



FEHR PEERS

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*Prepared for:*  
City of Spokane Valley

# University Road Overpass Study Draft Final Report

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## Table of Contents

<b>1.0</b>	<b>Executive Summary</b> .....	<b>1</b>
<b>2.0</b>	<b>Introduction</b> .....	<b>4</b>
<b>3.0</b>	<b>Existing Conditions</b> .....	<b>6</b>
3.1	Transportation Network .....	6
3.1.1	Study Area .....	6
3.1.2	Travel Patterns .....	21
3.1.3	Traffic Operations.....	32
3.2	Land Use .....	38
3.3	Utilities.....	40
<b>4.0</b>	<b>Future Conditions</b> .....	<b>42</b>
4.1	Growth Forecasts.....	42
4.2	2040 No Build Transportation Conditions .....	50
4.2.1	Intersection Level of Service.....	50
4.2.2	Travel Time.....	54
4.2.3	Pedestrian and Bicycle Conditions .....	55
4.3	Planned Projects .....	55
<b>5.0</b>	<b>Alternatives under Consideration</b> .....	<b>57</b>
5.1	Congestion Management Process .....	57
5.2	Project Alternatives .....	59
5.3	Considered, But Eliminated.....	64
5.4	Additional Analysis Methods.....	65
5.4.1	Project Alternative Traffic Volume Forecasts.....	65
5.4.2	Project Alternative Pedestrian and Bicycle Forecasts.....	65
5.4.3	Connectivity to Valley Mission Park.....	68
<b>6.0</b>	<b>Rating Approach</b> .....	<b>69</b>
6.1	Performance Metrics.....	69
<b>7.0</b>	<b>Findings</b> .....	<b>71</b>

7.1	Congestion Relief Alternatives.....	71
7.1.1	Cost.....	71
7.1.2	Congestion Relief .....	72
7.1.3	Neighborhood Impacts.....	92
7.1.4	Conflicts with Existing Infrastructure .....	92
7.1.5	Environmental Impacts.....	92
7.1.6	Consistency with Bike and Pedestrian Master Program .....	92
7.1.7	Transit Accommodation.....	92
7.1.8	Pedestrian and Bicycle Daily Forecast .....	93
7.1.9	Connectivity to Valley Mission park.....	93
7.1.10	Preferred Alternative.....	93
7.2	Pedestrian and Bicycle Connectivity Alternatives.....	94
7.2.1	Cost.....	96
7.2.2	Congestion Relief .....	96
7.2.3	Neighborhood Impacts.....	96
7.2.4	Conflicts with Existing Infrastructure .....	97
7.2.5	Environmental Impacts.....	97
7.2.6	Consistency with Bike and Pedestrian Master Program .....	97
7.2.7	Connectivity to Spokane Valley/Millwood Trail.....	97
7.2.8	Pedestrian and Bicycle Daily Forecast .....	97
7.2.9	Connectivity to Valley Mission Park.....	98
7.2.10	Recommended Alternative.....	102
<b>8.0</b>	<b>Potential Funding Sources.....</b>	<b>103</b>
8.1	SRTC Funding .....	103
8.2	WSDOT Funding .....	104
8.3	Other Funding Sources.....	104
<b>9.0</b>	<b>Benefit-Cost Analysis.....</b>	<b>106</b>
9.1	Methodology .....	106
9.1.1	Safety.....	106
9.1.2	Mobility .....	107

9.1.3	Fuel Consumption .....	107
9.2	Assumptions.....	108
9.3	Results .....	108

## **Appendices**

Appendix A: Pedestrian & Bicycle Counts

Appendix B: Vehicle Counts

Appendix C: Existing Conditions Level of Service Worksheets

Appendix D: Utility Maps

Appendix E: Pedestrian and Bicycle Forecast Memorandum

Appendix F: 2040 Level of Service Worksheets

Appendix G: Benefit-Cost Calculation Worksheets

Appendix H: Cost Estimation Worksheets

## List of Figures

Figure 1: Study Area .....	9
Figure 2: Existing Pedestrian and Bicycle Facilities.....	11
Figure 3: Public Facilities.....	12
Figure 4: Existing Transit Routes.....	14
Figure 5: Collision Rates.....	19
Figure 6: Average Weekday Bidirectional Flows from AirSage .....	28
Figure 7: Montgomery Industrial/Commercial Area Travel Pattern .....	29
Figure 8a: Splashdown Waterpark Area Travel Pattern.....	30
Figure 8b: Splashdown Waterpark Area – Trip Distribution.....	31
Figure 9: Peak Hour Turning Volumes and Lane Configurations .....	34
Figure 10: Peak Hour Level of Service .....	35
Figure 11: Land Use and Property Owners.....	39
Figure 12: Existing Utilities.....	41
Figure 13: Growth in Households (2010-2040).....	43
Figure 14: Growth in Employment/Jobs (2010-2040).....	44
Figure 15: Growth in Study Area Households (2010-2040).....	45
Figure 16: Growth in Study Area Employment/Jobs (2010-2040).....	46
Figure 17: 2040 No Build Alternative – Peak Hour Turning Volumes and Lane Configurations.....	48
Figure 18: No Build Alternative – 2040 PM Peak Hour Level of Service.....	53
Figure 19: University Road Overpass Study Alternatives.....	60
Figure 20: Alternative A – New Southbound Lane on Argonne Road.....	61
Figure 21: Alternative B – Four-Lane Diverging Diamond Interchange on Argonne Road .....	62
Figure 22: Alternative C – Six-Lane Diverging Diamond Interchange on Argonne Road.....	63
Figure 23: 2040 Alternatives A, B, and C - Peak Hour Turning Volumes and Lane Configurations.....	66
Figure 24: 2040 Alternative F (University Road Bridge) - Peak Hour Turning Volumes and Lane Configurations .....	67

Figure 25: Alternative A – New Southbound Lane on Argonne – 2040 PM Peak Hour Level of Service .....	75
Figure 26: Alternative B – Four-Lane Diverging Diamond Interchange on Argonne – 2040 PM Peak Hour Level of Service.....	78
Figure 27: Alternative C – Six-Lane Diverging Diamond Interchange on Argonne – 2040 PM Peak Hour Level of Service.....	81
Figure 28: Alternative F – University Road Bridge – 2040 PM Peak Hour Level of Service .....	85
Figure 29: Alternative I – Pines Signal Modifications – 2040 PM Peak Hour Level of Service .....	88
Figure 30: 30 Minute Walkshed from Valley Mission Park.....	100
Figure 31: 30 Minute Bikeshed from Valley Mission Park .....	101

### List of Tables

Table 1. Transit Route Headways in Minutes .....	13
Table 2: Collision Rate by Segment.....	16
Table 3: Collision Rate by Intersection.....	17
Table 4. Journey to Work (Commuting) Data for Residences within the Study Area .....	22
Table 5. Levels Of Service Criteria for Signalized and Unsignalized Intersections .....	32
Table 6. Existing PM Peak Hour Intersection Level of Service .....	36
Table 7. Existing AM Peak Hour Intersection Level of Service.....	37
Table 8: Land Use Growth (2010 – 2040) .....	42
Table 9: No Build Alternative – 2040 PM Peak Hour Intersection Level of Service.....	51
Table 10: No Build Alternative – 2040 PM Peak Hour Travel Time.....	55
Table 11: Consistency with CMP Strategies for the Argonne/Mullan Road Corridor .....	58
Table 12: Alternatives under Consideration.....	59
Table 13: Performance Metrics for Congestion Relief Alternatives .....	73
Table 14: Alternative A – 2040 PM Peak Hour Intersection Level of Service .....	74
Table 15: Alternative A – 2040 PM Peak Hour Travel Time .....	76
Table 16: Alternative B – 2040 PM Peak Hour Intersection Level of Service .....	77
Table 17: Alternative B – 2040 PM Peak Hour Travel Time.....	79
Table 18: Alternative C – 2040 PM Peak Hour Intersection Level of Service .....	80
Table 19: Alternative C – 2040 PM Peak Hour Travel Time.....	82
Table 20: Alternative F – 2040 PM Peak Hour Intersection Level of Service.....	84
Table 21: Alternative F – 2040 PM Peak Hour Travel Time .....	86
Table 22: Alternative I – 2040 PM Peak Hour Intersection Level of Service.....	87
Table 23: Summary of Alternatives – 2040 PM Peak Hour Travel Time.....	89
Table 24: Summary of Alternatives – 2040 PM Peak Hour Intersection Level of Service .....	90
Table 25: Performance Metrics for Pedestrian and Bicycle Connectivity Alternatives .....	95
Table 26: Cost by Alternative.....	96

Table 27: Households and Employment within 30-Minute Walkshed and Bikeshed from Valley Mission Park .....	99
Table 28: Benefit-Cost Analysis Results .....	109

## 1.0 EXECUTIVE SUMMARY

The City of Spokane Valley is studying options to improve accessibility and reduce traffic congestion between the Montgomery Industrial District, north of I-90, and the residential areas south of the freeway. This study evaluated a full array of options, from interchange improvements at Argonne and Pines to a new overpass across I-90, which could serve pedestrians, bicycles, or perhaps vehicles. Below, existing conditions are summarized and the following page presents a summary of the analysis results and the preferred improvement recommendation.

### EXISTING CONDITIONS

#### Auto

- The study area is bisected by I-90 and has two interchanges spaced roughly two miles apart at Argonne Road and at Pines Road.
- PM peak hour operations were studied at 24 intersections and AM peak hour operations were studied at the subset of intersections that include I-90 ramps. Generally, the area has typical levels of suburban traffic congestion. However, there is a substantial southbound queue and long travel times along Argonne Avenue between Trent Avenue and I-90 in the PM peak period.

#### Pedestrians & Bicycles

- The Spokane River Centennial Trail, which serves both pedestrians and bicyclists, runs along the Spokane River north of the study area. There are few options for travelers to cross I-90 and reach the trail system. The Argonne/Mullan and Pines overpasses each have a sidewalk on one side. There are no dedicated bicycle facilities that cross I-90 in the study area. Dedicated bicycle facilities are provided on several roadways within the study area including University Road and Broadway Avenue.
- Travel surveys indicate that walking and bicycling have low mode shares among work trips in the study area—roughly four and one percent, respectively. Recreational walking trips are more common, making up more than 10% of all trips. Counts at several locations in Spokane Valley yielded pedestrian volumes of roughly one-half to two percent of vehicle volumes. Pedestrian activity was higher in the better connected neighborhoods south of the study area.
- The City Council adopted Bicycle and Pedestrian Master Program identified a lack of connections across I-90, which is a major barrier in the City.

#### Rail

- Two railroads pass through the study area, crossing roadways at four locations. All crossings have standard safety treatments including gates, lights, and bells. These crossings form a barrier for travelers, in particular emergency response vehicles.
- Train/auto collisions are rare with only one incident at the five crossings in the past twenty years.

#### Transit

- Five Spokane Transit Authority bus routes serve the study area with destinations including local schools, shopping centers, and transit centers, as well as Downtown Spokane. Most bus routes run every 30 minutes during the day and every hour during the evening and weekends.

#### Land Use

- In general, the area south of I-90 is residential with commercial uses along the north-south arterials of Argonne, Mullan, and Pines. North of I-90 most of the study area is light industrial with pockets of residential.
- Property ownership is largely fragmented, especially in areas of single family residential and small commercial uses. There are several larger consolidated properties north of I-90.

#### Utilities

- No major utilities, such as an interstate gas line that may influence the location of a potential overpass, were identified along the potential alignments. However, numerous local utilities such as gas, water, and electricity are present within the study area.



## Future Conditions

Regional growth between 2014 and 2040 is expected to increase traffic volumes and the number of pedestrian and bicyclists in the area. Specifically, PM peak period traffic congestion on Argonne Road between Trent Avenue and I-90 is expected to increase substantially. Congestion on Pines Road will be less pronounced than on Argonne Road, in part due to the completion of the Mansfield Avenue extension project. Growth in pedestrian and bicycle travel would exacerbate the poor connectivity across I-90 identified in the Bicycle and Pedestrian Master Program. Based on these conditions, the project team sought to answer these two questions:

**What improvements could be made to relieve congestion at the Argonne & Pines interchanges?**

**What new north-south connections could be made across I-90 to improve pedestrian and bicycle travel?**

Each alternative was evaluated using a set of performance metrics. The results are summarized below.

### Pedestrian & Bicycle Connectivity

#### ALTERNATIVES CONSIDERED

- Pedestrian & bicycle overpass at University Road
- Pedestrian, bicycle & emergency vehicle overpass at University Road
- Pedestrian & bicycle overpass from Valley Mission Park to Spokane Valley/Millwood Trail
- Pedestrian & bicycle overpass from Valley Mission Park to Montgomery Drive

#### PERFORMANCE MEASURE FINDINGS

- The alternatives range in cost from \$4.6 to \$6.0 million.
- The Valley Mission Park alternatives best meet the "desire lines" for travel and would draw the highest number of users.
- The Valley Mission Park alternatives would have fewer neighborhood impacts than the University Road alternatives.

### Congestion Relief

#### ALTERNATIVES CONSIDERED

- New southbound lane on Argonne Road and intersection improvements at I-90
- Diverging diamond interchange (DDI) at Argonne Road
- Pedestrian, bicycle, & auto overpass at University Road
- Signal and turn pocket modifications at Pines Road and Mission Avenue

#### PERFORMANCE MEASURE FINDINGS

- The alternatives range in cost from \$250,000 (Pines Road modifications) to \$10.6 million (University Road overpass).
- The new southbound travel lane would provide the most congestion relief and best accommodate transit service.
- The University Road overpass would have the most neighborhood impacts.



### PREFERRED ALTERNATIVE

The preferred alternative is a new southbound lane on Argonne Road and turn pocket and signal modifications at the Pines Road and Mission Avenue intersection. It was determined that the most immediate need is for congestion relief along the Argonne Road and Pines Road corridors. These projects provide substantial improvements to travel time and intersection level of service, particularly along the Argonne Road corridor between Trent Avenue and I-90. A benefit-cost analysis was performed on these improvements and they demonstrated a benefit-cost ratio as high as 2.61.

While the new Argonne Road bridge would likely include a wide sidewalk that will facilitate pedestrian and bicycle travel across I-90, this enhancement will not fully address the connectivity need identified in the Bicycle and Pedestrian Master Program. Therefore, this document identifies a long-term project to improve pedestrian and bicycle mobility through a new overpass of I-90 and the UPRR railroad tracks in the vicinity of Valley Mission Park. This major pedestrian and bicycle improvement will be most relevant and serve the most users when the planned Appleway and Spokane Valley-Millwood Trails are completed. This new overpass will provide a safe, convenient, and pleasant connection between these new trails and between the neighborhoods on either side of I-90.



## 2.0 INTRODUCTION

As development in the Spokane Valley area has progressed over the decades, traffic congestion has been an increasing concern. In particular, the limited number of access points to and across I-90 have resulted in growing congestion over the years. About 10 years ago, the Washington State Department of Transportation (WSDOT) explored the feasibility of providing congestion relief in the Spokane Valley area by studying the feasibility of a new interchange at University Road. While this study confirmed the possibility of a new interchange or overpass at this location, the project was not a high priority for the department and the study was shelved.

In addition to exploring options for congestion relief, the focus on developing pedestrian and bicycle facilities within the Spokane region has become a significant part of regional transportation planning efforts. The concept of developing a regional trail network began with the development of the roughly 70 mile Centennial Trail that connects multiple communities and two states along the Spokane River. The Centennial Trail is considered by many as the backbone of the Spokane Regional Trail system. Since that time, several other trails in the region have been developed or are in the planning stages including Fish Lake Trail connecting the City of Spokane with Cheney, the cross state Columbia Plateau Trail, the Ben Burr Trail connecting the lower south hill of Spokane with the southern limits of the City, Greenacres Trail which would provide a loop trail connection to the Centennial Trail at the eastern limits of Spokane Valley, the Children of the Sun Trail which is a major north-south trail connection through the eastern edge of the City of Spokane, Appleway Trail which will provide a southerly east-west connection from Spokane Valley to Liberty Lake, and the Millwood Trail that will provide a northerly east-west connection from the eastern limit of the City of Spokane through Downtown Millwood and the northern Valley to the Spokane Valley Mall and the Centennial Trail.

The primary goal of this study is to determine how to reduce congestion near the Argonne Road and Pines Road interchanges and address the major barrier of I-90 that was identified in the Bicycle and Pedestrian Master Program. An early thought was to evaluate the potential of a new overpass at University Road to reduce vehicle congestion and provide a new connection across the freeway for bicycles and cars. However, to fully explore the options that could best meet the goals of the study, the extent of the study area and the options considered were expanded beyond University Road. In exploring the best options, the project team considered two key questions:

- What improvements should be made *at* the Argonne and Pines interchanges to relieve congestion?



- What new north-south connections should be made *between* the Argonne and Pines interchanges?

This document describes and evaluates each alternative using performance metrics. This study also describes the methodologies used to forecast travel demand for vehicles, pedestrians, and bicycles in the horizon year of 2040.



## 3.0 EXISTING CONDITIONS

This section describes the existing conditions in the study area. The existing conditions evaluation describes the following:

- Transportation Network – current configuration of roadway, pedestrian, bicycle, transit, and rail facilities in the study area.
  - Roadway operations for vehicles – Level of service (LOS) for autos at study intersections and identification of deficiencies as defined by the City of Spokane Valley’s Comprehensive Plan.
  - Pedestrian and Bicycle Operations – Description of current pedestrian and bicycle facilities and identification of deficiencies.
  - Transit Operations – Qualitative description of current transit service.
  - Safety – Summary of collision data within the study area, including collision rates and incident type.
  - Emergency Response – Qualitative description of emergency response routing within the study area.
  - Travel patterns – Evaluation of travel patterns both within the study area and throughout the City using cell phone origin-destination data.
- Land Use
  - Summary of land uses in the study area, including major property owners.
- Utilities
  - Summary of existing utilities in the study area that have the potential to be affected by a new overpass.

### 3.1 TRANSPORTATION NETWORK

This section describes the existing transportation infrastructure and operations within the study area.

#### 3.1.1 STUDY AREA

The study area is shown in **Figure 1**. The area is roughly bounded by the Spokane River to the north, Broadway Avenue to the south, Argonne Road to the west, and Pines Road to the east. Two railroads pass through the study area. The Burlington Northern and Santa Fe Railway Company (BNSF) has two parallel



tracks running alongside Trent Avenue/State Route (SR) 290 and Union Pacific Railroad (UPRR) has a railroad running from the northwest corner of the study area to just north of the I-90 interchange at the east edge of the study area. Twenty-four study intersections have been selected for evaluation. These intersections are located along the key roadways described below.

### 3.1.1.1 Regional Access

**Interstate 90 (I-90)** is a freeway that bisects the study area in an east-west direction, forming a barrier with few crossings through the City of Spokane Valley. The interstate serves both local and regional traffic and has interchanges at the Argonne Road/ Mullan Road couplet at the west end of the study area and at Pines Road at the east end of the study area.

**Trent Avenue/SR-290** is a state route running alongside the BNSF railroad tracks in a northeast-southwest direction. There are two lanes in each direction, with a two-way center turn lane along most of its length between Argonne Road and Pines Road.

### 3.1.1.2 Arterial and Local Access

Three minor arterials run east-west throughout the study area. **Montgomery Drive** is located on the north side of I-90, **Mission Avenue** is located on the south side of I-90, and **Broadway Avenue** runs along the southern boundary of the study area. All three roadways have a single through lane in each direction. Broadway Avenue and Mission Avenue have two-way center turn lanes throughout the study area. Montgomery Drive has a two-way center turn lane in some locations and two at-grade crossings with the UPRR railroad tracks.

The study area includes six key north-south roadways. Three of the roadways are principal arterials that have interchanges with I-90: **Argonne Road** and **Mullan Road** form a couplet at the west end of the study area and **Pines Road** is located at the east end of the study area. Argonne Road, running southbound, and Mullan Road, running northbound, operate as a couplet from just north of I-90 through the south end of the study area. Each road has three lanes throughout the couplet, with the exception of the Argonne Road overpass over I-90 which has only two southbound lanes. North of the I-90 interchange, the two roads merge into a single two-way road with an underpass beneath the BNSF railroad. Pines Road has two lanes in each direction, as well as a two-way center turn lane at some locations. The UPRR railroad tracks cross Pines Road at grade just north of the I-90 interchange. Pines Road is a WSDOT facility, State Route 27.

The remaining three north-south roadways have segments on both the north and south sides of I-90, but no connections are provided over the freeway. **Woodruff Road** is a local access road with one lane in



each direction. On the north side of I-90, **University Road** has one lane in each direction and at-grade crossings with the BNSF railroad immediately south of the intersection with Trent Avenue/SR-290. To the south of I-90, the University Road is a minor arterial and is primarily one through lane in each direction with a two-way center turn lane. North of I-90, **Bowdish Road** is classified as a local access road, running from the UPRR railroad tracks to north of Montgomery Drive. South of I-90, Bowdish Road is classified as a minor arterial with one through lane in each direction with parallel parking spaces on both sides.

Speed limits along nearly all of the arterials are 35 miles per hour (MPH). The exceptions are Trent Avenue/SR-290 which has speed limits of 40 and 50 MPH and Montgomery Avenue between Argonne Road and the UPRR railroad crossing, which has a 30 MPH speed limit. University Road north of Montgomery Drive has a 25 MPH speed limit. Local roads have a speed limit of 25 MPH.



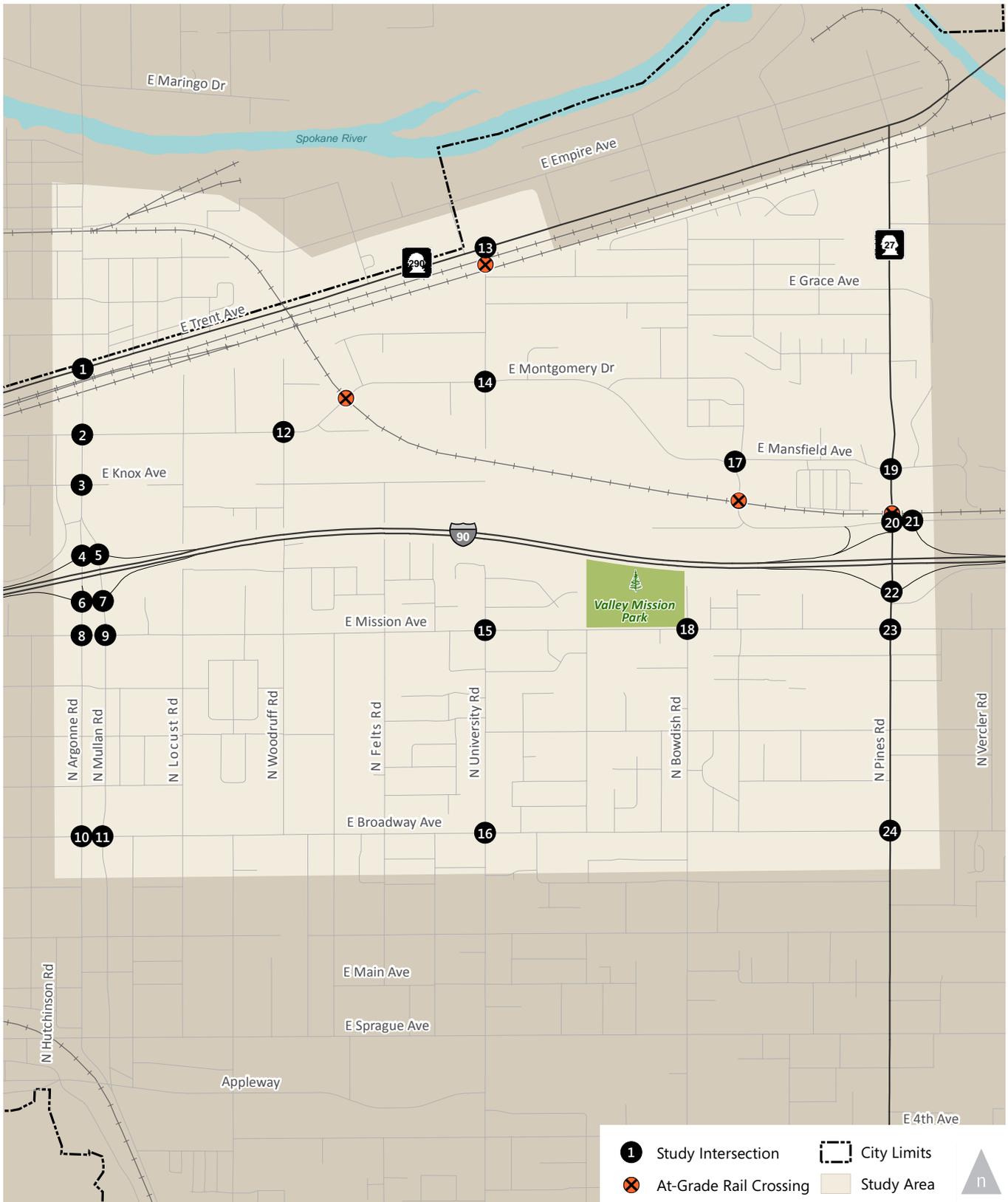


Figure 1.  
Study Area

### 3.1.1.3 Pedestrian and Bicycle

**Figure 2** shows the existing pedestrian and bicycle network within the study area. The Spokane River Centennial Trail runs along the Spokane River north of the study area. The trail is paved and serves both pedestrians and bicyclists. Most of the local access and arterial roadways previously described have sidewalks, although sometimes they are provided on only one side of the road. Mission Avenue and Woodruff Road lack sidewalks along most of their length through the study area. Each of the three bridges over I-90 (Argonne Road, Mullan Road, and Pines Road) have sidewalks on one side of the overpass.

Local schools have identified preferred walking routes for students. Those streets include the north-south streets of Locust Road, Felts Road, University Road, Bowdish Road, and Wilbur Road. East-west streets identified as preferred walking routes include Broadway Avenue as well as numerous local access roads.

The study area has no dedicated bicycle facility that crosses I-90. Bicycles lanes run in the east-west direction along Montgomery Avenue from Woodruff Road to University Road and along Mansfield Avenue from Montgomery Drive to Pines Road. On Mission Avenue, most of the roadway has wide shoulders that pedestrians and bicyclists share. Broadway Avenue has continuous bicycle lanes throughout the study area. University Road has bicycle lanes stretching from Mission Avenue to Sprague Avenue.

### 3.1.1.4 Public Facilities

**Figure 3** shows some of the public facilities within the study area. These facilities include schools, fire stations, hospitals, parks, and libraries. The facilities are located on both the north and south sides of the freeway requiring that some trips to, from, or between these facilities must cross I-90. For example, Fire Station 8 and the Valley Hospital and Medical Center are located on opposite sides of I-90. **Figure 3** also shows from which areas each elementary school draws students. Trent Elementary School, located north of I-90, draws students from the south side of the interstate, requiring them to use either the Argonne Road/Mullan Road or Pines Road overpasses.



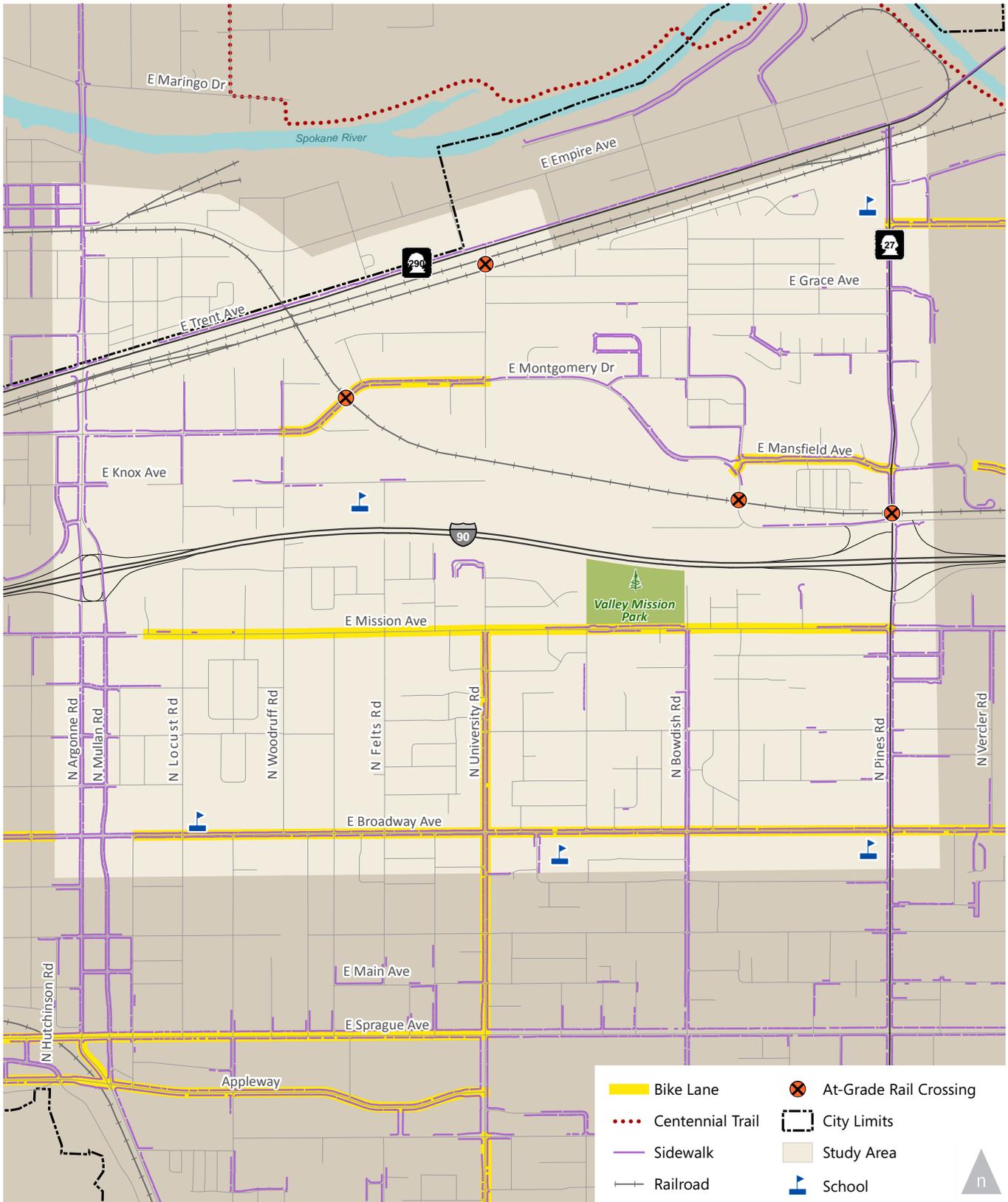


Figure 2.  
Existing Pedestrian and Bike Facilities



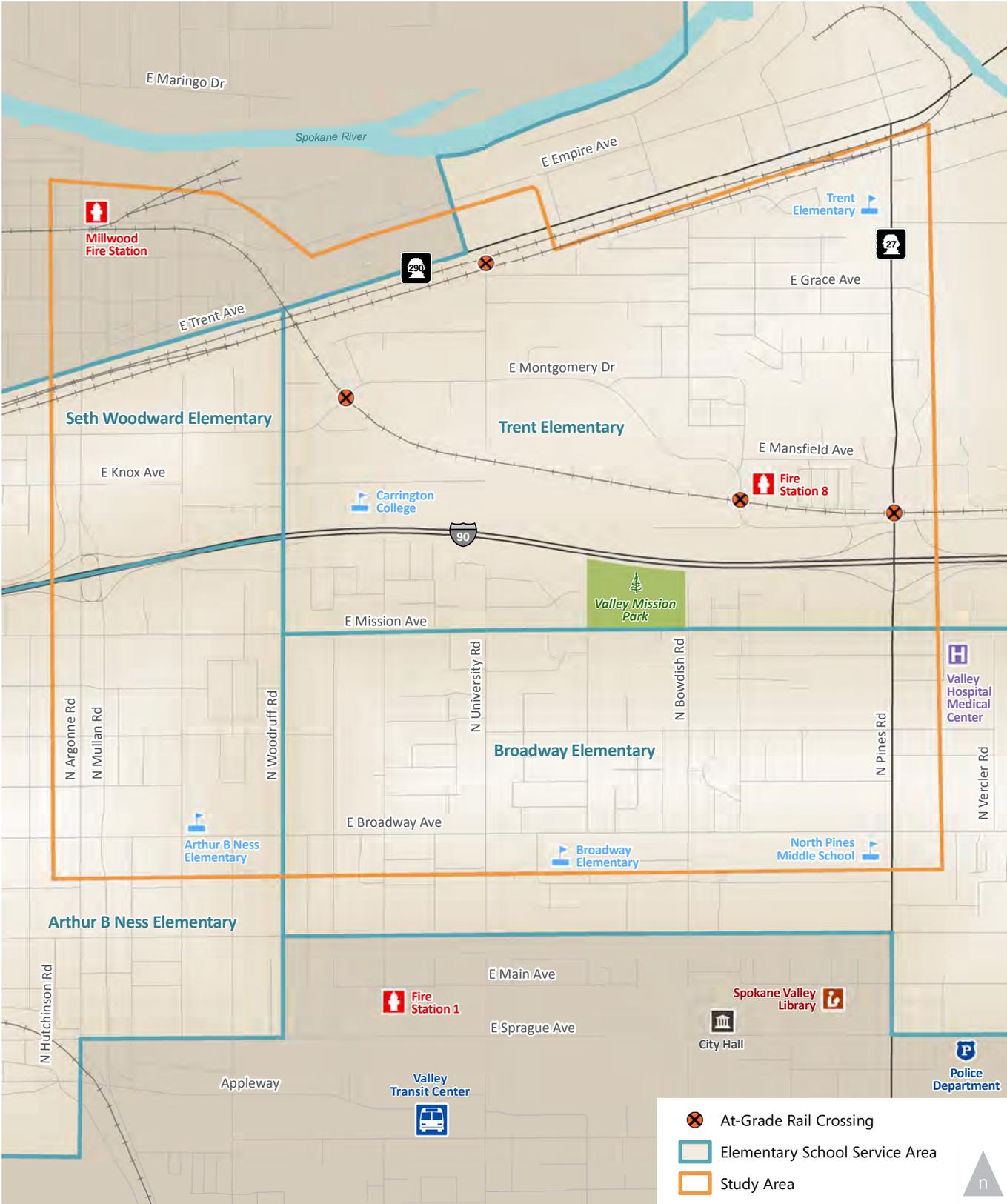


Figure 3.  
Public Facilities



### 3.1.1.6 Transit

The study area is served by the Spokane Transit Authority (STA). The routes serving the study area are shown in **Figure 4**. Headways (the average number of minutes between bus arrivals) for each route are shown in **Table 1**.

- **Route 32: Trent/Montgomery.** Destinations include Spokane Community College, Department of Social and Health Services, Argonne Village Shopping Center, and Mirabeau Park & Ride.
- **Route 94: East Central/Millwood.** Destinations include Argonne Village Shopping Center, Centennial Middle School, East Central Community Center, and Downtown Spokane.
- **Route 96: Pines/Sullivan.** Destinations include Valley Transit Center, University Shopping Center, Spokane Valley Library, North Pines Middle School, Valley Hospital & Medical Center, Mirabeau Park & Ride, Valley Mall, Spokane Industrial Park, East Valley High School, and East Valley Middle School.
- **Route 173: Valley Transit Center Express.** Destinations include Downtown Spokane, and Valley Transit Center.
- **Route 174: Liberty Lake Express.** Destinations include Downtown Spokane, Mirabeau Park & Ride, and Liberty Lake Park & Ride.

**TABLE 1. TRANSIT ROUTE HEADWAYS IN MINUTES**

Route	Weekdays				Saturdays		Sundays/Holidays	
	AM Peak	Midday	PM Peak	Evening	Day	Evening	Day	Evening
32	30	30	30	60	60	60	60	60
94	30	30	30	60	60	60	60	60
96	30	30	30	60	60	60	60	60
173	30	--	30	1 trip	--	--	--	--
174	15	105	15	1 trip	--	--	--	--

Source: Spokane Transit Authority, 2012.

STA also provides paratransit van service throughout the study area for travelers whose disability prevents them from riding a fixed route bus.



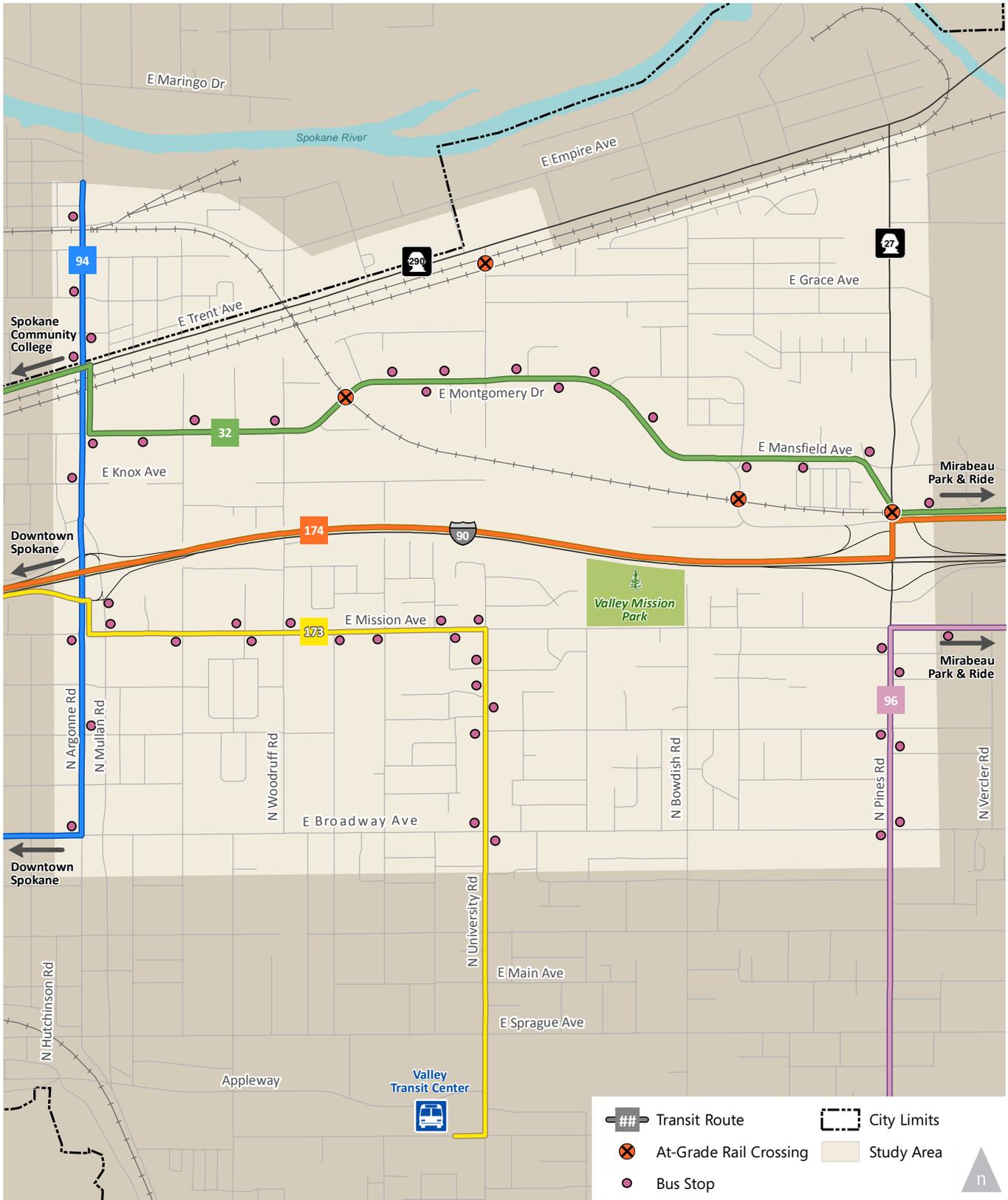


Figure 4.  
Existing Transit Routes

### 3.1.1.7 Safety

The City of Spokane Valley analyzed collision data citywide for the three year period from January 2009 to December 2011. Collision rates were calculated for both roadway segments and intersections using a methodology developed by WSDOT. The WSDOT methodology for calculating collision rates considers the total number of collisions and the annual daily traffic entering an intersection or traveling along a segment. This approach allows for a balanced comparison between locations with varying traffic volumes.

**Figure 5, Table 2** and **Table 3** show the collision rates for the roadway segments and intersections within the study area. Collision rates are given per million vehicle miles of travel (MVMT) for roadway segments and per million entering vehicles (MEV) for intersections.

**TABLE 2: COLLISION RATE BY SEGMENT**

Segment	Collision Rate per MVMT
Argonne Rd: from Knox Ave to Mission Ave	4.81
Mullan Rd: from Knox Ave to Mission Ave	3.89
Pines Rd: from Montgomery Dr to Mission Ave	3.48
Pines Rd: from Mission Ave to Broadway Ave	2.91
Pines Rd: from Mansfield Ave to Montgomery Dr	2.61
Pines Rd: from Mirabeau Pkwy to Mansfield Ave	2.51
Broadway Ave: from Bowdish Rd to Pines Rd	2.23
Broadway Ave: from Herald Rd to University Rd	2.01
Mullan Rd: from Mission Ave to Broadway Ave	1.95
Mission Ave: from Argonne Rd to Herald Rd	1.86
Mission Ave: from Herald Rd to University Rd	1.85
Mansfield Ave: from Montgomery Dr to Pines Rd	1.82
Mission Ave: from Bowdish Rd to Pines Rd	1.81
Bowdish Rd: from Mission Ave to Broadway Ave	1.79
Argonne Rd: from Mission Ave to Broadway Ave	1.69
Argonne Rd: from Montgomery Ave to Knox Ave	1.67
Broadway Ave: from Farr Rd to Herald Rd	1.67
Pines Rd: from Trent Ave to Mirabeau Pkwy	1.44
University Rd: from Trent Ave to Montgomery Ave	1.30
Mission Ave: from University Rd to Bowdish Rd	1.15
University Rd: from Mission Ave to Broadway Ave	1.04
Broadway Ave: from University Rd to Bowdish Rd	0.75
Montgomery Ave: from Argonne Rd to University Rd	0.75
Montgomery Dr: from University Rd to Wilbur Rd	0.71
Montgomery Dr: from Wilbur Rd to Pines Rd	0.62
Argonne Rd: from Trent Ave to Montgomery Ave	0.61
Trent Ave: from University Rd to Pines Rd	0.39
Broadway Ave: from Argonne Rd to Farr Rd	0.29
Trent Ave: from Argonne Rd to University Rd	0.26
Herald Rd: from Mission Ave to Broadway Ave	0.00



**TABLE 3: COLLISION RATE BY INTERSECTION**

ID	Intersection	Collision Rate per MEV
1	Trent Ave/SR-290 & Argonne Rd	1.09
2	Montgomery Ave & Argonne Rd	0.30
3	Knox Ave & Argonne Rd	0.14
8	Mission Ave & Argonne Rd	0.75
9	Mission Ave & Mullan Rd	0.87
10	Broadway Ave & Argonne Rd	0.35
11	Broadway Ave & Mullan Rd	0.65
13	Trent Ave/SR-290 & University Rd	0.17
15	Mission Ave & University Rd	0.11
16	Broadway Ave & University Rd	0.67
17	Montgomery Dr & Mansfield Ave	0.22
18	Mission Ave & Bowdish Rd	0.10
19	Mansfield Ave & Pines Rd	1.08
23	Mission Ave & Pines Rd	1.04
24	Broadway Ave & Pines Rd	0.55
	Pines Rd & Trent Ave	0.50
	Pines Rd & Mirabeau Pkwy	0.24
	Pines Rd & Montgomery Dr	0.95
	Bowdish Rd & Broadway Ave	0.70
	Farr Rd & Broadway Ave	0.39

A total of 2,708 collisions occurred citywide over the three-year study period. Of that total, 62 percent resulted in property damage only. Rates for injuries and fatalities were not included, so it is not possible to discern any patterns regarding collision severity. Citywide, 66 collisions involved bicycles and 62 collisions involved pedestrians. Argonne Road had a particularly high number of collisions involving bicycles and pedestrians in the vicinity of Knox Avenue.

Among the 276 roadway segments studied, the average collision rate was 1.25 collisions per million vehicle miles of travel. As shown in **Figure 5**, the north-south arterials of Argonne Road, Mullan Road, and Pines Road have collision rates above the citywide average. The highest occurs Argonne Road between Knox Avenue and Mission Avenue. However, it should be noted that since the I-90 ramp intersections were not studied separately, these segment rates likely include collisions at the ramp intersections. A review of WSDOT data indicates that most of the ramp intersections have collision rates below the



citywide average; the exception is the Pines Road/Westbound I-90 On-ramp/Indiana Avenue intersection which has a collision rate approximately twice the citywide average. Based on this more detailed look at intersection collision rates, these segments may not actually have above average collision rates.



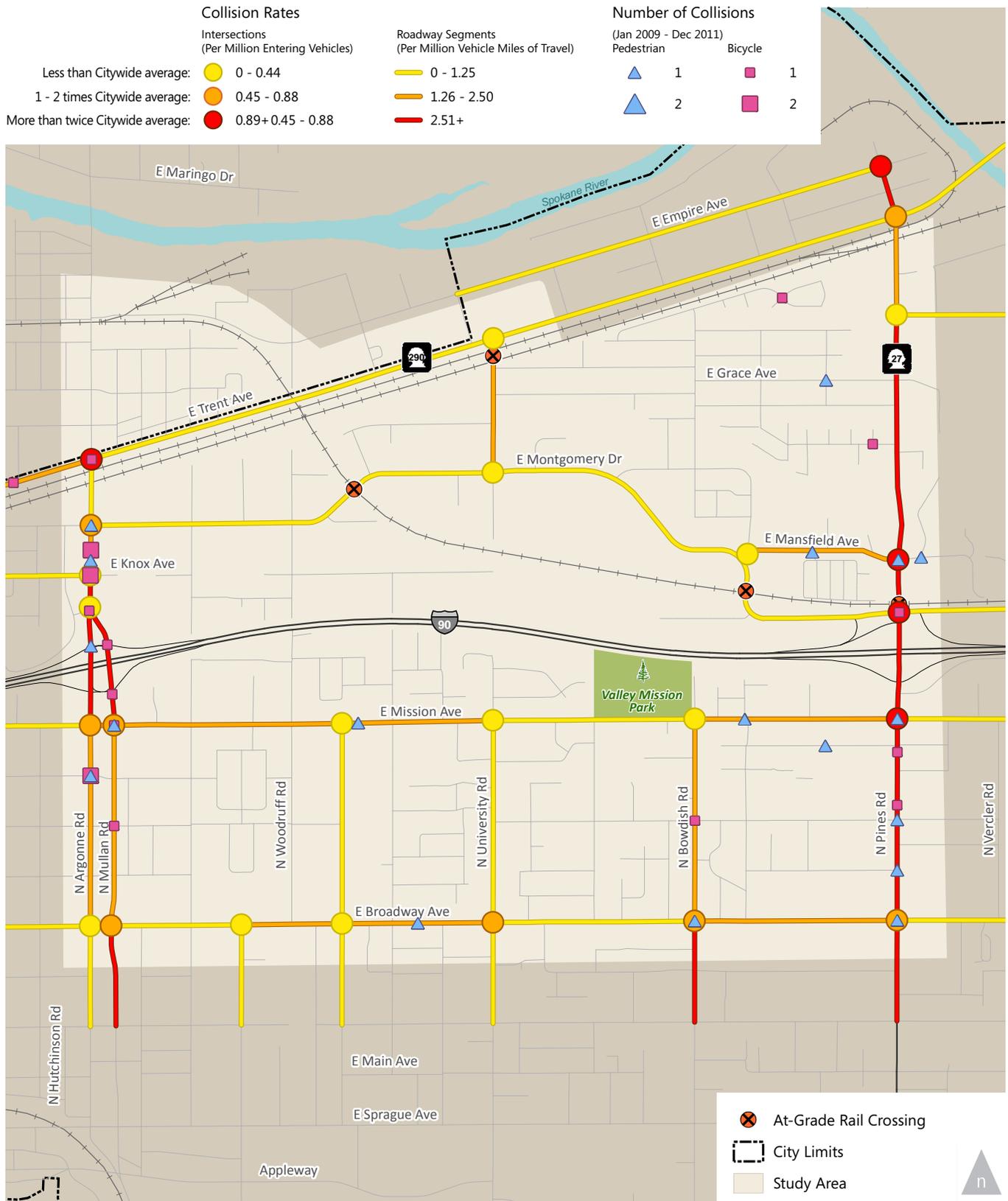


Figure 5.  
Collision Rates (Jan 2009 - Dec 2011)



Citywide, data were collected at 124 intersections yielding an average collision rate of 0.44 collisions per million entering vehicles. Two of the three intersections with the highest number of collisions citywide (categorized as more than 36 over the study period) are located within the study area: Trent Avenue/Argonne Rd and Mission Avenue/Pines Road. Nine study intersections had collision rates above the citywide average. Along Argonne Road, these include the intersections at Trent Avenue and Mission Avenue and along Mullan Road, these include the intersections at Mission Avenue and Broadway Avenue. Four of the intersections with rates above the citywide average are located along Pines Road: Mansfield Avenue, Indiana Avenue, Mission Avenue, and Broadway Avenue. Lastly, the collision rate for the intersection of Broadway Avenue and University Road falls above the average collision rate. Although not included as a study facility in this report, the intersection of Broadway Avenue and Bowdish Road has a collision rate greater than the citywide average. The City recently completed a restriping of Broadway Avenue from four through lanes (two in each direction) to three lanes (one in each direction with a center turn lane). Three-lane roads have a documented lower collision rate than four-lane roads, so it is expected that the collision rate on Broadway Avenue will decrease over time. It is worth noting that three of the study intersections with above average collision rates are along Mission Avenue (which is the first east-west minor arterial south of I-90 and serves residential and commercial land uses between the interchanges at Argonne Road and Pines Road).

### **3.1.1.8 Rail**

Two railroads pass through the study area, as shown in the preceding figures. The BNSF, with two parallel tracks running alongside Trent Avenue/SR 290, is a major transcontinental railway. Approximately 55 trains move along the railway each day at a maximum time table speed of 79 miles per hour. The BNSF railroad has an at-grade crossing at University Road just south of Trent Avenue/SR 290. This crossing (which spans two tracks) features standard safety treatments including gates, lights, and bells. In addition, a raised median extends approximately 100 feet north of the crossing and 60 feet south of the crossing, as well as between the two tracks, to reduce the likelihood of vehicles driving around the gates. The University Road crossing is a quiet zone, which means train crews are required to avoid sounding the horn when crossing. Federal Railroad Administration data, which provides collision records dating back to 1975, show one collision reported in 1981 and two collisions reported in 1988 at the southern University Road crossing; none were reported at the northern crossing. All collisions were caused by a vehicle being stopped or stalled on the tracks.

UPRR also has a railroad running through the study area. Approximately four trains run along the railway each day with a maximum time table speed of 40 miles per hour. The railroad crosses Montgomery Drive at-grade in two locations and crosses Pines Road just north of the I-90 interchange. All three locations



have railroad crossing arms, bells, and flashing lights. The Pines Road crossing has a raised median to prevent vehicles from driving around the gates. Federal Railroad Administration data show two collisions occurred at the western crossing of Montgomery Drive—one in 1977 and one in 1978. Since 1975, no collisions have been reported at the eastern crossing of Montgomery Drive. Two collisions have been reported at the Pines Road crossing: one in 1978 and one in 2008. Of these four collisions, three involved a vehicle stopping on the tracks and one involved a vehicle moving across the tracks.

### 3.1.1.9 Emergency Response

The Spokane Valley Fire Department's Station 8 is located on Montgomery Drive just south of Mansfield Avenue and north of the UPRR tracks. Station 8 houses one ladder truck and one rescue truck. Discussions with Fire Department staff have indicated that emergency responders traveling to calls south of I-90 are occasionally delayed on Pines Road as they wait for a train to pass. Station 8 responds to calls south of I-90 up to approximately ten times per month, and frequently need to reach Valley Hospital and Medical Center on Mission Avenue east of Pines Road. However, the areas south of I-90 are served by a neighboring station as well. An overpass, whether for general traffic or emergency vehicles only, could improve access, particularly if the overpass spans the UPRR railroad tracks. The Spokane Valley Police Department was contacted, but did not provide any input on their emergency response information. In general, police vehicles tend to come from various locations since they are typically on patrol. While an additional crossing of I-90 and the railroad tracks could be beneficial, this does not appear to be a major priority for the police department.

## 3.1.2 TRAVEL PATTERNS

This section discusses travel patterns discerned from three types of data: surveys, observed counts, and cell phone data.

### 3.1.2.1 Survey Data

The American Community Survey collects data on the mode by which residents travel to work. **Table 4** summarizes the statistics for the census tracts that comprise the study area. In general, travel habits are similar north and south of I-90. Walking is a more common mode of travel south of I-90 which likely reflects the superior pedestrian facilities and connectivity. The transit mode share south of I-90 is substantially higher than north of I-90. This may be due to the proximity of the Valley Transit Center, which is located just south of the census tract boundary. Pedestrian access to transit is also better south of the freeway compared to north. Bicycling had a zero percent commute mode share both north and south of I-90.



**TABLE 4. JOURNEY TO WORK (COMMUTING) DATA FOR RESIDENCES WITHIN THE STUDY AREA**

Mode	North of I-90	South of I-90	Total
Drive Alone/Motorcycle	81%	78%	80%
Carpool	11%	9%	11%
Public Transit	1%	4%	2%
Bicycle	0%	0%	0%
Walk	3%	5%	4%
Other	1%	0%	0%
Work at Home	3%	4%	3%
Total	100%	100%	100%

Source: 2007-2011 American Community Survey, Table B08301.

The 2005 Spokane and Kootenai County Regional Travel Survey provides additional data for trips beyond commuting, however, the level of detail is generally at the County level. For all of Spokane County and considering all trips, the following mode shares were found in the travel survey:

- Single Occupancy Vehicle (SOV) 64%
- High Occupancy Vehicle (HOV) 22%
- Walk 9%
- Bus (Public and School): 5%
- Bicycle: 1%

In addition to total travel, the household travel survey also identified travel mode information for several trip types:

Shopping	Recreation	School (K-12)
• SOV 51%	• SOV 35%	• SOV 11%
• HOV 43%	• HOV 47%	• HOV 41%
• Walk 5%	• Walk 14%	• Walk 15%
• Bus: 1%	• Bus: <1%	• Bus: 31%
• Bicycle: <1%	• Bicycle: 3%	• Bicycle: 1%

As shown in the bullets above, the prevalence of non-motorized modes (walking and to a lesser degree bicycling) is substantially higher for recreation and school trips than for shopping or work commute trips. A notable sub-category of the recreation trip was outdoor recreation activities, in which walking comprised 26 percent of all trips and bicycling 4 percent of all trips. Outdoor recreation trips include trips to parks, trails, and outdoor exercise (jogging, walking a dog).

Lastly, the National Household Travel Survey (NHTS) was evaluated in areas similar to Spokane Valley. The NHTS provides highly detailed travel data, but is limited by small sample sizes, so only large geographic areas can be analyzed. Within the State of Washington, excluding the Puget Sound region, 10 percent of all trips are made by walking, a result similar to the Spokane County household travel survey result. Among trips shorter than a mile, 46 percent are made by walking. Urban areas in Montana yielded similar results with walk trips comprising 14 percent of all trips and 50 percent of trips shorter than a mile. In the Washington State results, 73 percent of all walking trips are less than one mile in length.

Similar analyses were performed on bicycle trips. The travel survey results indicate that almost all bicycle trips are shorter than 10 miles, with about 80 percent shorter than five miles (note that bicycle trips are generally measured as one-way trips; a 10 mile round trip would be counted as two five mile trips in a travel survey).

### 3.1.2.2 Pedestrian and Bicycle Count Data

Recent pedestrian counts were taken at five locations within the study area: at the intersection of Woodruff Road and Montgomery Avenue and on Mission Avenue at Argonne Road, Mullan Road, Pierce Road, and Pines Road. These new counts were combined with other pedestrian counts conducted by



WSDOT throughout the City. Of the five recently counted locations, the Pines Road/Mission Avenue location had the highest two hour PM peak period counts with 19 pedestrians. The intersection of Pierce Road and Mission Avenue had the lowest with two pedestrians over the two hour PM peak period. The Argonne Road/Mission Avenue and Woodruff Road/Montgomery Drive intersections each had six pedestrians and the Mullan Road/Mission Avenue intersection had nine pedestrians.

In contrast, pedestrian activity in neighborhoods to the south was substantially higher. Along the Sprague Avenue commercial corridor bounded by residential neighborhoods, WSDOT data indicated that there were 24 pedestrians at Bowdish Road and 25 pedestrians at Evergreen Road. During the two hour PM peak period, 51 pedestrians traveled through the intersection of Appleway Boulevard and University Road and 17 pedestrians traveled through the intersection of Valleyway Avenue and University Road. These pedestrian volumes are approximately 0.4-1.4 percent of vehicle volumes during the same time period.

Bicycle counts were also collected at these locations. Along Sprague Avenue during the two hour PM peak period, 25 bicyclists traveled through the Sprague Avenue/Bowdish Road intersection with most traveling eastbound or westbound. Eleven bicyclists traveled through the intersection of Sprague Avenue and Evergreen Road. University Road is also a well-traveled bicycle route with 15 bicyclists counted at Appleway Boulevard and 23 bicyclists counted at Valleyway Avenue.

At the west end of the City, the Havana Street interchange and Custer Road pedestrian overpass provides an example of pedestrian activity in an area with more connectivity across the freeway. During a recent two-hour afternoon count, 15 pedestrians used the Havana Street underpass and 11 pedestrians used the pedestrian overpass. Another recent two-hour vehicle count recorded approximately 1,300 vehicles using the underpass, indicating pedestrian volumes are approximately two percent of the corresponding vehicle volumes.

These observed results are consistent with national data. Specifically, it has been noted that pedestrians and casual bicyclists generally prefer to travel on lower volume local streets as opposed to higher volume and speed arterial streets unless there are substantial pedestrian-oriented uses present. For recreation and school trips in particular, many pedestrians and cyclists stay on neighborhood streets and therefore would not be counted on or crossing arterials. The results on Havana Street are consistent with research that indicates that additional pedestrian and bicycle oriented infrastructure can spur additional pedestrian and bicycle traffic in an area.



### 3.1.2.3 Mobile Device Data

The project team obtained travel data from AirSage, a company that collects location information sent by anonymous mobile wireless device signals. These devices include cell phones, cellular-equipped vehicles, tablets, and other devices that use wireless communications. The data was collected for all of Spokane County, and aggregated into zones. Mobile device data provides information about the origin and destination of trips, trip length, and the time of day travel occurs.

Of particular interest to this study, the data can help us understand the nature of trips between the Montgomery Industrial District to the north of I-90 and the residential areas to the south. **Figure 6** shows an example of this data: the figure displays the average weekday bidirectional flows to the zone containing Splashdown Waterpark from nearby zones. From the area shown, more than half of the travel occurs across I-90, with much of that coming from the residential area in the northeast corner of the study area. These short trips would be candidates to use a new overcrossing of I-90, bypassing the busy Pines Road interchange.

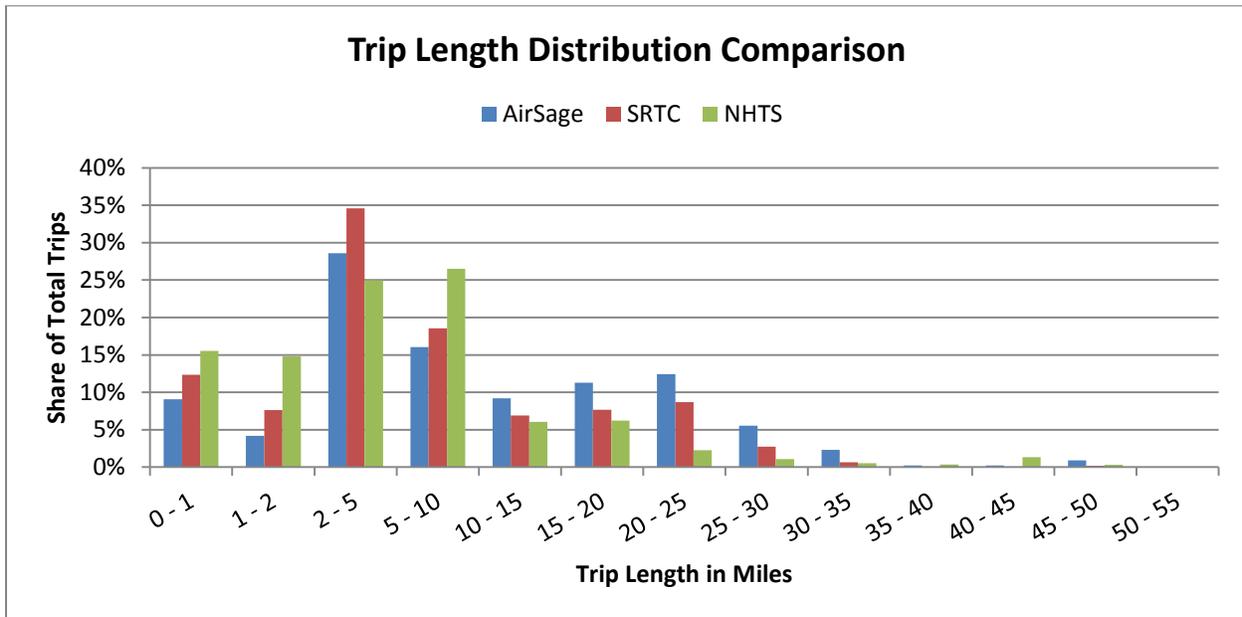
The project team has also examined the Spokane Regional Transportation Council (SRTC) travel demand model. The base year model has been validated to observed counts, and closely estimates roadway volumes within the study area. However, while the SRTC travel demand model performs well at representing regional travel flows, local conditions within an individual Traffic Analysis Zone (TAZ) are not as clear. Several comparisons of the SRTC model and AirSage mobile device data follow.

**Figure 7** compares the number of daily commercial trips to and from the northwest portion of the study area. TAZs are shaded based upon the number of trips per acre, a measure of “trip intensity” that normalizes for the size of a TAZ. SRTC and AirSage data show roughly the same number of overall trips; however, the trip length varies substantially. The SRTC model shows shorter trips, with Sprague Avenue and the Spokane Valley Mall as popular destinations, whereas the AirSage data shows longer trips into Spokane. This reflects the fact that cell phone data is biased to include longer trips since shorter trips are occasionally screened out as “noise.” The trip length distribution of the cell phone data was compared to that from NHTS<sup>1</sup> and from the SRTC travel demand model. As shown below, the overall trip length distribution patterns from the three sources are similar with most trips falling in the two to ten mile ranges; however, AirSage estimates fewer short trips and more long trips than the SRTC or NHTS data.

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<sup>1</sup> The NHTS data includes trips in Washington State, excluding those in the Seattle-Tacoma-Bellevue metropolitan area.





The SRTC travel demand model is driven largely by employment locations, and may not capture the local conditions related to special generators, such as Splashdown Waterpark and localized travel between homes and businesses. Therefore, the mobile device data is a valuable source of information to supplement the SRTC model, providing a fuller picture of travel patterns, both regionally and locally. This is demonstrated in **Figure 8a and 8b**. **Figure 8a** shows the same “trip intensity” measure as the previous figure using the Splashdown zone as the analysis area. The differences between AirSage and SRTC data are relatively minor. However, **Figure 8b**, which shows trip distribution as a percentage of the total trips, tells a more nuanced story. AirSage estimates a total of 2,176 trips, more than twice as many as the 897 trips estimated by the SRTC model. This indicates that Splashdown is more of a regional draw than reflected in the SRTC model (the SRTC model does not have a “special generator” identified for Splashdown). In addition, AirSage data suggest more local trips within the zone, highlighting the fact that the neighborhoods around Splashdown and Valley Mission Park are major users of the facilities.

Since the cell phone data was collected for the entire region, we can also look to travel in areas with better access as an indication of how travel patterns may change in the study area if an overpass is constructed. This type of data can help estimate the “latent” demand that may use a new overpass. Latent demand refers to travelers that forego trips due to constraints in the transportation system—in this case, the limited connectivity across I-90.

The results in the study area indicate that there are more short-distance trips in the areas south of I-90 than compared to the areas north of I-90. Overall trip lengths are about 12 percent shorter south of the



freeway. Comparing otherwise similar residential areas north and south of I-90, there are about 40 percent more trips shorter than 2 miles south of the freeway and about 20 percent fewer trips between 5 and 20 miles in length. Based on our observations, this difference in travel patterns is based partially on better connectivity and partially on more mixed land uses (specifically more retail) south of I-90.

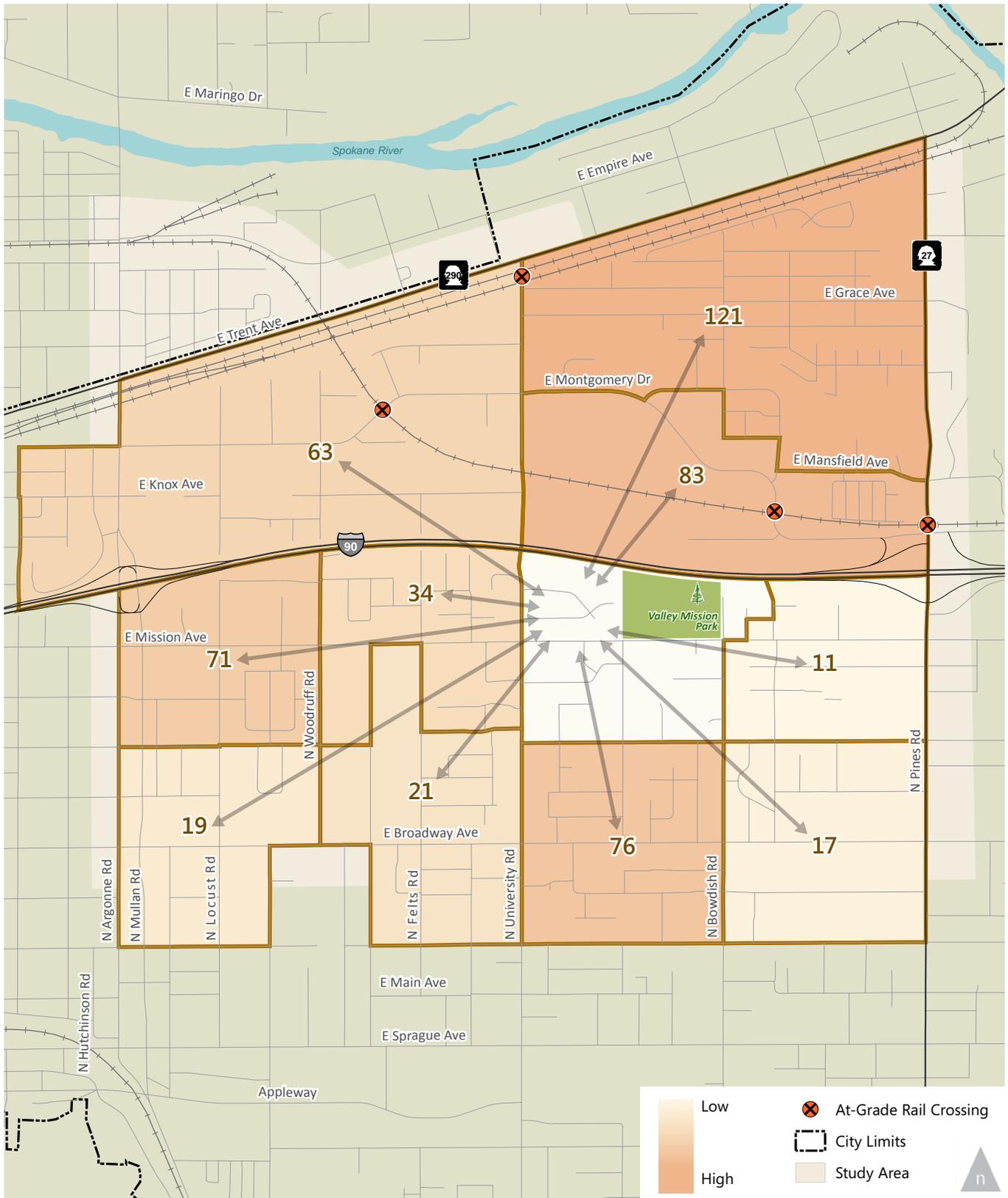


Figure 6.  
Average Weekday Bidirectional Flows from AirSage



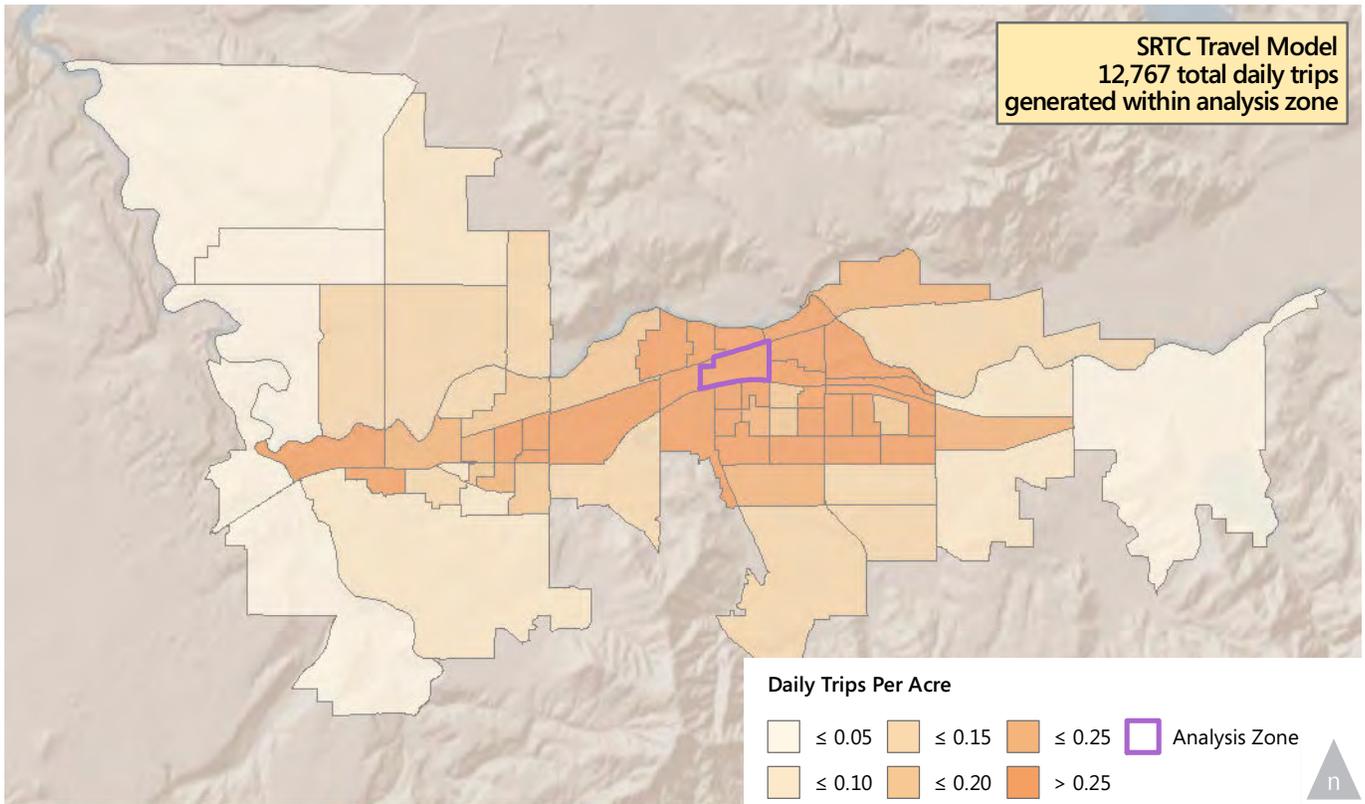
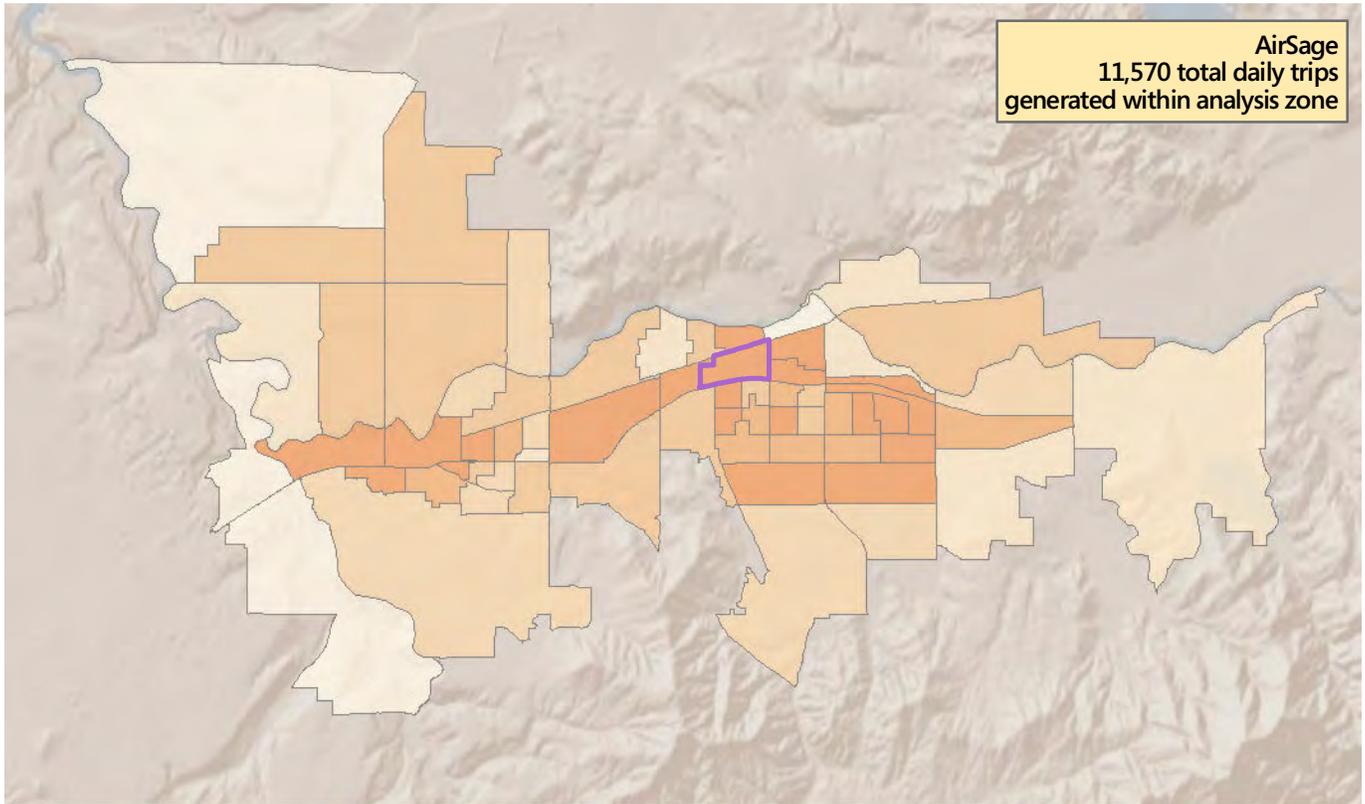


Figure 7.  
Montgomery Industrial/Commercial Area  
Travel Patterns

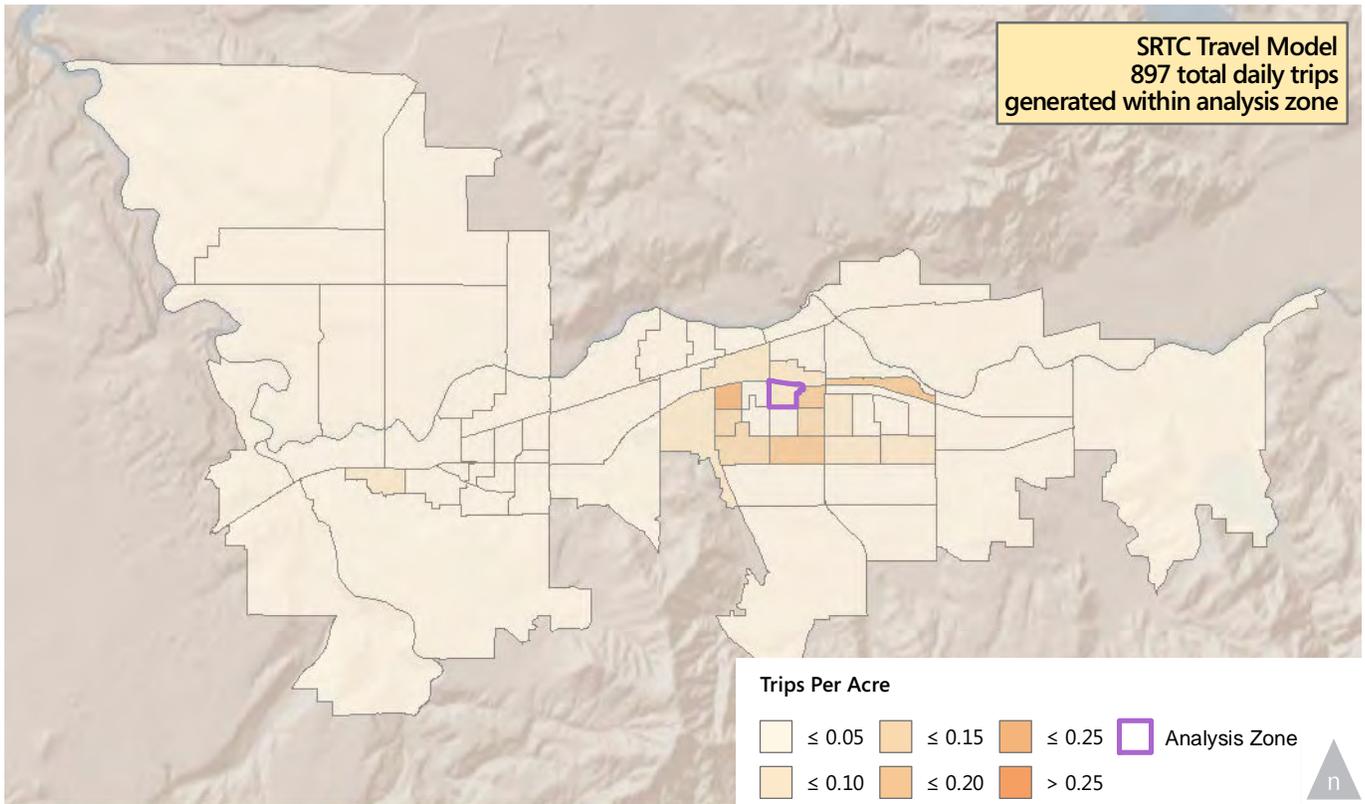
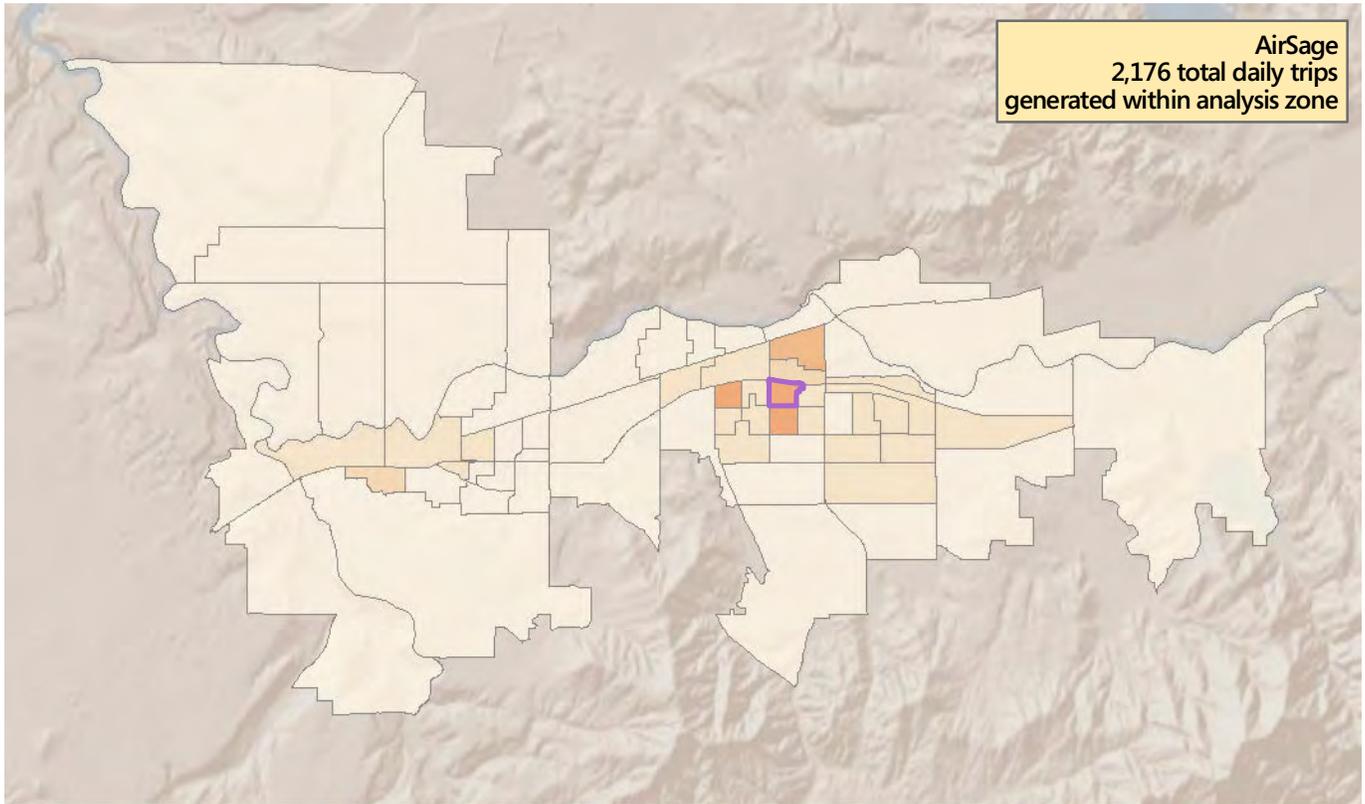


Figure 8a.

**Splashdown Waterpark Area  
Travel Patterns**



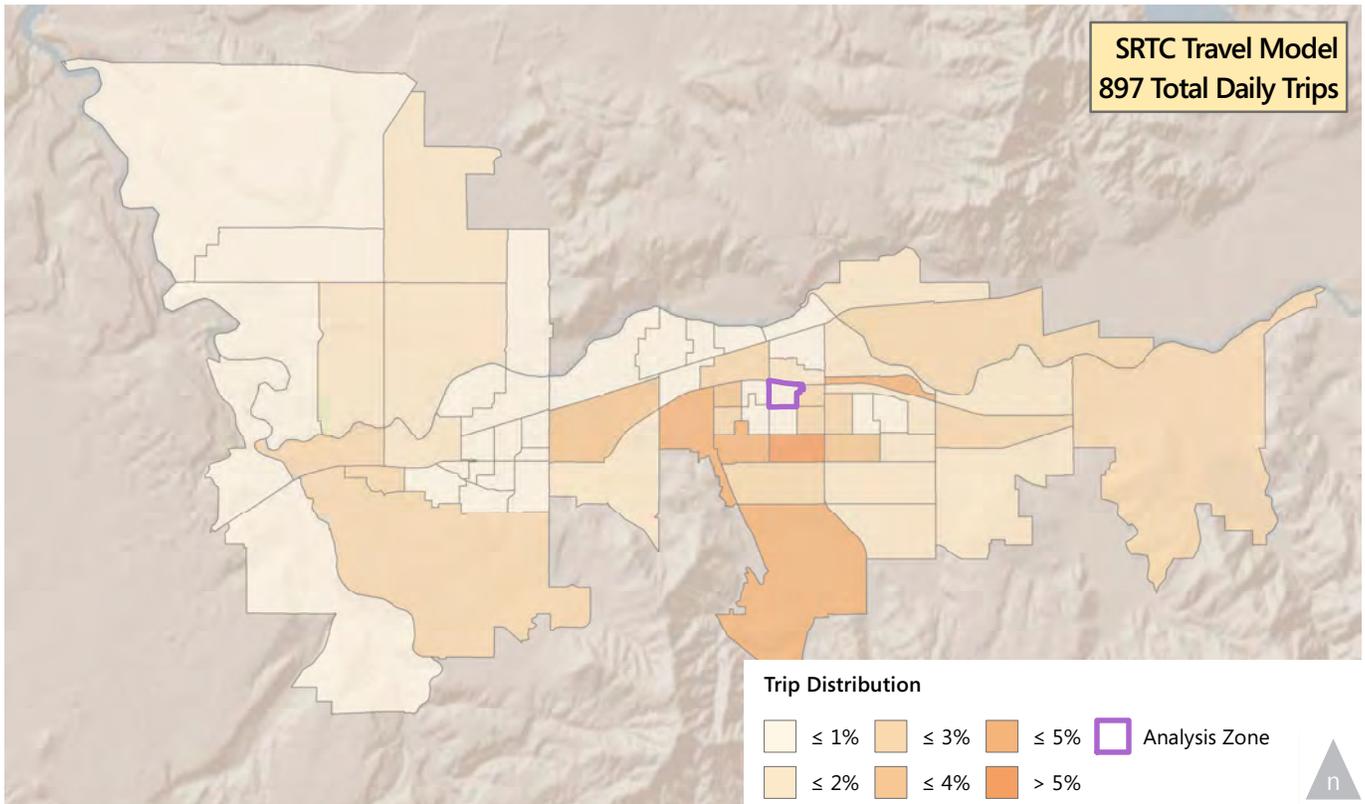
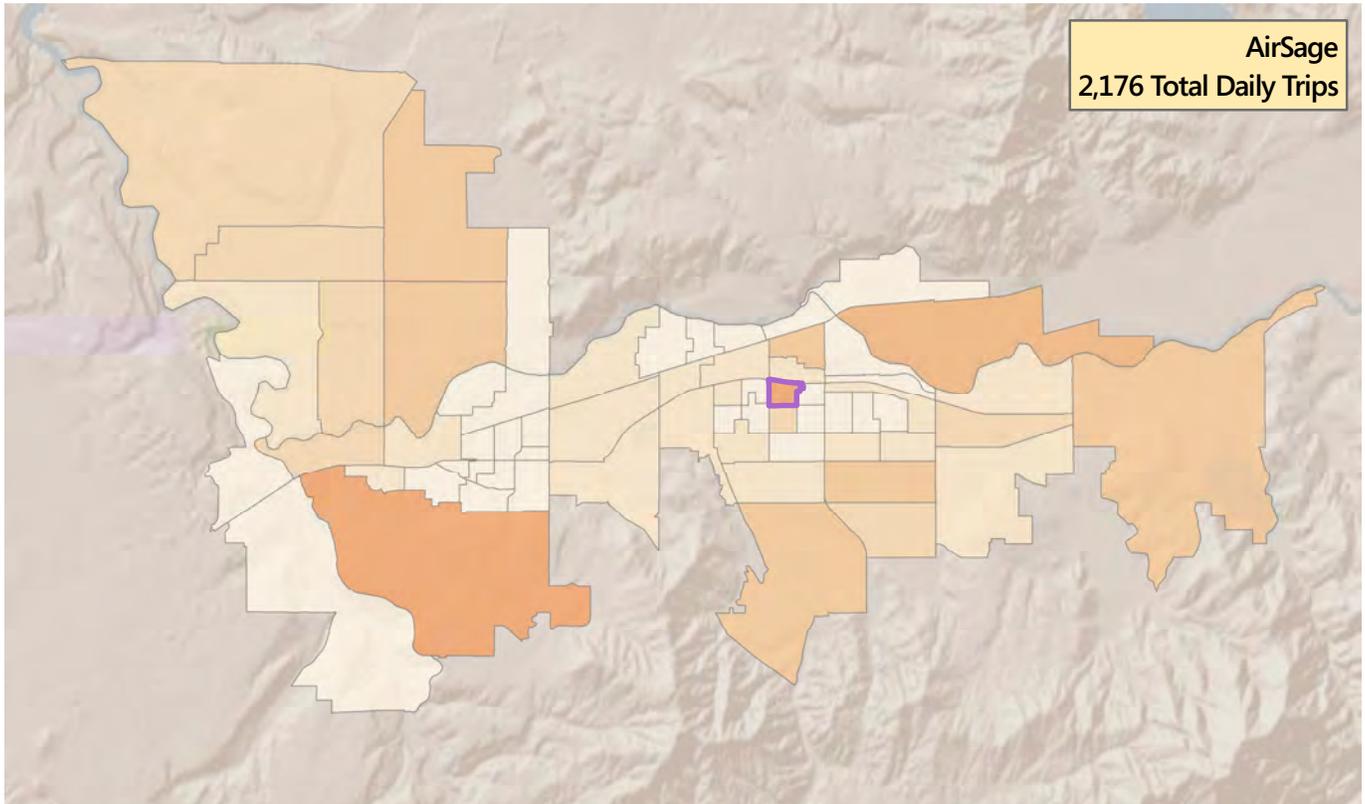


Figure 8b.

**Splashdown Waterpark Area  
Trip Distribution**



### 3.1.3 TRAFFIC OPERATIONS

This section assesses existing traffic operations within the study area.

#### 3.1.3.1 Roadway

Roadway operations were evaluated using the level of service concept. Roadway level of service (LOS) is a measure of the operational performance of a transportation facility. A letter grade, ranging from A (minimal delay and free-flow conditions) to F (highly congested), is assigned based on the delay experienced by drivers. LOS standards are used to assess existing traffic conditions and identify deficiencies.

##### 3.1.3.1.1 Methodology

The City of Spokane Valley uses intersection level of service to assess traffic operations. Intersection level of service is evaluated using the methodology outlined in the *Highway Capacity Manual (HCM) 2000*. Specifically, the project team used the Synchro software package to calculate the average delay per vehicle at each study intersection, based on factors such as signal timing and traffic volumes. Similarly, Sidra software was used to determine the level of service for roundabouts. For signalized intersections, all-way stop intersections, and roundabouts, LOS is assigned based on the average delay experienced by all vehicles at the intersection. For side-street stop controlled intersections, LOS is assigned based on the delay experienced by the vehicles on the highest-delay movement. **Table 5** summarizes the criteria used to assign LOS at signalized and unsignalized intersections.

**TABLE 5. LEVELS OF SERVICE CRITERIA FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS**

Level of Service	Signalized Intersection Delay per Vehicle (seconds)	Unsignalized Intersection Delay per Vehicle (seconds)
A	< 10	< 10
B	> 10 to 20	> 10 to 15
C	> 20 to 35	> 15 to 25
D	> 35 to 55	> 25 to 35
E	> 55 to 80	> 35 to 50
F	> 80	> 50

Source: 2000 Highway Capacity Manual.



The Spokane Valley Comprehensive Plan sets the level of service standard as LOS D for signalized intersections and LOS E for unsignalized intersections.

#### 3.1.3.1.2 Results

The PM peak hour LOS for each study intersection is shown in **Table 6** and **Figures 9** and **10**. All study intersections are operating at acceptable levels of service with one exception. Two stop controlled intersections in the study area (Trent Avenue/University Road and Montgomery Drive/Woodruff Road) are marginal on the minor approach at LOS E, but meet the City's LOS standard. In both cases, the lower LOS is caused by a lack of gaps for vehicles to turn onto the main street. Additionally, although the Mullan Road/I-90 WB Off-Ramp intersection operates at an acceptable level (LOS C), the westbound approach is congested (LOS F) during the PM peak hour due to the priority given to the northbound coordinated movement.



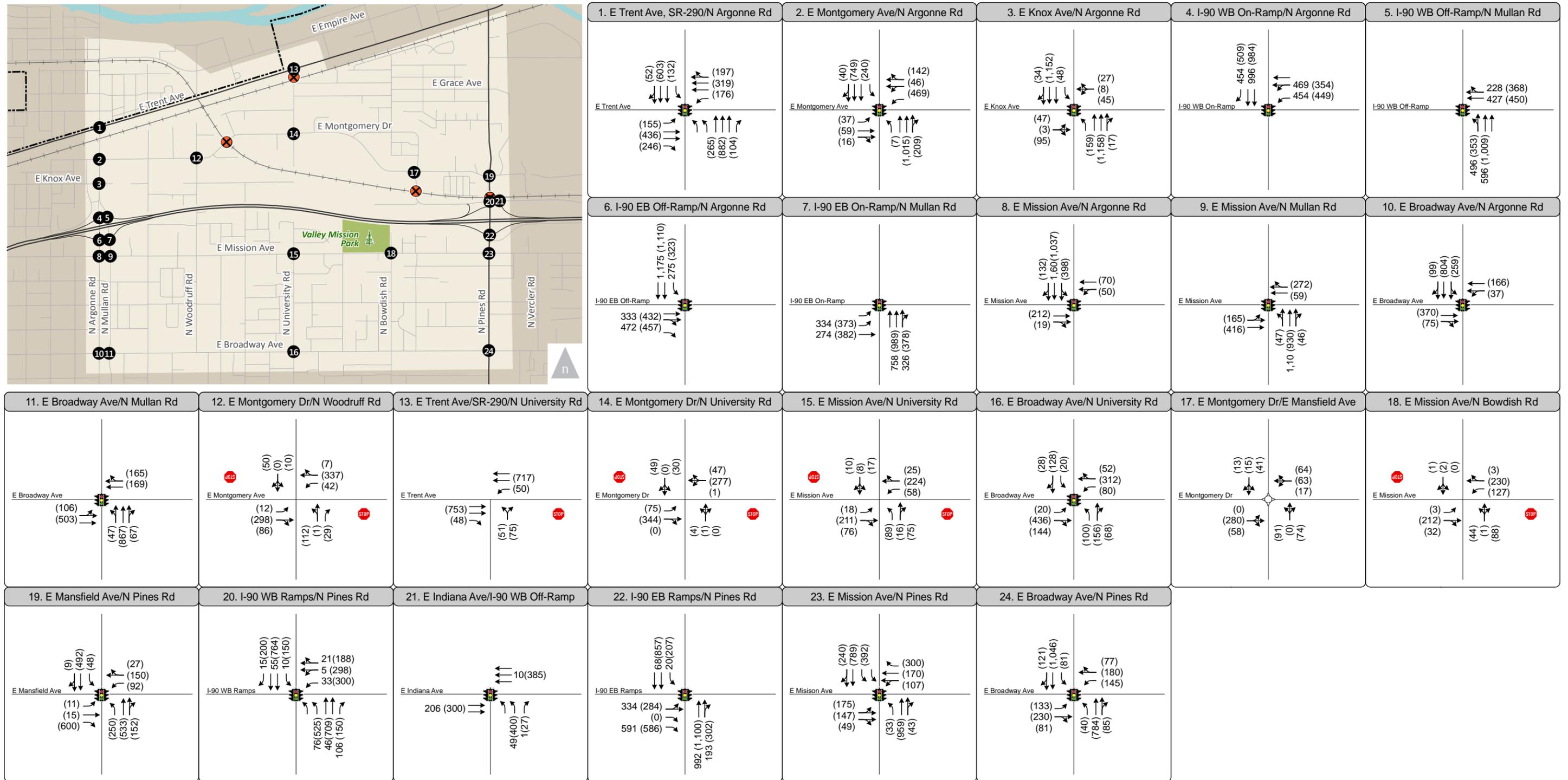


Figure 9.  
Peak Hour Traffic Volumes and Lane Configurations -  
Existing Conditions

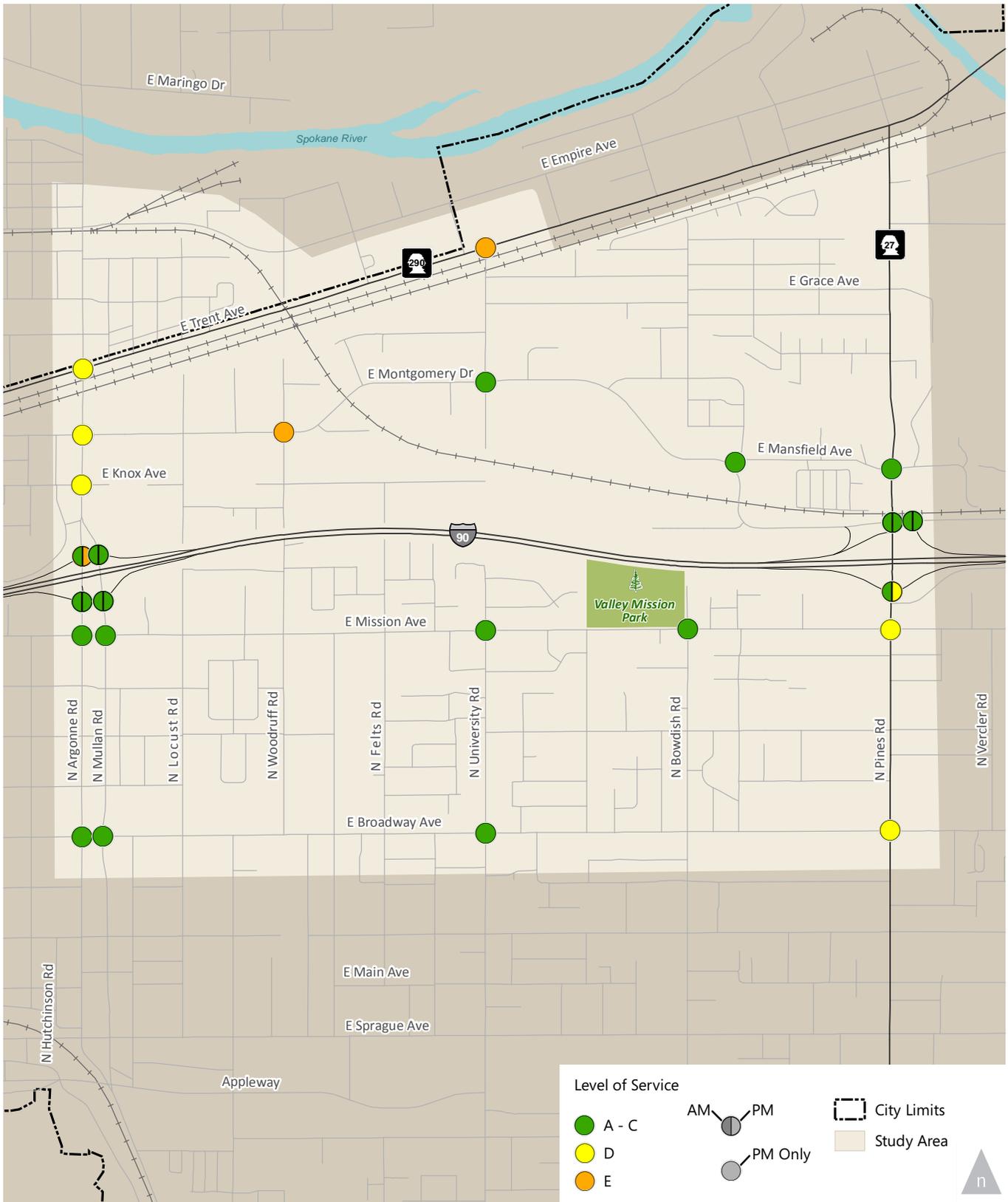


Figure 10.  
Existing Peak Hour Level of Service

**TABLE 6. EXISTING PM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Device	PM Peak Hour	
			LOS	Delay (seconds)
1	Trent Ave/SR-290 & Argonne Rd	Signalized	D	47
2	Montgomery Ave & Argonne Rd	Signalized	D	37
3	Knox Ave & Argonne Rd	Signalized	D	46
4	I-90 WB On-Ramp & Argonne Rd	Signalized	E	77
5	I-90 WB Off-Ramp & Mullan Rd	Signalized	C	33
6	I-90 EB Off-Ramp & Argonne Rd	Signalized	C	25
7	I-90 EB On-Ramp & Mullan Rd	Signalized	C	26
8	Mission Ave & Argonne Rd	Signalized	B	17
9	Mission Ave & Mullan Rd	Signalized	C	21
10	Broadway Ave & Argonne Rd	Signalized	B	19
11	Broadway Ave & Mullan Rd	Signalized	C	21
12	Montgomery Dr & Woodruff Rd	Side-Street Stop Control	E	NB / 43
13	Trent Ave/SR-290 & University Rd	Side-Street Stop Control	E	NB / 38
14	Montgomery Dr & University Rd	Side-Street Stop Control	C	NB / 22
15	Mission Ave & University Rd	Side-Street Stop Control	C	SB / 17
16	Broadway Ave & University Rd	Signalized	C	26
17	Montgomery Dr & Mansfield Ave	Roundabout	A	5
18	Mission Ave & Bowdish Rd	Side-Street Stop Control	C	NB / 16
19	Mansfield Ave & Pines Rd	Signalized	C	33
20	I-90 WB Ramps & Pines Rd	Signalized	C	33
21	Indiana Ave & I-90 WB Off-Ramp	Signalized	C	24
22	I-90 EB Ramps & Pines Rd	Signalized	D	39
23	Mission Ave & Pines Rd	Signalized	D	41
24	Broadway Ave & Pines Rd	Signalized	D	44

Source: Level of service for signalized and stop controlled intersections based on HCM2000 as reported by Synchro 7 or VISSIM. Roundabout level of service based on HCM2000 as reported by Sidra 5.1



AM peak hour operations were studied at the I-90 ramp termini intersections. As shown in **Table 7**, all of the ramp terminal intersections are operating at LOS C or higher. Although the westbound ramp at Mullan Road is congested (LOS F) during the PM peak, the westbound approach improves to LOS D during the AM peak with the intersection operating at LOS B.

**TABLE 7. EXISTING AM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Device	AM Peak Hour	
			LOS	Delay (seconds)
4	I-90 WB On-Ramp & Argonne Rd	Signalized	B	16
5	I-90 WB Off-Ramp & Mullan Rd	Signalized	B	14
6	I-90 EB Off-Ramp & Argonne Rd	Signalized	B	14
7	I-90 EB On-Ramp & Mullan Rd	Signalized	A	8
20	I-90 WB Ramps & Pines Rd	Signalized	C	25
21	Indiana Ave & I-90 WB Off-Ramp	Signalized	C	32
22	I-90 EB Ramps & Pines Rd	Signalized	C	34

Source: Level of service for signalized and stop controlled intersections based on HCM2000 as reported in Synchro 7 output.



## 3.2 LAND USE

The study area includes a variety of land uses including residential, commercial, and industrial. In general, the area south of I-90 is residential with commercial uses along the north-south arterials of Argonne Road, Mullan Road, and Pines Road. North of I-90, most of the study area is comprised of light industrial uses. Residential land uses are present between Locust Road and Woodruff Road as well as northeast of Montgomery Drive. There is a major retail center along Montgomery Drive east of Argonne Road.

Property ownership within the study area is largely fragmented, especially in the areas composed of single family residential and small commercial uses. However, there are a few large consolidated properties, as shown in **Figure 11**. The City has contiguous right-of-way along Locust Road, Woodruff Road, Felts Road, University Road and Bowdish Road, making those alignments potential locations for an overpass.



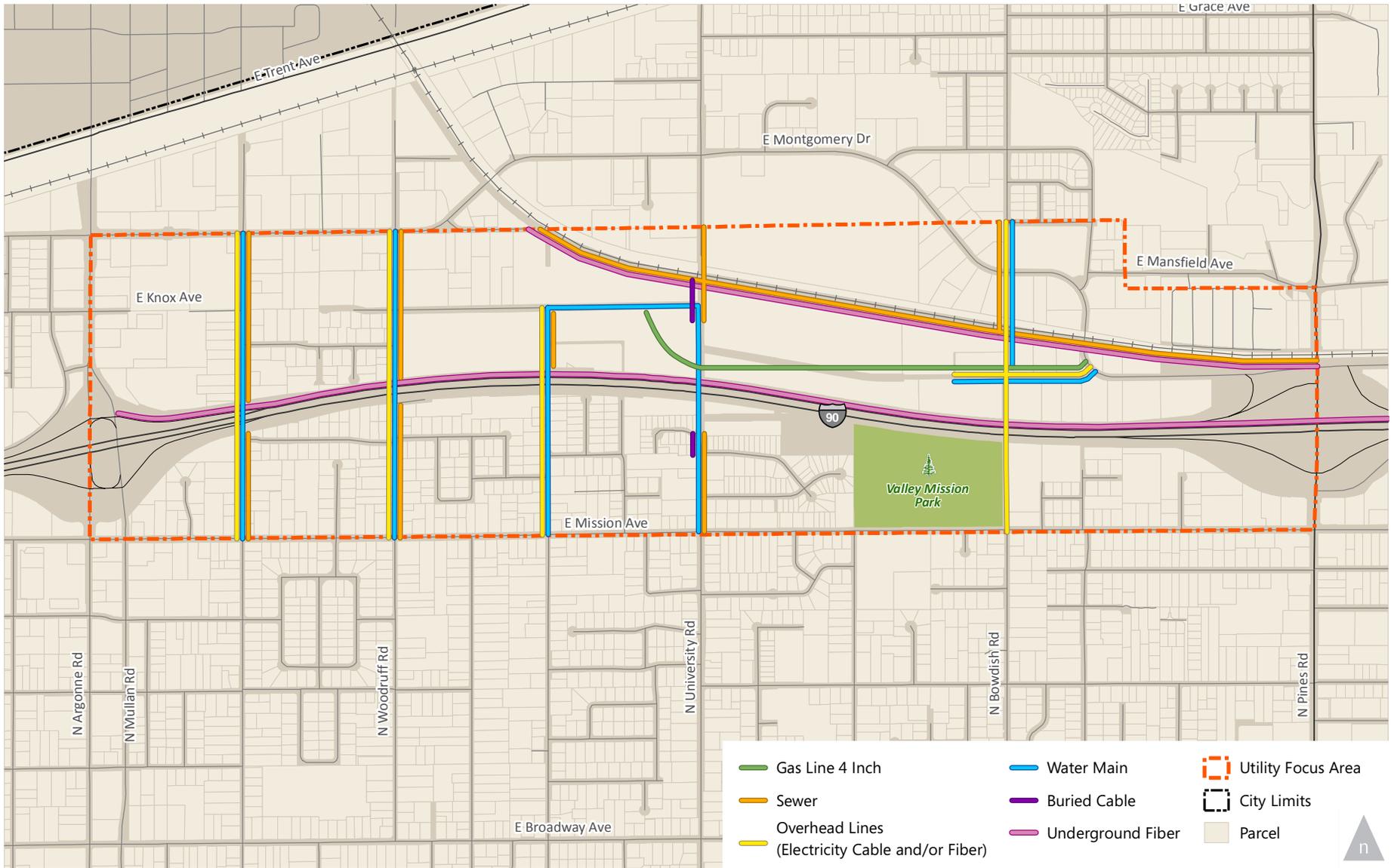


### 3.3 UTILITIES

The project team gathered information regarding the utilities in the study area to determine if there were any large-scale facilities present—such as an interstate natural gas line—that may influence the location of a potential overpass. No major utilities were identified along the potential overpass alignments, but numerous local utilities such as gas, water, and electricity are present. **Figure 12** shows overhead wire crossings, local gas lines, sewers, and water mains along the City’s north-south rights-of-way. Only the utilities most likely to be affected by an overpass are shown in here. Numerous other local distribution lines are present and are included in the appendix. Utility locations were provided by the following entities:

- Avista Utilities
- Electric Lightwave/Integra Telecom
- Inland Power & Light
- Irvin Water District #6
- Modern Electric & Water Co.
- Spokane County
- Washington Department of Transportation
- Zayo Bandwidth





Note: Only the utilities most likely to be affected by an overpass are shown here. See the appendix for more detailed utility maps.

Figure 12.  
Existing Utilities

## 4.0 FUTURE CONDITIONS

This chapter describes how future conditions were forecasted and the results of a 2040 No Build analysis. Under the 2040 No Build conditions, new growth is anticipated both in the city and regionally, but only planned and funded transportation infrastructure projects are assumed. In other words, no improvements to the Argonne Road/I-90 interchange or new pedestrian/bicycle crossings were assumed.

### 4.1 GROWTH FORECASTS

The future conditions analysis is principally based on 2040 population, employment, and travel forecasts that were extracted from the Spokane Regional Travel Council (SRTC) travel demand model. One of the building blocks of the SRTC travel demand model is land use. **Figure 13** and **Figure 14** display the projected regional household and employment growth by Traffic Analysis Zone (TAZ)—the unit of measure used by the travel demand model. **Figure 15** and **Figure 16** display the projected household and employment growth within the study area. The largest concentrations of household growth are expected largely on the outskirts of the region, with substantial growth in eastern Spokane Valley. Within the study area, there is moderate growth—500 households or 11 percent over 30 years. Immediately to the north and east, several thousand new households are expected.

Regional employment growth is expected to concentrate along Sprague Avenue and in northeastern Spokane Valley, with moderate growth in Downtown Spokane. Again, there is only moderate growth within the study area limits—1,000 jobs or 14 percent growth—but slightly larger growth to the east. Complete household and employment data for 2010 and 2040 may be found in the appendix. These data are shown below in **Table 8**.

**TABLE 8: LAND USE GROWTH (2010 – 2040)**

Land Use	Spokane County Region		Study Area	
	Households	Employment	Households	Employment
2010	187,200	196,900	4,300	7,100
2040	258,300	264,900	4,800	8,100
Absolute Growth	71,100	68,000	500	1,000
Percentage Growth	38%	35%	11%	14%
Yearly Growth	1.1%	1.0%	0.4%	0.4%

Source: SRTC Travel Demand Model.



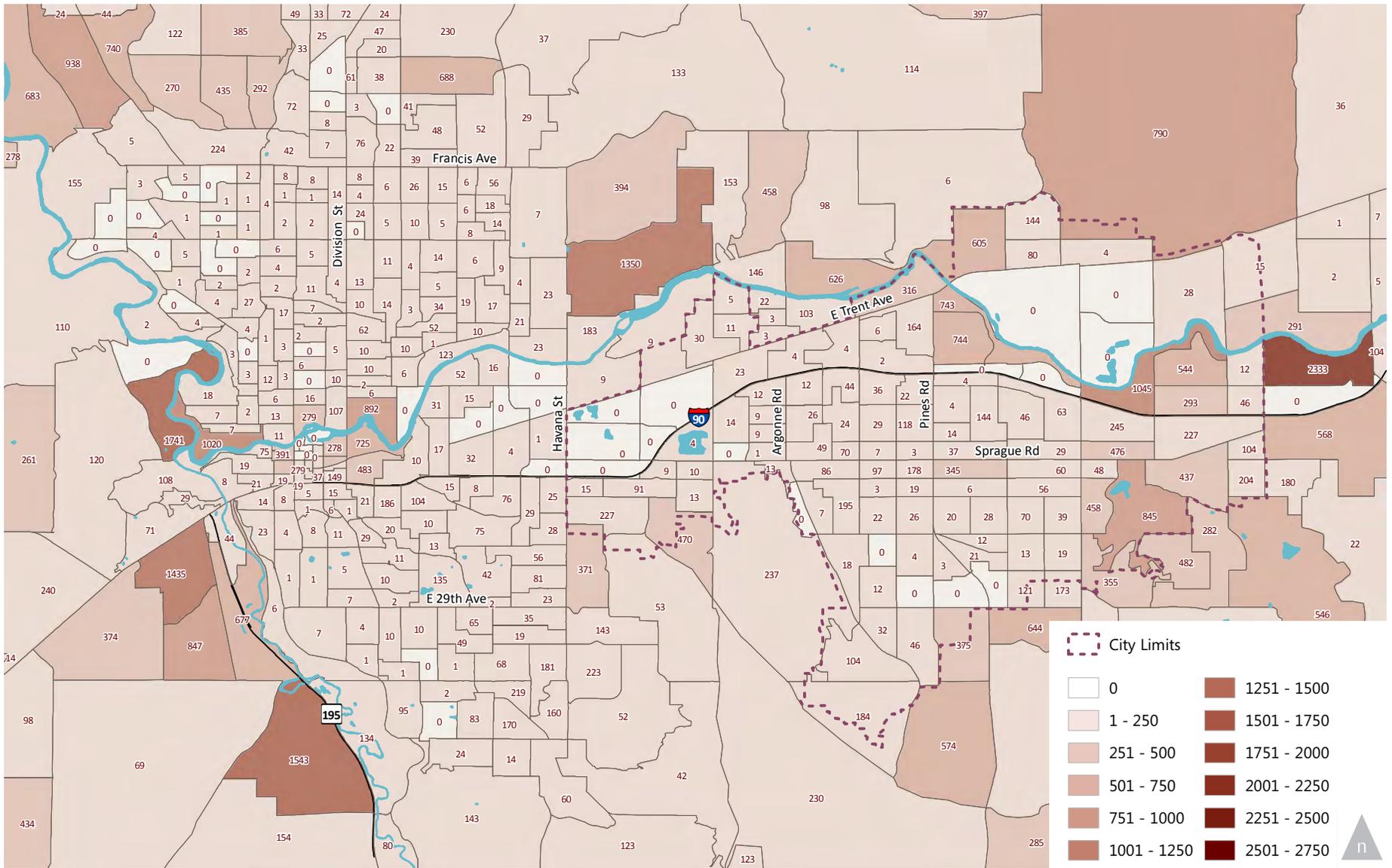


Figure 13.  
Growth in Households (2010 - 2040)

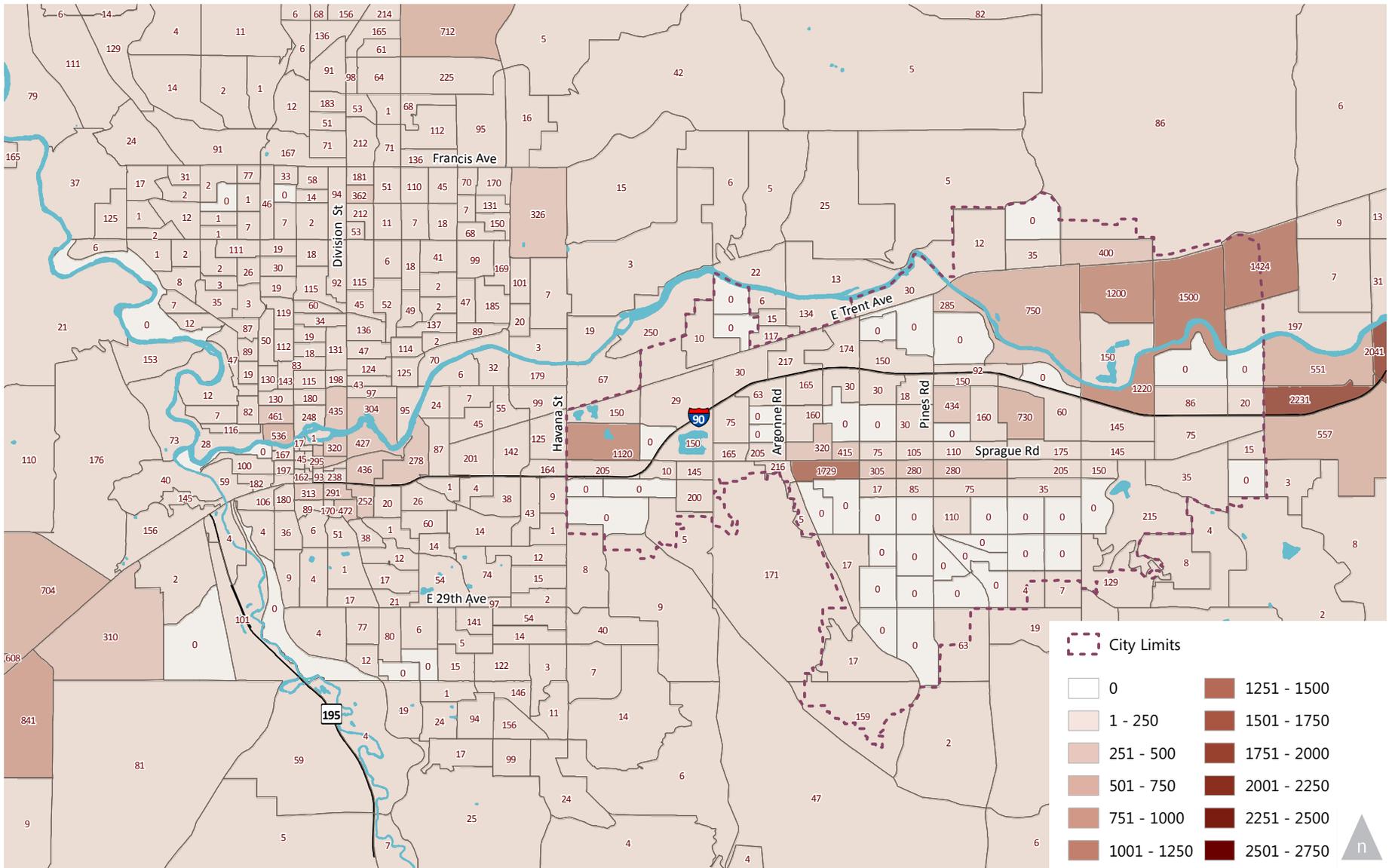


Figure 14.  
Growth in Employment/Jobs (2010 - 2040)

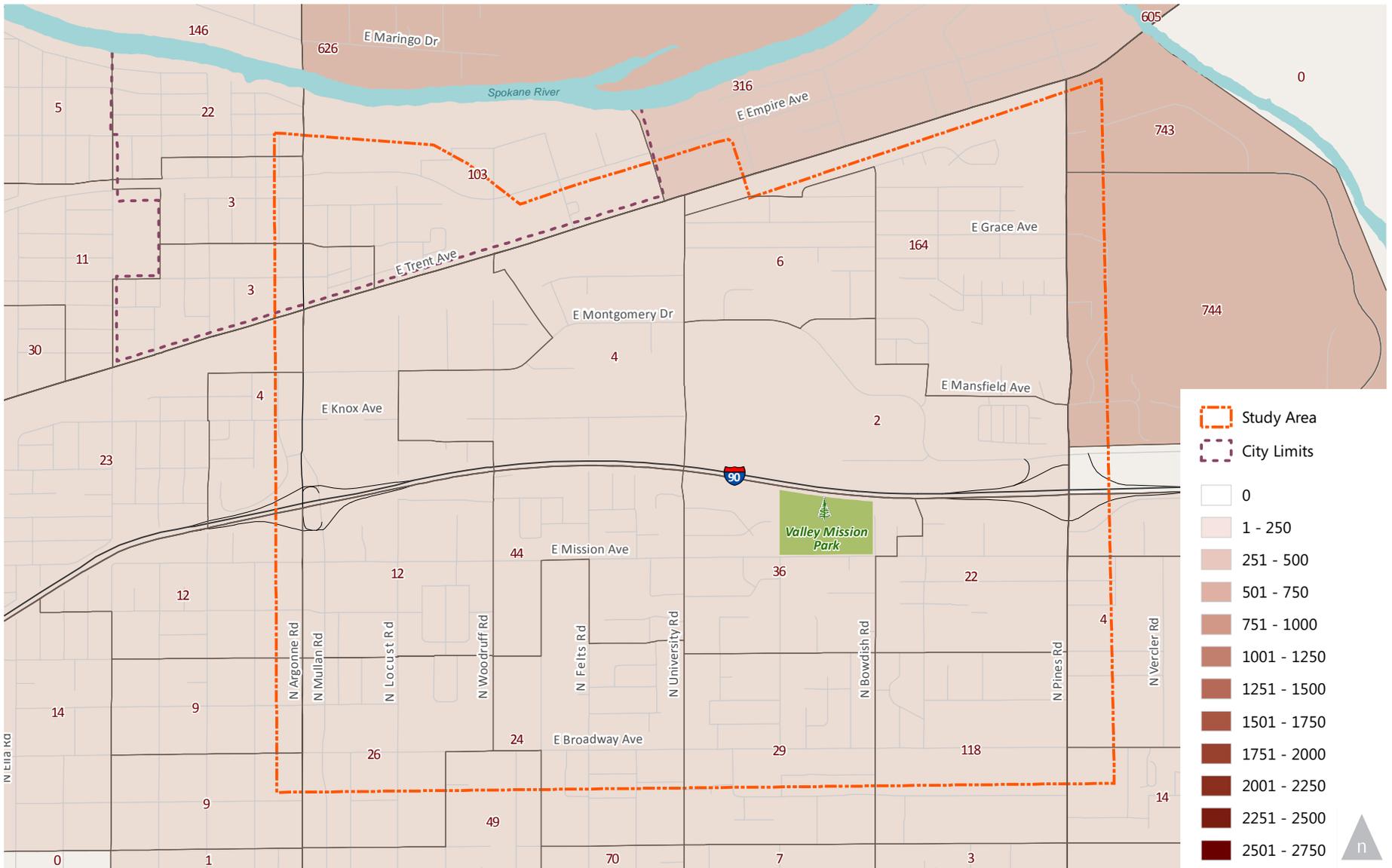


Figure 15.  
**Growth in Study Area  
 Households (2010 - 2040)**

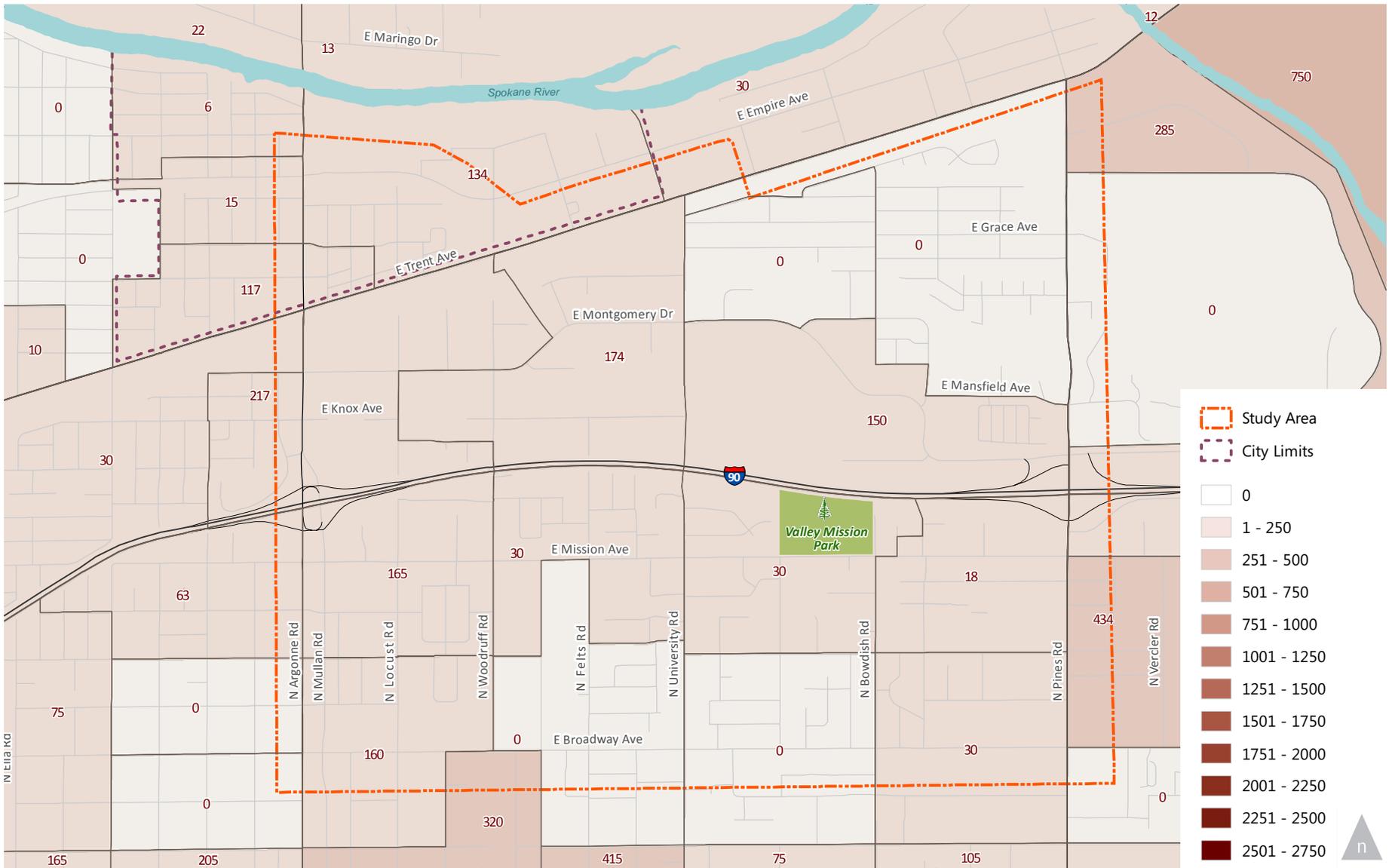


Figure 16.

**Growth in Study Area  
Employment/Jobs (2010 - 2040)**

The SRTC model includes some roadway improvement projects that are currently funded for construction within and near the study area:

- Mansfield Avenue extension from Pines Road to Mirabeau Parkway
- Widened Sullivan River Bridge

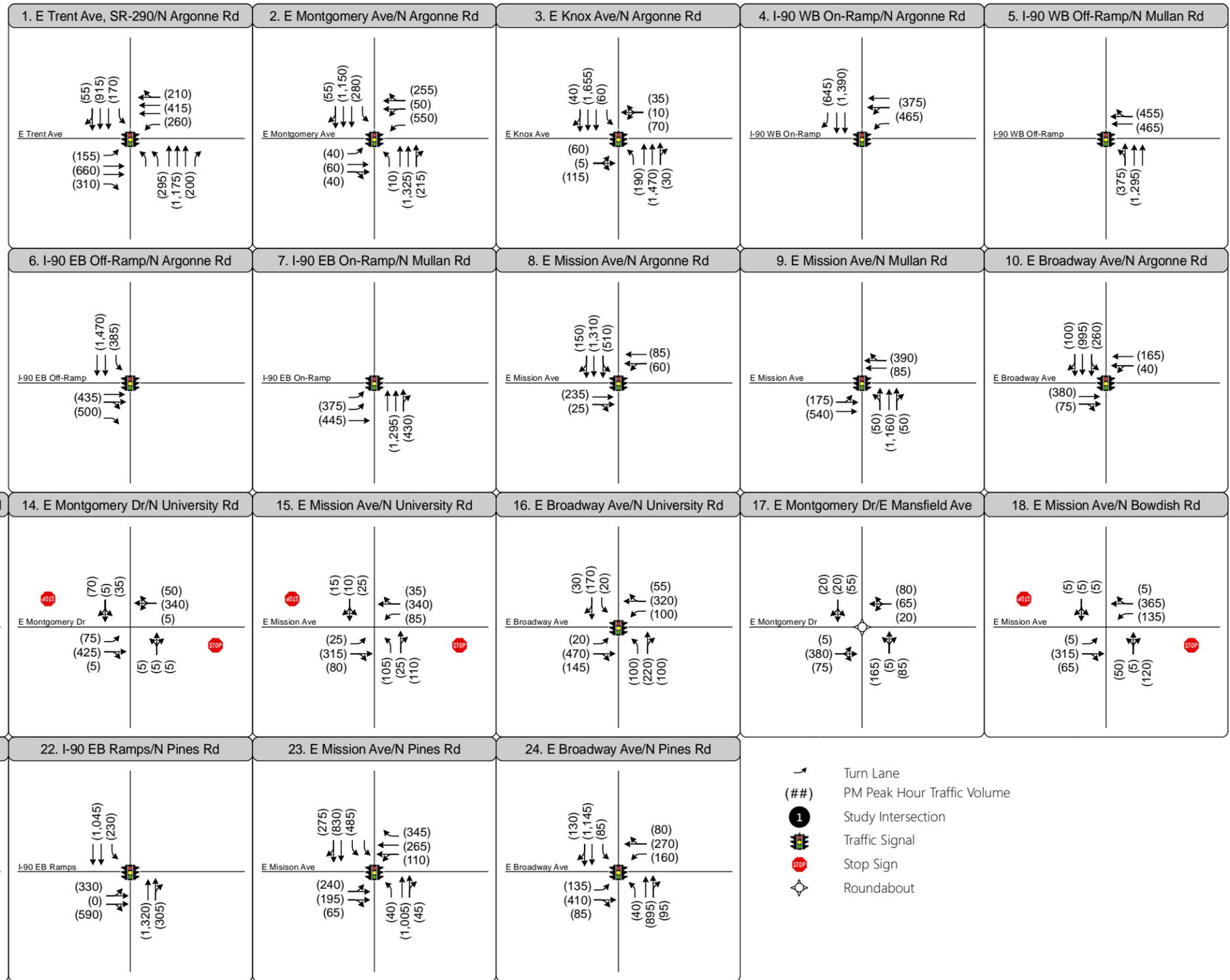
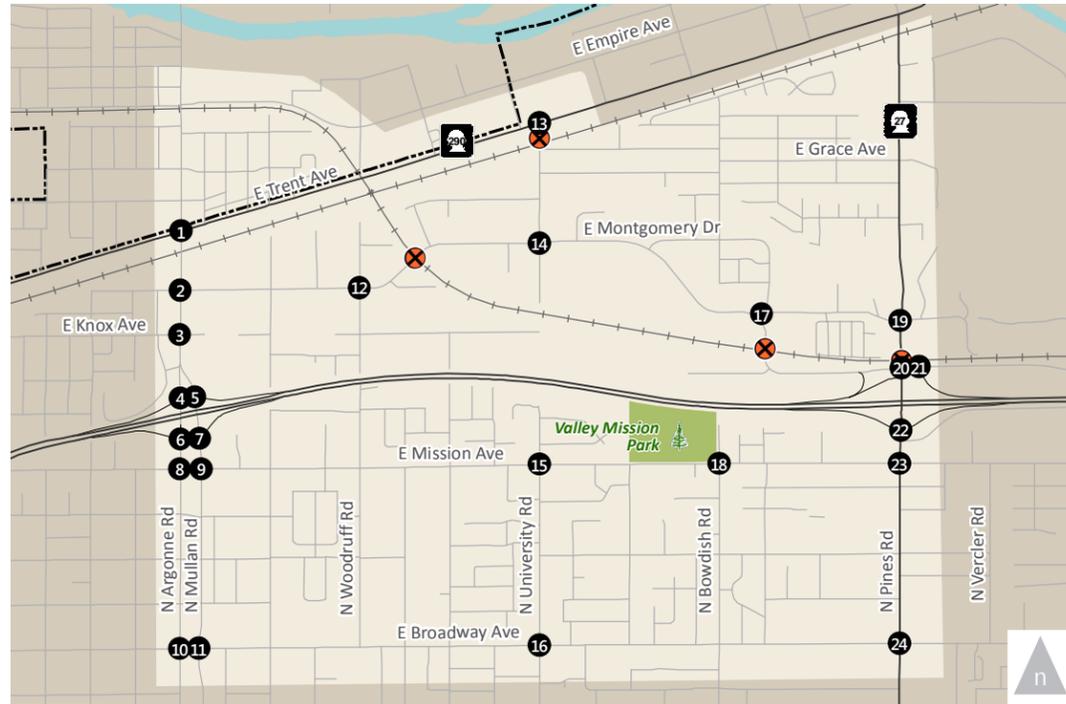
Also of note are two projects that are *not* assumed to be in place by 2040: the completion of the North Spokane Corridor beyond the current terminus at Francis Avenue and the closure of University Road at the BNSF tracks proposed in the Bridging the Valley project. Based on discussions with City staff, there are substantial questions about whether these projects would be implemented by 2040. However, sensitivity tests were run to give an indication of how these major projects could affect the study area.

Completion of the North Spokane Corridor would include construction of the roadway from its current terminus at Francis Avenue south to an interchange with I-90. This highway would have a large effect on travel patterns in the region by providing a major new north-south connection. In particular, the North Spokane Corridor would draw traffic from parallel north-south routes including Argonne Road, Mullan Road, and Pines Road. The model predicts the largest PM peak hour decreases along Argonne Road north of I-90: roughly 10 percent northbound and 16 percent southbound. Given the questions about how this project could get funded and implemented by 2040, the project team opted not to include it in the 2040 scenario. This is a conservative assumption since traffic congestion would be lower if the North Spokane Corridor were completed.

Closure of University Road at the BNSF railroad tracks just south of Trent Avenue would eliminate one of the main access points to the study area north of I-90. The travel demand model suggests that this closure would result in traffic volume decreases along University Road north of Montgomery Drive and increases along Montgomery Drive as well as Argonne Road and Pines Road north of Montgomery Drive. The traffic increases vary, but could reach roughly 20 percent on Montgomery Drive with more moderate increases on Argonne Road and Pines Road. Trent Avenue could see decreases of approximately 10 percent between Argonne Road and Pines Road.

**Figure 17** shows the 2040 forecasted traffic volumes at the study intersections, as well as the assumed 2040 lane configurations.





- Turn Lane
- (##)** PM Peak Hour Traffic Volume
- 1** Study Intersection
- Traffic Signal
- Stop Sign
- Roundabout

Figure 17.

**2040 PM Peak Hour Traffic Volumes and Lane Configurations - No Build Alternative**

In addition to traffic volume forecasts, the project team also estimated 2040 pedestrian and bicycle forecasts for the study area. Since the SRTC travel model does not include explicit forecasts of pedestrian and bicycle travel, the project team estimated that pedestrian and bicycle travel in the study area would follow current patterns. The focus of the pedestrian and bicycle travel forecasts were for daily trip crossings of I-90.

As described in the Existing Conditions Chapter, pedestrian and bicycle volumes across I-90 are about 1 percent of auto traffic volumes. By evaluating the 2040 traffic volume forecasts, the project team estimated that there would be approximately 250 daily combined pedestrian and bicycle trips crossing I-90 between Argonne and Pines Road under the No Build condition. Chapter 5 will provide additional detail about how the pedestrian and bicycle travel forecasts were developed under the "with project" conditions, since research indicates that new pedestrian/bicycle connectivity projects can encourage a substantial number of new trips.



## 4.2 2040 NO BUILD TRANSPORTATION CONDITIONS

Using the travel forecasts previously described, the 2040 transportation conditions were evaluated using the same analysis methods described in Chapter 3. The focus of this analysis is on traffic congestion and a description of pedestrian and bicycle travel conditions. A listing of planned future projects is also presented.

### 4.2.1 INTERSECTION LEVEL OF SERVICE

The results of the 2040 No Build intersection LOS results are presented in **Table 9** below. Only PM peak hour operations were evaluated since AM peak hour conditions were considerably less congested than the PM under the existing conditions analysis. Intersections that fall below the City's LOS standard are shown in bold. **Figure 18** summarizes the intersection LOS results.



**TABLE 9: NO BUILD ALTERNATIVE – 2040 PM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Device	LOS and Delay in Seconds
1	Trent Ave/SR-290 & Argonne Rd	Signalized	<b>E / 72</b>
2	Montgomery Ave & Argonne Rd	Signalized	<b>F / 150</b>
3	Knox Ave & Argonne Rd	Signalized	<b>F / 107</b>
4	I-90 WB On-Ramp & Argonne Rd	Signalized	<b>F / 80</b>
5	I-90 WB Off-Ramp & Mullan Rd	Signalized	C / 31
6	I-90 EB Off-Ramp & Argonne Rd	Signalized	B / 17
7	I-90 EB On-Ramp & Mullan Rd	Signalized	B / 13
8	Mission Ave & Argonne Rd	Signalized	B / 13
9	Mission Ave & Mullan Rd	Signalized	C / 24
10	Broadway Ave & Argonne Rd	Signalized	C / 23
11	Broadway Ave & Mullan Rd	Signalized	C / 23
12	Montgomery Dr & Woodruff Rd	Side-Street Stop Control	<b>F / 82</b>
13	Trent Ave/SR-290 & University Rd	Side-Street Stop Control	<b>F / &gt;150</b>
14	Montgomery Dr & University Rd	Side-Street Stop Control	C / 23
15	Mission Ave & University Rd	Side-Street Stop Control	D / 34
16	Broadway Ave & University Rd	Signalized	B / 17
17	Montgomery Dr & Mansfield Ave	Roundabout	A / 7
18	Mission Ave & Bowdish Rd	Side-Street Stop Control	D / 29
19	Mansfield Ave & Pines Rd	Signalized	D / 54
20	I-90 WB Ramps & Pines Rd	Signalized	D / 39
21	Indiana Ave & I-90 WB Off-Ramp	Signalized	C / 35
22	I-90 EB Ramps & Pines Rd	Signalized	C / 28
23	Mission Ave & Pines Rd	Signalized	D / 50
24	Broadway Ave & Pines Rd	Signalized	<b>F / 107</b>

Source: Level of service for signalized and stop controlled intersections based on HCM2000 as reported in Synchro 7 and VISSIM outputs. Roundabout level of service based on HCM2000 as reported by Sidra 5.1.



Under the No Build scenario, the analysis indicates there would be significant queuing and congestion southbound on Argonne Road between Trent Avenue and the westbound I-90 on-ramp. The four signalized intersections along that stretch of roadway would operate at LOS E or F, falling below the City's LOS standard. The intersection at the ramp interchange would not adequately serve the demand and the queue would spill back through several upstream intersections. At Argonne Road/Trent Avenue, the movements with the most delay are the southbound through and eastbound right movements. At Argonne Road/Montgomery Drive, the movements with the highest volume and delay are the southbound through and westbound left. There is significant queuing westbound on Montgomery Drive since southbound Argonne Road cannot accommodate turning vehicles. Although there would be congestion north of the interchange, the four intersections that control the movements to and from the freeway adequately serve vehicular demand from the off-ramps and clear vehicles from the two overpasses. Once southbound traffic crosses the overpass, congestion subsides. There is minimal delay for northbound vehicles on Mullan Road.



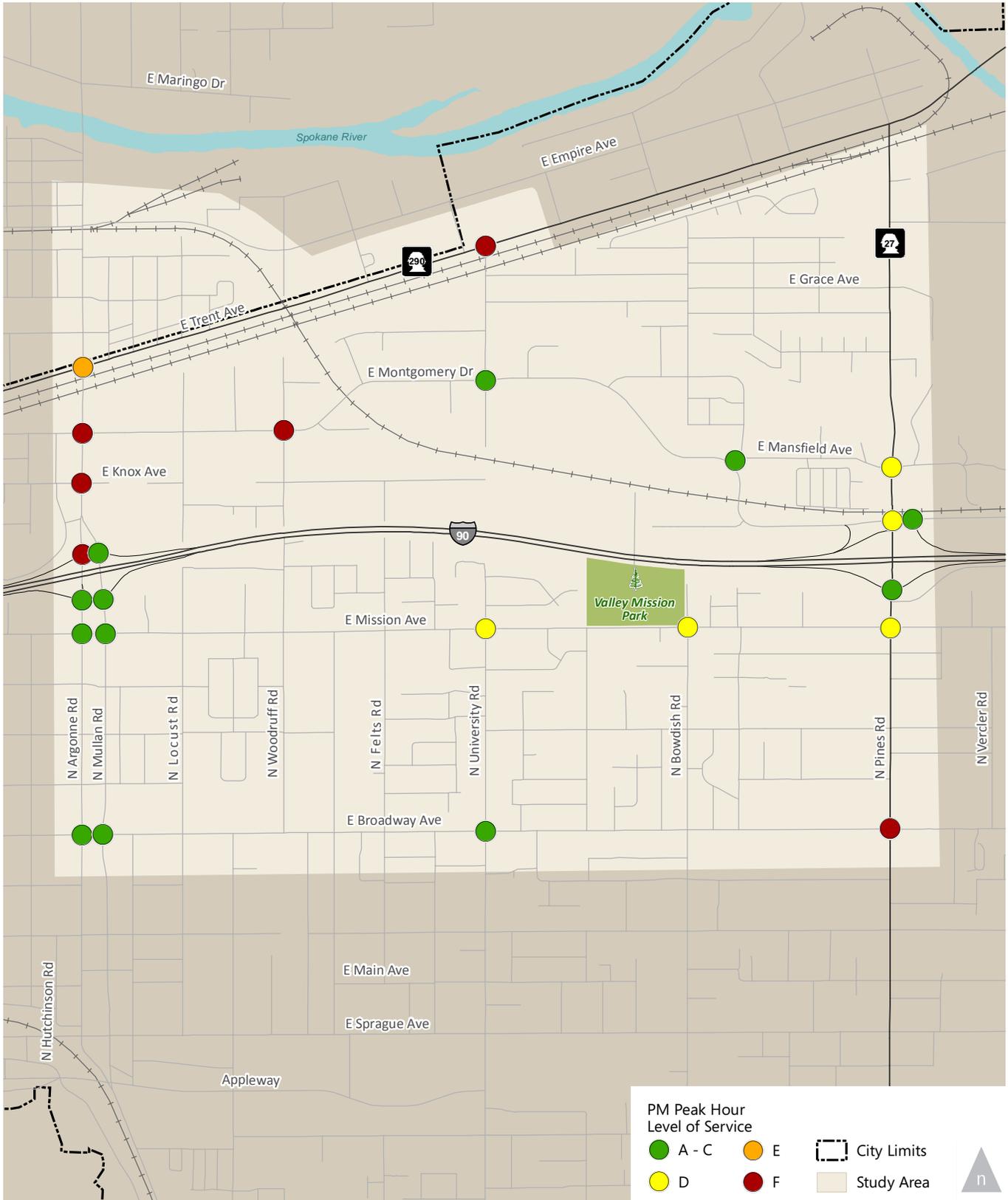


Figure 18.

**No Build Alternative  
2040 PM Peak Hour Level of Service**

Under the No Build scenario, all intersections along the Pines corridor would operate at LOS D or better during the PM peak hour, with the exception of Pines Road/Broadway Avenue, which would operate at LOS F. At the Pines Road/Mansfield Avenue intersection, the most delay would be experienced by eastbound drivers turning right onto Pines Road. The limited congestion in this corridor is expected to occur between Mansfield Avenue and Indiana Avenue. The southbound left turn pocket at Indiana Avenue is very short due to the geometry of the train tracks; vehicles waiting to turn spill back into the main travel lane. This movement is served twice during each signal cycle to minimize the delay. The signal coordination along Pines Road favors the through movements; as such, southbound vehicles experience less delay and use much of the available capacity, increasing the delay for eastbound vehicles. Vehicle progression across the overpass and through the Mission Avenue/Pines Road intersection operates adequately. There is limited queuing and no excessive delay for northbound vehicles on Pines Road.

There are three other intersections that are projected to operate at LOS F:

- Montgomery Drive & N Woodruff Road is expected to operate at LOS F due to the high delay experienced by northbound vehicles turning left from the stop sign controlled side street.
- Trent Avenue/SR-290 & N University Road is projected to operate at LOS F due to the delay on the northbound minor approach. Again, this intersection operates with side-street stop control and the high volumes along Trent Avenue result in limited gaps for traffic from University Road.
- Broadway Avenue & Pines Road would operate at LOS F due to high volumes on the eastbound, northbound, and southbound approaches.

#### 4.2.2 TRAVEL TIME

In addition to intersection level of service, corridor performance is an important indicator of congestion. Along Argonne, Mullan, and Pines, queues may form causing vehicular delay that could exceed that suggested by independent intersection analysis. To assess this effect, travel times along Argonne and Mullan were estimated using the VISSIM software package. Travel times were estimated along the following roadway segments:

- Southbound on Argonne Road from Trent Avenue to Mission Avenue
- Northbound on Mullan Road from Mission Avenue to Trent Avenue
- Southbound on Argonne Road from Montgomery to the I-90 westbound on-ramp

The results are presented in **Table 10** below.



**TABLE 10: NO BUILD ALTERNATIVE – 2040 PM PEAK HOUR TRAVEL TIME**

Segment	Northbound	Southbound
Argonne Road/Mullan Road: Trent Avenue to Mission Avenue	2:36	6:56
Argonne Road: Montgomery Avenue to WB I-90	N/A	6:05

Source: Fehr & Peers, 2013.

Three different paths were considered in the travel time analysis. Northbound through trips from Mission Avenue to Trent Avenue would take just over two and a half minutes under the No Build Alternative. Southbound trips along the same length of roadway would take more than twice as long, at nearly seven minutes. In addition to southbound through trips, southbound trips from Montgomery Drive to the westbound I-90 on-ramp were measured since that movement is particularly congested. Those trips took just over six minutes on average, indicating that motorists trying to access westbound I-90 would experience much more delay than those simply traveling through the length of the corridor.

### 4.2.3 PEDESTRIAN AND BICYCLE CONDITIONS

Under 2040 conditions, the bicycle and pedestrian network in the study area is expected to improve incrementally. It is likely that some of the bicycle lanes in the Bicycle and Pedestrian Master Program could be implemented through repaving and overlay projects. Additional sidewalks are also likely in some locations.

With respect to freeway crossing conditions for pedestrians and bicycles, conditions are not expected to change relative to existing conditions since there are no projects planned.

## 4.3 PLANNED PROJECTS

The following list summarizes planned projects that may affect the study area and any potential congestion relief and connectivity improvements. Some of these projects are in a preliminary planning stage with no identified funding—these projects are noted below. This information was gathered from the City of Spokane Valley, Spokane County, Washington State Department of Transportation, Burlington Northern and Santa Fe Railway Company (BNSF), Union Pacific Railroad (UPRR), and local utility providers.



- Argonne Road from I-90 to Trent Avenue – revise the signal phasing along the Argonne Road corridor, add a northbound right turn lane at Montgomery Drive, and make intersection improvements at Knox Avenue. Currently funded.
- Spokane Valley-Millwood Trail – construct shared use pathway along abandoned railroad right-of-way from Spokane Community College to Evergreen Road. Not currently funded.
- Mansfield Avenue Connection – construct 3-lane roadway with sidewalk from Pines Road to 200 feet east of Houk Road. Currently funded.
- Sullivan Road West Bridge – reconstruct and widen the southbound bridge to four lanes. Currently funded.
- Appleway Trail – construct shared use pathway along abandoned railroad right-of-way from University Road to Evergreen Road. Partially funded.
- Argonne Road and Mullan Road Safety Improvements – update traffic signal controllers and install countdown pedestrian signals and bicycle route signs from Empire Way to Knox Avenue and from Indiana Avenue to Broadway Avenue. Currently funded.
- Pines Road/Grace Avenue Intersection Improvements – construct left turn pockets. Currently funded.
- Balfour Park Expansion – expand Balfour Park and construct new library on the block bounded by Main Avenue, Sprague Avenue, Herald Road, and Balfour Road. Not currently funded.
- STA Argonne Park & Ride – construct two park & ride lots, one on either side of the I-90 interchange with a pedestrian bridge connecting the lots to freeway bus stops. Not currently funded, but under consideration for inclusion in a 2015 transit ballot initiative.
- Bridging the Valley – grade separate the Pines railroad crossing at Trent Avenue and close University Road. Also grade separations at Park Road and Barker Road. Not currently funded.
- North Spokane Corridor – construct the remaining portion of the North Spokane Corridor from Francis Avenue to I-90. Not currently funded.
- Additional UPRR and BNSF tracks within their existing right-of-way. Not planned in the near-to-mid-term.

## 5.0 ALTERNATIVES UNDER CONSIDERATION

With the 2040 No Build conditions defined, the project team evaluated numerous project alternatives. This chapter describes these alternative projects, some additional analysis methodologies that were used to assess the alternatives, and the performance metrics used to compare project performance.

### 5.1 CONGESTION MANAGEMENT PROCESS

The SRTC and a multi-jurisdictional Working Group have worked from 2012-2014 to update the region's Congestion Management Process (CMP). A CMP is a systematic and regionally-accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. Key for this project is that the Argonne/Mullan Road corridor is defined as a Tier 1 CMP Corridor, which requires that various strategies to manage congestion be considered before implementing any project that would substantially increase the vehicle capacity of the corridor.

The Draft CMP Report has identified the following types of congestion management strategies for the Argonne/Mullan Road corridor:

- Improvements for walking and cycling
- Turning movement enhancements
- Limited intersection improvements
- Traffic signal improvements
- Upgrades to ITS communications networks
- Transit service expansion and transit infrastructure improvements
- New park-and-ride facilities
- Adding lanes/roadway widening

While this list of CMP strategies was not available when the project alternatives were being developed, the congestion relief alternatives presented in this chapter are generally consistent with the strategies listed above. **Table 11** summarizes how the alternatives under consideration are aligned with the strategies identified in the CMP Report.



**TABLE 11: CONSISTENCY WITH CMP STRATEGIES FOR THE ARGONNE/MULLAN ROAD CORRIDOR**

CMP Strategy	Comments
Improvements for walking and cycling	A major focus of this study is to identify options to improve walking and cycling access in the study area. Some alternatives seek to provide a low-traffic stress alternative to the Argonne/Mullan corridor. All I-90/Argonne Road interchange projects include improved non-motorized access across the freeway.
Turning movement enhancements	An evaluation of an option convert the southbound right turn at the Argonne/I-90 westbound onramp intersection into a “free” movement was performed. However, this did not address the substantial southbound congestion and queue on Argonne Road.
Limited intersection improvements	Options to re-stripe the I-90 westbound ramp intersections with Argonne and Mullan Roads were evaluated, but these options did not substantially reduce congestion levels. A four-lane diverging diamond interchange was also evaluated – this interchange would not require any substantial reconstruction of bridges or ramps, just rebuilding of the ramp terminal intersections.
Traffic signal improvements	Traffic signal retiming was evaluated, but the signals are operating at or above capacity during the PM peak hour.
Upgrades to ITS communications networks	ITS communications networks were not specifically evaluated as part of this project; however, none of the alternatives would preclude improvements.
Transit service expansion and transit infrastructure improvements	Based on discussions with STA, new express bus service on I-90 between Downtown Spokane and Liberty Lake was assumed for all 2040 alternatives. Flyer stops to access a potential park-and-ride lot were also assumed.
New park-and-ride facilities	A potential park-and-ride facility near the I-90/Argonne Road interchange was considered in all 2040 alternatives.
Adding roadway capacity/widening	After evaluating other lower-cost options, roadway widening options were also identified, including a new southbound bridge across I-90 and a six-lane diverging diamond.

Source: Fehr & Peers, 2014.



## 5.2 PROJECT ALTERNATIVES

The evaluation process began with a total of sixteen alternatives at five locations—generally Argonne, Felts, University, Valley Mission Park, and Pines. Each of these locations had multiple options under consideration. Following a preliminary assessment with City staff and a Technical Advisory Committee comprised of a representative from WSDOT, STA, the City of Millwood, and Avista, the field of alternatives was narrowed to nine. **Figure 19** shows these alternatives, which are also listed in the **Table 12**. **Figure 20**, **Figure 21**, and **Figure 22** provide a more detailed view of Alternatives A, B, and C respectively.

**TABLE 12: ALTERNATIVES UNDER CONSIDERATION**

Alternative	Location	Project
No Build	N/A	None
A	Argonne Road	New southbound lane from north of the westbound on-ramp to the eastbound off-ramp
B	Argonne Road	Four-lane diverging diamond interchange
C	Argonne Road	Six-lane diverging diamond interchange
D	University Road	Pedestrian & bicycle overpass
E	University Road	Pedestrian, bicycle & emergency vehicle overpass
F	University Road	Pedestrian, bicycle & auto overpass
G	Valley Mission Park/Millwood Trail	Pedestrian & bicycle overpass
H	Valley Mission Park/Montgomery	Pedestrian & bicycle overpass
I	Pines Road	Signal and turn pocket modifications

Source: Fehr & Peers, 2013.



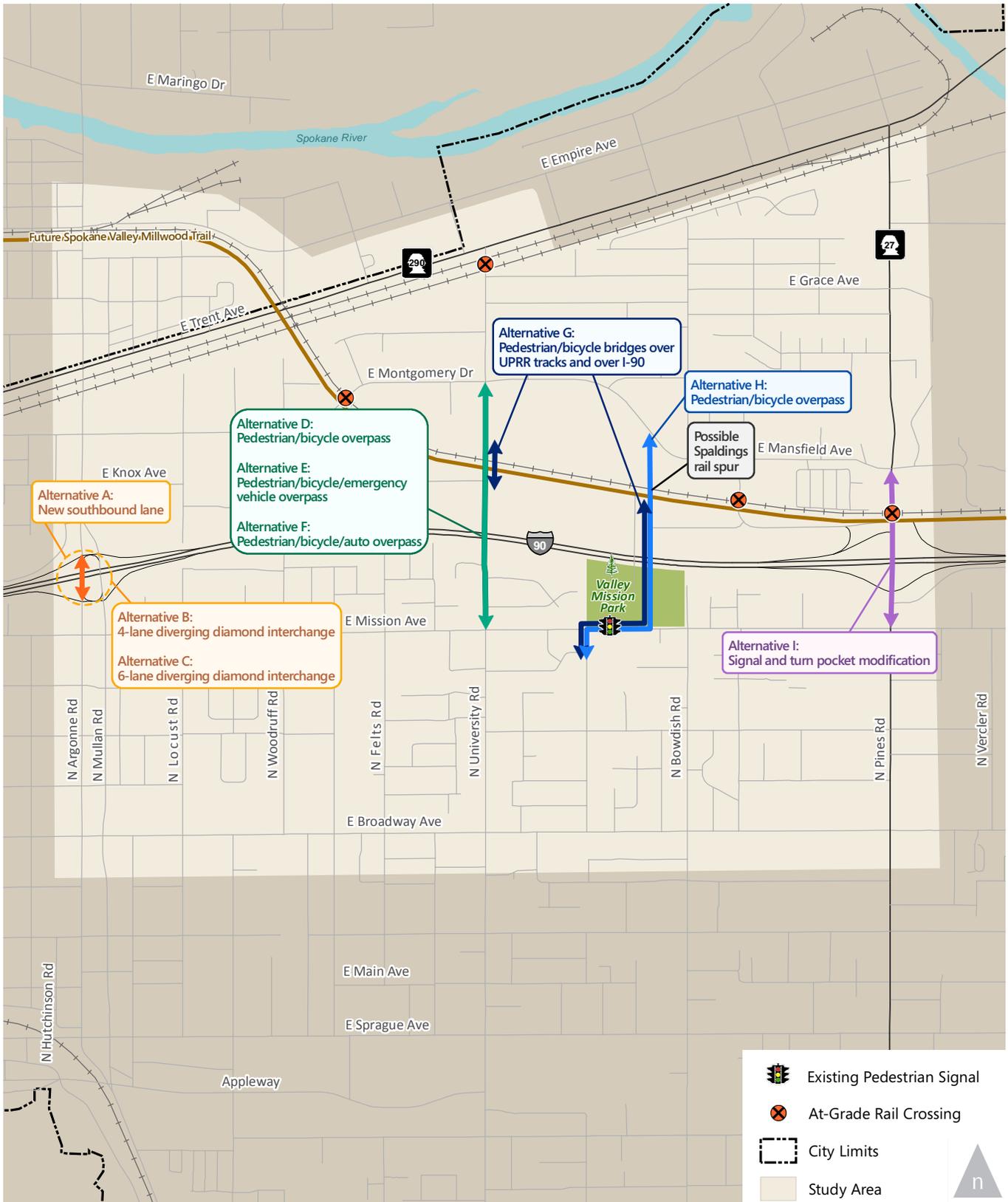


Figure 19.  
University Road Overpass Study Alternatives

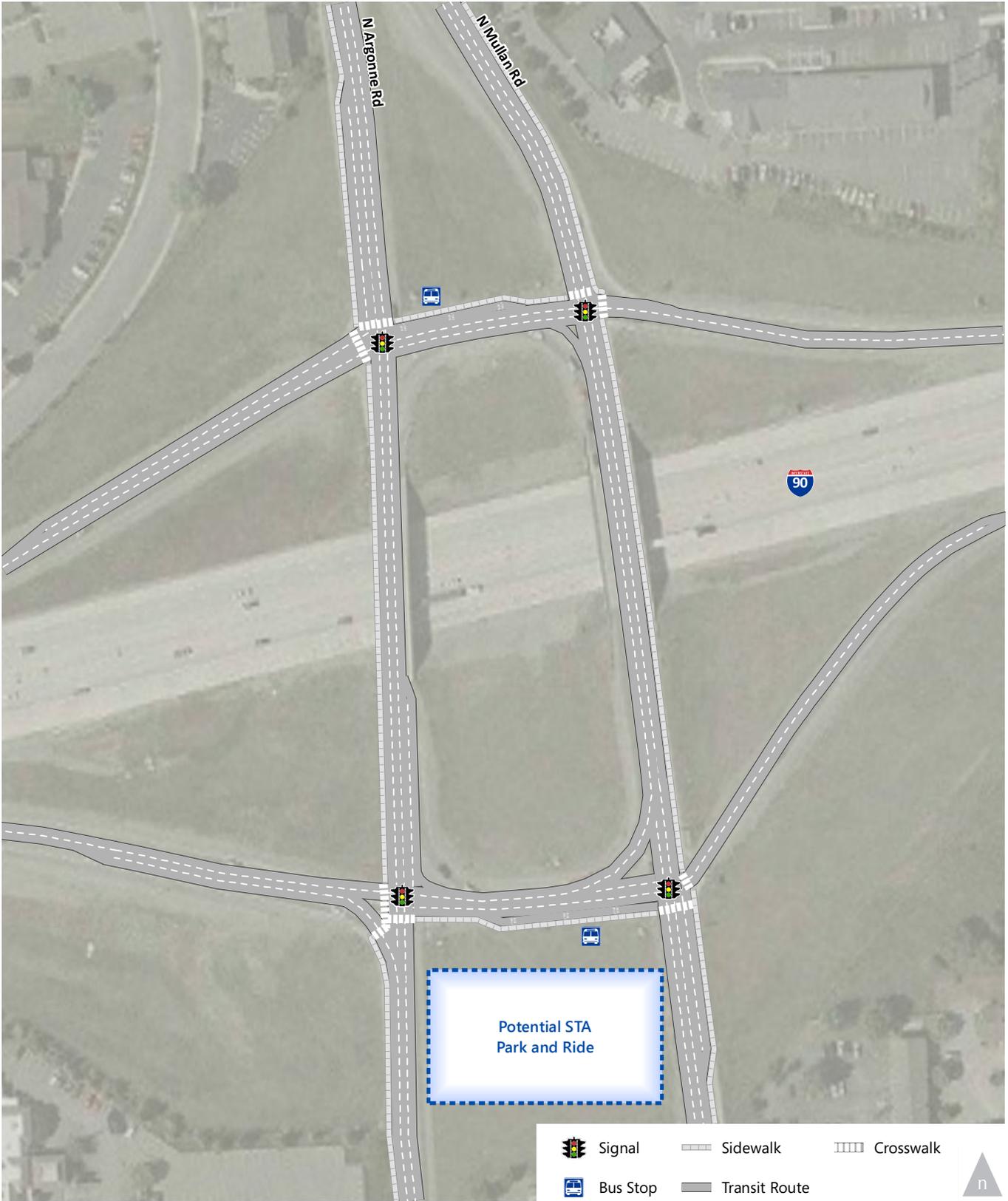


Figure 20.  
 Alternative A - New Southbound Lane on Argonne Road



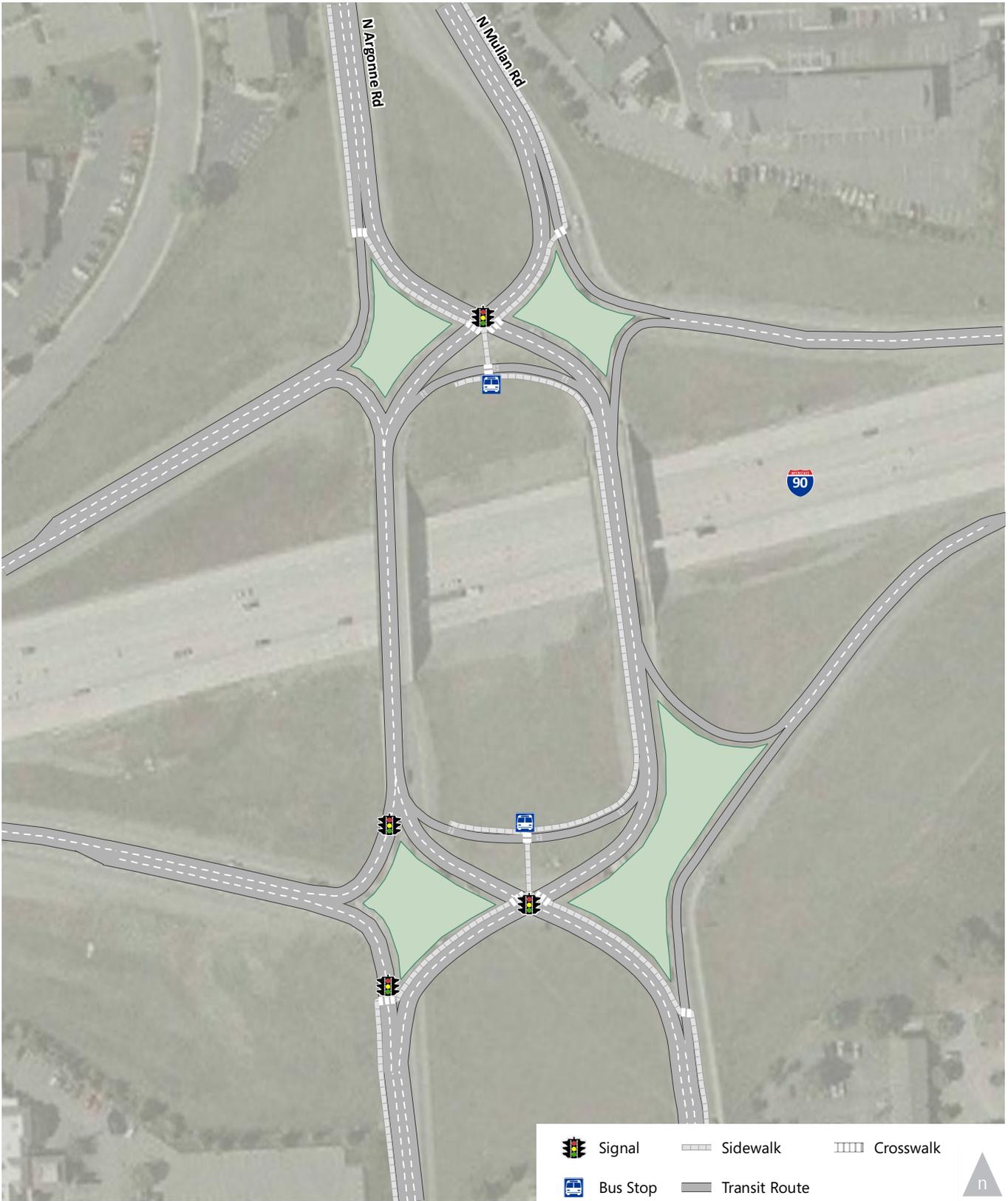


Figure 21.

**Alternative B - Four-Lane Diverging Diamond Interchange on Argonne Road**



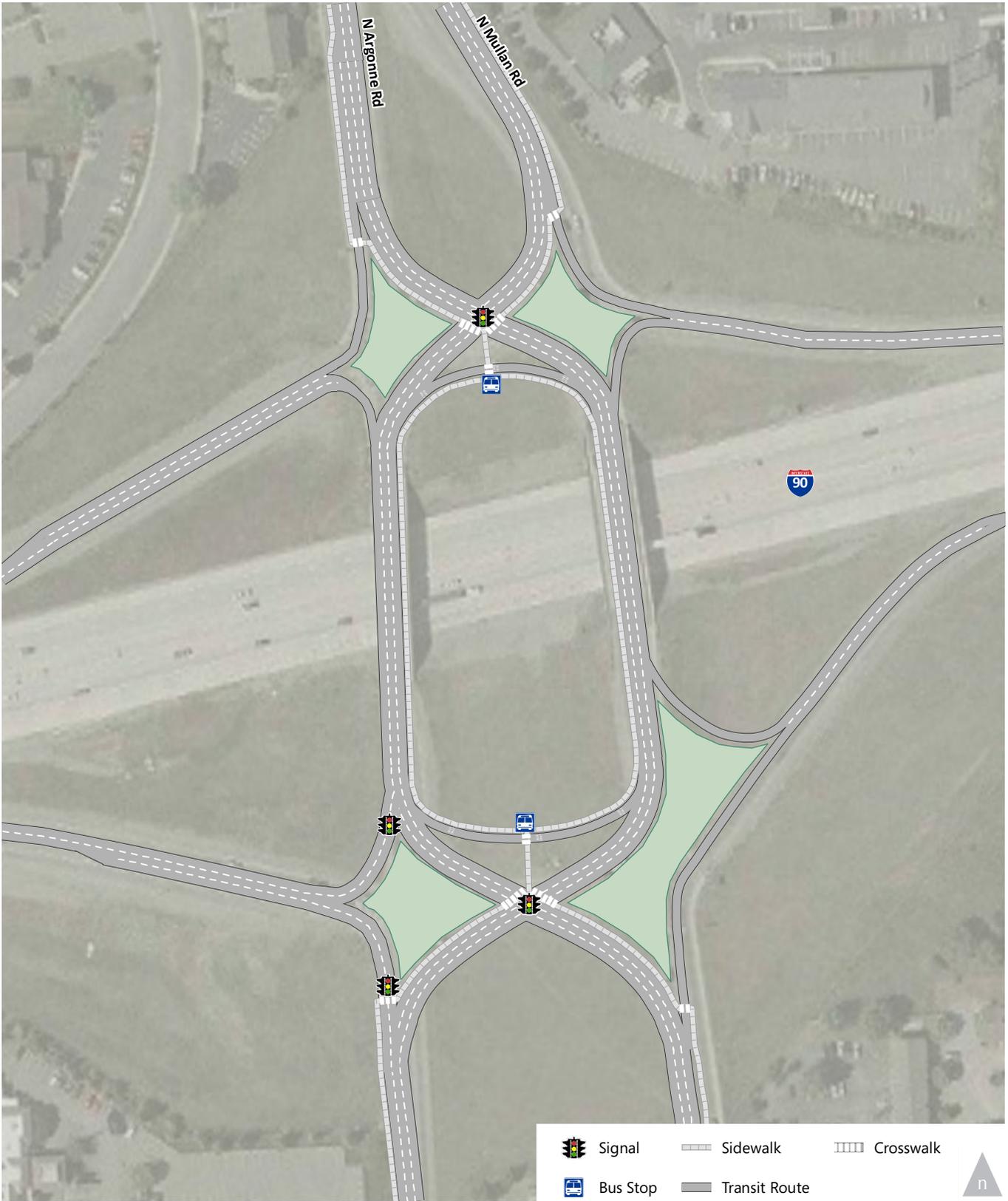


Figure 22.

**Alternative C - Six-Lane Diverging Diamond Interchange on Argonne Road**



### 5.3 CONSIDERED, BUT ELIMINATED

Eight additional alternatives were considered, but eliminated earlier in the evaluation process. These alternatives were eliminated for a variety of reasons including not meeting the objective of the project, low pedestrian and bicycle forecasts, conflicts with existing infrastructure, and cost. The options that were not carried forward to this stage are listed below:

- Pedestrian/bicycle bridges at Argonne Road and Pines Road were eliminated since they would not appreciably improve north-south connectivity between the interchanges.
- Three overpass options along a Felts Road alignment were eliminated because they would attract a relatively low number of users.
- A pedestrian/bicycle/emergency vehicle overpass through Valley Mission Park was eliminated because it would be too disruptive to the park, and would offer limited benefit to the Fire Department.
- A pedestrian/bicycle overpass through Valley Mission Park, and continuing via Indiana Avenue, was eliminated due to limited long-term benefit. However, this project could function as an interim step for the Valley Mission Park alternatives still under consideration.
- A northbound to eastbound loop ramp from Pines Road onto westbound I-90 was eliminated due to insufficient space under the existing bridge structure.



## 5.4 ADDITIONAL ANALYSIS METHODS

This section describes additional analysis methods that were used to assess the project alternatives.

### 5.4.1 PROJECT ALTERNATIVE TRAFFIC VOLUME FORECASTS

Although the underlying traffic forecast is the same for both the No Build and project alternative scenarios, select intersection turning volumes differ due to varying roadway configurations. **Figure 23** shows the traffic volumes for Alternatives A, B and C, and **Figure 24** for Alternative F. Alternative I has the same traffic volumes as the No Build scenario.

### 5.4.2 PROJECT ALTERNATIVE PEDESTRIAN AND BICYCLE FORECASTS

As described earlier, the No Build pedestrian and bicycle volumes were derived from existing travel patterns and SRTC travel model data. To develop pedestrian travel forecasts for the projects that include a new overpass at University Road, travel mode share data observed at the Havana Street underpass and Custer Road pedestrian overpass to the west of the study area were used. This location provides an example of pedestrian activity in an area with more connectivity across the freeway and is an ideal analog to the study area given the nature of the land use (residential to the south and mixed retail/industrial to the north of the freeway). The observed pedestrian mode share (which is about double that observed in the study area) was applied to the vehicle traffic demand forecasted for University Road to estimate the number of travelers that may shift their mode given a new connection. The University Road overpass bicycle forecasts were developed using a tool produced by the University of North Carolina Highway Safety Research Center based on National Cooperative Highway Research Program (NCHRP) Report 552 Guidelines for Analysis of Investments in Bicycle Facilities. The tool estimates daily bicycle demand based on population density, existing bicycle mode share, and length of the facility.



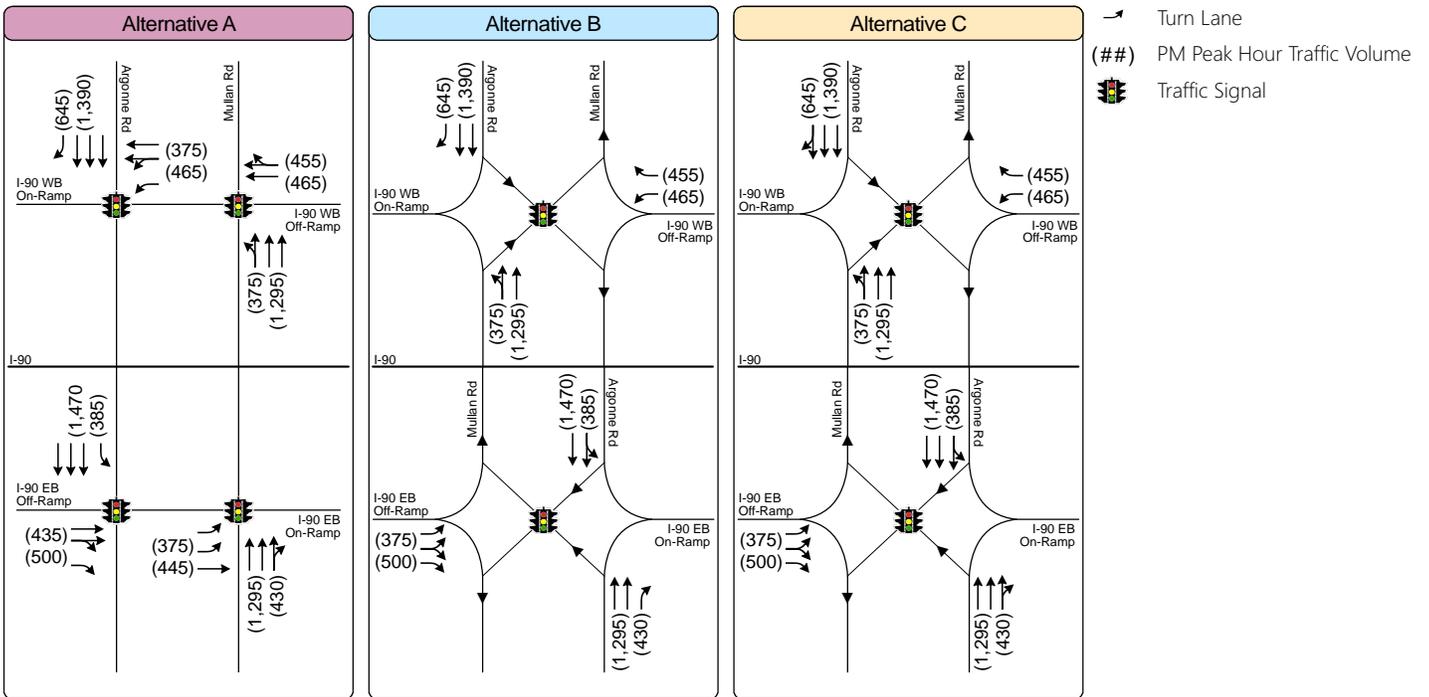
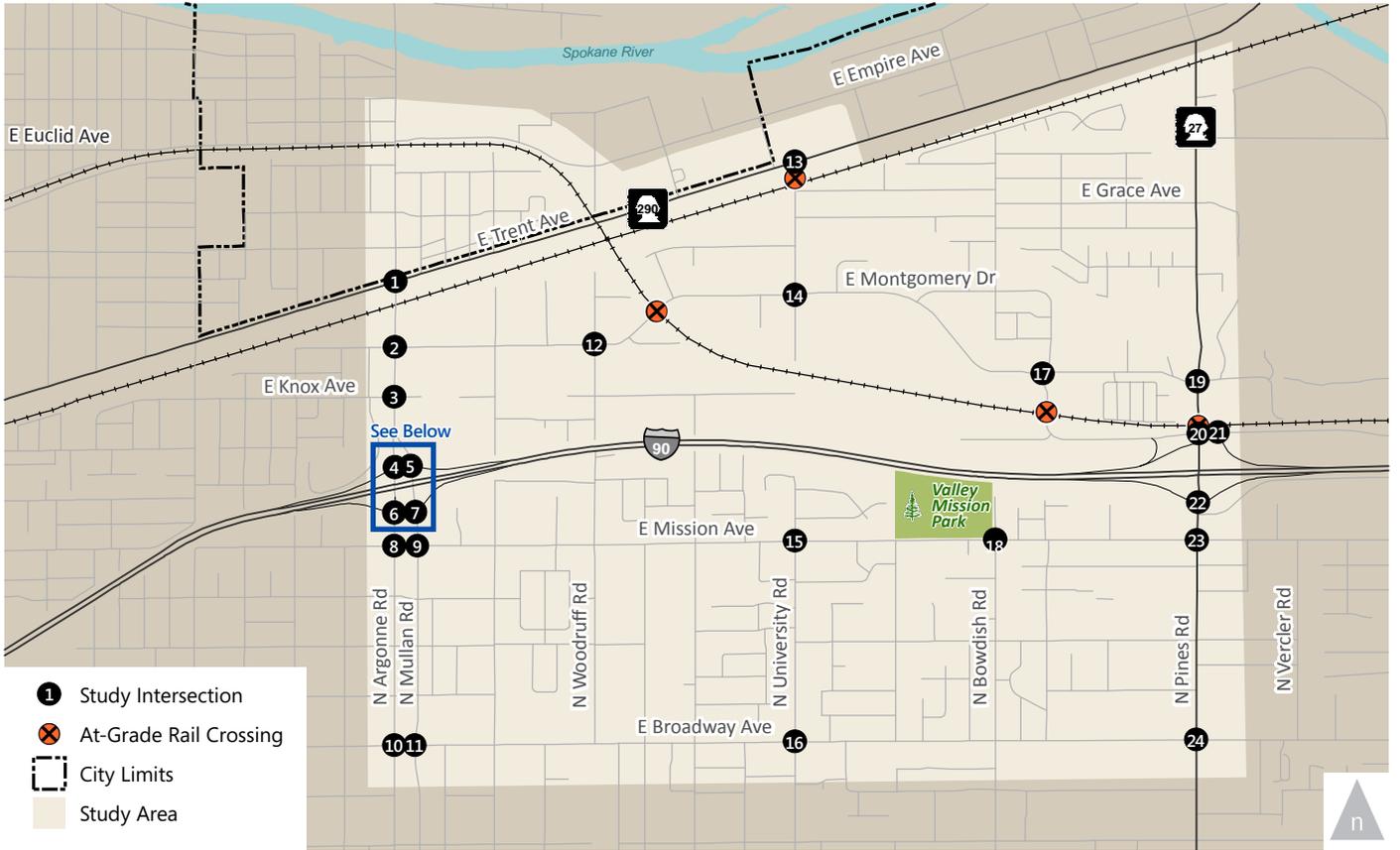


Figure 23.  
 2040 PM Peak Hour Traffic Volumes and Lane Configurations -  
 Alternatives A, B and C



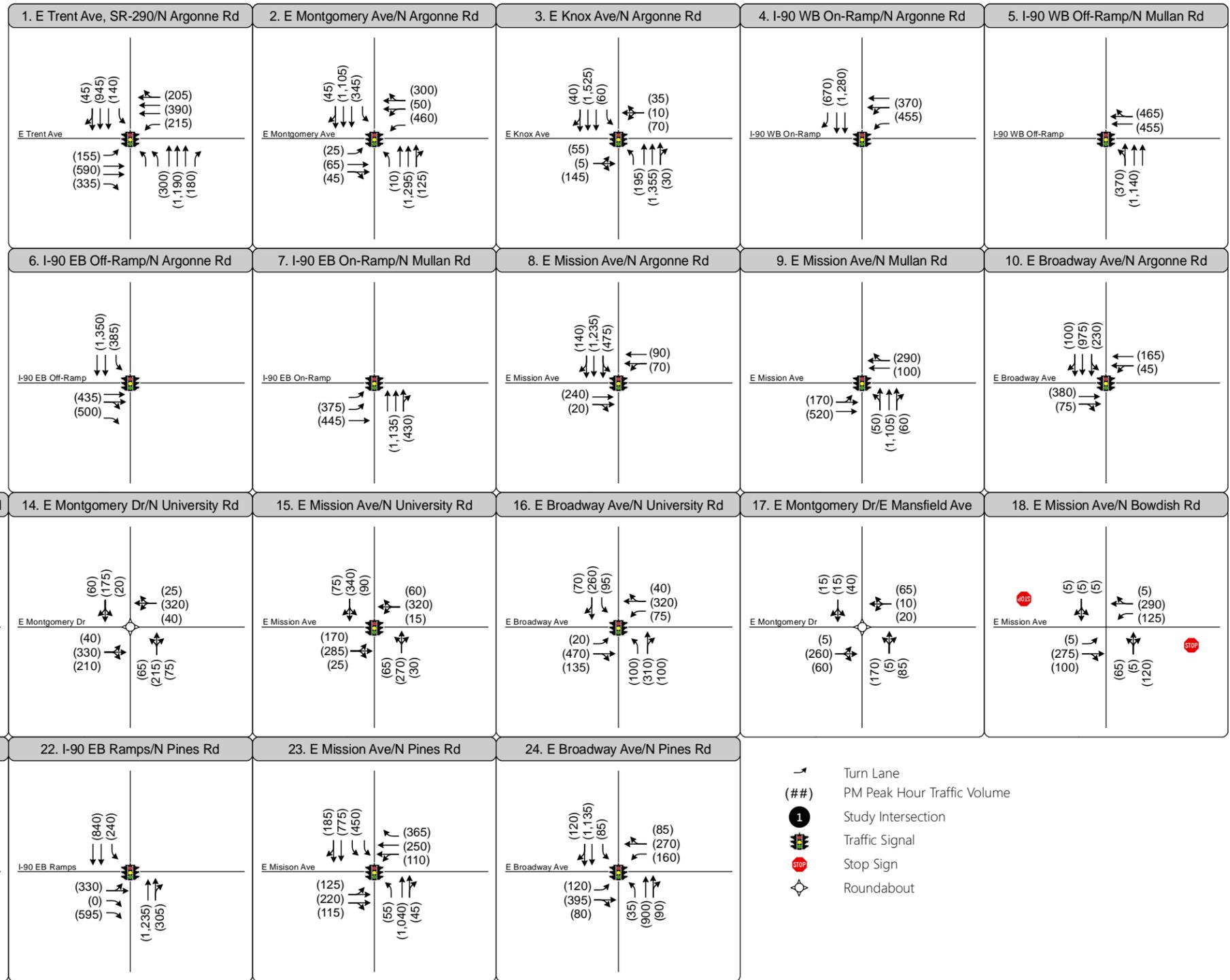
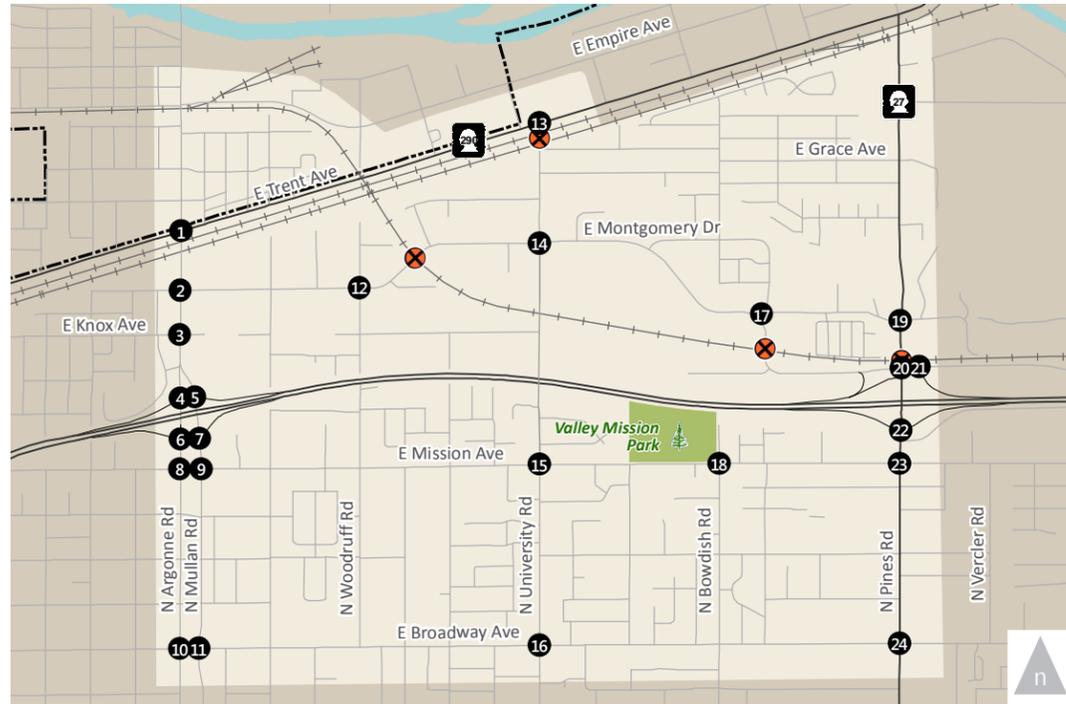


Figure 24.

2040 PM Peak Hour Traffic Volumes and Lane Configurations - Alternative F (University Road Bridge)

To refine the pedestrian and bicycle forecast for the Valley Mission Park overpass alignments, AirSage cell phone data was used to compare the number of short trips in the traffic analysis zones (TAZs) that contain each alignment. Some proportion of trips would occur regardless of the alignment; for instance, a bicyclist traveling five miles would not be likely to change their route based on the exact alignment of the overpass. However, the details of the alignment may weigh heavier in the decision making of someone traveling a shorter distance. To determine the pool of trips subject to change depending on the alignment, the project team consulted National Household Travel Survey (NHTS) data. Seventy-four percent of all walking trips are less than a mile in length and 36 percent of all biking trips are less than two miles in length. It is assumed that only those subsets of the pedestrian and bicycle trips are substantively influenced by the alignment of the path. Then, the factors determined from the AirSage data were applied to those trips. All pedestrian and bicycle forecasts are given for the future analysis year of 2040. Additional details may be found in the Pedestrian and Bicycle Forecasts technical memorandum included in the appendix. As described in the Findings Chapter, the pedestrian and bicycle forecasts range from 250 for the No Build scenario to 480 for Alternative H, which would construct a new overpass at Valley Mission Park.

### 5.4.3 CONNECTIVITY TO VALLEY MISSION PARK

Neighborhood connectivity is a key goal of this project. At the initial public workshop, residents identified connections to Valley Mission Park as an important component of any new pedestrian and bicycle facility. To quantify connections to the park, the project team used GIS to estimate two measures:

- The number of households and jobs within a 30 minute walk of Valley Mission Park (referred to as the “walkshed”)
- The number of households and jobs within a 30 minute bike ride of Valley Mission Park (referred to as the “bikeshed”)

The results of this analysis are presented in the Findings Chapter.



## 6.0 RATING APPROACH

This section describes the performance measures and the approach used to assign ratings for each of the performance measures.

### 6.1 PERFORMANCE METRICS

The project team has defined a set of performance metrics through consultation with City staff. These metrics were also developed to reflect the concerns of the public as heard at the initial workshop. Each alternative was evaluated using the following metrics (detailed methodology is included subsequently):

- Cost
  - Planning level range including estimated right-of-way costs
- Congestion Relief
  - Intersection level of service (LOS)
  - Travel time along key corridors
- Neighborhood Impacts
  - Low/medium/high qualitative assessment based on potential impacts to neighborhood residents
- Conflicts with Existing Infrastructure
  - Low/medium/high qualitative assessment based on how a project would affect existing and planned infrastructure such as power lines and railroads
- Environmental Impacts
  - Low/medium/high qualitative assessment based on potential effects on wetlands, geohazards, historic or cultural sites, wellheads, etc.
- Consistency with Bike and Pedestrian Master Program (BPMP)
  - Low/medium/high qualitative assessment based on whether or not a project is included in the City's BPMP and whether the project would further the BPMP's goals
- Connectivity to Spokane Valley/Millwood Trail
  - Low/medium/high qualitative assessment of each alternative's connectivity to the Spokane Valley/Millwood Trail
- Transit Accommodation
  - Low/medium/high qualitative assessment based on how each alternative would affect STA's plans for new park & rides and transit stops at the Argonne Road interchange



- Pedestrian & Bicycle Demand
  - Daily forecast of the number of pedestrians and bicycles using the new facility
- Connectivity to Valley Mission Park
  - Number of households and jobs within a 30 minute bike ride of Valley Mission Park
  - Number of households and jobs within a 30 minute walk of Valley Mission Park



## 7.0 FINDINGS

This chapter summarizes how each alternative performs using the metrics previously described. To facilitate the comparison, nine project alternatives were split into two groups based on the modes they principally serve. Projects that add substantial vehicle capacity are grouped into the congestion relief alternatives and projects that primarily serve pedestrians and bicyclists are grouped into the pedestrian and bicycle connectivity alternatives and projects. The results add capacity and relieve traffic congestion are discussed first.

### 7.1 CONGESTION RELIEF ALTERNATIVES

This section describes the findings related to the four congestion relief projects under consideration:

- Alternative A: New southbound lane along Argonne Road
- Alternative B: Four-Lane Diverging diamond interchange at Argonne Road
- Alternative C: Six-Lane Diverging diamond interchange at Argonne Road
- Alternative F: Pedestrian/bicycle/auto bridge at University Road
- Alternative I: Signal modification at Pines Road interchange

The performance of these four alternatives, in addition to the No Build Alternative, is compared for each metric in **Table 13**.

#### 7.1.1 COST

The costs for the four congestion relief alternatives vary greatly. Alternative I, which would involve only signal modification, would cost approximately \$250,000. Alternative B, a four-lane diverging diamond interchange, would make use of much of the existing infrastructure, but would still cost roughly \$2.5 million to implement. Alternatives A, C, and F, at \$8.1 million, \$10.3 million, and \$13.2 million respectively, are the most costly since they require construction of new bridges across I-90. The cost calculation spreadsheets are shown in Appendix H.



## 7.1.2 CONGESTION RELIEF

### 7.1.2.1 Alternative A – New Southbound Lane on Argonne Road

As previously described, southbound Argonne Road would experience substantial congestion under the No Build Alternative. The third southbound lane would alleviate that congestion by increasing capacity. Simulation analysis suggests that southbound congestion would substantially improve and level of service is generally better than under No Build. Note that with more southbound vehicles reaching the Argonne Road/Mission Avenue intersection, the Mullan Road/Mission Avenue intersection performs slightly worse since it spends more time serving traffic on Mission Avenue. Complete results are included in **Table 13**, **Table 14**, and **Figure 25**.

#### **New Southbound Lane on Argonne Road – Why Do We Need an Entirely New Bridge?**

City and Consultant staff worked with WSDOT to identify the most cost effective method to enhance mobility along the Argonne Road corridor across I-90. Based on the analysis, a new southbound lane across I-90 is a good solution to reduce congestion.

To implement this solution, the project team evaluated the cost-effectiveness and feasibility of widening the existing southbound Argonne Road bridge versus constructing an entirely new bridge. After discussing the project with WSDOT bridge engineers, it was determined that it would be less expensive and less disruptive to traffic to construct a new bridge to carry southbound traffic across I-90 for the following reasons:

- The existing Argonne Bridge is 60 years old and cannot support an additional traffic lane without new columns and abutments. Constructing these new structures next to the existing columns and abutments would be expensive and time consuming since extensive shoring and form-work would be required.
- The cost per unit area of a “cast-in-place” bridge widening project is about double that of a new pre-cast bridge. This translates into a comparable construction cost for the new southbound bridge structure when compared to a widening of the existing southbound bridge. The low clearance of the existing southbound bridge would result in more extensive traffic control procedures on I-90 during construction of the widening project.

Should the replacement of the southbound Argonne Road Bridge over I-90 move forward, additional study and design would be needed to understand the best way to phase construction to minimize disruption to Argonne Road and I-90 traffic.



**TABLE 13: PERFORMANCE METRICS FOR CONGESTION RELIEF ALTERNATIVES**

Performance Measure	No Build Alternative: No congestion relief or ped/bike connectivity projects	Alternative A: Argonne - New southbound lane	Alternative B: Argonne – 4-lane diverging diamond	Alternative C: Argonne – 6-lane diverging diamond	Alternative F: University - Vehicle bridge	Alternative I: Pines - Signal and turn pocket modifications
<b>Cost</b>	\$0	\$8.1M	\$2.5M	\$10.3M	\$13.2M	\$250K
<b>Congestion Relief</b>	○	●	◐	◑	◑	◑
<b>Neighborhood Impacts</b>	●	●	●	●	○	●
<b>Conflicts with Existing Infrastructure/Utilities</b>	●	●	●	●	○	●
<b>Pedestrian and Bicycle Daily Forecast</b>	250	250	250	250	420	250
<b>Environmental Impacts</b>	●	●	●	●	◑	●
<b>Consistency with Bike and Pedestrian Master Program</b>	N/A	N/A	N/A	N/A	●	N/A
<b>Connectivity to Spokane Valley/Millwood Trail</b>	○	○	○	○	●	○
<b>Transit Accommodation</b>	◐	●	○	○	◐	◐
<b>Connectivity to Valley Mission Park</b>	○	○	○	○	◑	○

Source: Fehr & Peers, 2013.

○ Performs Worse Performs Better ●



**TABLE 14: ALTERNATIVE A – 2040 PM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Device	No Build	Alternative A
1	Trent Ave/SR-290 & Argonne Rd	Signalized	<b>E / 72</b>	D / 45
2	Montgomery Ave & Argonne Rd	Signalized	<b>F / 150</b>	D / 46
3	Knox Ave & Argonne Rd	Signalized	<b>F / 107</b>	C / 22
4	I-90 WB On-Ramp & Argonne Rd	Signalized	<b>F / 80</b>	B / 19
5	I-90 WB Off-Ramp & Mullan Rd	Signalized	C / 31	D / 36
6	I-90 EB Off-Ramp & Argonne Rd	Signalized	B / 17	B / 18
7	I-90 EB On-Ramp & Mullan Rd	Signalized	B / 13	C / 23
8	Mission Ave & Argonne Rd	Signalized	B / 13	B / 13
9	Mission Ave & Mullan Rd	Signalized	C / 24	C / 33
10	Broadway Ave & Argonne Rd	Signalized	C / 23	No change
11	Broadway Ave & Mullan Rd	Signalized	C / 23	No change
12	Montgomery Dr & Woodruff Rd	Side-Street Stop Control	<b>F / 82</b>	<b>No change</b>
13	Trent Ave/SR-290 & University Rd	Side-Street Stop Control	<b>F / &gt;150</b>	<b>No change</b>
14	Montgomery Dr & University Rd	Side-Street Stop Control	C / 23	No change
15	Mission Ave & University Rd	Side-Street Stop Control	D / 34	No change
16	Broadway Ave & University Rd	Signalized	B / 17	No change
17	Montgomery Dr & Mansfield Ave	Roundabout	A / 7	No change
18	Mission Ave & Bowdish Rd	Side-Street Stop Control	D / 29	No change
19	Mansfield Ave & Pines Rd	Signalized	D / 54	No change
20	I-90 WB Ramps & Pines Rd	Signalized	D / 39	No change
21	Indiana Ave & I-90 WB Off-Ramp	Signalized	C / 35	No change
22	I-90 EB Ramps & Pines Rd	Signalized	C / 28	No change
23	Mission Ave & Pines Rd	Signalized	D / 50	No change
24	Broadway Ave & Pines Rd	Signalized	<b>F / 107</b>	<b>No change</b>

Source: Level of service for signalized and stop controlled intersections based on HCM2000 as reported in Synchro 7 output. Roundabout level of service based on HCM2000 as reported by Sidra 5.1



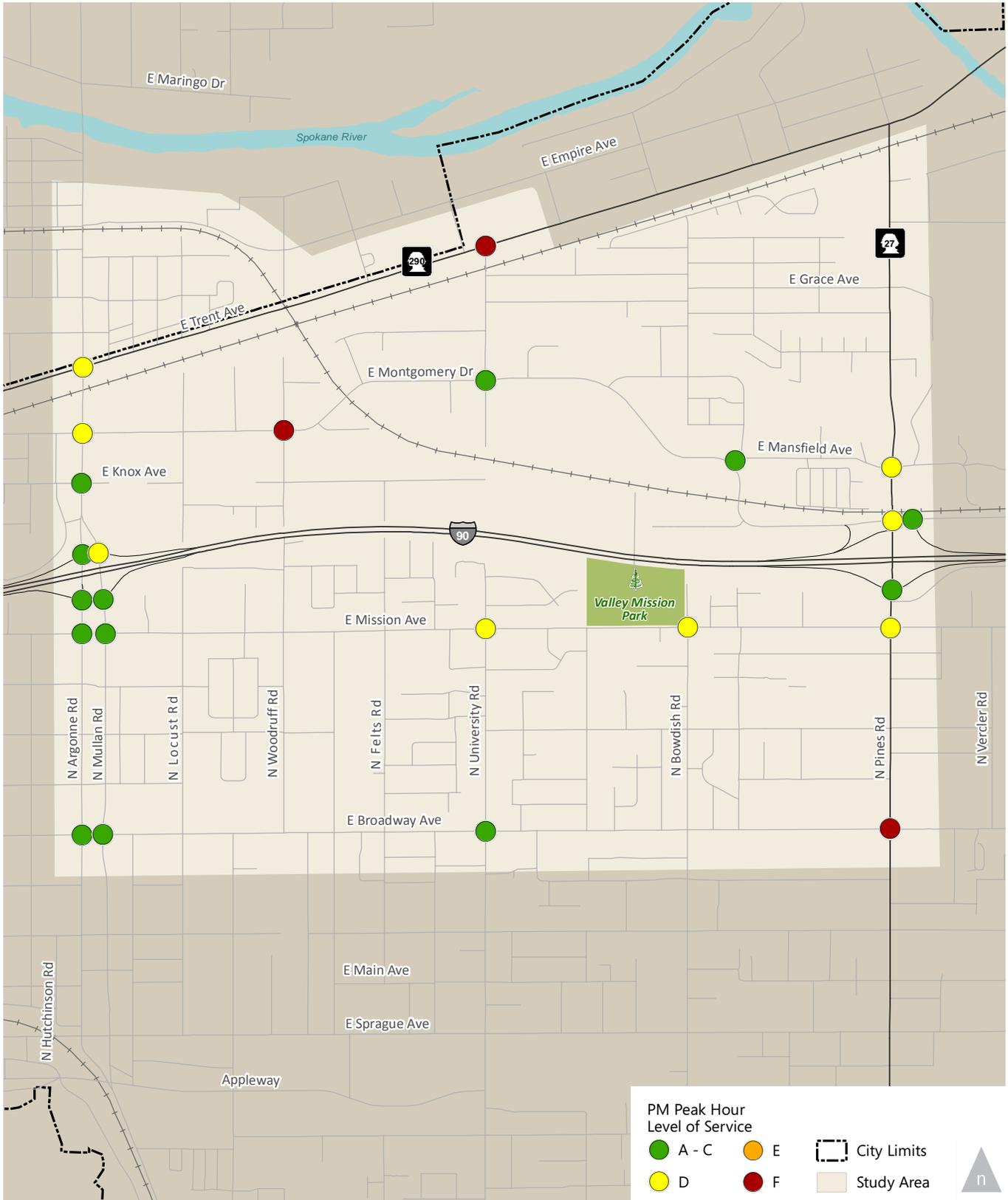


Figure 25.  
**Alternative A - New Southbound Lane on Argonne Road**  
**2040 PM Peak Hour Level of Service**



Constructing an additional southbound lane Argonne Road would dramatically reduce travel times, as shown in **Table 15**. The nearly seven minute trip through the corridor would drop to two minutes. Moreover, the time to travel from Montgomery Avenue to the westbound I-90 on-ramp would drop from six minutes to one minute. Northbound travel times through the corridor would increase slightly, although the difference is negligible. Based on the independent intersection LOS and travel time results, Alternative A is expected to provide substantial congestion relief over the No Build Alternative.

**TABLE 15: ALTERNATIVE A – 2040 PM PEAK HOUR TRAVEL TIME**

Segment	No Build Alternative		Alternative A	
	Northbound	Southbound	Northbound	Southbound
Argonne Road/Mullan Road: Trent Avenue to Mission Avenue	2:36	6:56	2:47	1:59
Argonne Road: Montgomery Avenue to WB I-90	N/A	6:05	N/A	0:58

Source: Fehr & Peers, 2013.

### 7.1.2.2 Alternative B – Four-Lane Diverging Diamond Interchange at Argonne Road

The four-lane diverging diamond interchange (DDI) at Argonne Road would provide some congestion relief, particularly for southbound vehicles traveling to the freeway. However, the cross-over intersections have limited capacity since only northbound or southbound traffic can travel at any given time. This results in only moderate improvements to southbound travel time. More southbound vehicles reaching the Argonne Road/Mission Avenue intersection results in substantially degraded operations at the Mullan Road/Mission Avenue intersection since it spends more time serving traffic on Mission Avenue. Results are shown in **Table 16**, **Table 17**, and **Figure 26**.



**TABLE 16: ALTERNATIVE B – 2040 PM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Device	No Build	Alternative B
1	Trent Ave/SR-290 & Argonne Rd	Signalized	<b>E / 72</b>	D / 45
2	Montgomery Ave & Argonne Rd	Signalized	<b>F / 150</b>	<b>E / 56</b>
3	Knox Ave & Argonne Rd	Signalized	<b>F / 107</b>	C / 30
4	I-90 WB On-Ramp & Argonne Rd	Signalized	<b>F / 80</b>	<b>E / 60</b>
5	I-90 WB Off-Ramp & Mullan Rd	Signalized	C / 31	N/A
6	I-90 EB Off-Ramp & Argonne Rd	Signalized	B / 17	D / 45
7	I-90 EB On-Ramp & Mullan Rd	Signalized	B / 13	N/A
8	Mission Ave & Argonne Rd	Signalized	B / 13	C / 20
9	Mission Ave & Mullan Rd	Signalized	C / 24	<b>F / 87</b>
10	Broadway Ave & Argonne Rd	Signalized	C / 23	No change
11	Broadway Ave & Mullan Rd	Signalized	C / 23	No change
12	Montgomery Dr & Woodruff Rd	Side-Street Stop Control	<b>F / 82</b>	<b>No change</b>
13	Trent Ave/SR-290 & University Rd	Side-Street Stop Control	<b>F / &gt;150</b>	<b>No change</b>
14	Montgomery Dr & University Rd	Side-Street Stop Control	C / 23	No change
15	Mission Ave & University Rd	Side-Street Stop Control	D / 34	No change
16	Broadway Ave & University Rd	Signalized	B / 17	No change
17	Montgomery Dr & Mansfield Ave	Roundabout	A / 7	No change
18	Mission Ave & Bowdish Rd	Side-Street Stop Control	D / 29	No change
19	Mansfield Ave & Pines Rd	Signalized	D / 54	No change
20	I-90 WB Ramps & Pines Rd	Signalized	D / 39	No change
21	Indiana Ave & I-90 WB Off-Ramp	Signalized	C / 35	No change
22	I-90 EB Ramps & Pines Rd	Signalized	C / 28	No change
23	Mission Ave & Pines Rd	Signalized	D / 50	No change
24	Broadway Ave & Pines Rd	Signalized	<b>F / 107</b>	<b>No change</b>

Source: Level of service for signalized and stop controlled intersections based on HCM2000 as reported in Synchro 7 output. Roundabout level of service based on HCM2000 as reported by Sidra 5.1



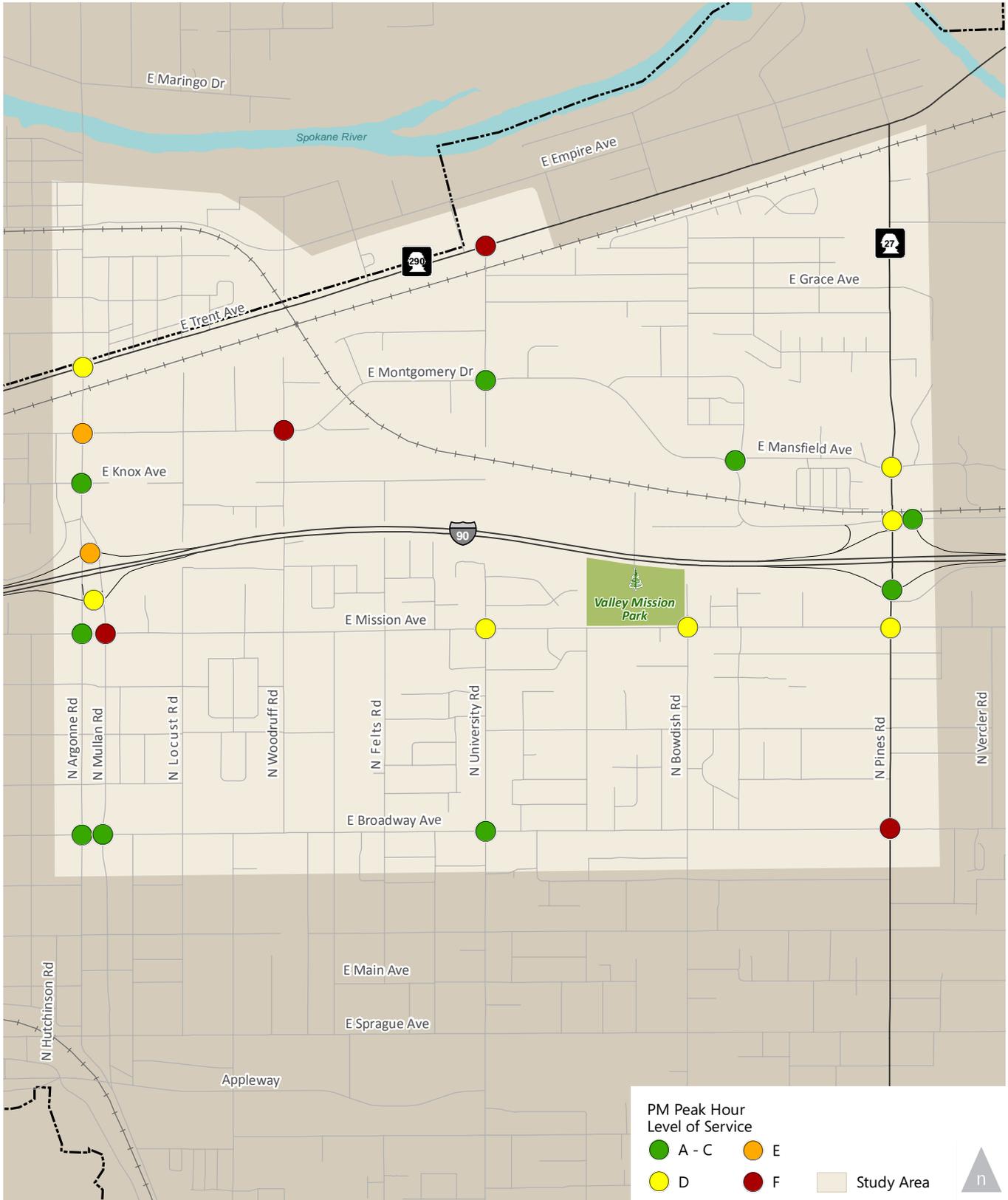


Figure 26.

**Alternative B - Four-Lane Diverging Diamond Interchange  
2040 PM Peak Hour Level of Service**

In terms of travel time, the four-lane DDI would create more balanced operations between northbound and southbound traffic. Although southbound traffic would see more than two minutes shaved off their travel time, northbound traffic would see an increase of just over two minutes. Southbound motorists traveling from Montgomery Drive to the westbound I-90 on-ramp would see a large time savings, with their trip falling from six minutes to under two minutes.

**TABLE 17: ALTERNATIVE B – 2040 PM PEAK HOUR TRAVEL TIME**

Segment	No Build Alternative		Alternative B	
	Northbound	Southbound	Northbound	Southbound
Argonne Road/Mullan Road: Trent Avenue to Mission Avenue	2:36	6:56	4:49	4:41
Argonne Road: Montgomery Avenue to WB I-90	N/A	6:05	N/A	1:42

Source: Fehr & Peers, 2013.

### 7.1.2.3 Alternative C – Six-Lane Diverging Diamond Interchange at Argonne Road

The six-lane diverging diamond interchange (DDI) at Argonne Road in this alternative adds a southbound lane for the interchange section over I-90 so that three lanes are provided in each direction. Operations are considerably improved due to the added capacity in comparison to the four-lane DDI. Only the Trent Avenue/Argonne Road intersection would still operate at a level of service E while intersections further south would realize substantial savings in vehicle delay. As opposed to the four-lane DDI, the Mission Avenue/Mullan Road intersection would not experience added delay with this alternative however the I-90 EB Off-ramp/Argonne Road would see a slight increase in delay. Results are shown in **Table 18**, **Table 19**, and **Figure 27**.



**TABLE 18: ALTERNATIVE C – 2040 PM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Device	No Build	Alternative C
1	Trent Ave/SR-290 & Argonne Rd	Signalized	<b>E / 72</b>	<b>E / 58</b>
2	Montgomery Ave & Argonne Rd	Signalized	<b>F / 150</b>	D / 52
3	Knox Ave & Argonne Rd	Signalized	<b>F / 107</b>	C / 22
4	I-90 WB On-Ramp & Argonne Rd	Signalized	<b>F / 80</b>	C / 29
5	I-90 WB Off-Ramp & Mullan Rd	Signalized	C / 31	N/A
6	I-90 EB Off-Ramp & Argonne Rd	Signalized	B / 17	C / 21
7	I-90 EB On-Ramp & Mullan Rd	Signalized	B / 13	N/A
8	Mission Ave & Argonne Rd	Signalized	B / 13	B / 19
9	Mission Ave & Mullan Rd	Signalized	C / 24	C / 22
10	Broadway Ave & Argonne Rd	Signalized	C / 23	No change
11	Broadway Ave & Mullan Rd	Signalized	C / 23	No change
12	Montgomery Dr & Woodruff Rd	Side-Street Stop Control	<b>F / 82</b>	<b>No change</b>
13	Trent Ave/SR-290 & University Rd	Side-Street Stop Control	<b>F / &gt;150</b>	<b>No change</b>
14	Montgomery Dr & University Rd	Side-Street Stop Control	C / 23	No change
15	Mission Ave & University Rd	Side-Street Stop Control	D / 34	No change
16	Broadway Ave & University Rd	Signalized	B / 17	No change
17	Montgomery Dr & Mansfield Ave	Roundabout	A / 7	No change
18	Mission Ave & Bowdish Rd	Side-Street Stop Control	D / 29	No change
19	Mansfield Ave & Pines Rd	Signalized	D / 54	No change
20	I-90 WB Ramps & Pines Rd	Signalized	D / 39	No change
21	Indiana Ave & I-90 WB Off-Ramp	Signalized	C / 35	No change
22	I-90 EB Ramps & Pines Rd	Signalized	C / 28	No change
23	Mission Ave & Pines Rd	Signalized	D / 50	No change
24	Broadway Ave & Pines Rd	Signalized	<b>F / 107</b>	<b>No change</b>

Source: Level of service for signalized and stop controlled intersections based on HCM2000 as reported in Synchro 7 output. Roundabout level of service based on HCM2000 as reported by Sidra 5.1



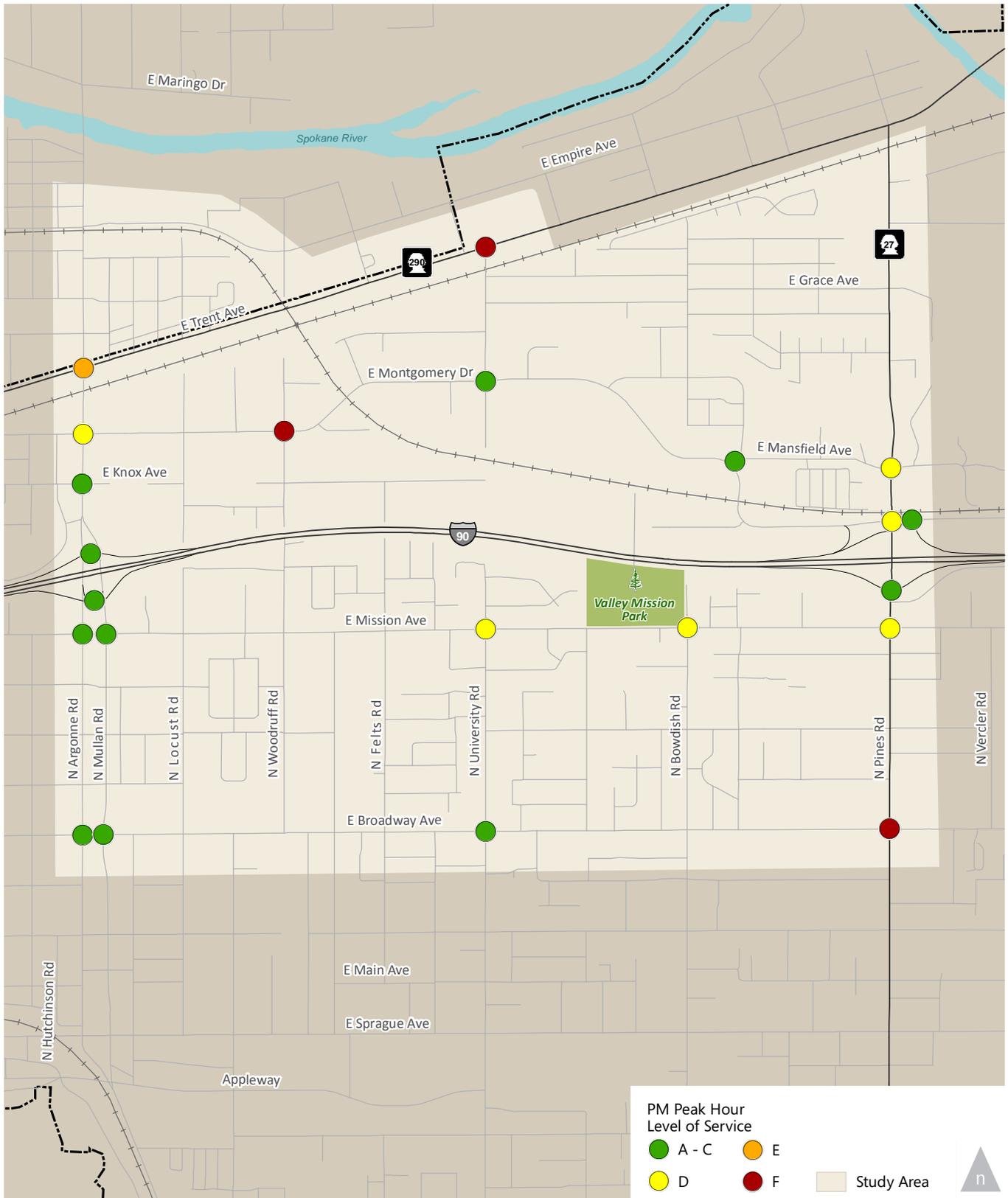


Figure 27.

**Alternative C - Six-Lane Diverging Diamond Interchange  
2040 PM Peak Hour Level of Service**

Similar to the four-lane alternative, the six-lane DDI would create more balanced operations between northbound and southbound traffic. Although the southbound movement would realize almost four minutes in travel time savings, northbound traffic would see an increase of almost two minutes. Southbound motorists traveling from Montgomery Drive to the westbound I-90 on-ramp would see a large time savings, with their trip falling from six minutes to just over a minute.

**TABLE 19: ALTERNATIVE C – 2040 PM PEAK HOUR TRAVEL TIME**

Segment	No Build Alternative		Alternative C	
	Northbound	Southbound	Northbound	Southbound
Argonne Road/Mullan Road: Trent Avenue to Mission Avenue	2:36	6:56	4:16	3:04
Argonne Road: Montgomery Avenue to WB I-90	N/A	6:05	N/A	1:09

Source: Fehr & Peers, 2013.

### 7.1.2.5 Alternative F – University Road Overpass

The University Road overpass would fundamentally alter the transportation network in the study area by providing a new north-south connection. Roughly 900 vehicles are forecasted to use the new bridge during the PM peak hour. The shift in travel patterns would require modification to several intersections along University Road to maintain acceptable operations<sup>2</sup>:

- Signal at Trent Avenue/University Road – Although the westbound movement on Trent Avenue is projected to experience the most delay with protected phasing, it is not advised to include permitted left turns due to the high speed of opposing traffic.
- Roundabout at Montgomery Drive/University Road – A signal was also tested at this location, but a roundabout is recommended due to its superior performance given the relatively uniform distribution of traffic on each approach. This location could accommodate an offset roundabout with minimal adverse impact to adjacent parcels.

<sup>2</sup> Peak hour volumes were extrapolated based on NCHRP 365 to complete a signal warrant analysis. The Trent Avenue/University Road and Montgomery Drive/University Road intersections would meet signal warrants for the peak hour, four-hour, and eight-hour vehicular volume scenarios. The Mission Avenue/University Road intersection would meet signal warrants for the peak hour and four-hour vehicular volumes scenarios. The signalized intersections were analyzed with fully actuated signal control assuming a 90 second cycle length without coordination. The roundabout analysis assumed a single lane roundabout with 130-foot diameter.



- Signal at Mission Avenue/University Road – A roundabout was also tested at this location; however, a signal is recommended because a 130-foot roundabout would impact residences on each of the four corners and the proximity to Mission Valley Park makes this an ideal location for the protected crossing of a signalized intersection due to high pedestrian volumes.

The LOS results shown in **Table 20**, **Table 21**, and **Figure 28** reflect operations after the above mitigation measures have been implemented.

While the University Road vehicle overpass would reduce through traffic volumes on Argonne Road to some degree, there would be a few more vehicles trying to access the westbound I-90 on-ramp. As noted in the No Build Alternative discussion, the turning movement from southbound Argonne Road to westbound I-90 is nearly at capacity in the future so these few (about 40) additional vehicles result in offsetting any benefit from the reduced through volumes. The net result is that the LOS along Argonne Road is slightly worse for the University Road overpass alternative because there are more cars queued in the outside lane, spilling back to the upstream intersections.

The construction of the University Road overpass would result in a substantial drop in the number of eastbound vehicles turning right at the Mansfield Avenue/Pines Road intersection. This reduction in volume decreases the average delay at that intersection. Delay is relatively unchanged for the remainder of intersections along the Pines Road corridor.

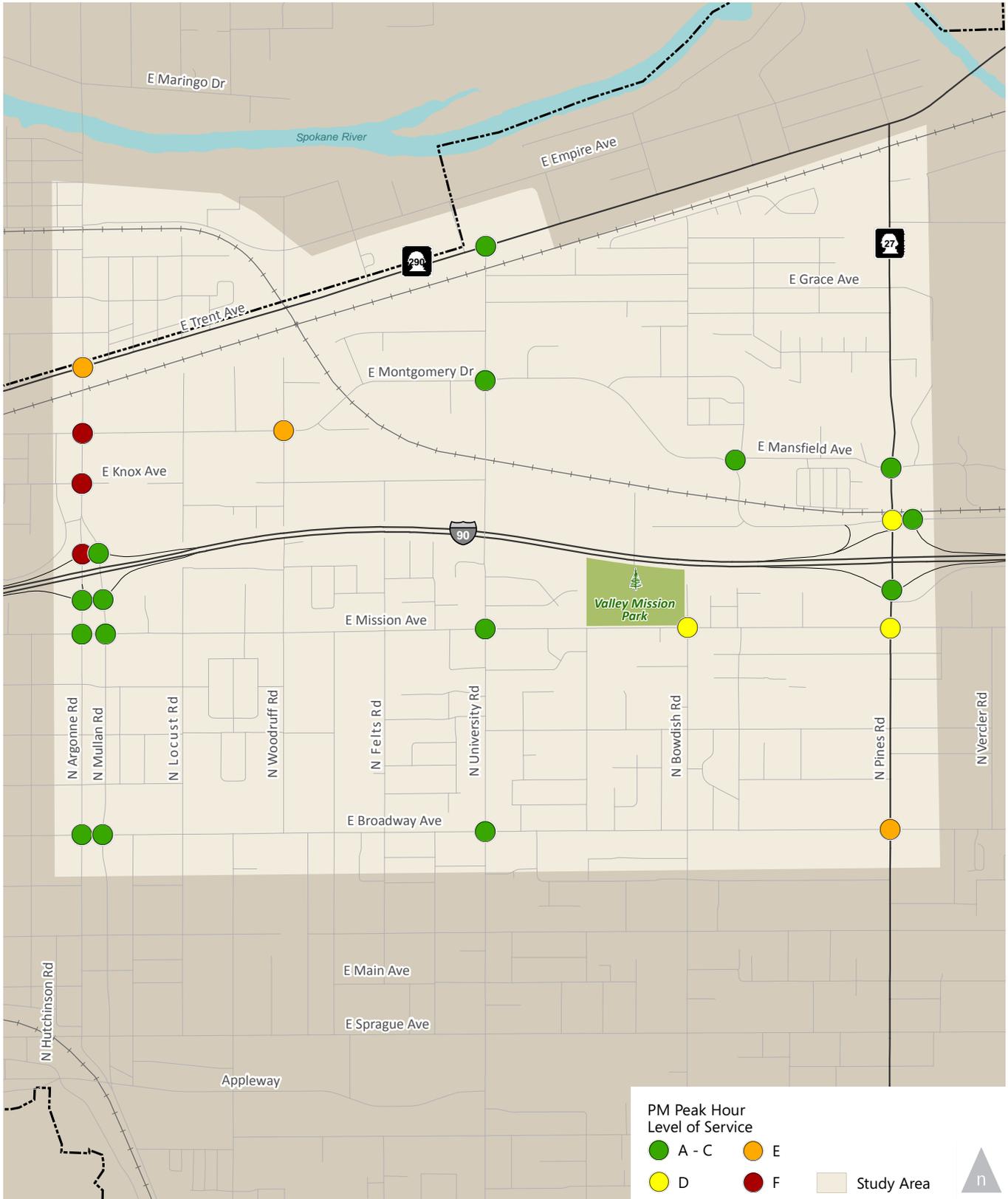
The Broadway Avenue/Pines Road intersection would continue to operate below the City's standard, but would improve from the LOS F operations under the No Build Alternative to LOS E under the University Road overpass alternative.

**TABLE 20: ALTERNATIVE F – 2040 PM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Device	No Build	Alternative F
1	Trent Ave/SR-290 & Argonne Rd	Signalized	<b>E / 72</b>	<b>E / 72</b>
2	Montgomery Ave & Argonne Rd	Signalized	<b>F / &gt;150</b>	<b>F / &gt;150</b>
3	Knox Ave & Argonne Rd	Signalized	<b>F / 107</b>	<b>F / &gt;150</b>
4	I-90 WB On-Ramp & Argonne Rd	Signalized	<b>F / 80</b>	<b>F / 87</b>
5	I-90 WB Off-Ramp & Mullan Rd	Signalized	C / 31	C / 29
6	I-90 EB Off-Ramp & Argonne Rd	Signalized	B / 17	B / 17
7	I-90 EB On-Ramp & Mullan Rd	Signalized	B / 13	A / 10
8	Mission Ave & Argonne Rd	Signalized	B / 13	B / 13
9	Mission Ave & Mullan Rd	Signalized	C / 24	C / 23
10	Broadway Ave & Argonne Rd	Signalized	C / 23	C / 23
11	Broadway Ave & Mullan Rd	Signalized	C / 23	C / 24
12	Montgomery Dr & Woodruff Rd	Side-Street Stop Control	<b>F / 82</b>	E / 45
13	Trent Ave/SR-290 & University Rd	<b>Signalized in Alternative F</b>	<b>F / &gt;150</b>	B / 18
14	Montgomery Dr & University Rd	<b>Roundabout in Alternative F</b>	C / 23	B / 11
15	Mission Ave & University Rd	<b>Signalized in Alternative F</b>	D / 34	C / 34
16	Broadway Ave & University Rd	Signalized	B / 17	C / 29
17	Montgomery Dr & Mansfield Ave	Roundabout	A / 7	A / 7
18	Mission Ave & Bowdish Rd	Side-Street Stop Control	D / 29	D / 28
19	Mansfield Ave & Pines Rd	Signalized	D / 54	B / 18
20	I-90 WB Ramps & Pines Rd	Signalized	D / 39	D / 36
21	Indiana Ave & I-90 WB Off-Ramp	Signalized	C / 35	C / 29
22	I-90 EB Ramps & Pines Rd	Signalized	C / 28	C / 27
23	Mission Ave & Pines Rd	Signalized	D / 50	D / 48
24	Broadway Ave & Pines Rd	Signalized	<b>F / 107</b>	<b>E / 80</b>

Source: Level of service for signalized and stop controlled intersections based on HCM2000 as reported in Synchro 7 output. Roundabout level of service based on HCM2000 as reported by Sidra 5.1





Note: This analysis assumes signals at Trent/University Road and Mission/University Road and a roundabout at Montgomery/University Road.

Figure 28.

**Alternative F - University Road Bridge  
2040 PM Peak Hour Level of Service**



Travel times are similar between the No Build and the University Road overpass options. The through trips along the corridor are expected to vary by only three seconds, a negligible amount. Travel from Montgomery Drive to the I-90 Westbound On-ramp is expected to increase slightly.

**TABLE 21: ALTERNATIVE F – 2040 PM PEAK HOUR TRAVEL TIME**

Segment	No Build Alternative		Alternative F	
	Northbound	Southbound	Northbound	Southbound
Argonne Road/Mullan Road: Trent Avenue to Mission Avenue	2:36	6:56	2:33	6:59
Argonne Road: Montgomery Avenue to WB I-90	N/A	6:05	N/A	6:33

Source: Fehr & Peers, 2013.

#### 7.1.2.6 Alternative I – Pines Road Signal and Turn Pocket Modifications

**Table 22** and **Figure 29** summarize the LOS results for Alternative I, which includes signal and turn pocket modifications along Pines Road. The intersection at Pines Road & Mission Avenue currently operates with split phasing for eastbound and westbound traffic. An alternative configuration was analyzed to determine whether the removal of split phasing would have an impact on operations. The proposed configuration includes two eastbound left lanes and one shared eastbound through/right lane. The westbound approach includes separate lanes for each movement (left, through, and right). Simulation indicated that this change would have a minimal impact on operations. The primary advantage of this configuration is that both through movements can occur concurrently. However, the through movements are not the dominant flows at this location, so the benefit is minimal. The eastbound left and westbound right movements would still be served for the same amount of green time. No discernible travel time benefits were identified.



**TABLE 22: ALTERNATIVE I – 2040 PM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	Traffic Control Device	No Build	Alternative I
1	Trent Ave/SR-290 & Argonne Rd	Signalized	<b>E / 72</b>	<b>No change</b>
2	Montgomery Ave & Argonne Rd	Signalized	<b>F / 150</b>	<b>No change</b>
3	Knox Ave & Argonne Rd	Signalized	<b>F / 107</b>	<b>No change</b>
4	I-90 WB On-Ramp & Argonne Rd	Signalized	<b>F / 80</b>	<b>No change</b>
5	I-90 WB Off-Ramp & Mullan Rd	Signalized	C / 31	No change
6	I-90 EB Off-Ramp & Argonne Rd	Signalized	B / 17	No change
7	I-90 EB On-Ramp & Mullan Rd	Signalized	B / 13	No change
8	Mission Ave & Argonne Rd	Signalized	B / 13	No change
9	Mission Ave & Mullan Rd	Signalized	C / 24	No change
10	Broadway Ave & Argonne Rd	Signalized	C / 23	No change
11	Broadway Ave & Mullan Rd	Signalized	C / 23	No change
12	Montgomery Dr & Woodruff Rd	Side-Street Stop Control	<b>F / 82</b>	<b>No change</b>
13	Trent Ave/SR-290 & University Rd	Side-Street Stop Control	<b>F / &gt;150</b>	<b>No change</b>
14	Montgomery Dr & University Rd	Side-Street Stop Control	C / 23	No change
15	Mission Ave & University Rd	Side-Street Stop Control	D / 34	No change
16	Broadway Ave & University Rd	Signalized	B / 17	No change
17	Montgomery Dr & Mansfield Ave	Roundabout	A / 7	No change
18	Mission Ave & Bowdish Rd	Side-Street Stop Control	D / 29	No change
19	Mansfield Ave & Pines Rd	Signalized	D / 54	<b>E / 61</b>
20	I-90 WB Ramps & Pines Rd	Signalized	D / 39	D / 40
21	Indiana Ave & I-90 WB Off-Ramp	Signalized	C / 35	C / 30
22	I-90 EB Ramps & Pines Rd	Signalized	C / 28	C / 27
23	Mission Ave & Pines Rd	Signalized	D / 50	D / 46
24	Broadway Ave & Pines Rd	Signalized	<b>F / 107</b>	<b>No change</b>

Source: Level of service for signalized and stop controlled intersections based on HCM2000 as reported in Synchro 7 output. Roundabout level of service based on HCM2000 as reported by Sidra 5.1



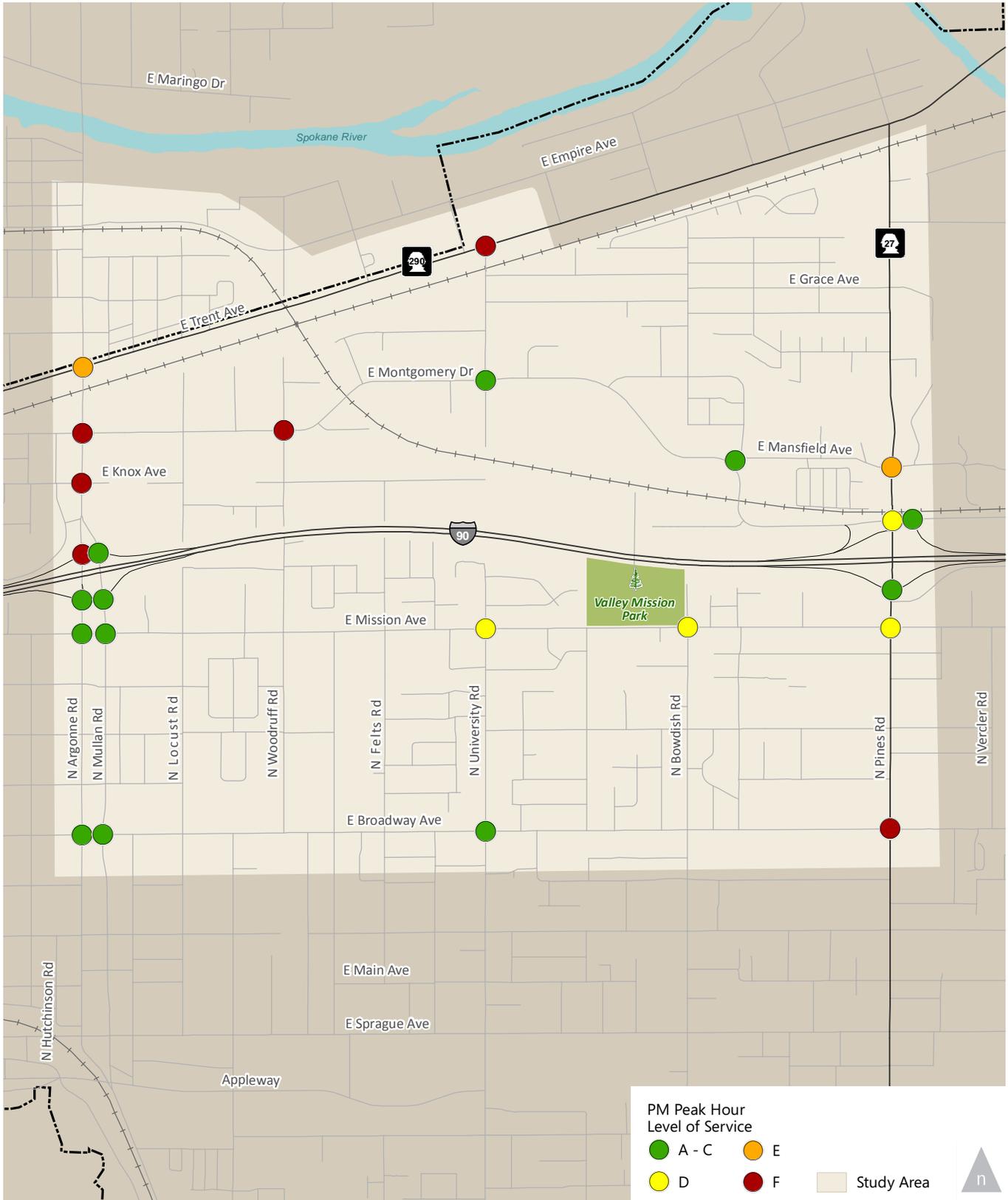


Figure 29.

**Alternative I - Pines Signal Modifications  
2040 PM Peak Hour Level of Service**

**7.1.2.7 Summary of Alternatives**

This section includes summary tables showing each alternative’s results for PM peak hour travel time and PM peak hour intersection level of service. **Table 23** provides a summary of peak hour travel time for Alternatives A, B, D, and F. No discernible travel time benefits were identified for Alternative I. **Table 24** provides a summary of peak hour intersection level of service for Alternatives A, B, C, F, and I.

**TABLE 23: SUMMARY OF ALTERNATIVES – 2040 PM PEAK HOUR TRAVEL TIME**

		Argonne Road/Mullan Road: Trent Avenue to Mission Avenue	Argonne Road: Montgomery Avenue to WB I-90:
<b>No Build Alternative</b>	Northbound	2:36	N/A
	Southbound	6:56	6:05
<b>Alternative A</b>	Northbound	2:47	N/A
	Southbound	1:59	0:58
<b>Alternative B</b>	Northbound	4:49	N/A
	Southbound	4:41	1:42
<b>Alternative C</b>	Northbound	4:16	N/A
	Southbound	3:04	1:09
<b>Alternative F</b>	Northbound	2:33	N/A
	Southbound	6:59	6:33

Note: No discernible travel time benefits were identified for Alternative I.

**TABLE 24: SUMMARY OF ALTERNATIVES – 2040 PM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	No Build	Alt A	Alt B	Alt C	Alt F	Alt I
1	Trent Ave/SR-290 & Argonne Rd	<b>E / 72</b>	D / 45	D / 45	<b>E / 58</b>	<b>E / 72</b>	<b>No change</b>
2	Montgomery Ave & Argonne Rd	<b>F / 150</b>	D / 46	<b>E / 56</b>	D / 52	<b>F / &gt;150</b>	<b>No change</b>
3	Knox Ave & Argonne Rd	<b>F / 107</b>	C / 22	C / 30	C / 22	<b>F / &gt;150</b>	<b>No change</b>
4	I-90 WB On-Ramp & Argonne Rd	<b>F / 80</b>	B / 19	<b>E / 60</b>	C / 29	<b>F / 87</b>	<b>No change</b>
5	I-90 WB Off-Ramp & Mullan Rd	C / 31	D / 36	N/A	N/A	C / 29	No change
6	I-90 EB Off-Ramp & Argonne Rd	B / 17	B / 18	D / 45	C / 21	B / 17	No change
7	I-90 EB On-Ramp & Mullan Rd	B / 13	C / 23	N/A	N/A	A / 10	No change
8	Mission Ave & Argonne Rd	B / 13	B / 13	C / 20	B / 19	B / 13	No change
9	Mission Ave & Mullan Rd	C / 24	C / 33	<b>F / 87</b>	C / 22	C / 23	No change
10	Broadway Ave & Argonne Rd	C / 23	No change	No change	No change	C / 23	No change
11	Broadway Ave & Mullan Rd	C / 23	No change	No change	No change	C / 24	No change
12	Montgomery Dr & Woodruff Rd	<b>F / 82</b>	<b>No change</b>	<b>No change</b>	<b>No change</b>	E / 45	<b>No change</b>
13	Trent Ave/SR-290 & University Rd	<b>F / &gt;150</b>	<b>No change</b>	<b>No change</b>	<b>No change</b>	B / 18	<b>No change</b>
14	Montgomery Dr & University Rd	C / 23	No change	No change	No change	B / 11	No change
15	Mission Ave & University Rd	D / 34	No change	No change	No change	C / 34	No change
16	Broadway Ave & University Rd	B / 17	No change	No change	No change	C / 29	No change
17	Montgomery Dr & Mansfield Ave	A / 7	No change	No change	No change	A / 7	No change



**TABLE 24: SUMMARY OF ALTERNATIVES – 2040 PM PEAK HOUR INTERSECTION LEVEL OF SERVICE**

ID	Intersection	No Build	Alt A	Alt B	Alt C	Alt F	Alt I
18	Mission Ave & Bowdish Rd	D / 29	No change	No change	No change	D / 28	No change
19	Mansfield Ave & Pines Rd	D / 54	No change	No change	No change	B / 18	<b>E / 61</b>
20	I-90 WB Ramps & Pines Rd	D / 39	No change	No change	No change	D / 36	D / 40
21	Indiana Ave & I-90 WB Off-Ramp	C / 35	No change	No change	No change	C / 29	C / 30
22	I-90 EB Ramps & Pines Rd	C / 28	No change	No change	No change	C / 27	C / 27
23	Mission Ave & Pines Rd	D / 50	No change	No change	No change	D / 48	D / 46
24	Broadway Ave & Pines Rd	<b>F / 107</b>	<b>No change</b>	<b>No change</b>	<b>No change</b>	<b>E / 80</b>	<b>No change</b>



### 7.1.3 NEIGHBORHOOD IMPACTS

Building a new vehicle bridge at University Road, would have substantial neighborhood impacts. Residents have expressed concerns with the increased traffic, aesthetics, and effect on property values that a new bridge would bring. In contrast, the improvements at Argonne and Pines would have little neighborhood effect, as the improvements are largely within the existing right-of-way and thus would not affect nearby residents.

### 7.1.4 CONFLICTS WITH EXISTING INFRASTRUCTURE

Alternative I would not conflict with existing infrastructure, since the only changes would relate to signals along the existing Pines corridor. Alternatives A, B, C, and F would require more extensive construction and new infrastructure and would therefore conflict with existing power lines and other utilities, and in the case of Alternative F, the UPRR tracks.

### 7.1.5 ENVIRONMENTAL IMPACTS

Alternatives A, B, C, and I are expected to have minimal environmental impacts. The only potential issue is the 1,000 foot wellhead protection zone bordering Mullan Road north of I-90. There are no wetlands or known historic or cultural sites at the existing interchanges. Alternative F could have potentially high environmental impacts due to the landing within the 1,000 foot wellhead protection zone and the alignment crossing the vehicle storage yard which could create soil contamination issues.

### 7.1.6 CONSISTENCY WITH BIKE AND PEDESTRIAN MASTER PROGRAM

Alternatives A, B, C, and I do not include any components of the BPMP, nor do they substantially advance the goals of the BPMP. However, Alternatives A, B, and C would include improved pedestrian facilities to cross the freeway, although they would not provide new connections beyond the interchange area. Alternative F creates a new pedestrian and bicycle connection along University Road, as cited in the BPMP. Therefore, it is rated as being highly consistent with the BPMP.

### 7.1.7 TRANSIT ACCOMMODATION

STA is considering constructing park & ride lots to the north and south of I-90 at the Argonne Road interchange. The park & ride lots would serve freeway stops and be connected by a pedestrian bridge. Alternative A could improve the accommodation of this plan since it offers the opportunity to build a new



pedestrian connection. Alternatives B and C may be problematic for the park & ride concept since they would require pedestrians to cross the roadway at an uncontrolled intersection.

### 7.1.8 PEDESTRIAN AND BICYCLE DAILY FORECAST

Alternatives A, B, C, and I would not create new connections for pedestrians and bicyclists. Therefore, they are predicted to carry 250 daily pedestrians and bicycles, the same as projected for the No Build Alternative. Alternative F would create a new connection, and is projected to carry substantially more travelers—420 pedestrians and bicyclists daily.

### 7.1.9 CONNECTIVITY TO VALLEY MISSION PARK

As described in the previous section, the only congestion relief alternative that also increases pedestrian and bicycle connectivity is Alternative F. Refer to **Figure 30** and **Figure 31** for the thirty-minute walksheds and bikesheds from Valley Mission Park. Although it was not rated as favorably when compared to the other pedestrian and bicycle options, Alternative F would result in a substantial increase in connectivity for pedestrians and bicycles compared to the No Build Alternative.

### 7.1.10 PREFERRED ALTERNATIVE

The City, Technical Advisory Committee, and consultant team have weighed the drawbacks and benefits of each option to identify a preferred alternative for congestion relief. Two complementary alternatives have been selected: Alternative A which constructs an additional southbound lane on Argonne Road and Alternative I which makes several minor modifications to the Pines Road interchange. The additional southbound lane on Argonne Road provides the most congestion relief, accommodates STA's plans for a flyer bus stop, and has minimal environmental and neighborhood impacts. The Pines Road improvements can also be made for a relatively low cost, with low impacts to the environment and neighborhoods.



## 7.2 PEDESTRIAN AND BICYCLE CONNECTIVITY ALTERNATIVES

There are four pedestrian and bicycle connectivity projects under consideration:

- Alternative D: Pedestrian/bicycle bridge at University Road
- Alternative E: Pedestrian/bicycle/emergency vehicle bridge at University Road
- Alternative G: Pedestrian/bicycle bridges along Valley Mission Park/Millwood Trail alignment
- Alternative H: Pedestrian/bicycle bridge along Valley Mission Park/Montgomery alignment

The performance of these four alternatives, in addition to the No Build Alternative, is compared for each metric in **Table 25**.



**TABLE 25: PERFORMANCE METRICS FOR PEDESTRIAN AND BICYCLE CONNECTIVITY ALTERNATIVES**

Performance Measure	No Build Alternative: No congestion relief or ped/bike connectivity projects	Alternative D: University - Ped/bike bridge	Alternative E: University - Ped/bike/EV bridge	Alternative G: Valley Mission Park/Trail - Ped/bike bridges (UPRR & I-90) <sup>1</sup>	Alternative H: Valley Mission Park/Montgomery - Ped/bike bridge
<b>Cost</b>	\$0	\$5.3M	\$7.0M	\$6.0M	\$5.3M
<b>Congestion Relief</b>	○	○	○	○	○
<b>Neighborhood Impacts</b>	●	◐	◐	●	●
<b>Conflicts with Existing Infrastructure/Utilities</b>	●	◐	○	◐	◐
<b>Environmental Impacts</b>	●	◐	◐	◐	●
<b>Consistency with Bike and Pedestrian Master Program</b>	○	●	●	◐	◐
<b>Connectivity to Spokane Valley/Millwood Trail</b>	○	●	●	●	●
<b>Pedestrian and Bicycle Daily Forecast</b>	250	420	420	450	480
<b>Connectivity to Valley Mission Park</b>	○	◐	◐	●	●

Source: Fehr & Peers, 2013.

○ Performs Worse Performs Better ●

Notes: 1. This project assumes that the portion of the Spokane Valley/Millwood Trail between the two bridges would be constructed.



### 7.2.1 COST

The cost range among the four connectivity projects is relatively narrow with Alternatives D and H at \$5.3 million, Alternative G at \$6.0 million, and Alternative E at \$7.0 million. **Table 26** summarizes the relative lengths and widths of the bridge and trail components. Alternative E has the highest cost since it would accommodate emergency vehicles in addition to pedestrians and bicyclists. Although the remaining three alternatives would serve only pedestrians and bicyclists, Alternative G has a slightly higher cost because two separate bridges would be constructed—one over the highway and one over the UPRR tracks—with a 3,800 foot section of trail connecting the two.

**TABLE 26: COST BY ALTERNATIVE**

Alt	Length of Bridge(s) (feet)	Width of Bridge (feet)	Length of Trail (feet)	Cost
D	410	14	1,500	\$5.3M
E	410	20	1,500	\$7.0M
G	400 <sup>1</sup>	14	3,800	\$6.0M
H	400	14	2,400	\$5.3M

<sup>1</sup> 250 ft. bridge across 1-90 and 150 ft. bridge across railroad.

### 7.2.2 CONGESTION RELIEF

The connectivity alternatives would have no discernible effect on traffic in the study area because the bridges would carry only pedestrians, bicycles, and in the case of Alternative E, a small number of emergency vehicles. Vehicle traffic would function as described for the No Build Alternative in the Congestion Relief Alternatives section.

### 7.2.3 NEIGHBORHOOD IMPACTS

The University Road alternatives (D and E) would have moderate neighborhood impacts. Impacts may be noticeable for residents in the immediate vicinity of the bridge landings, but would be minimal for most residents and businesses. The Valley Mission Park alternatives (G and H) are expected to have minimal neighborhood impacts.



#### 7.2.4 CONFLICTS WITH EXISTING INFRASTRUCTURE

The alternatives that would carry only pedestrians and bicycles (Alternatives D, G, and H) would have minimal conflicts with existing infrastructure. The main concerns are maintaining the required clearance over the UPRR tracks, as well as clearance below the existing power lines. Alternative E would have more extensive conflicts since it would carry emergency vehicles, and thus require additional clearance due to a deeper vehicle deck.

#### 7.2.5 ENVIRONMENTAL IMPACTS

All four connectivity alternatives would either border or cross the vehicle storage yard on the north side of I-90, which could lead to potential soil contamination issues. In addition, the bridge landings for Alternatives D, E, and G would be within 1,000 feet of a wellhead protection zone. Therefore, Alternative H is expected to result in minimal environmental impacts, while Alternatives D, E, and G are expected to result in moderate environmental impacts.

#### 7.2.6 CONSISTENCY WITH BIKE AND PEDESTRIAN MASTER PROGRAM

The City's BPMP recommends a pedestrian and bicycle bridge across I-90 along University Road. This alignment would connect with the existing bicycle lanes along University Road south of Mission Avenue. Since Alternatives D and E are explicitly included in the Program, they are rated high in consistency with the BPMP. Although Alternatives G and H deviate from the specific alignment of the pedestrian and bicycle bridge shown in the BPMP, they still achieve the Program's goals of providing a comprehensive bikeway and pedestrian system and increasing safety and accessibility. Therefore, they are rated as moderately consistent with the BPMP.

#### 7.2.7 CONNECTIVITY TO SPOKANE VALLEY/MILLWOOD TRAIL

All four of the connectivity alternatives would provide excellent access to the Spokane Valley/Millwood Trail although they would connect at slightly different locations. Compared to the No Build Alternative, the connectivity alternatives perform far better in this measure.

#### 7.2.8 PEDESTRIAN AND BICYCLE DAILY FORECAST

All four connectivity alternatives are projected to carry substantially more pedestrians and bicycles across the freeway than the No Build Alternative. If none of the alternatives were put in place, Argonne, Mullan, and Pines Roads are expected to carry 250 pedestrians and bicycles across the freeway daily. Alternatives



D and E—located along University Road—are projected to carry 420 pedestrians and bicycles across the freeway daily. Alternative H is most aligned with the desire lines across the freeway and therefore is expected to carry the highest number of pedestrians and bicycles, at 480. Alternative G would carry slightly fewer, at 450. In conjunction with each of the connectivity alternatives, Argonne, Mullan, and Pines Roads would continue to carry some smaller number of pedestrians and bicycles because those routes may still be more convenient for some travelers.

### 7.2.9 CONNECTIVITY TO VALLEY MISSION PARK

Alternatives G and H would provide the best connections to Valley Mission Park, a key concern heard from residents at the first public workshop. Alternatives D and E would provide a substantial improvement to connectivity when compared to the No Build Alternative, but would be slightly less convenient than the direct park access alternatives.

Thirty minute walksheds and bikesheds from Valley Mission Park are shown in **Figure 30** and **Figure 31**, respectively. The walkshed shows how far a pedestrian could travel in 30 minutes starting from Valley Mission Park. To quantify how each alternative would improve accessibility, the total households and employment in 2040 within the walkshed was estimated. The results are shown in **Table 27** as well as in the figures. The No Build walkshed demonstrates how inaccessible Valley Mission Park currently is for pedestrians north of I-90. Within a 30-minute walk, a pedestrian could not progress far beyond the Pines Road crossing of I-90. Under the No Build Alternative, 2,900 households and 3,200 jobs fall within the walkshed.

While Alternatives D and E would provide a substantial improvement to accessibility for the western half of the study area north of I-90, the residential neighborhood to the northeast would still fall outside the walkshed. However, this would capture another 300 households and 1,800 jobs within the walkshed. Alternative G would provide more coverage, while Alternative H would create the largest walkshed containing 3,700 households and 5,400 jobs.

The 30-minute bikeshed tells a similar story, although at a more regional scale. For this analysis, it was assumed that the average bicyclist would not want to cross I-90 on hostile roadways such as Argonne, Mullan, and Pines Roads. While a small contingent of “strong and fearless” cyclists may use busy arterials like Argonne, Mullan, and Pines, this project is aimed at accommodating a larger proportion of cyclists, often called the “8 to 80” group. This focus on capturing a wider population of cyclists results in a bikeshed almost exclusively located south of I-90. Since the connectivity alternatives are fairly similar on this more regional scale, one representative bikeshed was completed to show how a new connection



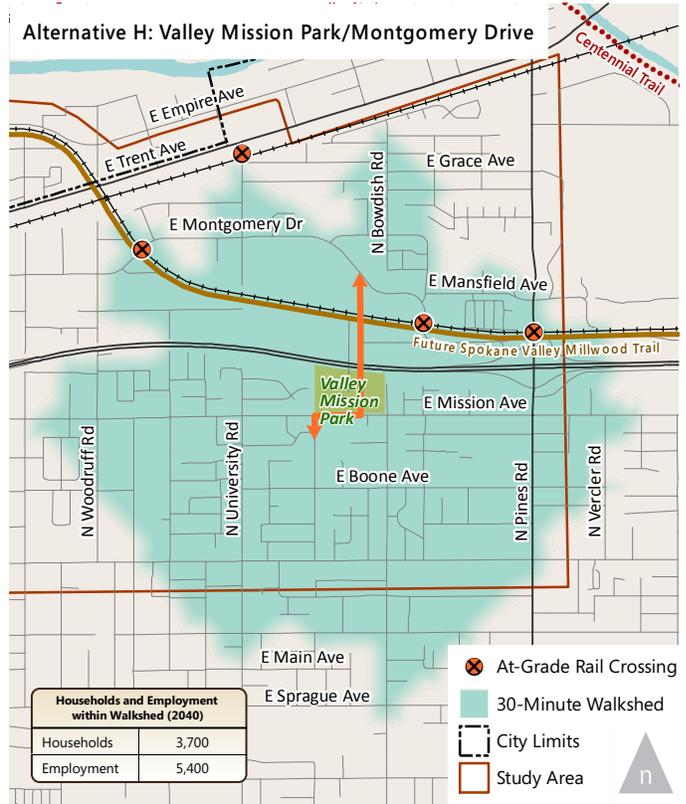
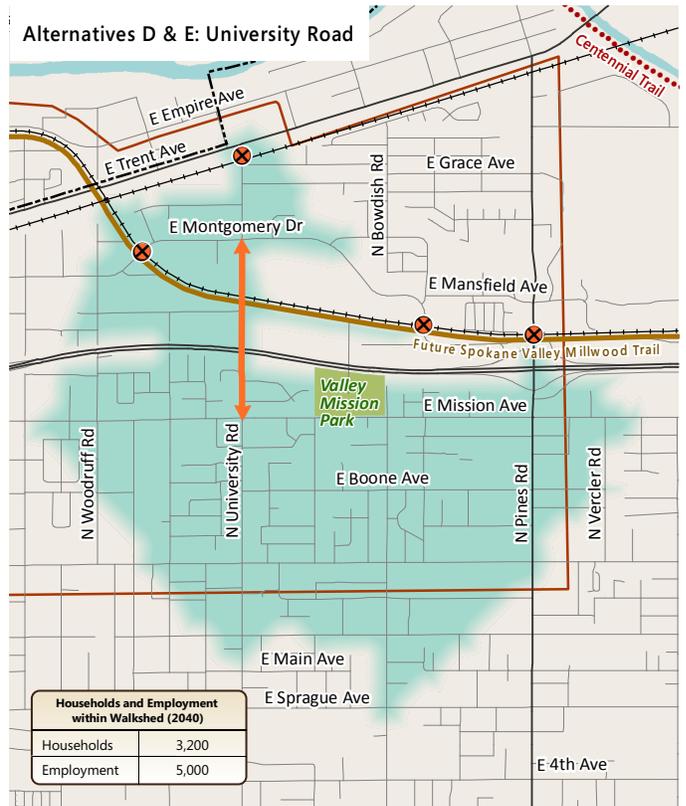
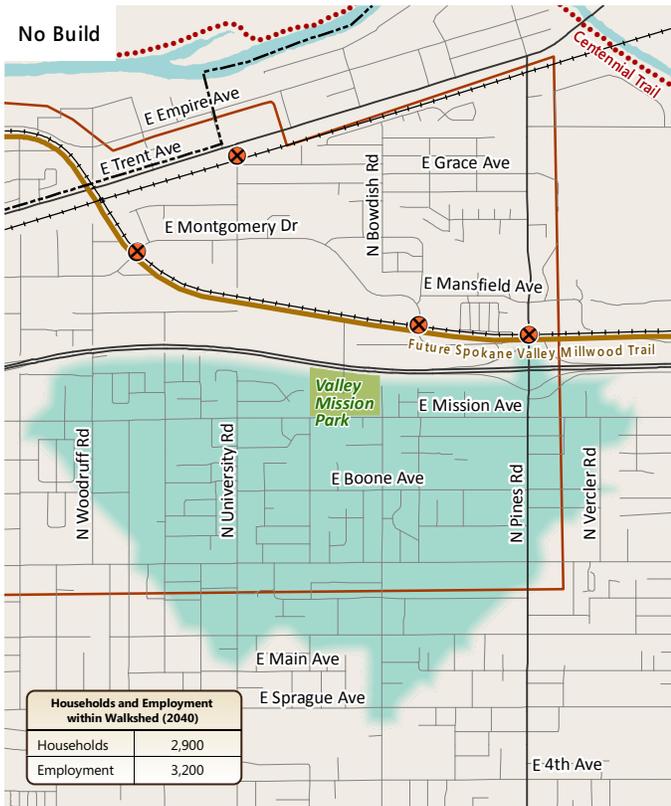
would improve accessibility. The entire study area, as well as far beyond, would fall within the new bikeshed. Households within the walkshed would increase by 12,400 (46 percent) and employment within the walkshed would increase by 11,500 (35 percent).

**TABLE 27: HOUSEHOLDS AND EMPLOYMENT WITHIN 30-MINUTE WALKSHED AND BIKESHED FROM VALLEY MISSION PARK**

Alternative	30 Minute Walkshed		30 Minute Bikeshed	
	Households	Employment	Households	Employment
No Build Alternative	2,900	3,200	27,200	32,600
Alternative D: University – Ped/bike bridge	3,200	5,000		
Alternative E: University – Ped/bike/EV bridge	3,200	5,000		
Alternative G: Valley Mission Park/Millwood Trail – Ped/bike bridge	3,500	5,300	39,600	44,100
Alternative H: Valley Mission Park/Montgomery – Ped/bike bridge	3,700	5,400		

Source: Fehr & Peers, 2013.

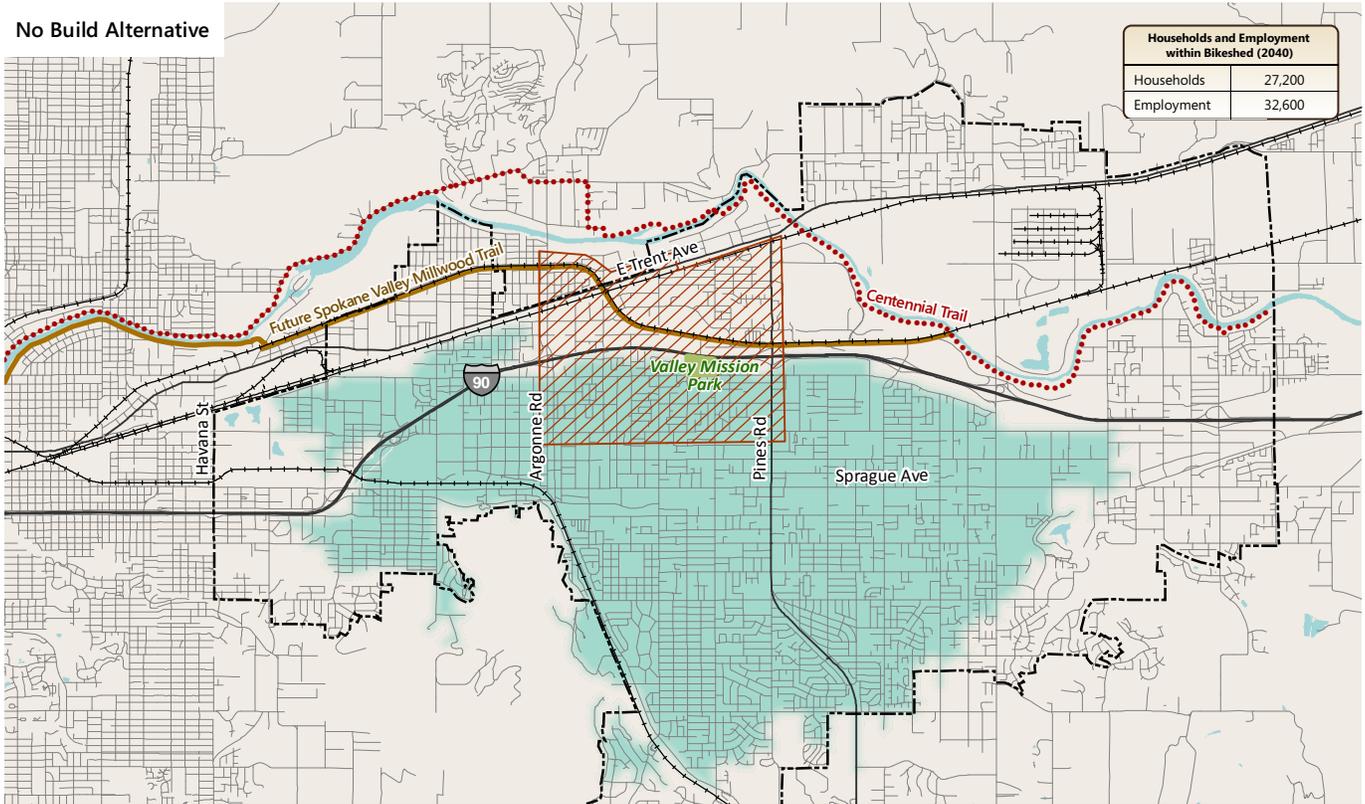




- At-Grade Rail Crossing
- 30-Minute Walkshed
- City Limits
- Study Area
- n

Figure 30.  
30-Minute Walkshed from Valley Mission Park

No Build Alternative



Connectivity Alternatives

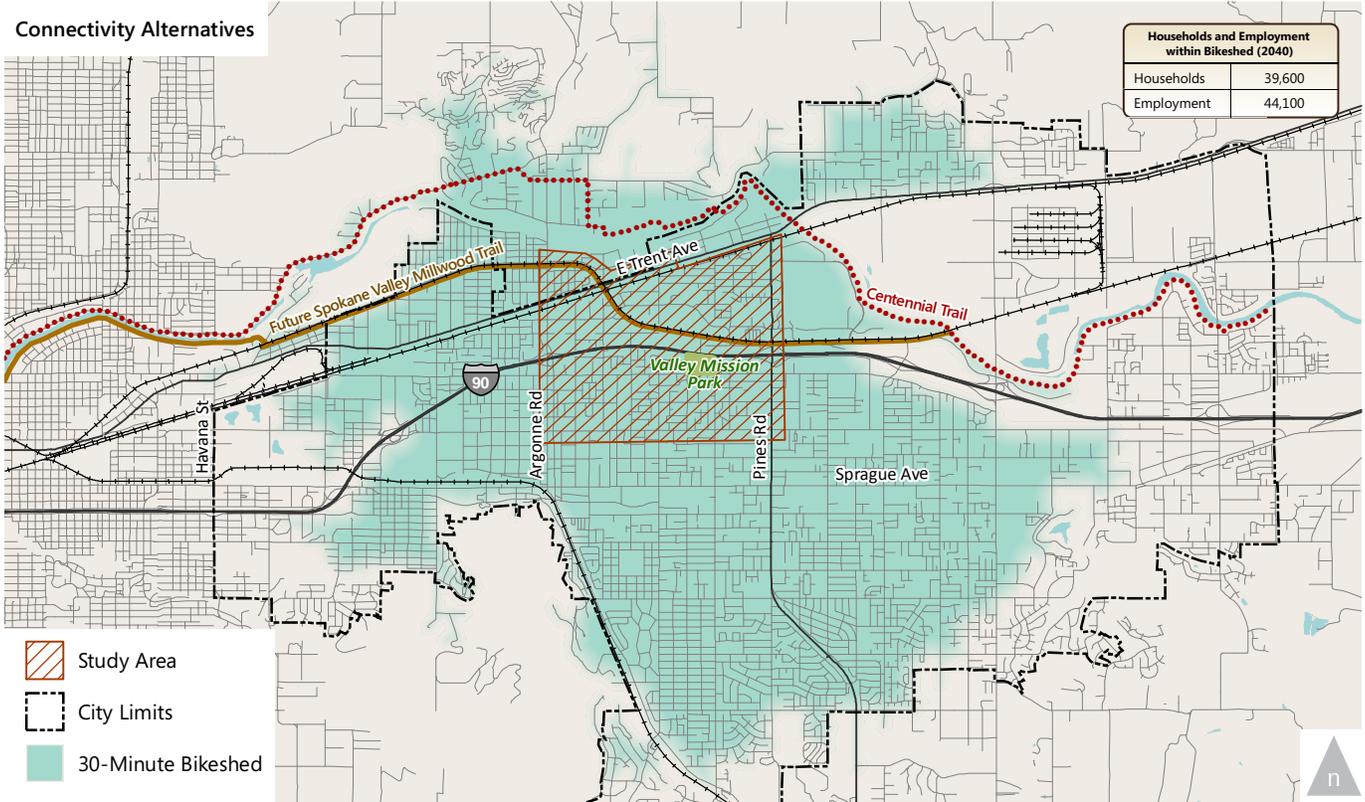


Figure 31.

30-Minute Bikeshed from Valley Mission Park



### 7.2.10 RECOMMENDED ALTERNATIVE

The City, Technical Advisory Committee, and consultant team have weighed the drawbacks and benefits of each option to identify the best pedestrian and bicycle connectivity alternative. The selected option is Alternative H, which would construct a pedestrian and bicycle overpass from Valley Mission Park to Montgomery Drive. This option was selected due to its high pedestrian and bicycle forecast, connectivity to Valley Mission Park, low neighborhood impacts, low environmental impacts, and low cost in relation to the other connectivity alternatives.

While pedestrian and bicycle mobility remains an important goal of the City, it was determined that the most immediate need is for congestion relief at the existing interchanges. While an alternative that also addressed pedestrian and bicycle connectivity was desired, no feasible option that accommodated both objectives was identified. However, the pedestrian and bicycle recommendations in this report are part of the City's long-term vision for improved mobility. Pedestrian and bicycle improvements across I-90 will be more appropriate once the Appleway and Spokane Valley-Millwood Trails are completed.



## 8.0 POTENTIAL FUNDING SOURCES

There are a variety of transportation funding sources that could be used to assist in funding the preferred alternatives described above. This chapter provides a brief listing along with some details about the funding sources.

### 8.1 SRTC FUNDING

The Spokane Regional Transportation Council (SRTC) is the federally designated Metropolitan Planning Organization (MPO) for Spokane County. As an MPO, SRTC is responsible for distributing federal funds that are specifically allocated to the Spokane region. These funds come from the following three programs: Surface Transportation Program (STP), Congestion Mitigation and Air Quality Improvement Program (CMAQ), and Transportation Alternatives Program (TAP). These funding sources are described below.

- **STP:** The STP program is the most flexible source of federal transportation funding. STP funds can be used for roadway construction, reconstruction or preservation; transit projects; bicycle and pedestrian facilities or programs; bridges; and planning efforts. SRTC issues a call for STP projects every two or three years. Recent STP projects in the area include a variety of maintenance projects, the Sullivan Road Corridor Study, trail construction projects, and wayfinding improvements.
- **CMAQ:** The purpose of the CMAQ program is to implement transportation projects and programs that improve air quality by increasing the efficiency of existing transportation facilities or reducing travel demand. CMAQ-funded projects and programs must be capable of demonstrating a reduction of either carbon monoxide (CO) or particulate matter (PM-10) within the Spokane CO and PM-10 boundaries. Eligible activities for CMAQ projects include projects that improve traffic flow (such as improved signalization or turn lanes), projects that shift traffic demand to off-peak times or other transportation modes, transit improvements, bicycle or pedestrian improvements, Intelligent Transportation Systems (ITS), or the establishment of a traffic monitoring and management facility.
- **TAP:** The TAP program funds on- and off-road facilities for bicyclists and pedestrians and other enhancements to surface transportation. Eligible projects include sidewalks, bicycle facilities, traffic calming projects, projects that bring a facility into compliance with the Americans with Disabilities Act (ADA), conversion of rail corridors for non-motorized users, scenic overlooks and



viewpoints, historic preservation, environmental mitigations, Safe Routes to School projects, and recreational trails. This funding source is substantially smaller than the STP or CMAQ programs. The Appleyay Trail project is partially funded by the TAP program.

## 8.2 WSDOT FUNDING

WSDOT has a local programs department that distributes funding to local jurisdictions through specific programs. Below is a listing of some of the programs that are relevant for the preferred alternatives.

- Highway Safety Improvement Program (HSIP): This is a grant program for jurisdictions in Washington State to reduce fatal and serious injury collisions using engineering countermeasures. The goal of the program is to fund the design/preliminary engineering, right-of-way, and construction phases of projects that will use engineering countermeasures to reduce fatal and serious injury collisions on city streets and state highways that serve as arterials. As described in the next chapter, the preferred congestion relief projects both have the potential to reduce collisions through engineering countermeasures.
- Federal Highway Bridge Program: The purpose of the Federal Highway Bridge program is to improve the condition of bridges through replacement, rehabilitation and preventative maintenance. WSDOT identifies the Mullan Road bridge as "structurally deficient," which would make this bridge eligible for program funds. The Argonne Road bridge is not eligible for these funds at this time.

## 8.3 OTHER FUNDING SOURCES

This section lists several other potential funding sources for the preferred alternative projects.

- Freight Mobility Strategic Investment Board (FMSIB): FMSIB provides grants to fund infrastructure that would improve freight mobility across the state. Projects must be on a strategic freight corridor that carries more than 4 million annual tons of truck traffic. Argonne Road meets this requirement and the interchange improvement project could be eligible for FMSIB funding.
- Transportation Improvement Board (TIB): funds high priority transportation projects in communities throughout the state to enhance the movement of people, goods and services. TIB is an independent state agency, created by the Legislature, which distributes and manages street construction and maintenance grants to 320 cities and urban counties throughout Washington State. Funding for TIB's grant programs comes from revenue generated by three cents of the



statewide gas tax. TIB funding is very flexible and both of the preferred congestion relief projects would be eligible for TIB funding.



## 9.0 BENEFIT-COST ANALYSIS

This chapter presents the results of a benefit-cost analysis of the preferred congestion relief alternatives. This analysis was prepared using the methods outlined in the Federal Highway Administration's (FHWA) *2013 Benefit-Cost Analysis Guidance for Transportation Investment Generating Economic Recovery (TIGER) Grant Applicants*, which is one of the more common analysis frameworks available.

### 9.1 METHODOLOGY

As described above, the benefit-cost analysis was performed using the TIGER guidelines from FHWA. The following benefit criteria were assessed:

- Safety
- Mobility (travel time savings)
- Fuel consumption

As defined in the TIGER criteria, benefits are calculated for each of the criteria above by comparing the cost savings in each category relative to the No Build alternative.

#### 9.1.1 SAFETY

The safety benefit was estimated by applying crash modification factors (CMF) to the observed collision rates within the affected area. For Argonne Road, the preferred alternative project would substantially reduce southbound traffic congestion and queues between Trent Avenue and I-90. Research indicates that the capacity projects that reduce congestion have a positive benefit on safety as vehicles do not make as many erratic movements (sudden stops, unexpected lane changes, red-light running, etc.) in response to, or to avoid, congestion. Therefore the affected area for Argonne Road includes the southbound lanes from Trent Avenue to I-90. For Pines Road, the improvements are more limited and the affected area includes only the intersection of Pines and Mission.

The CMFs used in this report are shown below:

- Argonne Road: 22% reduction after adding lanes; source: *Update of Florida Crash Reduction Factors and Countermeasures to Improve the Development of District Safety Improvement Projects*, FDOT, 2005



- Pines/Mission: 4% reduction after adding exclusive right-turn lane; source: *NCHRP Report 617*, TRB, 2008

Data from the TIGER guidelines were used to calculate the costs associated with different types of collisions, the collision cost details are shown in Appendix H.

### 9.1.2 MOBILITY

The mobility benefits are estimated by the VISSIM traffic simulation model. The simulation model quantifies the number of vehicle hours traveled within the analysis area for the No Build and the preferred alternative projects. The difference in vehicle hours traveled represents the travel time savings. The dollar value of travel time savings is calculated using the value of time factor identified by FHWA:

- 2013 value of travel time: \$13.13 (source: <http://www.dot.gov/office-policy/transportation-policy/guidance-value-time>)

### 9.1.3 FUEL CONSUMPTION

The VISSIM traffic simulation model used for the analysis estimates the vehicle volume and vehicle speed for the No Build and preferred alternative scenarios. Using fuel consumption factors calculated by the California Air Resources Board (<http://www.arb.ca.gov/emfac/>) to comply with the State's greenhouse gas reduction law, fuel consumption savings can be estimated. Fuel consumption is highly sensitive to changes in speed, with lower speed travel being much more inefficient (this is why the city fuel economy is lower than the highway fuel economy for vehicles). The relevant fuel consumption factors per mile traveled are shown below:

- 0.075 gallons per mile for No Build conditions
- 0.058 gallons per mile for the preferred alternative conditions

Using this data and a conservatively low 2013 fuel price of \$3.50 per gallon, the fuel consumption savings benefit was calculated. Realistically, fuel prices are likely to be higher in the future and the actual fuel savings would be higher than shown in this analysis.



## 9.2 ASSUMPTIONS

Additional assumptions, listed below, were needed for the benefit-cost calculations.

- 2025 construction year
- Project lifespan: 30 years; this is a conservative estimate, the project will probably have a longer life, which would increase the benefits
- Annual traffic growth rate: 2%
- Weekday-to-annual conversion factor: 280 (this is calculated by dividing annual traffic data over average weekday traffic data); source: Fehr & Peers research of statewide travel data
- Total capital costs: \$8.35 million (for Alternative A and I)
- Total maintenance costs over project life (10% of capital costs): \$835,000
- Discount rate: 3% and 7%, as defined in the TIGER methodology

## 9.3 RESULTS

Applying the TIGER grant application methods and using the assumptions listed above, the benefits associated with potential safety improvements, travel time savings (mobility), and fuel cost savings were calculated. The results are summarized in **Table 28**. A detailed calculation spreadsheet is presented in Appendix G.



**TABLE 28: BENEFIT-COST ANALYSIS RESULTS**

Category	No Build	3% Discount Rate	7% Discount Rate
Yearly Safety Cost	\$63,374		\$58,473
Yearly Mobility Cost	\$4,955,346		\$3,487,433
Yearly Fuel Consumption Cost	\$834,342		\$733,676
Total Yearly Costs	\$5,853,063		\$4,329,582
Yearly Savings Compared to No Build	N/A		\$1,523,480
Present Value of Savings Assuming 30 Year Life	N/A	\$23,931,476	\$15,149,938
Construction and Maintenance Cost	N/A	\$9,185,000	\$9,185,000
Benefit-Cost Ratio	N/A	2.61	1.65

Source: Fehr & Peers, 2014.

As shown in the table above, the preferred alternative projects perform very well, with a benefit-cost ratio of 1.65-2.61, even with several conservative assumptions. Much of the benefit stems from reduction in congestion and resulting improvements in the mobility (travel time savings) category. The fuel and safety savings represent less than 20% of the total benefit. These results suggest that the preferred congestion relief alternatives have strong merit and would perform well when competing for grant funding.



## **APPENDIX A: PEDESTRIAN & BICYCLE COUNTS**



**Pedestrian Summary**

Location: Argonne & Mission  
 Date: 12/18/2012  
 Day of Week: Tuesday  
 Weather: Cloudy  
 Responsible: J.J

**Total Pedrestrian Counts**

Interval starts	NE			NW			SW			SE			Total
	Left	Right	Total										
14:00-14:15	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15-14:30	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30-14:45	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45-15:00	0	0	0	0	0	0	0	0	0	2	0	2	2
15:00-15:15	0	0	0	0	0	0	0	0	0	1	0	1	1
15:15-15:30	0	0	0	0	0	0	1	0	1	0	0	0	1
15:30-15:45	0	0	0	0	0	0	0	1	1	1	0	1	2
15:45-16:00	0	0	0	0	0	0	0	0	0	0	0	0	0

**Intersection Peak Hour:** 14:45-15:45

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrian Total	0	0	0	0	0	0	1	1	2	4	0	4	6

**Pedestrian Summary**

Location: Custer & I-90  
 Date: 12/5/2012  
 Day of Week: Wednesday  
 Weather: Cloudy  
 Responsible: J.J

**Total Pedrestrian Counts**

Interval starts	NE			NW			SW			SE			Total
	Left	Right	Total										
14:00-14:15	0	0	0	0	0	0	2	0	2	0	0	0	2
14:15-14:30	0	0	0	0	0	0	3	0	3	0	0	0	3
14:30-14:45	0	0	0	0	1	1	0	0	0	0	0	0	1
14:45-15:00	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00-15:15	0	0	0	0	2	2	1	0	1	0	0	0	3
15:15-15:30	0	0	0	0	0	0	1	0	1	0	0	0	1
15:30-15:45	0	0	0	0	0	0	1	0	1	0	0	0	1
15:45-16:00	0	0	0	0	0	0	0	0	0	0	0	0	0

**Intersection Peak Hour:** 14:00-16:00

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrian Total	0	0	0	0	3	3	4	0	4	0	0	0	7

**Pedestrian Summary**

Location: Havana & I-90  
 Date: 12/4/2012  
 Day of Week: Tuesday  
 Weather: Cloudy  
 Responsible: J.J

**Total Pedrestrian Counts**

Interval starts	NE			NW			SW			SE			Total
	Left	Right	Total										
14:00-14:15	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15-14:30	0	0	0	0	0	0	0	0	0	0	2	2	2
14:30-14:45	2	0	2	0	0	0	0	0	0	0	0	0	2
14:45-15:00	0	0	0	0	2	2	0	0	0	0	0	0	2
15:00-15:15	0	0	0	0	0	0	1	0	1	0	1	1	2
15:15-15:30	1	0	1	0	0	0	0	0	0	0	0	0	1
15:30-15:45	0	0	0	0	1	1	3	0	3	0	0	0	4
15:45-16:00	1	0	1	0	1	1	0	0	0	0	0	0	2

**Intersection Peak Hour:** 14:45-15:45

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrian Total	1	0	1	0	3	3	4	0	4	0	1	1	9

**Pedestrian Summary**

Location: Mullan & Mission  
 Date: 12/19/2012  
 Day of Week: Wednesday  
 Weather: Snowing  
 Responsible: J.J

**Total Pedrestrian Counts**

Interval starts	NE			NW			SW			SE			Total
	Left	Right	Total										
14:00-14:15	0	0	0	0	1	1	0	2	2	0	2	2	5
14:15-14:30	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30-14:45	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45-15:00	0	0	0	0	0	0	1	0	1	0	0	0	1
15:00-15:15	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15-15:30	0	0	0	1	0	1	1	0	1	0	0	0	2
15:30-15:45	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45-16:00	1	0	1	0	0	0	0	0	0	0	0	0	1

**Intersection Peak Hour:** 14:00-15:00

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrian Total	0	0	0	0	1	1	1	2	3	0	2	2	6

**Pedestrian Summary**

Location: Pierce & Mission  
 Date: 12/3/2012  
 Day of Week: Monday  
 Weather: Cloudy  
 Responsible: J.J

**Total Pedrestrian Counts**

Interval starts	NE			NW			SW			SE			Total
	Left	Right	Total										
14:00-14:15	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15-14:30	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30-14:45	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45-15:00	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00-15:15	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15-15:30	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30-15:45	0	0	0	0	1	1	1	0	1	0	0	0	2
15:45-16:00	0	0	0	0	0	0	0	0	0	0	0	0	0

**Intersection Peak Hour:** 15:00-16:00

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrian Total	0	0	0	0	1	1	1	0	1	0	0	0	2

**Pedestrian Summary**

Location: Pines & Mission  
 Date: 12/17/2012  
 Day of Week: Monday  
 Weather: Cloudy  
 Responsible: J.J

**Total Pedrestrian Counts**

Interval starts	NE			NW			SW			SE			Total
	Left	Right	Total										
14:00-14:15	1	0	1	1	0	1	0	0	0	0	0	0	2
14:15-14:30	0	0	0	2	0	2	1	0	1	0	0	0	3
14:30-14:45	0	0	0	0	0	0	0	1	1	0	0	0	1
14:45-15:00	0	0	0	0	0	0	0	0	0	0	1	1	1
15:00-15:15	0	0	0	0	0	0	0	1	1	0	1	1	2
15:15-15:30	2	1	3	0	1	1	0	0	0	3	0	3	7
15:30-15:45	0	0	0	0	0	0	0	1	1	1	0	1	2
15:45-16:00	0	0	0	0	0	0	0	0	0	1	0	1	1

**Intersection Peak Hour:** 14:45-15:45

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrian Total	2	1	3	0	1	1	0	2	2	4	2	6	12

**Pedestrian Summary**

Location: Woodruff & Montgomery  
 Date: 12/12/2012  
 Day of Week: Wednesday  
 Weather: Rain/Snow  
 Responsible: J.J

**Total Pedrestrian Counts**

Interval starts	NE			NW			SW			SE			Total
	Left	Right	Total										
14:00-14:15	0	0	0	0	0	0	0	0	0	1	0	1	1
14:15-14:30	0	1	1	0	0	0	0	0	0	0	0	0	1
14:30-14:45	0	1	1	0	0	0	0	0	0	0	0	0	1
14:45-15:00	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00-15:15	0	1	1	0	0	0	0	0	0	0	1	1	2
15:15-15:30	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30-15:45	0	1	1	0	0	0	0	0	0	0	0	0	1
15:45-16:00	0	0	0	0	0	0	0	0	0	0	0	0	0

**Intersection Peak Hour:** 14:15-15:15

	NE			NW			SW			SE			Total
	Left	Right	Total										
Pedestrian Total	0	3	3	0	0	0	0	0	0	0	1	1	4



9/25/2012

Volunteer Instructions and Count Form | 2012

Appleway / University

7:00 - 9:00 a.m.  
Sunny

Appleway / UNIVERSITY

NORTHBOUND    SOUTHBOUND    EASTBOUND    WESTBOUND    TOTAL

	Gender	NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND	TOTAL
Bicyclist	Male					5
	Female					1
Pedestrian	Male					19
	Female	 				33
Other (rollerblade, etc.)						2
<b>No Helmet</b> (please provide a hatch for each cyclist NOT wearing a helmet)						1 (1)

Please check this box if you entered this data into WSDOT's data entry website here:  
<http://www.wsdot.wa.gov/bike/Count.htm>

# Volunteer Instructions and Count Form | 2012

Appleway / University

16:00 - 18:00 p.m.  
*Sunday*

NORTHBOUND    SOUTHBOUND    EASTBOUND    WESTBOUND    TOTAL

	Gender	NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND	TOTAL
<b>Bicyclist</b>	<i>Male</i>					13
	<i>Female</i>					2
<b>Pedestrian</b>	<i>Male</i>	 				32
	<i>Female</i>					19
<b>Other (rollerblade, etc.)</b>						2
<b>No Helmet</b> (please provide a hatch for each cyclist NOT wearing a helmet)						(9)

Please check this box if you entered this data into WSDOT's data entry website here:  
<http://www.wsdot.wa.gov/bike/Count.htm>

# Volunteer Instructions and Count Form | 2012

**Pedestrian and Bicyclist Count Form (page 1 of 2 – please return both pages)**

Name: Jorge Jordan City: Spokane Valley Date: 9/26/2012

Location: Sprague/Bowditch Time slot: 7-9am & 4-6pm

Weather: Sunny

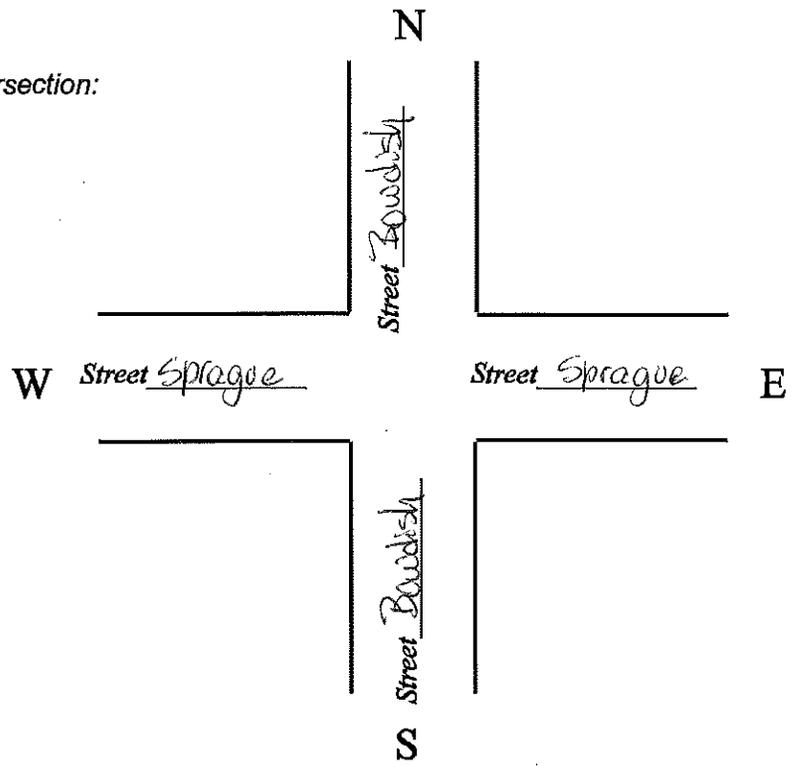
**Directions:** Please place a hatch mark on the form for each passing cyclist, pedestrian, or other non-motorized transit. People in wheelchairs are to be counted as pedestrians. People walking their bicycles count as bicyclists. People on rollerblades, skateboards, scooters, and other non-motorized transport devices are to be counted as "Other".

Have your bearings and ensure that the **hatch mark is placed in the direction of travel**. If you are located at an intersection, the direction of travel when leaving the intersection should be recorded. For example, a cyclist starting northbound and then turning right at your location should be noted as traveling eastbound.

**Gender and Helmet Use:** Depending on the volume of travelers at your location, you may be able to collect additional information, such as gender and helmet usage. If you are able to collect this information, please do so in the appropriate box on the following page. Some intersections may be too busy to capture this information – if this is the case, please focus on the direction and mode of travel.

For "day of count" questions, please call Mary Collins at 206-861-9890 or Max Hepp-Buchanan at 206-226-1040

Please indicate each leg of the intersection:



9/26/2012

Volunteer Instructions and Count Form | 2012

Sprague / Bowdich

7:00 - 9:00 a.m.  
Sunny

Bowdich  
Sprague

		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND	TOTAL
Bicyclist	Male	1				1
	Female					0
Pedestrian	Male				1	13
	Female					8
Other (rollerblade, etc.)		1			1	2
<b>No Helmet</b> (please provide a hatch for each cyclist NOT wearing a helmet)						(0)

Please check this box if you entered this data into WSDOT's data entry website here:  
<http://www.wsdot.wa.gov/bike/Count.htm>

# Volunteer Instructions and Count Form | 2012

Sprague / Bowdish

16:00 - 18:00 p.m.  
Sunny

		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND	TOTAL
<b>Bicyclist</b>	<i>Male</i>					21
	<i>Female</i>					4
<b>Pedestrian</b>	<i>Male</i>					18
	<i>Female</i>					6
<b>Other (rollerblade, etc.)</b>						6
<b>No Helmet</b> (please provide a hatch for each cyclist NOT wearing a helmet)						(16)

Please check this box if you entered this data into WSDOT's data entry website here:  
<http://www.wsdot.wa.gov/bike/Count.htm>

# Volunteer Instructions and Count Form | 2012

**Pedestrian and Bicyclist Count Form (page 1 of 2 – please return both pages)**

Name: Jorge Jordan City: Spokane Valley Date: 9/27/2012

Location: Valleyway & university Time slot: 7-9 a.m & 4-6 p.m

Weather: sunny

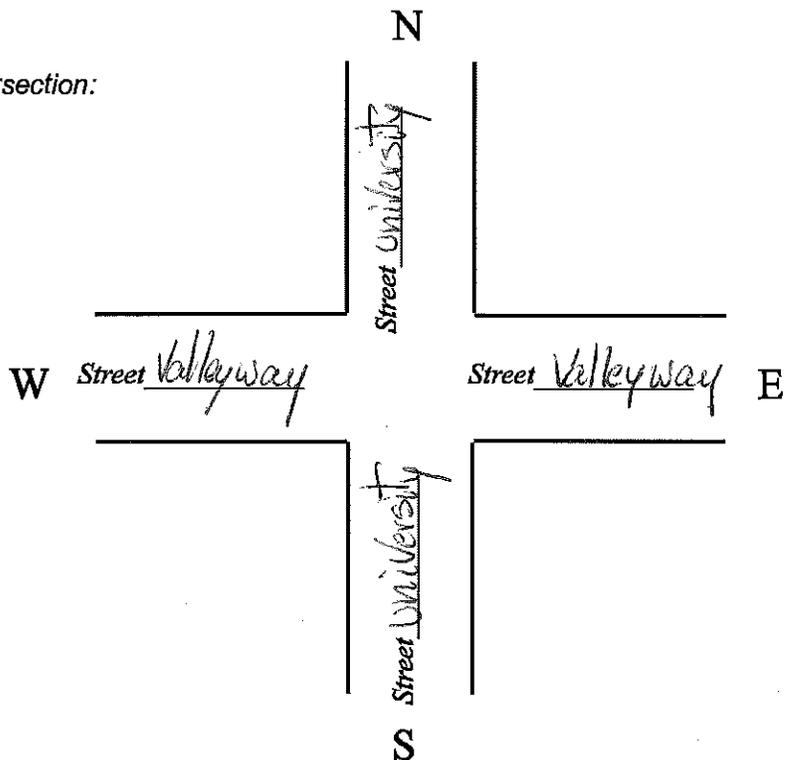
**Directions:** Please place a hatch mark on the form for each passing cyclist, pedestrian, or other non-motorized transit. People in wheelchairs are to be counted as pedestrians. People walking their bicycles count as bicyclists. People on rollerblades, skateboards, scooters, and other non-motorized transport devices are to be counted as "Other".

Have your bearings and ensure that the **hatch mark is placed in the direction of travel**. If you are located at an intersection, the direction of travel when leaving the intersection should be recorded. For example, a cyclist starting northbound and then turning right at your location should be noted as traveling eastbound.

**Gender and Helmet Use:** Depending on the volume of travelers at your location, you may be able to collect additional information, such as gender and helmet usage. If you are able to collect this information, please do so in the appropriate box on the following page. Some intersections may be too busy to capture this information – if this is the case, please focus on the direction and mode of travel.

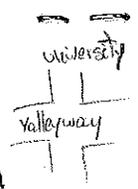
For "day of count" questions, please call Mary Collins at 206-861-9890 or Max Hepp-Buchanan at 206-226-1040

Please indicate each leg of the intersection:



9/27/2012

Volunteer Instructions and Count Form | 2012



Valleyway / University

7:00-9:00 a.m.  
Sonny

(School bus stop)\*

NORTHBOUND    SOUTHBOUND    EASTBOUND    WESTBOUND    TOTAL

	Gender	NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND	TOTAL
Bicyclist	Male					4
	Female					1
Pedestrian	Male					5
	Female					10
Other (rollerblade, etc.)						1
<b>No Helmet</b> (please provide a hatch for each cyclist NOT wearing a helmet)						(2)

Please check this box if you entered this data into WSDOT's data entry website here:  
<http://www.wsdot.wa.gov/bike/Count.htm>

# Volunteer Instructions and Count Form | 2012

Valleyway / university

16:00 - 18:00 p.m.  
Sunny

		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND	TOTAL
<b>Bicyclist</b>	<i>Male</i>					21
	<i>Female</i>					2
<b>Pedestrian</b>	<i>Male</i>					12
	<i>Female</i>					5
<b>Other (rollerblade, etc.)</b>						2
<b>No Helmet</b> (please provide a hatch for each cyclist NOT wearing a helmet)						(19)

Please check this box if you entered this data into WSDOT's data entry website here:  
<http://www.wsdot.wa.gov/bike/Count.htm>



# Volunteer Instructions and Count Form | 2012

		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND	TOTAL
<b>Bicyclist</b>	<i>Male</i>					10
	<i>Female</i>					1
<b>Pedestrian</b>	<i>Male</i>	<del>    </del>				14
	<i>Female</i>					11
<b>Other (rollerblade, etc.)</b>						
<b>No Helmet</b> (please provide a hatch for each cyclist NOT wearing a helmet)						

Please check this box if you entered this data into WSDOT's data entry website here:  
<http://www.wsdot.wa.gov/bike/Count.htm>

# Volunteer Instructions and Count Form | 2012

## Pedestrian and Bicyclist Count Form (page 1 of 2 – please return both pages)

Name: Michael Basinger City: COSV Date 9/27/12

Location: Sprague / Evergreen Time slot: 7am-9am

Weather: Sunny

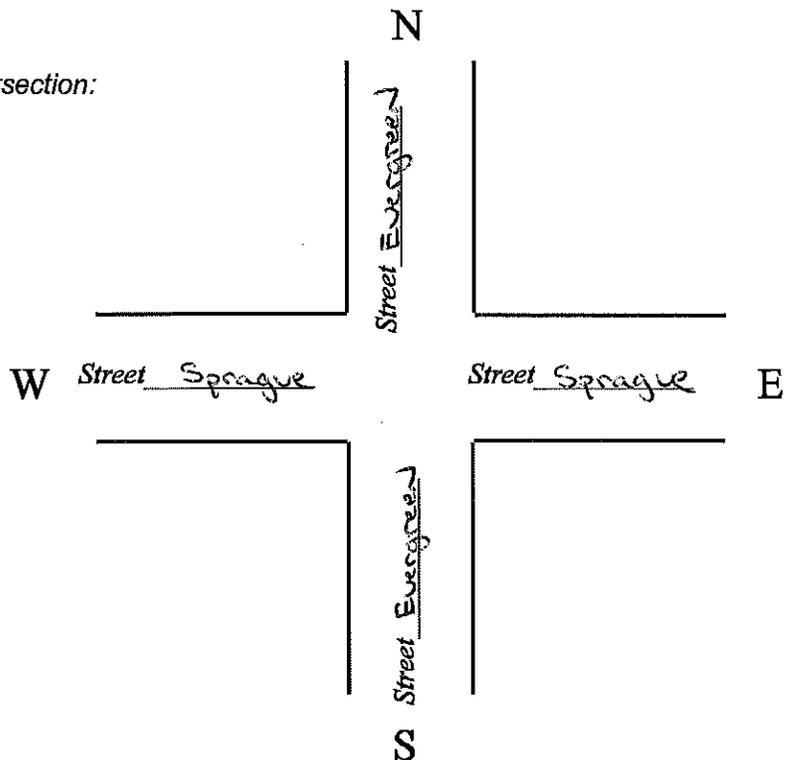
**Directions:** Please place a hatch mark on the form for each passing cyclist, pedestrian, or other non-motorized transit. People in wheelchairs are to be counted as pedestrians. People walking their bicycles count as bicyclists. People on rollerblades, skateboards, scooters, and other non-motorized transport devices are to be counted as "Other".

Have your bearings and ensure that the **hatch mark is placed in the direction of travel**. If you are located at an intersection, the direction of travel when leaving the intersection should be recorded. For example, a cyclist starting northbound and then turning right at your location should be noted as traveling eastbound.

**Gender and Helmet Use:** Depending on the volume of travelers at your location, you may be able to collect additional information, such as gender and helmet usage. If you are able to collect this information, please do so in the appropriate box on the following page. Some intersections may be too busy to capture this information – if this is the case, please focus on the direction and mode of travel.

For "day of count" questions, please call Mary Collins at 206-861-9890 or Max Hepp-Buchanan at 206-226-1040

Please indicate each leg of the intersection:



# Volunteer Instructions and Count Form | 2012

		NORTHBOUND	SOUTHBOUND	EASTBOUND	WESTBOUND	TOTAL
<b>Bicyclist</b>	<i>Gender</i> Male	1			1	2
	Female		1			1
<b>Pedestrian</b>	<i>Gender</i> Male					14
	Female			1		7
<b>Other</b> (rollerblade, etc.) <i>Wheel Chair</i>		1				1
<b>No Helmet</b> (please provide a hatch for each cyclist NOT wearing a helmet)						

Please check this box if you entered this data into WSDOT's data entry website here:  
<http://www.wsdot.wa.gov/bike/Count.htm>

## **APPENDIX B: VEHICLE COUNTS**



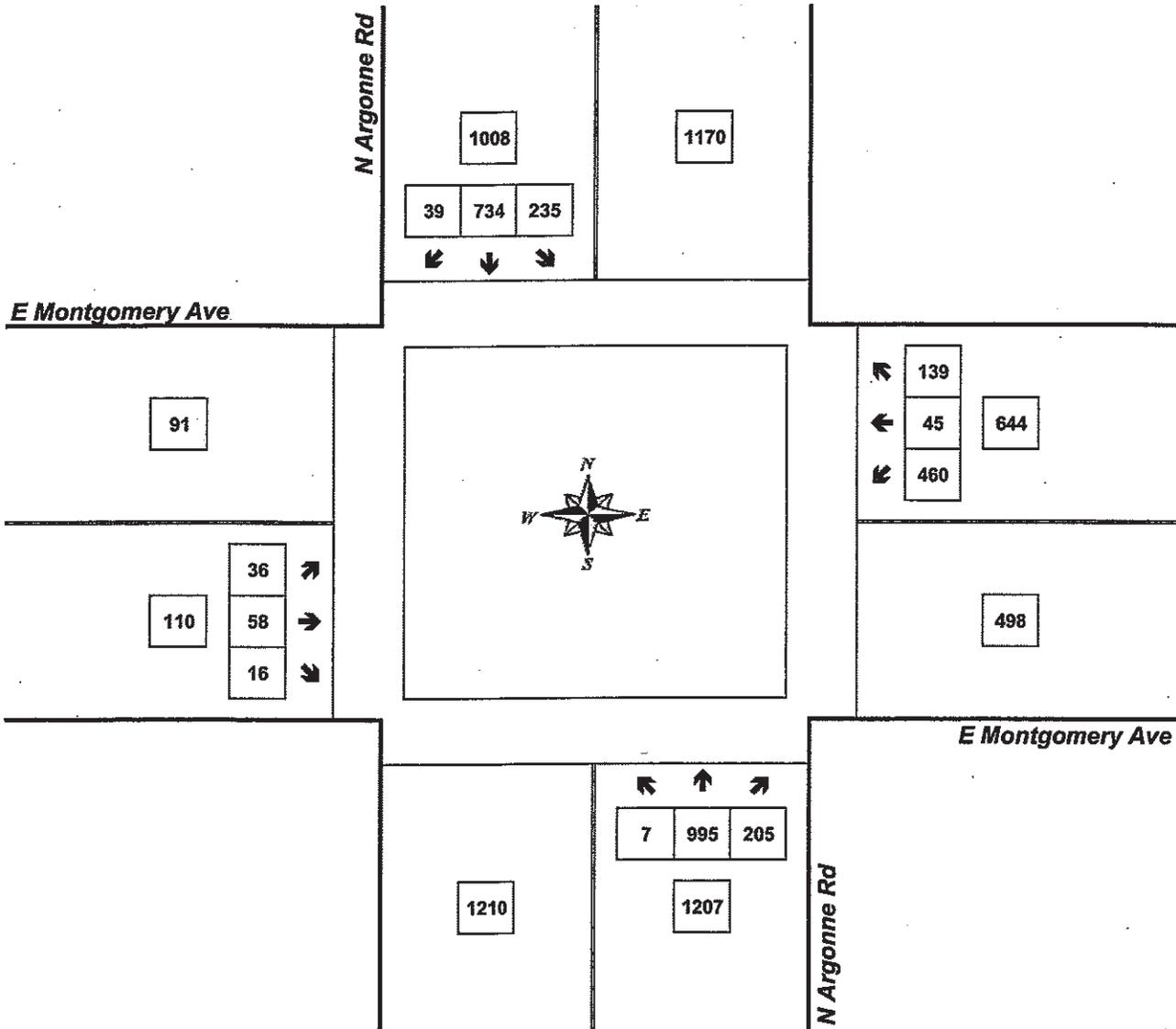
# Peak Hour Summary



Mark Skaggs  
(206) 251-0300

## N Argonne Rd & E Montgomery Ave

4:00 PM to 5:00 PM  
Tuesday, December 09, 2008



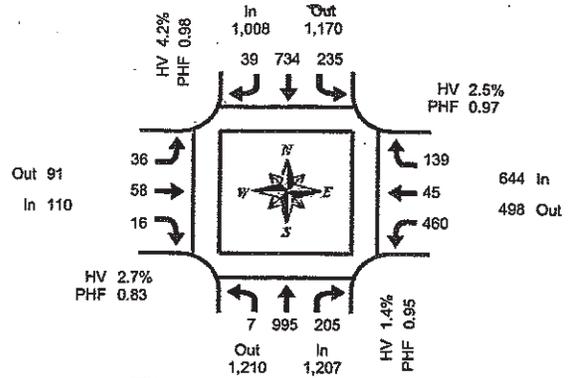
Approach	PHF	HV%	Volume
EB	0.83	2.7%	110
WB	0.97	2.5%	644
NB	0.95	1.4%	1,207
SB	0.98	4.2%	1,008
<b>Intersection</b>	<b>0.99</b>	<b>2.6%</b>	<b>2,969</b>

Count Period: 4:00 PM to 6:00 PM

# Total Vehicle Summary



Mark Skaggs  
(206) 251-0300



## N Argonne Rd & E Montgomery Ave

Tuesday, December 09, 2008  
4:00 PM to 6:00 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound E Montgomery Ave				Westbound E Montgomery Ave				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	1	257	48	5	58	186	12	13	15	11	1	1	114	11	35	3	749
4:15 PM	2	257	59	1	56	179	6	15	5	13	5	0	107	12	34	5	735
4:30 PM	4	230	43	6	62	180	15	6	9	17	7	0	122	12	32	4	733
4:45 PM	0	251	55	5	59	189	6	8	7	17	3	2	117	10	38	4	752
5:00 PM	0	219	66	4	48	186	7	15	22	9	4	1	113	13	39	3	728
5:15 PM	5	230	60	2	56	173	10	2	15	11	4	3	101	7	42	3	714
5:30 PM	1	230	44	4	42	155	7	5	16	9	7	0	87	9	35	2	642
5:45 PM	0	219	39	2	48	132	7	6	6	16	2	0	59	9	28	0	565
Total Survey	13	1,893	414	29	429	1,382	70	70	95	103	33	7	820	83	283	24	5,618

### Peak Hour Summary

4:00 PM to 5:00 PM

By Approach	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound E Montgomery Ave				Westbound E Montgomery Ave				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	1,207	1,210	2,417	17	1,008	1,170	2,178	42	110	91	201	3	644	498	1,142	16	2,969
%HV	1.4%				4.2%				2.7%				2.5%				2.6%
PHF	0.95				0.98				0.83				0.97				0.99

By Movement	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound E Montgomery Ave				Westbound E Montgomery Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	7	995	205	1,207	235	734	39	1,008	36	58	16	110	460	45	139	644	2,969
PHF	0.44	0.97	0.87	0.95	0.95	0.97	0.66	0.98	0.60	0.85	0.57	0.83	0.94	0.94	0.91	0.97	0.99

### Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound E Montgomery Ave				Westbound E Montgomery Ave				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	7	995	205	17	235	734	39	42	36	58	16	3	460	45	139	16	2,969
4:15 PM	6	957	223	16	225	736	34	44	43	56	19	3	459	47	143	16	2,948
4:30 PM	9	930	224	17	225	730	38	31	53	54	18	6	453	42	151	14	2,927
4:45 PM	6	930	225	15	205	705	30	30	60	46	18	6	418	39	154	12	2,836
5:00 PM	6	898	209	12	194	648	31	28	59	45	17	4	360	38	144	8	2,649

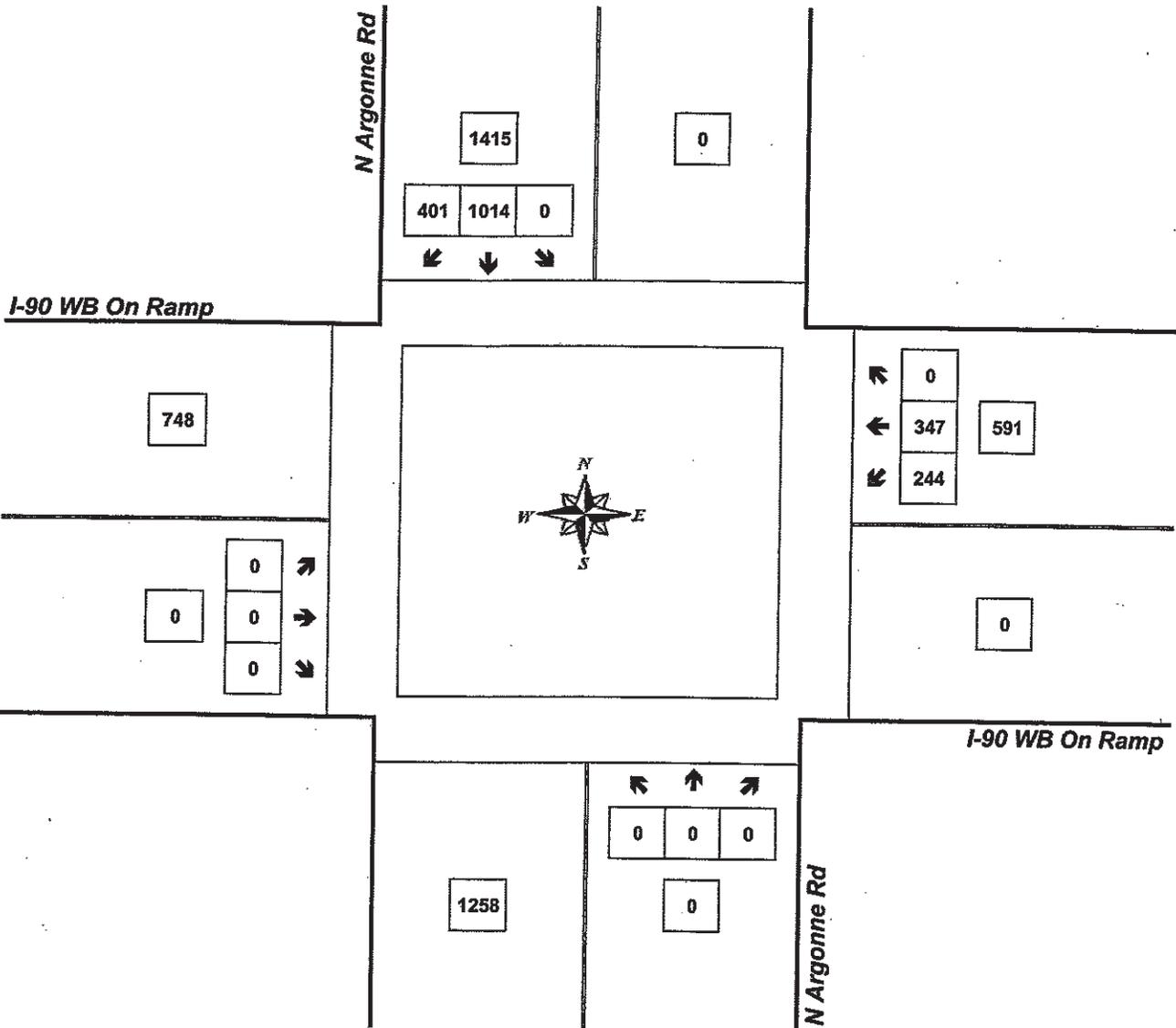
# Peak Hour Summary



Mark Skaggs  
(206) 251-0300

## N Argonne Rd & I-90 WB On Ramp

4:30 PM to 5:30 PM  
Tuesday, December 09, 2008



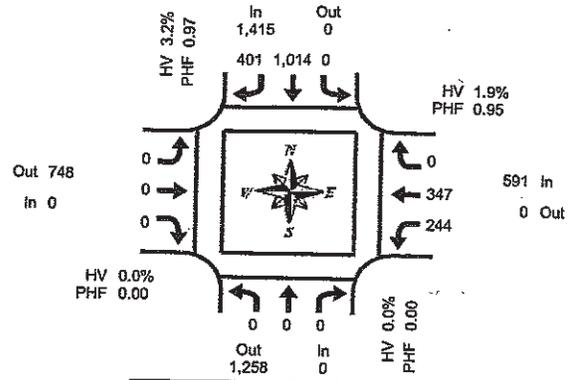
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.95	1.9%	591
NB	0.00	0.0%	0
SB	0.97	3.2%	1,415
<b>Intersection</b>	<b>0.96</b>	<b>2.8%</b>	<b>2,006</b>

Count Period: 4:00 PM to 6:00 PM

# Total Vehicle Summary



Mark Skaggs  
(206) 251-0300



## N Argonne Rd & I-90 WB On Ramp

Tuesday, December 09, 2008

4:00 PM to 6:00 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound I-90 WB On Ramp				Westbound I-90 WB On Ramp				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	0	0	0	0	0	243	89	16	0	0	0	0	60	82	0	3	474
4:15 PM	0	0	0	0	0	249	88	16	0	0	0	0	69	81	0	4	487
4:30 PM	0	0	0	0	0	236	111	14	0	0	0	0	67	89	0	3	503
4:45 PM	0	0	0	0	0	263	81	10	0	0	0	0	52	77	0	2	473
5:00 PM	0	0	0	0	0	252	113	13	0	0	0	0	66	89	0	3	520
5:15 PM	0	0	0	0	0	263	96	8	0	0	0	0	59	92	0	3	510
5:30 PM	0	0	0	0	0	221	71	8	0	0	0	0	62	66	0	1	420
5:45 PM	0	0	0	0	0	191	68	8	0	0	0	0	52	68	0	5	379
Total Survey	0	0	0	0	0	1,918	717	93	0	0	0	0	487	644	0	24	3,766

### Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound I-90 WB On Ramp				Westbound I-90 WB On Ramp				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	0	1,258	1,258	0	1,415	0	1,415	45	0	748	748	0	591	0	591	11	2,006
%HV		0.0%				3.2%				0.0%				1.9%			2.8%
PHF		0.00				0.97				0.00				0.95			0.96

By Movement	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound I-90 WB On Ramp				Westbound I-90 WB On Ramp				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	1,014	401	1,415	0	0	0	0	244	347	0	591	2,006
PHF	0.00	0.00	0.00	0.00	0.00	0.96	0.89	0.97	0.00	0.00	0.00	0.00	0.91	0.94	0.00	0.95	0.96

### Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound I-90 WB On Ramp				Westbound I-90 WB On Ramp				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	0	0	0	0	0	991	369	56	0	0	0	0	248	329	0	12	1,937
4:15 PM	0	0	0	0	0	1,000	393	53	0	0	0	0	254	336	0	12	1,983
4:30 PM	0	0	0	0	0	1,014	401	45	0	0	0	0	244	347	0	11	2,006
4:45 PM	0	0	0	0	0	999	361	39	0	0	0	0	239	324	0	9	1,923
5:00 PM	0	0	0	0	0	927	348	37	0	0	0	0	239	315	0	12	1,829

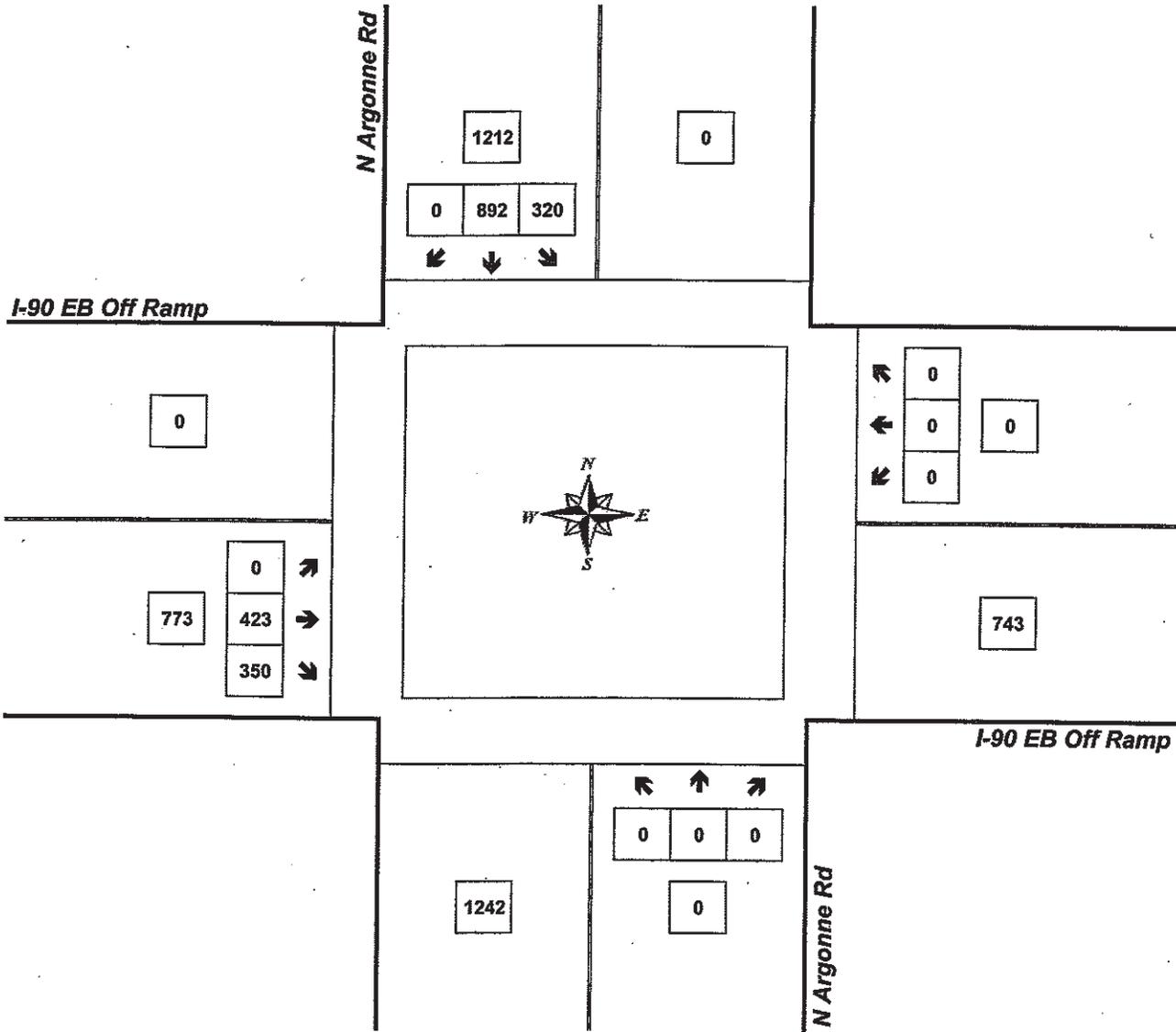
# Peak Hour Summary



Mark Skaggs  
(206) 251-0300

## N Argonne Rd & I-90 EB Off Ramp

4:45 PM to 5:45 PM  
Tuesday, December 09, 2008



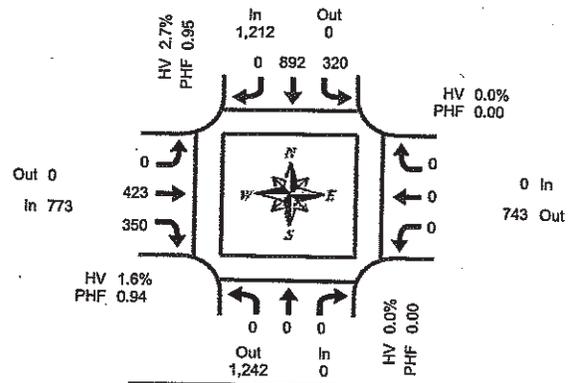
Approach	PHF	HV%	Volume
EB	0.94	1.6%	773
WB	0.00	0.0%	0
NB	0.00	0.0%	0
SB	0.95	2.7%	1,212
<b>Intersection</b>	<b>0.95</b>	<b>2.3%</b>	<b>1,985</b>

Count Period: 4:00 PM to 6:00 PM

# Total Vehicle Summary



Mark Skaggs  
(206) 251-0300



## N Argonne Rd & I-90 EB Off Ramp

Tuesday, December 09, 2008  
4:00 PM to 6:00 PM

**Peak Hour Summary**  
4:45 PM to 5:45 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound I-90 EB Off Ramp				Westbound I-90 EB Off Ramp				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	0	0	0	0	95	209	0	9	0	92	101	6	0	0	0	0	497
4:15 PM	0	0	0	0	86	237	0	16	0	90	91	7	0	0	0	0	504
4:30 PM	0	0	0	0	90	222	0	10	0	88	88	9	0	0	0	0	488
4:45 PM	0	0	0	0	88	220	0	7	0	112	79	6	0	0	0	0	479
5:00 PM	0	0	0	0	87	231	0	11	0	96	78	2	0	0	0	0	492
5:15 PM	0	0	0	0	101	219	0	8	0	114	91	1	0	0	0	0	525
5:30 PM	0	0	0	0	64	222	0	7	0	101	102	3	0	0	0	0	489
5:45 PM	0	0	0	0	77	165	0	7	0	90	82	4	0	0	0	0	414
Total Survey	0	0	0	0	668	1,725	0	75	0	783	712	38	0	0	0	0	3,688

### Peak Hour Summary

4:45 PM to 5:45 PM

By Approach	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound I-90 EB Off Ramp				Westbound I-90 EB Off Ramp				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	0	1,242	1,242	0	1,212	0	1,212	33	773	0	773	12	0	743	743	0	1,985
%HV	0.0%				2.7%				1.6%				0.0%				2.3%
PHF	0.00				0.95				0.94				0.00				0.95

By Movement	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound I-90 EB Off Ramp				Westbound I-90 EB Off Ramp				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	320	892	0	1,212	0	423	350	773	0	0	0	0	1,985
PHF	0.00	0.00	0.00	0.00	0.79	0.97	0.00	0.95	0.00	0.93	0.86	0.94	0.00	0.00	0.00	0.00	0.95

### Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Argonne Rd				Southbound N Argonne Rd				Eastbound I-90 EB Off Ramp				Westbound I-90 EB Off Ramp				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	0	0	0	0	339	888	0	42	0	382	359	28	0	0	0	0	1,968
4:15 PM	0	0	0	0	331	910	0	44	0	386	336	24	0	0	0	0	1,963
4:30 PM	0	0	0	0	346	892	0	36	0	410	336	18	0	0	0	0	1,984
4:45 PM	0	0	0	0	320	892	0	33	0	423	350	12	0	0	0	0	1,985
5:00 PM	0	0	0	0	329	837	0	33	0	401	353	10	0	0	0	0	1,920

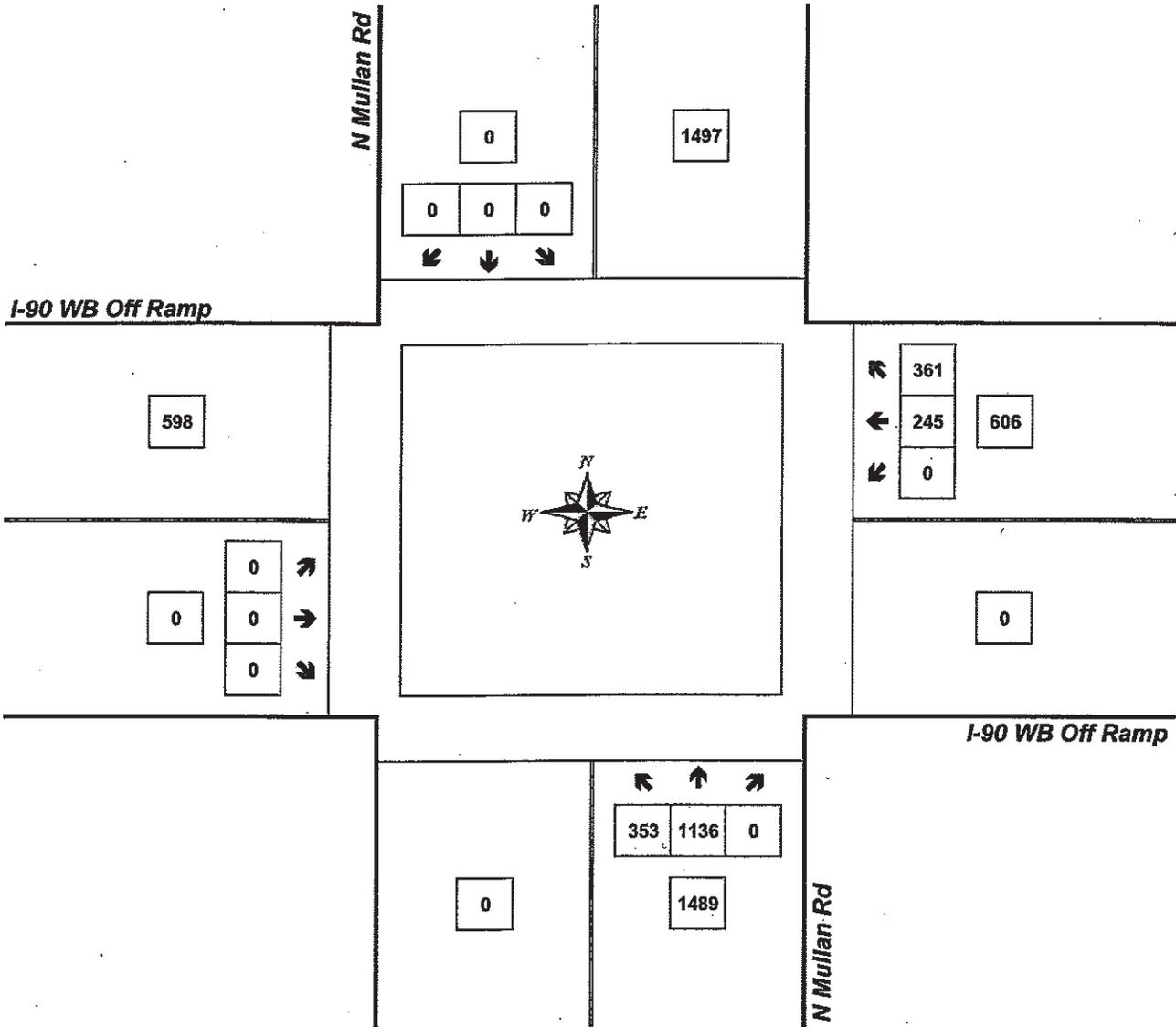
# Peak Hour Summary



Mark Skaggs  
(206) 251-0300

## N Mullan Rd & I-90 WB Off Ramp

4:30 PM to 5:30 PM  
Tuesday, December 09, 2008



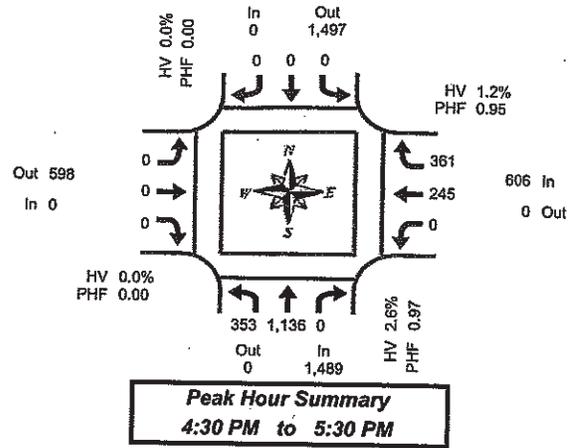
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.95	1.2%	606
NB	0.97	2.6%	1,489
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.97</b>	<b>2.2%</b>	<b>2,095</b>

Count Period: 4:00 PM to 6:00 PM

# Total Vehicle Summary



Mark Skaggs  
(206) 251-0300



## N Mullan Rd & I-90 WB Off Ramp

Tuesday, December 09, 2008  
4:00 PM to 6:00 PM

### 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound N Mullan Rd				Southbound N Mullan Rd				Eastbound I-90 WB Off Ramp				Westbound I-90 WB Off Ramp				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	83	263	0	5	0	0	0	0	0	0	0	0	0	63	90	5	499
4:15 PM	76	260	0	10	0	0	0	0	0	0	0	0	0	78	103	4	517
4:30 PM	91	282	0	10	0	0	0	0	0	0	0	0	0	74	85	2	532
4:45 PM	74	282	0	9	0	0	0	0	0	0	0	0	0	55	86	2	497
5:00 PM	93	282	0	12	0	0	0	0	0	0	0	0	0	63	88	3	526
5:15 PM	95	290	0	8	0	0	0	0	0	0	0	0	0	53	102	0	540
5:30 PM	68	245	0	4	0	0	0	0	0	0	0	0	0	57	92	5	462
5:45 PM	75	209	0	7	0	0	0	0	0	0	0	0	0	41	80	0	405
Total Survey	655	2,113	0	65	0	0	0	0	0	0	0	0	0	484	726	21	3,978

### Peak Hour Summary 4:30 PM to 5:30 PM

By Approach	Northbound N Mullan Rd				Southbound N Mullan Rd				Eastbound I-90 WB Off Ramp				Westbound I-90 WB Off Ramp				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	1,489	0	1,489	39	0	1,497	1,497	0	0	598	598	0	606	0	606	7	2,095
%HV	2.6%				0.0%				0.0%				1.2%				2.2%
PHF	0.97				0.00				0.00				0.95				0.97

By Movement	Northbound N Mullan Rd				Southbound N Mullan Rd				Eastbound I-90 WB Off Ramp				Westbound I-90 WB Off Ramp				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	353	1,136	0	1,489	0	0	0	0	0	0	0	0	0	245	361	606	2,095
PHF	0.93	0.98	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.88	0.95	0.97

### Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound N Mullan Rd				Southbound N Mullan Rd				Eastbound I-90 WB Off Ramp				Westbound I-90 WB Off Ramp				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	324	1,087	0	34	0	0	0	0	0	0	0	0	0	270	364	13	2,045
4:15 PM	334	1,106	0	41	0	0	0	0	0	0	0	0	0	270	362	11	2,072
4:30 PM	353	1,136	0	39	0	0	0	0	0	0	0	0	0	245	361	7	2,095
4:45 PM	330	1,099	0	33	0	0	0	0	0	0	0	0	0	228	368	10	2,025
5:00 PM	331	1,026	0	31	0	0	0	0	0	0	0	0	0	214	362	8	1,933

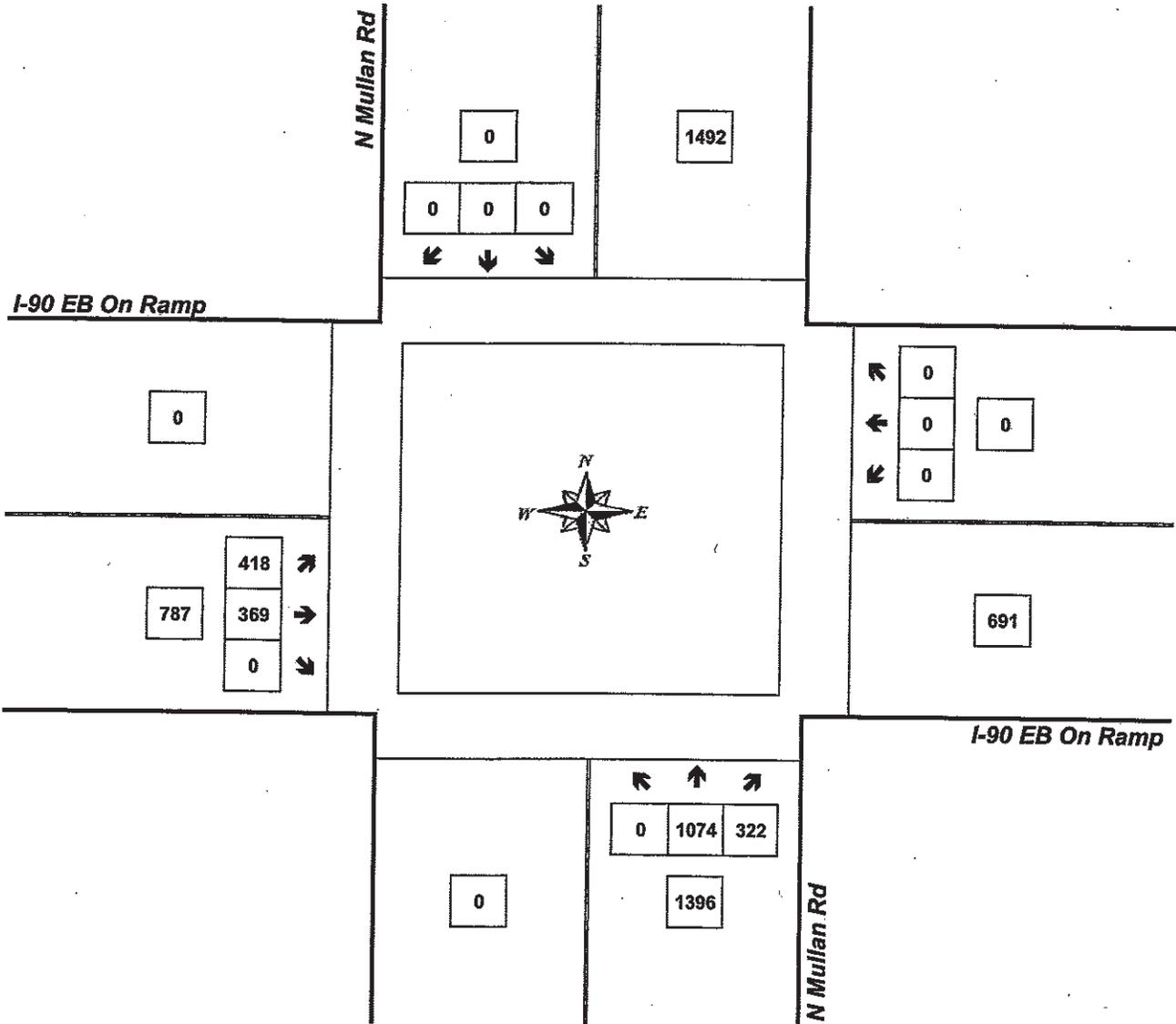
# Peak Hour Summary



Mark Skaggs  
(206) 251-0300

## N Mullan Rd & I-90 EB On Ramp

4:30 PM to 5:30 PM  
Tuesday, December 09, 2008



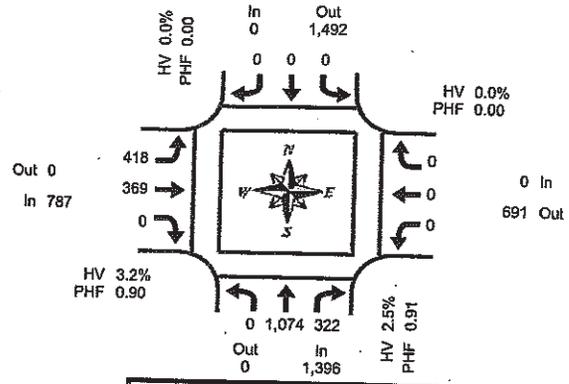
Approach	PHF	HV%	Volume
EB	0.90	3.2%	787
WB	0.00	0.0%	0
NB	0.91	2.5%	1,396
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.90</b>	<b>2.7%</b>	<b>2,183</b>

Count Period: 4:00 PM to 6:00 PM

# Total Vehicle Summary



Mark Skaggs  
(206) 251-0300



## N Mullan Rd & I-90 EB On Ramp

Tuesday, December 09, 2008  
4:00 PM to 6:00 PM

**Peak Hour Summary**  
4:30 PM to 5:30 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Mullan Rd				Southbound N Mullan Rd				Eastbound I-90 EB On Ramp				Westbound I-90 EB On Ramp				Interval Total	
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV		
4:00 PM	0	268	67	4	0	0	0	0	90	91	0	8	0	0	0	0	0	516
4:15 PM	0	239	65	8	0	0	0	0	89	90	0	7	0	0	0	0	0	483
4:30 PM	0	258	74	13	0	0	0	0	99	83	0	8	0	0	0	0	0	514
4:45 PM	0	246	93	7	0	0	0	0	114	82	0	7	0	0	0	0	0	535
5:00 PM	0	266	74	7	0	0	0	0	91	99	0	7	0	0	0	0	0	530
5:15 PM	0	304	81	8	0	0	0	0	114	105	0	3	0	0	0	0	0	604
5:30 PM	0	231	104	3	0	0	0	0	87	80	0	2	0	0	0	0	0	502
5:45 PM	0	192	53	7	0	0	0	0	80	84	0	2	0	0	0	0	0	409
Total Survey	0	2,004	611	57	0	0	0	0	764	714	0	44	0	0	0	0	0	4,093

### Peak Hour Summary

4:30 PM to 5:30 PM

By Approach	Northbound N Mullan Rd				Southbound N Mullan Rd				Eastbound I-90 EB On Ramp				Westbound I-90 EB On Ramp				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	1,396	0	1,396	35	0	1,492	1,492	0	787	0	787	25	0	691	691	0	2,183
%HV	2.5%				0.0%				3.2%				0.0%				2.7%
PHF	0.91				0.00				0.90				0.00				0.90

By Movement	Northbound N Mullan Rd				Southbound N Mullan Rd				Eastbound I-90 EB On Ramp				Westbound I-90 EB On Ramp				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	1,074	322	1,396	0	0	0	0	418	369	0	787	0	0	0	0	2,183
PHF	0.00	0.88	0.87	0.91	0.00	0.00	0.00	0.00	0.92	0.88	0.00	0.90	0.00	0.00	0.00	0.00	0.90

### Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Mullan Rd				Southbound N Mullan Rd				Eastbound I-90 EB On Ramp				Westbound I-90 EB On Ramp				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	0	1,011	299	32	0	0	0	0	392	346	0	30	0	0	0	0	2,048
4:15 PM	0	1,009	306	35	0	0	0	0	393	354	0	29	0	0	0	0	2,062
4:30 PM	0	1,074	322	35	0	0	0	0	418	369	0	25	0	0	0	0	2,183
4:45 PM	0	1,047	352	25	0	0	0	0	406	366	0	19	0	0	0	0	2,171
5:00 PM	0	993	312	25	0	0	0	0	372	368	0	14	0	0	0	0	2,045

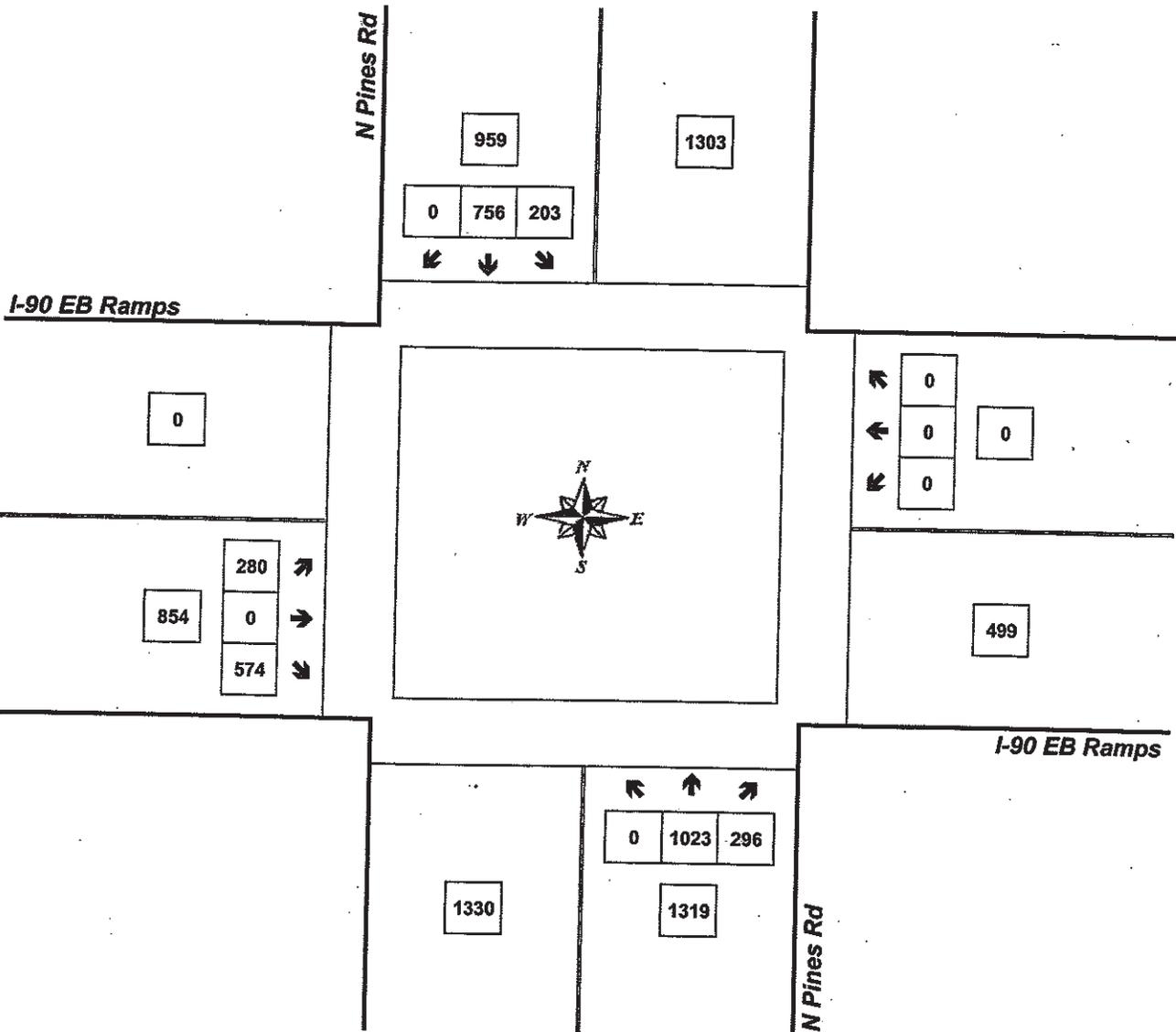
# Peak Hour Summary



Mark Skaggs  
(208) 251-0300

## N Pines Rd & I-90 EB Ramps

4:00 PM to 5:00 PM  
Tuesday, December 09, 2008



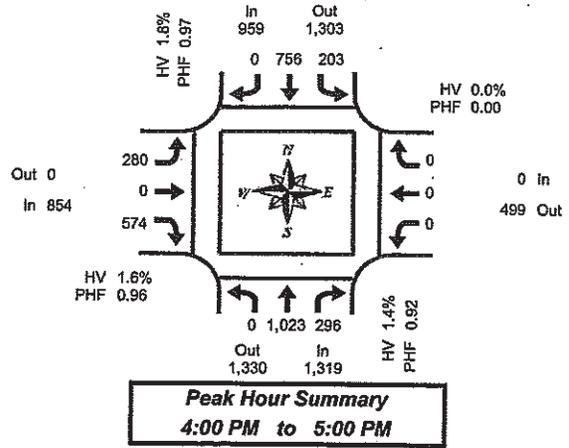
Approach	PHF	HV%	Volume
EB	0.96	1.6%	854
WB	0.00	0.0%	0
NB	0.92	1.4%	1,319
SB	0.97	1.8%	959
<b>Intersection</b>	<b>0.97</b>	<b>1.6%</b>	<b>3,132</b>

Count Period: 4:00 PM to 6:00 PM

# Total Vehicle Summary



Mark Skaggs  
(206) 251-0300



## N Pines Rd & I-90 EB Ramps

Tuesday, December 09, 2008  
4:00 PM to 6:00 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Pines Rd				Southbound N Pines Rd				Eastbound I-90 EB Ramps				Westbound I-90 EB Ramps				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	0	278	79	9	53	194	0	5	69	0	135	2	0	0	0	0	808
4:15 PM	0	236	69	2	48	191	0	3	72	0	151	4	0	0	0	0	767
4:30 PM	0	243	70	3	49	182	0	5	74	0	142	5	0	0	0	0	760
4:45 PM	0	266	78	4	53	189	0	4	65	0	146	3	0	0	0	0	797
5:00 PM	0	256	89	5	47	179	0	4	76	0	154	2	0	0	0	0	801
5:15 PM	0	252	62	3	40	189	0	6	64	0	160	5	0	0	0	0	767
5:30 PM	0	207	52	2	36	164	0	5	76	0	149	4	0	0	0	0	684
5:45 PM	0	201	53	5	29	166	0	3	88	0	138	5	0	0	0	0	675
Total Survey	0	1,939	552	33	355	1,454	0	35	584	0	1,175	30	0	0	0	0	6,059

### Peak Hour Summary

4:00 PM to 5:00 PM

By Approach	Northbound N Pines Rd				Southbound N Pines Rd				Eastbound I-90 EB Ramps				Westbound I-90 EB Ramps				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	1,319	1,330	2,649	18	959	1,303	2,262	17	854	0	854	14	0	499	499	0	3,132
%HV	1.4%				1.8%				1.6%				0.0%				1.6%
PHF	0.92				0.97				0.96				0.00				0.97

By Movement	Northbound N Pines Rd				Southbound N Pines Rd				Eastbound I-90 EB Ramps				Westbound I-90 EB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	1,023	296	1,319	203	756	0	959	280	0	574	854	0	0	0	0	3,132
PHF	0.00	0.92	0.94	0.92	0.96	0.97	0.00	0.97	0.95	0.00	0.95	0.96	0.00	0.00	0.00	0.00	0.97

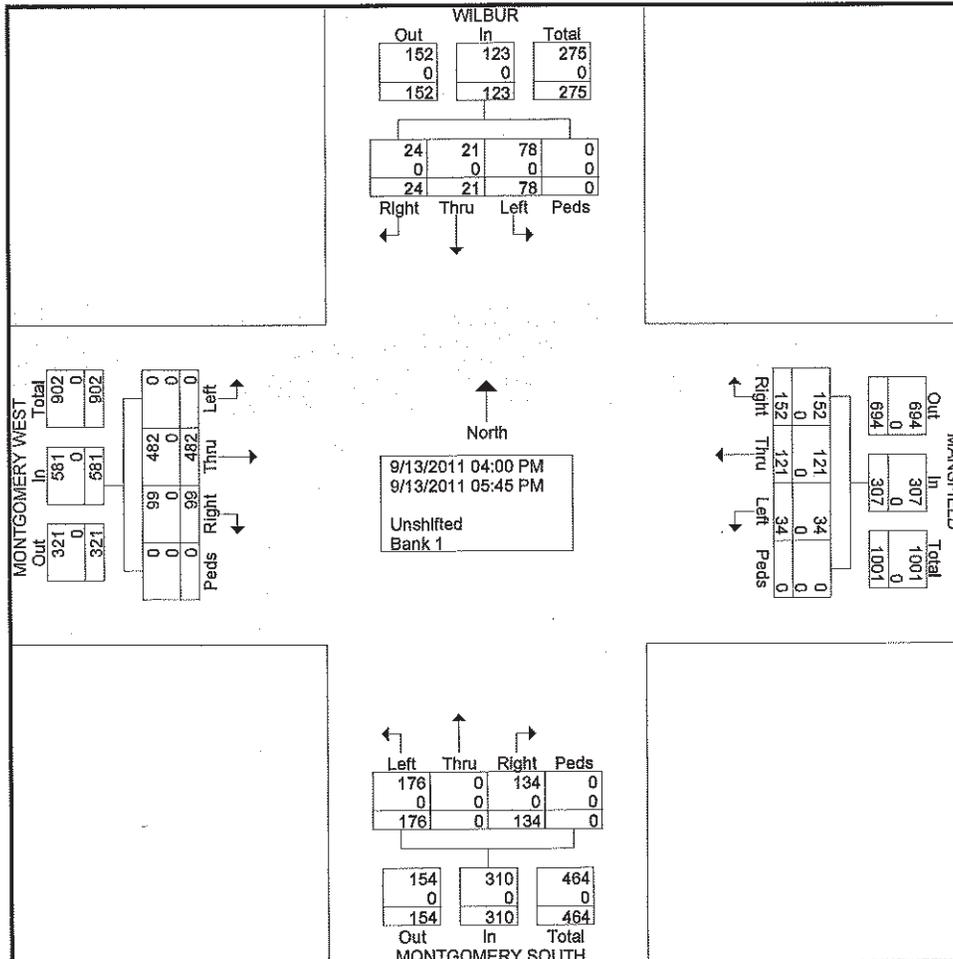
### Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N Pines Rd				Southbound N Pines Rd				Eastbound I-90 EB Ramps				Westbound I-90 EB Ramps				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	0	1,023	296	18	203	756	0	17	280	0	574	14	0	0	0	0	3,132
4:15 PM	0	1,001	306	14	197	741	0	16	287	0	593	14	0	0	0	0	3,125
4:30 PM	0	1,017	299	15	189	739	0	19	279	0	602	15	0	0	0	0	3,125
4:45 PM	0	981	281	14	176	721	0	19	281	0	609	14	0	0	0	0	3,049
5:00 PM	0	916	256	15	152	698	0	18	304	0	601	16	0	0	0	0	2,927

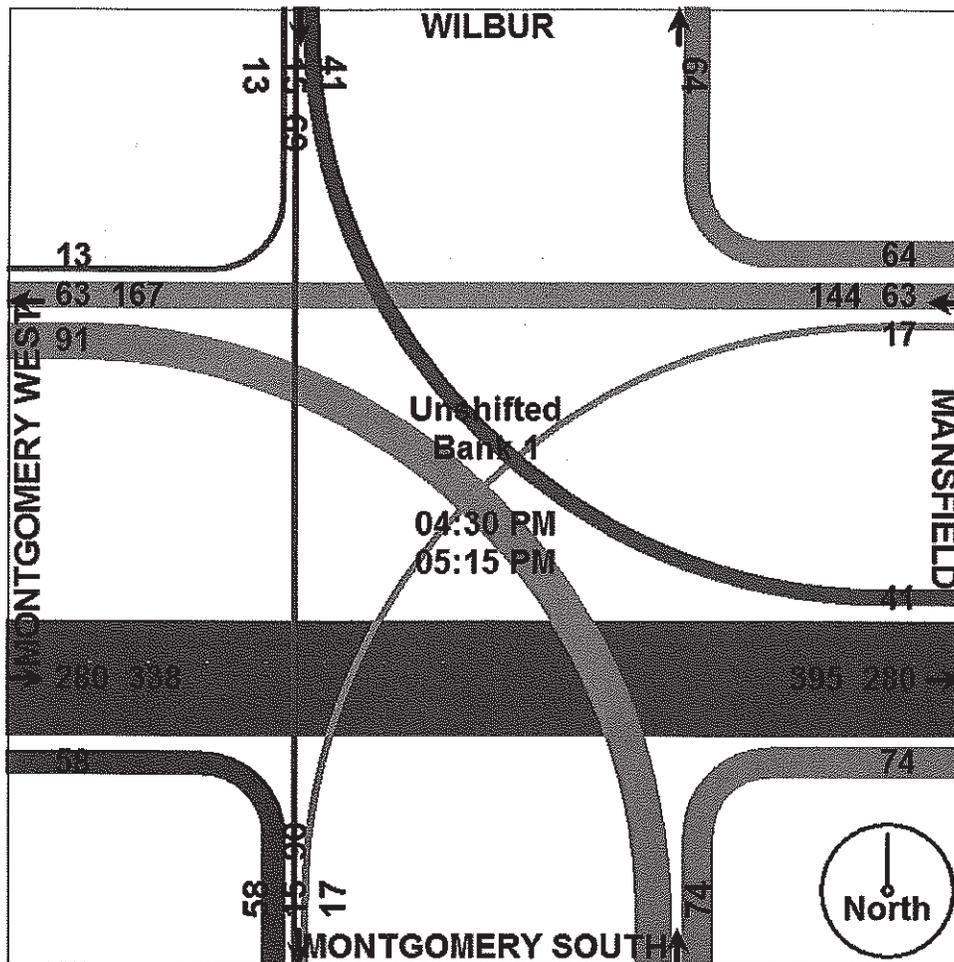
Groups Printed- Unshifted - Bank 1

Start Time	WILBUR From North					MANSFIELD From East					MONTGOMERY SOUTH From South					MONTGOMERY WEST From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	4	1	7	0	12	20	17	3	0	40	19	0	23	0	42	12	47	0	0	59	153
04:15 PM	3	1	10	0	14	22	14	3	0	39	24	0	24	0	48	11	55	0	0	66	167
04:30 PM	3	7	9	0	19	15	27	2	0	44	16	0	24	0	40	15	61	0	0	76	179
04:45 PM	3	2	11	0	16	12	11	5	0	28	19	0	27	0	46	10	60	0	0	70	160
Total	13	11	37	0	61	69	69	13	0	151	78	0	98	0	176	48	223	0	0	271	659
05:00 PM	4	1	8	0	13	11	16	4	0	31	27	0	21	0	48	23	87	0	0	110	202
05:15 PM	3	5	13	0	21	26	9	6	0	41	12	0	19	0	31	10	72	0	0	82	175
05:30 PM	3	1	10	0	14	24	12	4	0	40	12	0	26	0	38	10	68	0	0	78	170
05:45 PM	1	3	10	0	14	22	15	7	0	44	5	0	12	0	17	8	32	0	0	40	115
Total	11	10	41	0	62	83	52	21	0	156	56	0	78	0	134	51	259	0	0	310	662
Grand Total	24	21	78	0	123	152	121	34	0	307	134	0	176	0	310	99	482	0	0	581	1321
Apprch %	19.5	17.1	63.4	0		49.5	39.4	11.1	0		43.2	0	56.8	0		17	83	0	0		
Total %	1.8	1.6	5.9	0	9.3	11.5	9.2	2.6	0	23.2	10.1	0	13.3	0	23.5	7.5	36.5	0	0	44	
Unshifted	24	21	78	0	123	152	121	34	0	307	134	0	176	0	310	99	482	0	0	581	1321
% Unshifted	100	100	100	0	100	100	100	100	0	100	100	0	100	0	100	100	100	0	0	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



File Name : montgomery\_mansfield pm  
 Site Code : 00000000  
 Start Date : 9/13/2011  
 Page No : 2

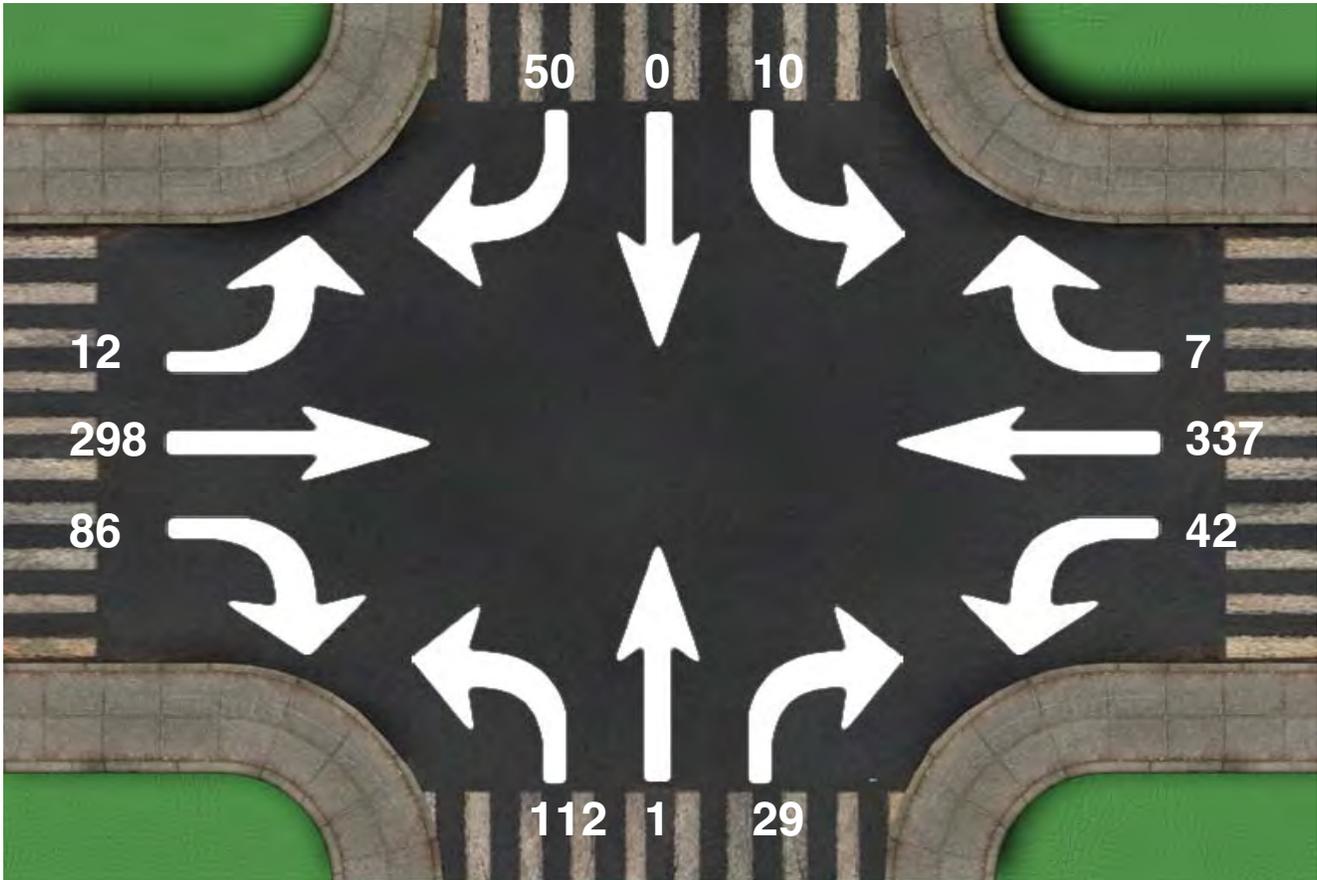
Start Time	WILBUR From North <i>SB</i>					MANSFIELD From East <i>WB</i>					MONTGOMERY SOUTH From South <i>NB</i>					MONTGOMERY WEST From West <i>EB</i>					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	3	7	9	0	19	15	27	2	0	44	16	0	24	0	40	15	61	0	0	76	179
04:45 PM	3	2	11	0	16	12	11	5	0	28	19	0	27	0	46	10	60	0	0	70	160
05:00 PM	4	1	8	0	13	11	16	4	0	31	27	0	21	0	48	23	87	0	0	110	202
05:15 PM	3	5	13	0	21	26	9	6	0	41	12	0	19	0	31	10	72	0	0	82	175
Total Volume	13	15	41	0	69	64	63	17	0	144	74	0	91	0	165	58	280	0	0	338	716
% App. Total	18.8	21.7	59.4	0		44.4	43.8	11.8	0		44.8	0	55.2	0		17.2	82.8	0	0		
PHF	.813	.536	.788	.000	.821	.615	.583	.708	.000	.818	.685	.000	.843	.000	.859	.630	.805	.000	.000	.768	.886





# Intersection Peak Hour

**Location:** Woodruff at Montgomery, Spokane Valley  
**GPS Coordinates:** N = 47.657862, W= -117.248193  
**Date:** 1/30/2013  
**Day of week:** Wednesday  
**Weather:** Cloudy  
**Analyst:** JJ



# Intersection Peak Hour

15:15 - 16:15

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	10	0	50	42	337	7	112	1	29	12	298	86	984
Factor	0.36	0.00	0.43	0.81	0.87	0.35	0.68	0.25	0.73	0.50	0.92	0.83	0.88
Approach factor	0.42			0.87			0.71			0.93			

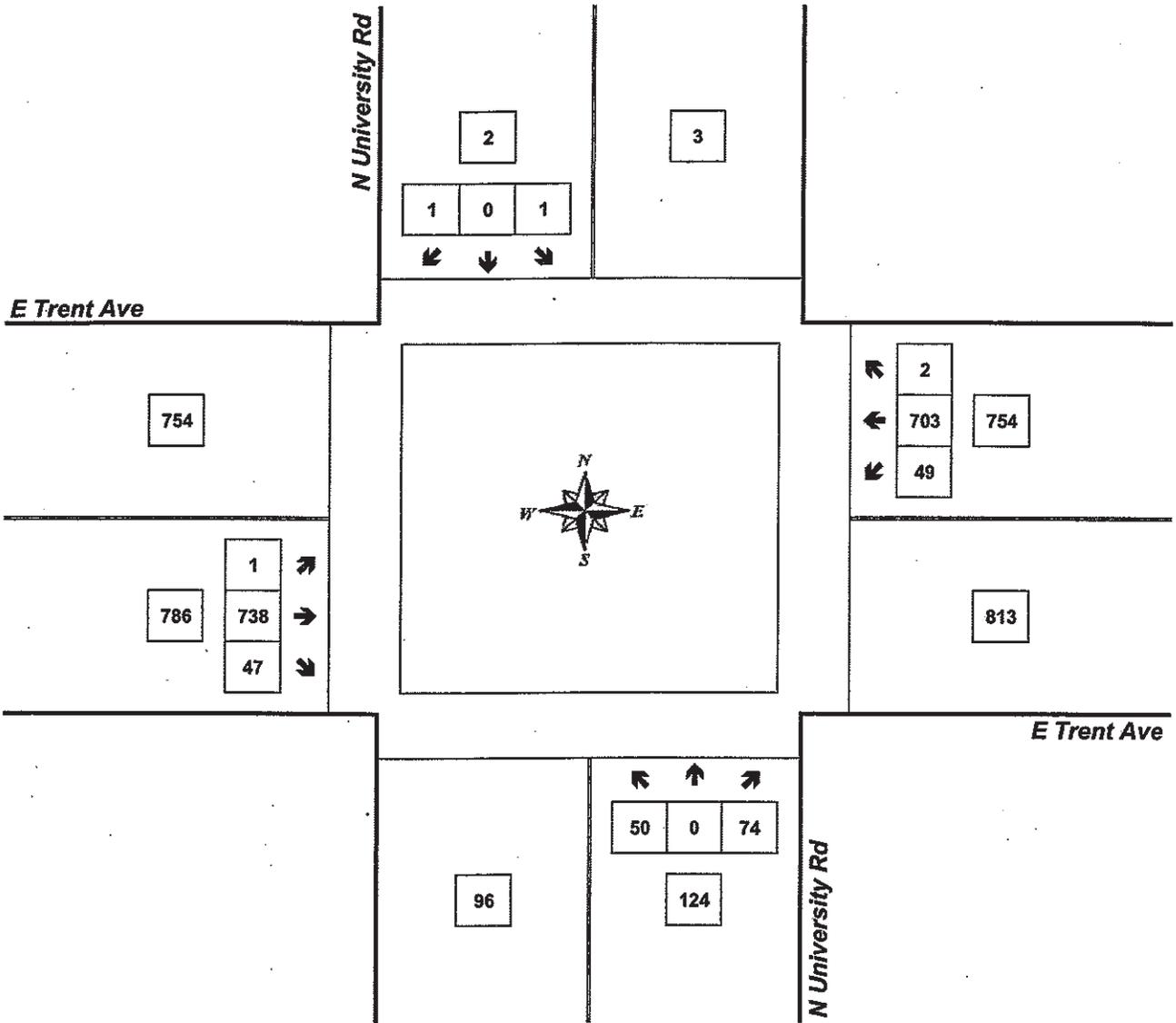
# Peak Hour Summary



Mark Skaggs  
(206) 251-0300

## N University Rd & E Trent Ave

4:15 PM to 5:15 PM  
Tuesday, December 09, 2008



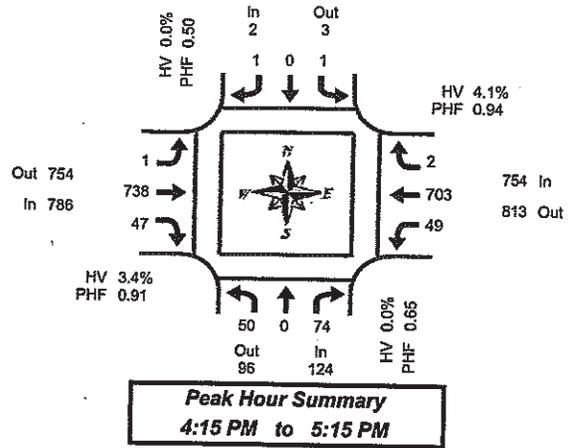
Approach	PHF	HV%	Volume
EB	0.91	3.4%	786
WB	0.94	4.1%	754
NB	0.65	0.0%	124
SB	0.50	0.0%	2
<b>Intersection</b>	<b>0.96</b>	<b>3.5%</b>	<b>1,666</b>

Count Period: 4:00 PM to 6:00 PM

# Total Vehicle Summary



Mark Skaggs  
(206) 251-0300



## N University Rd & E Trent Ave

Tuesday, December 09, 2008  
4:00 PM to 6:00 PM

**Peak Hour Summary**  
4:15 PM to 5:15 PM

### 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N University Rd				Southbound N University Rd				Eastbound E Trent Ave				Westbound E Trent Ave				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	11	0	16	1	2	0	0	0	0	160	12	5	16	172	0	11	389
4:15 PM	9	0	14	0	0	0	0	0	0	198	17	6	11	178	0	6	427
4:30 PM	13	0	20	0	0	0	0	0	0	194	8	6	16	184	1	11	436
4:45 PM	11	0	9	0	1	0	0	0	0	181	9	7	11	167	0	8	389
5:00 PM	17	0	31	0	0	0	1	0	1	165	13	8	11	174	1	6	414
5:15 PM	12	0	17	0	1	0	0	0	0	182	10	4	5	151	2	2	380
5:30 PM	13	0	12	0	0	0	0	0	1	173	16	2	5	143	0	4	363
5:45 PM	11	0	7	1	0	0	0	0	0	137	12	3	6	96	0	0	269
Total Survey	97	0	126	2	4	0	1	0	2	1,390	97	41	81	1,265	4	48	3,067

### Peak Hour Summary

4:15 PM to 5:15 PM

By Approach	Northbound N University Rd				Southbound N University Rd				Eastbound E Trent Ave				Westbound E Trent Ave				Total
	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	In	Out	Total	HV	
Volume	124	96	220	0	2	3	5	0	786	754	1,540	27	754	813	1,567	31	1,666
%HV	0.0%				0.0%				3.4%				4.1%				3.5%
PHF	0.65				0.50				0.91				0.94				0.96

By Movement	Northbound N University Rd				Southbound N University Rd				Eastbound E Trent Ave				Westbound E Trent Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	50	0	74	124	1	0	1	2	1	738	47	786	49	703	2	754	1,666
PHF	0.74	0.00	0.60	0.65	0.25	0.00	0.25	0.50	0.25	0.93	0.69	0.91	0.77	0.96	0.50	0.94	0.96

### Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound N University Rd				Southbound N University Rd				Eastbound E Trent Ave				Westbound E Trent Ave				Interval Total
	L	T	R	HV	L	T	R	HV	L	T	R	HV	L	T	R	HV	
4:00 PM	44	0	59	1	3	0	0	0	0	733	46	24	54	701	1	36	1,641
4:15 PM	50	0	74	0	1	0	1	0	1	738	47	27	49	703	2	31	1,666
4:30 PM	53	0	77	0	2	0	1	0	1	722	40	25	43	676	4	27	1,619
4:45 PM	53	0	69	0	2	0	1	0	2	701	48	21	32	635	3	20	1,546
5:00 PM	53	0	67	1	1	0	1	0	2	657	51	17	27	564	3	12	1,426



Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
 Lane No  1  2

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Direction Channel 1 \_\_\_\_\_  
 Direction Channel 2 \_\_\_\_\_  
 Unique ID# 133

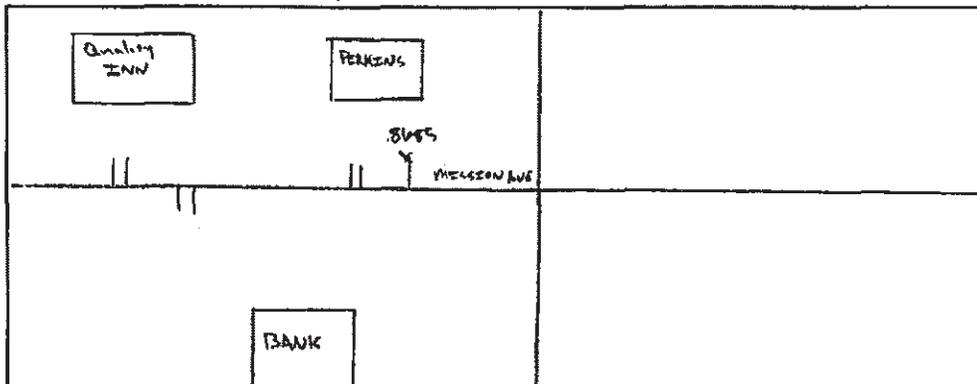
Counter No. 128685 Count ID SP#11-005  
 SR 90 RRT/RRQ \_\_\_\_\_ MP 287.83  
 Leg W Direction WB B  
 OSID 64

AWD 4771

Station Description ON MISSION AVE W/O ARGONNE RD

Date	Day	Time	Comments			
3/14	2	1302	Manual (1) <u>1</u> (2) _____ Counter (1) <u>1</u> (2) _____	SET OK	RT/DB	6.3
3/15	3	0845	Manual (1) <u>8</u> (2) _____ Counter (1) <u>8</u> (2) _____	CHECK OK	RT/DB	6.5
3/16	4	0820	Manual (1) <u>6</u> (2) _____ Counter (1) <u>6</u> (2) _____	CHECK OK	RT/DB	6.2
3/17	5	1011	Manual (1) <u>10</u> (2) _____ Counter (1) <u>10</u> (2) _____	CHECK OK	RT/DB	6.5
3/18	6	<u>0825</u>	Manual (1) <u>1</u> (2) _____ Counter (1) <u>1</u> (2) _____	<u>P/W OK</u>	<u>RT/DB</u>	<u>6.4</u>

Sketch



RT/DB

Field Person

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090	MP 287.83	OFF SYSTEM ID.	B	LEG W	DIRECTION OF TRAFFIC WESTBOUND																LANE ALL OF						
COUNT IDENTIFIER	11-005	COUNTER NUMBER	128685	DESCRIPTION: ON MISSION AVE W/O ARGONNE RD																							
03/14/11 MONDAY			AM HOURS											PM HOURS											DAILY		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15															40	37	52	55	38	21	20	18	9	9			
15-30														36	46	41	46	46	36	26	22	20	9				
30-45														32	58	44	53	58	29	19	12	12	2	2			
45-00														36	40	49	50	47	36	26	11	8	6	4			
HOUR	-----																										
TOT														104	184	171	201	206	139	92	65	58	26	15	1261		

AM PEAK HOUR 0000 TO 0000 VOLUME 0  
PM PEAK HOUR 0445 TO 0545 VOLUME 209  
AM TOTAL 0  
PM TOTAL 1261

03/15/11 TUESDAY			AM HOURS											PM HOURS											DAILY	
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	4	2	1	2	1	2	6	15	45	21	26	34	28	34	39	43	49	55	49	39	31	25	6	3		
15-30	3	4		1	3	5	7	18	22	21	28	25	41	37	34	46	60	73	56	22	27	14	7	3		
30-45	4		2		1	6	12	27	27	37	31	28	39	33	39	49	49	47	40	25	37	13	3	1		
45-00	3	3	1		1	1	16	58	24	20	36	55	42	32	53	52	41	59	25	23	20	9	5	2		
HOUR	-----																									
TOT	14	9	4	3	6	14	41	118	118	99	121	142	150	136	165	190	199	234	170	109	115	61	21	9	2248	

AM PEAK HOUR 0730 TO 0830 VOLUME 152  
PM PEAK HOUR 0500 TO 0600 VOLUME 234  
AM TOTAL 689  
PM TOTAL 1559

03/16/11 WEDNESDAY			AM HOURS											PM HOURS											DAILY	
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	5	1	2			2	7	24	41	25	34	25	53	49	39	45	38	58	58	31	19	17	10	3		
15-30		5	2		1	5	8	14	24	23	27	35	52	41	45	53	42	61	35	26	21	11	6	6		
30-45	3	1	2	1	1	5	20	20	19	26	22	38	49	45	38	31	57	49	49	21	15	9	8	3		
45-00	2				1	7	34	60	19	31	23	31	40	34	48	50	63	41	34	20	14	11	10	8		
HOUR	-----																									
TOT	10	7	6	1	3	19	69	118	103	105	106	129	194	169	170	179	200	209	176	98	69	48	34	20	2242	

AM PEAK HOUR 0730 TO 0830 VOLUME 145  
PM PEAK HOUR 0430 TO 0530 VOLUME 239  
AM TOTAL 676  
PM TOTAL 1566

DOT-RNBS15A-B

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIP SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

DATE 03/21/11  
TIME 11:54:12  
PAGE 182

SR 090	MP 287.83	OFF SYSTEM ID. B	LEG W	DIRECTION OF TRAFFIC WESTBOUND	LANE ALL OF																					
COUNT IDENTIFIER 11-005	COUNTER NUMBER 128685	DESCRIPTION: ON MISSION AVE W/O ARGONNE RD																								
03/17/11 THURSDAY		AM HOURS										PM HOURS										DAILY TOTAL				
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
00-15																										
15-30	6	1	2	1		5	8	21	24	35	27	37	36	31	45	40	41	54	40	22	24	26	13	3	3	
30-45	5		1			4	10	31	25	37	17	34	38	38	46	62	37	63	53	24	35	16	6	6	6	
45-00	3	1	2	1		7	18	63	23	35	30	52	41	44	49	51	63	49	39	26	13	13	5	4	4	
HOUR	-----																									
TOT	14	5	7	3		16	43	133	114	134	103	167	165	148	179	185	185	223	184	98	87	72	30	16	2311	

AM PEAK HOUR 1100 TO 1200 VOLUME 167  
PM PEAK HOUR 0445 TO 0545 VOLUME 237  
AM TOTAL 739  
PM TOTAL 1572

03/18/11 FRIDAY		AM HOURS										PM HOURS										DAILY TOTAL				
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
00-15	5	2	4	2	1	5	2	19	41																	
15-30	7	2	5		3	9	19																			
30-45	4	3	1		1	5	10	24																		
45-00	1	1	7	1	2	4	22	51																		
HOUR	-----																									
TOT	17	8	17	3	7	14	43	113	41																263	

AM PEAK HOUR 0715 TO 0815 VOLUME 135  
PM PEAK HOUR 0000 TO 0000 VOLUME 0  
AM TOTAL 263  
PM TOTAL 0

03/14/11 THRU 03/18/11  
TOTAL HOURS FOR COUNT 90

3 DAYS  
AVG WEEKDAY VOL 2267 X SEASONAL ADJ. FACTOR 1.0000 = 2267 X AXLE CORR FACTOR 1.0000 = ESTIMATED AVG DAILY TRAFFIC 2267

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090	MP 287.83	OFF SYSTEM ID. B	LEG W	DIRECTION OF TRAFFIC EASTBOUND	LANE ALL	OF																				
COUNT IDENTIFIER 11-005	COUNTER NUMBER 125867	DESCRIPTION: ON MISSION AVE W/O ARGONNE RD																								
03/14/11 MONDAY				AM HOURS								PM HOURS								DAILY						
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15															64	51	49	83	41	39	30	12	6	4		
15-30														42	36	74	47	37	47	29	10	10	5	7		
30-45														31	43	42	56	70	43	24	15	7	8	7		
45-00														49	61	53	57	53	33	13	13	14	4	4		
HR	-----																									
TOT														122	204	220	209	243	164	105	68	43	23	22	1423	

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0445 TO 0545 VOLUME 247 PM TOTAL 1423

03/15/11 TUESDAY				AM HOURS								PM HOURS								DAILY						
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	1	2			2	6	5	12	18	34	18	30	40	48	40	41	49	45	74	45	44	21	18	5	5	
15-30	3				1	2	10	10	40	26	29	33	30	51	32	45	41	55	54	55	29	20	19	5	9	
30-45	3	2	2	2	2	6	9	15	31	27	31	36	41	54	40	32	48	56	68	40	28	58	20	5	2	
45-00		2	1	1	2	8	18	31	30	25	27	41	52	55	58	48	52	57	41	22	36	12	3	2		
HR	-----																									
TOT	7	6	3	6	16	32	55	120	117	103	126	152	205	167	176	186	208	253	181	123	135	69	18	18	2482	

AM PEAK HOUR 1100 TO 1200 VOLUME 152 AM TOTAL 743  
PM PEAK HOUR 0500 TO 0600 VOLUME 253 PM TOTAL 1739

03/16/11 WEDNESDAY				AM HOURS								PM HOURS								DAILY						
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	1	2			1	1	10	24	44	21	35	35	62	33	38	64	36	80	46	43	31	25	8	6		
15-30	9		1		3	7	14	21	31	41	41	40	39	40	43	54	34	75	49	19	21	10	10	7		
30-45	1	1	1	3	6	9	16	34	47	29	26	34	45	44	38	42	55	69	49	27	12	17	13	3		
45-00	1	2	1	3	4	16	25	38	36	39	31	41	46	48	70	53	57	51	23	15	24	11	6	3		
HR	-----																									
TOT	12	5	3	6	14	33	65	117	158	130	133	150	192	165	189	213	182	275	167	104	88	63	37	19	2520	

AM PEAK HOUR 0745 TO 0845 VOLUME 160 AM TOTAL 826  
PM PEAK HOUR 0445 TO 0545 VOLUME 281 PM TOTAL 1694

DOT-RN8515A-B

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIP SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

DATE 03/21/11  
TIME 11:54:12  
PAGE 184

SR 090	MP 287.83	OFF SYSTEM ID. B	LEG W	DIRECTION OF TRAFFIC EASTBOUND	LANE ALL OF																				
COUNT IDENTIFIER 11-005	COUNTER NUMBER 125867	DESCRIPTION: ON MISSION AVE W/O ARGONNE RD																							
03/17/11 THURSDAY		AM HOURS										PM HOURS										DAILY TOTAL			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
00-15	3	2			1	2	8	22	47	14	31	38	55	48	38	48	51	85	47	39	15	13	5	4	
15-30	4	2	1		2	9	13	23	31	37	39	47	41	42	37	39	54	76	21	36	21	12	11	6	
30-45	1	1	2		3	11	17	40	26	22	23	64	59	52	26	59	67	72	35	29	19	14	5	4	
45-00	3	4			2	1	12	22	33	21	25	28	40	47	42	66	62	55	57	47	26	21	14	3	5
HOUR	-----																								
TOT	11	9	3	4	7	34	60	118	125	98	121	189	202	184	167	208	227	290	150	130	76	53	24	19	2509

AM PEAK HOUR 1100 TO 1200 VOLUME 189  
PM PEAK HOUR 0500 TO 0600 VOLUME 290  
AM TOTAL 779  
PM TOTAL 1730

03/18/11 FRIDAY		AM HOURS										PM HOURS										DAILY TOTAL			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
00-15	3	2			4	3	2	4	21																
15-30	1	1	2	1	2	7	10	24																	
30-45	5	1	3	1	5	7	17	39																	
45-00	9				3	11	29	30																	
HOUR	-----																								
TOT	18	4	5	6	13	27	60	114	34																281

AM PEAK HOUR 0715 TO 0815 VOLUME 127  
PM PEAK HOUR 0000 TO 0000 VOLUME 0  
AM TOTAL 281  
PM TOTAL 0

03/14/11 THRU 03/18/11  
TOTAL HOURS FOR COUNT 90

3 DAYS  
AVG WEEKDAY VOL 2504 X SEASONAL ADJ. FACTOR 1.0000 = 2504 X AXLE CORR FACTOR 1.0000 = ESTIMATED AVG DAILY TRAFFIC 2504

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIPS SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 MP 287.83 OFF SYSTEM ID. 8 LEG W DIRECTION OF TRAFFIC BOTH WAYS LANE ALL OF  
 COUNT IDENTIFIER 11-005 COUNTER NUMBER 125867 DESCRIPTION: ON MISSION AVE W/O ARGONNE RD

03/14/11 MONDAY

	AM HOURS												PM HOURS												DAILY TOTAL	
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		12
00-15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
15-30	---	---	---	---	---	---	---	---	---	---	---	---	---	78	104	88	101	138	79	60	50	30	15	13	---	
30-45	---	---	---	---	---	---	---	---	---	---	---	---	---	63	101	86	109	128	72	43	27	19	10	9	---	
45-00	---	---	---	---	---	---	---	---	---	---	---	---	---	85	101	102	107	100	69	39	24	22	10	8	---	
HOUR	-----																									
TOT	---	---	---	---	---	---	---	---	---	---	---	---	---	226	388	391	410	449	303	197	133	101	49	37	2684	

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
 PM PEAK HOUR 0445 TO 0545 VOLUME 456 PM TOTAL 2684

03/15/11 TUESDAY

	AM HOURS												PM HOURS												DAILY TOTAL	
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		12
00-15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
15-30	5	4	1	4	7	7	18	33	79	39	56	74	76	74	80	92	94	129	94	83	52	43	11	8		
30-45	6	4	1	2	5	15	17	58	48	50	61	55	92	69	79	87	115	127	111	51	47	33	12	12		
45-00	7	2	4	2	7	15	27	58	54	68	67	69	93	73	71	97	105	115	80	53	95	33	8	3		
HOUR	3	5	2	1	3	9	34	89	54	45	63	96	94	87	111	100	93	116	66	45	56	21	8	4		
TOT	21	15	7	9	22	46	96	238	235	202	247	294	355	303	341	376	407	487	351	232	250	130	39	27	4730	

AM PEAK HOUR 1100 TO 1200 VOLUME 294 AM TOTAL 1432  
 PM PEAK HOUR 0500 TO 0600 VOLUME 487 PM TOTAL 3298

03/16/11 WEDNESDAY

	AM HOURS												PM HOURS												DAILY TOTAL	
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		12
00-15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
15-30	6	3	2	---	1	3	17	48	85	46	69	60	115	82	77	109	74	138	104	74	50	42	18	9		
30-45	9	5	3	---	4	12	22	35	55	64	68	75	91	81	88	107	76	136	84	45	42	21	16	13		
45-00	4	2	3	4	7	14	36	54	66	55	48	72	94	89	76	73	112	118	98	48	27	26	21	6		
HOUR	3	2	1	3	5	23	59	98	55	70	54	72	86	82	118	103	120	92	57	35	38	22	16	11		
TOT	22	12	9	7	17	52	134	235	261	235	239	279	386	334	359	392	382	484	343	202	157	111	71	39	4762	

AM PEAK HOUR 0745 TO 0845 VOLUME 304 AM TOTAL 1502  
 PM PEAK HOUR 0445 TO 0545 VOLUME 512 PM TOTAL 3260

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIP SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 090	MP 287.83	OFF SYSTEM ID. B	LEG W	DIRECTION OF TRAFFIC BOTH WAYS	LANE ALL OF																				
COUNT IDENTIFIER 11-005	COUNTER NUMBER 125867	DESCRIPTION: ON MISSION AVE W/O ARGONNE RD																							
03/17/11 THURSDAY		AM HOURS										PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	3	5	2	1	1	2	15	40	89	41	60	82	105	83	77	80	95	142	99	65	30	30	11	7	
15-30	10	3	3	1	2	14	21	44	55	72	66	84	77	73	82	79	95	130	61	58	45	38	24	9	
30-45	6	1	3	2	3	15	27	71	51	59	40	98	97	90	72	121	104	135	88	53	54	30	11	10	
45-00	6	5	2	3	1	19	40	96	44	60	58	92	88	86	115	113	118	106	86	52	34	27	8	9	
HR	-----																								
TOT	25	14	10	7	7	50	103	251	239	232	224	356	367	332	346	393	412	513	334	228	163	125	54	35	4820

AM PEAK HOUR 1100 TO 1200 VOLUME 356 AM TOTAL 1518  
 PM PEAK HOUR 0445 TO 0545 VOLUME 525 PM TOTAL 3302

03/18/11 FRIDAY		AM HOURS										PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	8	4	4	6	4	7	6	40	75																
15-30	8	3	7	1	5	7	19	43																	
30-45	9	4	4	1	6	12	27	63																	
45-00	10	1	7	1	5	15	51	81																	
HR	-----																								
TOT	35	12	22	9	20	41	103	227	75																544

AM PEAK HOUR 0715 TO 0815 VOLUME 262 AM TOTAL 544  
 PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 0

03/14/11 THRU 03/18/11  
 TOTAL HOURS FOR COUNT 90

3 DAYS FACTOR GROUP FACTOR GROUP  
 AVG WEEKDAY VOL 4771 X SEASONAL ADJ. FACTOR 1.0000 = 4771 X AXLE CORR FACTOR 1.0000 = ESTIMATED AVG DAILY TRAFFIC 4771

PEAK HOUR PERCENTAGES: K = 11.00 D = 54.86  
 PEAK HOUR LOCATION : VOLUME = 525 DATE: 03/17/11 TIME: 04:45 PM

Date	8-Aug-11
Road Name	Argonne Rd.
Location	n/o Mission Ave.
Direction	Northbound
All Day Volume=	18454
PEAK VOL 4-5=	1417
PEAK VOL 5-6=	1479
PEAK VOL NOT PM=	0

Time	Lane 1	
12:00 AM	0	
1:00 AM	0	
2:00 AM	0	
3:00 AM	0	
4:00 AM	0	
5:00 AM	0	
6:00 AM	0	
7:00 AM	0	
8:00 AM	0	
9:00 AM	0	
10:00 AM	1055	
11:00 AM	1153	
12:00 PM	1272	
1:00 PM	1290	
2:00 PM	1298	
3:00 PM	1285	
4:00 PM	1402	
5:00 PM	1409	
6:00 PM	1047	
7:00 PM	716	
8:00 PM	646	
9:00 PM	510	
10:00 PM	358	
11:00 PM	199	13640
12:00 AM	129	
1:00 AM	77	
2:00 AM	71	
3:00 AM	43	
4:00 AM	131	
5:00 AM	271	
6:00 AM	629	
7:00 AM	1064	
8:00 AM	1089	
9:00 AM	1021	
10:00 AM	1150	
11:00 AM	1289	
12:00 PM	1310	
1:00 PM	1265	
2:00 PM	1214	
3:00 PM	1315	
4:00 PM	1417	
5:00 PM	1479	
6:00 PM	1020	
7:00 PM	763	
8:00 PM	653	
9:00 PM	558	
10:00 PM	309	
11:00 PM	187	18454
12:00 AM	110	
1:00 AM	72	
2:00 AM	57	
3:00 AM	63	
4:00 AM	111	
5:00 AM	242	
6:00 AM	625	
7:00 AM	1100	
8:00 AM	1088	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	0	
1:00 PM	0	
2:00 PM	0	
3:00 PM	0	
4:00 PM	0	
5:00 PM	0	
6:00 PM	0	
7:00 PM	0	
8:00 PM	0	
9:00 PM	0	
10:00 PM	0	
11:00 PM	0	3468

Date	20-Jul-11
Road Name	Mission Ave.
Location	e/o Mullan Rd.
Direction	Eastbound
All Day Volume	2922
PEAK VOL 4-5	273
PEAK VOL 5-6	321
PEAK VOL NOT PM	0

Time	Lane 1	
12:00 AM	0	
1:00 AM	0	
2:00 AM	0	
3:00 AM	0	
4:00 AM	0	
5:00 AM	0	
6:00 AM	0	
7:00 AM	0	
8:00 AM	0	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	228	
1:00 PM	178	
2:00 PM	195	
3:00 PM	211	
4:00 PM	273	
5:00 PM	321	
6:00 PM	216	
7:00 PM	122	
8:00 PM	116	
9:00 PM	117	
10:00 PM	70	
11:00 PM	46	2093
12:00 AM	30	
1:00 AM	13	
2:00 AM	9	
3:00 AM	11	
4:00 AM	5	
5:00 AM	24	
6:00 AM	68	
7:00 AM	122	
8:00 AM	116	
9:00 AM	140	
10:00 AM	161	
11:00 AM	178	
12:00 PM	168	
1:00 PM	198	
2:00 PM	215	
3:00 PM	237	
4:00 PM	264	
5:00 PM	300	
6:00 PM	210	
7:00 PM	137	
8:00 PM	123	
9:00 PM	87	
10:00 PM	0	
11:00 PM	0	2806
12:00 AM	0	
1:00 AM	0	
2:00 AM	0	
3:00 AM	0	
4:00 AM	0	
5:00 AM	0	
6:00 AM	0	
7:00 AM	0	
8:00 AM	0	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	0	
1:00 PM	0	
2:00 PM	0	
3:00 PM	0	
4:00 PM	0	
5:00 PM	0	
6:00 PM	0	
7:00 PM	0	
8:00 PM	0	
9:00 PM	0	
10:00 PM	0	
11:00 PM	0	0

Date	20-Jul-11
Road Name	Mission Ave.
Location	e/o Mullan Rd.
Direction	Westbound
All Day Volume=	3296
PEAK VOL 4-5=	258
PEAK VOL 5-6=	267
PEAK VOL NOT PM=	0

Time	Lane 1	
12:00 AM	0	
1:00 AM	0	
2:00 AM	0	
3:00 AM	0	
4:00 AM	0	
5:00 AM	0	
6:00 AM	0	
7:00 AM	0	
8:00 AM	0	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	232	
1:00 PM	262	
2:00 PM	233	
3:00 PM	239	
4:00 PM	258	
5:00 PM	262	
6:00 PM	194	
7:00 PM	147	
8:00 PM	125	
9:00 PM	93	
10:00 PM	58	
11:00 PM	28	2131
12:00 AM	22	
1:00 AM	11	
2:00 AM	5	
3:00 AM	7	
4:00 AM	25	
5:00 AM	55	
6:00 AM	129	
7:00 AM	208	
8:00 AM	162	
9:00 AM	177	
10:00 AM	193	
11:00 AM	193	
12:00 PM	259	
1:00 PM	224	
2:00 PM	230	
3:00 PM	237	
4:00 PM	258	
5:00 PM	267	
6:00 PM	202	
7:00 PM	140	
8:00 PM	111	
9:00 PM	95	
10:00 PM	0	
11:00 PM	0	3210
12:00 AM	0	
1:00 AM	0	
2:00 AM	0	
3:00 AM	0	
4:00 AM	0	
5:00 AM	0	
6:00 AM	0	
7:00 AM	0	
8:00 AM	0	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	0	
1:00 PM	0	
2:00 PM	0	
3:00 PM	0	
4:00 PM	0	
5:00 PM	0	
6:00 PM	0	
7:00 PM	0	
8:00 PM	0	
9:00 PM	0	
10:00 PM	0	
11:00 PM	0	0

Date	8-Aug-11
Road Name	Mullan Rd.
Location	n/o Mission Ave.
Direction	Northbound
All Day Volume=	19070
PEAK VOL: 4-5=	1516
PEAK VOL: 5-6=	1534
PEAK VOL: NOT PM=	0

Time	Lane 1	
12:00 AM	0	
1:00 AM	0	
2:00 AM	0	
3:00 AM	0	
4:00 AM	0	
5:00 AM	0	
6:00 AM	0	
7:00 AM	0	
8:00 AM	0	
9:00 AM	0	
10:00 AM	1099	
11:00 AM	1146	
12:00 PM	1296	
1:00 PM	1268	
2:00 PM	1384	
3:00 PM	1331	
4:00 PM	1438	
5:00 PM	1447	
6:00 PM	1003	
7:00 PM	758	
8:00 PM	635	
9:00 PM	483	
10:00 PM	321	
11:00 PM	191	13780
12:00 AM	122	
1:00 AM	90	
2:00 AM	77	
3:00 AM	67	
4:00 AM	177	
5:00 AM	377	
6:00 AM	730	
7:00 AM	1182	
8:00 AM	966	
9:00 AM	986	
10:00 AM	1047	
11:00 AM	1176	
12:00 PM	1359	
1:00 PM	1298	
2:00 PM	1290	
3:00 PM	1368	
4:00 PM	1516	
5:00 PM	1534	
6:00 PM	1087	
7:00 PM	749	
8:00 PM	737	
9:00 PM	583	
10:00 PM	340	
11:00 PM	232	19070
12:00 AM	110	
1:00 AM	75	
2:00 AM	58	
3:00 AM	72	
4:00 AM	181	
5:00 AM	362	
6:00 AM	722	
7:00 AM	1204	
8:00 AM	1023	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	0	
1:00 PM	0	
2:00 PM	0	
3:00 PM	0	
4:00 PM	0	
5:00 PM	0	
6:00 PM	0	
7:00 PM	0	
8:00 PM	0	
9:00 PM	0	
10:00 PM	0	
11:00 PM	0	3807



Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

---

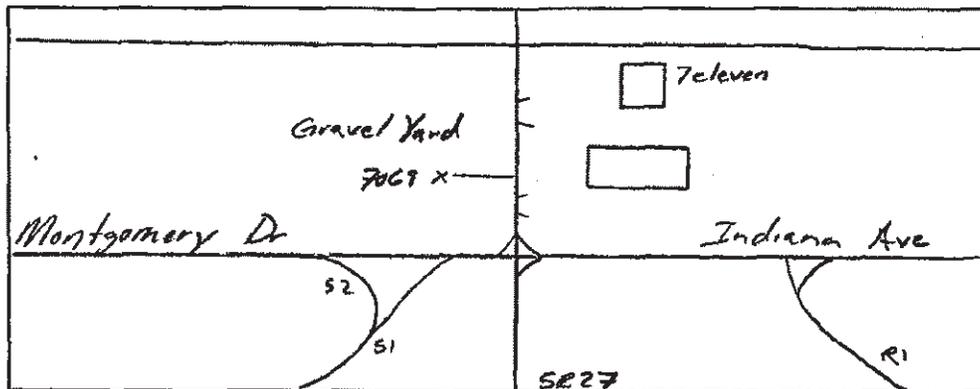
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# 156

Counter No. 127069 Count ID 11-005  
SR 27 RRT/RRQ \_\_\_\_\_ MP 86.73  
Leg 2 Direction SB OSID \_\_\_\_\_

Station Description ON SR27 N/O MONTGOMERY DR / INDIANA AVE WYE CONNS

Date	Day	Time	Comments
3/14/11	2	1303	Manual (1) <u>10</u> (2) _____ Counter (1) <u>10</u> (2) _____ Set o.k. JM/CP 6.4
3/15	3	0759	Manual (1) <u>50</u> (2) _____ Counter (1) <u>50</u> (2) _____ Check o.k. JM/CP 6.4
3/16	4	1210	Manual (1) <u>50</u> (2) _____ Counter (1) <u>50</u> (2) _____ Check o.k. JM/CP 7.1
3/17	5	1036	Manual (1) <u>42</u> (2) _____ Counter (1) <u>42</u> (2) _____ Check o.k. JM/CP 6.4
3/18	6	7:34	Manual (1) <u>1</u> (2) _____ Counter (1) <u>1</u> (2) _____ P/U o.k. JM/CP 6.3

Sketch



JM/CP  
Field Person

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC	SOUTHBOUND	LANE ALL OF																						
COUNT IDENTIFIER	11-005	COUNTER NUMBER	127069	DESCRIPTION: ON SR 27 N/O MONTGOMERY DR/INDIANA AVE WYE CONNS																								
03/14/11 MONDAY			AM HOURS											PM HOURS											DAILY			
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15																172	240	235	269	157	124	92	81	44	33			
15-30															191	198	253	211	239	151	134	84	61	54	20			
30-45															177	199	203	254	198	123	112	70	44	43	40			
45-00															184	209	234	245	203	109	92	82	58	22	21			
HOUR	-----																											
TOT															552	778	930	945	909	540	462	328	244	163	114	5965		

AM PEAK HOUR 0000 TO 0000 VOLUME 0  
PM PEAK HOUR 0430 TO 0530 VOLUME 1007  
AM TOTAL 0  
PM TOTAL 5965

03/15/11 TUESDAY			AM HOURS											PM HOURS											DAILY			
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
15-30	20	10	10	9	16	33	98	148	137	130	133	176	161	166	187	221	205	250	150	102	100	60	44	24				
30-45	9	10	6	11	23	50	148	191	231	164	142	199	182	161	252	246	255	211	148	95	91	73	49	30				
45-00	11	15	6	6	30	59	140	223	192	153	143	171	188	182	195	230	193	188	144	85	103	59	31	25				
HOUR	-----																											
TOT	52	46	36	31	85	169	475	702	752	578	563	688	770	699	823	872	884	923	612	427	379	261	170	95	11092			

AM PEAK HOUR 0745 TO 0845 VOLUME 783  
PM PEAK HOUR 0430 TO 0530 VOLUME 972  
AM TOTAL 4177  
PM TOTAL 6915

03/16/11 WEDNESDAY			AM HOURS											PM HOURS											DAILY			
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	14	10	12	8	16	31	64	103	177	146	159	157	239	176	174	215	224	293	184	139	89	93	62	33				
15-30	20	16	7	8	20	34	97	199	175	161	146	170	174	169	186	235	232	238	183	118	95	76	40	33				
30-45	19	10	9	8	31	60	115	186	174	157	144	204	203	184	191	231	253	235	147	98	94	54	37	44				
45-00	12	8	6	7	19	54	154	217	215	191	116	183	181	179	200	228	214	191	146	103	121	55	31	21				
HOUR	-----																											
TOT	65	44	34	31	86	179	430	705	741	655	565	714	797	708	751	909	923	957	660	458	399	278	170	131	11390			

AM PEAK HOUR 0715 TO 0815 VOLUME 779  
PM PEAK HOUR 0430 TO 0530 VOLUME 998  
AM TOTAL 4249  
PM TOTAL 7141

DOT-RNB515A-B

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

DATE 03/21/11  
TIME 11:54:12  
PAGE 152

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC SOUTHBOUND	LANE ALL OF																				
COUNT IDENTIFIER 11-005	COUNTER NUMBER 127069	DESCRIPTION: ON SR 27 N/O MONTGOMERY DR/INDIANA AVE WYE CONNS																							
03/17/11 THURSDAY												PM HOURS												DAILY	
AM HOURS																								TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
25	12	4	7	7	24	69	134	157	152	132	137	189	158	205	185	266	262	186	140	102	77	60	50		
23	14	9	8	18	36	101	172	191	126	169	167	173	182	170	237	221	248	156	97	75	87	57	21		
8	10	16	6	25	63	144	186	204	159	148	222	212	158	233	232	269	228	139	109	89	76	34	34		
11	9	8	9	31	60	137	216	195	173	179	194	204	190	211	234	256	220	140	177	110	56	36	35		
HOUR																									
TOT	67	45	37	30	81	183	451	708	747	610	628	720	778	688	819	888	1012	958	621	523	376	296	187	140	11593

AM PEAK HOUR 0745 TO 0845 VOLUME 768 AM TOTAL 4307  
PM PEAK HOUR 0430 TO 0530 VOLUME 1035 PM TOTAL 7286

03/18/11 FRIDAY												PM HOURS												DAILY	
AM HOURS																								TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
16	15	15	8	10	26	80	141																		
18	12	17	6	21	23	67	157																		
11	15	9	11	26	51	116																			
26	13	15	11	21	71	122																			
HOUR																									
TOT	71	55	56	36	78	171	385	298																1150	

AM PEAK HOUR 0630 TO 0730 VOLUME 536 AM TOTAL 1150  
PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 0

03/14/11 THRU 03/18/11  
TOTAL HOURS FOR COUNT 89

3 DAYS FACTOR GROUP GR-02 FACTOR GROUP GR-B2  
AVG WEEKDAY VOL 11358 X SEASONAL ADJ. FACTOR 0.9500 = 10790 X AXLE CORR FACTOR 0.9810 = ESTIMATED AVG DAILY TRAFFIC 10585

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027 MP 086.73 OFF SYSTEM ID. LEG 2 DIRECTION OF TRAFFIC NORTHBOUND LANE ALL OF

COUNT IDENTIFIER 11-005 COUNTER NUMBER 127054 DESCRIPTION: ON SR 27 N/O MONTGOMERY DR/INDIANA AVE WYE CONNS

03/14/11 MONDAY												AM HOURS											PM HOURS											DAILY TOTAL
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12									
00-15														155	139	217	206	258	185	115	122	114	64	34										
15-30														144	149	166	224	252	195	122	101	78	52	33										
30-45														135	161	197	209	234	157	120	99	55	54	38										
45-00														163	167	224	218	184	129	114	101	74	43	29										
HOUR																																		
TOT														597	616	804	857	928	666	471	423	321	213	134	6030									

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0445 TO 0545 VOLUME 962 PM TOTAL 6030

03/15/11 TUESDAY												AM HOURS											PM HOURS											DAILY TOTAL
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12									
00-15	33	20	10	12	10	18	49	108	141	107	87	94	138	153	123	215	225	239	179	131	116	89	62	49										
15-30	29	13	5	7	7	17	52	115	115	119	114	136	128	124	138	176	209	223	167	134	109	92	53	31										
30-45	26	11	9	10	14	29	68	139	109	92	108	143	124	142	142	200	239	210	127	117	119	65	50	39										
45-00	24	18	8	8	22	61	70	162	124	112	131	142	150	136	188	192	193	207	147	111	105	64	51	37										
HOUR																																		
TOT	112	62	32	37	53	125	239	524	489	430	440	515	540	555	591	783	866	879	620	493	449	310	216	156	9516									

AM PEAK HOUR 0715 TO 0815 VOLUME 557 AM TOTAL 3058  
PM PEAK HOUR 0430 TO 0530 VOLUME 894 PM TOTAL 6458

03/16/11 WEDNESDAY												AM HOURS											PM HOURS											DAILY TOTAL
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12									
00-15	35	10	13	7	11	13	35	92	134	119	98	122	149	155	147	204	222	246	185	117	122	101	87	54										
15-30	24	23	11	8	14	26	44	119	111	140	107	146	154	155	160	232	232	239	203	149	124	88	86	41										
30-45	20	15	9	12	9	38	81	122	107	108	107	133	148	159	180	172	225	209	158	113	122	85	69	31										
45-00	13	17	7	5	29	52	85	177	123	122	124	168	158	148	213	194	192	178	149	143	119	73	43	45										
HOUR																																		
TOT	92	65	40	32	63	129	245	510	475	489	436	569	609	617	700	802	871	872	695	522	487	347	285	171	10123									

AM PEAK HOUR 1100 TO 1200 VOLUME 569 AM TOTAL 3145  
PM PEAK HOUR 0430 TO 0530 VOLUME 902 PM TOTAL 6978

DOT-RNBS15A-B

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIP SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

DATE 03/21/11  
TIME 11:54:12  
PAGE 154

SR 027 MP 086.73 OFF SYSTEM ID. LEG 2 DIRECTION OF TRAFFIC NORTHBOUND LANE ALL OF

COUNT IDENTIFIER 11-005 COUNTER NUMBER 127054 DESCRIPTION: ON SR 27 N/O MONTGOMERY DR/INDIANA AVE WYE CONNS

03/17/11 THURSDAY	AM HOURS										PM HOURS										DAILY TOTAL				
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7		8	9	10	11
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
00-15	31	17	17	14	11	26	44	92	149	97	118	129	163	145	156	214	217	241	158	145	133	97	77	71	
15-30	14	11	10	10	5	24	56	107	124	96	98	137	147	166	184	187	240	254	182	124	119	107	50	56	
30-45	11	13	9	10	14	39	82	111	108	83	109	139	151	167	192	192	220	249	185	111	105	85	71	38	
45-00	15	11	9	11	21	38	102	157	115	108	133	136	133	162	214	206	234	225	178	117	108	65	52	41	
HOUR	-----																								
TOT	71	52	45	45	51	127	284	467	496	384	458	541	594	640	746	799	911	969	703	497	465	354	250	206	10155

AM PEAK HOUR 0730 TO 0830 VOLUME 541 AM TOTAL 3021  
PM PEAK HOUR 0445 TO 0545 VOLUME 978 PM TOTAL 7134

03/18/11 FRIDAY	AM HOURS										PM HOURS										DAILY TOTAL			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7		8	9	10
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	
00-15	35	17	20	8	13	15	50	88																
15-30	29	20	12	19	13	20	53	110																
30-45	38	21	16	14	16	35	66																	
45-00	28	23	18	17	24	32	92																	
HOUR	-----																							
TOT	130	81	66	58	66	102	261	198																962

AM PEAK HOUR 0630 TO 0730 VOLUME 356 AM TOTAL 962  
PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 0

03/14/11 THRU 03/18/11  
TOTAL HOURS FOR COUNT 90

3 DAYS FACTOR GROUP GR-02 FACTOR GROUP GR-B2  
AVG WEEKDAY VOL 9931 X SEASONAL ADJ. FACTOR 0.9500 = 9434 X AXLE CORR FACTOR 0.9810 = ESTIMATED AVG DAILY TRAFFIC 9255

DOT-RNB515A-B

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

DATE 03/21/11  
TIME 11:54:12  
PAGE 155

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC BOTH WAYS																	LANE ALL OF						
COUNT IDENTIFIER	11-005	COUNTER NUMBER	127054	DESCRIPTION: ON SR 27 N/O MONTGOMERY DR/INDIANA AVE WYE CONNS																							
03/14/11 MONDAY												PM HOURS												DAILY			
AM HOURS																								TOTAL			
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12				
00-15														311	457	441	527	342	239	214	195	108	67				
15-30													335	347	419	435	491	346	256	185	139	106	53				
30-45												312	360	400	463	432	280	232	169	99	97	78					
45-00												347	376	458	463	387	238	206	183	132	65	50					
HOUR																											
TOT													994	1394	1734	1802	1837	1206	933	751	565	376	248	11840			

AM PEAK HOUR 0000 TO 0000 VOLUME 0  
PM PEAK HOUR 0430 TO 0530 VOLUME 1944

AM TOTAL 0  
PM TOTAL 11840

03/15/11 TUESDAY												PM HOURS												DAILY	
AM HOURS																								TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	45	31	24	17	26	45	138	248	333	238	232	236	377	343	312	390	456	513	349	276	201	158	108	65	
15-30	49	23	15	16	23	50	150	263	252	249	247	312	289	290	325	397	414	473	317	236	209	152	97	55	
30-45	35	21	15	21	37	79	216	330	340	256	250	342	306	303	394	446	494	421	275	212	210	138	99	69	
45-00	35	33	14	14	52	120	210	385	316	265	274	313	338	318	383	422	386	395	291	196	208	123	82	62	
HOUR																									
TOT	164	108	68	68	138	294	714	1226	1241	1008	1003	1203	1310	1254	1414	1655	1750	1802	1232	920	828	571	386	251	20608

AM PEAK HOUR 0715 TO 0815 VOLUME 1311  
PM PEAK HOUR 0430 TO 0530 VOLUME 1866

AM TOTAL 7235  
PM TOTAL 13373

03/16/11 WEDNESDAY												PM HOURS												DAILY	
AM HOURS																								TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	49	20	25	15	27	44	99	195	311	265	257	279	388	331	321	419	446	539	369	256	211	194	149	87	
15-30	44	39	18	16	34	60	141	318	286	301	253	316	328	324	346	467	464	477	386	267	219	164	126	74	
30-45	39	25	18	20	40	98	196	308	281	265	251	337	351	343	371	403	478	444	305	211	216	139	106	75	
45-00	25	25	13	12	48	106	239	394	338	313	240	351	339	327	413	422	406	369	295	246	240	128	74	66	
HOUR																									
TOT	157	109	74	63	149	308	675	1215	1216	1144	1001	1283	1406	1325	1451	1711	1794	1829	1355	980	886	625	455	302	21513

AM PEAK HOUR 0715 TO 0815 VOLUME 1331  
PM PEAK HOUR 0430 TO 0530 VOLUME 1900

AM TOTAL 7394  
PM TOTAL 14119

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIP SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC BOTH WAYS																LANE ALL OF						
COUNT IDENTIFIER 11-005	COUNTER NUMBER 127054	DESCRIPTION: ON SR 27 N/O MONTGOMERY DR/INDIANA AVE WYE CONNS																								
03/17/11 THURSDAY				AM HOURS								PM HOURS								DAILY						
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	56	29	21	21	18	50	113	226	306	249	250	266	352	303	361	399	483	503	344	285	235	174	137	121		
15-30	37	25	19	18	23	60	157	279	315	222	267	304	320	348	354	424	461	502	338	221	194	194	107	77		
30-45	19	23	25	16	39	102	226	297	312	242	257	361	363	325	425	424	489	477	324	220	194	161	105	72		
45-00	26	20	17	20	52	98	239	373	310	281	312	330	337	352	425	440	490	445	318	294	218	121	88	76		
HR	-----																									
TOT	138	97	82	75	132	310	735	1175	1243	994	1086	1261	1372	1328	1565	1687	1923	1927	1324	1020	841	650	437	346	21748	

AM PEAK HOUR 0745 TO 0845 VOLUME 1306 AM TOTAL 7328  
 PM PEAK HOUR 0430 TO 0530 VOLUME 1984 PM TOTAL 14420

03/18/11 FRIDAY				AM HOURS								PM HOURS								DAILY						
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	51	32	35	16	23	41	130	229																		
15-30	47	32	29	25	34	43	120	267																		
30-45	49	36	25	25	42	86	182																			
45-00	54	36	33	28	45	103	214																			
HR	-----																									
TOT	201	136	122	94	144	273	646	496																	2112	

AM PEAK HOUR 0630 TO 0730 VOLUME 892 AM TOTAL 2112  
 PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 0

03/14/11 THRU 03/18/11  
 TOTAL HOURS FOR COUNT 89

3 DAYS FACTOR GROUP GR-02 FACTOR GROUP GR-B2  
 AVG WEEKDAY VOL 21290 X SEASONAL ADJ. FACTOR 0.9500 = 20226 X AXLE CORR FACTOR 0.9810 = ESTIMATED AVG DAILY TRAFFIC 19842

PEAK HOUR PERCENTAGES: K = 9.32 D = 52.17  
 PEAK HOUR LOCATION : VOLUME = 1984 DATE: 03/17/11 TIME: 04:30 PM

NOTE: COUNT HIGH ?



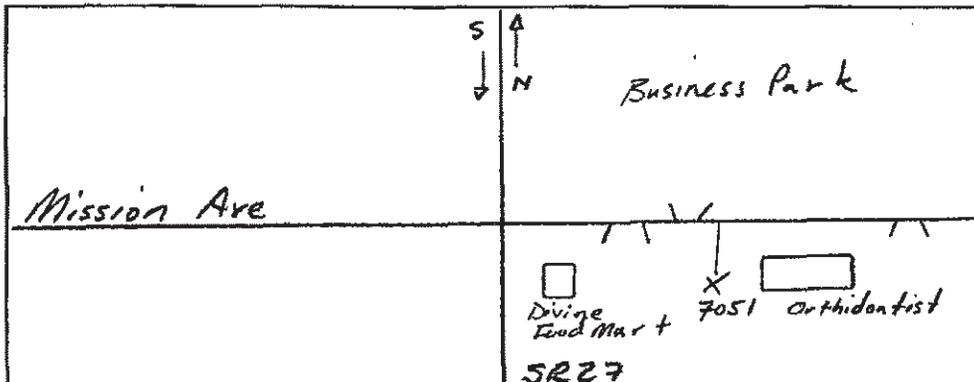
Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
 Lane No  1  2  
 Direction Channel 1 \_\_\_\_\_  
 Direction Channel 2 \_\_\_\_\_  
 Unique ID# \_\_\_\_\_

Counter No. 127051 Count ID 11-005  
 SR 27 RRT/RRQ \_\_\_\_\_ MP 86.45  
 Leg R Direction EB OSID \_\_\_\_\_

Station Description \_ ON MISSION AVE E/O SR27

Date	Day	Time	Comments
3/14/11	2	1236	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ Set o.k. JM/CP 6.5
3/15	3	0739	Manual (1) <u>26</u> (2) _____ Counter (1) <u>26</u> (2) _____ Check o.k. JM/CP 6.4
3/16	4	1151	Manual (1) <u>27</u> (2) _____ Counter (1) <u>27</u> (2) _____ Check o.k. JM/CP 6.8
3/17	5	1053	Manual (1) <u>33</u> (2) _____ Counter (1) <u>32</u> (2) _____ SP=1 Check o.k. JM/CP 7.0
3/18	6	7:18	Manual (1) <u>1</u> (2) _____ Counter (1) <u>1</u> (2) _____ P/U o.k. JM/CP 6.4

Sketch



North

JM/CP

Field Person

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.45	OFF SYSTEM ID.	LEG R	DIRECTION OF TRAFFIC WESTBOUND	LANE ALL	OF																			
COUNT IDENTIFIER 11-005	COUNTER NUMBER 127083	DESCRIPTION: ON MISSION AVE E/O SR 27																							
03/14/11 MONDAY												PM HOURS												DAILY	
AM HOURS																								TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15													100	124	150	144	164	77	50	35	39	19	21		
15-30													94	121	126	125	108	86	55	33	26	24	23		
30-45													111	107	144	142	138	73	51	28	17	20	23		
45-00												95	100	129	144	129	86	60	41	28	28	14	17		
HOUR	-----																								
TOT													95	405	481	564	540	496	296	197	124	110	77	84	3469

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0300 TO 0400 VOLUME 564 PM TOTAL 3469

03/15/11 TUESDAY												PM HOURS												DAILY	
AM HOURS																								TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	11	6	4	3	4	11	21	55	94	83	88	105	147	95	97	149	115	170	75	50	44	18	26	16	
15-30	8	2	2	1	5	11	46	67	68	90	99	120	92	112	108	116	170	135	64	50	37	30	32	11	
30-45	11	4	5	4	9	28	54	119	65	91	102	130	103	109	107	142	149	119	67	54	43	23	23	15	
45-00	4	2	3	3	7	24	53	95	101	81	87	102	86	103	133	132	148	95	69	42	33	36	21	9	
HOUR	-----																								
TOT	34	14	14	11	25	74	174	336	328	345	376	457	428	419	445	539	582	519	275	196	157	107	102	51	6008

AM PEAK HOUR 1100 TO 1200 VOLUME 457 AM TOTAL 2188  
PM PEAK HOUR 0415 TO 0515 VOLUME 637 PM TOTAL 3820

03/16/11 WEDNESDAY												PM HOURS												DAILY	
AM HOURS																								TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	13	3	3	4	5	5	24	59	80	77	90	102	142	96	115	149	143	157	83	74	49	36	29	15	
15-30	11	6	11	4	6	10	35	87	70	91	97	122	106	104	120	145	141	106	73	74	53	25	26	13	
30-45	9	4	6	2	7	23	65	114	69	101	95	107	132	109	129	118	126	112	65	54	37	17	21	19	
45-00	6	2	3	1	14	16	66	97	103	101	101	125	97	111	142	131	143	85	66	46	44	28	24	9	
HOUR	-----																								
TOT	39	15	23	11	32	54	190	357	322	370	383	456	477	420	506	543	553	460	287	248	183	106	100	56	6191

AM PEAK HOUR 1100 TO 1200 VOLUME 456 AM TOTAL 2252  
PM PEAK HOUR 0415 TO 0515 VOLUME 567 PM TOTAL 3939

DOT-RNB515A-B

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

DATE 03/21/11  
TIME 11:54:12  
PAGE 134

SR 027	MP 086.45	OFF SYSTEM ID.	LEG R	DIRECTION OF TRAFFIC WESTBOUND	LANE ALL OF																					
COUNT IDENTIFIER 11-005	COUNTER NUMBER 127083	DESCRIPTION: ON MISSION AVE E/O SR 27																								
03/17/11 THURSDAY		AM HOURS											PM HOURS											DAILY TOTAL		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
00-15	14	11	9	5	4	9	27	67	84	86	95	108	112	97	97	120	139	163	78	69	48	39	18	25		
15-30	14	12	4	3	6	15	35	69	84	65	96	124	113	111	131	136	131	137	72	58	39	33	27	17		
30-45	7	6	5	3	8	24	49	99	88	89	77	98	86	106	147	142	147	103	62	48	42	45	25	14		
45-00	6	1	5	4	9	20	63	93	84	100	91	105	88	88	115	127	133	91	67	48	26	23	13	11		
HOUR	-----																									
TOT	41	30	23	15	27	68	174	328	340	340	359	435	399	402	490	525	550	494	279	223	155	140	83	67	5987	

AM PEAK HOUR 1100 TO 1200 VOLUME 435  
PM PEAK HOUR 0430 TO 0530 VOLUME 580  
AM TOTAL 2180  
PM TOTAL 3807

03/18/11 FRIDAY		AM HOURS											PM HOURS											DAILY TOTAL				
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
00-15	9	6	5	3	5	15	29	63																				
15-30	9	6	6	3	9	18	41																					
30-45	10	5	3	6	4	25	56																					
45-00	12	6	3	7	8	22	68																					
HOUR	-----																											
TOT	40	23	17	19	26	80	194	63																				462

AM PEAK HOUR 0615 TO 0715 VOLUME 228  
PM PEAK HOUR 0000 TO 0000 VOLUME 0  
AM TOTAL 462  
PM TOTAL 0

03/14/11 THRU 03/18/11  
TOTAL HOURS FOR COUNT 90

3 DAYS  
AVG WEEKDAY VOL 6062 X SEASONAL ADJ. FACTOR 0.9500 = 5759 X AXLE CORR FACTOR 0.9810 = ESTIMATED AVG DAILY TRAFFIC 5650

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIPS SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.45	OFF SYSTEM ID.	LEG R	DIRECTION OF TRAFFIC EASTBOUND	LANE ALL	OF																				
COUNT IDENTIFIER 11-005	COUNTER NUMBER 127051	DESCRIPTION: ON MISSION AVE E/O SR 27																								
03/14/11 MONDAY	AM HOURS											PM HOURS											DAILY			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15														120	96	113	109	100	75	52	47	29	28	17		
15-30														121	136	139	112	105	53	49	37	22	23	13		
30-45														114	145	116	107	102	61	45	34	23	20	15		
45-00														145	116	133	121	121	71	62	38	26	26	20	10	
HOUR	-----																									
TOT														145	471	510	489	449	378	251	184	144	100	91	55	3267

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
 PM PEAK HOUR 0230 TO 0330 VOLUME 530 PM TOTAL 3267

03/15/11 TUESDAY	AM HOURS											PM HOURS											DAILY			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	9	7	4	1	4	6	22	73	123	112	93	99	106	107	127	133	116	104	54	64	42	36	21	9		
15-30	11	3	3	3	4	11	48	67	73	79	94	95	96	137	102	155	133	129	62	56	41	26	22	14		
30-45	7	6	1	3	4	23	65	108	110	108	101	88	109	119	124	145	92	100	61	37	47	27	19	14		
45-00	14	7	2	5	7	32	65	162	119	108	113	87	130	142	148	116	81	107	61	45	41	33	25	13		
HOUR	-----																									
TOT	41	23	10	12	19	72	200	410	425	407	401	369	441	505	501	549	422	440	238	202	171	122	87	50	6117	

AM PEAK HOUR 0745 TO 0845 VOLUME 468 AM TOTAL 2389  
 PM PEAK HOUR 0245 TO 0345 VOLUME 581 PM TOTAL 3728

03/16/11 WEDNESDAY	AM HOURS											PM HOURS											DAILY			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	8	8	5	6	5	6	24	55	125	113	109	91	112	123	112	112	135	88	78	71	39	27	30	16		
15-30	7	5	6	2	8	15	44	68	97	107	104	76	110	112	119	129	115	124	55	41	45	30	25	17		
30-45	4	3	3	6	4	15	44	112	92	91	93	83	94	115	140	140	106	117	68	46	44	32	24	13		
45-00	4	4	7	5	13	32	80	140	131	124	93	87	111	126	112	124	112	81	60	50	49	17	19	12		
HOUR	-----																									
TOT	23	20	21	19	30	68	192	375	445	435	399	337	427	476	483	505	468	410	261	208	177	106	98	58	6041	

AM PEAK HOUR 0730 TO 0830 VOLUME 474 AM TOTAL 2364  
 PM PEAK HOUR 0315 TO 0415 VOLUME 528 PM TOTAL 3677

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIPS SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.45	OFF SYSTEM ID.	LEG R	DIRECTION OF TRAFFIC EASTBOUND	LANE ALL	OF																			
COUNT IDENTIFIER 11-005	COUNTER NUMBER 127051	DESCRIPTION: ON MISSION AVE E/O SR 27																							
03/17/11 THURSDAY																									
AM HOURS																									
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	8	5	3	5	7	25	57	112	79	104	80	91	112	100	106	110	97	89	53	42	48	27	11		
15-30	13	5	3	6	9	16	45	83	94	83	87	95	91	132	124	123	113	144	72	57	49	35	30	17	
30-45	5	6	7	4	8	10	47	94	87	111	100	71	133	116	124	132	111	98	60	38	38	39	31	20	
45-00	7	4	1	10	10	28	87	143	116	96	115	92	119	124	120	126	121	86	72	54	38	27	23	18	
HOUR	-----																								
TOT	33	20	14	25	27	61	204	377	409	369	406	338	434	484	468	487	455	425	293	202	167	149	111	66	6024

AM PEAK HOUR 0730 TO 0830 VOLUME 443  
 PM PEAK HOUR 1230 TO 0130 VOLUME 496

AM TOTAL 2283  
 PM TOTAL 3741

03/18/11 FRIDAY																								
AM HOURS																								
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	7	3	9	5	4	12	19	59																
15-30	12	5	9	5	5	6	33																	
30-45	6	6	3	7	7	19	40																	
45-00	13	5	6	5	15	31	57																	
HOUR	-----																							
TOT	38	19	27	22	31	68	149	59																413

AM PEAK HOUR 0615 TO 0715 VOLUME 189  
 PM PEAK HOUR 0000 TO 0000 VOLUME 0

AM TOTAL 413  
 PM TOTAL 0

03/14/11 THRU 03/18/11  
 TOTAL HOURS FOR COUNT 90

3 DAYS  
 AVG WEEKDAY VOL 6061 X SEASONAL ADJ. FACTOR 0.9500 = 5758 X AXLE CORR FACTOR 0.9810 = ESTIMATED AVG DAILY TRAFFIC 5649

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIP SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.45	OFF SYSTEM ID.	LEG R	DIRECTION OF TRAFFIC	BOTH WAYS		LANE ALL OF																				
COUNT IDENTIFIER	11-005	COUNTER NUMBER	127051	DESCRIPTION:	ON MISSION AVE E/O SR 27																						
03/14/11 MONDAY				AM HOURS												PM HOURS											
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15														220	220	263	253	264	152	102	82	68	47	38			
15-30														215	257	265	237	213	139	104	70	48	47	36			
30-45														225	252	260	249	240	134	96	62	40	40	38			
45-00														240	216	262	265	250	157	122	79	54	54	34	27		
HOURLY																											
TOT														240	876	991	1053	989	874	547	381	268	210	168	139	6736	

AM PEAK HOUR 0000 TO 0000 VOLUME 0  
PM PEAK HOUR 0300 TO 0400 VOLUME 1053  
AM TOTAL 0  
PM TOTAL 6736

03/15/11 TUESDAY				AM HOURS												PM HOURS											
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	20	13	8	4	8	17	43	128	217	195	181	204	253	202	224	282	231	274	129	114	86	54	47	25			
15-30	19	5	5	4	9	22	94	134	141	169	193	215	188	249	210	271	303	264	126	106	78	56	54	25			
30-45	18	10	6	7	13	51	119	227	175	199	203	218	212	228	231	287	241	219	128	91	90	50	42	29			
45-00	18	9	5	8	14	56	118	257	220	189	200	189	216	245	281	248	229	202	130	87	74	69	46	22			
HOURLY																											
TOT	75	37	24	23	44	146	374	746	753	752	777	826	869	924	946	1088	1004	959	513	398	328	229	189	101	12125		

AM PEAK HOUR 0730 TO 0830 VOLUME 842  
PM PEAK HOUR 0245 TO 0345 VOLUME 1121  
AM TOTAL 4577  
PM TOTAL 7548

03/16/11 WEDNESDAY				AM HOURS												PM HOURS											
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	21	11	8	10	10	11	48	114	205	190	199	193	254	219	227	261	278	245	161	145	88	63	59	31			
15-30	18	11	17	6	14	25	79	155	167	198	201	198	216	216	239	274	256	230	128	115	98	55	51	30			
30-45	13	7	9	8	11	38	109	226	161	192	188	190	226	224	269	258	232	229	133	100	81	49	45	32			
45-00	10	6	10	6	27	48	146	237	234	225	194	212	208	237	254	255	255	166	126	96	93	45	43	21			
HOURLY																											
TOT	62	35	44	30	62	122	382	732	767	805	782	793	904	896	989	1048	1021	870	548	456	360	212	198	114	12232		

AM PEAK HOUR 0730 TO 0830 VOLUME 835  
PM PEAK HOUR 0315 TO 0415 VOLUME 1065  
AM TOTAL 4616  
PM TOTAL 7616

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIPS SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.45	OFF SYSTEM ID.	LEG R	DIRECTION OF TRAFFIC	BOTH WAYS	LANE ALL	OF																			
COUNT IDENTIFIER	11-005	COUNTER NUMBER	127051	DESCRIPTION: ON MISSION AVE E/O SR 27																						
03/17/11 THURSDAY		AM HOURS											PM HOURS											DAILY		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	22	16	12	10	4	16	52	124	196	165	199	188	203	209	197	226	249	260	167	122	90	87	45	36		
15-30	27	17	7	9	15	31	80	152	178	148	183	219	204	243	255	259	244	281	144	115	88	68	57	34		
30-45	12	12	12	7	16	34	96	193	175	200	177	169	219	222	271	274	258	201	122	86	80	84	56	34		
45-00	13	5	6	14	19	48	150	236	200	196	206	197	207	212	235	253	254	177	139	102	64	50	36	29		
HOUR	-----																									
TOT	74	50	37	40	54	129	378	705	749	709	765	773	833	886	958	1012	1005	919	572	425	322	289	194	133	12011	

AM PEAK HOUR 0730 TO 0830 VOLUME 803 AM TOTAL 4463  
 PM PEAK HOUR 0430 TO 0530 VOLUME 1053 PM TOTAL 7548

03/18/11 FRIDAY		AM HOURS											PM HOURS											DAILY		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	16	9	14	8	9	27	48	122																		
15-30	21	11	15	8	14	24	74																			
30-45	16	11	6	13	11	44	96																			
45-00	25	11	9	12	23	53	125																			
HOUR	-----																									
TOT	78	42	44	41	57	148	343	122																	875	

AM PEAK HOUR 0615 TO 0715 VOLUME 417 AM TOTAL 875  
 PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 0

03/14/11 THRU 03/18/11  
 TOTAL HOURS FOR COUNT 90

3 DAYS FACTOR GROUP GR-02 FACTOR GROUP GR-B2  
 AVG WEEKDAY VOL 12123 X SEASONAL ADJ. FACTOR 0.9500 = 11517 X AXLE CORR FACTOR 0.9810 = ESTIMATED AVG DAILY TRAFFIC 11298

PEAK HOUR PERCENTAGES: K = 9.25 D = 51.83  
 PEAK HOUR LOCATION : VOLUME = 1121 DATE: 03/15/11 TIME: 02:45 PM

Date	21-Jun-11
Road Name	Mansfield Rd.
Location	w/o SR-27   Pines Rd.
Direction	Eastbound
All Day Volume=	4023
PEAK VOL 4-5=	415
PEAK VOL 5-6=	424
PEAK VOL NOT PM=	0

Time	Lane 1	
12:00 AM	0	
1:00 AM	0	
2:00 AM	0	
3:00 AM	0	
4:00 AM	0	
5:00 AM	0	
6:00 AM	0	
7:00 AM	0	
8:00 AM	0	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	0	
1:00 PM	0	
2:00 PM	0	
3:00 PM	348	
4:00 PM	415	
5:00 PM	412	
6:00 PM	194	
7:00 PM	126	
8:00 PM	140	
9:00 PM	94	
10:00 PM	61	
11:00 PM	36	1826
12:00 AM	16	
1:00 AM	19	
2:00 AM	16	
3:00 AM	9	
4:00 AM	35	
5:00 AM	41	
6:00 AM	87	
7:00 AM	166	
8:00 AM	205	
9:00 AM	204	
10:00 AM	241	
11:00 AM	271	
12:00 PM	337	
1:00 PM	252	
2:00 PM	277	
3:00 PM	357	
4:00 PM	365	
5:00 PM	424	
6:00 PM	198	
7:00 PM	164	
8:00 PM	143	
9:00 PM	101	
10:00 PM	59	
11:00 PM	36	4023
12:00 AM	23	
1:00 AM	20	
2:00 AM	17	
3:00 AM	12	
4:00 AM	26	
5:00 AM	46	
6:00 AM	91	
7:00 AM	147	
8:00 AM	0	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	0	
1:00 PM	0	
2:00 PM	0	
3:00 PM	0	
4:00 PM	0	
5:00 PM	0	
6:00 PM	0	
7:00 PM	0	
8:00 PM	0	
9:00 PM	0	
10:00 PM	0	
11:00 PM	0	382

Date	20-Jun-11
Road Name	Mansfield Rd.
Location	w/o SR-27   Pines Rd.
Direction	Westbound
All Day Volume=	2580
PEAK VOL 4-5=	200
PEAK VOL 5-6=	204
PEAK VOL NOT PM=	0

Time	Lane 1	
12:00 AM	0	
1:00 AM	0	
2:00 AM	0	
3:00 AM	0	
4:00 AM	0	
5:00 AM	0	
6:00 AM	0	
7:00 AM	0	
8:00 AM	0	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	0	
1:00 PM	0	
2:00 PM	0	
3:00 PM	168	
4:00 PM	200	
5:00 PM	204	
6:00 PM	149	
7:00 PM	132	
8:00 PM	134	
9:00 PM	106	
10:00 PM	67	
11:00 PM	43	1203
12:00 AM	28	
1:00 AM	10	
2:00 AM	10	
3:00 AM	6	
4:00 AM	33	
5:00 AM	49	
6:00 AM	97	
7:00 AM	172	
8:00 AM	135	
9:00 AM	92	
10:00 AM	113	
11:00 AM	146	
12:00 PM	178	
1:00 PM	195	
2:00 PM	177	
3:00 PM	185	
4:00 PM	181	
5:00 PM	191	
6:00 PM	116	
7:00 PM	121	
8:00 PM	131	
9:00 PM	87	
10:00 PM	78	
11:00 PM	49	2580
12:00 AM	18	
1:00 AM	15	
2:00 AM	3	
3:00 AM	6	
4:00 AM	32	
5:00 AM	51	
6:00 AM	98	
7:00 AM	145	
8:00 AM	0	
9:00 AM	0	
10:00 AM	0	
11:00 AM	0	
12:00 PM	0	
1:00 PM	0	
2:00 PM	0	
3:00 PM	0	
4:00 PM	0	
5:00 PM	0	
6:00 PM	0	
7:00 PM	0	
8:00 PM	0	
9:00 PM	0	
10:00 PM	0	
11:00 PM	0	366

Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

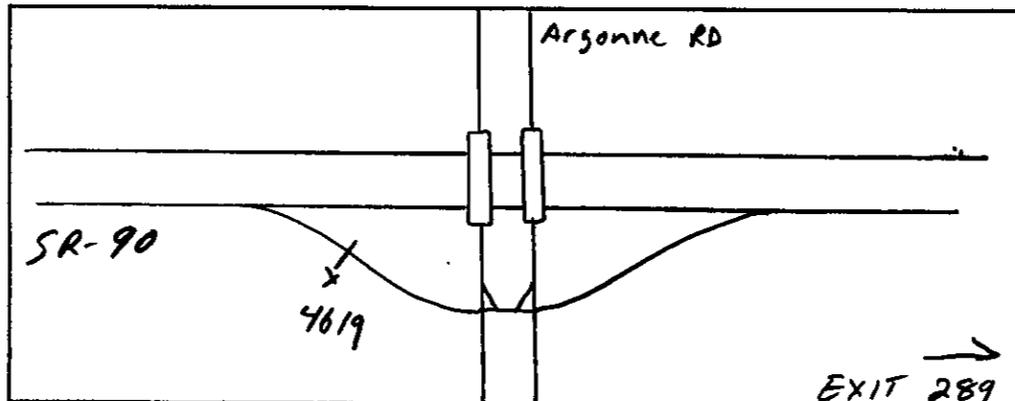
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

Counter No. 384619 Count ID 12-010  
SR 90 RRT/RRQ P1 28742 MP 0.00  
Leg 2 Direction EB OSID \_\_\_\_\_

Station Description ON SR 90 EB OFF RAMP TO ARGONNE RD *Mullan Rd*

Date	Day	Time	Comments
09/17/12	2	1553	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.4
09/18	3	0818	Manual (1) <u>37</u> (2) _____ Counter (1) <u>37</u> (2) _____ CHECK COUNTER OK 6.5
09/19	4	1228	Manual (1) <u>25</u> (2) _____ Counter (1) <u>25</u> (2) _____ COUNTER CHECK OK 6.9
09/20	5	0820	Manual (1) <u>22</u> (2) _____ Counter (1) <u>22</u> (2) _____ CHECK COUNTER OK 6.6
09/21	6	0654	Manual (1) <u>16</u> (2) _____ Counter (1) <u>16</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



DB/TWB  
Field Person



Continuation Sheet

Count ID 12:010  
~~SP#12-000~~ Counter No. 4619

Date	Day	Time	Comments
9-22-12	7	6:46am	<sup>6 19</sup> Manual (1) <u>        </u> (2) <u>        </u> Counter (1) 19 (2) <u>        </u> CHECK COUNTER OK TS 6.4v
9-23-12	1	0653	<sup>10 8</sup> Manual (1) <u>        </u> (2) <u>        </u> Counter (1) 8 (2) <u>        </u> CHECK COUNTER OK TS 6.4v
9-24-12	2	12:32	Manual (1) <u>        </u> (2) <u>        </u> Counter (1) 1 (2) <u>        </u> P/U OK 7.0v
			Manual (1) <u>        </u> (2) <u>        </u> Counter (1) <u>        </u> (2) <u>        </u>
			Manual (1) <u>        </u> (2) <u>        </u> Counter (1) <u>        </u> (2) <u>        </u>
			Manual (1) <u>        </u> (2) <u>        </u> Counter (1) <u>        </u> (2) <u>        </u>
			Manual (1) <u>        </u> (2) <u>        </u> Counter (1) <u>        </u> (2) <u>        </u>
			Manual (1) <u>        </u> (2) <u>        </u> Counter (1) <u>        </u> (2) <u>        </u>

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 P128742 MP 000.00		OFF SYSTEM ID.	LEG 2													DIRECTION OF TRAFFIC EASTBOUND				LANE ALL OF					
COUNT IDENTIFIER 12-010		COUNTER NUMBER 384619	DESCRIPTION: ON SR 90 EB OFF RAMP TO MULLAN RD																						
09/17/12 MONDAY		AM HOURS											PM HOURS											DAILY TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		12
00-15																	191	182	138	96	63	63	39	35	
15-30																	201	192	136	65	68	51	35	36	
30-45																	196	200	127	92	54	41	35	24	
45-00																	224	149	125	86	43	49	33	20	
HOUR	-----																								
TOT																	812	723	526	339	228	204	142	115	3089

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0400 TO 0500 VOLUME 812 PM TOTAL 3089

09/18/12 TUESDAY		AM HOURS											PM HOURS											DAILY TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		12
00-15	13	12	8	9	7	32	56	119	156	114	97	104	142	151	134	162	221	207	135	97	68	55	44	33	
15-30	30	16	10	5	18	35	82	165	117	118	148	119	139	134	155	174	200	184	124	84	101	63	38	27	
30-45	15	18	8	14	38	62	101	183	134	122	90	154	135	130	148	188	212	203	120	89	77	45	38	29	
45-00	10	11	10	18	47	81	132	230	152	144	134	155	179	147	190	214	188	151	125	90	63	42	37	23	
HOUR	-----																								
TOT	68	57	36	46	110	210	371	697	559	498	469	532	595	562	627	738	821	745	504	360	309	205	157	112	9388

AM PEAK HOUR 0715 TO 0815 VOLUME 734 AM TOTAL 3653  
PM PEAK HOUR 0345 TO 0445 VOLUME 847 PM TOTAL 5735

09/19/12 WEDNESDAY		AM HOURS											PM HOURS											DAILY TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		12
00-15	30	14	5	12	7	30	59	114	145	133	113	127	128	138	115	178	204	217	157	84	78	56	40	33	
15-30	24	10	6	4	26	26	68	140	133	115	123	130	153	147	177	178	224	205	154	108	60	65	50	42	
30-45	9	8	10	11	27	41	103	158	157	113	108	151	148	116	177	174	217	200	119	96	70	55	34	25	
45-00	11	6	8	20	55	78	121	239	141	141	107	135	156	148	177	203	205	173	115	85	70	35	53	23	
HOUR	-----																								
TOT	74	38	29	47	115	175	351	651	576	502	451	543	585	549	646	733	850	795	545	373	278	211	177	123	9417

AM PEAK HOUR 0715 TO 0815 VOLUME 682 AM TOTAL 3552  
PM PEAK HOUR 0415 TO 0515 VOLUME 863 PM TOTAL 5865

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 P128742 MP 000.00		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC EASTBOUND														LANE ALL OF							
COUNT IDENTIFIER 12-010		COUNTER NUMBER 384619		DESCRIPTION: ON SR 90 EB OFF RAMP TO MULLAN RD																							
09/20/12 THURSDAY												PM HOURS												DAILY TOTAL			
AM HOURS																											
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12				
00-15	18	14	14	20	11	24	53	110	157	116	119	128	136	139	168	177	199	221	156	105	83	80	43	37			
15-30	19	20	8	12	14	24	59	165	130	137	118	146	151	136	168	214	213	220	144	95	87	71	44	33			
30-45	18	16	11	21	29	44	102	173	139	144	137	127	150	134	180	182	226	178	114	99	74	56	47	45			
45-00	21	15	13	19	54	74	152	216	138	149	136	141	145	180	189	219	229	170	112	101	78	48	56	15			
HOUR	-----																										
TOT	76	65	46	72	108	166	366	664	564	546	510	542	582	589	705	792	867	789	526	400	322	255	190	130	9872		

AM PEAK HOUR 0715 TO 0815 VOLUME 711  
PM PEAK HOUR 0430 TO 0530 VOLUME 896  
AM TOTAL 3725  
PM TOTAL 6147

09/21/12 FRIDAY												PM HOURS												DAILY TOTAL		
AM HOURS																										
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
00-15	17	18	13	12	11	28	42	104	153	130	119	164	120	175	142	196	183	181	135	117	90	74	58	41		
15-30	17	26	11	10	18	27	57	163	138	134	116	133	163	170	185	191	204	203	135	97	72	78	43	55		
30-45	15	16	8	19	30	47	102	140	134	128	123	151	153	150	180	223	174	186	137	100	84	64	66	37		
45-00	15	19	9	24	55	66	129	213	156	147	157	139	138	159	219	216	227	171	115	98	60	71	59	40		
HOUR	-----																									
TOT	64	79	41	65	114	168	330	620	581	539	515	587	574	654	726	826	788	741	522	412	306	287	226	173	9938	

AM PEAK HOUR 0715 TO 0815 VOLUME 669  
PM PEAK HOUR 0245 TO 0345 VOLUME 829  
AM TOTAL 3703  
PM TOTAL 6235

09/22/12 SATURDAY												PM HOURS												DAILY TOTAL		
AM HOURS																										
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
00-15	32	18	17	7	14	15	23	37	65	85	123	103	120	116	125	99	99	96	117	86	83	73	66	42		
15-30	38	17	18	18	10	14	26	52	75	93	126	98	134	141	118	105	110	88	122	80	73	53	48	34		
30-45	22	17	15	8	8	16	34	58	79	95	93	129	120	111	119	94	109	94	106	83	65	61	68	38		
45-00	19	19	11	15	15	26	59	57	98	116	111	116	118	102	107	122	97	100	79	80	64	60	46	36		
HOUR	-----																									
TOT	111	71	61	48	47	71	142	204	317	389	453	446	492	470	469	420	415	378	424	329	285	247	228	150	6667	

AM PEAK HOUR 0930 TO 1030 VOLUME 460  
PM PEAK HOUR 1230 TO 0130 VOLUME 495  
AM TOTAL 2360  
PM TOTAL 4307

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 P128742 MP 000.00		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC EASTBOUND		LANE ALL OF																									
COUNT IDENTIFIER 12-010		COUNTER NUMBER 384619		DESCRIPTION: ON SR 90 EB OFF RAMP TO MULLAN RD																													
09/23/12 SUNDAY											AM HOURS											PM HOURS											DAILY
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL								
00-15	36	22	12	8	5	8	4	19	46	69	68	79	72	101	82	109	120	94	93	60	58	43	36	33									
15-30	38	22	17	9	12	8	9	33	43	91	72	93	104	100	108	101	107	115	94	81	52	48	29	23									
30-45	22	23	11	13	10	8	24	32	67	105	92	80	86	111	117	115	92	102	87	47	56	37	27	24									
45-00	21	13	14	7	7	16	19	36	65	108	94	76	99	89	119	112	105	98	81	54	50	41	33	14									
HOUR	-----																							-----									
TOT	117	80	54	37	34	40	56	120	221	373	326	328	361	401	426	437	424	409	355	242	216	169	125	94	5445								

AM PEAK HOUR 0900 TO 1000 VOLUME 373 AM TOTAL 1786  
PM PEAK HOUR 0330 TO 0430 VOLUME 454 PM TOTAL 3659

09/24/12 MONDAY											AM HOURS											PM HOURS											DAILY
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL								
00-15	19	13	7	17	12	37	52	103	156	101	90	97	135																				
15-30	9	12	10	12	12	31	58	144	148	119	137	123	115																				
30-45	24	8	8	8	22	45	85	195	143	114	104	160																					
45-00	11	2	14	10	52	69	133	231	120	120	124	147																					
HOUR	-----																							-----									
TOT	63	35	39	47	98	182	328	673	567	454	455	527	250												3718								

AM PEAK HOUR 0730 TO 0830 VOLUME 730 AM TOTAL 3468  
PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 250

09/17/12 THRU 09/24/12  
TOTAL HOURS FOR COUNT 92

3 DAYS FACTOR GROUP R036 FACTOR GROUP P24  
AVG WEEKDAY VOL 9559 X SEASONAL ADJ. FACTOR 0.8900 = 8508 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 7715

PEAK HOUR PERCENTAGES: K = 9.37 D = 100.00  
PEAK HOUR LOCATION : VOLUME = 896 DATE: 09/20/12 TIME: 04:30 PM

Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

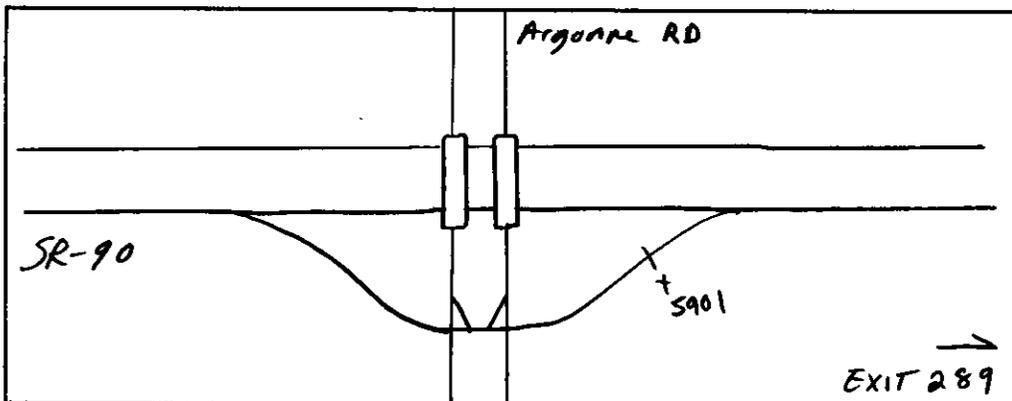
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

Counter No. 385901 Count ID 12-010  
SR 90 RRT/RRQ Q1 28825 MP 0.00  
Leg 2 Direction EB OSID \_\_\_\_\_

Station Description ON SR 90 EB ON RAMP FROM ARGONNE RD *Mullan Rd*

Date	Day	Time	Comments
09/17/12	2	1321	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.5
09/18	3	0920	Manual (1) <u>31</u> (2) _____ Counter (1) <u>31</u> (2) _____ CHECK COUNTER OK 6.6
09/19	4	1232	Manual (1) <u>14</u> (2) _____ Counter (1) <u>14</u> (2) _____ COUNTER CHECK OK 7.1
09/20	5	0909	Manual (1) <u>23</u> (2) _____ Counter (1) <u>23</u> (2) _____ CHECK COUNTER OK 6.6
09/21	6	0658	Manual (1) <u>12</u> (2) _____ Counter (1) <u>12</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



Field Person \_\_\_\_\_



Continuation Sheet

Count ID 12-D10  
~~SP#12-000~~ Counter No. 5901

Date	Day	Time	Comments
9-22-12	7	0721	<del>Manual (1) 15 (2) 25</del> <del>Counter (1) 25 (2)</del> CHECK COUNTER OK TS 6.5v
9-23-12	.1	0717	<del>Manual (1) 10 (2)</del> <del>Counter (1) 10 (2)</del> CHECK COUNTER OK TS 6.5v
9-24-12	2	12:50	<del>Manual (1) 1 (2)</del> <del>Counter (1) 1 (2)</del> 7.1v
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 Q128825 MP 000.00		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC EASTBOUND															LANE ALL OF						
COUNT IDENTIFIER 12-010		COUNTER NUMBER 385901		DESCRIPTION: ON SR 90 EB ON RAMP FROM MULLAN RD																							
09/17/12 MONDAY												PM HOURS											DAILY				
AM HOURS																											
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15														147	145	186	227	149	99	61	46	34	15				
15-30														129	151	163	172	141	75	58	45	28	17				
30-45													130	152	182	170	170	114	64	67	38	27	15				
45-00													134	166	165	143	173	95	79	44	31	21	18				
HOUR	-----																							-----			
TOT													264	594	643	662	742	499	317	230	160	110	65	4286			

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
 PM PEAK HOUR 0500 TO 0600 VOLUME 742 PM TOTAL 4286

09/18/12 TUESDAY												PM HOURS											DAILY				
AM HOURS																											
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	10	7	4	4	11	23	65	131	138	121	106	111	160	133	153	157	150	219	113	104	57	44	47	21			
15-30	11	10	8	15	14	46	88	141	138	109	131	139	159	166	142	142	162	176	138	97	75	41	25	15			
30-45	15	11	12	18	20	62	116	158	129	132	124	141	146	160	170	147	151	151	97	69	54	37	19	15			
45-00	9	6	5	11	26	66	100	156	142	124	116	140	144	125	146	182	159	161	95	54	45	29	20	5			
HOUR	-----																							-----			
TOT	45	34	29	48	71	197	369	586	547	486	477	531	609	584	611	628	622	707	443	324	231	151	111	56	8497		

AM PEAK HOUR 0715 TO 0815 VOLUME 593 AM TOTAL 3420  
 PM PEAK HOUR 0500 TO 0600 VOLUME 707 PM TOTAL 5077

09/19/12 WEDNESDAY												PM HOURS											DAILY				
AM HOURS																											
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	10	3	8	5	17	27	53	106	149	116	107	125	150	130	134	160	180	219	145	102	78	53	26	30			
15-30	9	10	10	8	16	37	79	124	138	145	130	121	139	129	146	146	160	206	144	107	69	48	28	14			
30-45	7	6	8	11	28	58	130	171	137	124	125	151	138	156	167	175	179	166	124	87	62	57	29	15			
45-00	6	1	11	11	26	74	124	166	145	131	126	144	137	134	136	161	159	139	108	85	62	37	28	11			
HOUR	-----																							-----			
TOT	32	20	37	35	87	196	386	567	569	516	488	541	564	549	583	642	678	730	521	381	271	195	111	70	8769		

AM PEAK HOUR 0730 TO 0830 VOLUME 624 AM TOTAL 3474  
 PM PEAK HOUR 0430 TO 0530 VOLUME 763 PM TOTAL 5295

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 Q128825 MP 000.00		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC EASTBOUND														LANE ALL OF					
COUNT IDENTIFIER 12-010		COUNTER NUMBER 385901		DESCRIPTION: ON SR 90 EB ON RAMP FROM MULLAN RD																					
09/20/12 THURSDAY												PM HOURS												DAILY	
AM HOURS																									
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	15	9	7	7	10	26	64	110	138	142	100	130	141	139	145	170	178	208	157	102	75	56	39	25	
15-30	8	12	14	11	9	28	81	134	125	105	120	149	144	154	170	173	173	178	149	84	75	36	28	26	
30-45	7	13	10	13	26	49	121	165	126	131	132	127	153	163	198	175	188	162	117	92	58	47	22	15	
45-00	10	12	8	10	28	85	133	166	159	106	123	145	173	123	190	174	181	160	97	85	51	36	19	14	
HOUR	-----																								
TOT	40	46	39	41	73	188	399	575	548	484	475	551	611	579	703	692	720	708	520	363	259	175	108	80	8977

AM PEAK HOUR 0715 TO 0815 VOLUME 603 AM TOTAL 3459  
PM PEAK HOUR 0430 TO 0530 VOLUME 755 PM TOTAL 5518

09/21/12 FRIDAY												PM HOURS												DAILY	
AM HOURS																									
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	13	10	5	13	10	28	66	106	141	114	123	139	191	195	171	180	199	202	168	109	97	46	63	26	
15-30	6	12	11	3	13	48	81	152	148	140	156	182	163	149	188	151	161	181	142	90	73	68	37	21	
30-45	11	8	13	13	19	49	104	172	145	160	144	174	187	176	162	192	178	196	148	102	80	58	45	24	
45-00	12	11	12	5	35	53	129	179	124	142	129	175	156	180	175	199	180	159	124	74	68	49	26	17	
HOUR	-----																								
TOT	42	41	41	34	77	178	380	609	558	556	552	670	697	700	696	722	718	738	582	375	318	221	171	88	9764

AM PEAK HOUR 1100 TO 1200 VOLUME 670 AM TOTAL 3738  
PM PEAK HOUR 0445 TO 0545 VOLUME 759 PM TOTAL 6026

09/22/12 SATURDAY												PM HOURS												DAILY	
AM HOURS																									
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	17	13	11	19	13	6	24	43	72	111	136	152	161	157	127	141	147	102	111	87	71	47	39	26	
15-30	19	11	6	6	10	16	39	56	79	118	137	143	162	154	155	149	117	148	123	85	58	50	26	30	
30-45	18	10	11	11	15	17	38	52	89	122	142	148	148	150	161	138	131	117	115	70	74	38	32	14	
45-00	7	22	13	4	7	26	52	84	105	131	180	163	150	117	150	142	133	116	91	60	51	29	33	16	
HOUR	-----																								
TOT	61	56	41	40	45	65	153	235	345	482	595	606	621	578	593	570	528	483	440	302	254	164	130	86	7473

AM PEAK HOUR 1045 TO 1145 VOLUME 623 AM TOTAL 2724  
PM PEAK HOUR 1200 TO 0100 VOLUME 621 PM TOTAL 4749

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 Q128825	MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC EASTBOUND	LANE ALL	OF																			
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385901	DESCRIPTION: ON SR 90 EB ON RAMP FROM MULLAN RD																					
09/23/12 SUNDAY		AM HOURS		PM HOURS																					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
00-15	19	22	11	7	2	4	10	25	54	66	93	122	99	129	99	117	109	117	82	76	59	41	36	18	
15-30	20	11	11	6	10	9	20	30	67	81	111	99	125	112	110	114	95	89	86	72	45	45	27	6	
30-45	10	6	9	4	11	14	38	54	71	79	130	119	122	108	119	108	110	120	71	76	48	37	31	13	
45-00	13	11	5	9	8	16	34	39	87	95	137	124	157	118	114	99	93	110	75	51	26	23	20	7	
HOUR	-----																								
TOT	62	50	36	26	31	43	102	148	279	321	471	464	503	467	442	438	407	436	314	275	178	146	114	44	5797

AM PEAK HOUR 1015 TO 1115 VOLUME 500 AM TOTAL 2033  
 PM PEAK HOUR 1215 TO 0115 VOLUME 533 PM TOTAL 3764

09/24/12 MONDAY		AM HOURS		PM HOURS																					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
00-15	6	7	9	1	13	18	60	115	149	114	96	119	139												
15-30	10	6	7	6	22	40	75	144	121	134	113	120	129												
30-45	7	8	5	18	23	58	102	169	123	117	138	129	132												
45-00	6	5	4	7	26	61	124	169	141	120	115	124													
HOUR	-----																								
TOT	29	26	25	32	84	177	361	597	534	485	462	492	400												3704

AM PEAK HOUR 0715 TO 0815 VOLUME 631 AM TOTAL 3304  
 PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 400

09/17/12 THRU 09/24/12  
 TOTAL HOURS FOR COUNT 94

3 DAYS FACTOR GROUP R036 FACTOR GROUP P24  
 AVG WEEKDAY VOL 8748 X SEASONAL ADJ. FACTOR 0.8900 = 7786 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 7060

PEAK HOUR PERCENTAGES: K = 8.72 D = 100.00  
 PEAK HOUR LOCATION : VOLUME = 763 DATE: 09/19/12 TIME: 04:30 PM



Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

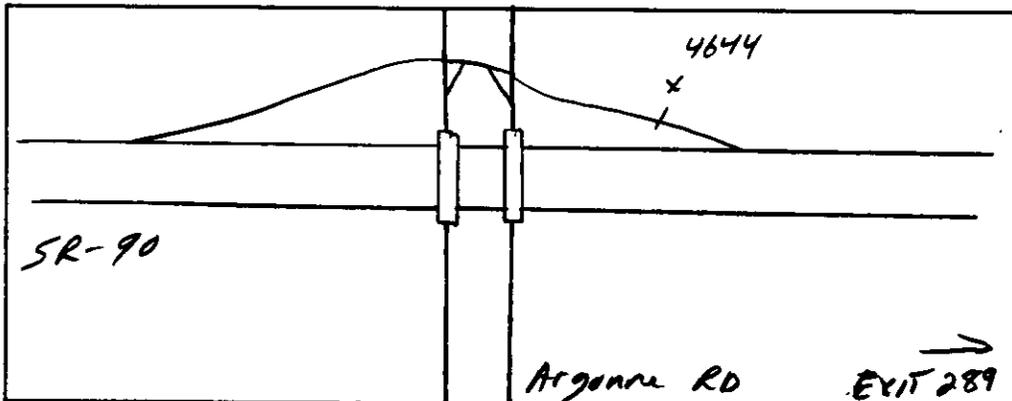
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

Counter No. 384644 Count ID 12-010  
SR 90 RRT/RRQ R1 28812 MP 0.00  
Leg 2 Direction WB OSID \_\_\_\_\_

Station Description \_ ON SR 90 WB OFF RAMP TO ARGONNE RD

Date	Day	Time	Comments
09/17/12	2	1536	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.5
09/18	3	1200	Manual (1) <u>35</u> (2) _____ Counter (1) <u>35</u> (2) _____ CHECK COUNTER OK 6.8
09/19	4	1209	Manual (1) <u>24</u> (2) _____ Counter (1) <u>24</u> (2) _____ COUNTER CHECK OK 7.2
09/20	5	1123	Manual (1) <u>28</u> (2) _____ Counter (1) <u>28</u> (2) _____ CHECK COUNTER OK 7.2
09/21	6	0825	Manual (1) <u>22</u> (2) _____ Counter (1) <u>22</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



DB/TWB  
Field Person



Continuation Sheet

Count ID 12-010  
~~SPW-12-009~~ Counter No. 4644

Date	Day	Time	Comments
9-22-12	7	1254	Manual (1) <sup>40</sup> (2) _____ Counter (1) 40 (2) _____ CHECK COUNTER OK TS 7.1
9-23-12	1	1157	Manual (1) <sup>99</sup> 40 (2) _____ Counter (1) 40 (2) _____ CHECK COUNTER OK TS 7.2v
9-24-12	2	1523	Manual (1) <sup>1</sup> (2) _____ Counter (1) 1 (2) _____ 6.9v
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S   S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 R128812 MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND	LANE ALL	OF																					
COUNT IDENTIFIER 12-010	COUNTER NUMBER 384644	DESCRIPTION: ON SR 90 WB OFF RAMP TO ARGONNE RD																								
09/17/12 MONDAY	AM HOURS											PM HOURS											DAILY			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
00-15	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	2979	
15-30																	170	172	128	91	73	57	48	27		
30-45																	154	173	117	98	66	62	34	12		
45-00																	158	140	117	82	70	56	33	22		
HOUR																	168	181	133	101	81	66	54	20	15	
TOT																	168	663	618	463	352	275	229	135	76	2979

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0430 TO 0530 VOLUME 684 PM TOTAL 2979

09/18/12 TUESDAY	AM HOURS											PM HOURS											DAILY		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
00-15	19	11	7	6	12	27	57	106	177	108	103	115	132	120	125	157	152	177	125	102	88	66	31	21	
15-30	12	6	3	2	15	27	82	66	145	93	115	116	121	129	158	173	179	188	125	103	80	42	41	18	
30-45	11	5	5	8	30	49	106	65	117	103	119	118	144	122	169	163	163	137	107	66	60	49	25	20	
45-00	11	9	2	6	29	56	131	75	93	90	116	131	123	122	139	152	154	153	126	95	68	65	18	16	
HOUR																									
TOT	53	31	17	22	86	159	376	312	532	394	453	480	520	493	591	645	648	655	483	366	296	222	115	75	8024

AM PEAK HOUR 0800 TO 0900 VOLUME 532 AM TOTAL 2915  
PM PEAK HOUR 0430 TO 0530 VOLUME 682 PM TOTAL 5109

09/19/12 WEDNESDAY	AM HOURS											PM HOURS											DAILY		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
00-15	13	14	12	7	2	26	49	120	152	125	118	114	135	126	127	123	170	168	144	97	73	69	34	19	
15-30	11	6	9	6	10	36	84	150	117	133	126	139	121	124	122	187	186	181	131	97	66	69	28	18	
30-45	8	11	5	14	22	60	114	158	147	104	94	120	131	126	154	154	161	169	100	91	74	52	26	27	
45-00	13	7	11	13	24	52	120	200	121	119	113	126	126	116	149	173	165	134	94	89	73	51	29	13	
HOUR																									
TOT	45	38	37	40	58	174	367	628	537	481	451	499	513	492	552	637	682	652	469	374	286	241	117	77	8447

AM PEAK HOUR 0715 TO 0815 VOLUME 660 AM TOTAL 3355  
PM PEAK HOUR 0345 TO 0445 VOLUME 690 PM TOTAL 5092

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 R128812 MP 000.00		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC WESTBOUND															LANE ALL OF															
COUNT IDENTIFIER 12-010		COUNTER NUMBER 384644		DESCRIPTION: ON SR 90 WB OFF RAMP TO ARGONNE RD																																
09/20/12 THURSDAY												AM HOURS												PM HOURS												DAILY TOTAL
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11													
00-15	13	21	12	8	8	25	65	108	140	111	122	109	126	143	133	165	178	179	139	121	86	68	46	23												
15-30	13	7	8	6	9	36	89	148	125	127	106	136	121	142	152	160	174	173	129	103	83	72	44	31												
30-45	10	9	4	7	30	42	108	159	127	101	107	119	133	120	169	150	168	140	124	103	71	52	42	21												
45-00	7	6	2	4	31	65	121	217	138	133	118	121	126	125	183	175	176	143	145	77	66	41	30	18												
HOUR	-----																																			
TOT	43	43	26	25	78	168	383	632	530	472	453	485	506	530	637	650	696	635	537	404	306	233	162	93	8727											

AM PEAK HOUR 0715 TO 0815 VOLUME 664  
PM PEAK HOUR 0415 TO 0515 VOLUME 697  
AM TOTAL 3338  
PM TOTAL 5389

09/21/12 FRIDAY												AM HOURS												PM HOURS												DAILY TOTAL
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11													
00-15	23	6	2	15	12	19	54	107	125	117	109	119	139	132	158	177	178	199	136	112	93	71	68	70												
15-30	15	11	10	6	12	32	67	172	115	112	103	124	171	137	147	155	191	151	141	120	81	82	68	73												
30-45	16	9	10	9	36	30	96	167	136	112	112	134	179	148	162	168	182	176	134	98	86	82	74	40												
45-00	16	6	4	5	24	65	116	174	128	123	126	172	156	165	190	178	181	179	132	92	69	92	68	33												
HOUR	-----																																			
TOT	70	32	26	35	84	146	333	620	504	464	450	549	645	582	657	678	732	705	543	422	329	327	278	216	9427											

AM PEAK HOUR 0715 TO 0815 VOLUME 638  
PM PEAK HOUR 0415 TO 0515 VOLUME 753  
AM TOTAL 3313  
PM TOTAL 6114

09/22/12 SATURDAY												AM HOURS												PM HOURS												DAILY TOTAL
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11													
00-15	31	16	15	7	10	5	21	43	58	80	111	134	138	147	143	142	141	139	125	104	74	53	45	48												
15-30	27	18	15	7	6	13	20	55	87	96	110	153	145	162	134	146	128	132	113	106	77	79	46	23												
30-45	18	13	11	11	7	14	28	42	87	83	120	149	130	136	129	144	123	130	97	115	74	86	60	25												
45-00	16	9	7	5	14	15	47	61	108	99	114	137	153	157	140	137	141	128	97	83	74	75	56	30												
HOUR	-----																																			
TOT	92	56	48	30	37	47	116	201	340	358	455	573	566	602	546	569	533	529	432	408	299	293	207	126	7463											

AM PEAK HOUR 1100 TO 1200 VOLUME 573  
PM PEAK HOUR 0100 TO 0200 VOLUME 602  
AM TOTAL 2353  
PM TOTAL 5110

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIPS SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 R128812 MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND																LANE ALL	OF					
COUNT IDENTIFIER 12-010	COUNTER NUMBER 384644	DESCRIPTION: ON SR 90 WB OFF RAMP TO ARGONNE RD																							
09/23/12 SUNDAY												PM HOURS													
AM HOURS																									
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	29	23	8	11	2	8	8	24	35	59	77	77	119	109	97	129	99	115	123	79	83	60	32	25	
15-30	22	14	15	4	10	9	15	28	44	76	84	103	130	114	98	110	126	121	115	101	75	35	19	18	
30-45	18	17	7	9	4	9	20	21	55	86	96	94	109	109	101	134	112	119	75	79	52	29	29	17	
45-00	11	9	10	15	6	11	21	28	84	95	105	117	107	105	121	118	111	115	96	81	48	30	24	9	
HOUR	-----																								
TOT	80	63	40	39	22	37	64	101	218	316	362	391	465	437	417	491	448	470	409	340	258	154	104	69	5795

AM PEAK HOUR 1100 TO 1200 VOLUME 391 AM TOTAL 1733  
 PM PEAK HOUR 0245 TO 0345 VOLUME 494 PM TOTAL 4062

09/24/12 MONDAY												PM HOURS													
AM HOURS																									
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	12	9	8	9	5	18	43	143	119	86	77	116	137	139	115	134									
15-30	7	9	3	6	16	35	80	156	122	120	119	122	118	123	153										
30-45	8	17	9	12	33	54	106	173	127	110	107	113	128	104	139										
45-00	3	4	6	13	34	64	119	184	134	115	93	106	124	125	155										
HOUR	-----																								
TOT	30	39	26	40	88	171	348	656	502	431	396	457	507	491	562	134								4878	

AM PEAK HOUR 0700 TO 0800 VOLUME 656 AM TOTAL 3184  
 PM PEAK HOUR 0215 TO 0315 VOLUME 581 PM TOTAL 1694

09/17/12 THRU 09/24/12  
 TOTAL HOURS FOR COUNT 95

2 DAYS 8587 FACTOR GROUP R036 7642 FACTOR GROUP P24 6930  
 AVG WEEKDAY VOL 8399 X SEASONAL ADJ. FACTOR 0.8900 = 7475 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 6778  
 PEAK HOUR PERCENTAGES: K = 8.12 D = 100.00  
 PEAK HOUR LOCATION : VOLUME = 697 DATE: 09/20/12 TIME: 04:15 PM



18

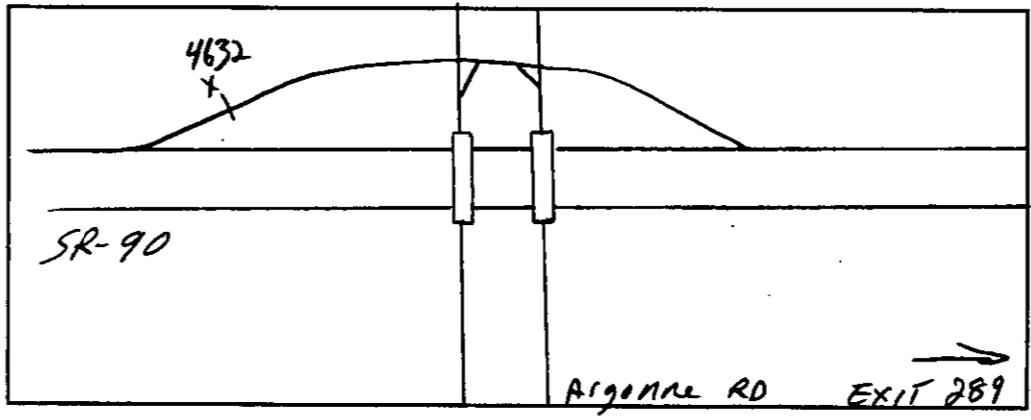
Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2  
  
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

Counter No. 384632 Count ID 12-010  
SR 90 RRT/RRQ S1 28746 MP 0.00  
Leg 2 Direction WB OSID \_\_\_\_\_

Station Description \_ ON SR 90 WB ON RAMP FROM ARGONE RD

Date	Day	Time	Comments
09/17/12	2	1542	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.5
09/18	3	0838	Manual (1) <u>50</u> (2) _____ Counter (1) <u>50</u> (2) _____ CHECK COUNTER OK 6.4
09/19	4	1221	Manual (1) <u>11</u> (2) _____ Counter (1) <u>11</u> (2) _____ COUNTER CHECK OK 6.4
09/20	5	0810	Manual (1) <u>26</u> (2) _____ Counter (1) <u>26</u> (2) _____ CHECK COUNTER OK 6.5
09/21	6	0646	Manual (1) <u>15</u> (2) _____ Counter (1) <u>15</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



DB / TWB  
Field Person



Continuation Sheet

Count ID 12-010  
~~SP#12-009~~ Counter No. 4632

Date	Day	Time	Comments
9-22-12	7	1301	Manual (1) <u>35</u> (2) _____ Counter (1) <u>35</u> (2) _____ CHECK COUNTER OK TS 6.4
9-23-12	1	1203	Manual (1) <u>38</u> (2) _____ Counter (1) <u>38</u> (2) _____ CHECK COUNTER OK TS 6.4
9-24-12	2	15:32	Manual (1) <u>1</u> (2) _____ P10 ok Counter (1) <u>1</u> (2) _____ 6.52
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 S128746 MP 000.00		OFF SYSTEM ID.	LEG 2													DIRECTION OF TRAFFIC WESTBOUND					LANE ALL OF													
COUNT IDENTIFIER 12-010		COUNTER NUMBER 384632	DESCRIPTION: ON SR 90 WB ON RAMP FROM ARGONNE RD																															
09/17/12 MONDAY												AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL								
00-15																		205	230	124	83	77	61	38	25									
15-30																		179	206	113	85	66	55	32	15									
30-45																		196	164	108	65	71	42	30	19									
45-00																		187	206	146	111	71	86	33	22	10								
HOUR																																		
TOT																		187	786	746	456	304	300	191	122	69	3161							

AM PEAK HOUR 0000 TO 0000 VOLUME 0  
 PM PEAK HOUR 0430 TO 0530 VOLUME 838  
 AM TOTAL 0  
 PM TOTAL 3161

09/18/12 TUESDAY												AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL								
00-15	8	5	8	12	20	42	83	196	207	136	142	138	203	178	176	183	202	236	131	98	82	52	42	23										
15-30	9	7	8	19	35	64	121	195	179	146	128	178	159	157	160	171	191	233	128	91	53	47	27	22										
30-45	10	11	10	10	31	82	170	291	174	149	187	173	154	157	206	228	220	213	117	91	80	39	27	24										
45-00	7	14	8	20	33	76	161	221	188	164	166	163	174	165	164	205	213	149	102	76	55	50	27	12										
HOUR																																		
TOT	34	37	34	61	119	264	535	903	748	595	623	652	690	657	706	787	826	831	478	356	270	188	123	81	10598									

AM PEAK HOUR 0715 TO 0815 VOLUME 914  
 PM PEAK HOUR 0430 TO 0530 VOLUME 902  
 AM TOTAL 4605  
 PM TOTAL 5993

09/19/12 WEDNESDAY												AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL								
00-15	15	9	16	6	26	35	99	176	196	159	153	162	158	190	148	180	202	213	169	107	109	65	47	32										
15-30	7	13	8	16	29	58	118	221	169	134	154	175	160	180	150	170	190	199	127	105	75	60	41	31										
30-45	13	10	7	12	35	100	189	266	197	151	156	172	164	148	192	214	222	164	118	86	80	56	41	36										
45-00	13	8	8	19	27	81	158	213	161	145	174	166	174	152	162	181	181	162	109	99	73	67	29	17										
HOUR																																		
TOT	48	40	39	53	117	274	564	876	723	589	637	675	656	670	652	745	795	738	523	397	337	248	158	116	10670									

AM PEAK HOUR 0715 TO 0815 VOLUME 896  
 PM PEAK HOUR 0430 TO 0530 VOLUME 815  
 AM TOTAL 4635  
 PM TOTAL 6035

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIP SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 S128746 MP 000.00		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC WESTBOUND																LANE ALL OF																										
COUNT IDENTIFIER 12-010		COUNTER NUMBER 384632		DESCRIPTION: ON SR 90 WB ON RAMP FROM ARGONNE RD																																												
09/20/12 THURSDAY												AM HOURS												PM HOURS												DAILY												
												12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL											
												1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL												
00-15	9	11	8	18	32	39	101	180	185	161	156	144	160	175	170	207	202	248	174	123	86	76	66	34	207	202	248	174	123	86	76	66	34	207	202	248	174	123	86	76	66	34	11061					
15-30	23	11	17	18	32	66	127	229	188	126	152	169	162	140	193	189	197	214	135	114	84	50	34	20	189	197	214	135	114	84	50	34	20	189	197	214	135	114	84	50	34	20	11061					
30-45	11	11	11	20	30	96	159	273	191	143	172	164	157	191	209	213	217	177	122	95	62	56	35	35	213	217	177	122	95	62	56	35	35	213	217	177	122	95	62	56	35	35	11061					
45-00	16	11	8	18	29	75	197	222	210	143	162	154	175	166	225	191	204	173	140	86	64	43	22	22	191	204	173	140	86	64	43	22	22	191	204	173	140	86	64	43	22	22	11061					
HOUR	-----																																															
TOT	59	44	44	74	123	276	584	904	774	573	642	631	654	672	797	800	820	812	571	418	296	225	157	111	11061	800	820	812	571	418	296	225	157	111	800	820	812	571	418	296	225	157	111	11061				

AM PEAK HOUR 0715 TO 0815 VOLUME 909  
PM PEAK HOUR 0430 TO 0530 VOLUME 883  
AM TOTAL 4728  
PM TOTAL 6333

09/21/12 FRIDAY												AM HOURS												PM HOURS												DAILY												
												12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL											
												1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL												
00-15	20	12	12	13	21	31	67	183	175	148	163	160	180	171	158	198	206	217	163	119	70	80	77	49	198	206	217	163	119	70	80	77	49	198	206	217	163	119	70	80	77	49	11175					
15-30	13	15	13	17	26	59	128	255	188	166	153	147	161	167	202	184	206	214	161	92	79	85	61	46	184	206	214	161	92	79	85	61	46	184	206	214	161	92	79	85	61	46	11175					
30-45	9	4	17	21	25	92	150	247	169	174	170	171	171	211	211	203	199	180	134	109	78	74	46	37	203	199	180	134	109	78	74	46	37	203	199	180	134	109	78	74	46	37	11175					
45-00	5	11	10	20	36	63	177	189	194	164	172	160	172	180	173	215	194	163	125	93	88	64	44	30	173	215	194	163	125	93	88	64	44	173	215	194	163	125	93	88	64	44	11175					
HOUR	-----																																															
TOT	47	42	52	71	108	245	522	874	726	652	658	638	684	729	744	800	805	774	583	413	315	303	228	162	11175	800	805	774	583	413	315	303	228	162	800	805	774	583	413	315	303	228	162	11175				

AM PEAK HOUR 0700 TO 0800 VOLUME 874  
PM PEAK HOUR 0330 TO 0430 VOLUME 830  
AM TOTAL 4635  
PM TOTAL 6540

09/22/12 SATURDAY												AM HOURS												PM HOURS												DAILY												
												12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL											
												1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL												
00-15	35	12	9	10	9	27	32	43	78	117	114	130	129	145	149	143	123	136	112	77	69	67	61	32	143	123	136	112	77	69	67	61	32	143	123	136	112	77	69	67	61	32	7584					
15-30	30	21	10	12	10	26	27	63	107	103	145	137	129	132	131	149	128	101	128	70	69	52	49	37	149	128	101	128	70	69	52	49	37	149	128	101	128	70	69	52	49	37	7584					
30-45	15	21	10	14	20	49	64	83	124	135	127	144	137	145	135	138	123	117	116	84	53	42	35	30	138	123	117	116	84	53	42	35	30	138	123	117	116	84	53	42	35	30	7584					
45-00	21	38	8	12	18	39	59	75	117	118	115	129	123	159	145	134	133	113	98	68	59	56	27	34	134	133	113	98	68	59	56	27	34	134	133	113	98	68	59	56	27	34	7584					
HOUR	-----																																															
TOT	101	92	37	48	57	141	182	264	426	473	501	540	518	581	560	564	507	467	454	299	250	217	172	133	7584	564	507	467	454	299	250	217	172	133	564	507	467	454	299	250	217	172	133	7584				

AM PEAK HOUR 1100 TO 1200 VOLUME 540  
PM PEAK HOUR 0115 TO 0215 VOLUME 585  
AM TOTAL 2862  
PM TOTAL 4722

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 S128746 MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND																LANE ALL	OF							
COUNT IDENTIFIER 12-010	COUNTER NUMBER 384632	DESCRIPTION: ON SR 90 WB ON RAMP FROM ARGONNE RD																									
09/23/12 SUNDAY		AM HOURS												PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	21	19	13	10	10	12	14	34	49	61	99	100	121	121	111	110	112	114	122	122	51	45	30	21			
15-30	22	17	13	13	9	24	41	48	81	85	94	93	131	121	126	120	99	98	82	83	55	35	41	18			
30-45	16	28	8	6	13	19	32	59	92	103	96	85	139	135	124	102	111	110	102	80	43	36	25	12			
45-00	19	29	10	11	9	22	32	51	80	102	108	103	130	136	122	118	114	92	89	72	49	34	26	15			
HOUR	-----																										
TOT	78	93	44	40	41	77	119	192	302	351	397	381	521	513	483	450	436	414	395	357	198	150	122	66	6220		

AM PEAK HOUR 0930 TO 1030 VOLUME 398  
PM PEAK HOUR 1215 TO 0115 VOLUME 521  
AM TOTAL 2115  
PM TOTAL 4105

09/24/12 MONDAY		AM HOURS												PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	9	5	2	11	18	40	82	201	228	131	156	139	164	153	195	150											
15-30	6	7	2	9	21	55	115	221	193	163	150	143	180	163	156	161											
30-45	9	5	4	15	37	94	147	265	168	149	151	211	155	191	196												
45-00	7	11	9	20	35	79	206	229	166	136	137	144	161	122	153												
HOUR	-----																										
TOT	31	28	17	55	111	268	550	916	755	579	594	637	660	629	700	311									6841		

AM PEAK HOUR 0715 TO 0815 VOLUME 943  
PM PEAK HOUR 0200 TO 0300 VOLUME 700  
AM TOTAL 4541  
PM TOTAL 2300

09/17/12 THRU 09/24/12  
TOTAL HOURS FOR COUNT 95

3 DAYS FACTOR GROUP R036 FACTOR GROUP P24  
AVG WEEKDAY VOL 10776 X SEASONAL ADJ. FACTOR 0.8900 = 9591 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 8697

PEAK HOUR PERCENTAGES: K = 8.48 D = 100.00  
PEAK HOUR LOCATION : VOLUME = 914 DATE: 09/18/12 TIME: 07:15 AM



TS

Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

---

Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

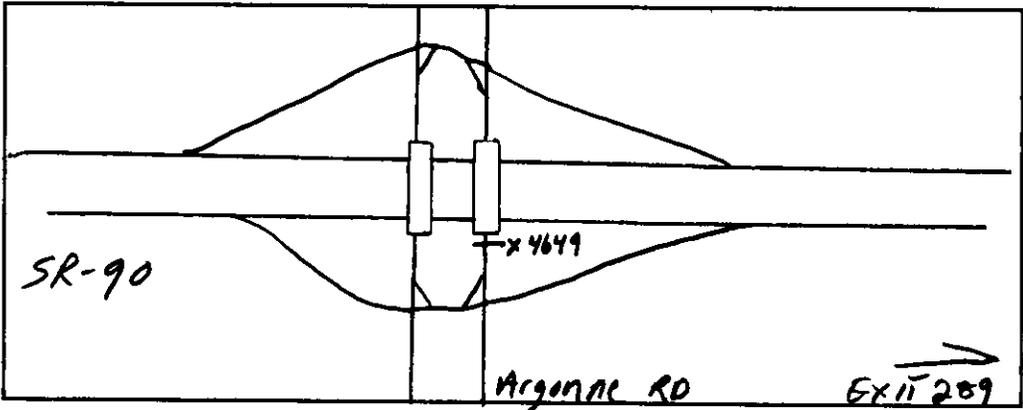
Counter No. 384649 Count ID 12-010  
SR 90 RRT/RRQ LX 28788 MP 0.03  
-0.02  
Leg 2 Direction NB OSID \_\_\_\_\_

*On Mullan Rd N/O SR 90 EB Ramps*

Station Description ON ARGONE RD S/O SR 90 WB RAMP WYE CONN

Date	Day	Time	Comments
09/17/12	2	1308	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.4
09/18	3	0826	Manual (1) <u>50</u> (2) _____ Counter (1) <u>47</u> (2) _____ CHECK COUNTER OK SP=3 6.5
09/19	4	1217	Manual (1) <u>20</u> (2) _____ Counter (1) <u>20</u> (2) _____ COUNTER CHECK OK 6.8
09/20	5	0825	Manual (1) <u>43</u> (2) _____ Counter (1) <u>42</u> (2) _____ CHECK COUNTER OK SP=1 6.6
09/21	6	<u>0638</u>	Manual (1) <u>15</u> (2) _____ Counter (1) <u>15</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



DB/TWB  
Field Person



Continuation Sheet

Count ID SP#12-009 <sup>12-010</sup> Counter No. 4649

Date	Day	Time	Comments
9-22-12	7	0655	<sup>55</sup> Manual (1) <u>30</u> (2) _____ Counter (1) <u>30</u> (2) _____ CHECK COUNTER OK TS 6.4V
9-23-12	1	0700	Manual (1) <u>14</u> (2) _____ Counter (1) <u>13</u> (2) _____ CHECK COUNTER OK TS SP=1 6.4V
9-24-12	2	12:45	Manual (1) <u>1</u> (2) _____ Counter (1) <u>1</u> (2) _____ P/D OK 6.9V
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 LX28788 MP 000.03		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC NORTHBOUND										LANE ALL OF											
COUNT IDENTIFIER 12-010		COUNTER NUMBER 384649		DESCRIPTION: ON MULLAN RD N/O SR 90 EB RAMPS																							
09/17/12 MONDAY		AM HOURS										PM HOURS										DAILY					
		12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15																	263	309	297	371	257	200	140	138	80	45	
15-30															271	291	298	306	339	231	162	118	81	69	43		
30-45															302	316	322	323	303	227	167	130	85	62	35		
45-00															290	307	326	338	288	221	137	133	82	45	23		
HOUR																											
TOT															863	1177	1255	1264	1301	936	666	521	386	256	146	8771	

AM PEAK HOUR 0000 TO 0000 VOLUME 0  
 PM PEAK HOUR 0430 TO 0530 VOLUME 1371  
 AM TOTAL 0  
 PM TOTAL 8771

09/18/12 TUESDAY		AM HOURS										PM HOURS										DAILY					
		12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15		31	22	13	20	21	64	104	177	244	170	229	237	275	226	254	276	331	361	246	188	139	126	76	46		
15-30		35	23	13	16	42	80	153	223	218	197	235	236	262	238	258	282	321	349	210	202	150	114	67	46		
30-45		20	20	15	20	47	115	208	212	225	208	223	267	236	249	292	318	311	325	239	162	158	101	62	40		
45-00		15	12	14	29	64	121	223	281	207	224	239	267	301	275	291	322	300	266	189	152	123	75	51	27		
HOUR																											
TOT		101	77	55	85	174	380	688	893	894	799	926	1007	1074	988	1095	1198	1263	1301	884	704	570	416	256	159	15987	

AM PEAK HOUR 1100 TO 1200 VOLUME 1007  
 PM PEAK HOUR 0445 TO 0545 VOLUME 1335  
 AM TOTAL 6079  
 PM TOTAL 9908

09/19/12 WEDNESDAY		AM HOURS										PM HOURS										DAILY					
		12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15		31	16	18	12	9	52	105	204	226	227	188	224	235	274	222	281	307	356	255	56	152	113	90	35		
15-30		35	21	14	12	34	75	147	243	225	206	230	258	268	245	270	286	303	337	235	92	118	112	73	54		
30-45		22	12	8	24	46	116	194	242	209	211	210	249	252	284	289	329	333	309	237	81	119	95	69	42		
45-00		21	10	13	31	54	115	215	297	241	218	205	238	276	251	293	278	284	283	233	90	131	87	67	28		
HOUR																											
TOT		109	59	53	79	143	358	661	986	901	862	833	969	1031	1054	1074	1174	1227	1285	960	319	520	407	299	159	15522	

AM PEAK HOUR 0715 TO 0815 VOLUME 1008  
 PM PEAK HOUR 0430 TO 0530 VOLUME 1310  
 AM TOTAL 6013  
 PM TOTAL 9509

*cnt low*

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 LX28788 MP 000.03	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC NORTHBOUND																		LANE ALL	OF					
COUNT IDENTIFIER 12-010	COUNTER NUMBER 384649	DESCRIPTION: ON MULLAN RD N/O SR 90 EB RAMPS																									
09/20/12 THURSDAY			AM HOURS											PM HOURS											DAILY		
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
00-15	25	24	16	24	27	43	106	192	215	194	220	229	270	262	293	274	304	382	274	190	157	138	94	56			
15-30	33	33	18	28	40	72	130	268	219	184	221	258	274	248	312	304	316	349	226	174	153	89	57	48			
30-45	19	17	17	19	53	109	181	320	214	212	263	247	260	275	313	302	298	271	211	164	125	96	57	55			
45-00	27	17	21	30	70	112	240	284	208	202	223	250	300	248	253	349	327	299	193	167	136	80	58	37			
HOUR	-----																										
TOT	104	91	72	101	190	336	657	1064	856	792	927	984	1104	1033	1171	1229	1245	1301	904	695	571	403	266	196	16292		

AM PEAK HOUR 0715 TO 0815 VOLUME 1087  
PM PEAK HOUR 0430 TO 0530 VOLUME 1356  
AM TOTAL 6174  
PM TOTAL 10118

09/21/12 FRIDAY			AM HOURS											PM HOURS											DAILY		
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
00-15	32	17	13	15	31	44	103	208	205	187	226	214	284	284	257	312	319	299	250	178	150	152	107	50			
15-30	25	30	15	23	34	74	158	318	238	212	218	247	254	292	278	295	291	299	231	161	160	165	101	64			
30-45	22	18	18	20	44	98	183	254	195	216	216	240	242	260	300	307	272	279	229	165	126	149	89	54			
45-00	19	26	18	33	62	119	169	280	208	223	268	263	260	243	280	288	297	247	209	138	155	135	70	51			
HOUR	-----																										
TOT	98	91	64	91	171	335	613	1060	846	838	928	964	1040	1079	1115	1202	1179	1124	919	642	591	601	367	219	16177		

AM PEAK HOUR 0700 TO 0800 VOLUME 1060  
PM PEAK HOUR 0315 TO 0415 VOLUME 1209  
AM TOTAL 6099  
PM TOTAL 10078

09/22/12 SATURDAY			AM HOURS											PM HOURS											DAILY		
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
00-15	49	32	29	18	21	27	35	65	132	156	217	192	242	219	219	228	205	198	194	179	120	126	95	63			
15-30	53	34	29	19	15	38	65	99	141	200	217	192	212	227	204	239	212	189	165	143	139	95	71	72			
30-45	26	59	27	14	16	27	71	125	171	209	204	211	216	222	239	220	212	179	178	131	93	91	85	65			
45-00	34	57	17	23	20	47	75	110	206	187	178	234	205	196	208	215	193	165	164	135	103	80	70	64			
HOUR	-----																										
TOT	162	182	102	74	72	139	246	399	650	752	816	829	875	864	870	902	822	731	701	588	455	392	321	264	12208		

AM PEAK HOUR 0930 TO 1030 VOLUME 830  
PM PEAK HOUR 0230 TO 0330 VOLUME 914  
AM TOTAL 4423  
PM TOTAL 7785





TS

Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

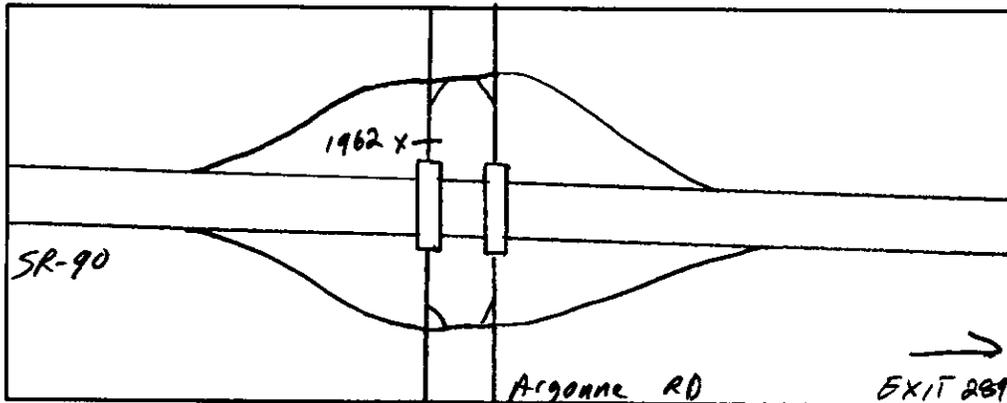
Counter No. 381962 Count ID 12-010  
SR 90 RRT/RRQ Lx 28783 ~~EX-28788~~ MP 0.02  
Leg 2 Direction SB OSID \_\_\_\_\_

On Argonne Rd s/o SR 90 WB Ramps

Station Description \_ ON ARGONE RD S/O SR-90 WB RAMP& WYE CONN

Date	Day	Time	Comments
09/17/12	2	1313	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.5
09/18	3	0832	Manual (1) <u>50</u> (2) _____ Counter (1) <u>49</u> (2) _____ CHECK COUNTER OK SP=1 6.7
09/19	4	1213	Manual (1) <u>50</u> (2) _____ Counter (1) <u>48</u> (2) _____ COUNTER CHECK OK SP=2 6.6
09/20	5	0829	Manual (1) <u>50</u> (2) _____ Counter (1) <u>49</u> (2) _____ CHECK COUNTER OK SP=1 6.6
09/21	6	<u>0641</u>	Manual (1) <u>25</u> (2) _____ Counter (1) <u>25</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



North

DB/TWB  
Field Person



Continuation Sheet

Count ID 12-210  
~~SP#12-009~~ Counter No. 1962

Date	Day	Time	Comments
9-22-12	7	0711	Manual <sup>50</sup> (1) <del>30</del> (2) CHECK COUNTER OK TS Counter (1) <del>30</del> (2) 6.4v
9-23-12	1	0707	Manual <sup>15</sup> (1) <del>23</del> (2) CHECK COUNTER OK TS Counter (1) <del>22</del> (2) SP=1 6.4v
9-24-12	2	12:42	Manual (1) <sup>1</sup> (2) P/U OK 6.9v Counter (1) 1 (2)
			Manual (1) (2) Counter (1) (2)
			Manual (1) (2) Counter (1) (2)
			Manual (1) (2) Counter (1) (2)
			Manual (1) (2) Counter (1) (2)
			Manual (1) (2) Counter (1) (2)

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S   S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 LX28783 MP 000.02		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC SOUTHBOUND										LANE ALL OF											
COUNT IDENTIFIER 12-010		COUNTER NUMBER 381962		DESCRIPTION: ON ARGONNE RD S/O SR 90 WB RAMPS																							
09/17/12 MONDAY		AM HOURS										PM HOURS										DAILY TOTAL					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15															318	315	413	444	332	203	142	95	78	37			
15-30														315	310	380	367	397	272	177	116	104	69	35			
30-45														311	403	398	408	304	310	166	140	107	66	33			
45-00														305	372	369	421	353	252	191	127	83	43	34			
HOUR	-----																										
TOT														931	1403	1462	1609	1498	1166	737	525	389	256	139	10115		

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0430 TO 0530 VOLUME 1670 PM TOTAL 10115

09/18/12 TUESDAY		AM HOURS										PM HOURS										DAILY TOTAL					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	26	24	10	6	14	41	126	229	430	267	247	269	334	290	325	291	361	391	237	211	178	96	86	43			
15-30	22	11	16	38	32	51	179	277	324	249	279	300	326	299	314	340	374	427	287	193	157	91	54	30			
30-45	30	16	24	20	51	83	218	331	303	263	263	269	314	304	389	365	364	353	234	178	130	107	49	32			
45-00	22	8	9	21	70	119	240	372	296	286	241	282	346	307	346	388	381	385	264	148	128	97	42	25			
HOUR	-----																										
TOT	100	59	59	85	167	294	763	1209	1353	1065	1030	1120	1320	1200	1374	1384	1480	1556	1022	730	593	391	231	130	18715		

AM PEAK HOUR 0730 TO 0830 VOLUME 1457 AM TOTAL 7304  
PM PEAK HOUR 0430 TO 0530 VOLUME 1563 PM TOTAL 11411

09/19/12 WEDNESDAY		AM HOURS										PM HOURS										DAILY TOTAL					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	29	13	15	7	12	38	96	243	327	269	245	273	332	284	301	301	381	360	334	214	166	121	64	49			
15-30	19	20	18	26	29	67	144	267	305	315	262	269	328	300	331	340	367	407	295	186	161	116	66	34			
30-45	16	18	12	12	46	77	210	352	304	290	235	306	305	279	361	386	366	374	260	168	145	123	51	39			
45-00	21	8	13	19	56	123	221	411	314	247	282	327	314	298	368	361	381	304	237	169	146	89	58	30			
HOUR	-----																										
TOT	85	59	58	64	143	305	671	1273	1250	1121	1024	1175	1279	1161	1361	1388	1495	1445	1126	737	618	449	239	152	18678		

AM PEAK HOUR 0730 TO 0830 VOLUME 1395 AM TOTAL 7228  
PM PEAK HOUR 0445 TO 0545 VOLUME 1522 PM TOTAL 11450

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 LX28783 MP 000.02		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC SOUTHBOUND		LANE ALL OF																	
COUNT IDENTIFIER 12-010		COUNTER NUMBER 381962		DESCRIPTION: ON ARGONNE RD S/O SR 90 WB RAMPS																					
09/20/12 THURSDAY																									
AM HOURS											PM HOURS														
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	32	26	13	11	18	47	106	256	369	268	270	281	317	321	318	344	373	393	322	223	176	133	79	64	
15-30	21	15	24	23	13	50	122	261	282	239	249	283	313	349	340	374	378	384	296	209	163	121	57	50	
30-45	16	19	10	22	43	74	209	316	273	271	257	287	311	300	380	383	365	381	261	208	146	126	48	38	
45-00	20	13	16	15	60	124	247	406	317	248	269	268	340	285	362	386	394	323	247	195	141	89	47	41	
HOUR	-----																								
TOT	89	73	63	71	134	295	684	1239	1241	1026	1045	1119	1281	1255	1400	1487	1510	1481	1126	835	626	469	231	193	18973

AM PEAK HOUR 0730 TO 0830 VOLUME 1373  
PM PEAK HOUR 0445 TO 0545 VOLUME 1552

AM TOTAL 7079  
PM TOTAL 11894

09/21/12 FRIDAY																									
AM HOURS											PM HOURS														
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	35	25	13	17	10	39	99	209	342	295	269	287	365	386	351	352	398	406	311	236	184	151	115	68	
15-30	15	12	30	12	30	65	142	334	276	269	294	335	389	296	360	346	359	353	330	197	164	172	119	67	
30-45	24	13	17	18	48	75	161	328	291	295	305	318	328	329	373	362	409	417	317	216	158	150	104	57	
45-00	26	16	17	12	71	111	239	433	285	307	277	376	381	326	407	383	398	358	277	160	153	131	88	34	
HOUR	-----																								
TOT	100	66	77	59	159	290	641	1304	1194	1166	1145	1316	1463	1337	1491	1443	1564	1534	1235	809	659	604	426	226	20308

AM PEAK HOUR 0715 TO 0815 VOLUME 1437  
PM PEAK HOUR 0445 TO 0545 VOLUME 1574

AM TOTAL 7517  
PM TOTAL 12791

09/22/12 SATURDAY																									
AM HOURS											PM HOURS														
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	48	32	22	21	19	12	52	64	124	200	248	280	278	315	301	282	300	250	256	200	172	128	105	78	
15-30	45	22	23	20	19	26	62	116	169	240	241	273	289	307	308	320	266	289	232	177	137	117	85	59	
30-45	45	21	19	15	22	32	57	126	212	254	281	329	277	324	303	276	268	251	223	178	157	119	87	46	
45-00	25	28	21	13	21	50	99	181	233	257	303	291	291	290	286	285	248	232	210	160	130	105	82	57	
HOUR	-----																								
TOT	163	103	85	69	81	120	270	487	738	951	1073	1173	1135	1236	1198	1163	1082	1022	921	715	596	469	359	240	15449

AM PEAK HOUR 1045 TO 1145 VOLUME 1185  
PM PEAK HOUR 1245 TO 0145 VOLUME 1237

AM TOTAL 5313  
PM TOTAL 10136

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 LX28783	MP 000.02	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC	SOUTHBOUND	LANE ALL	OF																			
COUNT IDENTIFIER	12-010	COUNTER NUMBER	381962	DESCRIPTION: ON ARGONNE RD S/O SR 90 WB RAMPS																						
09/23/12 SUNDAY				AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	38	28	22	17	9	13	20	37	94	151	175	216	214	282	228	234	234	247	220	208	153	99	79	32		
15-30	47	27	18	16	11	23	38	51	112	176	179	195	282	238	243	230	240	204	203	176	114	90	64	18		
30-45	33	22	22	12	20	16	53	77	121	176	226	211	279	230	238	254	262	272	186	162	112	74	47	18		
45-00	25	24	15	16	15	23	64	93	161	204	230	224	311	231	237	240	247	215	193	150	68	75	44	20		
HOUR	-----																									
TOT	143	101	77	61	55	75	175	258	488	707	810	846	1086	981	946	958	983	938	802	696	447	338	234	88	12293	

AM PEAK HOUR 1030 TO 1130 VOLUME 867 AM TOTAL 3796  
 PM PEAK HOUR 1215 TO 0115 VOLUME 1154 PM TOTAL 8497

09/24/12 MONDAY				AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	21	10	15	10	19	32	70	247	339	227	201	281	307													
15-30	17	14	8	13	31	58	142	321	275	301	255	258	291													
30-45	26	14	11	20	40	85	183	326	257	265	268	306														
45-00	8	12	16	17	62	108	221	408	311	263	260	298														
HOUR	-----																									
TOT	72	50	50	60	152	283	616	1302	1182	1056	984	1143	598													7548

AM PEAK HOUR 0715 TO 0815 VOLUME 1394 AM TOTAL 6950  
 PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 598

09/17/12 THRU 09/24/12  
 TOTAL HOURS FOR COUNT 94

3 DAYS FACTOR GROUP R036 FACTOR GROUP P24  
 AVG WEEKDAY VOL 18789 X SEASONAL ADJ. FACTOR 0.8900 = 16722 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 15164

PEAK HOUR PERCENTAGES: K = 8.89 D = 100.00  
 PEAK HOUR LOCATION : VOLUME = 1670 DATE: 09/17/12 TIME: 04:30 PM

TB

Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

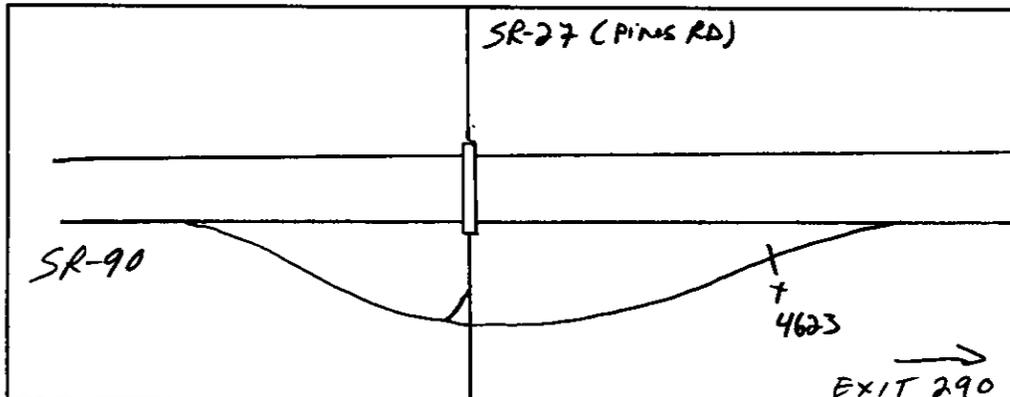
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

Counter No. 384623 Count ID 12-010  
SR 90 RRT/RRQ Q1 29014 MP 0.00  
Leg 2 Direction EB OSID \_\_\_\_\_

Station Description ON SR 90 EB ON RAMP FROM SR 27 PINES RD

Date	Day	Time	Comments
09/17/12	2	1407	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.4
09/18	3	1001	Manual (1) <u>21</u> (2) _____ Counter (1) <u>21</u> (2) _____ CHECK COUNTER OK 7.0
09/19	4	1138	Manual (1) <u>25</u> (2) _____ Counter (1) <u>25</u> (2) _____ COUNTER CHECK OK 7.0
09/20	5	1005	Manual (1) <u>17</u> (2) _____ Counter (1) <u>17</u> (2) _____ CHECK COUNTER OK 7.1
09/21	6	0721	Manual (1) <u>7</u> (2) _____ Counter (1) <u>7</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



DB / TWB  
Field Person



Continuation Sheet

Count ID 12-010  
~~SP#12-009~~ Counter No. 4623

Date	Day	Time	Comments
9-22-12	7	0805	$\begin{array}{r} \text{Manual (1)} \quad \overset{20}{16} \quad (2) \\ \text{Counter (1)} \quad \overset{16}{16} \quad (2) \end{array}$ CHECK COUNTER OK TS 6.6v
9-23-12	1	0800	$\begin{array}{r} \text{Manual (1)} \quad \overset{5}{7} \quad (2) \\ \text{Counter (1)} \quad \overset{7}{7} \quad (2) \end{array}$ CHECK COUNTER OK TS 6.5v
9-24-12	2	12:45	$\begin{array}{r} \text{Manual (1)} \quad \overset{1}{1} \quad (2) \\ \text{Counter (1)} \quad \overset{1}{1} \quad (2) \end{array}$ 7.0v
			$\begin{array}{r} \text{Manual (1)} \quad \quad (2) \\ \text{Counter (1)} \quad \quad (2) \end{array}$
			$\begin{array}{r} \text{Manual (1)} \quad \quad (2) \\ \text{Counter (1)} \quad \quad (2) \end{array}$
			$\begin{array}{r} \text{Manual (1)} \quad \quad (2) \\ \text{Counter (1)} \quad \quad (2) \end{array}$
			$\begin{array}{r} \text{Manual (1)} \quad \quad (2) \\ \text{Counter (1)} \quad \quad (2) \end{array}$
			$\begin{array}{r} \text{Manual (1)} \quad \quad (2) \\ \text{Counter (1)} \quad \quad (2) \end{array}$



STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 Q129014 MP 000.00		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC EASTBOUND		LANE ALL OF																		
COUNT IDENTIFIER	12-010	COUNTER NUMBER	384623	DESCRIPTION: ON SR 90 EB ON RAMP FROM SR 27																						
09/20/12 THURSDAY				AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	6	5	6	4	10	19	46	80	84	70	75	80	98	79	99	115	141	132	103	81	51	40	22	15		
15-30	4	8	7	4	6	38	85	109	87	82	72	96	92	104	101	101	121	128	91	78	43	36	18	8		
30-45	5	4	6	13	19	67	77	115	67	60	83	97	106	113	97	106	106	87	88	83	54	27	16	10		
45-00	9	4	5	11	37	48	75	117	90	76	76	85	93	104	107	112	136	98	77	50	39	34	20	12		
HOUR	-----																									
TOT	24	21	24	32	72	172	283	421	328	288	306	358	389	400	404	434	504	445	359	292	187	137	76	45	6001	

AM PEAK HOUR 0715 TO 0815 VOLUME 425  
PM PEAK HOUR 0400 TO 0500 VOLUME 504  
AM TOTAL 2329  
PM TOTAL 3672

09/21/12 FRIDAY				AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	4	6	6	5	9	29	48	74	81	75	61	85	122	124	97	111	129	138	101	79	55	64	42	23		
15-30	7	4	7	3	10	32	77	90	69	75	77	104	124	96	103	129	127	135	91	54	55	65	44	14		
30-45	9	6	2	12	29	62	81	114	93	82	76	94	103	103	106	137	130	108	94	65	60	54	34	26		
45-00	9	9	5	13	19	42	77	103	77	81	97	97	118	96	118	121	117	89	91	35	41	39	30	17		
HOUR	-----																									
TOT	29	25	20	33	67	165	283	381	320	313	311	380	467	419	424	498	503	470	377	233	211	222	150	80	6381	

AM PEAK HOUR 0715 TO 0815 VOLUME 388  
PM PEAK HOUR 0430 TO 0530 VOLUME 520  
AM TOTAL 2327  
PM TOTAL 4054

09/22/12 SATURDAY				AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	9	10	9	4	2	14	12	29	44	52	76	82	106	105	90	96	84	88	75	55	51	34	32	28		
15-30	13	11	7	10	9	9	23	32	41	59	99	88	109	128	102	90	86	87	50	58	29	33	27	16		
30-45	12	6	9	6	11	17	28	49	44	69	97	104	119	117	100	72	92	68	77	55	40	24	25	14		
45-00	11	11	7	10	5	25	17	62	73	73	90	96	112	103	100	92	93	81	66	42	43	31	18	12		
HOUR	-----																									
TOT	45	38	32	30	27	65	80	172	202	253	362	370	446	453	392	350	355	324	268	210	163	122	102	70	4931	

AM PEAK HOUR 1100 TO 1200 VOLUME 370  
PM PEAK HOUR 1230 TO 0130 VOLUME 464  
AM TOTAL 1676  
PM TOTAL 3255

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 Q129014 MP 000.00		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC EASTBOUND																LANE ALL OF			
COUNT IDENTIFIER 12-010		COUNTER NUMBER 384623		DESCRIPTION: ON SR 90 EB ON RAMP FROM SR 27																					
09/23/12 SUNDAY												PM HOURS												DAILY	
AM HOURS																									
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
00-15	10	10	8	2	3	5	8	15	28	31	58	73	68	69	63	66	66	72	54	31	39	33	22	13	
15-30	8	12	9	3	6	5	15	16	33	46	64	58	65	69	78	71	68	41	40	42	32	28	21	10	
30-45	11	5	8	4	7	14	12	29	39	54	53	80	78	49	56	50	59	54	49	34	29	17	15	9	
45-00	9	7	2	5	7	10	21	28	37	55	60	69	81	77	77	67	67	55	65	30	25	17	13	10	
HOUR	-----																						-----		
TOT	38	34	27	14	23	34	56	88	137	186	235	280	292	264	274	254	260	222	208	137	125	95	71	42	3396

AM PEAK HOUR 1100 TO 1200 VOLUME 280  
PM PEAK HOUR 1230 TO 0130 VOLUME 297  
AM TOTAL 1152  
PM TOTAL 2244

09/24/12 MONDAY												PM HOURS												DAILY	
AM HOURS																									
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
00-15	8	2	5	3	6	14	41	79	77	64	72	86	123												
15-30	5	4	4	4	14	38	72	92	91	81	71	73	85												
30-45	1	6	3	8	23	68	88	98	85	87	74	92	101												
45-00	1	7	5	7	24	52	83	108	77	69	101	83	83												
HOUR	-----																						-----		
TOT	15	19	17	22	67	172	284	377	330	301	318	334	392											2648	

AM PEAK HOUR 0700 TO 0800 VOLUME 377  
PM PEAK HOUR 1200 TO 0100 VOLUME 392  
AM TOTAL 2256  
PM TOTAL 392

09/17/12 THRU 09/24/12  
TOTAL HOURS FOR COUNT 94

3 DAYS FACTOR GROUP R036 FACTOR GROUP P24  
AVG WEEKDAY VOL 5973 X SEASONAL ADJ. FACTOR 0.8900 = 5316 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 4821

PEAK HOUR PERCENTAGES: K = 8.94 D = 100.00  
PEAK HOUR LOCATION : VOLUME = 534 DATE: 09/19/12 TIME: 03:45 PM

Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

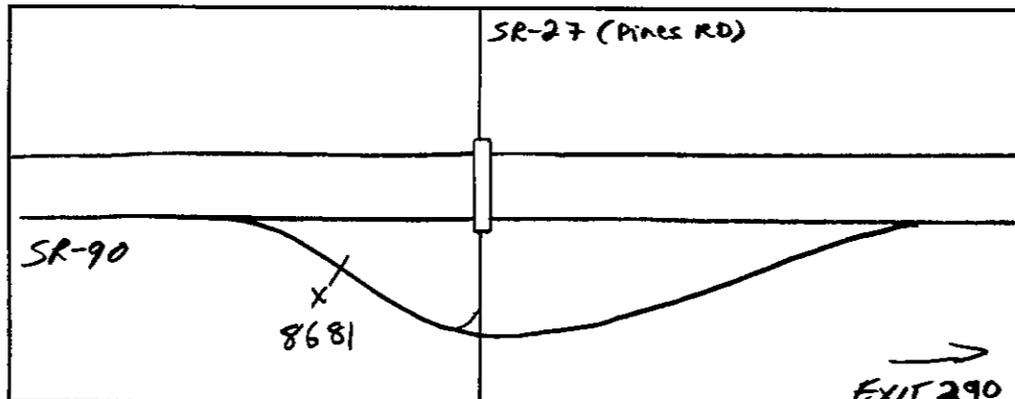
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

Counter No. 388681 Count ID 12-010  
SR 90 RRT/RRQ P1 28903 MP 0.00  
Leg 2 Direction EB OSID \_\_\_\_\_

Station Description \_ ON SR 90 EB OFF RAMP TO SR 27+PINES RD

Date	Day	Time	Comments
09/17/12	2	1328	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.5
09/18	3	0928	Manual (1) <u>32</u> (2) _____ Counter (1) <u>32</u> (2) _____ CHECK COUNTER OK 6.9
09/19	4	1236	Manual (1) <u>23</u> (2) _____ Counter (1) <u>23</u> (2) _____ COUNTER CHECK OK 7.0
09/20	5	0913	Manual (1) <u>25</u> (2) _____ Counter (1) <u>25</u> (2) _____ CHECK COUNTER OK 6.8
09/21	6	0704	Manual (1) <u>9</u> (2) _____ Counter (1) <u>9</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



North

DB / TWB  
Field Person



Continuation Sheet

Count ID 12-010 ~~SP#12-009~~ Counter No. 8681

Date	Day	Time	Comments
9-22-12	7	0729	<del>Manual (1) 20 (2)</del> <del>Counter (1) 20 (2)</del> CHECK COUNTER OK TS 6.4v
9-23-12	1	0725	<sup>23</sup> <del>Manual (1) 15 (2)</del> <del>Counter (1) 15 (2)</del> CHECK COUNTER OK TS 6.4v
9-24-12	2	12:59	<del>Manual (1) 1 (2)</del> <del>Counter (1) 1 (2)</del> 6.9v
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>
			<del>Manual (1) (2)</del> <del>Counter (1) (2)</del>

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 P128903	MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC EASTBOUND																	LANE ALL	OF						
COUNT IDENTIFIER	12-010	COUNTER NUMBER	388681	DESCRIPTION: ON SR 90 EB ON RAMP TO SR 27																								
09/17/12 MONDAY				AM HOURS												PM HOURS												DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15															152	179	224	254	155	96	89	70	48	39				
15-30														177	201	278	216	171	94	82	69	49	43					
30-45														187	193	232	241	206	120	89	89	49	46	30				
45-00														177	208	288	272	178	115	99	61	55	52	39				
HOUR	-----																											
TOT														364	730	900	1015	854	561	378	321	243	195	151	5712			

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0415 TO 0515 VOLUME 1045 PM TOTAL 5712

09/18/12 TUESDAY				AM HOURS												PM HOURS												DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	22	21	17	7	9	24	57	141	218	166	115	155	191	171	155	210	218	243	172	118	106	72	53	44				
15-30	31	12	11	4	12	39	100	182	171	144	155	169	155	163	210	203	261	261	145	115	86	69	45	39				
30-45	24	11	13	19	26	46	130	215	173	154	164	157	159	193	196	213	248	219	145	112	92	69	37	27				
45-00	19	10	5	12	26	64	173	273	221	176	178	174	179	184	210	271	261	212	155	102	87	52	54	28				
HOUR	-----																											
TOT	96	54	46	42	73	173	460	811	783	640	612	655	684	711	771	897	988	935	617	447	371	262	189	138	11455			

AM PEAK HOUR 0715 TO 0815 VOLUME 888 AM TOTAL 4445  
PM PEAK HOUR 0430 TO 0530 VOLUME 1013 PM TOTAL 7010

09/19/12 WEDNESDAY				AM HOURS												PM HOURS												DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	24	13	9	15	15	30	75	130	202	173	136	156	167	175	191	182	229	230	155	132	105	93	46	45				
15-30	14	5	13	10	18	35	75	172	162	177	163	128	182	147	180	253	251	276	158	128	95	56	41	48				
30-45	18	10	10	13	22	51	118	206	156	178	126	145	185	179	194	234	252	244	139	131	85	81	51	37				
45-00	19	11	4	9	22	62	188	248	200	186	184	150	189	199	209	263	225	221	135	95	67	80	46	24				
HOUR	-----																											
TOT	75	39	36	47	77	178	456	756	720	714	609	579	723	700	774	932	957	971	587	486	352	310	184	154	11416			

AM PEAK HOUR 0715 TO 0815 VOLUME 828 AM TOTAL 4286  
PM PEAK HOUR 0345 TO 0445 VOLUME 995 PM TOTAL 7130

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 P128903 MP 000.00		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC EASTBOUND		LANE ALL OF																	
COUNT IDENTIFIER 12-010		COUNTER NUMBER 388681		DESCRIPTION: ON SR 90 EB ON RAMP TO SR 27																					
09/20/12 THURSDAY																									
AM HOURS												PM HOURS													
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	17	17	12	5	10	25	68	169	206	149	113	163	173	174	195	214	217	238	177	122	94	87	52	41	
15-30	36	17	16	7	13	31	81	175	192	169	149	136	162	163	188	271	222	259	174	98	85	97	56	48	
30-45	25	16	11	15	17	47	132	208	192	153	153	143	175	182	193	256	244	275	139	115	82	59	46	39	
45-00	16	13	18	13	28	77	169	302	223	179	161	156	184	188	238	279	285	235	143	93	79	51	54	38	
HOUR	-----																								
TOT	94	63	57	40	68	180	450	854	813	650	576	598	694	707	814	1020	968	1007	633	428	340	294	208	166	11722

AM PEAK HOUR 0730 TO 0830 VOLUME 908 AM TOTAL 4443  
 PM PEAK HOUR 0445 TO 0545 VOLUME 1057 PM TOTAL 7279

09/21/12 FRIDAY																									
AM HOURS												PM HOURS													
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	27	14	10	12	7	21	54	110	189	161	154	152	190	185	193	211	246	276	185	125	101	83	72	46	
15-30	24	14	19	13	20	43	76	181	166	166	173	161	189	183	193	208	234	274	197	111	94	65	71	67	
30-45	26	16	13	11	16	27	110	181	159	176	177	166	193	174	203	253	231	224	183	132	99	100	69	51	
45-00	21	16	15	14	37	64	149	276	198	196	152	204	221	178	228	245	253	189	146	84	88	94	61	33	
HOUR	-----																								
TOT	98	60	57	50	80	155	389	748	712	699	656	683	793	720	817	917	964	963	711	452	382	342	273	197	11918

AM PEAK HOUR 0715 TO 0815 VOLUME 827 AM TOTAL 4387  
 PM PEAK HOUR 0430 TO 0530 VOLUME 1034 PM TOTAL 7531

09/22/12 SATURDAY																									
AM HOURS												PM HOURS													
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	38	33	23	6	13	8	28	45	85	141	156	161	179	189	148	132	134	119	118	88	84	57	65	41	
15-30	31	20	27	19	17	21	36	63	87	152	166	196	221	179	144	154	163	131	129	115	89	49	69	40	
30-45	24	21	27	18	13	20	51	96	134	161	150	167	154	163	182	145	131	142	118	118	79	63	81	49	
45-00	27	40	18	10	13	29	56	115	141	177	157	198	190	181	175	161	141	143	102	101	82	53	55	25	
HOUR	-----																								
TOT	120	114	95	53	56	78	171	319	447	631	629	722	744	712	649	592	569	535	467	422	334	222	270	155	9106

AM PEAK HOUR 1100 TO 1200 VOLUME 722 AM TOTAL 3435  
 PM PEAK HOUR 1215 TO 0115 VOLUME 754 PM TOTAL 5671

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 P128903 MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC EASTBOUND																	LANE ALL OF						
COUNT IDENTIFIER 12-010	COUNTER NUMBER 388681	DESCRIPTION: ON SR 90 EB ON RAMP TO SR 27																								
09/23/12 SUNDAY		AM HOURS											PM HOURS											DAILY		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	41	28	22	18	11	6	16	20	40	61	91	113	121	119	128	94	83	115	104	83	59	59	42	33		
15-30	46	28	29	16	13	8	32	38	61	110	100	107	105	123	144	111	104	110	79	77	75	59	54	29		
30-45	22	17	10	14	9	10	32	54	53	98	121	94	148	144	138	101	130	138	97	76	61	48	28	27		
45-00	32	21	12	11	11	23	41	72	77	121	118	109	143	123	134	119	103	119	108	66	72	54	49	19		
HOUR	-----																									
TOT	141	94	73	59	44	47	121	184	231	390	430	423	517	509	544	425	420	482	388	302	267	220	173	108	6592	

AM PEAK HOUR 1030 TO 1130 VOLUME 459 AM TOTAL 2237  
PM PEAK HOUR 0200 TO 0300 VOLUME 544 PM TOTAL 4355

09/24/12 MONDAY		AM HOURS											PM HOURS											DAILY		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	8	13	6	5	4	26	64	126	210	171	111	139	159													
15-30	13	10	3	11	12	41	75	187	157	171	141	143	155													
30-45	17	16	6	20	17	43	114	197	158	142	146	181	175													
45-00	15	12	6	6	27	69	172	268	237	158	169	154														
HOUR	-----																									
TOT	53	51	21	42	60	179	425	778	762	642	567	617	489													4686

AM PEAK HOUR 0715 TO 0815 VOLUME 862 AM TOTAL 4197  
PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 489

09/17/12 THRU 09/24/12  
TOTAL HOURS FOR COUNT 94

3 DAYS FACTOR GROUP R036 FACTOR GROUP P24  
AVG WEEKDAY VOL 11531 X SEASONAL ADJ. FACTOR 0.8900 = 10263 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 9306

PEAK HOUR PERCENTAGES: K = 9.17 D = 100.00  
PEAK HOUR LOCATION : VOLUME = 1057 DATE: 09/20/12 TIME: 04:45 PM



Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

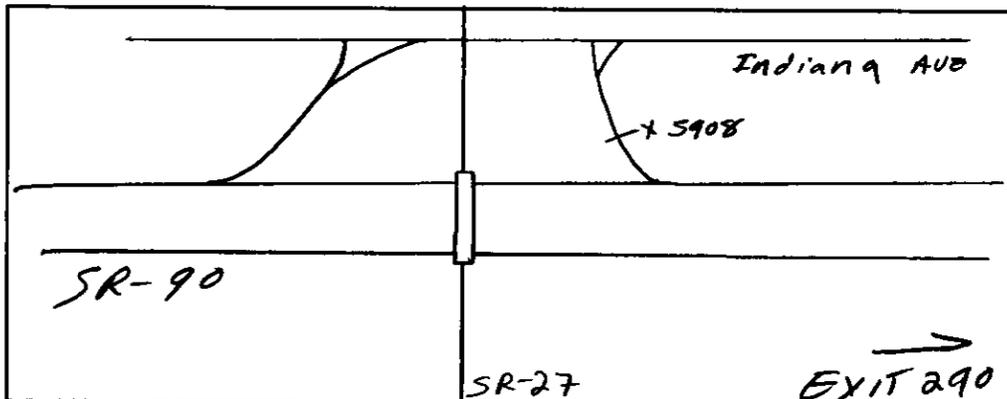
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

Counter No. 385908 Count ID 12-010  
SR 90 RRT/RRQ R1 29015 MP 0.00  
Leg 2 Direction WB OSID \_\_\_\_\_

Station Description ON SR 90 WB OFF RAMP TO INDIANA AVE

Date	Day	Time	Comments
09/17/12	2	1517	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.5
09/18	3	1138	Manual (1) <u>30</u> (2) _____ Counter (1) <u>30</u> (2) _____ CHECK COUNTER OK 6.5
09/19	4	1116	Manual (1) <u>18</u> (2) _____ Counter (1) <u>18</u> (2) _____ COUNTER CHECK OK 6.7
09/20	5	1111	Manual (1) <u>18</u> (2) _____ Counter (1) <u>18</u> (2) _____ CHECK COUNTER OK 6.6
09/21	6	0816	Manual (1) <u>12</u> (2) _____ Counter (1) <u>12</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



North

DB/TWB  
Field Person



Continuation Sheet

Count ID 12-010  
~~SP#12-000~~ Counter No. 5908

Date	Day	Time	Comments
9-22-12	7	1130	Manual (1) <u>11</u> (2) _____ Counter (1) <u>11</u> (2) _____ CHECK COUNTER OK TS 6.7v
9-23-12	1	1140	Manual (1) <sup>10</sup> <u>12</u> (2) _____ Counter (1) <u>12</u> (2) _____ CHECK COUNTER OK TS 6.8v
9-24-12	2	15:19	Manual (1) <u>1</u> (2) _____ Counter (1) <u>1</u> (2) _____ P/V ok 6.8v
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIP SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 R129015	MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND																	LANE ALL	OF																								
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385908	DESCRIPTION: ON SR 90 WB OFF RAMP TO INDIANA AVE																																										
09/17/12 MONDAY												AM HOURS											PM HOURS											DAILY												
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL																					
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11																							
00-15																		101	102	69	44	43	27	28	16																					
15-30																		110	136	77	50	45	36	23	15																					
30-45																117	118	104	62	41	37	30	10	10																						
45-00																118	126	103	63	42	30	23	15	18																						
HOUR	-----																																													
TOT	-----																							235	455	445	271	177	155	116	76	59	1989													

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0430 TO 0530 VOLUME 482 PM TOTAL 1989

09/18/12 TUESDAY												AM HOURS											PM HOURS											DAILY												
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL																					
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11																							
00-15	11	7	4	5	5	19	29	84	96	78	69	76	79	76	73	88	114	122	95	38	40	36	24	9																						
15-30	11	2	3	6	12	18	49	106	94	79	65	61	67	80	91	86	97	134	74	54	40	29	24	17																						
30-45	2	5	3	11	13	25	65	142	91	87	71	81	79	83	101	115	103	109	63	63	38	24	13	8																						
45-00	8	5	3	5	23	37	85	189	90	79	74	84	87	71	111	113	117	112	73	50	38	27	10	9																						
HOUR	-----																																													
TOT	32	19	13	27	53	99	228	521	371	323	279	302	312	310	376	402	431	477	305	205	156	116	71	43	5471																					

AM PEAK HOUR 0715 TO 0815 VOLUME 533 AM TOTAL 2267  
PM PEAK HOUR 0445 TO 0545 VOLUME 482 PM TOTAL 3204

09/19/12 WEDNESDAY												AM HOURS											PM HOURS											DAILY												
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL																					
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11																							
00-15	8	6	3	6	8	23	42	67	93	74	72	59	78	96	85	90	108	95	97	60	48	39	39	16																						
15-30	6	9	3	5	7	18	51	113	90	73	78	68	96	87	95	100	110	118	71	77	54	31	25	10																						
30-45	6	3	4	7	13	22	72	136	87	84	59	92	105	72	104	99	103	111	73	41	53	37	21	10																						
45-00	9	3	2	3	15	40	88	149	102	81	81	107	83	83	102	123	124	109	72	51	37	32	14	9																						
HOUR	-----																																													
TOT	29	21	12	21	43	103	253	465	372	312	290	326	362	338	386	412	445	433	313	229	192	139	99	45	5640																					

AM PEAK HOUR 0715 TO 0815 VOLUME 491 AM TOTAL 2247  
PM PEAK HOUR 0445 TO 0545 VOLUME 448 PM TOTAL 3393

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 R129015 MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND	LANE ALL OF																					
COUNT IDENTIFIER 12-010	COUNTER NUMBER 385908	DESCRIPTION: ON SR 90 WB OFF RAMP TO INDIANA AVE																							
09/20/12 THURSDAY																									
	AM HOURS											PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
00-15	11	10	5	2	5	19	31	71	93	71	87	85	113	110	96	102	99	114	89	66	58	45	30	17	
15-30	9	5	3	10	11	12	55	106	108	73	90	92	91	95	84	99	111	119	93	60	37	35	23	19	
30-45	5	1	3	10	13	22	69	112	79	82	68	81	80	71	103	109	106	90	83	60	49	31	17	10	
45-00	10	4	3	6	24	41	104	150	99	84	86	87	91	98	116	122	114	95	67	51	37	29	17	11	
HOUR	-----											-----											-----		
TOT	35	20	14	28	53	94	259	439	379	310	331	345	375	374	399	432	430	418	332	237	181	140	87	57	5769

AM PEAK HOUR 0730 TO 0830 VOLUME 463  
PM PEAK HOUR 0430 TO 0530 VOLUME 453  
AM TOTAL 2307  
PM TOTAL 3462

09/21/12 FRIDAY																									
	AM HOURS											PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
00-15	12	7	10	8	11	19	31	70	92	59	64	76	79	79	119	90	132	107	86	63	53	37	44	32	
15-30	8	7	3	7	8	25	30	104	92	67	83	95	90	99	102	105	98	117	92	86	50	51	50	41	
30-45	7	5	2	3	17	17	56	125	94	65	71	104	98	90	116	92	141	97	91	58	44	44	26	35	
45-00	10	3	2	5	12	30	91	135	87	103	82	100	79	93	103	129	129	88	81	46	55	37	42	26	
HOUR	-----											-----											-----		
TOT	37	22	17	23	48	91	208	434	365	294	300	375	346	361	440	416	500	409	350	253	202	169	162	134	5956

AM PEAK HOUR 0715 TO 0815 VOLUME 456  
PM PEAK HOUR 0400 TO 0500 VOLUME 500  
AM TOTAL 2214  
PM TOTAL 3742

09/22/12 SATURDAY																									
	AM HOURS											PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
00-15	22	11	7	7	3	9	13	27	45	74	65	87	77	73	67	83	49	64	46	68	53	40	39	22	
15-30	17	6	7	2	4	8	11	43	53	85	76	96	101	98	93	88	63	77	64	54	45	44	28	19	
30-45	8	12	4	4	4	15	25	38	73	90	89	88	102	84	87	70	74	70	60	49	48	30	30	11	
45-00	12	6	6	4	9	17	24	42	59	84	88	96	111	93	76	95	71	74	68	69	39	37	27	14	
HOUR	-----											-----											-----		
TOT	59	35	24	17	20	49	73	150	230	333	318	367	391	348	323	336	257	285	238	240	185	151	124	66	4619

AM PEAK HOUR 1100 TO 1200 VOLUME 367  
PM PEAK HOUR 1200 TO 0100 VOLUME 391  
AM TOTAL 1675  
PM TOTAL 2944

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 R129015	MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND																	LANE ALL	OF														
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385908	DESCRIPTION: ON SR 90 WB OFF RAMP TO INDIANA AVE																																
09/23/12 SUNDAY												AM HOURS												PM HOURS												DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL										
00-15	12	12	7	2	2	3	6	14	29	34	47	56	56	61	66	43	64	60	54	56	48	35	19	9												
15-30	19	7	10	3	2	7	4	8	22	40	44	37	58	64	63	61	56	57	58	46	32	28	21	8												
30-45	15	10	5	4	2	5	16	18	43	45	43	55	58	56	70	61	73	67	53	42	31	24	10	6												
45-00	11	6	3	2	4	7	14	17	46	59	55	58	87	65	71	62	59	70	46	33	31	17	14	5												
HOUR	-----																																			
TOT	57	35	25	11	10	22	40	57	140	178	189	206	259	246	270	227	252	254	211	177	142	104	64	28	3204											

AM PEAK HOUR 1100 TO 1200 VOLUME 206  
PM PEAK HOUR 0200 TO 0300 VOLUME 270  
AM TOTAL 970  
PM TOTAL 2234

09/24/12 MONDAY												AM HOURS												PM HOURS												DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL										
00-15	6	2	2	1	5	20	31	65	102	71	74	82	100	102	75	90																				
15-30	6	4	2	3	14	17	45	115	92	70	67	74	87	85	80																					
30-45	9	4	1	2	14	24	63	126	84	66	62	87	83	66	106																					
45-00	6	2	3	5	15	33	96	172	97	90	80	89	86	78	102																					
HOUR	-----																																			
TOT	27	12	8	11	48	94	235	478	375	297	283	332	356	331	363	90									3340											

AM PEAK HOUR 0715 TO 0815 VOLUME 515  
PM PEAK HOUR 0215 TO 0315 VOLUME 378  
AM TOTAL 2200  
PM TOTAL 1140

09/17/12 THRU 09/24/12  
TOTAL HOURS FOR COUNT 95

3 DAYS FACTOR GROUP R036 FACTOR GROUP P24  
AVG WEEKDAY VOL 5627 X SEASONAL ADJ. FACTOR 0.8900 = 5008 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 4541

PEAK HOUR PERCENTAGES: K = 9.47 D = 100.00  
PEAK HOUR LOCATION : VOLUME = 533 DATE: 09/18/12 TIME: 07:15 AM



Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
 Lane No  1  2

---

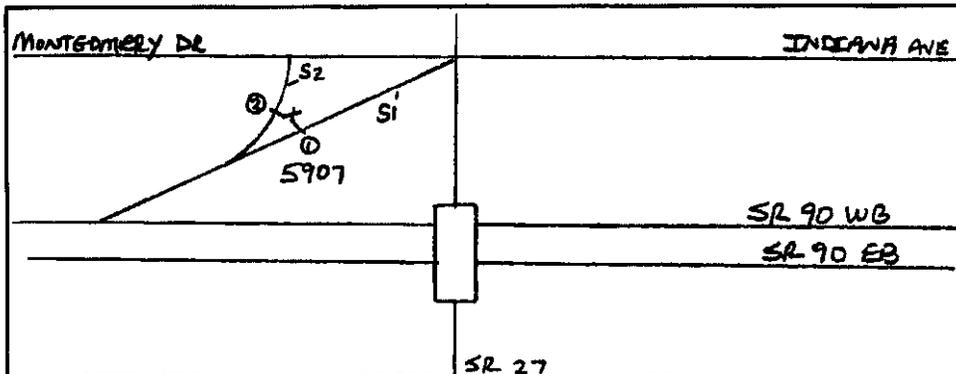
Direction Channel 1 S1 28907  
 Direction Channel 2 S2 28907 11  
 Unique ID# \_\_\_\_\_

Counter No. 385907 Count ID 12-010  
 SR 90 RRT/RRQ S128907 MP 0.02  
 Leg 2 Direction WB See 1,2 OSID \_\_\_\_\_

Station Description ON SR 90 on ramp from SR 27

Date	Day	Time	Comments				
9-17-12	2	1526	Manual (1) 5 (2) 5 Counter (1) 5 (2) 5	Set Cntrs	OK	TWB/DB	6.5
9-18-12	3	1152	Manual (1) 28 (2) 3 Counter (1) 28 (2) 3	Check Cntrs	OK	TWB/DB	7.0
9-19-12	4	1204	Manual (1) 20 (2) 1 Counter (1) 20 (2) 1	Check Cntrs	OK	TWB/DB	7.0
9-20-12	5	1117	Manual (1) 26 (2) 2 Counter (1) 26 (2) 2	Check Cntrs	OK	TWB/DB	7.0
9-21-12	6	0819	Manual (1) 20 (2) 3 Counter (1) 20 (2) 3	P/U Cntrs	OK	TWB/DB	6.7

Sketch



North

T. Breechel  
Field Person



Continuation Sheet

Count ID 12-010  
~~SP#12-009~~ Counter No. 5907

Date	Day	Time	Comments
9-22-12	7	1248	<del>Manual (1) 2 (2) 19</del> <del>Counter (1) 2 (2) 19</del> CHECK COUNTER OK TS 7.1v
9-23-12	1	1147	<del>Manual (1) 43 (2) 1</del> <del>Counter (1) 43 (2) 1</del> CHECK COUNTER OK TS 7.0v
9-24-12	2	15 23	<del>Manual (1) 1 (2) —</del> <del>Counter (1) 1 (2) —</del> PIV OK 6.9v
			<del>Manual (1) (2) —</del> <del>Counter (1) (2) —</del>
			<del>Manual (1) (2) —</del> <del>Counter (1) (2) —</del>
			<del>Manual (1) (2) —</del> <del>Counter (1) (2) —</del>
			<del>Manual (1) (2) —</del> <del>Counter (1) (2) —</del>
			<del>Manual (1) (2) —</del> <del>Counter (1) (2) —</del>

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 S128907	MP 000.02	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND																	LANE ALL	OF														
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385907	DESCRIPTION: ON SR 90 ON RAMP FROM SR 27																																
09/17/12 MONDAY												AM HOURS												PM HOURS												DAILY
												12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
												1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
00-15																								212	223	172	123	85	62	58	32					
15-30																								181	193	123	79	57	69	44	28					
30-45																								175	234	199	96	69	66	47	28					
45-00																								160	190	150	114	79	59	54	27					
HOUR	-----																																			
TOT																								335	817	765	505	350	267	232	155	115	3541			

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
 PM PEAK HOUR 0430 TO 0530 VOLUME 840 PM TOTAL 3541

09/18/12 TUESDAY												AM HOURS												PM HOURS												DAILY
												12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
												1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
00-15	15	11	9	8	12	34	97	178	137	154	126	135	162	173	149	194	189	219	165	94	90	76	71	34												
15-30	15	14	5	12	19	58	124	261	172	156	140	177	156	176	164	186	178	192	113	123	89	81	56	30												
30-45	12	8	9	13	27	96	187	267	155	140	158	165	133	153	212	187	214	165	132	100	87	62	55	16												
45-00	16	16	5	18	37	89	180	153	146	159	141	117	128	132	171	195	197	137	119	87	73	59	41	19												
HOUR	-----																																			
TOT	58	49	28	51	95	277	588	859	610	609	565	594	579	634	696	762	778	713	529	404	339	278	223	99	10417											

AM PEAK HOUR 0645 TO 0745 VOLUME 886 AM TOTAL 4383  
 PM PEAK HOUR 0430 TO 0530 VOLUME 822 PM TOTAL 6034

09/19/12 WEDNESDAY												AM HOURS												PM HOURS												DAILY
												12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
												1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
00-15	22	14	12	20	20	31	93	187	192	157	150	153	163	123	171	197	200	208	143	82	90	100	56	47												
15-30	17	9	5	13	17	52	133	231	172	154	150	162	157	163	153	146	199	182	138	94	77	82	51	31												
30-45	19	9	8	10	37	95	180	257	189	142	138	140	148	160	195	185	200	219	126	94	69	74	29	33												
45-00	18	7	6	18	23	82	181	210	164	154	125	171	161	159	153	176	172	148	104	71	91	59	46	24												
HOUR	-----																																			
TOT	76	39	31	61	97	260	587	885	717	607	563	626	629	605	672	704	771	757	511	341	327	315	182	135	10498											

AM PEAK HOUR 0715 TO 0815 VOLUME 890 AM TOTAL 4549  
 PM PEAK HOUR 0445 TO 0545 VOLUME 781 PM TOTAL 5949

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 S128907 MP 000.02		OFF SYSTEM ID.		LEG 2		DIRECTION OF TRAFFIC WESTBOUND		LANE ALL OF																														
COUNT IDENTIFIER 12-010		COUNTER NUMBER 385907		DESCRIPTION: ON SR 90 ON RAMP FROM SR 27																																		
09/20/12 THURSDAY												AM HOURS												PM HOURS												DAILY		
												12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12																								TOTAL		
00-15	12	18	6	14	14	32	100	175	215	127	119	164	153	153	151	208	207	237	163	121	79	99	72	30														
15-30	14	7	9	11	24	50	122	232	173	147	142	141	176	159	163	177	214	191	167	115	75	60	50	31														
30-45	11	5	14	13	31	108	180	243	207	141	139	127	136	151	206	221	241	207	135	109	67	55	46	28														
45-00	31	6	2	12	33	67	175	210	178	142	177	182	138	160	164	182	225	154	125	97	67	59	57	15														
HOUR	-----											-----											-----															
TOT	68	36	31	50	102	257	577	860	773	557	577	614	603	623	684	788	887	789	590	442	288	273	225	104	10798													

AM PEAK HOUR 0715 TO 0815 VOLUME 900 AM TOTAL 4502  
 PM PEAK HOUR 0415 TO 0515 VOLUME 917 PM TOTAL 6296

09/21/12 FRIDAY												AM HOURS												PM HOURS												DAILY		
												12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12																								TOTAL		
00-15	26	8	7	14	16	35	80	195	187	134	151	145	193	154	174	182	188	211	166	119	112	100	73	35														
15-30	13	9	9	7	16	57	106	229	165	162	151	170	165	147	163	199	174	187	158	91	113	122	72	36														
30-45	20	15	9	16	32	83	163	276	193	174	147	151	176	174	209	187	205	177	148	116	107	115	69	35														
45-00	11	11	9	9	25	68	157	234	169	153	127	155	147	187	149	185	201	189	146	75	103	74	49	42														
HOUR	-----											-----											-----															
TOT	70	43	34	46	89	243	506	934	714	623	576	621	681	662	695	753	768	764	618	401	435	411	263	148	11098													

AM PEAK HOUR 0700 TO 0800 VOLUME 934 AM TOTAL 4499  
 PM PEAK HOUR 0430 TO 0530 VOLUME 804 PM TOTAL 6599

09/22/12 SATURDAY												AM HOURS												PM HOURS												DAILY		
												12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12																								TOTAL		
00-15	36	26	15	12	7	21	40	50	81	111	119	145	158	122	157	160	172	186	154	96	97	82	50	46														
15-30	24	9	9	13	15	24	29	68	107	117	132	131	178	171	150	169	194	146	159	108	100	87	63	38														
30-45	30	21	14	4	12	39	58	75	114	118	140	161	177	160	161	131	162	159	148	92	81	66	59	33														
45-00	26	12	10	5	17	21	57	85	117	117	156	173	182	156	175	148	165	128	138	90	57	57	56	21														
HOUR	-----											-----											-----															
TOT	116	68	48	34	51	105	184	278	419	463	547	610	695	609	643	608	693	619	599	386	335	292	228	138	8768													

AM PEAK HOUR 1100 TO 1200 VOLUME 610 AM TOTAL 2923  
 PM PEAK HOUR 0415 TO 0515 VOLUME 707 PM TOTAL 5845

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIPS SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 S128907 MP 000.02	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND																		LANE ALL OF					
COUNT IDENTIFIER 12-010	COUNTER NUMBER 385907	DESCRIPTION: ON SR 90 ON RAMP FROM SR 27	AM HOURS											PM HOURS											DAILY TOTAL	
09/23/12 SUNDAY	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	25	13	13	11	15	9	25	46	47	56	94	85	106	115	108	146	118	136	99	77	63	75	38	29		
15-30	22	12	13	10	8	16	26	31	47	75	102	109	135	123	119	122	121	103	106	78	61	50	42	22		
30-45	21	16	13	11	17	23	50	39	79	86	108	102	142	136	120	151	124	96	75	61	61	42	39	21		
45-00	18	11	6	8	13	19	26	42	67	131	109	114	124	105	118	129	129	103	109	68	46	29	20	6		
HOUR	-----																									
TOT	86	52	45	40	53	67	127	158	240	348	413	410	507	479	465	548	492	438	389	284	231	196	139	78	6285	

AM PEAK HOUR 0945 TO 1045 VOLUME 435 AM TOTAL 2039  
 PM PEAK HOUR 0300 TO 0400 VOLUME 548 PM TOTAL 4246

09/24/12 MONDAY	AM HOURS											PM HOURS											DAILY TOTAL			
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	17	7	9	17	19	35	73	214	216	163	146	161	166	154	149	167										
15-30	17	9	9	14	18	65	106	230	167	156	151	152	143	147	161											
30-45	13	12	9	19	31	106	179	258	190	159	153	156	138	166	158											
45-00	11	8	8	15	37	73	208	221	155	135	167	152	136	156	153											
HOUR	-----																									
TOT	58	36	35	65	105	279	566	923	728	613	617	621	583	623	621	167									6640	

AM PEAK HOUR 0715 TO 0815 VOLUME 925 AM TOTAL 4646  
 PM PEAK HOUR 0215 TO 0315 VOLUME 639 PM TOTAL 1994

09/17/12 THRU 09/24/12  
 TOTAL HOURS FOR COUNT 95

3 DAYS FACTOR GROUP R036 FACTOR GROUP P24  
 AVG WEEKDAY VOL 10571 X SEASONAL ADJ. FACTOR 0.8900 = 9408 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 8531

PEAK HOUR PERCENTAGES: K = 8.84 D = 100.00  
 PEAK HOUR LOCATION : VOLUME = 934 DATE: 09/21/12 TIME: 07:00 AM



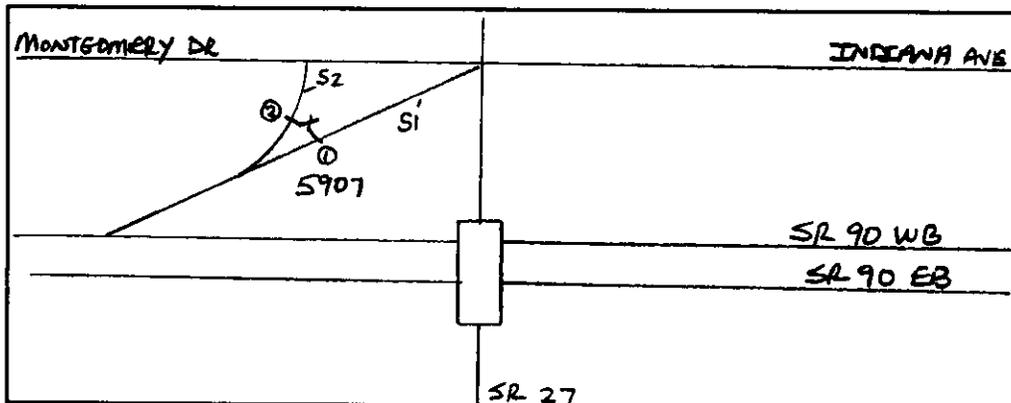
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 Binned(CL/SP)  Count(volume)  
 Lane No  1  2  
 Direction Channel 1 S1 28907 U  
 Direction Channel 2 S2 28907  
 Unique ID# \_\_\_\_\_

Counter No. 385907 Count ID 12-010  
 SR 90 RRT/RRQ 5228907 MP 0.00  
 Leg 2 Direction WB See 1,2 OSID \_\_\_\_\_

Station Description ON SR 90 WB on Ramp From Montgomery Rd

Date	Day	Time	Comments			
9-17-12	2	1526	Manual (1) 5 (2) 5 Counter (1) 5 (2) 5	Set Cntrs	OK	TWB/DB 6.5
9-18-12	3	1152	Manual (1) 28 (2) 3 Counter (1) 28 (2) 3	Check Cntrs	OK	TWB/DB 7.0
9-19-12	4	1204	Manual (1) 20 (2) 1 Counter (1) 20 (2) 1	Check Cntrs	OK	TWB/DB 7.0
9-20-12	5	1117	Manual (1) 26 (2) 2 Counter (1) 26 (2) 2	Check Cntrs	OK	TWB/DB 7.0
9-21-12	6	0819	Manual (1) 20 (2) 3 Counter (1) 20 (2) 3	P/U Cntrs	OK	TWB/DB 6.7

Sketch



T. Breduel  
Field Person



Continuation Sheet

Count ID 12-010  
~~SP#12-009~~ Counter No. 5907

Date	Day	Time	Comments
9-22-12	7	1248	Manual (1) <u>2</u> (2) <u>19</u> Counter (1) <u>2</u> (2) <u>19</u> 3 45 CHECK COUNTER OK TS 7.1v
9-23-12	1	1147	Manual (1) <u>43</u> (2) <u>1</u> Counter (1) <u>43</u> (2) <u>1</u> CHECK COUNTER OK TS 7.0v
9-24-12	2	15:23	Manual (1) <u>1</u> (2) <u>    </u> PIV OK Counter (1) <u>1</u> (2) <u>    </u> 6.9v
			Manual (1) <u>    </u> (2) <u>    </u> Counter (1) <u>    </u> (2) <u>    </u>
			Manual (1) <u>    </u> (2) <u>    </u> Counter (1) <u>    </u> (2) <u>    </u>
			Manual (1) <u>    </u> (2) <u>    </u> Counter (1) <u>    </u> (2) <u>    </u>
			Manual (1) <u>    </u> (2) <u>    </u> Counter (1) <u>    </u> (2) <u>    </u>
			Manual (1) <u>    </u> (2) <u>    </u> Counter (1) <u>    </u> (2) <u>    </u>

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 T R I P S S Y S T E M  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 S228907 MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND												LANE ALL	OF											
COUNT IDENTIFIER 12-010	COUNTER NUMBER 385907	DESCRIPTION: ON SR 90 WB ON RAMP FROM MONTGOMERY RD																									
09/17/12 MONDAY		AM HOURS												PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	DAILY TOTAL	
00-15																		25	20	14	7	4	2	1	1		
15-30																		23	23	11	7	14	1	1	1		
30-45																	23	27	24	15	13	8	5	2	2		
45-00																	20	20	7	8	8	2	1	1			
HOUR	-----																										
TOT																	43	95	74	48	35	28	9	3	5	340	

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
 PM PEAK HOUR 0400 TO 0500 VOLUME 95 PM TOTAL 340

09/18/12 TUESDAY		AM HOURS												PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	DAILY TOTAL	
00-15	1	1			4	8	11	23	21	6	14	8	23	14	19	17	15	18	14	3	7	7	1	3			
15-30	1	3	3		1	6	16	18	17	9	14	16	14	6	16	18	19	18	13	3	8	2	2				
30-45			1	3	2	7	18	24	17	6	20	15	11	16	25	22	16	15	15	10	3	3	4				
45-00	1			2	3	7	13	11	22	13	12	16	11	16	19	17	28	7	5	11	3		3				
HOUR	-----																										
TOT	3	4	4	5	10	28	58	76	77	34	60	55	59	52	79	74	78	58	47	27	21	9	10	3	931		

AM PEAK HOUR 0645 TO 0745 VOLUME 78 AM TOTAL 414  
 PM PEAK HOUR 0415 TO 0515 VOLUME 81 PM TOTAL 517

09/19/12 WEDNESDAY		AM HOURS												PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	DAILY TOTAL	
00-15				1	3	10	12	23	14	10	12	11	11	21	20	14	22	21	7	3	17	3	5	3			
15-30	2		1	1	1	9	10	18	19	16	19	10	16	12	16	12	23	14	10	5	6	1	1	2			
30-45	5			3	2	8	14	23	10	17	14	13	16	17	23	22	20	23	12	9	5	2	4				
45-00		2		1	3	9	15	17	12	12	8	18	12	10	18	18	20	13	9	6	6	2	5				
HOUR	-----																										
TOT	7	2	2	5	8	36	51	81	55	55	53	52	55	60	77	66	85	71	38	23	34	8	15	5	944		

AM PEAK HOUR 0700 TO 0800 VOLUME 81 AM TOTAL 407  
 PM PEAK HOUR 0400 TO 0500 VOLUME 85 PM TOTAL 537

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 S228907 MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND																		LANE ALL OF						
COUNT IDENTIFIER 12-010	COUNTER NUMBER 385907	DESCRIPTION: ON SR 90 WB ON RAMP FROM MONTGOMERY RD	AM HOURS												PM HOURS												DAILY TOTAL
09/20/12 THURSDAY	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15			1	1		7	15	18	15	14	11	17	6	15	8	12	24	22	8	10	2	6	4		4		
15-30			2	1	1	2	15	22	12	15	14	16	13	15	11	12	22	16	9	5	8	6			4		
30-45	2			3	3	18	13	23	18	13	17	11	10	15	16	21	24	15	3	8	4	6			4		
45-00	1	1			3	18	16	21	15	11	12	10	11	22	22	21	17	13	9	8	4	3	5				
HOUR	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
TOT	3	1	3	5	7	45	59	84	60	53	54	54	40	67	57	66	87	66	29	31	18	21	9	8	927		

AM PEAK HOUR 0700 TO 0800 VOLUME 84 AM TOTAL 428  
PM PEAK HOUR 0345 TO 0445 VOLUME 91 PM TOTAL 499

09/21/12 FRIDAY	AM HOURS												PM HOURS												DAILY TOTAL	
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	1				1	12	3	19	16	18	13	23	22	10	10	11	17	15	5	1	5	2	4		7	
15-30	1			1		3	8	13	22	13	9	15	13	22	12	11	14	19	8	6	4	1			7	
30-45	2			2	4	8	11	19	18	14	6	12	24	16	26	25	24	13	6	4	1	3	2	5	5	
45-00		1		2	7	16	18	9	14	12	11	16	12	14	13	12	18	11	2	5	4	3	2	5	5	
HOUR	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
TOT	4	1		5	12	39	40	60	70	57	39	66	71	62	61	59	73	58	21	16	14	9	8	17	862	

AM PEAK HOUR 0815 TO 0915 VOLUME 72 AM TOTAL 393  
PM PEAK HOUR 0430 TO 0530 VOLUME 76 PM TOTAL 469

09/22/12 SATURDAY	AM HOURS												PM HOURS												DAILY TOTAL	
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15		1					1	2	5	7	9	6	7	16	7	12	5	8	9	5	3	4	3	3	3	
15-30		1	2				2	1	5	6	4	8	16	9	9	8	3	3	4	2	5	5	1		3	
30-45					1	11	4	1	12	10	5	6	12	11	7	10	12	7	6	6	5	3	3		4	
45-00	3	1			1	3	5	3	8	6	6	10	11	9	3	5	10	2	3	3	2	2	2	4	4	
HOUR	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
TOT	3	3	2		2	14	12	7	30	29	24	30	46	45	26	35	30	20	22	16	15	14	9	7	441	

AM PEAK HOUR 0830 TO 0930 VOLUME 33 AM TOTAL 156  
PM PEAK HOUR 1215 TO 0115 VOLUME 55 PM TOTAL 285

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIP SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 090 S228907 MP 000.00	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC WESTBOUND														LANE ALL OF										
COUNT IDENTIFIER 12-010	COUNTER NUMBER 385907	DESCRIPTION: ON SR 90 WB ON RAMP FROM MONTGOMERY RD																									
09/23/12 SUNDAY		AM HOURS												PM HOURS												DAILY	
		12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	2	1						2	3	1	3	5	5	3	5	5	3	6	3	5	1	2			1	1	
15-30					1		1	3	3	2	2	4	7	5	2	8	3	6	4	4	4	3	1			1	
30-45			1			2	1	2	2	4	8	2	2	1	5	4	3	4	3			2		2	3		
45-00				2		1	3			5	2	12	2	6	2	8	6	8	6			3	2	5	1	1	
HOUR	-----																										
TOT	2	1	1	2	1	3	7	8	11	11	27	13	18	13	20	21	20	19	12	8	9	6	4	6	243		

AM PEAK HOUR 1030 TO 1130 VOLUME 29 AM TOTAL 87  
 PM PEAK HOUR 0315 TO 0415 VOLUME 24 PM TOTAL 156

09/24/12 MONDAY		AM HOURS												PM HOURS												DAILY	
		12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	1	1			1	2	10	8	18	22	13	14	10	20	9	8	14										
15-30	1		1	1	2	1	8	24	11	15	5	8	10	12	16												
30-45				1	6	8	15	26	17	8	15	13	10	9	27												
45-00					7	10	11	16	15	14	11	10	17	14	14												
HOUR	-----																										
TOT	2	1	1	3	17	29	42	84	65	50	45	41	57	44	65	14										560	

AM PEAK HOUR 0715 TO 0815 VOLUME 88 AM TOTAL 380  
 PM PEAK HOUR 0215 TO 0315 VOLUME 71 PM TOTAL 180

09/17/12 THRU 09/24/12  
 TOTAL HOURS FOR COUNT 95

3 DAYS FACTOR GROUP R036 FACTOR GROUP P24  
 AVG WEEKDAY VOL 934 X SEASONAL ADJ. FACTOR 0.8900 = 831 X AXLE CORR FACTOR 0.9068 = ESTIMATED AVG DAILY TRAFFIC 754

PEAK HOUR PERCENTAGES: K = 10.17 D = 100.00  
 PEAK HOUR LOCATION : VOLUME = 95 DATE: 09/17/12 TIME: 04:00 PM



18

Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

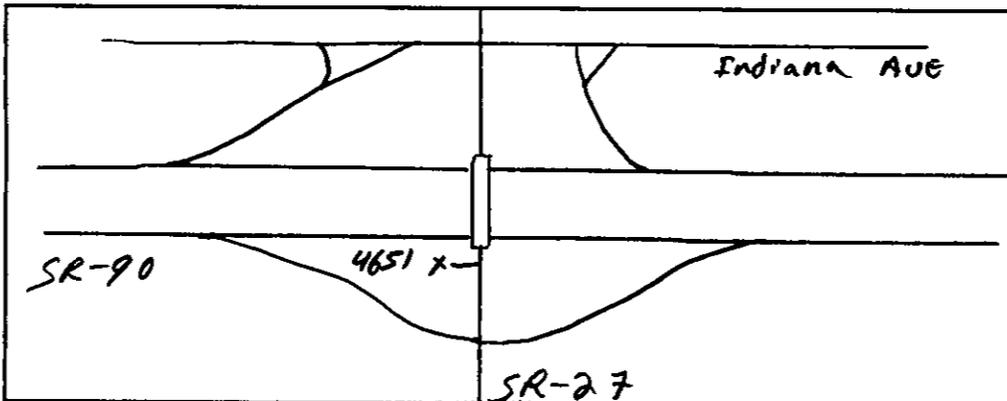
Counter No. 384651 Count ID 12-010  
SR 27 RRT/RRQ MP 86.63  
~~86.70~~  
Leg — Direction SB OSID \_\_\_\_\_

*On SR 27 @ SR 90 Bridge*

Station Description ON SR 27 S/O INDIANA AVE WYE CONN

Date	Day	Time	Comments
09/17/12	2	1338	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.5
09/18	3	0940	Manual (1) <u>50</u> (2) _____ Counter (1) <u>49</u> (2) _____ CHECK COUNTER OK SP=1 6.7
09/19	4	1134	Manual (1) <u>40</u> (2) _____ Counter (1) <u>40</u> (2) _____ COUNTER CHECK OK 7.0
09/20	5	0920	Manual (1) <u>26</u> (2) _____ Counter (1) <u>25</u> (2) _____ CHECK COUNTER OK SP=1 6.2
09/21	6	0710	Manual (1) <u>10</u> (2) _____ Counter (1) <u>10</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



*DB / TWB*  
Field Person



Continuation Sheet

Count ID 12-010  
SP#12-009 Counter No. 4651

Date	Day	Time	Comments
9-22-12	7	0757	<sup>85/20</sup> Manual (1) <u>29</u> (2) _____ Counter (1) <u>29</u> (2) _____ CHECK COUNTER OK TS 6.5v
9-23-12	1	0754	<sup>25</sup> Manual (1) <u>15</u> (2) _____ Counter (1) <u>15</u> (2) _____ CHECK COUNTER OK TS 6.5v
9-24-12	2	13:01	Manual (1) <u>1</u> (2) _____ Counter (1) <u>1</u> (2) _____ 6.9v
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____



TX

Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

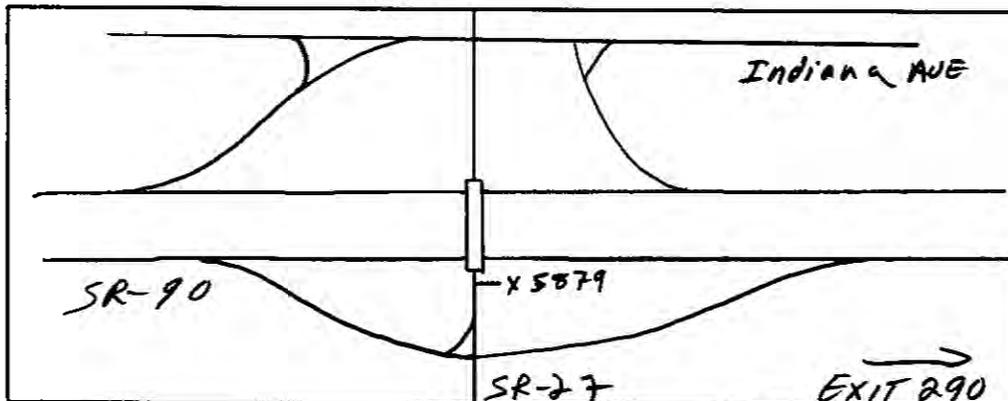
Counter No. 385879 Count ID 12-010  
SR 27 RRT/RRQ MP 86.63  
86.70  
Leg 1 Direction NB OSID \_\_\_\_\_

On SR 27 @ SR 90 Bridge

Station Description ON SR 27 S/O INDIANA AVE WYE CONN

Date	Day	Time	Comments
09/17/12	2	1335	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.6
09/18	3	0936	Manual (1) <u>50</u> (2) _____ Counter (1) <u>49</u> (2) _____ CHECK COUNTER OK SP=1 7.0
09/19	4	1135	Manual (1) <u>42</u> (2) _____ Counter (1) <u>41</u> (2) _____ COUNTER CHECK OK SP=1 7.0
09/20	5	0919	Manual (1) <u>33</u> (2) _____ Counter (1) <u>33</u> (2) _____ CHECK COUNTER OK 7.0
09/21	6	0708	Manual (1) <u>34</u> (2) _____ Counter (1) <u>34</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



North

DB / TWB  
Field Person



Continuation Sheet

Count ID 12-010  
~~SP#12-009~~ Counter No. 5879

Date	Day	Time	Comments
9-22-12	7	0737	<sup>65</sup> <del>Manual (1) 40 (2)</del> Counter (1) 40 (2) CHECK COUNTER OK TS 6.5v
9-23-12	1	0732	<sup>10</sup> <del>Manual (1) 17 (2)</del> Counter (1) 17 (2) CHECK COUNTER OK TS 6.5v
9-24-12	2	12:59	<del>Manual (1) 1 (2)</del> Counter (1) 1 (2) 6.9v
			<del>Manual (1) (2)</del> Counter (1) (2)
			<del>Manual (1) (2)</del> Counter (1) (2)
			<del>Manual (1) (2)</del> Counter (1) (2)
			<del>Manual (1) (2)</del> Counter (1) (2)
			<del>Manual (1) (2)</del> Counter (1) (2)

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIP SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.63	OFF SYSTEM ID.	LEG	DIRECTION OF TRAFFIC	SOUTHBOUND	LANE ALL OF																		
COUNT IDENTIFIER	12-010	COUNTER NUMBER	384651	DESCRIPTION: ON SR 27 @ SR 90 BRIDGE																				
09/17/12 MONDAY												09/17/12 MONDAY												DAILY TOTAL
AM HOURS						PM HOURS						PM HOURS												
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
00-15														190	235	264	287	168	167	125	77	46	27	
15-30														215	216	207	267	179	152	101	74	55	25	
30-45														227	275	330	289	169	141	76	67	34	24	
45-00													204	223	295	299	231	172	116	81	71	34	23	
HOUR	-----																							
TOT													204	855	1021	1100	1074	688	576	383	289	169	99	6458

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0430 TO 0530 VOLUME 1183 PM TOTAL 6458

09/18/12 TUESDAY												09/18/12 TUESDAY												DAILY TOTAL	
AM HOURS						PM HOURS						PM HOURS													
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
00-15	24	14	11	16	9	29	62	152	162	190	169	214	250	216	211	246	271	301	243	171	120	109	54	29	
15-30	13	15	16	10	17	33	90	183	162	183	167	177	197	202	202	208	230	296	171	161	104	71	49	28	
30-45	9	8	5	8	21	40	126	203	172	182	196	220	219	201	234	256	294	263	180	174	110	76	30	23	
45-00	8	13	3	15	29	59	142	259	222	196	154	216	195	187	254	252	262	209	176	132	114	70	37	23	
HOUR	-----																								
TOT	54	50	35	49	76	161	420	797	718	751	686	827	861	806	901	962	1057	1069	770	638	448	326	170	103	12735

AM PEAK HOUR 1100 TO 1200 VOLUME 827 AM TOTAL 4624  
PM PEAK HOUR 0430 TO 0530 VOLUME 1153 PM TOTAL 8111

09/19/12 WEDNESDAY												09/19/12 WEDNESDAY												DAILY TOTAL	
AM HOURS						PM HOURS						PM HOURS													
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
00-15	26	9	7	6	10	27	52	144	171	185	174	182	236	209	196	216	271	265	220	164	130	81	66	33	
15-30	11	12	6	8	10	46	86	172	175	177	140	202	203	182	228	242	264	274	192	172	128	95	56	30	
30-45	12	7	4	3	13	40	103	211	170	203	174	226	243	199	233	243	290	274	190	139	116	84	53	26	
45-00	12	12	14	13	34	60	144	237	243	175	197	230	200	203	265	291	273	244	173	122	100	77	35	20	
HOUR	-----																								
TOT	61	40	31	30	67	173	385	764	759	740	685	840	882	793	922	992	1098	1057	775	597	474	337	210	109	12821

AM PEAK HOUR 1100 TO 1200 VOLUME 840 AM TOTAL 4575  
PM PEAK HOUR 0345 TO 0445 VOLUME 1116 PM TOTAL 8246

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.63	OFF SYSTEM ID.	LEG	DIRECTION OF TRAFFIC SOUTHBOUND												LANE ALL	OF								
COUNT IDENTIFIER 12-010	COUNTER NUMBER 384651	DESCRIPTION: ON SR 27 @ SR 90 BRIDGE																							
09/20/12 THURSDAY												PM HOURS												DAILY	
AM HOURS												PM HOURS												TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	24	19	10	4	11	29	54	143	224	152	187	195	241	227	200	238	292	292	212	182	117	101	52	39	13220
15-30	13	16	9	8	13	26	90	176	187	176	205	206	218	237	191	263	286	297	199	180	112	79	58	34	
30-45	18	5	9	9	20	43	116	207	187	170	203	206	266	203	264	254	286	271	178	157	101	74	51	26	
45-00	21	9	14	12	42	76	137	231	216	178	171	243	216	204	249	295	274	228	201	119	108	57	34	37	
HOUR	-----																							-----	
TOT	76	49	42	33	86	174	397	757	814	676	766	850	941	871	904	1050	1138	1088	790	638	438	311	195	136	13220

AM PEAK HOUR 1100 TO 1200 VOLUME 850 AM TOTAL 4720  
PM PEAK HOUR 0345 TO 0445 VOLUME 1159 PM TOTAL 8500

09/21/12 FRIDAY												PM HOURS												DAILY	
AM HOURS												PM HOURS												TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	15	11	18	10	13	33	68	127	178	175	153	205	244	231	247	201	297	311	199	206	111	104	83	67	13437
15-30	14	9	13	6	16	26	71	170	141	165	176	219	230	215	249	218	291	279	230	177	100	113	95	61	
30-45	19	15	10	5	22	50	98	188	178	164	176	220	244	220	275	251	288	233	211	149	101	89	66	60	
45-00	17	9	14	14	18	69	147	221	185	206	205	237	240	226	280	301	286	232	187	104	110	82	79	45	
HOUR	-----																							-----	
TOT	65	44	55	35	69	178	384	706	682	710	710	881	958	892	1051	971	1162	1055	827	636	422	388	323	233	13437

AM PEAK HOUR 1100 TO 1200 VOLUME 881 AM TOTAL 4519  
PM PEAK HOUR 0345 TO 0445 VOLUME 1177 PM TOTAL 8918

09/22/12 SATURDAY												PM HOURS												DAILY	
AM HOURS												PM HOURS												TOTAL	
12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	33	20	17	10	7	16	22	52	99	140	164	214	294	262	273	252	217	181	217	151	140	147	81	48	12050
15-30	34	25	20	15	10	15	16	74	123	148	175	203	245	253	261	219	247	191	181	151	139	81	60	45	
30-45	16	15	9	10	12	30	43	100	156	157	191	228	264	251	263	211	211	210	205	121	128	92	61	28	
45-00	29	23	11	12	15	34	40	105	124	158	237	196	239	248	255	261	195	205	205	149	118	92	64	35	
HOUR	-----																							-----	
TOT	112	83	57	47	44	95	121	331	502	603	767	841	1042	1014	1052	943	870	787	808	572	525	412	266	156	12050

AM PEAK HOUR 1045 TO 1145 VOLUME 882 AM TOTAL 3603  
PM PEAK HOUR 0200 TO 0300 VOLUME 1052 PM TOTAL 8447

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.63	OFF SYSTEM ID.	LEG	DIRECTION OF TRAFFIC	SOUTHBOUND	LANE ALL	OF																		
COUNT IDENTIFIER	12-010	COUNTER NUMBER	384651	DESCRIPTION:	ON SR 27 @ SR 90 BRIDGE																				
09/23/12 SUNDAY				AM HOURS	-- --	PM HOURS																			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	32	19	13	3	9	8	12	28	51	72	131	123	158	161	177	198	188	167	146	125	109	77	41	15	
15-30	31	22	16	9	8	11	19	24	59	98	107	114	180	177	172	160	175	163	139	120	67	53	53	25	
30-45	32	15	15	6	3	16	26	47	90	104	134	131	198	184	173	185	185	165	115	97	64	51	32	14	
45-00	19	12	6	4	11	22	32	49	117	126	158	162	244	161	179	169	201	177	139	83	65	44	31	20	
HOUR	-----																								
TOT	114	68	50	22	31	57	89	148	317	400	530	530	780	683	701	712	749	672	539	425	305	225	157	74	8378

AM PEAK HOUR 1000 TO 1100 VOLUME 530 AM TOTAL 2356  
PM PEAK HOUR 1215 TO 0115 VOLUME 783 PM TOTAL 6022

09/24/12 MONDAY				AM HOURS	-- --	PM HOURS																			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	21	2	5	3	8	21	50	140	171	146	155	215	269												
15-30	16	9	2	2	23	32	85	165	166	157	149	177	226												
30-45	7	8	6	2	23	48	86	204	169	203	189	204	200												
45-00	12	6	2	9	29	71	155	229	197	187	215	202	228												
HOUR	-----																								
TOT	56	25	15	16	83	172	376	738	703	693	708	798	923												5306

AM PEAK HOUR 1045 TO 1145 VOLUME 811 AM TOTAL 4383  
PM PEAK HOUR 1200 TO 0100 VOLUME 923 PM TOTAL 923

09/17/12 THRU 09/24/12  
TOTAL HOURS FOR COUNT 95

3 DAYS FACTOR GROUP GR-02 FACTOR GROUP GR-B2  
AVG WEEKDAY VOL 12925 X SEASONAL ADJ. FACTOR 0.9100 = 11762 X AXLE CORR FACTOR 0.9769 = ESTIMATED AVG DAILY TRAFFIC 11490

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.63	OFF SYSTEM ID.	LEG	DIRECTION OF TRAFFIC	NORTHBOUND	LANE	ALL	OF																		
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385879	DESCRIPTION:	ON SR 27 @ SR 90 BRIDGE																					
09/17/12 MONDAY		AM HOURS											PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL		
00-15															278	311	396	379	287	207	145	122	95	63		
15-30															274	299	361	360	252	194	130	110	76	50		
30-45															309	357	340	333	225	158	114	90	64	37		
45-00														254	321	332	341	313	223	148	125	97	55	34		
HOUR	-----																									
TOT															254	1182	1299	1438	1385	987	707	514	419	290	184	8659

AM PEAK HOUR 0000 TO 0000 VOLUME 0  
PM PEAK HOUR 0330 TO 0430 VOLUME 1446

AM TOTAL 0  
PM TOTAL 8659

09/18/12 TUESDAY		AM HOURS											PM HOURS												
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
00-15	29	29	19	17	9	67	118	293	279	258	205	249	278	310	280	338	340	387	320	206	185	126	102	54	
15-30	17	17	14	15	24	74	175	342	246	258	235	283	283	291	359	366	404	272	210	168	121	76	52		
30-45	27	16	16	26	49	130	205	388	240	243	267	280	280	319	339	370	352	320	262	185	140	88	77	44	
45-00	24	16	8	18	57	131	257	341	276	263	249	285	258	241	284	374	366	350	240	186	125	91	71	35	
HOUR	-----																								
TOT	97	78	57	76	139	402	755	1364	1041	1022	956	1097	1099	1153	1194	1441	1424	1461	1094	787	618	426	326	185	18292

AM PEAK HOUR 0700 TO 0800 VOLUME 1364  
PM PEAK HOUR 0430 TO 0530 VOLUME 1509

AM TOTAL 7084  
PM TOTAL 11208

09/19/12 WEDNESDAY		AM HOURS											PM HOURS												
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
00-15	36	14	17	23	22	69	117	261	275	264	221	275	300	282	310	360	344	376	269	225	175	139	93	66	
15-30	23	15	10	10	25	84	159	325	239	263	249	274	307	305	269	356	350	406	289	217	153	128	83	48	
30-45	26	15	14	25	52	123	203	370	251	237	214	230	294	293	329	388	335	366	239	221	149	126	68	46	
45-00	19	11	2	17	43	127	255	382	290	259	235	273	304	264	276	386	345	317	220	164	125	108	81	39	
HOUR	-----																								
TOT	104	55	43	75	142	403	734	1338	1055	1023	919	1052	1205	1144	1184	1490	1374	1465	1017	827	602	501	325	199	18276

AM PEAK HOUR 0715 TO 0815 VOLUME 1352  
PM PEAK HOUR 0445 TO 0545 VOLUME 1493

AM TOTAL 6943  
PM TOTAL 11333

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.63	OFF SYSTEM ID.	LEG	DIRECTION OF TRAFFIC	NORTHBOUND	LANE ALL	OF																			
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385879	DESCRIPTION:	ON SR 27 @ SR 90 BRIDGE																					
09/20/12 THURSDAY																										
	AM HOURS										PM HOURS															
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	20	20	14	14	13	54	123	277	323	226	244	243	339	286	268	356	373	389	296	222	162	138	94	63		
15-30	30	18	16	14	34	81	171	333	287	212	242	254	271	304	316	376	380	403	307	200	146	106	73	40		
30-45	36	9	10	18	51	134	231	366	300	239	244	236	292	280	314	402	386	387	279	193	128	83	76	49		
45-00	35	19	12	17	54	124	238	367	273	246	262	281	290	285	321	395	367	327	258	155	141	91	73	35		
HOUR	-----																									
TOT	121	66	52	63	152	393	763	1343	1183	923	992	1014	1192	1155	1219	1529	1506	1506	1140	770	577	418	316	187	18580	

AM PEAK HOUR 0715 TO 0815 VOLUME 1389  
PM PEAK HOUR 0330 TO 0430 VOLUME 1550

AM TOTAL 7065  
PM TOTAL 11515

09/21/12 FRIDAY																										
	AM HOURS										PM HOURS															
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	42	21	16	20	14	52	115	245	283	247	282	267	326	295	308	373	349	390	304	208	167	192	117	82		
15-30	24	21	17	11	27	90	145	326	226	266	243	277	329	315	304	374	341	383	281	191	187	205	119	70		
30-45	32	16	19	23	46	97	212	349	253	284	244	240	314	305	307	377	341	367	271	193	180	192	107	70		
45-00	24	21	15	17	60	107	240	378	264	283	239	293	309	288	305	345	380	314	255	179	179	140	93	67		
HOUR	-----																									
TOT	122	79	67	71	147	346	712	1298	1026	1080	1008	1077	1278	1203	1224	1469	1411	1454	1111	771	713	729	436	289	19121	

AM PEAK HOUR 0715 TO 0815 VOLUME 1336  
PM PEAK HOUR 0445 TO 0545 VOLUME 1520

AM TOTAL 7033  
PM TOTAL 12088

09/22/12 SATURDAY																										
	AM HOURS										PM HOURS															
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	54	43	34	20	12	25	69	75	137	239	295	285	335	316	295	298	268	313	234	203	173	138	104	82		
15-30	43	20	32	21	19	33	76	103	177	307	320	320	378	335	269	259	291	253	223	194	122	120	111	54		
30-45	53	36	24	20	26	51	91	132	189	252	318	348	325	291	296	257	287	233	232	208	114	90	106	57		
45-00	41	30	26	11	18	45	89	148	229	291	310	366	371	343	298	271	283	242	231	159	130	99	86	51		
HOUR	-----																									
TOT	191	129	116	72	75	154	325	458	732	1089	1243	1319	1409	1285	1158	1085	1129	1041	920	764	539	447	407	244	16331	

AM PEAK HOUR 1100 TO 1200 VOLUME 1319  
PM PEAK HOUR 1200 TO 0100 VOLUME 1409

AM TOTAL 5903  
PM TOTAL 10428

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 T R I P S S Y S T E M  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.63	OFF SYSTEM ID.	LEG	DIRECTION OF TRAFFIC	NORTHBOUND	LANE ALL	OF																		
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385879	DESCRIPTION:	ON SR 27 @ SR 90 BRIDGE																				
09/23/12 SUNDAY		AM HOURS					PM HOURS																		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	51	27	35	21	13	12	33	58	84	113	166	206	236	234	231	194	200	192	195	147	110	100	68	36	
15-30	55	36	38	14	10	19	51	52	80	170	187	226	239	205	244	226	193	184	154	140	99	100	64	44	
30-45	40	29	21	18	19	26	60	84	109	183	222	177	235	270	231	217	205	195	163	142	87	94	63	42	
45-00	46	21	11	12	18	22	54	95	123	228	231	252	216	216	232	201	181	183	163	114	99	68	63	16	
HOUR	-----																								
TOT	192	113	105	65	60	79	198	289	396	694	806	861	926	925	938	838	779	754	675	543	395	362	258	138	11389

AM PEAK HOUR 1030 TO 1130 VOLUME 885 AM TOTAL 3858  
 PM PEAK HOUR 0130 TO 0230 VOLUME 961 PM TOTAL 7531

09/24/12 MONDAY		AM HOURS					PM HOURS																		
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	24	20	7	21	20	67	117	266	288	263	242	248	270												
15-30	25	14	15	12	25	83	139	340	226	289	223	262	273												
30-45	23	26	9	28	51	141	214	347	274	244	255	254	252												
45-00	15	15	14	17	51	117	277	390	282	249	282	277													
HOUR	-----																								
TOT	87	75	45	78	147	408	747	1343	1070	1045	1002	1041	795												7883

AM PEAK HOUR 0715 TO 0815 VOLUME 1365 AM TOTAL 7088  
 PM PEAK HOUR 0000 TO 0000 VOLUME 0 PM TOTAL 795

09/17/12 THRU 09/24/12  
 TOTAL HOURS FOR COUNT 94

3 DAYS FACTOR GROUP GR-02 FACTOR GROUP GR-82  
 AVG WEEKDAY VOL 18383 X SEASONAL ADJ. FACTOR 0.9100 = 16729 X AXLE CORR FACTOR 0.9769 = ESTIMATED AVG DAILY TRAFFIC 16343

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S   S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.63	OFF SYSTEM ID.	LEG	DIRECTION OF TRAFFIC BOTH WAYS																LANE ALL	OF						
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385879	DESCRIPTION: ON SR 27 @ SR 90 BRIDGE																							
09/17/12 MONDAY				AM HOURS											PM HOURS												
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	DAILY	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15															468	546	660	666	455	374	270	199	141	90			
15-30														489	515	568	627	431	346	231	184	131	75				
30-45														536	632	670	622	394	299	190	157	98	61				
45-00														458	544	627	640	544	395	264	206	168	89	57			
HOUR	-----																										
TOT														458	2037	2320	2538	2459	1675	1283	897	708	459	283	15117		

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0430 TO 0530 VOLUME 2603 PM TOTAL 15117

09/18/12 TUESDAY				AM HOURS											PM HOURS												
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	DAILY	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	53	43	30	33	18	96	180	445	441	448	374	463	528	526	491	584	611	688	563	377	305	235	156	83			
15-30	30	32	30	25	41	107	265	525	408	441	402	460	480	485	493	567	596	700	443	371	272	192	125	80			
30-45	36	24	21	34	70	170	331	591	412	425	463	500	499	520	573	626	646	583	442	359	250	164	107	67			
45-00	32	29	11	33	86	190	399	600	498	459	403	501	453	428	538	626	628	559	416	318	239	161	108	58			
HOUR	-----																										
TOT	151	128	92	125	215	563	1175	2161	1759	1773	1642	1924	1960	1959	2095	2403	2481	2530	1864	1425	1066	752	496	288	31027		

AM PEAK HOUR 0700 TO 0800 VOLUME 2161 AM TOTAL 11708  
PM PEAK HOUR 0430 TO 0530 VOLUME 2662 PM TOTAL 19319

09/19/12 WEDNESDAY				AM HOURS											PM HOURS												
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	DAILY	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	62	23	24	29	32	96	169	405	446	449	395	457	536	491	506	576	615	641	489	389	305	220	159	99			
15-30	34	27	16	18	35	130	245	497	414	440	389	476	510	487	497	598	614	680	481	389	281	223	139	78			
30-45	38	22	18	28	65	163	306	581	421	440	388	456	537	492	562	631	625	640	429	360	265	210	121	72			
45-00	31	23	16	30	77	187	399	619	533	434	432	503	504	467	541	677	618	561	393	286	225	185	116	59			
HOUR	-----																										
TOT	165	95	74	105	209	576	1119	2102	1814	1763	1604	1892	2087	1937	2106	2482	2472	2522	1792	1424	1076	838	535	308	31097		

AM PEAK HOUR 0715 TO 0815 VOLUME 2143 AM TOTAL 11518  
PM PEAK HOUR 0445 TO 0545 VOLUME 2579 PM TOTAL 19579

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S   S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.63				OFF SYSTEM ID.				LEG				DIRECTION OF TRAFFIC BOTH WAYS				LANE ALL OF								
COUNT IDENTIFIER	12-010				COUNTER NUMBER 385879				DESCRIPTION: ON SR 27 @ SR 90 BRIDGE																
09/20/12 THURSDAY				AM HOURS								PM HOURS								DAILY					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
00-15	44	39	24	18	24	83	177	420	547	378	431	438	580	513	468	594	665	681	508	404	279	239	146	102	
15-30	43	34	25	22	47	107	261	509	474	388	447	460	489	541	507	639	666	700	506	380	258	185	131	74	
30-45	54	14	19	27	71	177	347	573	487	409	447	442	558	483	578	656	672	658	457	350	229	157	127	75	
45-00	56	28	26	29	96	200	375	598	489	424	433	524	506	489	570	690	641	555	459	274	249	148	107	72	
HOUR	-----				-----				-----				-----				-----				-----				
TOT	197	115	94	96	238	567	1160	2100	1997	1599	1758	1864	2133	2026	2123	2579	2644	2594	1930	1408	1015	729	511	323	31800

AM PEAK HOUR 0715 TO 0815 VOLUME 2227 AM TOTAL 11785  
PM PEAK HOUR 0430 TO 0530 VOLUME 2694 PM TOTAL 20015

09/21/12 FRIDAY				AM HOURS								PM HOURS								DAILY					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
00-15	57	32	34	30	27	85	183	372	461	422	435	472	570	526	555	574	646	701	503	414	278	296	200	149	
15-30	38	30	30	17	43	116	216	496	367	431	419	496	559	530	553	592	632	662	511	368	287	318	214	131	
30-45	51	31	29	28	68	147	310	537	431	448	420	460	558	525	582	628	629	600	482	342	281	281	173	130	
45-00	41	30	29	31	78	176	387	599	449	489	444	530	549	514	585	646	666	546	442	283	289	222	172	112	
HOUR	-----				-----				-----				-----				-----				-----				
TOT	187	123	122	106	216	524	1096	2004	1708	1790	1718	1958	2236	2095	2275	2440	2573	2509	1938	1407	1135	1117	759	522	32558

AM PEAK HOUR 0715 TO 0815 VOLUME 2093 AM TOTAL 11552  
PM PEAK HOUR 0430 TO 0530 VOLUME 2658 PM TOTAL 21006

09/22/12 SATURDAY				AM HOURS								PM HOURS								DAILY					
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL
00-15	87	63	51	30	19	41	91	127	236	379	459	499	629	578	568	550	485	494	451	354	313	285	185	130	
15-30	77	45	52	36	29	48	92	177	300	455	495	523	623	588	530	478	538	444	404	345	261	201	171	99	
30-45	69	51	33	30	38	81	134	232	345	409	509	576	589	542	559	468	498	443	437	329	242	182	167	85	
45-00	70	53	37	23	33	79	129	253	353	449	547	562	610	591	553	532	478	447	436	308	248	191	150	86	
HOUR	-----				-----				-----				-----				-----				-----				
TOT	303	212	173	119	119	249	446	789	1234	1692	2010	2160	2451	2299	2210	2028	1999	1828	1728	1336	1064	859	673	400	28381

AM PEAK HOUR 1100 TO 1200 VOLUME 2160 AM TOTAL 9506  
PM PEAK HOUR 1200 TO 0100 VOLUME 2451 PM TOTAL 18875

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.63	OFF SYSTEM ID.	LEG	DIRECTION OF TRAFFIC	BOTH WAYS	LANE ALL	OF																		
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385879	DESCRIPTION:	ON SR 27 @ SR 90 BRIDGE																				
09/23/12 SUNDAY				AM HOURS	-- --	PM HOURS																			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	83	46	48	24	22	20	45	86	135	185	297	329	394	395	408	392	388	359	341	272	219	177	109	51	
15-30	86	58	54	23	18	30	70	76	139	268	294	340	419	382	416	386	368	347	293	260	166	153	117	69	
30-45	72	44	36	24	22	42	86	131	199	287	356	308	433	454	404	402	390	360	278	239	151	145	95	56	
45-00	65	33	17	16	29	44	86	144	240	354	389	414	460	377	411	370	382	360	302	197	164	112	94	36	
HOUR	-----																								
TOT	306	181	155	87	91	136	287	437	713	1094	1336	1391	1706	1608	1639	1550	1528	1426	1214	968	700	587	415	212	19767

AM PEAK HOUR 1030 TO 1130 VOLUME 1414  
PM PEAK HOUR 1215 TO 0115 VOLUME 1707  
AM TOTAL 6214  
PM TOTAL 13553

09/24/12 MONDAY				AM HOURS	-- --	PM HOURS																			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	45	22	12	24	28	88	167	406	459	409	397	463	539												
15-30	41	23	17	14	48	115	224	505	392	446	372	439	499												
30-45	30	34	15	30	74	189	300	551	443	447	444	458	452												
45-00	27	21	16	26	80	188	432	619	479	436	497	479													
HOUR	-----																								
TOT	143	100	60	94	230	580	1123	2081	1773	1738	1710	1839	1490												12961

AM PEAK HOUR 0715 TO 0815 VOLUME 2134  
PM PEAK HOUR 0000 TO 0000 VOLUME 0  
AM TOTAL 11471  
PM TOTAL 1490

09/17/12 THRU 09/24/12  
TOTAL HOURS FOR COUNT 94

3 DAYS FACTOR GROUP GR-02 FACTOR GROUP GR-B2  
AVG WEEKDAY VOL 31308 X SEASONAL ADJ. FACTOR 0.9100 = 28490 X AXLE CORR FACTOR 0.9769 = ESTIMATED AVG DAILY TRAFFIC 27832

PEAK HOUR PERCENTAGES: K = 8.60 D = 57.35  
PEAK HOUR LOCATION : VOLUME = 2694 DATE: 09/20/12 TIME: 04:30 PM



Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

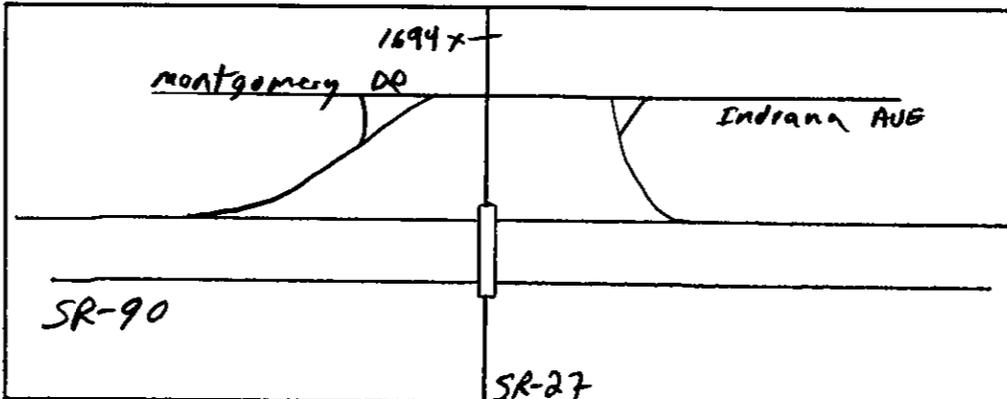
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

Counter No. 381694 Count ID 12-010  
SR 27 RRT/RRQ \_\_\_\_\_ MP 86.73  
Leg 2 Direction SB OSID \_\_\_\_\_

Station Description \_ ON SR 27 N/O INDIANA AVE / MONTGOMERY DR WYE CONN

Date	Day	Time	Comments
09/17/12	2	1350	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.35
09/18	3	0950	Manual (1) <u>50</u> (2) _____ Counter (1) <u>49</u> (2) _____ CHECK COUNTER OK SP=1 7.1
09/19	4	1123	Manual (1) <u>29</u> (2) _____ Counter (1) <u>29</u> (2) _____ COUNTER CHECK OK 7.1
09/20	5	0925	Manual (1) <u>12</u> (2) _____ Counter (1) <u>12</u> (2) _____ CHECK COUNTER OK 6.0
09/21	6	0714	Manual (1) <u>17</u> (2) _____ Counter (1) <u>17</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



DB/TWB  
Field Person



Continuation Sheet

Count ID 12-010  
~~SP#12-009~~ Counter No. 1694

Date	Day	Time	Comments
9-22-12	7	0750	Manual (1) <u>44</u> (2) _____ Counter (1) <u>44</u> (2) _____ CHECK COUNTER OK TS 6.6
9-23-12	1	0747	Manual (1) <sup>10</sup> <u>11</u> (2) _____ Counter (1) <u>11</u> (2) _____ CHECK COUNTER OK TS 6.6v
9-24-12	2	13:08	Manual (1) <u>1</u> (2) _____ Counter (1) <u>1</u> (2) _____ 7.0v
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____
			Manual (1) _____ (2) _____ Counter (1) _____ (2) _____



18

Interval  60 min.  15 min.  
 Binned(CL/SP)  Count(volume)  
Lane No  1  2

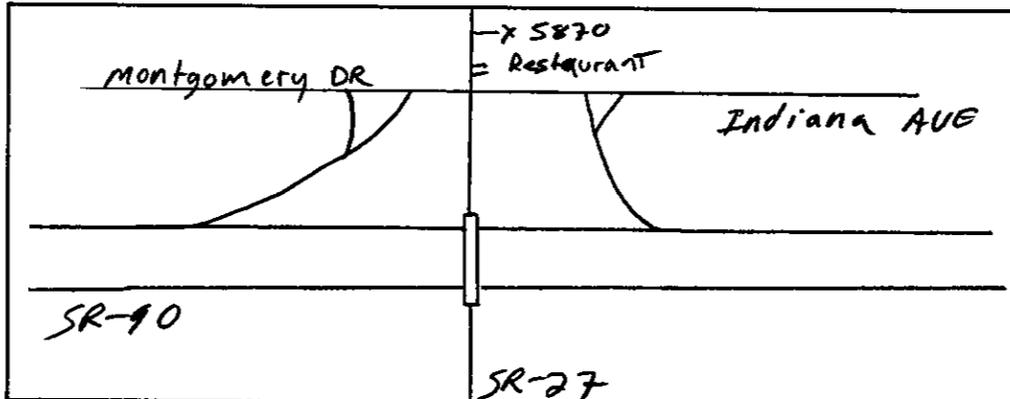
Direction Channel 1 \_\_\_\_\_  
Direction Channel 2 \_\_\_\_\_  
Unique ID# \_\_\_\_\_

Counter No. 385870 Count ID 12-010  
SR 27 RRT/RRQ \_\_\_\_\_ MP 86.73  
Leg 2 Direction NB OSID \_\_\_\_\_

Station Description ON SR 27 N/O INDIANA AVE / MONTGOMERY DR WYE CONN

Date	Day	Time	Comments
09/17/12	2	1348	Manual (1) <u>5</u> (2) _____ Counter (1) <u>5</u> (2) _____ SET COUNTER OK DB/TWB 6.3
09/18	3	0949	Manual (1) <u>42</u> (2) _____ Counter (1) <u>42</u> (2) _____ CHECK COUNTER OK 6.6
09/19	4	1122	Manual (1) <u>15</u> (2) _____ Counter (1) <u>15</u> (2) _____ COUNTER CHECK OK 7.1
09/20	5	End 0924 20:15	Manual (1) <u>14</u> (2) _____ Counter (1) <u>14</u> (2) _____ CHECK COUNTER OK 6.8
09/21	6	0713	Manual (1) <u>18</u> (2) _____ Counter (1) <u>18</u> (2) _____ CHECK COUNTER OK 6.5

Sketch



DB/TWB  
Field Person



Continuation Sheet

Count ID 12-010  
~~SP#12-009~~ Counter No. 5870

Date	Day	Time	Comments
9-22-12	7	0744	Manual (1) <del>0 8</del> (2) Counter (1) 8 (2) CHECK COUNTER OK TS 6.4
9-23-12	1	0738	<sup>23</sup> Manual (1) <del>9</del> (2) Counter (1) 9 (2) CHECK COUNTER OK TS 6.4v
9-24-12	2	13:05	Manual (1) <del>1</del> (2) Counter (1) 1 (2) 6.7v
			Manual (1) <del>   </del> (2) Counter (1) <del>   </del> (2)
			Manual (1) <del>   </del> (2) Counter (1) <del>   </del> (2)
			Manual (1) <del>   </del> (2) Counter (1) <del>   </del> (2)
			Manual (1) <del>   </del> (2) Counter (1) <del>   </del> (2)
			Manual (1) <del>   </del> (2) Counter (1) <del>   </del> (2)

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIPS SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC	SOUTHBOUND	LANE ALL	OF																			
COUNT IDENTIFIER	12-010	COUNTER NUMBER	381694	DESCRIPTION: ON SR 27 N/O INDIANA AVE/MONTGOMERY DR WYE CONN																						
09/17/12 MONDAY				AM HOURS								PM HOURS								DAILY						
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15															165	219	253	280	174	158	117	75	53	27		
15-30														177	184	188	237	163	131	83	68	48	17			
30-45														197	249	329	264	151	111	70	44	39	26			
45-00														188	266	272	192	146	121	85	62	25	33			
HOUR	-----																									
TOT														727	918	1042	973	634	521	355	249	165	103	5687		

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0430 TO 0530 VOLUME 1118 PM TOTAL 5687

09/18/12 TUESDAY				AM HOURS								PM HOURS								DAILY						
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	24	8	11	15	14	44	87	161	170	168	157	186	269	212	208	252	260	294	211	168	101	102	51	32		
15-30	22	18	15	16	16	54	115	187	177	164	167	181	188	215	197	196	198	250	136	160	101	69	38	29		
30-45	8	12	6	6	29	67	169	200	181	160	183	212	205	173	216	241	292	226	201	136	114	65	46	25		
45-00	11	17	4	27	39	74	174	235	212	182	146	196	193	206	238	245	240	159	159	116	105	61	36	23		
HOUR	-----																									
TOT	65	55	36	64	98	239	545	783	740	674	653	775	855	806	859	934	990	929	707	580	421	297	171	109	12385	

AM PEAK HOUR 0715 TO 0815 VOLUME 792 AM TOTAL 4727  
PM PEAK HOUR 0430 TO 0530 VOLUME 1076 PM TOTAL 7658

09/19/12 WEDNESDAY				AM HOURS								PM HOURS								DAILY						
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	25	11	7	11	17	29	73	182	178	178	160	181	212	181	177	201	257	262	200	148	130	79	63	39		
15-30	20	8	10	12	18	51	118	185	196	168	132	190	189	183	188	202	279	261	159	149	105	96	48	29		
30-45	13	11	6	3	28	66	143	208	164	204	170	191	203	182	214	232	285	239	199	125	95	63	42	26		
45-00	14	13	20	22	38	75	169	230	219	167	166	218	190	198	243	264	267	187	133	110	107	60	23	23		
HOUR	-----																									
TOT	72	43	43	48	101	221	503	805	757	717	628	780	794	744	822	899	1088	949	691	532	437	298	176	117	12265	

AM PEAK HOUR 0730 TO 0830 VOLUME 812 AM TOTAL 4718  
PM PEAK HOUR 0415 TO 0515 VOLUME 1093 PM TOTAL 7547

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC	SOUTHBOUND	LANE ALL	OF																			
COUNT IDENTIFIER	12-010	COUNTER NUMBER	381694	DESCRIPTION: ON SR 27 N/O INDIANA AVE/MONTGOMERY DR WYE CONN																						
09/20/12 THURSDAY				AM HOURS				PM HOURS				DAILY														
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	22	16	11	7	22	38	82	135	191	153	144	204	198	192	176	240	277	276	211	177	96	99	52	26		
15-30	18	13	10	7	11	42	120	186	191	160	171	189	202	191	168	244	269	261	147	163	97	71	57	33		
30-45	18	7	14	11	30	87	141	234	186	168	170	193	214	175	258	239	300	260	175	148	75	79	46	26		
45-00	27	8	13	13	47	77	168	232	220	170	144	238	202	190	207	281	263	218	158	112	109	48	44	36		
HOUR	-----																									
TOT	85	44	48	38	110	244	511	787	788	651	629	824	816	748	809	1004	1109	1015	691	600	377	297	199	121	12545	

AM PEAK HOUR 0730 TO 0830 VOLUME 848  
PM PEAK HOUR 0345 TO 0445 VOLUME 1127  
AM TOTAL 4759  
PM TOTAL 7786

09/21/12 FRIDAY				AM HOURS				PM HOURS				DAILY														
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	20	10	14	7	20	45	84	144	180	163	143	192	255	212	226	208	278	281	172	176	87	111	76	48		
15-30	15	5	15	12	20	33	99	192	157	164	163	197	229	184	207	226	255	253	203	147	88	82	70	45		
30-45	22	15	8	7	34	86	130	225	182	169	161	196	212	219	270	247	269	211	166	119	100	78	70	40		
45-00	16	10	18	15	25	76	159	228	196	189	181	216	223	195	236	281	263	214	164	89	99	70	56	36		
HOUR	-----																									
TOT	73	40	55	41	99	240	472	789	715	685	648	801	919	810	939	962	1065	959	705	531	374	341	272	169	12704	

AM PEAK HOUR 0715 TO 0815 VOLUME 825  
PM PEAK HOUR 0345 TO 0445 VOLUME 1083  
AM TOTAL 4658  
PM TOTAL 8046

09/22/12 SATURDAY				AM HOURS				PM HOURS				DAILY														
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL	
00-15	31	23	13	14	12	23	33	55	87	123	161	236	298	265	283	233	214	161	198	117	138	102	48	41		
15-30	25	21	14	18	15	24	27	60	108	142	180	202	256	250	255	216	218	209	196	147	102	59	59	48		
30-45	20	13	11	9	14	34	58	92	149	164	204	205	258	261	253	219	188	184	229	121	92	72	58	34		
45-00	27	25	11	13	15	35	50	99	125	155	233	212	258	242	257	233	178	190	176	122	86	69	60	29		
HOUR	-----																									
TOT	103	82	49	54	56	116	168	306	469	584	778	855	1070	1018	1048	901	798	744	799	507	418	302	225	152	11602	

AM PEAK HOUR 1045 TO 1145 VOLUME 876  
PM PEAK HOUR 1200 TO 0100 VOLUME 1070  
AM TOTAL 3620  
PM TOTAL 7982

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
TRIP SYSTEM  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC SOUTHBOUND	LANE ALL OF																				
COUNT IDENTIFIER 12-010	COUNTER NUMBER 381694	DESCRIPTION: ON SR 27 N/O INDIANA AVE/MONTGOMERY DR WYE CONN																							
09/23/12 SUNDAY	AM HOURS											PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	31	18	18	2	14	6	16	39	45	69	120	141	156	175	162	193	174	160	118	114	80	75	45	25	
15-30	28	19	9	9	10	14	24	24	62	91	117	129	202	163	165	167	176	159	111	94	81	46	42	20	
30-45	23	8	15	7	8	22	46	41	86	111	147	141	217	181	172	191	143	137	94	83	62	55	41	13	
45-00	17	13	5	9	10	21	33	47	97	133	161	146	229	146	171	157	195	135	117	85	58	40	24	21	
HOUR	-----																								
TOT	99	58	47	27	42	63	119	151	290	404	545	557	804	665	670	708	688	591	440	376	281	216	152	79	8072

AM PEAK HOUR 1030 TO 1130 VOLUME 578  
PM PEAK HOUR 1215 TO 0115 VOLUME 823  
AM TOTAL 2402  
PM TOTAL 5670

09/24/12 MONDAY	AM HOURS											PM HOURS													
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	DAILY
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
00-15	23	3	10	7	13	36	67	165	191	138	142	208	245												
15-30	21	9	5	3	25	49	108	186	170	160	141	168	199												
30-45	12	7	6	6	29	78	121	210	167	201	174	178	195												
45-00	13	10	2	16	44	86	189	199	183	179	220	206	176												
HOUR	-----																								
TOT	69	29	23	32	111	249	485	760	711	678	677	760	815												5399

AM PEAK HOUR 0715 TO 0815 VOLUME 786  
PM PEAK HOUR 1200 TO 0100 VOLUME 815  
AM TOTAL 4584  
PM TOTAL 815

09/17/12 THRU 09/24/12  
TOTAL HOURS FOR COUNT 95

3 DAYS  
AVG WEEKDAY VOL 12398 X SEASONAL ADJ. FACTOR 0.9100 = 11282 X AXLE CORR FACTOR 0.9769 = ESTIMATED AVG DAILY TRAFFIC 11021

FACTOR GROUP GR-02  
FACTOR GROUP GR-B2

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC NORTHBOUND												LANE ALL OF												
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385870	DESCRIPTION: ON SR 27 N/O INDIANA AVE/MONTGOMERY DR WYE CONN																								
09/17/12 MONDAY				AM HOURS												PM HOURS												DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15															145	186	235	246	188	136	110	94	84	43				
15-30														144	199	216	224	169	155	106	89	53	33					
30-45														180	199	209	220	151	113	89	76	46	23					
45-00														178	204	214	205	129	102	105	73	38	32					
HOUR	-----																											
TOT														647	788	874	895	637	506	410	332	221	131	5441				

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0445 TO 0545 VOLUME 904 PM TOTAL 5441

09/18/12 TUESDAY				AM HOURS												PM HOURS												DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	26	26	15	11	2	37	52	121	144	123	102	102	154	161	150	205	211	246	239	152	148	107	68	31				
15-30	26	9	13	14	10	27	86	146	138	138	109	139	148	165	174	208	205	255	183	141	113	92	48	37				
30-45	18	10	10	16	26	45	66	143	122	100	133	131	160	154	197	236	223	227	174	129	114	70	48	37				
45-00	16	12	5	9	31	74	130	215	144	130	117	182	167	169	152	226	248	173	167	131	87	58	52	27				
HOUR	-----																											
TOT	86	57	43	50	69	183	334	625	548	491	461	554	629	649	673	875	887	901	763	553	462	327	216	132	10568			

AM PEAK HOUR 0715 TO 0815 VOLUME 648 AM TOTAL 3501  
PM PEAK HOUR 0445 TO 0545 VOLUME 976 PM TOTAL 7067

09/19/12 WEDNESDAY				AM HOURS												PM HOURS												DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
00-15	23	11	7	12	13	23	53	109	131	120	102	114	186	157	160	194	216	220	185	170	149	109	72	45				
15-30	18	15	10	5	11	30	66	146	113	128	106	132	151	179	148	217	206	279	164	161	126	89	66	34				
30-45	13	12	11	15	27	54	96	145	113	116	108	112	152	164	175	261	242	240	156	169	129	94	55	26				
45-00	16	10	2	11	26	76	124	197	119	121	122	148	188	138	167	223	229	203	144	140	97	68	52	27				
HOUR	-----																											
TOT	70	48	30	43	77	183	339	597	476	485	438	506	677	638	650	895	893	942	649	640	501	360	245	132	10514			

AM PEAK HOUR 0715 TO 0815 VOLUME 619 AM TOTAL 3292  
PM PEAK HOUR 0430 TO 0530 VOLUME 970 PM TOTAL 7222

DOT-RNB515A-B

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

DATE 10/05/12  
TIME 09:29:22  
PAGE 14

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC NORTHBOUND	LANE ALL	OF																					
COUNT IDENTIFIER 12-010	COUNTER NUMBER 385870	DESCRIPTION: ON SR 27 N/O INDIANA AVE/MONTGOMERY DR WYE CONN																									
09/20/12 THURSDAY				AM HOURS		PM HOURS		DAILY TOTAL																			
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	DAILY TOTAL	
00-15	20	17	15	5	10	26	62	102	139	101	134	144	191	152	162	211	261	263	207	149	138						
15-30	26	9	9	9	10	34	95	142	126	90	124	133	156	138	182	232	210	243	182	136	120						
30-45	30	6	4	16	26	56	99	159	139	115	114	150	179	170	173	254	224	251	198	135							
45-00	18	18	11	9	26	69	108	150	154	133	91	126	149	188	176	246	229	200	141	122							
HOUR	-----																										
TOT	94	50	39	39	72	185	364	553	558	439	463	553	675	648	693	943	924	957	728	542	258						9777

AM PEAK HOUR 0715 TO 0815 VOLUME 590  
PM PEAK HOUR 0315 TO 0415 VOLUME 993

AM TOTAL 3409  
PM TOTAL 6368

09/17/12 THRU 09/20/12  
TOTAL HOURS FOR COUNT 78

2 DAYS  
AVG WEEKDAY VOL 10541 X SEASONAL ADJ. FACTOR 0.9100 = 9592 X AXLE CORR FACTOR 0.9769 = ESTIMATED AVG DAILY TRAFFIC 9370

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
T R I P S S Y S T E M  
15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC BOTH WAYS																	LANE ALL OF					
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385870	DESCRIPTION: ON SR 27 N/O INDIANA AVE/MONTGOMERY DR WYE CONN																						
09/17/12 MONDAY				AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15															310	405	488	526	362	294	227	169	137	70		
15-30															321	383	404	461	332	286	189	157	101	50		
30-45															377	448	538	484	302	224	159	120	85	49		
45-00															366	470	486	397	275	223	190	135	63	65		
HOUR	-----																									
TOT															1374	1706	1916	1868	1271	1027	765	581	386	234	11128	

AM PEAK HOUR 0000 TO 0000 VOLUME 0 AM TOTAL 0  
PM PEAK HOUR 0430 TO 0530 VOLUME 2011 PM TOTAL 11128

09/18/12 TUESDAY				AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	50	34	26	26	16	81	139	282	314	291	259	288	423	373	358	457	471	540	450	320	249	209	119	63		
15-30	48	27	28	30	26	81	201	333	315	302	276	320	336	380	371	404	403	505	319	301	214	161	86	66		
30-45	26	22	16	22	55	112	235	343	303	260	316	343	365	327	413	477	515	453	375	265	228	135	94	62		
45-00	27	29	9	36	70	148	304	450	356	312	263	378	360	375	390	471	488	332	326	247	192	119	88	50		
HOUR	-----																									
TOT	151	112	79	114	167	422	879	1408	1288	1165	1114	1329	1484	1455	1532	1809	1877	1830	1470	1133	883	624	387	241	22953	

AM PEAK HOUR 0715 TO 0815 VOLUME 1440 AM TOTAL 8228  
PM PEAK HOUR 0430 TO 0530 VOLUME 2048 PM TOTAL 14725

09/19/12 WEDNESDAY				AM HOURS											PM HOURS											DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
00-15	48	22	14	23	30	52	126	291	309	298	262	295	398	338	337	395	473	482	385	318	279	188	135	84		
15-30	38	23	20	17	29	81	184	331	309	296	238	322	340	362	336	419	485	540	323	310	231	185	114	63		
30-45	26	23	17	18	55	120	239	353	277	320	278	303	355	346	389	493	527	479	355	294	224	157	97	52		
45-00	30	23	22	33	64	151	293	427	338	288	288	366	378	336	410	487	496	390	277	250	204	128	75	50		
HOUR	-----																									
TOT	142	91	73	91	178	404	842	1402	1233	1202	1066	1286	1471	1382	1472	1794	1981	1891	1340	1172	938	658	421	249	22779	

AM PEAK HOUR 0715 TO 0815 VOLUME 1420 AM TOTAL 8010  
PM PEAK HOUR 0430 TO 0530 VOLUME 2045 PM TOTAL 14769

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 TRIPS SYSTEM  
 15 MINUTE TRAFFIC COUNT SUMMARY

SR 027	MP 086.73	OFF SYSTEM ID.	LEG 2	DIRECTION OF TRAFFIC BOTH WAYS																LANE ALL OF								
COUNT IDENTIFIER	12-010	COUNTER NUMBER	385870	DESCRIPTION: ON SR 27 N/O INDIANA AVE/MONTGOMERY DR WYE CONN																								
09/20/12 THURSDAY				AM HOURS												PM HOURS												DAILY
	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12				
00-15	42	33	26	12	32	64	144	237	330	254	278	348	389	344	338	451	538	539	418	326	234							
15-30	44	22	19	16	21	76	215	328	317	250	295	322	358	329	350	476	479	504	329	299	217							
30-45	48	13	18	27	56	143	240	393	325	283	284	343	393	345	431	493	524	511	373	283								
45-00	45	26	24	22	73	146	276	382	374	303	235	364	351	378	383	527	492	418	299	234								
HOUR	-----																											
TOT	179	94	87	77	182	429	875	1340	1346	1090	1092	1377	1491	1396	1502	1947	2033	1972	1419	1142	451				21521			

AM PEAK HOUR 0715 TO 0815 VOLUME 1433 AM TOTAL 8168  
 PM PEAK HOUR 0345 TO 0445 VOLUME 2068 PM TOTAL 13353

09/17/12 THRU 09/20/12  
 TOTAL HOURS FOR COUNT 78

2 DAYS FACTOR GROUP GR-02 FACTOR GROUP GR-B2  
 AVG WEEKDAY VOL 22866 X SEASONAL ADJ. FACTOR 0.9100 = 20808 X AXLE CORR FACTOR 0.9769 = ESTIMATED AVG DAILY TRAFFIC 20327

PEAK HOUR PERCENTAGES: K = 9.04 D = 54.50  
 PEAK HOUR LOCATION : VOLUME = 2068 DATE: 09/20/12 TIME: 03:45 PM

**APPENDIX C: EXISTING CONDITIONS LEVEL OF SERVICE WORKSHEETS**



# HCM Signalized Intersection Capacity Analysis

## 4: I-90 WB Ramps & Argonne

4/10/2013

												
Movement	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER	
Lane Configurations		 						 				
Volume (vph)	454	469	0	0	0	0	0	996	454	0	0	
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	
Total Lost time (s)	3.0	3.0						3.0	3.0			
Lane Util. Factor	0.91	0.91						0.95	1.00			
Frt	1.00	1.00						1.00	0.85			
Flt Protected	0.95	0.95						1.00	1.00			
Satd. Flow (prot)	1377	2755						3027	1354			
Flt Permitted	0.95	0.95						1.00	1.00			
Satd. Flow (perm)	1377	2755						3027	1354			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	478	494	0	0	0	0	0	1048	478	0	0	
RTOR Reduction (vph)	50	41	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	275	606	0	0	0	0	0	1048	478	0	0	
Turn Type	Perm				Perm							
Protected Phases	6 7		8									
Permitted Phases	6 7		8									
Actuated Green, G (s)	23.0	23.0							33.0	33.0		
Effective Green, g (s)	25.0	25.0							35.0	35.0		
Actuated g/C Ratio	0.38	0.38							0.54	0.54		
Clearance Time (s)									5.0	5.0		
Vehicle Extension (s)									2.0	2.0		
Lane Grp Cap (vph)	530	1060							1630	729		
v/s Ratio Prot									0.35			
v/s Ratio Perm	0.20	0.22							c0.35			
v/c Ratio	0.52	0.57							0.64	0.66		
Uniform Delay, d1	15.4	15.8							10.6	10.7		
Progression Factor	0.02	1.84							1.00	1.00		
Incremental Delay, d2	0.2	0.4							2.0	4.6		
Delay (s)	0.6	29.4							12.6	15.3		
Level of Service	A	C							B	B		
Approach Delay (s)	19.8		0.0				13.4		0.0			
Approach LOS	B		A				B		A			
<b>Intersection Summary</b>												
HCM Average Control Delay	15.9		HCM Level of Service				B					
HCM Volume to Capacity ratio	0.63											
Actuated Cycle Length (s)	65.0		Sum of lost time (s)				6.0					
Intersection Capacity Utilization	59.4%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: I-90 WB Ramps & Mullan

4/10/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					 			  				
Volume (vph)	0	0	0	0	427	228	496	596	0	0	0	0
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)					3.0			3.0				
Lane Util. Factor					0.95			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.98				
Satd. Flow (prot)					2869			4253				
Flt Permitted					1.00			0.98				
Satd. Flow (perm)					2869			4253				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	0	449	240	522	627	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	109	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	580	0	0	1149	0	0	0	0
Turn Type							Perm					
Protected Phases					2			4				
Permitted Phases							4					
Actuated Green, G (s)					14.4			40.6				
Effective Green, g (s)					16.4			42.6				
Actuated g/C Ratio					0.25			0.66				
Clearance Time (s)					5.0			5.0				
Vehicle Extension (s)					2.0			3.0				
Lane Grp Cap (vph)					724			2787				
v/s Ratio Prot					c0.20							
v/s Ratio Perm								0.27				
v/c Ratio					0.80			0.41				
Uniform Delay, d1					22.8			5.3				
Progression Factor					1.00			0.83				
Incremental Delay, d2					6.0			0.4				
Delay (s)					28.8			4.8				
Level of Service					C			A				
Approach Delay (s)		0.0			28.8			4.8			0.0	
Approach LOS		A			C			A			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			13.8				HCM Level of Service				B	
HCM Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			65.0				Sum of lost time (s)			6.0		
Intersection Capacity Utilization			61.1%				ICU Level of Service			B		
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

## 6: I-90 EB Ramps & Argonne

4/10/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑							↑	↑↑	
Volume (vph)	0	333	472	0	0	0	0	0	0	275	1175	0
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)		3.0	3.0							3.0	3.0	
Lane Util. Factor		0.91	0.91							1.00	0.95	
Frt		0.94	0.85							1.00	1.00	
Flt Protected		1.00	1.00							0.95	1.00	
Satd. Flow (prot)		2726	1232							1513	3027	
Flt Permitted		1.00	1.00							0.95	1.00	
Satd. Flow (perm)		2726	1232							1513	3027	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	351	497	0	0	0	0	0	0	289	1237	0
RTOR Reduction (vph)	0	64	64	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	521	199	0	0	0	0	0	0	289	1237	0
Turn Type		Perm					Split					
Protected Phases		6								8	8	
Permitted Phases			6									
Actuated Green, G (s)		14.4	14.4							40.6	40.6	
Effective Green, g (s)		16.4	16.4							42.6	42.6	
Actuated g/C Ratio		0.25	0.25							0.66	0.66	
Clearance Time (s)		5.0	5.0							5.0	5.0	
Vehicle Extension (s)		3.0	3.0							3.0	3.0	
Lane Grp Cap (vph)		688	311							992	1984	
v/s Ratio Prot		c0.19								0.19	c0.41	
v/s Ratio Perm			0.16									
v/c Ratio		0.76	0.64							0.29	0.62	
Uniform Delay, d1		22.5	21.7							4.8	6.5	
Progression Factor		1.00	1.00							0.36	1.11	
Incremental Delay, d2		4.8	4.3							0.6	1.2	
Delay (s)		27.2	25.9							2.3	8.4	
Level of Service		C	C							A	A	
Approach Delay (s)		26.8			0.0			0.0			7.3	
Approach LOS		C			A			A			A	

### Intersection Summary

HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 7: I-90 EB Ramps & Mullan

4/10/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							  				
Volume (vph)	334	274	0	0	0	0	0	758	326	0	0	0
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)	3.0	3.0						3.0				
Lane Util. Factor	0.97	1.00						0.91				
Frt	1.00	1.00						0.95				
Flt Protected	0.95	1.00						1.00				
Satd. Flow (prot)	2936	1593						4153				
Flt Permitted	0.95	1.00						1.00				
Satd. Flow (perm)	2936	1593						4153				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	352	288	0	0	0	0	0	798	343	0	0	0
RTOR Reduction (vph)	29	0	0	0	0	0	0	87	0	0	0	0
Lane Group Flow (vph)	323	288	0	0	0	0	0	1054	0	0	0	0
Turn Type	Split											
Protected Phases	2 3	2 3						4				
Permitted Phases												
Actuated Green, G (s)	26.3	26.3						29.7				
Effective Green, g (s)	28.3	28.3						31.7				
Actuated g/C Ratio	0.44	0.44						0.49				
Clearance Time (s)								5.0				
Vehicle Extension (s)								3.0				
Lane Grp Cap (vph)	1278	694						2025				
v/s Ratio Prot	0.11	c0.18						c0.25				
v/s Ratio Perm												
v/c Ratio	0.25	0.41						0.52				
Uniform Delay, d1	11.6	12.6						11.4				
Progression Factor	0.00	2.11						0.40				
Incremental Delay, d2	0.1	0.4						0.9				
Delay (s)	0.1	27.1						5.5				
Level of Service	A	C						A				
Approach Delay (s)		12.2			0.0			5.5			0.0	
Approach LOS		B			A			A			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			7.9		HCM Level of Service			A				
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			65.0		Sum of lost time (s)			6.0				
Intersection Capacity Utilization			96.4%		ICU Level of Service			F				
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 20: Indiana & Pines

4/10/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	330	50	210	760	460	106	100	550	150
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Total Lost time (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0	5.5
Lane Util. Factor				0.91	0.91		0.97	0.95	1.00	1.00	0.95	1.00
Fr <sub>t</sub>				1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Fl <sub>t</sub> Protected				0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)				1271	2418		2710	2794	1250	1397	2794	1250
Fl <sub>t</sub> Permitted				0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)				1271	2418		2710	2794	1250	1397	2794	1250
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	359	54	228	826	500	115	109	598	163
RTOR Reduction (vph)	0	0	0	0	175	0	0	0	63	0	0	60
Lane Group Flow (vph)	0	0	0	223	243	0	826	500	52	109	598	103
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type				Perm			Prot		Perm	Prot		Perm
Protected Phases					4		1	6		5 15	2	
Permitted Phases				4					6			2
Actuated Green, G (s)				26.8	26.8		40.6	52.3	52.3	19.9	36.6	36.6
Effective Green, g (s)				27.8	27.8		42.1	53.8	53.8	21.9	38.1	36.6
Actuated g/C Ratio				0.23	0.23		0.35	0.45	0.45	0.18	0.32	0.31
Clearance Time (s)				5.0	5.0		5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)				4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)				294	560		951	1253	560	255	887	381
v/s Ratio Prot							c0.30	0.18		0.08	c0.21	
v/s Ratio Perm				c0.18	0.10				0.04			0.08
v/c Ratio				0.76	0.43		0.87	0.40	0.09	0.43	0.67	0.27
Uniform Delay, d <sub>1</sub>				43.0	39.4		36.4	22.2	19.0	43.5	35.6	31.6
Progression Factor				0.29	0.03		0.73	0.60	0.95	1.00	1.00	1.00
Incremental Delay, d <sub>2</sub>				10.6	0.7		3.8	0.4	0.1	1.6	4.1	1.7
Delay (s)				23.3	1.9		30.4	13.6	18.3	45.1	39.6	33.3
Level of Service				C	A		C	B	B	D	D	C
Approach Delay (s)		0.0			9.4			23.6			39.1	
Approach LOS		A			A			C			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			25.1	HCM Level of Service				C				
HCM Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)				12.0				
Intersection Capacity Utilization			72.3%	ICU Level of Service				C				
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 21: Indiana & I-90 WB Ramps

4/10/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑	↑↑	↑
Volume (vph)	206	0	0	100	490	10
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650
Total Lost time (s)	4.0			4.0	4.0	5.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Fr <sub>t</sub>	1.00			1.00	1.00	0.85
Fl <sub>t</sub> Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3104			4460	2924	1349
Fl <sub>t</sub> Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3104			4460	2924	1349
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	224	0	0	109	533	11
RTOR Reduction (vph)	0	0	0	0	0	5
Lane Group Flow (vph)	224	0	0	109	533	6
Heavy Vehicles (%)	1%	2%	2%	1%	4%	4%
Turn Type						Perm
Protected Phases	8			4	6	
Permitted Phases						6
Actuated Green, G (s)	82.2			82.2	27.8	27.8
Effective Green, g (s)	83.2			83.2	28.8	27.8
Actuated g/C Ratio	0.69			0.69	0.24	0.23
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2152			3092	702	313
v/s Ratio Prot	c0.07			0.02	c0.18	
v/s Ratio Perm						0.00
v/c Ratio	0.10			0.04	0.76	0.02
Uniform Delay, d <sub>1</sub>	6.1			5.8	42.4	35.6
Progression Factor	1.35			1.00	1.00	1.00
Incremental Delay, d <sub>2</sub>	0.1			0.0	4.7	0.0
Delay (s)	8.3			5.8	47.1	35.6
Level of Service	A			A	D	D
Approach Delay (s)	8.3			5.8	46.9	
Approach LOS	A			A	D	

### Intersection Summary

HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	29.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 22: I-90 EB Ramps & Pines

4/10/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	334	0	591	0	0	0	0	992	193	200	680	0
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Total Lost time (s)		4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor		1.00	0.88					0.95		1.00	0.95	
Frt		1.00	0.85					0.98		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1537	2420					2998		1537	3074	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1537	2420					2998		1537	3074	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	363	0	642	0	0	0	0	1078	210	217	739	0
RTOR Reduction (vph)	0	0	119	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	363	523	0	0	0	0	1275	0	217	739	0
Turn Type	Split		custom							Prot		
Protected Phases	8	8	8 1					6		5	2	
Permitted Phases												
Actuated Green, G (s)		32.5	54.5					52.3		19.7	55.5	
Effective Green, g (s)		33.0	55.0					53.8		21.2	57.0	
Actuated g/C Ratio		0.28	0.46					0.45		0.18	0.48	
Clearance Time (s)		4.5						5.5		5.5	5.5	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		423	1109					1344		272	1460	
v/s Ratio Prot		c0.24	0.22					c0.43		c0.14	0.24	
v/s Ratio Perm												
v/c Ratio		0.86	0.47					0.95		0.80	0.51	
Uniform Delay, d1		41.3	22.5					31.8		47.3	21.8	
Progression Factor		1.00	1.00					1.00		0.31	0.45	
Incremental Delay, d2		15.7	0.3					15.0		11.3	1.0	
Delay (s)		57.0	22.8					46.8		26.0	10.9	
Level of Service		E	C					D		C	B	
Approach Delay (s)		35.1			0.0			46.8			14.3	
Approach LOS		D			A			D			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			33.6					HCM Level of Service		C		
HCM Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			120.0					Sum of lost time (s)		12.0		
Intersection Capacity Utilization			82.7%					ICU Level of Service		E		
Analysis Period (min)			15									
c	Critical Lane Group											

Intersection 1

Argonne/SR290

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	265	261	98.6%	47.4	5.3	D
	Through	882	892	101.1%	17.1	2.4	B
	Right Turn	104	104	100.4%	4.5	0.8	A
	<b>Subtotal</b>	<b>1,251</b>	<b>1,257</b>	<b>100.5%</b>	<b>22.8</b>	<b>2.4</b>	<b>C</b>
SB	Left Turn	132	131	99.3%	69.9	8.7	E
	Through	755	744	98.5%	33.6	6.8	C
	Right Turn	52	56	107.3%	21.2	8.0	C
	<b>Subtotal</b>	<b>939</b>	<b>931</b>	<b>99.1%</b>	<b>37.7</b>	<b>6.2</b>	<b>D</b>
EB	Left Turn	155	155	99.7%	69.9	5.5	E
	Through	436	440	100.9%	60.8	5.6	E
	Right Turn	315	319	101.3%	3.4	0.9	A
	<b>Subtotal</b>	<b>906</b>	<b>914</b>	<b>100.8%</b>	<b>42.5</b>	<b>3.5</b>	<b>D</b>
WB	Left Turn	230	230	99.8%	243.5	103.2	F
	Through	319	317	99.2%	54.8	6.2	D
	Right Turn	197	196	99.5%	10.7	5.8	B
	<b>Subtotal</b>	<b>746</b>	<b>742</b>	<b>99.5%</b>	<b>105.7</b>	<b>37.9</b>	<b>F</b>
<b>Total</b>		<b>3,842</b>	<b>3,844</b>	<b>100.0%</b>	<b>47.0</b>	<b>7.2</b>	<b>D</b>

Intersection 2

Argonne/Montgomery

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	8	8	93.8%	76.8	52.6	E
	Through	1,015	1,019	100.4%	23.1	2.6	C
	Right Turn	209	213	101.8%	12.3	3.7	B
	<b>Subtotal</b>	<b>1,232</b>	<b>1,240</b>	<b>100.6%</b>	<b>21.7</b>	<b>2.4</b>	<b>C</b>
SB	Left Turn	240	232	96.7%	183.3	117.2	F
	Through	1,020	1,014	99.4%	12.1	2.4	B
	Right Turn	40	37	93.5%	7.3	2.1	A
	<b>Subtotal</b>	<b>1,300</b>	<b>1,284</b>	<b>98.7%</b>	<b>44.8</b>	<b>24.8</b>	<b>D</b>
EB	Left Turn	37	36	96.5%	61.5	15.6	E
	Through	59	61	103.6%	61.4	10.4	E
	Right Turn	120	122	101.3%	22.5	6.5	C
	<b>Subtotal</b>	<b>216</b>	<b>218</b>	<b>101.1%</b>	<b>40.8</b>	<b>6.7</b>	<b>D</b>
WB	Left Turn	375	375	99.9%	55.4	4.0	E
	Through	46	49	106.3%	57.0	10.1	E
	Right Turn	142	141	99.4%	24.2	7.6	C
	<b>Subtotal</b>	<b>563</b>	<b>565</b>	<b>100.3%</b>	<b>47.7</b>	<b>3.9</b>	<b>D</b>
<b>Total</b>		<b>3,311</b>	<b>3,306</b>	<b>99.9%</b>	<b>36.6</b>	<b>10.1</b>	<b>D</b>

Intersection 3

Argonne/Knox

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	159	161	101.4%	91.4	21.9	F
	Through	1,158	1,164	100.5%	15.3	1.9	B
	Right Turn	17	17	97.1%	16.2	12.7	B
	Subtotal	<b>1,334</b>	<b>1,342</b>	<b>100.6%</b>	<b>24.9</b>	<b>3.1</b>	<b>C</b>
SB	Left Turn	50	51	101.2%	91.4	11.3	F
	Through	1,430	1,410	98.6%	49.9	35.8	D
	Right Turn	35	38	109.1%	102.4	97.8	F
	Subtotal	<b>1,515</b>	<b>1,499</b>	<b>98.9%</b>	<b>52.5</b>	<b>36.3</b>	<b>D</b>
EB	Left Turn	47	45	96.4%	59.6	13.0	E
	Through	3	3	100.0%	32.2	45.6	C
	Right Turn	200	198	99.2%	38.9	49.0	D
	Subtotal	<b>250</b>	<b>247</b>	<b>98.7%</b>	<b>43.3</b>	<b>39.7</b>	<b>D</b>
WB	Left Turn	155	157	101.0%	158.7	128.1	F
	Through	8	8	96.3%	114.8	100.6	F
	Right Turn	27	29	107.0%	56.2	80.2	E
	Subtotal	<b>190</b>	<b>193</b>	<b>101.6%</b>	<b>143.9</b>	<b>122.8</b>	<b>F</b>
Total		<b>3,289</b>	<b>3,280</b>	<b>99.7%</b>	<b>45.7</b>	<b>23.3</b>	<b>D</b>

Intersection 4

Argonne/WB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn						
	Through	1,240	1,238	99.9%	82.7	20.4	F
	Right Turn	560	537	95.8%	162.4	40.9	F
	Subtotal	<b>1,800</b>	<b>1,775</b>	<b>98.6%</b>	<b>107.0</b>	<b>13.3</b>	<b>F</b>
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	451	455	100.9%	1.4	0.1	A
	Through	353	359	101.8%	22.4	1.9	C
	Right Turn						
	Subtotal	<b>804</b>	<b>814</b>	<b>101.3%</b>	<b>10.6</b>	<b>1.4</b>	<b>B</b>
Total		<b>2,604</b>	<b>2,589</b>	<b>99.4%</b>	<b>77.3</b>	<b>9.1</b>	<b>E</b>

Intersection 5

Mullan/WB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	353	359	101.7%	35.2	11.9	D
	Through	1,068	1,071	100.3%	27.2	1.0	C
	Right Turn						
	Subtotal	<b>1,421</b>	<b>1,430</b>	<b>100.6%</b>	<b>29.4</b>	<b>3.7</b>	<b>C</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through	451	455	100.9%	47.0	5.9	D
	Right Turn	368	364	99.0%	29.3	8.6	C
	Subtotal	<b>819</b>	<b>819</b>	<b>100.0%</b>	<b>39.2</b>	<b>6.3</b>	<b>D</b>
Total		<b>2,240</b>	<b>2,249</b>	<b>100.4%</b>	<b>33.0</b>	<b>1.1</b>	<b>C</b>

Intersection 6

Argonne/EB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	371	368	99.1%	35.0	14.7	C
	Through	1,320	1,325	100.4%	15.5	3.8	B
	Right Turn						
	Subtotal	<b>1,691</b>	<b>1,692</b>	<b>100.1%</b>	<b>19.9</b>	<b>6.3</b>	<b>B</b>
EB	Left Turn						
	Through	432	431	99.7%	45.5	2.8	D
	Right Turn	455	458	100.5%	20.3	2.3	C
	Subtotal	<b>887</b>	<b>888</b>	<b>100.1%</b>	<b>32.6</b>	<b>2.2</b>	<b>C</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>2,578</b>	<b>2,580</b>	<b>100.1%</b>	<b>24.5</b>	<b>5.4</b>	<b>C</b>

Intersection 7

Mullan/EB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through	989	998	100.9%	33.7	1.4	C
	Right Turn	378	378	100.0%	34.0	2.6	C
	<b>Subtotal</b>	<b>1,367</b>	<b>1,376</b>	<b>100.7%</b>	<b>33.8</b>	<b>1.1</b>	<b>C</b>
SB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
EB	Left Turn	432	431	99.7%	2.9	0.8	A
	Through	371	367	99.0%	24.0	1.2	C
	Right Turn						
	<b>Subtotal</b>	<b>803</b>	<b>798</b>	<b>99.4%</b>	<b>12.1</b>	<b>0.7</b>	<b>B</b>
WB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
<b>Total</b>		<b>2,170</b>	<b>2,174</b>	<b>100.2%</b>	<b>26.0</b>	<b>0.9</b>	<b>C</b>

Intersection 8

Argonne/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
SB	Left Turn	440	433	98.4%	16.3	2.7	B
	Through	1,190	1,204	101.2%	12.1	1.2	B
	Right Turn	145	146	100.8%	8.5	2.0	A
	<b>Subtotal</b>	<b>1,775</b>	<b>1,783</b>	<b>100.4%</b>	<b>12.8</b>	<b>1.4</b>	<b>B</b>
EB	Left Turn						
	Through	212	210	99.1%	41.9	3.2	D
	Right Turn	19	19	100.0%	21.7	7.9	C
	<b>Subtotal</b>	<b>231</b>	<b>229</b>	<b>99.2%</b>	<b>40.3</b>	<b>3.0</b>	<b>D</b>
WB	Left Turn	50	49	97.8%	37.6	8.7	D
	Through	70	72	102.6%	28.6	4.1	C
	Right Turn						
	<b>Subtotal</b>	<b>120</b>	<b>121</b>	<b>100.6%</b>	<b>32.3</b>	<b>4.5</b>	<b>C</b>
<b>Total</b>		<b>2,126</b>	<b>2,133</b>	<b>100.3%</b>	<b>17.3</b>	<b>1.6</b>	<b>B</b>

# HCM Signalized Intersection Capacity Analysis

## 9: Mission & Mullan

2/11/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕↕				
Volume (vph)	165	416	0	0	59	272	47	930	46	0	0	0
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)		3.0			3.0			3.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.88			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		2985			2654			4310				
Flt Permitted		0.70			1.00			1.00				
Satd. Flow (perm)		2104			2654			4310				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	181	457	0	0	65	299	52	1022	51	0	0	0
RTOR Reduction (vph)	0	0	0	0	135	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	638	0	0	229	0	0	1120	0	0	0	0
Turn Type	pm+pt						Perm					
Protected Phases	1	6			2			4				
Permitted Phases	6						4					
Actuated Green, G (s)		53.0			33.0			37.0				
Effective Green, g (s)		55.0			35.0			39.0				
Actuated g/C Ratio		0.55			0.35			0.39				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		1307			929			1681				
v/s Ratio Prot		c0.08			0.09							
v/s Ratio Perm		c0.19						0.26				
v/c Ratio		0.49			0.25			0.67				
Uniform Delay, d1		13.8			23.1			25.1				
Progression Factor		1.88			1.00			0.57				
Incremental Delay, d2		0.2			0.6			1.8				
Delay (s)		26.2			23.7			16.2				
Level of Service		C			C			B				
Approach Delay (s)		26.2			23.7			16.2			0.0	
Approach LOS		C			C			B			A	

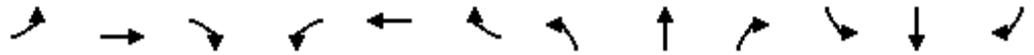
### Intersection Summary

HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 10: Broadway & Argonne

2/11/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑						↑↑↑	
Volume (vph)	0	370	75	37	166	0	0	0	0	259	804	99
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)		3.0			3.0						3.0	
Lane Util. Factor		0.95			0.95						0.91	
Frt		0.97			1.00						0.99	
Flt Protected		1.00			0.99						0.99	
Satd. Flow (prot)		2951			3000						4246	
Flt Permitted		1.00			0.85						0.99	
Satd. Flow (perm)		2951			2579						4246	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	411	83	41	184	0	0	0	0	288	893	110
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	477	0	0	225	0	0	0	0	0	1280	0
Turn Type				pm+pt							Perm	
Protected Phases		6		5	2							4
Permitted Phases				2						4		
Actuated Green, G (s)		20.0			35.0						55.0	
Effective Green, g (s)		22.0			37.0						57.0	
Actuated g/C Ratio		0.22			0.37						0.57	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		649			1005						2420	
v/s Ratio Prot		c0.16			c0.03							
v/s Ratio Perm					0.06						0.30	
v/c Ratio		0.73			0.22						0.53	
Uniform Delay, d1		36.3			21.6						13.2	
Progression Factor		1.00			0.93						0.61	
Incremental Delay, d2		7.2			0.5						0.7	
Delay (s)		43.5			20.5						8.9	
Level of Service		D			C						A	
Approach Delay (s)		43.5			20.5			0.0			8.9	
Approach LOS		D			C			A			A	

### Intersection Summary

HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 11: Broadway & Mullan

2/11/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕↕				
Volume (vph)	106	503	0	0	169	165	47	867	67	0	0	0
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)		3.0			3.0			3.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.93			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		3001			2803			4295				
Flt Permitted		0.77			1.00			1.00				
Satd. Flow (perm)		2334			2803			4295				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	118	559	0	0	188	183	52	963	74	0	0	0
RTOR Reduction (vph)	0	0	0	0	134	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	677	0	0	237	0	0	1081	0	0	0	0
Turn Type	pm+pt						Perm					
Protected Phases	5	2			6			4				
Permitted Phases	2						4					
Actuated Green, G (s)		45.0			25.0			45.0				
Effective Green, g (s)		47.0			27.0			47.0				
Actuated g/C Ratio		0.47			0.27			0.47				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1210			757			2019				
v/s Ratio Prot		c0.10			0.08							
v/s Ratio Perm		c0.17						0.25				
v/c Ratio		0.56			0.31			0.54				
Uniform Delay, d1		19.1			29.1			18.8				
Progression Factor		0.87			1.00			1.00				
Incremental Delay, d2		1.4			1.1			1.0				
Delay (s)		18.0			30.2			19.8				
Level of Service		B			C			B				
Approach Delay (s)		18.0			30.2			19.8			0.0	
Approach LOS		B			C			B			A	

### Intersection Summary

HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 12: Montgomery & Woodruff

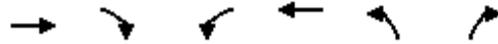
2/11/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 										
Volume (veh/h)	12	298	86	42	337	7	112	1	29	10	0	50
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	331	96	47	374	8	124	1	32	11	0	56
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	382			427			929	881	213	697	925	378
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	382			427			929	881	213	697	925	378
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			36	100	96	96	100	91
cM capacity (veh/h)	1173			1129			194	269	792	301	254	619
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1			
Volume Total	13	221	206	47	382	124	1	32	67			
Volume Left	13	0	0	47	0	124	0	0	11			
Volume Right	0	0	96	0	8	0	0	32	56			
cSH	1173	1700	1700	1129	1700	194	269	792	527			
Volume to Capacity	0.01	0.13	0.12	0.04	0.22	0.64	0.00	0.04	0.13			
Queue Length 95th (ft)	1	0	0	3	0	93	0	3	11			
Control Delay (s)	8.1	0.0	0.0	8.3	0.0	51.6	18.4	9.7	12.8			
Lane LOS	A			A		F	C	A	B			
Approach Delay (s)	0.2			0.9		42.8			12.8			
Approach LOS						E			B			
Intersection Summary												
Average Delay			7.4									
Intersection Capacity Utilization			48.5%			ICU Level of Service			A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: SR-290 & University

2/11/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑	↑	↵	↑↑	↵		
Volume (veh/h)	753	48	50	717	51	75	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	837	53	56	797	57	83	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume			890			1346	418
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			890			1346	418
tC, single (s)			4.1			6.8	6.9
tC, 2 stage (s)							
tF (s)			2.2			3.5	3.3
p0 queue free %			93			57	86
cM capacity (veh/h)			757			132	583

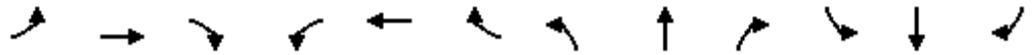
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	418	418	53	56	398	398	140
Volume Left	0	0	0	56	0	0	57
Volume Right	0	0	53	0	0	0	83
cSH	1700	1700	1700	757	1700	1700	245
Volume to Capacity	0.25	0.25	0.03	0.07	0.23	0.23	0.57
Queue Length 95th (ft)	0	0	0	6	0	0	80
Control Delay (s)	0.0	0.0	0.0	10.1	0.0	0.0	37.7
Lane LOS				B	E		
Approach Delay (s)	0.0			0.7	37.7		
Approach LOS					E		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

# HCM Unsignalized Intersection Capacity Analysis

## 14: Montgomery & University

2/11/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	344	0	1	277	47	4	1	0	30	0	49
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	382	0	1	308	52	4	1	0	33	0	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	360			382			939	911	382	886	885	334
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	360			382			939	911	382	886	885	334
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			98	100	100	87	100	92
cM capacity (veh/h)	1199			1176			213	255	665	250	264	708

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	83	382	361	6	88
Volume Left	83	0	1	4	33
Volume Right	0	0	52	0	54
cSH	1199	1700	1176	220	418
Volume to Capacity	0.07	0.22	0.00	0.03	0.21
Queue Length 95th (ft)	6	0	0	2	20
Control Delay (s)	8.2	0.0	0.0	21.8	15.9
Lane LOS	A		A	C	C
Approach Delay (s)	1.5		0.0	21.8	15.9
Approach LOS				C	C

Intersection Summary		
Average Delay		2.4
Intersection Capacity Utilization	56.9%	ICU Level of Service
Analysis Period (min)		15
		B

# HCM Unsignalized Intersection Capacity Analysis

## 15: Mission & University

2/11/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	211	76	58	224	25	89	16	75	17	8	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	234	84	64	249	28	99	18	83	19	9	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	277			319			710	722	277	758	751	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	277			319			710	722	277	758	751	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			69	95	89	93	97	99
cM capacity (veh/h)	1286			1241			319	329	762	262	317	776
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>					
Volume Total	20	319	64	277	99	101	39					
Volume Left	20	0	64	0	99	0	19					
Volume Right	0	84	0	28	0	83	11					
cSH	1286	1700	1241	1700	319	619	340					
Volume to Capacity	0.02	0.19	0.05	0.16	0.31	0.16	0.11					
Queue Length 95th (ft)	1	0	4	0	32	15	10					
Control Delay (s)	7.8	0.0	8.1	0.0	21.3	11.9	17.0					
Lane LOS	A		A		C	B	C					
Approach Delay (s)	0.5		1.5		16.6		17.0					
Approach LOS					C		C					
<b>Intersection Summary</b>												
Average Delay			5.1									
Intersection Capacity Utilization			42.6%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

## 16: Broadway & University

2/11/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	436	144	80	312	52	100	156	68	20	128	28
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1513	1534		1513	1559		1513	1520		1513	1550	
Flt Permitted	0.43	1.00		0.25	1.00		0.65	1.00		0.60	1.00	
Satd. Flow (perm)	680	1534		398	1559		1032	1520		963	1550	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	484	160	89	347	58	111	173	76	22	142	31
RTOR Reduction (vph)	0	30	0	0	15	0	0	40	0	0	19	0
Lane Group Flow (vph)	22	614	0	89	390	0	111	209	0	22	154	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	4			8			2			6		
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	272	614		159	624		413	608		385	620	
v/s Ratio Prot		c0.40			0.25			c0.14			0.10	
v/s Ratio Perm	0.03			0.22			0.11			0.02		
v/c Ratio	0.08	1.00		0.56	0.62		0.27	0.34		0.06	0.25	
Uniform Delay, d1	7.4	12.0		9.3	9.6		8.1	8.4		7.4	8.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	36.3		13.5	4.7		1.6	1.5		0.3	1.0	
Delay (s)	8.0	48.3		22.8	14.3		9.7	9.9		7.7	9.0	
Level of Service	A	D		C	B		A	A		A	A	
Approach Delay (s)		47.0			15.8			9.8			8.8	
Approach LOS		D			B			A			A	

### Intersection Summary

HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# MOVEMENT SUMMARY

Site: Roundabout

Montgomery and Mansfield (EX PM Peak Hour)  
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Wilbur											
3L	L	101	2.0	0.208	6.2	LOS A	1.2	29.2	0.55	0.78	27.0
8R	R	83	2.0	0.208	6.2	LOS A	1.2	29.2	0.55	0.62	29.4
Approach		184	2.0	0.208	6.2	LOS A	1.2	29.2	0.55	0.71	28.0
East: Mansfield											
1L	L	19	2.0	0.078	3.8	LOS A	0.4	11.1	0.30	0.77	28.3
6T	T	70	2.0	0.078	3.8	LOS A	0.4	11.1	0.30	0.30	29.1
6R	R	1	2.0	0.078	3.8	LOS A	0.4	11.1	0.30	0.53	31.0
Approach		90	2.0	0.078	3.8	LOS A	0.4	11.1	0.30	0.40	29.0
North East: Wilbur											
1X	L	46	2.0	0.071	4.0	LOS A	0.4	9.1	0.37	0.71	27.6
6X	T	17	2.0	0.071	4.0	LOS A	0.4	9.1	0.37	0.67	28.6
16X	R	14	2.0	0.071	4.0	LOS A	0.4	9.1	0.37	0.41	31.7
Approach		77	2.0	0.071	4.0	LOS A	0.4	9.1	0.37	0.64	28.4
West: Montgomery											
5L	L	1	2.0	0.292	5.4	LOS A	1.9	49.1	0.30	0.83	28.1
2T	T	311	2.0	0.292	5.4	LOS A	1.9	49.1	0.30	0.32	28.8
2R	R	64	2.0	0.292	5.4	LOS A	1.9	49.1	0.30	0.50	30.6
Approach		377	2.0	0.292	5.4	LOS A	1.9	49.1	0.30	0.35	29.1
All Vehicles		728	2.0	0.292	5.2	LOS A	1.9	49.1	0.37	0.48	28.7

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Model used. Geometric Delay not included.

# HCM Unsignalized Intersection Capacity Analysis

## 18: Mission & Bowdish

2/11/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	212	32	127	230	3	44	1	88	0	2	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	236	36	141	256	3	49	1	98	0	2	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	259			271			800	801	253	880	817	257
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	259			271			800	801	253	880	817	257
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			89			82	100	88	100	99	100
cM capacity (veh/h)	1306			1292			275	282	785	214	276	781
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	<b>SB 1</b>						
Volume Total	3	271	141	259	148	3						
Volume Left	3	0	141	0	49	0						
Volume Right	0	36	0	3	98	1						
cSH	1306	1700	1292	1700	483	352						
Volume to Capacity	0.00	0.16	0.11	0.15	0.31	0.01						
Queue Length 95th (ft)	0	0	9	0	32	1						
Control Delay (s)	7.8	0.0	8.1	0.0	15.7	15.3						
Lane LOS	A		A		C	C						
Approach Delay (s)	0.1		2.9		15.7	15.3						
Approach LOS					C	C						
<b>Intersection Summary</b>												
Average Delay			4.3									
Intersection Capacity Utilization			49.4%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

## 19: Montgomery & Pines

2/11/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	15	600	92	150	27	250	533	152	48	492	9
Ideal Flow (vphpl)	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1667	1417	1583	1629		1583	3061		1583	3158	
Flt Permitted	0.64	1.00	1.00	0.66	1.00		0.34	1.00		0.34	1.00	
Satd. Flow (perm)	1061	1667	1417	1094	1629		570	3061		575	3158	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	16	652	100	163	29	272	579	165	52	535	10
RTOR Reduction (vph)	0	0	369	0	4	0	0	18	0	0	1	0
Lane Group Flow (vph)	12	16	283	100	188	0	272	726	0	52	544	0
Turn Type	pm+pt		Perm	pm+pt			pm+pt			pm+pt		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8		8	4			6			2		
Actuated Green, G (s)	31.2	28.4	28.4	44.7	37.4		75.8	64.7		60.6	54.5	
Effective Green, g (s)	32.2	28.9	28.9	45.2	37.9		76.8	65.7		62.6	55.5	
Actuated g/C Ratio	0.25	0.22	0.22	0.35	0.29		0.59	0.51		0.48	0.43	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	276	371	315	427	475		472	1547		332	1348	
v/s Ratio Prot	0.00	0.01		c0.02	c0.12		c0.08	0.24		0.01	0.17	
v/s Ratio Perm	0.01		c0.20	0.06			c0.26			0.07		
v/c Ratio	0.04	0.04	0.90	0.23	0.40		0.58	0.47		0.16	0.40	
Uniform Delay, d1	37.1	39.7	49.1	29.6	36.9		14.3	20.8		18.1	25.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.18	0.32		1.00	1.00	
Incremental Delay, d2	0.1	0.0	26.2	0.3	0.5		1.3	0.8		0.2	0.9	
Delay (s)	37.1	39.7	75.3	29.9	37.4		18.3	7.5		18.3	26.7	
Level of Service	D	D	E	C	D		B	A		B	C	
Approach Delay (s)		73.8			34.8			10.4			26.0	
Approach LOS		E			C			B			C	

### Intersection Summary

HCM Average Control Delay	33.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 20: Indiana & Pines

2/11/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↔		↘	↕	↗	↘	↕	↗
Volume (vph)	0	0	0	300	298	188	525	709	150	150	764	200
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Total Lost time (s)				4.0	4.0		4.0	4.0	4.0	4.0	4.0	5.5
Lane Util. Factor				0.91	0.91		0.97	0.95	1.00	1.00	0.95	1.00
Frt				1.00	0.95		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
Satd. Flow (prot)				1271	2523		2710	2794	1250	1397	2794	1250
Flt Permitted				0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)				1271	2523		2710	2794	1250	1397	2794	1250
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	326	324	204	571	771	163	163	830	217
RTOR Reduction (vph)	0	0	0	0	57	0	0	0	95	0	0	51
Lane Group Flow (vph)	0	0	0	287	510	0	571	771	68	163	830	166
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type				Perm			Prot		Perm	Prot		Perm
Protected Phases					4		1	6		5 15		2
Permitted Phases				4					6			2
Actuated Green, G (s)				35.0	35.0		30.6	52.4	52.4	21.6	48.4	48.4
Effective Green, g (s)				36.0	36.0		32.1	53.9	53.9	23.6	49.9	48.4
Actuated g/C Ratio				0.28	0.28		0.25	0.41	0.41	0.18	0.38	0.37
Clearance Time (s)				5.0	5.0		5.5	5.5	5.5		5.5	5.5
Vehicle Extension (s)				4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Grp Cap (vph)				352	699		669	1158	518	254	1072	465
v/s Ratio Prot							c0.21	0.28		0.12	c0.30	
v/s Ratio Perm				c0.23	0.20				0.05			0.13
v/c Ratio				0.82	0.73		0.85	0.67	0.13	0.64	0.77	0.36
Uniform Delay, d1				43.9	42.6		46.7	30.8	23.5	49.3	35.1	29.5
Progression Factor				0.67	0.59		0.69	0.79	1.88	0.89	0.84	0.70
Incremental Delay, d2				14.0	4.0		3.2	0.8	0.1	4.5	4.0	1.6
Delay (s)				43.3	29.3		35.4	25.2	44.4	48.6	33.5	22.3
Level of Service				D	C		D	C	D	D	C	C
Approach Delay (s)		0.0			34.0			31.1			33.5	
Approach LOS		A			C			C			C	

### Intersection Summary

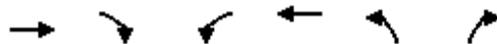
HCM Average Control Delay	32.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 21: Indiana & I-90 WB Ramps

2/11/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑	↑↑	↑
Volume (vph)	300	0	0	385	400	27
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650
Total Lost time (s)	4.0			4.0	4.0	5.0
Lane Util. Factor	0.95			0.91	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3104			4460	2924	1349
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3104			4460	2924	1349
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	0	0	418	435	29
RTOR Reduction (vph)	0	0	0	0	0	15
Lane Group Flow (vph)	326	0	0	418	435	14
Heavy Vehicles (%)	1%	2%	2%	1%	4%	4%
Turn Type						Perm
Protected Phases	8			4	6	
Permitted Phases						6
Actuated Green, G (s)	94.5			94.5	25.5	25.5
Effective Green, g (s)	95.5			95.5	26.5	25.5
Actuated g/C Ratio	0.73			0.73	0.20	0.20
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2280			3276	596	265
v/s Ratio Prot	c0.11			0.09	c0.15	
v/s Ratio Perm						0.01
v/c Ratio	0.14			0.13	0.73	0.05
Uniform Delay, d1	5.1			5.1	48.4	42.4
Progression Factor	1.39			1.00	1.00	1.00
Incremental Delay, d2	0.1			0.1	4.5	0.1
Delay (s)	7.2			5.1	52.9	42.5
Level of Service	A			A	D	D
Approach Delay (s)	7.2			5.1	52.2	
Approach LOS	A			A	D	

### Intersection Summary

HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 22: I-90 EB Ramps & Pines

2/11/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	284	0	586	0	0	0	0	1100	302	207	857	0
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Total Lost time (s)		4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor		1.00	0.88					0.95		1.00	0.95	
Frt		1.00	0.85					0.97		1.00	1.00	
Flt Protected		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1537	2420					2974		1537	3074	
Flt Permitted		0.95	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1537	2420					2974		1537	3074	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	309	0	637	0	0	0	0	1196	328	225	932	0
RTOR Reduction (vph)	0	0	73	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	309	564	0	0	0	0	1506	0	225	932	0
Turn Type	Split		custom							Prot		
Protected Phases	8	8	8	1				6		5	2	
Permitted Phases												
Actuated Green, G (s)		32.0	55.0					61.0		22.0	65.0	
Effective Green, g (s)		33.0	53.0					62.0		23.0	66.0	
Actuated g/C Ratio		0.25	0.41					0.48		0.18	0.51	
Clearance Time (s)		5.0						5.0		5.0	5.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		390	987					1418		272	1561	
v/s Ratio Prot		c0.20	0.23					c0.51		c0.15	0.30	
v/s Ratio Perm												
v/c Ratio		0.79	0.57					1.06		0.83	0.60	
Uniform Delay, d1		45.3	29.7					34.0		51.6	22.6	
Progression Factor		1.00	1.00					0.52		0.58	0.46	
Incremental Delay, d2		10.5	0.8					37.9		12.1	1.1	
Delay (s)		55.8	30.5					55.4		41.8	11.4	
Level of Service		E	C					E		D	B	
Approach Delay (s)		38.8			0.0			55.4			17.3	
Approach LOS		D			A			E			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			38.9					HCM Level of Service		D		
HCM Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			130.0					Sum of lost time (s)		12.0		
Intersection Capacity Utilization			87.4%					ICU Level of Service		E		
Analysis Period (min)			15									
c	Critical Lane Group											

# HCM Signalized Intersection Capacity Analysis

## 23: Mission & Pines

4/12/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	147	49	107	170	300	33	959	43	392	789	240
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			0.95	1.00	1.00	0.95		0.97	0.95	
Frt	1.00	0.96			1.00	0.85	1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1537	1557			3015	1375	1537	3054		2981	2966	
Flt Permitted	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1537	1557			3015	1375	1537	3054		2981	2966	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	155	52	113	179	316	35	1009	45	413	831	253
RTOR Reduction (vph)	0	9	0	0	0	275	0	2	0	0	22	0
Lane Group Flow (vph)	184	198	0	0	292	41	35	1052	0	413	1062	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases						4						
Actuated Green, G (s)	18.7	18.7			15.9	15.9	13.1	54.1		21.3	62.3	
Effective Green, g (s)	19.7	19.7			16.9	16.9	14.1	55.1		22.3	63.3	
Actuated g/C Ratio	0.15	0.15			0.13	0.13	0.11	0.42		0.17	0.49	
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		6.0	3.0	
Lane Grp Cap (vph)	233	236			392	179	167	1294		511	1444	
v/s Ratio Prot	0.12	c0.13			c0.10		0.02	c0.34		c0.14	0.36	
v/s Ratio Perm						0.03						
v/c Ratio	0.79	0.84			0.74	0.23	0.21	0.81		0.81	0.74	
Uniform Delay, d1	53.2	53.6			54.5	50.7	52.9	32.9		51.8	26.7	
Progression Factor	1.00	1.00			1.00	1.00	0.66	0.54		1.21	0.89	
Incremental Delay, d2	16.2	22.0			7.5	0.7	2.0	4.1		9.2	2.8	
Delay (s)	69.3	75.6			62.0	51.4	36.7	21.9		71.7	26.7	
Level of Service	E	E			E	D	D	C		E	C	
Approach Delay (s)		72.6			56.5			22.4			39.1	
Approach LOS		E			E			C			D	

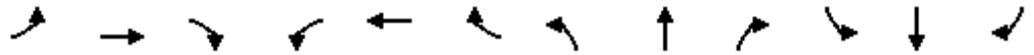
### Intersection Summary

HCM Average Control Delay	40.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 24: Broadway & Pines

4/12/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Volume (vph)	133	230	81	145	180	77	40	784	85	81	1046	121
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1537	1554		1537	1545		1537	3029		1537	3026	
Flt Permitted	0.37	1.00		0.22	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	601	1554		363	1545		1537	3029		1537	3026	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	145	250	88	158	196	84	43	852	92	88	1137	132
RTOR Reduction (vph)	0	11	0	0	13	0	0	6	0	0	6	0
Lane Group Flow (vph)	145	327	0	158	267	0	43	938	0	88	1263	0
Turn Type	pm+pt			pm+pt			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	42.0	31.3		45.6	33.1		11.0	53.9		12.3	55.2	
Effective Green, g (s)	44.0	32.3		47.6	34.1		12.0	54.9		13.3	56.2	
Actuated g/C Ratio	0.34	0.25		0.37	0.26		0.09	0.42		0.10	0.43	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	288	386		255	405		142	1279		157	1308	
v/s Ratio Prot	0.05	c0.21		c0.06	0.17		0.03	c0.31		0.06	c0.42	
v/s Ratio Perm	0.13			0.16								
v/c Ratio	0.50	0.85		0.62	0.66		0.30	0.73		0.56	0.97	
Uniform Delay, d1	32.0	46.5		31.0	42.8		55.1	31.4		55.6	36.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.84	0.87	
Incremental Delay, d2	1.4	15.8		4.4	4.0		5.4	3.8		3.9	16.1	
Delay (s)	33.4	62.3		35.5	46.8		60.5	35.2		50.4	47.3	
Level of Service	C	E		D	D		E	D		D	D	
Approach Delay (s)		53.6			42.7			36.3			47.5	
Approach LOS		D			D			D			D	

### Intersection Summary

HCM Average Control Delay	44.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

## **APPENDIX D: UTILITY MAPS**



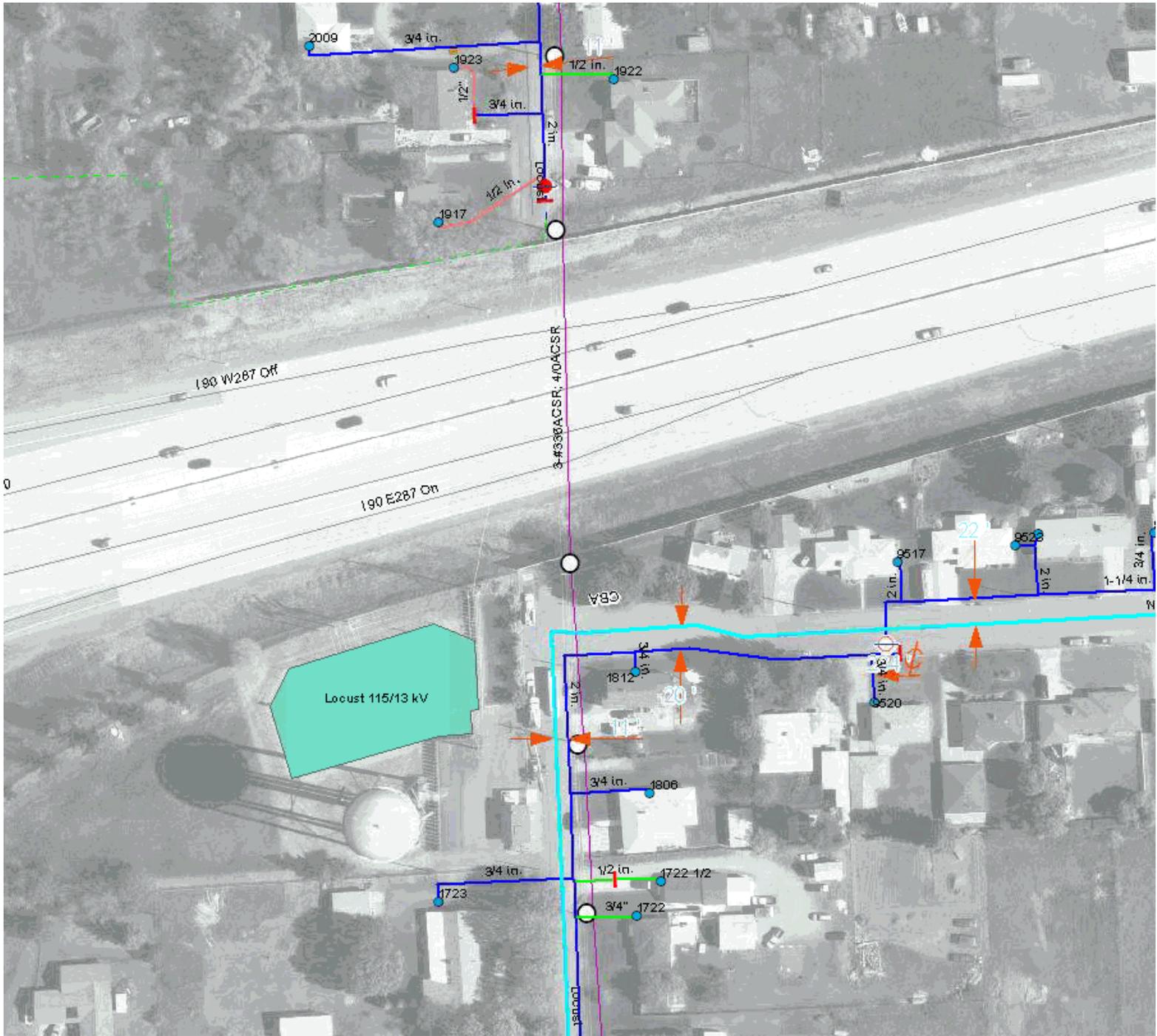
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Avista - Felts Road Gas



Avista - Locust Road Gas & Electricity



Avista - University Road Gas



Avista - University Road Gas

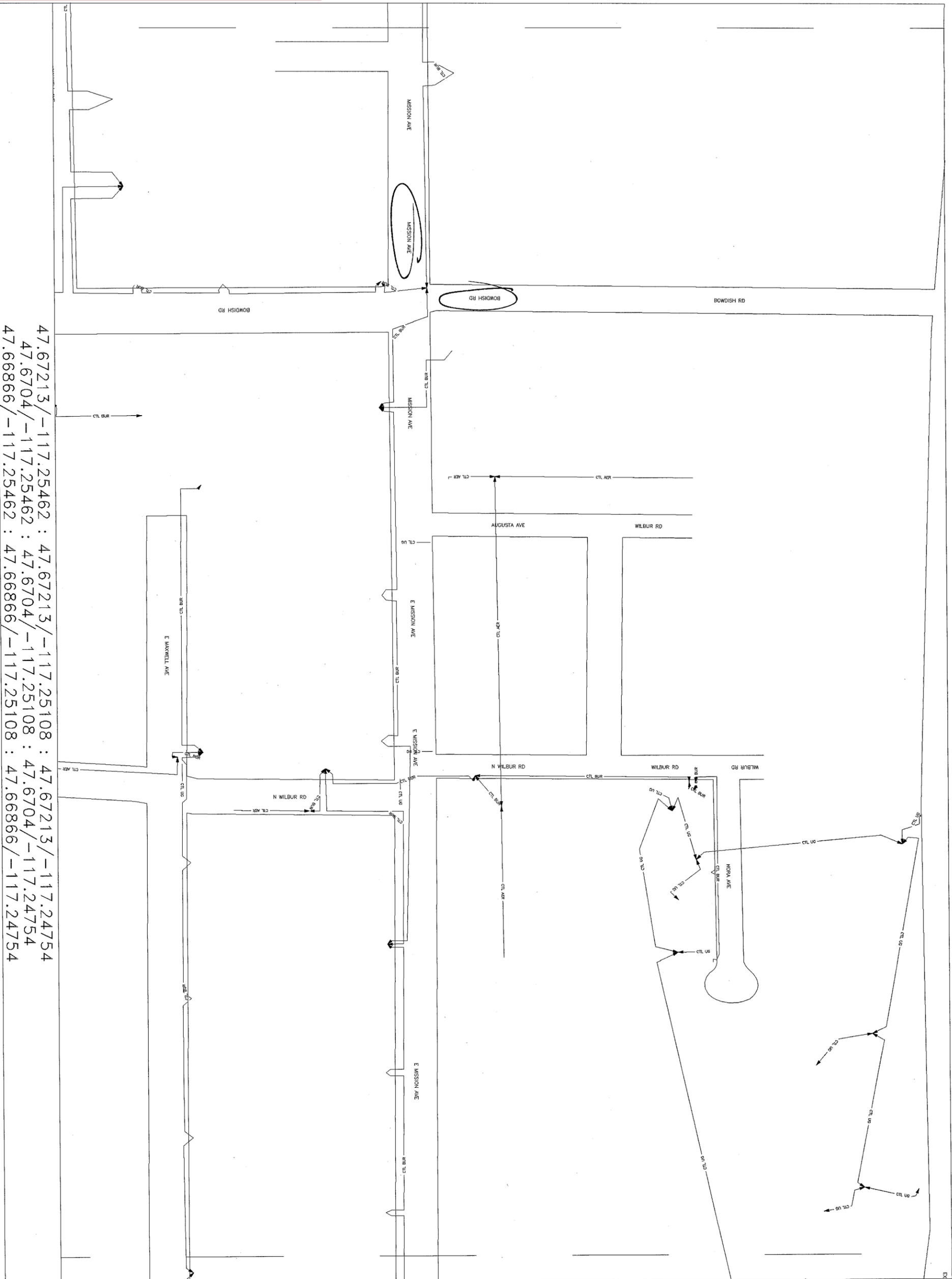


Avista - University Road Gas



# Avista - Woodruff Road Gas





47.67213/-117.25462 : 47.67213/-117.25108 : 47.67213/-117.24754  
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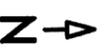
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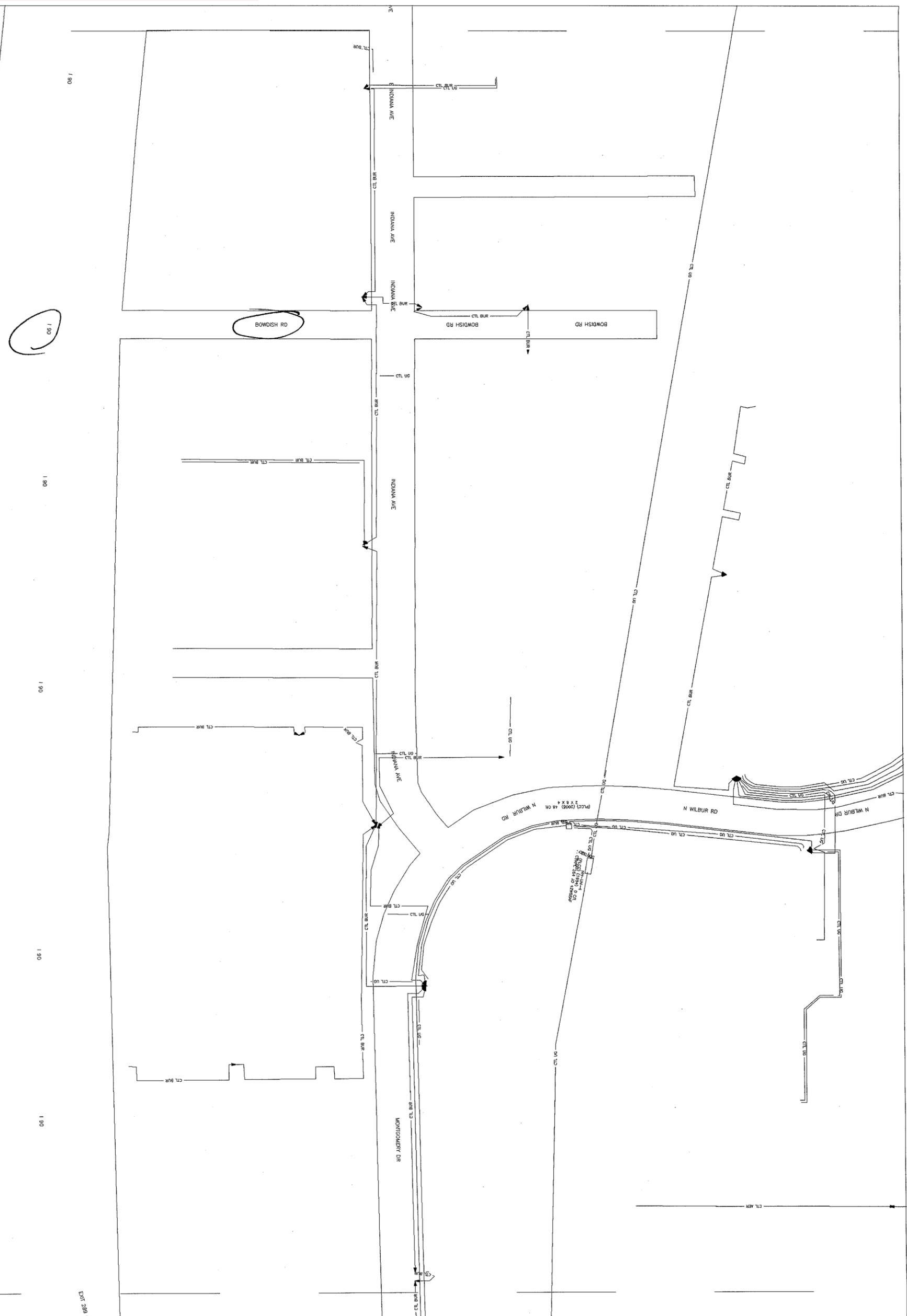
WIRE CENTER  
 SPOKANE-WALNUT  
 WASHINGTON

Grid ID: (Lat/Long)  
 47.6704/-117.25108

1" = 150'



DISCLAIMER: All Facility Locations are Approximate and Facilities Must be Spotted by Appropriate Agency Prior to Excavation



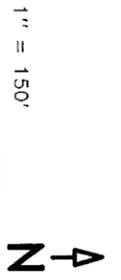
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 47.67387/-117.25462 : 47.67387/-117.25108 : 47.67387/-117.24754  
 47.67213/-117.25462 : 47.67213/-117.25108 : 47.67213/-117.24754

CENTURYLINK CONFIDENTIAL AND PROPRIETARY INFORMATION. DISCLOSED TO GOVERNMENTAL AGENCY PURSUANT TO LAW. NOT TO BE DISCLOSED BY GOVERNMENTAL AGENCY TO ANY THIRD PARTY WITHOUT WRITTEN AUTHORIZATION BY CENTURYLINK INC..



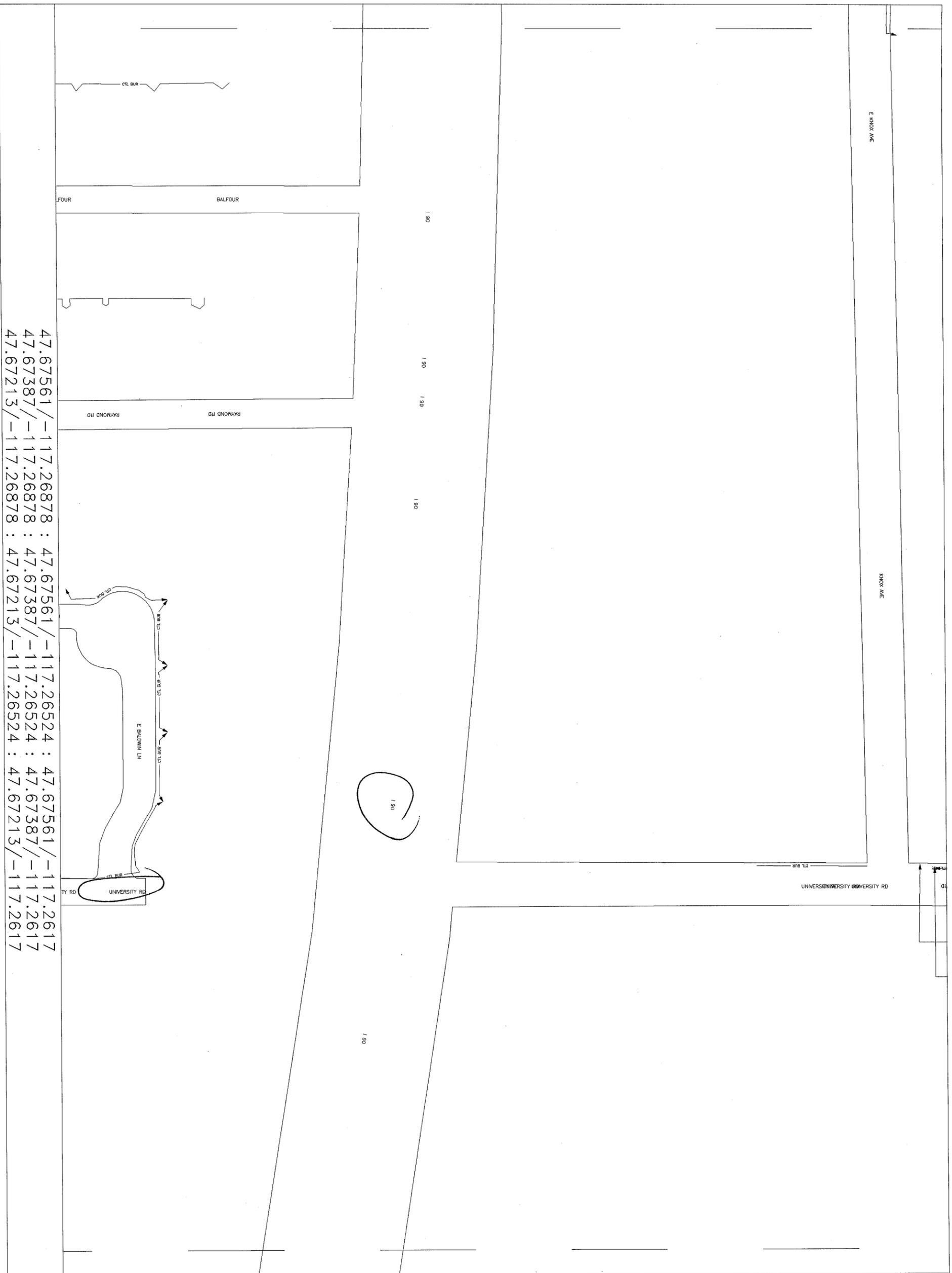
WIRE CENTER  
 SPOKANE-WALNUT  
 WASHINGTON

Grid ID: (Lat/Long)  
 47.67387/-117.25108



DISCLAIMER: All Facility Locations are Approximate and Facilities Must be Spotted by Appropriate Agency Prior to Excavation

**Century Link - Overhead and Buried Cable**



47.67561/-117.26878 : 47.67561/-117.26524 : 47.67561/-117.2617  
 47.67387/-117.26878 : 47.67387/-117.26524 : 47.67387/-117.2617  
 47.67213/-117.26878 : 47.67213/-117.26524 : 47.67213/-117.2617

CENTURYLINK CONFIDENTIAL AND PROPRIETARY INFORMATION. DISCLOSED TO GOVERNMENTAL AGENCY PURSUANT TO LAW. NOT TO BE DISCLOSED BY GOVERNMENTAL AGENCY TO ANY THIRD PARTY WITHOUT WRITTEN AUTHORIZATION BY CENTURYLINK, INC..



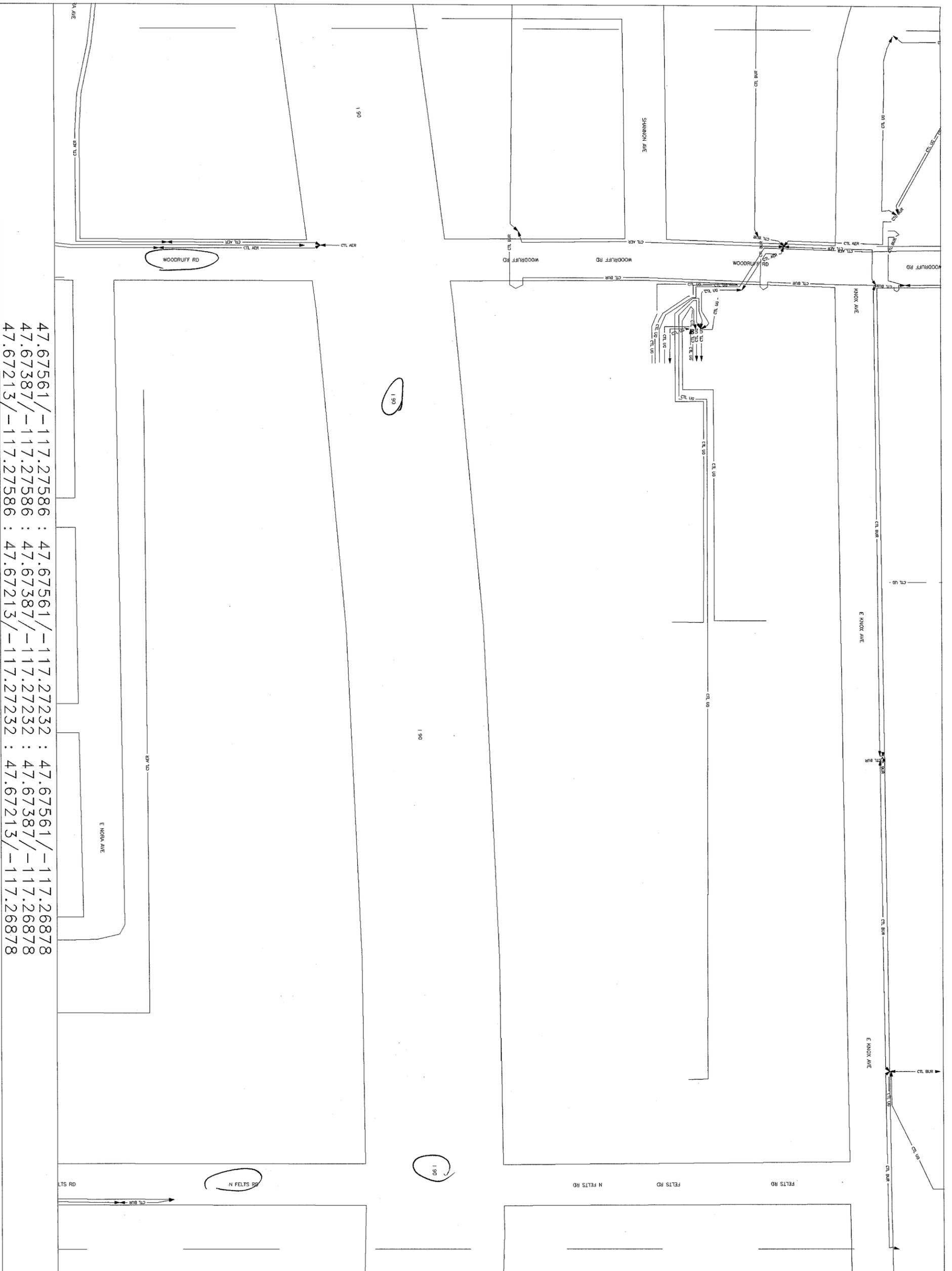
WIRE CENTER  
 SPOKANE - WALNUT  
 WASHINGTON

Grid ID: (Lat/Long)  
 47.67387/-117.26524



DISCLAIMER: All Facility Locations are Approximate and Facilities Must be Spotted by Appropriate Agency Prior to Excavation

**Century Link - Overhead and Buried Cable**



47.67561/-117.27586 : 47.67561/-117.27232 : 47.67561/-117.26878  
 47.67387/-117.27586 : 47.67387/-117.27232 : 47.67387/-117.26878  
 47.67213/-117.27586 : 47.67213/-117.27232 : 47.67213/-117.26878

CENTURYLINK CONFIDENTIAL AND PROPRIETARY INFORMATION. DISCLOSED TO GOVERNMENTAL AGENCIES PURSUANT TO FEDERAL AND STATE LAWS. NOT BE DISCLOSED BY GOVERNMENTAL AGENCIES TO ANY THIRD PARTY WITHOUT WRITTEN AUTHORIZATION BY CENTURYLINK INC...

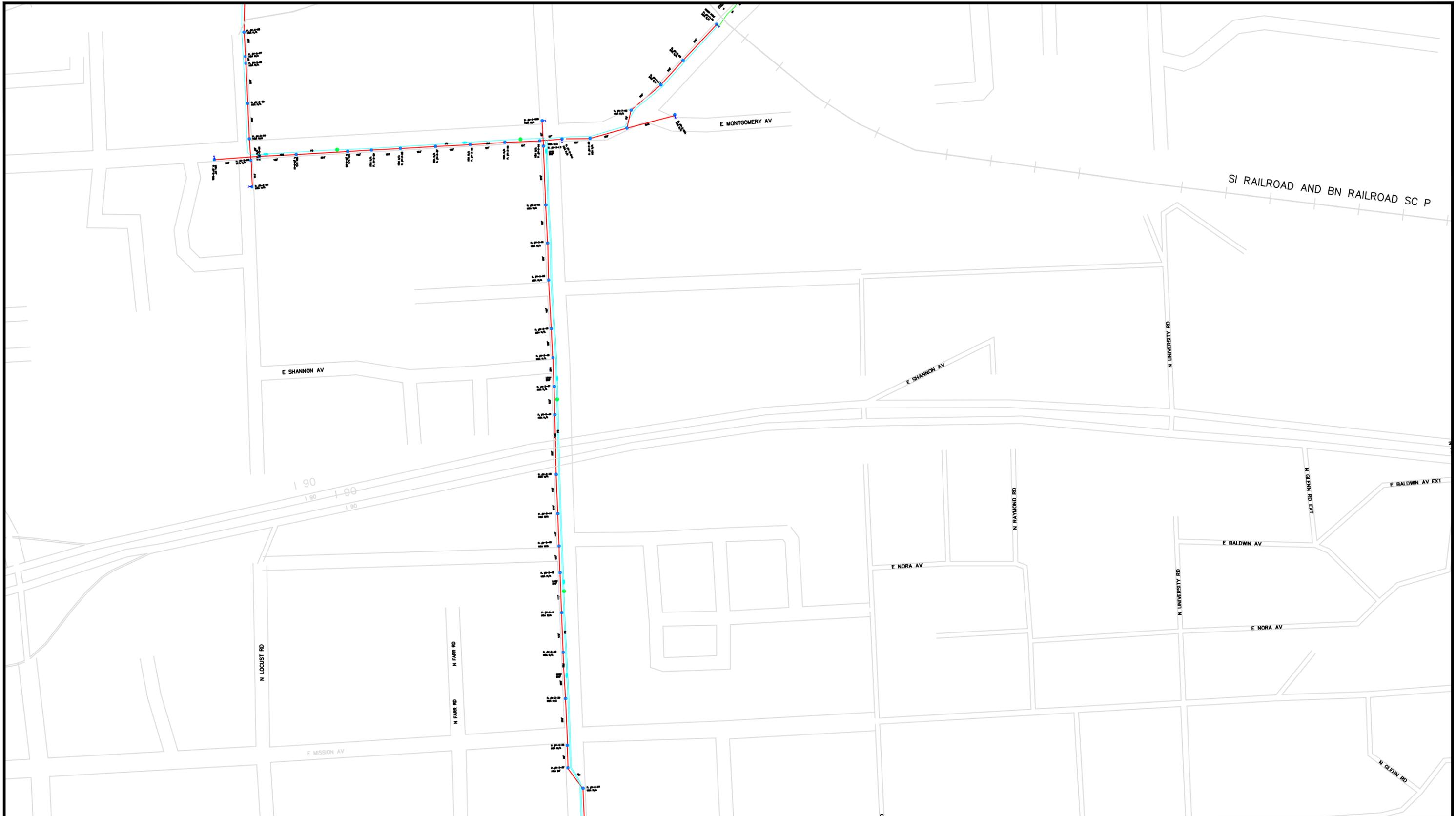


WIRE CENTER  
 SPOKANE-WALNUT  
 WASHINGTON

Grid ID: (Lat/Long)  
 47.67387/-117.27232



DISCLAIMER: All Facility Locations are Approximate and Facilities Must Be Spotted by Appropriate Agency Prior to Excavation



DEPARTMENT	INITIALS	DATE
OSP ENGINEERING		
TRANSPORT ENGINEERING		
DATA ENGINEERING		
LONGHAUL ENGINEERING		
POWER ENGINEERING DC		
CONSTRUCTION ENGINEERING		
AC		
HVAC		
SECURITY		
FIRE SUPPRESSION		

Revisions:

No.	Description	ESO	Date	Drn	Eng

**ELECTRIC LIGHTWAVE**  
An Integra Telecom Company

4400 NE 77th AVENUE  
PO BOX 8905  
VANCOUVER, WA 98668-8905  
CORP. (360) 816-3000  
FAX. (360) 816-3297

**SPOKANE MAN  
SPOKANE**

\*THE INFORMATION CONTAINED HEREIN IS HIGHLY CONFIDENTIAL AND COMPETITIVELY SENSITIVE. DISCLOSURE OR USE WITHOUT THE WRITTEN CONSENT OF ELECTRIC LIGHTWAVE, INC. WILL SUBJECT THE DISCLOSING PARTY TO LEGAL ACTION, INJUNCTIVE RELIEF AND PENALTIES TO THE FULLEST EXTENT OF THE LAW.\*

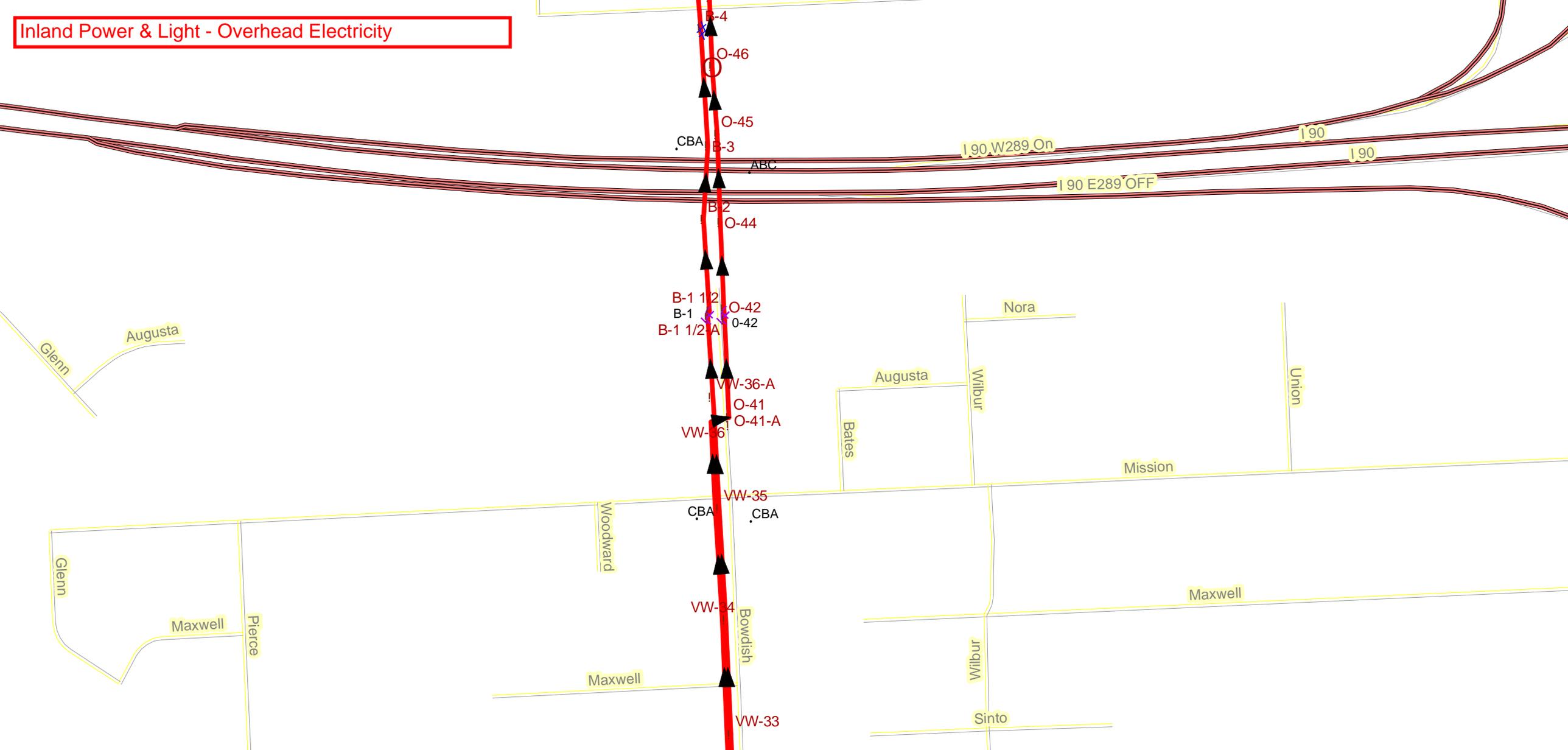
DRAWN BY:  
ENGINEER:  
DATE:  
SCALE: AS SHOWN  
SECTION:  
CELL:  
DRAWING NAME:

**ASBUILT  
OSP  
N WOODRUFF RD**

CLLICODE

1 OF XX

Inland Power & Light - Overhead Electricity



**Irvin Water District #6 - Water Lines**

**ODWARD**

**ISH**

**INDIANA  
INDIANA**

**KNOX**

**REEVES**

**MANSFIELD**

**WILBUR**

**ERMINA**

**MONTGOMERY**

10" PVC

8" PVC

6" PVC

6" PVC

8" PVC

8" PVC

6" PVC

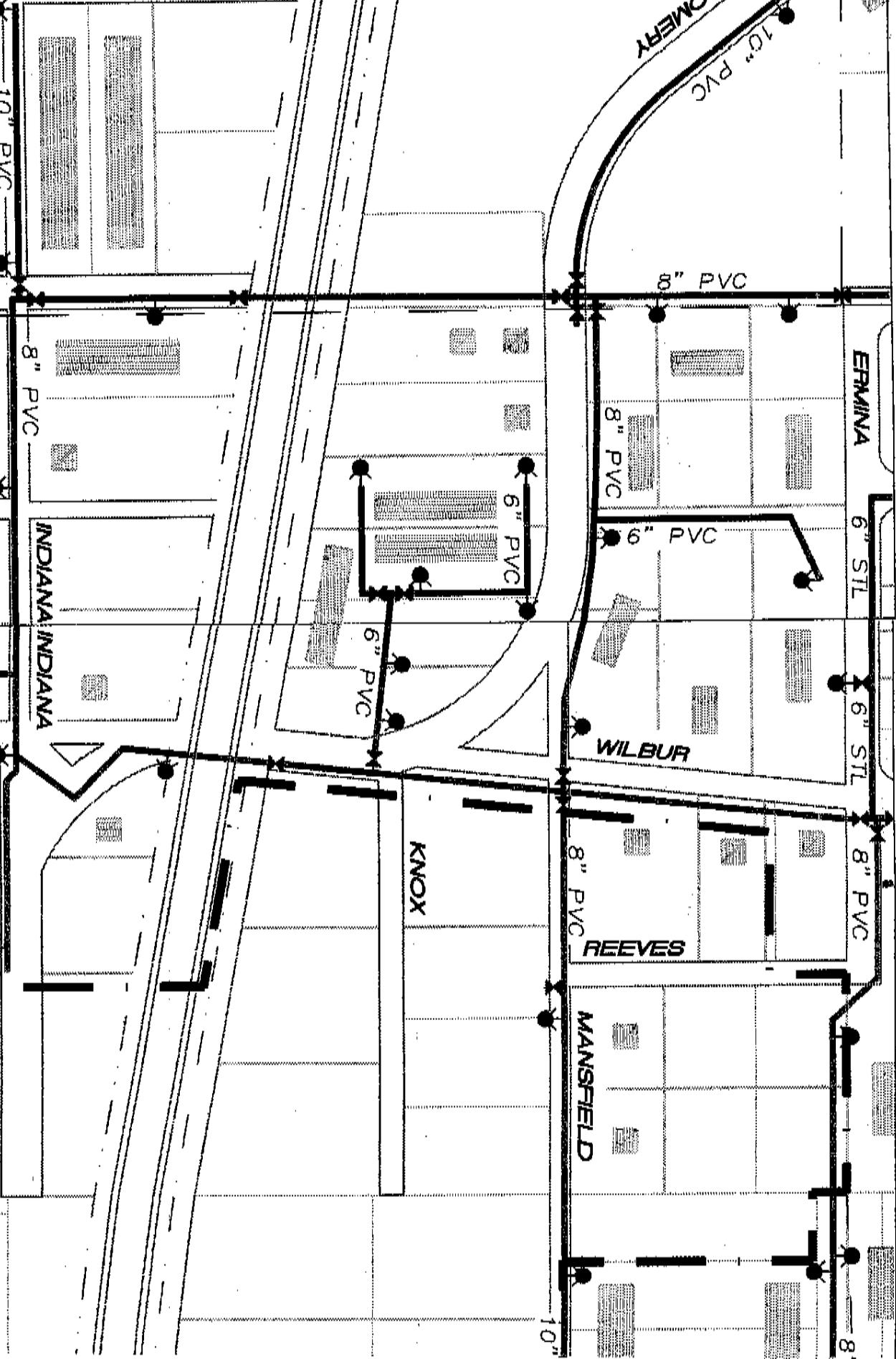
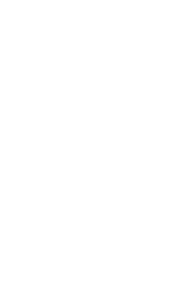
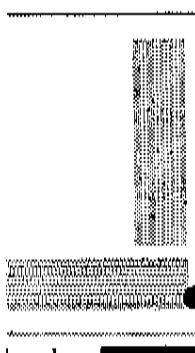
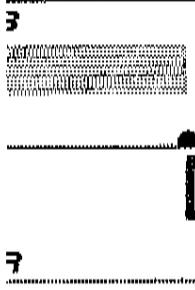
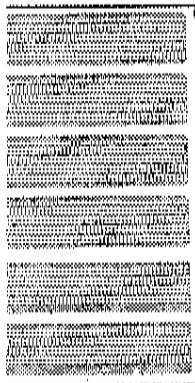
6" STL

6" STL

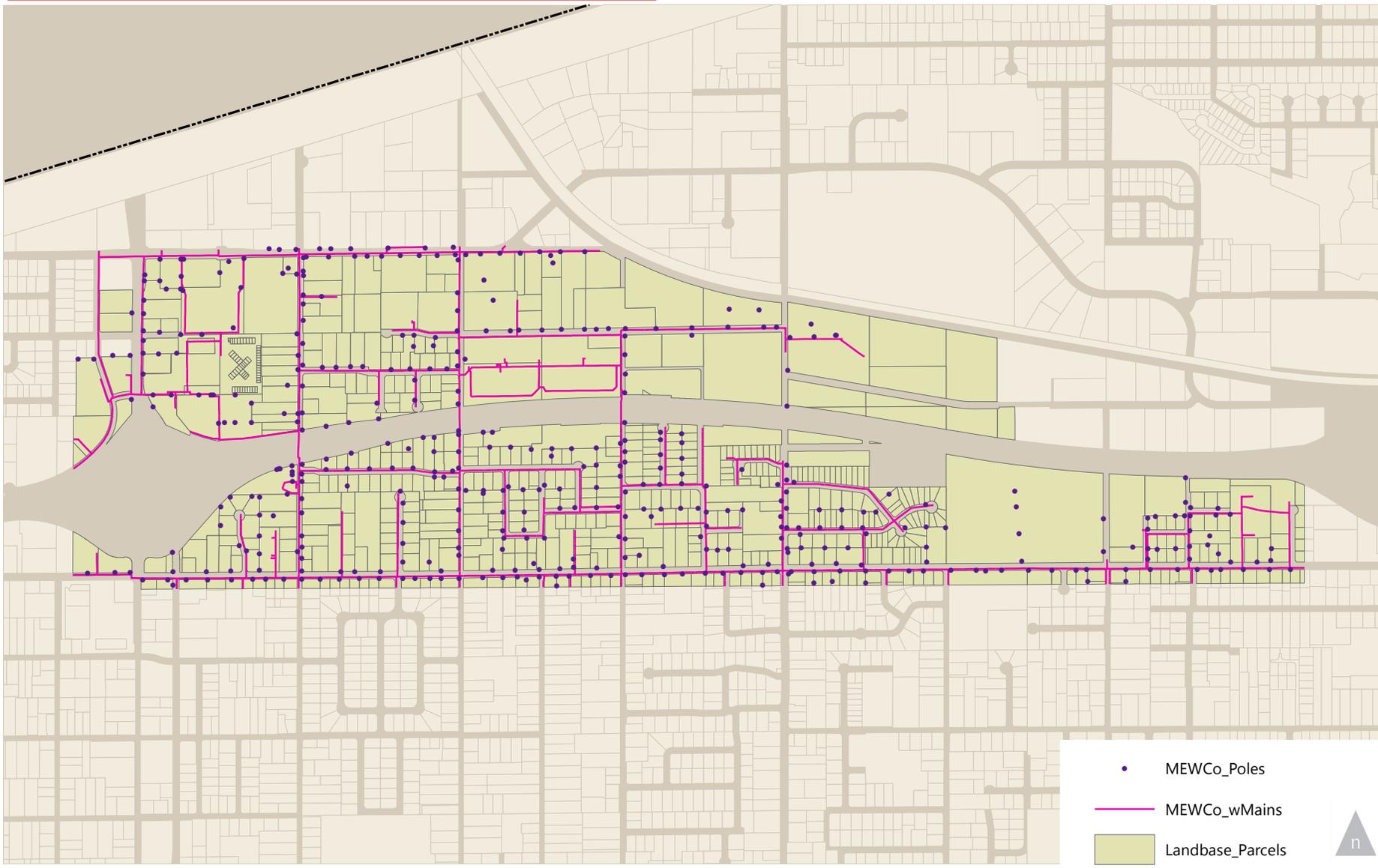
8" PVC

8" PVC

10" PVC



# Modern Electric & Water Co. - Water Mains & Power Lines



# Spokane County - Sewer Lines

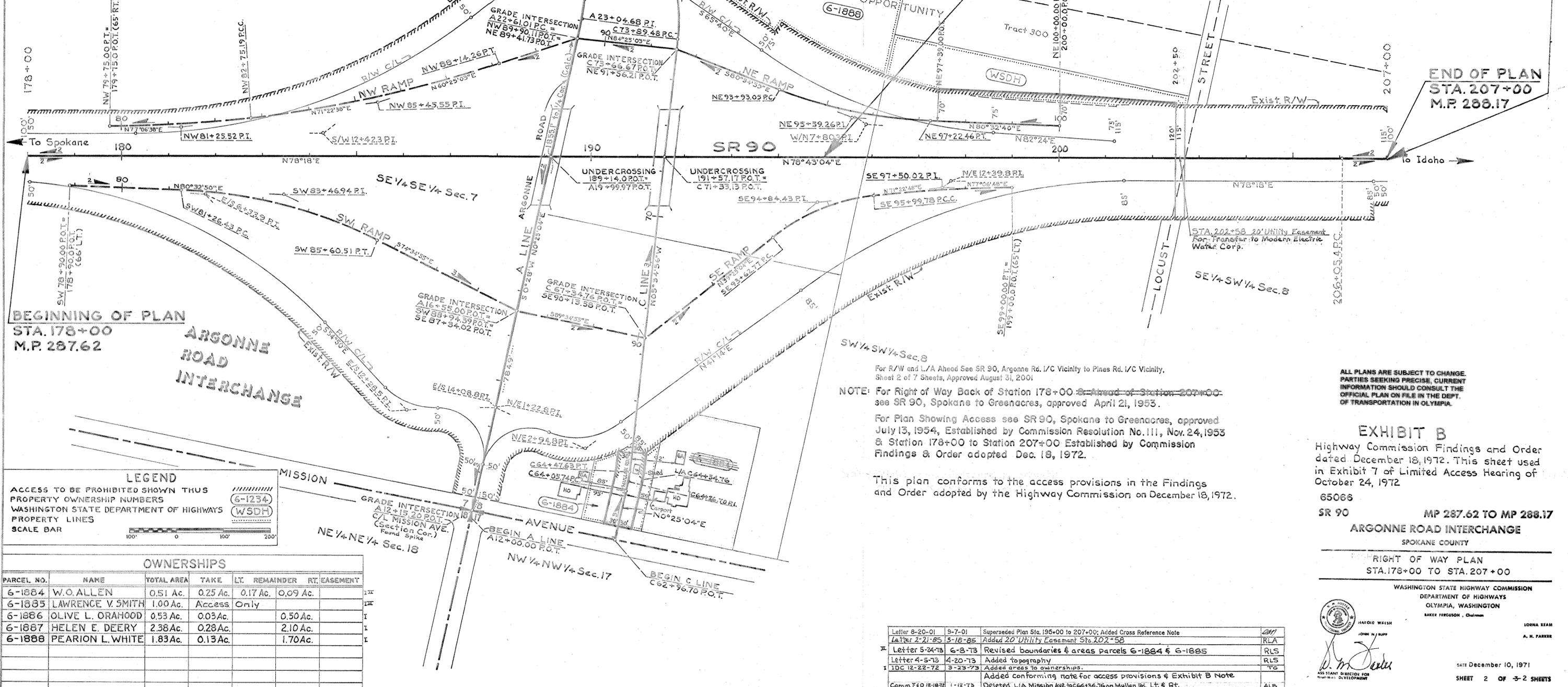
**Legend**

- Active Manholes
- Lift Station Facilities**
  - Construction Phase
  - Currently Active Sewer
- Gravity Mains**
  - Construction Phase
  - Currently Active Sewer
- Force Mains**
  - Construction Phase
  - Currently Active Sewer



CURVE DATA					
P.I. STATION	Δ	R	T	L	D
A23+04.68	5°00'04"LT	1000'	43.67'	87.29'	
A26+52.66	4°40'44"RT	1000'	40.86'	81.67'	
C64+26.70	6°00'00"LT	400'	20.96'	41.89'	
C74+96.66	30°00'00"LT	400'	107.18'	209.44'	
C78+22.17	35°40'40"RT	400'	128.73'	249.08'	
SW63+46.94	24°52'15"RT	1000'	220.51'	434.08'	
SE94+84.43	31°57'44"RT	425'	121.72'	237.08'	
SE97+50.02	5°44'00"RT	3000'	150.22'	300.20'	
NE95+59.26	18°52'25"LT	1000'	166.21'	329.41'	
NW81+25.22	5°44'00"LT	3000'	150.22'	300.20'	
NW85+45.55	10°57'35"LT	2818'	270.34'	539.04'	
S/W12+42.3	38°41'LT	1146.0'	402.3'	773.7'	5°00'
S/W19+82.8	39°09'LT	150.8'	53.6'	103.0'	38°00'
E/S14+28.5	46°23'LT	150.8'	64.6'	122.1'	38°00'
E/S14+08.8	101°41'RT	100.0'	122.8'	177.5'	
W/N0+98.2	66°08'LT	150.8'	98.2'	174.0'	38°00'
W/N7+80.3	31°56'LT	955.0'	273.3'	532.2'	6°00'
N/E1+22.8	101°41'RT	100.0'	122.8'	177.5'	
N/E2+94.8	60°55'LT	150.8'	88.7'	160.3'	38°00'
N/E12+39.8	37°04'RT	1146.0'	384.2'	741.3'	5°00'
227+79.4	21°29'RT	11,460.0'	2,174.0'	4,298.7'	0°30'

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
10	WASH.	I-90-6( )	



DATE	BY	REVISION

DATE	BY	REVISION

DATE	BY	REVISION

**BEGINNING OF PLAN**  
STA. 178+00  
M.P. 287.62

**ARGONNE ROAD INTERCHANGE**

**LEGEND**

ACCESS TO BE PROHIBITED THUS PROPERTY OWNERSHIP NUMBERS WASHINGTON STATE DEPARTMENT OF HIGHWAYS PROPERTY LINES

SCALE BAR

OWNERSHIPS					
PARCEL NO.	NAME	TOTAL AREA	TAKE	LT. REMAINDER	RT. EASEMENT
6-1884	W.O. ALLEN	0.51 Ac.	0.25 Ac.	0.17 Ac.	0.09 Ac.
6-1885	LAWRENCE V. SMITH	1.00 Ac.	Access	Only	
6-1886	OLIVE L. ORAHOOD	0.53 Ac.	0.03 Ac.		0.50 Ac.
6-1887	HELEN E. DEERY	2.38 Ac.	0.28 Ac.		2.10 Ac.
6-1888	PEARION L. WHITE	1.83 Ac.	0.13 Ac.		1.70 Ac.

**NOTE:** For Right of Way Back of Station 178+00 to Station 207+00 see SR 90, Spokane to Greenacres, approved April 21, 1953.

For Plan Showing Access see SR 90, Spokane to Greenacres, approved July 13, 1954, Established by Commission Resolution No. 111, Nov. 24, 1953 & Station 178+00 to Station 207+00 Established by Commission Findings & Order adopted Dec. 18, 1972.

This plan conforms to the access provisions in the Findings and Order adopted by the Highway Commission on December 18, 1972.

**ALL PLANS ARE SUBJECT TO CHANGE.** PARTIES SEEKING PRECISE, CURRENT INFORMATION SHOULD CONSULT THE OFFICIAL PLAN ON FILE IN THE DEPT. OF TRANSPORTATION IN OLYMPIA.

**EXHIBIT B**  
Highway Commission Findings and Order dated December 18, 1972. This sheet used in Exhibit 7 of Limited Access Hearing of October 24, 1972.

65066  
SR 90 MP 287.62 TO MP 288.17  
**ARGONNE ROAD INTERCHANGE**  
SPOKANE COUNTY

**RIGHT OF WAY PLAN**  
STA. 178+00 TO STA. 207+00

WASHINGTON STATE HIGHWAY COMMISSION  
DEPARTMENT OF HIGHWAYS  
OLYMPIA, WASHINGTON  
BAKES FERGUSON, Chairman

DATE December 10, 1971  
SHEET 2 OF 3-2 SHEETS

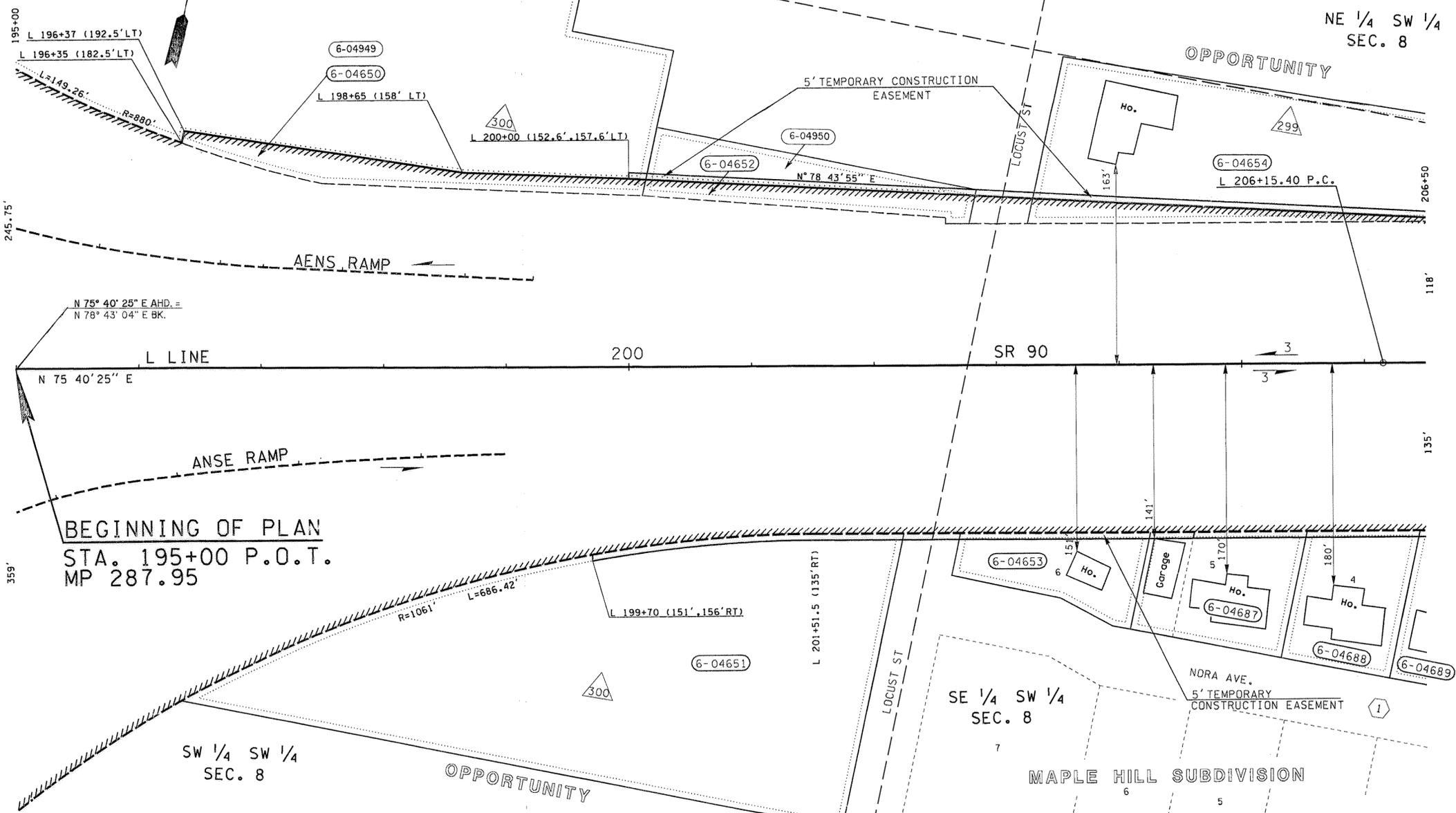
NO.	DATE	DESCRIPTION	BY
1	Letter 8-20-01	9-7-01 Superseded Plan Sta. 195+00 to 207+00; Added Cross Reference Note	AM
2	Letter 2-21-85	5-18-85 Added 20' Utility Easement Sta. 202+58	RLA
3	Letter 5-24-73	6-8-73 Revised boundaries & areas parcels 6-1884 & 6-1885	RLS
4	Letter 4-5-73	4-20-73 Added topography	RLS
5	IDC 12-22-72	3-23-73 Added areas to ownerships.	TG
6	Comm. File 12-18-72	1-12-73 Added conforming note for access provisions & Exhibit B Note	ALB
7	Authority	Deleted L/A Mission Ave. to C64+154.76 on Mullen Rd. Lt. & Rt.	BY

CURVE DATA				
P.I. STATION	DELTA	RADIUS	TANGENT	LENGTH
L 227+86.46	21° 27' 17" RT	11460'	2171.06'	4291.26'

T.25N. R.44E. W.M.

NW 1/4 SW 1/4 SEC. 8

NE 1/4 SW 1/4 SEC. 8



TO SPOKANE

TO IDAHO

BEGINNING OF PLAN  
STA. 195+00 P.O.T.  
MP 287.95

FOR RIGHT OF WAY WESTERLY SEE SR 90, ARGONNE ROAD INTERCHANGE, SHEET 2 OF 2 SHEETS, DATED DECEMBER 10, 1971

FOR LIMITED ACCESS WESTERLY SEE SR 90, SPOKANE TO GREENACRES PLAN SHOWING ACCESS, SHEET 2 OF 5 SHEETS, APPROVED JULY 13, 1954

SW 1/4 SW 1/4 SEC. 8

SE 1/4 SW 1/4 SEC. 8

MAPLE HILL SUBDIVISION

SR 90  
ARGONNE RD. I/C VICINITY  
TO PINES RD. I/C VICINITY

SPOKANE COUNTY

RIGHT OF WAY AND LIMITED ACCESS PLAN  
FULL CONTROL  
MP 287.95 TO MP 288.17  
STATION 195+00 TO STATION 206+50  
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
OLYMPIA, WASHINGTON

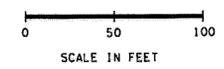
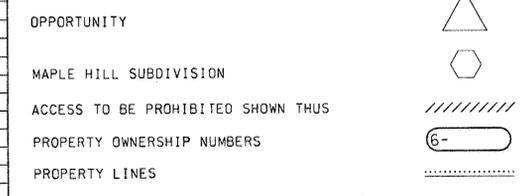
\* CALCULATED TOTAL AREAS

THIS PLAN SUPERSEDES SHEET 2 OF 2 SHEETS OF SR 90, ARGONNE ROAD INTERCHANGE, DATED DECEMBER 10, 1971 AND SHEET 2 OF 5 SHEETS OF SR 90, SPOKANE TO GREENACRES PLAN SHOWING ACCESS, APPROVED JULY 13, 1954

ALL PLANS ARE SUBJECT TO CHANGE. PARTIES SEEKING PRECISE, CURRENT INFORMATION SHOULD CONSULT THE OFFICIAL PLAN ON FILE IN THE DEPT. OF TRANSPORTATION IN OLYMPIA.

● TEMPORARY CONSTRUCTION EASEMENT

LEGEND



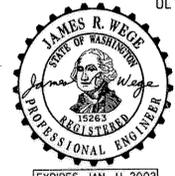
PARCEL NO.	NAME	TOTAL AREA	R/W	LT. REMAINDER RT.	EASM'T
6-04950	W.E. & C.M. THOMAS	6705 SF			1349 SF ●
6-04949	BOND STREET ASSOC. LLC	221073 SF			70 SF ●
6-04689	PATRICIA DUNPHY	11558 SF *			200 SF ●
6-04688	JUDY K. ROGERS	10285 SF			460 SF ●
6-04687	DONNA L. & JAMES S. BLUE	11659 SF			642 SF ●
6-04654	DENNIS & CINDEE FLYNN	39833 SF *	3904 SF	35929 SF	1845 SF ●
6-04653	MARY K. ALLEN	8304 SF *			793 SF ●
6-04652	W.E. & C.M. THOMAS	10977 SF *	4272 SF	6705 SF	1349 SF ●
6-04651	MODERN ELEC. WTR. CO.	87000 SF			1270 SF ●
6-04650	BOND STREET ASSOC. LLC	227822 SF	6749 SF	221073 SF	70 SF ●

NOTE: TOTAL AREA IS FROM ASSESSOR'S RECORDS UNLESS OTHERWISE NOTED

OWNERSHIPS

ALL AREAS ARE SHOWN IN SQUARE FEET UNLESS OTHERWISE NOTED

Reference	Approval	Revision Description	HEP	By
Letter 3-02-04	3-12-04	Added parcels 6-04949 and 6-04950		
Letter 5-21-03	6-13-03	Added Bearing Equation		



RIGHT OF WAY PLANS ENGINEER  
ESTABLISHED BY COMMISSION FINDINGS AND ORDER ADOPTED DECEMBER 18, 1972

R/W D-12 SR90/702

C:\AAwork\sr90\ARGONNE RD I C RW.dgn PLOT11 08/30/2001 03:47:30 PM Cochraa

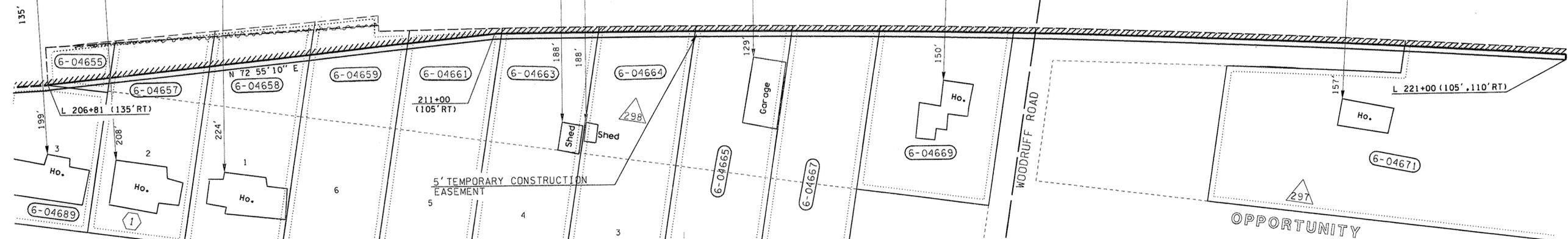
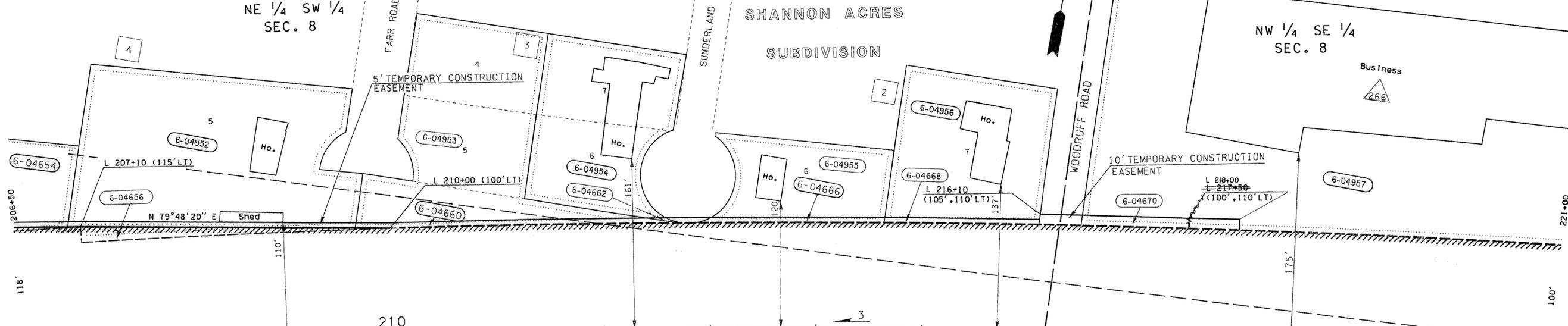
T.25N. R.44E. W.M.

P.I. STATION	DEL TA	RADIUS	TANGENT	LENGTH
L 227+86.46	21° 27' 17" RT	11460'	2171.06'	4291.26'

NE 1/4 SW 1/4 SEC. 8

SHANNON ACRES SUBDIVISION

NW 1/4 SE 1/4 SEC. 8



MAPLE HILL SUBDIVISION

SW 1/4 SE 1/4 SEC. 8

ALL PLANS ARE SUBJECT TO CHANGE. PARTIES SEEKING PRECISE, CURRENT INFORMATION SHOULD CONSULT THE OFFICIAL PLAN ON FILE IN THE DEPT. OF TRANSPORTATION IN OLYMPIA.

SR 90  
ARGONNE RD. I/C VICINITY  
TO PINES RD. I/C VICINITY

SPOKANE COUNTY  
RIGHT OF WAY AND LIMITED ACCESS PLAN  
FULL CONTROL  
MP 288.17 TO MP 288.44  
STATION 206+50 TO STATION 221+00  
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
OLYMPIA, WASHINGTON



APPROVED AUGUST 31, 2001  
PLANS ENGINEER  
SHEET 3 OF 7 SHEETS  
ESTABLISHED BY COMMISSION FINDINGS AND ORDER ADOPTED DECEMBER 18, 1972

● TEMPORARY CONSTRUCTION EASEMENT

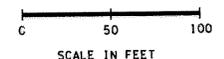
WOOD LO HEIGHTS

PARCEL NO.	NAME	TOTAL AREA	R/W	LT.	REMAINDER RT.	EASM'T
6-04957	IGC PROPERTIES LLC	171370 SF				
6-04956	GARY D. & JOAN M. WALTER	20425 SF				
6-04955	DONALD R. & JUDY B. MILLER	11641 SF				
6-04954	D.E. & B.L. TORSKI	20320 SF				
6-04953	R.L. & L.J. SIMPSON	27679 SF				
6-04952	VIRGINIA M. WATTS	36836 SF				
6-04689	SEE SHEET 2					
6-04671	JUDY K. MADDEN	76912 SF	* 2489 SF		74423 SF	750 SF
6-04670	IGC PROPERTIES LLC	171370 SF	*			1515 SF
6-04669	DAVID & CAREENA CORNETT	19065 SF	620 SF		18445 SF	620 SF
6-04668	GARY D. & JOAN M. WALTER	20425 SF	*			850 SF
6-04667	ALVIN A. SEVERSON	23086 SF	404 SF		22682 SF	404 SF
6-04666	DONALD R. & JUDY B. MILLER	11641 SF	*			710 SF
6-04665	R. L. & D. F. TWEEDY	24491 SF	448 SF		24043 SF	448 SF
6-04664	DOUGLAS L. HOWE	22063 SF	* 448 SF		21615 SF	448 SF
6-04663	LA CHAPELLE FAMILY TRUST	20481 SF	455 SF		20026 SF	448 SF
6-04662	D. E. & B. L. TORSKI	20320 SF				47 SF
6-04661	V.R. & F.E. ERHART	19429 SF	712 SF		18717 SF	440 SF
6-04660	R. L. & L. J. SIMPSON	27702 SF	* 23 SF	27679 SF		1453 SF
6-04659	ROBERT E. KENNEDY	19599 SF	* 2035 SF		17564 SF	455 SF
6-04658	MARCUS & KIMBERLY HICKS	18900 SF	2701 SF		16199 SF	465 SF
6-04657	DONALD L. & B. L. LYNCH	17100 SF	2936 SF		14164 SF	465 SF
6-04656	VIRGINIA M. WATTS	38834 SF	* 1998 SF	36836 SF		1363 SF
6-04655	M. E. & J. L. SCHOEFF	2449 SF	* 2059 SF		390 SF	239 SF
6-04654	SEE SHEET 2					

\* CALCULATED TOTAL AREAS  
THIS PLAN SUPERSEDES R/W PLAN SHEET 8 OF 25 SHEETS OF SR 90, SPOKANE TO GREENACRES, APPROVED APRIL 21, 1953 AND L/A PLAN SHEETS 2 AND 3 OF 5 SHEETS OF SR 90, SPOKANE TO GREENACRES PLAN SHOWING ACCESS, APPROVED JULY 13, 1954

LEGEND

- SHANNON ACRES SUBDIVISION
- WOOD LO HEIGHTS
- OPPORTUNITY
- MAPLE HILL SUBDIVISION
- ACCESS TO BE PROHIBITED SHOWN THUS
- PROPERTY OWNERSHIP NUMBERS
- PROPERTY LINES



Letter	Date	Approval	Revision Description	By
Letter 3-02-04	3-12-04		Added parcels 6-04952 thru 6-04957	HEP
Letter 8-26-02	9-6-02		Corrected Areas and Boundaries Parcels 6-04655, 6-04657 thru 6-04659	
Letter 10-29-01	11-9-01		Revised Temporary Construction Easement on Lt. Sta. L 217+50 to L 218+00; Revised Area Parcel 6-04670	
Reference	Approval		Revision Description	By

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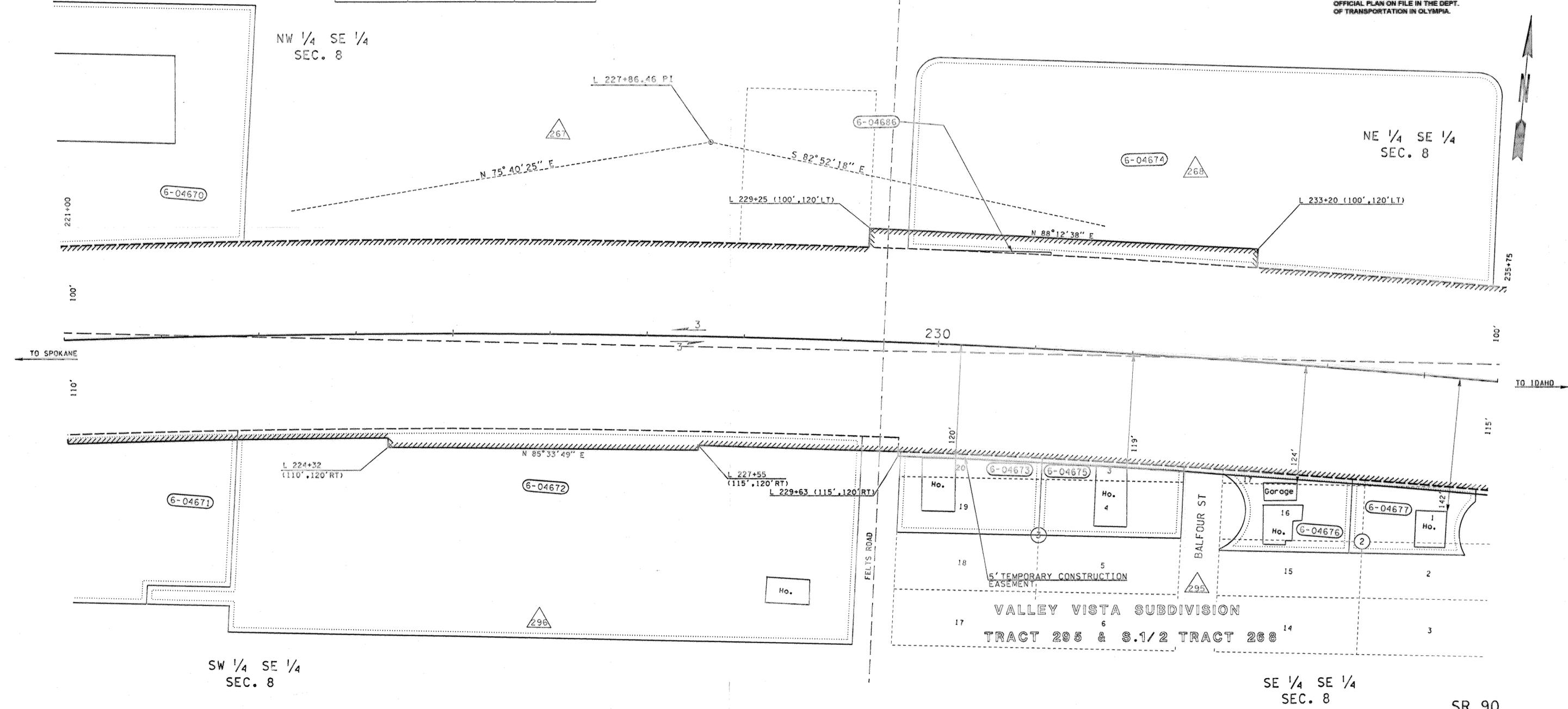
R/W SR 90/702 D-1

C:\AA\Work\sr90\ARGONNE RD I C RW.dgn PLOT13 08/30/2001 03:46:36 PM Cochraa

CURVE DATA				
P.I. STATION	DELTA	RADIUS	TANGENT	LENGTH
L 227+86.46	21°27'17"RT	11460'	2171.06'	4291.26'

T.25N. R.44E. W.M.

ALL PLANS ARE SUBJECT TO CHANGE. PARTIES SEEKING PRECISE, CURRENT INFORMATION SHOULD CONSULT THE OFFICIAL PLAN ON FILE IN THE DEPT. OF TRANSPORTATION IN OLYMPIA.



THIS PLAN SUPERSEDES R/W PLAN SHEET 8 OF 25 SHEETS OF SR 90, SPOKANE TO GREENACRES, APPROVED APRIL 21, 1953 AND L/A PLAN SHEETS 2 AND 3 OF 5 SHEETS OF SR 90, SPOKANE TO GREENACRES PLAN SHOWING ACCESS, APPROVED JULY 13, 1954  
 \* CALCULATED TOTAL AREAS

SR 90  
 ARGONNE RD. I/C VICINITY  
 TO PINES RD. I/C VICINITY

SPOKANE COUNTY  
 RIGHT OF WAY AND LIMITED ACCESS PLAN  
 FULL CONTROL  
 MP 288.44 TO MP 288.72  
 STATION 221+00 TO STATION 235+75  
 WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
 OLYMPIA, WASHINGTON



APPROVED AUGUST 31, 2001  
 PLANS ENGINEER SHEET 4 OF 7 SHEETS  
 ESTABLISHED BY COMMISSION FINDINGS AND ORDER ADOPTED DECEMBER 18, 1972

**LEGEND**

- VALLEY VISTA SUBDIVISION (Circle symbol)
- OPPORTUNITY (Triangle symbol)
- ACCESS TO BE PROHIBITED SHOWN THUS (Hatched area symbol)
- PROPERTY OWNERSHIP NUMBERS (Numbered box symbol)
- PROPERTY LINES (Dashed line symbol)

SCALE IN FEET  
 0 50 100

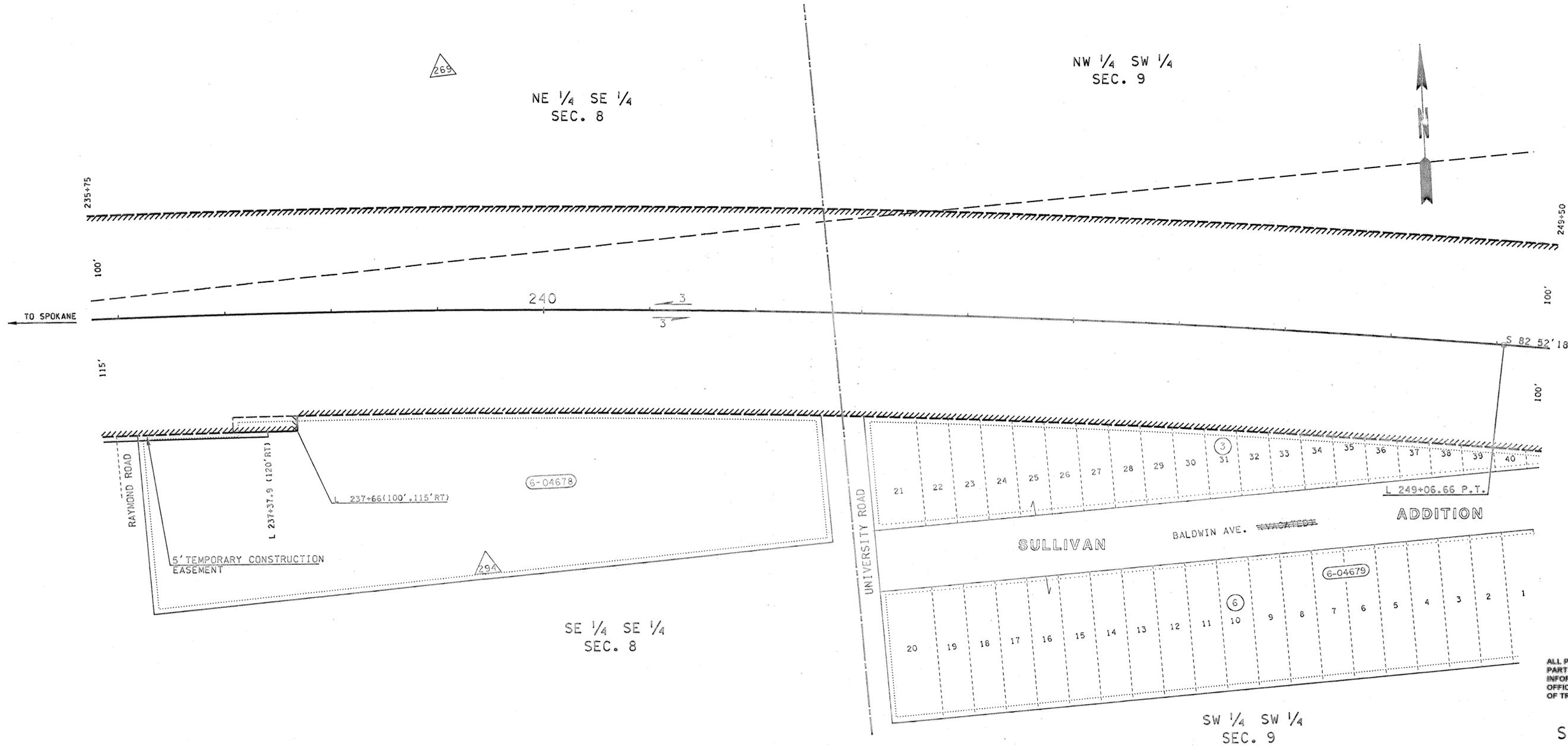
PARCEL NO.	NAME	TOTAL AREA	R/W	LT. REMAINDER RT.	EASM'T
6-04686	DOROTHY DUPRIE	164 SF *	164 SF		
6-04677	KING (STAZEL)	8853 SF *			636 SF
6-04676	B & A CHRISTENSEN	9564 SF *			665 SF
6-04675	JASON J. CHARETTE	11566 SF *			730 SF
6-04674	MAX SPALDING	126605 SF *	6742 SF	119863 SF	
6-04673	D. E. & G. C. CUMMINGS	12268 SF *			730 SF
6-04672	MAURICE & ELAINE FLYNN	135036 SF	10767 SF	124269 SF	
6-04671	SEE SHEET 2				
6-04670	SEE SHEET 2				

NOTE: TOTAL AREA IS FROM ASSESSOR'S RECORDS UNLESS OTHERWISE NOTED

CURVE DATA				
P.I. STATION	DELTA	RADIUS	TANGENT	LENGTH
L 227+86.46	21° 27' 17" RT	11460'	2171.06'	4291.26'

T.25N. R.44E. W.M.

C:\AA\work\sr90\ARGONNE RD I C RW.dgn PLOT14 08/30/2001 03:46:21 PM Cochra



ALL PLANS ARE SUBJECT TO CHANGE. PARTIES SEEKING PRECISE, CURRENT INFORMATION SHOULD CONSULT THE OFFICIAL PLAN ON FILE IN THE DEPT. OF TRANSPORTATION IN OLYMPIA.

\* CALCULATED TOTAL AREAS  
 THIS PLAN SUPERSEDES R/W PLAN SHEETS 8 AND 9 OF 25 SHEETS OF SR 90, SPOKANE TO GREENACRES, APPROVED APRIL 21, 1953 AND L/A PLAN SHEETS 3 OF 5 SHEETS OF SR 90, SPOKANE TO GREENACRES PLAN SHOWING ACCESS, APPROVED JULY 13, 1954

**LEGEND**

- SULLIVAN ADDITION
- OPPORTUNITY
- ACCESS TO BE PROHIBITED SHOWN THUS
- PROPERTY OWNERSHIP NUMBERS
- PROPERTY LINES

SCALE IN FEET  
 0 50 100

PARCEL NO.	NAME	TOTAL AREA	R/W	LT. REMAINDER RT.	EASM T
6-04679	THELMA S. SPALDING	313101 SF	78432 SF		234669 SF
6-04678	THELMA S. SPALDING	101320 SF * 909 SF		100411 SF	610 SF

NOTE: TOTAL AREA IS FROM ASSESSOR'S RECORDS UNLESS OTHERWISE NOTED

SR 90  
 ARGONNE RD. I/C VICINITY  
 TO PINES RD. I/C VICINITY  
 SPOKANE COUNTY  
 RIGHT OF WAY AND LIMITED ACCESS PLAN  
 FULL CONTROL  
 MP 288.72 TO MP 268.98  
 STATION 235+75 TO STATION 249+50  
 WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
 OLYMPIA, WASHINGTON



EXPIRES JAN. 11, 2002  
 RIGHT OF WAY  
 PLANS ENGINEER  
 ESTABLISHED BY COMMISSION FINDINGS AND ORDER ADOPTED DECEMBER 18, 1972

Letter	Reference	Approval	Revision	Description
I-2-02	I-18-02			Noted Baldwin Ave. as Not Vacated; Revised Boundary and Areas Parcel 6-04679

R/W SR 90/902

C:\AAWork\sr90\ARGONNE RD I C RW.dgn

PLOT15

08/30/2001 03:46:06 PM

Cochraa

SCANNED

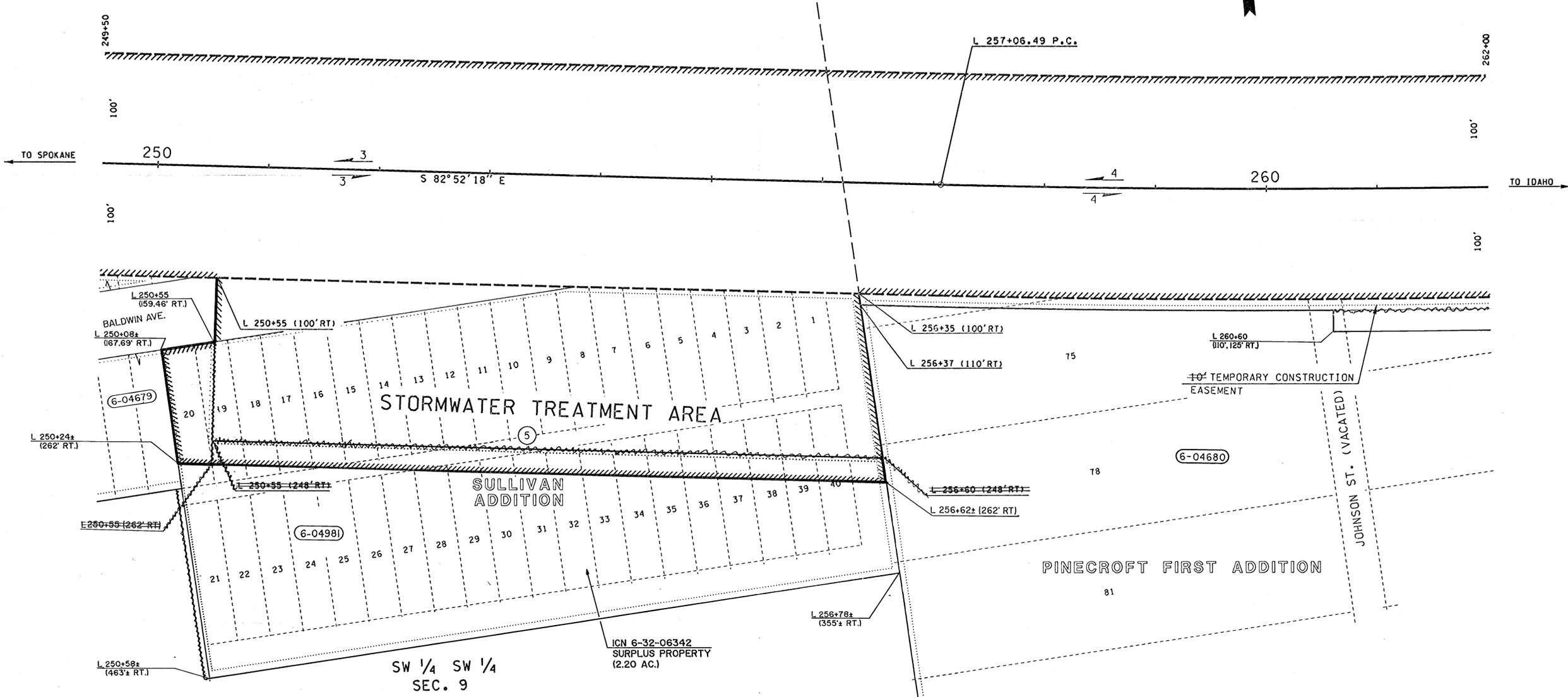
CURVE DATA				
P.I. STATION	DELTA	RADIUS	TANGENT	LENGTH
L 268+26.00	11 09' 32" LT	11460'	1119.51'	2231.94'

NW 1/4 SW 1/4  
SEC. 9

T.25N. R.44E. W.M.

SE 1/4 SW 1/4  
SEC. 9

ALL PLANS ARE SUBJECT TO CHANGE.  
OWNERSHIP SHOULD BE VERIFIED.  
PROPOSED PROPERTY RIGHTS SHOWN  
MAY NOT HAVE BEEN ACQUIRED. PARTIES  
SEEKING CURRENT INFORMATION SHOULD  
CONSULT THE DEPARTMENT OF  
TRANSPORTATION HEADQUARTERS RIGHT  
OF WAY PLANS OFFICE FOR THE OFFICIAL  
PLAN ON FILE.



● TEMPORARY CONSTRUCTION EASEMENT

THIS PLAN SUPERSEDES R/W PLAN SHEET 9 OF 25 SHEETS OF SR 90, SPOKANE TO GREENACRES, APPROVED APRIL 21, 1953 AND L/A PLAN SHEETS 3 OF 5 SHEETS OF SR 90, SPOKANE TO GREENACRES PLAN SHOWING ACCESS, APPROVED JULY 13, 1954

**LEGEND**

SULLIVAN ADDITION

ACCESS TO BE PROHIBITED SHOWN THUS

PROPERTY OWNERSHIP NUMBERS

PROPERTY LINES

SCALE IN FEET

0 50 100

PARCEL NO.	NAME	TOTAL AREA	R/W	LT. REMAINDER RT.	EASM'T
6-04981	WSDOT	106608 SF	8487 SF	98121 SF	
6-04680	SPOKANE COUNTY	980025 SF		19174 SF ●	
6-04679	SEE SHEET 5				

NOTE: TOTAL AREA IS FROM ASSESSOR'S RECORDS UNLESS OTHERWISE NOTED

**OWNERSHIPS**

ALL AREAS ARE SHOWN IN SQUARE FEET UNLESS OTHERWISE NOTED

Reference	Approval	Revision Description	CM
Letter 2-15-12	2-16-12	Added "L" to Stationing on Rt. Sta. L 250+08 to L 256+78	0/2
Letter 10-27-10	1-5-12	Revised R/W & L/A on Rt. Sta. 250+08 to 250+55, Added ICN 6-32-06342, Added Ownership Verification Note	0/2
Letter 12-21-05	12-30-05	Revised R/W and L/A on Rt. Sta. L250+55 to L256+62; Added parcel 6-04981	
Letter 1-2-02	1-18-02	Noted Baldwin Ave.; Revised Boundary Parcel 6-04679	
Letter 10-29-01	11-9-01	Revised Temporary Construction Easement on Rt. Sta. L 260+60 to L 262+00; Revised Area Parcel 6-04680	

SR 90  
ARGONNE RD. I/C VICINITY  
TO PINES RD. I/C VICINITY  
SPOKANE COUNTY  
RIGHT OF WAY AND LIMITED ACCESS PLAN  
FULL CONTROL  
MP 288.98 TO MP 289.22  
STATION 249+50 TO STATION 262+00  
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
OLYMPIA, WASHINGTON



EXPIRES JAN. 11, 2002

RIGHT OF WAY PLANS ENGINEER

APPROVED AUGUST 31, 2001

SHEET 6 OF 7 SHEETS

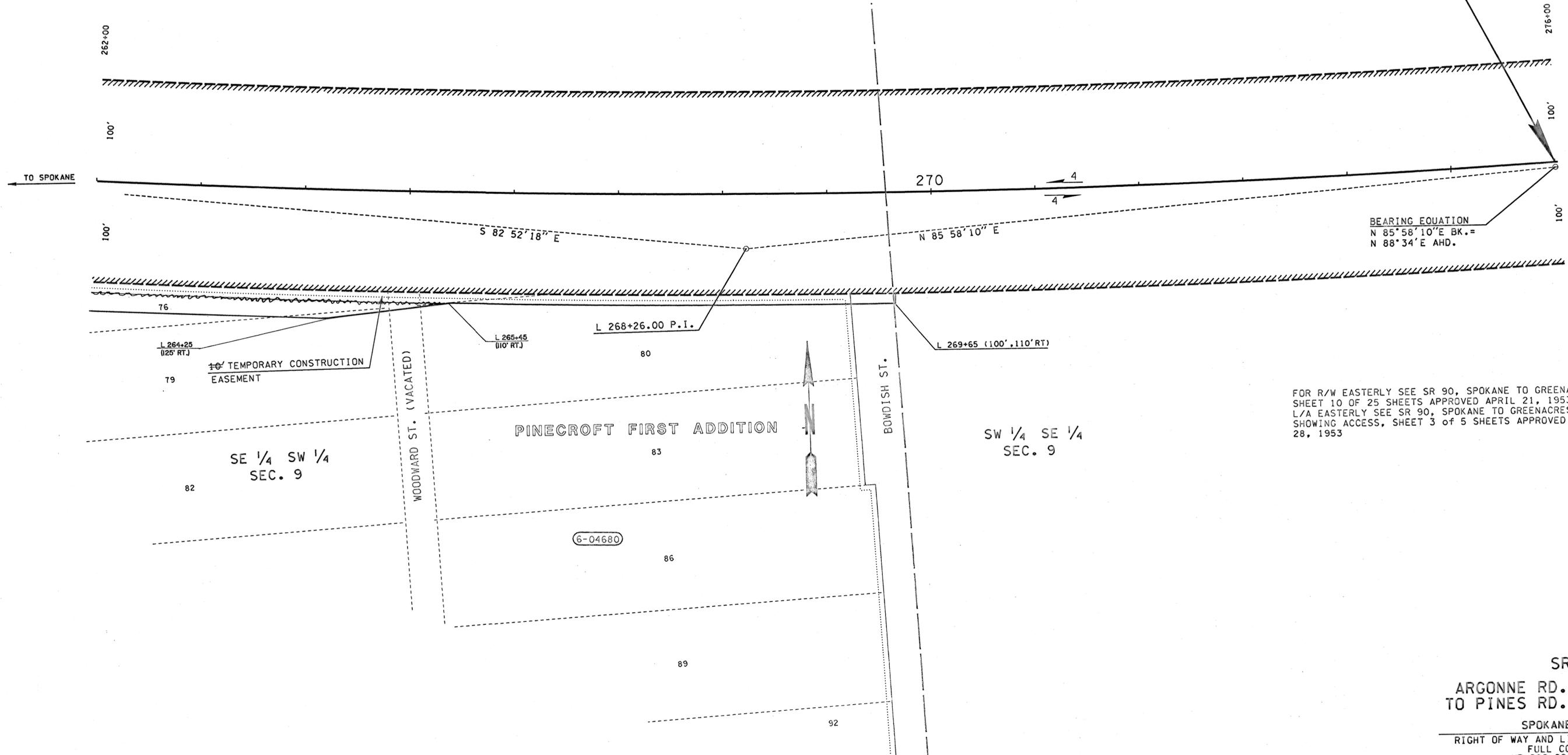
ESTABLISHED BY COMMISSION FINDINGS AND ORDER ADOPTED DECEMBER 18, 1972

CURVE DATA				
P.I. STATION	DELTA	RADIUS	TANGENT	LENGTH
L 268+26.00	11 09' 32" LT	11460'	1119.51'	2231.94'

T.25N. R.44E. W.M.

END OF PLAN  
 STA. 276+00 P.O.C. BK.=  
 STA. 276+07.66 P.O.C. AHD.  
 MP 289.48

C:\AAWork\sf90\ARGONNE RD I C RW.dgn PLOT16 08/30/2001 03:45:55 PM Cochraa



FOR R/W EASTERLY SEE SR 90, SPOKANE TO GREENACRES, SHEET 10 OF 25 SHEETS APPROVED APRIL 21, 1953 AND L/A EASTERLY SEE SR 90, SPOKANE TO GREENACRES PLAN SHOWING ACCESS, SHEET 3 OF 5 SHEETS APPROVED APRIL 28, 1953

SR 90  
 ARGONNE RD. I/C VICINITY  
 TO PINES RD. I/C VICINITY

SPOKANE COUNTY  
 RIGHT OF WAY AND LIMITED ACCESS PLAN  
 FULL CONTROL  
 MP 289.22 TO MP 289.48  
 STATION 262+00 TO STATION 276+00  
 WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
 OLYMPIA, WASHINGTON



APPROVED AUGUST 31, 2001  
 RIGHT OF WAY PLANS ENGINEER SHEET 7 OF 7 SHEETS  
 ESTABLISHED BY COMMISSION FINDINGS AND ORDER ADOPTED DECEMBER 18, 1972

THIS PLAN SUPERSEDES R/W PLAN SHEET 9 OF 25 SHEETS OF SR 90, SPOKANE TO GREENACRES, APPROVED APRIL 21, 1953 AND L/A PLAN SHEETS 3 OF 5 SHEETS OF SR 90, SPOKANE TO GREENACRES PLAN SHOWING ACCESS, APPROVED JULY 13, 1954

**LEGEND**

ACCESS TO BE PROHIBITED SHOWN THUS

PROPERTY OWNERSHIP NUMBERS

PROPERTY LINES

SCALE IN FEET  
 0 50 100

ALL PLANS ARE SUBJECT TO CHANGE. PARTIES SEEKING PRECISE, CURRENT INFORMATION SHOULD CONSULT THE OFFICIAL PLAN ON FILE IN THE DEPT. OF TRANSPORTATION IN OLYMPIA.

PARCEL NO.	NAME	TOTAL AREA	R/W	LT. REMAINDER RT.	EASM' T
6-04680	SEE SHEET 6				

NOTE: TOTAL AREA IS FROM ASSESSOR'S RECORDS UNLESS OTHERWISE NOTED

**OWNERSHIPS**

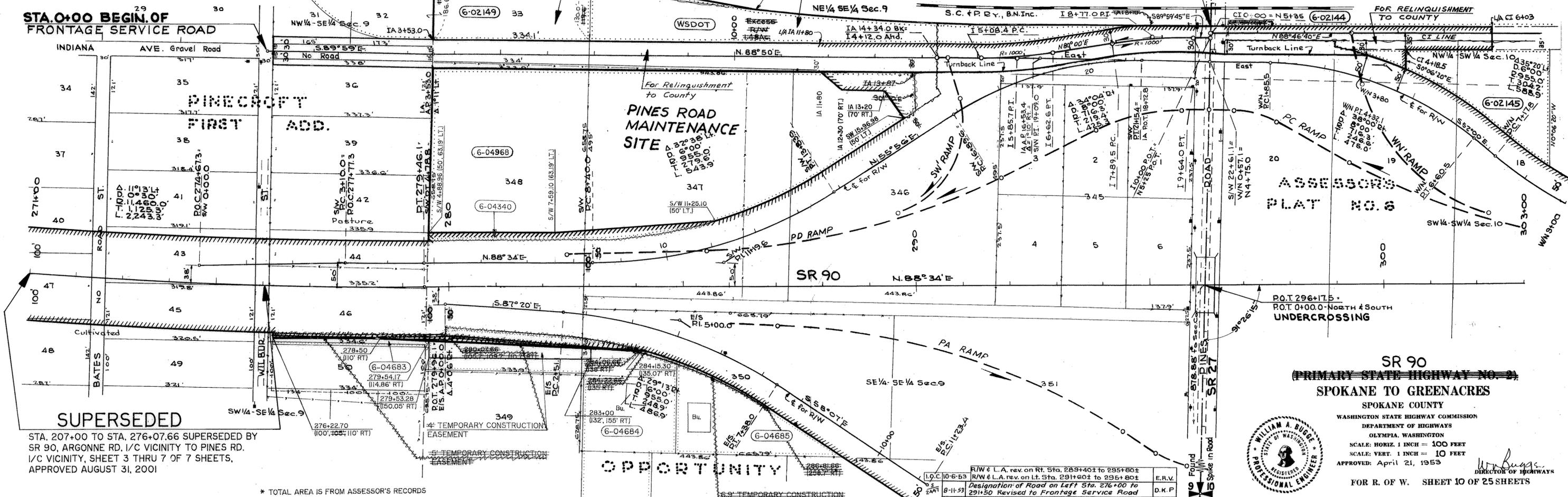
Letter	Date	Reference	Approval	Revision Description
Letter 10-29-01	11-9-01	Revised Temporary Construction Easement on Rt. Sta. L 262+00 to L 265+45		

STA. 0+00 BEGIN OF FRONTAGE SERVICE ROAD

PINES ROAD PARK & RIDE LOT

LIMIT OF PLAN STA. N 5+50± P.O.T. BK. = SR 27 STA. 67+49.18 P.O.T. (12' LT.) AHD.

FOR R/W NORTHERLY, SEE SR 27, SR 90 TO SR 290, SHEET 2 OF 5, APPROVED AND ADOPTED JANUARY 11, 2002  
FOR R/W NORTHERLY, SEE SR 27, JCT. SR 90 TO JCT. SR 290, SHEET 1 OF 1 SHEET, ADOPTED AUGUST 10, 1995



SUPERSEDED

STA. 207+00 TO STA. 276+07.66 SUPERSEDED BY SR 90, ARGONNE RD. I/C VICINITY TO PINES RD. I/C VICINITY, SHEET 3 THRU 7 OF 7 SHEETS, APPROVED AUGUST 31, 2001

\* TOTAL AREA IS FROM ASSESSOR'S RECORDS  
△ TEMPORARY CONSTRUCTION EASEMENT

PARCEL NO.	NAME	TOTAL AREA	R/W	LT. REMAINDER RT.	EASEMENT
6-02144	Burlington Northern Inc.	Undetermined	Access Only		
6-02145	C.K. Barbo et al.	45,417 S.F.	20,705 S.F.	43,347 S.F.	
6-02149	Patricia B. Culley et al.	2.49 AC.	1.07 AC.	1.42 AC.	
6-04340	WSDOT	307,818 S.F.	9,290 S.F.	298,528 S.F.	
6-04683	JOE & PEARL KREMSREITER	8803 SF	3592 SF	5211 SF	
6-04684	CORNERSTONE APTS. INC.	108780 SF*	9391 SF	99389 SF	△ 10079 SF
6-04685	NOT USED				
6-04968	WSDOT	298,528 S.F.	9,496 S.F.	289,032 S.F.	

SR 90 PRIMARY STATE HIGHWAY NO. 2 SPOKANE TO GREENACRES SPOKANE COUNTY

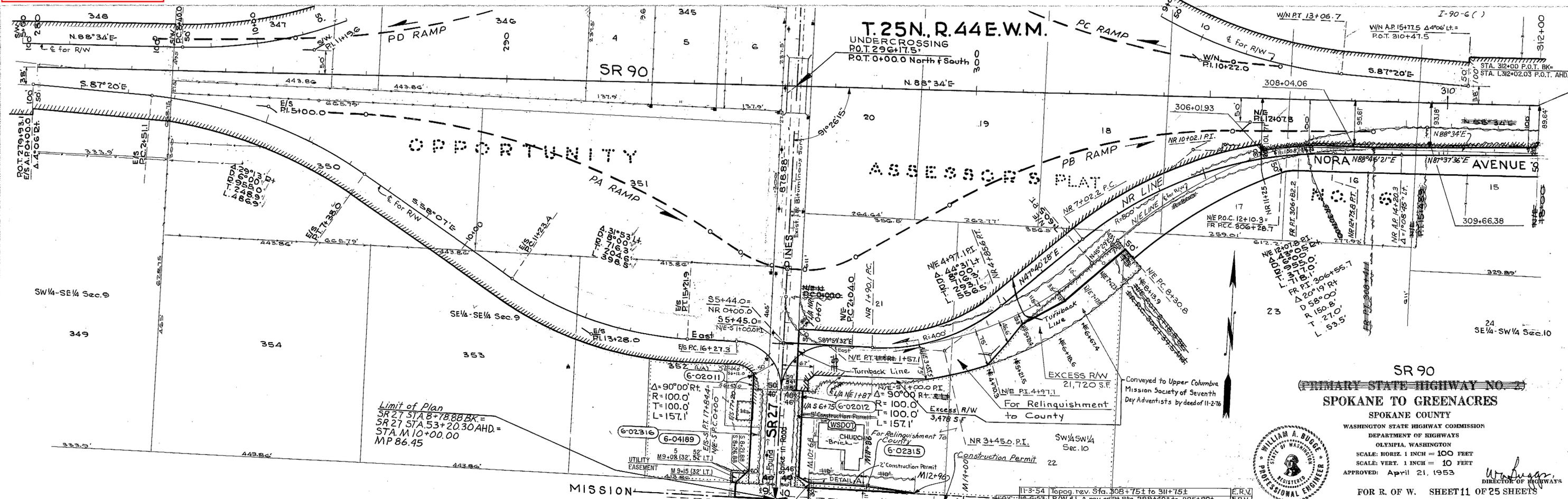


WASHINGTON STATE HIGHWAY COMMISSION DEPARTMENT OF HIGHWAYS OLYMPIA, WASHINGTON SCALE: HORIZ. 1 INCH = 100 FEET SCALE: VERT. 1 INCH = 10 FEET APPROVED: April 21, 1953 FOR R. OF W. SHEET 10 OF 25 SHEETS

NOTE: FOR L/A FEATURES SEE SR 90, SPOKANE TO GREENACRES PLAN SHOWING ACCESS.

ALL PLANS ARE SUBJECT TO CHANGE. PARTIES SEEKING PRECISE, CURRENT INFORMATION SHOULD CONSULT THE OFFICIAL PLAN ON FILE IN THE DEPT. OF TRANSPORTATION IN OLYMPIA.

REVISION	DATE	DESCRIPTION	BY
S/2466	10-27-53	L.A. added on S/W line Sta. 16+89.6 to Pine Road	E.R.V.
5-4-54	5-4-54	Profile Grades added Sta. 271+00 to Sta. 303+00	L.G.S.
4-12-58	4-12-58	Profile Grades, Revised Sta. 276+00 to Sta. 284+00	R.M.S.
SUBSEQUENT APPROVAL			
Letter 12-26-74	12-26-74	Revised R/W & L/A on Rt. Sta. 290+40± to 295+60±, I Line 4+12 to 10+10, added turnback lines & reling. to county, interchange ramps, noted excess R/W on Lt.	RLS
Letter 12-19-80	12-19-80	Revised R/W on Rt. IA 13+87 to IA 14+34 & CI 3+00± to CI 4+18.5; L/A IA 11+80 to CI 6+03; added parcels 6-02144 & 6-02145, Ramps SW & NW	RLS
Letter 9-17-81	9-17-81	Added Pines Road Park & Ride Lot & parcel 6-02149, deleted excess R/W	RLS
Letter 11-29-82	11-29-82	Revised north boundary parcel 6-02149 & Pines Road Park & Ride Lot	RLS
Letter 7-21-95	7-21-95	Added Limit of Plan and cross reference note	HEP
Letter 11-24-98	11-24-98	Revised R/W and L/A on Lt. Sta. S/W 4+88.96 to S/W 11+25.10; Added parcel 6-04340	HEP
Letter B-20-01	9-7-01	Superseded Plan Sta. 271+00 to 276+07.66; Revised R/W and L/A on Rt. Sta. 276+22.70 to 284+22.66; Added Temporary Construction Easement on Rt. Sta. 276+22.70 to 286+81.66; Added Parcels 6-04683 thru 6-04685	ATC
Letter 10-17-01	11-2-01	Deleted Temporary Construction Easement on Rt. Sta. 276+22.70 to 279+54.17 and Sta. 283+00 to 286+81.66; Rev. Temporary Construction Easement on Rt. Sta. 279+53.28 to 283+00; Revised Areas Parcels 6-04683 and 6-04684; Deleted Parcel 6-04685; Revised R/W and L/A on Rt. Sta. 276+22.70 to 284+15.30	ATC
Letter 10-9-01	1-25-02	Revised Cross Reference Note	ATC
Letter 5-5-04	5-21-04	Revised R/W and L/A Sta. IA 11+80 Rt. to Sta. SW 15+96.98 Lt.; Added Parcel 6-04968; Revised Limit of Plan Equation	ATC



**SR 90**  
**PRIMARY STATE HIGHWAY NO. 2**  
**SPOKANE TO GREENACRES**  
 SPOKANE COUNTY

WASHINGTON STATE HIGHWAY COMMISSION  
 DEPARTMENT OF HIGHWAYS  
 OLYMPIA, WASHINGTON  
 SCALE: HORIZ. 1 INCH = 100 FEET  
 SCALE: VERT. 1 INCH = 10 FEET  
 APPROVED: April 21, 1953



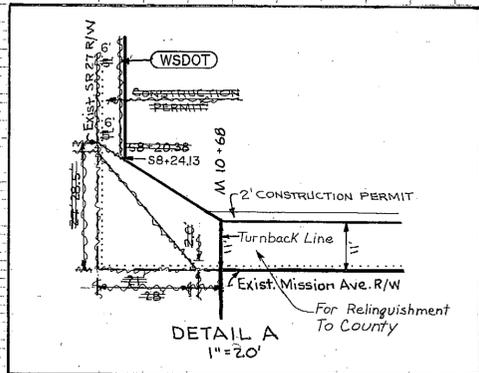
FOR R. OF W. SHEET 11 OF 25 SHEETS

*Limit of Plan*  
 SR 27 STA 8+78.88 BK =  
 SR 27 STA 53+20.30 AHD =  
 STA. M 10+00.00  
 MP 86.45

NOTE: For Right of Way South see SR 27,  
 Sprague Ave to Spokane Freeway,  
 approved, Oct. 24, 1956.

OWNERSHIPS					
PARCEL NO	NAME	TOTAL AREA	R/W	LT. REMAINDER RT	EASEMENT
6-02011	F.S. Hartley		Access	Only	
6-02012	Seventh Day Adventists	4.52 AC.	Access	Only	
6-02316	Milton Jeckle (Atrium)	102,802 S.F.	4,204 S.F.		98,598 S.F.
6-02315	Upper Columbia Mission Society	218,611 S.F.	6,595 S.F.	212,016 S.F.	*12,315 S.F.
6-04189	MISSION PROPERTIES	57,171 S.F.	313 S.F.	56,858 S.F.	Δ 400 S.F.

AUTHORITY	DATE	REVISION	E.R.V.
I.C.C. 9-3-57	9-17-57	Name of Nora Avenue Added to Frontage Service Road	J.H.M.
Comm. Res. 27-63	3-28-75	Revised L/A added turnback lines & reling. to county on Rt. Sta. 295+85± to 312+00 (Nora Ave), added interchange ramps & parcels 6-02011 & 6-02012	RLS
Letter 10-3-75	10-31-75	Revised turnback line, L/A & NR Line alignment Sta. 296+00± to Sta. 312+00± on Rt. Sta. 295+85±	RLS
Letter 6-14-76	8-13-76	Revised R/W noted excess R/W on Rt. NE 1/4 to NE 8+30.8, revised boundary & area parcel 6-02012	RLS
Letter 9-16-76	Cal. 9-17-76	Noted property conveyed to Upper Columbia Mission Society of Seventh Day Adventists by deed 11-2-76	CLV
Letter 6-8-83	7-25-83	Revised R/W on Rt. Sta. E/S 17+20 to S 8+50±, on Lt. Sta. S 8+181 to S 8+50±, added parcels 6-02315 & 6-02316	RLS
Letter 11-18-83	12-19-83	Revised R/W added const. permit N side Mission Ave., detail A, areas 6-02315, added const. permit 6-02316	RLS
Letter 7-10-84	8-13-84	Revised R/W on Rt. Sta. N/E 5+70.4 to N/E 8+30.8, Rev. R/W L/A and Noted Excess R/W on Rt. Sta. S 6+45.0 to N/E 3+35.5, Revised areas parcel 6-02315	RA
Letter 8-8-84	8-21-84	Added construction permit turnback line and Relinquishment note on Mission Ave, Added Limit of Plan on SR 27, Added M Line on Mission Ave.	RA
Letter 7-11-96	7-26-96	Revised R/W on I. L. Sta. M 9+15 to S 8+21.88; Added parcel 6-04189	HEP
Letters 8-22-96	1-10-97	Revised R/W as Acquired on Lt. Sta. S 6+45 to S 8+24.13; Deleted Construction Permit on Lt. Vic. Sta. S 7+00; Added Utility Easement Sta. M 9+20 Lt. to S 8+21.88 Rt.	HEP
Letter 1-29-96	2-14-97	Revised utility easement Sta. M 9+20 Lt. to S 8+21.88 Rt.; Revised area parcel 6-04189	HEP
Letter 6-22-98	7-10-98	Revised R/W and L/A on Rt. Sta. 306+01.93 to 312+00	HEP
Letter 1-22-08	1-24-08	Added Station Equation at end of Sheet, Noted Conveyance, Added Cross reference Note	CM



ALL PLANS ARE SUBJECT TO CHANGE.  
 PARTIES SEEKING PRECISE, CURRENT  
 INFORMATION SHOULD CONSULT THE  
 OFFICIAL PLAN ON FILE IN THE DEPT.  
 OF TRANSPORTATION IN OLYMPIA.

NOTE: FOR L/A FEATURES SEE SR 90,  
 SPOKANE TO GREENACRES,  
 PLAN SHOWING ACCESS.

FOR R/W AND L/A AHEAD SEE SR 90,  
 EVERGREEN ROAD INTERCHANGE,  
 SHEET 2 OF 5 SHEETS, APPROVED  
 DECEMBER 23, 1997

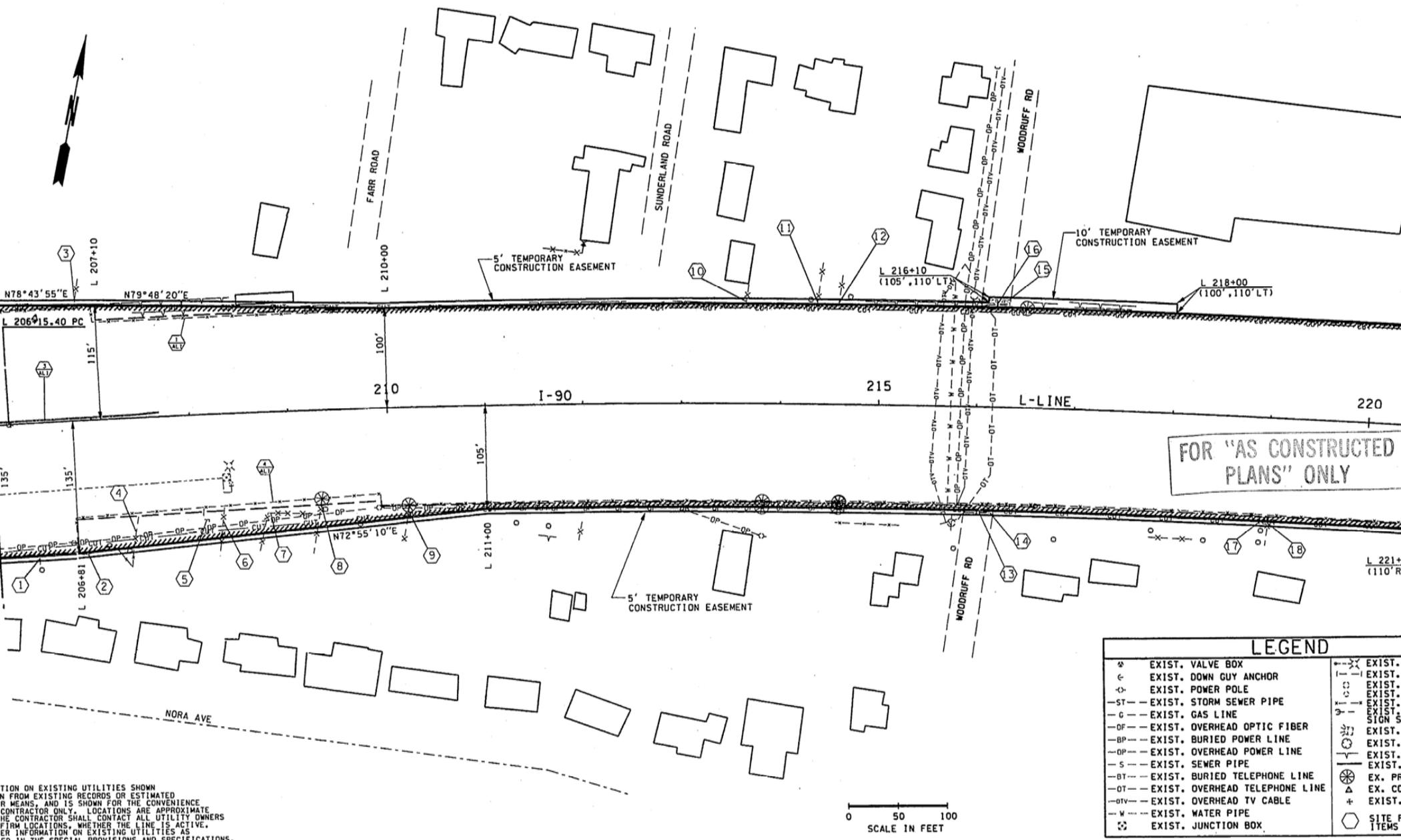
PLAN  
 DATE: 2/27/83  
 DRAWN BY: J. H. M.  
 CHECKED BY: J. H. M.  
 IN CHARGE: J. H. M.

SR 90  
 SPOKANE TO GREENACRES  
 SHEET 11 OF 25 SHEETS



**WSDOT - As Built Plans**

CURVE DATA				
STATION	DELTA	RADIUS	TANGENT	LENGTH
206+46	+21°27'17"	11460'	2171.05'	4291.28'



FOR "AS CONSTRUCTED PLANS" ONLY

LEGEND	
⊛	EXIST. VALVE BOX
⊙	EXIST. DOWN GUY ANCHOR
⊕	EXIST. POWER POLE
-ST-	EXIST. STORM SEWER PIPE
-G-	EXIST. GAS LINE
-OF-	EXIST. OVERHEAD OPTIC FIBER
-BP-	EXIST. BURIED POWER LINE
-OP-	EXIST. OVERHEAD POWER LINE
-S-	EXIST. SEWER PIPE
-BT-	EXIST. BURIED TELEPHONE LINE
-OT-	EXIST. OVERHEAD TELEPHONE LINE
-OTV-	EXIST. OVERHEAD TV CABLE
-W-	EXIST. WATER PIPE
⊗	EXIST. JUNCTION BOX
⊗	EXIST. SIGN
⊗	EXIST. EX. PR
⊗	EXIST. EX. CO
⊗	EXIST. SITE P
⊗	EXIST. ITEMS

NOTICE: INFORMATION ON EXISTING UTILITIES SHOWN IS BASED ON RECORDS OR ESTIMATED MEANS, AND IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. LOCATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL CONTACT ALL UTILITY OWNERS TO VERIFY THE LOCATION, DEPTH, AND STATUS OF ALL UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND INFORMATION ON EXISTING UTILITIES AS REQUIRED IN THE SPECIAL PROVISIONS AND SPECIFICATIONS.

PROJECT NAME	g:\464304\13515 Argonne Rd to Sullivan Rd\microstation english\L13515AL_UT.dgn
DATE	06:09:27 AM
REVISION	05/14/2003
DESIGNED BY	L HOLMQUIST
CHECKED BY	HOOVER/SPANGLE
DRAWN BY	G HURT
IN CHARGE	B HILMES PE
PROJECT ADM.	JC LENZI PE

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	NH-0906(203)
JOB NUMBER	03Z012	
CONTRACT NO.	LOCATION NO.	

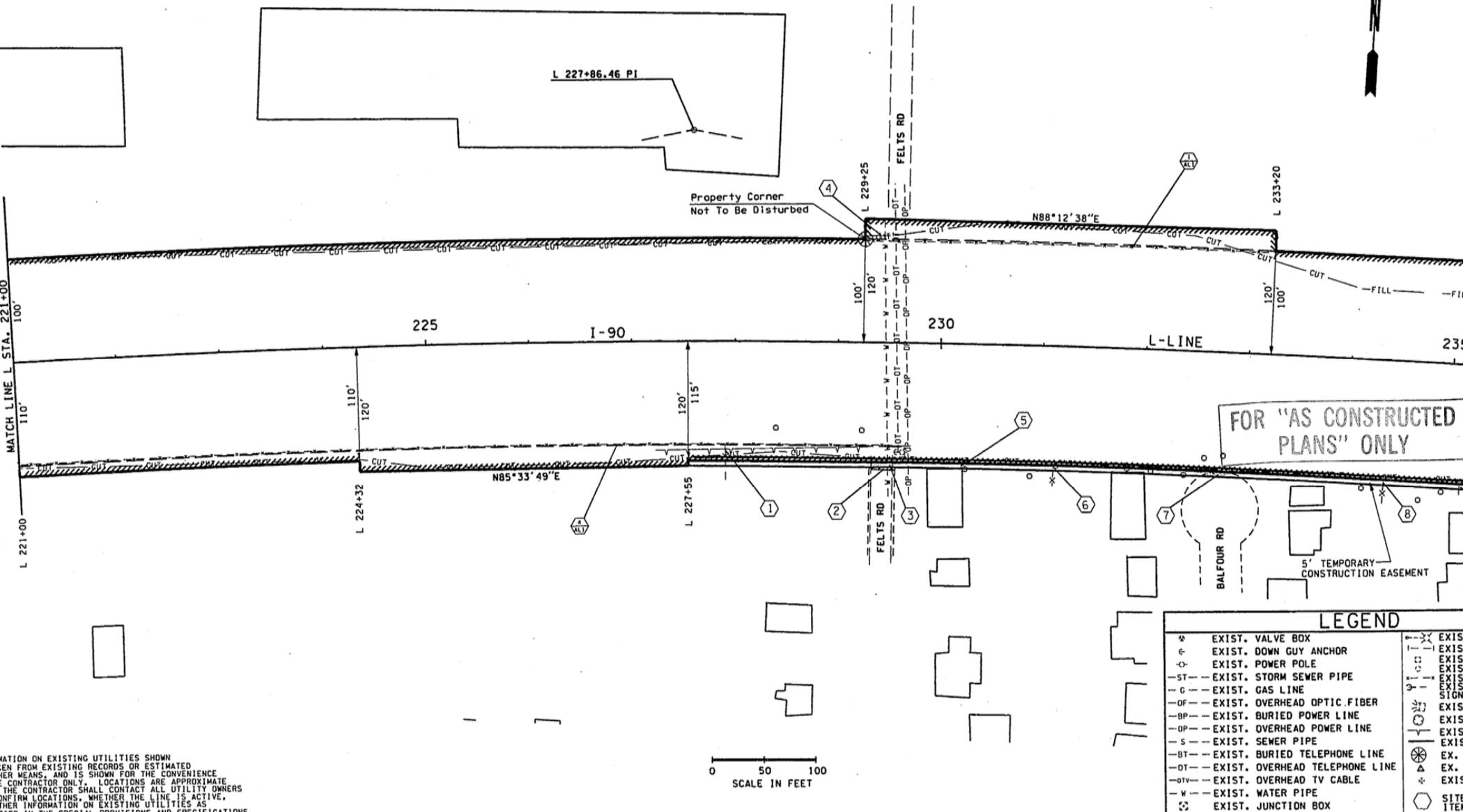
**BOB L. HILMES**  
 STATE OF WASHINGTON  
 PROFESSIONAL ENGINEER  
 LICENSE NO. 13515  
 DATE: 5/15/03  
 P.E. STAMP BOX

DATE: \_\_\_\_\_  
 P.E. STAMP BOX

**Washington State**  
 Department of Transportation

**I-90**  
 ARGONNE RD. TO SULLIVAN RD.  
 ALIGNMENT/RW/UTILITY PLAN

CURVE DATA				
STATION	DELTA	RADIUS	TANGENT	LENGTH
221+00	+21°27'17"	11460'	2171.06'	4291.28'



INFORMATION ON EXISTING UTILITIES SHOWN IS BASED ON RECORDS OR ESTIMATED LOCATIONS. THE CONTRACTOR SHALL CONTACT ALL UTILITY OWNERS TO VERIFY LOCATIONS, WHETHER THE LINE IS ACTIVE, AND FOR OTHER INFORMATION ON EXISTING UTILITIES AS PROVIDED IN THE SPECIAL PROVISIONS AND SPECIFICATIONS.

LEGEND	
⊕	EXIST. VALVE BOX
⊖	EXIST. DOWN GUY ANCHOR
⊙	EXIST. POWER POLE
-ST-	EXIST. STORM SEWER PIPE
-G-	EXIST. GAS LINE
-OF-	EXIST. OVERHEAD OPTIC FIBER
-BP-	EXIST. BURIED POWER LINE
-OP-	EXIST. OVERHEAD POWER LINE
-S-	EXIST. SEWER PIPE
-BT-	EXIST. BURIED TELEPHONE LINE
-OT-	EXIST. OVERHEAD TELEPHONE LINE
-OTV-	EXIST. OVERHEAD TV CABLE
-W-	EXIST. WATER PIPE
⊗	EXIST. JUNCTION BOX

PROJECT NAME	g:\464304\13515 Argonne Rd to Sullivan Rd\microstation english\13515AL_UT.dgn		
DATE	06:09:37 AM		
REVISION	05/14/2003		
DESIGNED BY	L HOLMQUIST		
CHECKED BY	HOOVER/SPANGLE		
DRAWN BY	G HURT		
ENGINEER	B HILMES PE		
ADMINISTRATOR	JC LENZI PE		

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	NH-0906(203)
JOB NUMBER	CONTRACT NO.	
03Z012		
LOCATION NO.		

P.E. STAMP BOX	DATE

Washington State  
Department of Transportation

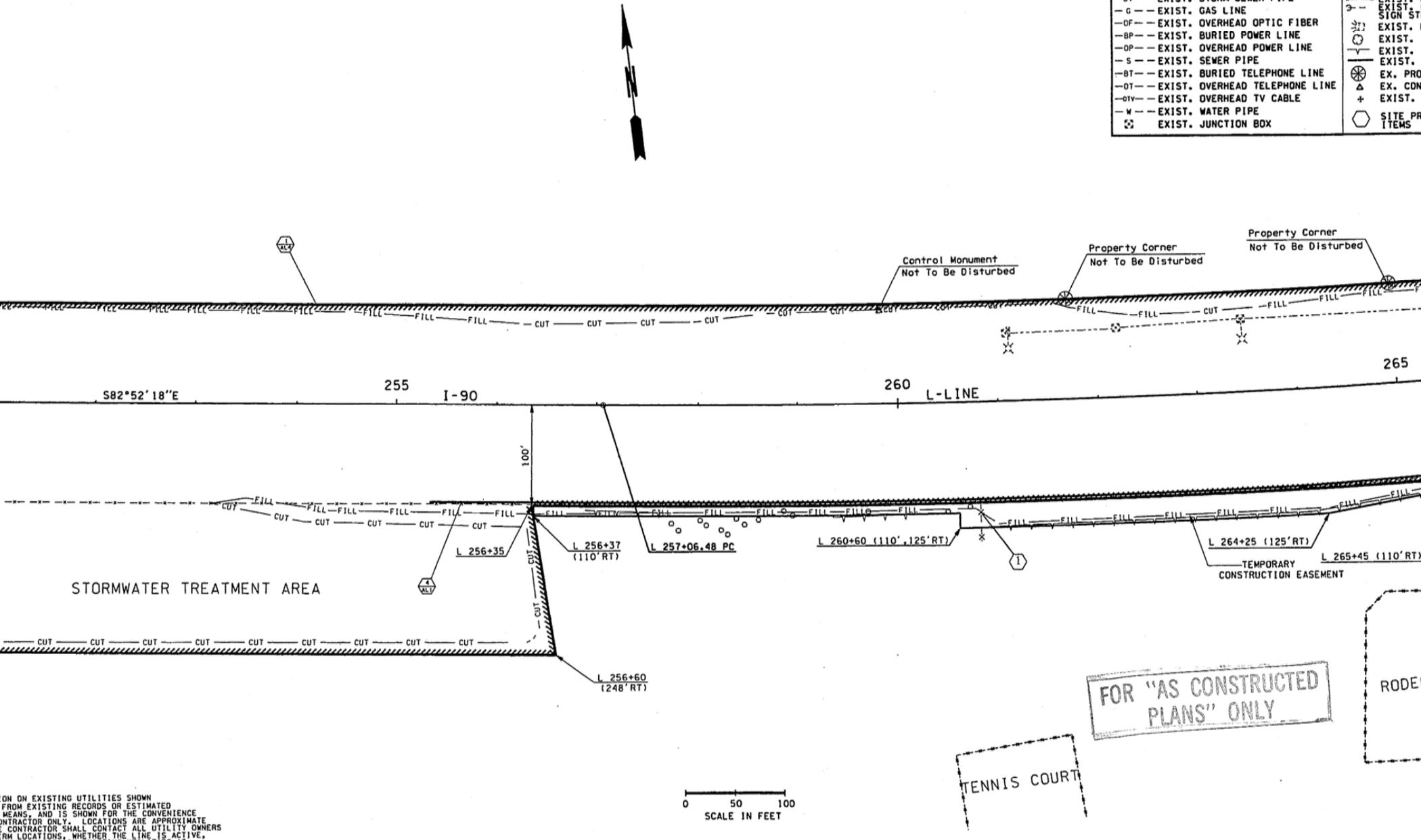
I-90  
ARGONNE RD. TO SULLIVAN RD  
ALIGNMENT/RW/UTILITY PLAN



**WSDOT - As Built Plans**

CURVE DATA				
STATION	DELTA	RADIUS	TANGENT	LENGTH
00	-11°09'32"	11460'	1119.52'	2231.96'

LEGEND			
⊗	EXIST. VALVE BOX	⊗	EXIST. SIGN ST
⊖	EXIST. DOWN GUY ANCHOR	⊖	EXIST. SIGN ST
⊕	EXIST. POWER POLE	⊕	EXIST. SIGN ST
-ST-	EXIST. STORM SEWER PIPE	⊕	EXIST. SIGN ST
-G-	EXIST. GAS LINE	⊕	EXIST. SIGN ST
-OF-	EXIST. OVERHEAD OPTIC FIBER	⊕	EXIST. SIGN ST
-BP-	EXIST. BURIED POWER LINE	⊕	EXIST. SIGN ST
-OP-	EXIST. OVERHEAD POWER LINE	⊕	EXIST. SIGN ST
-S-	EXIST. SEWER PIPE	⊕	EXIST. SIGN ST
-BT-	EXIST. BURIED TELEPHONE LINE	⊕	EXIST. SIGN ST
-OT-	EXIST. OVERHEAD TELEPHONE LINE	⊕	EXIST. SIGN ST
-TV-	EXIST. OVERHEAD TV CABLE	⊕	EXIST. SIGN ST
-W-	EXIST. WATER PIPE	⊕	EXIST. SIGN ST
⊗	EXIST. JUNCTION BOX	⊕	EXIST. SIGN ST
⊗	EXIST. VALVE BOX	⊕	EXIST. SIGN ST
⊖	EXIST. DOWN GUY ANCHOR	⊕	EXIST. SIGN ST
⊕	EXIST. POWER POLE	⊕	EXIST. SIGN ST
-ST-	EXIST. STORM SEWER PIPE	⊕	EXIST. SIGN ST
-G-	EXIST. GAS LINE	⊕	EXIST. SIGN ST
-OF-	EXIST. OVERHEAD OPTIC FIBER	⊕	EXIST. SIGN ST
-BP-	EXIST. BURIED POWER LINE	⊕	EXIST. SIGN ST
-OP-	EXIST. OVERHEAD POWER LINE	⊕	EXIST. SIGN ST
-S-	EXIST. SEWER PIPE	⊕	EXIST. SIGN ST
-BT-	EXIST. BURIED TELEPHONE LINE	⊕	EXIST. SIGN ST
-OT-	EXIST. OVERHEAD TELEPHONE LINE	⊕	EXIST. SIGN ST
-TV-	EXIST. OVERHEAD TV CABLE	⊕	EXIST. SIGN ST
-W-	EXIST. WATER PIPE	⊕	EXIST. SIGN ST
⊗	EXIST. JUNCTION BOX	⊕	EXIST. SIGN ST
⊗	EXIST. VALVE BOX	⊕	EXIST. SIGN ST
⊖	EXIST. DOWN GUY ANCHOR	⊕	EXIST. SIGN ST
⊕	EXIST. POWER POLE	⊕	EXIST. SIGN ST
-ST-	EXIST. STORM SEWER PIPE	⊕	EXIST. SIGN ST
-G-	EXIST. GAS LINE	⊕	EXIST. SIGN ST
-OF-	EXIST. OVERHEAD OPTIC FIBER	⊕	EXIST. SIGN ST
-BP-	EXIST. BURIED POWER LINE	⊕	EXIST. SIGN ST
-OP-	EXIST. OVERHEAD POWER LINE	⊕	EXIST. SIGN ST
-S-	EXIST. SEWER PIPE	⊕	EXIST. SIGN ST
-BT-	EXIST. BURIED TELEPHONE LINE	⊕	EXIST. SIGN ST
-OT-	EXIST. OVERHEAD TELEPHONE LINE	⊕	EXIST. SIGN ST
-TV-	EXIST. OVERHEAD TV CABLE	⊕	EXIST. SIGN ST
-W-	EXIST. WATER PIPE	⊕	EXIST. SIGN ST
⊗	EXIST. JUNCTION BOX	⊕	EXIST. SIGN ST



**FOR "AS CONSTRUCTED PLANS" ONLY**

TENNIS COURT

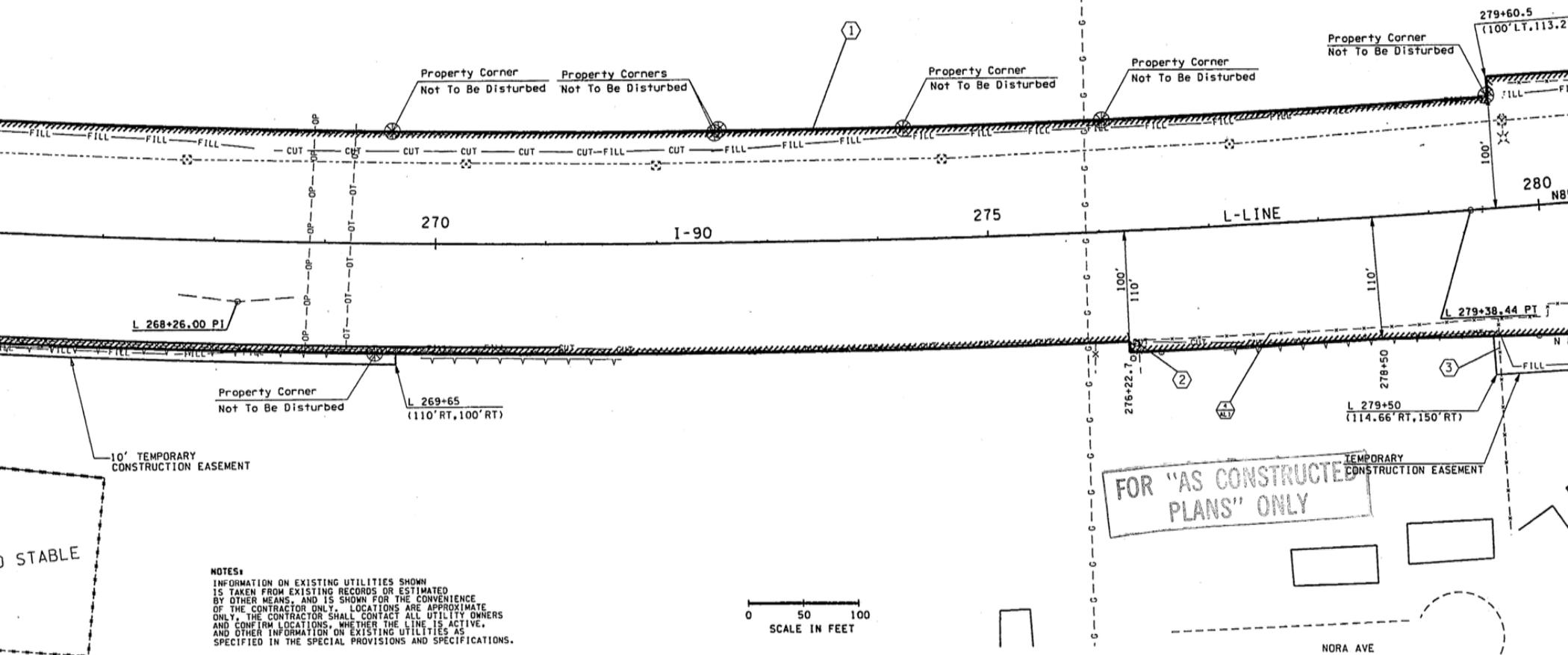
ON EXISTING UTILITIES SHOWN FROM EXISTING RECORDS OR ESTIMATED MEANS, AND IS SHOWN FOR THE CONVENIENCE OF CONTRACTOR ONLY. LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL CONTACT ALL UTILITY OWNERS FOR LOCATIONS, WHETHER THE LINE IS ACTIVE, AND INFORMATION ON EXISTING UTILITIES AS SHOWN IN THE SPECIAL PROVISIONS AND SPECIFICATIONS.

g:\464304\13515 Argonne Rd to Sullivan Rd\microstation english\13515AL-UT.dgn		REGION NO.	STATE	FED. AID PROJ. NO.			<b>I-90</b> <b>ARGONNE RD. TO SULLIVAN RD.</b>
06:09:41 AM	05/14/2003	10	WASH	NH-0906(203)			
BY L HOLMQUIST		JOB NUMBER		LOCATION NO.	DATE	P.E. STAMP BOX	ALIGNMENT/RW/UTILITY PL
BY HOOVER/SPANGLE		03Z012			5/15/03		
BY G HURT		CONTRACT NO.					
GR. B HILMES PE							
ADM. JC LENZI PE	REVISION	DATE	BY				

**WSDOT - As Built Plans**

CURVE DATA			
ON	DELTA	RADIUS	TANGENT LENGTH
00	-11°09'32"	11460'	1119.52'
			2231.96'

LEGEND	
EXIST. VALVE BOX	EXIST. LUMINAIRE
EXIST. DOWN GUY ANCHOR	EXIST. GUARDRAIL
EXIST. POWER POLE	EXIST. CATCH BASIN
EXIST. STORM SEWER PIPE	EXIST. DRYWELL
EXIST. GAS LINE	EXIST. FENCE
EXIST. OVERHEAD OPTIC FIBER	EXIST. CANTILEVER SIGN STRUCTURE
EXIST. BURIED POWER LINE	EXIST. LIGHT ON SIGN
EXIST. OVERHEAD POWER LINE	EXIST. TREES
EXIST. SEWER PIPE	EXIST. TREE LINE
EXIST. BURIED TELEPHONE LINE	EXIST. CONC. BARRIER
EXIST. OVERHEAD TELEPHONE LINE	EX. PROPERTY CORNER
EXIST. OVERHEAD TV CABLE	EX. CONTROL MONUMENT
EXIST. WATER PIPE	EXIST. MONUMENT
EXIST. JUNCTION BOX	SITE PREPARATION ITEMS



**NOTES:**  
 INFORMATION ON EXISTING UTILITIES SHOWN IS TAKEN FROM EXISTING RECORDS OR ESTIMATED BY OTHER MEANS, AND IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. LOCATIONS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL CONTACT ALL UTILITY OWNERS AND CONFIRM LOCATIONS, WHETHER THE LINE IS ACTIVE, AND OTHER INFORMATION ON EXISTING UTILITIES AS SPECIFIED IN THE SPECIAL PROVISIONS AND SPECIFICATIONS.

**FOR "AS CONSTRUCTED PLANS" ONLY**

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BY	DATE	BY	REVISION
L HOLMQUIST			
BY	DATE	BY	REVISION
HOODER/SPANGLE			
BY	DATE	BY	REVISION
G HURT			
ENGR.	DATE	BY	REVISION
B HILMES PE			
ADM.	DATE	BY	REVISION
JC LENZI PE			

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	NH-0906(203)
JOB NUMBER	CONTRACT NO.	LOCATION NO.
03Z012		

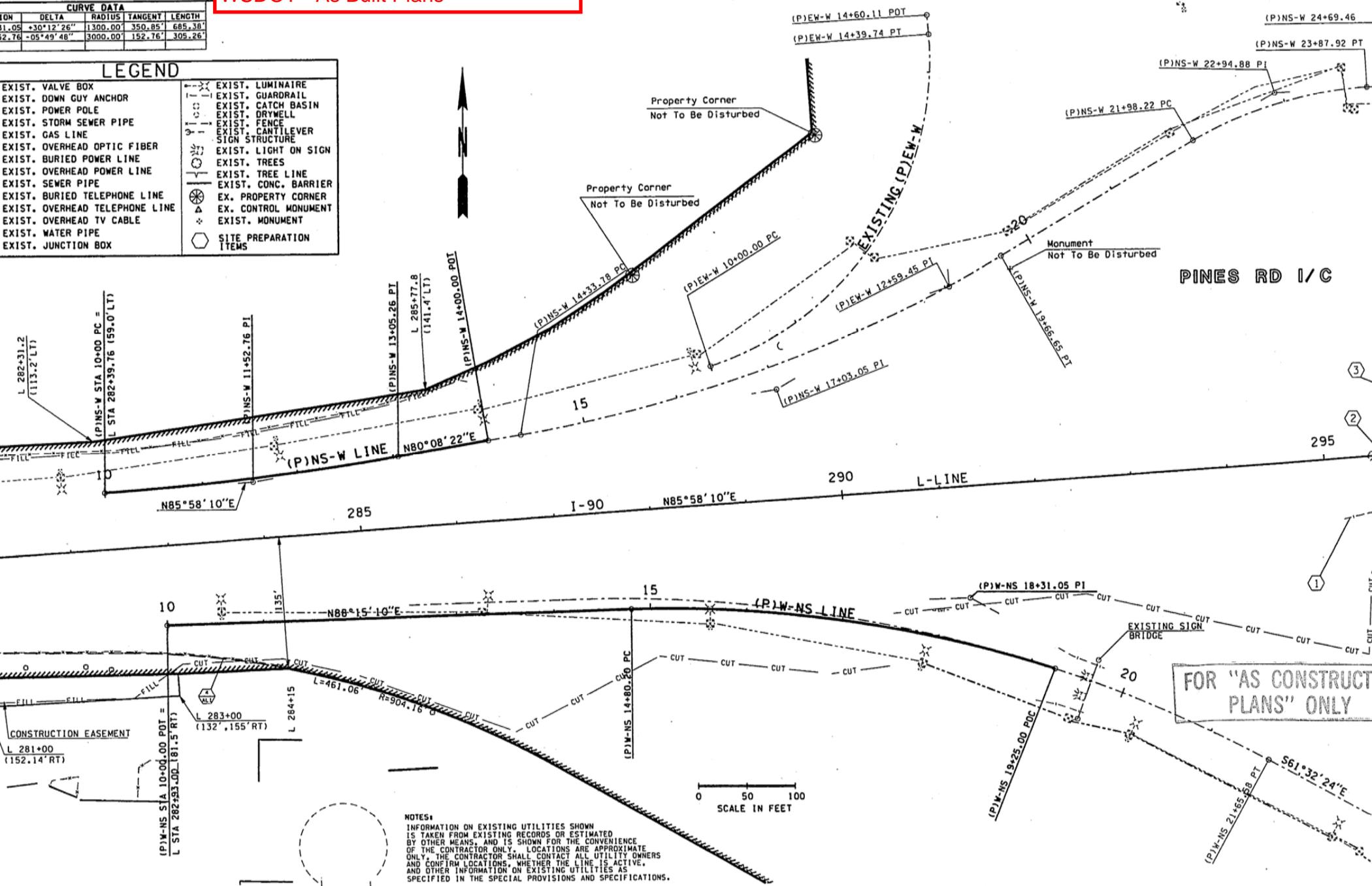
**I-90**  
**ARGONNE RD. TO SULLIVAN RD.**  
**ALIGNMENT/RW/UTILITY PLAN**

**WSDOT - As Built Plans**

STATION	DELTA	RADIUS	TANGENT	LENGTH
11.05	+30°12'26"	1300.00	350.85	685.38
12.76	-05°49'48"	3000.00	152.76	305.26

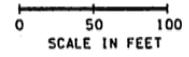
**LEGEND**

EXIST. VALVE BOX	EXIST. LUMINAIRE
EXIST. DOWN GUY ANCHOR	EXIST. GUARDRAIL
EXIST. POWER POLE	EXIST. CATCH BASIN
EXIST. STORM SEWER PIPE	EXIST. DRYWELL
EXIST. GAS LINE	EXIST. FENCE
EXIST. OVERHEAD OPTIC FIBER	EXIST. CANTILEVER SIGN STRUCTURE
EXIST. BURIED POWER LINE	EXIST. LIGHT ON SIGN
EXIST. OVERHEAD POWER LINE	EXIST. TREES
EXIST. SEWER PIPE	EXIST. TREE LINE
EXIST. BURIED TELEPHONE LINE	EXIST. CONC. BARRIER
EXIST. OVERHEAD TELEPHONE LINE	EX. PROPERTY CORNER
EXIST. OVERHEAD TV CABLE	EX. CONTROL MONUMENT
EXIST. WATER PIPE	EXIST. MONUMENT
EXIST. JUNCTION BOX	SITE PREPARATION ITEMS



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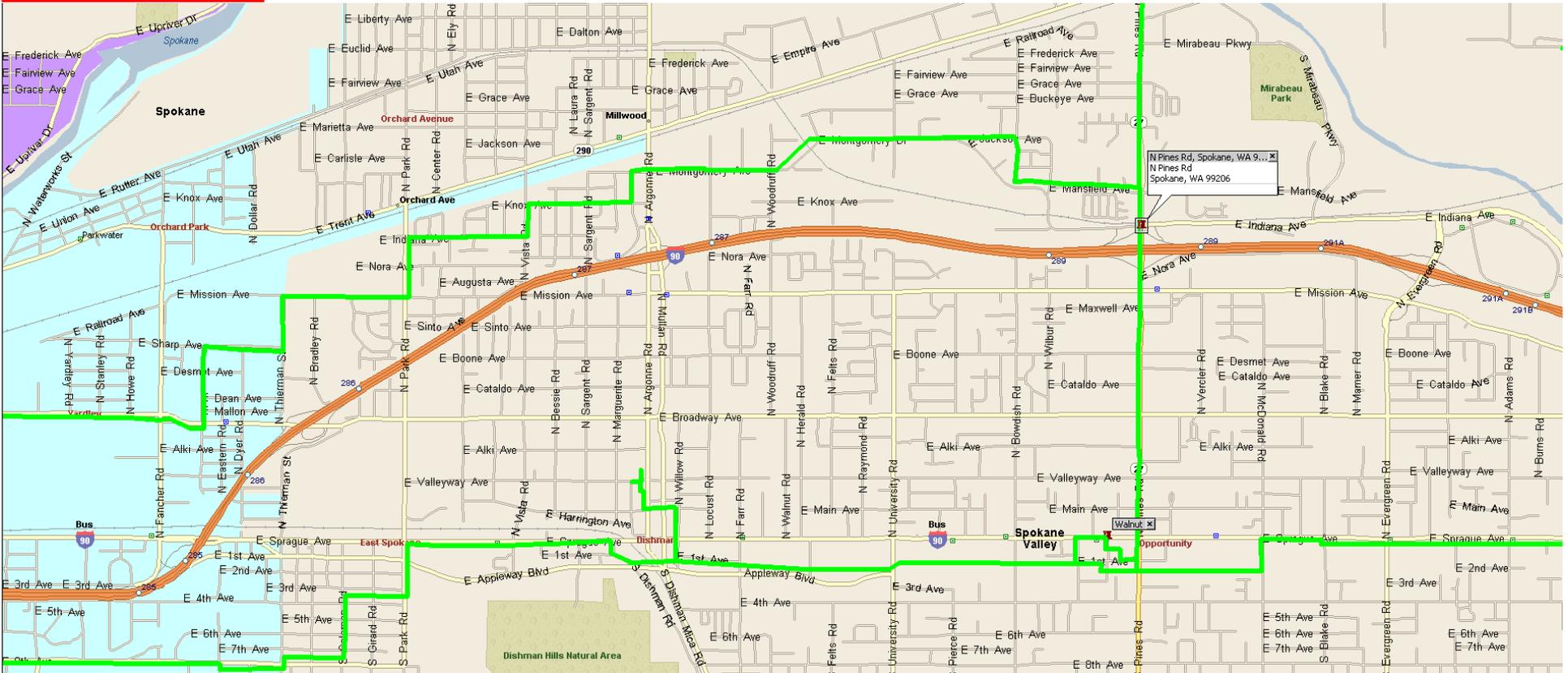
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DATE	06:09:53 AM
TIME	05/14/2003
DESIGNED BY	L HOLMQUIST
CHECKED BY	HOOVER/SPANGLE
IN CHARGE	G HURT
PROJECT MANAGER	B HILMES PE
ADMINISTRATOR	JC LENZI PE
REVISION	DATE BY

REGION NO.	STATE	FED. AID PROJ. NO.
10	WASH	NH-0906(203)
JOB NUMBER	03Z012	
CONTRACT NO.	LOCATION NO.	

**BOB L. HILMES**  
 STATE OF WASHINGTON  
 PROFESSIONAL ENGINEER  
 LICENSE NO. 13515  
 EXPIRES 08/30/04  
 DATE 5/15/03

**Washington State**  
 Department of Transportation

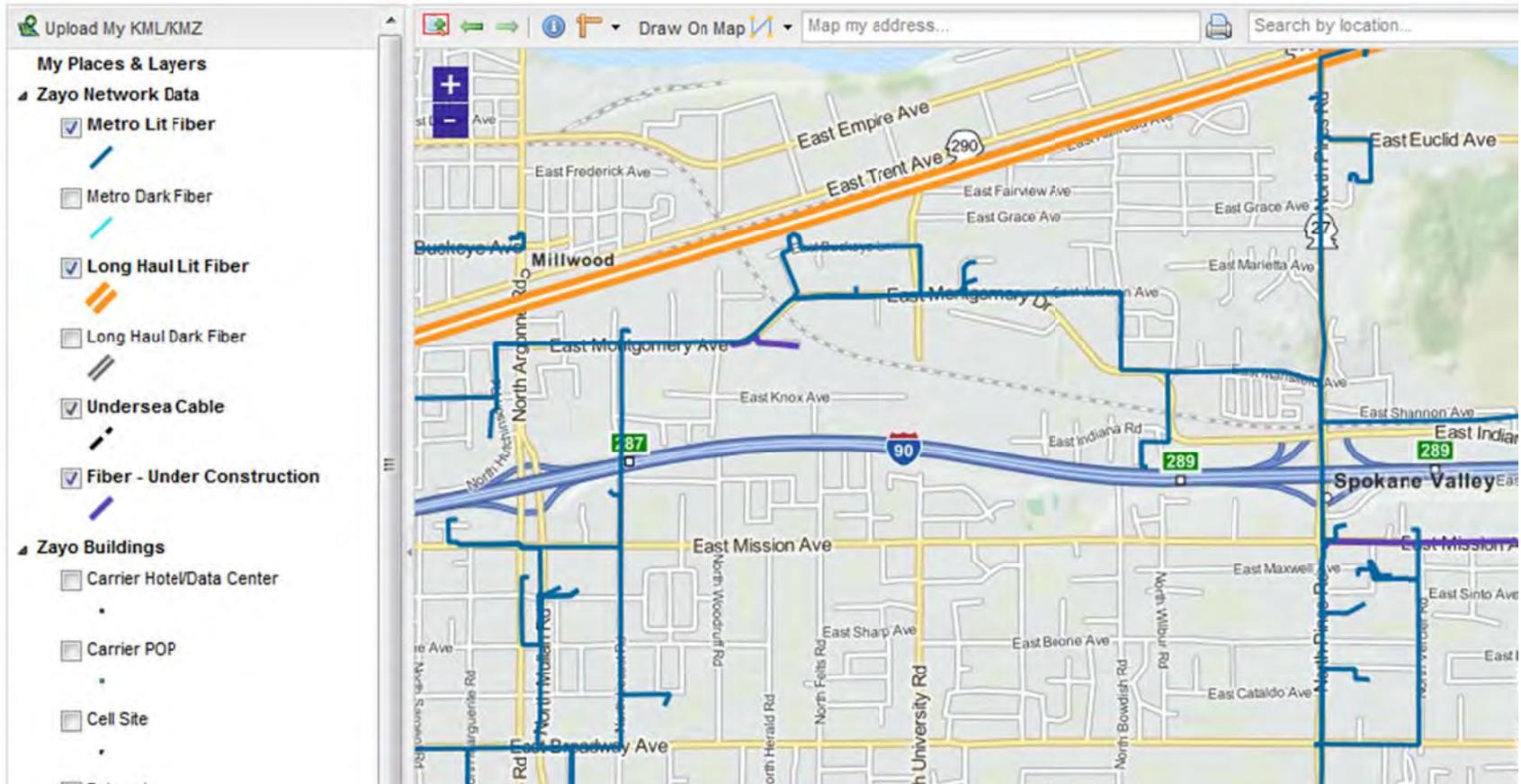
**I-90**  
**ARGONNE RD. TO SULLIVAN RD.**  
 ALIGNMENT/RW/UTILITY PLAN



# Zayo Bandwidth - Fiber

Explore the Zayo Network

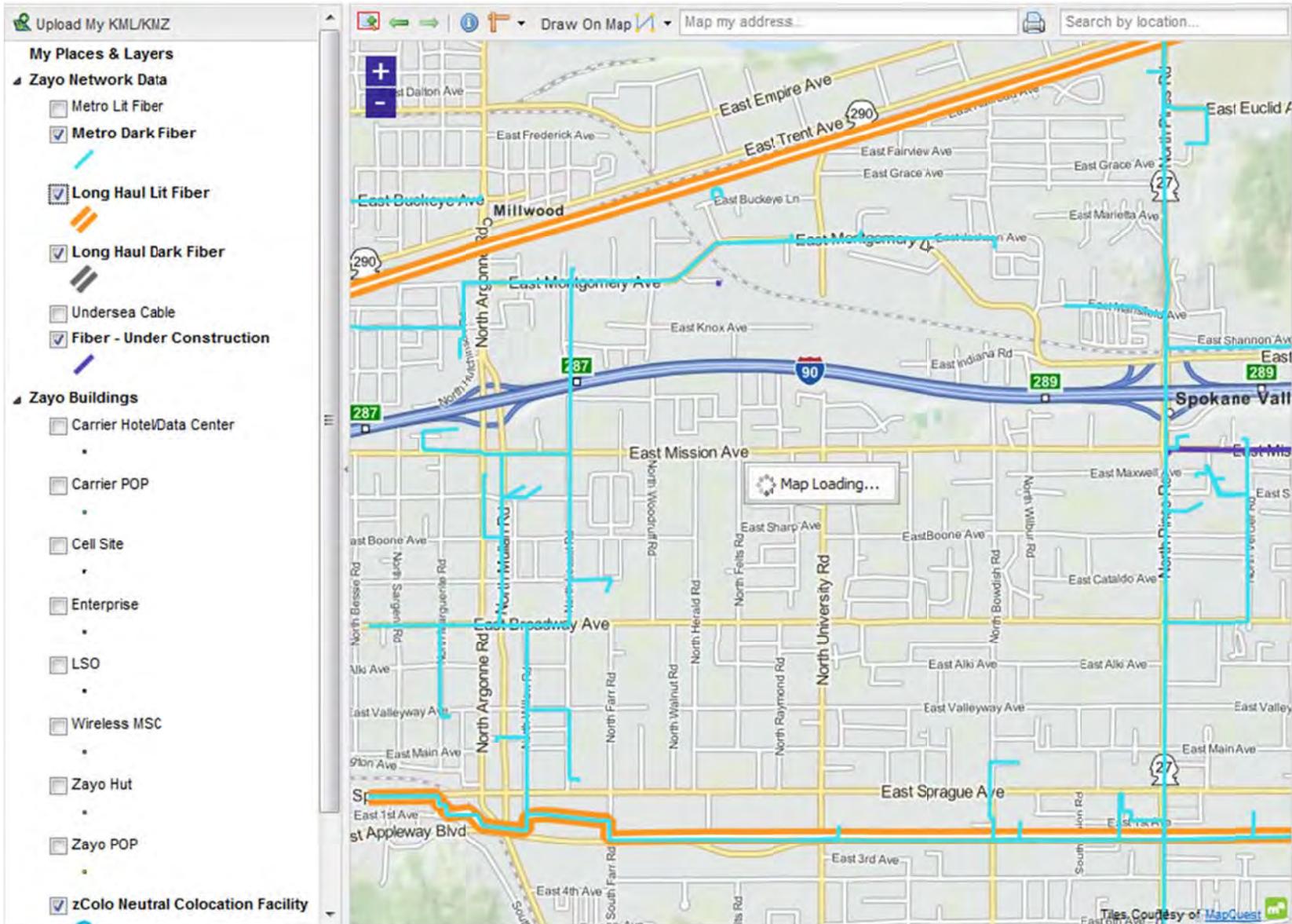
[Request More Info](#) 



# Zayo Bandwidth - Fiber

## Explore the Zayo Network

Request More Info 1



**APPENDIX E: PEDESTRIAN & BICYCLE FORECAST MEMORANDUM**





## MEMORANDUM

Date: August 23, 2013  
To: Inga Note, City of Spokane Valley  
From: Ariel Davis and Chris Breiland, Fehr & Peers  
Subject: **Pedestrian and Bicycle Forecasts**

*SE12-0282*

---

This memo summarizes the preliminary pedestrian and bicycle forecasts developed for the University Road Overpass Study.

### METHODOLOGY

A variety of forecasting methodologies were reviewed and the most applicable were selected for the study area. Some approaches estimated both pedestrians and bicyclists while others only estimated one or the other. Ultimately, we selected one approach for pedestrians and another for bicyclists. In addition to the two methodologies selected, we tested a pedestrian and bike forecast methodology developed by the Maricopa Association of Government and a bike forecast methodology developed by the California Air Pollution Control Officers Association. The selected methodologies are described below.

#### **Pedestrian Forecast**

The Havana Street interchange and Custer Road pedestrian overpass to the west of the study area provides an example of pedestrian activity in an area with more connectivity across the freeway. The Havana Street/Custer Road area is an ideal analog to the study area given the nature of the land use with single family residential to the south of I-90 and primarily industrial uses to the north. Therefore, the relationship between the vehicle and pedestrian volumes at this location provides a reasonable comparison off which to base forecasts for University Road.

The pedestrian count data collected on the Havana Street underpass and the Custer Road overpass represented approximately two percent of the corresponding vehicle volumes. In contrast, current pedestrian activity along Argonne Road, Mullan Road, and Pines Road is



substantially lower in terms of mode share. This is due to a smaller number of pedestrians as well as higher vehicle volumes. The University Road overpass is forecast to carry 840 vehicles during the PM peak hour. Applying the two percent factor from Havana Street/Custer Road and factoring to represent a full day of demand results in an estimate of 170 daily pedestrians on the University Road overpass.

### **Bicycle Forecast**

The University of North Carolina Highway Safety Research Center produced an online Benefit-Cost tool that provides bicycle demand based on population density, existing bicycle mode share, and length of the facility. The methodology is largely based on NCHRP Report 552 *Guidelines for Analysis of Investments in Bicycle Facilities*. Population density was calculated using data from the 2007-2011 American Community Survey 5-Year Estimates. The length of the trail is assumed to be approximately 2,500 meters, the distance from the Spokane Valley-Millwood Trail to the Appleway Trail along University Road. The online tool predicts 135 cyclists would use that segment daily.

## **FORECAST**

### **Forecast Refinement to Distinguish Between Path Alignments**

The methodologies applied above do not allow us to distinguish between alternatives—i.e., the forecast on the Felts alignment versus University Road versus the Valley Mission Park alignment. To refine the forecast further, AirSage data was used to compare the number of short trips in the traffic analysis zones (TAZs) including each alignment. Some proportion of trips would occur regardless of the alignment; for instance, a bicyclist traveling five miles would not be likely to change their route based on the exact alignment of the overpass. However, the details of the alignment may weigh heavier in the decision making of someone traveling a shorter distance. The AirSage data indicates that there would be approximately 1.7 times as many short trips along the Valley Mission Park alignment than along the Felts alignment. Note that there are multiple Valley Mission Park alignments under consideration. This TAZ analysis most closely reflects the alignment connecting to Montgomery Drive. Pedestrian and bicycle activity along the other two Valley Mission Park alignments would likely fall between the University Road and Valley Mission Park/Montgomery forecasts.



To determine the pool of trips subject to change depending on the alignment, we consulted National Household Travel Survey (NHTS) data. Seventy-four percent of all walking trips are less than a mile in length and 36 percent of all biking trips are less than two miles in length. It is assumed that only those subsets of the pedestrian and bicycle trips are substantively influenced by the alignment of the path. Then, the factors determined from the AirSage data was applied to those trips. The results are shown in Table 1.

**TABLE 1. DAILY PEDESTRIAN AND BICYCLE FORECASTS – BASE YEAR CONDITIONS**

	<b>Pedestrians</b>	<b>Bicyclists</b>
<b>Base Forecast</b>		
Base Forecast	168	135
Short Distance Trips Subject to Fluctuate Based on Alignment	124	49
Long Distance Trips Unaffected by Alignment	44	86
<b>Alignment Adjustments</b>		
Felts Short Trip Forecast (Adjustment Factor = 0.74)	92	36
<b>Final Rounded Felts Alignment Forecast</b>	<b>135</b>	<b>120</b>
University Short Trip Forecast (Adjustment Factor = 1)	124	49
<b>Final Rounded University Alignment Forecast</b>	<b>170</b>	<b>135</b>
Valley Mission Park/Montgomery Short Trip Forecast (Adjustment Factor = 1.26)	156	62
<b>Final Rounded Valley Mission Park-Montgomery Alignment Forecast</b>	<b>200</b>	<b>150</b>
Valley Mission Park-Trail and Indiana Options Short Trip Forecast (Adjustment Factor = 1.13)	140	55
<b>Final Rounded Valley Mission Park-Trail and Indiana Options Alignment Forecast</b>	<b>185</b>	<b>140</b>

Source: Fehr & Peers, 2013.

The pedestrian forecast ranges from 135 to 200 daily trips and the bicycle forecast ranges from 120 to 150 daily trips, with the lower end estimated for the Felts alignment and the higher end estimated for the Valley Mission Park-Montgomery alignment.



The pedestrian and bicycle forecasts were generated for base year conditions. To maintain consistency with the 2040 horizon year, the forecasts were adjusted to reflect the growth in households expected regionally. The number of households in the SRTC model grows by approximately 38 percent between the base year and year 2040. The 2040 forecasts are shown in Table 2.

**TABLE 2. DAILY PEDESTRIAN AND BICYCLE FORECASTS – 2040**

	<b>Pedestrians</b>	<b>Bicyclists</b>
<b>Felts Alignment Forecast</b>	<b>185</b>	<b>165</b>
<b>University Alignment Forecast</b>	<b>235</b>	<b>185</b>
<b>Valley Mission Park-Montgomery Alignment Forecast</b>	<b>275</b>	<b>205</b>
<b>Valley Mission Park-Trail and Indiana Options Alignment Forecast</b>	<b>255</b>	<b>195</b>

Source: Fehr & Peers, 2013.

### **Seasonal Fluctuation**

Pedestrian activity can vary substantially over the course of a year due to the season. According to the National Bicycle and Pedestrian Documentation Project, climates such as the study area could have roughly four times more activity in the summer months than in the winter months.

**APPENDIX F: 2040 LEVEL OF SERVICE WORKSHEETS**



VISSIM Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

University Road - Argonne Section  
2030 No Build  
PM Peak Hour

Intersection 1

Argonne/SR290

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	295	285	96.7%	39.0	5.3	D
	Through	1,175	1,129	96.1%	17.6	3.9	B
	Right Turn	200	192	96.1%	7.5	1.7	A
	Subtotal	<b>1,670</b>	<b>1,607</b>	<b>96.2%</b>	<b>20.5</b>	<b>3.6</b>	<b>C</b>
SB	Left Turn	170	161	94.9%	123.9	56.2	F
	Through	915	887	96.9%	127.7	71.6	F
	Right Turn	55	54	98.9%	92.3	74.1	F
	Subtotal	<b>1,140</b>	<b>1,102</b>	<b>96.7%</b>	<b>125.2</b>	<b>69.0</b>	<b>F</b>
EB	Left Turn	155	154	99.0%	106.0	45.6	F
	Through	660	646	97.9%	88.7	34.1	F
	Right Turn	310	287	92.7%	209.2	213.8	F
	Subtotal	<b>1,125</b>	<b>1,087</b>	<b>96.6%</b>	<b>117.5</b>	<b>73.9</b>	<b>F</b>
WB	Left Turn	260	261	100.5%	133.8	62.9	F
	Through	415	416	100.2%	46.2	7.4	D
	Right Turn	210	210	100.2%	10.0	3.2	A
	Subtotal	<b>885</b>	<b>888</b>	<b>100.3%</b>	<b>62.8</b>	<b>17.9</b>	<b>E</b>
Total		<b>4,820</b>	<b>4,683</b>	<b>97.2%</b>	<b>72.0</b>	<b>26.4</b>	<b>E</b>

Intersection 2

Argonne/Montgomery

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	10	10	104.0%	120.2	35.3	F
	Through	1,325	1,322	99.8%	33.8	6.9	C
	Right Turn	230	242	105.3%	32.3	7.3	C
	Subtotal	<b>1,565</b>	<b>1,574</b>	<b>100.6%</b>	<b>34.2</b>	<b>6.7</b>	<b>C</b>
SB	Left Turn	280	269	96.1%	111.7	9.0	F
	Through	1,150	1,052	91.5%	173.5	39.8	F
	Right Turn	55	48	86.9%	339.1	112.3	F
	Subtotal	<b>1,485</b>	<b>1,369</b>	<b>92.2%</b>	<b>166.8</b>	<b>33.3</b>	<b>F</b>
EB	Left Turn	40	43	106.5%	60.6	17.3	E
	Through	60	60	100.0%	59.8	7.7	E
	Right Turn	55	56	102.2%	71.8	21.0	E
	Subtotal	<b>155</b>	<b>159</b>	<b>102.5%</b>	<b>65.1</b>	<b>7.6</b>	<b>E</b>
WB	Left Turn	550	364	66.1%	1051.3	114.0	F
	Through	50	35	69.4%	938.2	110.4	F
	Right Turn	255	181	70.9%	892.5	121.0	F
	Subtotal	<b>855</b>	<b>579</b>	<b>67.7%</b>	<b>998.1</b>	<b>112.9</b>	<b>F</b>
Total		<b>4,060</b>	<b>3,681</b>	<b>90.7%</b>	<b>220.6</b>	<b>24.8</b>	<b>F</b>

Intersection 3

Argonne/Knox

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	190	189	99.5%	104.5	35.5	F
	Through	1,470	1,488	101.2%	12.3	1.8	B
	Right Turn	30	29	97.7%	8.3	5.0	A
	Subtotal	<b>1,690</b>	<b>1,707</b>	<b>101.0%</b>	<b>22.9</b>	<b>6.8</b>	<b>C</b>
SB	Left Turn	60	50	83.2%	100.2	13.8	F
	Through	1,655	1,365	82.5%	123.7	17.7	F
	Right Turn	40	30	74.0%	549.6	203.6	F
	Subtotal	<b>1,755</b>	<b>1,445</b>	<b>82.3%</b>	<b>131.4</b>	<b>19.6</b>	<b>F</b>
EB	Left Turn	60	53	88.7%	405.9	246.0	F
	Through	5	4	82.0%	275.3	285.7	F
	Right Turn	300	258	86.0%	494.4	263.6	F
	Subtotal	<b>365</b>	<b>315</b>	<b>86.4%</b>	<b>475.8</b>	<b>255.6</b>	<b>F</b>
WB	Left Turn	70	71	101.3%	60.6	14.9	E
	Through	10	8	83.0%	28.0	31.5	C
	Right Turn	35	35	100.0%	6.1	2.9	A
	Subtotal	<b>115</b>	<b>114</b>	<b>99.3%</b>	<b>40.7</b>	<b>8.6</b>	<b>D</b>
Total		<b>3,925</b>	<b>3,581</b>	<b>91.2%</b>	<b>106.6</b>	<b>24.9</b>	<b>F</b>

Intersection 4

Argonne/WB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn						
	Through	1,390	1,171	84.3%	67.7	5.3	E
	Right Turn	645	531	82.3%	221.7	17.1	F
	Subtotal	<b>2,035</b>	<b>1,702</b>	<b>83.6%</b>	<b>115.8</b>	<b>6.9</b>	<b>F</b>
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	465	465	99.9%	1.7	0.2	A
	Through	375	372	99.1%	13.3	1.6	B
	Right Turn						
	Subtotal	<b>840</b>	<b>836</b>	<b>99.6%</b>	<b>6.8</b>	<b>0.8</b>	<b>A</b>
Total		<b>2,875</b>	<b>2,538</b>	<b>88.3%</b>	<b>80.4</b>	<b>3.9</b>	<b>F</b>

Intersection 5

Mullan/WB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	375	372	99.1%	19.7	4.2	B
	Through	1,295	1,371	105.8%	6.8	1.0	A
	Right Turn						
	Subtotal	<b>1,670</b>	<b>1,742</b>	<b>104.3%</b>	<b>9.5</b>	<b>1.3</b>	<b>A</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through	465	464	99.8%	81.8	22.6	F
	Right Turn	455	458	100.7%	61.6	22.1	E
	Subtotal	<b>920</b>	<b>923</b>	<b>100.3%</b>	<b>71.8</b>	<b>21.9</b>	<b>E</b>
Total		<b>2,590</b>	<b>2,665</b>	<b>102.9%</b>	<b>30.7</b>	<b>3.6</b>	<b>C</b>

Intersection 6

Argonne/EB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	385	316	82.1%	16.1	3.0	B
	Through	1,470	1,316	89.5%	8.0	1.0	A
	Right Turn						
	Subtotal	<b>1,855</b>	<b>1,632</b>	<b>88.0%</b>	<b>9.7</b>	<b>1.4</b>	<b>A</b>
EB	Left Turn						
	Through	435	438	100.6%	40.4	3.0	D
	Right Turn	500	503	100.6%	19.0	2.4	B
	Subtotal	<b>935</b>	<b>941</b>	<b>100.6%</b>	<b>29.2</b>	<b>2.2</b>	<b>C</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>2,790</b>	<b>2,573</b>	<b>92.2%</b>	<b>17.0</b>	<b>1.4</b>	<b>B</b>

Intersection 7

Mullan/EB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,295	1,303	100.6%	15.1	2.7	B
	Right Turn	430	442	102.8%	18.5	3.9	B
	Subtotal	<b>1,725</b>	<b>1,745</b>	<b>101.2%</b>	<b>16.0</b>	<b>2.8</b>	<b>B</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn	375	438	116.7%	2.3	0.2	A
	Through	445	316	71.0%	10.4	1.0	B
	Right Turn						
	Subtotal	<b>820</b>	<b>754</b>	<b>91.9%</b>	<b>5.7</b>	<b>0.6</b>	<b>A</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>2,545</b>	<b>2,499</b>	<b>98.2%</b>	<b>12.9</b>	<b>1.1</b>	<b>B</b>

Intersection 8

Argonne/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	510	467	91.6%	12.4	1.8	B
	Through	1,310	1,209	92.3%	5.4	0.6	A
	Right Turn	150	143	95.2%	3.0	1.0	A
	Subtotal	<b>1,970</b>	<b>1,819</b>	<b>92.3%</b>	<b>7.0</b>	<b>0.7</b>	<b>A</b>
EB	Left Turn						
	Through	235	244	104.0%	45.3	3.3	D
	Right Turn	25	24	96.8%	26.7	10.1	C
	Subtotal	<b>260</b>	<b>269</b>	<b>103.3%</b>	<b>43.7</b>	<b>3.7</b>	<b>D</b>
WB	Left Turn	60	58	97.0%	16.9	5.5	B
	Through	85	88	103.4%	31.6	4.2	C
	Right Turn						
	Subtotal	<b>145</b>	<b>146</b>	<b>100.8%</b>	<b>25.9</b>	<b>3.7</b>	<b>C</b>
Total		<b>2,375</b>	<b>2,234</b>	<b>94.0%</b>	<b>12.8</b>	<b>1.2</b>	<b>B</b>

Intersection 9

Mullan/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	50	52	103.0%	25.7	5.7	C
	Through	1,160	1,158	99.9%	27.4	3.1	C
	Right Turn	50	48	96.0%	22.7	5.8	C
	<b>Subtotal</b>	<b>1,260</b>	<b>1,258</b>	<b>99.8%</b>	<b>27.2</b>	<b>3.2</b>	<b>C</b>
SB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
EB	Left Turn	175	181	103.4%	8.9	3.0	A
	Through	540	499	92.3%	23.9	0.8	C
	Right Turn						
	<b>Subtotal</b>	<b>715</b>	<b>680</b>	<b>95.0%</b>	<b>19.8</b>	<b>1.0</b>	<b>B</b>
WB	Left Turn						
	Through	85	85	99.8%	29.0	6.0	C
	Right Turn	390	406	104.2%	19.4	4.9	B
	<b>Subtotal</b>	<b>475</b>	<b>491</b>	<b>103.4%</b>	<b>21.1</b>	<b>4.5</b>	<b>C</b>
<b>Total</b>		<b>2,450</b>	<b>2,429</b>	<b>99.1%</b>	<b>24.0</b>	<b>1.5</b>	<b>C</b>

Intersection 1

Argonne/SR290

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	295	308	104.5%	44.6	5.1	D
	Through	1,175	1,216	103.5%	32.6	7.8	C
	Right Turn	200	213	106.3%	13.4	5.6	B
	<b>Subtotal</b>	<b>1,670</b>	<b>1,736</b>	<b>104.0%</b>	<b>32.6</b>	<b>6.6</b>	<b>C</b>
SB	Left Turn	170	164	96.3%	84.2	10.9	F
	Through	915	909	99.3%	46.3	3.2	D
	Right Turn	55	60	108.7%	29.7	11.9	C
	<b>Subtotal</b>	<b>1,140</b>	<b>1,132</b>	<b>99.3%</b>	<b>51.3</b>	<b>3.4</b>	<b>D</b>
EB	Left Turn	155	160	103.2%	71.5	13.2	E
	Through	660	667	101.1%	55.7	3.5	E
	Right Turn	310	307	99.0%	4.4	1.1	A
	<b>Subtotal</b>	<b>1,125</b>	<b>1,134</b>	<b>100.8%</b>	<b>44.2</b>	<b>3.4</b>	<b>D</b>
WB	Left Turn	260	271	104.2%	133.5	48.2	F
	Through	415	416	100.1%	44.8	4.8	D
	Right Turn	210	211	100.7%	11.9	3.6	B
	<b>Subtotal</b>	<b>885</b>	<b>898</b>	<b>101.5%</b>	<b>65.2</b>	<b>17.4</b>	<b>E</b>
<b>Total</b>		<b>4,820</b>	<b>4,901</b>	<b>101.7%</b>	<b>45.3</b>	<b>4.2</b>	<b>D</b>

Intersection 2

Argonne/Montgomery

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	10	9	94.0%	104.3	25.4	F
	Through	1,325	1,387	104.7%	40.3	6.7	D
	Right Turn	230	247	107.5%	45.9	11.4	D
	<b>Subtotal</b>	<b>1,565</b>	<b>1,643</b>	<b>105.0%</b>	<b>41.5</b>	<b>7.3</b>	<b>D</b>
SB	Left Turn	280	277	99.0%	68.6	4.8	E
	Through	1,150	1,150	100.0%	13.1	2.7	B
	Right Turn	55	59	106.4%	11.9	3.3	B
	<b>Subtotal</b>	<b>1,485</b>	<b>1,486</b>	<b>100.1%</b>	<b>23.9</b>	<b>2.2</b>	<b>C</b>
EB	Left Turn	40	39	98.3%	74.2	8.5	E
	Through	60	58	97.3%	66.8	12.7	E
	Right Turn	55	55	100.4%	22.2	8.6	C
	<b>Subtotal</b>	<b>155</b>	<b>153</b>	<b>98.6%</b>	<b>52.9</b>	<b>9.0</b>	<b>D</b>
WB	Left Turn	550	532	96.8%	111.3	38.5	F
	Through	50	48	95.2%	89.0	30.5	F
	Right Turn	255	258	101.0%	51.4	27.3	D
	<b>Subtotal</b>	<b>855</b>	<b>838</b>	<b>98.0%</b>	<b>91.5</b>	<b>34.7</b>	<b>F</b>
<b>Total</b>		<b>4,060</b>	<b>4,120</b>	<b>101.5%</b>	<b>46.0</b>	<b>7.5</b>	<b>D</b>

Intersection 3

Argonne/Knox

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	190	198	103.9%	114.5	44.6	F
	Through	1,470	1,523	103.6%	14.0	3.5	B
	Right Turn	30	30	100.3%	12.9	7.2	B
	Subtotal	<b>1,690</b>	<b>1,751</b>	<b>103.6%</b>	<b>25.8</b>	<b>8.1</b>	<b>C</b>
SB	Left Turn	60	56	94.0%	77.9	8.7	E
	Through	1,655	1,643	99.3%	11.6	1.3	B
	Right Turn	40	41	101.5%	8.7	4.2	A
	Subtotal	<b>1,755</b>	<b>1,740</b>	<b>99.1%</b>	<b>13.9</b>	<b>1.3</b>	<b>B</b>
EB	Left Turn	60	83	138.0%	66.5	12.6	E
	Through	5	6	120.0%	57.0	31.5	E
	Right Turn	300	270	90.1%	16.7	4.2	B
	Subtotal	<b>365</b>	<b>359</b>	<b>98.4%</b>	<b>28.4</b>	<b>4.9</b>	<b>C</b>
WB	Left Turn	70	73	103.9%	63.2	10.8	E
	Through	10	9	92.0%	52.1	35.1	D
	Right Turn	35	35	99.7%	21.9	13.4	C
	Subtotal	<b>115</b>	<b>117</b>	<b>101.6%</b>	<b>50.5</b>	<b>10.4</b>	<b>D</b>
Total		<b>3,925</b>	<b>3,967</b>	<b>101.1%</b>	<b>21.7</b>	<b>4.4</b>	<b>C</b>

Intersection 4

Argonne/WB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn						
	Through	1,390	1,359	97.7%	28.2	2.6	C
	Right Turn	645	634	98.3%	14.9	2.4	B
	Subtotal	<b>2,035</b>	<b>1,993</b>	<b>97.9%</b>	<b>24.0</b>	<b>2.4</b>	<b>C</b>
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	465	468	100.6%	1.5	0.2	A
	Through	375	376	100.2%	15.2	1.9	B
	Right Turn						
	Subtotal	<b>840</b>	<b>844</b>	<b>100.4%</b>	<b>7.5</b>	<b>1.0</b>	<b>A</b>
Total		<b>2,875</b>	<b>2,836</b>	<b>98.7%</b>	<b>19.2</b>	<b>1.8</b>	<b>B</b>

Intersection 5

Mullan/WB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	375	376	100.2%	41.9	22.4	D
	Through	1,295	1,369	105.7%	8.4	1.5	A
	Right Turn						
	Subtotal	<b>1,670</b>	<b>1,745</b>	<b>104.5%</b>	<b>16.0</b>	<b>5.8</b>	<b>B</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through	465	468	100.6%	62.7	23.3	E
	Right Turn	455	451	99.1%	77.7	33.1	E
	Subtotal	<b>920</b>	<b>919</b>	<b>99.9%</b>	<b>70.2</b>	<b>28.1</b>	<b>E</b>
Total		<b>2,590</b>	<b>2,663</b>	<b>102.8%</b>	<b>35.5</b>	<b>11.6</b>	<b>D</b>

Intersection 6

Argonne/EB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	385	374	97.1%	24.5	4.5	C
	Through	1,470	1,452	98.8%	8.9	0.5	A
	Right Turn						
	Subtotal	<b>1,855</b>	<b>1,826</b>	<b>98.5%</b>	<b>12.1</b>	<b>1.2</b>	<b>B</b>
EB	Left Turn						
	Through	435	434	99.7%	34.9	1.8	C
	Right Turn	500	510	101.9%	25.4	3.0	C
	Subtotal	<b>935</b>	<b>943</b>	<b>100.9%</b>	<b>29.8</b>	<b>1.6</b>	<b>C</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>2,790</b>	<b>2,770</b>	<b>99.3%</b>	<b>18.2</b>	<b>1.4</b>	<b>B</b>

Intersection 7

Mullan/EB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,295	1,308	101.0%	28.9	5.6	C
	Right Turn	430	441	102.7%	34.9	6.9	C
	Subtotal	<b>1,725</b>	<b>1,749</b>	<b>101.4%</b>	<b>30.4</b>	<b>5.7</b>	<b>C</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn	375	433	115.5%	2.1	0.3	A
	Through	445	374	84.0%	10.9	0.9	B
	Right Turn						
	Subtotal	<b>820</b>	<b>807</b>	<b>98.4%</b>	<b>6.1</b>	<b>0.6</b>	<b>A</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>2,545</b>	<b>2,556</b>	<b>100.4%</b>	<b>22.7</b>	<b>3.1</b>	<b>C</b>

Intersection 8

Argonne/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	510	504	98.9%	12.9	1.5	B
	Through	1,310	1,314	100.3%	6.2	0.9	A
	Right Turn	150	145	96.9%	4.4	1.2	A
	Subtotal	<b>1,970</b>	<b>1,964</b>	<b>99.7%</b>	<b>7.8</b>	<b>0.8</b>	<b>A</b>
EB	Left Turn						
	Through	235	246	104.8%	45.8	2.8	D
	Right Turn	25	27	106.0%	19.0	10.0	B
	Subtotal	<b>260</b>	<b>273</b>	<b>104.9%</b>	<b>43.1</b>	<b>3.6</b>	<b>D</b>
WB	Left Turn	60	58	96.3%	18.5	6.5	B
	Through	85	94	111.1%	30.9	3.6	C
	Right Turn						
	Subtotal	<b>145</b>	<b>152</b>	<b>105.0%</b>	<b>26.3</b>	<b>3.3</b>	<b>C</b>
Total		<b>2,375</b>	<b>2,389</b>	<b>100.6%</b>	<b>13.0</b>	<b>1.0</b>	<b>B</b>

Intersection 9

Mullan/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	50	49	98.4%	38.5	10.0	D
	Through	1,160	1,161	100.1%	46.1	15.6	D
	Right Turn	50	49	98.8%	45.1	19.3	D
	Subtotal	<b>1,260</b>	<b>1,260</b>	<b>100.0%</b>	<b>45.7</b>	<b>15.3</b>	<b>D</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn	175	182	104.2%	7.3	1.9	A
	Through	540	547	101.3%	23.9	1.3	C
	Right Turn						
	Subtotal	<b>715</b>	<b>729</b>	<b>102.0%</b>	<b>19.7</b>	<b>1.1</b>	<b>B</b>
WB	Left Turn						
	Through	85	83	97.2%	27.3	3.6	C
	Right Turn	390	403	103.2%	21.5	3.2	C
	Subtotal	<b>475</b>	<b>485</b>	<b>102.1%</b>	<b>22.4</b>	<b>3.1</b>	<b>C</b>
Total		<b>2,450</b>	<b>2,474</b>	<b>101.0%</b>	<b>33.4</b>	<b>2.0</b>	<b>C</b>

Intersection 19

Pines/Montgomery-Mansfield

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	250	234	93.8%	25.9	16.0	C
	Through	750	717	95.6%	6.8	1.4	A
	Right Turn	270	250	92.7%	8.3	1.2	A
	<b>Subtotal</b>	<b>1,270</b>	<b>1,202</b>	<b>94.6%</b>	<b>11.2</b>	<b>3.8</b>	<b>B</b>
SB	Left Turn	60	61	101.5%	21.7	6.7	C
	Through	595	600	100.8%	31.5	15.0	C
	Right Turn	20	21	106.0%	24.4	17.1	C
	<b>Subtotal</b>	<b>675</b>	<b>682</b>	<b>101.1%</b>	<b>30.4</b>	<b>14.2</b>	<b>C</b>
EB	Left Turn	25	23	90.8%	163.0	46.3	F
	Through	175	166	94.7%	154.5	52.0	F
	Right Turn	580	545	93.9%	154.5	56.2	F
	<b>Subtotal</b>	<b>780</b>	<b>733</b>	<b>94.0%</b>	<b>154.6</b>	<b>54.7</b>	<b>F</b>
WB	Left Turn	165	168	101.6%	36.1	8.3	D
	Through	165	159	96.4%	32.6	3.4	C
	Right Turn	35	33	94.0%	18.5	7.8	B
	<b>Subtotal</b>	<b>365</b>	<b>360</b>	<b>98.5%</b>	<b>33.1</b>	<b>3.5</b>	<b>C</b>
<b>Total</b>		<b>3,090</b>	<b>2,977</b>	<b>96.3%</b>	<b>53.7</b>	<b>14.3</b>	<b>D</b>

Intersection 20

Pines/Indiana

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	535	525	98.1%	51.9	6.9	D
	Through	955	949	99.4%	24.9	2.2	C
	Right Turn	160	158	98.4%	3.7	0.9	A
	<b>Subtotal</b>	<b>1,650</b>	<b>1,632</b>	<b>98.9%</b>	<b>31.8</b>	<b>3.3</b>	<b>C</b>
SB	Left Turn	110	110	100.0%	62.5	15.6	E
	Through	960	944	98.3%	52.2	12.4	D
	Right Turn	270	267	98.9%	45.1	11.2	D
	<b>Subtotal</b>	<b>1,340</b>	<b>1,321</b>	<b>98.6%</b>	<b>51.7</b>	<b>12.5</b>	<b>D</b>
EB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
WB	Left Turn	315	322	102.1%	34.5	7.1	C
	Through	350	346	98.7%	39.8	3.5	D
	Right Turn	245	243	99.3%	22.3	5.4	C
	<b>Subtotal</b>	<b>910</b>	<b>910</b>	<b>100.0%</b>	<b>33.3</b>	<b>4.8</b>	<b>C</b>
<b>Total</b>		<b>3,900</b>	<b>3,863</b>	<b>99.1%</b>	<b>38.8</b>	<b>3.7</b>	<b>D</b>

VISSIM Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

University Road - Pines Section  
2030 No Build  
PM Peak Hour

Intersection 21

WB90 Ramp/Indiana

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	510	506	99.1%	48.3	3.9	D
	Through						
	Right Turn	35	34	95.7%	27.8	9.8	C
	Subtotal	<b>545</b>	<b>539</b>	<b>98.9%</b>	<b>47.1</b>	<b>3.8</b>	<b>D</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	270	268	99.1%	3.7	1.6	A
	Right Turn						
	Subtotal	<b>270</b>	<b>268</b>	<b>99.1%</b>	<b>3.7</b>	<b>1.6</b>	<b>A</b>
WB	Left Turn						
	Through	400	406	101.4%	37.6	27.6	D
	Right Turn						
	Subtotal	<b>400</b>	<b>406</b>	<b>101.4%</b>	<b>37.6</b>	<b>27.6</b>	<b>D</b>
Total		<b>1,215</b>	<b>1,212</b>	<b>99.8%</b>	<b>34.6</b>	<b>9.2</b>	<b>C</b>

Intersection 22

Pines/EB 90 Ramps

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,320	1,296	98.2%	19.9	3.4	B
	Right Turn	305	291	95.5%	21.5	4.9	C
	Subtotal	<b>1,625</b>	<b>1,587</b>	<b>97.7%</b>	<b>20.2</b>	<b>3.6</b>	<b>C</b>
SB	Left Turn	230	230	100.1%	67.2	9.3	E
	Through	1,045	1,031	98.6%	22.4	7.1	C
	Right Turn						
	Subtotal	<b>1,275</b>	<b>1,261</b>	<b>98.9%</b>	<b>29.9</b>	<b>6.3</b>	<b>C</b>
EB	Left Turn	330	332	100.5%	58.5	6.6	E
	Through						
	Right Turn	590	587	99.5%	27.5	2.6	C
	Subtotal	<b>920</b>	<b>919</b>	<b>99.8%</b>	<b>39.2</b>	<b>2.5</b>	<b>D</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>3,820</b>	<b>3,767</b>	<b>98.6%</b>	<b>28.2</b>	<b>3.0</b>	<b>C</b>

VISSIM Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

University Road - Pines Section  
2030 No Build  
PM Peak Hour

Intersection 23

Pines/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	40	38	94.3%	70.2	22.5	E
	Through	1,005	994	98.9%	63.7	20.3	E
	Right Turn	45	44	98.2%	62.3	21.1	E
	<b>Subtotal</b>	<b>1,090</b>	<b>1,076</b>	<b>98.7%</b>	<b>63.9</b>	<b>20.3</b>	<b>E</b>
SB	Left Turn	495	485	97.9%	63.2	7.7	E
	Through	850	844	99.3%	29.0	3.2	C
	Right Turn	290	293	101.0%	24.6	4.0	C
	<b>Subtotal</b>	<b>1,635</b>	<b>1,622</b>	<b>99.2%</b>	<b>38.4</b>	<b>3.7</b>	<b>D</b>
EB	Left Turn	240	237	98.6%	77.4	16.9	E
	Through	195	192	98.4%	59.2	11.2	E
	Right Turn	65	69	106.6%	42.6	9.1	D
	<b>Subtotal</b>	<b>500</b>	<b>498</b>	<b>99.5%</b>	<b>66.3</b>	<b>13.3</b>	<b>E</b>
WB	Left Turn	110	111	101.3%	56.9	3.7	E
	Through	265	274	103.4%	53.7	2.7	D
	Right Turn	345	352	102.0%	31.1	9.8	C
	<b>Subtotal</b>	<b>720</b>	<b>737</b>	<b>102.4%</b>	<b>43.9</b>	<b>4.7</b>	<b>D</b>
<b>Total</b>		<b>3,945</b>	<b>3,933</b>	<b>99.7%</b>	<b>50.0</b>	<b>6.3</b>	<b>D</b>

Intersection 1

Argonne/SR290

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	295	296	100.3%	43.6	7.1	D
	Through	1,175	1,224	104.2%	33.5	4.8	C
	Right Turn	200	206	103.0%	13.4	4.2	B
	<b>Subtotal</b>	<b>1,670</b>	<b>1,726</b>	<b>103.3%</b>	<b>32.8</b>	<b>4.9</b>	<b>C</b>
SB	Left Turn	170	161	94.7%	84.7	20.7	F
	Through	915	932	101.8%	45.4	3.4	D
	Right Turn	55	57	103.3%	32.5	5.2	C
	<b>Subtotal</b>	<b>1,140</b>	<b>1,149</b>	<b>100.8%</b>	<b>50.6</b>	<b>5.1</b>	<b>D</b>
EB	Left Turn	155	156	100.6%	77.7	10.7	E
	Through	660	667	101.1%	55.7	5.3	E
	Right Turn	310	309	99.6%	4.3	0.9	A
	<b>Subtotal</b>	<b>1,125</b>	<b>1,132</b>	<b>100.6%</b>	<b>44.4</b>	<b>4.0</b>	<b>D</b>
WB	Left Turn	260	272	104.5%	122.0	58.6	F
	Through	415	415	100.1%	42.5	4.8	D
	Right Turn	210	215	102.3%	10.9	2.0	B
	<b>Subtotal</b>	<b>885</b>	<b>902</b>	<b>101.9%</b>	<b>60.4</b>	<b>19.0</b>	<b>E</b>
<b>Total</b>		<b>4,820</b>	<b>4,909</b>	<b>101.8%</b>	<b>44.7</b>	<b>3.7</b>	<b>D</b>

Intersection 2

Argonne/Montgomery

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	10	10	97.0%	82.7	38.6	F
	Through	1,325	1,377	103.9%	44.9	9.9	D
	Right Turn	230	245	106.7%	51.6	14.3	D
	<b>Subtotal</b>	<b>1,565</b>	<b>1,632</b>	<b>104.3%</b>	<b>46.2</b>	<b>10.3</b>	<b>D</b>
SB	Left Turn	280	283	101.1%	72.3	5.1	E
	Through	1,150	1,169	101.7%	19.4	10.2	B
	Right Turn	55	61	110.4%	20.5	11.2	C
	<b>Subtotal</b>	<b>1,485</b>	<b>1,513</b>	<b>101.9%</b>	<b>29.8</b>	<b>8.7</b>	<b>C</b>
EB	Left Turn	40	39	96.8%	72.1	7.6	E
	Through	60	55	90.8%	69.5	9.9	E
	Right Turn	55	56	101.5%	35.0	11.7	C
	<b>Subtotal</b>	<b>155</b>	<b>149</b>	<b>96.1%</b>	<b>57.3</b>	<b>7.1</b>	<b>E</b>
WB	Left Turn	550	533	96.9%	146.7	80.0	F
	Through	50	48	95.8%	113.3	64.8	F
	Right Turn	255	259	101.6%	72.6	54.0	E
	<b>Subtotal</b>	<b>855</b>	<b>840</b>	<b>98.2%</b>	<b>122.0</b>	<b>72.4</b>	<b>F</b>
<b>Total</b>		<b>4,060</b>	<b>4,134</b>	<b>101.8%</b>	<b>55.6</b>	<b>15.9</b>	<b>E</b>

Intersection 3

Argonne/Knox

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	190	195	102.7%	101.7	20.8	F
	Through	1,470	1,518	103.2%	13.8	3.3	B
	Right Turn	30	29	97.3%	12.1	5.3	B
	Subtotal	<b>1,690</b>	<b>1,742</b>	<b>103.1%</b>	<b>24.2</b>	<b>4.2</b>	<b>C</b>
SB	Left Turn	60	57	95.2%	85.6	16.1	F
	Through	1,655	1,664	100.6%	31.8	23.6	C
	Right Turn	40	38	94.5%	39.7	30.7	D
	Subtotal	<b>1,755</b>	<b>1,759</b>	<b>100.2%</b>	<b>33.8</b>	<b>23.4</b>	<b>C</b>
EB	Left Turn	60	83	138.8%	57.3	13.2	E
	Through	5	7	130.0%	52.0	36.3	D
	Right Turn	300	272	90.6%	14.4	6.7	B
	Subtotal	<b>365</b>	<b>362</b>	<b>99.1%</b>	<b>25.3</b>	<b>8.6</b>	<b>C</b>
WB	Left Turn	70	70	100.4%	79.3	18.0	E
	Through	10	9	85.0%	45.9	28.9	D
	Right Turn	35	33	94.3%	14.5	7.8	B
	Subtotal	<b>115</b>	<b>112</b>	<b>97.2%</b>	<b>59.9</b>	<b>16.2</b>	<b>E</b>
Total		<b>3,925</b>	<b>3,975</b>	<b>101.3%</b>	<b>29.7</b>	<b>10.4</b>	<b>C</b>

Intersection 4

Argonne/WB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	375	363	96.7%	27.0	3.5	C
	Through	1,330	1,345	101.1%	45.9	2.5	D
	Right Turn						
	Subtotal	<b>1,705</b>	<b>1,708</b>	<b>100.2%</b>	<b>41.6</b>	<b>2.8</b>	<b>D</b>
SB	Left Turn						
	Through	1,390	1,364	98.1%	86.6	20.3	F
	Right Turn	645	650	100.7%	29.2	11.3	C
	Subtotal	<b>2,035</b>	<b>2,013</b>	<b>98.9%</b>	<b>68.7</b>	<b>17.8</b>	<b>E</b>
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn	465	459	98.7%	109.6	51.1	F
	Through						
	Right Turn	455	452	99.4%	31.6	27.1	C
	Subtotal	<b>920</b>	<b>911</b>	<b>99.1%</b>	<b>72.5</b>	<b>40.3</b>	<b>E</b>
Total		<b>4,660</b>	<b>4,632</b>	<b>99.4%</b>	<b>59.7</b>	<b>11.2</b>	<b>E</b>

Intersection 0

Mullan/WB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn				#N/A	#N/A	#N/A
	Through				#N/A	#N/A	#N/A
	Right Turn				#N/A	#N/A	#N/A
	Subtotal				#N/A	#N/A	#N/A
SB	Left Turn				#N/A	#N/A	#N/A
	Through				#N/A	#N/A	#N/A
	Right Turn				#N/A	#N/A	#N/A
	Subtotal				#N/A	#N/A	#N/A
EB	Left Turn				#N/A	#N/A	#N/A
	Through				#N/A	#N/A	#N/A
	Right Turn				#N/A	#N/A	#N/A
	Subtotal				#N/A	#N/A	#N/A
WB	Left Turn				#N/A	#N/A	#N/A
	Through				#N/A	#N/A	#N/A
	Right Turn				#N/A	#N/A	#N/A
	Subtotal				#N/A	#N/A	#N/A
Total					0.0	#N/A	A

Intersection 6

Argonne/EB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,295	1,272	98.2%	78.1	7.2	E
	Right Turn	430	426	99.0%	15.2	4.7	B
	Subtotal	1,725	1,697	98.4%	62.6	7.0	E
SB	Left Turn	385	382	99.2%	10.7	2.0	B
	Through	1,470	1,444	98.2%	39.1	4.0	D
	Right Turn						
	Subtotal	1,855	1,826	98.4%	33.0	3.7	C
EB	Left Turn	375	438	116.9%	34.9	6.8	C
	Through						
	Right Turn	500	508	101.5%	38.2	10.3	D
	Subtotal	875	946	108.1%	36.8	8.3	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		4,455	4,469	100.3%	44.9	4.2	D

Intersection 0

Mullan/EB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn				#N/A	#N/A	#N/A
	Through				#N/A	#N/A	#N/A
	Right Turn				#N/A	#N/A	#N/A
	Subtotal				#N/A	#N/A	#N/A
SB	Left Turn				#N/A	#N/A	#N/A
	Through				#N/A	#N/A	#N/A
	Right Turn				#N/A	#N/A	#N/A
	Subtotal				#N/A	#N/A	#N/A
EB	Left Turn				#N/A	#N/A	#N/A
	Through				#N/A	#N/A	#N/A
	Right Turn				#N/A	#N/A	#N/A
	Subtotal				#N/A	#N/A	#N/A
WB	Left Turn				#N/A	#N/A	#N/A
	Through				#N/A	#N/A	#N/A
	Right Turn				#N/A	#N/A	#N/A
	Subtotal				#N/A	#N/A	#N/A
Total					0.0	#N/A	A

Intersection 8

Argonne/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	510	504	98.9%	20.6	3.0	C
	Through	1,310	1,298	99.1%	13.8	1.7	B
	Right Turn	150	150	100.0%	11.0	1.4	B
	Subtotal	1,970	1,952	99.1%	15.3	1.7	B
EB	Left Turn						
	Through	235	242	103.0%	46.1	6.3	D
	Right Turn	25	26	103.2%	16.9	8.8	B
	Subtotal	260	268	103.0%	43.5	5.8	D
WB	Left Turn	60	57	95.2%	55.5	10.3	E
	Through	85	96	112.9%	37.7	5.7	D
	Right Turn						
	Subtotal	145	153	105.6%	45.3	10.4	D
Total		2,375	2,373	99.9%	20.4	2.2	C

Intersection 9

Mullan/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	50	49	97.6%	152.5	70.2	F
	Through	1,160	1,133	97.7%	150.6	67.3	F
	Right Turn	50	51	102.8%	107.7	59.6	F
	<b>Subtotal</b>	<b>1,260</b>	<b>1,233</b>	<b>97.9%</b>	<b>149.0</b>	<b>67.1</b>	<b>F</b>
SB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
EB	Left Turn	175	177	100.9%	68.2	9.8	E
	Through	540	546	101.1%	13.0	4.3	B
	Right Turn						
	<b>Subtotal</b>	<b>715</b>	<b>722</b>	<b>101.0%</b>	<b>27.3</b>	<b>2.3</b>	<b>C</b>
WB	Left Turn						
	Through	85	85	99.6%	38.7	6.9	D
	Right Turn	390	392	100.4%	23.8	5.4	C
	<b>Subtotal</b>	<b>475</b>	<b>476</b>	<b>100.3%</b>	<b>26.5</b>	<b>4.5</b>	<b>C</b>
<b>Total</b>		<b>2,450</b>	<b>2,432</b>	<b>99.3%</b>	<b>86.7</b>	<b>29.9</b>	<b>F</b>

Intersection 1

Argonne/SR290

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	300	280	93.4%	35.2	6.0	D
	Through	1,190	1,141	95.9%	17.6	2.7	B
	Right Turn	180	167	92.7%	7.5	1.9	A
	<b>Subtotal</b>	<b>1,670</b>	<b>1,588</b>	<b>95.1%</b>	<b>19.7</b>	<b>2.7</b>	<b>B</b>
SB	Left Turn	140	130	93.1%	136.6	51.7	F
	Through	945	931	98.5%	139.0	69.6	F
	Right Turn	45	44	97.1%	94.0	55.5	F
	<b>Subtotal</b>	<b>1,130</b>	<b>1,105</b>	<b>97.8%</b>	<b>137.0</b>	<b>66.4</b>	<b>F</b>
EB	Left Turn	155	157	101.5%	94.5	36.9	F
	Through	590	584	99.0%	73.9	30.1	E
	Right Turn	335	318	94.8%	163.3	154.4	F
	<b>Subtotal</b>	<b>1,080</b>	<b>1,059</b>	<b>98.1%</b>	<b>103.4</b>	<b>68.5</b>	<b>F</b>
WB	Left Turn	215	217	101.0%	96.0	22.8	F
	Through	390	402	103.1%	48.0	4.9	D
	Right Turn	205	211	102.7%	8.9	1.8	A
	<b>Subtotal</b>	<b>810</b>	<b>830</b>	<b>102.4%</b>	<b>50.9</b>	<b>5.9</b>	<b>D</b>
<b>Total</b>		<b>4,690</b>	<b>4,581</b>	<b>97.7%</b>	<b>71.6</b>	<b>24.8</b>	<b>E</b>

Intersection 2

Argonne/Montgomery

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	10	8	76.0%	100.8	48.8	F
	Through	1,295	1,262	97.4%	38.4	7.7	D
	Right Turn	140	136	97.1%	34.3	10.0	C
	<b>Subtotal</b>	<b>1,445</b>	<b>1,405</b>	<b>97.2%</b>	<b>38.5</b>	<b>7.5</b>	<b>D</b>
SB	Left Turn	345	332	96.1%	123.1	23.7	F
	Through	1,105	1,024	92.7%	159.0	45.8	F
	Right Turn	45	44	97.6%	259.1	74.8	F
	<b>Subtotal</b>	<b>1,495</b>	<b>1,400</b>	<b>93.6%</b>	<b>154.1</b>	<b>39.8</b>	<b>F</b>
EB	Left Turn	25	25	100.0%	64.3	20.6	E
	Through	65	64	99.1%	66.3	10.1	E
	Right Turn	60	62	103.7%	64.7	22.9	E
	<b>Subtotal</b>	<b>150</b>	<b>152</b>	<b>101.1%</b>	<b>65.2</b>	<b>10.6</b>	<b>E</b>
WB	Left Turn	460	345	75.0%	764.4	112.9	F
	Through	50	39	78.2%	629.7	127.4	F
	Right Turn	300	241	80.2%	587.6	132.5	F
	<b>Subtotal</b>	<b>810</b>	<b>625</b>	<b>77.1%</b>	<b>692.5</b>	<b>119.1</b>	<b>F</b>
<b>Total</b>		<b>3,900</b>	<b>3,581</b>	<b>91.8%</b>	<b>195.4</b>	<b>29.1</b>	<b>F</b>

Intersection 3

Argonne/Knox

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	195	200	102.6%	93.6	23.7	F
	Through	1,355	1,352	99.8%	12.3	2.4	B
	Right Turn	30	32	107.3%	10.7	8.0	B
	<b>Subtotal</b>	<b>1,580</b>	<b>1,585</b>	<b>100.3%</b>	<b>22.3</b>	<b>4.8</b>	<b>C</b>
SB	Left Turn	60	51	85.5%	99.9	14.6	F
	Through	1,525	1,315	86.2%	128.1	7.6	F
	Right Turn	40	33	83.0%	271.2	55.5	F
	<b>Subtotal</b>	<b>1,625</b>	<b>1,399</b>	<b>86.1%</b>	<b>130.0</b>	<b>8.2</b>	<b>F</b>
EB	Left Turn	55	24	44.4%	1653.3	621.6	F
	Through	5	3	62.0%	886.7	940.5	F
	Right Turn	345	152	44.2%	1854.9	115.7	F
	<b>Subtotal</b>	<b>405</b>	<b>180</b>	<b>44.4%</b>	<b>1778.1</b>	<b>207.4</b>	<b>F</b>
WB	Left Turn	70	69	98.6%	59.1	14.6	E
	Through	10	9	89.0%	29.9	32.2	C
	Right Turn	35	33	95.4%	6.9	3.1	A
	<b>Subtotal</b>	<b>115</b>	<b>111</b>	<b>96.8%</b>	<b>40.8</b>	<b>9.3</b>	<b>D</b>
<b>Total</b>		<b>3,725</b>	<b>3,275</b>	<b>87.9%</b>	<b>168.4</b>	<b>19.1</b>	<b>F</b>

Intersection 4

Argonne/WB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
SB	Left Turn						
	Through	1,280	1,017	79.4%	73.1	7.8	E
	Right Turn	670	532	79.3%	232.1	20.6	F
	<b>Subtotal</b>	<b>1,950</b>	<b>1,548</b>	<b>79.4%</b>	<b>127.7</b>	<b>9.7</b>	<b>F</b>
EB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
WB	Left Turn	455	460	101.2%	1.7	0.2	A
	Through	370	369	99.8%	13.8	1.6	B
	Right Turn						
	<b>Subtotal</b>	<b>825</b>	<b>829</b>	<b>100.5%</b>	<b>7.0</b>	<b>0.7</b>	<b>A</b>
<b>Total</b>		<b>2,775</b>	<b>2,378</b>	<b>85.7%</b>	<b>86.6</b>	<b>5.9</b>	<b>F</b>

Intersection 5

Mullan/WB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	370	369	99.8%	17.3	3.5	B
	Through	1,140	1,208	105.9%	5.9	0.8	A
	Right Turn						
	Subtotal	<b>1,510</b>	<b>1,577</b>	<b>104.4%</b>	<b>8.4</b>	<b>1.5</b>	<b>A</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
WB	Left Turn						
	Through	455	459	101.0%	70.2	22.4	E
	Right Turn	465	458	98.6%	57.0	26.7	E
	Subtotal	<b>920</b>	<b>918</b>	<b>99.8%</b>	<b>63.5</b>	<b>24.2</b>	<b>E</b>
Total		<b>2,430</b>	<b>2,495</b>	<b>102.7%</b>	<b>28.7</b>	<b>6.1</b>	<b>C</b>

Intersection 6

Argonne/EB90-West

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	385	301	78.1%	14.9	3.4	B
	Through	1,350	1,178	87.3%	7.0	1.5	A
	Right Turn						
	Subtotal	<b>1,735</b>	<b>1,479</b>	<b>85.2%</b>	<b>8.6</b>	<b>1.7</b>	<b>A</b>
EB	Left Turn						
	Through	435	437	100.4%	39.7	2.1	D
	Right Turn	500	502	100.4%	18.5	1.6	B
	Subtotal	<b>935</b>	<b>939</b>	<b>100.4%</b>	<b>28.5</b>	<b>1.8</b>	<b>C</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>2,670</b>	<b>2,418</b>	<b>90.5%</b>	<b>16.8</b>	<b>1.6</b>	<b>B</b>

Intersection 7

Mullan/EB90-East

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,135	1,140	100.4%	10.6	2.0	B
	Right Turn	430	441	102.6%	14.5	3.2	B
	Subtotal	<b>1,565</b>	<b>1,581</b>	<b>101.0%</b>	<b>11.8</b>	<b>2.1</b>	<b>B</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn	375	436	116.4%	2.1	0.2	A
	Through	445	301	67.6%	11.3	1.1	B
	Right Turn						
	Subtotal	<b>820</b>	<b>737</b>	<b>89.9%</b>	<b>5.7</b>	<b>0.4</b>	<b>A</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>2,385</b>	<b>2,318</b>	<b>97.2%</b>	<b>9.9</b>	<b>0.8</b>	<b>A</b>

Intersection 8

Argonne/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
SB	Left Turn	475	420	88.5%	11.4	2.2	B
	Through	1,235	1,125	91.1%	5.1	0.7	A
	Right Turn	140	132	94.2%	3.3	0.7	A
	Subtotal	<b>1,850</b>	<b>1,677</b>	<b>90.7%</b>	<b>6.5</b>	<b>0.9</b>	<b>A</b>
EB	Left Turn						
	Through	240	241	100.4%	45.9	3.6	D
	Right Turn	20	20	99.5%	23.1	7.4	C
	Subtotal	<b>260</b>	<b>261</b>	<b>100.3%</b>	<b>44.1</b>	<b>3.6</b>	<b>D</b>
WB	Left Turn	70	72	102.6%	15.3	3.7	B
	Through	90	90	100.4%	30.1	3.5	C
	Right Turn						
	Subtotal	<b>160</b>	<b>162</b>	<b>101.4%</b>	<b>23.6</b>	<b>3.2</b>	<b>C</b>
Total		<b>2,270</b>	<b>2,100</b>	<b>92.5%</b>	<b>12.6</b>	<b>0.9</b>	<b>B</b>

Intersection 9

Mullan/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	50	51	101.2%	26.9	6.8	C
	Through	1,105	1,115	100.9%	25.8	2.0	C
	Right Turn	60	64	106.2%	22.1	5.7	C
	<b>Subtotal</b>	<b>1,215</b>	<b>1,230</b>	<b>101.2%</b>	<b>25.6</b>	<b>2.0</b>	<b>C</b>
SB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
EB	Left Turn	170	170	100.1%	6.6	1.8	A
	Through	520	467	89.8%	24.2	1.4	C
	Right Turn						
	<b>Subtotal</b>	<b>690</b>	<b>637</b>	<b>92.3%</b>	<b>19.6</b>	<b>1.2</b>	<b>B</b>
WB	Left Turn						
	Through	100	104	103.8%	26.3	6.4	C
	Right Turn	290	295	101.8%	13.8	3.9	B
	<b>Subtotal</b>	<b>390</b>	<b>399</b>	<b>102.3%</b>	<b>17.1</b>	<b>4.3</b>	<b>B</b>
<b>Total</b>		<b>2,295</b>	<b>2,266</b>	<b>98.7%</b>	<b>22.5</b>	<b>1.1</b>	<b>C</b>

Intersection 19

Pines/Montgomery-Mansfield

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	165	164	99.6%	11.8	4.5	B
	Through	690	674	97.6%	6.5	1.8	A
	Right Turn	270	268	99.3%	9.0	1.4	A
	<b>Subtotal</b>	<b>1,125</b>	<b>1,106</b>	<b>98.3%</b>	<b>7.9</b>	<b>1.6</b>	<b>A</b>
SB	Left Turn	55	57	103.8%	13.9	7.1	B
	Through	550	564	102.5%	15.3	4.5	B
	Right Turn	25	25	98.8%	13.1	6.1	B
	<b>Subtotal</b>	<b>630</b>	<b>645</b>	<b>102.4%</b>	<b>15.1</b>	<b>4.3</b>	<b>B</b>
EB	Left Turn	25	26	103.2%	46.5	10.3	D
	Through	35	35	99.4%	47.5	11.1	D
	Right Turn	400	401	100.2%	22.1	9.0	C
	<b>Subtotal</b>	<b>460</b>	<b>461</b>	<b>100.3%</b>	<b>25.6</b>	<b>7.2</b>	<b>C</b>
WB	Left Turn	170	168	98.9%	47.6	13.9	D
	Through	165	166	100.4%	44.4	9.3	D
	Right Turn	30	28	93.3%	34.4	16.1	C
	<b>Subtotal</b>	<b>365</b>	<b>362</b>	<b>99.2%</b>	<b>45.5</b>	<b>11.9</b>	<b>D</b>
<b>Total</b>		<b>2,580</b>	<b>2,575</b>	<b>99.8%</b>	<b>18.2</b>	<b>2.8</b>	<b>B</b>

Intersection 20

Pines/Indiana

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	540	529	97.9%	51.5	2.9	D
	Through	850	851	100.1%	24.8	1.8	C
	Right Turn	175	174	99.7%	3.4	1.1	A
	<b>Subtotal</b>	<b>1,565</b>	<b>1,554</b>	<b>99.3%</b>	<b>31.2</b>	<b>0.9</b>	<b>C</b>
SB	Left Turn	110	114	103.2%	61.9	18.6	E
	Through	735	755	102.7%	48.5	9.3	D
	Right Turn	275	277	100.8%	40.8	7.1	D
	<b>Subtotal</b>	<b>1,120</b>	<b>1,146</b>	<b>102.3%</b>	<b>47.9</b>	<b>9.0</b>	<b>D</b>
EB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
WB	Left Turn	345	341	98.8%	31.9	4.5	C
	Through	335	336	100.3%	36.4	4.0	D
	Right Turn	245	245	100.2%	19.0	4.8	B
	<b>Subtotal</b>	<b>925</b>	<b>922</b>	<b>99.7%</b>	<b>30.0</b>	<b>3.7</b>	<b>C</b>
<b>Total</b>		<b>3,610</b>	<b>3,622</b>	<b>100.3%</b>	<b>36.3</b>	<b>2.8</b>	<b>D</b>

Intersection 21

WB90 Ramp/Indiana

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	520	518	99.5%	50.0	3.2	D
	Through						
	Right Turn	35	35	99.4%	24.3	15.1	C
	Subtotal	<b>555</b>	<b>552</b>	<b>99.5%</b>	<b>48.6</b>	<b>3.0</b>	<b>D</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	285	289	101.3%	2.6	1.3	A
	Right Turn						
	Subtotal	<b>285</b>	<b>289</b>	<b>101.3%</b>	<b>2.6</b>	<b>1.3</b>	<b>A</b>
WB	Left Turn						
	Through	405	405	100.0%	20.8	13.6	C
	Right Turn						
	Subtotal	<b>405</b>	<b>405</b>	<b>100.0%</b>	<b>20.8</b>	<b>13.6</b>	<b>C</b>
Total		<b>1,245</b>	<b>1,246</b>	<b>100.1%</b>	<b>28.7</b>	<b>3.9</b>	<b>C</b>

Intersection 22

Pines/EB 90 Ramps

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,235	1,222	98.9%	19.0	2.7	B
	Right Turn	305	299	98.2%	19.7	2.7	B
	Subtotal	<b>1,540</b>	<b>1,521</b>	<b>98.8%</b>	<b>19.1</b>	<b>2.4</b>	<b>B</b>
SB	Left Turn	240	241	100.6%	64.9	13.4	E
	Through	840	853	101.6%	17.5	2.9	B
	Right Turn						
	Subtotal	<b>1,080</b>	<b>1,095</b>	<b>101.4%</b>	<b>27.8</b>	<b>4.0</b>	<b>C</b>
EB	Left Turn	330	329	99.7%	57.4	6.3	E
	Through						
	Right Turn	595	591	99.3%	26.4	2.3	C
	Subtotal	<b>925</b>	<b>920</b>	<b>99.4%</b>	<b>37.9</b>	<b>3.5</b>	<b>D</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>3,545</b>	<b>3,536</b>	<b>99.7%</b>	<b>26.8</b>	<b>1.9</b>	<b>C</b>

VISSIM Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

University Road - Pines Section  
2030 University Bridge  
PM Peak Hour

Intersection 23

Pines/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	55	55	100.7%	80.9	15.4	F
	Through	1,040	1,022	98.3%	63.3	13.7	E
	Right Turn	45	43	94.7%	53.4	16.6	D
	<b>Subtotal</b>	<b>1,140</b>	<b>1,120</b>	<b>98.3%</b>	<b>63.9</b>	<b>13.6</b>	<b>E</b>
SB	Left Turn	455	465	102.2%	51.3	3.2	D
	Through	790	794	100.5%	25.4	2.1	C
	Right Turn	190	190	99.8%	22.5	2.7	C
	<b>Subtotal</b>	<b>1,435</b>	<b>1,449</b>	<b>101.0%</b>	<b>33.2</b>	<b>1.8</b>	<b>C</b>
EB	Left Turn	125	123	98.0%	56.8	6.6	E
	Through	220	220	100.1%	55.2	5.0	E
	Right Turn	115	120	103.9%	40.2	9.0	D
	<b>Subtotal</b>	<b>460</b>	<b>462</b>	<b>100.5%</b>	<b>52.2</b>	<b>4.3</b>	<b>D</b>
WB	Left Turn	110	115	104.6%	60.6	10.6	E
	Through	250	256	102.4%	55.4	5.5	E
	Right Turn	365	372	101.8%	43.6	30.4	D
	<b>Subtotal</b>	<b>725</b>	<b>743</b>	<b>102.4%</b>	<b>50.7</b>	<b>16.1</b>	<b>D</b>
<b>Total</b>		<b>3,760</b>	<b>3,774</b>	<b>100.4%</b>	<b>48.2</b>	<b>6.7</b>	<b>D</b>

Intersection 19

Pines/Montgomery-Mansfield

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	250	236	94.3%	29.3	11.0	C
	Through	750	720	96.0%	7.5	0.9	A
	Right Turn	270	254	94.0%	9.2	1.4	A
	<b>Subtotal</b>	<b>1,270</b>	<b>1,210</b>	<b>95.3%</b>	<b>12.6</b>	<b>2.4</b>	<b>B</b>
SB	Left Turn	60	63	104.2%	23.4	7.4	C
	Through	595	609	102.3%	33.7	6.5	C
	Right Turn	20	20	99.0%	24.3	9.7	C
	<b>Subtotal</b>	<b>675</b>	<b>691</b>	<b>102.4%</b>	<b>32.5</b>	<b>6.2</b>	<b>C</b>
EB	Left Turn	25	20	80.8%	187.2	50.0	F
	Through	175	164	93.7%	191.6	50.6	F
	Right Turn	580	535	92.2%	187.8	52.6	F
	<b>Subtotal</b>	<b>780</b>	<b>719</b>	<b>92.2%</b>	<b>188.7</b>	<b>51.7</b>	<b>F</b>
WB	Left Turn	165	167	101.2%	34.5	6.5	C
	Through	165	160	97.0%	32.4	4.0	C
	Right Turn	35	33	95.4%	16.7	7.9	B
	<b>Subtotal</b>	<b>365</b>	<b>360</b>	<b>98.7%</b>	<b>32.0</b>	<b>3.0</b>	<b>C</b>
<b>Total</b>		<b>3,090</b>	<b>2,980</b>	<b>96.5%</b>	<b>61.3</b>	<b>11.7</b>	<b>E</b>

Intersection 20

Pines/Indiana

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	535	522	97.6%	49.4	6.3	D
	Through	955	946	99.0%	25.9	2.3	C
	Right Turn	160	159	99.1%	4.4	0.8	A
	<b>Subtotal</b>	<b>1,650</b>	<b>1,627</b>	<b>98.6%</b>	<b>31.3</b>	<b>3.5</b>	<b>C</b>
SB	Left Turn	110	113	102.3%	69.0	17.0	E
	Through	960	946	98.6%	57.3	11.1	E
	Right Turn	270	264	97.8%	46.5	10.5	D
	<b>Subtotal</b>	<b>1,340</b>	<b>1,323</b>	<b>98.7%</b>	<b>56.2</b>	<b>11.1</b>	<b>E</b>
EB	Left Turn						
	Through						
	Right Turn						
	<b>Subtotal</b>						
WB	Left Turn	315	315	100.0%	34.1	4.3	C
	Through	350	347	99.2%	36.5	4.3	D
	Right Turn	245	252	103.0%	19.6	3.5	B
	<b>Subtotal</b>	<b>910</b>	<b>915</b>	<b>100.5%</b>	<b>31.1</b>	<b>3.5</b>	<b>C</b>
<b>Total</b>		<b>3,900</b>	<b>3,864</b>	<b>99.1%</b>	<b>39.7</b>	<b>2.6</b>	<b>D</b>

Intersection 21

WB90 Ramp/Indiana

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	510	513	100.6%	49.4	3.0	D
	Through						
	Right Turn	35	36	104.0%	27.7	16.1	C
	Subtotal	<b>545</b>	<b>550</b>	<b>100.8%</b>	<b>48.1</b>	<b>3.2</b>	<b>D</b>
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	270	272	100.6%	2.6	0.5	A
	Right Turn						
	Subtotal	<b>270</b>	<b>272</b>	<b>100.6%</b>	<b>2.6</b>	<b>0.5</b>	<b>A</b>
WB	Left Turn						
	Through	400	402	100.6%	24.1	12.9	C
	Right Turn						
	Subtotal	<b>400</b>	<b>402</b>	<b>100.6%</b>	<b>24.1</b>	<b>12.9</b>	<b>C</b>
Total		<b>1,215</b>	<b>1,223</b>	<b>100.7%</b>	<b>30.0</b>	<b>5.0</b>	<b>C</b>

Intersection 22

Pines/EB 90 Ramps

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn						
	Through	1,320	1,290	97.7%	22.2	2.9	C
	Right Turn	305	295	96.8%	22.4	5.0	C
	Subtotal	<b>1,625</b>	<b>1,585</b>	<b>97.5%</b>	<b>22.2</b>	<b>3.1</b>	<b>C</b>
SB	Left Turn	230	229	99.7%	62.9	8.8	E
	Through	1,045	1,026	98.2%	16.7	4.5	B
	Right Turn						
	Subtotal	<b>1,275</b>	<b>1,255</b>	<b>98.4%</b>	<b>25.3</b>	<b>3.6</b>	<b>C</b>
EB	Left Turn	330	333	100.9%	58.0	7.5	E
	Through						
	Right Turn	590	588	99.7%	27.4	2.8	C
	Subtotal	<b>920</b>	<b>921</b>	<b>100.1%</b>	<b>37.9</b>	<b>3.4</b>	<b>D</b>
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		<b>3,820</b>	<b>3,761</b>	<b>98.5%</b>	<b>27.2</b>	<b>2.3</b>	<b>C</b>

VISSIM Post-Processor  
Average Results from 10 Runs  
Volume and Delay by Movement

University Road - Pines Section  
2030 Optimized Timing  
PM Peak Hour

Intersection 23

Pines/Mission

Signal

Direction	Movement	Volume (vph)		Percent Served	Total Delay (sec/veh)		
		Demand	Served		Average	Std. Dev.	LOS
NB	Left Turn	40	39	98.5%	61.2	17.2	E
	Through	1,005	990	98.5%	51.4	10.7	D
	Right Turn	45	45	99.3%	53.0	17.3	D
	<b>Subtotal</b>	<b>1,090</b>	<b>1,074</b>	<b>98.5%</b>	<b>51.8</b>	<b>10.9</b>	<b>D</b>
SB	Left Turn	495	490	99.0%	56.7	4.2	E
	Through	850	831	97.8%	25.4	2.1	C
	Right Turn	290	296	102.0%	23.6	2.8	C
	<b>Subtotal</b>	<b>1,635</b>	<b>1,617</b>	<b>98.9%</b>	<b>34.4</b>	<b>2.1</b>	<b>C</b>
EB	Left Turn	240	240	99.9%	60.0	7.5	E
	Through	195	194	99.3%	56.5	15.5	E
	Right Turn	65	70	107.4%	42.2	11.7	D
	<b>Subtotal</b>	<b>500</b>	<b>503</b>	<b>100.6%</b>	<b>56.8</b>	<b>9.0</b>	<b>E</b>
WB	Left Turn	110	112	102.2%	57.5	10.3	E
	Through	265	270	101.8%	56.1	7.1	E
	Right Turn	345	349	101.3%	54.2	46.3	D
	<b>Subtotal</b>	<b>720</b>	<b>732</b>	<b>101.6%</b>	<b>55.3</b>	<b>22.5</b>	<b>E</b>
<b>Total</b>		<b>3,945</b>	<b>3,926</b>	<b>99.5%</b>	<b>46.2</b>	<b>5.1</b>	<b>D</b>

# HCM Signalized Intersection Capacity Analysis

## 10: Broadway & Argonne

8/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑						↑↑↑	
Volume (vph)	0	380	75	40	165	0	0	0	0	260	995	100
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)		3.0			3.0						3.0	
Lane Util. Factor		0.95			0.95						0.91	
Frt		0.98			1.00						0.99	
Flt Protected		1.00			0.99						0.99	
Satd. Flow (prot)		2952			2998						4260	
Flt Permitted		1.00			0.81						0.99	
Satd. Flow (perm)		2952			2438						4260	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	422	83	44	183	0	0	0	0	289	1106	111
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	491	0	0	227	0	0	0	0	0	1499	0
Turn Type				pm+pt							Perm	
Protected Phases		6		5	2							4
Permitted Phases				2						4		
Actuated Green, G (s)		35.0			44.0						66.0	
Effective Green, g (s)		37.0			46.0						68.0	
Actuated g/C Ratio		0.31			0.38						0.57	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		910			963						2414	
v/s Ratio Prot		c0.17			c0.01							
v/s Ratio Perm					0.08						0.35	
v/c Ratio		0.54			0.24						0.62	
Uniform Delay, d1		34.4			25.1						17.4	
Progression Factor		1.00			1.11						0.96	
Incremental Delay, d2		2.3			0.5						0.9	
Delay (s)		36.7			28.5						17.6	
Level of Service		D			C						B	
Approach Delay (s)		36.7			28.5			0.0			17.6	
Approach LOS		D			C			A			B	

### Intersection Summary

HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 11: Broadway & Mullan

8/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕↕				
Volume (vph)	130	505	0	0	170	170	55	1065	75	0	0	0
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)		3.0			3.0			3.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.93			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		2996			2800			4299				
Flt Permitted		0.73			1.00			1.00				
Satd. Flow (perm)		2223			2800			4299				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	144	561	0	0	189	189	61	1183	83	0	0	0
RTOR Reduction (vph)	0	0	0	0	46	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	705	0	0	333	0	0	1321	0	0	0	0
Turn Type	pm+pt						Perm					
Protected Phases	5	2			6			4				
Permitted Phases	2						4					
Actuated Green, G (s)		57.0			48.0			53.0				
Effective Green, g (s)		59.0			50.0			55.0				
Actuated g/C Ratio		0.49			0.42			0.46				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1132			1167			1970				
v/s Ratio Prot		c0.03			0.12							
v/s Ratio Perm		c0.28						0.31				
v/c Ratio		0.62			0.28			0.67				
Uniform Delay, d1		22.3			23.2			25.4				
Progression Factor		0.64			0.95			1.00				
Incremental Delay, d2		2.1			0.6			1.8				
Delay (s)		16.5			22.7			27.3				
Level of Service		B			C			C				
Approach Delay (s)		16.5			22.7			27.3			0.0	
Approach LOS		B			C			C			A	

### Intersection Summary

HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 12: Montgomery & Woodruff

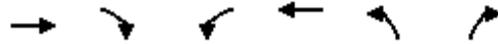
8/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (veh/h)	15	330	95	50	380	10	125	5	35	15	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	367	106	56	422	11	139	6	39	17	0	61
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	433			472			1047	997	236	797	1044	428
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433			472			1047	997	236	797	1044	428
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			10	98	95	93	100	89
cM capacity (veh/h)	1123			1086			155	227	765	245	213	575
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1			
Volume Total	17	244	228	56	433	139	6	39	78			
Volume Left	17	0	0	56	0	139	0	0	17			
Volume Right	0	0	106	0	11	0	0	39	61			
cSH	1123	1700	1700	1086	1700	155	227	765	447			
Volume to Capacity	0.01	0.14	0.13	0.05	0.25	0.90	0.02	0.05	0.17			
Queue Length 95th (ft)	1	0	0	4	0	157	2	4	16			
Control Delay (s)	8.3	0.0	0.0	8.5	0.0	104.8	21.3	10.0	14.8			
Lane LOS	A			A		F	C	A	B			
Approach Delay (s)	0.3			1.0		82.1			14.8			
Approach LOS						F			B			
Intersection Summary												
Average Delay				13.6								
Intersection Capacity Utilization			52.2%			ICU Level of Service			A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: SR-290 & University

8/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Volume (veh/h)	1105	55	80	900	55	75
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1228	61	89	1000	61	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1289		1906	614
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1289		1906	614
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			83		0	81
cM capacity (veh/h)			534		50	435

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	614	614	61	89	500	500	144
Volume Left	0	0	0	89	0	0	61
Volume Right	0	0	61	0	0	0	83
cSH	1700	1700	1700	534	1700	1700	103
Volume to Capacity	0.36	0.36	0.04	0.17	0.29	0.29	1.41
Queue Length 95th (ft)	0	0	0	15	0	0	260
Control Delay (s)	0.0	0.0	0.0	13.1	0.0	0.0	306.1
Lane LOS				B	F		
Approach Delay (s)	0.0			1.1		306.1	
Approach LOS						F	

Intersection Summary			
Average Delay			18.0
Intersection Capacity Utilization	59.8%		ICU Level of Service B
Analysis Period (min)			15

# HCM Unsignalized Intersection Capacity Analysis

## 14: Montgomery & University

8/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	425	5	5	340	50	5	5	5	35	5	70
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	472	6	6	378	56	6	6	6	39	6	78
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	433			478			1139	1086	475	1064	1061	406
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433			478			1139	1086	475	1064	1061	406
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			96	97	99	79	97	88
cM capacity (veh/h)	1126			1084			144	199	590	183	206	645
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>							
Volume Total	83	478	439	17	122							
Volume Left	83	0	6	6	39							
Volume Right	0	6	56	6	78							
cSH	1126	1700	1084	220	339							
Volume to Capacity	0.07	0.28	0.01	0.08	0.36							
Queue Length 95th (ft)	6	0	0	6	40							
Control Delay (s)	8.5	0.0	0.2	22.7	21.5							
Lane LOS	A		A	C	C							
Approach Delay (s)	1.3		0.2	22.7	21.5							
Approach LOS				C	C							
<b>Intersection Summary</b>												
Average Delay			3.3									
Intersection Capacity Utilization			71.1%		ICU Level of Service				C			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 15: Mission & University

8/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	315	80	85	340	35	105	25	110	25	10	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	350	89	94	378	39	117	28	122	28	11	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	417			439			1039	1056	394	1128	1081	397
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	417			439			1039	1056	394	1128	1081	397
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			92			35	86	81	77	94	97
cM capacity (veh/h)	1142			1121			179	201	655	121	195	652
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>					
Volume Total	28	439	94	417	117	150	56					
Volume Left	28	0	94	0	117	0	28					
Volume Right	0	89	0	39	0	122	17					
cSH	1142	1700	1121	1700	179	462	178					
Volume to Capacity	0.02	0.26	0.08	0.25	0.65	0.32	0.31					
Queue Length 95th (ft)	2	0	7	0	95	35	31					
Control Delay (s)	8.2	0.0	8.5	0.0	56.6	16.5	34.0					
Lane LOS	A		A		F	C	D					
Approach Delay (s)	0.5		1.6		34.0		34.0					
Approach LOS					D		D					
<b>Intersection Summary</b>												
Average Delay			9.2									
Intersection Capacity Utilization			56.7%		ICU Level of Service		B					
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

## 16: Broadway & University

8/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	470	145	100	320	55	100	220	100	20	170	30
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1513	1537		1513	1558		1513	1518		1513	1558	
Flt Permitted	0.45	1.00		0.24	1.00		0.57	1.00		0.39	1.00	
Satd. Flow (perm)	711	1537		381	1558		907	1518		619	1558	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	522	161	111	356	61	111	244	111	22	189	33
RTOR Reduction (vph)	0	19	0	0	10	0	0	27	0	0	11	0
Lane Group Flow (vph)	22	664	0	111	407	0	111	328	0	22	211	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	4			8			2			6		
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.0	32.0		32.0	32.0		20.0	20.0		20.0	20.0	
Effective Green, g (s)	32.0	32.0		32.0	32.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.53	0.53		0.53	0.53		0.33	0.33		0.33	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	379	820		203	831		302	506		206	519	
v/s Ratio Prot		c0.43			0.26			c0.22			0.14	
v/s Ratio Perm	0.03			0.29			0.12			0.04		
v/c Ratio	0.06	0.81		0.55	0.49		0.37	0.65		0.11	0.41	
Uniform Delay, d1	6.7	11.5		9.2	8.8		15.2	17.0		13.8	15.4	
Progression Factor	0.71	0.90		1.00	1.00		1.00	1.00		0.99	0.97	
Incremental Delay, d2	0.2	7.1		10.2	2.1		3.4	6.3		1.0	2.3	
Delay (s)	5.0	17.5		19.4	10.9		18.6	23.3		14.7	17.3	
Level of Service	A	B		B	B		B	C		B	B	
Approach Delay (s)		17.1			12.7			22.2			17.1	
Approach LOS		B			B			C			B	

### Intersection Summary

HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# MOVEMENT SUMMARY

Site: Roundabout

Montgomery and Mansfield (2040 NO BUILD PM Peak Hour)  
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Wilbur											
3L	L	183	2.0	0.363	9.0	LOS A	2.3	57.5	0.70	0.85	25.7
8R	R	100	2.0	0.363	9.0	LOS A	2.3	57.5	0.70	0.75	27.6
Approach		283	2.0	0.363	9.0	LOS A	2.3	57.5	0.70	0.81	26.3
East: Mansfield											
1L	L	22	2.0	0.177	5.1	LOS A	1.1	27.5	0.45	0.75	27.7
6T	T	72	2.0	0.177	5.1	LOS A	1.1	27.5	0.45	0.40	28.0
6R	R	89	2.0	0.177	5.1	LOS A	1.1	27.5	0.45	0.58	30.1
Approach		183	2.0	0.177	5.1	LOS A	1.1	27.5	0.45	0.53	29.0
North East: Wilbur											
1X	L	61	2.0	0.107	4.6	LOS A	0.6	14.5	0.47	0.74	27.3
6X	T	22	2.0	0.107	4.6	LOS A	0.6	14.5	0.47	0.70	28.2
16X	R	22	2.0	0.107	4.6	LOS A	0.6	14.5	0.47	0.48	31.0
Approach		106	2.0	0.107	4.6	LOS A	0.6	14.5	0.47	0.67	28.2
West: Montgomery											
5L	L	6	2.0	0.406	6.8	LOS A	3.1	78.4	0.39	0.80	27.5
2T	T	422	2.0	0.406	6.8	LOS A	3.1	78.4	0.39	0.36	27.9
2R	R	83	2.0	0.406	6.8	LOS A	3.1	78.4	0.39	0.52	29.7
Approach		511	2.0	0.406	6.8	LOS A	3.1	78.4	0.39	0.39	28.2
All Vehicles		1083	2.0	0.406	6.9	LOS A	3.1	78.4	0.49	0.55	27.8

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Model used.

# HCM Unsignalized Intersection Capacity Analysis

## 18: Mission & Bowdish

8/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	315	65	135	365	5	50	5	120	5	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	350	72	150	406	6	56	6	133	6	6	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	411			422			1111	1108	386	1206	1142	408
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	411			422			1111	1108	386	1206	1142	408
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			87			66	97	80	95	97	99
cM capacity (veh/h)	1148			1137			161	181	662	112	173	643
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	<b>SB 1</b>						
Volume Total	6	422	150	411	194	17						
Volume Left	6	0	150	0	56	6						
Volume Right	0	72	0	6	133	6						
cSH	1148	1700	1137	1700	337	185						
Volume to Capacity	0.00	0.25	0.13	0.24	0.58	0.09						
Queue Length 95th (ft)	0	0	11	0	86	7						
Control Delay (s)	8.2	0.0	8.6	0.0	29.2	26.4						
Lane LOS	A		A		D	D						
Approach Delay (s)	0.1		2.3		29.2	26.4						
Approach LOS					D	D						
<b>Intersection Summary</b>												
Average Delay			6.2									
Intersection Capacity Utilization			58.0%		ICU Level of Service				B			
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

## 24: Broadway & Pines

8/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Volume (vph)	135	410	85	160	270	80	40	895	95	85	1145	130
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Fr <sub>t</sub>	1.00	0.97		1.00	0.97		1.00	0.99		1.00	0.98	
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1537	1576		1537	1562		1537	3029		1537	3027	
Fl <sub>t</sub> Permitted	0.36	1.00		0.11	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	584	1576		176	1562		1537	3029		1537	3027	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	446	92	174	293	87	43	973	103	92	1245	141
RTOR Reduction (vph)	0	5	0	0	7	0	0	6	0	0	7	0
Lane Group Flow (vph)	147	533	0	174	373	0	43	1070	0	92	1379	0
Turn Type	pm+pt			pm+pt			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	55.3	42.9		62.7	46.6		7.0	44.0		7.0	44.0	
Effective Green, g (s)	57.3	43.9		64.7	47.6		8.0	45.0		8.0	45.0	
Actuated g/C Ratio	0.44	0.34		0.50	0.37		0.06	0.35		0.06	0.35	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	356	532		267	572		95	1049		95	1048	
v/s Ratio Prot	0.04	c0.34		c0.09	0.24		0.03	c0.35		0.06	c0.46	
v/s Ratio Perm	0.14			0.24								
v/c Ratio	0.41	1.00		0.65	0.65		0.45	1.02		0.97	1.32	
Uniform Delay, d <sub>1</sub>	23.4	43.0		25.1	34.3		58.9	42.5		60.9	42.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.15	0.66	
Incremental Delay, d <sub>2</sub>	0.8	39.3		5.6	2.7		14.8	33.0		72.2	147.9	
Delay (s)	24.2	82.4		30.7	37.0		73.7	75.5		141.9	175.8	
Level of Service	C	F		C	D		E	E		F	F	
Approach Delay (s)		69.9			35.0			75.4			173.7	
Approach LOS		E			D			E			F	

### Intersection Summary

HCM Average Control Delay	106.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 10: Broadway & Argonne

8/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑						↑↑↑	
Volume (vph)	0	380	75	45	165	0	0	0	0	230	975	100
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)		3.0			3.0						3.0	
Lane Util. Factor		0.95			0.95						0.91	
Frt		0.98			1.00						0.99	
Flt Protected		1.00			0.99						0.99	
Satd. Flow (prot)		2952			2995						4262	
Flt Permitted		1.00			0.77						0.99	
Satd. Flow (perm)		2952			2316						4262	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	422	83	50	183	0	0	0	0	256	1083	111
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	493	0	0	233	0	0	0	0	0	1443	0
Turn Type				pm+pt							Perm	
Protected Phases		6		5	2							4
Permitted Phases				2						4		
Actuated Green, G (s)		39.0			48.0						72.0	
Effective Green, g (s)		41.0			50.0						74.0	
Actuated g/C Ratio		0.32			0.38						0.57	
Clearance Time (s)		5.0			5.0						5.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		931			922						2426	
v/s Ratio Prot		c0.17			c0.01							
v/s Ratio Perm					0.09						0.34	
v/c Ratio		0.53			0.25						0.59	
Uniform Delay, d1		36.6			27.3						18.2	
Progression Factor		1.00			1.11						0.84	
Incremental Delay, d2		2.2			0.6						0.9	
Delay (s)		38.7			31.0						16.2	
Level of Service		D			C						B	
Approach Delay (s)		38.7			31.0			0.0			16.2	
Approach LOS		D			C			A			B	

### Intersection Summary

HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 11: Broadway & Mullan

8/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕↕				
Volume (vph)	125	470	0	0	155	170	65	1040	70	0	0	0
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)		3.0			3.0			3.0				
Lane Util. Factor		0.95			0.95			0.91				
Frt		1.00			0.92			0.99				
Flt Protected		0.99			1.00			1.00				
Satd. Flow (prot)		2995			2789			4298				
Flt Permitted		0.73			1.00			1.00				
Satd. Flow (perm)		2219			2789			4298				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	139	522	0	0	172	189	72	1156	78	0	0	0
RTOR Reduction (vph)	0	0	0	0	48	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	661	0	0	313	0	0	1301	0	0	0	0
Turn Type	pm+pt						Perm					
Protected Phases	5	2			6			4				
Permitted Phases	2						4					
Actuated Green, G (s)		60.0			51.0			60.0				
Effective Green, g (s)		62.0			53.0			62.0				
Actuated g/C Ratio		0.48			0.41			0.48				
Clearance Time (s)		5.0			5.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		1094			1137			2050				
v/s Ratio Prot		c0.03			0.11							
v/s Ratio Perm		c0.26						0.30				
v/c Ratio		0.60			0.28			0.63				
Uniform Delay, d1		25.0			25.7			25.5				
Progression Factor		0.62			1.00			1.00				
Incremental Delay, d2		2.1			0.6			1.5				
Delay (s)		17.5			26.3			27.0				
Level of Service		B			C			C				
Approach Delay (s)		17.5			26.3			27.0			0.0	
Approach LOS		B			C			C			A	

### Intersection Summary

HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis  
 12: Montgomery & Woodruff

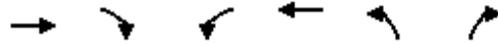
8/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (veh/h)	15	305	90	45	345	10	115	5	50	30	0	50
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	339	100	50	383	11	128	6	56	33	0	56
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	394			439			961	917	219	750	961	389
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	394			439			961	917	219	750	961	389
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			30	98	93	87	100	91
cM capacity (veh/h)	1161			1117			183	255	785	262	240	610
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1			
Volume Total	17	226	213	50	394	128	6	56	89			
Volume Left	17	0	0	50	0	128	0	0	33			
Volume Right	0	0	100	0	11	0	0	56	56			
cSH	1161	1700	1700	1117	1700	183	255	785	407			
Volume to Capacity	0.01	0.13	0.13	0.04	0.23	0.70	0.02	0.07	0.22			
Queue Length 95th (ft)	1	0	0	4	0	107	2	6	21			
Control Delay (s)	8.1	0.0	0.0	8.4	0.0	60.7	19.4	9.9	16.3			
Lane LOS	A			A		F	C	A	C			
Approach Delay (s)	0.3			0.9		44.5			16.3			
Approach LOS						E			C			
Intersection Summary												
Average Delay			8.8									
Intersection Capacity Utilization			49.4%			ICU Level of Service			A			
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

## 13: SR-290 & University

8/29/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↑
Volume (vph)	1060	30	220	840	40	255
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625
Total Lost time (s)	5.5	5.5	5.5	5.0	5.0	5.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3027	1354	1513	3027	1513	1354
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3027	1354	1513	3027	1513	1354
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1178	33	244	933	44	283
RTOR Reduction (vph)	0	8	0	0	0	250
Lane Group Flow (vph)	1178	25	244	933	44	33
Turn Type		Perm	Prot			Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4
Actuated Green, G (s)	35.3	35.3	15.4	56.7	8.7	8.7
Effective Green, g (s)	35.3	35.3	15.4	56.7	8.7	8.7
Actuated g/C Ratio	0.47	0.47	0.20	0.75	0.12	0.12
Clearance Time (s)	5.5	5.5	5.5	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1417	634	309	2276	175	156
v/s Ratio Prot	c0.39		c0.16	0.31	c0.03	
v/s Ratio Perm		0.02				0.02
v/c Ratio	0.83	0.04	0.79	0.41	0.25	0.21
Uniform Delay, d1	17.5	10.9	28.5	3.4	30.4	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	0.0	12.6	0.1	0.8	0.7
Delay (s)	21.8	10.9	41.0	3.5	31.1	30.9
Level of Service	C	B	D	A	C	C
Approach Delay (s)	21.5			11.3	30.9	
Approach LOS	C			B	C	

### Intersection Summary

HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# MOVEMENT SUMMARY

Site: Roundabout

Montgomery and University (2040 BRIDGE PM Peak Hour)  
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph	
South: University												
3L	L	72	2.0	0.502	11.6	LOS B	4.0	100.4	0.78	0.93	25.1	
8T	T	239	2.0	0.502	11.6	LOS B	4.0	100.4	0.78	0.79	27.1	
8R	R	83	2.0	0.502	11.6	LOS B	4.0	100.4	0.78	0.83	26.8	
Approach		394	2.0	0.502	11.6	LOS B	4.0	100.4	0.78	0.82	26.6	
East: Montgomery												
1L	L	44	2.0	0.484	10.3	LOS B	3.7	94.1	0.74	0.86	25.6	
6T	T	356	2.0	0.484	10.3	LOS B	3.7	94.1	0.74	0.67	25.2	
6R	R	28	2.0	0.484	10.3	LOS B	3.7	94.1	0.74	0.73	27.5	
Approach		428	2.0	0.484	10.3	LOS B	3.7	94.1	0.74	0.70	25.4	
North: University												
7	L	22	2.0	0.407	10.7	LOS B	2.4	60.5	0.68	0.95	25.5	
4	T	194	2.0	0.407	10.7	LOS B	2.4	60.5	0.68	0.75	27.7	
14	R	67	2.0	0.407	10.7	LOS B	2.4	60.5	0.68	0.79	27.4	
Approach		283	2.0	0.407	10.7	LOS B	2.4	60.5	0.68	0.78	27.4	
West: Montgomery												
5L	L	44	2.0	0.629	12.4	LOS B	6.4	161.7	0.76	0.84	24.8	
2T	T	367	2.0	0.629	12.4	LOS B	6.4	161.7	0.76	0.67	24.7	
2R	R	233	2.0	0.629	12.4	LOS B	6.4	161.7	0.76	0.72	26.5	
Approach		644	2.0	0.629	12.4	LOS B	6.4	161.7	0.76	0.70	25.4	
All Vehicles		1750	2.0	0.629	11.4	LOS B	6.4	161.7	0.75	0.74	26.0	

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Model used.

Processed: Monday, August 05, 2013 4:51:54 PM

SIDRA INTERSECTION 5.1.3.1990

Project: P:\F\FEHR00000001\0600INFO\Traffic\August-Bridge Models\SIDRA

\Montgomery\_University\_2040\_BRIDGE\_PM.sip

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# HCM Signalized Intersection Capacity Analysis

## 15: Mission & University

8/5/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	285	25	15	320	60	65	270	30	90	340	75
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1513	1574		1513	1555		1513	1569			1548	
Flt Permitted	0.22	1.00		0.52	1.00		0.36	1.00			0.82	
Satd. Flow (perm)	358	1574		834	1555		580	1569			1285	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	189	317	28	17	356	67	72	300	33	100	378	83
RTOR Reduction (vph)	0	3	0	0	7	0	0	5	0	0	8	0
Lane Group Flow (vph)	189	342	0	17	416	0	72	328	0	0	553	0
Turn Type	pm+pt			pm+pt			Perm			Perm		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	39.5	34.0		28.9	27.4		37.5	37.5			37.5	
Effective Green, g (s)	39.5	34.0		28.9	27.4		37.5	37.5			37.5	
Actuated g/C Ratio	0.46	0.40		0.34	0.32		0.44	0.44			0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	276	630		296	501		256	692			567	
v/s Ratio Prot	c0.07	0.22		0.00	c0.27			0.21				
v/s Ratio Perm	0.25			0.02			0.12				c0.43	
v/c Ratio	0.68	0.54		0.06	0.83		0.28	0.47			0.98	
Uniform Delay, d1	16.3	19.5		18.7	26.6		15.2	16.8			23.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	6.9	1.0		0.1	10.9		0.6	0.5			31.4	
Delay (s)	23.2	20.5		18.8	37.5		15.8	17.3			54.7	
Level of Service	C	C		B	D		B	B			D	
Approach Delay (s)		21.4			36.8			17.0			54.7	
Approach LOS		C			D			B			D	

### Intersection Summary

HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.1%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Mitigation - Signalized			
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 16: Broadway & University

8/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Volume (vph)	20	470	135	75	320	40	100	310	100	95	260	70
Ideal Flow (vphpl)	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625	1625
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr <sub>t</sub>	1.00	0.97		1.00	0.98		1.00	0.96		1.00	0.97	
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1513	1540		1513	1567		1513	1535		1513	1542	
Fl <sub>t</sub> Permitted	0.43	1.00		0.25	1.00		0.47	1.00		0.37	1.00	
Satd. Flow (perm)	689	1540		398	1567		749	1535		592	1542	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	522	150	83	356	44	111	344	111	106	289	78
RTOR Reduction (vph)	0	26	0	0	11	0	0	29	0	0	24	0
Lane Group Flow (vph)	22	646	0	83	389	0	111	426	0	106	343	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	276	616		159	627		300	614		237	617	
v/s Ratio Prot		c0.42			0.25			c0.28			0.22	
v/s Ratio Perm	0.03			0.21			0.15			0.18		
v/c Ratio	0.08	1.05		0.52	0.62		0.37	0.69		0.45	0.56	
Uniform Delay, d <sub>1</sub>	7.4	12.0		9.1	9.6		8.5	10.0		8.8	9.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d <sub>2</sub>	0.6	49.8		11.7	4.6		3.5	6.4		6.0	3.6	
Delay (s)	8.0	61.8		20.8	14.1		11.9	16.3		14.8	12.8	
Level of Service	A	E		C	B		B	B		B	B	
Approach Delay (s)		60.1			15.3			15.5			13.3	
Approach LOS		E			B			B			B	

### Intersection Summary

HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# MOVEMENT SUMMARY

Site: Roundabout

Montgomery and Mansfield (2040 BUILD PM Peak Hour)  
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Wilbur											
3L	L	183	2.0	0.363	9.0	LOS A	2.3	57.5	0.70	0.85	25.7
8R	R	100	2.0	0.363	9.0	LOS A	2.3	57.5	0.70	0.75	27.6
Approach		283	2.0	0.363	9.0	LOS A	2.3	57.5	0.70	0.81	26.3
East: Mansfield											
1L	L	22	2.0	0.177	5.1	LOS A	1.1	27.5	0.45	0.75	27.7
6T	T	72	2.0	0.177	5.1	LOS A	1.1	27.5	0.45	0.40	28.0
6R	R	89	2.0	0.177	5.1	LOS A	1.1	27.5	0.45	0.58	30.1
Approach		183	2.0	0.177	5.1	LOS A	1.1	27.5	0.45	0.53	29.0
North East: Wilbur											
1X	L	61	2.0	0.107	4.6	LOS A	0.6	14.5	0.47	0.74	27.3
6X	T	22	2.0	0.107	4.6	LOS A	0.6	14.5	0.47	0.70	28.2
16X	R	22	2.0	0.107	4.6	LOS A	0.6	14.5	0.47	0.48	31.0
Approach		106	2.0	0.107	4.6	LOS A	0.6	14.5	0.47	0.67	28.2
West: Montgomery											
5L	L	6	2.0	0.406	6.8	LOS A	3.1	78.4	0.39	0.80	27.5
2T	T	422	2.0	0.406	6.8	LOS A	3.1	78.4	0.39	0.36	27.9
2R	R	83	2.0	0.406	6.8	LOS A	3.1	78.4	0.39	0.52	29.7
Approach		511	2.0	0.406	6.8	LOS A	3.1	78.4	0.39	0.39	28.2
All Vehicles		1083	2.0	0.406	6.9	LOS A	3.1	78.4	0.49	0.55	27.8

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Model used.

Processed: Friday, August 16, 2013 2:28:21 PM

SIDRA INTERSECTION 5.1.3.1990

Project: P:\FVEHR00000001\0600INFO\Traffic\August-Bridge Models\SIDRA

\Montgomery\_Mansfield\_2040\_BUILD.sip

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**SIDRA**  
**INTERSECTION**

# HCM Unsignalized Intersection Capacity Analysis

## 18: Mission & Bowdish

8/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	275	100	125	290	5	65	5	120	5	5	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	306	111	139	322	6	72	6	133	6	6	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	328			417			981	978	361	1056	1031	325
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	328			417			981	978	361	1056	1031	325
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			64	97	80	96	97	99
cM capacity (veh/h)	1232			1142			201	219	683	145	204	716
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	<b>SB 1</b>						
Volume Total	6	417	139	328	211	17						
Volume Left	6	0	139	0	72	6						
Volume Right	0	111	0	6	133	6						
cSH	1232	1700	1142	1700	364	227						
Volume to Capacity	0.00	0.25	0.12	0.19	0.58	0.07						
Queue Length 95th (ft)	0	0	10	0	87	6						
Control Delay (s)	7.9	0.0	8.6	0.0	27.7	22.1						
Lane LOS	A		A		D	C						
Approach Delay (s)	0.1		2.6		27.7	22.1						
Approach LOS					D	C						
<b>Intersection Summary</b>												
Average Delay			6.7									
Intersection Capacity Utilization			59.6%		ICU Level of Service				B			
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

## 24: Broadway & Pines

8/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Volume (vph)	120	395	80	160	270	85	35	900	90	85	1135	120
Ideal Flow (vphpl)	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.96		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1537	1577		1537	1560		1537	3032		1537	3030	
Flt Permitted	0.35	1.00		0.11	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	570	1577		174	1560		1537	3032		1537	3030	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	429	87	174	293	92	38	978	98	92	1234	130
RTOR Reduction (vph)	0	5	0	0	7	0	0	5	0	0	5	0
Lane Group Flow (vph)	130	511	0	174	378	0	38	1071	0	92	1359	0
Turn Type	pm+pt			pm+pt			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	60.5	47.7		71.0	53.2		5.0	55.0		9.0	59.0	
Effective Green, g (s)	62.5	48.7		72.0	54.2		6.0	56.0		10.0	60.0	
Actuated g/C Ratio	0.42	0.32		0.48	0.36		0.04	0.37		0.07	0.40	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	326	512		259	564		61	1132		102	1212	
v/s Ratio Prot	0.04	c0.32		c0.09	0.24		0.02	c0.35		0.06	c0.45	
v/s Ratio Perm	0.13			0.24								
v/c Ratio	0.40	1.00		0.67	0.67		0.62	0.95		0.90	1.12	
Uniform Delay, d1	29.0	50.6		30.0	40.4		70.9	45.5		69.5	45.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.78	0.99	
Incremental Delay, d2	0.8	39.1		6.7	3.1		39.5	16.6		51.5	64.0	
Delay (s)	29.8	89.7		36.7	43.5		110.4	62.1		105.6	108.4	
Level of Service	C	F		D	D		F	E		F	F	
Approach Delay (s)		77.7			41.4			63.8			108.2	
Approach LOS		E			D			E			F	

### Intersection Summary

HCM Average Control Delay	80.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

**APPENDIX G: BENEFIT-COST CALCULATION WORKSHEETS**



**Present Value and Benefit-Cost Calculations**

	No Build	3% Discount	7% Discount
		Alt A & I	Alt A & I
2025 Yearly Societal Cost - Safety	\$63,374.70	\$58,472.75	\$58,472.75
2025 Yearly Societal Cost - Mobility	\$4,955,346.03	\$3,487,433.04	\$3,487,433.04
2025 Yearly Societal Cost - Fuel Consumption	\$834,341.87	\$783,676.36	\$783,676.36
2025 Total Yearly Societal Cost	\$5,853,062.60	\$4,329,582.16	\$4,329,582.16
2025 Yearly Savings	-	\$1,523,480.45	\$1,523,480.45
2025 PV assuming 30 Year Life	-	(\$34,120,562.14)	(\$34,120,562.14)
Present Value	-	\$23,931,475.79	\$15,149,937.65
Cost - Construction & Maintenance	-	(\$9,185,000.00)	(\$9,185,000.00)
<b>Benefit to Cost Ratio</b>	-	<b>2.61</b>	<b>1.65</b>
Net Present Value	-	\$14,746,475.79	\$5,964,937.65

**PM Peak Hour Collision Costs**

Street	No Build			Alt A				Alt I				Alt A & I			
	Collision Rate (MEV)	Vehicles	Cost	Collision Rate (MEV)	Vehicles	Cost	BCA	Collision Rate (MEV)	Vehicles	Cost	BCA	Collision Rate (MEV)	Vehicles	Cost	BCA
Argonne Rd & SR-290 (Trent Ave)	1.09		\$0.00	0.85		\$0.00	\$0.00	1.09	0	\$0.00	\$0.00	0.85	0	\$0.00	\$0.00
Argonne Rd & Montgomery Ave	0.30	3,247	\$33.21	0.23	3,709	\$29.59	\$3.62	0.30	3,247	\$33.21	\$0.00	0.23	3,709	\$29.59	\$3.62
Argonne Rd & Knox Ave	0.14	3,300	\$15.75	0.11	3,520	\$13.11	\$2.65	0.14	3,300	\$15.75	\$0.00	0.11	3,520	\$13.11	\$2.65
Argonne Rd & WB On-Ramp	0.32	2,308	\$25.04	0.25	2,866	\$24.25	\$0.79	0.32	2,308	\$25.04	\$0.00	0.25	2,866	\$24.25	\$0.79
Pines Rd & Mission Ave	1.04	3,787	\$108.53	1.04	3,787	\$108.53	\$0.00	1.00	3,688	\$101.46	\$7.06	1.00	3,688	\$101.46	\$7.06
Total (PM Peak Hour - Daily)			\$182.53			\$175.48	\$7.05			\$175.47	\$7.06			\$168.41	\$14.12
Total (Annual)			\$51,108.63			\$49,133.56	\$1,975.07			\$49,130.51	\$1,978.12			\$47,155.44	

**PM Peak Hour Mobility Costs**

Street	No Build		Alt A			Alt I			Alt A & I		
	VHT	Cost	VHT	Cost	BCA	VHT	Cost	BCA	VHT	Cost	BCA
N Argonne Rd	709	\$9,309.17	403	\$5,291.39	\$4,017.78	709	\$9,309.17	\$0.00	403	\$5,291.39	\$4,017.78
N Pines Rd	378	\$4,963.14	378	\$4,963.14	\$0.00	362	\$4,753.06	\$210.08	362	\$4,753.06	\$210.08
Total (PM Peak Hour - Daily)		\$14,272.31		\$10,254.53	\$4,017.78		\$14,062.23	\$210.08		\$10,044.45	\$4,227.86
Total (Annual)		\$3,996,246.80		\$2,871,268.40	\$1,124,978.40		\$3,937,424.40	\$58,822.40		\$2,812,446.00	\$1,183,800.80

? VHT <> Person hours. How to calculate Person hours (need to know HOV2,3+)

Source: Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis (Revision 2 – corrected) <http://www.dot.gov/office-policy/transportation-policy/guidance>

\$2009 per person hour (Local Travel - All Purposes)

12.5

\$2012 per person hour

13.13

Annualize (days)

280

**PM Peak Hour Fuel Costs**

Street	No Build			Alt A				Alt I				Alt I			
	Avg Speed	VMT	Cost	Avg Speed	VMT	Cost	BCA	Avg Speed	VMT	Cost	BCA	Avg Speed	VMT	Cost	BCA
N Argonne Rd	6.5	4644	\$1,303.13	13.5	5433	\$1,174.28	\$128.85	6.5	4644	\$1,303.13	\$0.00	13.5	5433	\$1,174.28	\$128.85
N Pines Rd	13.5	5089	\$1,099.93	13.5	5089	\$1,099.93	\$0.00	13.8	5010	\$1,082.85	\$17.07	13.8	5010	\$1,082.85	\$17.07
Total (PM Peak Hour - Daily)			\$2,403.06			\$2,274.21	\$128.85			\$2,385.98	\$17.07			\$2,257.13	\$145.93
Total (Annual)			\$672,856.35			\$636,778.05	\$36,078.30			\$668,075.37	\$4,780.98			\$631,997.07	\$40,859.28

Cost per gallon of gasoline 3.75

Annualize (days) 280

## **APPENDIX H: COST ESTIMATION WORKSHEETS**



## Alternative A: New Southbound Lane - Argonne (12'SW)

Improvement Type: Bridge Replacement/Road Improvements

Date: Nov. 20, 2014

Notes/Assumptions:

- North tie in of Argonne approximately 250' north of I-90 back to existing
- South tie in of Argonne occurs at EB off ramp intersection
- Westbound ramp tie in is approximately 300' west of Argonne
- SB-WB turn lane length is approximately 200'
- Bridge to be built immediately west of existing

	Qty	Units	\$/unit	Cost
--	-----	-------	---------	------

### Demolition

Roadway Demolition	5,000	SY	\$ 5.00	\$ 25,000
Sidewalk Demolition	400	SY	\$ 6.00	\$ 2,400
Curb Demolition	600	LF	\$ 4.00	\$ 2,400
Site Clearing	1	LS	\$ 20,000	\$ 20,000
Signal/Lighting Demo	10	EA	\$ 2,000	\$ 20,000
Bridge Demo	7350	SF	\$ 55	\$ 404,250
Concrete Pavement Demo	350	SY	\$ 30.00	\$ 10,500
Barrier Demo	150	LF	\$ 50	\$ 7,500
Misc	1	LS	\$ 25,000	\$ 25,000

	Width	Length	Qty	Units	\$/unit	Cost
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### Improvements

Traffic Control			1	LS	\$ 250,000	\$ 250,000
Temporary Concrete Barrier			300	LF	\$ 15.00	\$ 4,500
Structural Excavation			1,500	CY	\$ 25.00	\$ 37,500
Excavation			5,000	CY	\$ 20.00	\$ 100,000
Import			12,000	CY	\$ 25.00	\$ 300,000
Temporary Paving			1	LS	\$ 50,000	\$ 50,000
Single Lane Ramp	24	240	640	SY	\$ 30.00	\$ 19,200
2 Lane Ramp	34	500	1,889	SY	\$ 30.00	\$ 56,667
Road Section	40	750	3,333	SY	\$ 35.00	\$ 116,667
Turn Lane	14	200	311	SY	\$ 35.00	\$ 10,889
Curb			800	LF	\$ 22.00	\$ 17,600
12' Sidewalk	12	750	1,000	SY	\$ 54.00	\$ 54,000
Median Barrier			150	LF	\$ 150.00	\$ 22,500
Concrete Pavement			350	SY	\$ 100.00	\$ 35,000

			Qty	Units	\$/unit	Cost
Bridge	60	220	13,200	SF	\$ 175.00	\$ 2,310,000
Approach Slabs	60	40	2,400	SF	\$ 35.00	\$ 84,000
Traffic Signals (2)			1	LS	\$ 300,000	\$ 300,000
Illumination			1	LS	\$ 50,000	\$ 50,000
Signing/Striping			1	LS	\$ 50,000	\$ 50,000
Drainage			1	LS	\$ 40,000	\$ 40,000
				Sub-total		\$ 4,425,572
				Mobilization (10%)		\$ 442,557
				Contingency (30%)		\$ 1,460,439
				Engineering (20%)		\$ 1,177,202
				Construction Adm (18%)		\$ 1,059,482
						<u>\$ 8,122,695</u>

## Alternative B:

### Diverging Diamond Interchange - Argonne

Improvement Type: Diverging Diamond Interchange

#### Notes/Assumptions:

- North tie in of Mullan and Argonne approximately 300' north of I-90 back to existing
- South tie in of Mullan and Argonne approximately 250' north of Mission back to existing
- Eastbound and Westbound ramp tie ins are approximately 300' east and west of Mullan and Argonne
- 3 lane roadway for both Mullan and Argonne
- No modifications to the existing bridges across I-90 are included

	Qty	Units	\$/unit	Cost
<b>Demolition</b>				
Roadway Demolition	15,000	SY	\$ 5.00	\$ 75,000
Sidewalk Demolition	1,200	SY	\$ 6.00	\$ 7,200
Curb Demolition	2,500	LF	\$ 4.00	\$ 10,000
Signal/Lighting Demo	20	EA	\$ 1,500	\$ 30,000
Misc	1	LS	\$ 25,000	\$ 25,000

	Width	Length	Qty	Units	\$/unit	Cost
<b>Improvements</b>						
Traffic Control			1	LS	\$ 120,000	\$ 120,000
Excavation			6,000	CY	\$ 15.00	\$ 90,000
Single Lane Ramp	24	1800	4,800	SY	\$ 30.00	\$ 144,000
2 Lane Ramp	34	600	2,267	SY	\$ 30.00	\$ 68,000
Road Section	40	2200	9,778	SY	\$ 35.00	\$ 342,222
Curb			6,000	LF	\$ 22.00	\$ 132,000
Sidewalk	6	1100	733	SY	\$ 28.00	\$ 20,533
Traffic Signal			1	LS	\$ 300,000	\$ 300,000
Illumination			1	LS	\$ 100,000	\$ 100,000
Signing/Striping			1	LS	\$ 50,000	\$ 50,000
Drainage			1	LS	\$ 25,000	\$ 25,000
				Sub-total		\$ 1,538,956
				Mobilization (10%)		\$ 153,896
				Contingency (30%)		\$ 507,855
				Engineering (20%)		\$ 409,362
						<u>\$ 2,456,173</u>

\*All work would be completed within existing WSDOT and City right of way

## Alternative C: 3-Lane Diverging Diamond Interchange w/ SB Bridge Replacement (12'SW)

Improvement Type: Bridge Replacement/Road Improvements

Notes/Assumptions:

- North tie in of Mullan and Argonne approximately 300' north of I-90 back to existing
- South tie in of Mullan and Argonne occurs just north of the Mission Avenue intersections.
- Eastbound and Westbound ramp tie ins are approximately 300' east and west of Mullan and Argonne
- New 3-lane bridge to be built for southbound traffic
- Bridge to be built immediately east of existing
- Existing Northbound bridge to be maintained

	Qty	Units	\$/unit	Cost
<b>Demolition</b>				
Roadway Demolition	15,000	SY	\$ 5.00	\$ 75,000
Sidewalk Demolition	1,200	SY	\$ 6.00	\$ 7,200
Curb Demolition	2,500	LF	\$ 4.00	\$ 10,000
Site Clearing	1	LS	\$ 10,000	\$ 10,000
Signal/Lighting Demo	20	EA	\$ 1,500	\$ 30,000
Bridge Demo	7350	SF	\$ 55	\$ 404,250
Misc	1	LS	\$ 25,000	\$ 25,000

	Width	Length	Qty	Units	\$/unit	Cost
<b>Improvements</b>						
Traffic Control			1	LS	\$ 175,000	\$ 175,000
Excavation			6,500	CY	\$ 20.00	\$ 130,000
Import			12,000	CY	\$ 25.00	\$ 300,000
Temporary Paving			1	LS	\$ 50,000	\$ 50,000
Single Lane Ramp	24	1580	4,213	SY	\$ 30.00	\$ 126,400
2 Lane Ramp	34	1020	3,853	SY	\$ 30.00	\$ 115,600
3 Lane Ramp	48	150	800	SY	\$ 30.00	\$ 24,000
3 Lane Road Section	40	2825	12,556	SY	\$ 35.00	\$ 439,444
Curb			6,000	LF	\$ 22.00	\$ 132,000
6' Sidewalk	6	1800	1,200	SY	\$ 28.00	\$ 33,600
12' Sidewalk	12	600	800	SY	\$ 54.00	\$ 43,200
Bridge	60	220	13,200	SF	\$ 165.00	\$ 2,178,000
Approach Slabs	60	40	2,400	SF	\$ 30.00	\$ 72,000
Traffic Signals (4)			1	LS	\$ 600,000	\$ 600,000
Illumination			1	LS	\$ 100,000	\$ 100,000
Signing/Striping			1	LS	\$ 50,000	\$ 50,000
Drainage			1	LS	\$ 40,000	\$ 40,000

Sub-total	\$ 5,170,694
Mobilization (10%)	\$ 517,069
Contingency (30%)	\$ 1,706,329
Engineering (20%)	\$ 1,375,405
	<u>\$ 8,252,428</u>

## Alternative D: University (Ped Bridge)

Bridge Type: Pedestrian

Total Bridge Length: 410 feet (220 @ I-90, 70' Spaldings, 120' Railroad)

Bridge Width: 14 feet

Approaches: Fill slopes south of Railroad, fully contained north of railroad

Trail Impr'mts: 1500 feet total (trail improvement on bridge included in bridge costs)

### Notes/Assumptions:

- Improvements run from 400' south of Montgomery to Baldwin
- Structure clearance over railroad a minimum of 23.5', assumed existing rail grade about 5 feet lower than grade north and south.
- Approach north of railroad would be fully contained. All approach and road/trail grade south of railroad would be typical fill slope with 2:1 side slopes
- Access to both sides of Spaldings would be via short 70' bridge span at roughly Knox Avenue
- Property for fill slopes would need to be acquired from Spaldings

	Length	Width	SqFt	\$/sq ft	Cost
Bridge	410	14	5,740	\$ 225.00	\$ 1,291,500
Approach Slabs	120	14	1,680	\$ 30.00	\$ 50,400

	Length	Ave. height	# walls	SqFt	\$/sq ft	Cost
Apprh Walls (N of RR)	500	12	2	12,000	\$ 35.00	\$ 420,000
Apprh Walls (other)	480	20	1	9,600	\$ 35.00	\$ 336,000

	Total Lgt	Ave. height	Vol (cf)	Vol (cy)	\$/cu yd	Cost
Contained Approach Fill	500	12	84,000	3,111	\$ 35.00	\$ 108,889
Sloped Fill Approaches			525,000	19,444	\$ 20.00	\$ 388,889

	Total Lgt	\$/ LF	Cost
Approach rail	1,200	\$ 50.00	\$ 60,000

	Length	Width	Units	\$/unit	Cost
Trail Impr'mts					
Trail Section	1500	12	2,000 SY	\$ 27.00	\$ 54,000
Drainage			1 LS	\$ 25,000	\$ 25,000

	Qty	Units	\$/unit	Cost
Miscellaneous				
Traffic Control	1	LS	\$ 50,000	\$ 50,000
		Sub-total		\$ 2,784,678
		Contingency (30%)		\$ 835,403
		Engineering (20%)		\$ 724,016
				<u>\$ 4,344,097</u>

Property Acquisition

Description	SqFt	\$/sq ft	Cost
Spaldings Property	31,500	\$ 4.00	\$ 126,000
Railroad Agreement			\$ 50,000
		Sub-total Property	\$ 176,000
		Legal Costs (15%)	\$ 26,400
			<u>\$ 202,400</u>
		Total project cost	\$ 4,546,497

## Alternative E: University (EV Bridge)

Bridge Type: Pedestrian/Emergency Vehicle

Total Bridge Length: 410 feet (220 @ I-90, 70' Spaldings, 120' Railroad)

Bridge Width: 20 feet

Approaches: Fill slopes south of Railroad, fully contained north of railroad

Trail/Road Impr'mts: 1500 feet total (improvements on bridge included in bridge costs)

### Notes/Assumptions:

- Improvements run from 400' south of Montgomery to Baldwin
- Structure clearance over railroad a minimum of 23.5', assumed existing rail grade about 5 feet lower than grade north and south.
- Approach north of railroad would be fully contained. All approach and road/trail grade south of railroad would be typical fill slope with 2:1 side slopes
- Access to both sides of Spaldings would be via short 70' bridge span at roughly Knox Avenue
- Property for fill slopes would need to be acquired from Spaldings

	Length	Width	SqFt	\$/sq ft	Cost
Bridge	410	20	8,200	\$ 200.00	\$ 1,640,000
Approach Slabs	120	20	2,400	\$ 30.00	\$ 72,000

	Length	Ave. height	# walls	SqFt	\$/sq ft	Cost
Apprh Walls (N of RR)	500	12	2	12,000	\$ 35.00	\$ 420,000
Apprh Walls (other)	480	20	1	9,600	\$ 35.00	\$ 336,000

	Total Lgt	Ave. height	Vol (cf)	Vol (cy)	\$/cu yd	Cost
Contained Approach Fill	500	12	120,000	4,444	\$ 35.00	\$ 155,556
Sloped Fill Approaches			607,500	22,500	\$ 20.00	\$ 450,000

	Total Lgt	\$/ LF	Cost
Barrier Railing	2,700	\$ 125.00	\$ 337,500

	Length	Width	Units	\$/unit	Cost
Trail Impr'mts					
Trail Section	1500	20	3,333 SY	\$ 30.00	\$ 100,000
Drainage			1 LS	\$ 30,000	\$ 30,000

	Qty	Units	\$/unit	Cost
Miscellaneous				
Traffic Control	1	LS	\$ 100,000	\$ 100,000
		Sub-total		\$ 3,641,056
		Contingency (30%)		\$ 1,092,317
		Engineering (20%)		\$ 946,674
				<u>\$ 5,680,047</u>

Property Acquisition

Description	SqFt	\$/sq ft	Cost
Spaldings Property	38,500	\$ 4.00	\$ 154,000
Railroad Agreement			\$ 50,000
		Sub-total Property	\$ 204,000
		Legal Costs (15%)	\$ 30,600
			<u>\$ 234,600</u>
		Total project cost	\$ 5,914,647

## Alternative F: University (Roadway)

Bridge Type: Vehicular/Ped

Total Bridge Length: 410 feet (220 @ I-90, 70' Spaldings, 120' Railroad)

Bridge Width: 52 feet

Approaches: Fill slopes south of Railroad, fully contained north of railroad

Road Impr'mts: 2700 feet total (improvements on bridge included in bridge costs)

### Notes/Assumptions:

- Improvements run from Montgomery to Mission
- Structure clearance over railroad a minimum of 23.5', assumed existing rail grade about 5 feet lower than grade north and south.
- Approach north of railroad would be fully contained. All approach and road/trail grade south of railroad would be typical fill slope with 2:1 side slopes
- Access to both sides of Spaldings would be via short 70' bridge span at roughly Knox Avenue
- Property for fill slopes would need to be acquired from Spaldings

	Length	Width	SqFt	\$/sq ft	Cost
Bridge	410	52	21,320	\$ 155.00	\$ 3,304,600
Approach Slabs	120	52	6,240	\$ 30.00	\$ 187,200

	Length	Ave. height	# walls	SqFt	\$/sq ft	Cost
Apprh Walls (N of RR)	500	12	2	12,000	\$ 35.00	\$ 420,000
Apprh Walls (other)	480	20	1	9,600	\$ 35.00	\$ 336,000

	Total Lgt	Ave. height	Vol (cf)	Vol (cy)	\$/cu yd	Cost
Contained Approach Fill	500	12	312,000	11,556	\$ 35.00	\$ 404,444
Sloped Fill Approaches			960,000	35,556	\$ 20.00	\$ 711,111

	Total Lgt	\$/ LF	Cost
Barrier Railing	2,700	\$ 125.00	\$ 337,500

	Length	Width	QTY	Units	\$/unit	Cost
Road Impr'mts						
Excavation			4,000	CY	\$ 10.00	\$ 40,000
Road Section	2700	40	12,000	SY	\$ 32.00	\$ 384,000
Curb			5,400	LF	\$ 22.00	\$ 118,800
Sidewalk	0	6	3,600	SY	\$ 28.00	\$ 100,800
Drainage			1	LS	\$ 65,000	\$ 65,000

	Qty	Units	\$/unit	Cost
Miscellaneous				
Traffic Control	1	LS	\$ 100,000	\$ 100,000
		Sub-total		\$ 6,509,456
		Contingency (30%)		\$ 1,952,837
		Engineering (20%)		\$ 1,692,458
				<u>\$ 10,154,751</u>

Property Acquisition

Description	SqFt	\$/sq ft	Cost
Spaldings Property	63,000	\$ 4.00	\$ 252,000
Railroad Agreement			\$ 50,000
Easements for Sidewalk			\$ 50,000
		Sub-total Property	\$ 352,000
		Legal Costs (15%)	\$ 52,800
			<u>\$ 404,800</u>
		Total project cost	\$ 10,559,551

## Alternative G: Park/Trail (Ped Bridge)

Bridge Type: Pedestrian

Total Bridge Length: 400 feet (250 @ I-90, 150' @ Railroad)

Bridge Width: 14 feet

Approaches: Fully contained approaches north and south of the railroad and south of I-90

Trail Impr'mts: 3800 feet total (trail improvement on bridge included in bridge costs)

### Notes/Assumptions:

- Improvements run from 400' south of Montgomery to Mission
- Structure clearance over railroad a minimum of 23.5', assumed existing rail grade about 5 feet lower than grade north and south.
- Approaches north and south of railroad would be fully contained. Approach south of I-90 would be fully contained, north side would be typical fill slope with 2:1 side slopes
- Trail would follow Millwood Trail alignment
- Property for north bridge approach across I-90 would need to be acquired.

	Length	Width	SqFt	\$/sq ft	Cost
Bridge	400	14	5,600	\$ 225.00	\$ 1,260,000
Approach Slabs	80	14	1,120	\$ 30.00	\$ 33,600

	Length	Ave. height	# walls	SqFt	\$/sq ft	Cost
Apprh Walls (N&S of RR)	500	12	4	24,000	\$ 35.00	\$ 840,000
Apprh Walls (I-90)	600	12	1	7,200	\$ 35.00	\$ 252,000

	Total Lgt	Ave. height	Vol (cf)	Vol (cy)	\$/cu yd	Cost
Contained Approach Fill	1,200	12	201,600	7,467	\$ 35.00	\$ 261,333
Sloped Fill Approaches			160,000	5,926	\$ 25.00	\$ 148,148

	Total Lgt	\$/ LF	Cost
Railing	2,500	\$ 50.00	\$ 125,000

	Length	Width	Units	\$/unit	Cost
Trail Impr'mts					
Trail Section	3800	12	5,067 SY	\$ 27.00	\$ 136,800
Drainage			1 LS	\$ 30,000	\$ 30,000

	Qty	Units	\$/unit	Cost
Miscellaneous				
Traffic Control	1	LS	\$ 50,000	\$ 50,000
		Sub-total		\$ 3,136,881
		Contingency (30%)		\$ 941,064
		Engineering (20%)		\$ 815,589
				<u>\$ 4,893,535</u>

Property Acquisition

Description	SqFt	\$/sq ft	Cost
Spaldings Property	10,500	\$ 4.00	\$ 42,000
Parcel north of I-90	32,000	\$ 3.00	\$ 96,000
Railroad Agreement			\$ 50,000
		Sub-total Property	\$ 188,000
		Legal Costs (15%)	\$ 28,200
			<u>\$ 216,200</u>
		Total project cost	\$ 5,109,735

## Alternative H: Park/Montgomery (Ped Bridge)

Bridge Type: Pedestrian

Total Bridge Length: 400 feet (250 @ I-90, 150' @ Railroad)

Bridge Width: 14 feet

Approaches: Fully contained approaches north and south of the railroad and south of I-90

Trail Impr'mts: 2400 feet total (trail improvement on bridge included in bridge costs)

### Notes/Assumptions:

- Improvements run from Montgomery to Mission
- Structure clearance over railroad a minimum of 23.5', existing rail grade is about the same elevation as grade north and south.
- Approaches north and south of railroad would partially contained. Approach south of I-90 would be fully contained, north side would be typical fill slope with 2:1 side slopes
- Property acquisition needed for trail north of railroad to Montgomery
- Property for north bridge approach across I-90 would need to be aquired.

	Length	Width	SqFt	\$/sq ft	Cost
Bridge	400	14	5,600	\$ 225.00	\$ 1,260,000
Approach Slabs	80	14	1,120	\$ 30.00	\$ 33,600

	Length	Ave. height	# walls	SqFt	\$/sq ft	Cost
Apprh Walls (N of RR)	175	14	2	4,900	\$ 35.00	\$ 171,500
Apprh Walls (I-90)	600	12	1	7,200	\$ 35.00	\$ 252,000

	Total Lgt	Ave. height	Vol (cf)	Vol (cy)	\$/cu yd	Cost
Contained Approach Fill	300	12	50,400	1,867	\$ 35.00	\$ 65,333
Sloped Fill Approaches			850,000	31,481	\$ 20.00	\$ 629,630

	Total Lgt	\$/ LF	Cost
Railing	500	\$ 50.00	\$ 25,000

	Length	Width	Units	\$/unit	Cost
Trail Impr'mts					
Trail Section	2400	12	3,200 SY	\$ 27.00	\$ 86,400
Drainage			1 LS	\$ 30,000	\$ 30,000

	Qty	Units	\$/unit	Cost
Miscellaneous				
Traffic Control	1	LS	\$ 50,000	\$ 50,000
		Sub-total		\$ 2,603,463
		Contingency (30%)		\$ 781,039
		Engineering (20%)		\$ 676,900
				<u>\$ 4,061,402</u>

Property Acquisition

Description	SqFt	\$/sq ft	Cost
Spaldings Property	37,500	\$ 3.00	\$ 112,500
Parcel north of I-90	32,000	\$ 3.00	\$ 96,000
Property north of RR-South of Montgomery	65,000	\$ 3.00	\$ 195,000
Railroad Agreement			\$ 50,000
		Sub-total Property	\$ 453,500
		Legal Costs (15%)	\$ 68,025
			<u>\$ 521,525</u>
		Total project cost	\$ 4,582,927

## Alternative I: Turn Lane - Pines Road Southbound

Improvement Type: Lane Widening

Notes/Assumptions:

- Lane length approximately 250'
- Overhead powerlines don't require relocation only new poles

	Qty	Units	\$/unit	Cost
<b>Demolition</b>				
Roadway Demolition		SY	\$ 8.00	\$ -
Curb Demolition	250	LF	\$ 4.00	\$ 1,000
Sign Relocation	1	EA	\$ 300	\$ 300
Signal Relocate	1	EA	\$ 50,000	\$ 50,000
Lightpole Relocate	2	EA	\$ 5,000	\$ 10,000
Overhead Power Adjustments	1	LS	\$ 10,000	\$ 10,000

	Width	Length	Qty	Units	\$/unit	Cost
<b>Improvements</b>						
Traffic Control			1	LS	\$ 25,000	\$ 25,000
Excavation			600	CY	\$ 20.00	\$ 12,000
Asphalt Pavement			375	SY	\$ 35.00	\$ 13,125
Curb			250	LF	\$ 22.00	\$ 5,500
ADA Ramp			1	EA	\$ 500.00	\$ 500
Signing/Striping			1	LS	\$ 3,000	\$ 3,000
Landscape Restoration			1	LS	\$ 10,000	\$ 10,000

Sub-total	\$ 140,425
Mobilization (10%)	\$ 14,043
Contingency (30%)	\$ 46,340
Engineering (20%)	\$ 37,353
	<u>\$ 224,118</u>