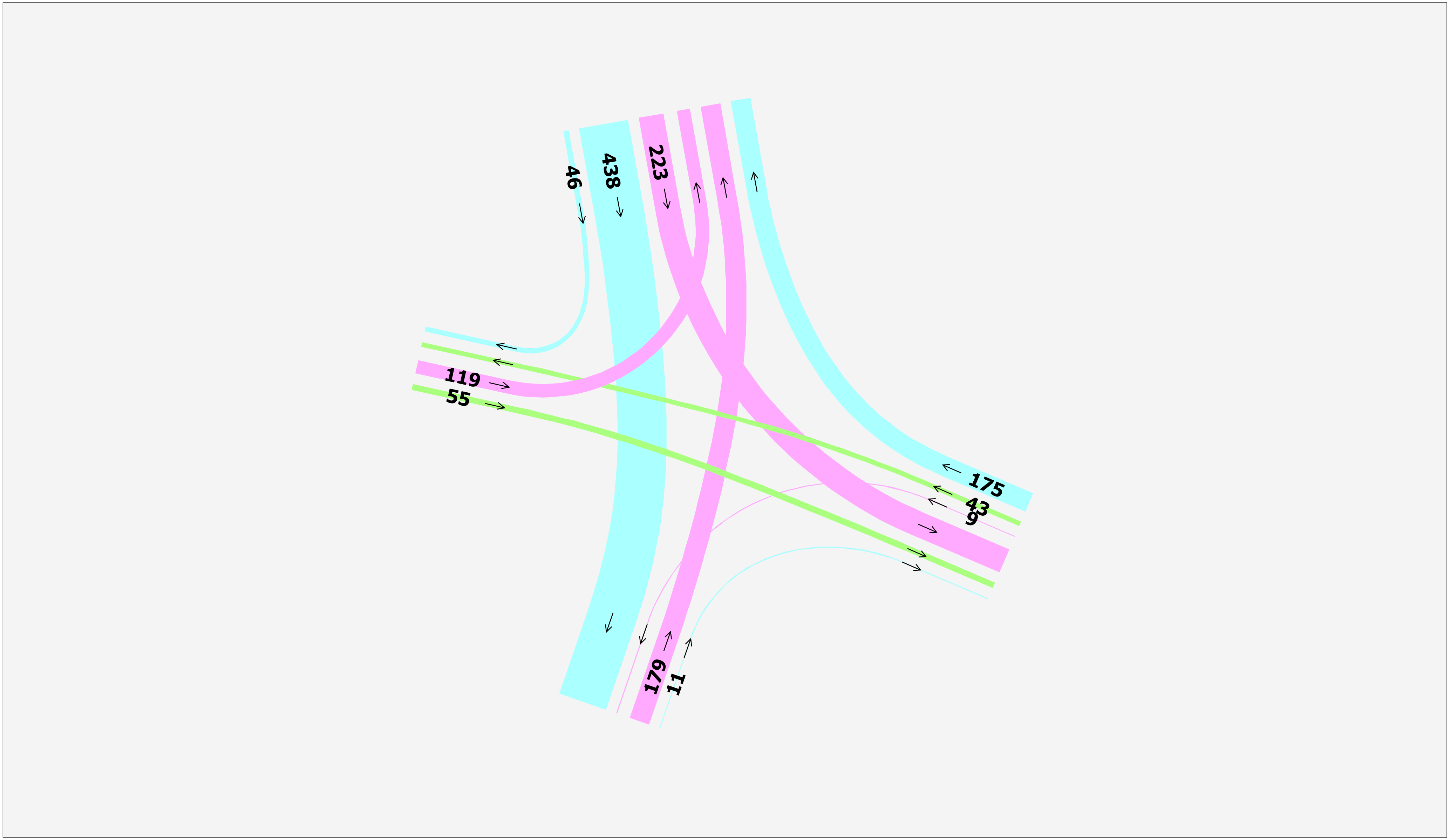


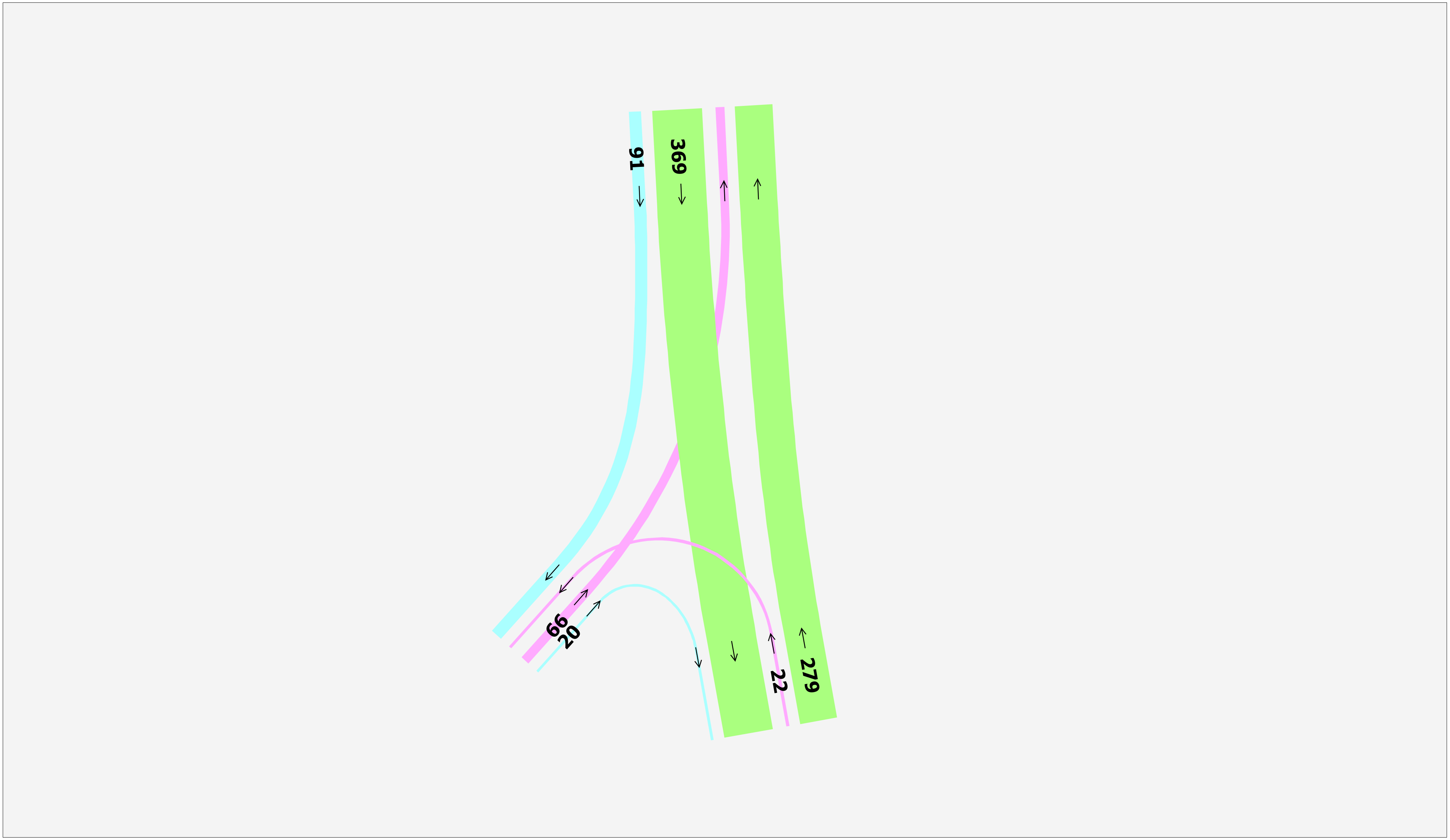
Beavercreek 22:00

2040



Beavercreek 23:00

2040



Redland 0:00

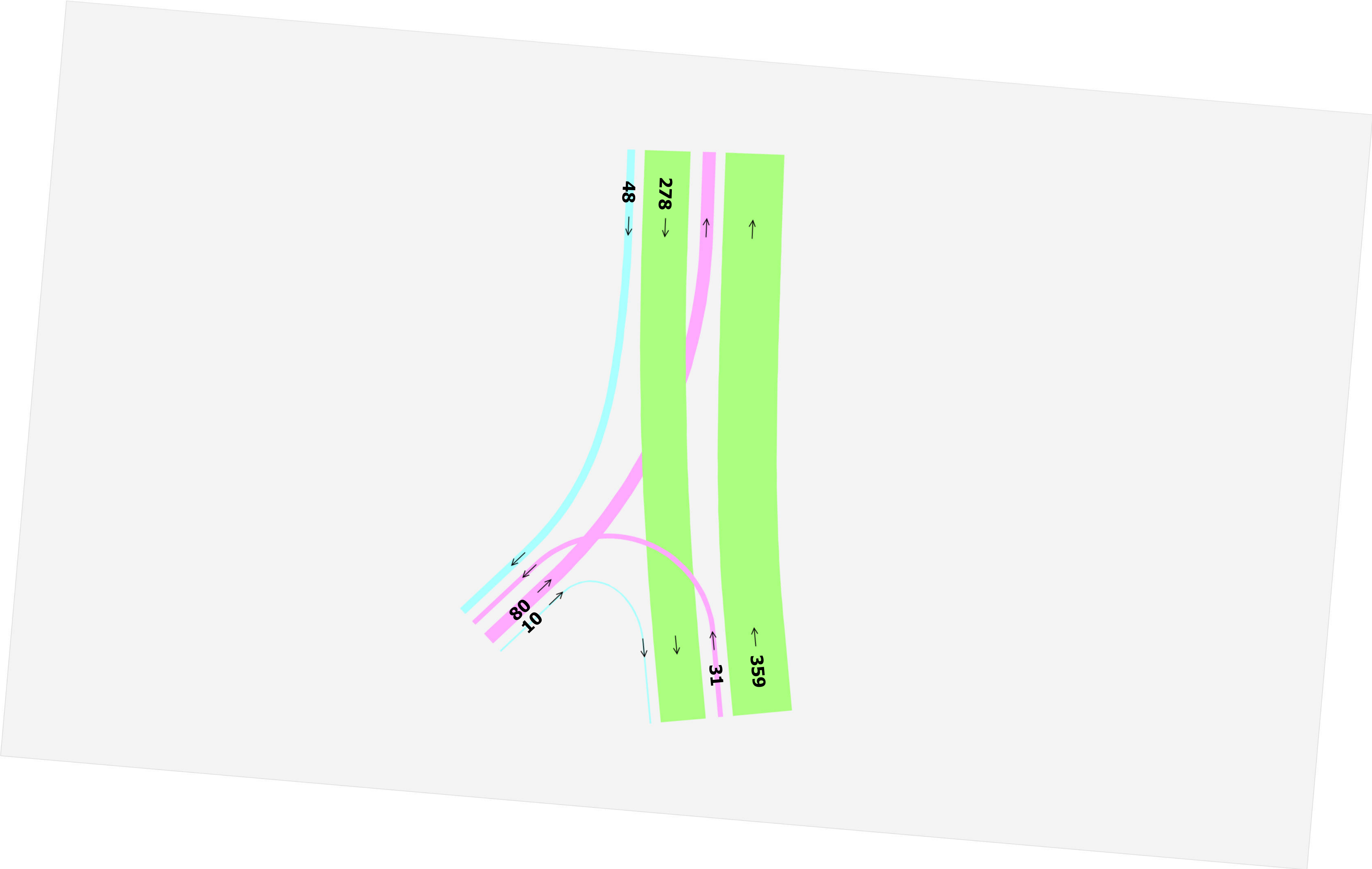
2040

Redland 1:00

2040

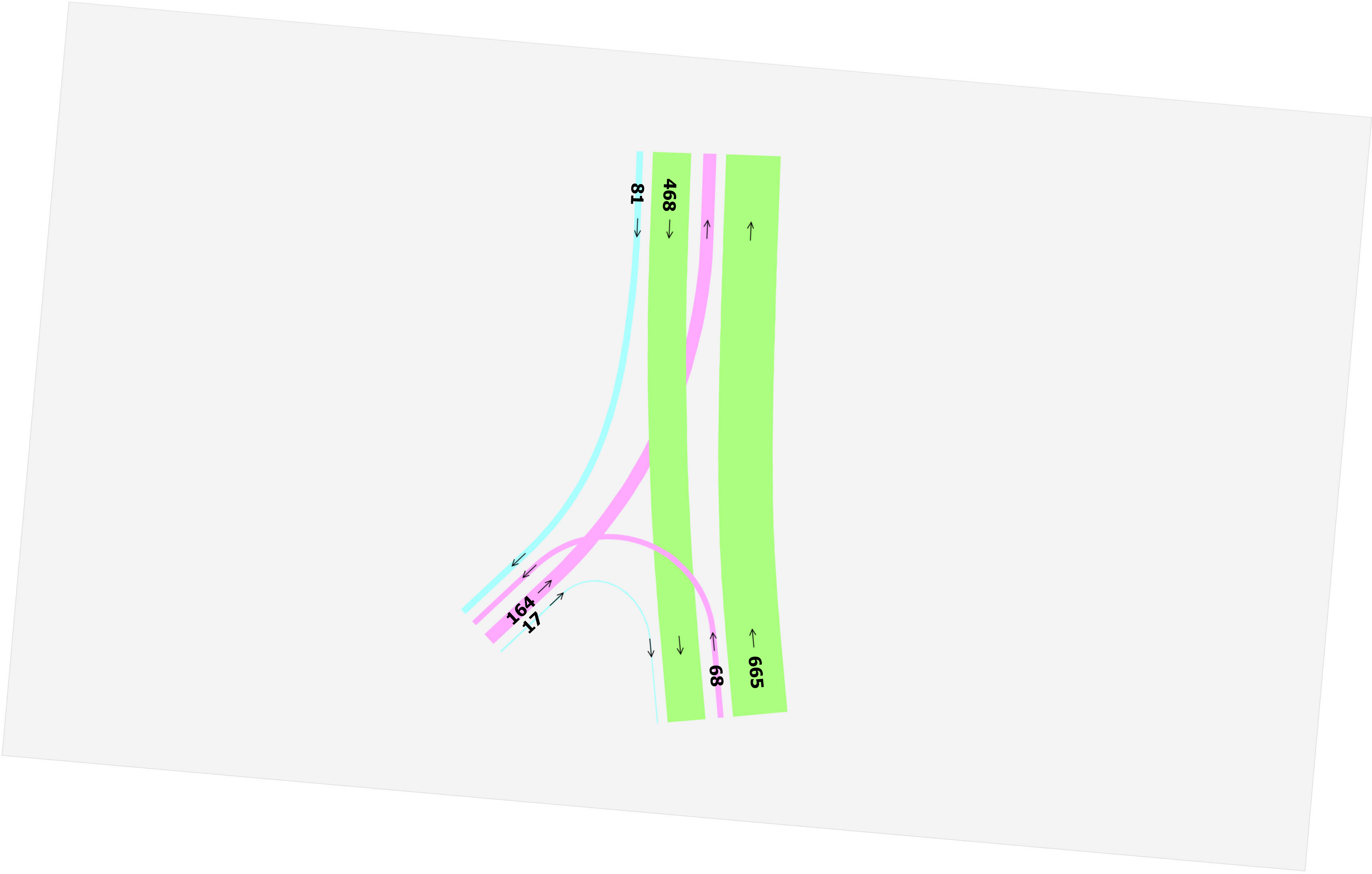
Redland 2:00

2040



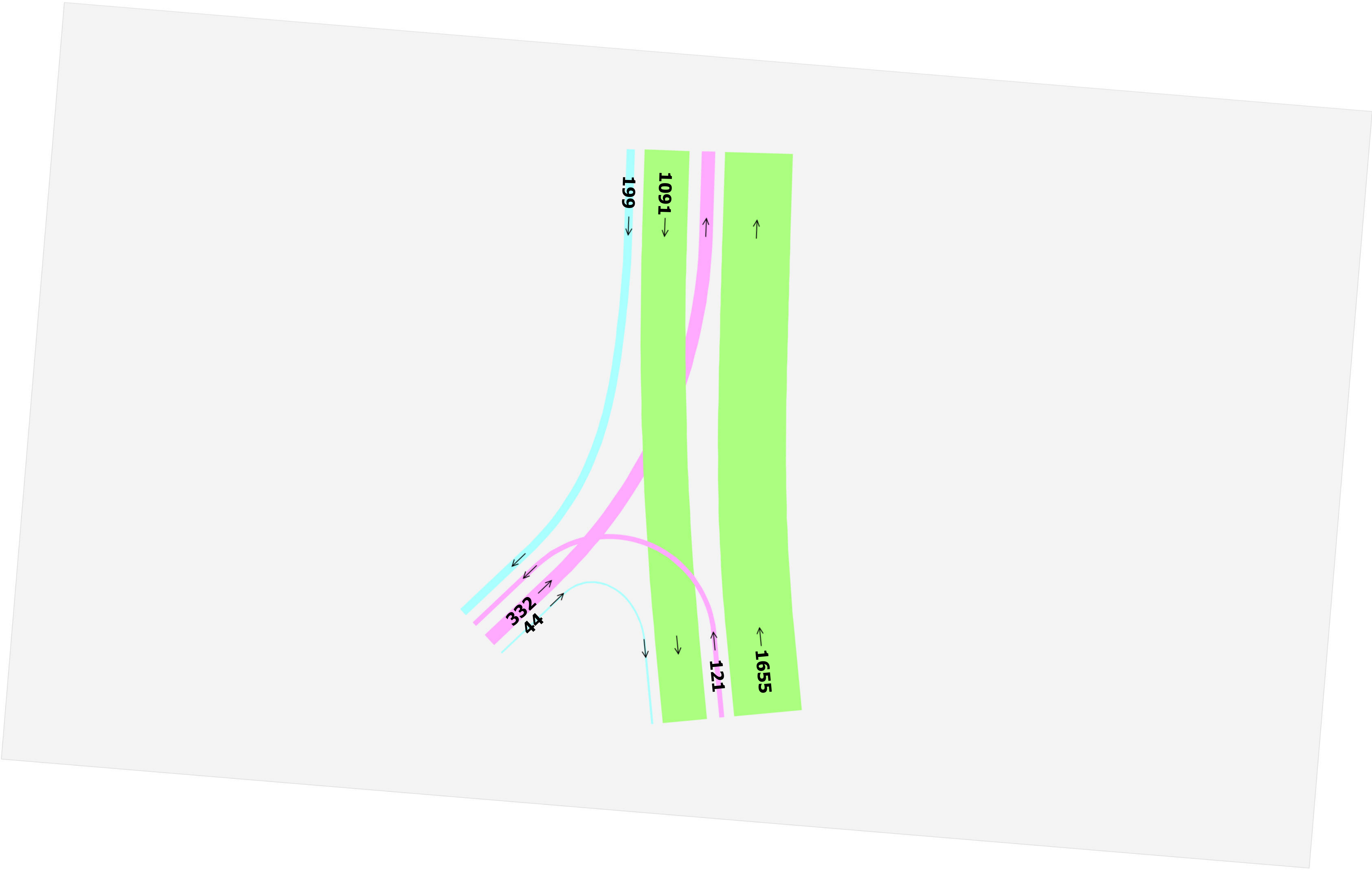
Redland 3:00

2040



Redland 4:00

2040

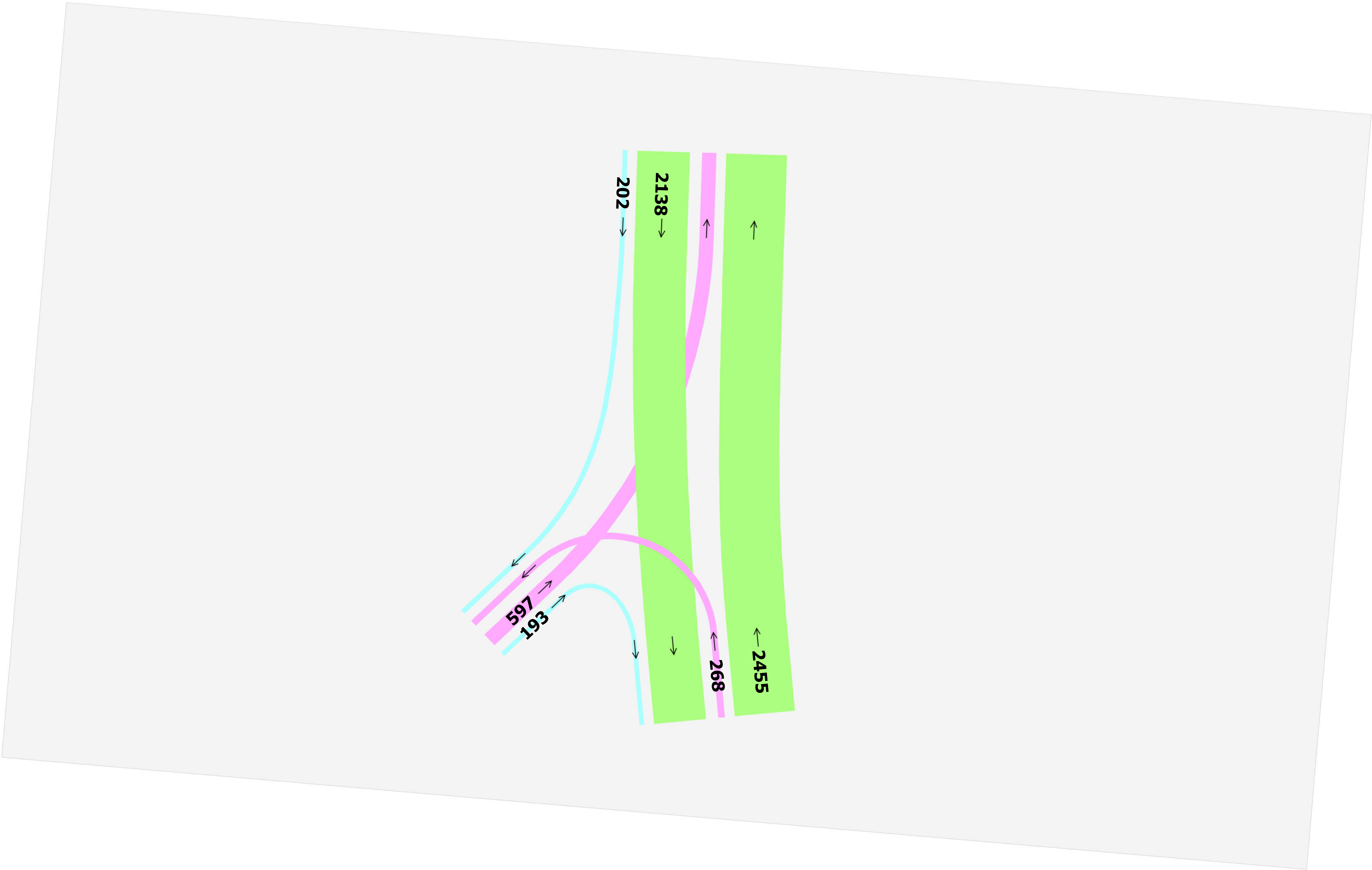


Redland 5:00

2040

Redland 6:00

2040



Redland 7:00

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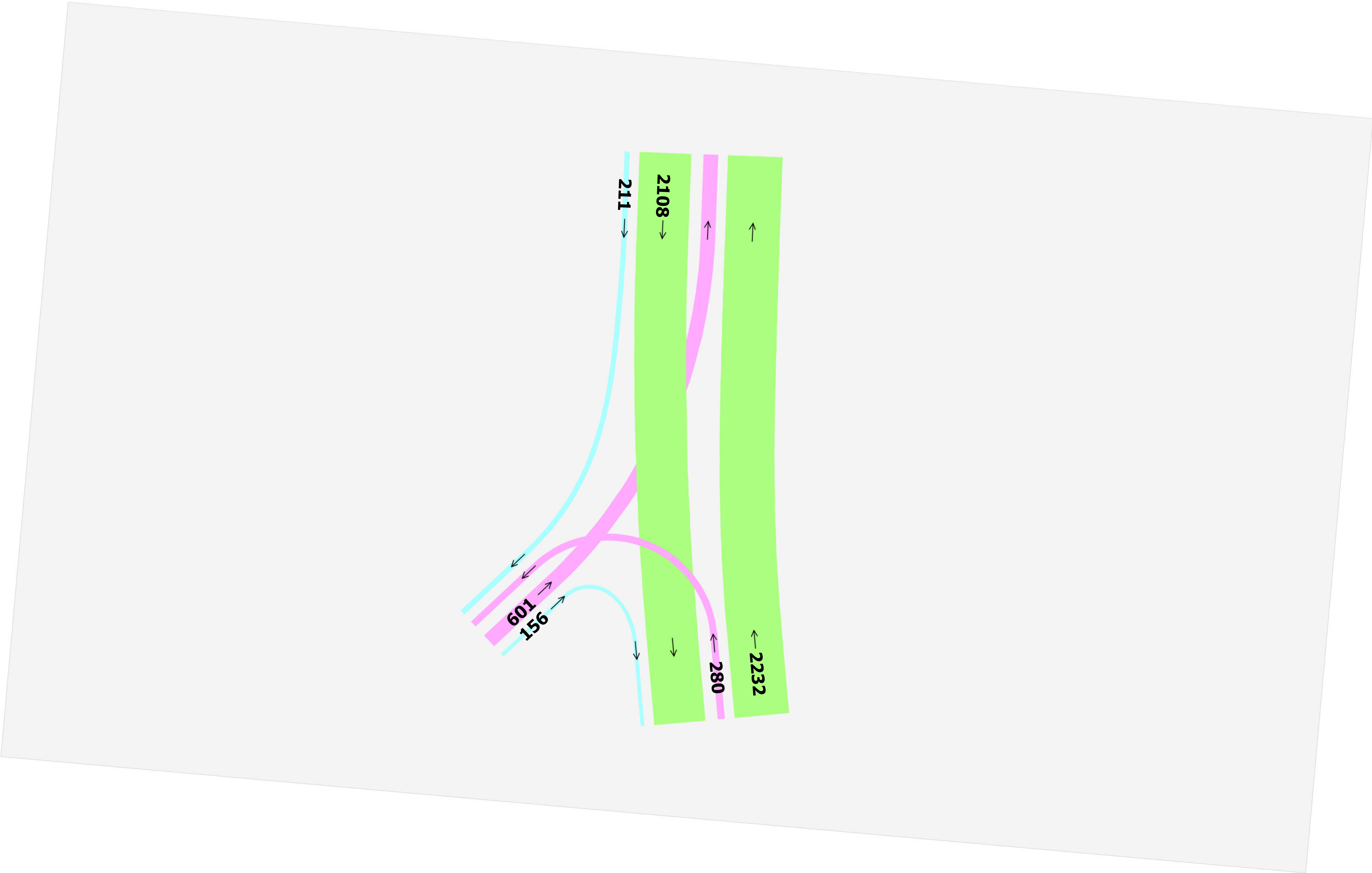

Redland 8:00

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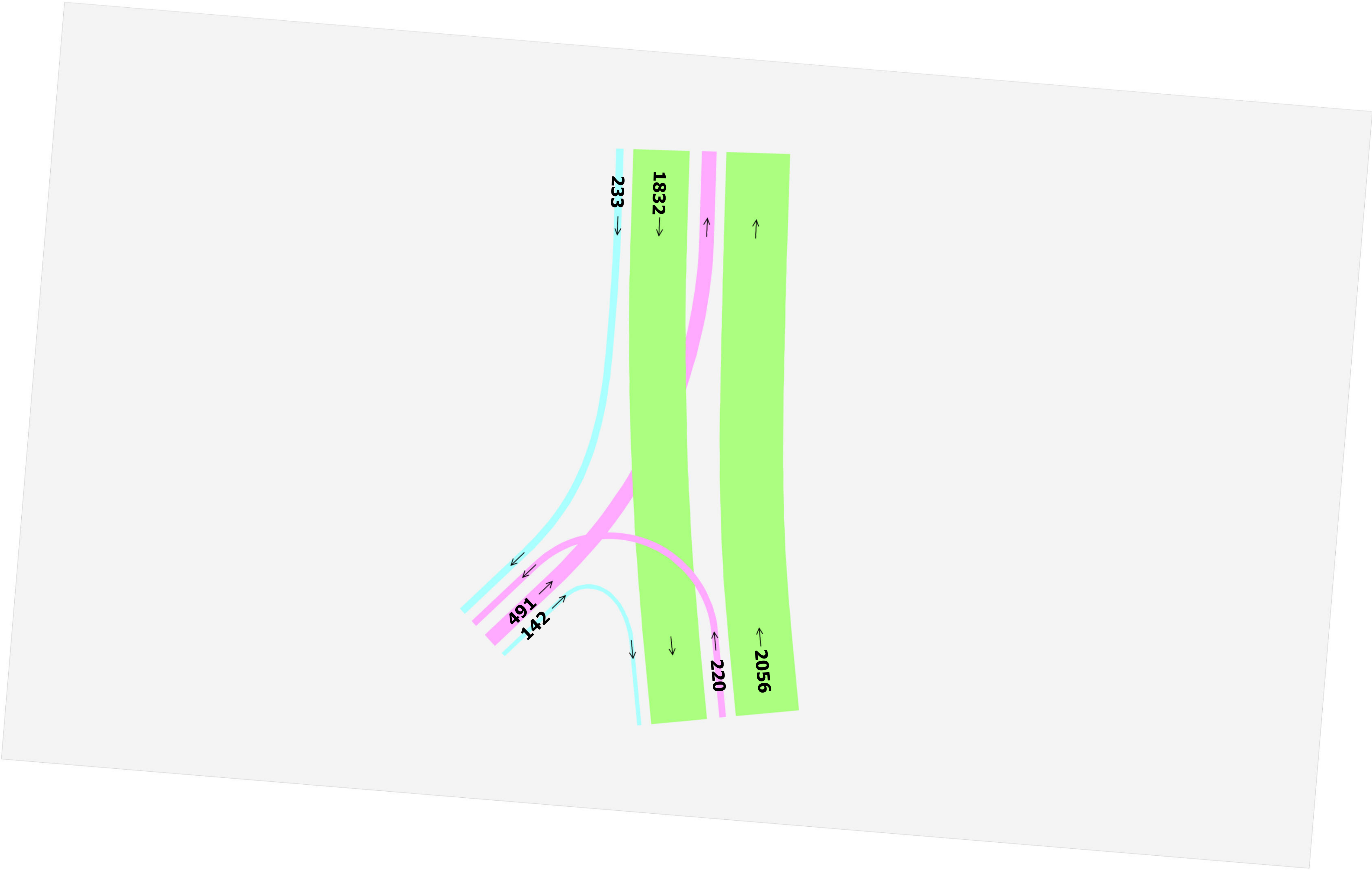

Redland 9:00

Redland 10:00

2040

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 16:00

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Redland 17:00

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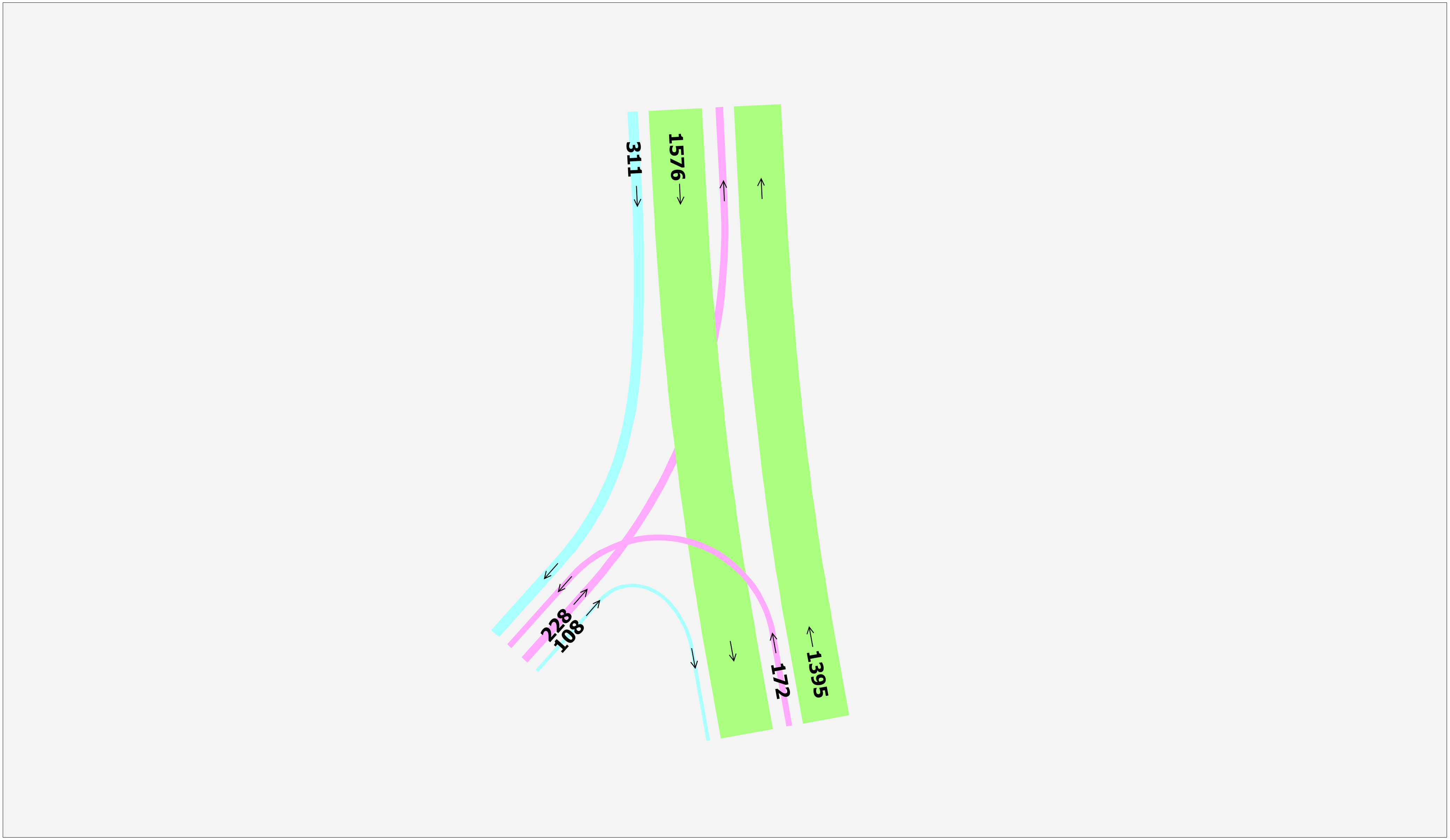
Redland 18:00

2040



Redland 19:00

2040

Redland 20:00

2040

Redland 21:00

2040

Redland 22:00

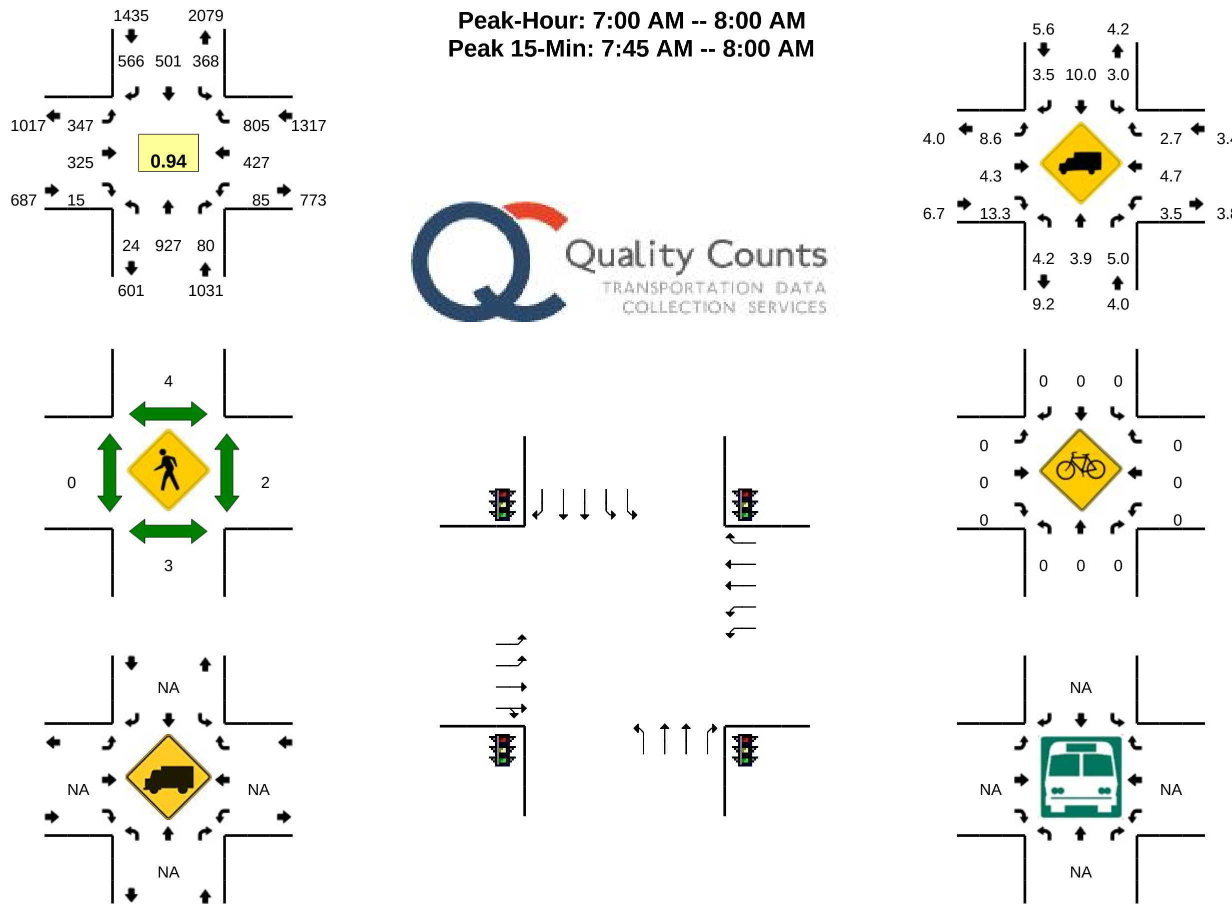
2040

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　　**QC JOB #:** 14414701
CITY/STATE: Oregon City, OR　　**DATE:** Tue, May 16 2017

Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:45 AM -- 8:00 AM



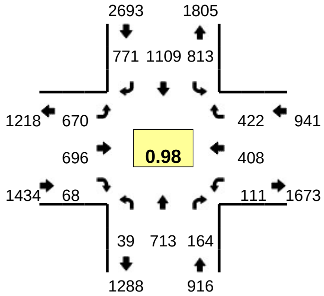
5-Min Count Period Beginning At	Cascade Hwy (Northbound) Left	Thru	Right	U	Cascade Hwy (Southbound) Left	Thru	Right	U	S Beavercreek Rd (Eastbound) Left	Thru	Right	U	S Beavercreek Rd (Westbound) Left	Thru	Right	U	Total	Hourly Totals
7:00 AM	0	75	7	0	25	28	42	0	29	19	2	0	4	27	67	0	325	
7:05 AM	0	82	3	0	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 Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
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																	

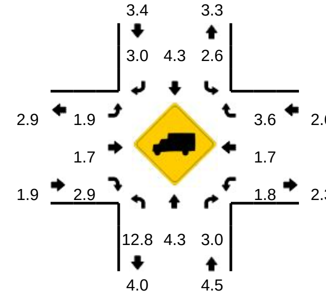
Comments:

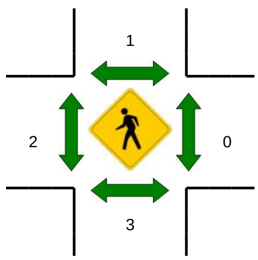
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

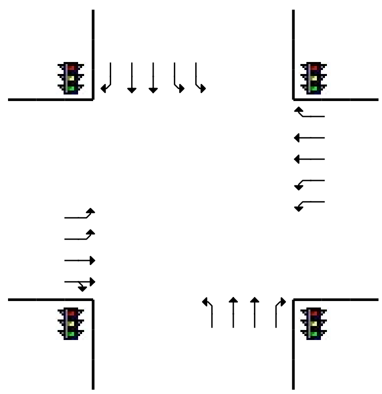
LOCATION: Cascade Hwy -- S Beavercreek Rd | **QC JOB #:** 14414702
CITY/STATE: Oregon City, OR | **DATE:** Tue, May 16 2017

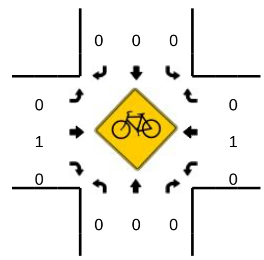


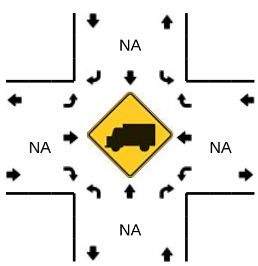
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

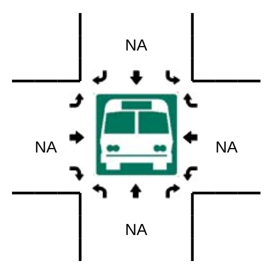












5-Min Count Period Beginning At	Cascade Hwy (Northbound) Left	Thru	Right	U	Cascade Hwy (Southbound) Left	Thru	Right	U	S Beavercreek Rd (Eastbound) Left	Thru	Right	U	S Beavercreek Rd (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	3	63	14	0	45	74	63	0	59	55	8	0	9	41	33	0	467	5599
4:05 PM	3	45	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

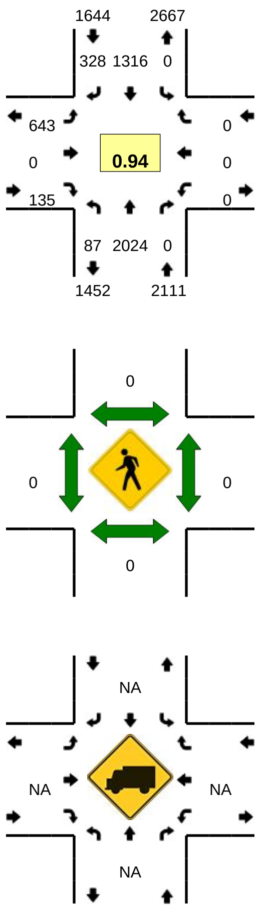
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	24	720	172	0	820	1008	772	0	788	740	52	0	104	420	508	0	6128
Heavy Trucks	0	36	4		24	60	20		0	8	0		4	12	12		180
Pedestrians		8				0				4				0			12
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

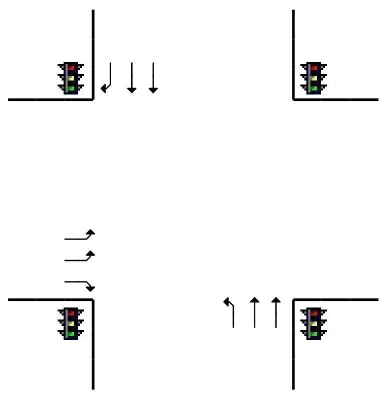
Comments:

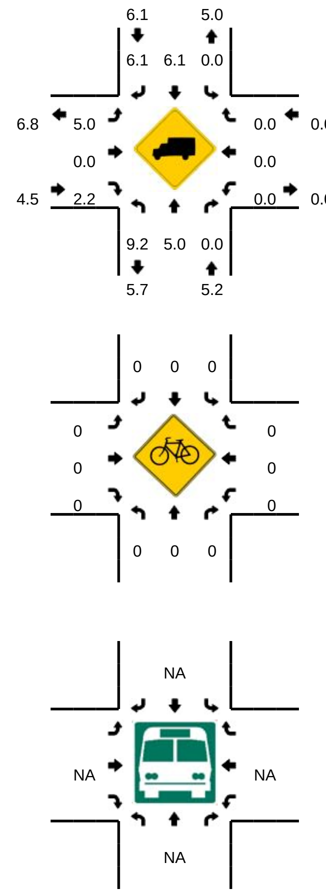
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

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







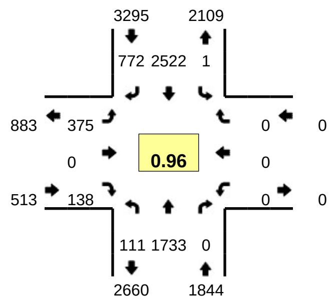
5-Min Count Period Beginning At	Cascade Hwy (Northbound) Left	Thru	Right	U	Cascade Hwy (Southbound) Left	Thru	Right	U	Redland Rd (Eastbound) Left	Thru	Right	U	Redland Rd (Westbound) Left	Thru	Right	U	Total	Hourly Totals
7:00 AM	5	163	0	0	0	77	32	0	52	0	8	0	0	0	0	0	337	
7:05 AM	0	162	0	0	0	86	18	0	64	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 Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
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																	

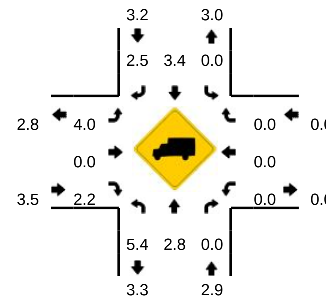
Comments:

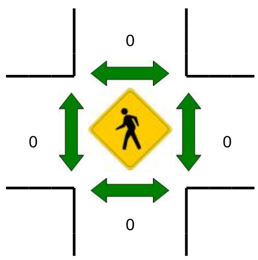
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

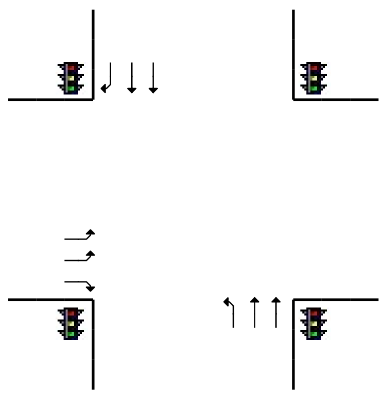
LOCATION: Cascade Hwy -- Redland Rd | **QC JOB #:** 14414704
CITY/STATE: Oregon City, OR | **DATE:** Tue, May 16 2017

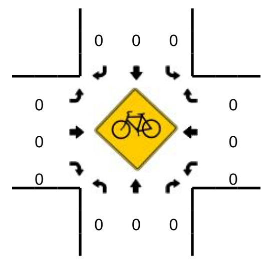


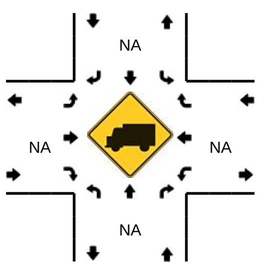
Peak-Hour: 4:35 PM -- 5:35 PM
Peak 15-Min: 5:10 PM -- 5:25 PM

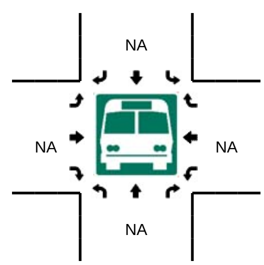












5-Min Count Period Beginning At	Cascade Hwy (Northbound) Left	Thru	Right	U	Cascade Hwy (Southbound) Left	Thru	Right	U	Redland Rd (Eastbound) Left	Thru	Right	U	Redland Rd (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	12	118	0	0	0	177	64	0	41	0	13	0	0	0	0	0	425	5212
4:05 PM	20	137	0	0	0	200	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 Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
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	From Beavercreek
0:00															
1:00															
2:00															
3:00															
4:00															
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	From Beavercreek
0:00															
1:00															
2:00															
3:00															
4:00															
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	From Beavercreek
0:00															
1:00															
2:00															
3:00															
4:00															
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%
21:00															
22:00															
23:00															
Total												AADT	73,154		
												Major	64,774		
												Minor	8,379		

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			

HCM Signalized Intersection Capacity Analysis
16: OR 213 & Beavercreek Road 6/1/2017

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

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 F 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.

F. 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

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.F 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 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

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.

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

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

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: [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.*

"Implementing the Plan – Page 4

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 Meriwether Dr
	Vonnie Cowan	20231 " "
	Marcella Tobe	20226 " "
	Doug & Karen Duesing	14429 S. Andrea Lynn Ter.
NEW	Daren & Lowell Bennett	15084 Persimmon Way
NEW	Ann Fisher	14671 Thayer Rd
CHANGE	Mary Jo Tyler	20006 Mossy Meadows
	Maggie Grant	14946 Coquille CT
	Robert Cone	14477 Andrea Lynn Ter
	Dee Dee & Joe Watson	20196 Quinalt Dr.
	KRISTINA BROWNING	18919 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/ GAFF LANE NEIGHBORHOOD ASSOCIATION PLEASE PRINT ARLY

NAME	HOME ADDRESS	EMAIL ADDRESS
CHRISTINE CORE	14052 Conway Dr	quilting77@centurylink.net
Dayna Webb - Oregon City PW		dwebb@orcity.org
Larry Stopper	Pioneer Ridge	KROYALTEA@OUTLOOK.com
JAY RUSSELL	13017 S [illegible] OC	jayrussell@[illegible].com
Cynthia Gates	OCPD	cgates@orcity.org
Ed Turpin	13911 So. Caufield Rd OC	edandjuby@hotmail.com
Michelle Don - Citizens Bank	19245 Molalla Ave OC	mdon@citizensebank.com
Sharon Mora	19854 Castleberry Lp.	
Joseph Scharlau	19856 S Castleberry	joe[illegible]fs@comcast.net
Joann Cholas	19213 Coleman dr	
Jack Wright	13718 Char Diaz Dr. - O.C.	
Joan Schultz	Stillmeadow	
Pamelyn Richardson	Meadows Courtyard	
Shirley Markey		
Amy		

Angela.

16

7:05

8:38

City of Oregon City

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

Staff Report

File Number: PC 18-004

Agenda Date: 1/22/2018

Status: Agenda Ready

To: City Commission

Agenda #: 3c.

From: Community Development Director Laura Terway

File Type: Land Use Item

SUBJECT:

Continuance of Planning files SP 17-0119: Site Plan and Design Review and VR 17-0011: Variance for a 24 Unit Multi-Family Development at 31 Pleasant Avenue until February 26, 2018.

RECOMMENDED ACTION (Motion):

Continuance of Planning files SP 17-0119 and VR 17-0011 to the February 26, 2018 Planning Commission hearing.

BACKGROUND:

The applicant has asked to continue the application until February 26, 2018 and has extended the 120 date accordingly.

BUDGET IMPACT:

Amount:
FY(s):
Funding Source:

City of Oregon City

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

Staff Report

File Number: PC 18-007

Agenda Date: 1/22/2018

Status: Draft

To: Planning Commission

Agenda #:

From: Community Development Director Laura Terway

File Type: Land Use Item

SUBJECT:
Continuance of Planning file L 17-04 Legislative Amendment to adopt various development code changes until February 26, 2018.

RECOMMENDED ACTION (Motion):
Continuance of Planning file L 17-04 to the February 26, 2018 Planning Commission hearing.

BACKGROUND:
The Planning Commission will hold a work session for the January 22nd meeting on this item.

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

City of Oregon City

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

Staff Report

File Number: PC 18-005

Agenda Date: 1/22/2018

Status: Draft

To: Planning Commission

Agenda #:

From: Community Development Director Laura Terway

File Type: Planning Item

SUBJECT:
Work Session for Proposed Amendments to the Development Sections of the Oregon City Municipal Code (Including Lot Averaging)

RECOMMENDED ACTION (Motion):
Provide comment and feedback.

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

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 proposed amendments include alterations to the existing "lot averaging" provisions which allow subdivisions to include lots that are up to 20% smaller than the minimum lot size, provided the average size of all of the lots within the subdivision meet the minimum lot area identified in the underlying zone. In response to significant concerns about the provision from the public and Planning Commission, the City Commission held a work session on December 12, 2017 to discuss the issues and directed staff to assemble amendments. The amended language has been included in the enclosed draft amendments for review by the Commission.

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 January 10, 2018

Oregon City Municipal Code Section	Summary of Change	Explanation
16.12.050	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.
17.04.420	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 on the same lot 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	Add fence posts under NROD exemptions	Fence posts are similar in nature to utility poles, which are already exempt
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.
17.50.260	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

16.12.050 - ~~Calculations of lot area~~ Lot Size Reduction~~s~~.

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.

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 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 that may be leased or rented to tenants, which excludes 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, ~~and~~ single and two-family ~~units~~in the same building ~~when in conjunction with and located on the same lot~~ 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 w~~
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
E. Activities in which 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, 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.
F. 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.
G. 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.
H. 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.
I. 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.
J. 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.
K. Routine repair and maintenance of existing structures, roadways, driveways and utilities.
L. Replacement, additions, alterations and rehabilitation of existing structures, roadways, utilities, etc., where the ground level impervious surface area is not increased.
M. Measures mandated by the City of Oregon City to remove or abate nuisances or hazardous conditions.

N. 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.

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~~	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 ~~(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.

~~17.50.260 - 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 a fixed transit route.~~ 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 s~~S~~ite.

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~~g~~ 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 proposed exterior alterations or additions to the site~~, as determined by the community development director, is more then 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.~~

    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 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 gate for a refuse enclosure).

[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 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	0.5	7:1 max/min ratio	1.5
Building Entrances	3		
Bicycle Parking Areas	3		
Abutting property	N/A	.05	

~~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.

C~~B~~. 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.~~A~~B;
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 17.80.90~~D~~E. as needed.

D~~C.~~ 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.~~A~~B;

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.E~~D~~. 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 17.80.90E~~D~~.

E~~D~~. 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 <u>it qualifies as an "eligible modification" under Section 17.80.035 or </u>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.

Draft Code Amendments

January 22, 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

Planning Commission Hearings in February

Amend Lot Averaging

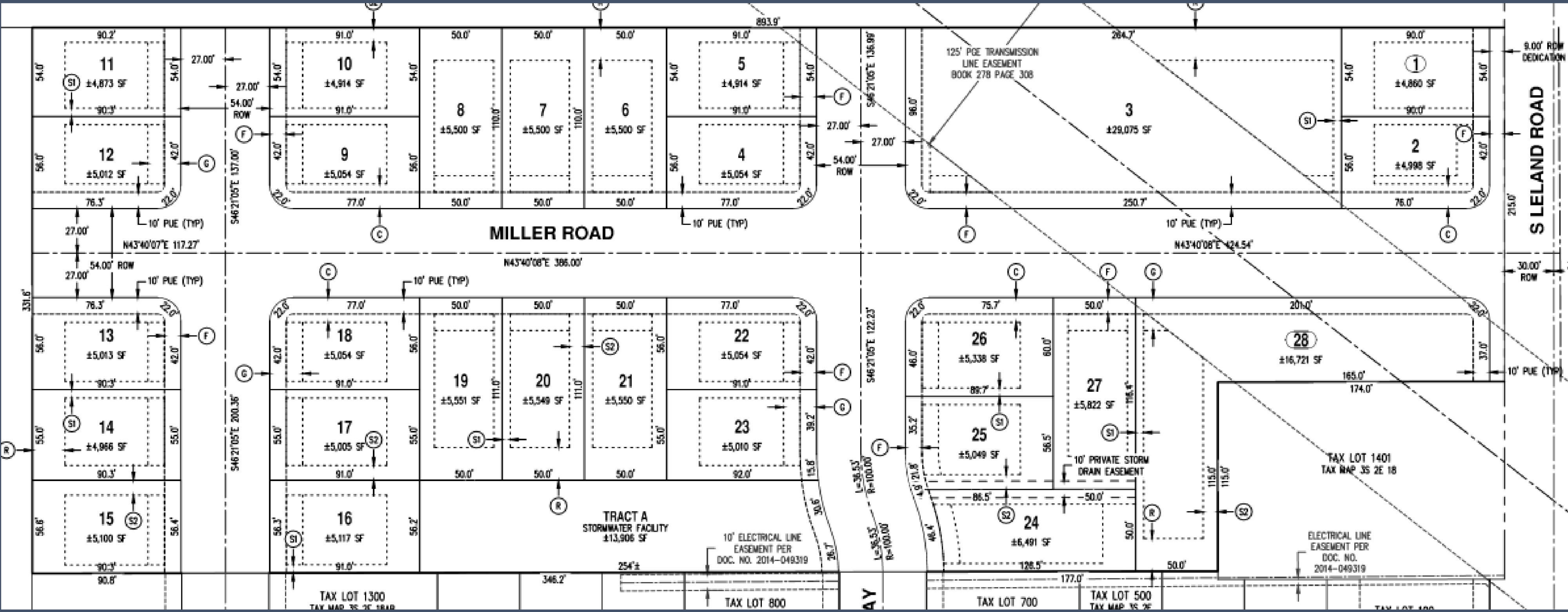
Current:

Lot sizes may be up to 20% less than the zoning designation if the subdivision as a whole averages the zoning minimum.

Proposed:

- 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%.

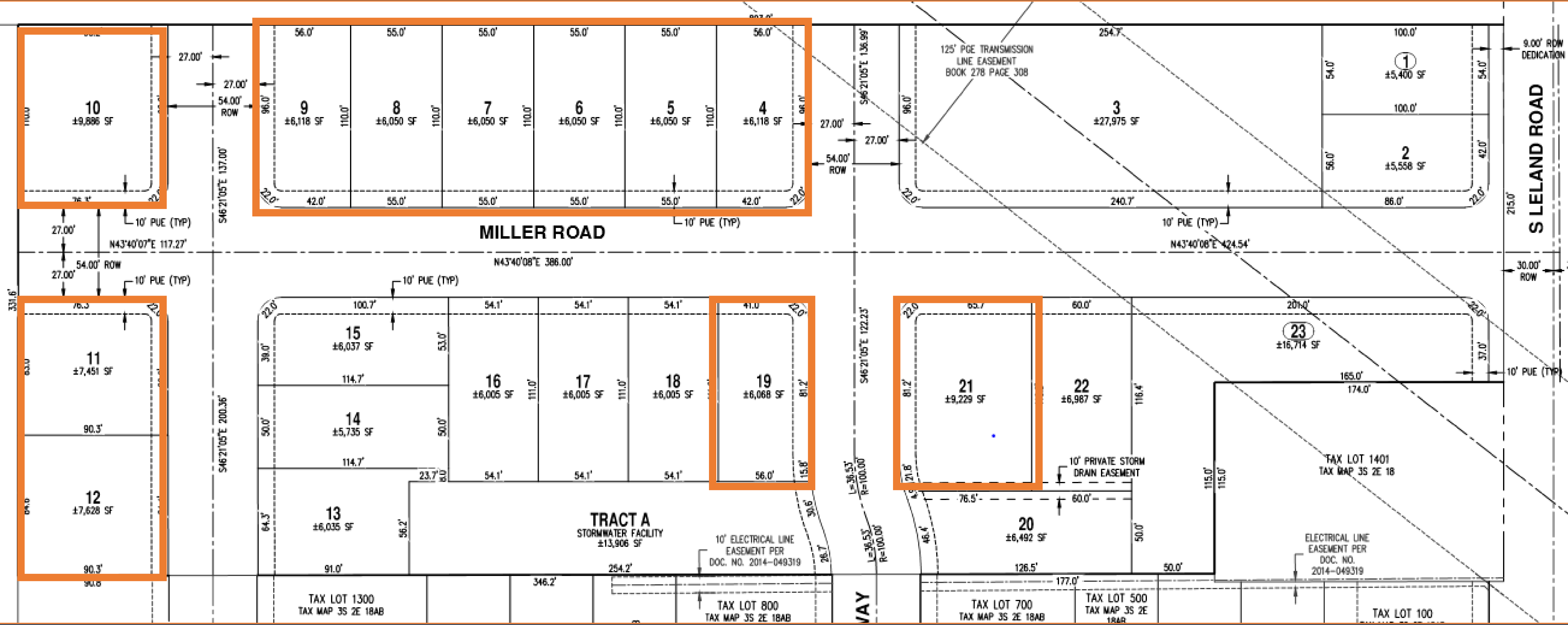
Lindsay Anne Too: Original



“R-6” Single-Family Dwelling District

Minimum Lot Size: 4,800 sq ft - Yields 28 Lots

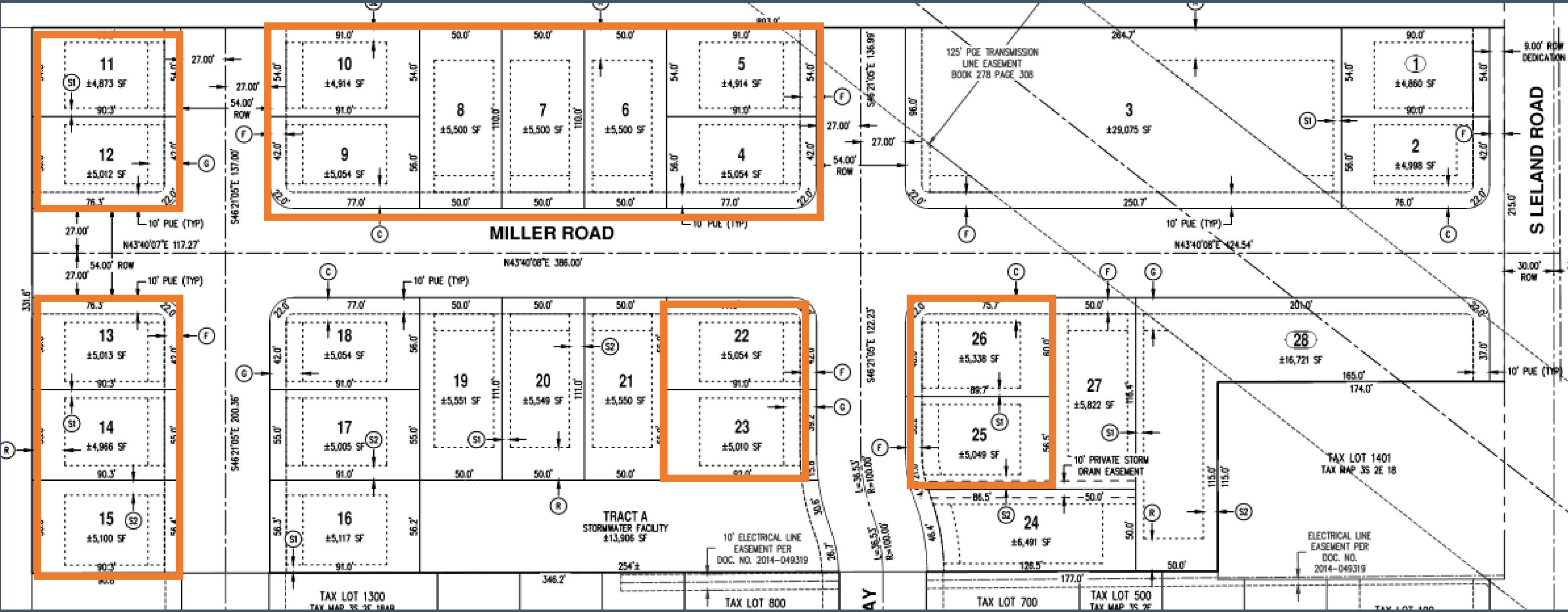
Lindsay Anne Too: Under Proposed Code



Minimum Lot Size: 5,400 sq ft - 23 Lots – 5 Less & Up to 5 below 6,000 sq. ft.

Design limited by pre-existing road connections to the south and PGE easement

Lindsay Anne Too: Original



Family Daycare Provider

- Increase the number of children from 13 to 16.
- Update to comply with ORS

Definitions

- Add definition of building
- “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.

1 and 2 Dwelling Units in Commercial Areas

- 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 fence posts are exempt as they are similar in nature to utility poles
- 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

Clarification of Applicability of Nonconforming Upgrades

- Clarify nonconforming upgrades is required for 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

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 approve of projects less than 500 sq. ft. rather than a landscape architect.
- Remove requirement for 10% landscaping for major remodeling.

Site Plan

- 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 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 if such replacement meets the standards in paragraph 4 below.

Questions?