GROUP MACKENZIE

TRANSPORTATION IMPACT ANALYSIS

FRED MEYER CANBY FUEL FACILITY

Canby, Oregon

Prepared For
Fred Meyer

Completed On
May 17, 2012

Submittal To
City of Canby

Project Number
2120130.00

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I. INTRODUCTION

This Transportation Impact Analysis (TIA) has been prepared for the proposed Fred Meyer fuel facility in Canby, Oregon. The subject site, currently undeveloped, is located at the southwest corner of the Highway 99E (SE 1st Avenue)/S. Locust Street intersection. The site is approximately 0.75 acres and currently zoned Highway Commercial C-2 by the City of Canby, in which the proposed use is permitted. Figure 1 is a vicinity map indicating the project location.

PROJECT DESCRIPTION

The proposed fuel facility includes six dispensers providing 12 fueling locations. The dispensers will be located beneath a 5,336 SF canopy. A cashier's kiosk/restroom building, a propane tank, two parking spaces (one of them van-accessible), a trash enclosure, and a storage shed will be located around the site perimeter. The site is designed for two-way vehicle circulation (north-south) past the dispensers. One full-movement access is proposed to SE 2nd Avenue. One full-movement shared access is proposed to Highway 99E; this access will replace the existing access used by the adjacent site and will continue to provide access for vehicles entering the adjacent site. No access is proposed to Locust Street.

Project construction is planned to occur in one phase, with completion anticipated in 2012. Figure 2 presents the proposed site plan.

SCOPE OF REPORT

This analysis conforms to City of Canby Code 16.08.150 – Traffic Impact Study (TIS) and the Oregon Department of Transportation (ODOT) April 2006 (updated January 2011) *Analysis Procedures Manual*. Topics include: existing conditions, crash history, trip generation and distribution for the proposed development, existing and planned transportation infrastructure, intersection capacity analysis, site circulation, and access review.

The TIA study area includes the following intersections:

- Highway 99E / Site Access
- Highway 99E / S. Locust Street
- S. Locust Street / SE 2nd Avenue
- SE 2nd Avenue / Site Access

Weekday AM and PM peak hour analysis is presented for the following scenarios:

- 2012 Existing Conditions
- 2012 Post-Development

No background growth or in-process developments are included in this TIA, so no pre-development scenario is presented.

This TIA also includes an Access Management Plan (AMP) as required by the City of Canby *Transportation System Plan* (TSP). The AMP study area includes the following intersections:

- Highway 99E / S. Knott Street
- Highway 99E / Domino's Site West Access
- Highway 99E / Domino's Site East Access (shared with the proposed Fred Meyer Fuel site access; considered aligned with Hulbert's Flowers Site West Access)
- Highway 99E / Hulbert's Flowers Site West Access (considered aligned with Domino's Site East Access)
- Highway 99E / Hulbert's Flowers East Access (considered aligned with S. Locust Street)
- Highway 99E / 76 Fuel West Site Access
- Highway 99E / 76 Fuel East Site Access
- Highway 99E / Napa West Site Access

The AMP addresses weekday AM and PM peak hour conditions for the following scenarios:

- No access to Highway 99E
- Restricted movement access to Highway 99E (right-in/right-out)
- Full access to Highway 99E (shared with adjacent parcel)

II. EXISTING CONDITIONS

SITE CONDITIONS

The subject site is bounded by Highway 99E (SE 1st Avenue) to the north, SE 2nd Avenue to the south, S. Locust Street to the east ,and existing commercial and residential developments to the west. The site includes Parcels 100, 200, 300, 2200, and 2300 in the southwest ¼ of the southeast ¼ of Section 33 in Township 3 South, Range 1 East, of the Willamette Meridian. These parcels are identified with street addresses 391, 369 and 351 SE 1st Avenue, and 354 and 392 SE 2nd Avenue.

The site is approximately 0.75 acres and currently undeveloped. The applicable City of Canby land use zone is Highway Commercial C-2, in which the proposed use is permitted.

Each of the five existing parcels currently has its own access on the public right-of-way. Parcels 100 and 2300 access Locust Street. Parcel 200 accesses Highway 99E. Parcel 300 accesses Highway 99E via a shared improved driveway also serving the adjacent development. Parcel 2200 accesses SE 2nd Avenue. None of these accesses are currently in use except for the trips entering and exiting the adjacent site.

TRANSPORTATION FACILITIES

Table 1 presents the roadway classifications and characteristics within the study area. Classifications are based on those provided in the City of Canby *Transportation System Plan* (TSP), December 2010 Edition, and in the ODOT *Oregon Highway Plan*, 1999 Edition, as updated through December 21, 2011, and the ODOT "Functional Classification and National Highway System Status on Oregon State Highways" table, dated March 19, 2012.

TABLE 1 – ROADWAY CHARACTERISTICS

Roadway	Classification	Posted Speed (mph)	Travel Lanes	Bike Lanes	On-Street Parking	Side-walks
Highway 99E (SE 1st Avenue)	City: Arterial ODOT: Urban Principal Arterial-Other, Regional Highway, Truck Route, Special Transportation Area (STA)	35	5	No	No	Yes
Locust Street	Local	25	2	No	Yes	Yes
SE 2nd Avenue	Local	25	2	No	Yes	Yes

The public street intersections within the study area are unsignalized. All access intersections are stop-controlled on the private approaches to public roadways. Figure 3 presents existing lane configurations and traffic controls at each study area intersection.

PLANNED IMPROVEMENTS

No planned improvements were identified that are funded for completion within the analysis years and would impact traffic volumes within the study area.

PEDESTRIAN AND BICYCLE FACILITIES

Sidewalks are currently provided throughout the study area, including along all site frontages. Bicycle lanes are not currently provided within the study area. No changes to pedestrian or bicycle facilities are proposed with this project.

TRANSIT FACILITIES

Canby Area Transit (CAT) agency provides fixed-route Neighborhood Shuttle service and demand-response (dial-a-ride) transit service within the Canby Urban Growth Boundary. CAT also provides inter-city transit service along the Highway 99E corridor between Woodburn and Oregon City. The South Clackamas Transit District (SCTD) provides inter-city transit service between Molalla and Canby. The South Metro Area Regional Transit (SMART) provides inter-city transit service between Wilsonville and Canby.

The nearest transit stops to the subject site are:

- SE 2nd Avenue/Locust Street, at the southeast corner of the site (served by the CAT Orange Line).
- Township Road/Maple Street, approximately 0.4 miles southeast of the site (served by CAT Neighborhood Shuttle).
- Canby Transit Center, near the NW 1st Avenue/N. Ivy Street intersection, approximately 0.3 miles northwest of the site (served by CAT Neighborhood Shuttle, CAT Orange Line, SCTD, and SMART).

Copies of CAT route maps and schedules are provided in the appendix.

EXISTING TRAFFIC COUNTS

Existing traffic volumes were collected at the study area intersections on Wednesday April 4, 2012, between the hours of 7:00-9:00 AM and 4:00-6:00 PM. The system peak hours were found to be 7:30-8:30 AM and 4:45-5:45 PM. Count summary sheets are included in the Appendix.

SEASONAL ADJUSTMENT

In accordance with ODOT *Analysis Procedures Manual* standards, a seasonal adjustment factor of 1.092 was applied according to the ATR Characteristic Table Method. This adjustment is required by ODOT to estimate the 30th highest hour for use in the analysis. ATR 18-018, located on Oregon Highway 39 in Klamath Falls, was selected based on its similar characteristics to Highway 99E in Canby:

- "Commuter" seasonal traffic trend
- "Small urban" area type
- Five-lane section
- "Regional highway" OHP classification
- AADT within 10%(±) of the AADT in Canby

Because the counts were collected in early April, an average of the March and April data from ATR 18-018 was used for the count month. The peak month varied significantly by year. Figure 4 presents the seasonally adjusted intersection traffic volumes. The seasonal adjustment calculations and data sheets are provided in the appendix.

Table 4 presents the results of the existing conditions capacity analysis.

CRASH ANALYSIS

When evaluating the relative safety of an intersection, consideration is given not only to the total number and types of crashes occurring, but also to the number of vehicles entering the intersection. This leads to the concept known as "crash rate," which is usually expressed in terms of the number of crashes occurring per one million vehicles entering the intersection (mev). Intersections having a crash rate less than 1.0 crashes/mev are considered relatively safe. At crash rates higher than 1.0 crashes/mev, consideration may be given to correcting operational problems.

Crash data for the study area intersections were obtained from ODOT for January 2006 through December 2010. The following table presents calculated crash rates at the study intersections for the five-year data period. Annual traffic entering the intersection was estimated by multiplying the average annual daily traffic (AADT) entering the intersection by 365. AADT was estimated by multiplying the intersection PM peak hour total volumes by 10, a typical method of estimating daily traffic. Crash data and calculations are presented in the Appendix.

TABLE 2 – INTERSECTION CRASH RATES

Intersection	Number of Crashes						Crash Rate
	2006	2007	2008	2009	2010	Total	
Highway 99E / Site Access	1	0	0	0	1	2	0.05
Highway 99E / S. Locust Street	1	2	2	2	0	7	0.16
S. Locust Street / SE 2nd Avenue	0	0	2	0	0	2	0.49

As presented in the previous table, crash rates are below the 1.0 crashes/mev threshold rate at all study area intersections; therefore, these intersections do not currently merit further consideration for safety mitigation measures.

III. SITE DEVELOPMENT

As described in the Introduction, the proposed fuel facility provides 12 fueling locations and other accessory facilities. Vehicles will circulate in both directions past the fuel dispensers. One 40-foot-wide full-movement access on SE 2nd Avenue will replace the existing access for parcel 2200. One 40-foot-wide full-movement shared access is proposed on Highway 99E; this access will replace the existing access used by the adjacent site and will continue to provide access for vehicles entering the adjacent site. The existing drive-through lane for the adjacent dry cleaning service may continue to operate. The existing Highway 99E access for parcel 200 will be closed. No access is proposed to Locust Street. The existing accesses on Locust Street will be closed.

TRIP GENERATION

Trip generation estimates for the proposed fuel facility have been prepared based on the higher rate between either a survey of two existing similar Fred Meyer fuel facilities or the Institute of Transportation Engineers' (ITE) *Trip Generation*, 8th Edition, Land Use Code 944 – Gasoline/Service Station. Specifically, the AM peak hour rate of 12.16 trips/fueling position from *Trip Generation* and the PM peak hour rate of 20.46 trips/fueling position from the survey were used. Due to the nature of the fuel facility, no alternate trip modes are assumed. No large trucks are anticipated to use the fuel facility other than for fuel delivery.

TRIP SURVEY

Trip surveys were conducted at two existing Fred Meyer Fuel facilities (Sandy and Oak Grove) to estimate the average AM and PM trip generation rates for a fuel facility in Canby.

The facility in Sandy, Oregon (35885 Industrial Way, Sandy, OR 97055) was selected because:

- Similar to Canby, it is located in a small urban area just outside the Portland metro area.
- It is located near a state highway that serves a high percentage of the area's trips.
- It is unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Sandy. The nearest Fred Meyer store is in Gresham (2497 SE Burnside Road), and this store also has a fuel facility.

The facility in Oak Grove, Oregon (13625 SE McLoughlin Boulevard, Oak Grove, OR 97222) was selected because:

- It is located adjacent to a state highway that serves a high percentage of the area's trips.
- Similar to the Canby site, it is located approximately 0.6 miles away from the associated Fred Meyer store.
- It is unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Oak Grove. The nearest Fred Meyer stores are in Clackamas at 16301 SE 82nd Drive near Highway 212/224, and in Happy Valley at 8955 SE

82nd Avenue at Johnson Creek Boulevard. The existing fuel facility at the Johnson Creek store is likely more convenient for patrons of both stores.

Similar to the Sandy and Oak Grove Fred Meyer Fuel locations, the Canby facility is not likely to see many trips by regular patrons of Fred Meyer stores other than the one in Canby. The nearest Fred Meyer stores are in Wilsonville (30300 SW Boones Ferry Road) and Oregon City (1839 Molalla Avenue), and both stores already have fuel facilities.

A copy of the trip generation calculations from surveys in Sandy and Oak Grove is attached. The average AM peak hour trip generation rate was found to be 11.96 trips per vehicle fueling position (VFP), and the average PM rate was 20.46 trips per VFP. The ITE AM rate of 12.16 is slightly higher, so the ITE AM rate is used in this analysis. The ITE PM rate of 13.87 is lower, so the Fred Meyer surveyed rate is used in this analysis to estimate the highest potential impact.

TRIP TYPES

Total Trips

Based on a fuel facility with 12 vehicle fueling position, ITE estimates 146 AM peak hour total trips, and the survey data estimate 246 PM peak hour total trips. These are total trips, representing the total number of vehicle trips to and from the fuel facility. Total trips consist of shared, pass-by, diverted linked and primary trips.

Shared Trips

Because the proposed site is not located at the Fred Meyer store, shared trips typically would not be assumed. From surveys conducted at Fred Meyer fuel facilities, customers are known to take advantage of the rewards card fuel discounts during a trip to the store. For this site, these trips are still expected to occur and will add trips to Highway 99E between the Fred Meyer store and fuel facility.

Surveys conducted at Fred Meyer fuel facilities in 2012 indicate a 38% shared trip rate with the main store. Rewards Card data for all Fred Meyer-branded fuel facilities indicate 89% of all fuel customers use a Rewards Card for a fuel price discount, with 70% of customers receiving the larger 10- to 15-cent discount, and 19% receiving the 3-cent discount. This means 70% of the fuel purchases are made by customers also spending a minimum amount at Fred Meyer stores. This data supports use of the 38% shared trip rate.

The surveys were conducted at Fred Meyer locations with adjacent or on-site fuel facilities. The proposed fuel facility in Canby is located off-site, so the shared trips will be treated as primary trips traveling along Highway 99E directly to/from the Canby Fred Meyer store at 1401 SE 1st Avenue.

Pass-By Trips

Pass-by trips are those site trips already driving past the site on the adjacent roadways. These trips do not increase the total traffic volumes on the roadways, but do add to turning movement volumes at the site accesses. Based only on survey data a 30% pass-by rate was applied.

For purposes of this analysis, pass-by trips were drawn from Highway 99E.

Primary Trips and Diverted Linked Trips

Primary trips are those site trips stopping only at the fuel facility and then returning to their origins. These are considered new trips generated by the fuel facility.

Diverted linked trips are those site trips already traveling in the site vicinity on streets other than those immediately adjacent to the site; these vehicles change their direction or route to access the site.

For the purposes of this analysis, diverted/linked trips were included with primary trips. Together they represent 32% of total trips.

NET TRIP GENERATION

The following table summarizes the trip generation estimates for a Fred Meyer fuel facility with 12 vehicle fueling positions.

TABLE 3 – TRIP GENERATION

Trip Type	AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
Total Trips (100%)	74	72	146	123	123	246
Shared Fred Meyer Trips (38%)	*28*	*27*	*55*	*46*	*47*	*93*
Pass-By Trips (30%)	*22*	*22*	*44*	*37*	*37*	*74*
Primary Trips (32%)	24	23	47	40	39	79

TRIP DISTRIBUTION

Shared Trips

Distribution for shared trips is simply between the fuel facility and the Canby Fred Meyer store location, similar to primary trips.

Figure 5 presents the weekday AM and PM peak hour shared trip distribution and assignment.

Pass-By Trips

Distribution for pass-by trips was estimated based on the proportions of traffic traveling in each direction on nearby roadways in the site vicinity. The percentages noted represent weekday AM and PM peak hour conditions.

- 49% AM / 47% PM from the west on Highway 99E
- 51% AM / 53% PM from the east on Highway 99E

Figure 6 presents the weekday AM and PM peak hour pass-by trip distribution and assignment.

Primary Trips

Distribution for primary trips was estimated based on a select zone assignment model provided by DKS Associates. A copy of the model output is included in the appendix. Based on this model, primary trips are anticipated to use area roadways in the following distribution proportions.

- 45% to and from the west on Highway 99E (includes 15% to and from Ivy Street north of Highway 99E and 30% to and from Highway 99E west of Ivy Street)
- 20% to and from Ivy Street south of 2nd Avenue
- 30% to and from the east on Highway 99E
- 5% to and from Locust Street south of 2nd Avenue

Figure 7 presents weekday AM and PM peak hour primary trip distribution and assignment.

Total Trips

Figure 8 presents weekday AM and PM peak hour total trip assignments, or the sum of shared trips, pass-by trips, and primary trips.

POST-DEVELOPMENT TRAFFIC

Post-development traffic is the sum of the seasonally adjusted traffic and site trips. Figure 9 presents post-development weekday AM and PM peak hour traffic volumes.

In order to address alternate access configurations, as required by the City and ODOT, adjustments to the volumes were made to account for scenarios with the proposed Highway 99E driveway limited to right turns (right-in/right-out, or RIRO) and with no driveway.

The RIRO access scenario reroutes left turn movements from the Highway 99E access:

- Westbound entering trips would turn left at Locust Street.
- Westbound exiting trips would turn right to westbound SE 2nd Avenue or would turn left to eastbound 2nd Avenue, left to northbound Locust Street and left to westbound Highway 99E. The split between these routes is estimated at 50/50.

Figure 10 presents the weekday AM and PM peak hour total site trip assignments with the RIRO access to Highway 99E. Figure 11 presents the right turn only scenario peak hour volumes. Detailed assignment sheets are presented in the appendix.

The No Access scenario reroutes all site trips from the Highway 99E access:

- Westbound entering trips would turn left at Locust Street.
- Eastbound entering trips would turn right at Locust Street.
- Westbound exiting trips would turn right to westbound SE 2nd Avenue or would turn left to eastbound 2nd Avenue, left to northbound Locust Street, and left to westbound Highway 99E. The split between these routes is estimated at 50/50.
- Eastbound exiting trips would turn left to eastbound SE 2nd Avenue.

Figure 12 presents the weekday AM and PM peak hour total site trip assignments with no access to Highway 99E. Figure 13 presents volumes for a scenario with no access to Highway 99E. Detailed assignment sheets are presented in the appendix

ON-SITE CIRCULATION

The site will be designed for two-way vehicle circulation (north-to-south) past the fuel dispensers. Bypass lanes will be provided between the fueling lanes and between the fuel canopy and the perimeter curbs.

VEHICLE TURNING PATHS

Fuel Delivery Trucks

Fuel delivery trucks are anticipated to visit the site during off-peak hours and only on an as-needed basis, typically two to three times per week. Trucks are anticipated to enter the site via a right turn from eastbound Highway 99E, circulate clockwise around the site, park between the parking spaces and fuel tanks to off-load fuel, and exit via a right turn to eastbound Highway 99E. The anticipated vehicle turning path is provided in the Appendix.

Emergency Vehicles

Emergency vehicles are anticipated to visit the site only on an as-needed basis. A fire engine is the largest emergency vehicle likely to visit the site. Some sample vehicle turning paths are provided in the Appendix.

Passenger Autos

Passenger autos are anticipated to be the primary vehicle entering and exiting the site. Both proposed accesses will accommodate all entering and exiting movements by passenger autos. Drivers will maneuver within the open paved area to select a fueling lane or a parking space. Bypass lanes will permit passenger autos to queue at and behind the fueling positions without impeding on-site circulation around or beneath the canopy. Some sample vehicle turning paths are provided in the Appendix.

SIGHT DISTANCE

Sight distance evaluation has been prepared for the proposed site accesses based on the standards presented in the American Association of State and Highway Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*, 6th Edition (2011). Specifically, standards for left turns and right turns exiting the driveways are presented in Tables 9-5 through 9-8.

For the access to Highway 99E, with a posted speed limit of 35 mph, AASHTO recommends at least 440 feet for left turns and 335 feet for right turns. Sight distance is available for at least 500 feet in both directions at the proposed access location, so the standard is met.

For the access to SE 2nd Avenue, with a posted speed limit of 25 mph, AASHTO recommends at least 280 feet for left turns and 240 feet for right turns. Sight distance is available for at least 300 feet in both directions at the proposed access location. The sight distance to Locust Street is approximately 100 feet. Vehicles approaching from the Locust Street intersection will typically be traveling more slowly—estimated intersection departure speed is 15 mph—than the posted speed. The minimum stopping sight distance for 15 mph is 80 feet, so the standard is met.

IV. CAPACITY AND QUEUING ANALYSIS

CAPACITY ANALYSIS

Intersection capacity calculations were prepared using methodologies presented in the Transportation Research Board's *Highway Capacity Manual*, 2000 Edition (HCM). Trafficware's Synchro software, version 8, which implements HCM methodologies, was used to prepare the capacity and level-of-service calculations. Copies of the calculations are included in the Appendix.

Intersection capacity characteristics are generally defined by two measurements: volume-to-capacity (v/c) ratio and level-of-service (LOS).

V/c ratio is a measurement of capacity used by a given traffic movement or for an entire intersection. It is defined by the rate of traffic flow or traffic demand divided by the theoretical capacity.

LOS is a relative measure of the average control delay (in seconds) experienced by drivers at an intersection and is described by a letter on the scale from A to F. LOS A represents optimum operating conditions and minimum delay. LOS F indicates long delays and often over-capacity conditions.

ODOT uses v/c to assess capacity on state highways, with a standard of 1.00 for this location along Highway 99E (Table 6 of the *Oregon Highway Plan*) because it is within an adopted Special Transportation Area (STA).

The City of Canby uses LOS to assess capacity on city streets. Unsignalized two-way stop controlled intersections need to maintain an LOS E or better (City TSP).

Capacity analysis was performed for the weekday AM and PM peak hour at the study area intersections for the following development scenarios:

- 2012 Existing
- 2012 Post-Development

Calculation results are summarized in the following table.

TABLE 4 – INTERSECTION CAPACITY ANALYSIS (FULL ACCESS)

Intersection	Capacity Criteria	Approach	2012 Existing		2012 Post-Development	
			AM	PM	AM	PM
Highway 99E / Site Access	v/c	NB Lt	0.00	0.06	0.07	0.25
Highway 99E / S. Locust Street	v/c	NB	0.13	0.24	0.16	0.30
S. Locust Street / SE 2nd Avenue	LOS	EB	A	B	A	B
		WB	A	A	A	A
SE 2nd Avenue / Site Access	LOS	SB Lt			A	A

All the study intersections and site driveways are anticipated to operate within acceptable capacity standards during all analysis scenarios.

In addition to a full movement access to Highway 99E, two other access scenarios were analyzed: Right-in/right-out (RIRO) and No Access to the state highway.

Calculation results are summarized in the following table.

TABLE 5 – INTERSECTION CAPACITY ANALYSIS (ALTERNATE ACCESSES)						
Intersection	Capacity Criteria	Approach	2012 Post-Development			
			RIRO		No Access	
			AM	PM	AM	PM
Highway 99E / Site Access	v/c	NB Rt	0.07	0.17		
Highway 99E / S. Locust Street	v/c	NB	0.20	0.45	0.27	0.61
S. Locust Street / SE 2nd Avenue	LOS	EB	A	B	B	B
		WB	A	B	A	B
SE 2nd Avenue / Site Access	LOS	SB Lt	A	A	A	B

All the study intersections and site driveways are anticipated to operate within acceptable capacity standards during all alternate analysis scenarios.

QUEUING ANALYSIS

Queuing analyses were prepared at study area intersections using Synchro software, version 8, to estimate the 95th percentile queues for each lane group. Calculations are provided in the Appendix.

The available queue storage and the anticipated queue demand values are listed in the following table. Queue demand results are reported for stop-controlled or yield-controlled movements. Values are rounded to the nearest 25 feet.

TABLE 6 – QUEUING ANALYSIS (FEET)												
Intersection	Movements		Available Storage	Analysis Scenario								
				Existing		Post-Dev		RIRO		No Access		
				AM	PM	AM	PM	AM	PM	AM	PM	
Highway 99E / Site Access	NB	Lt,Th	25	0	25	25	25					
		Rt	50			25	25	25	25			
	WB	Lt	125	0	0	25	25					
Highway 99E / S. Locust Street	NB	Lt,Th,Rt	175	25	25	25	25	25	50	25	100	
	WB	Lt	300+	25	25	25	25	25	25	25	25	
S. Locust Street / SE 2nd Avenue	EB	Lt,Th,Rt	300+	25	25	25	25	25	25	25	25	
	WB	Lt,Th,Rt	100	25	25	25	25	25	25	25	25	
SE 2nd Avenue / Site Access	SB	Lt	50			25	25	25	25	25	25	
		Rt				0	25	25	25	25	25	

As presented in the previous table, queue demand is not anticipated to exceed the available storage in any scenario.

At the proposed site access on 2nd Avenue, up to 50 feet is available for vehicle queuing; however, vehicles will rarely be queued at this location.

The proposed configuration of the driveway to Highway 99E is such that 25 feet is available for left/through lane queuing, and approximately 50 feet is available for the right turn lane. Queues are not expected to exceed these available distances.

V. ACCESS MANAGEMENT PLAN

The proposed fuel facility will access Highway 99E to the north and SE 2nd Avenue to the south. Both accesses are proposed to be 40 feet wide, including one, 16-foot-wide entering lane and two, and 12-foot-wide exiting lanes. The City of Canby TSP requires an Access Management Plan (AMP) be prepared for the access to Highway 99E. Based on correspondence with City staff, the scope of this AMP includes conditions at the following accesses and public street intersections along Highway 99E within 250 feet of the property boundaries. Where accesses are included in the above TIA capacity and queuing analyses, a note is included.

- Napa Auto Parts (505 SE 1st Avenue) West Driveway
- 76 Fuel Station (453 SE 1st Avenue) East Driveway
- 76 Fuel Station (453 SE 1st Avenue) West Driveway
- S. Locust Street
- Hulbert's Flowers (334 SE 1st Avenue) East Driveway (enter only) – part of the Highway 99E/Locust Street intersection
- Hulbert's Flowers (334 SE 1st Avenue) West Driveway (exit only) – part of the Highway 99E/Site Access intersection
- Domino's Pizza (325 SE 1st Avenue) East Driveway – closed and combined with the Highway 99E/Site Access intersection
- Domino's Pizza (325 SE 1st Avenue) West Driveway
- S. Knott Street

The existing access to site parcel 200 will be closed with the development and is not a part of the AMP study area. Within the study area this AMP addresses:

- The potential impacts on operations and safety from the proposed Fred Meyer fuel facility.
- The existing and future access conditions for all properties.
- The potential impacts based on the access alternatives (full movement, restricted movement, and no access at Highway 99E).
- The improvements necessary to mitigate the potential impacts.

EXISTING CONDITIONS

Traffic Volumes

Existing turning movement volumes were collected at the AMP study area intersections on Wednesday April 4, 2012, between the hours of 7:00-9:00 AM and 4:00-6:00 PM. As with the TIA above, the system peak hours of 7:30-8:30 AM and 4:45-5:45 PM are addressed in this AMP. Count summary sheets are included in the Appendix. Figure 14 presents a summary of the existing peak hour volumes at the study area intersections. Where only turning movements were counted, through volumes on Highway 99E were interpolated from adjacent intersections.

Access Configurations

Except at Hulbert's Flowers, where the east driveway is enter-only and the west driveway is exit-only, each existing driveway and side street permits full-movement access to and from Highway 99E.

Access Spacing

The proposed access is located within the Highway 99E segment between Ivy and Pine Streets. As identified in Table 3-5 of the City TSP, this 2,670-foot highway segment includes 27 access points, inclusive of public streets. The frequency of accesses within the AMP study area (9 within 660 feet) has a slightly higher frequency of accesses than the Ivy-to-Pine segment as a whole.

The proposed access is subject to City and ODOT spacing standards, which are a minimum of 330 feet and 350 feet, respectively, between the access centerline and the nearest access or public roadway centerline (City TSP, Table 7-2, and Oregon Administrative Rules Chapter 734, Division 51, Temporary Rules Amended May 3, 2012, Table 5). The existing street grid provides approximately 420 feet between Knott and Locust Streets, so by definition no accesses could meet the spacing standard in this segment. Furthermore, the existing street spacing does not meet the minimum 660 feet specified in TSP Table 7-2.

FUTURE CONDITIONS

Traffic Volumes

The following table identifies the added trips at each access point within the AMP study area from the proposed Fred Meyer fuel facility (assuming full-movement access to Highway 99E).

TABLE 7 – ADDITIONAL TRAFFIC AT STUDY AREA ACCESS POINTS

Access Points along Highway 99E	Weekday AM Peak Hour		Weekday PM Peak Hour	
	Added Trips	Percent Increase	Added Trips	Percent Increase
Napa West Driveway	69	4.3%	116	4.9%
76 Fuel East Driveway	69	4.3%	116	4.9%
76 Fuel West Driveway	69	4.3%	116	4.9%
Locust Street Hulbert's East Driveway (enter only)	71	4.3%	120	5.0%
Hulbert's West Driveway (exit only) Proposed Driveway	102*	6.4%	167*	7.1%
Domino's Pizza West Driveway	22*	1.4%	44*	1.8%
Knott Street	21	1.3%	35	1.5%

* Includes adjustments for existing exiting Domino's trips

The fuel facility will increase traffic by 1.3% to 7.1% at the AMP study area access points. As presented in the capacity and queuing analysis sections of the TIA, no significant impacts are anticipated at the locations with the greatest traffic increase, i.e., the site access to Highway 99E (coincident with Hulbert's West driveway) and Locust Street, so it is reasonable to assume no adverse impacts will be generated at locations with lower levels of traffic increases.

Figure 15 presents a summary of the post-development peak hour volumes at the study area intersections following opening of the proposed Fred Meyer fuel facility with a full-movement access to Highway 99E.

Access Configurations

The existing Domino's East driveway will be consolidated with the Fred Meyer fuel access. The limited space (approximately 25 feet) between the existing building and the property line will allow for only a one-way (enter-only) shared access from the Fred Meyer fuel site. Existing exiting trips will be rerouted to the Domino's West driveway. Trips exiting the Fred Meyer fuel site will be permitted to access Highway 99E directly. All other accesses and public streets will retain their existing access configurations.

In the future, as redevelopment takes place and as the City of Canby Special Transportation Area (STA) plan takes shape, highway access points within the study area will likely be consolidated or eliminated. Parcels with frontage on Highway 99E may be combined with parcels fronting SE 2nd Avenue or the alley parallel to SE 2nd Avenue east of Locust Street to provide access to the lower classification roadways.

Access Spacing

The proposed access spacing will be similar to the existing spacing. The Fred Meyer fuel facility proposes to consolidate, improve, and share the existing Domino's East driveway. The net effect will be no net change in the number of accesses. The proposed access will be located approximately 26 feet east of the existing Domino's East driveway (measured between centerlines).

SAFETY

The foremost potential safety concern arising from the proposed Fred Meyer fuel facility is the potential for conflicts within the Highway 99E center left-turn lane. Westbound vehicles entering the fuel facility or northbound vehicles exiting the site via a two-stage left turn may conflict with eastbound vehicles entering Hulbert's Flowers. No other driveways along the north side of Highway 99E permit entering traffic, so no other driveway movements are expected to experience or contribute to center left-turn lane conflicts.

During the weekday AM peak hour 41 westbound vehicles are anticipated to enter the fuel facility and 19 northbound-to-westbound vehicles are anticipated to exit the fuel facility. The average delay for the entering movement is 9.7 seconds per vehicle. Assuming, for a conservative analysis, each of the 41 vehicles arrives separately, 397.7 seconds of total delay are anticipated within the peak hour. In other words, the lane would be occupied for approximately 11% of the hour. This makes it unlikely any eastbound vehicles entering Hulbert's will experience a conflict with the vehicles entering the fuel facility. Since a total of 3 eastbound vehicles entered Hulbert's during the 2-hour traffic count period (only 1 during the peak hour), no safety concerns are anticipated.

During the weekday PM peak hour 72 westbound vehicles are anticipated to enter the fuel facility and 34 northbound-to-westbound vehicles are anticipated to exit the fuel facility. The average delay for the entering movement is 13.1 seconds per vehicle. Assuming, for a conservative analysis, each of the 72 vehicles arrives separately; 943.2 seconds of total delay are anticipated within the peak hour. In other words, the lane would be occupied for approximately 26% of the hour. This makes it unlikely any eastbound vehicles entering Hulbert's will experience a conflict with the vehicles

entering the fuel facility. Since a total of 3 eastbound vehicles entered Hulbert's during the 2-hour traffic count period (none during the peak hour), no safety concerns are anticipated.

ACCESS ALTERNATIVES

No significant impacts are anticipated at the AMP study area access points under the full-movement proposed access condition. Under the restricted-movement (RIRO) and no-access alternatives the traffic increases along Highway 99E would be the same or less than in the full-movement access alternative. Therefore, no significant impacts are anticipated at the AMP study area access points under the RIRO or no-access alternatives.

Highway 99E Access

The proposed access to Highway 99E cannot meet access spacing standards. It is, however, situated as far as possible from the nearest public roadway intersection (Locust Street) and it encourages shared access to the maximum possible extent by allowing vehicles to enter the adjacent site.

The proposed common development of the five subject parcel permits consolidates accesses from five to two. If the parcels were to develop individually, Parcel 100 would be required to access Locust Street, Parcel 200 would have a right to access Highway 99E, and Parcel 300 would either have its own access to Highway 99E or would continue to share an access with the adjacent development. Thus, the proposed development provides an access configuration better addressing the intent of access spacing standards than could the five parcels individually.

The proposed access to Highway 99E provides the preferred circulation for fuel delivery trucks, which are anticipated to enter the site via a right turn from eastbound Highway 99E and exit via a right turn to eastbound Highway 99E. Any physical means of restricting the access to RIRO at Highway 99E would limit the fuel truck's ability to follow this preferred routing or require a specific design of median treatments to allow for truck turning movements. Without a median design for truck access, the RIRO alternative, as well as the No Access alternative, would introduce additional truck trips to SE 2nd Avenue, which is not part of a designated truck route

In addition, while it is physically possible for the fuel truck to enter and exit the proposed access to SE 2nd Avenue, this path would encroach even more upon opposing lanes of traffic than does the proposed path. A copy of this path is provided in the Appendix. Customers queued behind the dispensers would block the fuel truck circulation through the site. The preferred routing to/from Highway 99E does not have this conflict with queued vehicles.

SE 2nd Avenue Access

The proposed access to SE 2nd Avenue meets access spacing standards (minimum 50 feet to the nearest roadway and minimum 10 feet to the nearest driveway, according to Table 7-2 of the City TSP). According to City access management standards, this access should serve as the only site access because it meets spacing standards and because it accesses a roadway with a lower functional classification than arterial. This would equate the No Access alternative.

This approach, however, would be contrary to the City's policy for Neighborhood Traffic Management (NTM), which targets a maximum of 1,200 daily vehicles on local residential streets such as SE 2nd Avenue. The No Access alternative would concentrate all fuel facility trips at the access to SE 2nd Avenue, increasing the PM peak hour total volume there to 196. Estimating the daily traffic as ten times the PM peak hour volume yields 1,960 ADT, exceeding the 1,200 ADT maximum by over 60%. By similar methods, the RIRO access alternative would yield approximately 1,340 ADT and the Full Access alternative would yield approximately 1,250 ADT. Therefore all three access scenarios would exceed the 1,200 ADT target; the Full Access alternative would be the closest to the target.

SUMMARY

The proposed Fred Meyer fuel facility will increase traffic by 1.3% to 7.1% at the AMP study area access points, but these increases are not anticipated to generate adverse impacts to intersection capacity or queuing. The total number of access points to Highway 99E will be maintained. The existing character of the highway segment, which currently provides direct access between the retail sites and the highway, also will be maintained.

The fuel facility traffic may generate vehicle conflicts within the Highway 99E center left-turn lane, but due to the low level of conflicting traffic and the low levels of entering vehicle delay no safety concerns are anticipated.

The spacing of existing driveways does not meet standards, and the physical configuration of the site makes it impossible to meet access spacing standards. Furthermore, the existing street spacing does not meet minimum standards. However, the proposed access will be located as far as possible from Locust Street, will permit entering traffic to enter the adjacent site, and will consolidate access rights among the three existing parcels fronting Highway 99E.

The proposed access to Highway 99E will provide the preferred routing for the fuel delivery truck. Restricting or eliminating the access to Highway 99E would route the fuel trucks onto SE 2nd Avenue and would encroach upon oncoming traffic lanes at several locations.

By standards the access to SE 2nd Avenue should serve as the only site access. However, this approach would increase the traffic levels on SE 2nd Avenue to approximately 1,960 ADT. The 1,250 ADT anticipated with the Full Access alternative is more in keeping with the City maximum policy of 1,200 ADT on local residential roadways.

VI. CONCLUSIONS AND RECOMMENDATIONS

This TIA has been prepared for the proposed Fred Meyer fuel facility in Canby, Oregon, located on Tax Lots 100, 200, 300, 2200 and 2300 in Section 33 in Township 3 South, Range 1 East. The site is approximately 0.75 acres and currently zoned City of Canby Highway Commercial C-2, in which the proposed use is permitted.

The proposed fuel facility includes six dispensers, providing 12 fueling locations, beneath a 5,336 SF canopy. A cashier's kiosk/restroom building, a propane tank, a trash enclosure, and a storage shed will be located around the site perimeter. Project construction is planned to occur in one phase, with completion anticipated in 2012.

Study area intersections are stop-controlled on the minor approaches. Highway 99E is under state (ODOT) jurisdiction, while Locust Street and SE 2nd Avenue are under City jurisdiction.

Sidewalks are currently provided throughout the study area but bicycle lanes are not. Canby Area Transit (CAT) provides fixed-route and demand-response (dial-a-ride) within the study area. Inter-city transit service is available at the Canby Transit Center, approximately 0.3 miles northwest of the fuel site.

Existing traffic volumes were collected at the study area intersections on Wednesday, April 4, 2012, between the hours of 7:00-9:00 AM and 4:00-6:00 PM. A seasonal adjustment factor of 1.092 was applied to highway traffic volumes to estimate the design hour volumes.

Intersection crash rates are below the 1.0 crashes/mev threshold rate at all study area intersections, warranting no further consideration for safety mitigation measures.

There are no planned improvements funded for completion within the analysis years and within the study area. No background growth or in-process traffic is anticipated to add to the existing volumes.

Trip generation estimates utilize Land Use Code 944 – Gasoline/Service Station in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 8th Edition, for AM trip rates and Fred Meyer fuel facility surveys for PM trip rates. These estimate 146 weekday AM peak hour total trips and 246 weekday PM peak hour total trips for a fuel facility with 12 vehicle fueling positions. These total trips include shared, pass-by and primary trips.

All the study intersections and site driveways are anticipated to operate within acceptable capacity standards during all analysis scenarios, including scenarios with full access, limited access (right-in/right-out) and no access to Highway 99E. Queue demand is not anticipated to exceed the available storage in any analysis scenario, including scenarios with full access, limited access (right-in/right-out) and no access to Highway 99E.

The Access Management Plan indicates no operational or safety concerns are likely to be generated by the proposed full-movement access to Highway 99E and the site trips. We recommend a full-movement access be provided to serve the subject site.

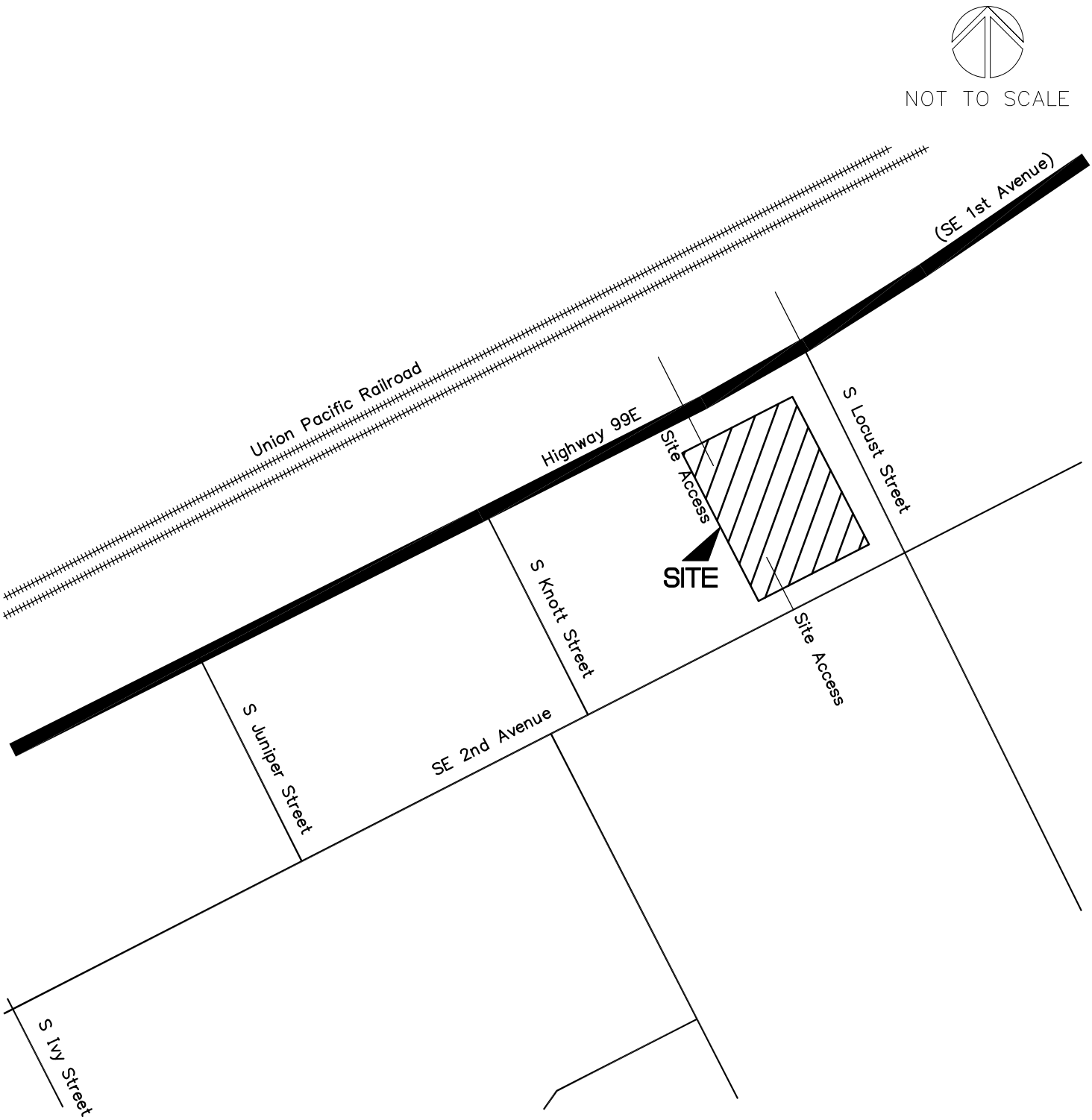
Based on these results, no mitigations or improvements are expected with the proposed fuel facility. The transportation facilities are anticipated to operate within acceptable standards with the addition of the proposed development.

VII. APPENDIX

A. Figures
B. Transit Routes and Schedules
C. Traffic Count Summaries (System Peak Hours)
D. Seasonal Adjustment
E. Trip Surveys
F. Crash Data and Calculations
G. Trip Distribution Model
H. Capacity Calculations
I. Vehicle Turning Paths
J. Scoping

APPENDIX A

Figures



GROUP MACKENZIE

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Seattle WA 206.749.9993

DATE: 05.16.12
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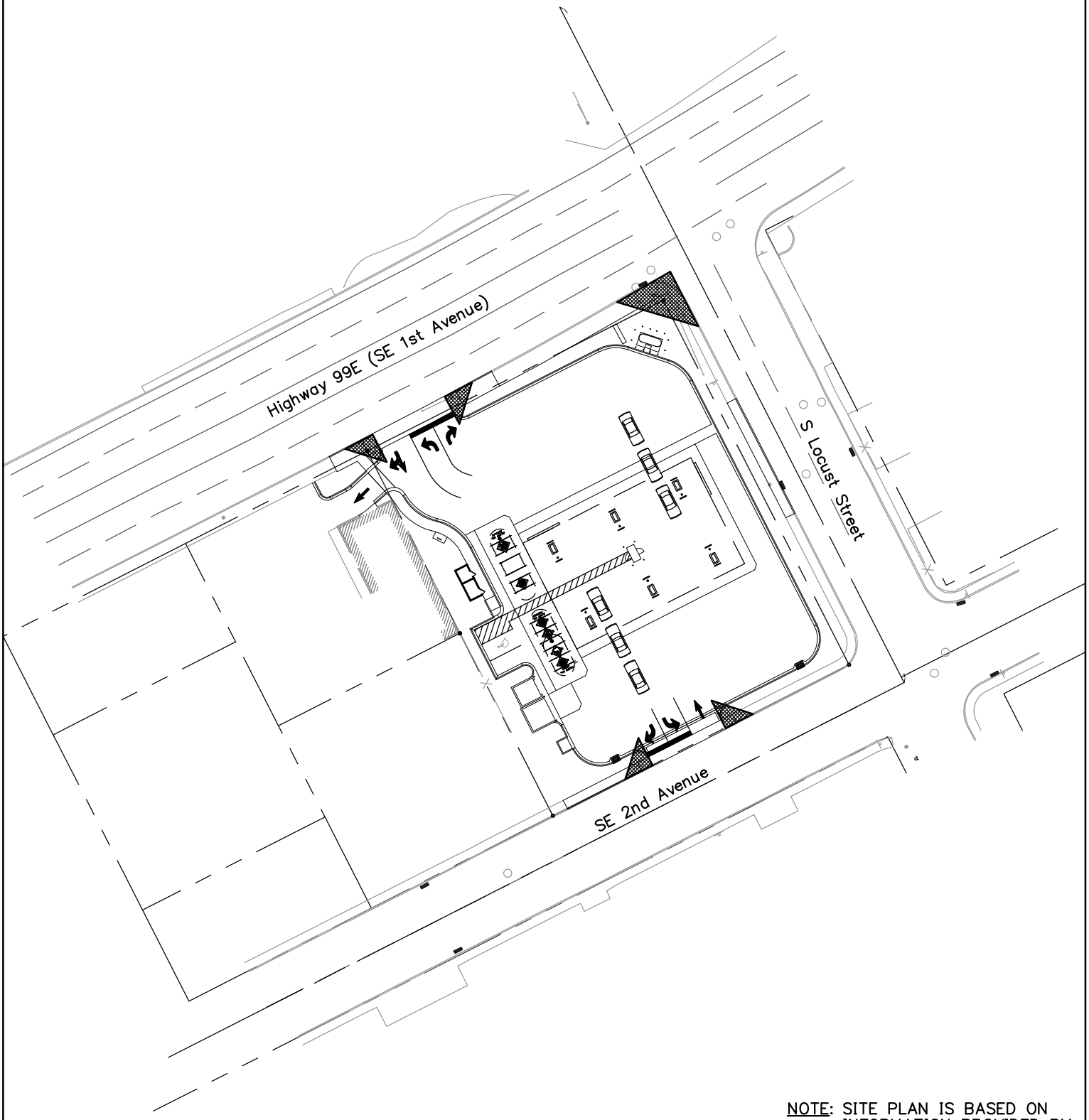
VICINITY MAP

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 1



NOTE: SITE PLAN IS BASED ON INFORMATION PROVIDED BY GREAT BASIN ENGINEERING ON MAY 15, 2012.

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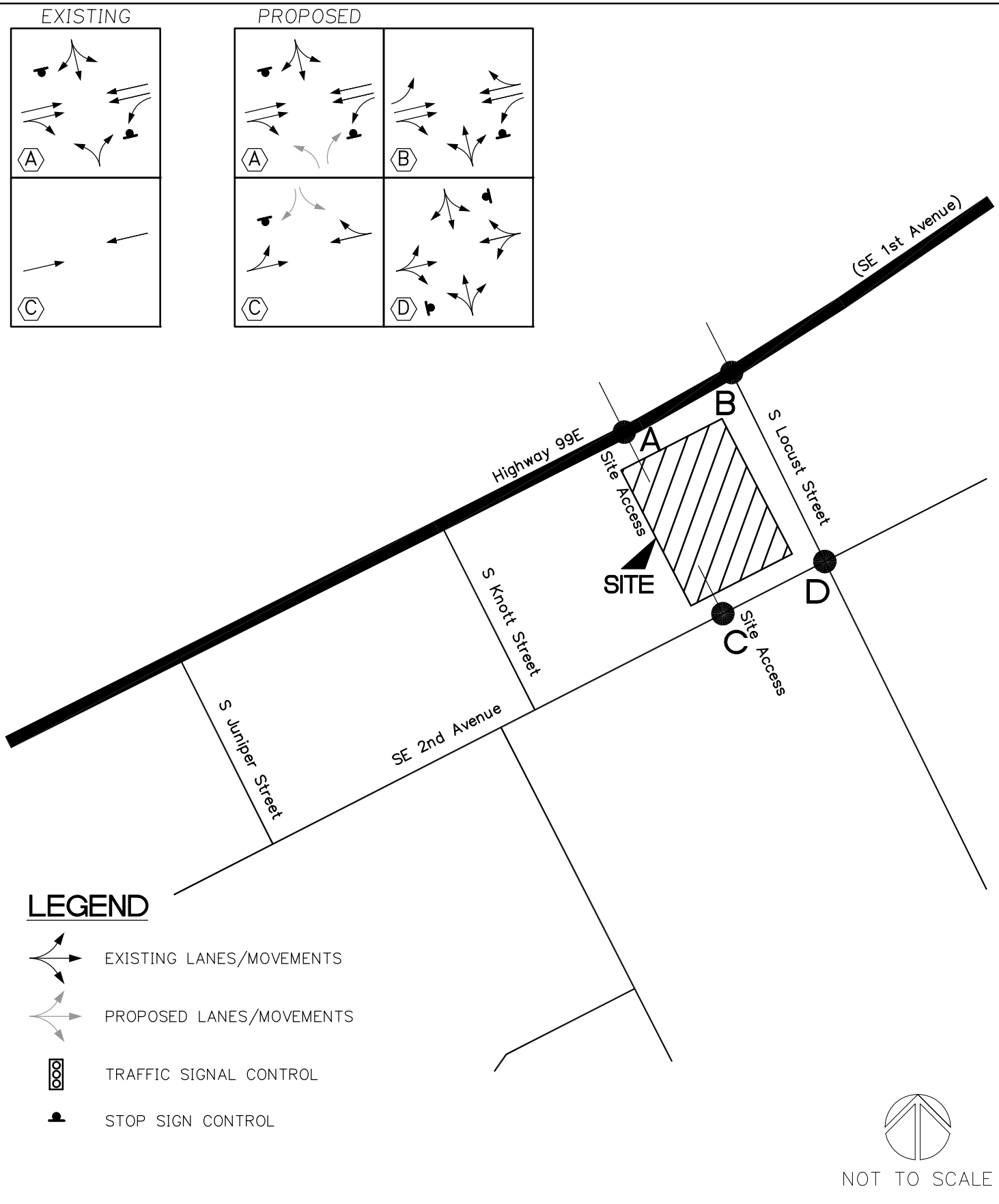
SITE PLAN

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 2



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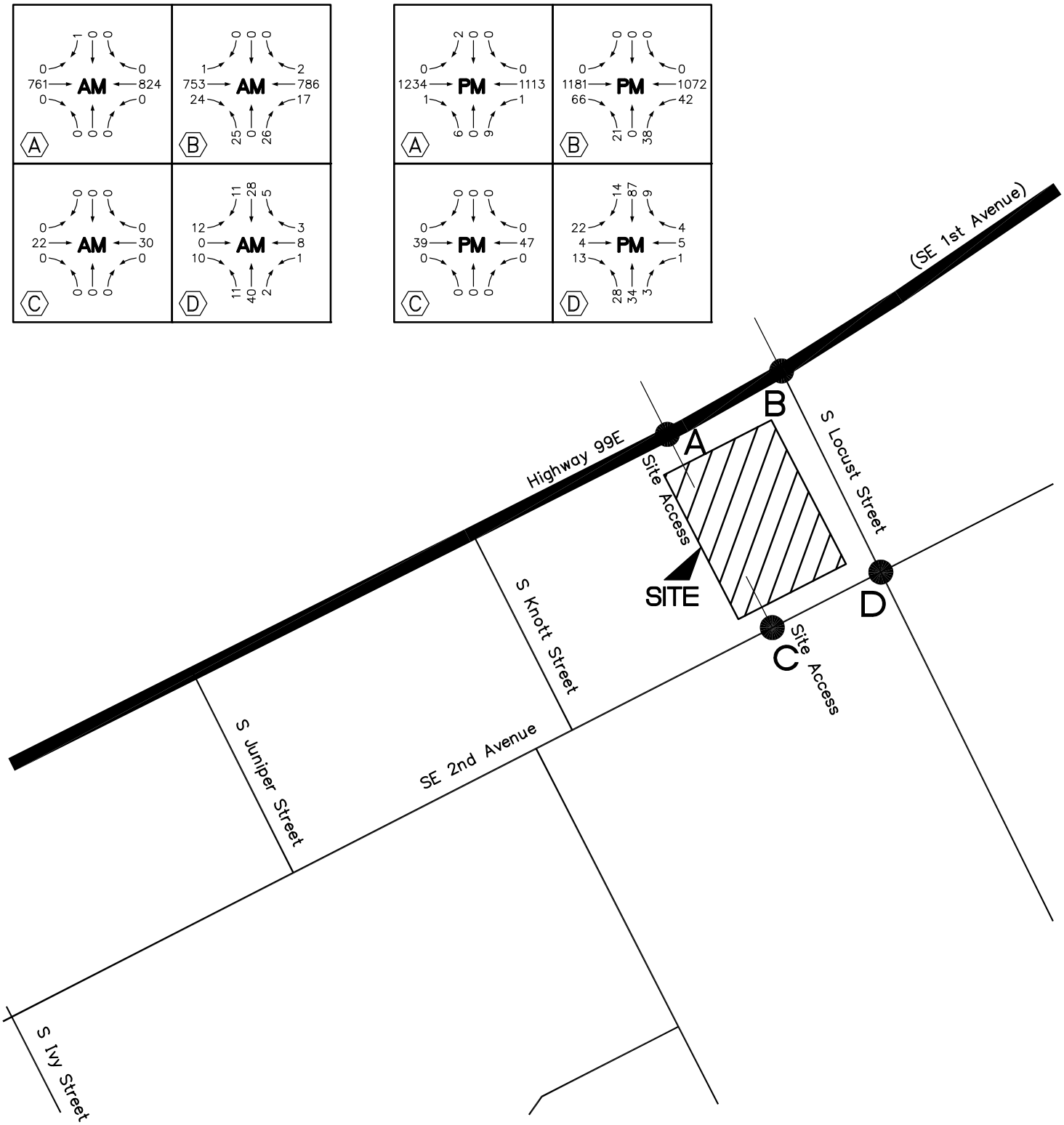
TRAFFIC CONTROLS AND LANE CONFIGURATIONS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 3



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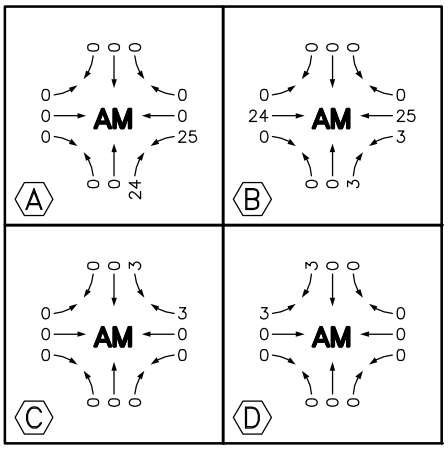
SEASONALLY ADJUSTED TRAFFIC VOLUMES - WEEKDAY PEAK HOURS

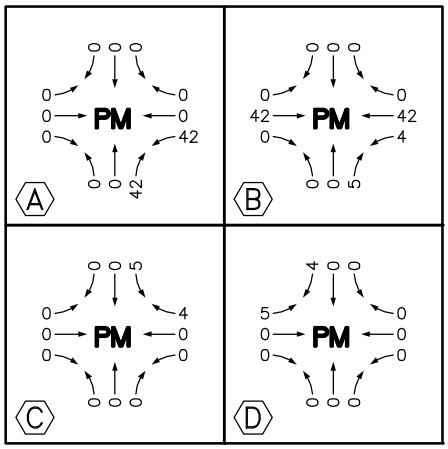
FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 4



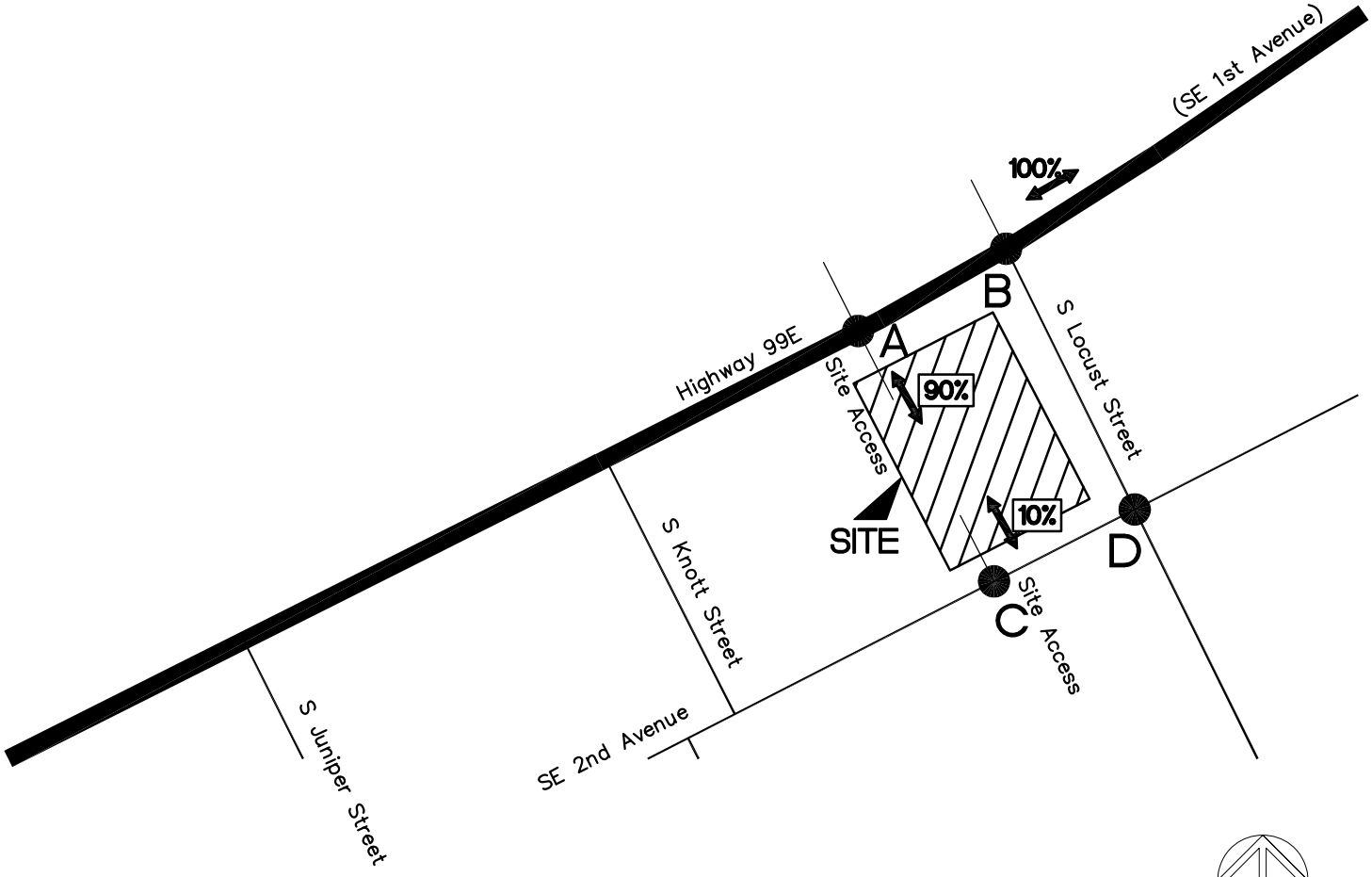
WEEKDAY AM PEAK HOUR
SHARED SITE TRIPS

ENTER = 28
EXIT = 27
TOTAL = 55



WEEKDAY PM PEAK HOUR
SHARED SITE TRIPS

ENTER = 46
EXIT = 47
TOTAL = 93



NOT TO SCALE

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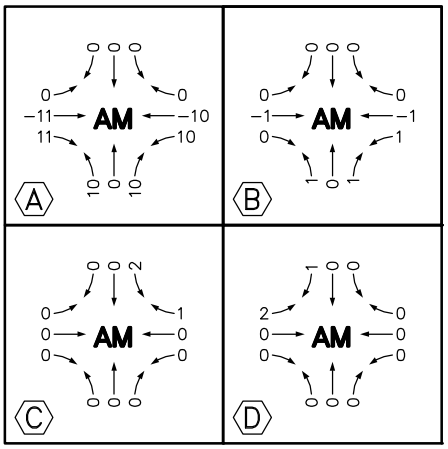
SHARED TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT - WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

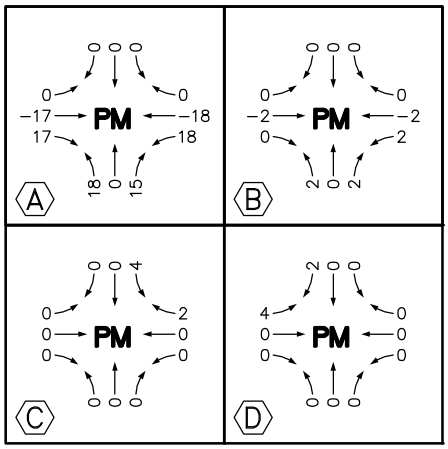
FIGURE 5



WEEKDAY AM PEAK HOUR
PASS-BY SITE TRIPS

ENTER = 22
EXIT = 22

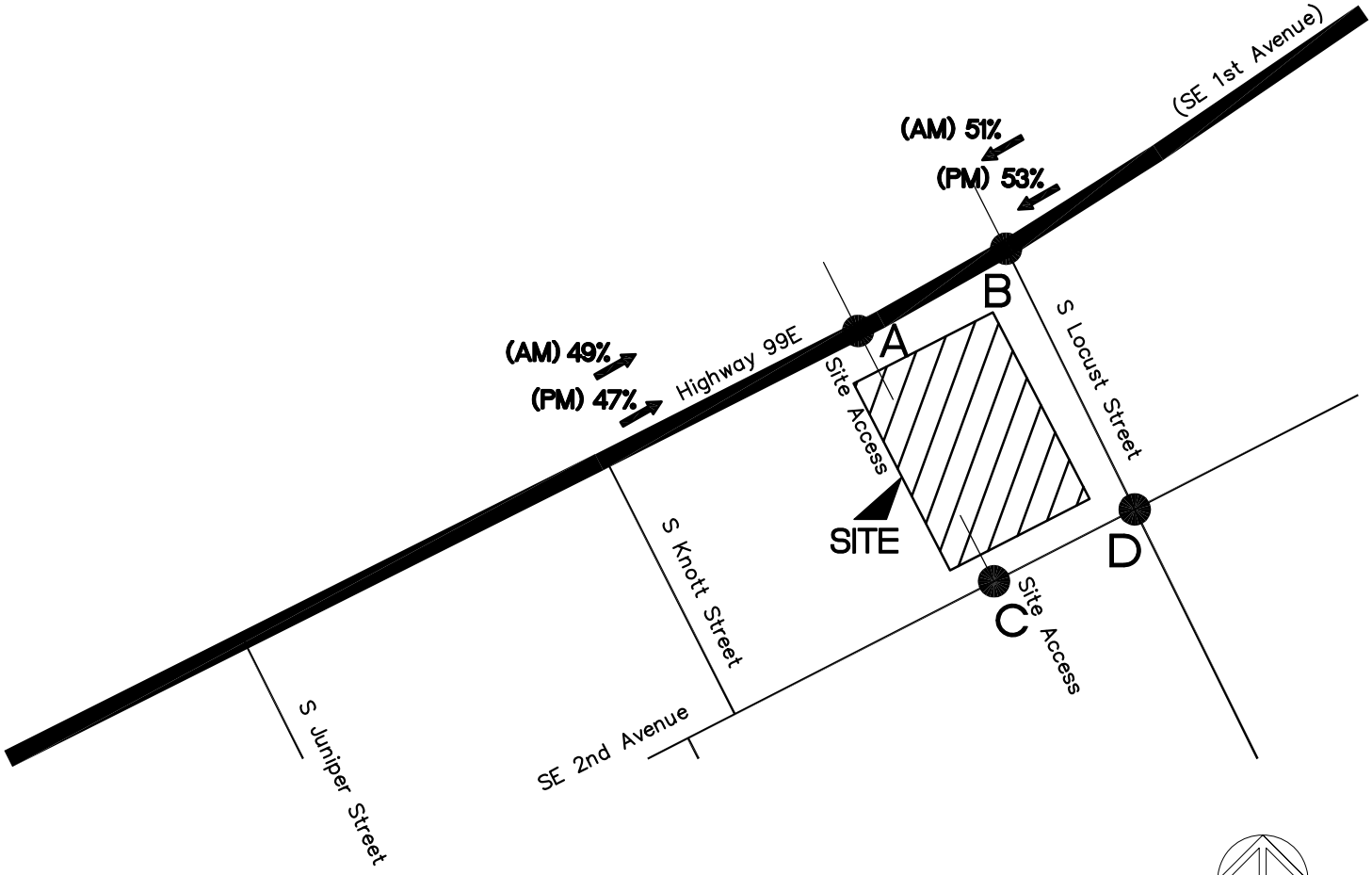
TOTAL = 44



WEEKDAY PM PEAK HOUR
PASS-BY SITE TRIPS

ENTER = 37
EXIT = 37

TOTAL = 74



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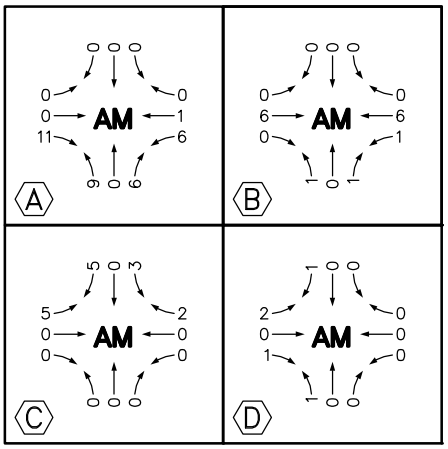
PASS-BY TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT - WEEKDAY PEAK HOURS

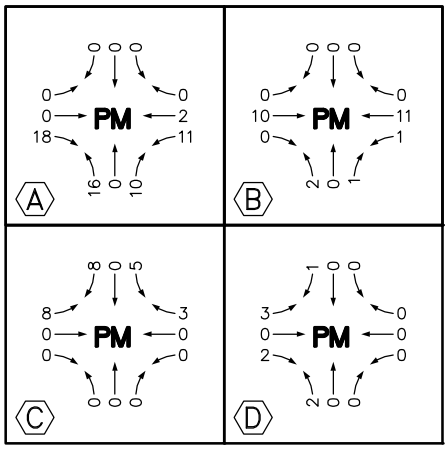
FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 6



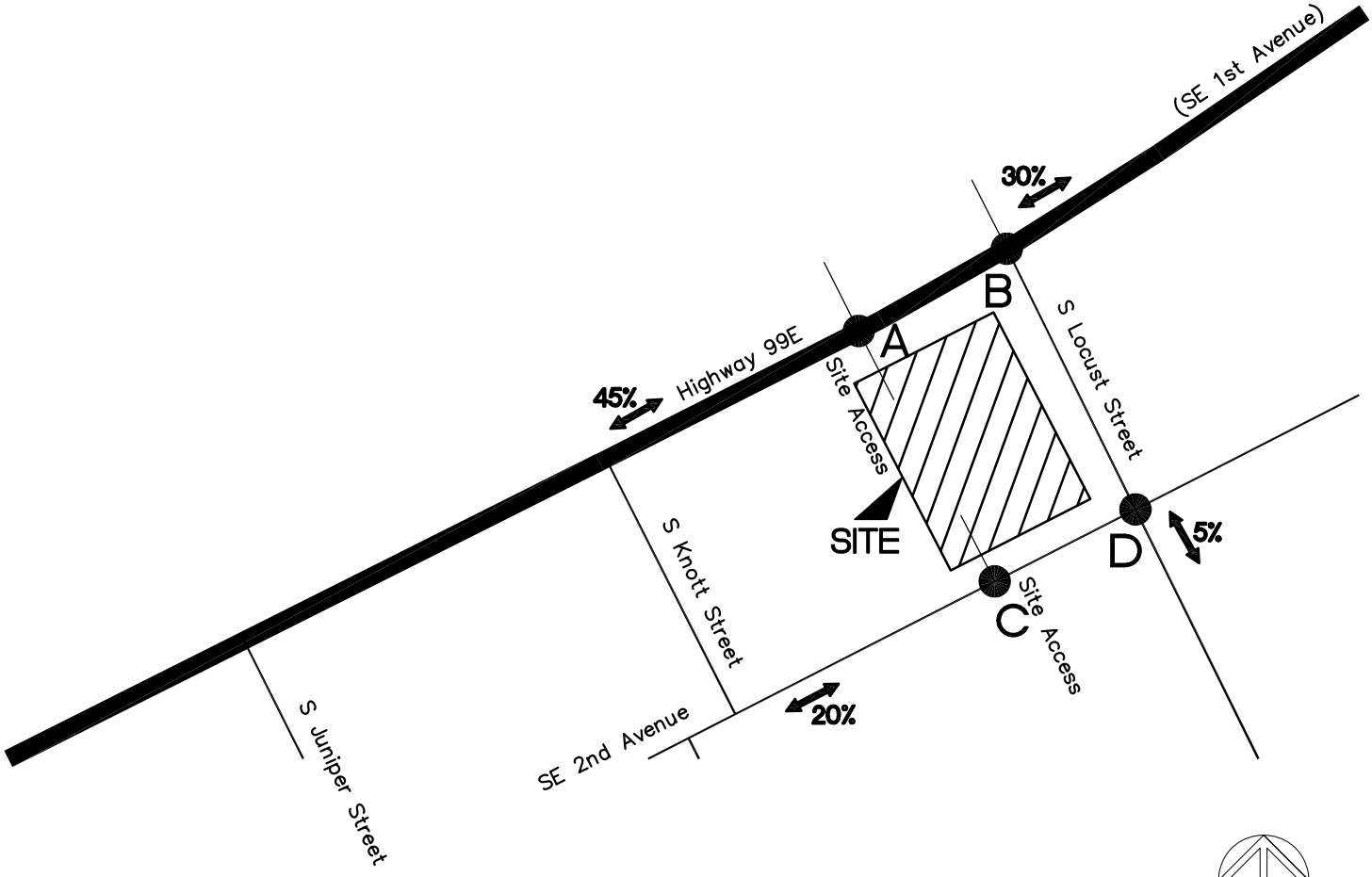
WEEKDAY AM PEAK HOUR
PRIMARY SITE TRIPS

ENTER = 24
EXIT = 23
TOTAL = 47



WEEKDAY PM PEAK HOUR
PRIMARY SITE TRIPS

ENTER = 40
EXIT = 39
TOTAL = 79



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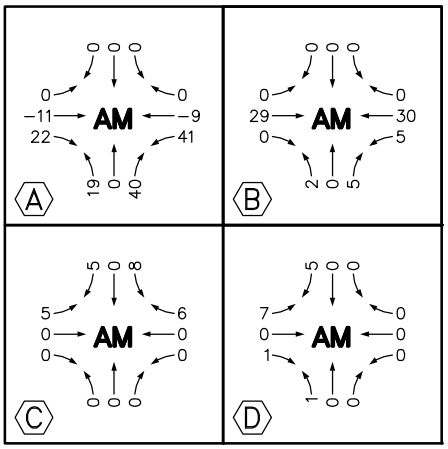
PRIMARY TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT - WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

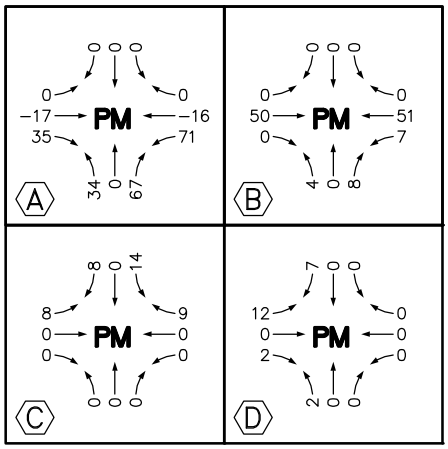
FIGURE 7



WEEKDAY AM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 74
EXIT = 72

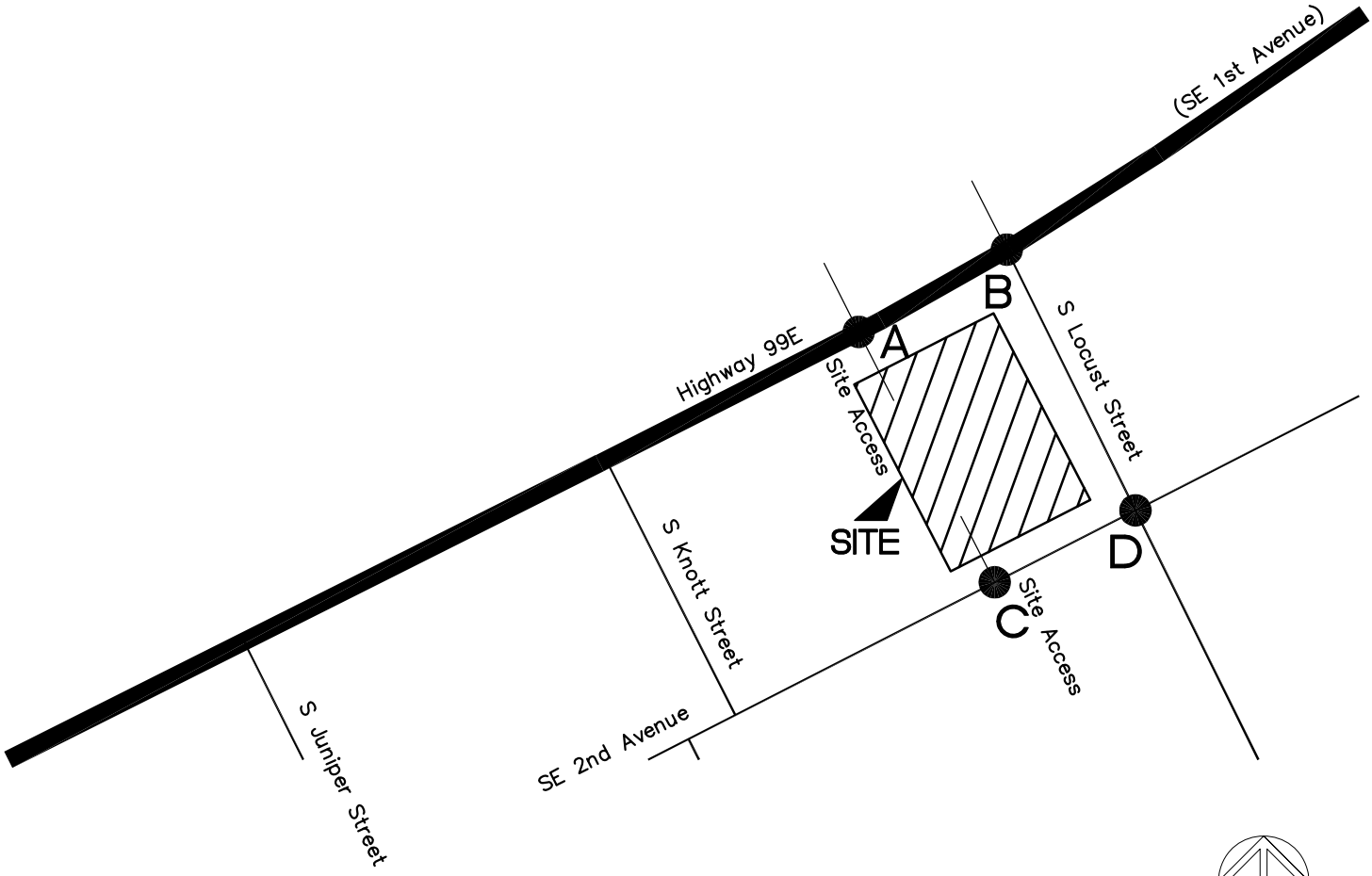
TOTAL = 146



WEEKDAY PM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 123
EXIT = 123

TOTAL = 246



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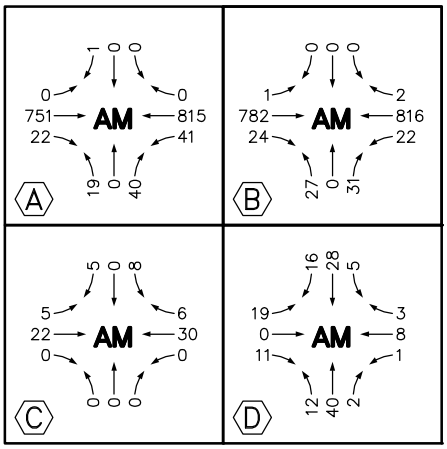
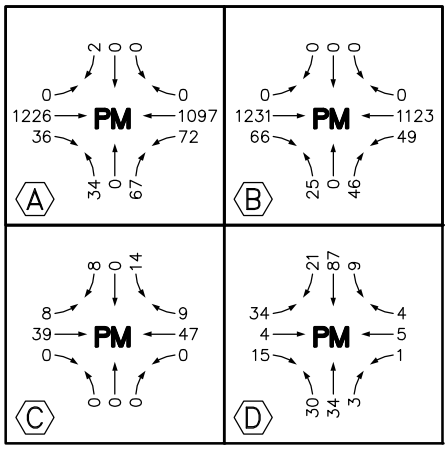
JOB NO: 2120130.00

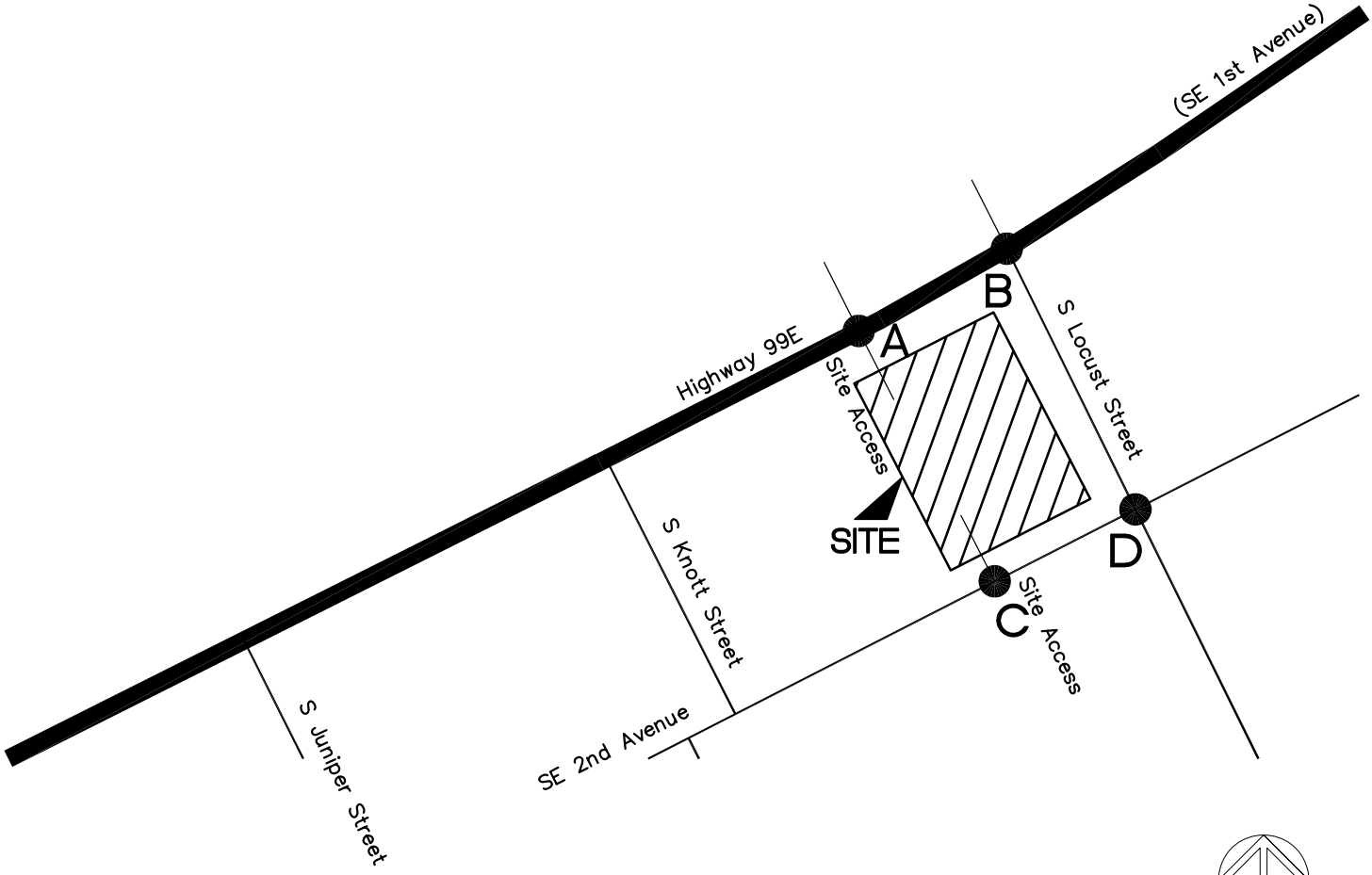
TOTAL SITE TRIP ASSIGNMENT (FULL ACCESS ALTERNATIVE) - WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE
8







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DATE: 05.16.12
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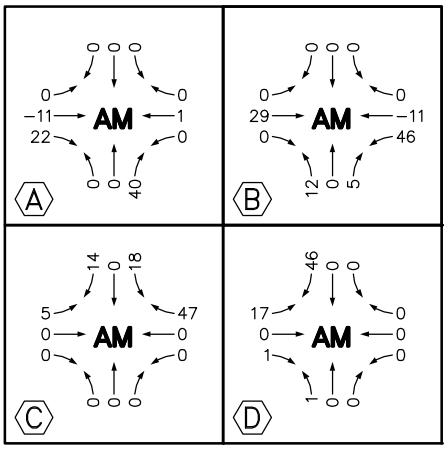
POST-DEVELOPMENT TRAFFIC (FULL ACCESS ALTERNATIVE) - WEEKDAY PEAK HOURS

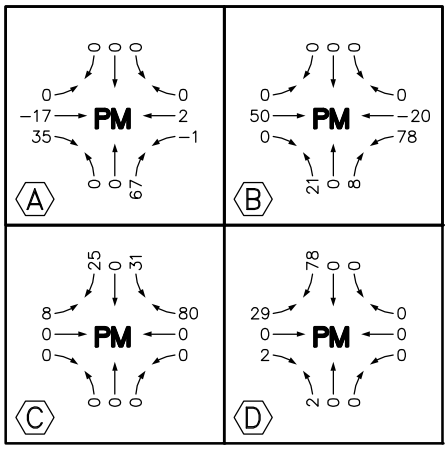
FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE
9



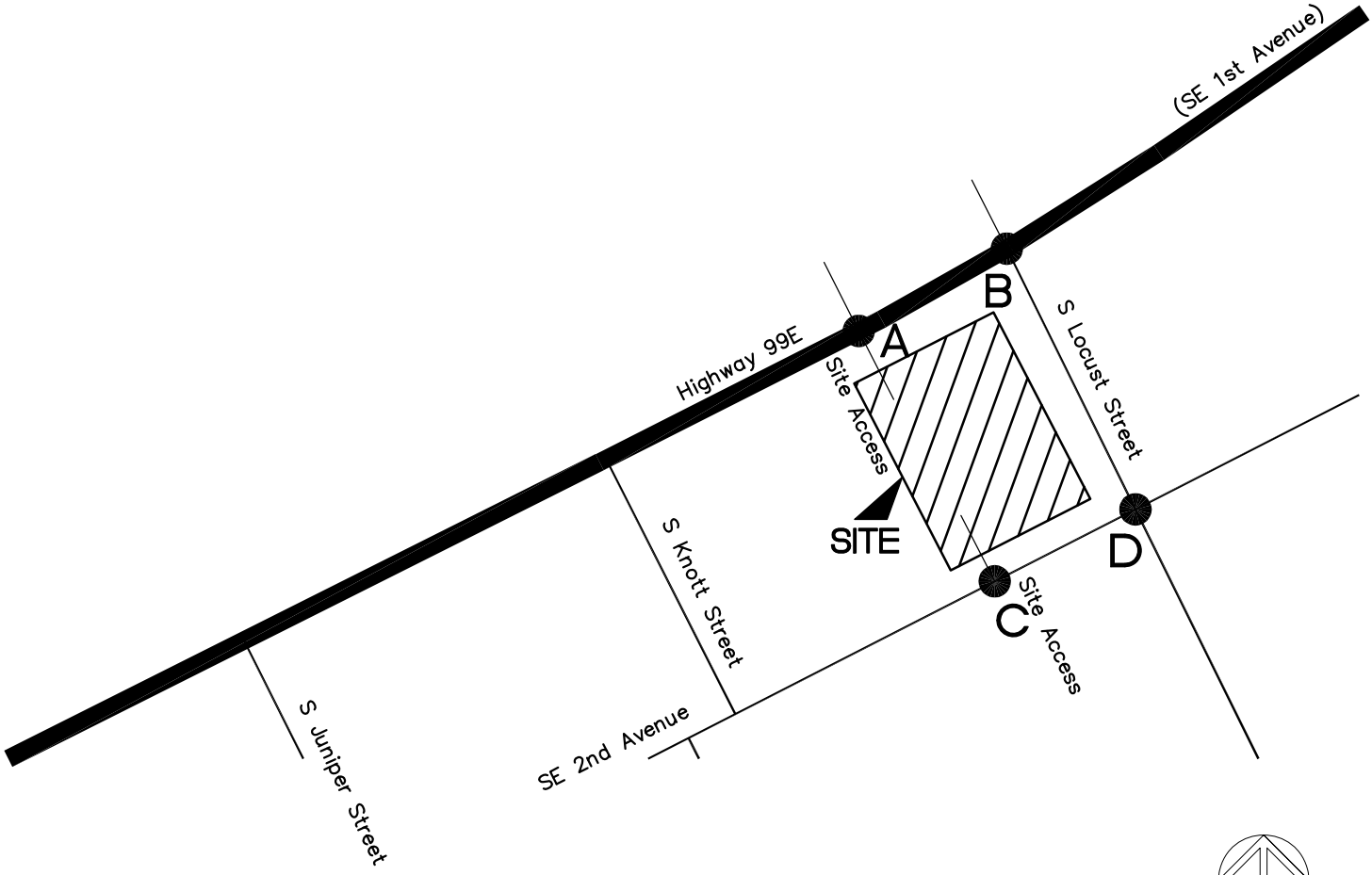
WEEKDAY AM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 74
EXIT = 72
TOTAL = 146



WEEKDAY PM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 123
EXIT = 123
TOTAL = 246



NOT TO SCALE

GROUP MACKENZIE

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Seattle WA 206.749.9993

DATE: 05.16.12
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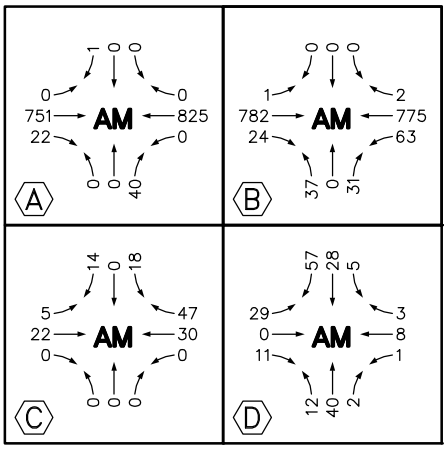
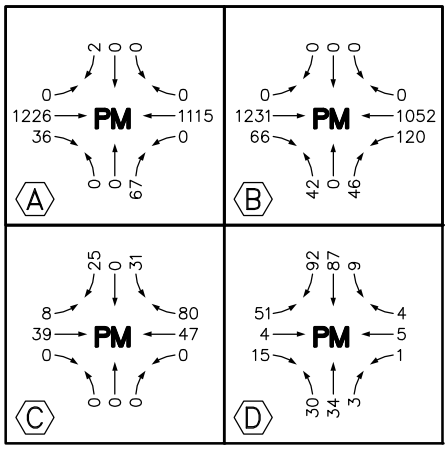
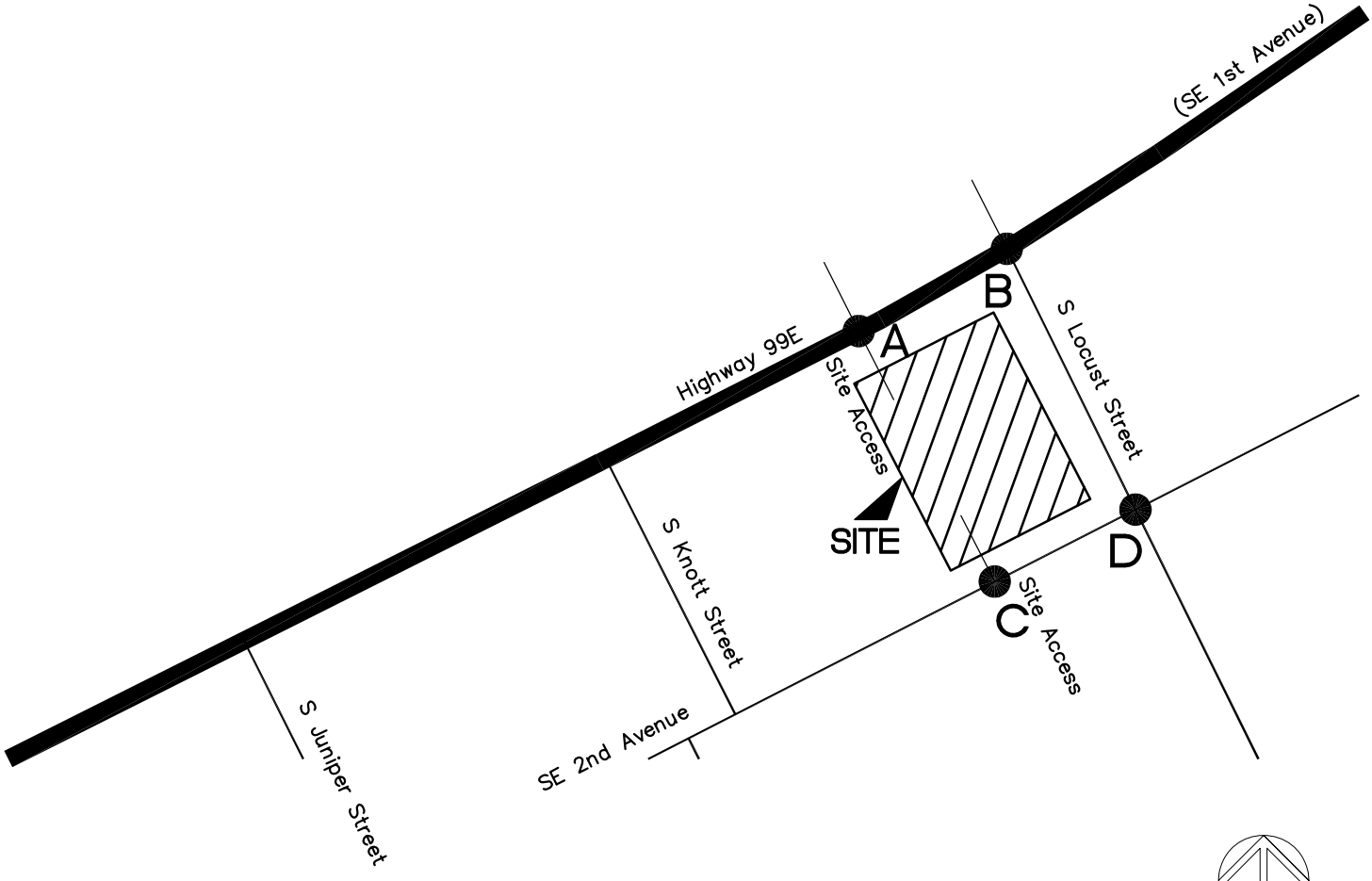
TOTAL SITE TRIP ASSIGNMENT (RIRO ACCESS ALTERNATIVE) - WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE
10







NOT TO SCALE

GROUP MACKENZIE

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DATE: 05.16.12
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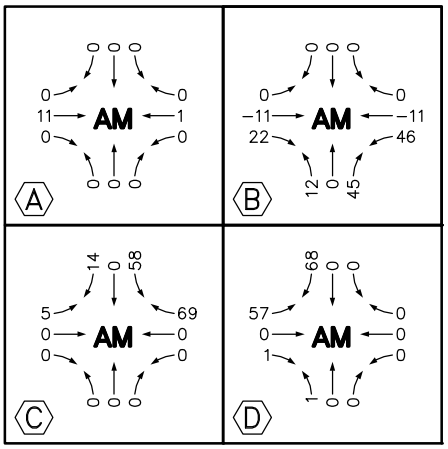
JOB NO: 2120130.00

POST-DEVELOPMENT TRAFFIC (RIRO ACCESS ALTERNATIVE) - WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

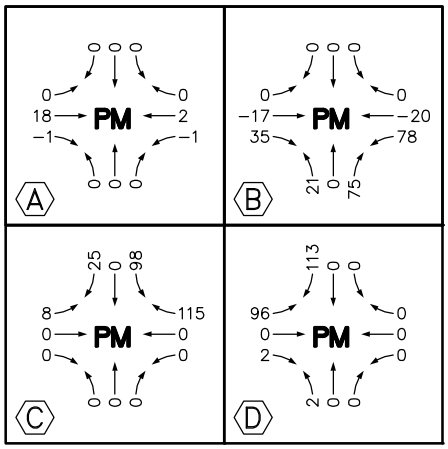
FIGURE 11



WEEKDAY AM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 74
EXIT = 72

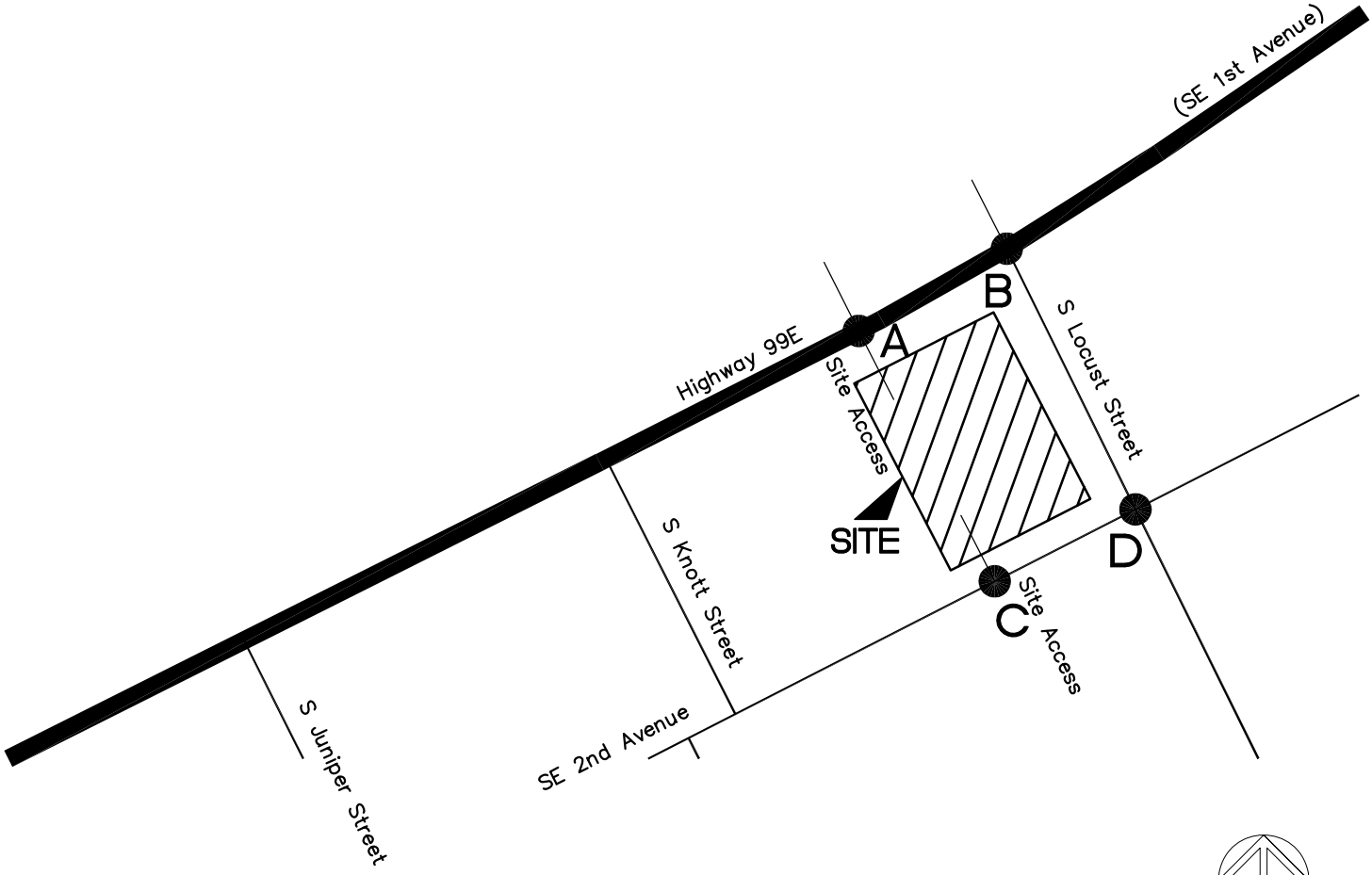
TOTAL = 146



WEEKDAY PM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 123
EXIT = 123

TOTAL = 246



NOT TO SCALE

GROUP MACKENZIE

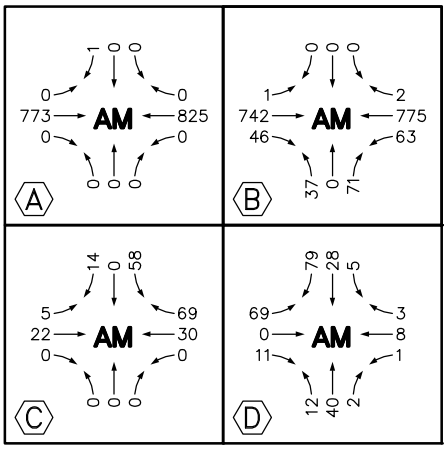
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

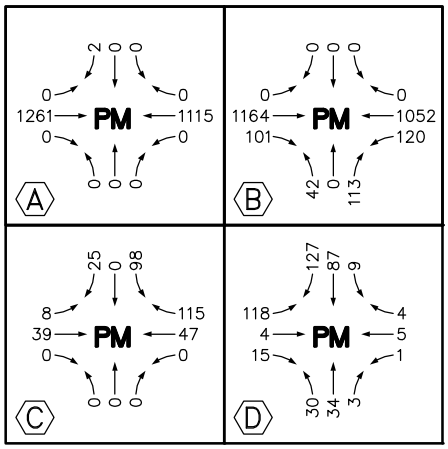
DATE: 05.16.12
DRAWN BY: JRB
CHECKED BY: BTA
JOB NO: 2120130.00

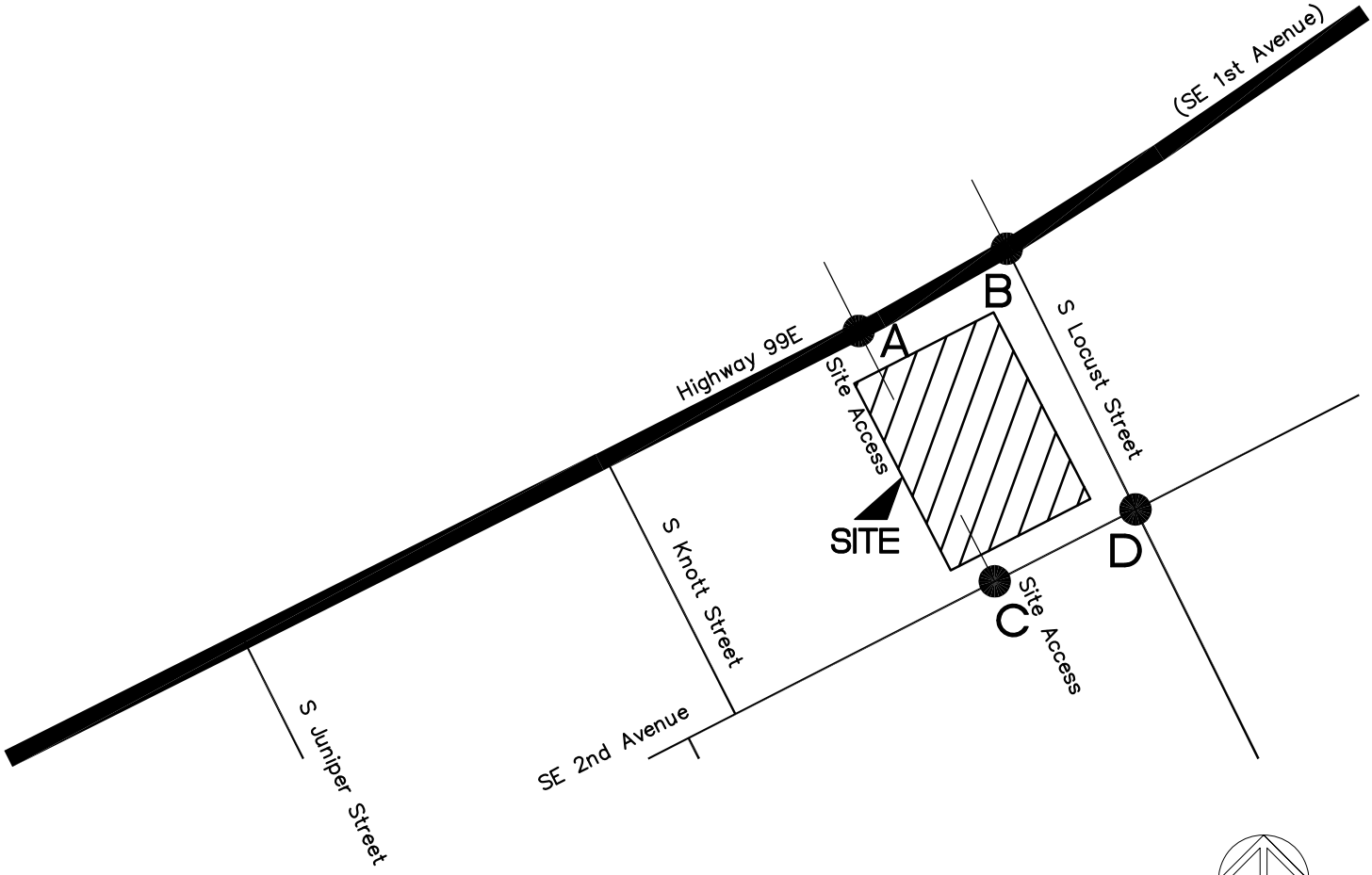
TOTAL SITE TRIP ASSIGNMENT (NO ACCESS ALTERNATIVE) - WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE
12







NOT TO SCALE

GROUP MACKENZIE

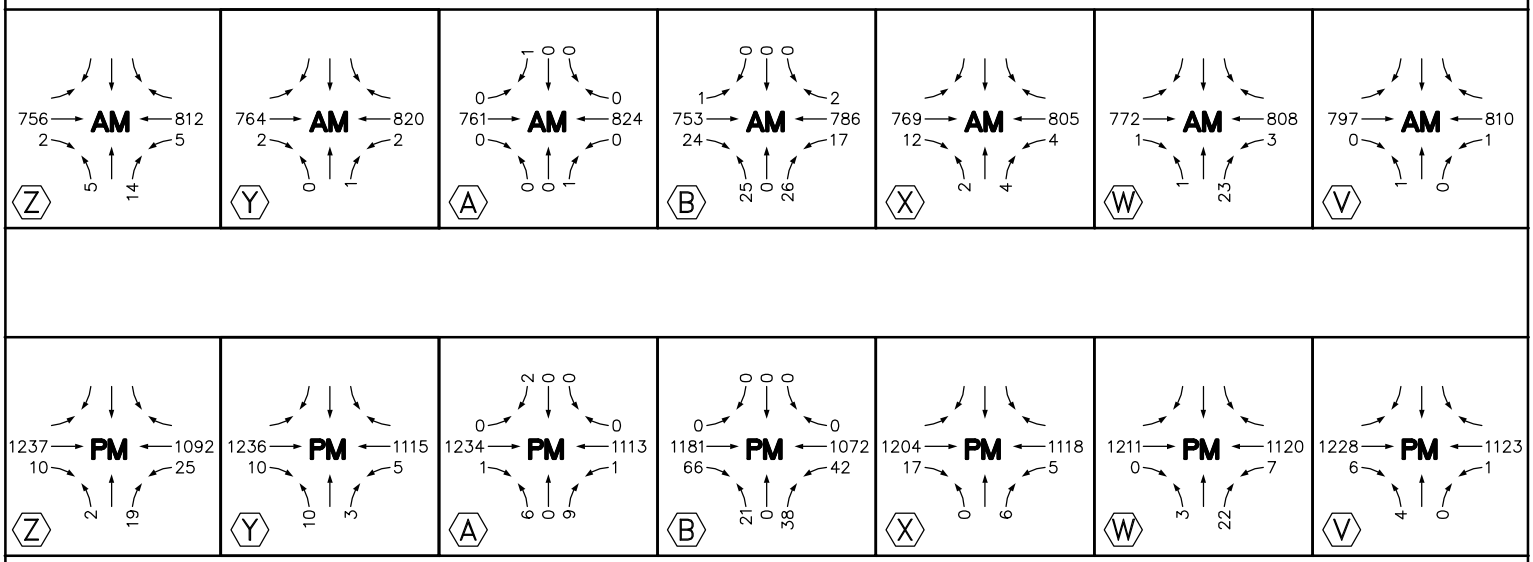
Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 05.16.12
DRAWN BY: JRB
CHECKED BY: BTA
JOB NO: 2120130.00

POST-DEVELOPMENT TRAFFIC (NO ACCESS ALTERNATIVE) - WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 13



NOT TO SCALE

GROUP MACKENZIE

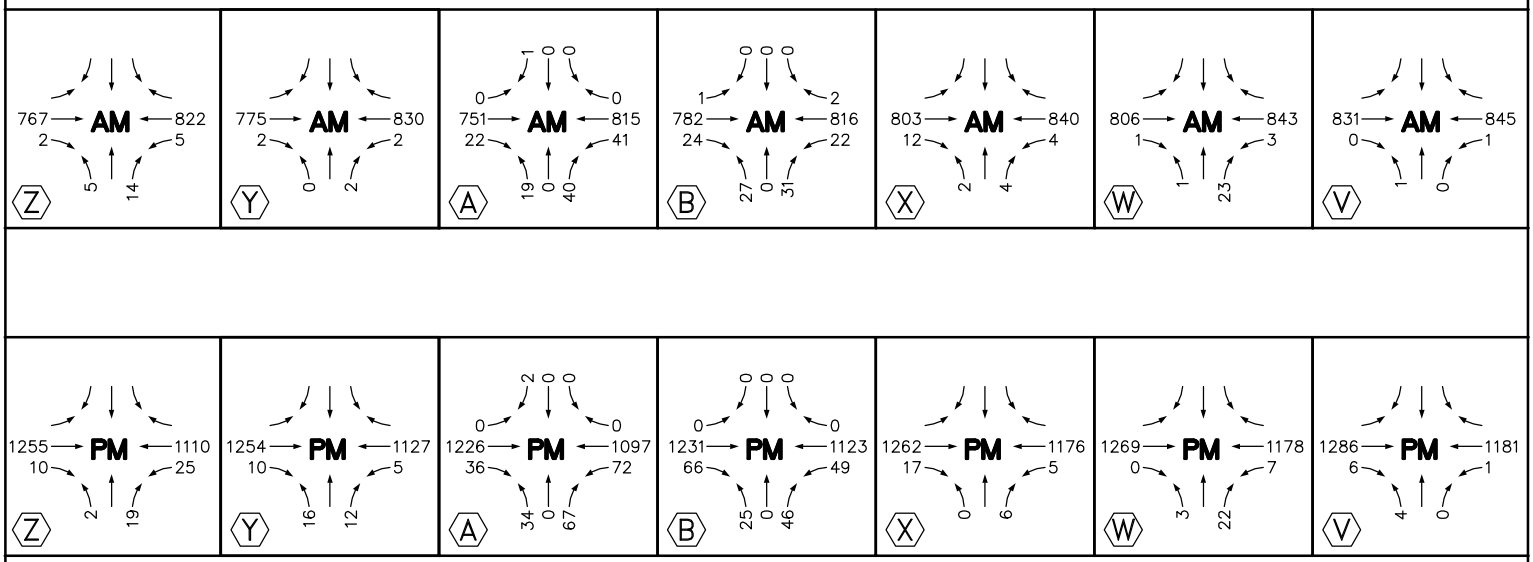
Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 05.16.12
DRAWN BY: JRB
CHECKED BY: BTA
JOB NO: 2120130.00

EXISTING TRAFFIC VOLUMES WITHIN 250 FEET OF SITE

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 14



NOT TO SCALE

GROUP MACKENZIE

Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 05.16.12
DRAWN BY: JRB
CHECKED BY: BTA
JOB NO: 2120130.00

FUTURE TRAFFIC VOLUMES WITHIN 250 FEET OF SITE

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 15

APPENDIX B

Transit Routes and Schedules

Accessibility Features

- Buses are **wheelchair lift** equipped.
- **Priority seating** is available on all buses for senior citizens and people with disabilities.
- Controlled **service animals** are permitted on buses (on a leash or in a pet container) .
- Buses are equipped with **bike racks**.
- **Complementary Paratransit service is** provided to qualified individuals who are unable to use shuttles or fixed route buses. Call 503.266.4022 for more information.

Holidays

CAT does not operate on the following holidays:

- New Years Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas

Title VI Non Discrimination Policy

Canby Area Transit (CAT) operates equal opportunity programs without regard to race, color, national origin, religion, age, marital status, sexual orientation, or disability in accordance with Title VI of the Civil Rights Act, ORS Chapter 659A or other applicable law.

Canby Area Transit
PO BOX 930
123 NW 2nd Ave
Canby, OR 97013
503.266.4022
Oregon Relay Service 800-735-2900
email: cat@ci.canby.or.us
website: **www.canbyareatransit.org**

CAT is supported by Canby Area Businesses

Alternative formats available upon request.

CAT
CANBY AREA TRANSIT

Starting June 27, 2011

Neighborhood Shuttles & Dial-A-Ride

services for the general public

Effective 6-27-11

Dial-A-Ride

On **June 27, 2011**, Canby Area Transit will implement a new Dial-A-Ride service for the general public. Anyone traveling to or from destinations within the Canby Urban Growth Boundary is eligible for this service. The service operates from 6:00 am—8:00 pm Monday through Friday. Reservations are accepted between 8:00 am and 5:00 pm.

How do I get a ride?

- Register by calling us and answering a few questions. Registration only happens one time. After that just let us know if you change your name, address, or phone number.
- Call for a ride reservation at least 24 hours before you need the ride.
- Tell us where you are going and what time you need to be there.

It's that easy! We will pick you up and take you anywhere you need to go in Canby.

Reservations

Reservations may be scheduled as early as 14 days in advance or up to 24 hours prior to the trip.

Reservations may be placed by calling the dispatcher/ scheduler during office hours (Monday through Friday, 8:00am to 5:00pm) or on weekends and holidays by leaving a message on the office answering system. Please call with complete trip information (dates, times, addresses) and a phone number for trip confirmation.

Pick-up time may be negotiated and scheduled within an hour of the requested time.

It is best to pre-schedule return trips with a specific pick-up time. When this is not possible, the return trip is scheduled as a "call back". When you are ready for your return pick-up, please call Dispatch. At that time an estimated pick-up time will be given based on driver/vehicle availability. Although we will do our best to get to you promptly, during busy times it may take up to 60-minutes for a "call back" ride.

To cancel a Dial-A-Ride reservation please call the office as soon as possible. A trip reservation cancelled with less than one (1) hour notice prior to pick-up time may be considered a no-show.

When a rider is late by more than five (5) minutes past the scheduled pick-up time the trip will be considered a no-show

A pattern of no-shows could result in a suspension of ridership privileges. Suspended riders will be notified in writing.

Trip Planning

Please plan trips with these points in mind:

- CAT may arrive 10 minutes before or after the scheduled pick-up time.
- Depending on route/passenger needs, CAT may send a bus or mini-van for your pick-up. If possible, make allowances for bus access to the pick-up and delivery addresses.

CAT vehicles are wheelchair accessible. Drivers are trained to assist persons with disabilities in boarding and de-boarding.

Carry-on items such as groceries must be limited to what you can carry. Packages may not block the aisle. No hazardous materials are allowed on the vehicles.

All items found on vehicles will be donated to charity if not claimed within 30 days.

Severe weather may result in a suspension of service.

Children under the age of 5 must be accompanied by a person over the age of 16. Children aged 5-8 may travel alone if adult supervision is arranged at the pick-up and drop-off points. Children aged 9 and older may travel alone.

All General Public Dial-A-Ride reservations are made on a space available basis. So make your reservation early.

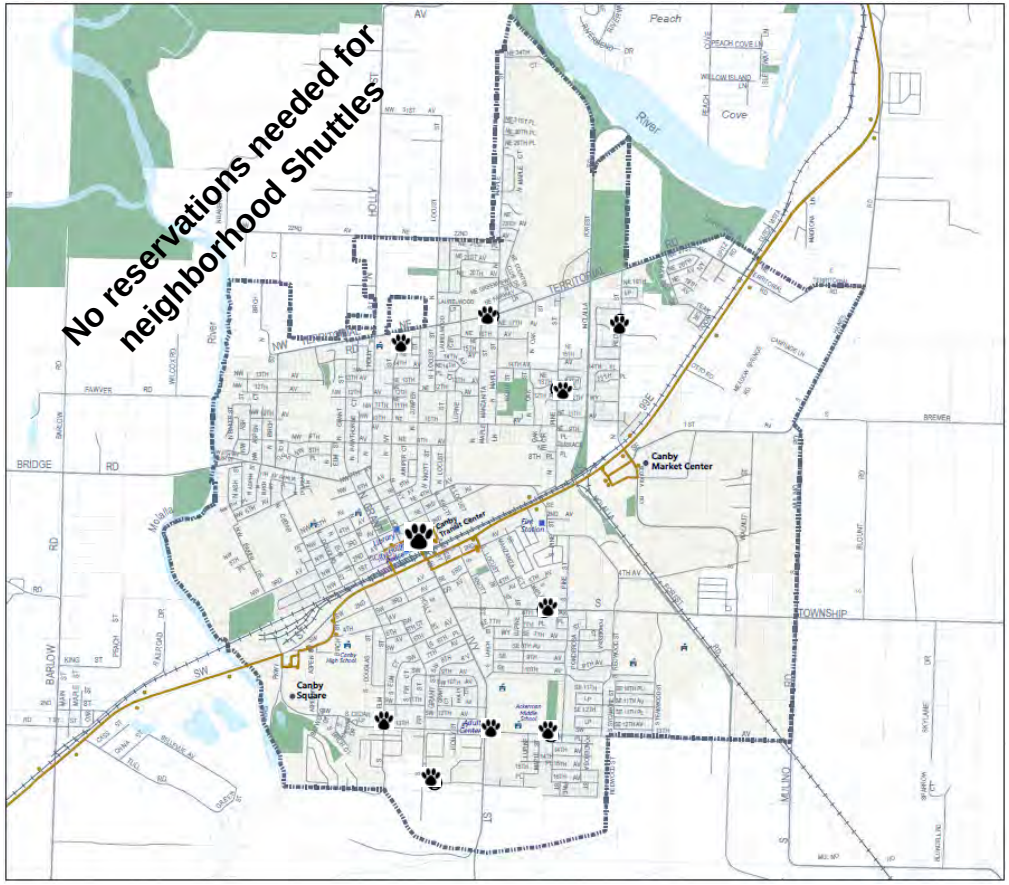
Neighborhood Shuttle Schedule

Shuttle Stops

Shuttle Stops - North Canby				
NE 18th Place & N Redwood St		7:24	11:39	**2:24**
NE 13th Ave & N Pine St		7:28	11:43	**2:28**
NE Territorial & N Maple St		7:32	11:47	**2:32**
N Ivy & NW Territorial Road		7:35	11:50	**2:35**
Arrive at Canby Transit Center		7:40	11:55	**2:40**
Shuttle Stops - South Canby				
SW 13th Ave & S Elm St		6:55	11:10	**1:55**
Hope Village (near Cascade House)		6:58	11:13	**1:58**
Canby Adult Center (SE 13th Ave & S Ivy St)		7:02	11:17	**2:02**
SE 13th Ave & S Pine		7:05	11:20	**2:05**
S Township Rd & S Maple		7:09	11:24	**2:09**
Arrive at Canby Transit Center		7:14	11:29	**2:14**
Return Shuttles from Canby Transit Center:	7:45	**12:00**	**2:45**	**5:00**

AM in regular print

PM in bold print



How to read the schedule

- Find the Shuttle stop where you will board the bus.
- Read top to bottom to find your stop.
- Shuttles times provided are approximate. Expect the Shuttle to arrive as much as 5 minutes before or after the time on the schedule.
- Schedules are subject to change without notice. For the most current schedule check the CAT website www.canbyareatransit.org.

Rider Tips

- Arrive at the Shuttle stop early! Posted Shuttle times are approximate (+ or - 5 minutes).
- Shuttle riders may only travel between Shuttle stops and the Canby Transit Center.
- No reservation is required for Shuttle rides.
- For destinations other than the Canby Transit Center please schedule a Dial-A-Ride trip.
- Give priority seating to seniors and people with disabilities.

CAT
CANBY AREA TRANSIT

503.266.4022

www.canbyareatransit.org

Effective June 27, 2011

Updated June 15, 2011

Everyone rides for free | ***Catch a CAT*** | CAT is fareless | ***CAT is supported by Canby Area Businesses*** | everyone rides for free | ***Catch a CAT*** | CAT is fareless

Service Changes:

A Shuttle Service between Canby Transit Center and a limited number of neighborhood stops will be implemented on June 27, 2011.

CAT's Blue and Green Lines and CAT's portion of the Purple Line will be replaced by a General Public Dial-A-Ride service effective June 27, 2011.

Check our website or call 503.266.4022 for more details.

Orange Line - to Canby or Woodburn

Southbound on 99E

	Oregon City TC	Main Street	Canby Market Center	Fred Meyer	SE 2nd & S Locust	Canby Transit Center	Thriftway	Canby Square	Safeway	Aurora	99E & Liberty	Hubbard	99E & D Street	Woodburn	Bi-Mart
														arrive	depart
	5:35		5:51		5:55	6:00		6:05		6:10		6:17		6:26	6:28
	6:15		6:31		6:35	6:40		6:45							
	6:50		7:06		7:10	7:15		7:20							
	7:20		7:36		7:40	7:45		7:50							
	8:20		8:36		8:40	8:45		8:50		8:55		9:02		9:11	9:15
	8:50		9:06		9:10	9:15		9:20							
	10:20		10:36		10:40	10:45		10:50							
	10:35		10:51		10:55	11:00		11:05		11:10		11:17		11:26	11:28
	12:35		**12:51**		**12:55**	**1:00**		**1:05**							
	1:20		**1:36**		**1:40**	**1:45**		**1:50**		**1:55**		**2:02**		**2:11**	**2:15**
	3:20		**3:36**		**3:40**	**3:45**		**3:50**							
	3:35		**3:51**		**3:55**	**4:00**		**4:05**		**4:10**		**4:17**		**4:26**	**4:28**
X	**4:15**		-		-	**4:33**		**4:38**							
	4:50		**5:06**		**5:10**	**5:15**		**5:20**							
X	**5:35**		-		-	**5:53**		**5:58**							
	6:05		**6:21**		**6:25**	**6:30**		**6:35**		**6:40**		**6:47**		**6:56**	**7:00**
	6:50		**7:06**		**7:10**	**7:15**		**7:20**							
	8:00		**8:21**		**8:25**	**8:30**									

Orange Line - to Canby or Oregon City

Northbound on 99E

	Hubbard	99E & D Street	Aurora	99E & Liberty	Canby Square	Safeway	Canby Transit Center	Thriftway	SE 2nd & S Locust	Canby Market Center	Fred Meyer	Oregon City TC	Main Street	
							5:15		-	-		5:33		X
							5:55		-	-		6:13		X
							6:30		-	-		6:48		X
	6:36		6:45		6:51		7:00		-	-		7:18		X
					7:25		7:45		7:55	7:59		8:15		
					7:53		8:15		8:25	8:29		8:45		
	9:25		9:34		9:39		9:45		9:55	9:59		10:15		
					9:22		10:00		10:10	10:14		10:30		
	11:38		11:47		11:52		**12:00**		**12:10**	**12:14**		**12:30**		
							12:45		**12:55**	**12:59**		**1:15**		
	2:25		**2:34**		**2:39**		**2:45**		**2:55**	**2:59**		**3:15**		
							3:00		**3:10**	**3:14**		**3:30**		
							3:40		**3:50**	**3:54**		**4:10**		
					3:53		**4:15**		**4:25**	**4:29**		**4:45**		
	4:38		**4:47**		**4:52**		**5:00**		**5:10**	**5:14**		**5:30**		
							5:30		**5:40**	**5:44**		**6:00**		
					5:24		**6:15**		**6:25**	**6:29**		**6:45**		
	7:10		**7:19**		**7:23**		**7:30**		**7:40**	**7:44**		**8:00**		
					7:25		**7:30**							

Service available Monday - Friday

X = Express no stop at SE 2nd & Locust or Canby Market Center
— = no service
AM in regular print
PM in bold print

How to read this schedule

- Find the stop where you will board the bus.
- Read top to bottom to find scheduled arrival times at the listed stops.
- Read from left to right to find how long it takes to travel between stops.
- Schedules are subject to change without notice. For the most current schedule check the CAT website www.canbyareatransit.org.

Effective June 27, 2011
Updated October 11, 2011

Everyone rides for free | ***Catch a CAT*** | CAT is fareless | ***CAT is supported by Canby Area Businesses*** | everyone rides for free | ***Catch a CAT*** | CAT is fareless

Accessibility Features

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- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas

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Canby Area Transit
PO BOX 930
123 NW 2nd Ave
Canby, OR 97013
503.266.4022
Oregon Relay Service 800-735-2900
email: cat@ci.canby.or.us
website: **www.canbyareatransit.org**

CAT is supported by Canby Area Businesses

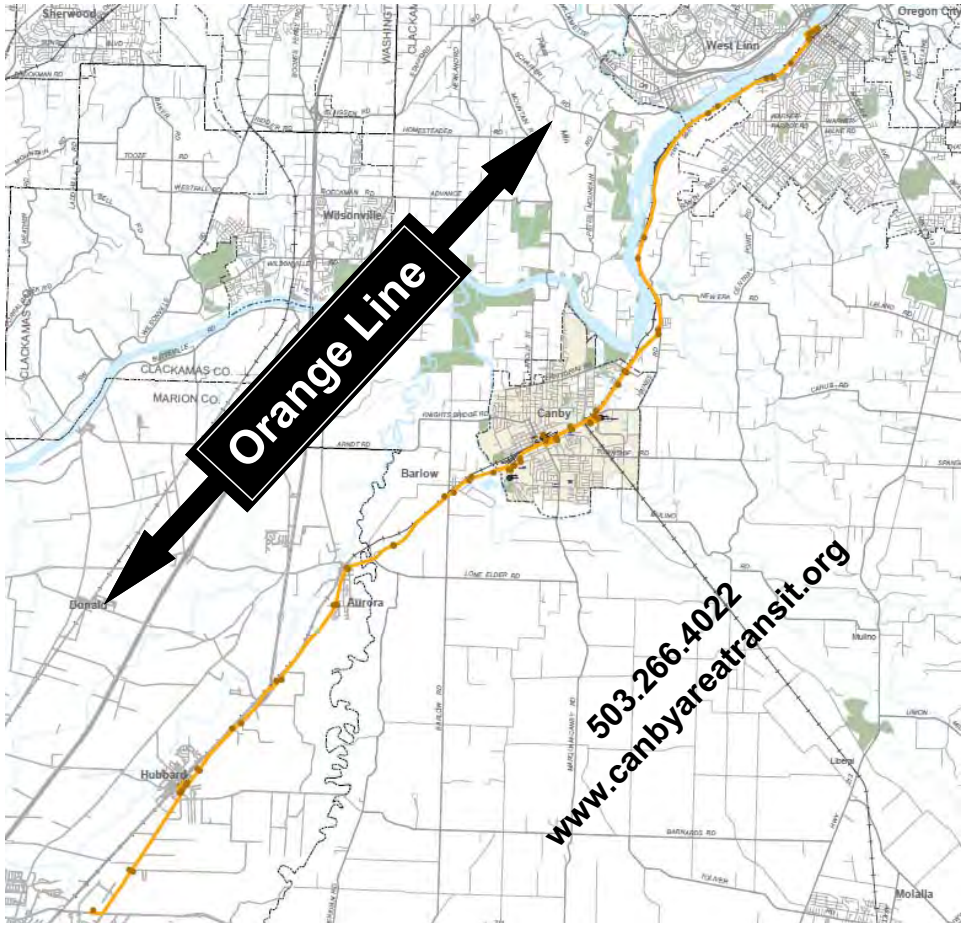
Alternative formats available upon request.

Orange Line

CAT
CANBY AREA TRANSIT

- **Oregon City**
- **Canby**
- **Aurora**
- **Hubbard**
- **Woodburn**

Effective 10-17-11



Rider Tips

- Check bus route times and stop locations (see schedule inside).
- Arrive at the bus stop at least 5 minutes early.
- If needed, ask the driver for assistance.
- Press the bell bar or pull the cord to signal the driver about a block before the bus stop.
- Give priority seating to seniors and people with disabilities.

APPENDIX C

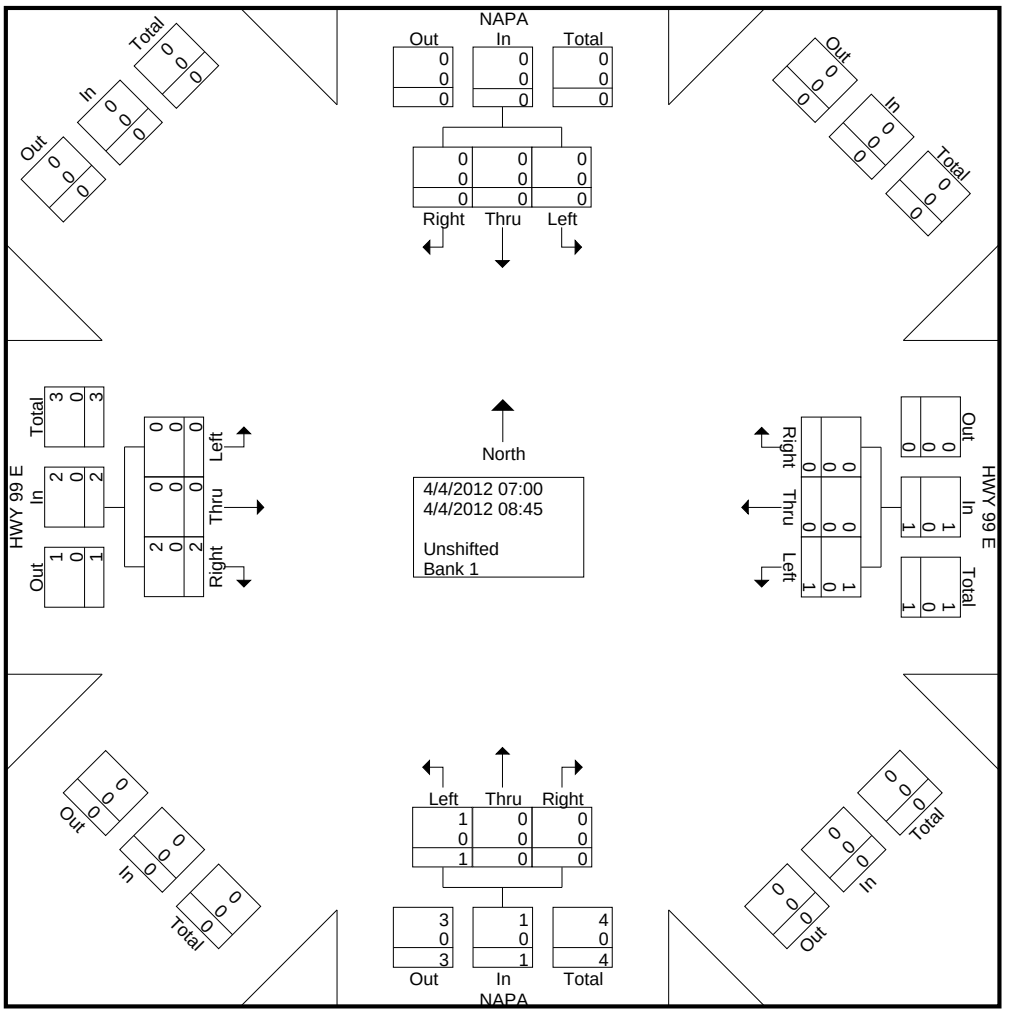
Traffic Count Summaries (System Peak Hours)

All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : Napa&Hwy99 AM
Site Code :
Start Date : 4/4/2012
Page No : 1

Groups Printed- Unshifted - Bank 1

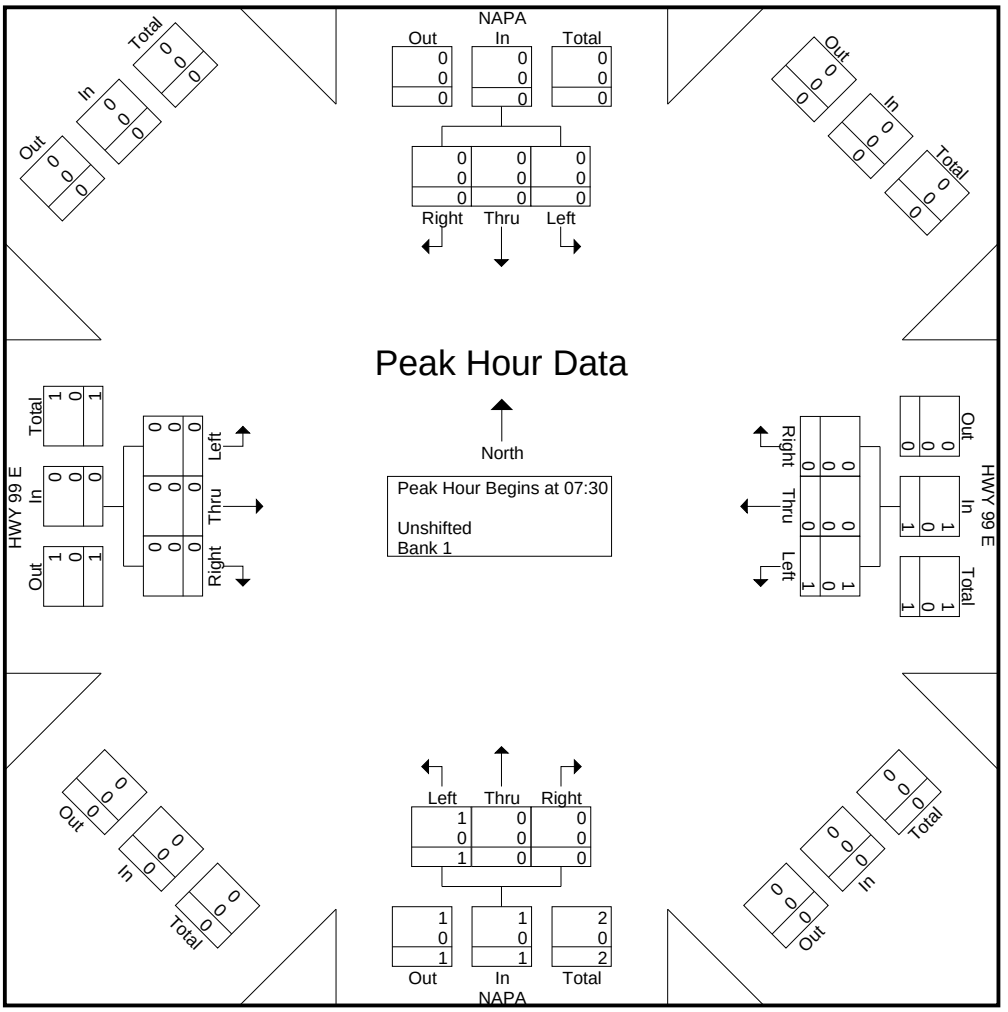
	NAPA Southbound					HWY 99 E Westbound					NAPA Northbound					HWY 99 E Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	1	2
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	1	2
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1
08:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	2	1	2	3
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	2	0	2	2	3	5
Grand Total	0	0	0	0	0	1	0	0	0	1	1	0	0	3	1	0	0	2	0	2	3	4	7
Apprch %	0	0	0			100	0	0			100	0	0			0	0	100					
Total %	0	0	0		0	25	0	0		25	25	0	0		25	0	0	50		50	42.9	57.1	
Unshifted	0	0	0		0	1	0	0		1	1	0	0		4	0	0	2		2	0	0	7
% Unshifted	0	0	0	0	0	100	0	0	0	100	100	0	0	100	100	0	0	100	0	100	0	0	100
Bank 1	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	0	0



All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : Napa&Hwy99 AM
Site Code :
Start Date : 4/4/2012
Page No : 2

	NAPA Southbound				HWY 99 E Westbound				NAPA Northbound				HWY 99 E Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 to 08:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	0	0	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	**1**
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	1	0	0	1	1	0	0	1	0	0	0	0	2
% App. Total	0	0	0		100	0	0		100	0	0		0	0	0		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.250	.000	.000	.250	.000	.000	.000	.000	.500
Unshifted	0	0	0	0	1	0	0	1	1	0	0	1	0	0	0	0	2
% Unshifted	0	0	0	0	100	0	0	100	100	0	0	100	0	0	0	0	100
Bank 1	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

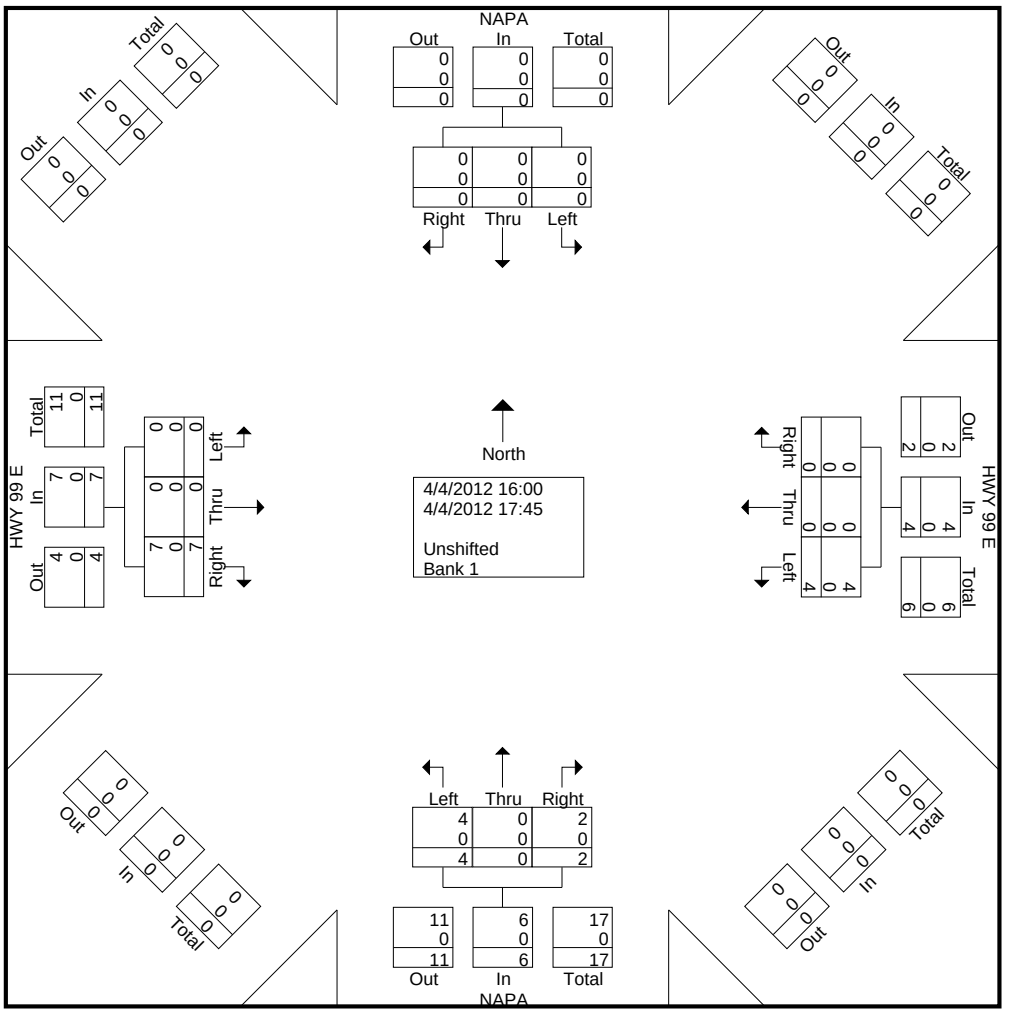


All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : Napa&Hwy99 PM
Site Code :
Start Date : 4/4/2012
Page No : 1

Groups Printed- Unshifted - Bank 1

	NAPA Southbound					HWY 99 E Westbound					NAPA Northbound					HWY 99 E Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:00	0	0	0	0	0	1	0	0	0	1	0	0	1	1	1	0	0	1	0	1	1	3	4
16:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
16:30	0	0	0	0	0	1	0	0	0	1	0	0	0	3	0	0	0	0	0	0	3	1	4
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	2
Total	0	0	0	0	0	3	0	0	0	3	0	0	1	6	1	0	0	1	0	1	6	5	11
17:00	0	0	0	0	0	1	0	0	0	1	2	0	0	0	2	0	0	3	0	3	0	6	6
17:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	2	2
17:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2	0	2	0	3	3
17:45	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	1	2
Total	0	0	0	0	0	1	0	0	0	1	4	0	1	1	5	0	0	6	0	6	1	12	13
Grand Total	0	0	0	0	0	4	0	0	0	4	4	0	2	7	6	0	0	7	0	7	7	17	24
Apprch %	0	0	0			100	0	0			66.7	0	33.3			0	0	100					
Total %	0	0	0		0	23.5	0	0		23.5	23.5	0	11.8		35.3	0	0	41.2		41.2	29.2	70.8	
Unshifted	0	0	0		0	4	0	0		4	4	0	2		13	0	0	7		7	0	0	24
% Unshifted	0	0	0	0	0	100	0	0	0	100	100	0	100	100	100	0	0	100	0	100	0	0	100
Bank 1	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	0	0



All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : Napa&Hwy99 PM
Site Code :
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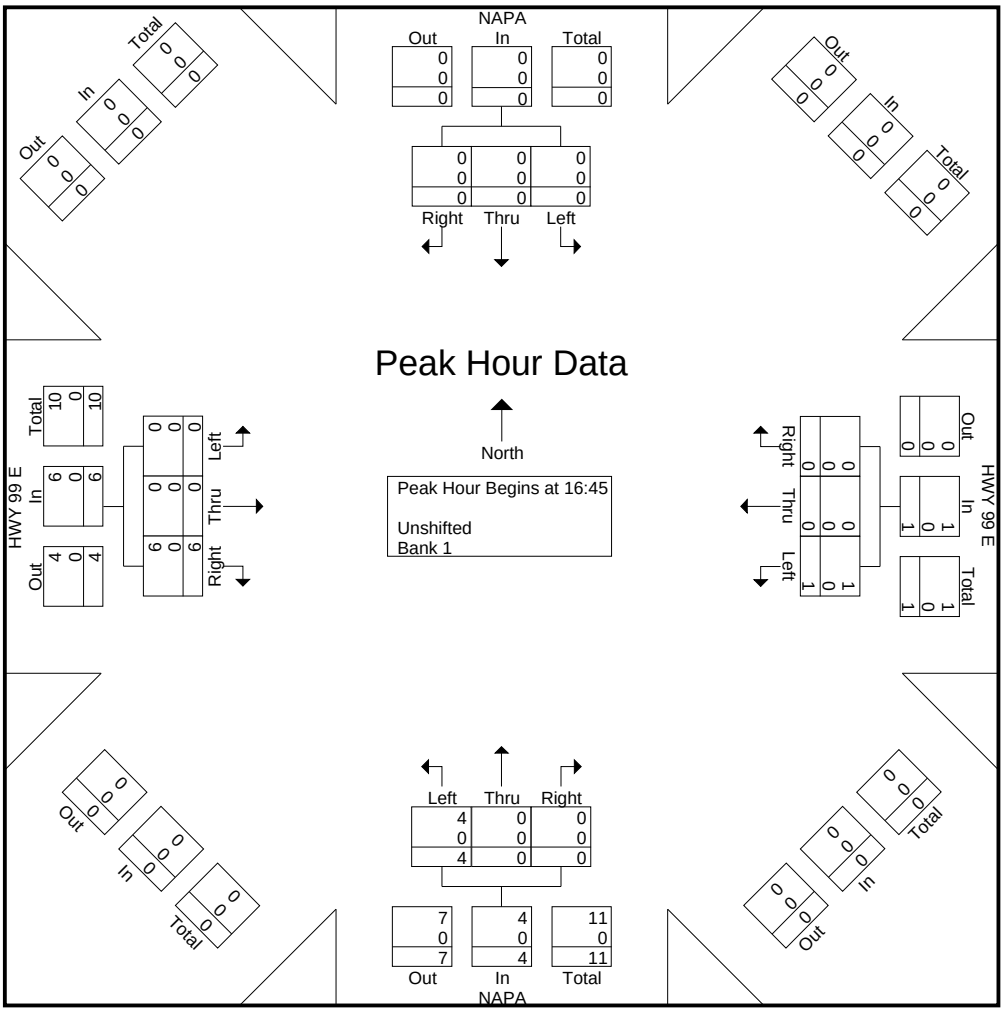
	NAPA Southbound				HWY 99 E Westbound				NAPA Northbound				HWY 99 E Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:45 to 17:30 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	**1**	0	0	**1**	**2**	0	0	**2**	0	0	**3**	**3**	**6**
17:15	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	2
17:30	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	2	3
Total Volume	0	0	0	0	1	0	0	1	4	0	0	4	0	0	6	6	11
% App. Total	0	0	0		100	0	0		100	0	0		0	0	100		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.500	.000	.000	.500	.000	.000	.500	.500	.458
Unshifted	0	0	0	0	1	0	0	1	4	0	0	4	0	0	6	6	11
% Unshifted	0	0	0	0	100	0	0	100	100	0	0	100	0	0	100	100	100
Bank 1	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

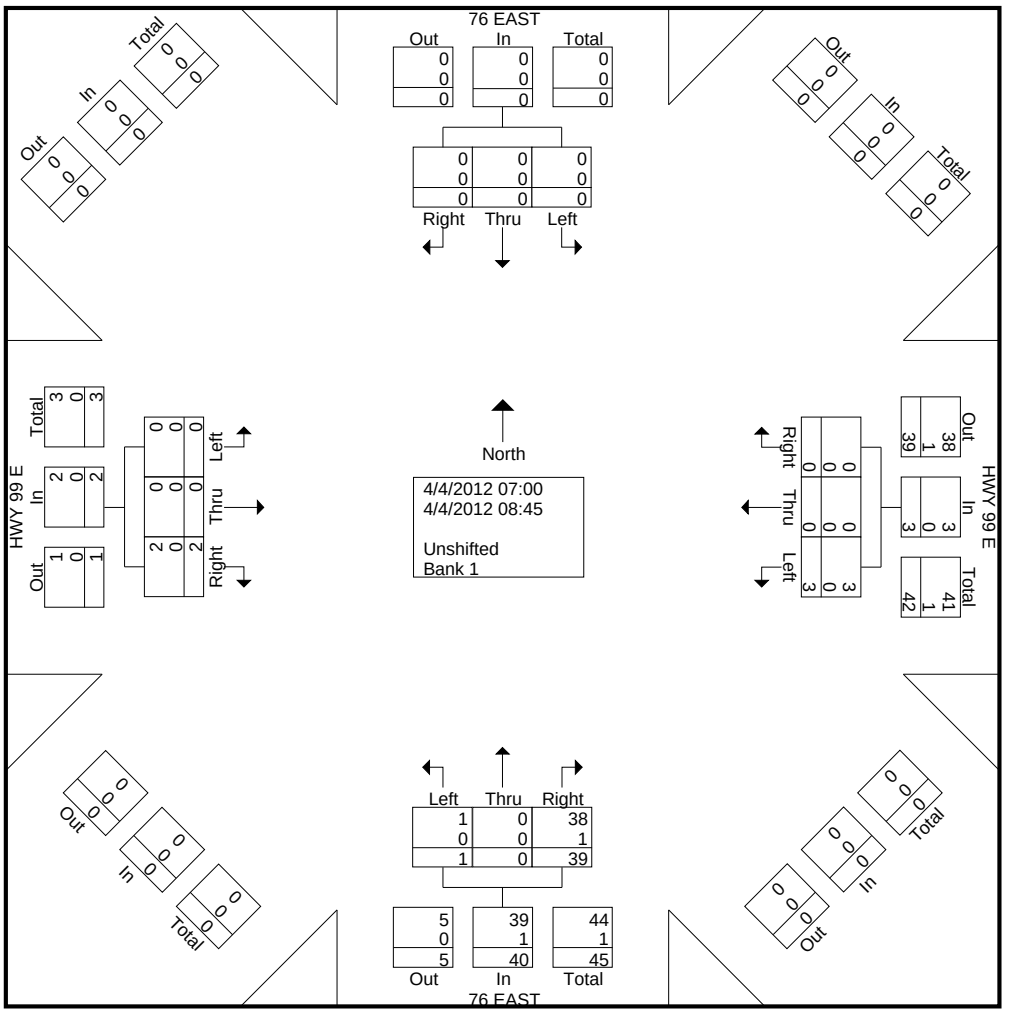


All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : 76East&Hwy99 AM
Site Code :
Start Date : 4/4/2012
Page No : 1

Groups Printed- Unshifted - Bank 1

	76 EAST Southbound					HWY 99 E Westbound					76 EAST Northbound					HWY 99 E Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2	2
07:15	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	0	0	7	7
07:30	0	0	0	0	0	0	0	0	0	0	0	0	3	1	3	0	0	1	0	1	1	4	5
07:45	0	0	0	0	0	1	0	0	0	1	0	0	3	0	3	0	0	0	0	0	0	4	4
Total	0	0	0	0	0	1	0	0	0	1	0	0	15	1	15	0	0	1	0	1	1	17	18
08:00	0	0	0	0	0	0	0	0	0	0	1	0	5	1	6	0	0	0	0	0	1	6	7
08:15	0	0	0	0	0	2	0	0	0	2	0	0	12	0	12	0	0	0	0	0	0	14	14
08:30	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	0	1	0	1	1	3	4
08:45	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	0	5	5
Total	0	0	0	0	0	2	0	0	0	2	1	0	24	2	25	0	0	1	0	1	2	28	30
Grand Total	0	0	0	0	0	3	0	0	0	3	1	0	39	3	40	0	0	2	0	2	3	45	48
Apprch %	0	0	0			100	0	0			2.5	0	97.5			0	0	100					
Total %	0	0	0		0	6.7	0	0		6.7	2.2	0	86.7		88.9	0	0	4.4		4.4	6.2	93.8	
Unshifted	0	0	0		0	3	0	0		3	1	0	38		42	0	0	2		2	0	0	47
% Unshifted	0	0	0	0	0	100	0	0	0	100	100	0	97.4	100	97.7	0	0	100	0	100	0	0	97.9
Bank 1	0	0	0		0	0	0	0		0	0	0	1		1	0	0	0		0	0	0	1
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	2.6	0	2.3	0	0	0	0	0	0	0	2.1



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File Name : 76East&Hwy99 AM
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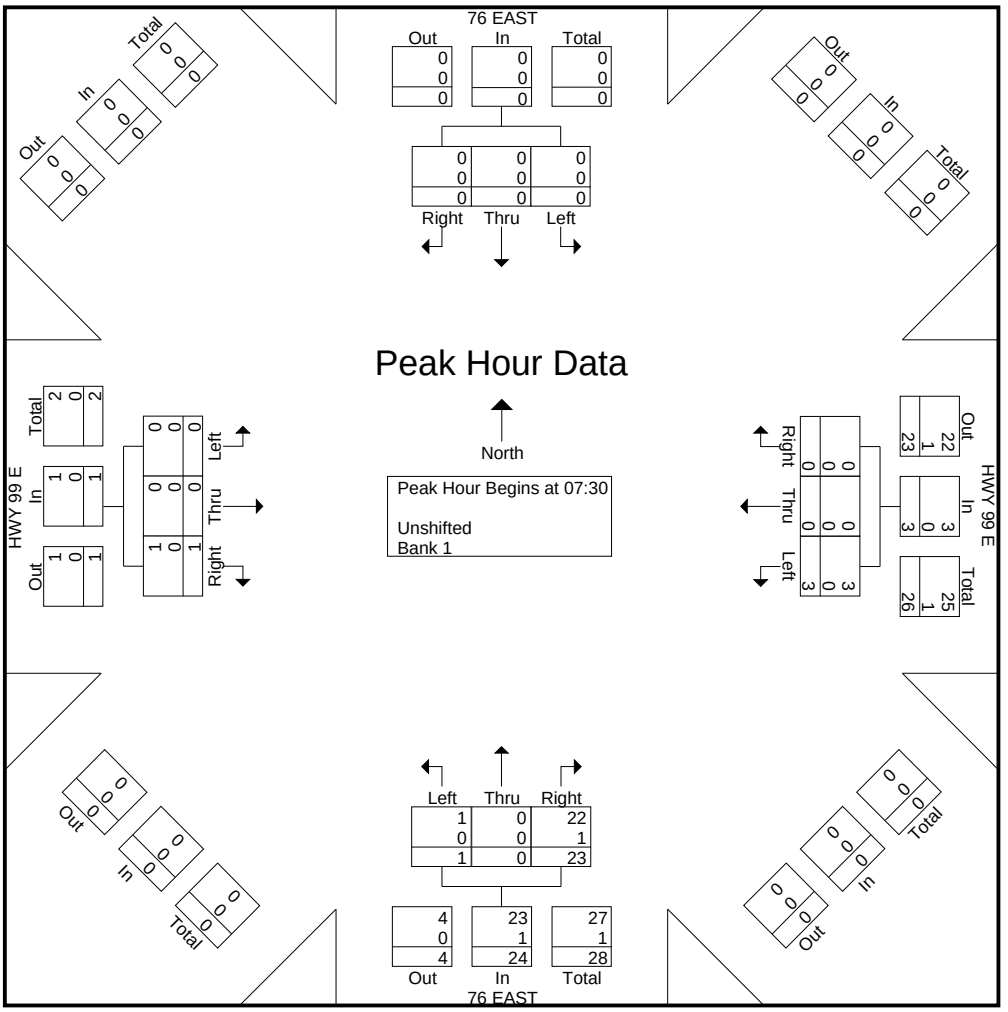
	76 EAST Southbound				HWY 99 E Westbound				76 EAST Northbound				HWY 99 E Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 to 08:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	0	0	0	0	0	0	0	0	0	0	3	3	0	0	**1**	**1**	4
07:45	0	0	0	0	1	0	0	1	0	0	3	3	0	0	0	0	4
08:00	0	0	0	0	0	0	0	0	**1**	0	5	6	0	0	0	0	6
08:15	0	0	0	0	**2**	0	0	**2**	0	0	**12**	**12**	0	0	0	0	**14**
Total Volume	0	0	0	0	3	0	0	3	1	0	23	24	0	0	1	1	28
% App. Total	0	0	0		100	0	0		4.2	0	95.8		0	0	100		
PHF	.000	.000	.000	.000	.375	.000	.000	.375	.250	.000	.479	.500	.000	.000	.250	.250	.500
Unshifted	0	0	0	0	3	0	0	3	1	0	22	23	0	0	1	1	27
% Unshifted	0	0	0	0	100	0	0	100	100	0	95.7	95.8	0	0	100	100	96.4
Bank 1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
% Bank 1	0	0	0	0	0	0	0	0	0	0	4.3	4.2	0	0	0	0	3.6



All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
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File Name : 76East&Hwy99 PM
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Start Date : 4/4/2012
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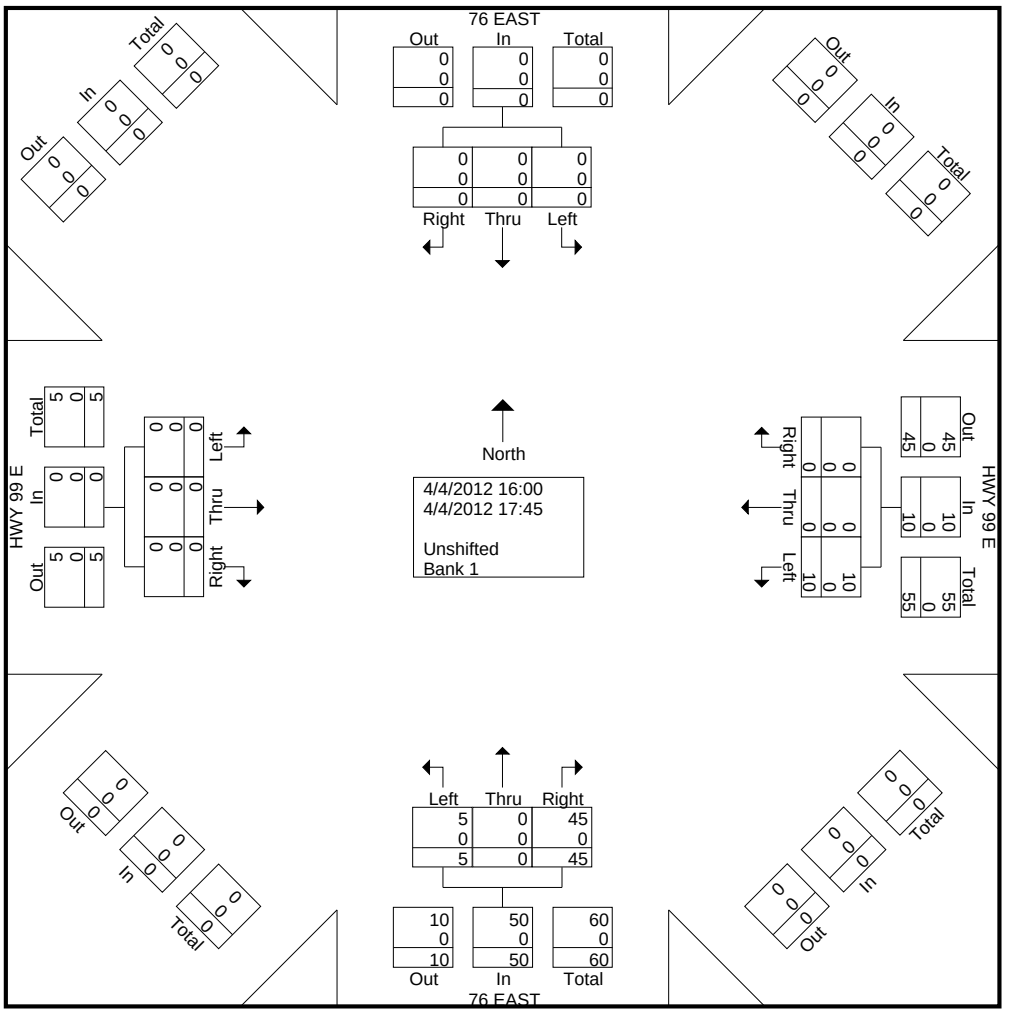
Groups Printed- Unshifted - Bank 1

	76 EAST Southbound					HWY 99 E Westbound					76 EAST Northbound					HWY 99 E Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:00	0	0	0	0	0	1	0	0	0	1	2	0	5	1	7	0	0	0	0	0	1	8	9
16:15	0	0	0	0	0	2	0	0	0	2	0	0	5	0	5	0	0	0	0	0	0	7	7
16:30	0	0	0	0	0	0	0	0	0	0	0	0	7	1	7	0	0	0	0	0	1	7	8
16:45	0	0	0	0	0	2	0	0	0	2	0	0	7	0	7	0	0	0	0	0	0	9	9
Total	0	0	0	0	0	5	0	0	0	5	2	0	24	2	26	0	0	0	0	0	2	31	33
17:00	0	0	0	0	0	1	0	0	0	1	1	0	5	0	6	0	0	0	0	0	0	7	7
17:15	0	0	0	0	0	2	0	0	0	2	0	0	6	0	6	0	0	0	0	0	0	8	8
17:30	0	0	0	0	0	2	0	0	0	2	2	0	4	0	6	0	0	0	0	0	0	8	8
17:45	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	0	0	0	6	6
Total	0	0	0	0	0	5	0	0	0	5	3	0	21	0	24	0	0	0	0	0	0	29	29
Grand Total	0	0	0	0	0	10	0	0	0	10	5	0	45	2	50	0	0	0	0	0	2	60	62
Apprch %	0	0	0			100	0	0			10	0	90			0	0	0					
Total %	0	0	0		0	16.7	0	0		16.7	8.3	0	75		83.3	0	0	0		0	3.2	96.8	
Unshifted	0	0	0		0	10	0	0		10	5	0	45		52	0	0	0		0	0	0	62
% Unshifted	0	0	0	0	0	100	0	0	0	100	100	0	100	100	100	0	0	0	0	0	0	0	100
Bank 1	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	0	0



All Traffic Data Services, Inc.
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File Name : 76East&Hwy99 PM
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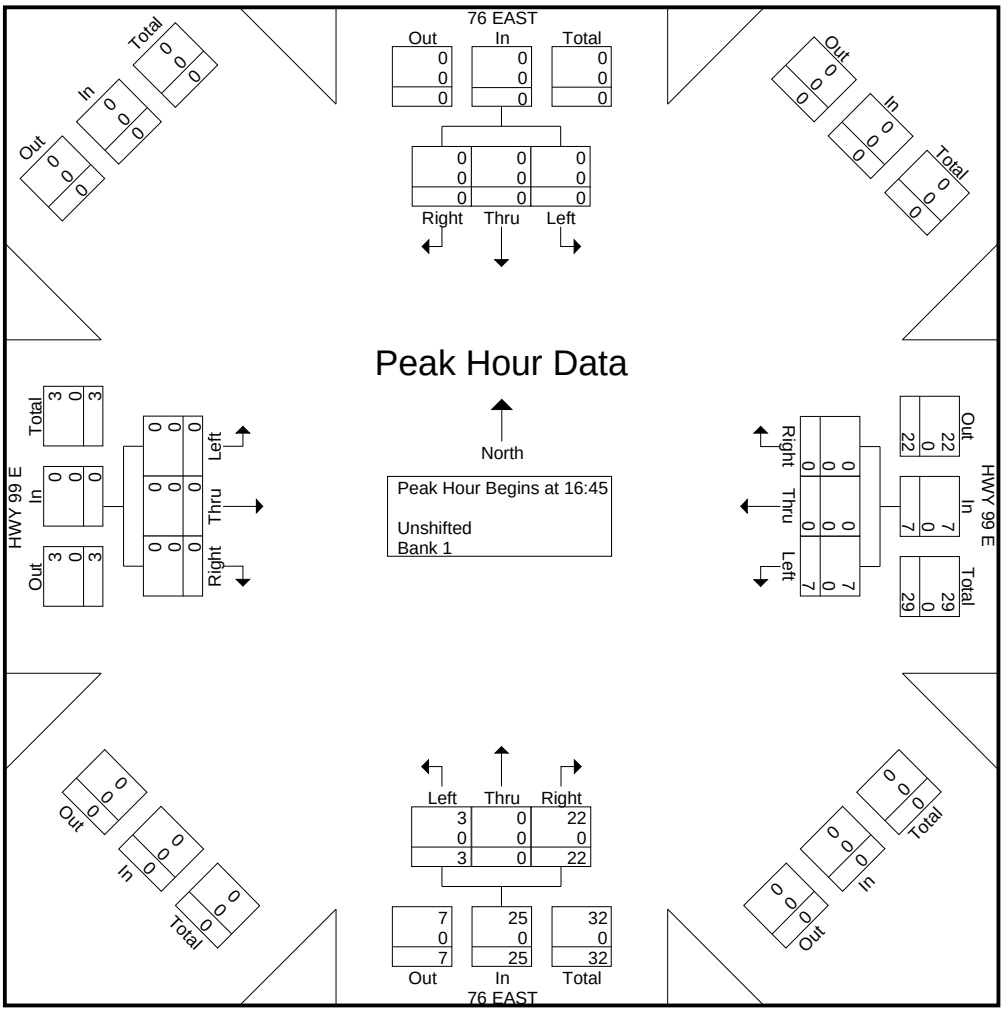
	76 EAST Southbound				HWY 99 E Westbound				76 EAST Northbound				HWY 99 E Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:45 to 17:30 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	0	0	0	0	**2**	0	0	**2**	0	0	**7**	**7**	0	0	0	0	**9**
17:00	0	0	0	0	1	0	0	1	1	0	5	6	0	0	0	0	7
17:15	0	0	0	0	2	0	0	2	0	0	6	6	0	0	0	0	8
17:30	0	0	0	0	2	0	0	2	**2**	0	4	6	0	0	0	0	8
Total Volume	0	0	0	0	7	0	0	7	3	0	22	25	0	0	0	0	32
% App. Total	0	0	0		100	0	0		12	0	88		0	0	0		
PHF	.000	.000	.000	.000	.875	.000	.000	.875	.375	.000	.786	.893	.000	.000	.000	.000	.889
Unshifted	0	0	0	0	7	0	0	7	3	0	22	25	0	0	0	0	32
% Unshifted	0	0	0	0	100	0	0	100	100	0	100	100	0	0	0	0	100
Bank 1	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



All Traffic Data Services, Inc.
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File Name : 76West&Hwy99 AM
Site Code :
Start Date : 4/4/2012
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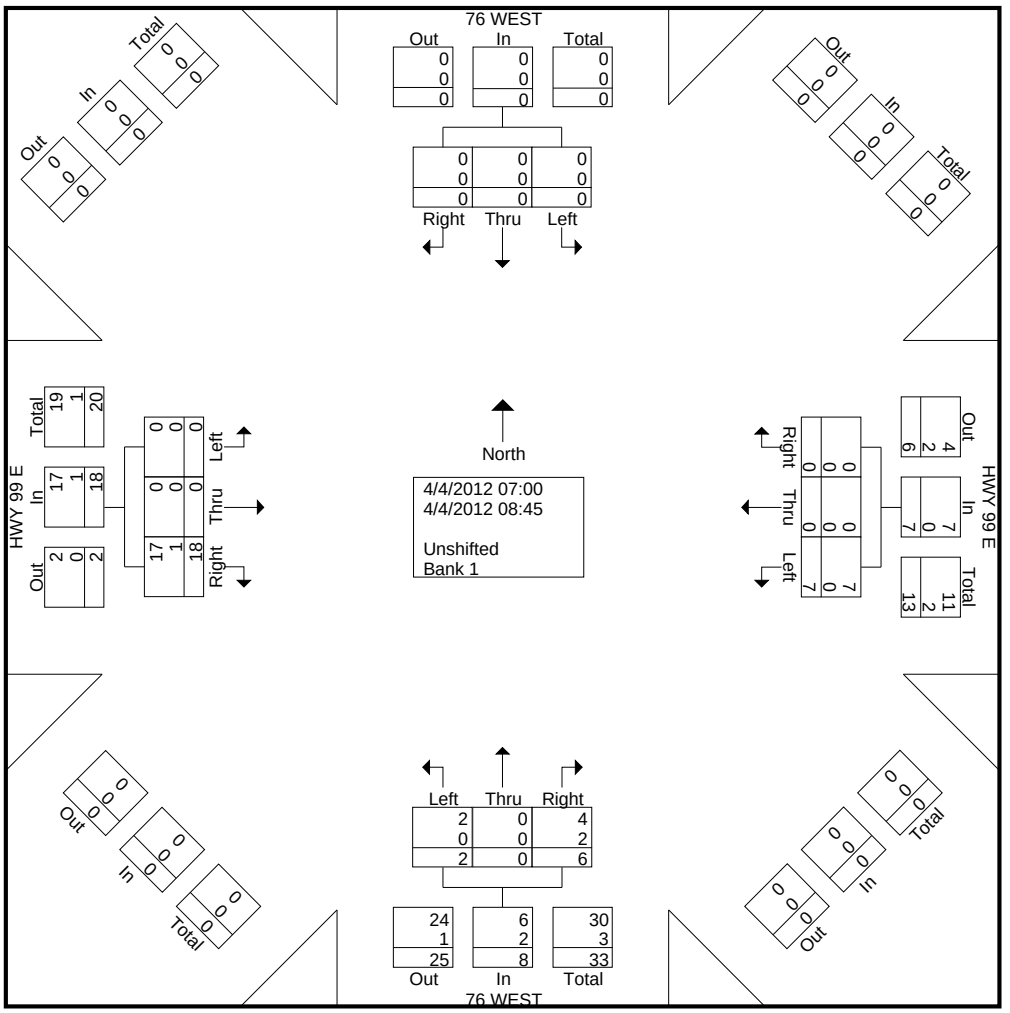
Groups Printed- Unshifted - Bank 1

	76 WEST Southbound					HWY 99 E Westbound					76 WEST Northbound					HWY 99 E Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1
07:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	2	0	3	3
07:30	0	0	0	0	0	1	0	0	0	1	1	0	0	1	1	0	0	2	0	2	1	4	5
07:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	2	2
Total	0	0	0	0	0	2	0	0	0	2	2	0	0	1	2	0	0	6	0	6	1	10	11
08:00	0	0	0	0	0	2	0	0	0	2	0	0	3	1	3	0	0	5	0	5	1	10	11
08:15	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	4	0	4	0	6	6
08:30	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	0	0	2	0	2	1	4	5
08:45	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0	3	3
Total	0	0	0	0	0	5	0	0	0	5	0	0	6	2	6	0	0	12	0	12	2	23	25
Grand Total	0	0	0	0	0	7	0	0	0	7	2	0	6	3	8	0	0	18	0	18	3	33	36
Apprch %	0	0	0			100	0	0			25	0	75			0	0	100					
Total %	0	0	0		0	21.2	0	0		21.2	6.1	0	18.2		24.2	0	0	54.5		54.5	8.3	91.7	
Unshifted	0	0	0		0	7	0	0		7	2	0	4		9	0	0	17		17	0	0	33
% Unshifted	0	0	0	0	0	100	0	0	0	100	100	0	66.7	100	81.8	0	0	94.4	0	94.4	0	0	91.7
Bank 1	0	0	0		0	0	0	0		0	0	0	2		2	0	0	1		1	0	0	3
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	33.3	0	18.2	0	0	5.6	0	5.6	0	0	8.3



All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
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File Name : 76West&Hwy99 AM
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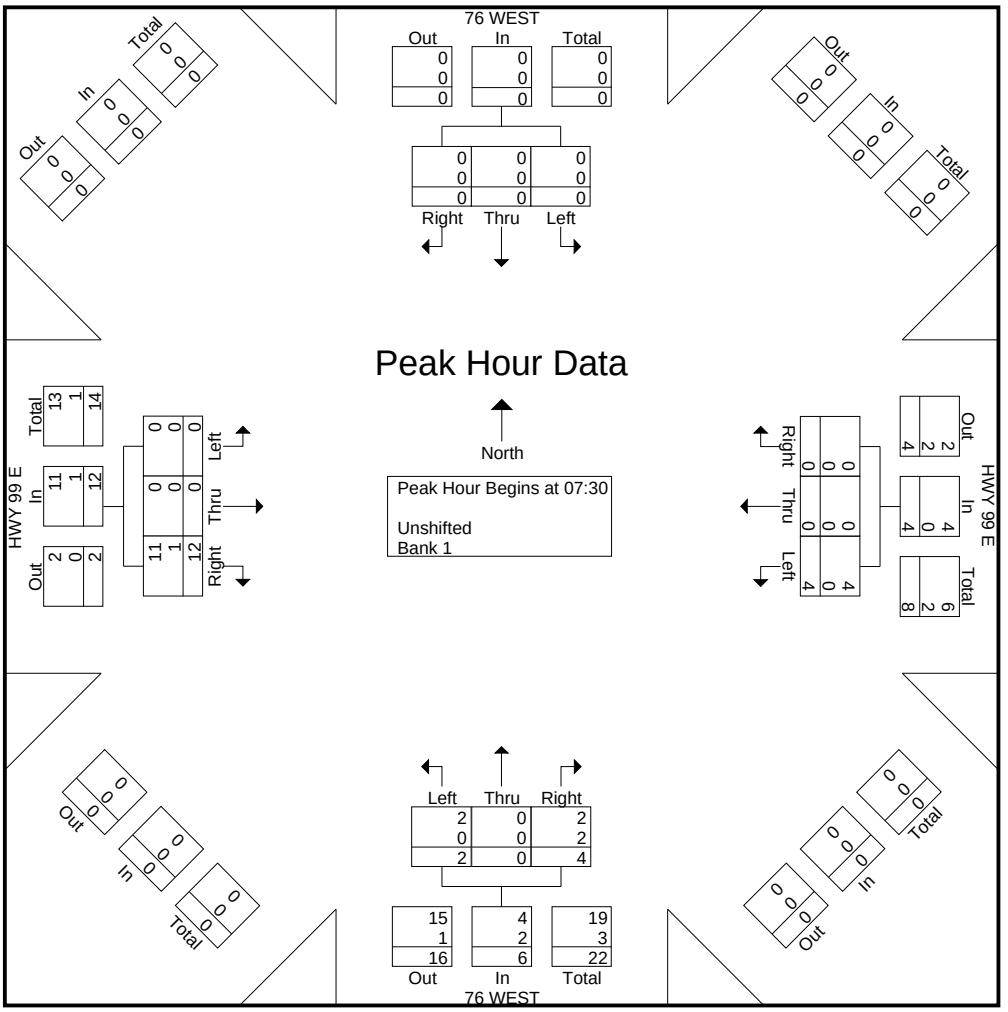
	76 WEST Southbound				HWY 99 E Westbound				76 WEST Northbound				HWY 99 E Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 to 08:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	0	0	0	0	1	0	0	1	**1**	0	0	1	0	0	2	2	4
07:45	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	2
08:00	0	0	0	0	**2**	0	0	**2**	0	0	**3**	**3**	0	0	**5**	**5**	**10**
08:15	0	0	0	0	1	0	0	1	0	0	1	1	0	0	4	4	6
Total Volume	0	0	0	0	4	0	0	4	2	0	4	6	0	0	12	12	22
% App. Total	0	0	0		100	0	0		33.3	0	66.7		0	0	100		
PHF	.000	.000	.000	.000	.500	.000	.000	.500	.500	.000	.333	.500	.000	.000	.600	.600	.550
Unshifted	0	0	0	0	4	0	0	4	2	0	2	4	0	0	11	11	19
% Unshifted	0	0	0	0	100	0	0	100	100	0	50.0	66.7	0	0	91.7	91.7	86.4
Bank 1	0	0	0	0	0	0	0	0	0	0	2	2	0	0	1	1	3
% Bank 1	0	0	0	0	0	0	0	0	0	0	50.0	33.3	0	0	8.3	8.3	13.6



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15105 SE 17th St. Vancouver, WA. 98683
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File Name : 76West&Hwy99 PM
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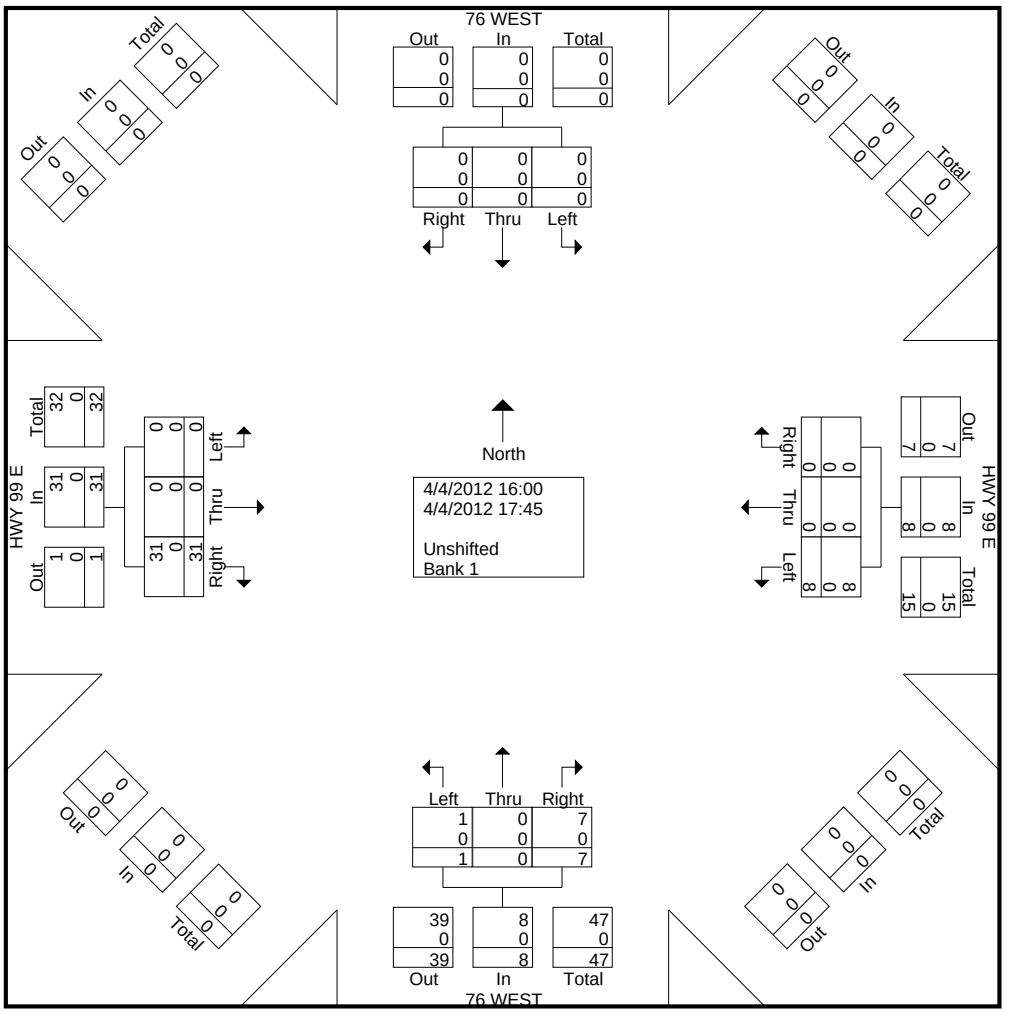
Groups Printed- Unshifted - Bank 1

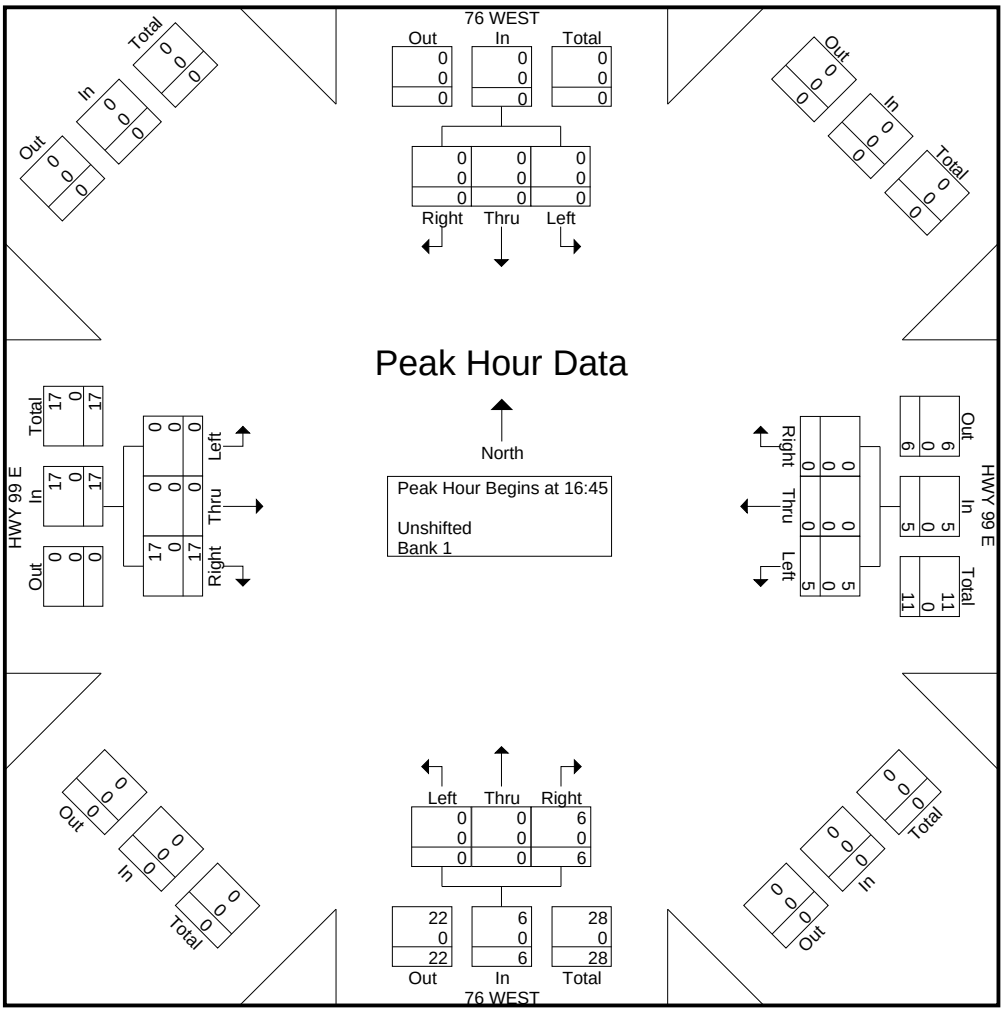
	76 WEST Southbound					HWY 99 E Westbound					76 WEST Northbound					HWY 99 E Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:00	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	5	0	5	1	6	7
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	2
16:30	0	0	0	0	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	2	1	5	6
16:45	0	0	0	0	0	1	0	0	0	1	0	0	2	0	2	0	0	3	0	3	0	6	6
Total	0	0	0	0	0	4	0	0	0	4	0	0	3	2	3	0	0	12	0	12	2	19	21
17:00	0	0	0	0	0	1	0	0	0	1	0	0	2	0	2	0	0	7	0	7	0	10	10
17:15	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	4	0	4	0	6	6
17:30	0	0	0	0	0	2	0	0	0	2	0	0	1	0	1	0	0	3	0	3	0	6	6
17:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	5	0	5	0	6	6
Total	0	0	0	0	0	4	0	0	0	4	1	0	4	0	5	0	0	19	0	19	0	28	28
Grand Total	0	0	0	0	0	8	0	0	0	8	1	0	7	2	8	0	0	31	0	31	2	47	49
Apprch %	0	0	0			100	0	0			12.5	0	87.5			0	0	100					
Total %	0	0	0		0	17	0	0		17	2.1	0	14.9		17	0	0	66		66	4.1	95.9	
Unshifted	0	0	0		0	8	0	0		8	1	0	7		10	0	0	31		31	0	0	49
% Unshifted	0	0	0	0	0	100	0	0	0	100	100	0	100	100	100	0	0	100	0	100	0	0	100
Bank 1	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	0	0



All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

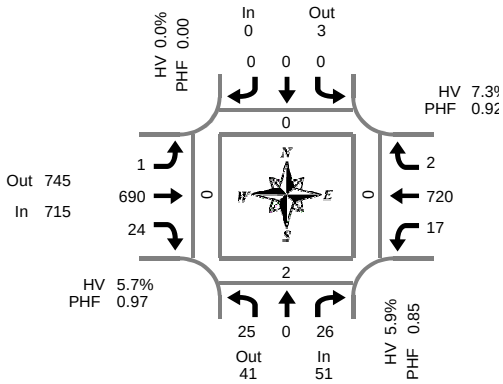
File Name : 76West&Hwy99 PM
Site Code :
Start Date : 4/4/2012
Page No : 2

	76 WEST Southbound				HWY 99 E Westbound				76 WEST Northbound				HWY 99 E Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:45 to 17:30 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	0	0	0	0	1	0	0	1	0	0	**2**	**2**	0	0	3	3	6
17:00	0	0	0	0	1	0	0	1	0	0	2	2	0	0	**7**	**7**	**10**
17:15	0	0	0	0	1	0	0	1	0	0	1	1	0	0	4	4	6
17:30	0	0	0	0	**2**	0	0	**2**	0	0	1	1	0	0	3	3	6
Total Volume	0	0	0	0	5	0	0	5	0	0	6	6	0	0	17	17	28
% App. Total	0	0	0		100	0	0		0	0	100		0	0	100		
PHF	.000	.000	.000	.000	.625	.000	.000	.625	.000	.000	.750	.750	.000	.000	.607	.607	.700
Unshifted	0	0	0	0	5	0	0	5	0	0	6	6	0	0	17	17	28
% Unshifted	0	0	0	0	100	0	0	100	0	0	100	100	0	0	100	100	100
Bank 1	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



Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:30 AM to 8:30 AM

S Locust St & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

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

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	3	0	12	0	0	0	0	161	3	4	140	0	323	0	1	0	0
7:15 AM	5	0	7	0	0	0	0	159	2	6	154	0	333	0	0	0	0
7:30 AM	6	0	9	0	0	0	0	176	6	5	166	1	369	0	1	0	0
7:45 AM	7	0	6	0	0	0	0	182	2	5	174	1	377	0	0	0	0
8:00 AM	7	0	5	0	0	0	0	156	9	7	179	0	363	0	1	0	0
8:15 AM	5	0	6	0	0	0	1	176	7	0	201	0	396	0	0	0	0
8:30 AM	6	0	10	0	0	0	0	167	7	1	139	0	330	0	1	0	0
8:45 AM	6	0	9	0	0	0	2	131	4	1	126	0	279	0	2	0	0
Total Survey	45	0	64	0	0	0	3	1,308	40	29	1,279	2	2,770	0	6	0	0

Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	51	41	92	0	3	3	715	745	1,460	739	716	1,455	1,505	0	2	0	0
%HV	5.9%			0.0%			5.7%			7.3%			6.5%				
PHF	0.85			0.00			0.97			0.92			0.95				

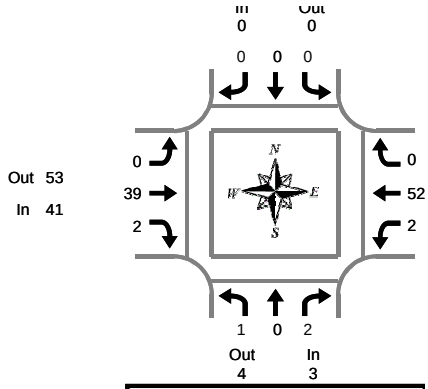
By Movement	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	25	0	26	0	0	0	1	690	24	17	720	2	1,505
%HV	4.0%	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%	5.7%	8.3%	11.8%	7.2%	0.0%	6.5%
PHF	0.89	0.00	0.72	0.00	0.00	0.00	0.25	0.95	0.67	0.61	0.90	0.50	0.95

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	21	0	34	0	0	0	0	678	13	20	634	2	1,402	0	2	0	0
7:15 AM	25	0	27	0	0	0	0	673	19	23	673	2	1,442	0	2	0	0
7:30 AM	25	0	26	0	0	0	1	690	24	17	720	2	1,505	0	2	0	0
7:45 AM	25	0	27	0	0	0	1	681	25	13	693	1	1,466	0	2	0	0
8:00 AM	24	0	30	0	0	0	3	630	27	9	645	0	1,368	0	4	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Locust St & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	8	0	8	1	7	0	8	16
7:15 AM	0	0	2	2	0	0	0	0	0	6	0	6	2	7	0	9	17
7:30 AM	0	0	0	0	0	0	0	0	0	6	0	6	1	9	0	10	16
7:45 AM	0	0	1	1	0	0	0	0	0	10	0	10	1	13	0	14	25
8:00 AM	0	0	0	0	0	0	0	0	0	11	1	12	0	17	0	17	29
8:15 AM	1	0	1	2	0	0	0	0	0	12	1	13	0	13	0	13	28
8:30 AM	0	0	0	0	0	0	0	0	0	11	0	11	1	14	0	15	26
8:45 AM	0	0	0	0	0	0	0	0	0	14	0	14	0	13	0	13	27
Total Survey	1	0	4	5	0	0	0	0	0	78	2	80	6	93	0	99	184

Heavy Vehicle Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	4	7	0	0	0	41	53	94	54	41	95	98
PHF	0.25			0.00			0.27			0.30			0.30

By Movement	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	2	3	0	0	0	0	0	39	2	41	2	52	0	54	98
PHF	0.25	0.00	0.17	0.25	0.00	0.00	0.00	0.00	0.00	0.26	0.25	0.27	0.13	0.30	0.00	0.30	0.30

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

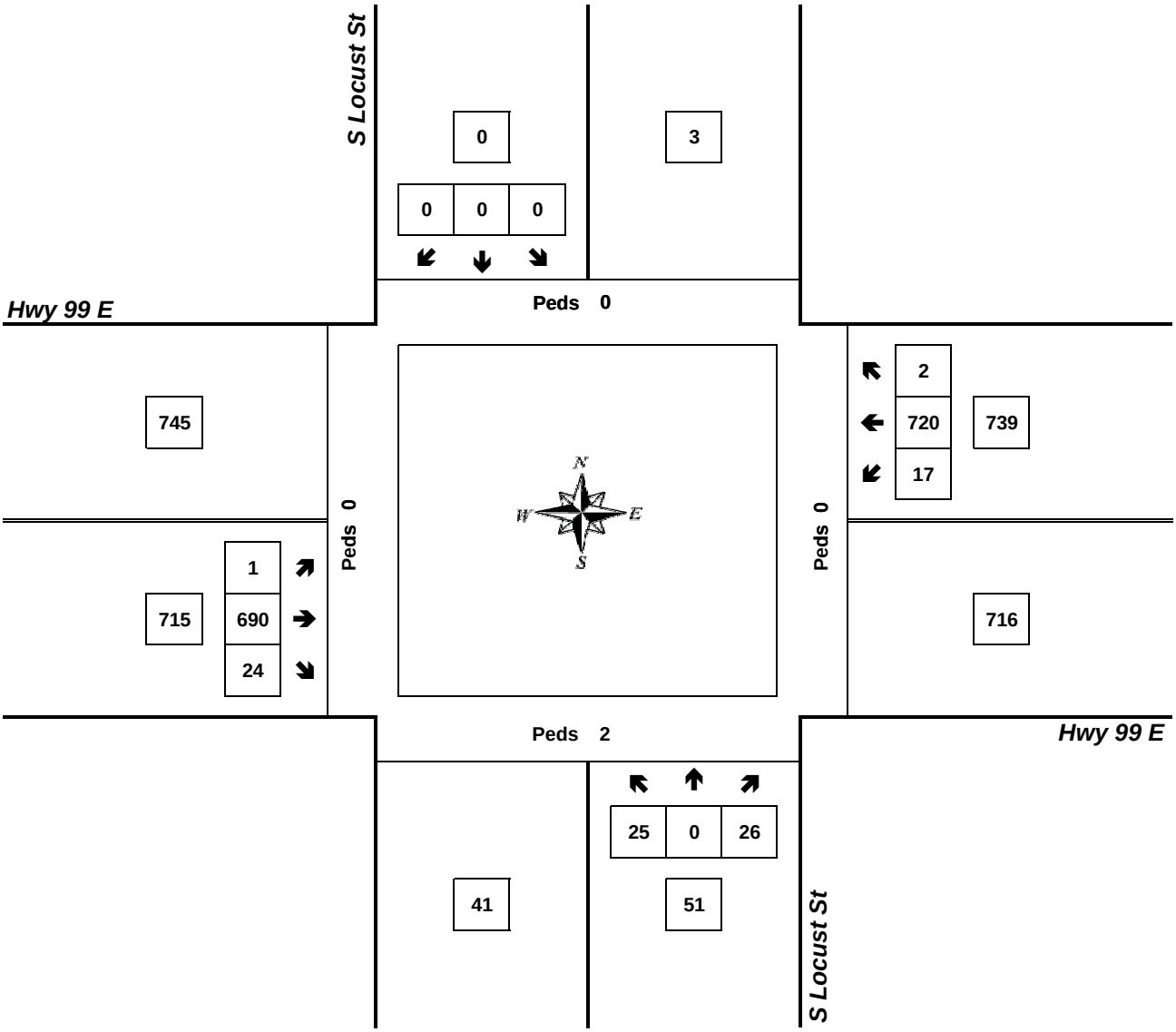
Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	3	3	0	0	0	0	0	30	0	30	5	36	0	41	74
7:15 AM	0	0	3	3	0	0	0	0	0	33	1	34	4	46	0	50	87
7:30 AM	1	0	2	3	0	0	0	0	0	39	2	41	2	52	0	54	98
7:45 AM	1	0	2	3	0	0	0	0	0	44	2	46	2	57	0	59	108
8:00 AM	1	0	1	2	0	0	0	0	0	48	2	50	1	57	0	58	110

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Locust St & Hwy 99 E

7:30 AM to 8:30 AM
Wednesday, April 04, 2012

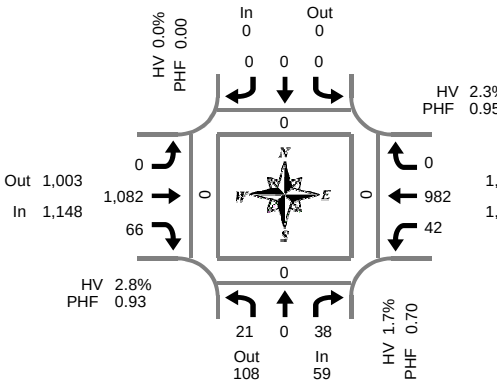


Approach	PHF	HV%	Volume
EB	0.97	5.7%	715
WB	0.92	7.3%	739
NB	0.85	5.9%	51
SB	0.00	0.0%	0
Intersection	0.95	6.5%	1,505

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



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

S Locust St & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	7	0	3	0	0	0	1	238	13	9	227	0	498	0	1	0	0
4:15 PM	3	0	7	0	0	0	0	255	11	5	236	1	518	0	0	0	0
4:30 PM	4	0	7	0	0	0	2	246	9	14	252	0	534	0	0	0	0
4:45 PM	6	0	15	0	0	0	0	244	17	9	252	0	543	0	0	0	0
5:00 PM	4	0	7	0	0	0	0	292	17	12	258	0	590	0	0	0	0
5:15 PM	7	0	8	0	0	0	0	264	14	6	244	0	543	0	0	0	0
5:30 PM	4	0	8	0	0	0	0	282	18	15	228	0	555	0	0	0	0
5:45 PM	4	0	1	0	0	0	0	192	13	9	185	0	404	0	0	0	0
Total Survey	39	0	56	0	0	0	3	2,013	112	79	1,882	1	4,185	0	1	0	0

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

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	59	108	167	0	0	0	1,148	1,003	2,151	1,024	1,120	2,144	2,231	0	0	0	0
%HV	1.7%			0.0%			2.8%			2.3%			2.6%				
PHF	0.70			0.00			0.93			0.95			0.95				

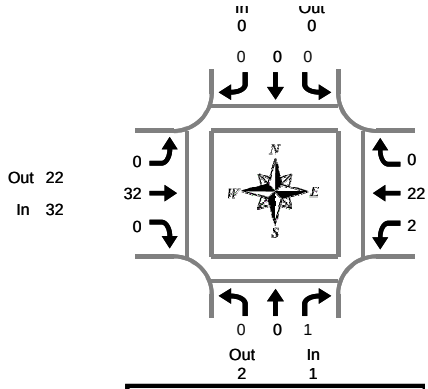
By Movement	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	21	0	38	0	0	0	0	1,082	66	42	982	0	2,231
%HV	0.0%	0.0%	2.6%	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%	4.8%	2.2%	0.0%	2.6%
PHF	0.75	0.00	0.63	0.00	0.00	0.00	0.00	0.93	0.92	0.70	0.95	0.00	0.95

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

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	20	0	32	0	0	0	3	983	50	37	967	1	2,093	0	1	0	0
4:15 PM	17	0	36	0	0	0	2	1,037	54	40	998	1	2,185	0	0	0	0
4:30 PM	21	0	37	0	0	0	2	1,046	57	41	1,006	0	2,210	0	0	0	0
4:45 PM	21	0	38	0	0	0	0	1,082	66	42	982	0	2,231	0	0	0	0
5:00 PM	19	0	24	0	0	0	0	1,030	62	42	915	0	2,092	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Locust St & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	8	0	8	0	5	0	5	13
4:15 PM	0	0	1	1	0	0	0	0	0	6	0	6	1	7	0	8	15
4:30 PM	0	0	0	0	0	0	0	0	0	7	0	7	1	3	0	4	11
4:45 PM	0	0	0	0	0	0	0	0	0	8	0	8	0	8	0	8	16
5:00 PM	0	0	0	0	0	0	0	0	0	11	0	11	1	5	0	6	17
5:15 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	3	0	3	10
5:30 PM	0	0	1	1	0	0	0	0	0	6	0	6	1	6	0	7	14
5:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6
Total Survey	0	0	2	2	0	0	0	0	0	56	0	56	4	40	0	44	102

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	2	3	0	0	0	32	22	54	24	33	57	57
PHF	0.25			0.00			0.31			0.30			0.32

By Movement	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	1	1	0	0	0	0	0	32	0	32	2	22	0	24	57
PHF	0.00	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.31	0.25	0.31	0.00	0.30	0.32

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

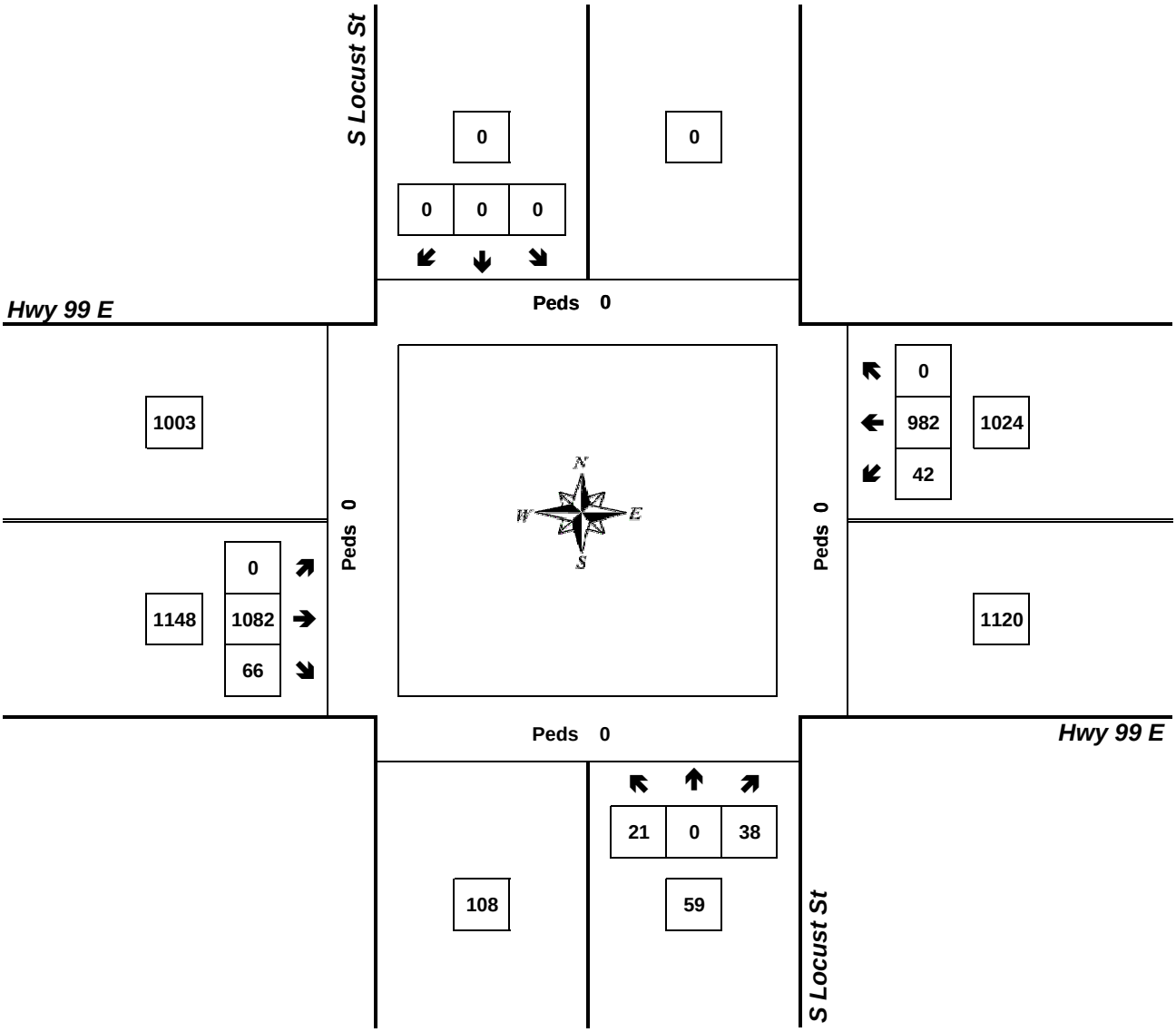
Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	0	0	0	0	0	29	0	29	2	23	0	25	55
4:15 PM	0	0	1	1	0	0	0	0	0	32	0	32	3	23	0	26	59
4:30 PM	0	0	0	0	0	0	0	0	0	33	0	33	2	19	0	21	54
4:45 PM	0	0	1	1	0	0	0	0	0	32	0	32	2	22	0	24	57
5:00 PM	0	0	1	1	0	0	0	0	0	27	0	27	2	17	0	19	47

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Locust St & Hwy 99 E

4:45 PM to 5:45 PM
Wednesday, April 04, 2012

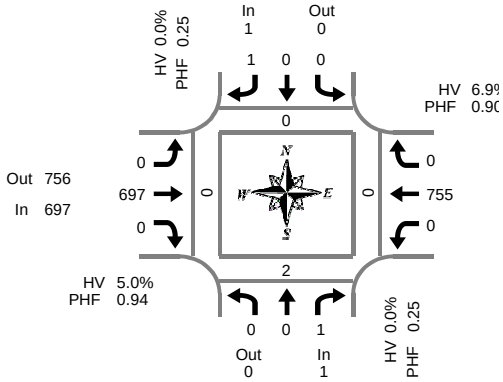


Approach	PHF	HV%	Volume
EB	0.93	2.8%	1,148
WB	0.95	2.3%	1,024
NB	0.70	1.7%	59
SB	0.00	0.0%	0
Intersection	0.95	2.6%	2,231

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Dominos East & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

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

Interval Start Time	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	0	0	1	0	0	0	0	153	0	0	142	0	296	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	162	0	0	150	0	312	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	186	0	0	185	0	371	0	2	0	0
7:45 AM	0	0	0	0	0	0	0	165	0	0	190	0	355	0	0	0	0
8:00 AM	0	0	1	0	0	1	0	176	0	0	170	0	348	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	170	0	0	210	0	380	0	0	0	0
8:30 AM	1	0	0	0	0	0	0	181	0	0	158	0	340	0	0	0	0
8:45 AM	1	0	1	0	0	1	0	145	0	0	147	0	295	0	0	0	0
Total Survey	2	0	3	0	0	2	0	1,338	0	0	1,352	0	2,697	0	3	0	0

Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	1	0	1	1	0	1	697	756	1,453	755	698	1,453	1,454	0	2	0	0
%HV	0.0%			0.0%			5.0%			6.9%			6.0%				
PHF	0.25			0.25			0.94			0.90			0.96				

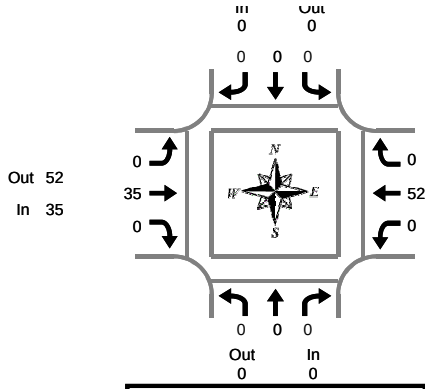
By Movement	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	0	0	1	0	0	1	0	697	0	0	755	0	1,454
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	0.0%	0.0%	6.9%	0.0%	6.0%
PHF	0.00	0.00	0.25	0.00	0.00	0.25	0.00	0.94	0.00	0.00	0.90	0.00	0.96

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	0	0	1	0	0	0	0	666	0	0	667	0	1,334	0	3	0	0
7:15 AM	0	0	1	0	0	1	0	689	0	0	695	0	1,386	0	2	0	0
7:30 AM	0	0	1	0	0	1	0	697	0	0	755	0	1,454	0	2	0	0
7:45 AM	1	0	1	0	0	1	0	692	0	0	728	0	1,423	0	0	0	0
8:00 AM	2	0	2	0	0	2	0	672	0	0	685	0	1,363	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Dominos East & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	12	0	12	0	5	0	5	17
7:15 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	7	0	7	14
7:30 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	11	0	11	18
7:45 AM	0	0	0	0	0	0	0	0	0	8	0	8	0	13	0	13	21
8:00 AM	0	0	0	0	0	0	0	0	0	11	0	11	0	15	0	15	26
8:15 AM	0	0	0	0	0	0	0	0	0	9	0	9	0	13	0	13	22
8:30 AM	0	0	0	0	0	0	0	0	0	12	0	12	0	17	0	17	29
8:45 AM	0	0	0	0	0	0	0	0	0	14	0	14	0	12	0	12	26
Total Survey	0	0	0	0	0	0	0	0	0	80	0	80	0	93	0	93	173

Heavy Vehicle Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	35	52	87	52	35	87	87
PHF	0.00			0.00			0.25			0.29			0.28

By Movement	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	0	0	0	0	35	0	35	0	52	0	52	87
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.29	0.00	0.29	0.28

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

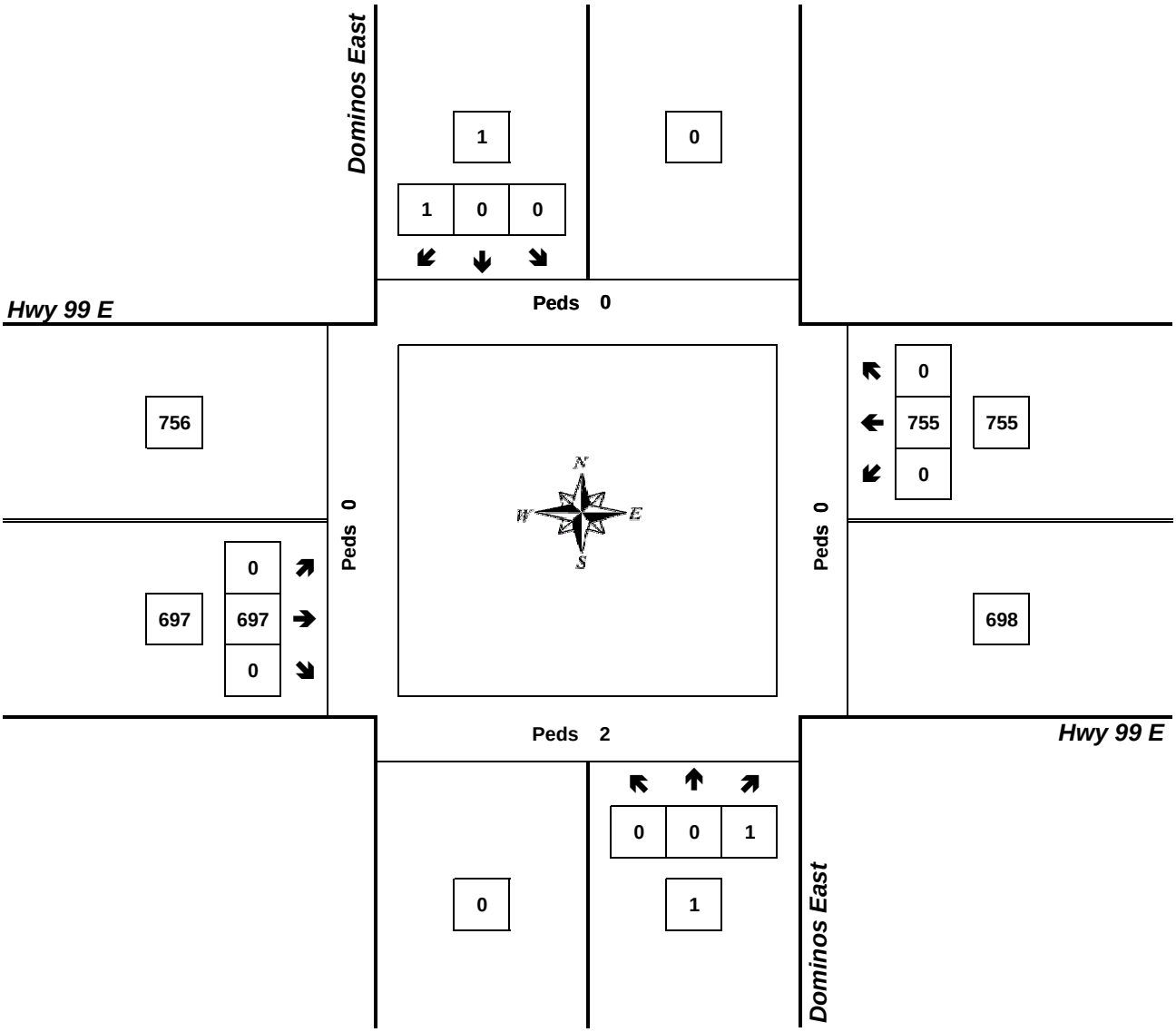
Interval Start Time	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	34	0	34	0	36	0	36	70
7:15 AM	0	0	0	0	0	0	0	0	0	33	0	33	0	46	0	46	79
7:30 AM	0	0	0	0	0	0	0	0	0	35	0	35	0	52	0	52	87
7:45 AM	0	0	0	0	0	0	0	0	0	40	0	40	0	58	0	58	98
8:00 AM	0	0	0	0	0	0	0	0	0	46	0	46	0	57	0	57	103

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Dominos East & Hwy 99 E

7:30 AM to 8:30 AM
Wednesday, April 04, 2012

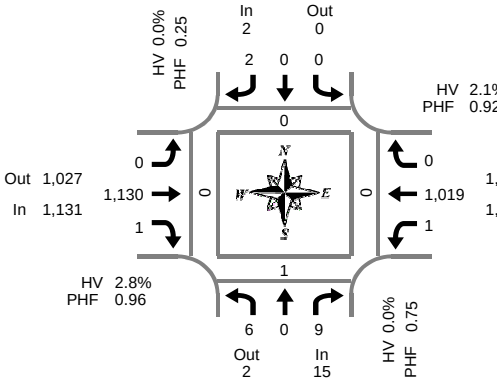


Approach	PHF	HV%	Volume
EB	0.94	5.0%	697
WB	0.90	6.9%	755
NB	0.25	0.0%	1
SB	0.25	0.0%	1
Intersection	0.96	6.0%	1,454

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Dominos East & Hwy 99 E

Wednesday, April 04, 2012
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 Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	0	0	2	0	0	2	0	239	0	0	229	0	472	2	1	0	0
4:15 PM	1	0	1	0	0	1	0	279	0	0	240	0	522	0	0	0	0
4:30 PM	0	0	3	0	0	2	0	249	1	0	246	0	501	0	0	0	0
4:45 PM	0	0	1	0	0	0	0	275	0	0	255	0	531	0	0	0	0
5:00 PM	2	0	2	0	0	0	0	294	0	1	269	0	568	0	0	0	0
5:15 PM	3	0	2	0	0	0	0	281	0	0	276	0	562	0	1	0	0
5:30 PM	1	0	4	0	0	2	0	280	1	0	219	0	507	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	233	0	1	197	0	431	0	1	0	0
Total Survey	7	0	15	0	0	7	0	2,130	2	2	1,931	0	4,094	2	3	0	0

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

By Approach	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	15	2	17	2	0	2	1,131	1,027	2,158	1,020	1,139	2,159	2,168	0	1	0	0
%HV	0.0%			0.0%			2.8%			2.1%			2.4%				
PHF	0.75			0.25			0.96			0.92			0.95				

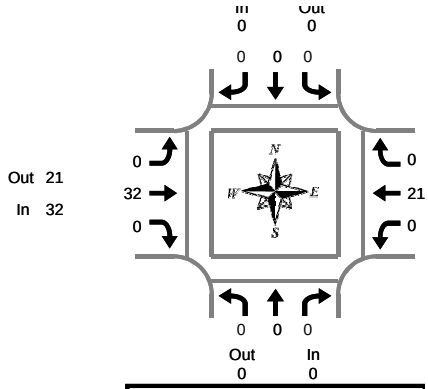
By Movement	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	6	0	9	0	0	2	0	1,130	1	1	1,019	0	2,168
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	0.0%	0.0%	2.1%	0.0%	2.4%
PHF	0.50	0.00	0.56	0.00	0.00	0.25	0.00	0.96	0.25	0.25	0.92	0.00	0.95

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

Interval Start Time	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	1	0	7	0	0	5	0	1,042	1	0	970	0	2,026	2	1	0	0
4:15 PM	3	0	7	0	0	3	0	1,097	1	1	1,010	0	2,122	0	0	0	0
4:30 PM	5	0	8	0	0	2	0	1,099	1	1	1,046	0	2,162	0	1	0	0
4:45 PM	6	0	9	0	0	2	0	1,130	1	1	1,019	0	2,168	0	1	0	0
5:00 PM	6	0	8	0	0	2	0	1,088	1	2	961	0	2,068	0	2	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



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

Dominos East & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	4	0	4	11
4:15 PM	0	0	0	0	0	0	0	0	0	6	0	6	0	8	0	8	14
4:30 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	3	0	3	10
4:45 PM	0	0	0	0	0	0	0	0	0	9	0	9	0	8	0	8	17
5:00 PM	0	0	0	0	0	0	0	0	0	10	0	10	0	5	0	5	15
5:15 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	3	0	3	10
5:30 PM	0	0	0	0	0	0	0	0	0	6	0	6	0	5	0	5	11
5:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	4	0	4	7
Total Survey	0	0	0	0	0	0	0	0	0	55	0	55	0	40	0	40	95

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	32	21	53	21	32	53	53
PHF	0.00			0.00			0.31			0.28			0.32

By Movement	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	0	0	0	0	32	0	32	0	21	0	21	53
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.31	0.00	0.28	0.00	0.28	0.32

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

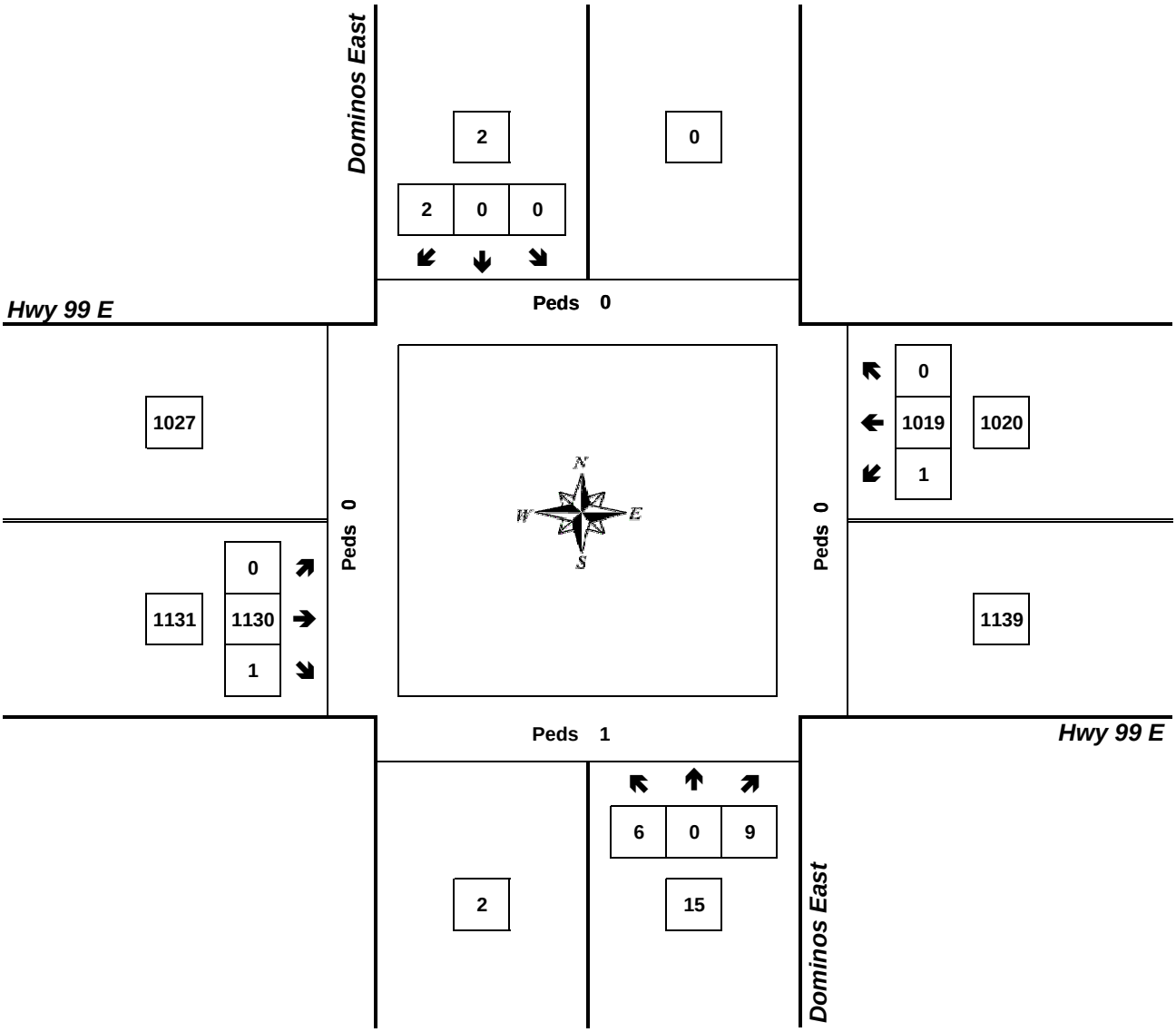
Interval Start Time	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	29	0	29	0	23	0	23	52
4:15 PM	0	0	0	0	0	0	0	0	0	32	0	32	0	24	0	24	56
4:30 PM	0	0	0	0	0	0	0	0	0	33	0	33	0	19	0	19	52
4:45 PM	0	0	0	0	0	0	0	0	0	32	0	32	0	21	0	21	53
5:00 PM	0	0	0	0	0	0	0	0	0	26	0	26	0	17	0	17	43

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Dominos East & Hwy 99 E

4:45 PM to 5:45 PM
Wednesday, April 04, 2012



Approach	PHF	HV%	Volume
EB	0.96	2.8%	1,131
WB	0.92	2.1%	1,020
NB	0.75	0.0%	15
SB	0.25	0.0%	2
Intersection	0.95	2.4%	2,168

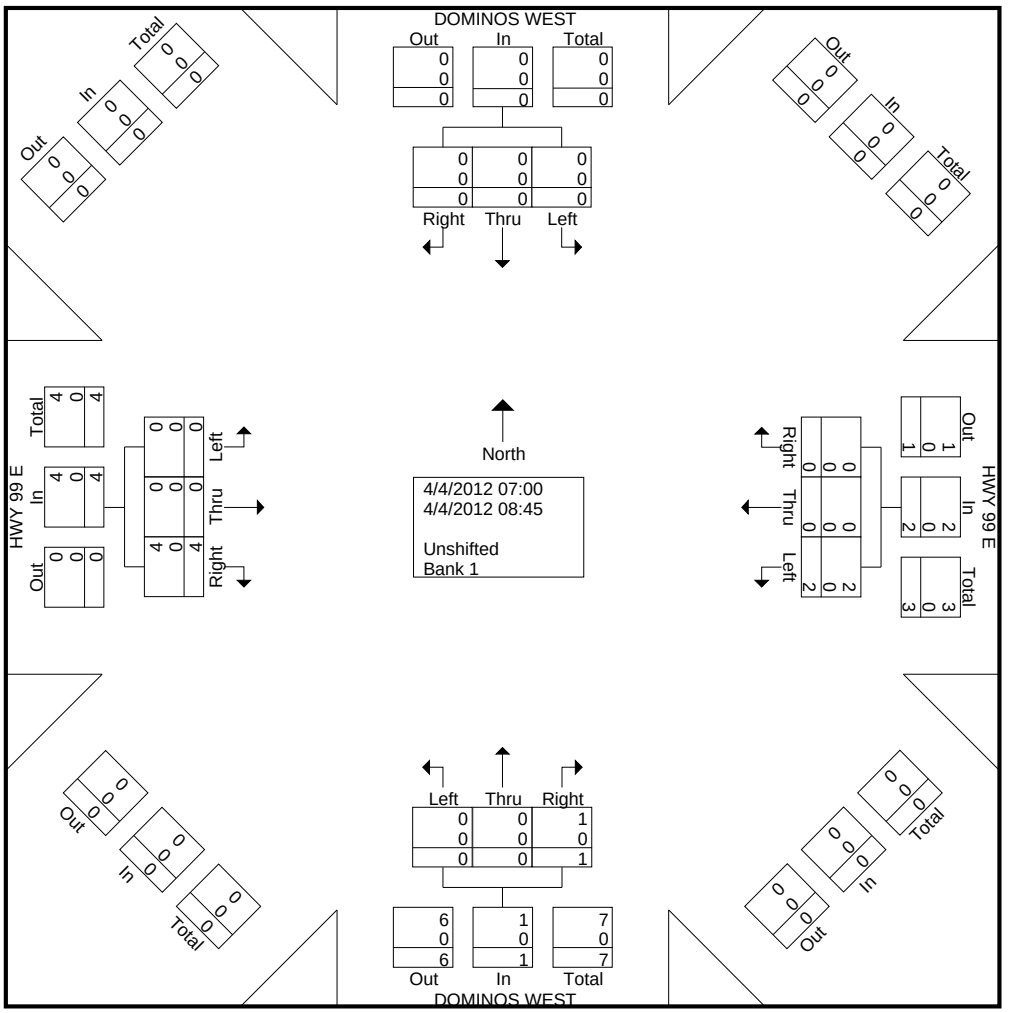
Count Period: 4:00 PM to 6:00 PM

All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : DominosWest&Hwy99 AM
Site Code :
Start Date : 4/4/2012
Page No : 1

Groups Printed- Unshifted - Bank 1

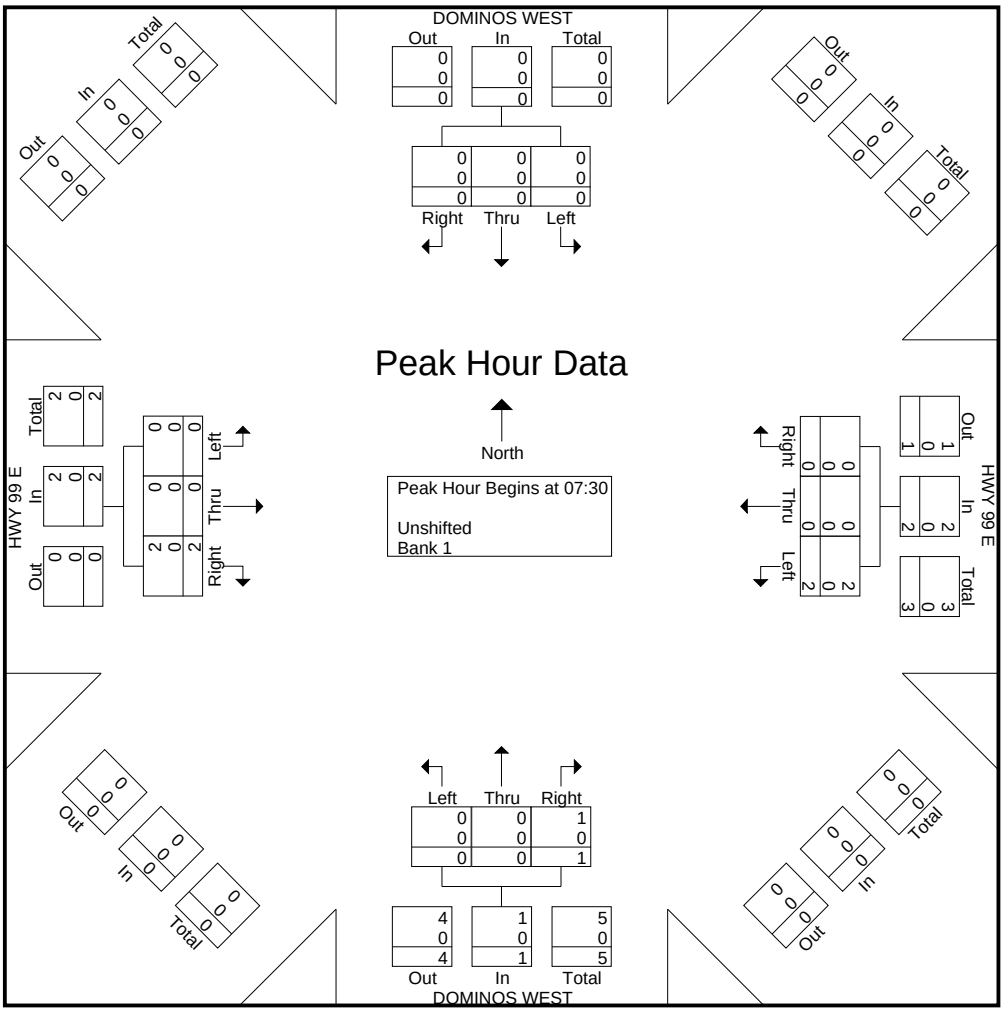
	DOMINOS WEST Southbound					HWY 99 E Westbound					DOMINOS WEST Northbound					HWY 99 E Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	2	2
Total	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	2	0	3	3
08:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1
08:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	2	2
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1
Total	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	2	0	2	0	4	4
Grand Total	0	0	0	0	0	2	0	0	0	2	0	0	1	0	1	0	0	4	0	4	0	7	7
Apprch %	0	0	0			100	0	0			0	0	100			0	0	100					
Total %	0	0	0		0	28.6	0	0		28.6	0	0	14.3		14.3	0	0	57.1		57.1	0	100	
Unshifted	0	0	0		0	2	0	0		2	0	0	1		1	0	0	4		4	0	0	7
% Unshifted	0	0	0	0	0	100	0	0	0	100	0	0	100	0	100	0	0	100	0	100	0	0	100
Bank 1	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	0	0



All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : DominosWest&Hwy99 AM
Site Code :
Start Date : 4/4/2012
Page No : 2

	DOMINOS WEST Southbound				HWY 99 E Westbound				DOMINOS WEST Northbound				HWY 99 E Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 to 08:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	**1**	**1**	**2**
08:00	0	0	0	0	0	0	0	0	0	0	**1**	**1**	0	0	0	0	1
08:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	2
Total Volume	0	0	0	0	2	0	0	2	0	0	1	1	0	0	2	2	5
% App. Total	0	0	0		100	0	0		0	0	100		0	0	100		
PHF	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.250	.250	.000	.000	.500	.500	.625
Unshifted	0	0	0	0	2	0	0	2	0	0	1	1	0	0	2	2	5
% Unshifted	0	0	0	0	100	0	0	100	0	0	100	100	0	0	100	100	100
Bank 1	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

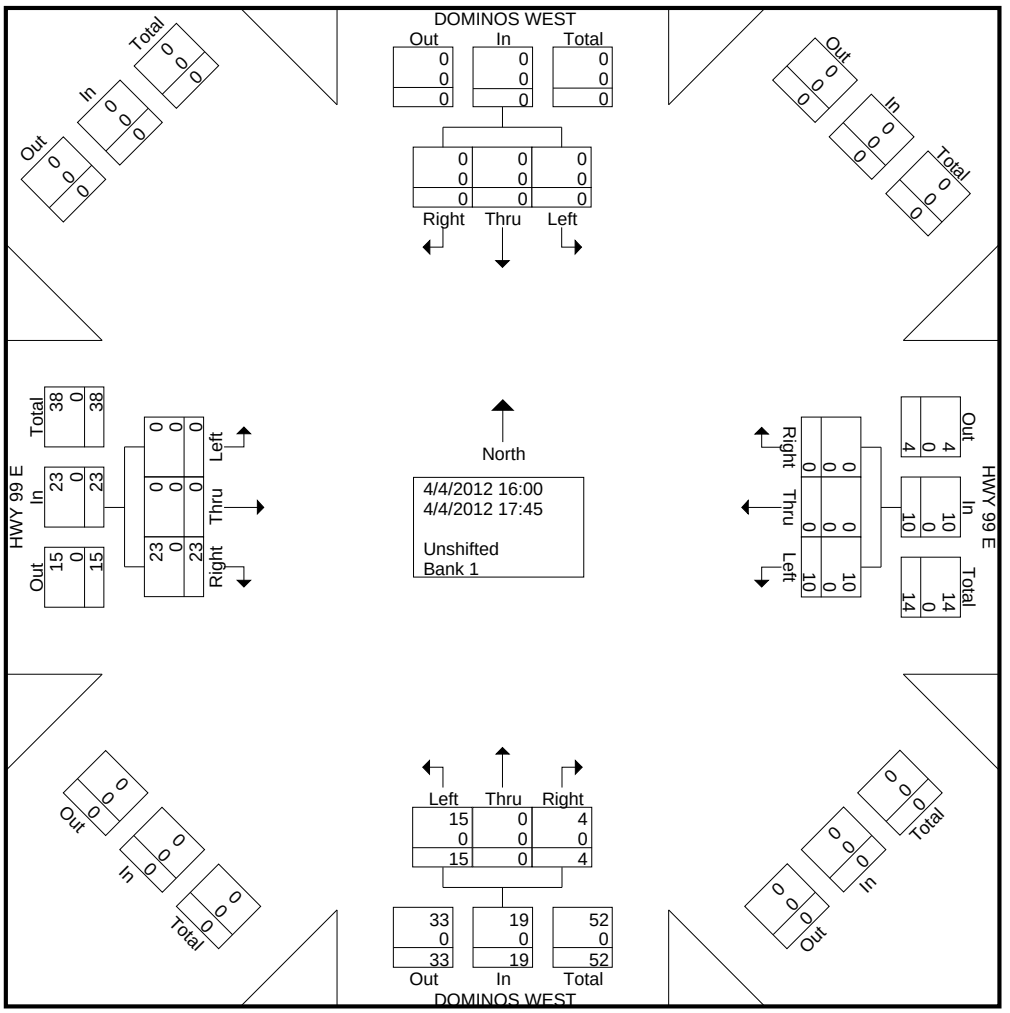


All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : DominosWest&Hwy99 PM
Site Code :
Start Date : 4/4/2012
Page No : 1

Groups Printed- Unshifted - Bank 1

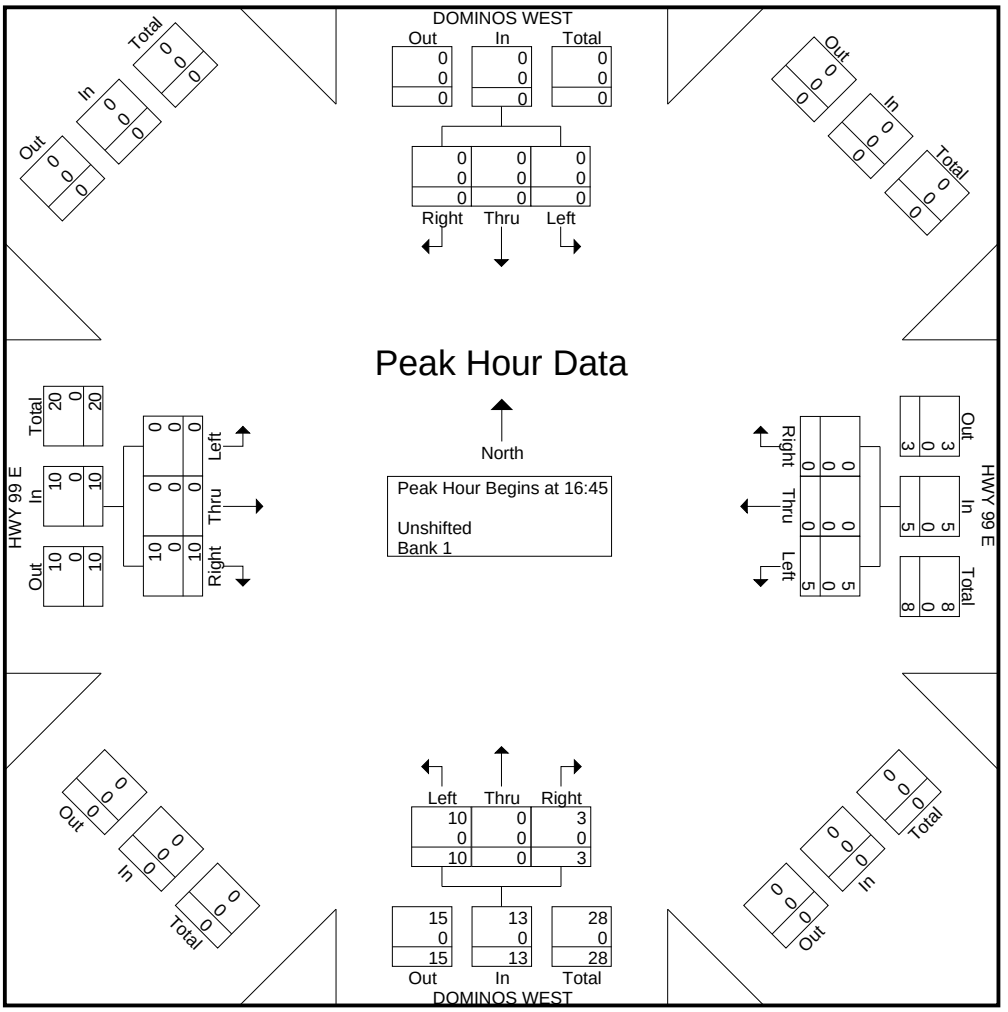
	DOMINOS WEST Southbound					HWY 99 E Westbound					DOMINOS WEST Northbound					HWY 99 E Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:00	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	5	0	5	1	6	7
16:15	0	0	0	0	0	2	0	0	0	2	0	0	1	0	1	0	0	2	0	2	0	5	5
16:30	0	0	0	0	0	2	0	0	0	2	3	0	0	0	3	0	0	2	0	2	0	7	7
16:45	0	0	0	0	0	2	0	0	0	2	3	0	0	0	3	0	0	0	0	0	0	5	5
Total	0	0	0	0	0	6	0	0	0	6	7	0	1	1	8	0	0	9	0	9	1	23	24
17:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	5	0	5	0	6	6
17:15	0	0	0	0	0	1	0	0	0	1	2	0	1	0	3	0	0	2	0	2	0	6	6
17:30	0	0	0	0	0	2	0	0	0	2	4	0	2	0	6	0	0	3	0	3	0	11	11
17:45	0	0	0	0	0	1	0	0	0	1	1	0	0	1	1	0	0	4	0	4	1	6	7
Total	0	0	0	0	0	4	0	0	0	4	8	0	3	1	11	0	0	14	0	14	1	29	30
Grand Total	0	0	0	0	0	10	0	0	0	10	15	0	4	2	19	0	0	23	0	23	2	52	54
Apprch %	0	0	0			100	0	0			78.9	0	21.1			0	0	100					
Total %	0	0	0		0	19.2	0	0		19.2	28.8	0	7.7		36.5	0	0	44.2		44.2	3.7	96.3	
Unshifted	0	0	0		0	10	0	0		10	15	0	4		21	0	0	23		23	0	0	54
% Unshifted	0	0	0	0	0	100	0	0	0	100	100	0	100	100	100	0	0	100	0	100	0	0	100
Bank 1	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	0	0



All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

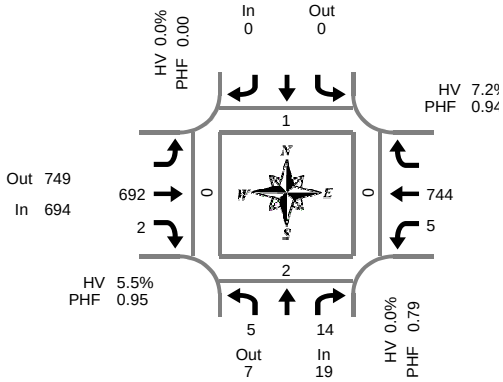
File Name : DominosWest&Hwy99 PM
Site Code :
Start Date : 4/4/2012
Page No : 2

	DOMINOS WEST Southbound				HWY 99 E Westbound				DOMINOS WEST Northbound				HWY 99 E Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:45 to 17:30 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	0	0	0	0	**2**	0	0	**2**	3	0	0	3	0	0	0	0	5
17:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	**5**	**5**	6
17:15	0	0	0	0	1	0	0	1	2	0	1	3	0	0	2	2	6
17:30	0	0	0	0	2	0	0	2	**4**	0	**2**	**6**	0	0	3	3	**11**
Total Volume	0	0	0	0	5	0	0	5	10	0	3	13	0	0	10	10	28
% App. Total	0	0	0		100	0	0		76.9	0	23.1		0	0	100		
PHF	.000	.000	.000	.000	.625	.000	.000	.625	.625	.000	.375	.542	.000	.000	.500	.500	.636
Unshifted	0	0	0	0	5	0	0	5	10	0	3	13	0	0	10	10	28
% Unshifted	0	0	0	0	100	0	0	100	100	0	100	100	0	0	100	100	100
Bank 1	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



Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:30 AM to 8:30 AM

S Knott St & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

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

Interval Start Time	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	1		4				156	0		0	150		311	0	1	0	0
7:15 AM	1		1				164	0		2	149		317	0	0	0	0
7:30 AM	1		5				175	0		2	181		364	1	0	0	0
7:45 AM	2		3				181	1		1	174		362	0	1	0	0
8:00 AM	2		1				162	0		0	191		356	0	1	0	0
8:15 AM	0		5				174	1		2	198		380	0	0	0	0
8:30 AM	1		3				181	1		1	151		338	0	0	0	0
8:45 AM	1		2				135	3		1	137		279	0	2	0	0
Total Survey	9		24				1,328	6		9	1,331		2,707	1	5	0	0

Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	19	7	26	0	0	0	694	749	1,443	749	706	1,455	1,462	1	2	0	0
%HV	0.0%			0.0%			5.5%			7.2%			6.3%				
PHF	0.79			0.00			0.95			0.94			0.96				

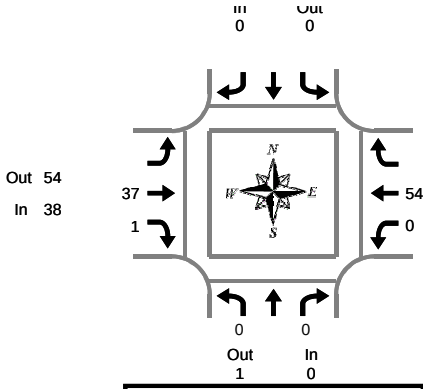
By Movement	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	5		14				692	2		5	744		1,462
%HV	0.0%	NA	0.0%	NA	NA	NA	5.3%	50.0%		0.0%	7.3%	NA	6.3%
PHF	0.63		0.70				0.96	0.50		0.63	0.94		0.96

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	5		13				676	1		5	654		1,354	1	2	0	0
7:15 AM	6		10				682	1		5	695		1,399	1	2	0	0
7:30 AM	5		14				692	2		5	744		1,462	1	2	0	0
7:45 AM	5		12				698	3		4	714		1,436	0	2	0	0
8:00 AM	4		11				652	5		4	677		1,353	0	3	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



S Knott St & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		11	0	11	0	7		7	18
7:15 AM	0		0	0				0		6	0	6	0	6		6	12
7:30 AM	0		0	0				0		3	0	3	0	11		11	14
7:45 AM	0		0	0				0		12	0	12	0	12		12	24
8:00 AM	0		0	0				0		9	0	9	0	17		17	26
8:15 AM	0		0	0				0		13	1	14	0	14		14	28
8:30 AM	0		0	0				0		13	0	13	0	13		13	26
8:45 AM	0		0	0				0		15	0	15	0	12		12	27
Total Survey	0		0	0				0		82	1	83	0	92		92	175

Heavy Vehicle Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	1	1	0	0	0	38	54	92	54	37	91	92
PHF	0.00			0.00			0.23			0.31			0.28

By Movement	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		0	0				0		37	1	38	0	54		54	92
PHF	0.00		0.00	0.00				0.00		0.23	0.25	0.23	0.00	0.31		0.31	0.28

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

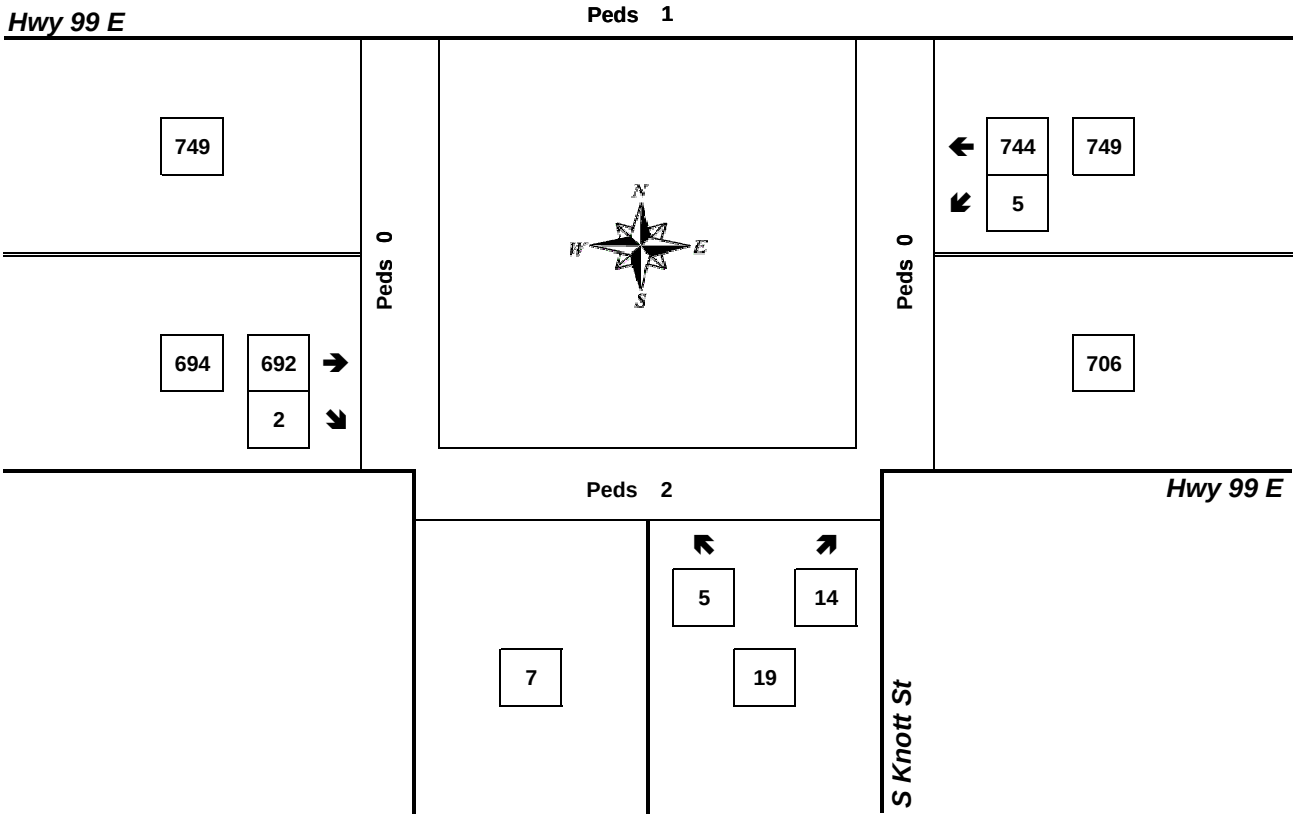
Interval Start Time	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		32	0	32	0	36		36	68
7:15 AM	0		0	0				0		30	0	30	0	46		46	76
7:30 AM	0		0	0				0		37	1	38	0	54		54	92
7:45 AM	0		0	0				0		47	1	48	0	56		56	104
8:00 AM	0		0	0				0		50	1	51	0	56		56	107

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Knott St & Hwy 99 E

7:30 AM to 8:30 AM
Wednesday, April 04, 2012

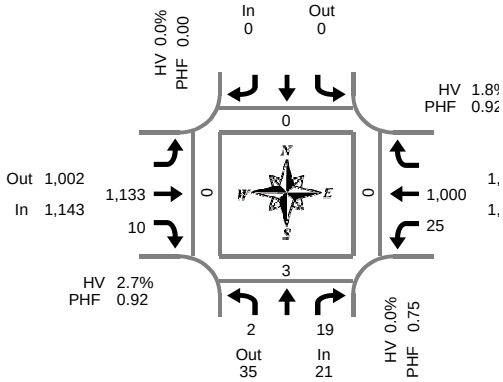


Approach	PHF	HV%	Volume
EB	0.95	5.5%	694
WB	0.94	7.2%	749
NB	0.79	0.0%	19
SB	0.00	0.0%	0
Intersection	0.96	6.3%	1,462

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



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

S Knott St & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	0		7				244	1		5	229		486	0	2	0	0
4:15 PM	1		1				266	2		6	236		512	0	0	0	0
4:30 PM	2		3				254	0		4	256		519	0	1	0	0
4:45 PM	0		3				263	3		7	245		521	0	1	0	0
5:00 PM	1		5				308	4		10	268		596	0	0	0	0
5:15 PM	1		6				269	1		6	261		544	0	1	0	0
5:30 PM	0		5				293	2		2	226		528	0	1	0	0
5:45 PM	0		4				208	1		5	192		410	0	11	0	0
Total Survey	5		34				2,105	14		45	1,913		4,116	0	17	0	0

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

By Approach	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	21	35	56	0	0	0	1,143	1,002	2,145	1,025	1,152	2,177	2,189	0	3	0	0
%HV	0.0%			0.0%			2.7%			1.8%			2.2%				
PHF	0.75			0.00			0.92			0.92			0.92				

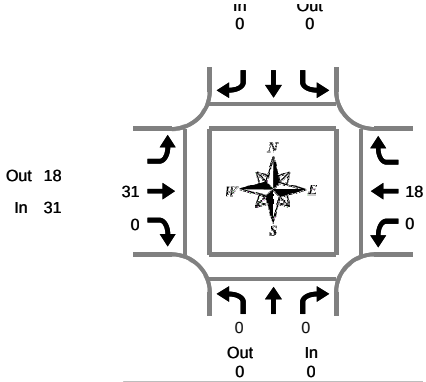
By Movement	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	2		19				1,133	10		25	1,000		2,189
%HV	0.0%	NA	0.0%	NA	NA	NA	2.7%	0.0%		0.0%	1.8%	NA	2.2%
PHF	0.50		0.79				0.92	0.63		0.63	0.93		0.92

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

Interval Start Time	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	3		14				1,027	6		22	966		2,038	0	4	0	0
4:15 PM	4		12				1,091	9		27	1,005		2,148	0	2	0	0
4:30 PM	4		17				1,094	8		27	1,030		2,180	0	3	0	0
4:45 PM	2		19				1,133	10		25	1,000		2,189	0	3	0	0
5:00 PM	2		20				1,078	8		23	947		2,078	0	13	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Knott St & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		6	0	6	0	6		6	12
4:15 PM	0		0	0				0		8	0	8	0	7		7	15
4:30 PM	0		1	1				0		5	0	5	0	6		6	12
4:45 PM	0		0	0				0		9	0	9	0	6		6	15
5:00 PM	0		0	0				0		11	0	11	0	4		4	15
5:15 PM	0		0	0				0		7	0	7	0	3		3	10
5:30 PM	0		0	0				0		4	0	4	0	5		5	9
5:45 PM	0		0	0				0		3	0	3	0	4		4	7
Total Survey	0		1	1				0		53	0	53	0	41		41	95

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	31	18	49	18	31	49	49
PHF	0.00			0.00			0.29			0.24			0.29

By Movement	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		0	0				0		31	0	31	0	18		18	49
PHF	0.00		0.00	0.00				0.00		0.29	0.00	0.29	0.00	0.24		0.24	0.29

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

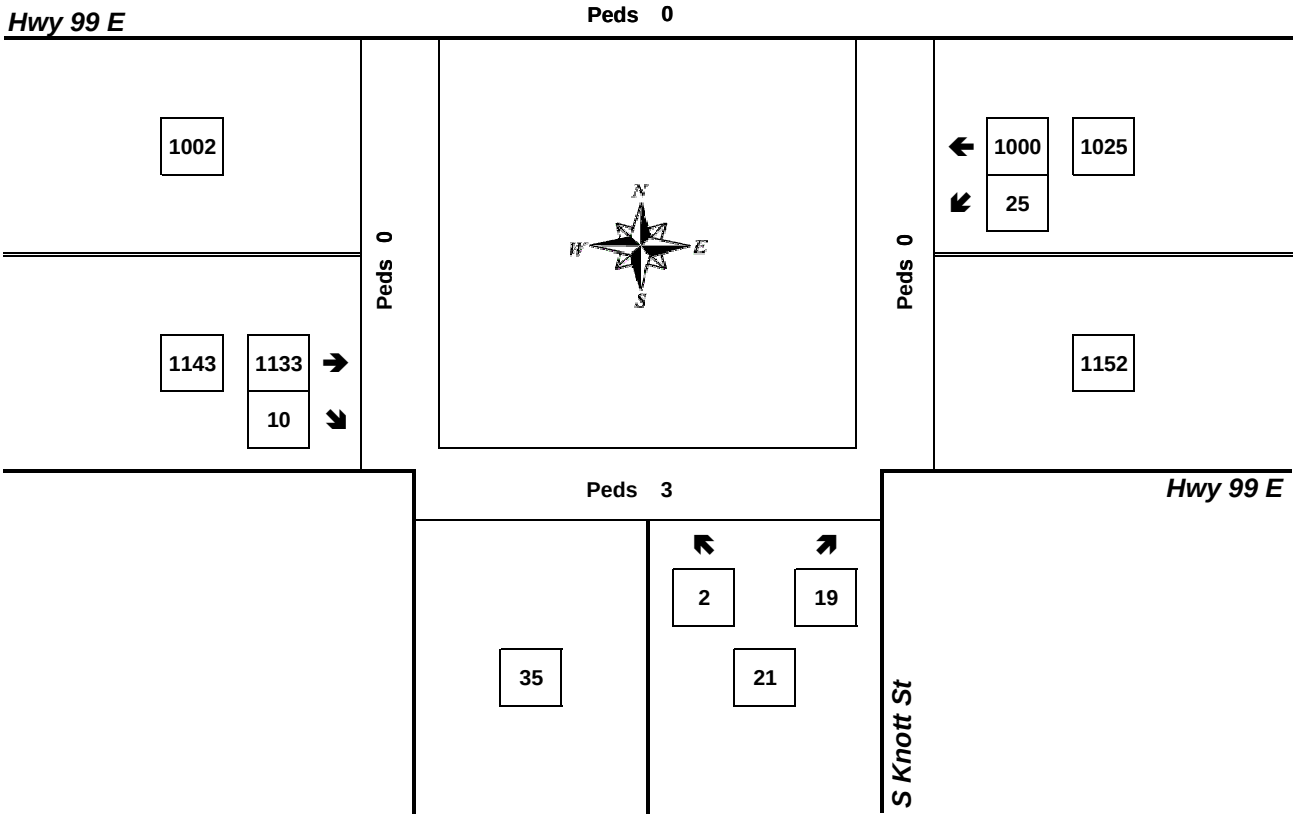
Interval Start Time	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		1	1				0		28	0	28	0	25		25	54
4:15 PM	0		1	1				0		33	0	33	0	23		23	57
4:30 PM	0		1	1				0		32	0	32	0	19		19	52
4:45 PM	0		0	0				0		31	0	31	0	18		18	49
5:00 PM	0		0	0				0		25	0	25	0	16		16	41

Peak Hour Summary

Clay Carney
(503) 833-2740

S Knott St & Hwy 99 E

4:45 PM to 5:45 PM
Wednesday, April 04, 2012



Approach	PHF	HV%	Volume
EB	0.92	2.7%	1,143
WB	0.92	1.8%	1,025
NB	0.75	0.0%	21
SB	0.00	0.0%	0
Intersection	0.92	2.2%	2,189

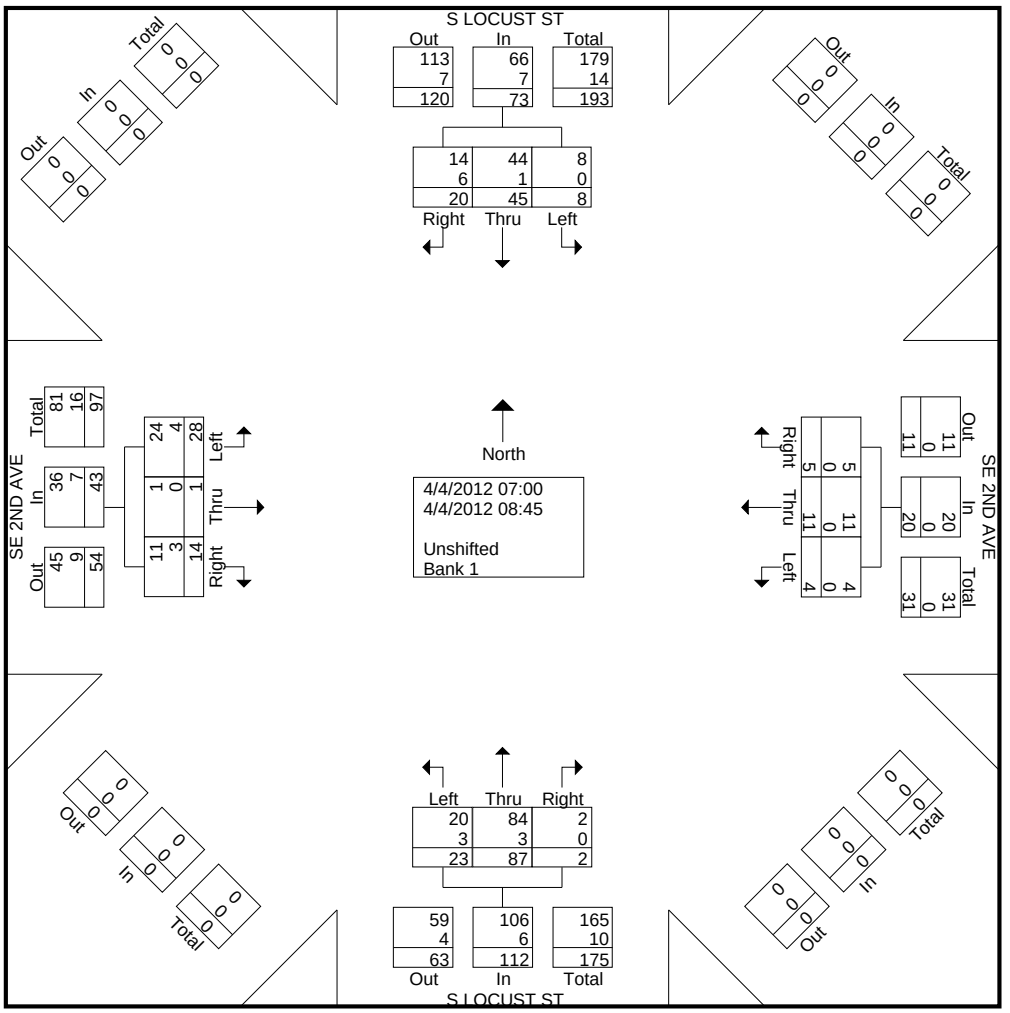
Count Period: 4:00 PM to 6:00 PM

All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : Locust&2nd AM
Site Code :
Start Date : 4/4/2012
Page No : 1

Groups Printed- Unshifted - Bank 1

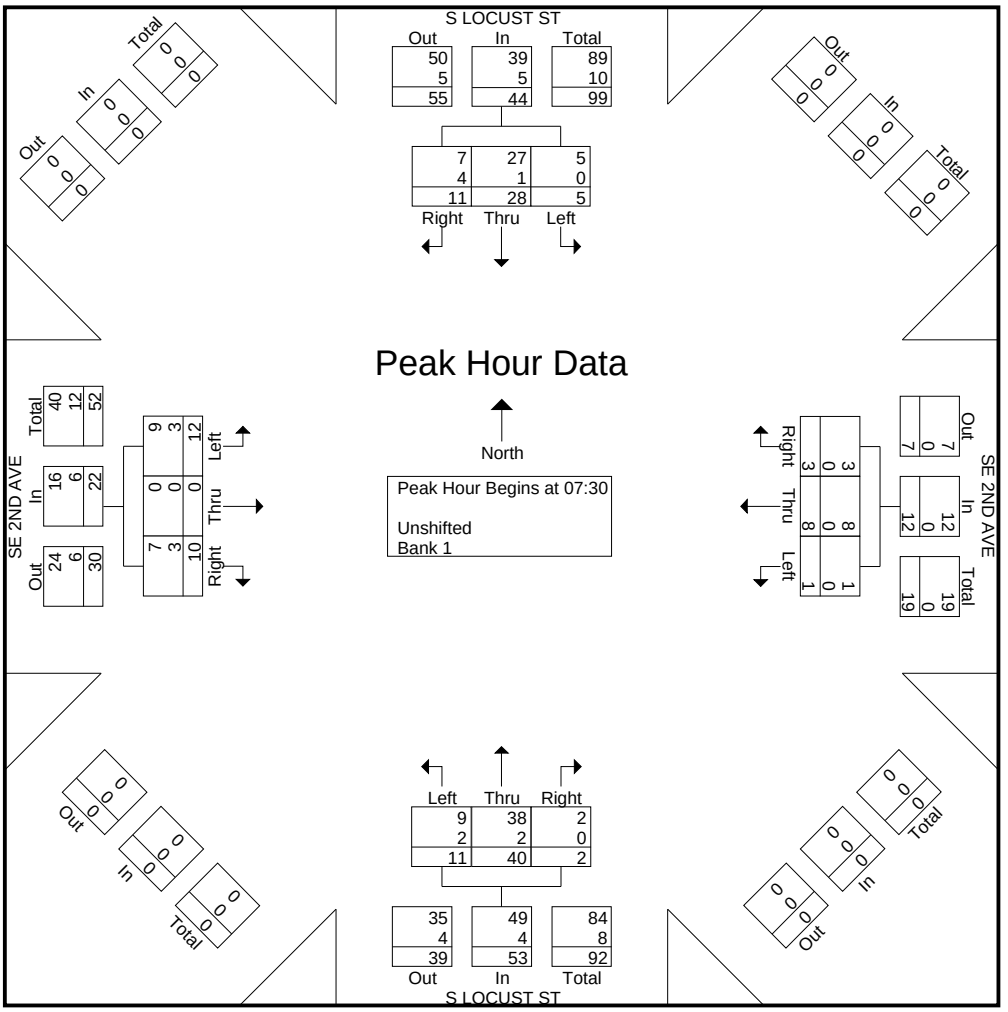
	S LOCUST ST Southbound					SE 2ND AVE Westbound					S LOCUST ST Northbound					SE 2ND AVE Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00	2	5	3	1	10	3	1	1	0	5	4	12	0	1	16	5	0	0	0	5	2	36	38
07:15	0	3	3	0	6	0	0	0	0	0	5	10	0	1	15	3	0	3	1	6	2	27	29
07:30	1	7	4	1	12	0	1	0	2	1	3	13	0	3	16	4	0	1	0	5	6	34	40
07:45	3	2	5	0	10	0	3	1	1	4	3	7	1	2	11	2	0	5	0	7	3	32	35
Total	6	17	15	2	38	3	5	2	3	10	15	42	1	7	58	14	0	9	1	23	13	129	142
08:00	1	13	2	0	16	1	2	2	2	5	3	9	0	8	12	3	0	3	0	6	10	39	49
08:15	0	6	0	0	6	0	2	0	2	2	2	11	1	0	14	3	0	1	0	4	2	26	28
08:30	0	3	3	0	6	0	1	0	0	1	1	13	0	0	14	5	0	1	0	6	0	27	27
08:45	1	6	0	0	7	0	1	1	0	2	2	12	0	1	14	3	1	0	0	4	1	27	28
Total	2	28	5	0	35	1	6	3	4	10	8	45	1	9	54	14	1	5	0	20	13	119	132
Grand Total	8	45	20	2	73	4	11	5	7	20	23	87	2	16	112	28	1	14	1	43	26	248	274
Apprch %	11	61.6	27.4			20	55	25			20.5	77.7	1.8			65.1	2.3	32.6					
Total %	3.2	18.1	8.1		29.4	1.6	4.4	2		8.1	9.3	35.1	0.8		45.2	11.3	0.4	5.6		17.3	9.5	90.5	
Unshifted	8	44	14		68	4	11	5		27	20	84	2		122	24	1	11		37	0	0	254
% Unshifted	100	97.8	70	100	90.7	100	100	100	100	100	87	96.6	100	100	95.3	85.7	100	78.6	100	84.1	0	0	92.7
Bank 1	0	1	6		7	0	0	0		0	3	3	0		6	4	0	3		7	0	0	20
% Bank 1	0	2.2	30	0	9.3	0	0	0	0	0	13	3.4	0	0	4.7	14.3	0	21.4	0	15.9	0	0	7.3



All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : Locust&2nd AM
Site Code :
Start Date : 4/4/2012
Page No : 2

	S LOCUST ST Southbound				SE 2ND AVE Westbound				S LOCUST ST Northbound				SE 2ND AVE Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 to 08:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30																	
07:30	1	7	4	12	0	1	0	1	**3**	**13**	0	**16**	**4**	0	1	5	34
07:45	**3**	2	**5**	10	0	**3**	1	4	3	7	**1**	11	2	0	**5**	**7**	32
08:00	1	**13**	2	**16**	**1**	2	**2**	**5**	3	9	0	12	3	0	3	6	**39**
08:15	0	6	0	6	0	2	0	2	2	11	1	14	3	0	1	4	26
Total Volume	5	28	11	44	1	8	3	12	11	40	2	53	12	0	10	22	131
% App. Total	11.4	63.6	25		8.3	66.7	25		20.8	75.5	3.8		54.5	0	45.5		
PHF	.417	.538	.550	.688	.250	.667	.375	.600	.917	.769	.500	.828	.750	.000	.500	.786	.840
Unshifted	5	27	7	39	1	8	3	12	9	38	2	49	9	0	7	16	116
% Unshifted	100	96.4	63.6	88.6	100	100	100	100	81.8	95.0	100	92.5	75.0	0	70.0	72.7	88.5
Bank 1	0	1	4	5	0	0	0	0	2	2	0	4	3	0	3	6	15
% Bank 1	0	3.6	36.4	11.4	0	0	0	0	18.2	5.0	0	7.5	25.0	0	30.0	27.3	11.5

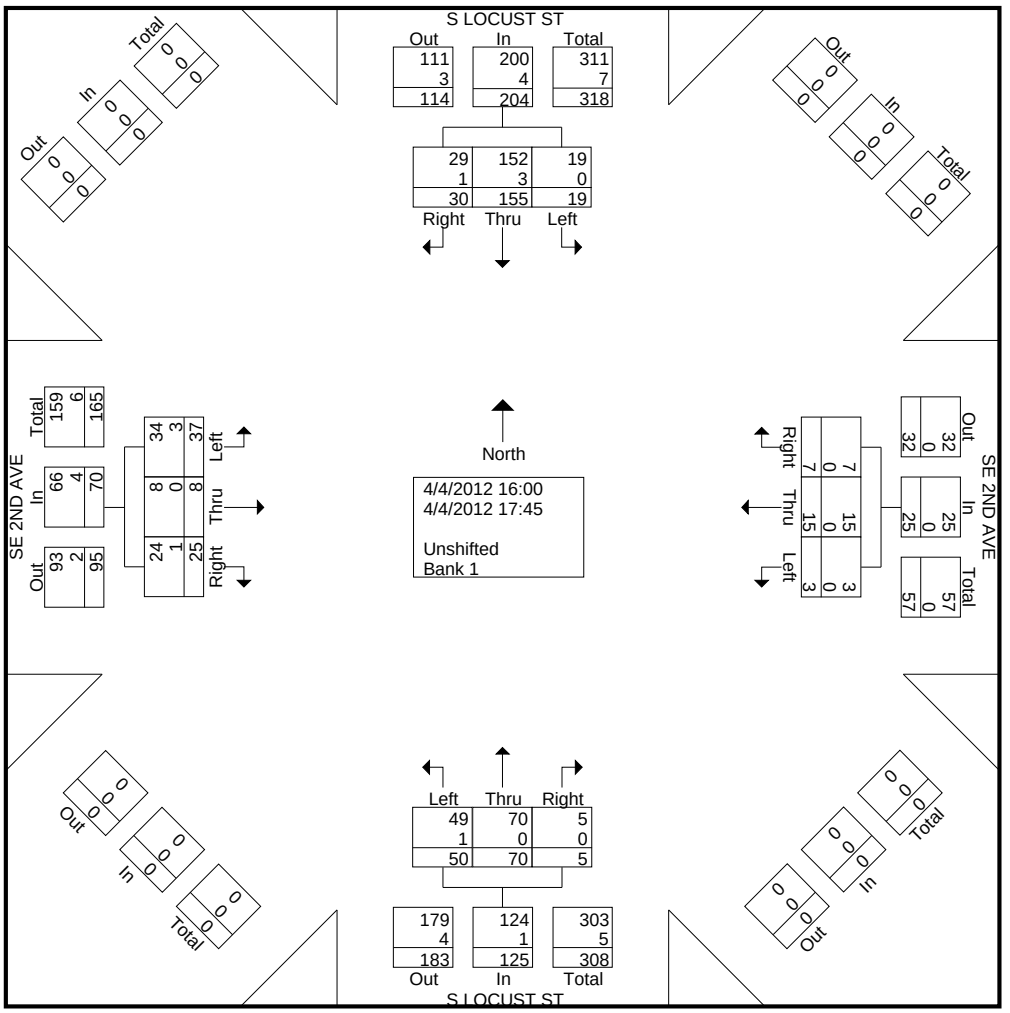


All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : Locust&2nd PM
Site Code :
Start Date : 4/4/2012
Page No : 1

Groups Printed- Unshifted - Bank 1

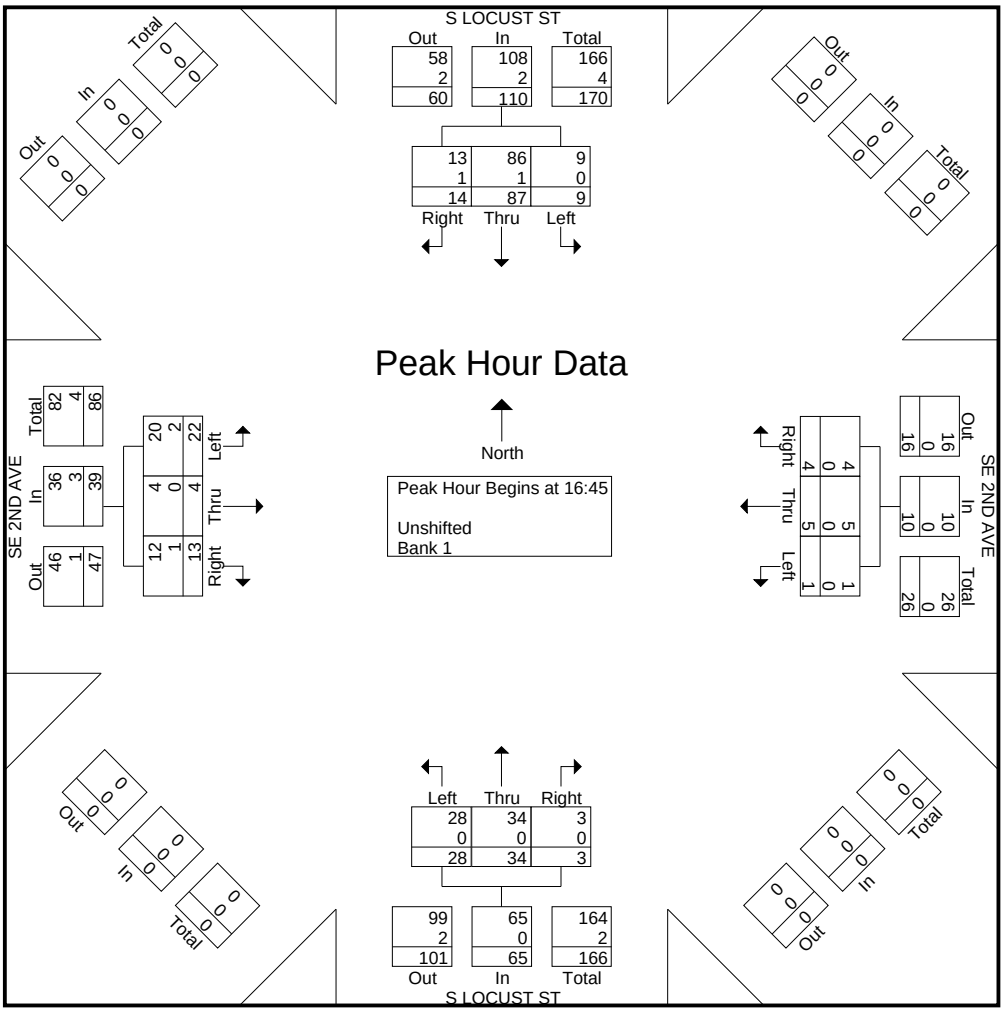
	S LOCUST ST Southbound					SE 2ND AVE Westbound					S LOCUST ST Northbound					SE 2ND AVE Eastbound							
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
16:00	4	17	5	0	26	1	4	1	3	6	1	9	0	5	10	2	2	1	0	5	8	47	55
16:15	1	15	3	1	19	0	1	1	0	2	3	6	0	10	9	8	0	2	2	10	13	40	53
16:30	3	16	6	0	25	1	4	0	3	5	15	12	2	4	29	3	1	2	0	6	7	65	72
16:45	2	22	1	0	25	0	1	1	1	2	5	10	0	5	15	8	1	4	0	13	6	55	61
Total	10	70	15	1	95	2	10	3	7	15	24	37	2	24	63	21	4	9	2	34	34	207	241
17:00	3	22	7	2	32	0	0	0	3	0	6	8	1	4	15	7	2	3	0	12	9	59	68
17:15	1	20	1	0	22	0	3	3	1	6	5	9	0	2	14	2	1	2	0	5	3	47	50
17:30	3	23	5	2	31	1	1	0	0	2	12	7	2	2	21	5	0	4	3	9	7	63	70
17:45	2	20	2	0	24	0	1	1	1	2	3	9	0	3	12	2	1	7	0	10	4	48	52
Total	9	85	15	4	109	1	5	4	5	10	26	33	3	11	62	16	4	16	3	36	23	217	240
Grand Total	19	155	30	5	204	3	15	7	12	25	50	70	5	35	125	37	8	25	5	70	57	424	481
Apprch %	9.3	76	14.7			12	60	28			40	56	4			52.9	11.4	35.7					
Total %	4.5	36.6	7.1		48.1	0.7	3.5	1.7		5.9	11.8	16.5	1.2		29.5	8.7	1.9	5.9		16.5	11.9	88.1	
Unshifted	19	152	29		205	3	15	7		37	49	70	5		159	34	8	24		71	0	0	472
% Unshifted	100	98.1	96.7	100	98.1	100	100	100	100	100	98	100	100	100	99.4	91.9	100	96	100	94.7	0	0	98.1
Bank 1	0	3	1		4	0	0	0		0	1	0	0		1	3	0	1		4	0	0	9
% Bank 1	0	1.9	3.3	0	1.9	0	0	0	0	0	2	0	0	0	0.6	8.1	0	4	0	5.3	0	0	1.9



All Traffic Data Services, Inc.
15105 SE 17th St. Vancouver, WA. 98683
503-833-2740

File Name : Locust&2nd PM
Site Code :
Start Date : 4/4/2012
Page No : 2

	S LOCUST ST Southbound				SE 2ND AVE Westbound				S LOCUST ST Northbound				SE 2ND AVE Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:45 to 17:30 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:45																	
16:45	2	22	1	25	0	1	1	2	5	**10**	0	15	**8**	1	**4**	**13**	55
17:00	**3**	22	**7**	**32**	0	0	0	0	6	8	1	15	7	**2**	3	12	59
17:15	1	20	1	22	0	**3**	**3**	**6**	5	9	0	14	2	1	2	5	47
17:30	3	**23**	5	31	**1**	1	0	2	**12**	7	**2**	**21**	5	0	4	9	**63**
Total Volume	9	87	14	110	1	5	4	10	28	34	3	65	22	4	13	39	224
% App. Total	8.2	79.1	12.7		10	50	40		43.1	52.3	4.6		56.4	10.3	33.3		
PHF	.750	.946	.500	.859	.250	.417	.333	.417	.583	.850	.375	.774	.688	.500	.813	.750	.889
Unshifted	9	86	13	108	1	5	4	10	28	34	3	65	20	4	12	36	219
% Unshifted	100	98.9	92.9	98.2	100	100	100	100	100	100	100	100	90.9	100	92.3	92.3	97.8
Bank 1	0	1	1	2	0	0	0	0	0	0	0	0	2	0	1	3	5
% Bank 1	0	1.1	7.1	1.8	0	0	0	0	0	0	0	0	9.1	0	7.7	7.7	2.2



APPENDIX D

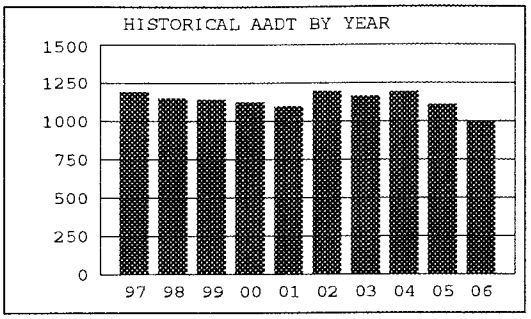
Seasonal Adjustment

2011 ATR CHARACTERISTIC TABLE (Printed: 10/27/11)										
SEASONAL TRAFFIC TREND	**AREA TYPE**	**# OF LANES**	**WEEKLY TRAFFIC TREND**	**AADT**	**OHP CLASSIFICATION**	**ATR**	**COUNTY**	**HIGHWAY ROUTE, NAME, & LOCATION**	**MP**	**STATE HIGHWAY NUMBER**
COMMUTER	SMALL URBAN	5	WEEKDAY	22500	REGIONAL HIGHWAY	**18-018**	KLAMATH	OR39, KLAMATH FALLS-MALLIN HWY, 0.46 MILES SOUTH OF MAIN STREET	-4.00	50

Location: OR140 MP 44.98, KLAMATH FALLS-LAKEVIEW HWY, NO. 20 Recorder: BEATTY, 18-017
4.20 miles east of Yellow Jacket Springs Rd Installed: January, 1958

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1997	1192	191	16.4	14.4	13.3	12.8
1998	1151	212	17.5	14.5	13.4	13.0
1999	1143	208	17.9	14.8	13.6	12.9
2000	1125	187	16.1	13.8	12.9	12.7
2001	1098	190	16.3	14.2	13.3	12.6
2002	1196	187	15.6	13.8	13.1	12.6
2003	1163	196	16.6	13.8	12.7	12.5
2004	1191	182	30.8	13.5	12.7	12.3
2005	1107	181	15.4	13.5	13.0	12.5
2006	997	183	16.2	14.0	13.3	12.7



2006 TRAFFIC DATA

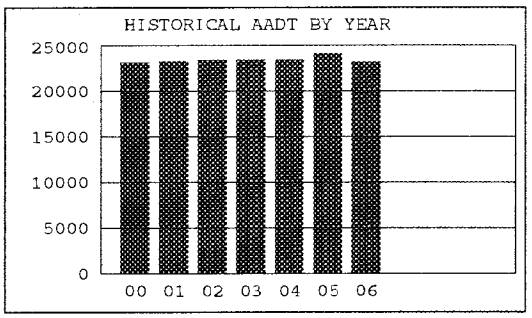
	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	709	71	656	66
February	817	82	784	79
March	793	80	751	75
April	881	88	859	86
May	1042	105	1043	105
June	1280	128	1255	126
July	1323	133	1324	133
August	1330	133	1311	131
September	1270	127	1274	128
October	1158	116	1152	116
November	822	82	823	83
December	770	77	732	73

Classification Breakdown	Percent of ADT
Passenger Cars	21.4
Other 2 axle 4 tire vehicles	55.0
Single Unit 2 axle 6 tire	6.9
Single Unit 3 axle	5.0
Single Unit 4 axle or more	0.1
Single Trailer Truck 4 axle or less	0.0
Single Trailer Truck 5 axle	7.8
Single Trailer Truck 6 axle or more	0.3
Dbl-Trailer Truck 5 axle or less	1.1
Dbl-Trailer Truck 6 axle	0.0
Dbl-Trailer Truck 7 axle or more	0.9
Triple Trailer Trucks	0.0
Buses	1.2
Motorcycles & Scooters	0.3

Location: OR39/US97B MP -4.00, K FALLS-MALIN HWY, NO. 50 Recorder: KLAMATH FALLS, 18-018
0.46 mile south of Main St Installed: November, 1999

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	23138	125	11.2	10.6	10.4	10.2
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	****	****	****	****



2006 TRAFFIC DATA

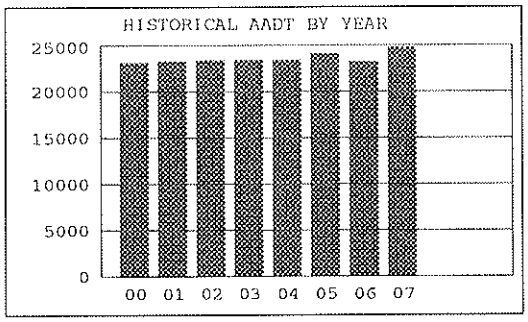
	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	20828	90	18771	81
February	22785	98	20484	88
March	22480	97	20266	87
April	24249	105	21924	94
May	26591	115	24629	106
June	27692	119	25314	109
July	26358	114	24319	105
August	26707	115	24153	104
September	29745	128	26831	116
October	29335	126	26431	114
November	25510	110	23051	99
December	23965	103	22245	96

Classification Breakdown	Percent of ADT
Passenger Cars	39.5
Other 2 axle 4 tire vehicles	56.4
Single Unit 2 axle 6 tire	1.8
Single Unit 3 axle	0.4
Single Unit 4 axle or more	0.0
Single Trailer Truck 4 axle or less	0.0
Single Trailer Truck 5 axle	0.7
Single Trailer Truck 6 axle or more	0.1
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.0
Dbl-Trailer Truck 7 axle or more	0.1
Triple Trailer Trucks	0.0
Buses	0.7
Motorcycles & Scooters	0.3

Location: OR39-US97BUS MP -4.00, K-FALLS-MALIN HWY, NO. 50 Recorder: KLAMATH FALLS, 18-018
0.46 miles south of Main St Installed: November, 1999

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	23138	125	11.2	10.6	10.4	10.2
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	****	****	****	****
2007	24757	131	11.6	10.6	10.5	10.4



2007 TRAFFIC DATA

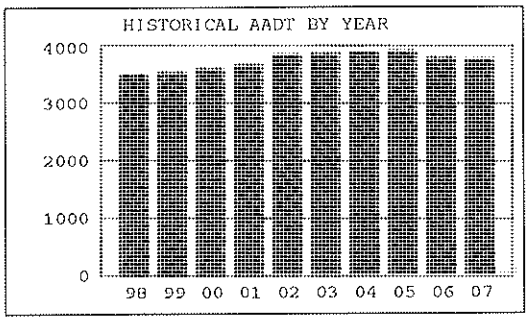
	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	24507	99	22528	91
February	25040	101	22880	92
March	26201	106	24001	97
April	28470	115	25708	104
May	28797	116	26142	106
June	29643	120	26920	109
July	27687	112	25242	102
August	28088	113	25452	103
September	28861	117	26166	106
October	29132	118	26324	106
November	27012	109	24426	99
December	23211	94	21294	86

Classification Breakdown	Percent of ADT
Passenger Cars	67.6
Other 2 axle 4 tire vehicles	28.5
Single Unit 2 axle 6 tire	1.4
Single Unit 3 axle	0.4
Single Unit 4 axle or more	0.1
Single Trailer Truck 4 axle or less	0.3
Single Trailer Truck 5 axle	0.5
Single Trailer Truck 6 axle or more	0.1
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.0
Dbl-Trailer Truck 7 axle or more	0.1
Triple Trailer Trucks	0.0
Buses	0.6
Motorcycles & Scooters	0.5

Location: US97 MP 291.73, THE DALLES-CALIFORNIA HWY, NO. 4 Recorder: MIDLAND, 18-019
At the Oregon-California State Line Installed: January, 1955

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1998	3515	160	14.3	12.0	11.6	11.2
1999	3544	162	13.2	12.0	11.3	11.0
2000	3616	163	12.9	11.6	11.2	10.9
2001	3669	150	14.6	12.1	11.7	11.4
2002	3848	162	14.8	12.8	11.8	11.5
2003	3869	159	14.3	12.4	11.7	11.3
2004	3884	154	13.3	12.3	11.5	11.2
2005	3901	170	20.1	13.0	12.1	11.8
2006	3786	169	16.7	12.1	11.5	11.3
2007	3755	147	14.0	12.2	11.8	11.5



2007 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	2807	75	2769	74
February	2734	73	2810	75
March	3233	86	3350	89
April	3590	96	3662	98
May	3967	106	3973	106
June	4377	117	4528	121
July	4557	121	4774	127
August	4511	120	4726	126
September	4159	111	4156	111
October	3840	102	3857	103
November	3504	93	3565	95
December	2810	75	2893	77

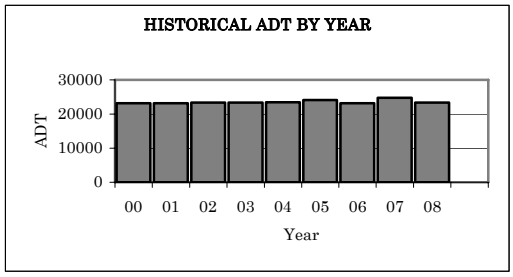
Classification Breakdown	Percent of ADT
Passenger Cars	34.8
Other 2 axle 4 tire vehicles	27.6
Single Unit 2 axle 6 tire	8.6
Single Unit 3 axle	1.4
Single Unit 4 axle or more	0.0
Single Trailer Truck 4 axle or less	2.5
Single Trailer Truck 5 axle	23.3
Single Trailer Truck 6 axle or more	0.3
Dbl-Trailer Truck 5 axle or less	0.2
Dbl-Trailer Truck 6 axle	0.3
Dbl-Trailer Truck 7 axle or more	0.0
Triple Trailer Trucks	0.0
Buses	0.3
Motorcycles & Scooters	0.7

Location: OR39; MP -4.00; KLAMATH FALLS-MALIN HIGHWAY NO. 50; 0.46 mile south of Main Street

Site Name: Klamath Falls (18-018)
Installed: November, 1999

HISTORICAL TRAFFIC DATA

		Percent of AADT			
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	23138	125	11.2	10.6	10.4	10.2
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	***	***	***	***
2007	24757	131	11.6	10.6	10.5	10.4
2008	23409	131	10.8	10.4	10.3	10.2



2008 TRAFFIC DATA

	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	22166	95	20556	88
February	24464	105	21574	92
March	25172	108	22751	97
April	26888	115	24295	104
May	26774	114	24622	105
June	26491	113	24285	104
July	25518	109	22807	97
August	25267	108	22927	98
September	26814	115	24978	107
October	29187	125	26905	115
November	27376	117	25210	108
December	23000	98	20000	85

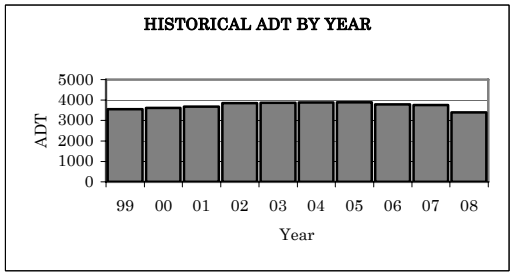
Classification Breakdown	Percent of AADT
Motorcyles	0.5
Passenger cars	67.6
Light Trucks	28.5
Buses	0.6
Single unit trucks (2 axles)	1.4
Single unit trucks (3 axles)	0.4
Single unit trucks (4 or more axles)	0.1
Single trailer trucks (4 or less axles)	0.3
Single trailer trucks (5 axles)	0.5
Single trailer trucks (6 or more axles)	0.1
Multi trailer trucks (5 or less axles)	0.0
Multi trailer trucks (6 axles)	0.0
Multi trailer trucks (7 or more axles)	0.1

Location: US97; MP 291.73; THE DALLES-CALIFORNIA HIGHWAY NO. 4; At the Oregon-California State Line

Site Name: Midland (18-019)
Installed: January, 1955

HISTORICAL TRAFFIC DATA

		Percent of AADT			
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1999	3544	162	13.2	12.0	11.3	11.0
2000	3616	163	12.9	11.6	11.2	10.9
2001	3669	150	14.6	12.1	11.7	11.4
2002	3848	162	14.8	12.8	11.8	11.5
2003	3869	159	14.3	12.4	11.7	11.3
2004	3884	154	13.3	12.3	11.5	11.2
2005	3901	170	20.1	13.0	12.1	11.8
2006	3786	169	16.7	12.1	11.5	11.3
2007	3755	147	14.0	12.2	11.8	11.5
2008	3402	159	15.1	13.0	12.1	11.7



2008 TRAFFIC DATA

	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	2201	65	2194	64
February	2576	76	2519	74
March	2982	88	3084	91
April	3079	91	3174	93
May	3593	106	3582	105
June	4000	118	4120	121
July	4324	127	4395	129
August	4152	122	4300	126
September	3778	111	3796	112
October	3768	111	3742	110
November	3247	95	3327	98
December	2619	77	2591	76

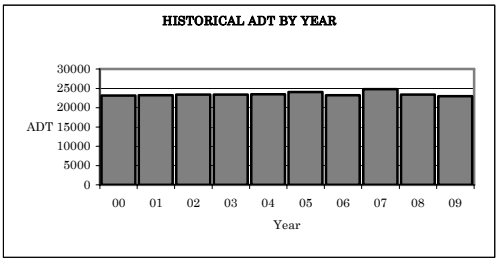
Classification Breakdown	Percent of AADT
Motorcyles	0.7
Passenger cars	33.7
Light Trucks	27.5
Buses	0.3
Single unit trucks (2 axles)	9.9
Single unit trucks (3 axles)	0.9
Single unit trucks (4 or more axles)	0.0
Single trailer trucks (4 or less axles)	2.6
Single trailer trucks (5 axles)	23.7
Single trailer trucks (6 or more axles)	0.3
Multi trailer trucks (5 or less axles)	0.2
Multi trailer trucks (6 axles)	0.3
Multi trailer trucks (7 or more axles)	0.0

Location: OR39; MP -4.00; KLAMATH FALLS-MALIN HIGHWAY NO. 50; 0.46 mile south of Main Street

Site Name: Klamath Falls (18-018)
Installed: November, 1999

HISTORICAL TRAFFIC DATA

		Percent of ADT				
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	23138	125	11.2	10.6	10.4	10.2
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	***	***	***	***
2007	24757	131	11.6	10.6	10.5	10.4
2008	23409	131	10.8	10.4	10.3	10.2
2009	22965	128	12.6	10.2	10.1	10.0



2009 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	26336	115	24425	106
February	26400	115	24500	107
March	24395	106	22076	96
April	26366	115	23979	104
May	25925	113	23749	103
June	26022	113	23827	104
July	25165	110	22537	98
August	25082	109	22781	99
September	24666	107	22445	98
October	25456	111	23374	102
November	24003	105	21674	94
December	22810	99	20209	88

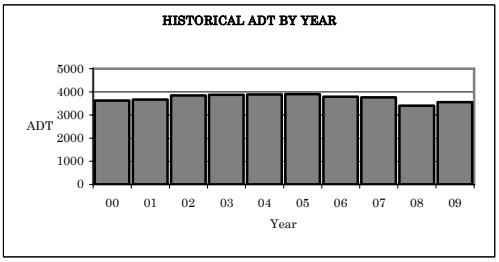
Classification Breakdown	Percent of ADT
Motorcyles	0.48
Passenger cars	67.62
Light Trucks	28.50
Buses	0.58
Single unit trucks (2 axles)	1.38
Single unit trucks (3 axles)	0.41
Single unit trucks (4 or more axles)	0.05
Single trailer trucks (4 or less axles)	0.32
Single trailer trucks (5 axles)	0.46
Single trailer trucks (6 or more axles)	0.13
Multi trailer trucks (5 or less axles)	0.01
Multi trailer trucks (6 axles)	0.00
Multi trailer trucks (7 or more axles)	0.06

Location: US97; MP 291.73; THE DALLES-CALIFORNIA HIGHWAY NO. 4; At the Oregon-California State Line

Site Name: Midland (18-019)
Installed: January, 1955

HISTORICAL TRAFFIC DATA

		Percent of ADT				
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	3616	163	12.9	11.6	11.2	10.9
2001	3669	150	14.6	12.1	11.7	11.4
2002	3848	162	14.8	12.8	11.8	11.5
2003	3869	159	14.3	12.4	11.7	11.3
2004	3884	154	13.3	12.3	11.5	11.2
2005	3901	170	20.1	13.0	12.1	11.8
2006	3786	169	16.7	12.1	11.5	11.3
2007	3755	147	14.0	12.2	11.8	11.5
2008	3402	159	15.1	13.0	12.1	11.7
2009	3550	157	14.5	12.9	12.2	11.8



2009 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	2483	70	2540	72
February	2525	71	2564	72
March	2842	80	2969	84
April	3308	93	3408	96
May	3734	105	3754	106
June	4258	120	4403	124
July	4503	127	4624	130
August	4421	125	4559	128
September	3976	112	4019	113
October	3702	104	3785	107
November	3255	92	3241	91
December	2783	78	2729	77

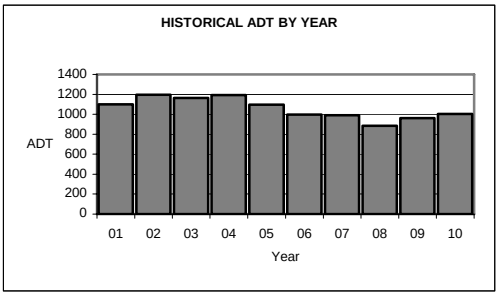
Classification Breakdown	Percent of ADT
Motorcyles	0.62
Passenger cars	32.93
Light Trucks	28.34
Buses	0.31
Single unit trucks (2 axles)	11.88
Single unit trucks (3 axles)	0.48
Single unit trucks (4 or more axles)	0.02
Single trailer trucks (4 or less axles)	2.77
Single trailer trucks (5 axles)	21.94
Single trailer trucks (6 or more axles)	0.23
Multi trailer trucks (5 or less axles)	0.23
Multi trailer trucks (6 axles)	0.24
Multi trailer trucks (7 or more axles)	0.01

Location: OR140; MP 44.98; KLAMATH FALLS-LAKEVIEW HIGHWAY NO. 20; 4.20 miles east of Yellow Jacket Springs Road at Beatty

Site Name: Beatty (18-017)
Installed: December, 1969

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Max Day	Max Hour	Percent of ADT 10TH Hour	20TH Hour	30TH Hour
2001	1098	190	16.3	14.2	13.3	12.6
2002	1196	187	15.6	13.8	13.1	12.6
2003	1163	196	16.6	13.8	12.7	12.5
2004	1191	182	30.8	13.5	12.7	12.3
2005	1095	183	15.5	13.6	13.1	12.6
2006	997	183	16.2	14.0	13.3	12.7
2007	991	179	16.3	14.3	13.2	12.9
2008	884	173	17.9	13.9	13.2	12.9
2009	962	***	***	***	***	***
2010	1004	***	***	***	***	***



2010 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	600	60	600	60
February	650	65	650	65
March	700	70	700	70
April	750	75	750	75
May	950	95	950	95
June	1293	129	1314	131
July	1455	145	1416	141
August	1407	140	1391	139
September	1396	139	1396	139
October	1200	120	1226	122
November	946	94	910	91
December	774	77	740	74

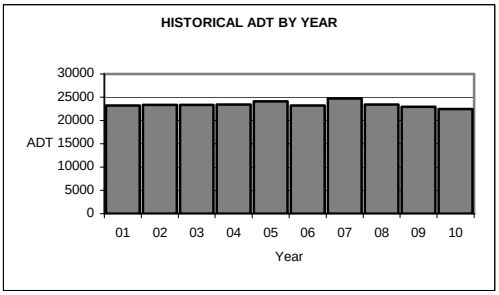
Classification Breakdown	Percent of ADT
Motorcyles	1.98
Passenger cars	43.11
Light Trucks	25.51
Buses	0.95
Single unit trucks (2 axles)	16.01
Single unit trucks (3 axles)	0.74
Single unit trucks (4 or more axles)	0.00
Single trailer trucks (4 or less axles)	6.96
Single trailer trucks (5 axles)	3.78
Single trailer trucks (6 or more axles)	0.39
Multi trailer trucks (5 or less axles)	0.35
Multi trailer trucks (6 axles)	0.04
Multi trailer trucks (7 or more axles)	0.18

Location: OR39/US97Bus MP -4.00; KLAMATH FALLS-MALIN HIGHWAY NO. 50; 0.46 mile south of Main Street

Site Name: Klamath Falls (18-018)
Installed: November, 1999

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Max Day	Max Hour	Percent of ADT 10TH Hour	20TH Hour	30TH Hour
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	***	***	***	***
2007	24757	131	11.6	10.6	10.5	10.4
2008	23409	131	10.8	10.4	10.3	10.2
2009	22965	128	12.6	10.2	10.1	10.0
2010	22496	130	10.8	10.4	10.3	10.2



2010 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	23817	106	21051	94
February	24463	109	22506	100
March	24357	108	22047	98
April	25705	114	23267	103
May	25837	115	23701	105
June	25903	115	23704	105
July	24906	111	22644	101
August	24941	111	22627	101
September	25327	113	22972	102
October	26589	118	24336	108
November	23887	106	21344	95
December	22340	99	19758	88

Classification Breakdown	Percent of ADT
Motorcyles	0.81
Passenger cars	70.34
Light Trucks	25.17
Buses	0.33
Single unit trucks (2 axles)	1.96
Single unit trucks (3 axles)	0.24
Single unit trucks (4 or more axles)	0.02
Single trailer trucks (4 or less axles)	0.26
Single trailer trucks (5 axles)	0.71
Single trailer trucks (6 or more axles)	0.10
Multi trailer trucks (5 or less axles)	0.00
Multi trailer trucks (6 axles)	0.00
Multi trailer trucks (7 or more axles)	0.06

ODOT SEASONAL ADJUSTMENT FACTOR (SAF) CALCULATION									
ATR 18-018	2006	2007	2008	2009	2010	MAX	MIN	AVERAGE	SAF
Peak Month (Month)	128% (Sep)	120% (Jun)	125% (Oct)	115% (Feb)	118% (Oct)	128%	115%	121%	**109.2%**
Count Month (March)	97%	106%	108%	106%	108%				
Count Month (April)	105%	115%	115%	115%	114%				
Count Month (March-April Average)	101%	110%	111%	111%	111%	111%	101%	111%	

APPENDIX E

Trip Surveys

FRED MEYER FUEL FACILITY TRIP SURVEY AT SANDY, OREGON

Sandy Fred Meyer Fuel
4/11/12

WEEKDAY AM PEAK HOUR TRIP COUNTS							
		Enter		Exit		Total	
Start Time	End Time	15-Min Total	60-Min Total	15-Min Total	60-Min Total	15-Min Total	60-Min Total
7:00	7:15	10	--	7	--	17	--
7:15	7:30	10	--	12	--	22	--
7:30	7:45	17	--	14	--	31	--
7:45	8:00	15	52	16	49	31	101
8:00	8:15	16	58	16	58	32	116
8:15	8:30	15	63	16	62	31	125
8:30	8:45	14	60	18	66	32	126
8:45	9:00	22	67	27	77	49	144
	Totals	119	--	126	--	245	--

WEEKDAY PM PEAK HOUR TRIP COUNTS							
		Enter		Exit		Total	
Start Time	End Time	15-Min Total	60-Min Total	15-Min Total	60-Min Total	15-Min Total	60-Min Total
4:00	4:15	31	--	28		59	--
4:15	4:30	41	--	37		78	--
4:30	4:45	34	--	40		74	--
4:45	5:00	38	144	30	135	68	279
5:00	5:15	34	147	40	147	74	294
5:15	5:30	35	141	33	143	68	284
5:30	5:45	35	142	32	135	67	277
5:45	6:00	39	143	35	140	74	283
	Totals	287	--	275	--	562	--

FRED MEYER FUEL FACILITY TRIP SURVEY AT OAK GROVE, OREGON

Oak Grove Fred Meyer Fuel

4/11/12

WEEKDAY AM PEAK HOUR TRIP COUNTS							
		Enter		Exit		Total	
Start Time	End Time	15-Min Total	60-Min Total	15-Min Total	60-Min Total	15-Min Total	60-Min Total
7:00	7:15	21	--	17	--	38	--
7:15	7:30	25	--	24	--	49	--
7:30	7:45	25	--	25	--	50	--
7:45	8:00	26	97	27	93	53	190
8:00	8:15	20	96	19	95	39	191
8:15	8:30	22	93	23	94	45	187
8:30	8:45	13	81	17	86	30	167
8:45	9:00	24	79	21	80	45	159
	Totals	176	--	173	--	349	--

WEEKDAY PM PEAK HOUR TRIP COUNTS							
		Enter		Exit		Total	
Start Time	End Time	15-Min Total	60-Min Total	15-Min Total	60-Min Total	15-Min Total	60-Min Total
4:00	4:15	39	--	37		76	--
4:15	4:30	36	--	31		67	--
4:30	4:45	39	--	40		79	--
4:45	5:00	27	141	30	138	57	279
5:00	5:15	25	127	31	132	56	259
5:15	5:30	39	130	26	127	65	257
5:30	5:45	40	131	40	127	80	258
5:45	6:00	38	142	38	135	76	277
	Totals	283	--	273	--	556	--

FRED MEYER FUEL FACILITY - TRIP GENERATION CALCULATIONS

WEEKDAY AM PEAK HOUR TRIP GENERATION					
Data Source	Vehicle Fueling Positions (VFP)	Site Trips			Trip Generation Rate per VFP
		Enter	Exit	Total	
Sandy Fred Meyer Fuel	14	67	77	144	10.29
		47%	53%	100%	
Oak Grove Fred Meyer Fuel	14	96	95	191	13.64
		50%	50%	100%	
Survey Averages	14	48%	52%	100%	11.96
ITE Rates (Land Use Code 944)	4 to 12	51%	49%	100%	12.16

WEEKDAY PM PEAK HOUR TRIP GENERATION					
Data Source	Vehicle Fueling Positions (VFP)	Site Trips			Trip Generation Rate per VFP
		Enter	Exit	Total	
Sandy Fred Meyer Fuel	14	147	147	294	21.00
		50%	50%	100%	
Oak Grove Fred Meyer Fuel	14	141	138	279	19.93
		51%	49%	100%	
Survey Averages	14	50%	50%	100%	20.46
ITE Rates (Land Use Code 944)	4 to 16	50%	50%	100%	13.87

APPENDIX F

Crash Data and Calculations

COLLISION RATE CALCULATIONS

Highway 99E (SE 1st Avenue) / Site Access (Domino's East Driveway)

2012 Existing PM Peak Hour Total Entering Volume (TEV) = 2,366 vehicles

Million Entering Vehicles (MEV) per Year =

$$\left(\frac{ADT * 365}{1{,}000{,}000}\right) \approx \left(\frac{Peak\,Hour\,TEV * 10 * 365}{1{,}000{,}000}\right) = \left(\frac{2{,}366 * 10 * 365}{1{,}000{,}000}\right) = 8.64$$

Collision Rate per Year (using ODOT data Jan. 2006 – Dec. 2010) =

$$\left(\frac{\left(Total\ number\ of\ collisions \,/\, Number\ of\ Years\right)}{MEV\ per\ Year}\right) = \left(\frac{2\,collisions \,/\, 5\,years}{8.64\,MEV\ per\ Year}\right) = \mathbf{0.05}$$

Highway 99E (SE 1st Avenue) / S. Locust Street

2012 Existing PM Peak Hour Volume = 2,420 vehicles

Million Entering Vehicles (MEV) per Year =

$$\left(\frac{ADT * 365}{1{,}000{,}000}\right) \approx \left(\frac{Peak\,Hour\,TEV * 10 * 365}{1{,}000{,}000}\right) = \left(\frac{2{,}420 * 10 * 365}{1{,}000{,}000}\right) = 8.83$$

Collision Rate per Year (using ODOT data Jan. 2006 – Dec. 2010) =

$$\left(\frac{\left(Total\ number\ of\ collisions \,/\, Number\ of\ Years\right)}{MEV\ per\ Year}\right) = \left(\frac{7\,collisions \,/\, 5\,years}{8.83\,MEV\ per\ Year}\right) = \mathbf{0.16}$$

COLLISION RATE CALCULATIONS

S. Locust Street / SE 2nd Avenue

2012 Existing PM Peak Hour Volume = 224 vehicles

Million Entering Vehicles (MEV) per Year =

$$\left(\frac{ADT * 365}{1{,}000{,}000}\right) \approx \left(\frac{Peak\,Hour\,TEV * 10 * 365}{1{,}000{,}000}\right) = \left(\frac{224 * 10 * 365}{1{,}000{,}000}\right) = 0.82$$

Collision Rate per Year (using ODOT data Jan. 2006 – Dec. 2010) =

$$\left(\frac{\left(Total\ number\ of\ collisions \,/\, Number\ of\ Years\right)}{MEV\ per\ Year}\right) = \left(\frac{2\,collisions \,/\, 5\,years}{0.82\,MEV\ per\ Year}\right) = \mathbf{0.49}$$

081 PACIFIC HIGHWAY EAST

Pacific Highway East (Hwy 081) MP 20.52 to MP 21.24
January 1, 2006 through December 31, 2010

SER# / INVEST	S P E D / E A U C O / L G H R / C S L K	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- CNTL	OFFRD / WTHR / SURF / LIGHT / CRASH TYP / COLL TYP / SVRTY	V# / SPCL USE / TRLR QTY / OWNER / VEH TYPE / MOVE / FROM / TO	P# / PRTC TYPE / INJ SVRTY / A G E / S E X / LICNS RES / PED LOC / ERROR	ACTN EVENT	CAUSE
03333	N N N	08/31/2008	CLACKAMAS	1 14		STRGHT		N	N CLR S-STRGHT	01 NONE 0 STRGHT			13
NONE		Sun	CANBY	0 0	PACIFIC HY 99E	UN	(NONE)	UNKNOWN	N DRY SS-O	PRVTE SW NE		000	00
		9A	CANBY UA	20.89	PINE ST	06			N DAY PDO	PSNGR CAR	01 DRVR NONE 49 M OR-Y 045	000	13
							(04)				OR<25		
										02 NONE 0 STRGHT			
										PRVTE SW NE		000	00
										PSNGR CAR	01 DRVR NONE 00 F OR-Y 000	000	00
											OR<25		
01572	N N N N N	05/15/2010	CLACKAMAS	1 14		ALLEY		N	N CLR ANGL-OTH	01 NONE 0 STRGHT			02
CITY		Sat	CANBY	0 0	PACIFIC HY 99E	UN	(NONE)	NONE	N DRY TURN	PRVTE SW NE		000	00
		9A	CANBY UA	20.91	SE LOCUST ST	06			N DAY INJ	PSNGR CAR	01 DRVR INJC 23 F OR-Y 000	000	00
							(04)				OR<25		
										02 NONE 0 TURN-R			
										PRVTE SE NE		018	00
										PSNGR CAR	01 DRVR NONE 87 F OR-Y 028	000	02
											OR<25		
02271	N N N	05/28/2006	CLACKAMAS	1 14		STRGHT		N	N CLR ANGL-OTH	01 NONE 0 STRGHT			08
CITY		Sun	CANBY	0 0	PACIFIC HY 99E	NE	(NONE)	UNKNOWN	N DRY TURN	PRVTE SW NE		000	00
		10A	CANBY UA	20.91	SE LOCUST ST	03			N DAY PDO	PSNGR CAR	01 DRVR NONE 70 M OR-Y 000	000	00
							(04)				OR<25		
										02 NONE 0 TURN-L			
										PRVTE NE SE		019	00
										PSNGR CAR	01 DRVR NONE 85 F OR-Y 004	000	08
											OR<25		
01399	N N N	04/05/2007	CLACKAMAS	1 14		INTER	3-LEG	N	N CLR BIKE	01 NONE 0 TURN-R			05
CITY		Thu	CANBY	+ 0 0	SE LOCUST ST	SE		STOP SIGN	N DRY TURN	PRVTE SE NE		000	00
		6P	CANBY UA	20.92	PACIFIC HY 99E	06	0		N DAY INJ	PSNGR CAR	01 DRVR NONE 73 M OR-Y 000	026	00
											OR<25		
										STRGHT 01 BIKE INJC 14 M	039	042	05
										NE SW			
04731	N N N N N	12/06/2008	CLACKAMAS	1 14		INTER	3-LEG	N	N CLR BIKE	01 NONE 0 TURN-R			18,02
CITY		Sat	CANBY	+ 0 0	SE LOCUST ST	SE		STOP SIGN	N DRY TURN	PRVTE SE NE		015	00
		3P	CANBY UA	20.92	PACIFIC HY 99E	06	0		N DAY INJ	PSNGR CAR	01 DRVR NONE 38 M OR-Y 000	000	00
											OR<25		
										STRGHT 01 BIKE INJC 38 M 03 054,028,047	034		18,02,01
										NE SW			
03279	N N N N N	08/29/2008	CLACKAMAS	1 14		INTER	3-LEG	N	N CLR BIKE	01 NONE 0 STRGHT			02
CITY		Fri	CANBY	+ 0 0	SE LOCUST ST	S		STOP SIGN	N DRY ANGL	PRVTE S N		000	00
		6A	CANBY UA	20.92	PACIFIC HY 99E	06	0		N DAY INJ	PSNGR CAR	01 DRVR NONE 30 F OR-Y 027,028	000	02
											OR<25		
										STRGHT 01 BIKE INJB 35 M 01 000		000	00
										W E			

NOT IN STUDY AREA

SITE ACCESS

SITE ACCESS

INTERSECTION

INTERSECTION

INTERSECTION

081 PACIFIC HIGHWAY EAST

Pacific Highway East (Hwy 081) MP 20.52 to MP 21.24
January 1, 2006 through December 31, 2010

SER# / INVEST	SPEC	DALC	RSLK	SWCHR	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA		RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00824	N	N	N		02/26/2007	CLACKAMAS		1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										02
CITY					Mon	CANBY	+	0 0		SE LOCUST ST	CN		STOP SIGN	N	WET	TURN		PRVTE	SW NE									000	00
					7A	CANBY UA		20.92		PACIFIC HY 99E	03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y OR<25		000	000	00
								INTERSECTION																				
																	02	NONE 0	TURN-L									
																		PRVTE	SE SW								000	00
																		PSNGR CAR		01	DRVR	NONE	28	M	OR-Y OR<25	028	000	02
01701	N	N	N		05/09/2009	CLACKAMAS		1	14		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										02
NONE					Sat	CANBY	+	0 0		SE LOCUST ST	CN		STOP SIGN	N	DRY	TURN		PRVTE	SE SW									015	00
					7P	CANBY UA		20.92		PACIFIC HY 99E	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OTH-Y N-RES	028	000	02
								INTERSECTION																				
																	02	NONE 0	STRGHT									
																		PRVTE	NE SW								000	00
																		PSNGR CAR		01	DRVR	INJC	38	M	OTH-Y OR<25	000	000	00
00167	N	N	N	N	01/13/2009	CLACKAMAS		1	14		INTER	3-LEG	N	N	CLR	S-1TURN	01	NONE 0	TURN-R										08,02
CITY					Tue	CANBY	+	0 0		SE LOCUST ST	CN		STOP SIGN	N	DRY	TURN		PRVTE	SW SE									000	00
					5P	CANBY UA		20.92		PACIFIC HY 99E	04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	76	F	OR-Y OR<25	006,028	000	08,02
								INTERSECTION																				
																	02	NONE 0	STRGHT									
																		PRVTE	SW NE								000	00
																		PSNGR CAR		01	DRVR	INJC	29	M	OTH-Y N-RES	000	000	00
02072	N	N	N		05/20/2006	CLACKAMAS		1	14		STRGHT		N	N	RAIN	O-1TURN	01	NONE 0	STRGHT										08
NO RPT					Sat	CANBY		0 0		PACIFIC HY 99E	SE	(NONE)	UNKNOWN	N	WET	TURN		PRVTE	NW SE								000	00
					10A	CANBY UA		20.94		SE LOCUST ST	06	(04)		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y OR<25	000	000	00
NOT IN STUDY AREA																												
																	02	NONE 0	TURN-L									
																		PRVTE	SE SW								019	00
																		PSNGR CAR		01	DRVR	NONE	85	F	OR-Y OR<25	004	000	08
02682	N	N	N		06/28/2006	CLACKAMAS		1	14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										13
STATE					Wed	CANBY		0 0		PACIFIC HY 99E	UN	(NONE)	UNKNOWN	N	DRY	SS-O		PRVTE	SW NE								000	00
					1P	CANBY UA		21.00		SW 4TH AVE	03	(04)		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	F	OR-Y OR<25	045	000	13
NOT IN STUDY AREA																												
																	02	NONE 0	STRGHT									
																		PRVTE	SW NE								000	00
																		PSNGR CAR		01	DRVR	NONE	57	F	OR-Y OR<25	000	000	00
																				02	PSNG	INJC	53	F		000	000	00

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

CITY OF CANBY, CLACKAMAS COUNTY

SE 2nd Avenue from S. Knott Street to East of Locust Street

January 1. 2006 through December 31, 2010

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
03178	N	N	N	N	N	08/22/2008	19	SE LOCUST ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
CITY						Fri	0	+ SE 2ND AVE	CN		STOP SIGN	N	DRY	ANGL		PRVTE	E W										000		00
						2P		INTERSECTION	01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	69	M	OR-Y OR<25		028	000		02
															02	NONE 0	STRGHT											
																PRVTE	N S									000		00
																PSNGR CAR		01	DRVR	INJC	24	M	OR-Y OR<25		000	000		00
04015	Y	N	N			10/24/2008	19	SE LOCUST ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											01,04
CITY						Fri	0	+ SE 2ND AVE	CN		UNKNOWN	N	DRY	ANGL		PRVTE	N S										000		00
						10A		INTERSECTION	04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	47	F	OR-Y OR<25		000	000		00
															02	NONE 0	STRGHT											
																PRVTE	W E									000		00
																PSNGR CAR		01	DRVR	NONE	23	M	OR-Y OR<25		047,021	000		01,04

APPENDIX G

Trip Distribution Model

30%

15%

30%

5%

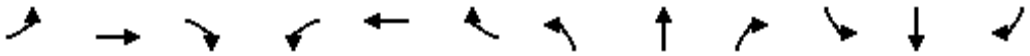
20%

Total
101 Out
93 In

Canby TSP	Canby2009BaseYearModel_v11_r1(BarlowGreens).ver	Created on: 11.04.2012
DKS Associates	2009 PM Peak Hour Volumes	1:6313

APPENDIX H

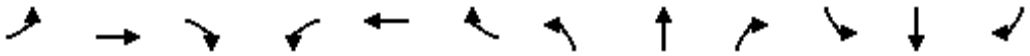
Capacity Calculations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	761	0	0	824	0	0	0	1	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	793	0	0	858	0	0	0	1	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		969										
pX, platoon unblocked												
vC, conflicting volume	858			793			1223	1651	396	1256	1651	429
vC1, stage 1 conf vol							793	793		858	858	
vC2, stage 2 conf vol							430	858		397	793	
vCu, unblocked vol	858			793			1223	1651	396	1256	1651	429
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	772			824			311	282	603	291	282	574

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	528	264	0	429	429	1	1
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	1	1
cSH	1700	1700	1700	1700	1700	603	574
Volume to Capacity	0.31	0.16	0.00	0.25	0.25	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.0	11.3
Lane LOS						B	B
Approach Delay (s)	0.0		0.0			11.0	11.3
Approach LOS						B	B

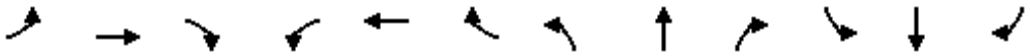
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	753	24	17	786	2	25	0	26	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	793	25	18	827	2	26	0	27	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1150										
pX, platoon unblocked												
vC, conflicting volume	829			818			1257	1673	409	1290	1684	415
vC1, stage 1 conf vol							807	807		864	864	
vC2, stage 2 conf vol							449	865		426	820	
vCu, unblocked vol	829			818			1257	1673	409	1290	1684	415
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			91	100	95	100	100	100
cM capacity (veh/h)	792			806			301	274	592	276	267	587

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1	528	289	18	552	278	54
Volume Left	1	0	0	18	0	0	26
Volume Right	0	0	25	0	0	2	27
cSH	792	1700	1700	806	1700	1700	402
Volume to Capacity	0.00	0.31	0.17	0.02	0.32	0.16	0.13
Queue Length 95th (ft)	0	0	0	2	0	0	11
Control Delay (s)	9.6	0.0	0.0	9.6	0.0	0.0	15.3
Lane LOS	A			A			C
Approach Delay (s)	0.0			0.2			15.3
Approach LOS							C

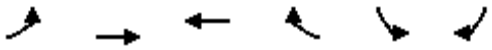
Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	34.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	0	10	1	8	3	11	40	2	5	28	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	14	0	12	1	10	4	13	48	2	6	33	13
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	135	128	40	139	133	49	46			50		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	135	128	40	139	133	49	46			50		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	100	99	100	99			100		
cM capacity (veh/h)	818	753	1031	814	748	1020	1561			1557		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	26	14	63	52
Volume Left	14	1	13	6
Volume Right	12	4	2	13
cSH	903	807	1561	1557
Volume to Capacity	0.03	0.02	0.01	0.00
Queue Length 95th (ft)	2	1	1	0
Control Delay (s)	9.1	9.5	1.6	0.9
Lane LOS	A	A	A	A
Approach Delay (s)	9.1	9.5	1.6	0.9
Approach LOS	A	A		

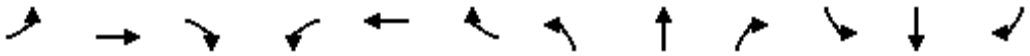
Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	18.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	22	30	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	28	38	0	0	0
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	38				65	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	38				65	38
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1547				941	1035

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	28	38	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1547	1700	1700	1700
Volume to Capacity	0.00	0.02	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS			A	

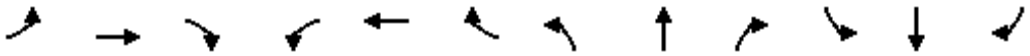
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	751	22	41	815	0	19	0	40	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	791	23	43	858	0	20	0	42	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		969										
pX, platoon unblocked												
vC, conflicting volume	858			814			1318	1746	407	1382	1758	429
vC1, stage 1 conf vol							802	802		944	944	
vC2, stage 2 conf vol							516	944		437	814	
vCu, unblocked vol	858			814			1318	1746	407	1382	1758	429
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			93	100	93	100	100	100
cM capacity (veh/h)	772			809			291	255	594	240	242	574

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	527	287	43	429	429	20	42	1
Volume Left	0	0	43	0	0	20	0	0
Volume Right	0	23	0	0	0	0	42	1
cSH	1700	1700	809	1700	1700	291	594	574
Volume to Capacity	0.31	0.17	0.05	0.25	0.25	0.07	0.07	0.00
Queue Length 95th (ft)	0	0	4	0	0	5	6	0
Control Delay (s)	0.0	0.0	9.7	0.0	0.0	18.3	11.5	11.3
Lane LOS			A			C	B	B
Approach Delay (s)	0.0		0.5			13.7		11.3
Approach LOS						B		B

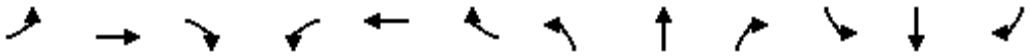
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	45.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	782	24	22	816	2	27	0	31	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	823	25	23	859	2	28	0	33	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1150										
pX, platoon unblocked												
vC, conflicting volume	861			848			1314	1745	424	1353	1757	431
vC1, stage 1 conf vol							838	838		906	906	
vC2, stage 2 conf vol							476	907		446	851	
vCu, unblocked vol	861			848			1314	1745	424	1353	1757	431
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			90	100	94	100	100	100
cM capacity (veh/h)	770			785			287	260	578	258	252	573

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1	549	300	23	573	288	61
Volume Left	1	0	0	23	0	0	28
Volume Right	0	0	25	0	0	2	33
cSH	770	1700	1700	785	1700	1700	393
Volume to Capacity	0.00	0.32	0.18	0.03	0.34	0.17	0.16
Queue Length 95th (ft)	0	0	0	2	0	0	14
Control Delay (s)	9.7	0.0	0.0	9.7	0.0	0.0	15.8
Lane LOS	A			A			C
Approach Delay (s)	0.0			0.3			15.8
Approach LOS							C

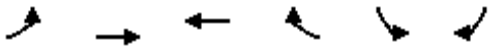
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	35.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	19	0	11	1	8	3	12	40	2	5	28	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	23	0	13	1	10	4	14	48	2	6	33	19
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	140	133	43	145	142	49	52			50		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	140	133	43	145	142	49	52			50		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	100	99	100	99			100		
cM capacity (veh/h)	810	748	1028	805	740	1020	1553			1557		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	36	14	64	58
Volume Left	23	1	14	6
Volume Right	13	4	2	19
cSH	878	800	1553	1557
Volume to Capacity	0.04	0.02	0.01	0.00
Queue Length 95th (ft)	3	1	1	0
Control Delay (s)	9.3	9.6	1.7	0.8
Lane LOS	A	A	A	A
Approach Delay (s)	9.3	9.6	1.7	0.8
Approach LOS	A	A		

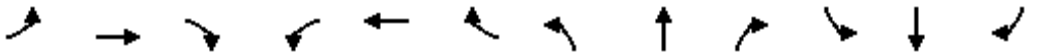
Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	21.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	22	30	6	8	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	6	28	38	8	10	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	45				81	41
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45				81	41
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1538				917	1030

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	34	45	10	6
Volume Left	6	0	10	0
Volume Right	0	8	0	6
cSH	1538	1700	917	1030
Volume to Capacity	0.00	0.03	0.01	0.01
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	1.4	0.0	9.0	8.5
Lane LOS	A		A	A
Approach Delay (s)	1.4	0.0	8.8	
Approach LOS			A	

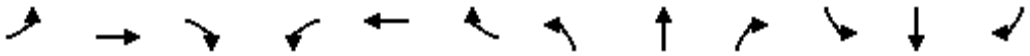
Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	16.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	751	22	0	825	0	0	0	40	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	782	23	0	859	0	0	0	42	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		969										
pX, platoon unblocked												
vC, conflicting volume	859			805			1224	1653	403	1292	1665	430
vC1, stage 1 conf vol							794	794		859	859	
vC2, stage 2 conf vol							431	859		433	805	
vCu, unblocked vol	859			805			1224	1653	403	1292	1665	430
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	93	100	100	100
cM capacity (veh/h)	771			815			311	281	597	282	280	574

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	522	284	430	430	42	0	1
Volume Left	0	0	0	0	0	0	0
Volume Right	0	23	0	0	42	0	1
cSH	1700	1700	1700	1700	597	1700	574
Volume to Capacity	0.31	0.17	0.25	0.25	0.07	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	6	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	11.5	0.0	11.3
Lane LOS					B	A	B
Approach Delay (s)	0.0		0.0		11.5	11.3	
Approach LOS					B	B	

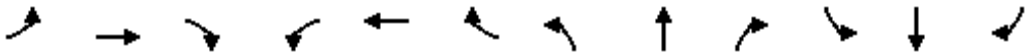
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	782	24	63	775	2	37	0	31	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	823	25	66	816	2	39	0	33	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1150										
pX, platoon unblocked												
vC, conflicting volume	818			848			1378	1788	424	1396	1800	409
vC1, stage 1 conf vol							838	838		949	949	
vC2, stage 2 conf vol							541	951		446	851	
vCu, unblocked vol	818			848			1378	1788	424	1396	1800	409
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			86	100	94	100	100	100
cM capacity (veh/h)	800			785			273	243	578	230	224	592

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1	549	300	66	544	274	72
Volume Left	1	0	0	66	0	0	39
Volume Right	0	0	25	0	0	2	33
cSH	800	1700	1700	785	1700	1700	360
Volume to Capacity	0.00	0.32	0.18	0.08	0.32	0.16	0.20
Queue Length 95th (ft)	0	0	0	7	0	0	18
Control Delay (s)	9.5	0.0	0.0	10.0	0.0	0.0	17.5
Lane LOS	A			B			C
Approach Delay (s)	0.0			0.8			17.5
Approach LOS							C

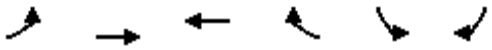
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	29	0	11	1	8	3	12	40	2	5	28	57
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	35	0	13	1	10	4	14	48	2	6	33	68
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	165	158	67	170	190	49	101			50		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	165	158	67	170	190	49	101			50		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	99	100	99	100	99			100		
cM capacity (veh/h)	781	725	996	776	695	1020	1491			1557		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	48	14	64	107
Volume Left	35	1	14	6
Volume Right	13	4	2	68
cSH	830	762	1491	1557
Volume to Capacity	0.06	0.02	0.01	0.00
Queue Length 95th (ft)	5	1	1	0
Control Delay (s)	9.6	9.8	1.7	0.4
Lane LOS	A	A	A	A
Approach Delay (s)	9.6	9.8	1.7	0.4
Approach LOS	A	A		

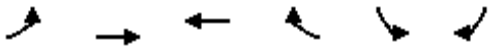
Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	23.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	22	30	47	18	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	6	28	38	59	22	18
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	96				107	67
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96				107	67
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	100				97	98
cM capacity (veh/h)	1473				887	997

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	34	96	22	18
Volume Left	6	0	22	0
Volume Right	0	59	0	18
cSH	1473	1700	887	997
Volume to Capacity	0.00	0.06	0.03	0.02
Queue Length 95th (ft)	0	0	2	1
Control Delay (s)	1.4	0.0	9.2	8.7
Lane LOS	A		A	A
Approach Delay (s)	1.4	0.0	9.0	
Approach LOS			A	

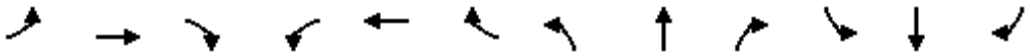
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	16.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	773	825	0	0	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	805	859	0	0	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		969				
pX, platoon unblocked						
vC, conflicting volume	859				1262	430
vC1, stage 1 conf vol					859	
vC2, stage 2 conf vol					403	
vCu, unblocked vol	859				1262	430
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	771				341	574

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	403	403	430	430	1
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	1
cSH	1700	1700	1700	1700	574
Volume to Capacity	0.24	0.24	0.25	0.25	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	11.3
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.3
Approach LOS					B

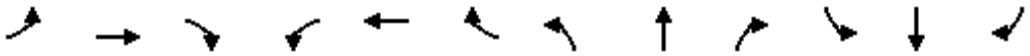
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	742	46	63	775	2	37	0	71	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	781	48	66	816	2	39	0	75	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1150										
pX, platoon unblocked												
vC, conflicting volume	818			829			1348	1758	415	1417	1781	409
vC1, stage 1 conf vol							807	807		949	949	
vC2, stage 2 conf vol							541	951		467	832	
vCu, unblocked vol	818			829			1348	1758	415	1417	1781	409
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			86	100	87	100	100	100
cM capacity (veh/h)	800			798			282	247	587	223	227	592

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	1	521	309	66	544	274	114
Volume Left	1	0	0	66	0	0	39
Volume Right	0	0	48	0	0	2	75
cSH	800	1700	1700	798	1700	1700	428
Volume to Capacity	0.00	0.31	0.18	0.08	0.32	0.16	0.27
Queue Length 95th (ft)	0	0	0	7	0	0	26
Control Delay (s)	9.5	0.0	0.0	9.9	0.0	0.0	16.4
Lane LOS	A			A			C
Approach Delay (s)	0.0			0.7			16.4
Approach LOS							C

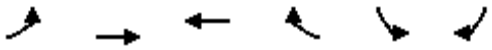
Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	45.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	69	0	11	1	8	3	12	40	2	5	28	79
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	82	0	13	1	10	4	14	48	2	6	33	94
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	178	171	80	183	217	49	127			50		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	171	80	183	217	49	127			50		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	100	99	100	99	100	99			100		
cM capacity (veh/h)	765	712	980	760	672	1020	1459			1557		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	95	14	64	133
Volume Left	82	1	14	6
Volume Right	13	4	2	94
cSH	789	743	1459	1557
Volume to Capacity	0.12	0.02	0.01	0.00
Queue Length 95th (ft)	10	1	1	0
Control Delay (s)	10.2	9.9	1.7	0.4
Lane LOS	B	A	A	A
Approach Delay (s)	10.2	9.9	1.7	0.4
Approach LOS	B	A		

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	26.9%	ICU Level of Service	A	
Analysis Period (min)	15			



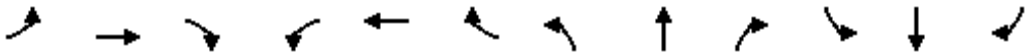
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	22	30	69	58	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	6	28	38	86	72	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	124				121	81
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				121	81
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	100				92	98
cM capacity (veh/h)	1439				871	979

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	34	124	72	18
Volume Left	6	0	72	0
Volume Right	0	86	0	18
cSH	1439	1700	871	979
Volume to Capacity	0.00	0.07	0.08	0.02
Queue Length 95th (ft)	0	0	7	1
Control Delay (s)	1.4	0.0	9.5	8.7
Lane LOS	A		A	A
Approach Delay (s)	1.4	0.0	9.4	
Approach LOS			A	

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
1: FM Fuel Driveway & Highway 99E (SE 1st Avenue)

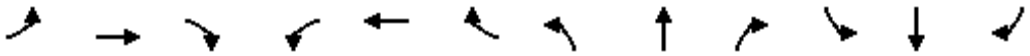
5/15/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1234	1	1	1113	0	6	0	9	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1299	1	1	1172	0	6	0	9	0	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		969										
pX, platoon unblocked												
vC, conflicting volume	1172			1300			1889	2473	650	1833	2474	586
vC1, stage 1 conf vol							1299	1299		1174	1174	
vC2, stage 2 conf vol							590	1174		659	1300	
vCu, unblocked vol	1172			1300			1889	2473	650	1833	2474	586
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	98	100	100	100
cM capacity (veh/h)	586			529			158	169	412	181	168	454

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	866	434	1	586	586	16	2
Volume Left	0	0	1	0	0	6	0
Volume Right	0	1	0	0	0	9	2
cSH	1700	1700	529	1700	1700	251	454
Volume to Capacity	0.51	0.26	0.00	0.34	0.34	0.06	0.00
Queue Length 95th (ft)	0	0	0	0	0	5	0
Control Delay (s)	0.0	0.0	11.8	0.0	0.0	20.3	13.0
Lane LOS			B			C	B
Approach Delay (s)	0.0		0.0			20.3	13.0
Approach LOS						C	B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1181	66	42	1072	0	21	0	38	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1243	69	44	1128	0	22	0	40	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1150										
pX, platoon unblocked												
vC, conflicting volume	1128			1313			1931	2495	656	1878	2529	564
vC1, stage 1 conf vol							1278	1278		1217	1217	
vC2, stage 2 conf vol							653	1217		662	1313	
vCu, unblocked vol	1128			1313			1931	2495	656	1878	2529	564
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			86	100	90	100	100	100
cM capacity (veh/h)	609			523			158	160	408	154	140	469

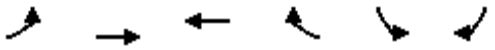
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	0	829	484	44	752	376	62
Volume Left	0	0	0	44	0	0	22
Volume Right	0	0	69	0	0	0	40
cSH	1700	1700	1700	523	1700	1700	261
Volume to Capacity	0.00	0.49	0.28	0.08	0.44	0.22	0.24
Queue Length 95th (ft)	0	0	0	7	0	0	23
Control Delay (s)	0.0	0.0	0.0	12.5	0.0	0.0	23.1
Lane LOS				B			C
Approach Delay (s)	0.0			0.5			23.1
Approach LOS							C

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	49.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	22	4	13	1	5	4	28	34	3	9	87	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	25	4	15	1	6	4	31	38	3	10	98	16
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	236	230	106	246	237	40	113			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	236	230	106	246	237	40	113			42		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	99	98	100	99	100	98			99		
cM capacity (veh/h)	696	651	949	679	646	1031	1476			1568		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	44	11	73	124
Volume Left	25	1	31	10
Volume Right	15	4	3	16
cSH	758	764	1476	1568
Volume to Capacity	0.06	0.01	0.02	0.01
Queue Length 95th (ft)	5	1	2	0
Control Delay (s)	10.0	9.8	3.3	0.6
Lane LOS	B	A	A	A
Approach Delay (s)	10.0	9.8	3.3	0.6
Approach LOS	B	A		

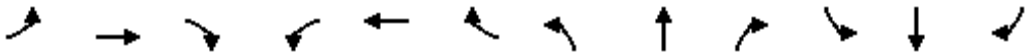
Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	26.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	39	47	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	49	59	0	0	0
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	59				108	59
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	59				108	59
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1520				890	1007

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	49	59	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1520	1700	1700	1700
Volume to Capacity	0.00	0.03	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS			A	

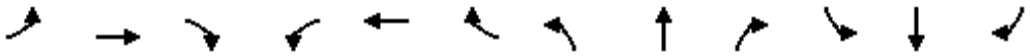
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1226	36	72	1097	0	34	0	67	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1291	38	76	1155	0	36	0	71	0	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		969										
pX, platoon unblocked												
vC, conflicting volume	1155			1328			2041	2616	664	2022	2635	577
vC1, stage 1 conf vol							1309	1309		1306	1306	
vC2, stage 2 conf vol							731	1306		716	1328	
vCu, unblocked vol	1155			1328			2041	2616	664	2022	2635	577
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			85			75	100	83	100	100	100
cM capacity (veh/h)	595			516			146	143	403	122	114	459

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	860	468	76	577	577	36	71	2
Volume Left	0	0	76	0	0	36	0	0
Volume Right	0	38	0	0	0	0	71	2
cSH	1700	1700	516	1700	1700	146	403	459
Volume to Capacity	0.51	0.28	0.15	0.34	0.34	0.25	0.17	0.00
Queue Length 95th (ft)	0	0	13	0	0	23	16	0
Control Delay (s)	0.0	0.0	13.2	0.0	0.0	37.5	15.8	12.9
Lane LOS			B			E	C	B
Approach Delay (s)	0.0		0.8			23.1		12.9
Approach LOS						C		B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1231	66	49	1123	0	25	0	46	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1296	69	52	1182	0	26	0	48	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1150										
pX, platoon unblocked												
vC, conflicting volume	1182			1365			2025	2616	683	1982	2651	591
vC1, stage 1 conf vol							1331	1331		1285	1285	
vC2, stage 2 conf vol							694	1285		696	1365	
vCu, unblocked vol	1182			1365			2025	2616	683	1982	2651	591
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			82	100	88	100	100	100
cM capacity (veh/h)	581			499			146	147	392	136	124	450

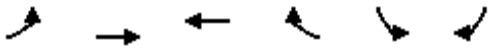
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	0	864	501	52	788	394	75
Volume Left	0	0	0	52	0	0	26
Volume Right	0	0	69	0	0	0	48
cSH	1700	1700	1700	499	1700	1700	246
Volume to Capacity	0.00	0.51	0.29	0.10	0.46	0.23	0.30
Queue Length 95th (ft)	0	0	0	9	0	0	31
Control Delay (s)	0.0	0.0	0.0	13.0	0.0	0.0	25.9
Lane LOS				B			D
Approach Delay (s)	0.0			0.5			25.9
Approach LOS							D

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	34	4	15	1	5	4	30	34	3	9	87	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	38	4	17	1	6	4	34	38	3	10	98	24
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	244	239	110	256	249	40	121			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	244	239	110	256	249	40	121			42		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	99	98	100	99	100	98			99		
cM capacity (veh/h)	686	643	944	666	635	1031	1466			1568		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	60	11	75	131
Volume Left	38	1	34	10
Volume Right	17	4	3	24
cSH	739	754	1466	1568
Volume to Capacity	0.08	0.01	0.02	0.01
Queue Length 95th (ft)	7	1	2	0
Control Delay (s)	10.3	9.8	3.5	0.6
Lane LOS	B	A	A	A
Approach Delay (s)	10.3	9.8	3.5	0.6
Approach LOS	B	A		

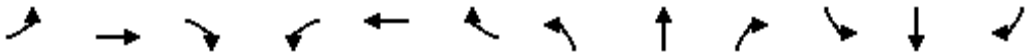
Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	28.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	39	47	9	14	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	10	49	59	11	18	10
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	70				133	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	70				133	64
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	1506				855	1000

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	59	70	18	10
Volume Left	10	0	18	0
Volume Right	0	11	0	10
cSH	1506	1700	855	1000
Volume to Capacity	0.01	0.04	0.02	0.01
Queue Length 95th (ft)	1	0	2	1
Control Delay (s)	1.3	0.0	9.3	8.6
Lane LOS	A		A	A
Approach Delay (s)	1.3	0.0	9.1	
Approach LOS			A	

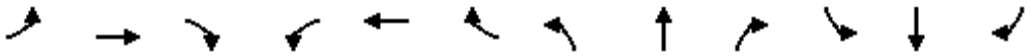
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1226	36	0	1115	0	0	0	67	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1291	38	0	1174	0	0	0	71	0	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		969										
pX, platoon unblocked												
vC, conflicting volume	1174			1328			1898	2483	664	1889	2502	587
vC1, stage 1 conf vol							1309	1309		1174	1174	
vC2, stage 2 conf vol							589	1174		716	1328	
vCu, unblocked vol	1174			1328			1898	2483	664	1889	2502	587
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	83	100	100	100
cM capacity (veh/h)	585			516			156	168	403	169	166	453

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	860	468	587	587	71	2
Volume Left	0	0	0	0	0	0
Volume Right	0	38	0	0	71	2
cSH	1700	1700	1700	1700	403	453
Volume to Capacity	0.51	0.28	0.35	0.35	0.17	0.00
Queue Length 95th (ft)	0	0	0	0	16	0
Control Delay (s)	0.0	0.0	0.0	0.0	15.8	13.0
Lane LOS					C	B
Approach Delay (s)	0.0		0.0		15.8	13.0
Approach LOS					C	B

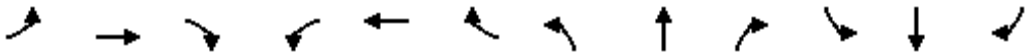
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1231	66	120	1052	0	42	0	46	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1296	69	126	1107	0	44	0	48	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1150										
pX, platoon unblocked												
vC, conflicting volume	1107			1365			2137	2691	683	2056	2725	554
vC1, stage 1 conf vol							1331	1331		1360	1360	
vC2, stage 2 conf vol							806	1360		696	1365	
vCu, unblocked vol	1107			1365			2137	2691	683	2056	2725	554
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			75			67	100	88	100	100	100
cM capacity (veh/h)	620			499			134	125	392	102	75	476

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	0	864	501	126	738	369	93
Volume Left	0	0	0	126	0	0	44
Volume Right	0	0	69	0	0	0	48
cSH	1700	1700	1700	499	1700	1700	204
Volume to Capacity	0.00	0.51	0.29	0.25	0.43	0.22	0.45
Queue Length 95th (ft)	0	0	0	25	0	0	54
Control Delay (s)	0.0	0.0	0.0	14.6	0.0	0.0	36.6
Lane LOS				B			E
Approach Delay (s)	0.0			1.5			36.6
Approach LOS							E

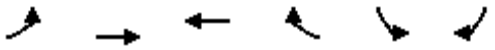
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	63.3%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	51	4	15	1	5	4	30	34	3	9	87	92
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	57	4	17	1	6	4	34	38	3	10	98	103
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	284	279	149	296	329	40	201			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	284	279	149	296	329	40	201			42		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	99	98	100	99	100	98			99		
cM capacity (veh/h)	645	610	897	625	572	1031	1371			1568		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	79	11	75	211
Volume Left	57	1	34	10
Volume Right	17	4	3	103
cSH	684	703	1371	1568
Volume to Capacity	0.12	0.02	0.02	0.01
Queue Length 95th (ft)	10	1	2	0
Control Delay (s)	10.9	10.2	3.6	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	10.9	10.2	3.6	0.4
Approach LOS	B	B		

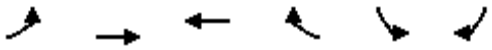
Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	35.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	39	47	80	31	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	10	49	59	100	39	31
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	159				178	109
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	159				178	109
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				95	97
cM capacity (veh/h)	1397				806	945

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	59	159	39	31
Volume Left	10	0	39	0
Volume Right	0	100	0	31
cSH	1397	1700	806	945
Volume to Capacity	0.01	0.09	0.05	0.03
Queue Length 95th (ft)	1	0	4	3
Control Delay (s)	1.3	0.0	9.7	8.9
Lane LOS	A		A	A
Approach Delay (s)	1.3	0.0	9.4	
Approach LOS			A	

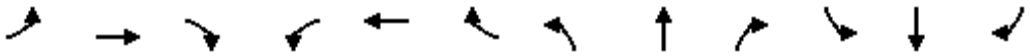
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	1261	1115	0	0	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1327	1174	0	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		969				
pX, platoon unblocked						
vC, conflicting volume	1174				1837	587
vC1, stage 1 conf vol					1174	
vC2, stage 2 conf vol					664	
vCu, unblocked vol	1174				1837	587
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	585				226	453

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	664	664	587	587	2
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	2
cSH	1700	1700	1700	1700	453
Volume to Capacity	0.39	0.39	0.35	0.35	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	13.0
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.0
Approach LOS					B

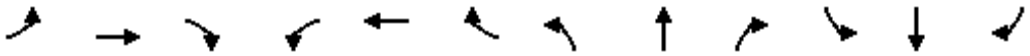
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1164	101	120	1052	0	42	0	113	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1225	106	126	1107	0	44	0	119	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1150										
pX, platoon unblocked												
vC, conflicting volume	1107			1332			2085	2638	666	2092	2692	554
vC1, stage 1 conf vol							1278	1278		1360	1360	
vC2, stage 2 conf vol							806	1360		732	1332	
vCu, unblocked vol	1107			1332			2085	2638	666	2092	2692	554
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			75			69	100	70	100	100	100
cM capacity (veh/h)	620			514			142	129	402	89	81	476

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	0	817	515	126	738	369	163
Volume Left	0	0	0	126	0	0	44
Volume Right	0	0	106	0	0	0	119
cSH	1700	1700	1700	514	1700	1700	268
Volume to Capacity	0.00	0.48	0.30	0.25	0.43	0.22	0.61
Queue Length 95th (ft)	0	0	0	24	0	0	91
Control Delay (s)	0.0	0.0	0.0	14.3	0.0	0.0	37.2
Lane LOS				B			E
Approach Delay (s)	0.0			1.5			37.2
Approach LOS							E

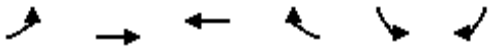
Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	118	4	15	1	5	4	30	34	3	9	87	127
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	133	4	17	1	6	4	34	38	3	10	98	143
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	304	298	169	316	368	40	240			42		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304	298	169	316	368	40	240			42		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	99	98	100	99	100	97			99		
cM capacity (veh/h)	625	594	875	606	543	1031	1326			1568		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	154	11	75	251
Volume Left	133	1	34	10
Volume Right	17	4	3	143
cSH	644	679	1326	1568
Volume to Capacity	0.24	0.02	0.03	0.01
Queue Length 95th (ft)	23	1	2	0
Control Delay (s)	12.3	10.4	3.6	0.3
Lane LOS	B	B	A	A
Approach Delay (s)	12.3	10.4	3.6	0.3
Approach LOS	B	B		

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	39	47	115	98	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	10	49	59	144	122	31
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	202				199	131
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	202				199	131
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				84	97
cM capacity (veh/h)	1346				783	919

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	59	202	122	31
Volume Left	10	0	122	0
Volume Right	0	144	0	31
cSH	1346	1700	783	919
Volume to Capacity	0.01	0.12	0.16	0.03
Queue Length 95th (ft)	1	0	14	3
Control Delay (s)	1.4	0.0	10.4	9.1
Lane LOS	A		B	A
Approach Delay (s)	1.4	0.0	10.2	
Approach LOS			B	

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	23.8%	ICU Level of Service	A
Analysis Period (min)	15		

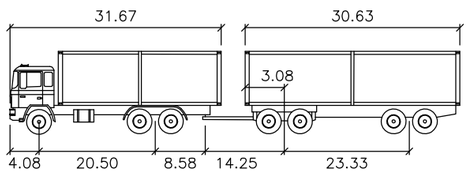
APPENDIX I

Vehicle Turning Paths

HIGHWAY 99E / SE 1ST AVENUE)

S LOCUST STREET

SE 2ND AVENUE



Fred Meyer Fuel Tanker

	feet		feet
First Part Width	: 8.53	Lock to Lock Time	: 6.0
Trailer Width	: 8.53	Steering Angle	: 47.7
First Part Track	: 8.53	Articulating Angle	: 70.0
Trailer Track	: 8.53		

SCALE: 1"=30'

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 208.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
FUEL DELIVERY TRUCK ENTERING AND EXITING AT HIGHWAY 99E

DATE:
05.16.12
DRAWN BY:
DAH
CHECKED BY:
BTA

SHEET:
A

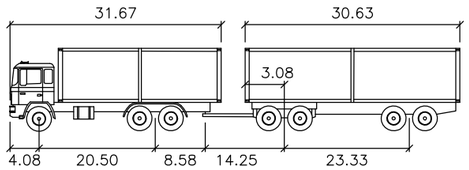
JOB NO:
2120130.00

TIA - MAY 16, 2012

HIGHWAY 99E / SE 1ST AVENUE)

S LOCUST STREET

SE 2ND AVENUE



Fred Meyer Fuel Tanker

	feet		feet
First Part Width	: 8.53	Lock to Lock Time	: 6.0
Trailer Width	: 8.53	Steering Angle	: 47.7
First Part Track	: 8.53	Articulating Angle	: 70.0
Trailer Track	: 8.53		

SCALE: 1"=30'

TIA - MAY 16, 2012

212013000\TRAFFIC\FIGURES-TRUCK_TURNING.DWG: FuelTruck-2ndAve DAH 05/16/12 12:37 1:0.00

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
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Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
FUEL DELIVERY TRUCK ENTERING AND EXITING AT SE 2ND AVENUE

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

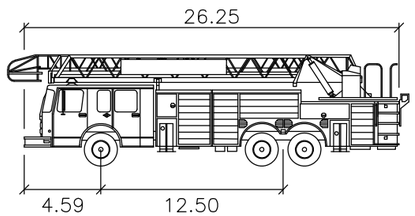
SHEET: B

JOB NO: 2120130.00

HIGHWAY 99E / SE 1ST AVENUE)

S LOCUST STREET

SE 2ND AVENUE



BRANDWEERAUTO feet

Width	: 7.15
Track	: 7.15
Lock to Lock Time	: 6.0
Steering Angle	: 33.1

SCALE: 1"=30'

GROUP MACKENZIE
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Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

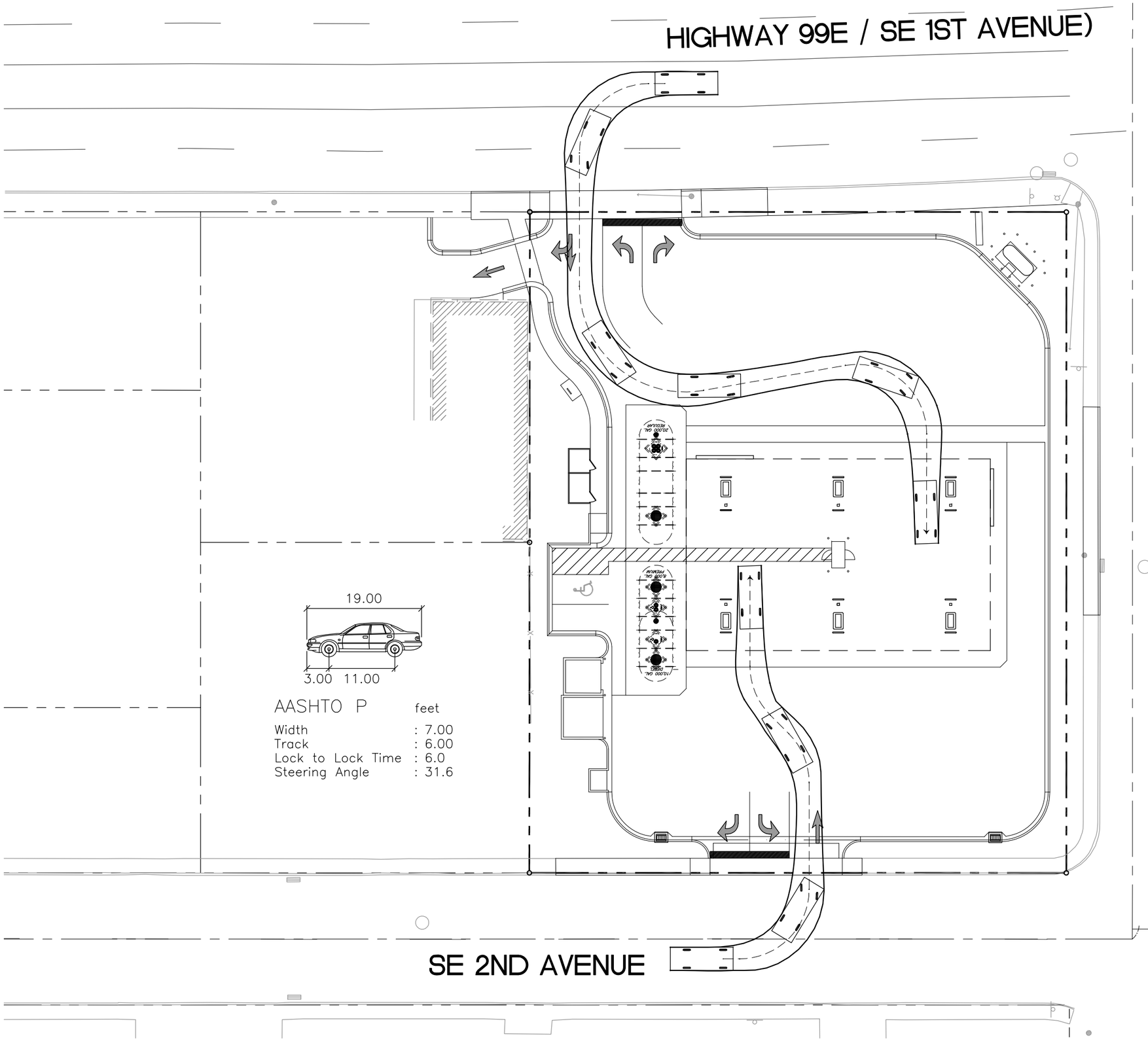
SHEET TITLE:
SAMPLE EMERGENCY VEHICLE (FIRE TRUCK) ROUTES

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: C

JOB NO: 2120130.00

TIA - MAY 16, 2012



SCALE: 1"=30'

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
SAMPLE PASSENGER AUTO ROUTES - ENTERING LEFT TURNS

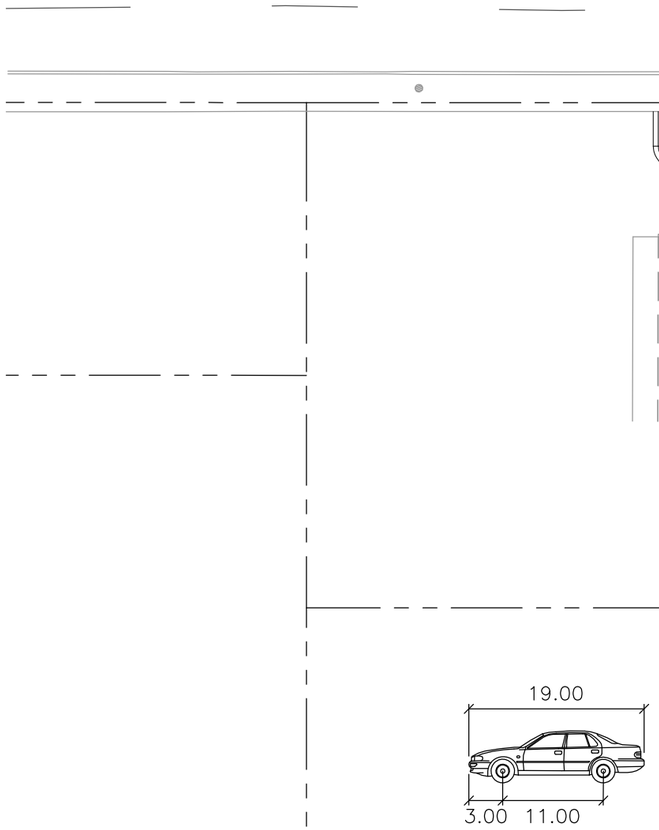
DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: D

JOB NO: 2120130.00

TIA - MAY 16, 2012

HIGHWAY 99E / SE 1ST AVENUE)



AASHTO P feet

Width	: 7.00
Track	: 6.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.6

S LOCUST STREET

SCALE: 1"=30'

SE 2ND AVENUE

TIA - MAY 16, 2012

212013000\TRAFFIC\FIGURES-TRUCK_TURNING.DWG:P-Entering RT DAH 05/16/12 12:37 1:0.00

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 208.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

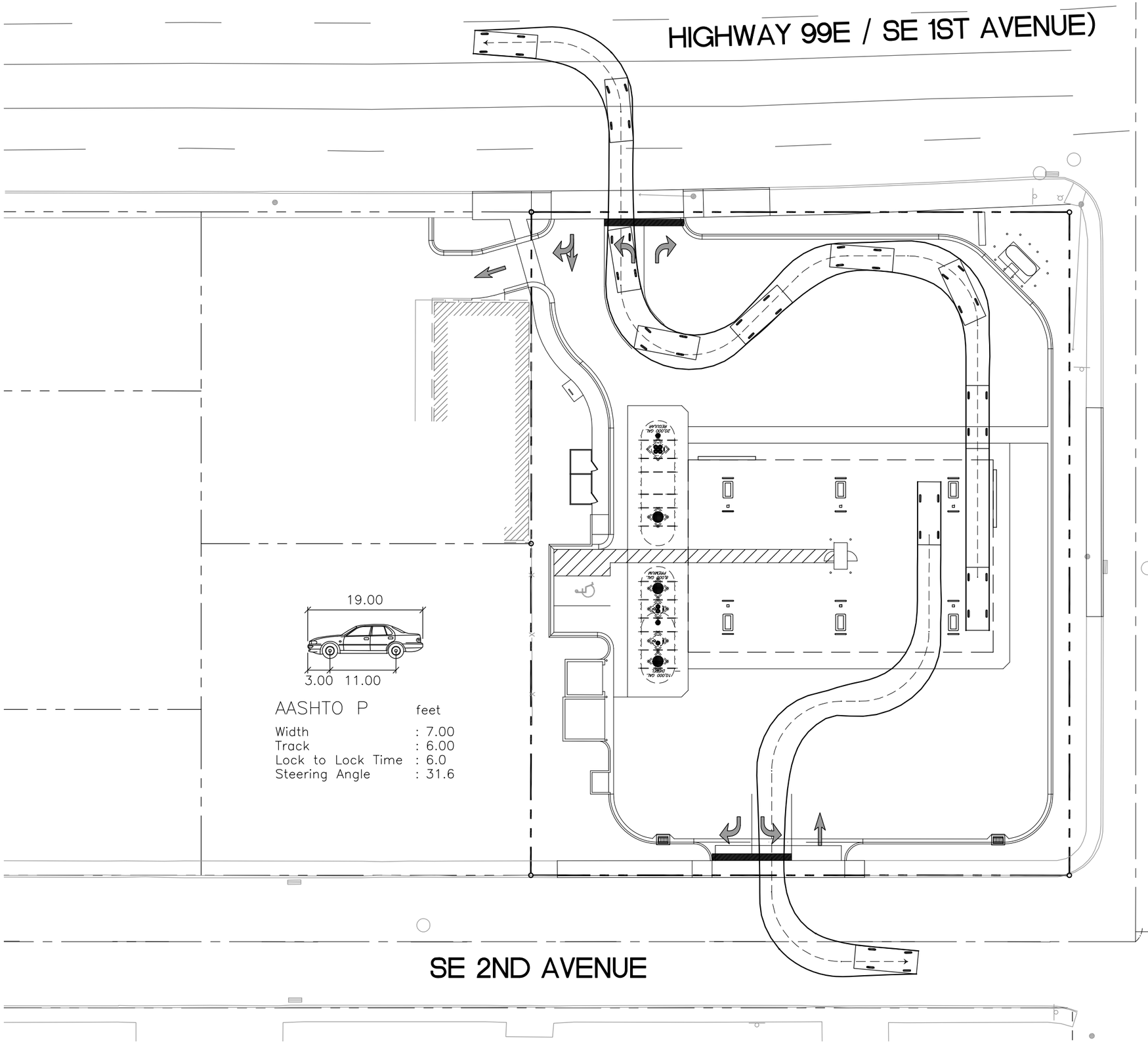
PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
SAMPLE PASSENGER AUTO ROUTES - ENTERING RIGHT TURNS

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: E

JOB NO: 2120130.00



SCALE: 1"=30'

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

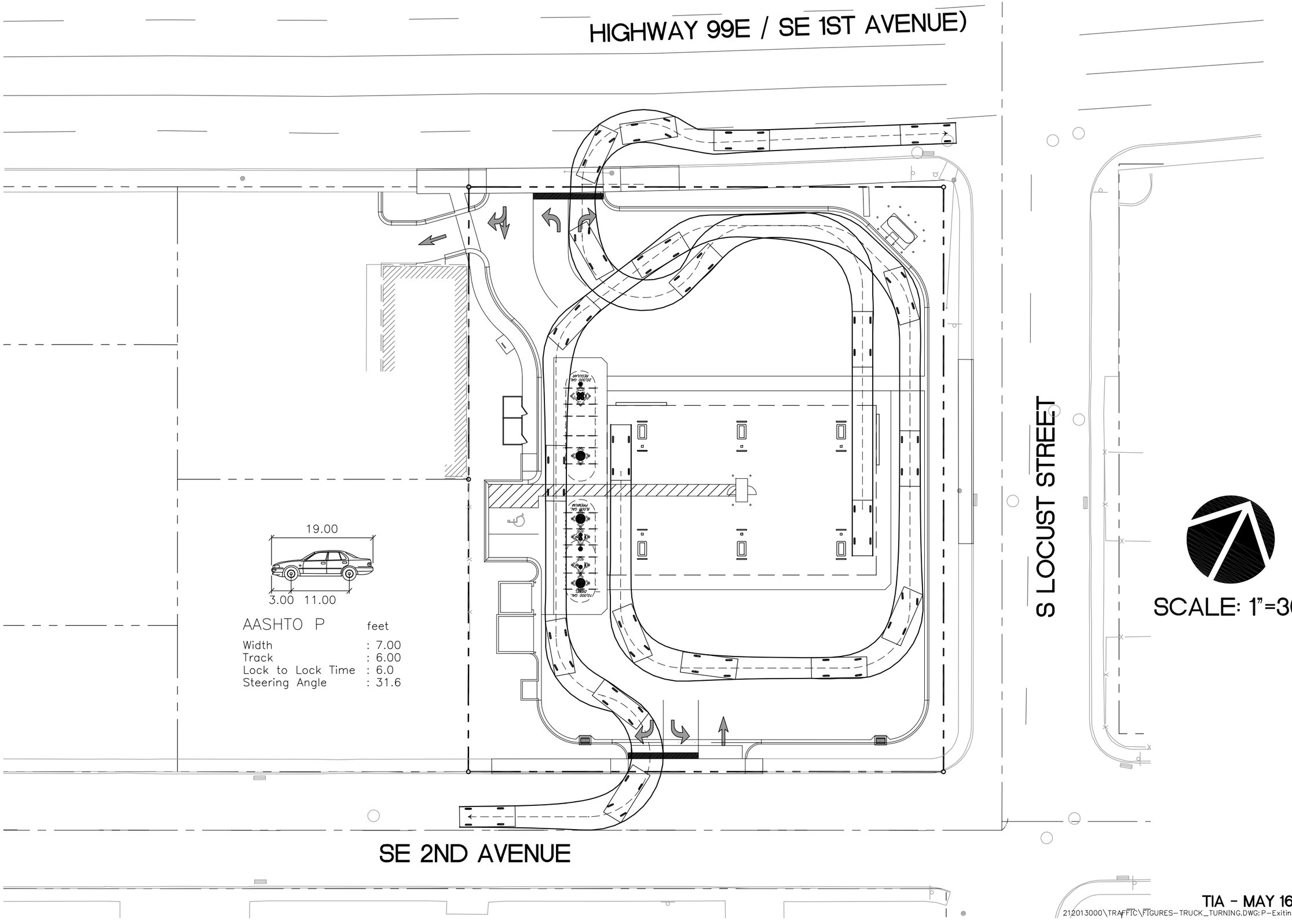
SHEET TITLE:
SAMPLE PASSENGER AUTO ROUTES - EXITING LEFT TURNS

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: F

JOB NO: 2120130.00

TIA - MAY 16, 2012



SCALE: 1"=30'

TIA - MAY 16, 2012

212013000\TRAFFIC\FIGURES-TRUCK_TURNING.DWG:P-Exiting RT DAH 05/16/12 12:37 1:0.00

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
SAMPLE PASSENGER AUTO ROUTES - EXITING RIGHT TURNS

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: G

JOB NO: 2120130.00

APPENDIX J

Scoping

David Holt

From: David Holt
Sent: Friday, April 20, 2012 12:19 PM
To: 'abraham.tayar@odot.state.or.us'; 'brownb@ci.canby.or.us'; 'csm@dksassociates.com'
Cc: Brent Ahrend; Jim Coombes (james.coombes@fredmeyer.com); 'Jake Tate'
Subject: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions
Attachments: Canby 6MPD (Oregon 6) Option_Mar. 13 ,2012.pdf; Trip Gen Calcs - Sandy+Oak Grove.pdf; Select Zone Assignment.pdf

Good morning, Mr. Tayar, Mr. Brown, and Mr. Maciejewski,

We are preparing the transportation impact analysis (TIA) for the Fred Meyer Canby Fuel Facility project at 391 SE 1st Avenue, the southwest corner of the Highway 99E/S Locust Street intersection in Canby. The project proposes to provide 6 pumps (12 fueling positions) and an attendant's kiosk; a copy of the site plan is attached.

We've been asked to circulate this information so you may review the scope and assumptions of the TIA.

TRIP GENERATION

We conducted trip surveys at two existing Fred Meyer Fuel facilities (Sandy and Oak Grove) to estimate the average AM and PM trip generation rates for a fuel facility in Canby.

The facility in Sandy, Oregon (35885 Industrial Way, Sandy, OR 97055) was selected because

- Similar to Canby, it is located in a small urban area just outside the Portland Metro Area.
- It is located near a state highway that serves a high percentage of the area's trips.
- It's unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Sandy. The nearest Fred Meyer store is in Gresham (2497 SE Burnside Road), and this store also has a fuel facility.

The facility in Oak Grove, Oregon (13625 SE McLoughlin Boulevard, Oak Grove, OR 97222) was selected because

- It is located adjacent to a state highway – coincidentally the same highway (99E) that runs through Canby – that serves a high percentage of the area's trips.
- Similar to the Canby site, it is located approximately 0.6 miles away from the associated Fred Meyer store.
- It's unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Oak Grove. The nearest Fred Meyer stores are in Clackamas at 16301 SE 82nd Drive (near Highway 212/224) and in Happy Valley at 8955 SE 82nd Avenue (at Johnson Creek Boulevard). The existing fuel facility at the Johnson Creek store is likely more convenient for patrons of both these stores.

Similar to the Sandy and Oak Grove Fred Meyer Fuel locations, the Canby facility is not likely to see many trips by regular patrons of Fred Meyer stores other than the one in Canby. The nearest Fred Meyer stores are in Wilsonville (30300 SW Boones Ferry Road) and Oregon City (1839 Molalla Avenue), and both these stores have fuel facilities.

A copy of the trip generation calculations from surveys in Sandy and Oak Grove is attached. The average AM peak hour trip generation rate was found to be 11.96 trips per vehicle fueling position (VFP), and the average PM rate was 20.46 trips per VFP. The ITE AM rate of 12.16 is slightly higher, so we will use the ITE AM rate. The ITE PM rate of 13.87 is lower, so we will use the Fred Meyer surveyed rate to estimate the highest potential impact.

TRIP TYPES

Group Mackenzie recently conducted customer surveys at the Sandy and Gresham fuel facilities to determine the types of trips being made. We will apply the average rates determined from these surveys for the following trip types. A copy of the survey results is available upon request.

- Internal/Shared: 38% -- Sandy and Gresham fuel facilities are adjacent to the respective Fred Meyer stores and thus have shared or internal trips between the two operations. For the facility in Canby, "internal" trips will be assigned to travel along Highway 99E directly to/from the Canby Fred Meyer store (1401 SE 1st Avenue).

- Pass-By: 30% -- Pass-by trips will be drawn from existing volumes passing by the site on Highway 99E. Percentages will be based on the existing directional distributions.

- Diverted Linked: 20% -- Diverted linked trips will be drawn from existing volumes moving through the signalized Highway 99E intersection at Ivy Street but not already passing the site. Percentages will be based on the existing directional distributions.

- Primary: 12% -- Primary trips will be distributed according to the assignment model provided by DKS Associates, which is attached for reference.

STUDY SCOPE

The TIA will analyze AM and PM operations at the proposed site accesses:

- Access to Highway 99E
- Access to SE 2nd Avenue

The TIA will analyze AM and PM operations at the adjacent public street intersections:

- Highway 99E (SE 1st Avenue) / S Locust Street
- SE 2nd Avenue / S Locust Street

In addition, an Access Management Plan (AMP) compliant with City of Canby guidelines will be prepared to review conditions at the Highway 99E frontage and nearby existing accesses within 250 feet of the subject property. The AMP will address these potential access scenarios for the Fred Meyer Fuel site:

- No access to Highway 99E
- Restricted movement access to Highway 99E
- Shared access to Highway 99E via the existing development to the west
- Full access to Highway 99E

Please note the current proposed access condition is for full-movement access that consolidates one of the existing accesses for the adjacent development to the west. The proposed access would permit vehicles only to enter the adjacent site, not to exit.

EXISTING TRAFFIC COUNTS

Count data was collected April 4th at the existing study area intersections and at the nearby existing access locations. In accordance with ODOT standard procedures, Highway 99E traffic volumes will be increased by a seasonal adjustment factor, currently estimated at 9.2%, to approximate the existing design hour volumes.

ANALYSIS SCENARIOS

Per the March 29th memo from DKS to the City of Canby, existing volumes will not be increased by a growth factor, nor will any in-process trips be added, to estimate a future background growth scenario. Analysis will include the following scenarios:

- 2012 Existing Conditions (AM & PM)
- 2012 Post-Development Conditions (AM & PM) – which also will include the access alternatives discussed above

Please confirm the scope and analysis assumptions above are appropriate. Please contact Brent Ahrend or me with any questions or comments. Thank you for your time.

Sincerely,

David Holt, P.E.
Transportation/Civil Project Engineer

GROUP MACKENZIE
Architecture | Interior Design | Structural Engineering
Civil Engineering | Landscape Architecture | Land Use Planning | Transportation Planning

Heritage Building | Suite 101
601 Main Street
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David Holt

From: Bryan Brown [BrownB@ci.canby.or.us]
Sent: Friday, April 20, 2012 4:29 PM
To: David Holt; abraham.tayar@odot.state.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: RE: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

All:

I wanted you to all know I did a really quick review of the outlined scope and assumptions today, as I will be out Monday & Tuesday next week. It seems to follow the scope set out by DKS well and makes sense to me – as a none traffic analysis guy. I appreciated hearing of your current driveway proposal regarding 99E and seeing the revised site plan. I'll deferred to any technical comments that Mr. Tayar or Mr. Maciejewski may have. Thanks. Bryan

Bryan Brown
Planning Director
City of Canby
111 NW 2nd Avenue
Canby, OR 97013
Ph: 503-266-7001 ext: 202

From: David Holt [mailto:DHolt@grpmack.com]
Sent: Friday, April 20, 2012 12:19 PM
To: abraham.tayar@odot.state.or.us; Bryan Brown; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

Good morning, Mr. Tayar, Mr. Brown, and Mr. Maciejewski,

We are preparing the transportation impact analysis (TIA) for the Fred Meyer Canby Fuel Facility project at 391 SE 1st Avenue, the southwest corner of the Highway 99E/S Locust Street intersection in Canby. The project proposes to provide 6 pumps (12 fueling positions) and an attendant's kiosk; a copy of the site plan is attached.

We've been asked to circulate this information so you may review the scope and assumptions of the TIA.

TRIP GENERATION

We conducted trip surveys at two existing Fred Meyer Fuel facilities (Sandy and Oak Grove) to estimate the average AM and PM trip generation rates for a fuel facility in Canby.

David Holt

From: Chris Maciejewski [csm@dksassociates.com]
Sent: Tuesday, April 24, 2012 8:10 AM
To: David Holt
Cc: abraham.tayar@odot.state.or.us; brownb@ci.canby.or.us; Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: Re: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

Please do send the survey information you collected to determine the internal, pass-by, and diverted-linked information. My initial reaction is that diverted-linked trip reductions don't apply to this evaluation given the small study area (i.e., we are not evaluating a large enough network to include the intersections/links that the trips are diverting from). Also, I'm not sure that the internal reductions reasonably apply when the site is not adjacent to the Fred Meyer store...I'll think more about that as I review the survey information.

Thanks,

Chris

--

Christopher S. Maciejewski, P.E., PTOE
DKS *Associates*
TRANSPORTATION SOLUTIONS

720 SW Washington Street, Suite 500
Portland, Oregon 97205
Office: 503.243.3500 | Direct: 503.972.1231 | Mobile: 503.916.9610
csm@dksassociates.com
www.dksassociates.com

On Fri, Apr 20, 2012 at 12:18 PM, David Holt <DHolt@grpmack.com> wrote:

Good morning, Mr. Tayar, Mr. Brown, and Mr. Maciejewski,

We are preparing the transportation impact analysis (TIA) for the Fred Meyer Canby Fuel Facility project at 391 SE 1st Avenue, the southwest corner of the Highway 99E/S Locust Street intersection in Canby. The project proposes to provide 6 pumps (12 fueling positions) and an attendant's kiosk; a copy of the site plan is attached.

We've been asked to circulate this information so you may review the scope and assumptions of the TIA.

TRIP GENERATION

David Holt

From: TAYAR Abraham * Avi [Abraham.TAYAR@odot.state.or.us]
Sent: Tuesday, April 24, 2012 4:53 PM
To: David Holt; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: RE: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

ODOT has concern regarding applying diverted and internal trip reductions for this development. ODOT suggests that the analysis follow ITE's Trip Generation Handbook with its recommendation for pass-by trip reduction for the proposed land use for the site.

Avi Tayar, P.E.
Development Review Team Leader
ODOT Region 1
503-731-8221

From: David Holt [mailto:DHolt@grpmack.com]
Sent: Friday, April 20, 2012 12:19 PM
To: TAYAR Abraham * Avi; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

Good morning, Mr. Tayar, Mr. Brown, and Mr. Maciejewski,

We are preparing the transportation impact analysis (TIA) for the Fred Meyer Canby Fuel Facility project at 391 SE 1st Avenue, the southwest corner of the Highway 99E/S Locust Street intersection in Canby. The project proposes to provide 6 pumps (12 fueling positions) and an attendant's kiosk; a copy of the site plan is attached.

We've been asked to circulate this information so you may review the scope and assumptions of the TIA.

TRIP GENERATION

We conducted trip surveys at two existing Fred Meyer Fuel facilities (Sandy and Oak Grove) to estimate the average AM and PM trip generation rates for a fuel facility in Canby.

The facility in Sandy, Oregon (35885 Industrial Way, Sandy, OR 97055) was selected because

- Similar to Canby, it is located in a small urban area just outside the Portland Metro Area.
- It is located near a state highway that serves a high percentage of the area's trips.
- It's unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Sandy. The nearest Fred Meyer store is in Gresham (2497 SE Burnside Road), and this store also has a fuel facility.

The facility in Oak Grove, Oregon (13625 SE McLoughlin Boulevard, Oak Grove, OR 97222) was selected because

- It is located adjacent to a state highway – coincidentally the same highway (99E) that runs through Canby – that serves a high percentage of the area's trips.
- Similar to the Canby site, it is located approximately 0.6 miles away from the associated Fred Meyer store.
- It's unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Oak Grove. The nearest Fred Meyer stores are in Clackamas at 16301 SE 82nd Drive (near Highway 212/224) and in Happy Valley at 8955 SE 82nd Avenue (at Johnson Creek Boulevard). The existing fuel facility at the Johnson Creek store is likely more convenient for patrons of both these stores.

David Holt

From: Brent Ahrend
Sent: Wednesday, April 25, 2012 4:29 PM
To: TAYAR Abraham * Avi; David Holt; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: james.coombes@fredmeyer.com; Jake Tate
Subject: RE: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

Avi & Chris,

Based on your comments, we will treat the diverted trips as primary (appropriate for this small study area).

We know from surveys at Fred Meyer fuel facilities, that many customers utilize their rewards card fuel discount at the same time they shop at the store. This shared trip is internal when the fuel is located adjacent to the store. In this case, with the fuel located about ½ mile away, we expect these shared trips will still occur, but will now be added to the adjacent streets (Hwy 99E). We propose this 38% of fuel trips be treated as primary trips traveling to and from the store.

The 32% primary trips (representing true primary and diverted link) will be assigned per the distribution from the modeling. For comparison, ITE estimates 42% pass-by for a stand-alone fuel facility.

Pass-by trips represent 30% of fuel trips and will be assigned based on the existing volumes on Hwy 99E

We trust this will address your concerns, and believe this best models the expected traffic conditions.

Thanks,

Brent

From: TAYAR Abraham * Avi [mailto:Abraham.TAYAR@odot.state.or.us]
Sent: Tuesday, April 24, 2012 4:53 PM
To: David Holt; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: RE: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

ODOT has concern regarding applying diverted and internal trip reductions for this development. ODOT suggests that the analysis follow ITE's Trip Generation Handbook with its recommendation for pass-by trip reduction for the proposed land use for the site.

Avi Tayar, P.E.
Development Review Team Leader
ODOT Region 1
503-731-8221

From: David Holt [mailto:DHolt@grpmack.com]
Sent: Friday, April 20, 2012 12:19 PM
To: TAYAR Abraham * Avi; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

Good morning, Mr. Tayar, Mr. Brown, and Mr. Maciejewski,

DKS Associates
TRANSPORTATION SOLUTIONS

MEMORANDUM

DATE: March 29, 2012

TO: Bryan Brown, City of Canby

FROM: Chris Maciejewski, PE, PTOE

SUBJECT: **Canby Fred Meyer Fuel Station Traffic Impact Study (TIS) Scope**

P11010-015

This memorandum describes the scope of services to evaluate the transportation impacts associated with the proposed Fred Meyer Fuel Station in the City of Canby. This scope of services has been prepared through our on-call services contract and coordination with ODOT staff[1]. The proposed fuel station would consist of twelve fueling stations (6 fuel pumps), a 3,956 square foot covered canopy, a 176 square foot kiosk with bathroom, two underground storage tanks, three employee parking spaces, an air dispenser station, and a 1,000 gallon propone fuel station[2]. No convenience store will be provided.

The project site is located on the southwest corner of the intersection of Highway 99E (SE 1st Ave) and S Locus Street. Highway 99E is a state facility and is classified as a regional highway and state truck route[3]. Both S Locus Street and SE 2nd Avenue are classified as local City streets.

The site is made up of five property lots all of which are currently vacant. All lots are currently designated as Highway Commercial (HC) per the City's Comprehensive Plan and are zoned Highway Commercial (C-2). A service station is an outright permitted development based on the current zoning of the site; therefore no zone change would be required for the proposed application.

Scope of Services

Task 1: Existing Conditions Analysis/Data Collection

An existing conditions analysis will document the existing transportation conditions within the project study area. A description of the surrounding transportation network will be provided

[1] Phone conversation with Abraham Tayar, ODOT, March 14, 2012
[2] Fred Meyer Gas Station Pre-Application Meeting, February 28, 2012.
[3] 1999 Oregon Highway Plan, Appendix D: Highway Classification by Milepoint.

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including functional classification of roadways, roadway cross-sections, posted speed limits, and pedestrian/bicycle/transit facilities.

The study intersections will be reviewed to determine the existing geometry, traffic control, and operations during the peak hours. Existing intersection operating conditions will be analyzed to establish the current peak hour performance. The critical peak periods for this evaluation will be the weekday morning (7:00 to 9:00 am) and evening (4:00 to 6:00 pm). These are the times during a typical weekday when the study area street system would be expected to experience the highest vehicle volumes. DKS will collect vehicle turn movement counts at the study area intersections during each of the identified peak periods.

The study area intersections include the following:

- Highway 99E/S Locust Street
- S Locust Street/SE 2nd Avenue
- Onsite and Offsite study intersections (see Access Management Plan)

Furthermore, collision records at study intersections will be reviewed and summarized in a table.

Preliminary trip generation and distribution estimates indicate that trip levels would not trigger analysis to be conducted at any other intersections based on the City's and ODOT's intersection analysis evaluation guidelines. In addition, it does not appear that a Neighborhood Through-Trip Study would be required[4].

Task 2: Project Trip Generation/Trip Distribution

The amount of new vehicle trips generated by the proposed fuel station to the site will be estimated using traffic counts collected by DKS at one similar land use within the surrounding area. DKS will collect traffic counts (entering/exiting volume) during the critical peak morning (7:00 to 9:00 am) and evening (4:00 to 6:00 pm) periods. The counts collected will be compared to trip generation estimates published in the ITE Trip Generation Manual for similar land use type[5]. The greater trip generation estimate will be used for analysis to evaluate worst case impacts. Trip generation estimates will be provided for daily, morning, and evening peak hour periods. The project trip generation estimate will be summarized in a table, including pass-by trip reductions.

The distribution of site vehicle traffic will be based on the existing travel patterns as determined by traffic counts at surrounding intersections, the City of Canby Travel Forecast Tool, and input from the project team. The project trip distribution will be shown on a study area figure.

[4] City of Canby Transportation System Plan, Chapter 10: Implementation Plan, December 2010
[5] Trip Generation Manual, Institute of Transportation Engineers, 8th Edition.

Task 3: Traffic Impact Analysis

A transportation impact analysis for the proposed project will be conducted in accordance to the City's requirements[6]. The new vehicle trips generated by the proposed project will be added onto the existing traffic volumes to identify the expected traffic operating conditions once the project is built and fully operational. The traffic conditions will be evaluated at the same study intersections as was considered in the Existing Conditions analysis. At this time, there are no significant approved but un-built projects in the study area, so a future background growth scenario will not be evaluated.

Street facilities and intersections that are shown to fall below the minimum acceptable operating thresholds will be identified for possible mitigation measures. Typical mitigation measures can include traffic control strategies, access management plans, intersection widening for turn lanes, and roadway widening. Transportation performance criteria will consider City of Canby and ODOT standards, where applicable.

Task 4: Site Access and Circulation Review

The forecasted site traffic accessing the public road system via the sites access will be evaluated for performance and safety. DKS will collect video recordings during the critical peak morning (7:00 to 9:00 am) and evening (4:00 to 6:00 pm) periods at a similar land use site to assist with estimating vehicle stacking within the proposed site. The video recordings will take place simultaneously with the traffic counts collected as part of Task 2.

Internal circulation routes will be examined using the AutoTURN™ turn simulation software to determine adequacy for serving fuel delivery vehicles, emergency vehicles, and motor vehicle traffic. In addition, site access for non-auto modes of travel (pedestrians and bicyclists) will be evaluated for connectivity to the surrounding transportation system. Any inadequacies discovered during the evaluation will be identified and mitigation measures will be recommended, as needed.

Sight distance will be verified at all site access locations and vision triangles will be checked to ensure that they are clear from any obstructions.

Task 5: Access Management Plan

The preliminary site plan indicates two proposed full accesses to the site. One is located along Highway 99E and the other along SE 2nd Avenue. Proposed access locations will be compared to both ODOT and the City's access spacing requirements. Preliminary review of the proposed site plan reveals that the City's access spacing standards would not be able to be met based on the close proximately of adjacent intersections (S Locust Street). The City's standard requires that accesses be located at least 330 feet away from any street intersection; therefore an access management plan

[6] City of Canby Transportation System Plan, Chapter 10: Implementation Plan, December 2010.

will be prepared per the City's requirements to assess the potential impacts of the proposed access locations[7]. At a minimum the access management plan will include:

- The minimum study area shall include the length of the site's frontage plus 250 feet measured from each property line or access point(s), whichever is greater.
- The potential safety and operational problems associated with the proposed access point. The access management plan shall review both existing and future access for all properties within the study area as defined above.
- A comparison of all alternatives examined. At a minimum, the access management plan shall evaluate the proposed modification to the access spacing standard and the impacts of a plan utilizing the City standard for access spacing. Specifically, the access management plan shall identify any impacts on the operations and/or safety of the various alternatives.
- A list of improvements and recommendations necessary to implement the proposed access modification, specifically addressing all safety and operational concerns identified.
- References to standards or publications used to prepare the access management plan.

The access management plan will examine access alternatives such as the relocation of proposed access locations and the potential for shared use with adjacent accesses (property to the west). The plan will include the following alternative scenarios:

- No Access to Highway 99E
- Shared access to Highway 99E with the development to the west
- Restricted movement access to Highway 99E
- Full Access to Highway 99E

Based on the preliminary access management plan study area, approximately seven access points along Highway 99E and one additional intersection (Highway 99E/S Knott Street) would need to analyzed. DKS will collect traffic counts at these locations during the critical peak morning (7:00 to 9:00 am) and evening (4:00 to 6:00 pm) periods. These counts will be collected in conjunction with those identified in Task 1.

Task 6: Documentation

The findings and recommendations of this traffic impact analysis will be presented in a Draft Report that will be submitted to the City and ODOT (one electronic copy). The report will document data collection, analysis procedure, results, and mitigation measures for the proposed project traffic if necessary. A technical appendix supporting calculations will accompany the report. After the City

[7] City of Canby Transportation System Plan, Chapter 10: Implementation Plan, December 2010.

and ODOT have reviewed the Draft Report, we will make appropriate edits and submit a revised Draft Report. Once comments are received, DKS will make appropriate edits and submit a Final Report (one electronic copy).

Task 7: Meetings

The DKS project manager will attend up to one (1) coordination meeting or hearing as part of this project. Additional meetings as directed by the City will be provided for an additional fee on a time and expenses basis.

Budget

The level of effort for these tasks is up to 130 hours in addition to data collection efforts. Therefore, including expenses, our fee estimate for this effort is $17,000.

If the applicant chooses to utilize another consultant to complete this task, our assistance with forecasting (using the Canby TSP Travel Forecast Tool) and review with written response of the applicant's TIS would be approximately $1,500.

If you have any questions, please feel free to call or email.

M E M O R A N D U M

TO: *Jake Tate, PE, Project Engineer*

RE: ***Pre-Application Conference for Site and Design Review (Clackamas County Assessor Tax Lot No's: 100, 200, 300, 2200,& 2300 of Tax Map 3-1E33DC at 351, 369, & 391 SE 1st Ave and 360, & 392 SE 2nd Ave).***

FROM: *Bryan Brown, Planning Director*

DATE: *February 28, 2011*

APPLICANT:
James Coombes
503-797-3539
3800 SE 22nd Ave, Portland, OR 97202
james.coombes@fredmeyer.com

PREVIOUS FILE NO.:
N/A Vacant

OWNER:
Oliver Lang LLC
PO Box 353
Canby, Oregon 97013
503-266-2715

STAFF:
Bryan Brown
Planning Director

LEGAL DESCRIPTION:
Lots 1, 2, 3, 12, 13, 14 of Albert Lee's Second Addition to the City of Canby, Clackamas County Oregon

DATE OF REPORT:
February 28, 2012

LOCATION:
Southwest Corner of the Intersection of Hwy 99E & S Locust Street – Canby, Oregon

COMP. PLAN DESIGNATION:
Highway Commercial – HC

ZONING DESIGNATION:
Highway Commercial – C-2; Core Commercial (CC) sub area of the Downtown Canby Overlay Zone (DCO).

Proposal: Construct a Six Pump fuel station with an approximate 3,956 square foot covered canopy, attendant 176 square foot kiosk w/bathroom, 2 – proposed access driveways (new) – one from highway and one on 2nd Avenue, 2 underground gasoline

storage tanks, 3 employee parking spaces, an air dispenser station, and a 1,000 gallon propane fuel station.

The project is proposed to be constructed on a 32,560 sq. ft. tract of land abutting Highway 99E in Canby, Oregon. The parcel is currently zoned Highway Commercial (C-2) with a Canby Downtown Overlay district. The parcel is currently owned by Oliver Lang LLC.

Site Development Comments and Issues to Address:

1. We would expect an increase in impact on most City services since the property is currently vacant.
2. Use of sanitary sewer is evident and service connection point should be confirmed with Canby publics works and/or City Engineer.
3. Use of domestic water needs is evident – but minimal for restroom. Service connection should be confirmed with Canby Utility.
4. Evaluation of nearest existing fire hydrant should be determined for fire suppression requirements and whether it is adequately located or whether installation of additional hydrants may be needed.
5. Interior Fire Sprinkler suppression system is NOT likely to be needed for a fuel canopy and one man employee kiosk?
6. Electrical Service needs for the lot must be determined
   - 3 phase - ?
   - Service amps total?
7. Use of Natural Gas Service should be determined and is it available?
8. Will Existing Phone/Cable Service be needed and is it available? Or modify as necessary
9. Storm water runoff must be controlled onsite through either approved existing DEQ registered injection drywell sites or on-site swale/detention facilities as determined through a storm water pre-and post-development drainage analysis.
10. Driveway access to existing property is generally allowed, but coordination with the City & ODOT is very important since a new proposed driveway is involved onto a State Hwy 99E. Driveway separation distance from the Locust Street intersection will likely need to be as far away as possible – with a shared driveway with a neighboring property if possible.
11. Garbage facility needs must be determined, shown on the site plan, and confirmed with Canby disposal as suitable for access and pickup.
12. US Mail service means should be determined and shared with staff.
13. A Traffic Scoping and likely Traffic Impact Study must be completed prior to submittal of your land use application. Increased traffic loads to 99E must be evaluated along with impacts to one or more nearby intersections and site circulation functionality by a registered Transportation engineer.
14. On-site parking needs are minimal based on enclosed kiosk building square footage – presumably the 1 space per 550 square feet indicated by the "all other uses" category in CMC Table 16.10.050.

15. Vision Triangles. Your project must comply with vision triangle requirements at the street intersection and where your driveways intersect with a public street. They are measured along the curb 30 feet in either direction at the street intersection and 15 feet at the driveways. No obstruction is allowed within the vision clearance areas that exceed 30 inches in height. The masonry wall is likely within the designated vision clearance area and would need to be lowered.
16. Pylon Sign. Assuming that you take staff's recommendation to process a Text Amendment to secure approval of your project, your property would be placed in the Outer Highway Subarea of the Downtown Canby Overlay making it subject to Table 3 of the Sign Ordinance. Pole signs are allowed a maximum sign area of 48 square feet per side, and 18 feet in height. The current Core Commercial Subarea only allows a pole sign of 12 feet in height.
17. Access Management Guidelines. The applicable access limitations indicated in CMC 16.46.30 require a minimum driveway separation – measured centerline to centerline – of 330 feet for a proposed driveway onto an arterial street and 10 feet of separation onto a local street. The minimum spacing of a proposed driveway to a street is also 330 feet on an arterial street and 50 feet on a local street.
18. Engineered Traffic Study/Access Management Plan Evaluation shall be submitted through a variance of access spacing policies request when access to a lower classification facility (street) is not feasible. That appears to be the case in your proposed project. The City may allow a driveway not meeting spacing requirements with use of restricted turning movements. Consideration of a joint or shared driveway use must be explored if you do not meet access spacing standards. These do not necessarily need to meet all spacing standards. The city, with ODOT's approval, may waive or modify the joint access requirements if shown to be impractical.
19. Gateway Corridor Plan Compliance. Staff wants you to be aware that the City is currently in the process of completing and working toward the adoption of a 99E Gateway Corridor Plan which may have design considerations which would be applicable to your project. They relate primarily to the sidewalk widths and/or their joint use by bicycles and in some limited instances the need for minor right-of-way dedication to accomplish the vision of the Plan that is likely to be adopted. The exact standards are unknown at this time.

Existing Conditions: The property is currently vacant. The subject development site is a 32,560 sq. ft. in size with potential access to 3 public streets – Hwy 99 E, Locust Street, and SE 2nd Avenue. The site plan indicates two-way access from lot on the South side of Highway 99E between Ivy and Grant Streets. Commercial development exists on the adjacent lot to the west.

Application(s) to Submit: To complete your necessary land use approval for this development project you will need to submit the following:

1. Text Amendment (application fee is $2880); needed to adequately justify conformance with Downtown Canby Overlay design standards by altering the DCO subarea boundary so as to remove this property from the Core Commercial Subarea (CC) and thus adding it to the Outer Highway Commercial Subarea (OHC). I believe staff can and will support such an amendment, but you need to adequately justify making the request to the Planning Commission – as staff does not believe it is appropriate for us to serve as your direct advocate in this request. Staff believes your application will be very weak and difficult to justify conformance with the intent of the purpose and design review criteria within the Core Commercial Subarea.
2. Site and Design Review Type III (application fee currently $1,750 for a 0.75 acre site); application reviewed by the Planning Commission at an advertised public hearing with notice to property owners and residents within a 500 foot radius prepared by the applicant and mailed out by city staff 20 days prior to the hearing date. The process is described in Canby's Municipal Code for Type III applications 16.89.040. The application packet is online. Application must be signed by the property owner.
3. Replat/Existing Platted Lot/Tax Lot Consolidation with possible Final Plat. You do not want to be in the position of risking a building permit denial based on building a structure over an existing property or tax lot line. You need to abandon the existing lot arrangement in favor of a single tract. You will need to contact the County surveyor to obtain advice about the necessary procedure. The City is likely to only be involved should a Final Plat be necessary to implement the lot consolidation. The Final Plat review by the City is ministerial and the cost is $100.

Process: There is a use approval issue with a fuel station at this location due to the Downtown Overlay District and its applicable development standards and site and design review guidelines. The primary use concern arises from the designated Core Commercial Subarea of the Downtown Overlay District in which the property is located. The Downtown Canby Framework Diagram (Figure 7) indicates the boundaries of the three sub-areas and are further described in CMC 16.41.020(A)(1-3). It is planning staff's professional opinion that placing a fuel station within the Core Commercial subarea will pose significant problems in adequately demonstrating compliance with the intent and actual design guidelines. Therefore, staff would suggest that the applicant consider submitting a Development Code Text Amendment to modify Figure 11 and associated explanatory paragraphs in order to modify the boundary between the Core Commercial Subarea and the Outer Highway Commercial Subarea in order to move the property into the more suitable Outer Highway Commercial Subarea. Within this overlay subarea the use may be embraced and compliance or lack thereof with the applicable design guidelines more easily demonstrated.

It is evident to planning staff, that you should consider filing a Site and Design Review Type III application due to the potential inability to specifically meet <u>all</u> development standards. This public hearing process, will allow the applicant to propose the use of alternative methods to meet the intent of the standards for the unique use proposed.

The Site and Design Type II (DR) process is a "quasi-judicial" process which is considered through a public hearing with a decision made by the Planning Commission. This application requires notice to property owners and residents within a 500 foot radius from the outside boundary of the property limits; a neighborhood meeting is required prior to submittal of your application to share the project and garner any possible suggestions for its design. The Type III review process is described in further detail in Canby Municipal Code (CMC) 16.89.050. If appealed, the decision is heard by the City Council.

The DR application form is on the City's website:
http://www.ci.canby.or.us/Departments/communitydev&plan/forms.htm

Zoning: The lot has an underlying Highway Commercial (C-2) zone with an overlay of the Canby Downtown Overlay (DCO) and is within the Core Commercial (CC) subarea. The proposed use is clearly permitted outright within the underlying C-2 zone but as mentioned above, poses problems within the CC subarea of the Canby Downtown Overlay since the intent and development standards of the DCO and CC subarea supersede the base zone standards.

Validity: The information in this Pre-application conference is valid for one year. The Planning Commission's decision is generally valid for one year.

Zoning Standards Applicable to this Application

The following goals, policies, standards and criteria apply and should be addressed either written and/or graphically in the applicant's Text Amendment and Site and Design Review application narrative and/or plans. Without applicant-supplied information, there may be insufficient information to review the application and it could be deemed incomplete causing processing delay.

Applicable Canby Municipal Code Chapters	
16.10	Off Street Parking
16.22	C-2 Highway Commercial Zone
16.41	Downtown Canby Overlay Zone
16.43	Outdoor Lighting Standards
16.46.30	Access Management Guidelines for City Streets
16.49	Site and Design Review
16.89.050	Application and Review Procedures Type III Decision

16.10 Off Street Parking

Proposed standard: A fuel station is not a listed use, therefore the applicable parking standard is (All Others: 1.00 spaces per 500 square feet). This appears to imply a

minimum of 1 parking space based on enclosed building area. Practical needs will prevail. The standard is met as proposed. Joint parking or parking reductions are not proposed and are not needed to meet the standard, however a joint parking agreement would not be opposed if planned.

16.28 C-2 Highway Commercial Zone

The DCO is the superseding development Chapter for this proposal. According to this CMC 16.41.030: *Unless modified pursuant to the following Subsection, uses permitted outright in the underlying base zones are permitted outright in the DCO zone, subject to the respective zone district boundaries.... Uses permitted in the C-2 zone are permitted in the DCO zone,*

The base zone, the C-2 is a "stackable" zone in respect to use provisions. Per CMC 16.28.010.A, uses permitted outright in the C-2 Zone includes a fuel station.

All other development standards are contained in the DCO.

16.49.035 Application for Site and Design Review

A. *For projects in the Downtown Canby Overlay Zone, applicants may choose one of the following two processes. Your proposal appears to need the Type III process:*

1. *Type II - If the applicant meets all applicable site and design review standards set forth in Chapters 16.41 and 16.49, applicant shall submit a Type II application for approval pursuant to the approval criteria set forth in 16.49.040.5; or*

2. *Type III - If the applicant proposes the use of alternative methods or materials to meet the intent of the site and design review standards set forth in Section 16.41.070, the applicant shall submit a Type III application for approval pursuant to the approval criteria set forth in 16.49.040.6. The applicant must still meet all applicable requirements of Chapter 16.49.*

16.41 Downtown Overlay Zone

16.41.050 Development standards (selection of primary; others apply)

- Street Setback for OHC Subarea: 10' max. 0' min. other.
- At least 40% of the length of each lot frontage shall be developed with a building(s) built at the minimum setback from the street lot line for the OHC Subarea – more for the CC Subarea.
- FAR: 0.25 for OHC

16.41.060.B.2.A DCO Site And Design Review Guidelines

Existing Core Commercial Sub-Area (CC). The inner highway portion of the Core Commercial area spans the length of Highway 99E between Elm and Locust. In many ways, it serves as an extension of the Downtown Core, just across the highway. Because this area serves as a "gateway" from Highway 99E into the traditional downtown and serves many of the same purposes and types of uses, buildings here should be appropriately scaled, inviting to pedestrians, and demonstrate high-quality architectural design. As a result, architectural standards for this area and the downtown are identical, although some development standards differ as described in section 16.41.050. Staff believes that modification of the subarea boundary would not be particularly detrimental to the objectives of the Downtown Canby Overlay. Changing subarea would also eliminate the parking lot location standards.

16.41.070 DCO Site And Design Review Standards

Refer to the Applicable Subarea design criteria dealing with:
Visible transmittance.
Building Entries and doors Orientation
Transparency
Additional architectural standards/elements Bays, awnings, etc.
Rooftop structures
Parking
Parking and Maneuvering Landscaping
Overall Site Landscaping

16.43 Outdoor Lighting Standards

Planning Comment: See Appendix A. This is in designated Lighting Zone Two (LZ 2). Applicant must submit a photometric plan.

Appendix A
Chapter 16.43
OUTDOOR LIGHTING STANDARDS

Sections:

16.43.010 Purpose.

The purpose of this section is to provide regulations for outdoor lighting that will:

A. Regulate uses of outdoor lighting for nighttime safety, utility, security, productivity, enjoyment and commerce.

B. Minimize glare, particularly in and around public rights-of-way.

C. Minimize light trespass, so that each owner of property does not cause unreasonable light spillover to other property.

D. Preserve the night sky for astronomy and enjoyment.

E. Conserve energy and resources to the greatest extent possible.

16.43.020 Definitions

The following words, phrases and terms as used in this chapter shall have the following meaning:

A. Artificial Sky Glow. The brightening of the night sky attributable to man made sources of light.

B. Candela. The unit of luminous intensity of a lighting source emitted in a given direction.

C. Curfew. A time each night after which certain electric illumination must be turned off or reduced in intensity.

D. Glare. Light that causes visual discomfort, annoyance or disability, or a loss of visual performance.

E. Landscape Lighting. Luminaires mounted in or at grade (not to exceed 3 feet above grade) and used solely for landscape rather than area lighting, or fully shielded luminaires mounted in trees and used solely for landscape or Facade lighting.

F. Light Trespass. Light flowing across the property boundary. See Figure 16.43.1 for illustration.

G. Lumen. The unit of luminous flux: a measure of the amount of light emitted by a lamp.

H. Luminaire. A complete lighting unit consisting of one or more electric lamps, the lamp holder or holders, reflector, lens, diffuser, ballast, and/or other components and accessories.

I. Luminous Flux. A measure of the total light output from a source, the unit being the lumen.

J. Mounting Height. The vertical distance between the lowest part of the luminaire and the ground surface directly below the luminaire. See Figure 16.43.2 for illustration.

K. Photometric Test Report. A report by an independent testing laboratory or one certified by the National Institute of Standards and Technology (NIST) describing the candela distribution, shielding type, luminance, and other optical characteristics of a specific luminaire.

L. External Point of Service. An outdoor service which a business provides some service to a customer, such as drive up food service, a bank transaction, or the like

M. Shielding. A device or technique for controlling the distribution of light. Four levels of shielding are defined as follows:

1. Fully Shielded. A luminaire emitting no luminous flux above the horizontal plane;

2. Shielded. A luminaire emitting less than 2.0 percent of its luminous flux above the horizontal plane;

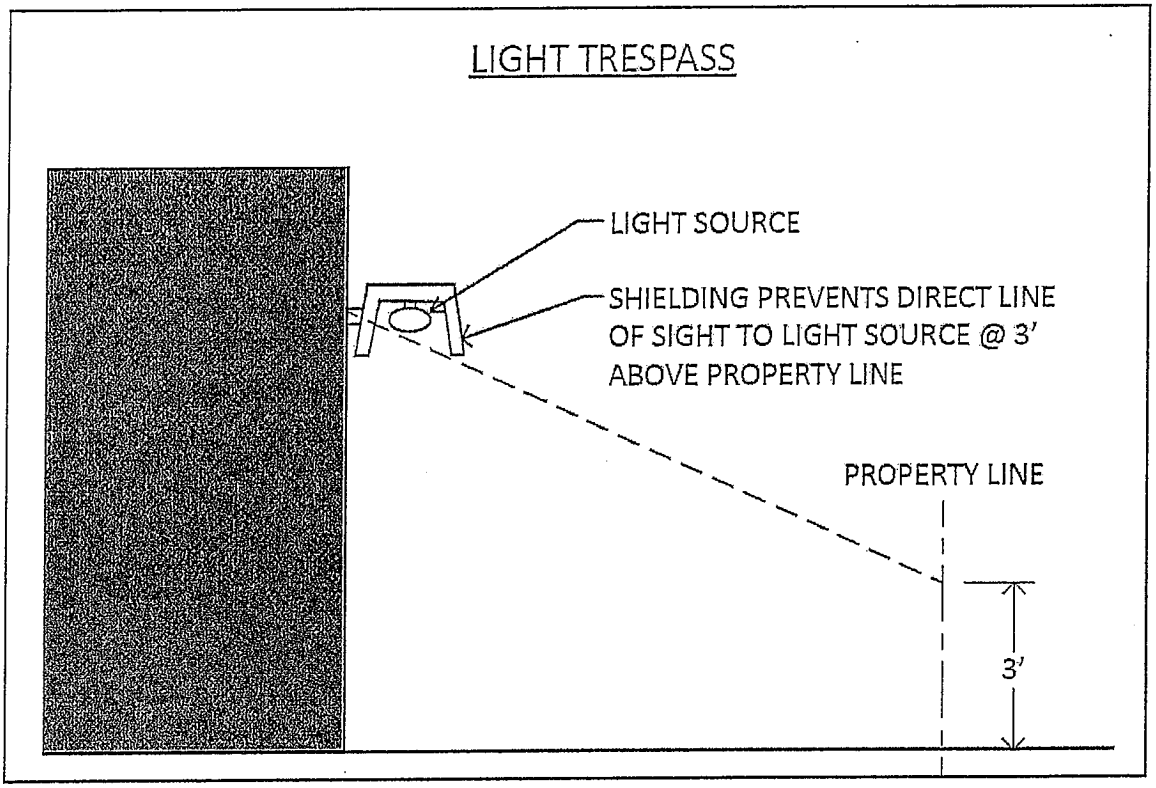
3. Partly Shielded. A luminaire emitting less than 10 percent of its luminous flux above the horizontal plane;

4. Unshielded. A luminaire that may emit its flux in any direction.

N. Spill Light. Lighting from a lighting installation that falls outside of the boundaries of the property on which the installation is sited.

O. Temporary Lighting. Lighting installed with temporary wiring and operated for less than 60 days in any calendar year.

Figure 16.43.1: Light Trespass



16.43.030 Applicability.

The outdoor lighting standards in this section apply to the following:

A. New uses, buildings, and major additions or modifications:

1. For all proposed new land uses, developments, buildings, and structures that require a building permit, all outdoor lighting fixtures shall meet the requirements of this Code.

2. All building additions or modifications of fifty (50) percent or greater in terms of additional dwelling units, gross floor area, or parking spaces, either with a single addition or cumulative additions subsequent to the effective date of this provision, shall invoke the requirements of this Code for the entire property, including previously installed and any new outdoor lighting.

B. Minor additions. Additions or modifications of less than fifty (50) percent to existing uses, as defined in Section A(2) above, and that require a building permit, shall require the submission of a complete inventory and site plan detailing all existing and any proposed new outdoor lighting. Any new lighting on the site shall meet the requirements of this Code with regard to shielding and lamp type. The total outdoor light output after

the modifications are complete shall not exceed that on the site before the modification, or that permitted by this Code, whichever is larger.

16.43.040 Lighting Zones.

A. Zoning districts designated for residential uses (R-1, R-1.5 and R-2) are designated Lighting Zone One (LZ 1). All other zoning districts are designated Lighting Zone Two (LZ 2).

B. The designated Lighting Zone of a parcel or project shall determine the limitations for lighting as specified in this ordinance.

Table 16.43.040 Lighting Zone descriptions

Zone	Ambient Illumination	Representative Locations
LZ 1	Low	Rural areas, low-density urban neighborhoods and districts, residential historic districts. This zone is intended to be the default for residential areas.
LZ 2	Medium	High-density urban neighborhoods, shopping and commercial districts, industrial parks and districts. This zone is intended to be the default condition for commercial and industrial districts in urban areas.

16.43.050 Exempt Lighting.

The following luminaires and lighting systems are exempt from the requirements of this Section.

A. Externally illuminated signs in conformance with provisions in section 16.42.040 of this code.

B. Internal lighting for signs in conformance with provisions in section 16.42.040 of this code.

C. Temporary lighting for theatrical, television, and performance events.

D. Lighting in swimming pools and other water features governed by Article 680 of the National Electrical Code.

E. Code-required exit signs.

F. Code-required lighting for stairs and ramps.

G. Lighting required and regulated by the Federal Aviation Administration, U.S. Coast Guard, or other federal, state, or county agency.

H. Interior lighting.

I. Temporary lights for emergency public or private utility maintenance or public safety.

J. Lighting fixtures existing prior to this ordinance not exceeding 30 watts.

16.43.060 Prohibited Light and Lighting.

A. All outdoor light sources, except street lights, shall be shielded or installed so that there is no direct line of sight between the light source or its reflection at a point 3 feet or higher above the ground at the property line of the source. Light that does not meet this requirement constitutes light trespass. Streetlights shall be fully shielded.

B. The following lighting systems are prohibited from being installed or used except by special use permit:.

1. Aerial Lasers.

2. "Searchlight" style lights.

3. Other very intense lighting, defined as having a light source exceeding 300 watts.

16.43.070 Luminaire Lamp Wattage, Shielding, and Installation Requirements.

A. All outdoor lighting shall comply with the limits to lamp wattage and the shielding requirements in Table 16.43.070 per the applicable Lighting Zone. These limits are the upper limits. Good lighting design will usually result in lower limits.

B. The city may accept a photometric test report, demonstration or sample, or other satisfactory confirmation that the luminaire meets the requirements of the shielding classification.

C. Such shielded fixtures must be constructed and installed in such a manner that all light emitted by the fixture complies with the specification given. This includes all the light emitted by the fixture, either directly from the lamp or by a diffusing element, or indirectly by reflection or refraction from any part of the fixture. Any structural part of the fixture providing this shielding must be permanently affixed.

D. All canopy lighting must be fully shielded. However, indirect upward light is permitted under an opaque canopy provided that no lamp or vertical element of a lens or diffuser is visible from beyond the canopy and such that no direct upward light is emitted beyond the opaque canopy. Landscape features shall be used to block vehicle headlight trespass while vehicles are at an external point of service (i.e. drive-thru aisle).

E. All facade lighting must be restricted to the facade surface. The margins of the facade shall not be illuminated. Light trespass is prohibited. The sides of commercial buildings without a customer entrance shall not be lit.

Table 16.43.070 – Luminaire Maximum Wattage and Required Shielding

Lighting Zone	Fully Shielded	Shielded	Partly Shielded	Unshielded (Shielding is highly encouraged. Light trespass is prohibited.)
LZ 1	150	60	None Permitted	Low voltage landscape lighting and temporary holiday lighting.
LZ 2	450	100	60	Landscape and facade lighting 100 watts or less; ornamental lights of 60 watts or less.

16.43.080 Height Limits.

Pole and surface-mounted luminaires under this section must conform with Section 16.43.070.

A. Lighting mounted onto poles or any structures intended primarily for mounting of lighting shall not exceed a mounting height of 40% of the horizontal distance of the light pole from the property line, nor a maximum height according to Table 16.43.080, whichever is lower. The following exceptions apply:

1. Lighting for residential sports courts and pools shall not exceed 15 feet above court or pool deck surface.

2. Lights specifically for driveways, and then only at the intersection of the road providing access to the site, may be mounted at any distance relative to the property line, but may not exceed the mounting height listed in Table 16.43.080.

3. Mounting heights greater than 40% of the horizontal distance to the property line but no greater than permitted by Table 16.43.080 may be used provided that the luminaire is side-shielded toward the property line.

4. Landscape lighting installed in a tree. See the Definitions section.

5. Street and bicycle path lights.

B. Lighting mounted onto buildings or other structures shall not exceed a mounting height greater than 4 feet higher than the tallest part of the building or structure at the place where the lighting is installed, nor higher than 40% of the horizontal distance of the light from the property line, whichever is less. The following exceptions apply:

1. Lighting attached to single family residences shall not exceed the height of the eave. Lighting for driveways shall conform to Table 16.43.080.

2. Lighting for facades may be mounted at any height equal to or less than the total height of the structure being illuminated regardless of horizontal distance to property line.

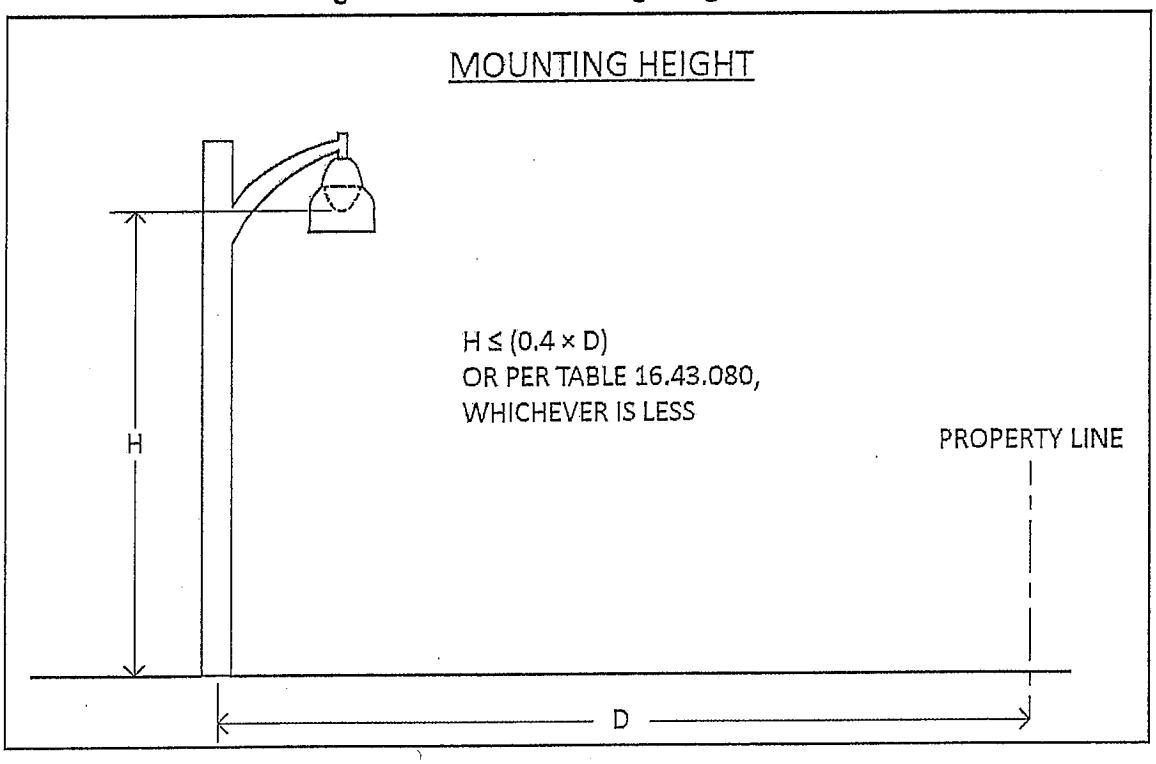
3. For buildings less than 40 feet to the property line, including canopies or overhangs onto the sidewalk or public right of way, luminaires may be mounted to the vertical facade or the underside of canopies at 16 feet or less.

4, The top exterior deck of parking garages should be treated as normal pole mounted lighting rather than as lights mounted to buildings. The lights on the outside edges of such a deck must be side shielded to the property line.

Table 16.43.080 – Maximum Lighting Mounting Height in Feet

Lighting Zone	Lighting for Driveways, Parking and Transit	Lighting for Walkways, Plazas and other Pedestrian Areas	All Other Lighting
LZ 1	35.0	18.0	8.0
LZ 2	37.5	18.0	15.0

Figure 16.43.2: Mounting Height



16.43.090 Lighting Controls

The city strongly recommends the use of timers and/or motion detectors on outdoor lighting, and that motion detectors be set to minimize unnecessary activation. For example, motion detectors for entryway or driveway lights should not activate for off-site pedestrians or cars.

16.43.100 Exceptions to Standards.

A. Exceptions to the lighting standards in this section may be approved by the Planning Director. Lighting systems not complying with the technical requirements of this ordinance but consistent with the intent of the ordinance may be approved for the following:

1. Sport fields.

2. Construction lighting.

3. Industrial lighting for hazardous areas where the heat of the lighting fixture may cause a dangerous situation.

4. National and State Flag lighting with spotlights greater than 40 watts.

B. To obtain such approval of an exception, applicants shall demonstrate that the proposed lighting installation:

1. Has received every reasonable effort to mitigate obtrusive light and artificial sky glow, supported by a signed statement from a registered engineer or by a lighting certified professional describing the mitigation measures.

2. The Planning Director shall review each such application. Approval may be granted if, upon review, the Planning Director believes that the proposed lighting will not create unwarranted glare, sky glow, or light trespass.

16.43.110 Lighting Plan Required

A lighting plan shall be submitted with the development or building permit application and shall include:

A. A site plan showing the location of all buildings and building heights, parking, and pedestrian areas.

B. The location and height (above grade) of all proposed and existing luminaires on the subject property.

C. Luminaire details including type and wattage of each lamp, shielding and cutoff information, and a copy of the manufacturer's specification sheet for each luminaire.

D. Control descriptions including type of control (time, motion sensor, etc.), the luminaire to be controlled by each control type, and the control schedule when applicable.

E. Any additional information necessary to demonstrate compliance with the standards in this section. (Ord.1338, 2010)

I. The property owner and the temporary vendor permit holder shall be jointly and severably responsible for any violation of this section or other applicable sections of the Canby Municipal Code. Any such violation may result in the immediate revocation or non-renewal of a temporary vendor permit, and may result in the denial of any future temporary vendor permit for the site upon which the violation occurred. (Ord 1315, 2009)

16.08.150 Traffic Impact Study (TIS).

A. Purpose. The purpose of this section of the code is to implement Section 660-012-0045(2)(b) of the State Transportation Planning Rule, which requires the city to adopt a process to apply conditions to development proposals in order to minimize adverse impacts to and protect transportation facilities. This section establishes the standards to determine when a proposal must be reviewed for potential traffic impacts; when a Traffic Impact Study must be submitted with a development application in order to determine whether conditions are needed to minimize impacts to and protect transportation facilities: what information must be included in a Traffic Impact Study; and who is qualified to prepare the Study.

B. Initial scoping. During the pre-application conference, the city will review existing transportation data to determine whether a proposed development will have impacts on the transportation system. It is the responsibility of the applicant to provide enough detailed information for the city to make a determination. If the city cannot properly evaluate a proposed development's impacts without a more detailed study, a transportation impact study (TIS) will be required to evaluate the adequacy of the transportation system to serve the proposed development and determine proportionate mitigation of impacts. If a TIS is required, the city will provide the applicant with a "scoping checklist" to be used when preparing the TIS.

C. Determination. Based on information provided by the applicant about the proposed development, the city will determine when a TIS is required and will consider the following when making that determination.

1. Changes in land use designation, zoning designation, or development standard.

2. Changes in use or intensity of use.

3. Projected increase in trip generation.

4. Potential impacts to residential areas and local streets.

5. Potential impacts to priority pedestrian and bicycle routes, including, but not limited to school routes and multimodal street improvements identified in the TSP.

6. Potential impacts to intersection level of service (LOS).

D. TIS General Provisions

1. All transportation impact studies, including neighborhood through-trip and access studies, shall be prepared and certified by a registered Traffic or Civil Engineer in the State of Oregon.

2. Prior to TIS scope preparation and review, the applicant shall pay to the city the fees and deposits associated with TIS scope preparation and review in accordance with the adopted fee schedule. The city's costs associated with TIS scope preparation and review will be charged against the respective deposits. Additional funds may be required if actual costs exceed deposit amounts. Any unused deposit funds will be refunded to the applicant upon final billing.

3. For preparation of the TIS, the applicant may choose one of the following:

a. The applicant may hire a registered Oregon Traffic or Civil Engineer to prepare the TIS for submittal to the city. The city Traffic Engineer will then review the TIS and the applicant will be required to pay to the city any fees associated with the TIS review; or

b. The applicant may request that the city Traffic Engineer prepare the TIS. The applicant will pay to the city any fees associated with preparation of the TIS by the city Traffic Engineer.

4. The TIS shall be submitted with a concurrent land use application and associated with application materials. The city will not accept a land use application for process if it does not include the required TIS.

5. The city may require a TIS review conference with the applicant to discuss the information provided in the TIS once it is complete. This conference would be in addition to any required pre-application conference. If such a conference is required, the city will not accept the land use application for processing until the conference has taken place. The applicant shall pay the TIS review conference fee at the time of conference scheduling, in accordance with the adopted fee schedule.

6. A TIS determination is not a land use action and may not be appealed.

E. TIS Scope. The city shall determine the study area, study intersections, trip rates, traffic distribution, and required content of the TIS based on information provided by the applicant about the proposed development.

1. The study area will generally comprise an area within a ½-mile radius of the development site. If the city determines that development impacts may extend more than ½ mile from the development site, a larger study area may be required. Required study intersections will generally include (in addition to the primary access points) collector/collector and above intersections with an anticipated peak hour traffic increase of five-percent from the proposed project.

2. If notice to ODOT or other agency is required pursuant to noticing requirements in Chapter 16.89, the city will coordinate with those agencies to provide a comprehensive TIS scope. ODOT may also require a TIS directly to support an OR 99E approach permit application.

F. TIS Content. A project-specific TIS checklist will be provided to the applicant by the city once the city has determined the TIS scope. A TIS shall include all of the following elements, unless waived by the city.

1. Introduction and Summary. This section shall include existing and projected trip generation including vehicular trips and mitigation of approved development not built to date; existing level and proposed level of service standard for city and county streets and volume to capacity for state roads; project build year and average growth in traffic between traffic count year and build year; summary of transportation operations; traffic queuing and delays at study area intersections; and proposed mitigation(s).

2. Existing Conditions. This section shall include a study area description, including information about existing study intersection level of service.

3. Impacts. This section should include the proposed site plan, evaluation of the proposed site plan, and a project-related trip analysis. A figure showing the assumed future year roadway network (number and type of lanes at each intersection) also shall be provided. For subdivision and other developments, the future analysis shall be for the year of proposed site build-out. For proposed comprehensive plan and/or zoning map amendments, the future analysis year shall be 20 years from the date of the City's adopted TSP, or 15 years, whichever is greater.

4. Mitigation. This section shall include proposed site and area-wide specific mitigation measures. Mitigation measures shall be roughly proportional to potential impacts. See Subsection K below for rough proportionality determination.

5. Appendix. This section shall include traffic counts, capacity calculations, warrant analysis, and any other information necessary to convey a complete understanding of the technical adequacy of the TIS.

G. TIS Methodology. The City will include the required TIS methodology with the TIS scope.

H. Neighborhood Through-Trip Study. Any development projected to add more than 30 through-vehicles in a peak hour or 300 through-vehicle per day to an adjacent residential local street or neighborhood route will be require assessment and mitigation of residential street impacts. Through-trips are defined as those to and from a proposed development that have neither an origin nor a destination in the neighborhood. The through-trip study may be required as a component of the TIS

or may be a stand-alone study, depending on the level of study required in the scoping checklist. The through-trip study shall include all of the following:

1. Existing number of through-trips per day on adjacent residential local streets or neighborhood routes.

2. Projected number of through-trips per day on adjacent residential local streets or neighborhood routes that will be added by the proposed development.

3. Traffic management strategies to mitigate for the impacts of projected through-trip consistent.

If a residential street is significantly impacted, mitigation shall be required. Thresholds used to determine if residential streets are significantly impacted are:

1. Local residential street volumes should not increase above 1,200 average daily trips

2. Local residential street speeds should not exceed 28 miles per hour (85^{th} percentile speed).

I. Mitigation. Transportation impacts shall be mitigated at the time of development when the TIS identifies an increase in demand for vehicular, pedestrian, bicycle, or transit transportation facilities within the study area. Mitigation measures may be suggested by the applicant or recommended by ODOT or Clackamas County in circumstances where a state or county facility will be impacted by a proposed development. The city shall determine if the proposed mitigation measures are adequate and feasible. ODOT must be consulted to determine if improvements proposed for OR 99E comply with ODOT standards and are supported by ODOT. The following measures may be used to meet mitigation requirements:

1. On-and off-site improvements beyond required standard frontage improvements.

2. Development of a transportation demand management program.

3. Payment of a fee in lieu of construction, if construction is not feasible.

4. Correction of off-site transportation deficiencies within the study area that are substantially exacerbated by development impacts.

5. Construction of on-site facilities or facilities located within the right-of-way adjoining the development site that exceed minimum required standards and that have a transportation benefit to the public.

J. Conditions of Approval. The city may deny, approve, or approve with appropriate conditions a development proposal in order to minimize impacts and protect transportation facilities.

1. Where the existing transportation system will be impacted by the proposed development, dedication of land for streets, transit facilities, sidewalks, bikeways, paths, or accessways may be required to ensure that the transportation system is adequate to handle the additional burden caused by the proposed use.

2. Where the existing transportation system is shown to be burdened by the proposed use, improvements such as paving, curbing, installation or contribution to traffic signals, traffic channelization, construction of sidewalks, bikeways, accessways, paths, or street that serve the proposed use may be required.

3. The city may require the development to grant a cross-over access easement(s) to adjacent parcel(s) to address access spacing standards on arterials and collector roadways or site-specific safety concerns. Construction of shared access may be required at the time of development if feasible, given existing adjacent land use. The access easement must be established by deed.

K. Rough Proportionality Determination. Improvements to mitigate impacts identified in the TIS shall be provided in rough proportion to the transportation impacts of the proposed development.

1. The TIS shall include information regarding how the proportional share of improvements was calculated, using the ratio of development trips to growth trips and the anticipated cost of the full Canby Transportation System Plan. The calculation is provided below:

Proportionate Share Contribution = [Net New Trips/(Planning Period Trips-Existing Trips)] X Estimated Construction Cost

a. Net new trips means the estimated number of new trips that will be created by the proposed development within the study area.

b. Planning period trips means the estimated number of total trips within the study area within the planning period identified in the TSP.

c. Existing trips means the estimated number of existing trips within the study area at the time of TIS preparation.

d. Estimated construction cost means the estimated total cost of construction of identified improvements in the TSP. (Ord 1340, 2011)

16.08.160 Safety and Functionality Standards.

The City will not issue any development permits unless the proposed development complies with the city's basic transportation safety and functionality standards, the purpose of which is to ensure that development does not occur in areas where the surrounding public facilities are inadequate. Upon submission of a development permit application, an applicant shall demonstrate that the development property has or will have the following:

MACKENZIE.

DESIGN DRIVEN | CLIENT FOCUSED

TRANSPORTATION IMPACT ANALYSIS

FRED MEYER CANBY FUEL FACILITY

Canby, Oregon

Prepared For
Fred Meyer

Updated On
July 8, 2013

Completed On
May 17, 2012

Submittal To
City of Canby

Project Number
2120130.00

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I. INTRODUCTION

This updated Transportation Impact Analysis (TIA) has been prepared for the proposed Fred Meyer fuel facility in Canby, Oregon. The subject site, currently undeveloped, is located at the southwest corner of the Highway 99E (SE 1st Avenue)/S. Locust Street intersection. The site is approximately 0.75 acres and currently zoned Highway Commercial C-2 by the City of Canby, in which the proposed use is permitted. Figure 1 is a vicinity map indicating the project location.

The purpose of this update is to addresses questions and concerns raised during the public hearing process. Because City staff determined the traffic study was complete and met their requirements, the additional information is provided voluntarily. Specifically, the updated TIA addresses trip generation, includes the intersections of Pine and Ivy Streets with Highway 99E, and provides a Neighborhood-Through Trip Study. In addition, new traffic counts were conducted at most study area intersections.

PROJECT DESCRIPTION

The proposed fuel facility includes six dispensers providing 12 fueling locations. The dispensers will be located beneath a canopy. A cashier's kiosk/restroom building, a propane tank, two parking spaces (one of them van-accessible), a trash enclosure, and a storage shed will be located around the site perimeter. The site is designed for two-way vehicle circulation (north-south) past the dispensers. One full-movement access is proposed to SE 2nd Avenue. One full-movement shared access is proposed to Highway 99E; this access will replace the existing access used by the adjacent site and will continue to provide access for vehicles entering the adjacent site. No access is proposed to Locust Street.

Project construction is planned to occur in one phase, with completion anticipated in 2014. Figure 2 presents the proposed site plan.

SCOPE OF REPORT

This analysis conforms to City of Canby Code 16.08.150 – Traffic Impact Study (TIS) and the Oregon Department of Transportation (ODOT) *Analysis Procedures Manual*, April 2006 Edition (updated January 2011). Topics include: existing conditions, crash history, trip generation and distribution for the proposed development, existing and planned transportation infrastructure, intersection capacity analysis, site circulation, and access review.

The TIA study area includes the following intersections:

- Highway 99E/S. Ivy Street
- Highway 99E/Site Access
- Highway 99E/S. Locust Street
- Highway 99E/S. Pine Street
- SE 2nd Avenue/S. Ivy Street
- SE 2nd Avenue/Site Access
- SE 2nd Avenue/S. Locust Street

Weekday AM and PM peak hour analyses are presented for the following scenarios:

- 2013 Existing Conditions
- 2014 Pre-Development
- 2014 Post-Development

This TIA also includes an Access Management Plan (AMP) as required by the City of Canby *Transportation System Plan* (TSP), December 2010 Edition. The AMP study area includes the following intersections:

- Highway 99E/S. Knott Street
- Highway 99E/Domino's Site West Access
- Highway 99E/Domino's Site East Access (shared with the proposed Fred Meyer Fuel site access; considered aligned with Hulbert's Flowers Site West Access)
- Highway 99E/Hulbert's Flowers Site West Access (considered aligned with Domino's Site East Access)
- Highway 99E/Hulbert's Flowers East Access (considered aligned with S. Locust Street)
- Highway 99E/76 Fuel West Site Access
- Highway 99E/76 Fuel East Site Access
- Highway 99E/Napa West Site Access

The AMP addresses weekday AM and PM peak hour conditions for the following scenarios:

- No access to Highway 99E
- Restricted movement access to Highway 99E (right-in/right-out)
- Full access to Highway 99E (shared with adjacent parcel)

II. EXISTING CONDITIONS

SITE CONDITIONS

The subject site is bounded by Highway 99E (SE 1st Avenue) to the north, SE 2nd Avenue to the south, S. Locust Street to the east, and existing commercial and residential developments to the west. The site includes Parcels 100, 200, 300, 2200, and 2300 in the southwest ¼ of the southeast ¼ of Section 33 in Township 3 South, Range 1 East, of the Willamette Meridian. These parcels are identified with street addresses 391, 369 and 351 SE 1st Avenue, and 354 and 392 SE 2nd Avenue.

The site is approximately 0.75 acres and currently undeveloped. The applicable City of Canby land use zone is Highway Commercial C-2, in which the proposed use is permitted.

Each of the five existing parcels currently has its own access on the public right-of-way. Parcels 100 and 2300 access Locust Street. Parcel 200 accesses Highway 99E. Parcel 300 accesses Highway 99E via a shared improved driveway also serving the adjacent development. Parcel 2200 accesses SE 2nd Avenue. None of these accesses are currently in use except for the trips entering and exiting the adjacent site.

TRANSPORTATION FACILITIES

Table 1 presents the roadway classifications and characteristics within the study area. Classifications are based on those provided in the City of Canby *Transportation System Plan* (TSP), December 2010 Edition, and in the ODOT *Oregon Highway Plan*, 1999 Edition, as updated through December 21, 2011, and the ODOT "Functional Classification and National Highway System Status on Oregon State Highways" table, dated March 19, 2012.

TABLE 1 – ROADWAY CHARACTERISTICS

Roadway	Classification	Posted Speed (mph)	Travel Lanes	Bike Lanes	On-Street Parking	Side-walks
Highway 99E (SE 1st Avenue)	City: Arterial ODOT: Urban Principal Arterial-Other, Regional Highway, Truck Route, Special Transportation Area (STA)	35	5	No	No	Yes
Ivy Street	Arterial	25	3	Yes	Partial	Yes
Pine Street	Collector	25	2	Yes	No	Yes
Locust Street	Local	25	2	No	Yes	Yes
SE 2nd Avenue	Local	25	2	No	Yes	Yes

The Highway 99E intersections with Ivy and Pine Streets are signalized. The other public street intersections within the study area are unsignalized. All access intersections are stop-controlled on the private approaches to public roadways. Figure 3 presents existing lane configurations and traffic controls at each study area intersection.

PEDESTRIAN AND BICYCLE FACILITIES

Sidewalks are currently provided throughout the study area, including along all site frontages. Bicycle lanes are currently provided along Ivy and Pine Streets within the study area. Other than standard frontage improvements, no changes to pedestrian or bicycle facilities are proposed with this project.

TRANSIT FACILITIES

Canby Area Transit (CAT) agency provides fixed-route Neighborhood Shuttle service and demand-response (dial-a-ride) transit service within the Canby Urban Growth Boundary. CAT also provides inter-city transit service along the Highway 99E corridor between Woodburn and Oregon City. The South Clackamas Transit District (SCTD) provides inter-city transit service between Molalla and Canby. The South Metro Area Regional Transit (SMART) provides inter-city transit service between Wilsonville and Canby.

The nearest transit stops to the subject site are:

- SE 2nd Avenue/Locust Street, at the southeast corner of the site (served by the CAT Orange Line).
- Township Road/Maple Street, approximately 0.4 miles southeast of the site (served by CAT Neighborhood Shuttle).
- Canby Transit Center, near the NW 1st Avenue/N. Ivy Street intersection, approximately 0.3 miles northwest of the site (served by CAT Neighborhood Shuttle, CAT Orange Line, SCTD, and SMART).

Copies of CAT route maps and schedules are provided in the appendix.

EXISTING TRAFFIC COUNTS

Existing traffic volumes were collected at most study area intersections on Tuesday, May 21, 2013, 7:00-9:00 AM, and on Wednesday, May 29, 2013, 4:00-6:00 PM. Additional volume data were collected at nearby accesses to Highway 99E and at the SE 2nd Avenue/S. Locust Street intersection on Wednesday April 4, 2012, between the hours of 7:00-9:00 AM and 4:00-6:00 PM. The system peak hours were calculated based on the 2013 counts and were found to be 7:00-8:00 AM and 4:45-5:45 PM. Count summary sheets are included in the Appendix.

SEASONAL ADJUSTMENT

In accordance with ODOT *Analysis Procedures Manual* standards, a seasonal adjustment factor of 1.039 was applied using the ATR Characteristic Table Method. This adjustment is required by ODOT to estimate the 30th highest hour for use in the analysis. ATR 18-018, located on Oregon Highway 39 in Klamath Falls, was selected based on its similar characteristics to Highway 99E in Canby:

- "Commuter" seasonal traffic trend
- "Small urban" area type
- Five-lane section
- "Regional highway" OHP classification

- AADT within 10%(±) of the AADT in Canby

Because the 2013 counts along Highway 99E were collected in late May, an average of the May and June data from ATR 18-018 was used for the count month. The peak month varied significantly by year. Figure 4 presents the seasonally adjusted intersection traffic volumes. The seasonal adjustment calculations and data sheets are provided in the appendix.

Table 4 presents the results of the existing conditions capacity analysis.

EXISTING TRAFFIC SIGNAL TIMING

The traffic signal timing plans currently in operation at the Highway 99E intersections with Ivy and Pine Streets were obtained from ODOT. Copies are provided in the Appendix. The current AM and PM coordination plans were input to the operations and queuing analyses for all analysis scenarios.

CRASH ANALYSIS

When evaluating the relative safety of an intersection, consideration is given not only to the total number and types of crashes occurring, but also to the number of vehicles entering the intersection. This leads to the concept known as "crash rate," which is usually expressed in terms of the number of crashes occurring per one million vehicles entering the intersection (mev). Intersections having a crash rate less than 1.0 crashes/mev are considered relatively safe. At crash rates higher than 1.0 crashes/mev, consideration may be given to correcting operational problems.

Crash data for the study area intersections were obtained from ODOT for January 2006 through December 2010. The following table presents calculated crash rates at the study intersections for the five-year data period. Annual traffic entering the intersection was estimated by multiplying the average annual daily traffic (AADT) entering the intersection by 365. AADT was estimated by multiplying the intersection PM peak hour total volumes by 10, a typical method of estimating daily traffic. Crash data and calculations are presented in the Appendix.

TABLE 2 – INTERSECTION CRASH RATES

Intersection	Number of Crashes						Crash Rate
	2006	2007	2008	2009	2010	Total	
Highway 99E / S. Ivy Street	0	2	4	1	2	9	0.17
Highway 99E / Site Access	1	0	0	0	1	2	0.05
Highway 99E / S. Locust Street	1	2	2	2	0	7	0.16
Highway 99E / S. Pine Street	3	4	2	4	6	19	0.41
SE 2nd Avenue / S. Ivy Street	n/a*	2	0	1	2	5	0.39
SE 2nd Avenue / S. Locust Street	0	0	2	0	0	2	0.49

* Year 2006 crash data for the SE 2nd Avenue/Ivy Street intersection were not available for inclusion in this TIA.

As presented in the previous table, crash rates are below the 1.0 crashes/mev threshold rate at all study area intersections; therefore, these intersections do not currently merit further consideration for safety mitigation measures.

III. PRE-DEVELOPMENT CONDITIONS

The pre-development analysis scenario presents conditions during the anticipated year of project completion (2014) in the absence of the proposed Fred Meyer fuel facility. The pre-development scenario addresses planned public improvements and in-process trips within the study area. Background growth was not considered.

PLANNED IMPROVEMENTS

No planned improvements were identified that are funded for completion within the analysis years and would impact traffic volumes within the study area.

IN-PROCESS TRIPS

Trips anticipated to be generated by developments approved for construction but not yet fully occupied are considered in-process trips. These trips are added to the existing volumes on the roadway network to assess the pre-development conditions. Two projects were identified as adding in-process trips to the study area.

- Canby Library (TIA prepared by DKS Associates, February 2013)
- Canby Pro-Active Warehouse Expansion (TIA prepared by DKS Associates, April 25, 2013)

Copies of both TIA's are provided in the Appendix. Figure 5 presents a summary of the in-process trip assignments.

PRE-DEVELOPMENT SCENARIO

Figure 6 presents the 2014 Pre-Development scenario peak hour volumes.

Note, at the proposed site access to Highway 99E, the pre-development scenario anticipates existing trips exiting the Domino's site were shifted to the west Domino's driveway.

IV. SITE DEVELOPMENT

As described in the Introduction, the proposed fuel facility provides 12 fueling locations and other accessory facilities. Vehicles will circulate in both directions past the fuel dispensers. One 40-foot-wide full-movement access on SE 2nd Avenue will replace the existing access for parcel 2200. One 40-foot-wide full-movement shared access is proposed on Highway 99E; this access will replace the existing access used by the adjacent site and will continue to provide access for vehicles entering the adjacent site. The existing drive-through lane for the adjacent dry cleaning service may continue to operate. The existing Highway 99E access for parcel 200 will be closed. No access is proposed to Locust Street. The existing accesses on Locust Street will be closed.

TRIP GENERATION

Trip generation estimates for the proposed fuel facility have been prepared based on the higher rate between either a survey of two existing similar Fred Meyer fuel facilities or the Institute of Transportation Engineers' (ITE) *Trip Generation*, 8th Edition, Land Use Code 944 – Gasoline/Service Station. Specifically, the AM peak hour rate of 12.16 trips/fueling position from *Trip Generation* and the PM peak hour rate of 20.46 trips/fueling position from the survey were used. Due to the nature of the fuel facility, no alternate trip modes are assumed. No large trucks are anticipated to use the fuel facility other than for fuel delivery.

TRIP SURVEY

Trip surveys were conducted at two existing Fred Meyer Fuel facilities (Sandy and Oak Grove) to estimate the average AM and PM trip generation rates for a fuel facility in Canby.

The on-site fuel facility in Sandy, Oregon (35885 Industrial Way, Sandy, OR 97055) was selected because:

- Similar to Canby, it is located in a small urban area just outside the Portland metro area.
- It is located near a state highway that serves a high percentage of the area's trips.
- It is unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Sandy. The nearest Fred Meyer store is in Gresham (2497 SE Burnside Road), and this store also has a fuel facility.

The off-site fuel facility in Oak Grove, Oregon (13625 SE McLoughlin Boulevard, Oak Grove, OR 97222) was selected because:

- It is located adjacent to a state highway that serves a high percentage of the area's trips.
- Similar to the Canby site, it is located approximately 0.6 miles away from the associated Fred Meyer store.

- It is unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Oak Grove. The nearest Fred Meyer stores are in Clackamas at 16301 SE 82nd Drive near Highway 212/224, and in Happy Valley at 8955 SE 82nd Avenue at Johnson Creek Boulevard. The existing fuel facility at the Johnson Creek store is likely more convenient for patrons of both stores.

Similar to the Sandy and Oak Grove Fred Meyer Fuel locations, the Canby facility is not likely to see many trips by regular patrons of Fred Meyer stores other than the one in Canby. The nearest Fred Meyer stores are in Wilsonville (30300 SW Boones Ferry Road) and Oregon City (1839 Molalla Avenue), and both stores already have fuel facilities (off-site in Wilsonville, on-site in Oregon City).

A copy of the trip generation calculations from surveys in Sandy and Oak Grove is attached. The average AM peak hour trip generation rate was found to be 11.96 trips per vehicle fueling position (VFP), and the average PM rate was 20.46 trips per VFP. The ITE AM rate of 12.16 is slightly higher, so the ITE AM rate is used in this analysis. The ITE PM rate of 13.87 is lower, so the Fred Meyer surveyed rate is used in this analysis to estimate the highest potential impact.

The average daily trips (ADT) were estimated proportionately to the sum of AM and PM peak hour trips in ITE's Trip Generation Manual, 8th Edition, Land Use Code 944 – Gasoline/Service Station. This represents approximately 6.5 times the sum of AM and PM peak hour trips.

TRIP TYPES

Total Trips

Based on a fuel facility with 12 vehicle fueling position, ITE estimates 146 AM peak hour total trips, and the survey data estimate 246 PM peak hour total trips. These are total trips, representing the total number of vehicle trips to and from the fuel facility. Total trips consist of pass-by and primary trips.

Pass-By Trips

Pass-by trips are those site trips already driving past the site on the adjacent roadways. These trips do not increase the total traffic volumes on the roadways, but they do add to turning movement volumes at the site accesses. Based only on survey data a 30% pass-by rate was applied.

For purposes of this analysis, pass-by trips were drawn from Highway 99E.

Primary Trips

Primary trips are those site trips stopping only at the fuel facility and then returning to their origins. These are considered new trips generated by the fuel facility. For purposes of this analysis, shared, and diverted linked trips were treated as primary trips.

Surveys conducted in 2012 at Fred Meyer fuel facilities indicate a 12% primary trip rate. The 2012 surveys also assessed two other trip types:

- Diverted linked trips are those site trips already traveling in the site vicinity on streets other than those immediately adjacent to the site; these vehicles change their direction or route to access the site. The calculated diverted linked trip rate was 20% of total trips.

- Shared trips are those site trips with either an origin or a destination located within the same contiguous site; these vehicles do not travel on public streets between the origin/destination and the fuel facility. The surveys were conducted at fuel facilities sharing sites with Fred Meyer stores, and the calculated diverted linked trip rate was 38% of total trips.

Both diverted linked trips and shared trips were treated as primary trips because, for this analysis study area, both would appear similar to primary trips. Taken together, the combined primary trip rate for this analysis was 70% of total trips.

NET TRIP GENERATION

The following table summarizes the trip generation estimates for a Fred Meyer fuel facility with 12 vehicle fueling positions.

TABLE 3 – TRIP GENERATION

Trip Type	AM Peak Hour			PM Peak Hour			ADT
	Enter	Exit	Total	Enter	Exit	Total	
Total Trips (100%)	74	72	146	123	123	246	2,548
Pass-By Trips (30%)	*22*	*22*	*44*	*37*	*37*	*74*	*764*
Primary Trips (70%)	**52**	**50**	**102**	**86**	**86**	**172**	**1,784**

TRIP DISTRIBUTION

Pass-By Trips

Distribution for pass-by trips was estimated based on the proportions of traffic traveling in each direction on nearby roadways in the site vicinity. The percentages noted represent weekday AM and PM peak hour conditions.

- 50% AM / 53% PM from the west on Highway 99E
- 50% AM / 47% PM from the east on Highway 99E

Figure 7 presents the weekday AM and PM peak hour pass-by trip distribution and assignment.

Primary Trips

Distribution for primary trips was estimated based on a select zone assignment model provided by the City's traffic consultant, DKS Associates. A copy of the model output is included in the appendix. Based on this model, primary trips are anticipated to use area roadways in the following distribution proportions.

- 15% to and from Ivy Street north of Highway 99E
- 30% to and from Highway 99E west of Ivy Street
- 20% to and from Ivy Street south of 2nd Avenue

- 5% to and from Pine Street north of Highway 99E
- 20% to and from Highway 99E east of Pine Street
- 5% to and from Pine Street south of Highway 99E
- 5% to and from Locust Street south of 2nd Avenue

Figure 8 presents the weekday AM and PM peak hour primary trip distribution and assignment.

Total Trips

Figure 9 presents the weekday AM and PM peak hour total trip assignments or the sum of pass-by trips and primary trips.

POST-DEVELOPMENT TRAFFIC

Post-development traffic is the sum of the pre-development volumes and site trips. In order to address alternate access scenarios, as scoped by the City and ODOT, three levels of Highway 99E access were considered:

- Full-movement access: All entering and exiting driveway movements would be permitted. This is the proposed scenario, as described above, and has been approved by ODOT.
- Right-in/right-out (RIRO) access: Only right-turn entering and exiting driveway movements would be permitted. This scenario is presented to address either of two possible future improvements to Highway 99E:
  - A pedestrian refuge island at the west side of the Highway 99E/S. Locust Street intersection, as depicted in the "Canby OR 99E Corridor and Gateway Design Plan" (June 2012), which would be included if the City were to implement a designated pedestrian crossing of highway 99E at that location.
  - An access management program implementation by either the City or ODOT.
- No access: No driveway would be permitted. This scenario is presented to address a possible future access management program implementation along Highway 99E. As with the RIRO scenario, the TWLTL between the proposed site access and Locust Street would be removed.

Full Access

Figure 10 presents 2014 Post-Development weekday AM and PM peak hour traffic volumes.

Right-In/Right-Out

Adjustments were made to the site trip volumes to account for the RIRO limitation. Specifically, the RIRO access scenario reroutes left turn movements from the Highway 99E access as follows:

- Westbound entering trips would turn left at Locust Street.
- Westbound exiting pass-by trips would turn left to eastbound SE 2nd Avenue and return to the westbound via Locust Street, preferring the unsignalized left turn to the long queue at the signalized left turn at Ivy Street.
- Westbound exiting primary trips would either
  - Turn right to westbound SE 2nd Avenue, turn right to northbound Ivy Street, and turn left or continue straight (as appropriate) at the Highway 99E signal, or
  - Turn left to eastbound 2nd Avenue, left to northbound Locust Street, and left to westbound Highway 99E.

  The split between these routes is estimated at 50/50.

Figure 11 presents the weekday AM and PM peak hour total site trip assignments with the RIRO access to Highway 99E. Figure 12 presents post-development volumes for the RIRO access scenario.

No Access

Adjustments were made to the site trip volumes to account for the total access limitation. Specifically, the no access scenario reroutes all site trips from the Highway 99E access as follows:

- Westbound entering trips would turn left at Locust Street.
- Eastbound entering trips would turn right at Locust Street.
- Eastbound exiting trips would turn left to eastbound SE 2nd Avenue.
- Westbound exiting pass-by trips would turn left to eastbound SE 2nd Avenue and return to the westbound via Locust Street, preferring the unsignalized left turn to the long queue at the signalized left turn at Ivy Street.
- Westbound exiting primary trips would either
  - Turn right to westbound SE 2nd Avenue, turn right to northbound Ivy Street, and turn left or continue straight (as appropriate) at the Highway 99E signal, or
  - Turn left to eastbound 2nd Avenue, left to northbound Locust Street, and left to westbound Highway 99E.

  The split between these routes is estimated at 50/50.

Figure 13 presents the weekday AM and PM peak hour total site trip assignments with no access to Highway 99E. Figure 14 presents post-development volumes for the scenario with no access to Highway 99E.

ON-SITE CIRCULATION

The site will be designed for two-way vehicle circulation (north-to-south) past the fuel dispensers. Bypass lanes will be provided between the fueling lanes and between the fuel canopy and the perimeter curbs.

VEHICLE TURNING PATHS

The anticipated vehicle turning paths for the proposed fuel facility with full access at Highway 99E are addressed below. Vehicle turning paths for the RIRO and no access scenarios are addressed in the Access Management Plan section.

Fuel Delivery Trucks

Fuel delivery trucks are anticipated to visit the site during off-peak hours and only on an as-needed basis, typically two to three times per week. Trucks are anticipated to enter the site via a right turn from eastbound Highway 99E, circulate clockwise around the site, park between the parking spaces and fuel tanks to off-load fuel, and exit via a right turn to eastbound Highway 99E. The anticipated vehicle turning path is provided in the Appendix.

Emergency Vehicles

Emergency vehicles are anticipated to visit the site only on an as-needed basis. A fire engine is the largest emergency vehicle likely to visit the site. Some sample vehicle turning paths are provided in the Appendix.

Passenger Autos

Passenger autos are anticipated to be the primary vehicle entering and exiting the site. Both proposed accesses will accommodate all entering and exiting movements by passenger autos. Drivers will maneuver within the open paved area to select a fueling lane or a parking space. Bypass lanes will permit passenger autos to queue at and behind the fueling positions without impeding on-site circulation around or beneath the canopy. Some sample vehicle turning paths are provided in the Appendix.

SIGHT DISTANCE

Sight distance evaluation has been prepared for the proposed site accesses based on the standards presented in the American Association of State and Highway Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*, 6th Edition (2011). Specifically, standards for left turns and right turns exiting the driveways are presented in Tables 9-5 through 9-8.

For the access to Highway 99E, with a posted speed limit of 35 mph, AASHTO recommends at least 440 feet for left turns and 335 feet for right turns. Sight distance is available for at least 500 feet in both directions at the proposed access location, so the standard is met.

For the access to SE 2nd Avenue, with a posted speed limit of 25 mph, AASHTO recommends at least 280 feet for left turns and 240 feet for right turns. Sight distance is available for at least 300 feet in both directions at the proposed access location. The sight distance to Locust Street is approximately 100 feet. Vehicles approaching from the Locust Street intersection will typically be traveling more slowly—estimated intersection departure speed is 15 mph—than the posted speed. The minimum stopping sight distance for 15 mph is 80 feet, so the standard is met.

V. CAPACITY AND QUEUING ANALYSIS

CAPACITY ANALYSIS

Intersection capacity calculations were prepared using methodologies presented in the Transportation Research Board's *Highway Capacity Manual*, 2000 Edition (HCM). Trafficware's Synchro software, version 8, which implements HCM methodologies, was used to prepare the capacity and level-of-service calculations. Copies of the calculations are included in the Appendix.

Intersection capacity characteristics are generally defined by two measurements: volume-to-capacity (v/c) ratio and level-of-service (LOS).

V/c ratio is a measurement of capacity used by a given traffic movement or for an entire intersection. It is defined by the rate of traffic flow or traffic demand divided by the theoretical capacity.

LOS is a relative measure of the average control delay (in seconds) experienced by drivers at an intersection and is described by a letter on the scale from A to F. LOS A represents optimum operating conditions and minimum delay. LOS F indicates long delays and often over-capacity conditions.

ODOT uses v/c to assess capacity on state highways, with a standard of 1.00 for this location along Highway 99E (Table 6 of the *Oregon Highway Plan*) because it is within an adopted Special Transportation Area (STA).

The City of Canby uses LOS to assess capacity on city streets. Unsignalized two-way stop controlled intersections need to maintain an LOS E or better (City TSP).

Capacity analysis was performed for the weekday AM and PM peak hour at the study area intersections for the following development scenarios:

- 2013 Existing
- 2014 Pre-Development
- 2014 Post-Development

Existing traffic signal timing plans were input for all analysis scenarios. Calculation results are summarized in the following table.

TABLE 4 – INTERSECTION CAPACITY ANALYSIS (FULL ACCESS)

Intersection	Capacity Criteria	Intersection or Approach	2013 Existing		2014 Pre-Development		2014 Post-Development	
			AM	PM	AM	PM	AM	PM
Highway 99E / Ivy Street	v/c	Int	0.67	0.80	0.69	0.82	0.70	0.83
Highway 99E / Site Access	v/c	NB Lt	0.00	0.02	0.00	0.02	0.11	0.18
Highway 99E / S. Locust Street	v/c	NB	0.14	0.13	0.14	0.14	0.16	0.17
Highway 99E / Pine Street	v/c	Int	0.51	0.64	0.51	0.65	0.52	0.67
SE 2nd Avenue / Ivy Street	LOS	WB	B	B	B	B	B	B
SE 2nd Avenue / Site Access	LOS	SB Lt					A	A
SE 2nd Avenue / S. Locust Street	LOS	EB	A	B	A	B	A	B
		WB	A	A	A	A	A	A

All the study intersections and site driveways are anticipated to operate within acceptable capacity standards during all analysis scenarios.

In addition to a full movement access to Highway 99E, two other access scenarios were analyzed: Right-in/right-out (RIRO) and No Access to the state highway.

Calculation results are summarized in the following table.

TABLE 5 – INTERSECTION CAPACITY ANALYSIS (ALTERNATE ACCESS SCENARIOS)

Intersection	Capacity Criteria	Intersection or Approach	2014 Post-Development			
			RIRO		No Access	
			AM	PM	AM	PM
Highway 99E / Ivy Street	v/c	Int	0.71	0.84	0.71	0.84
Highway 99E / Site Access	v/c	NB Rt	0.03	0.06		
Highway 99E / S. Locust Street	v/c	NB	0.24	0.31	0.26	0.36
Highway 99E / Pine Street	v/c	Int	0.52	0.67	0.52	0.67
SE 2nd Avenue / S. Ivy Street	LOS	WB	B	B	B	B
SE 2nd Avenue / Site Access	LOS	SB Lt	A	A	A	B
SE 2nd Avenue / S. Locust Street	LOS	EB	A	B	B	B
		WB	A	B	A	B

All the study intersections and site driveways are anticipated to operate within acceptable capacity standards during all alternate analysis scenarios.

QUEUING ANALYSIS

Queuing analyses at unsignalized study area intersections were prepared using Synchro software, version 8, to estimate the 95th percentile queues for each lane group. Queuing analyses at signalized study area intersections were prepared using SimTraffic software, version 8, to estimate the 95th percentile queues for each lane group. Calculations are provided in the Appendix.

The available queue storage and the anticipated queue demand values are listed in the following table. Queue demand results are reported for signalized, stop-controlled, or yield-controlled movements to which site trips are added. Values are rounded to the nearest 25 feet, the average length of a queued vehicle. Calculated queues greater than zero, but less than 13, are rounded up to 25 feet.

TABLE 6 – 95TH PERCENTILE QUEUING ANALYSIS (FEET)											
Intersection	Movements		Available Storage	Analysis Scenarios							
				Pre-Dev		Post-Dev		RIRO		No Access	
				AM	PM	AM	PM	AM	PM	AM	PM
Highway 99E / Ivy Street	EB	Th,Rt	700	225	425	225	525	250	500	250	525
	WB	Th,Rt	300+	275	**475**	250	**500**	275	**475**	275	**500**
	NB	Lt	200	200	175	200	200	200	200	200	200
		Th,Rt	200+	175	**250**	175	**250**	200	**225**	175	**250**
	SB	Lt	175+	125	175	125	**200**	125	**200**	150	**175**
Highway 99E / Site Access	WB	Lt	125	0	25	25	25				
	NB	Lt,Th	25	25	25	25	25				
		Rt	50	25	25	25	25	25	25		
Highway 99E / S. Locust Street	WB	Lt	300+	25	25	25	25	25	25	25	25
	NB	Lt,Th,Rt	175	25	25	25	25	25	25	25	50
Highway 99E / Pine Street	EB	Lt	200	50	125	75	125	75	150	50	100
		Th,Rt	1000+	175	375	175	350	200	350	200	325
	WB	Th,Rt	650+	200	325	225	300	225	325	200	350
	NB	Lt,Th	1000+	175	225	200	250	200	250	200	250
	SB	Rt	75	75	50	75	50	50	50	75	50
SE 2nd Avenue / S. Ivy Street	WB	Lt,Rt	300+	25	25	25	25	25	25	25	25
SE 2nd Avenue / Site Access	EB	Lt,Th	250+			25	25	25	25	25	25
	SB	Lt	50			25	25	25	25	25	25
		Rt	50			25	25	25	25	25	25
SE 2nd Avenue / S. Locust Street	EB	Lt,Th,Rt	350+	25	25	25	25	25	25	25	25
	NB	Lt,Th,Rt	875+	25	25	25	25	25	25	25	25

*Note: Queue demand results printed in **BOLD** exceed the available storage noted.*

At the Highway 99E/Ivy Street intersection the pre-development weekday PM peak hour queues exceed the available storage lengths at three reported locations.

- The queue on the westbound through/right lane group, as modeled, currently spills back beyond S. Juniper Street. The queue increases generated by the added site trips—up to 25 feet—are generally minor and do not cause the lane group queue to exceed its available storage.

- The queue on the northbound through/right lane group currently spills back beyond SE 2nd Avenue. The added site trips are not anticipated to increase the queue in any significant way, and they do not cause the lane group queue to exceed its available storage.

- The queue on the southbound left turn lane, as modeled, may currently spill back to NW 1st Avenue. The queue increases generated by the added site trips—up to 25 feet— are minor.

Queues exiting the proposed site accesses to Highway 99E and SE 2nd Avenue are not anticipated to exceed the available on-site storage, so on-site vehicle circulation patterns will remain unimpeded.

VI. EFFECT ON HIGHWAY 99E PEDESTRIAN CROSSING PLAN

The City of Canby's Transportation System Plan (TSP) calls for a future pedestrian crossing of Highway 99E in the vicinity of the Subject Property. While it is unclear whether the potential future pedestrian crossing contained within the TSP is criteria for purposes of this application, for completeness we analyzed the impact of the potential future pedestrian crossing on the proposed development and the transportation system. The west side of the Highway 99E/S Locust Street intersection is one of several potential alignments for such a crossing and is the only logical alternative which is adjacent to the site. The particular location for a pedestrian crossing, the physical elements to be constructed to implement it (such as striping, signage or other alert or control mechanisms, center refuge island, etc.), and their safety and operational impacts should be the subject of a detailed analysis prior to any construction.

For purposes of this analysis, the proposed actions (zoning code text and map amendments and the proposed Fred Meyer fuel facility) were evaluated to determine whether or not they would conflict with implementation of a Highway 99E pedestrian crossing at the S. Locust Street intersection in the future.

A pedestrian refuge island at the center of Highway 99E was assumed to be included in a crosswalk design to enable pedestrians to cross one direction of travel at a time, waiting in the median for a gap in traffic flow. In this configuration, the pedestrian crossing would conflict with a center turn lane for queuing of westbound vehicles waiting to turn left into the site driveway on Highway 99E, so that turning movement would have to be eliminated.

As a result, a Highway 99E pedestrian crossing on the west side of the S. Locust Street intersection would conflict with the "Full Access to Highway 99E" scenario modeled in this analysis; however, the access limitation necessary for the pedestrian crossing does not conflict with either of the other two Highway 99E access scenarios evaluated in this analysis (Right-In/Right-Out and No Access).

As detailed above in this TIA, traffic movements at site accesses and intersections in the vicinity of the subject property will operate satisfactorily in any of the three access scenarios. If the City were to implement a Highway 99E pedestrian crossing on the west side of the S. Locust Street intersection and introduce site access limitation consistent with that installation, traffic operations would continue to meet capacity standards. Therefore, approvals of the proposed amendments and development plan are consistent with the City's plan for a future pedestrian crossing.

VII. NEIGHBORHOOD THROUGH-TRIP STUDY

The City of Canby requires any development projected to add more than 30 through-vehicles in a peak hour or 300 through vehicles per day on an adjacent residential local street to assess and mitigate residential street impacts with a Through Trip Study (City of Canby Code 16.08.150.H). In each access analysis scenario the proposed Fred Meyer fuel facility will add 30 or more peak hour trips to SE 2nd Avenue, a public roadway classified as a Local Street in the City of Canby TSP.

The code section addressing Neighborhood Through-Trip Study defines through trips as those to and from a proposed development that have neither an origin nor a destination in the neighborhood. Clearly, any vehicle trips traveling to and from the proposed fuel facility on SE 2nd Avenue have an origin or destination in the neighborhood.

While SE 2nd Avenue is classified as a Local Street, it is not exclusively serving residential uses. The subject site and other parcels along the north side of the street are zoned for commercial uses. In fact, Table 7-1 of the City's Transportation System Plan notes the roadway classification was changed from its prior Collector designation. The TSP identifies Collector streets as being 0.5 to 1.0 miles in length and serving through traffic, which is not the case for SE 2nd Avenue. The TSP defines local streets as having "the sole function of providing immediate access to adjacent land" and further states "…classifications do not mean that because a route is an arterial it is large and has lots of traffic. Nor do the definitions dictate that a local street should only be small with little traffic."

Thresholds for determining a significant impact on a local residential street include if volumes increase above 1,200 average daily trips, or if speeds exceed 28 mph. As noted below, the west segment of SE 2nd Avenue already exceeds 1,200 daily trips.

Although not clearly required, we have prepared a Neighborhood Through-Trip Study (NTTS) to address traffic volumes and impacts on SE 2nd Avenue.

EXISTING CONDITIONS

Existing traffic volume data were collected at the site frontage west of Locust during peak travel hours on April 4, 2012, and at the street segment's west end between Ivy and Juniper Streets during the entire day on May 21, 2013. The data are summarized in the following table. For the segment west of Locust Street, the daily volumes were estimated proportionate to the volumes east of Ivy Street at approximately six times the sum of AM and PM volumes.

TABLE 7 – EXISTING WEEKDAY TRAFFIC VOLUMES ON SE 2ND AVENUE (TOTALS IN BOTH DIRECTIONS)

Date	Count Location	AM Peak Hour	PM Peak Hour	Daily Total
April 4, 2012	West of Locust Street	58 (7:00-8:00 AM)	93 (4:15-5:15 PM)	904
May 21, 2013	East of Ivy Street	173 (7:00-8:00 AM)	191 (3:00-4:00 PM)	2,180

Traffic volumes east of Ivy Street already exceed the threshold of 1,200 daily trips for the significant impact definition.

SITE IMPACTS

The proposed Fred Meyer fuel facility will add trips to the segments of SE 2nd Avenue both east and west of the site driveway. The volumes added are summarized in the following table for each of the three access scenarios and corresponding trip assignment discussed in prior sections. The average daily trips (ADT) were estimated proportionately to the sum of AM and PM peak hour trips in ITE's Trip Generation Manual, 8th Edition, Land Use Code 944 – Gasoline/Service Station. This represents approximately 6.5 times the sum of AM and PM peak hour trips.

TABLE 8 – ADDED WEEKDAY SITE TRIPS ON SE 2ND AVENUE (TOTALS IN BOTH DIRECTIONS)

Access Alternative	Location	Site Trips Added			Roadway Total		
		AM Peak Hour	PM Peak Hour	ADT	AM Peak Hour	PM Peak Hour	ADT
Full Access	West of Locust Street	14	25	239	72	118	1,143
	East of Ivy Street	20	34	356	193	225	2,536
RIRO	West of Locust Street	57	92	985	115	185	1,889
	East of Ivy Street	31	54	551	204	245	2,731
No Access	West of Locust Street	115	192	1,992	173	285	2,896
	East of Ivy Street	31	54	551	204	245	2,731

The full access scenario would add the lowest site trip volumes to SE 2nd Avenue, while the no access scenario would add the greatest site trip volumes to SE 2nd Avenue. Even with daily volumes approaching 3000 vehicles, the peak hour volumes remain below 300 vehicles per hour and operational standards continue to be met.

TRAFFIC IMPACT MITIGATION

Acknowledging the proposed Fred Meyer fuel facility will add trips to SE 2nd Avenue beyond the site frontage—specifically between the site access and Ivy Street—it is recommended and proposed to construct curb extensions or curb bulb-outs at the SE 2nd Avenue/S. Knott Street intersection. This common traffic calming technique will serve to visually narrow the roadway without detrimentally affecting its functional capacity. The anticipated benefits include:

- Discouraging drivers from using SE 2nd Avenue as a parallel route to Highway 99E between Ivy and Locust Streets
- Discouraging drivers from speeding along SE 2nd Avenue
- Shortening the pedestrian crossing distance
- Improving pedestrians' visibility to drivers

- Improving streetscape amenities

A conceptual sketch of the proposed curb extensions is provided in the Appendix.

VIII. ACCESS MANAGEMENT PLAN

The proposed Fred Meyer fuel facility will access Highway 99E to the north and SE 2nd Avenue to the south. Both accesses are proposed to be 40 feet wide, including one 16-foot-wide entering lane and two 12-foot-wide exiting lanes. The City of Canby TSP requires an Access Management Plan (AMP) be prepared for the access to Highway 99E. Based on correspondence with City staff, the scope of this AMP includes conditions at the following accesses and public street intersections along Highway 99E within 250 feet of the property boundaries. Where accesses are included in the above TIA capacity and queuing analyses, a note is included.

- Napa Auto Parts (505 SE 1st Avenue) West Driveway
- 76 Fuel Station (453 SE 1st Avenue) East Driveway
- 76 Fuel Station (453 SE 1st Avenue) West Driveway
- S. Locust Street
- Hulbert's Flowers (334 SE 1st Avenue) East Driveway (enter only) – part of the Highway 99E/Locust Street intersection
- Hulbert's Flowers (334 SE 1st Avenue) West Driveway (exit only) – part of the Highway 99E/Site Access intersection
- Domino's Pizza (325 SE 1st Avenue) East Driveway – closed and combined with the Highway 99E/Site Access intersection
- Domino's Pizza (325 SE 1st Avenue) West Driveway
- S. Knott Street

The existing access to site parcel 200 will be closed with the development and is not a part of the AMP study area. Within the study area this AMP addresses:

- The potential impacts on operations and safety from the proposed Fred Meyer fuel facility.
- The existing and future access conditions for all properties.
- The potential impacts based on the access alternatives (full movement, restricted RIRO movements, and no access at Highway 99E).
- The improvements necessary to mitigate the potential impacts.

EXISTING CONDITIONS

Access Spacing

The proposed access is located within the Highway 99E segment between Ivy and Pine Streets. As identified in Table 3-5 of the City TSP, this 2,670-foot highway segment includes 27 access points, inclusive of public streets. The frequency of accesses within the AMP study area (9 within 660 feet) has a slightly higher frequency of accesses than the Ivy-to-Pine segment as a whole.

The proposed access is subject to City and ODOT spacing standards, which are a minimum of 330 feet and 350 feet, respectively, between the access centerline and the nearest access or public roadway centerline (City TSP, Table 7-2, and Oregon

Administrative Rules Chapter 734, Division 51, Section 4020(8), Table 5). The existing street grid provides approximately 420 feet between Knott and Locust Streets, so by definition no accesses could meet the spacing standard in this segment. Furthermore, the existing public street spacing does not meet the minimum 660 feet specified in TSP Table 7-2.

Access Configurations

Except at Hulbert's Flowers, where the east driveway is enter-only and the west driveway is exit-only, each existing driveway and side street permits full-movement access to and from Highway 99E.

Traffic Volumes

Existing turning movement volumes were collected at the AMP study area accesses on Wednesday April 4, 2012, between the hours of 7:00-9:00 AM and 4:00-6:00 PM. As with the TIA above, the system peak hours of 7:00-8:00 AM and 4:45-5:45 PM, as calculated from the 2013 intersection counts, are addressed in this AMP. Count summary sheets are included in the Appendix. Figure 15 presents a summary of the pre-development peak hour volumes at the study area intersections. In general, only turning movements were counted, so through volumes on Highway 99E were interpolated from 2013 counts at the Highway 99E/S. Locust Street intersection.

FUTURE CONDITIONS

Access Spacing

The proposed access spacing will be similar to the existing spacing. The Fred Meyer fuel facility proposes to consolidate, improve, and share the existing Domino's East driveway. The net effect will be no net change in the number of highway accesses. The proposed access will be located approximately 26 feet east of the existing Domino's East driveway (measured between centerlines).

Access Configurations

The existing Domino's East driveway will be consolidated with the Fred Meyer fuel access. The limited space (approximately 25 feet) between the existing building and the property line will allow for only a one-way (enter-only) shared access from the Fred Meyer fuel site. Existing exiting trips will be rerouted to the Domino's West driveway. Trips exiting the Fred Meyer fuel site will be permitted to access Highway 99E directly. All other accesses and public streets will retain their existing access configurations.

In the future, as redevelopment takes place and as the City of Canby Special Transportation Area (STA) plan takes shape, other highway access points within the study area will likely be consolidated or eliminated. Parcels with frontage on Highway 99E may be combined with parcels fronting SE 2nd Avenue or the alley parallel to SE 2nd Avenue east of Locust Street to provide access to the lower classification roadways.

Traffic Volumes

The following table identifies the fuel site trips added as through trips on Highway 99E at each access point within the AMP study area. The trip volumes are stated from the proposed full access scenario to Highway 99E, and the reported percentage increases are based on the pre-development scenario volumes.

TABLE 9 – ADDITIONAL TRAFFIC AT STUDY AREA ACCESS POINTS

Access Points along Highway 99E	Weekday AM Peak Hour		Weekday PM Peak Hour	
	Added Trips	Percent Increase	Added Trips	Percent Increase
Napa West Driveway	30	1.7%	51	2.2%
76 Fuel East Driveway	30	1.7%	51	2.2%
76 Fuel West Driveway	30	1.7%	51	2.2%
Locust Street	33	1.8%	57	2.4%
Hulbert's East Driveway (enter only)				
Hulbert's West Driveway (exit only)	92*	5.2%	150*	6.6%
Proposed Driveway				
Domino's Pizza West Driveway	48*	2.7%	87*	3.8%
Knott Street	47	2.7%	78	3.4%

* Includes adjustments for existing exiting Domino's trips

The fuel facility will increase through traffic passing by the AMP study area access points on Highway 99E by 1.7% to 6.6%. As presented in the capacity and queuing analysis sections of the TIA, no significant impacts are anticipated at the locations with the greatest traffic increase, i.e., the site access to Highway 99E (coincident with Hulbert's West driveway) and Locust Street, so it is reasonable to assume no adverse impacts will be generated at locations with lower levels of traffic increases.

Figure 16 presents a summary of the post-development peak hour volumes at the study area intersections following opening of the proposed Fred Meyer fuel facility with a full-movement access to Highway 99E.

SAFETY

The foremost potential safety concern arising from the proposed Fred Meyer fuel facility is the potential for conflicts within the Highway 99E center left-turn lane. Westbound vehicles entering the fuel facility or northbound vehicles exiting the site via a two-stage left turn may conflict with eastbound vehicles entering Hulbert's Flowers. No other driveways along the north side of Highway 99E permit entering traffic, so no other driveway movements are expected to experience or contribute to center left-turn lane conflicts.

During the weekday AM peak hour 23 westbound vehicles are anticipated to enter the fuel facility and 31 northbound-to-westbound vehicles are anticipated to exit the fuel facility. The average delay for the entering movement is 9.6 seconds per vehicle. Assuming, for a conservative analysis, each of the 23 vehicles arrives separately;

220.8 seconds of total delay are anticipated within the peak hour. In other words, the lane would be occupied for approximately 6% of the hour. This makes it unlikely any eastbound vehicles entering Hulbert's will experience a conflict with the vehicles entering the fuel facility. Since a total of 3 eastbound vehicles entered Hulbert's during the 2-hour traffic count period (none during the peak hour), no safety concerns are anticipated.

During the weekday PM peak hour 38 westbound vehicles are anticipated to enter the fuel facility and 50 northbound-to-westbound vehicles are anticipated to exit the fuel facility. The average delay for the entering movement is 10.1 seconds per vehicle. Assuming, for a conservative analysis, each of the 38 vehicles arrives separately; 383.8 seconds of total delay are anticipated within the peak hour. In other words, the lane would be occupied for approximately 11% of the hour. This makes it unlikely any eastbound vehicles entering Hulbert's will experience a conflict with the vehicles entering the fuel facility. Since a total of 3 eastbound vehicles entered Hulbert's during the 2-hour traffic count period (none during the peak hour), no safety concerns are anticipated.

ACCESS ALTERNATIVES

No significant impacts are anticipated at the AMP study area access points under the full-movement proposed access condition. Under the restricted-movement (RIRO) and no-access alternatives the traffic increases along Highway 99E would be the same or less than in the full-movement access alternative. Therefore, no significant impacts are anticipated at the AMP study area access points under the RIRO or no-access alternatives.

Highway 99E Access

The proposed access to Highway 99E cannot meet access spacing standards. It is, however, situated as far as possible from the nearest public roadway intersection (Locust Street) and it encourages shared access to the maximum possible extent by allowing vehicles to enter the adjacent site, effectively replacing an existing access.

The proposed common development of the five subject parcels consolidates potential accesses from five to two. If the parcels were to develop individually, Parcel 100 would be required to access Locust Street, Parcel 200 would have a right to access Highway 99E, and Parcel 300 would either have its own access to Highway 99E or would continue to share an access with the adjacent development. Thus, the proposed development provides an access configuration better addressing the intent of access spacing standards than could the five parcels if developed individually.

The proposed access to Highway 99E provides the preferred circulation for fuel delivery trucks, which are anticipated to enter the site via a right turn from eastbound Highway 99E and exit via a right turn to eastbound Highway 99E. Any physical means of restricting the access to RIRO at Highway 99E would limit the fuel truck's ability to follow this preferred routing or would require a specific design of median treatments to allow for truck turning movements. Without a median design for truck access, the RIRO alternative, as well as the No Access alternative, would introduce additional truck trips to SE 2nd Avenue, which is not part of a designated truck route.

In addition, while it is physically possible for the fuel truck to enter and exit the proposed access to SE 2nd Avenue, this path would encroach even more upon opposing lanes of traffic than does the proposed path. A copy of this path is provided in the Appendix. Customers queued behind the dispensers would block the fuel truck circulation through the site. The preferred routing to/from Highway 99E does not have this conflict with queued vehicles.

ODOT approved the Highway 99E access application on August 15, 2012, because the access proposal "moves in the direction of," or brings conditions closer to conformance with, the standards than previously existed or could otherwise be proposed if the parcels developed individually.

SE 2nd Avenue Access

The proposed access to SE 2nd Avenue meets access spacing standards (minimum 50 feet to the nearest roadway and minimum 10 feet to the nearest driveway, according to Table 7-2 of the City TSP). According to City access management standards, this access should serve as the only site access because it meets spacing standards and because it accesses a roadway with a lower functional classification than arterial. This would equate to the No Access alternative.

This approach, however, would be contrary to the City's policy for Neighborhood Traffic Management (NTM), which targets a maximum of 1,200 daily vehicles on local residential streets such as SE 2nd Avenue. The No Access alternative would concentrate all fuel facility trips at the access to SE 2nd Avenue, increasing the PM peak hour total volume there to 332. Estimating the daily traffic as ten times the PM peak hour volume yields 3,320 ADT, exceeding the 1,200 ADT maximum by over 100%. By similar methods, the RIRO access alternative would yield approximately 2,320 ADT and the Full Access alternative would yield approximately 1,450 ADT. Therefore, although all three access scenarios would exceed the 1,200 ADT target, the Full Access alternative would be the closest to the target.

It is noted again that the December 2010 Edition of the City TSP downgraded SE 2nd Avenue from Collector, which has no maximum ADT target, to Local Street.

SUMMARY

The proposed Fred Meyer fuel facility will increase traffic passing by the AMP study area access points on Highway 99E by 1.7% to 6.6%, but these increases are not anticipated to generate adverse impacts to intersection capacity or queuing. The total number of access points to Highway 99E will be maintained. The existing character of the highway segment, which currently provides direct access between the retail sites and the highway, also will be maintained.

The fuel facility traffic may generate vehicle conflicts within the Highway 99E center left-turn lane, but due to the low level of conflicting traffic and the low levels of entering vehicle delay, no safety concerns are anticipated.

The spacing of existing driveways does not meet standards, and the physical configuration of the site makes it impossible to meet access spacing standards along Highway 99E. Furthermore, the existing street spacing does not meet minimum

standards. However, the proposed access will be located as far as possible from Locust Street, will permit entering traffic to enter the adjacent site, and will consolidate access rights among the three existing parcels fronting Highway 99E.

The proposed access to Highway 99E will provide the preferred routing for the fuel delivery truck. Restricting or eliminating the access to Highway 99E would route the fuel trucks onto SE 2nd Avenue, and their route would encroach upon oncoming traffic lanes at several locations.

Strictly imposing access standards would require SE 2nd Avenue to serve as the only site access point. However, this approach would increase traffic levels on SE 2nd Avenue to approximately 3,320 ADT. The proposed Full Access alternative would increase traffic volumes to 1,450 ADT and thus is more in keeping with the City maximum policy of 1,200 ADT on local residential roadways.

IX. CONCLUSIONS AND RECOMMENDATIONS

This TIA has been prepared for the proposed Fred Meyer fuel facility in Canby, Oregon, located on Tax Lots 100, 200, 300, 2200, and 2300 in Section 33 in Township 3 South, Range 1 East. The site is approximately 0.75 acres and currently zoned City of Canby Highway Commercial C-2, in which the proposed use is permitted.

The proposed fuel facility includes six dispensers, providing 12 fueling locations, beneath an open-air canopy. A cashier's kiosk/restroom building, a propane tank, a trash enclosure, and a storage shed will be located around the site perimeter. Project construction is planned to occur in one phase, with completion anticipated in 2014.

Two study area intersections, Highway 99E at Ivy Street and Pine Street, are signalized. The remaining study area intersections are stop-controlled on the minor approaches. Highway 99E is under state (ODOT) jurisdiction, while Locust Street and SE 2nd Avenue are under City jurisdiction.

Sidewalks are currently provided throughout the study area, but bicycle lanes are not. Canby Area Transit (CAT) provides fixed-route and demand-response (dial-a-ride) within the study area. Inter-city transit service is available at the Canby Transit Center, approximately 0.3 miles northwest of the fuel site.

Existing traffic volumes were collected at most study area intersections on Tuesday, May 21, 2013, 7:00-9:00 AM, and on Wednesday, May 29, 2013, 4:00-6:00 PM. Additional volumes were collected on Wednesday, April 4, 2012, 7:00-9:00 AM and 4:00-6:00 PM. A seasonal adjustment factor of 1.039 was applied to highway traffic volumes to estimate the design hour volumes.

Intersection crash rates are below the 1.0 crashes/mev threshold rate at all study area intersections, warranting no further consideration for safety mitigation measures.

There are no planned improvements funded for completion within the analysis years and within the study area. Trips from two in-process projects were included at study area intersections. No background growth is anticipated to add to the existing volumes.

Trip generation estimates utilize the higher of either Land Use Code 944 – Gasoline/Service Station in the Institute of Transportation Engineers' (ITE) *Trip Generation*, 8th Edition, (AM trip rates) or Fred Meyer fuel facility surveys (PM trip rates). These estimate 146 weekday AM peak hour total trips and 246 weekday PM peak hour total trips for a fuel facility with 12 vehicle fueling positions. These total trips include pass-by and primary trips.

All the study intersections and site driveways are anticipated to operate within acceptable capacity standards during all analysis scenarios, including scenarios with full access, limited access (right-in/right-out), and no access to Highway 99E. Site trips are not anticipated to push queue demand beyond the available storage in any analysis scenario, including scenarios with full access, limited access (right-in/right-out), and no access to Highway 99E. Signal timing refinements or optimization will adjust for the minor increases in queues generated by site trips.

The proposed development will add at least 30 peak hour trips to SE 2nd Avenue in all three access scenarios. The existing daily traffic volume near Ivy Street (2,180) already exceeds the City code maximum of 1,200 for local residential streets. It is recommended to provide curb extensions at S. Knott Street to discourage cut-through traffic and vehicle speeding.

The Access Management Plan indicates no operational or safety concerns are likely to be generated by the proposed full-movement access to Highway 99E and the site trips. We recommend a full-movement access be provided to serve the subject site.

Based on these results, the study area transportation facilities are anticipated to operate within acceptable standards with the addition of the proposed development. Two improvements are recommended:

- Refine and/or optimize traffic signal timing along Highway 99E to better manage weekday PM peak hour queues, particularly at Ivy Street.

- Construct curb extensions at the SE 2nd Avenue/S. Knott Street intersection with the proposed fuel facility to slow speeds on SE 2nd Avenue, discourage cut-through traffic, and improve pedestrian safety.

X. APPENDIX

A. Figures

B. Transit Routes and Schedules

C. Traffic Count Summaries

D. Seasonal Adjustment

E. In-Process Traffic

F. Crash Data and Calculations

G. Trip Surveys

H. Trip Distribution Model

I. Traffic Signal Plans

J. Capacity Calculations

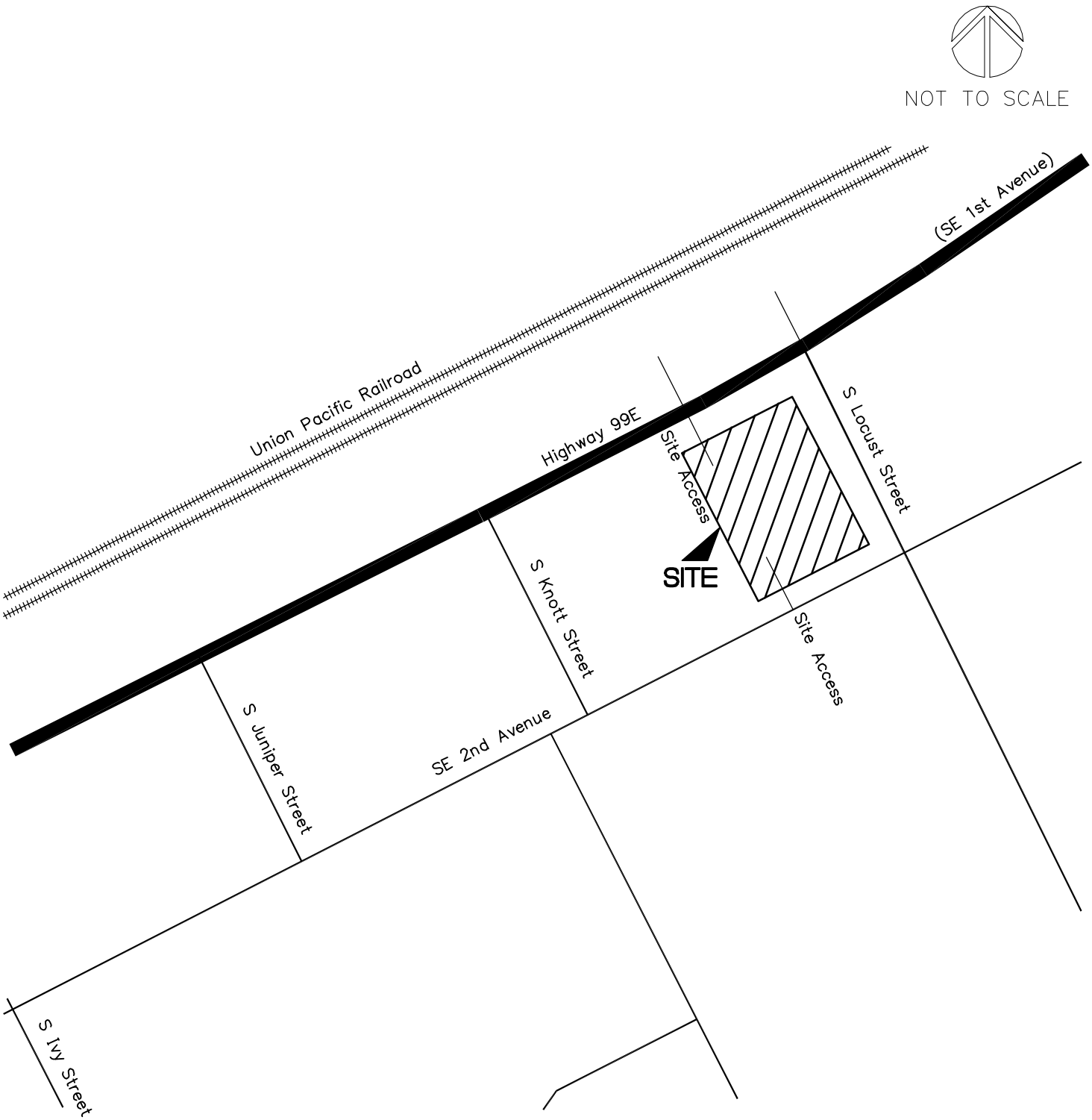
K. Queuing Calculations

L. Vehicle Turning Paths

M. Curb Extension Sketch

N. Scoping

APPENDIX A
FIGURES



GROUP MACKENZIE

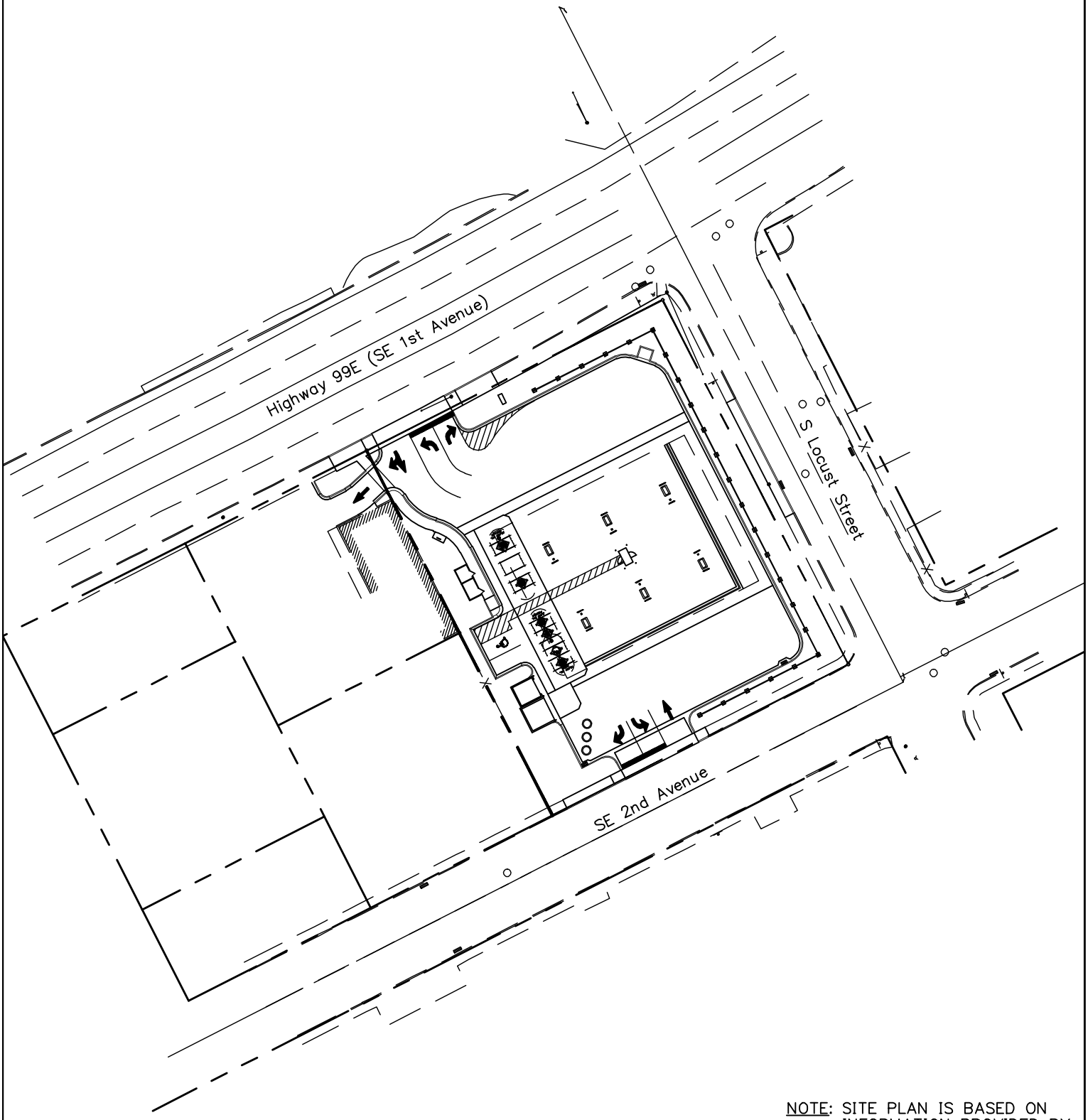
Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 6.24.13
DRAWN BY: JRB
CHECKED BY: BTA
JOB NO: 2120130.00

VICINITY MAP

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 1



NOTE: SITE PLAN IS BASED ON INFORMATION PROVIDED BY GREAT BASIN ENGINEERING ON JUNE 27, 2013.

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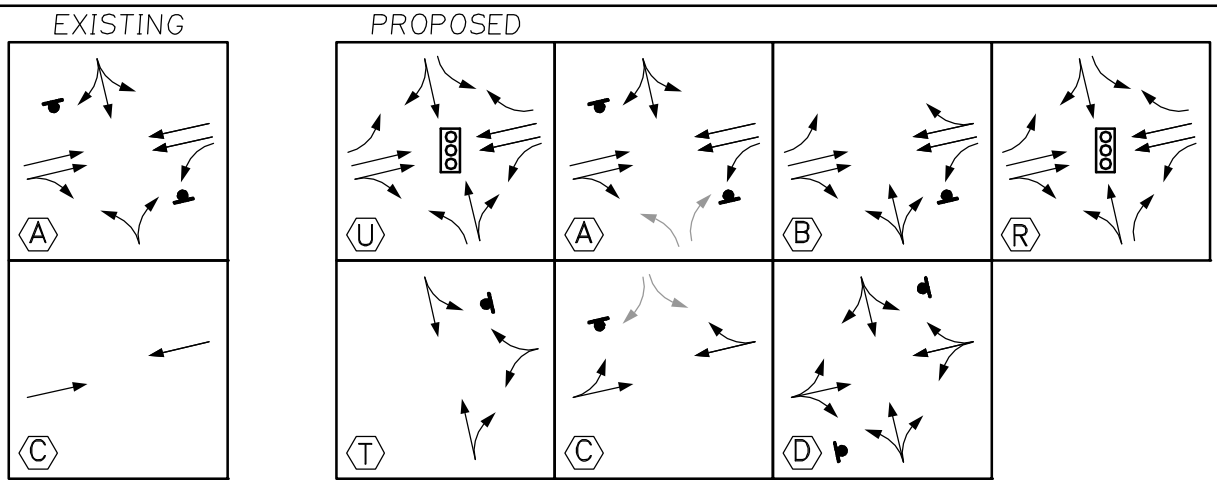
SITE PLAN

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 2



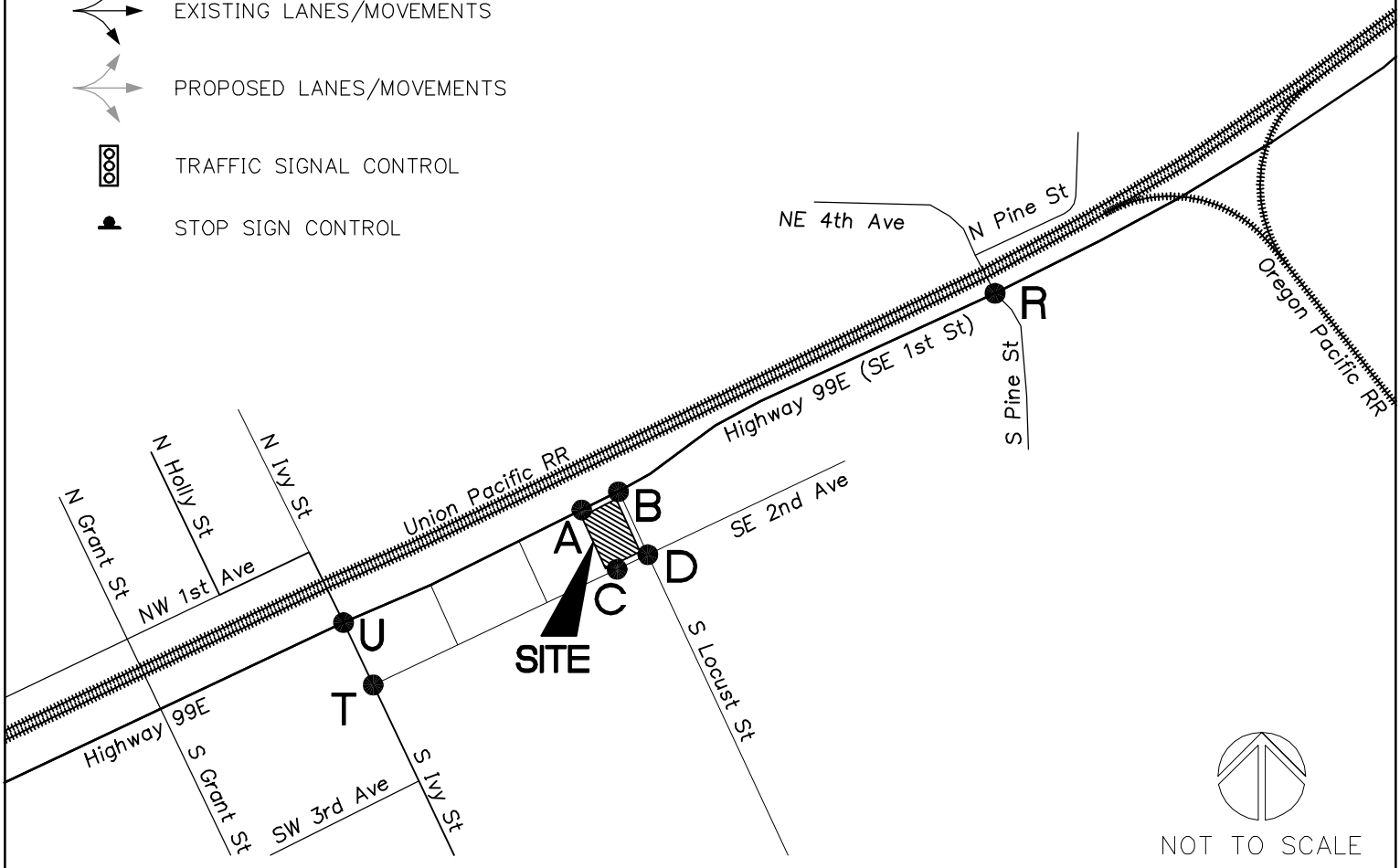
LEGEND

EXISTING LANES/MOVEMENTS

PROPOSED LANES/MOVEMENTS

TRAFFIC SIGNAL CONTROL

STOP SIGN CONTROL



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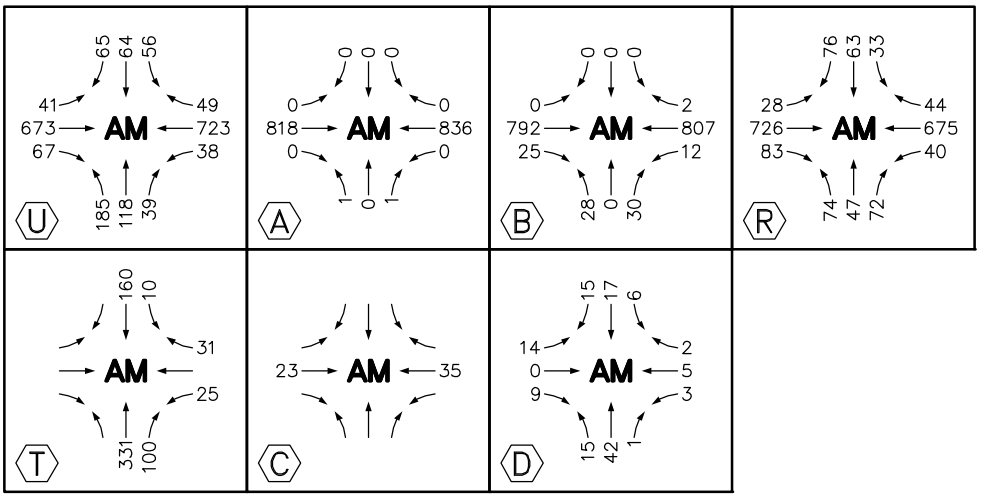
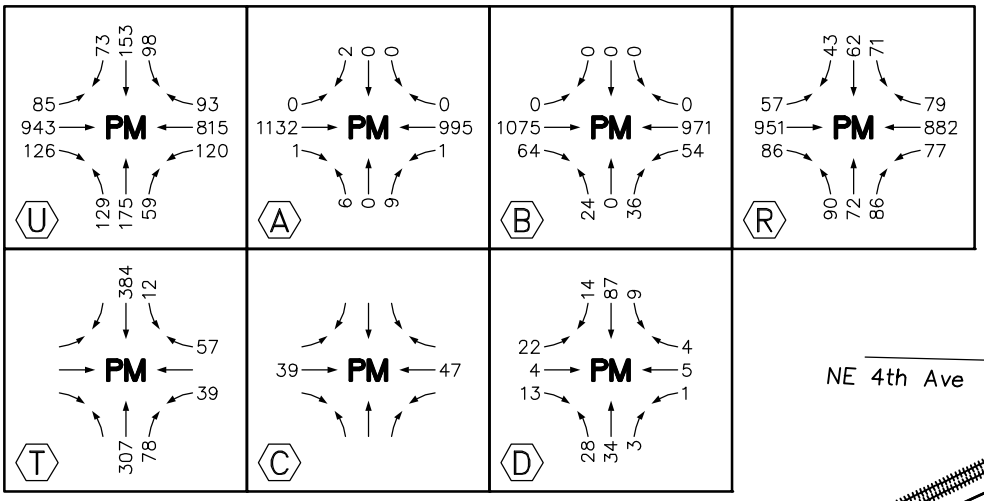
TRAFFIC CONTROLS AND LANE CONFIGURATIONS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

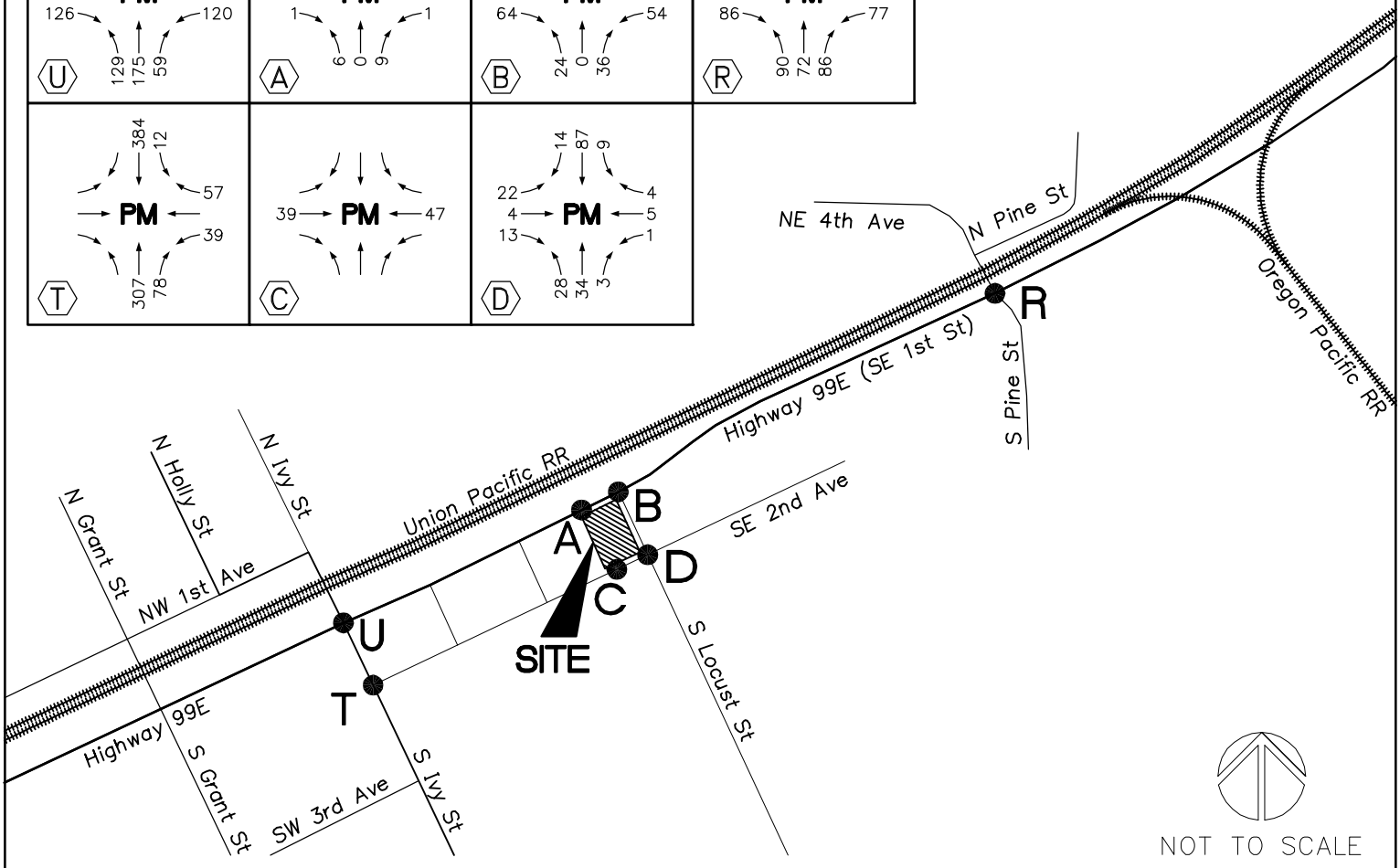
FIGURE 3



WEEKDAY AM PEAK DESIGN
HOUR – 7:00–8:00 AM



WEEKDAY PM PEAK DESIGN
HOUR – 4:45–5:45 PM



NOT TO SCALE

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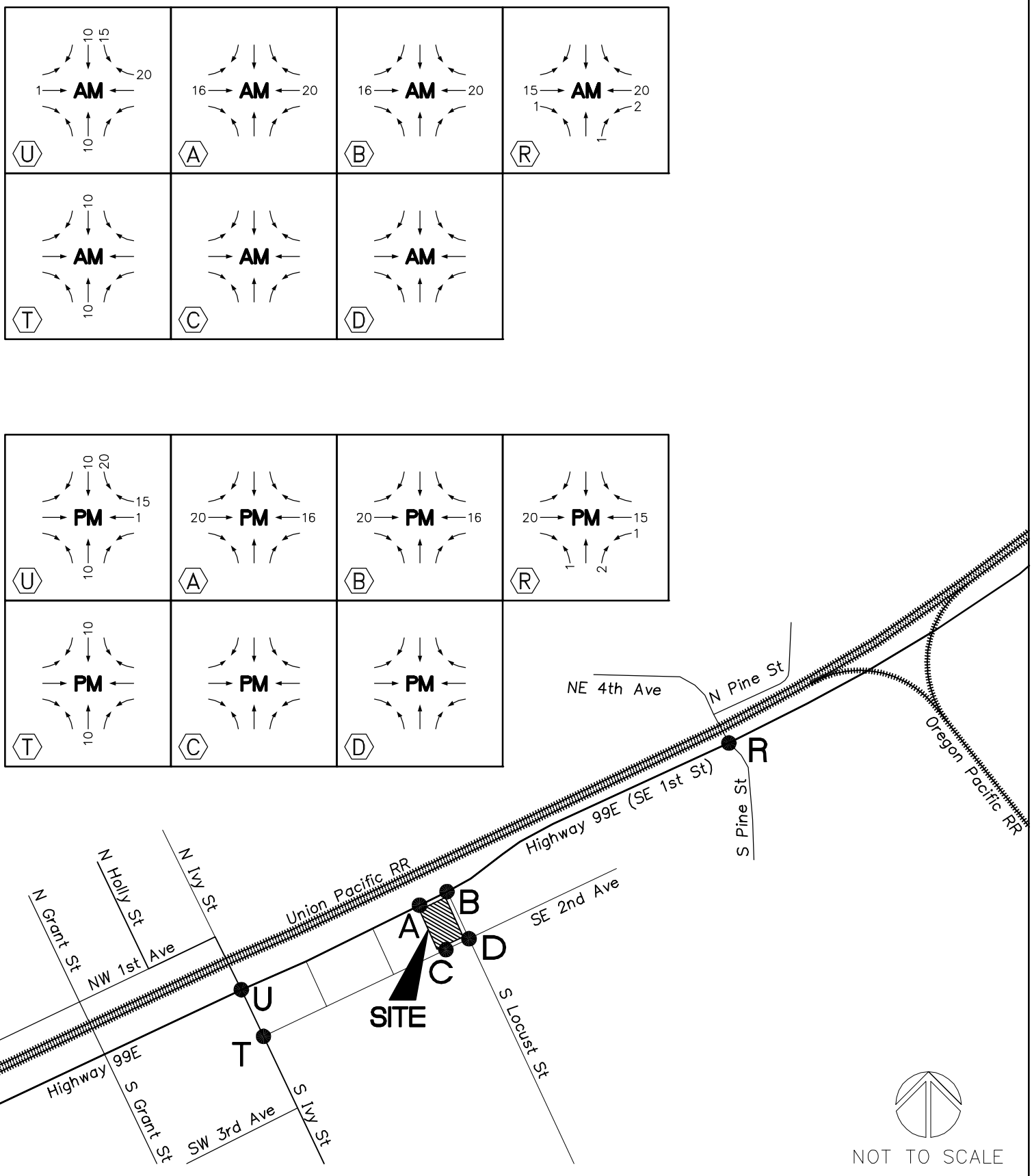
SEASONALLY ADJUSTED TRAFFIC VOLUMES WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 4



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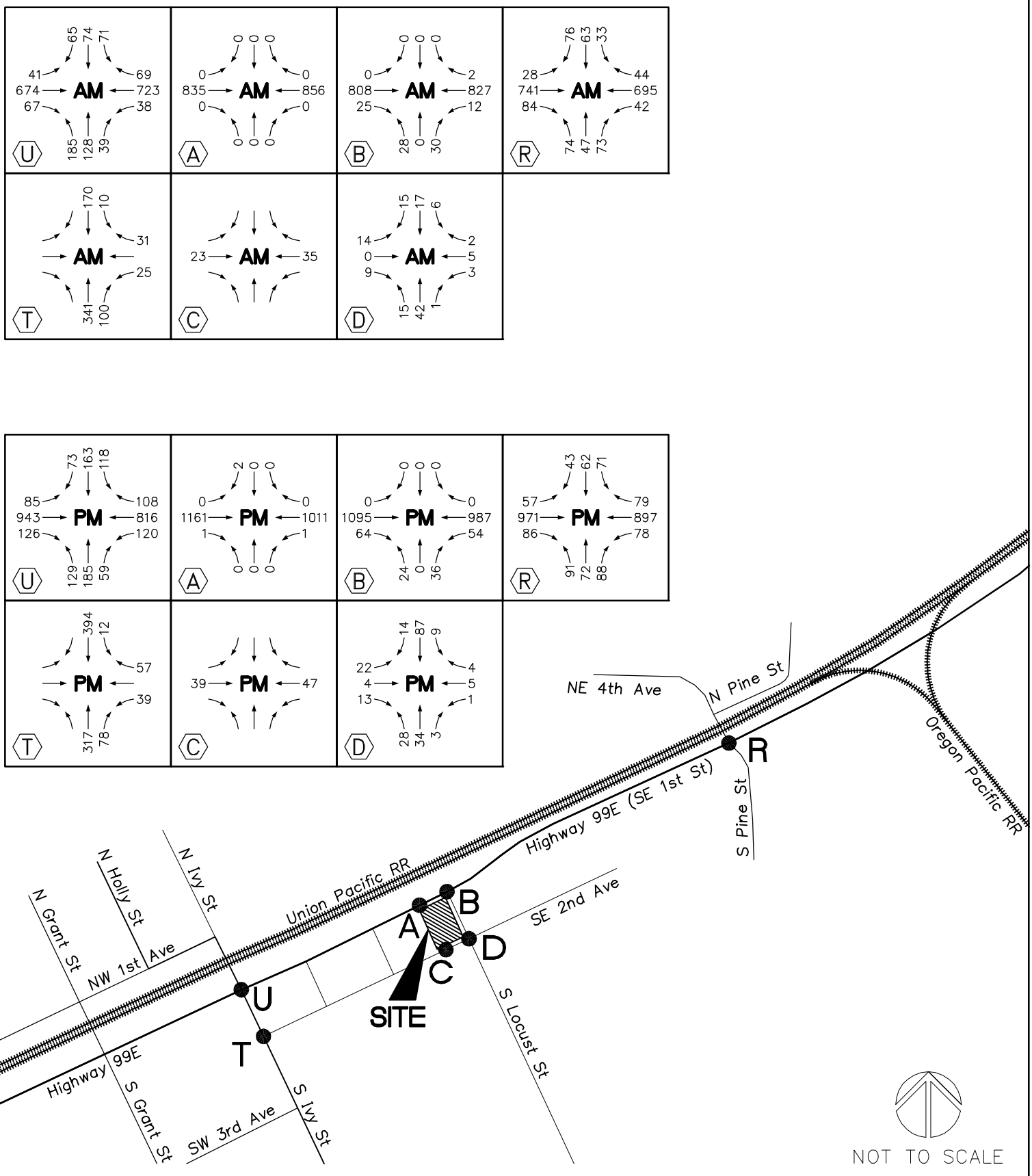
IN-PROCESS TRAFFIC VOLUMES WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 5



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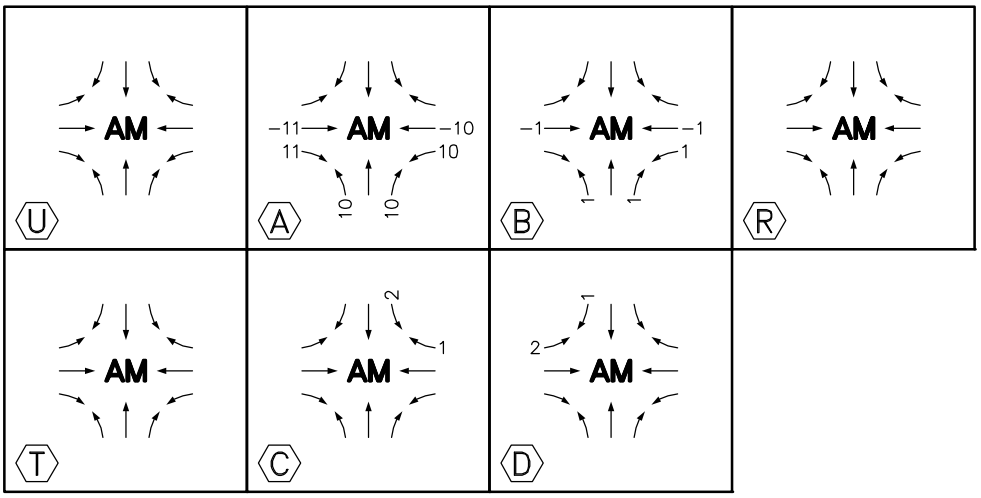
JOB NO: 2120130.00

PRE-DEVELOPMENT TRAFFIC VOLUMES WEEKDAY PEAK HOURS

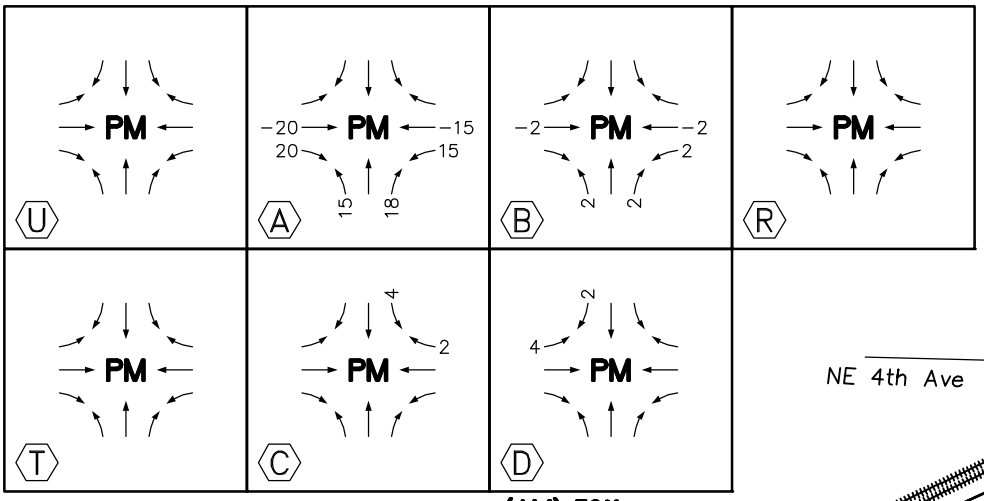
FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 6



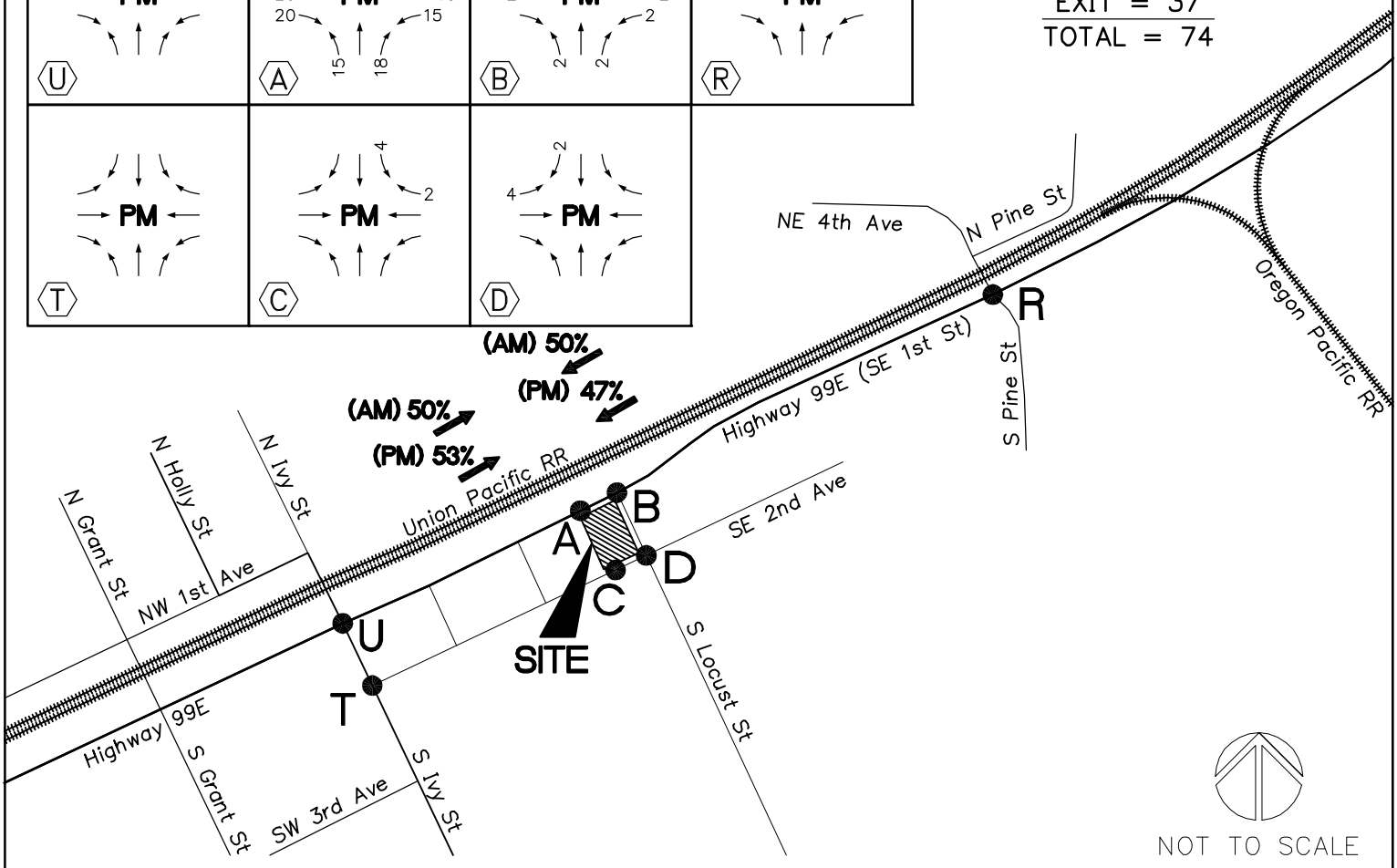
WEEKDAY AM PEAK HOUR
PASS-BY SITE TRIPS

ENTER = 22
EXIT = 22
TOTAL = 44



WEEKDAY PM PEAK HOUR
PASS-BY SITE TRIPS

ENTER = 37
EXIT = 37
TOTAL = 74



NOT TO SCALE

GROUP MACKENZIE

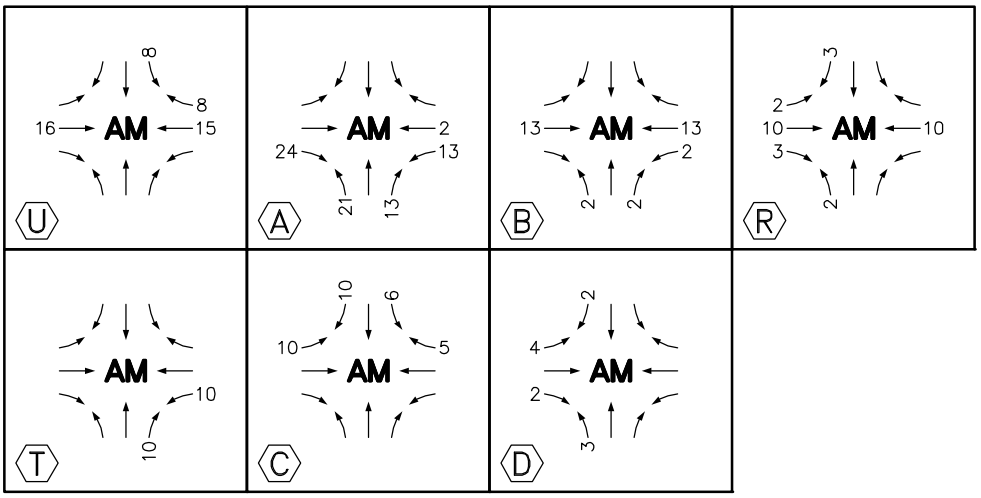
Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

PASS-BY TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT - WEEKDAY PEAK HOURS

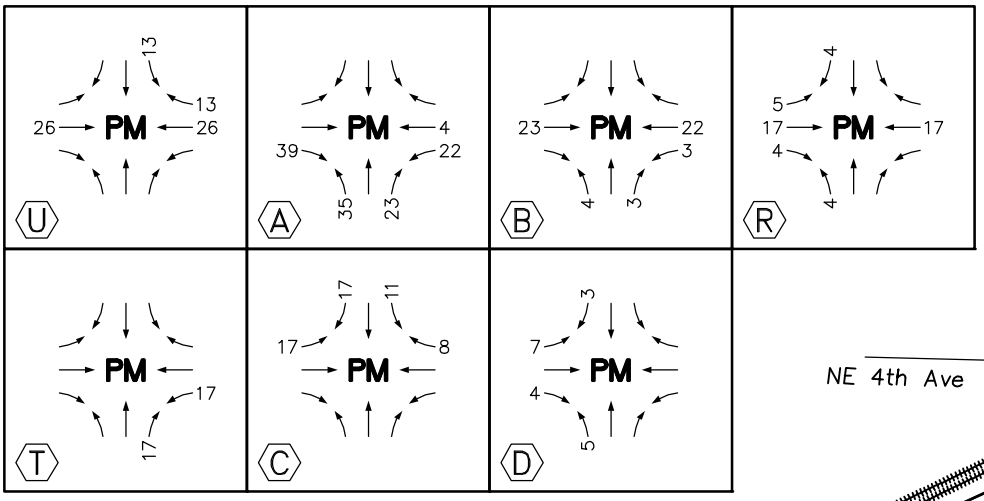
FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 7



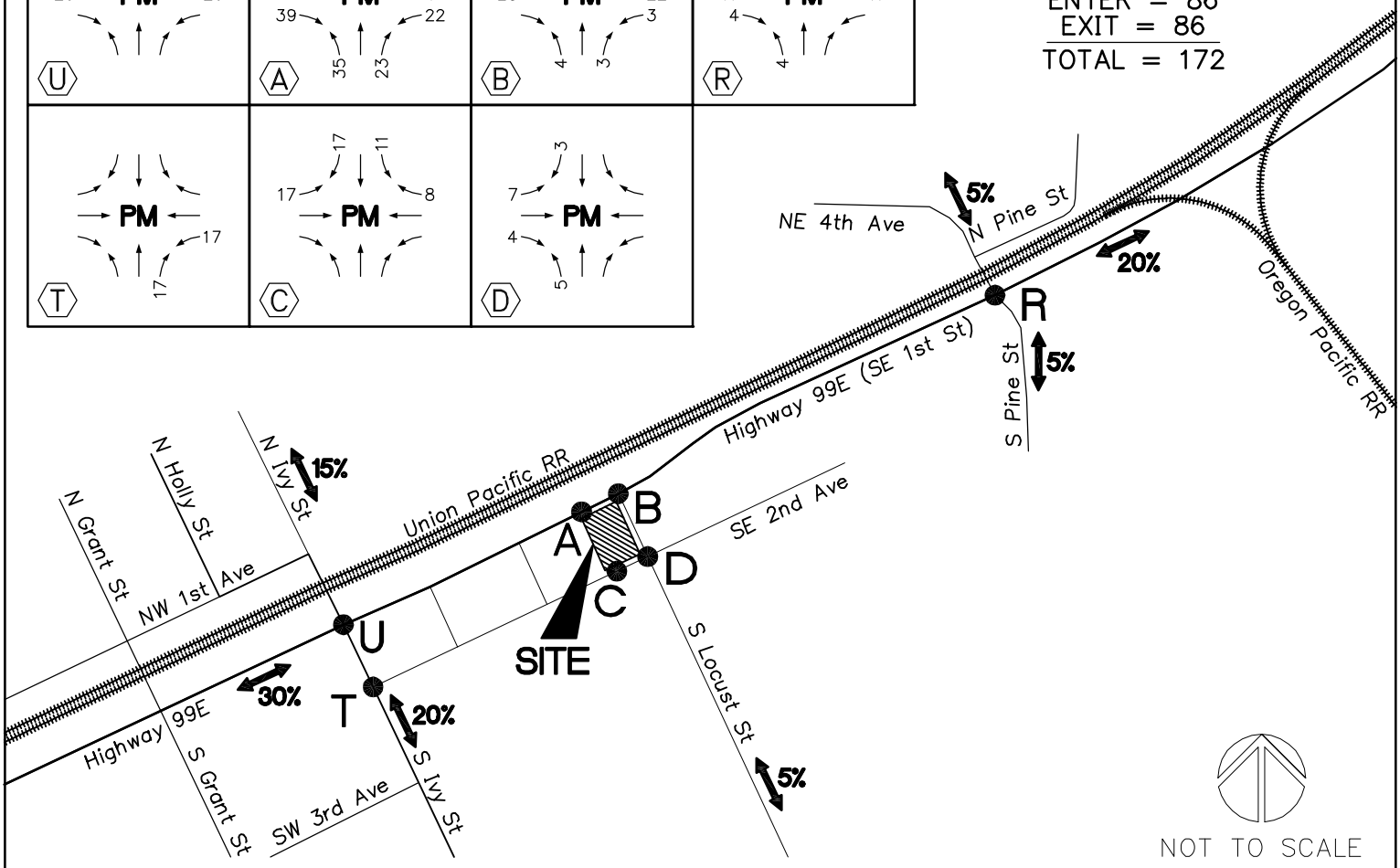
WEEKDAY AM PEAK HOUR
PRIMARY SITE TRIPS

ENTER = 52
EXIT = 50
TOTAL = 102



WEEKDAY PM PEAK HOUR
PRIMARY SITE TRIPS

ENTER = 86
EXIT = 86
TOTAL = 172



NOT TO SCALE

GROUP MACKENZIE

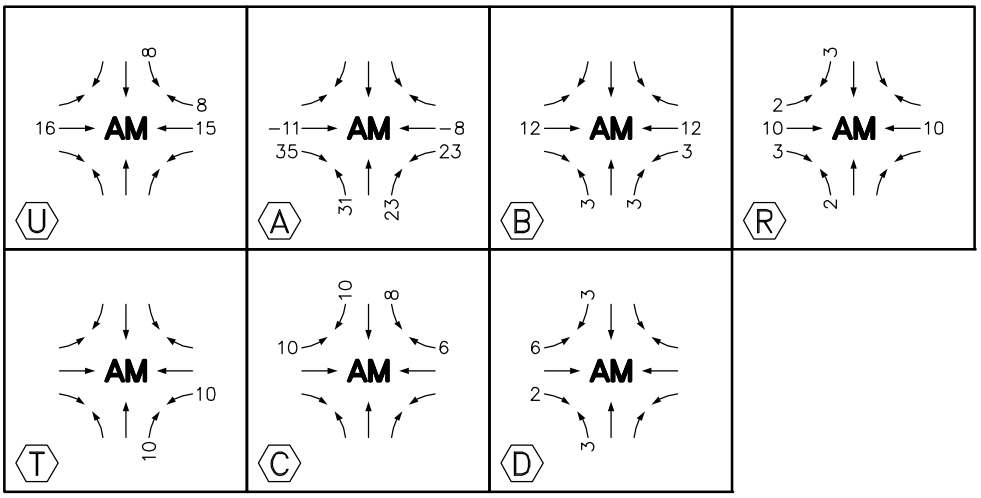
Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

PRIMARY TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT - WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

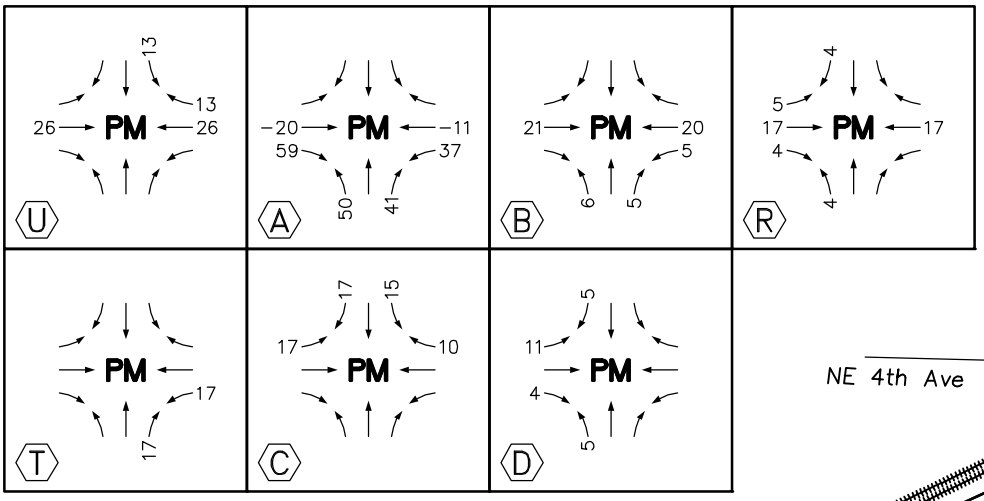
FIGURE 8



WEEKDAY AM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 74
EXIT = 72

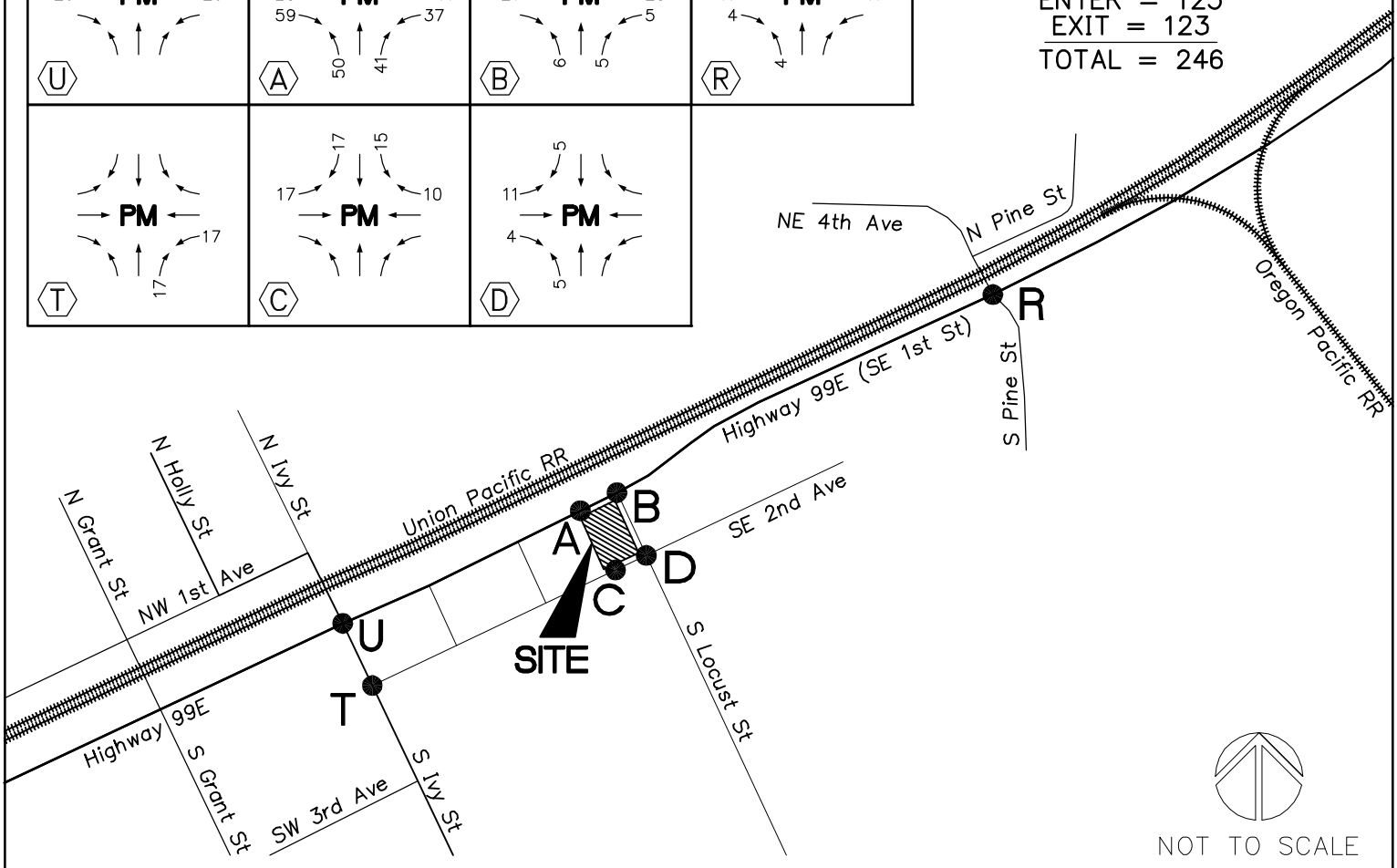
TOTAL = 146



WEEKDAY PM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 123
EXIT = 123

TOTAL = 246



NOT TO SCALE

GROUP MACKENZIE

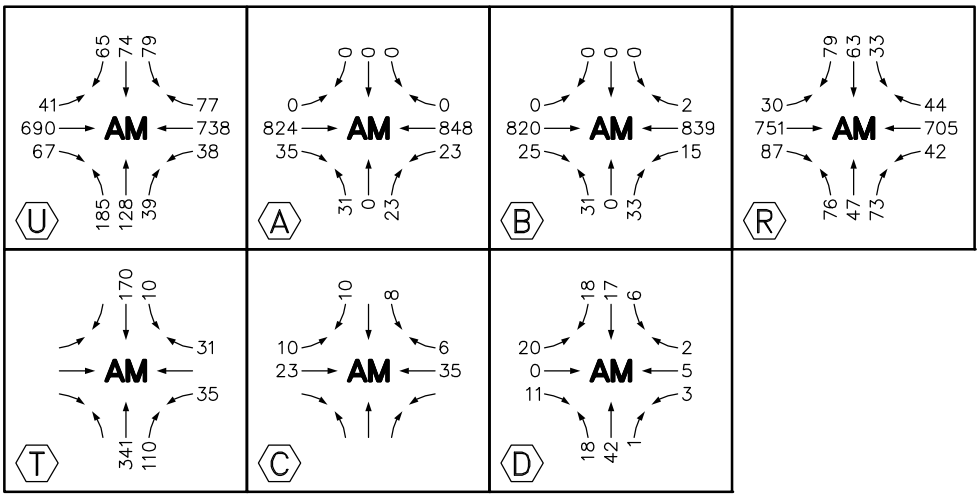
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

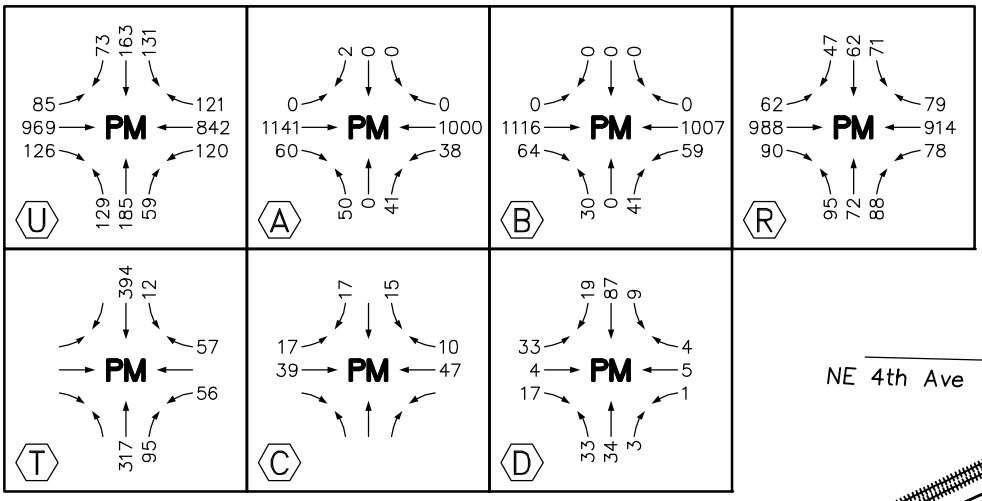
DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

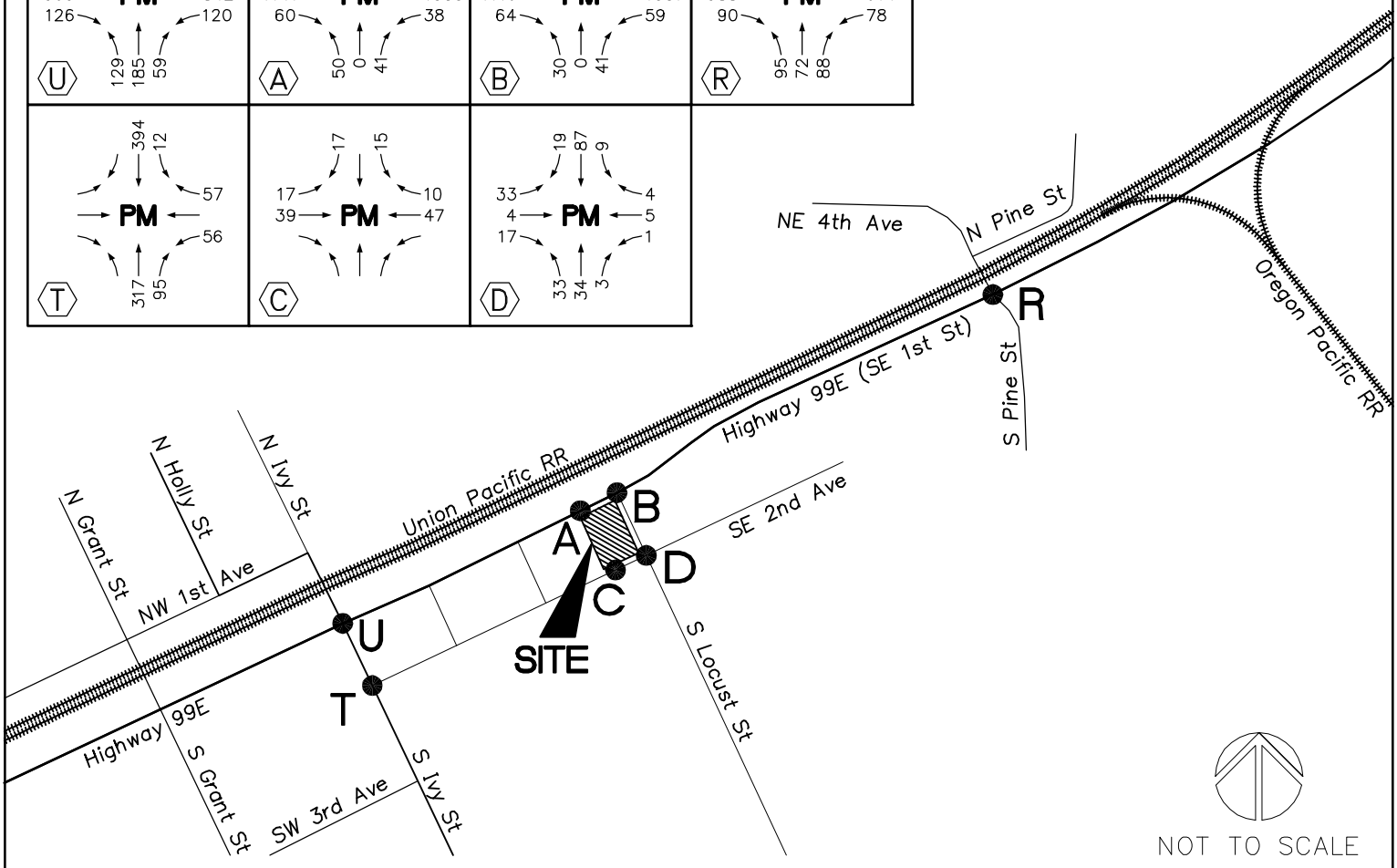
TOTAL SITE TRIP ASSIGNMENT (FULL ACCESS ALTERNATIVE) WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 9







NOT TO SCALE

GROUP MACKENZIE

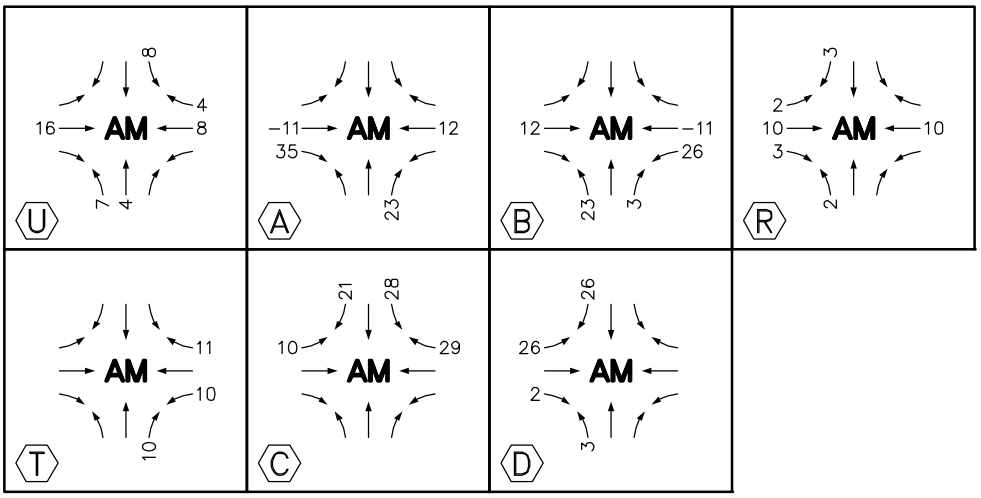
Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

POST DEVELOPMENT TRAFFIC (FULL ACCESS ALTERNATIVE) WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

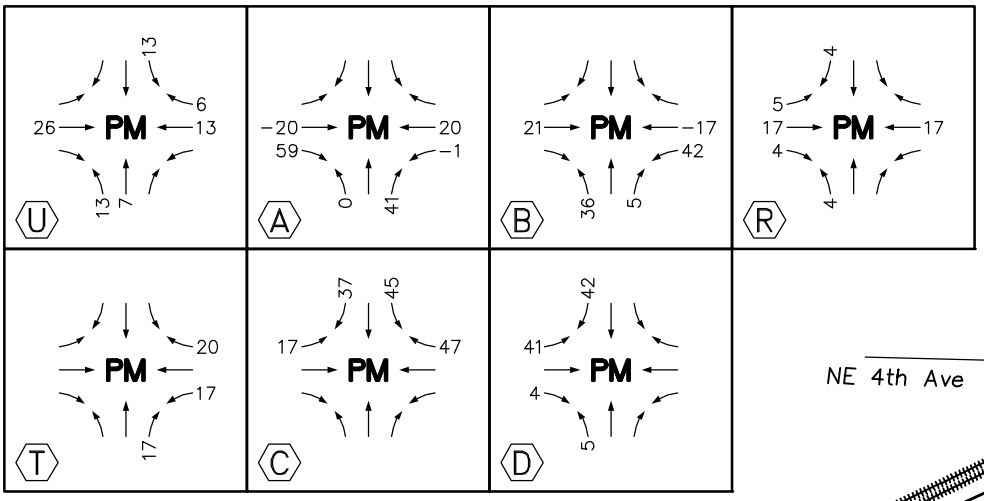
FIGURE 10



WEEKDAY AM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 74
EXIT = 72

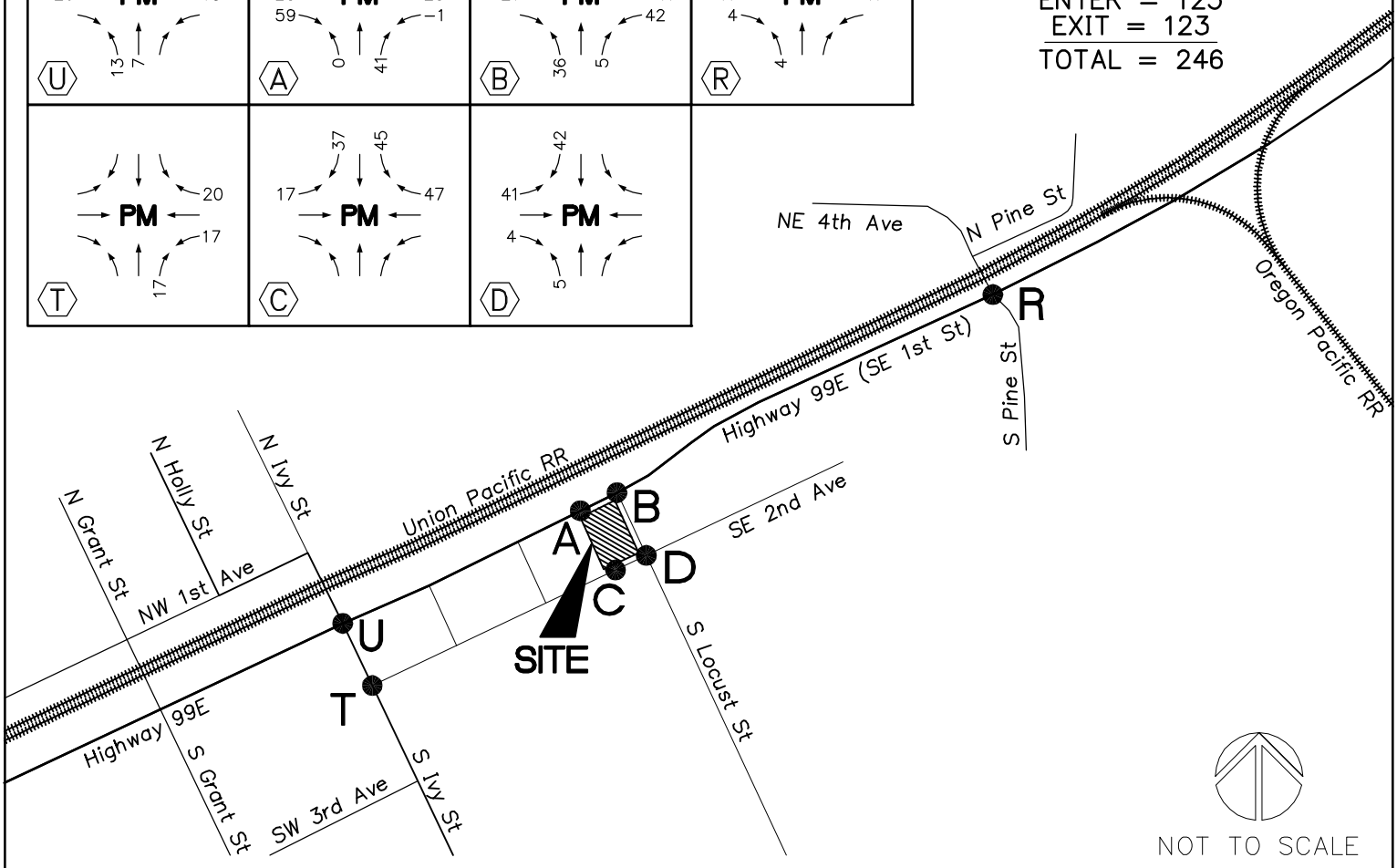
TOTAL = 146



WEEKDAY PM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 123
EXIT = 123

TOTAL = 246



NOT TO SCALE

GROUP MACKENZIE

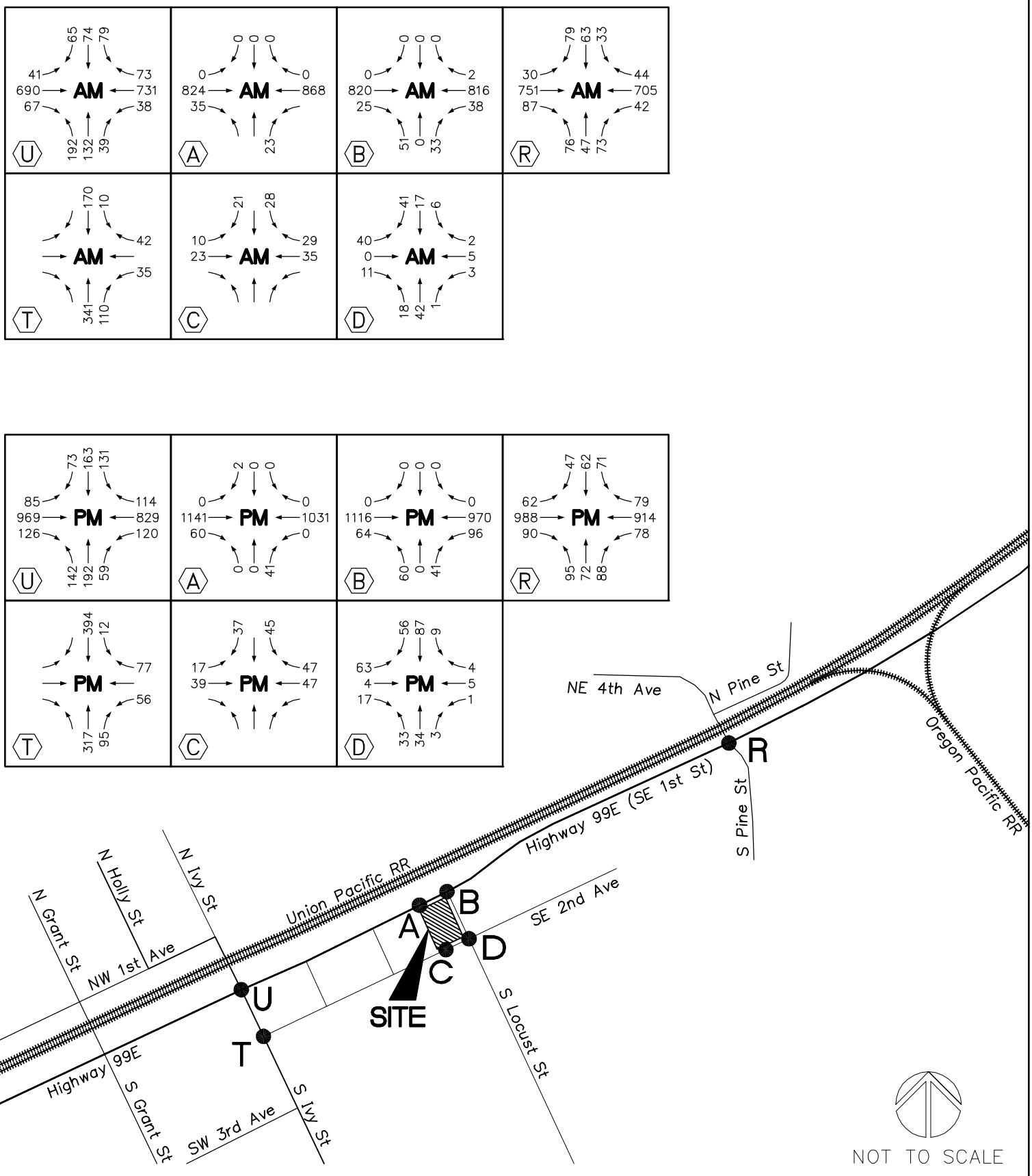
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

TOTAL SITE TRIP ASSIGNMENT (RIRO ACCESS ALTERNATIVE) WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 11



GROUP MACKENZIE

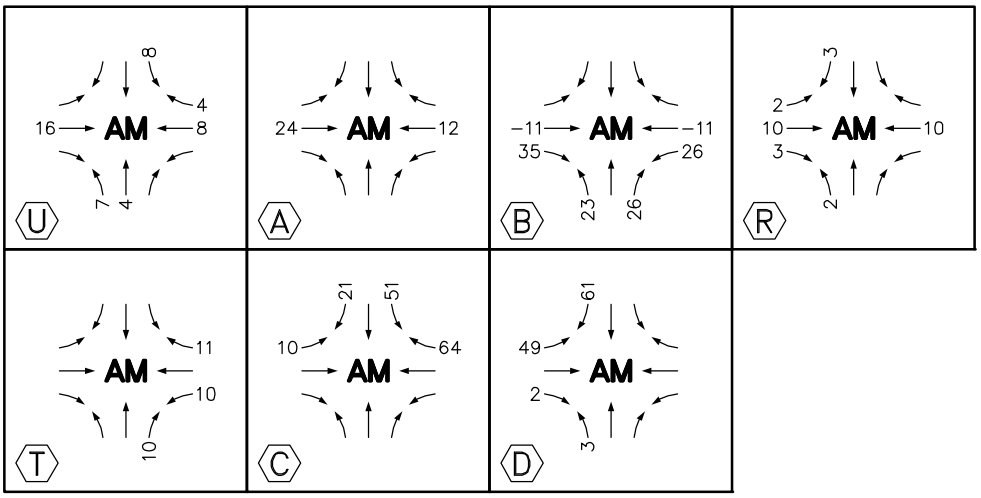
Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

POST DEVELOPMENT TRAFFIC (RIRO ACCESS ALTERNATIVE) WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

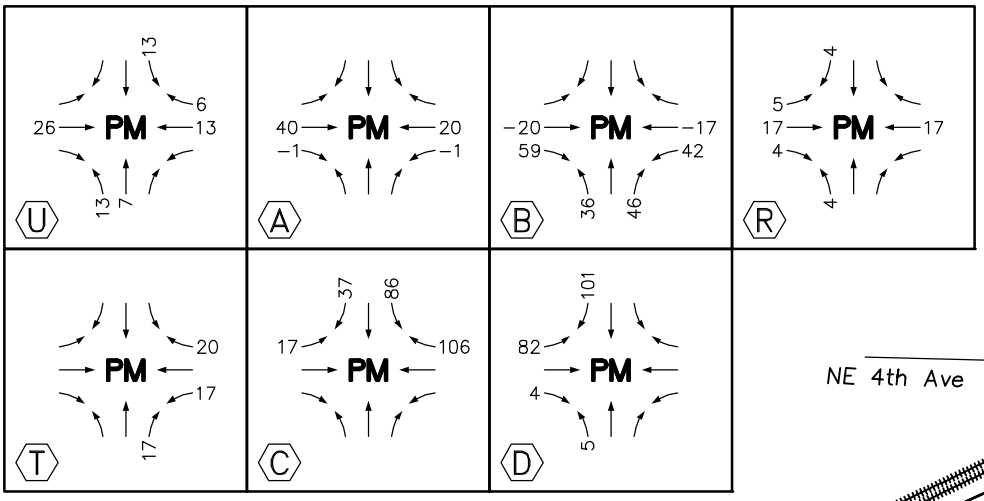
FIGURE 12



WEEKDAY AM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 74
EXIT = 72

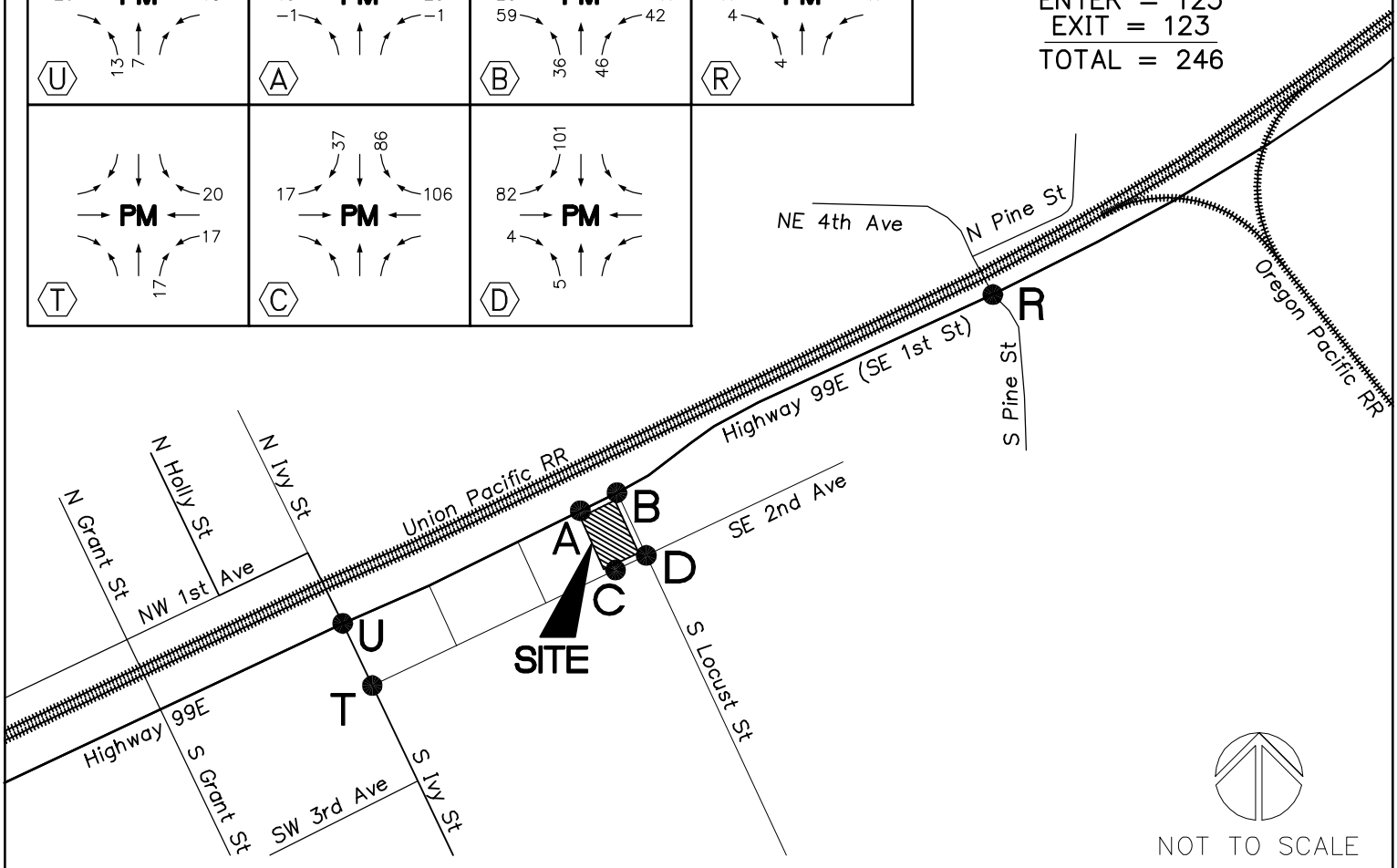
TOTAL = 146



WEEKDAY PM PEAK HOUR
TOTAL SITE TRIPS

ENTER = 123
EXIT = 123

TOTAL = 246



NOT TO SCALE

GROUP MACKENZIE

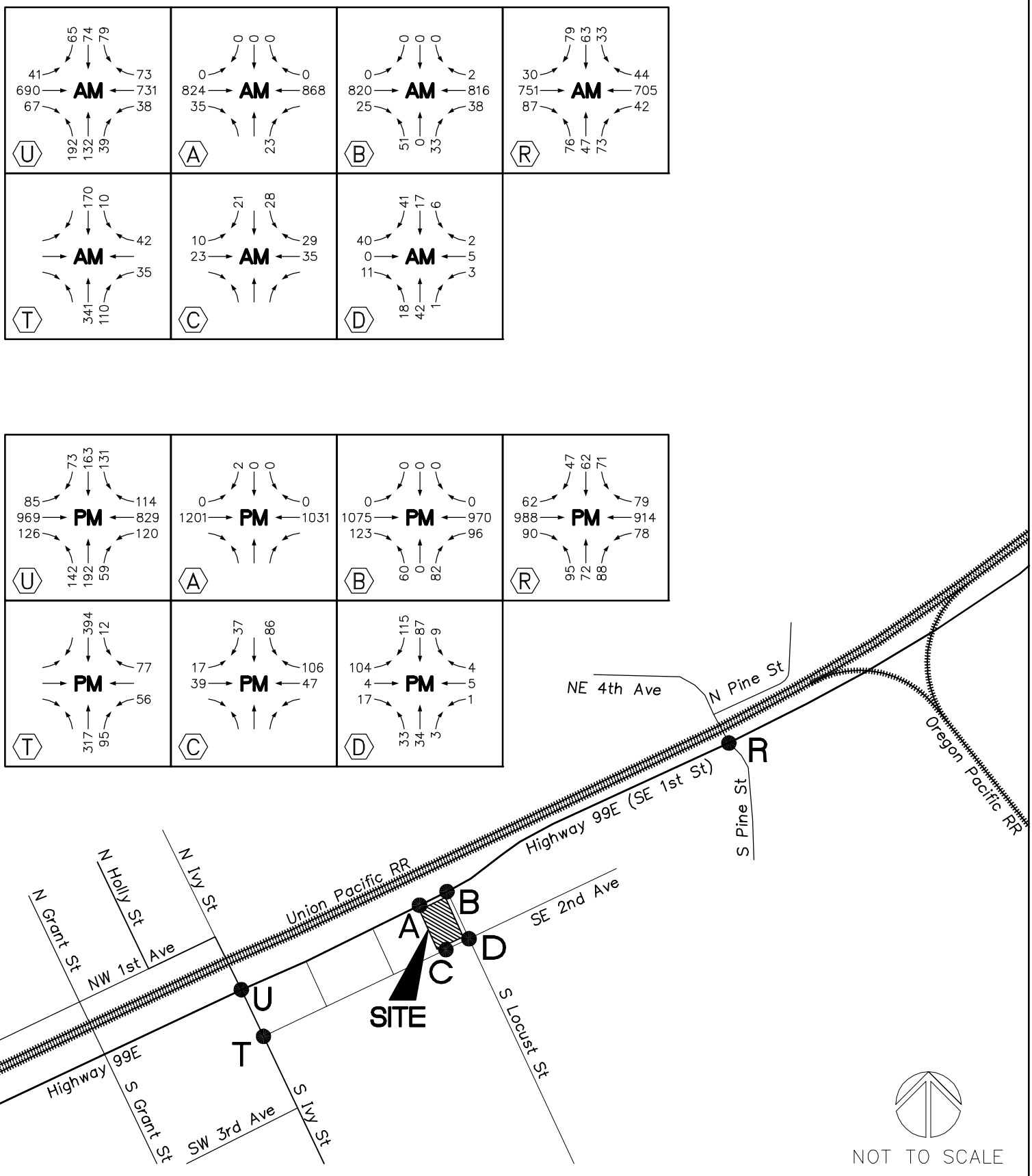
Portland OR 503.224.9560 Vancouver WA 360.695.7879 Seattle WA 206.749.9993

DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

TOTAL SITE TRIP ASSIGNMENT (NO ACCESS ALTERNATIVE) WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 13



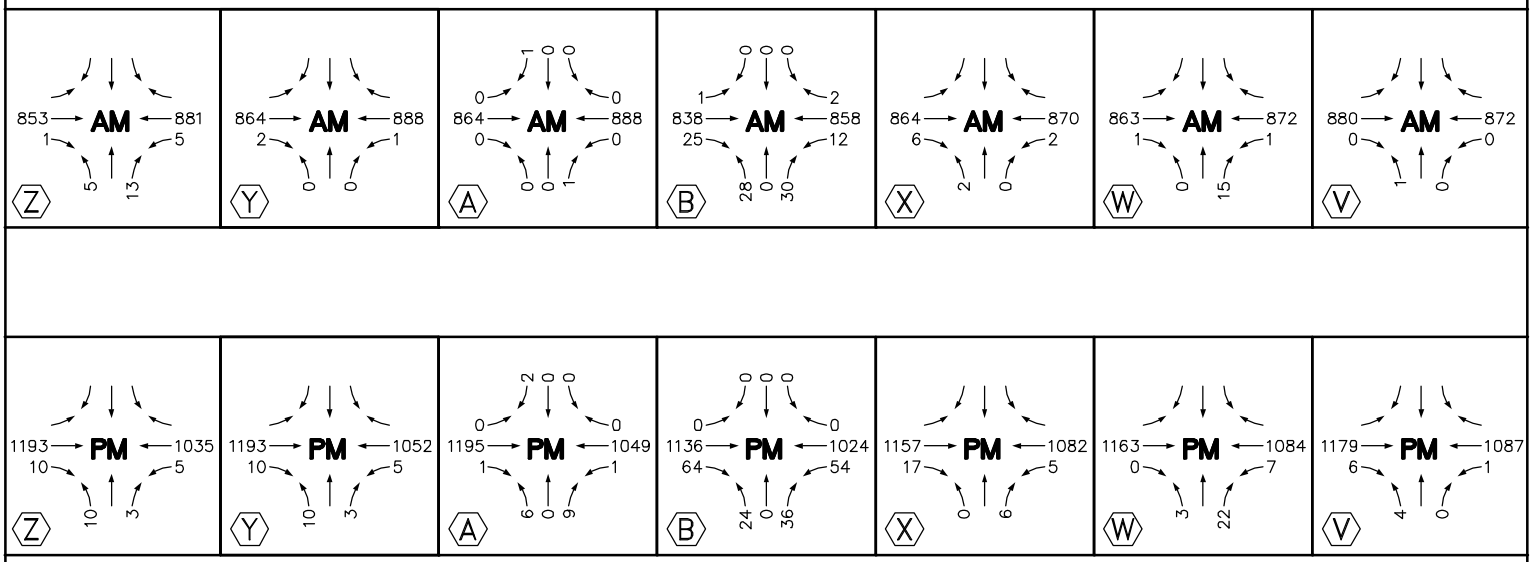
GROUP MACKENZIE
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

POST DEVELOPMENT TRAFFIC (NO ACCESS ALTERNATIVE) WEEKDAY PEAK HOURS

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 14



NOT TO SCALE

GROUP MACKENZIE

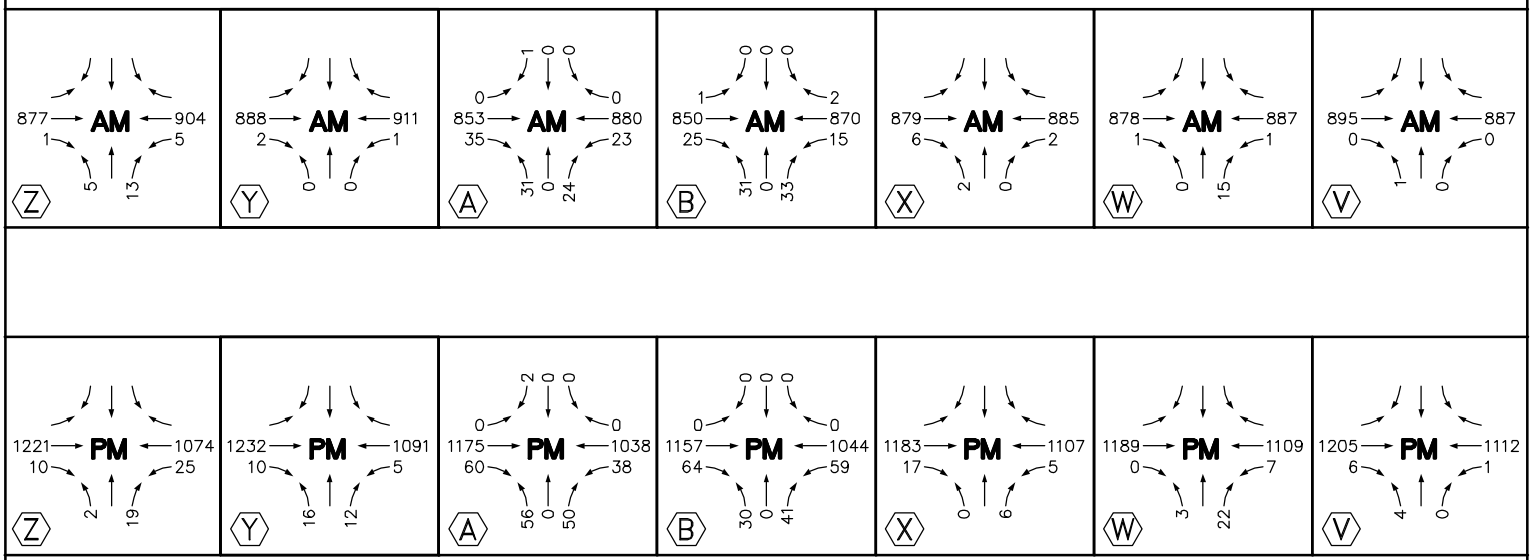
Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

PRE-DEVELOPMENT TRAFFIC VOLUMES WITHIN 250 FEET OF SITE

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 15



NOT TO SCALE

GROUP MACKENZIE

Portland OR 503.224.9560 | Vancouver WA 360.695.7879 | Seattle WA 206.749.9993

DATE: 06.24.13
DRAWN BY: KLA
CHECKED BY: BTA
JOB NO: 2120130.00

FUTURE TRAFFIC VOLUMES WITHIN 250 FEET OF SITE

FRED MEYER CANBY FUEL FACILITY
CANBY, OREGON

FIGURE 16

APPENDIX B
TRANSIT ROUTES AND SCHEDULES

Accessibility Features

- Buses are **wheelchair lift** equipped.
- **Priority seating** is available on all buses for senior citizens and people with disabilities.
- Controlled **service animals** are permitted on buses (on a leash or in a pet container) .
- Buses are equipped with **bike racks**.
- **Complementary Paratransit service is** provided to qualified individuals who are unable to use shuttles or fixed route buses. Call 503.266.4022 for more information.

Holidays

CAT does not operate on the following holidays:

- New Years Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas

Title VI Non Discrimination Policy

Canby Area Transit (CAT) operates equal opportunity programs without regard to race, color, national origin, religion, age, marital status, sexual orientation, or disability in accordance with Title VI of the Civil Rights Act, ORS Chapter 659A or other applicable law.

Canby Area Transit
PO BOX 930
123 NW 2nd Ave
Canby, OR 97013
503.266.4022
Oregon Relay Service 800-735-2900
email: cat@ci.canby.or.us
website: **www.canbyareatransit.org**

CAT is supported by Canby Area Businesses

Alternative formats available upon request.

CAT
CANBY AREA TRANSIT

Starting June 27, 2011

Neighborhood Shuttles & Dial-A-Ride

services for the general public

Effective 6-27-11

Dial-A-Ride

On **June 27, 2011**, Canby Area Transit will implement a new Dial-A-Ride service for the general public. Anyone traveling to or from destinations within the Canby Urban Growth Boundary is eligible for this service. The service operates from 6:00 am—8:00 pm Monday through Friday. Reservations are accepted between 8:00 am and 5:00 pm.

How do I get a ride?

- Register by calling us and answering a few questions. Registration only happens one time. After that just let us know if you change your name, address, or phone number.
- Call for a ride reservation at least 24 hours before you need the ride.
- Tell us where you are going and what time you need to be there.

It's that easy! We will pick you up and take you anywhere you need to go in Canby.

Reservations

Reservations may be scheduled as early as 14 days in advance or up to 24 hours prior to the trip.

Reservations may be placed by calling the dispatcher/ scheduler during office hours (Monday through Friday, 8:00am to 5:00pm) or on weekends and holidays by leaving a message on the office answering system. Please call with complete trip information (dates, times, addresses) and a phone number for trip confirmation.

Pick-up time may be negotiated and scheduled within an hour of the requested time.

It is best to pre-schedule return trips with a specific pick-up time. When this is not possible, the return trip is scheduled as a "call back". When you are ready for your return pick-up, please call Dispatch. At that time an estimated pick-up time will be given based on driver/vehicle availability. Although we will do our best to get to you promptly, during busy times it may take up to 60-minutes for a "call back" ride.

To cancel a Dial-A-Ride reservation please call the office as soon as possible. A trip reservation cancelled with less than one (1) hour notice prior to pick-up time may be considered a no-show.

When a rider is late by more than five (5) minutes past the scheduled pick-up time the trip will be considered a no-show

A pattern of no-shows could result in a suspension of ridership privileges. Suspended riders will be notified in writing.

Trip Planning

Please plan trips with these points in mind:

- CAT may arrive 10 minutes before or after the scheduled pick-up time.
- Depending on route/passenger needs, CAT may send a bus or mini-van for your pick-up. If possible, make allowances for bus access to the pick-up and delivery addresses.

CAT vehicles are wheelchair accessible. Drivers are trained to assist persons with disabilities in boarding and de-boarding.

Carry-on items such as groceries must be limited to what you can carry. Packages may not block the aisle. No hazardous materials are allowed on the vehicles.

All items found on vehicles will be donated to charity if not claimed within 30 days.

Severe weather may result in a suspension of service.

Children under the age of 5 must be accompanied by a person over the age of 16. Children aged 5-8 may travel alone if adult supervision is arranged at the pick-up and drop-off points. Children aged 9 and older may travel alone.

All General Public Dial-A-Ride reservations are made on a space available basis. So make your reservation early.

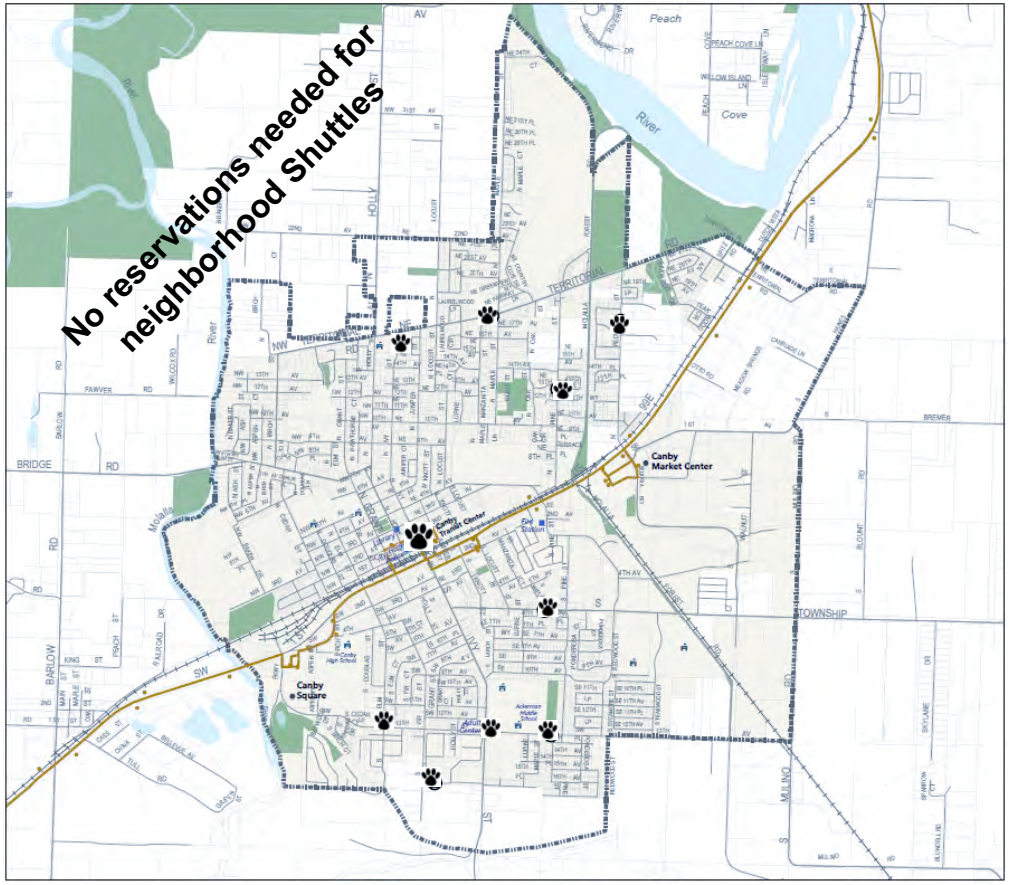
Shuttle Stops

Neighborhood Shuttle Schedule

Shuttle Stops - North Canby				
NE 18th Place & N Redwood St		7:24	11:39	**2:24**
NE 13th Ave & N Pine St		7:28	11:43	**2:28**
NE Territorial & N Maple St		7:32	11:47	**2:32**
N Ivy & NW Territorial Road		7:35	11:50	**2:35**
Arrive at Canby Transit Center		7:40	11:55	**2:40**
Shuttle Stops - South Canby				
SW 13th Ave & S Elm St		6:55	11:10	**1:55**
Hope Village (near Cascade House)		6:58	11:13	**1:58**
Canby Adult Center (SE 13th Ave & S Ivy St)		7:02	11:17	**2:02**
SE 13th Ave & S Pine		7:05	11:20	**2:05**
S Township Rd & S Maple		7:09	11:24	**2:09**
Arrive at Canby Transit Center		7:14	11:29	**2:14**
Return Shuttles from Canby Transit Center:	7:45	**12:00**	**2:45**	**5:00**

AM in regular print

PM in bold print



How to read the schedule

- Find the Shuttle stop where you will board the bus.
- Read top to bottom to find your stop.
- Shuttles times provided are approximate. Expect the Shuttle to arrive as much as 5 minutes before or after the time on the schedule.
- Schedules are subject to change without notice. For the most current schedule check the CAT website www.canbyareatransit.org.

Rider Tips

- Arrive at the Shuttle stop early! Posted Shuttle times are approximate (+ or - 5 minutes).
- Shuttle riders may only travel between Shuttle stops and the Canby Transit Center.
- No reservation is required for Shuttle rides.
- For destinations other than the Canby Transit Center please schedule a Dial-A-Ride trip.
- Give priority seating to seniors and people with disabilities.

CAT
CANBY AREA TRANSIT

503.266.4022
www.canbyareatransit.org

Effective June 27, 2011
Updated June 15, 2011

Everyone rides for free | ***Catch a CAT*** | CAT is fareless | ***CAT is supported by Canby Area Businesses*** | everyone rides for free | ***Catch a CAT*** | CAT is fareless

Service Changes:

A Shuttle Service between Canby Transit Center and a limited number of neighborhood stops will be implemented on June 27, 2011.

CAT's Blue and Green Lines and CAT's portion of the Purple Line will be replaced by a General Public Dial-A-Ride service effective June 27, 2011.

Check our website or call 503.266.4022 for more details.

Orange Line - to Canby or Woodburn

Southbound on 99E

	Oregon City TC	Main Street	Canby Market Center	Fred Meyer	SE 2nd & S Locust	Canby Transit Center	Thriftway	Canby Square	Safeway	Aurora	99E & Liberty	Hubbard	99E & D Street	Woodburn	Bi-Mart
														arrive	depart
	5:35		5:51		5:55	6:00		6:05		6:10		6:17		6:26	6:28
	6:15		6:31		6:35	6:40		6:45							
	6:50		7:06		7:10	7:15		7:20							
	7:20		7:36		7:40	7:45		7:50							
	8:20		8:36		8:40	8:45		8:50		8:55		9:02		9:11	9:15
	8:50		9:06		9:10	9:15		9:20							
	10:20		10:36		10:40	10:45		10:50							
	10:35		10:51		10:55	11:00		11:05		11:10		11:17		11:26	11:28
	12:35		**12:51**		**12:55**	**1:00**		**1:05**							
	1:20		**1:36**		**1:40**	**1:45**		**1:50**		**1:55**		**2:02**		**2:11**	**2:15**
	3:20		**3:36**		**3:40**	**3:45**		**3:50**							
	3:35		**3:51**		**3:55**	**4:00**		**4:05**		**4:10**		**4:17**		**4:26**	**4:28**
X	**4:15**		-		-	**4:33**		**4:38**							
	4:50		**5:06**		**5:10**	**5:15**		**5:20**							
X	**5:35**		-		-	**5:53**		**5:58**							
	6:05		**6:21**		**6:25**	**6:30**		**6:35**		**6:40**		**6:47**		**6:56**	**7:00**
	6:50		**7:06**		**7:10**	**7:15**		**7:20**							
	8:00		**8:21**		**8:25**	**8:30**									

Orange Line - to Canby or Oregon City

Northbound on 99E

	Hubbard	99E & D Street	Aurora	99E & Liberty	Canby Square	Safeway	Canby Transit Center	Thriftway	SE 2nd & S Locust	Canby Market Center	Fred Meyer	Oregon City TC	Main Street	
							5:15		-	-		5:33		X
							5:55		-	-		6:13		X
							6:30		-	-		6:48		X
	6:36		6:45		6:51		7:00		-	-		7:18		X
					7:25		7:45		7:55	7:59		8:15		
					7:53		8:15		8:25	8:29		8:45		
	9:25		9:34		9:39		9:45		9:55	9:59		10:15		
					9:22		10:00		10:10	10:14		10:30		
	11:38		11:47		11:52		**12:00**		**12:10**	**12:14**		**12:30**		
							12:45		**12:55**	**12:59**		**1:15**		
	2:25		**2:34**		**2:39**		**2:45**		**2:55**	**2:59**		**3:15**		
							3:00		**3:10**	**3:14**		**3:30**		
							3:40		**3:50**	**3:54**		**4:10**		
					3:53		**4:15**		**4:25**	**4:29**		**4:45**		
	4:38		**4:47**		**4:52**		**5:00**		**5:10**	**5:14**		**5:30**		
							5:30		**5:40**	**5:44**		**6:00**		
					5:24		**6:15**		**6:25**	**6:29**		**6:45**		
	7:10		**7:19**		**7:23**		**7:30**		**7:40**	**7:44**		**8:00**		
					7:25		**7:30**							

Service available Monday - Friday

X = Express no stop at SE 2nd & Locust or Canby Market Center
— = no service
AM in regular print
PM in bold print

How to read this schedule

- Find the stop where you will board the bus.
- Read top to bottom to find scheduled arrival times at the listed stops.
- Read from left to right to find how long it takes to travel between stops.
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Effective June 27, 2011
Updated October 11, 2011

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- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas

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Canby Area Transit
PO BOX 930
123 NW 2nd Ave
Canby, OR 97013
503.266.4022
Oregon Relay Service 800-735-2900
email: cat@ci.canby.or.us
website: **www.canbyareatransit.org**

CAT is supported by Canby Area Businesses

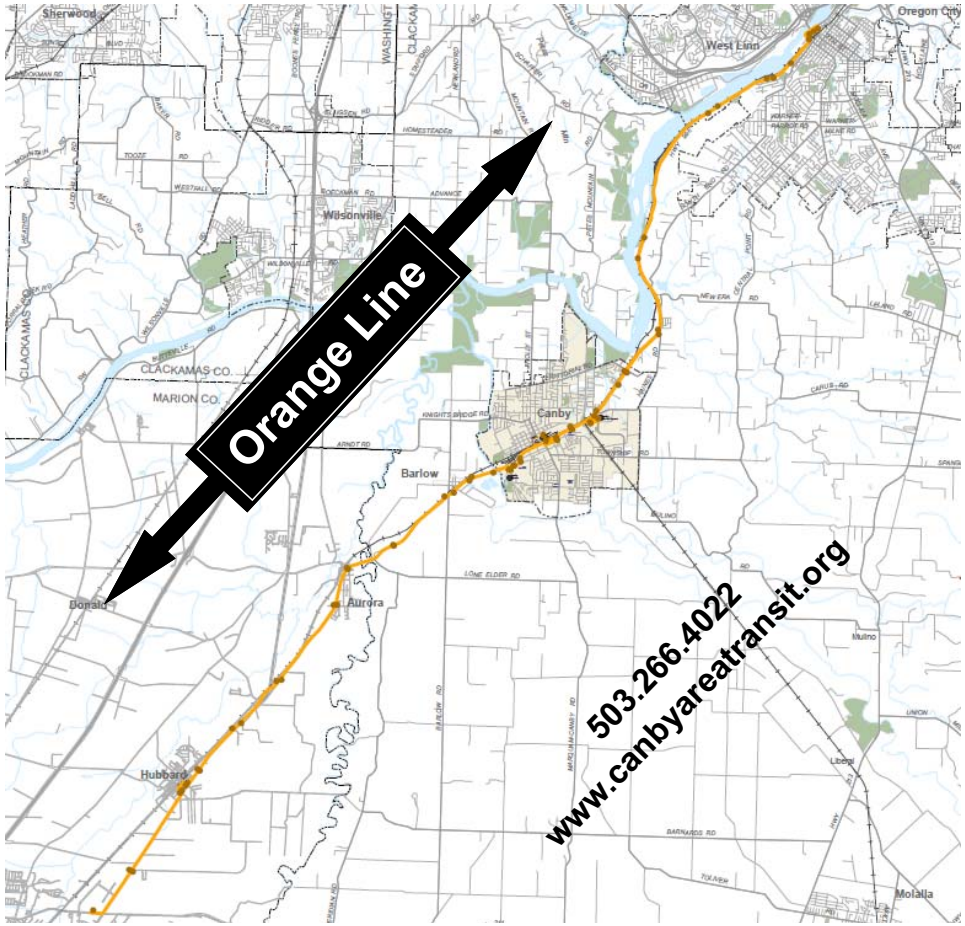
Alternative formats available upon request.

Orange Line

CAT
CANBY AREA TRANSIT

- **Oregon City**
- **Canby**
- **Aurora**
- **Hubbard**
- **Woodburn**

Effective 10-17-11



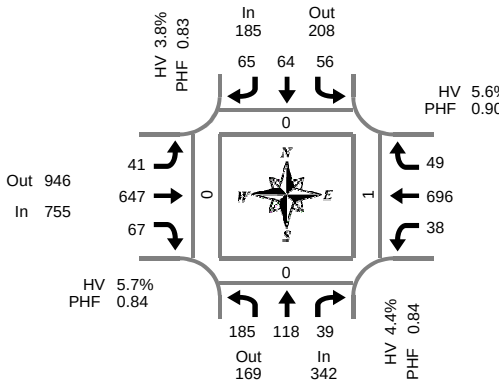
Rider Tips

- Check bus route times and stop locations (see schedule inside).
- Arrive at the bus stop at least 5 minutes early.
- If needed, ask the driver for assistance.
- Press the bell bar or pull the cord to signal the driver about a block before the bus stop.
- Give priority seating to seniors and people with disabilities.

APPENDIX C
TRAFFIC COUNT
SUMMARIES

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Ivy St & Hwy 99E

Tuesday, May 21, 2013
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

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

Interval Start Time	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	36	17	14	11	7	19	8	144	10	9	153	13	441	0	0	0	0
7:15 AM	50	19	10	14	22	20	13	163	14	6	204	7	542	0	0	0	0
7:30 AM	54	41	7	17	15	14	10	191	24	10	195	10	588	0	0	0	0
7:45 AM	45	41	8	14	20	12	10	149	19	13	144	19	494	0	0	1	0
8:00 AM	20	19	7	11	21	14	10	140	7	8	118	14	389	0	0	0	0
8:15 AM	32	24	12	17	20	8	7	132	7	9	120	21	409	0	1	2	0
8:30 AM	26	22	10	15	19	11	10	129	17	16	117	24	416	0	0	1	0
8:45 AM	40	40	13	15	26	10	13	151	21	26	153	25	533	2	0	1	0
Total Survey	303	223	81	114	150	108	81	1,199	119	97	1,204	133	3,812	2	1	5	0

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	342	169	511	185	208	393	755	946	1,701	783	742	1,525	2,065
%HV	4.4%			3.8%			5.7%			5.6%			5.3%
PHF	0.84			0.83			0.84			0.90			0.88

Pedestrians Crosswalk			
North	South	East	West
0	0	1	0

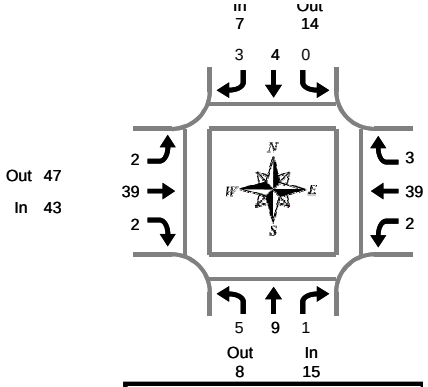
By Movement	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	185	118	39	56	64	65	41	647	67	38	696	49	2,065
%HV	2.7%	7.6%	2.6%	0.0%	6.3%	4.6%	4.9%	6.0%	3.0%	5.3%	5.6%	6.1%	5.3%
PHF	0.86	0.72	0.70	0.82	0.73	0.81	0.79	0.85	0.70	0.73	0.85	0.64	0.88

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	185	118	39	56	64	65	41	647	67	38	696	49	2,065	0	0	1	0
7:15 AM	169	120	32	56	78	60	43	643	64	37	661	50	2,013	0	0	1	0
7:30 AM	151	125	34	59	76	48	37	612	57	40	577	64	1,880	0	1	3	0
7:45 AM	123	106	37	57	80	45	37	550	50	46	499	78	1,708	0	1	4	0
8:00 AM	118	105	42	58	86	43	40	552	52	59	508	84	1,747	2	1	4	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Ivy St & Hwy 99E

Tuesday, May 21, 2013
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Ivy St				Southbound Ivy St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	3	0	4	0	1	1	2	0	0	0	0	1	14	0	15	21
7:15 AM	1	0	0	1	0	1	0	1	1	8	0	9	0	7	0	7	18
7:30 AM	2	3	1	6	0	2	1	3	0	18	2	20	1	11	1	13	42
7:45 AM	1	3	0	4	0	0	1	1	1	13	0	14	0	7	2	9	28
8:00 AM	0	3	1	4	2	5	1	8	1	9	0	10	0	11	0	11	33
8:15 AM	2	2	0	4	0	1	0	1	0	10	0	10	0	13	0	13	28
8:30 AM	1	1	0	2	1	1	0	2	1	10	0	11	0	13	1	14	29
8:45 AM	1	4	0	5	2	5	0	7	0	14	0	14	2	19	0	21	47
Total Survey	9	19	2	30	5	16	4	25	4	82	2	88	4	95	4	103	246

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	15	8	23	7	14	21	43	47	90	44	40	84	109
PHF	0.27			0.15			0.24			0.23			0.26

By Movement	Northbound Ivy St				Southbound Ivy St				Eastbound Hwy 99E				Westbound Hwy 99E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	5	9	1	15	0	4	3	7	2	39	2	43	2	39	3	44	109
PHF	0.31	0.25	0.13	0.27	0.00	0.14	0.25	0.15	0.25	0.24	0.25	0.24	0.25	0.22	0.25	0.23	0.26

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

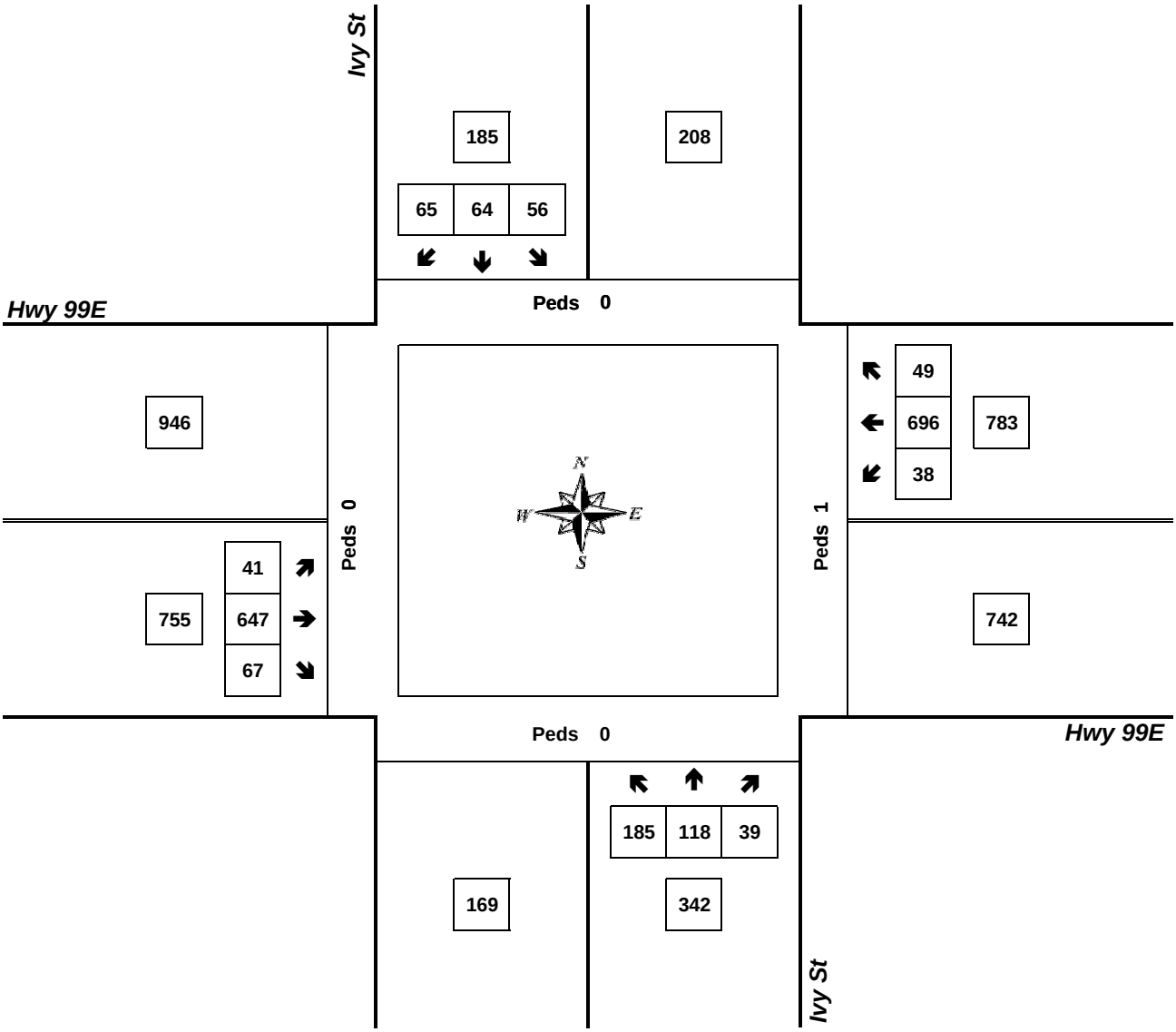
Interval Start Time	Northbound Ivy St				Southbound Ivy St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	5	9	1	15	0	4	3	7	2	39	2	43	2	39	3	44	109
7:15 AM	4	9	2	15	2	8	3	13	3	48	2	53	1	36	3	40	121
7:30 AM	5	11	2	18	2	8	3	13	2	50	2	54	1	42	3	46	131
7:45 AM	4	9	1	14	3	7	2	12	3	42	0	45	0	44	3	47	118
8:00 AM	4	10	1	15	5	12	1	18	2	43	0	45	2	56	1	59	137

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Ivy St & Hwy 99E

7:00 AM to 8:00 AM
Tuesday, May 21, 2013

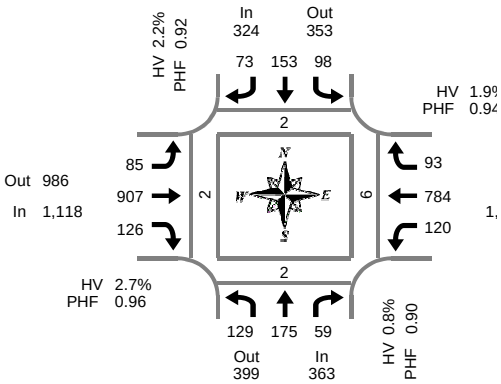


Approach	PHF	HV%	Volume
EB	0.84	5.7%	755
WB	0.90	5.6%	783
NB	0.84	4.4%	342
SB	0.83	3.8%	185
Intersection	0.88	5.3%	2,065

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



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

Ivy St & Hwy 99E

Wednesday, May 29, 2013
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	34	42	12	25	35	16	19	203	28	27	157	23	621	0	0	2	1
4:15 PM	36	39	15	32	38	17	21	208	31	27	180	31	675	2	2	1	0
4:30 PM	31	36	10	30	34	13	26	202	28	29	170	36	645	0	0	0	1
4:45 PM	30	51	12	30	36	16	20	218	34	31	191	20	689	1	1	2	0
5:00 PM	26	45	16	26	43	19	20	222	32	29	208	29	715	0	0	3	0
5:15 PM	43	41	17	26	42	20	24	230	36	40	194	19	732	1	0	0	2
5:30 PM	30	38	14	16	32	18	21	237	24	20	191	25	666	0	1	1	0
5:45 PM	25	30	13	21	37	12	17	204	29	28	157	20	593	2	2	2	0
Total Survey	255	322	109	206	297	131	168	1,724	242	231	1,448	203	5,336	6	6	11	4

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

By Approach	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	363	399	762	324	353	677	1,118	986	2,104	997	1,064	2,061	2,802	2	2	6	2
%HV	0.8%			2.2%			2.7%			1.9%			2.1%				
PHF	0.90			0.92			0.96			0.94			0.96				

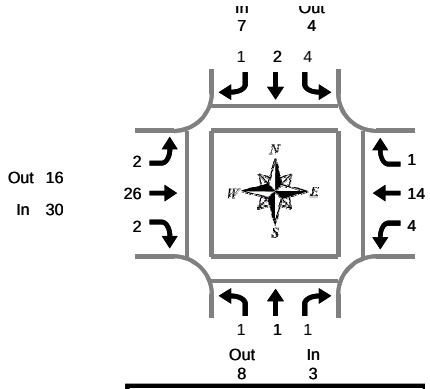
By Movement	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	129	175	59	98	153	73	85	907	126	120	784	93	2,802
%HV	0.8%	0.6%	1.7%	4.1%	1.3%	1.4%	2.4%	2.9%	1.6%	3.3%	1.8%	1.1%	2.1%
PHF	0.75	0.86	0.87	0.82	0.89	0.91	0.89	0.96	0.88	0.75	0.94	0.80	0.96

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

Interval Start Time	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	131	168	49	117	143	62	86	831	121	114	698	110	2,630	3	3	5	2
4:15 PM	123	171	53	118	151	65	87	850	125	116	749	116	2,724	3	3	6	1
4:30 PM	130	173	55	112	155	68	90	872	130	129	763	104	2,781	2	1	5	3
4:45 PM	129	175	59	98	153	73	85	907	126	120	784	93	2,802	2	2	6	2
5:00 PM	124	154	60	89	154	69	82	893	121	117	750	93	2,706	3	3	6	2

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Ivy St & Hwy 99E

Wednesday, May 29, 2013
4:00 PM to 6:00 PM

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

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Ivy St				Southbound Ivy St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	1	0	3	0	2	1	3	1	7	1	9	2	3	1	6	21
4:15 PM	0	2	0	2	1	1	0	2	0	5	0	5	0	4	0	4	13
4:30 PM	1	0	1	2	0	2	0	2	2	7	0	9	1	4	1	6	19
4:45 PM	1	0	1	2	2	1	1	4	1	8	1	10	0	3	0	3	19
5:00 PM	0	1	0	1	1	0	0	1	0	4	0	4	2	6	0	8	14
5:15 PM	0	0	0	0	0	1	0	1	0	9	1	10	1	1	0	2	13
5:30 PM	0	0	0	0	1	0	0	1	1	5	0	6	1	4	1	6	13
5:45 PM	0	1	0	1	0	1	0	1	0	5	0	5	0	3	0	3	10
Total Survey	4	5	2	11	5	8	2	15	5	50	3	58	7	28	3	38	122

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound Ivy St			Southbound Ivy St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	8	11	7	4	11	30	16	46	19	31	50	59
PHF	0.11			0.22			0.31			0.28			0.28

By Movement	Northbound Ivy St				Southbound Ivy St				Eastbound Hwy 99E				Westbound Hwy 99E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	1	1	3	4	2	1	7	2	26	2	30	4	14	1	19	59
PHF	0.08	0.08	0.13	0.11	0.33	0.10	0.25	0.22	0.17	0.31	0.25	0.31	0.25	0.27	0.13	0.28	0.28

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

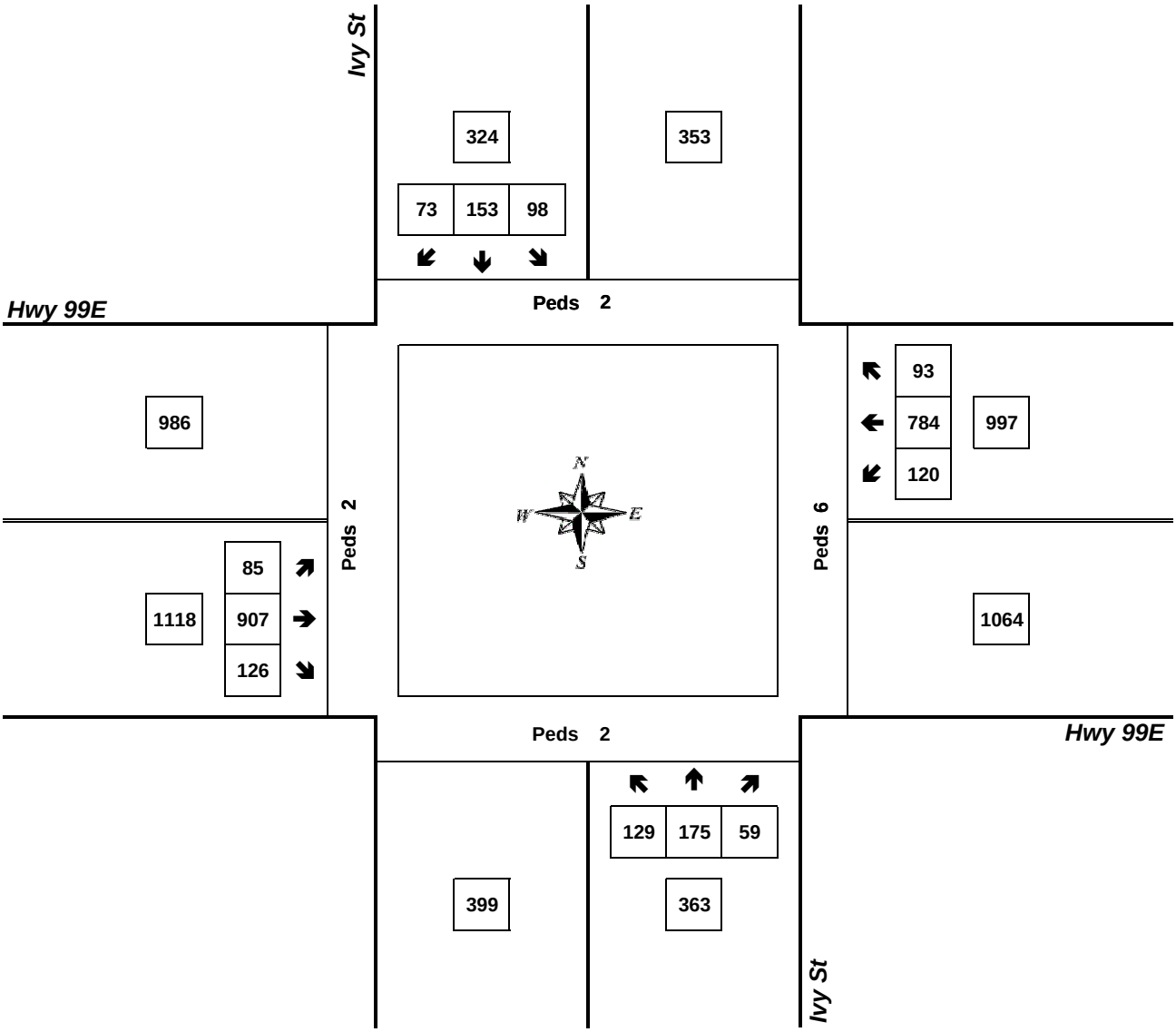
Interval Start Time	Northbound Ivy St				Southbound Ivy St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	4	3	2	9	3	6	2	11	4	27	2	33	3	14	2	19	72
4:15 PM	2	3	2	7	4	4	1	9	3	24	1	28	3	17	1	21	65
4:30 PM	2	1	2	5	3	4	1	8	3	28	2	33	4	14	1	19	65
4:45 PM	1	1	1	3	4	2	1	7	2	26	2	30	4	14	1	19	59
5:00 PM	0	2	0	2	2	2	0	4	1	23	1	25	4	14	1	19	50

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Ivy St & Hwy 99E

4:45 PM to 5:45 PM
Wednesday, May 29, 2013

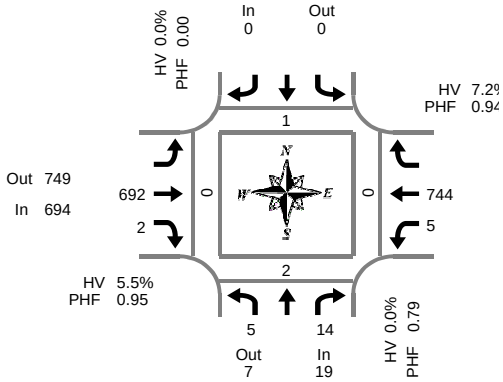


Approach	PHF	HV%	Volume
EB	0.96	2.7%	1,118
WB	0.94	1.9%	997
NB	0.90	0.8%	363
SB	0.92	2.2%	324
Intersection	0.96	2.1%	2,802

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:30 AM to 8:30 AM

S Knott St & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

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

Interval Start Time	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	1		4				156	0		0	150		311	0	1	0	0
7:15 AM	1		1				164	0		2	149		317	0	0	0	0
7:30 AM	1		5				175	0		2	181		364	1	0	0	0
7:45 AM	2		3				181	1		1	174		362	0	1	0	0
8:00 AM	2		1				162	0		0	191		356	0	1	0	0
8:15 AM	0		5				174	1		2	198		380	0	0	0	0
8:30 AM	1		3				181	1		1	151		338	0	0	0	0
8:45 AM	1		2				135	3		1	137		279	0	2	0	0
Total Survey	9		24				1,328	6		9	1,331		2,707	1	5	0	0

Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	19	7	26	0	0	0	694	749	1,443	749	706	1,455	1,462	1	2	0	0
%HV	0.0%			0.0%			5.5%			7.2%			6.3%				
PHF	0.79			0.00			0.95			0.94			0.96				

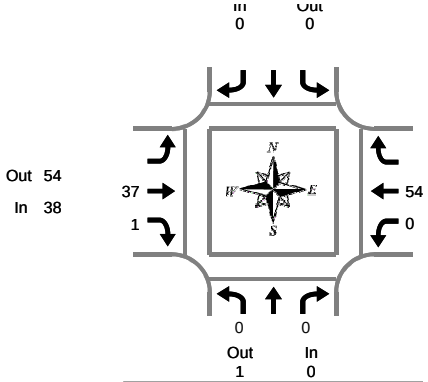
By Movement	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	5		14				692	2		5	744		1,462
%HV	0.0%	NA	0.0%	NA	NA	NA	5.3%	50.0%		0.0%	7.3%	NA	6.3%
PHF	0.63		0.70				0.96	0.50		0.63	0.94		0.96

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	5		13				676	1		5	654		1,354	1	2	0	0
7:15 AM	6		10				682	1		5	695		1,399	1	2	0	0
7:30 AM	5		14				692	2		5	744		1,462	1	2	0	0
7:45 AM	5		12				698	3		4	714		1,436	0	2	0	0
8:00 AM	4		11				652	5		4	677		1,353	0	3	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Knott St & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		11	0	11	0	7		7	18
7:15 AM	0		0	0				0		6	0	6	0	6		6	12
7:30 AM	0		0	0				0		3	0	3	0	11		11	14
7:45 AM	0		0	0				0		12	0	12	0	12		12	24
8:00 AM	0		0	0				0		9	0	9	0	17		17	26
8:15 AM	0		0	0				0		13	1	14	0	14		14	28
8:30 AM	0		0	0				0		13	0	13	0	13		13	26
8:45 AM	0		0	0				0		15	0	15	0	12		12	27
Total Survey	0		0	0				0		82	1	83	0	92		92	175

Heavy Vehicle Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	1	1	0	0	0	38	54	92	54	37	91	92
PHF	0.00			0.00			0.23			0.31			0.28

By Movement	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		0	0				0		37	1	38	0	54		54	92
PHF	0.00		0.00	0.00				0.00		0.23	0.25	0.23	0.00	0.31		0.31	0.28

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

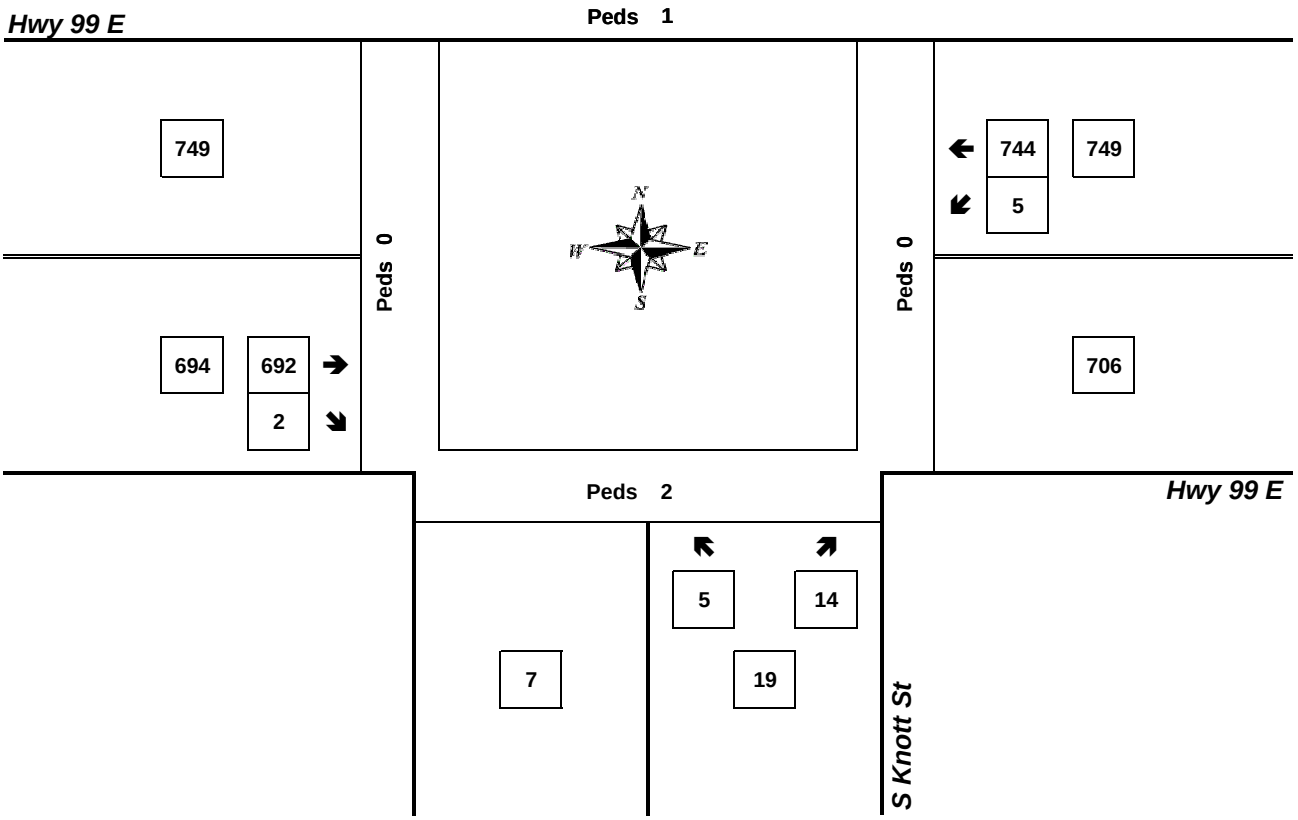
Interval Start Time	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		32	0	32	0	36		36	68
7:15 AM	0		0	0				0		30	0	30	0	46		46	76
7:30 AM	0		0	0				0		37	1	38	0	54		54	92
7:45 AM	0		0	0				0		47	1	48	0	56		56	104
8:00 AM	0		0	0				0		50	1	51	0	56		56	107

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Knott St & Hwy 99 E

7:30 AM to 8:30 AM
Wednesday, April 04, 2012

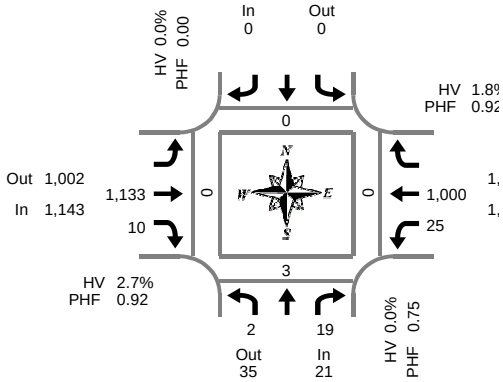


Approach	PHF	HV%	Volume
EB	0.95	5.5%	694
WB	0.94	7.2%	749
NB	0.79	0.0%	19
SB	0.00	0.0%	0
Intersection	0.96	6.3%	1,462

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



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

S Knott St & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		T				North	South	East	West
4:00 PM	0		7				244	1		229	5		486	0	2	0	0
4:15 PM	1		1				266	2		236	6		512	0	0	0	0
4:30 PM	2		3				254	0		256	4		519	0	1	0	0
4:45 PM	0		3				263	3		245	7		521	0	1	0	0
5:00 PM	1		5				308	4		268	10		596	0	0	0	0
5:15 PM	1		6				269	1		261	6		544	0	1	0	0
5:30 PM	0		5				293	2		226	2		528	0	1	0	0
5:45 PM	0		4				208	1		192	5		410	0	11	0	0
Total Survey	5		34				2,105	14		1,913	45		4,116	0	17	0	0

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

By Approach	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	21	35	56	0	0	0	1,143	1,002	2,145	1,025	1,152	2,177	2,189	0	3	0	0
%HV	0.0%			0.0%			2.7%			1.8%			2.2%				
PHF	0.75			0.00			0.92			0.92			0.92				

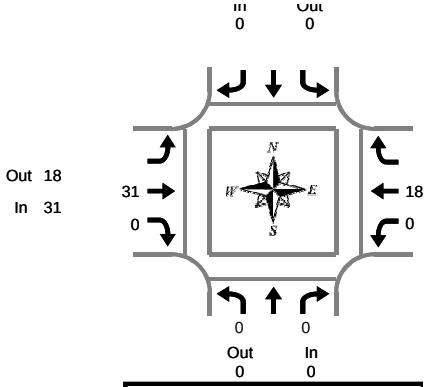
By Movement	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	2		19				1,133	10		25	1,000		2,189
%HV	0.0%	NA	0.0%	NA	NA	NA	2.7%	0.0%		0.0%	1.8%	NA	2.2%
PHF	0.50		0.79				0.92	0.63		0.63	0.93		0.92

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

Interval Start Time	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	3		14				1,027	6		22	966		2,038	0	4	0	0
4:15 PM	4		12				1,091	9		27	1,005		2,148	0	2	0	0
4:30 PM	4		17				1,094	8		27	1,030		2,180	0	3	0	0
4:45 PM	2		19				1,133	10		25	1,000		2,189	0	3	0	0
5:00 PM	2		20				1,078	8		23	947		2,078	0	13	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



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

S Knott St & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	0		0	0				0	6	0	6	0	6		6	12
4:15 PM	0		0	0				0	8	0	8	0	7		7	15
4:30 PM	0		1	1				0	5	0	5	0	6		6	12
4:45 PM	0		0	0				0	9	0	9	0	6		6	15
5:00 PM	0		0	0				0	11	0	11	0	4		4	15
5:15 PM	0		0	0				0	7	0	7	0	3		3	10
5:30 PM	0		0	0				0	4	0	4	0	5		5	9
5:45 PM	0		0	0				0	3	0	3	0	4		4	7
Total Survey	0		1	1				0	53	0	53	0	41		41	95

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound S Knott St			Southbound S Knott St			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	31	18	49	18	31	49	49
PHF	0.00			0.00			0.29			0.24			0.29

By Movement	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total	T	R	Total	L	T		Total	
Volume	0		0	0				0	31	0	31	0	18		18	49
PHF	0.00		0.00	0.00				0.00	0.29	0.00	0.29	0.00	0.24		0.24	0.29

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

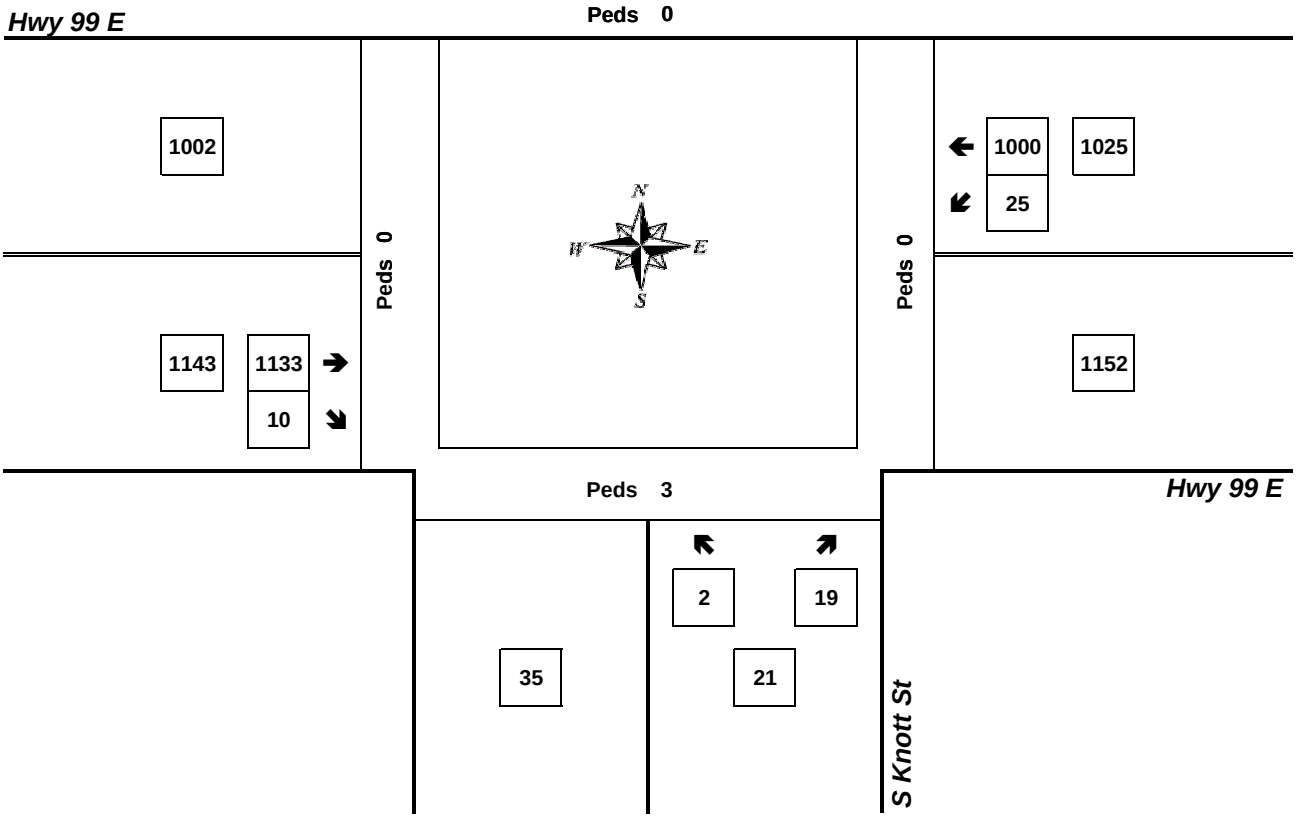
Interval Start Time	Northbound S Knott St				Southbound S Knott St				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total	T	R	Total	L	T		Total	
4:00 PM	0		1	1				0	28	0	28	0	25		25	54
4:15 PM	0		1	1				0	33	0	33	0	23		23	57
4:30 PM	0		1	1				0	32	0	32	0	19		19	52
4:45 PM	0		0	0				0	31	0	31	0	18		18	49
5:00 PM	0		0	0				0	25	0	25	0	16		16	41

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Knott St & Hwy 99 E

4:45 PM to 5:45 PM
Wednesday, April 04, 2012

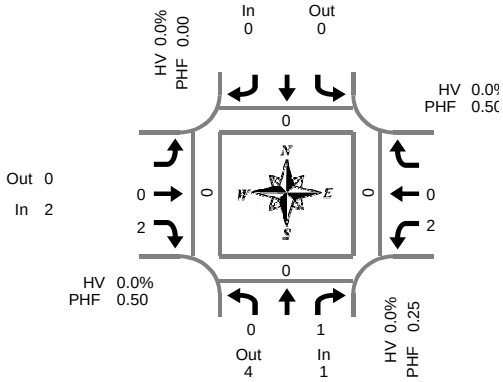


Approach	PHF	HV%	Volume
EB	0.92	2.7%	1,143
WB	0.92	1.8%	1,025
NB	0.75	0.0%	21
SB	0.00	0.0%	0
Intersection	0.92	2.2%	2,189

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:30 AM to 8:30 AM

Dominos West & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

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

Interval Start Time	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	0		0				0	1		0	0		1	0	0	0	0
7:15 AM	0		0				0	0		0	0		0	0	0	0	0
7:30 AM	0		0				0	0		0	0		0	0	0	0	0
7:45 AM	0		0				0	1		1	0		2	0	0	0	0
8:00 AM	0		1				0	0		0	0		1	0	0	0	0
8:15 AM	0		0				0	1		1	0		2	0	0	0	0
8:30 AM	0		0				0	0		0	0		0	0	0	0	0
8:45 AM	0		0				0	1		0	0		1	0	0	0	0
Total Survey	0		1				0	4		2	0		7	0	0	0	0

Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	1	4	5	0	0	0	2	0	2	2	1	3	5	0	0	0	0
%HV	0.0%			0.0%			0.0%			0.0%			0.0%				
PHF	0.25			0.00			0.50			0.50			0.63				

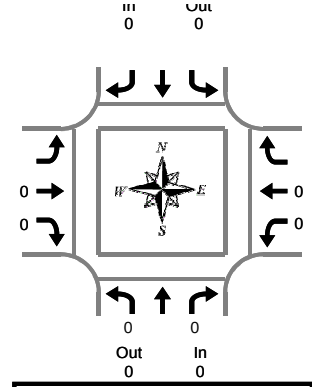
By Movement	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	0		1				0	2		2	0		5
%HV	0.0%	NA	0.0%	NA	NA	NA	0.0%	0.0%		0.0%	0.0%	NA	0.0%
PHF	0.00		0.25				0.00	0.50		0.50	0.00		0.63

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	0		0				0	2		1	0		3	0	0	0	0
7:15 AM	0		1				0	1		1	0		3	0	0	0	0
7:30 AM	0		1				0	2		2	0		5	0	0	0	0
7:45 AM	0		1				0	2		2	0		5	0	0	0	0
8:00 AM	0		1				0	2		1	0		4	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Dominos West & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Dominos West				Southbound Dominos West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		0	0	0	0	0		0	0
7:15 AM	0		0	0				0		0	0	0	0	0		0	0
7:30 AM	0		0	0				0		0	0	0	0	0		0	0
7:45 AM	0		0	0				0		0	0	0	0	0		0	0
8:00 AM	0		0	0				0		0	0	0	0	0		0	0
8:15 AM	0		0	0				0		0	0	0	0	0		0	0
8:30 AM	0		0	0				0		0	0	0	0	0		0	0
8:45 AM	0		0	0				0		0	0	0	0	0		0	0
Total Survey	0		0	0				0		0	0	0	0	0		0	0

Heavy Vehicle Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.00			0.00			0.00			0.00			0.00

By Movement	Northbound Dominos West				Southbound Dominos West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		0	0				0		0	0	0	0	0		0	0
PHF	0.00		0.00	0.00				0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

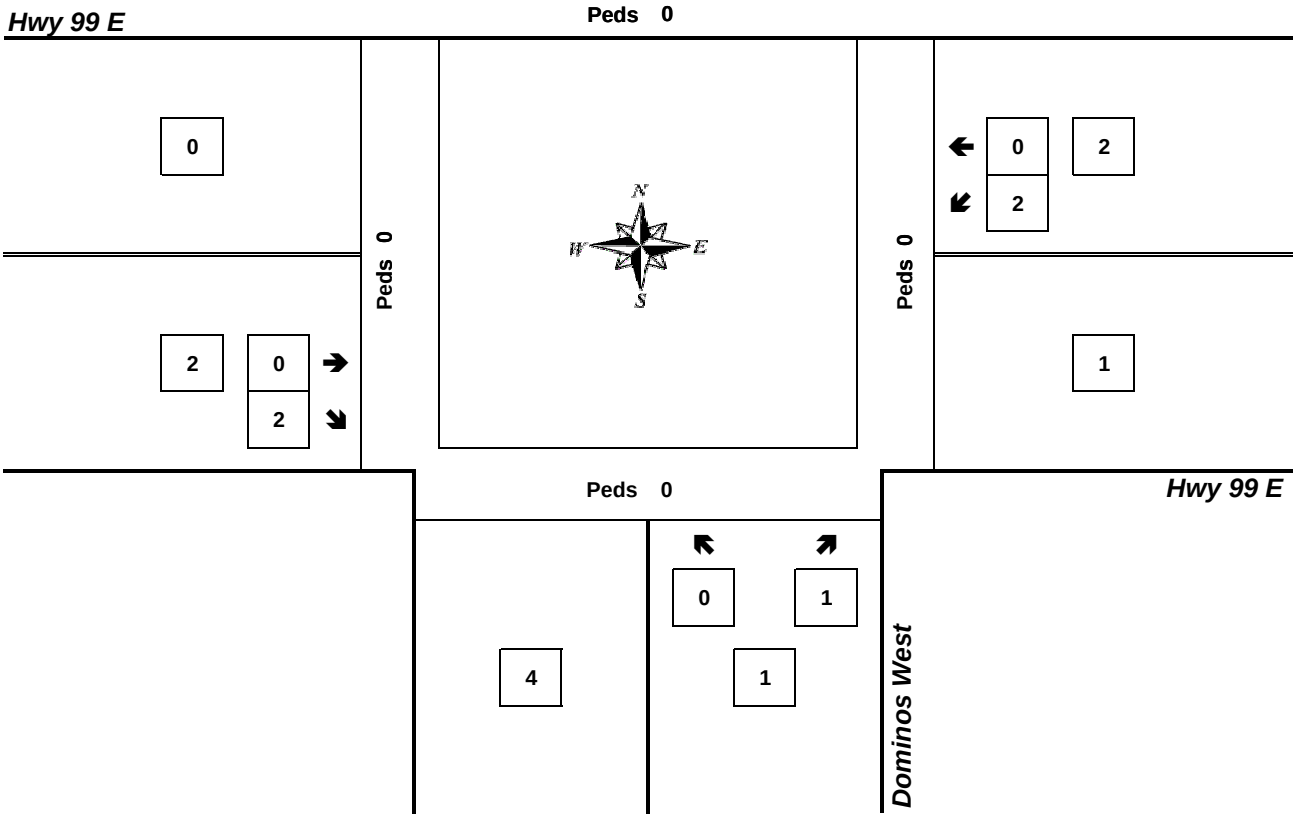
Interval Start Time	Northbound Dominos West				Southbound Dominos West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		0	0	0	0	0		0	0
7:15 AM	0		0	0				0		0	0	0	0	0		0	0
7:30 AM	0		0	0				0		0	0	0	0	0		0	0
7:45 AM	0		0	0				0		0	0	0	0	0		0	0
8:00 AM	0		0	0				0		0	0	0	0	0		0	0

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Dominos West & Hwy 99 E

7:30 AM to 8:30 AM
Wednesday, April 04, 2012

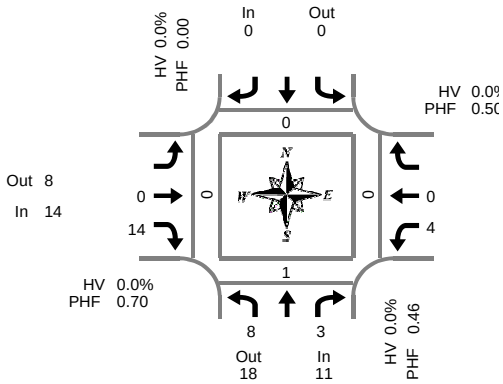


Approach	PHF	HV%	Volume
EB	0.50	0.0%	2
WB	0.50	0.0%	2
NB	0.25	0.0%	1
SB	0.00	0.0%	0
Intersection	0.63	0.0%	5

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Dominos West & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

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

Interval Start Time	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	1		0				0	5		0	0		6	0	1	0	0
4:15 PM	0		1				0	2		2	0		5	0	0	0	0
4:30 PM	3		0				0	2		2	0		7	0	0	0	0
4:45 PM	3		0				0	0		2	0		5	0	0	0	0
5:00 PM	1		0				0	5		0	0		6	0	0	0	0
5:15 PM	2		1				0	2		1	0		6	0	0	0	0
5:30 PM	4		2				0	3		2	0		11	0	0	0	0
5:45 PM	1		0				0	4		1	0		6	0	1	0	0
Total Survey	15		4				0	23		10	0		52	0	2	0	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	11	18	29	0	0	0	14	8	22	4	3	7	29	0	1	0	0
%HV	0.0%			0.0%			0.0%			0.0%			0.0%				
PHF	0.46			0.00			0.70			0.50			0.66				

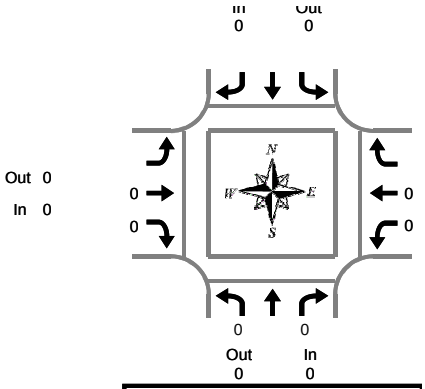
By Movement	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	8		3				0	14		4	0		29
%HV	0.0%	NA	0.0%	NA	NA	NA	0.0%	0.0%	NA	0.0%	0.0%	NA	0.0%
PHF	0.50		0.38				0.00	0.70		0.50	0.00		0.66

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

Interval Start Time	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	7		1				0	9		6	0		23	0	1	0	0
4:15 PM	7		1				0	9		6	0		23	0	0	0	0
4:30 PM	9		1				0	9		5	0		24	0	0	0	0
4:45 PM	10		3				0	10		5	0		28	0	0	0	0
5:00 PM	8		3				0	14		4	0		29	0	1	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Dominos West & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Dominos West				Southbound Dominos West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		0	0	0	0	0		0	0
4:15 PM	0		0	0				0		0	0	0	0	0		0	0
4:30 PM	0		0	0				0		0	0	0	0	0		0	0
4:45 PM	0		0	0				0		0	0	0	0	0		0	0
5:00 PM	0		0	0				0		0	0	0	0	0		0	0
5:15 PM	0		0	0				0		0	0	0	0	0		0	0
5:30 PM	0		0	0				0		0	0	0	0	0		0	0
5:45 PM	0		0	0				0		0	0	0	0	0		0	0
Total Survey	0		0	0				0		0	0	0	0	0		0	0

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Dominos West			Southbound Dominos West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.00			0.00			0.00			0.00			0.00

By Movement	Northbound Dominos West				Southbound Dominos West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		0	0				0		0	0	0	0	0		0	0
PHF	0.00		0.00	0.00				0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

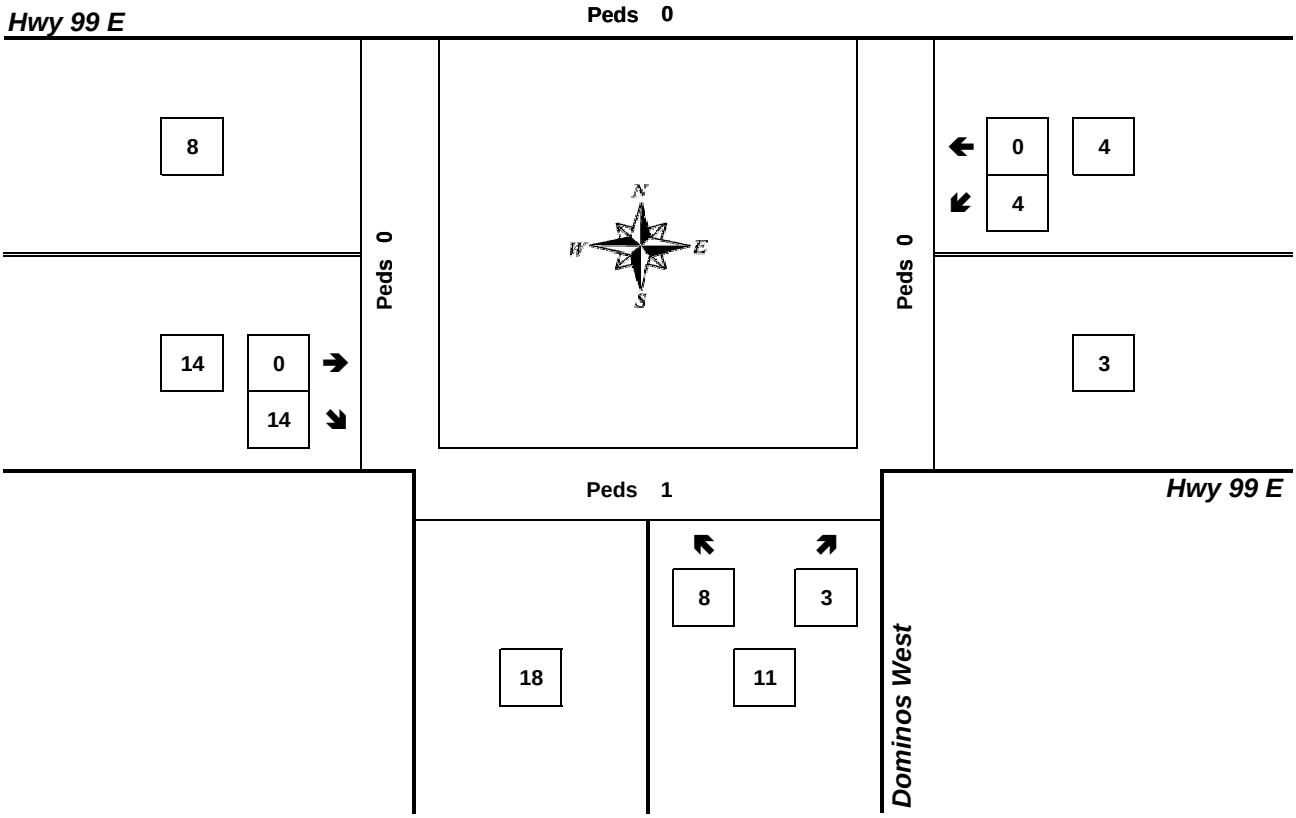
Interval Start Time	Northbound Dominos West				Southbound Dominos West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		0	0	0	0	0		0	0
4:15 PM	0		0	0				0		0	0	0	0	0		0	0
4:30 PM	0		0	0				0		0	0	0	0	0		0	0
4:45 PM	0		0	0				0		0	0	0	0	0		0	0
5:00 PM	0		0	0				0		0	0	0	0	0		0	0

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Dominos West & Hwy 99 E

5:00 PM to 6:00 PM
Wednesday, April 04, 2012

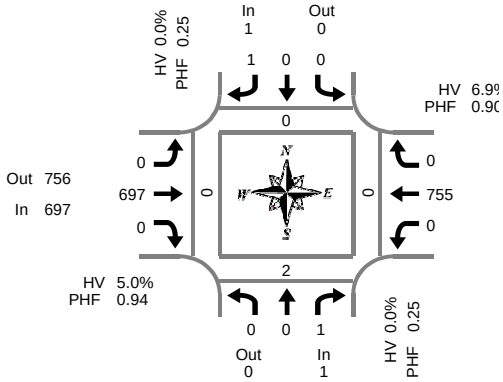


Approach	PHF	HV%	Volume
EB	0.70	0.0%	14
WB	0.50	0.0%	4
NB	0.46	0.0%	11
SB	0.00	0.0%	0
Intersection	0.66	0.0%	29

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Dominos East & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

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

Interval Start Time	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	0	0	1	0	0	0	0	153	0	0	142	0	296	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	162	0	0	150	0	312	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	186	0	0	185	0	371	0	2	0	0
7:45 AM	0	0	0	0	0	0	0	165	0	0	190	0	355	0	0	0	0
8:00 AM	0	0	1	0	0	1	0	176	0	0	170	0	348	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	170	0	0	210	0	380	0	0	0	0
8:30 AM	1	0	0	0	0	0	0	181	0	0	158	0	340	0	0	0	0
8:45 AM	1	0	1	0	0	1	0	145	0	0	147	0	295	0	0	0	0
Total Survey	2	0	3	0	0	2	0	1,338	0	0	1,352	0	2,697	0	3	0	0

Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	1	0	1	1	0	1	697	756	1,453	755	698	1,453	1,454	0	2	0	0
%HV	0.0%			0.0%			5.0%			6.9%			6.0%				
PHF	0.25			0.25			0.94			0.90			0.96				

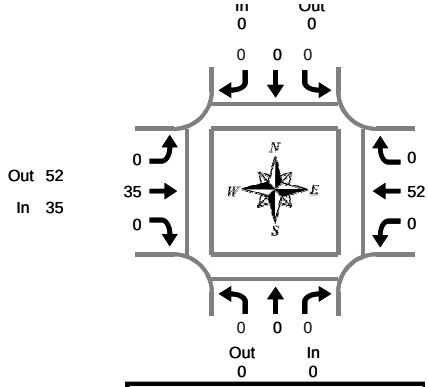
By Movement	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	0	0	1	0	0	1	0	697	0	0	755	0	1,454
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	0.0%	0.0%	6.9%	0.0%	6.0%
PHF	0.00	0.00	0.25	0.00	0.00	0.25	0.00	0.94	0.00	0.00	0.90	0.00	0.96

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	0	0	1	0	0	0	0	666	0	0	667	0	1,334	0	3	0	0
7:15 AM	0	0	1	0	0	1	0	689	0	0	695	0	1,386	0	2	0	0
7:30 AM	0	0	1	0	0	1	0	697	0	0	755	0	1,454	0	2	0	0
7:45 AM	1	0	1	0	0	1	0	692	0	0	728	0	1,423	0	0	0	0
8:00 AM	2	0	2	0	0	2	0	672	0	0	685	0	1,363	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Dominos East & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	12	0	12	0	5	0	5	17
7:15 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	7	0	7	14
7:30 AM	0	0	0	0	0	0	0	0	0	7	0	7	0	11	0	11	18
7:45 AM	0	0	0	0	0	0	0	0	0	8	0	8	0	13	0	13	21
8:00 AM	0	0	0	0	0	0	0	0	0	11	0	11	0	15	0	15	26
8:15 AM	0	0	0	0	0	0	0	0	0	9	0	9	0	13	0	13	22
8:30 AM	0	0	0	0	0	0	0	0	0	12	0	12	0	17	0	17	29
8:45 AM	0	0	0	0	0	0	0	0	0	14	0	14	0	12	0	12	26
Total Survey	0	0	0	0	0	0	0	0	0	80	0	80	0	93	0	93	173

Heavy Vehicle Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	35	52	87	52	35	87	87
PHF	0.00			0.00			0.25			0.29			0.28

By Movement	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	0	0	0	0	35	0	35	0	52	0	52	87
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.25	0.00	0.29	0.00	0.29	0.28

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

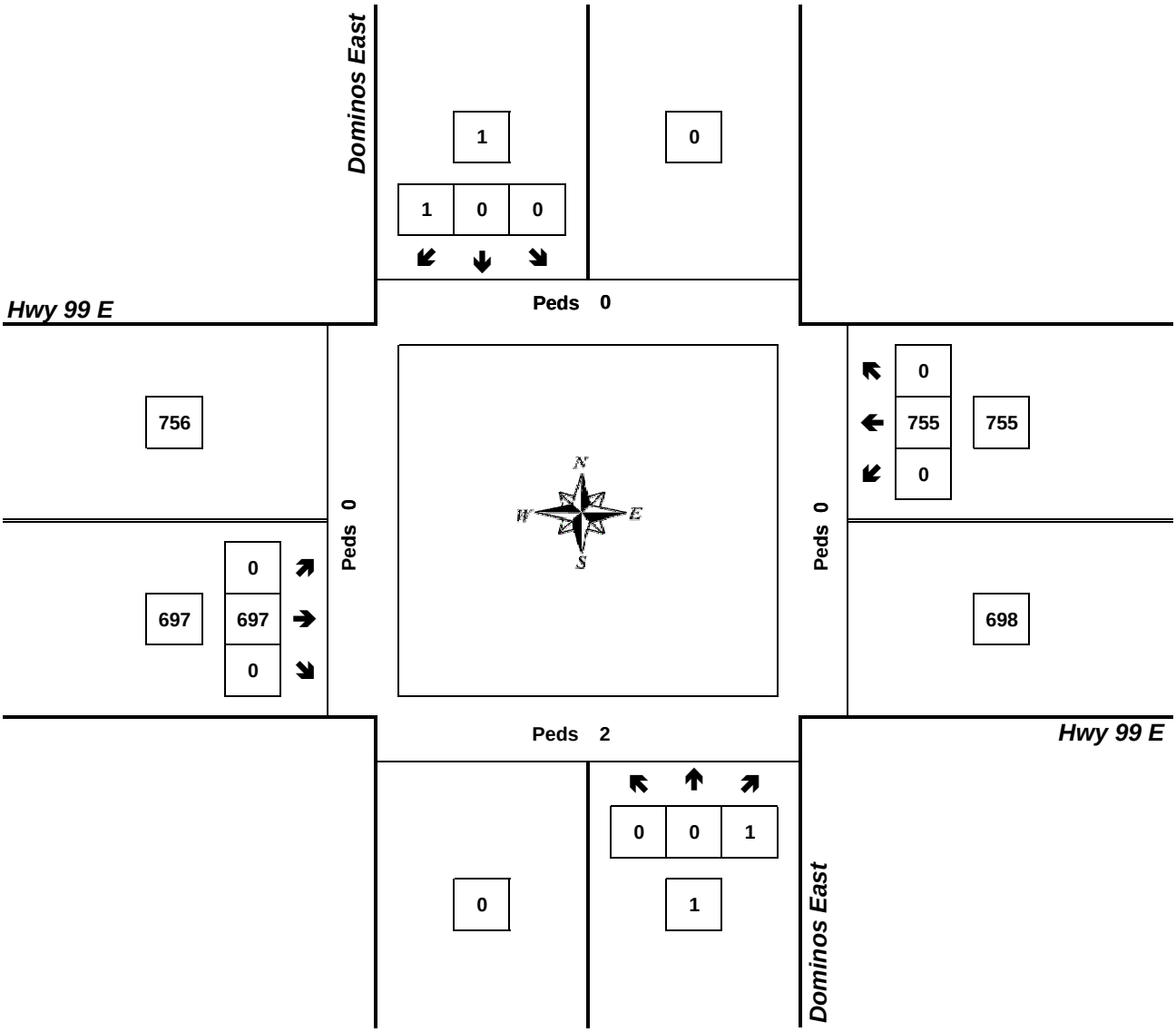
Interval Start Time	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	34	0	34	0	36	0	36	70
7:15 AM	0	0	0	0	0	0	0	0	0	33	0	33	0	46	0	46	79
7:30 AM	0	0	0	0	0	0	0	0	0	35	0	35	0	52	0	52	87
7:45 AM	0	0	0	0	0	0	0	0	0	40	0	40	0	58	0	58	98
8:00 AM	0	0	0	0	0	0	0	0	0	46	0	46	0	57	0	57	103

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Dominos East & Hwy 99 E

7:30 AM to 8:30 AM
Wednesday, April 04, 2012

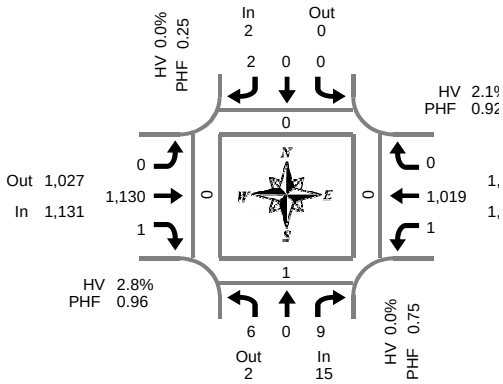


Approach	PHF	HV%	Volume
EB	0.94	5.0%	697
WB	0.90	6.9%	755
NB	0.25	0.0%	1
SB	0.25	0.0%	1
Intersection	0.96	6.0%	1,454

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



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

Dominos East & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	0	0	2	0	0	2	0	239	0	0	229	0	472	2	1	0	0
4:15 PM	1	0	1	0	0	1	0	279	0	0	240	0	522	0	0	0	0
4:30 PM	0	0	3	0	0	2	0	249	1	0	246	0	501	0	0	0	0
4:45 PM	0	0	1	0	0	0	0	275	0	0	255	0	531	0	0	0	0
5:00 PM	2	0	2	0	0	0	0	294	0	1	269	0	568	0	0	0	0
5:15 PM	3	0	2	0	0	0	0	281	0	0	276	0	562	0	1	0	0
5:30 PM	1	0	4	0	0	2	0	280	1	0	219	0	507	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	233	0	1	197	0	431	0	1	0	0
Total Survey	7	0	15	0	0	7	0	2,130	2	2	1,931	0	4,094	2	3	0	0

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

By Approach	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	15	2	17	2	0	2	1,131	1,027	2,158	1,020	1,139	2,159	2,168	0	1	0	0
%HV	0.0%			0.0%			2.8%			2.1%			2.4%				
PHF	0.75			0.25			0.96			0.92			0.95				

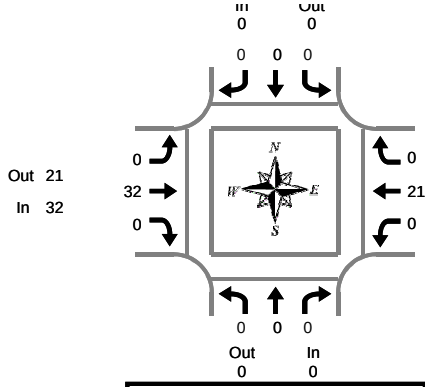
By Movement	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	6	0	9	0	0	2	0	1,130	1	1	1,019	0	2,168
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	0.0%	0.0%	2.1%	0.0%	2.4%
PHF	0.50	0.00	0.56	0.00	0.00	0.25	0.00	0.96	0.25	0.25	0.92	0.00	0.95

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

Interval Start Time	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	1	0	7	0	0	5	0	1,042	1	0	970	0	2,026	2	1	0	0
4:15 PM	3	0	7	0	0	3	0	1,097	1	1	1,010	0	2,122	0	0	0	0
4:30 PM	5	0	8	0	0	2	0	1,099	1	1	1,046	0	2,162	0	1	0	0
4:45 PM	6	0	9	0	0	2	0	1,130	1	1	1,019	0	2,168	0	1	0	0
5:00 PM	6	0	8	0	0	2	0	1,088	1	2	961	0	2,068	0	2	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



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

Dominos East & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	4	0	4	11
4:15 PM	0	0	0	0	0	0	0	0	0	6	0	6	0	8	0	8	14
4:30 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	3	0	3	10
4:45 PM	0	0	0	0	0	0	0	0	0	9	0	9	0	8	0	8	17
5:00 PM	0	0	0	0	0	0	0	0	0	10	0	10	0	5	0	5	15
5:15 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	3	0	3	10
5:30 PM	0	0	0	0	0	0	0	0	0	6	0	6	0	5	0	5	11
5:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	4	0	4	7
Total Survey	0	0	0	0	0	0	0	0	0	55	0	55	0	40	0	40	95

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound Dominos East			Southbound Dominos East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	32	21	53	21	32	53	53
PHF	0.00			0.00			0.31			0.28			0.32

By Movement	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	0	0	0	0	32	0	32	0	21	0	21	53
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.31	0.00	0.28	0.00	0.28	0.32

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

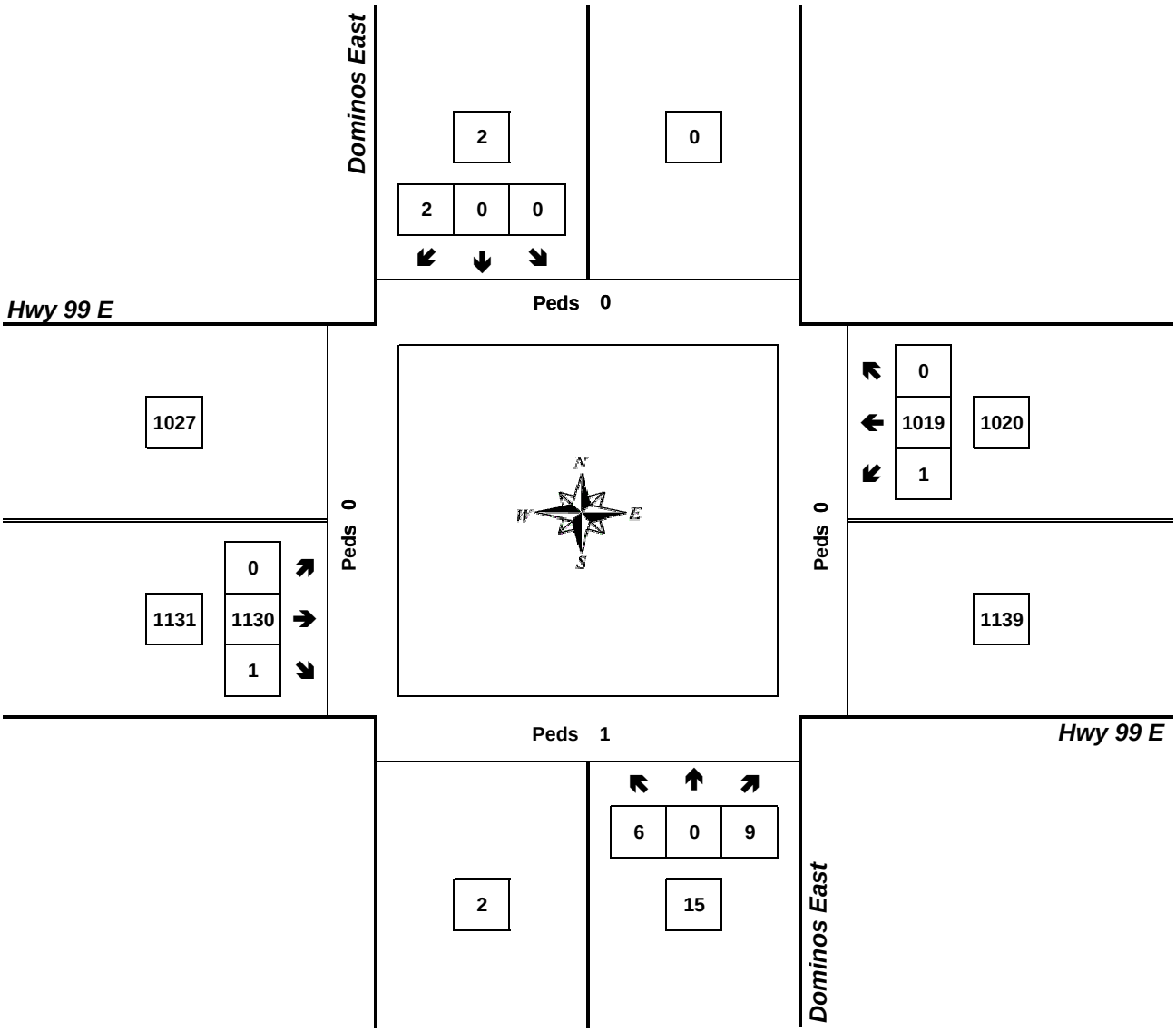
Interval Start Time	Northbound Dominos East				Southbound Dominos East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	29	0	29	0	23	0	23	52
4:15 PM	0	0	0	0	0	0	0	0	0	32	0	32	0	24	0	24	56
4:30 PM	0	0	0	0	0	0	0	0	0	33	0	33	0	19	0	19	52
4:45 PM	0	0	0	0	0	0	0	0	0	32	0	32	0	21	0	21	53
5:00 PM	0	0	0	0	0	0	0	0	0	26	0	26	0	17	0	17	43

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Dominos East & Hwy 99 E

4:45 PM to 5:45 PM
Wednesday, April 04, 2012

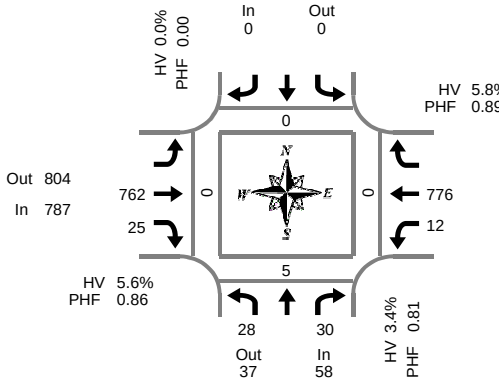


Approach	PHF	HV%	Volume
EB	0.96	2.8%	1,131
WB	0.92	2.1%	1,020
NB	0.75	0.0%	15
SB	0.25	0.0%	2
Intersection	0.95	2.4%	2,168

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Locust St & Hwy 99E

Tuesday, May 21, 2013
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

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

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	7		5				170	6		3	156		347	0	1	0	0
7:15 AM	6		6				179	7		3	212		413	0	1	0	0
7:30 AM	9		9				222	6		3	218		467	0	2	0	0
7:45 AM	6		10				191	6		3	190		406	0	1	0	0
8:00 AM	3		4				167	3		1	141		319	0	0	0	0
8:15 AM	2		5				175	5		6	142		335	0	2	0	1
8:30 AM	7		8				156	6		3	169		349	0	0	0	0
8:45 AM	6		6				180	10		7	188		397	0	0	0	0
Total Survey	46		53				1,440	49		29	1,416		3,033	0	7	0	1

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	58	37	95	0	0	0	787	804	1,591	788	792	1,580	1,633	0	5	0	0
%HV	3.4%			0.0%			5.6%			5.8%			5.6%				
PHF	0.81			0.00			0.86			0.89			0.87				

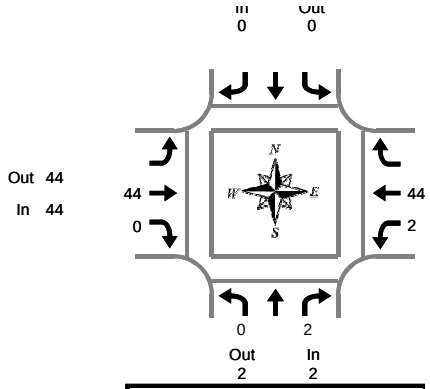
By Movement	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	L		R				T	R		L	T		
Volume	28		30				762	25		12	776		1,633
%HV	0.0%	NA	6.7%	NA	NA	NA	5.8%	0.0%		16.7%	5.7%	NA	5.6%
PHF	0.78		0.75				0.86	0.89		1.00	0.89		0.87

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	28		30				762	25		12	776		1,633	0	5	0	0
7:15 AM	24		29				759	22		10	761		1,605	0	4	0	0
7:30 AM	20		28				755	20		13	691		1,527	0	5	0	1
7:45 AM	18		27				689	20		13	642		1,409	0	3	0	1
8:00 AM	18		23				678	24		17	640		1,400	0	2	0	1

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Locust St & Hwy 99E

Tuesday, May 21, 2013
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		1	1				0		2	0	2	1	13		14	17
7:15 AM	0		0	0				0		9	0	9	0	6		6	15
7:30 AM	0		1	1				0		18	0	18	1	12		13	32
7:45 AM	0		0	0				0		15	0	15	0	13		13	28
8:00 AM	0		2	2				0		16	0	16	0	11		11	29
8:15 AM	0		0	0				0		8	1	9	1	11		12	21
8:30 AM	0		0	0				0		10	0	10	0	13		13	23
8:45 AM	0		0	0				0		15	0	15	2	16		18	33
Total Survey	0		4	4				0		93	1	94	5	95		100	198

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	2	4	0	0	0	44	44	88	46	46	92	92
PHF	0.17			0.00			0.22			0.27			0.26

By Movement	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99E				Westbound Hwy 99E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		2	2				0		44	0	44	2	44		46	92
PHF	0.00		0.17	0.17				0.00		0.22	0.00	0.22	0.17	0.28		0.27	0.26

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

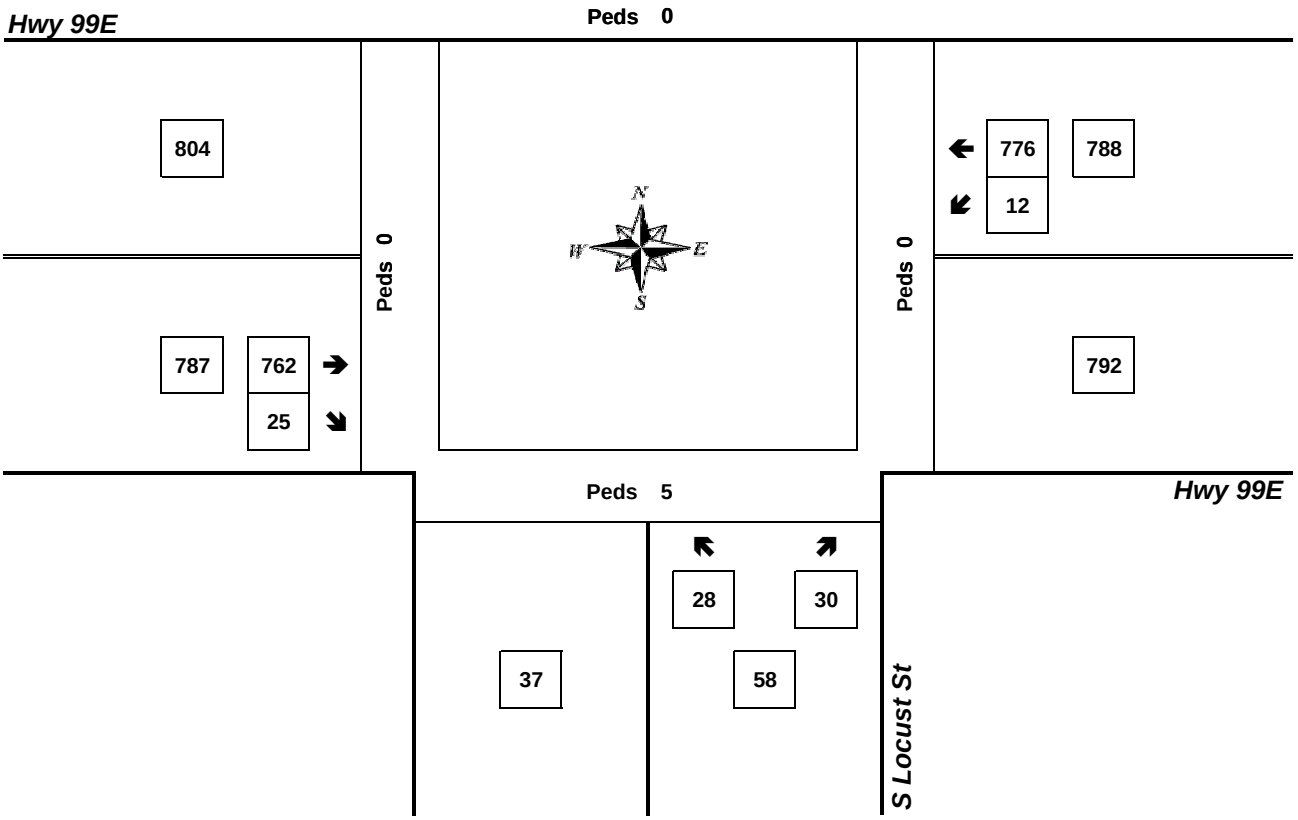
Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		2	2				0		44	0	44	2	44		46	92
7:15 AM	0		3	3				0		58	0	58	1	42		43	104
7:30 AM	0		3	3				0		57	1	58	2	47		49	110
7:45 AM	0		2	2				0		49	1	50	1	48		49	101
8:00 AM	0		2	2				0		49	1	50	3	51		54	106

Peak Hour Summary

Clay Carney
(503) 833-2740

S Locust St & Hwy 99E

7:00 AM to 8:00 AM
Tuesday, May 21, 2013

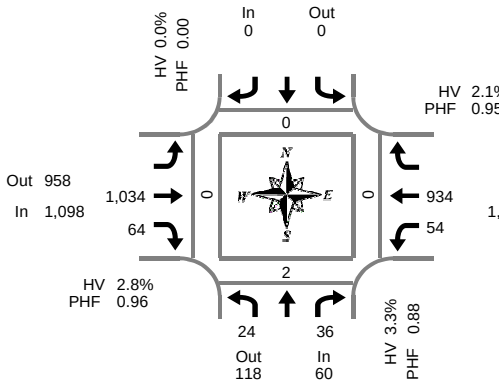


Approach	PHF	HV%	Volume
EB	0.86	5.6%	787
WB	0.89	5.8%	788
NB	0.81	3.4%	58
SB	0.00	0.0%	0
Intersection	0.87	5.6%	1,633

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



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

S Locust St & Hwy 99E

Wednesday, May 29, 2013
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	4		4				236	9		10	206		469	0	2	0	0
4:15 PM	5		5				233	15		7	219		484	0	2	0	0
4:30 PM	7		9				239	17		11	233		516	0	0	0	0
4:45 PM	6		11				251	13		14	237		532	0	1	0	0
5:00 PM	9		5				270	15		10	249		558	0	0	0	0
5:15 PM	5		9				251	16		15	232		528	0	0	0	0
5:30 PM	4		11				262	20		15	216		528	0	1	0	0
5:45 PM	8		7				238	14		12	200		479	0	0	0	0
Total Survey	48		61				1,980	119		94	1,792		4,094	0	6	0	0

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

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	60	118	178	0	0	0	1,098	958	2,056	988	1,070	2,058	2,146	0	2	0	0
%HV	3.3%			0.0%			2.8%			2.1%			2.5%				
PHF	0.88			0.00			0.96			0.95			0.96				

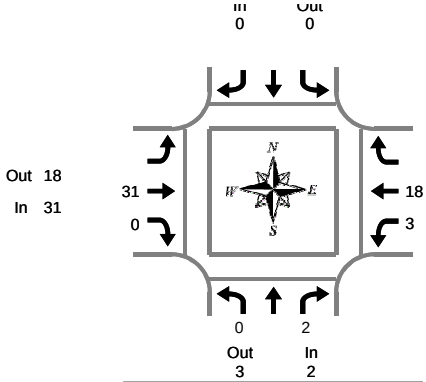
By Movement	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	L		R				T	R		L	T		
Volume	24		36				1,034	64		54	934		2,146
%HV	0.0%	NA	5.6%	NA	NA	NA	3.0%	0.0%		5.6%	1.9%	NA	2.5%
PHF	0.67		0.82				0.96	0.80		0.90	0.94		0.96

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

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	22		29				959	54		42	895		2,001	0	5	0	0
4:15 PM	27		30				993	60		42	938		2,090	0	3	0	0
4:30 PM	27		34				1,011	61		50	951		2,134	0	1	0	0
4:45 PM	24		36				1,034	64		54	934		2,146	0	2	0	0
5:00 PM	26		32				1,021	65		52	897		2,093	0	1	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Locust St & Hwy 99E

Wednesday, May 29, 2013
4:00 PM to 6:00 PM

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

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound S Locust St					Southbound S Locust St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		9	0	9	0	5		5	14
4:15 PM	0		0	0				0		5	0	5	0	4		4	9
4:30 PM	0		0	0				0		7	0	7	0	6		6	13
4:45 PM	0		1	1				0		10	0	10	2	3		5	16
5:00 PM	0		0	0				0		6	0	6	0	8		8	14
5:15 PM	0		1	1				0		10	0	10	1	1		2	13
5:30 PM	0		0	0				0		5	0	5	0	6		6	11
5:45 PM	0		0	0				0		6	0	6	0	3		3	9
Total Survey	0		2	2				0		58	0	58	3	36		39	99

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	3	5	0	0	0	31	18	49	21	33	54	54
PHF	0.25			0.00			0.30			0.28			0.31

By Movement	Northbound S Locust St				Southbound S Locust St				Eastbound Hwy 99E				Westbound Hwy 99E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		2	2				0		31	0	31	3	18		21	54
PHF	0.00		0.25	0.25				0.00		0.30	0.00	0.30	0.25	0.26		0.28	0.31

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

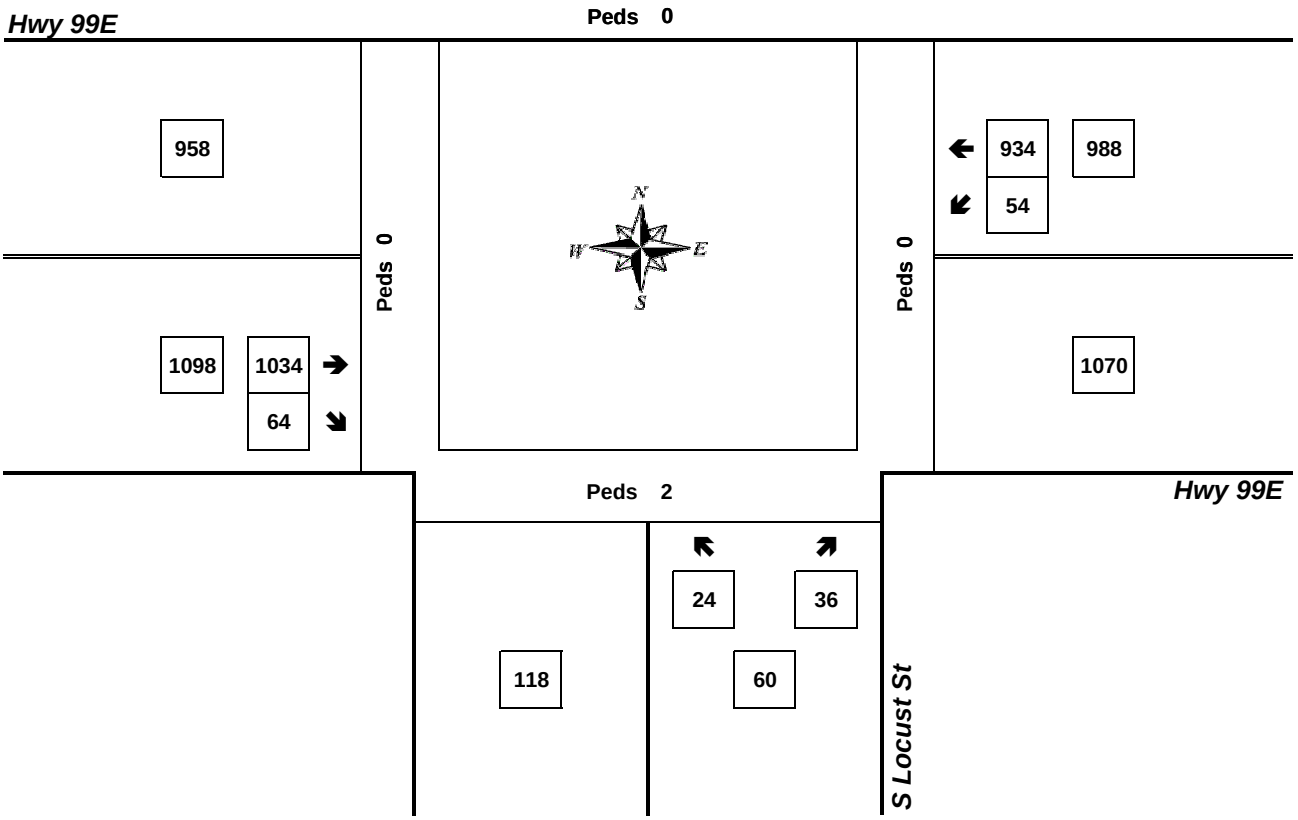
Interval Start Time	Northbound S Locust St					Southbound S Locust St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		1	1				0		31	0	31	2	18		20	52
4:15 PM	0		1	1				0		28	0	28	2	21		23	52
4:30 PM	0		2	2				0		33	0	33	3	18		21	56
4:45 PM	0		2	2				0		31	0	31	3	18		21	54
5:00 PM	0		1	1				0		27	0	27	1	18		19	47

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Locust St & Hwy 99E

4:45 PM to 5:45 PM
Wednesday, May 29, 2013

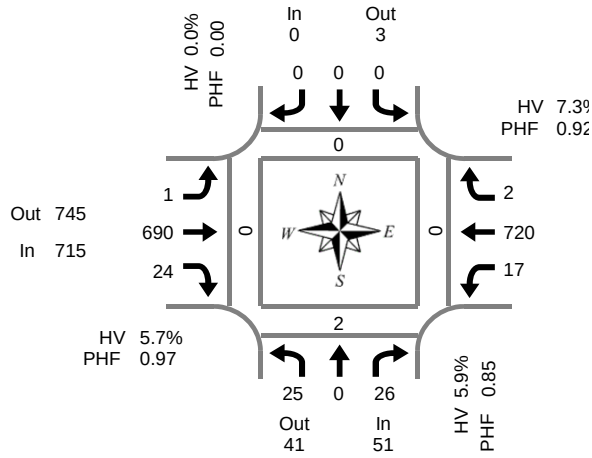


Approach	PHF	HV%	Volume
EB	0.96	2.8%	1,098
WB	0.95	2.1%	988
NB	0.88	3.3%	60
SB	0.00	0.0%	0
Intersection	0.96	2.5%	2,146

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Hulbert's East & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

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

Interval Start Time	Northbound S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total
	L	T	R	L	T	R	L	T	R	L	T	R	
7:00 AM	3	0	12	0	0	0	0	161	3	4	140	0	323
7:15 AM	5	0	7	0	0	0	0	159	2	6	154	0	333
7:30 AM	6	0	9	0	0	0	0	176	6	5	166	1	369
7:45 AM	7	0	6	0	0	0	0	182	2	5	174	1	377
8:00 AM	7	0	5	0	0	0	0	156	9	7	179	0	363
8:15 AM	5	0	6	0	0	0	1	176	7	0	201	0	396
8:30 AM	6	0	10	0	0	0	0	167	7	1	139	0	330
8:45 AM	6	0	9	0	0	0	2	131	4	1	126	0	279
Total Survey	45	0	64	0	0	0	3	1,308	40	29	1,279	2	2,770

Pedestrians Crosswalk			
North	South	East	West
0	1	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	1	0	0
0	0	0	0
0	1	0	0
0	2	0	0
0	6	0	0

Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	51	41	92	0	3	3	715	745	1,460	739	716	1,455	1,505
%HV	5.9%			0.0%			5.7%			7.3%			6.5%
PHF	0.85			0.00			0.97			0.92			0.95

Pedestrians Crosswalk			
North	South	East	West
0	2	0	0

By Movement	Northbound S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	25	0	26	0	0	0	1	690	24	17	720	2	1,505
%HV	4.0%	0.0%	7.7%	0.0%	0.0%	0.0%	0.0%	5.7%	8.3%	11.8%	7.2%	0.0%	6.5%
PHF	0.89	0.00	0.72	0.00	0.00	0.00	0.25	0.95	0.67	0.61	0.90	0.50	0.95

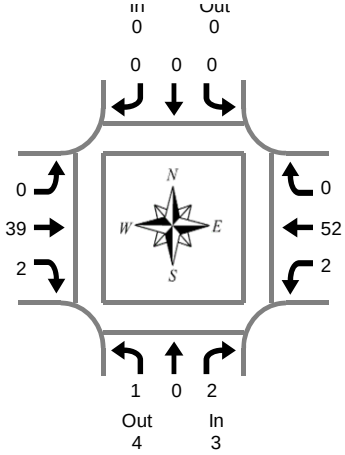
Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total
	L	T	R	L	T	R	L	T	R	L	T	R	
7:00 AM	21	0	34	0	0	0	0	678	13	20	634	2	1,402
7:15 AM	25	0	27	0	0	0	0	673	19	23	673	2	1,442
7:30 AM	25	0	26	0	0	0	1	690	24	17	720	2	1,505
7:45 AM	25	0	27	0	0	0	1	681	25	13	693	1	1,466
8:00 AM	24	0	30	0	0	0	3	630	27	9	645	0	1,368

Pedestrians Crosswalk			
North	South	East	West
0	2	0	0
0	2	0	0
0	2	0	0
0	2	0	0
0	4	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Out 53
In 41

Hulbert's East & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Locust St				Southbound Hulbert's East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	8	0	8	1	7	0	8	16
7:15 AM	0	0	2	2	0	0	0	0	0	6	0	6	2	7	0	9	17
7:30 AM	0	0	0	0	0	0	0	0	0	6	0	6	1	9	0	10	16
7:45 AM	0	0	1	1	0	0	0	0	0	10	0	10	1	13	0	14	25
8:00 AM	0	0	0	0	0	0	0	0	0	11	1	12	0	17	0	17	29
8:15 AM	1	0	1	2	0	0	0	0	0	12	1	13	0	13	0	13	28
8:30 AM	0	0	0	0	0	0	0	0	0	11	0	11	1	14	0	15	26
8:45 AM	0	0	0	0	0	0	0	0	0	14	0	14	0	13	0	13	27
Total Survey	1	0	4	5	0	0	0	0	0	78	2	80	6	93	0	99	184

Heavy Vehicle Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	3	4	7	0	0	0	41	53	94	54	41	95	98
PHF	0.25			0.00			0.27			0.30			0.30

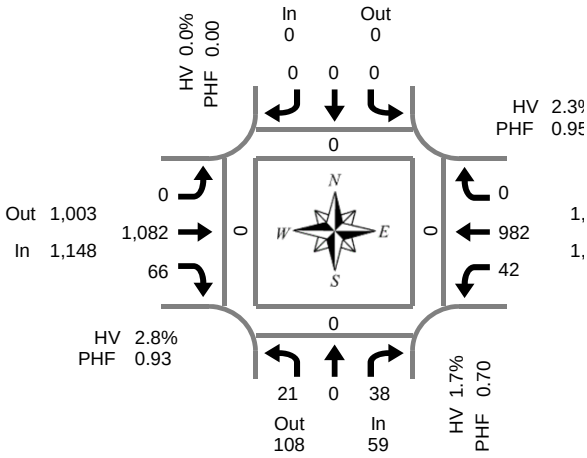
By Movement	Northbound S Locust St				Southbound Hulbert's East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	2	3	0	0	0	0	0	39	2	41	2	52	0	54	98
PHF	0.25	0.00	0.17	0.25	0.00	0.00	0.00	0.00	0.00	0.26	0.25	0.27	0.13	0.30	0.00	0.30	0.30

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Locust St				Southbound Hulbert's East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	3	3	0	0	0	0	0	30	0	30	5	36	0	41	74
7:15 AM	0	0	3	3	0	0	0	0	0	33	1	34	4	46	0	50	87
7:30 AM	1	0	2	3	0	0	0	0	0	39	2	41	2	52	0	54	98
7:45 AM	1	0	2	3	0	0	0	0	0	44	2	46	2	57	0	59	108
8:00 AM	1	0	1	2	0	0	0	0	0	48	2	50	1	57	0	58	110

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Hulbert's East & Hwy 99 E

Wednesday, April 04, 2012
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 S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	7	0	3	0	0	0	1	238	13	9	227	0	498	0	1	0	0
4:15 PM	3	0	7	0	0	0	0	255	11	5	236	1	518	0	0	0	0
4:30 PM	4	0	7	0	0	0	2	246	9	14	252	0	534	0	0	0	0
4:45 PM	6	0	15	0	0	0	0	244	17	9	252	0	543	0	0	0	0
5:00 PM	4	0	7	0	0	0	0	292	17	12	258	0	590	0	0	0	0
5:15 PM	7	0	8	0	0	0	0	264	14	6	244	0	543	0	0	0	0
5:30 PM	4	0	8	0	0	0	0	282	18	15	228	0	555	0	0	0	0
5:45 PM	4	0	1	0	0	0	0	192	13	9	185	0	404	0	0	0	0
Total Survey	39	0	56	0	0	0	3	2,013	112	79	1,882	1	4,185	0	1	0	0

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

By Approach	Northbound S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	59	108	167	0	0	0	1,148	1,003	2,151	1,024	1,120	2,144	2,231	0	0	0	0
%HV	1.7%			0.0%			2.8%			2.3%			2.6%				
PHF	0.70			0.00			0.93			0.95			0.95				

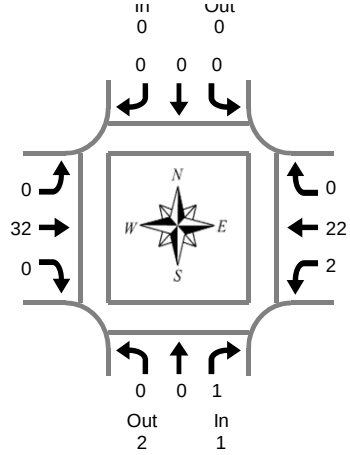
By Movement	Northbound S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	21	0	38	0	0	0	0	1,082	66	42	982	0	2,231
%HV	0.0%	0.0%	2.6%	0.0%	0.0%	0.0%	0.0%	3.0%	0.0%	4.8%	2.2%	0.0%	2.6%
PHF	0.75	0.00	0.63	0.00	0.00	0.00	0.00	0.93	0.92	0.70	0.95	0.00	0.95

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

Interval Start Time	Northbound S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	20	0	32	0	0	0	3	983	50	37	967	1	2,093	0	1	0	0
4:15 PM	17	0	36	0	0	0	2	1,037	54	40	998	1	2,185	0	0	0	0
4:30 PM	21	0	37	0	0	0	2	1,046	57	41	1,006	0	2,210	0	0	0	0
4:45 PM	21	0	38	0	0	0	0	1,082	66	42	982	0	2,231	0	0	0	0
5:00 PM	19	0	24	0	0	0	0	1,030	62	42	915	0	2,092	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Out 22

In 32

Hulbert's East & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound S Locust St				Southbound Hulbert's East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	8	0	8	0	5	0	5	13
4:15 PM	0	0	1	1	0	0	0	0	0	6	0	6	1	7	0	8	15
4:30 PM	0	0	0	0	0	0	0	0	0	7	0	7	1	3	0	4	11
4:45 PM	0	0	0	0	0	0	0	0	0	8	0	8	0	8	0	8	16
5:00 PM	0	0	0	0	0	0	0	0	0	11	0	11	1	5	0	6	17
5:15 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	3	0	3	10
5:30 PM	0	0	1	1	0	0	0	0	0	6	0	6	1	6	0	7	14
5:45 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6
Total Survey	0	0	2	2	0	0	0	0	0	56	0	56	4	40	0	44	102

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound S Locust St			Southbound Hulbert's East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	2	3	0	0	0	32	22	54	24	33	57	57
PHF	0.25			0.00			0.31			0.30			0.32

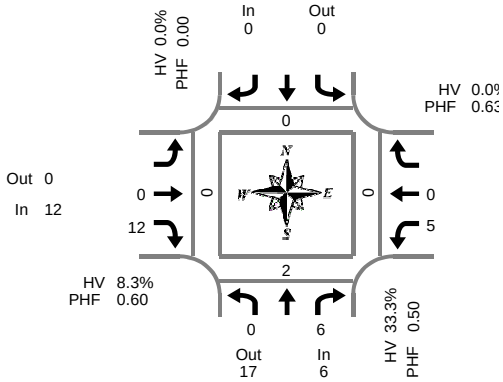
By Movement	Northbound S Locust St				Southbound Hulbert's East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	1	1	0	0	0	0	0	32	0	32	2	22	0	24	57
PHF	0.00	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.31	0.25	0.31	0.00	0.30	0.32

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound S Locust St				Southbound Hulbert's East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	0	0	0	0	0	29	0	29	2	23	0	25	55
4:15 PM	0	0	1	1	0	0	0	0	0	32	0	32	3	23	0	26	59
4:30 PM	0	0	0	0	0	0	0	0	0	33	0	33	2	19	0	21	54
4:45 PM	0	0	1	1	0	0	0	0	0	32	0	32	2	22	0	24	57
5:00 PM	0	0	1	1	0	0	0	0	0	27	0	27	2	17	0	19	47

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



76 West & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
8:00 AM to 9:00 AM

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

Interval Start Time	Northbound 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	0		0				0	1		0	0		1	0	0	0	0
7:15 AM	0		0				0	2		1	0		3	0	0	0	0
7:30 AM	1		0				0	2		1	0		4	0	1	0	0
7:45 AM	1		0				0	1		0	0		2	0	0	0	0
8:00 AM	0		3				0	5		2	0		10	0	1	0	0
8:15 AM	0		1				0	4		1	0		6	0	0	0	0
8:30 AM	0		2				0	2		0	0		4	0	1	0	0
8:45 AM	0		0				0	1		2	0		3	0	0	0	0
Total Survey	2		6				0	18		7	0		33	0	3	0	0

Peak Hour Summary
8:00 AM to 9:00 AM

By Approach	Northbound 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	6	17	23	0	0	0	12	0	12	5	6	11	23	0	2	0	0
%HV	33.3%			0.0%			8.3%			0.0%			13.0%				
PHF	0.50			0.00			0.60			0.63			0.58				

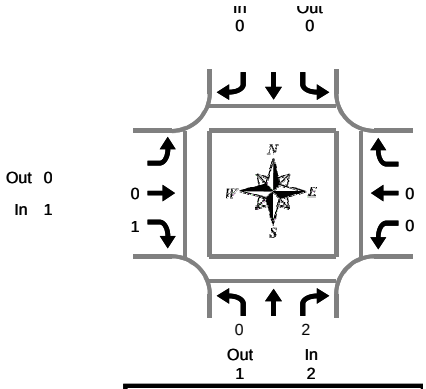
By Movement	Northbound 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	0		6				0	12		5	0		23
%HV	0.0%	NA	33.3%	NA	NA	NA	0.0%	8.3%		0.0%	0.0%	NA	13.0%
PHF	0.00		0.50				0.00	0.60		0.63	0.00		0.58

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	2		0				0	6		2	0		10	0	1	0	0
7:15 AM	2		3				0	10		4	0		19	0	2	0	0
7:30 AM	2		4				0	12		4	0		22	0	2	0	0
7:45 AM	1		6				0	12		3	0		22	0	2	0	0
8:00 AM	0		6				0	12		5	0		23	0	2	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



76 West & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
8:00 AM to 9:00 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound 76 West				Southbound 76 West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		0	0	0	0	0		0	0
7:15 AM	0		0	0				0		0	0	0	0	0		0	0
7:30 AM	0		0	0				0		0	0	0	0	0		0	0
7:45 AM	0		0	0				0		0	0	0	0	0		0	0
8:00 AM	0		2	2				0		0	1	1	0	0		0	3
8:15 AM	0		0	0				0		0	0	0	0	0		0	0
8:30 AM	0		0	0				0		0	0	0	0	0		0	0
8:45 AM	0		0	0				0		0	0	0	0	0		0	0
Total Survey	0		2	2				0		0	1	1	0	0		0	3

Heavy Vehicle Peak Hour Summary
8:00 AM to 9:00 AM

By Approach	Northbound 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	1	3	0	0	0	1	0	1	0	2	2	3
PHF	0.25			0.00			0.25			0.00			0.25

By Movement	Northbound 76 West				Southbound 76 West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		2	2				0		0	1	1	0	0		0	3
PHF	0.00		0.25	0.25				0.00		0.00	0.25	0.25	0.00	0.00		0.00	0.25

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

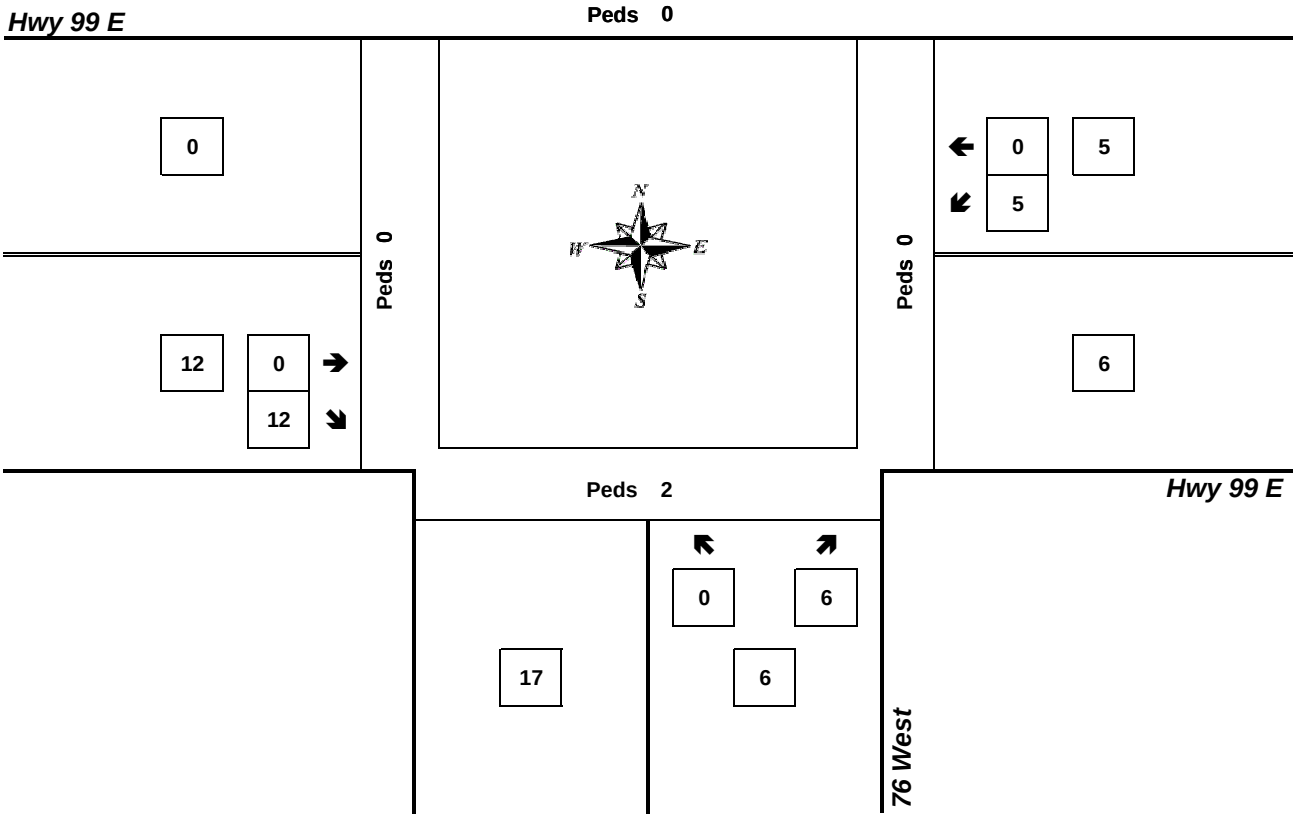
Interval Start Time	Northbound 76 West				Southbound 76 West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		0	0	0	0	0		0	0
7:15 AM	0		2	2				0		0	1	1	0	0		0	3
7:30 AM	0		2	2				0		0	1	1	0	0		0	3
7:45 AM	0		2	2				0		0	1	1	0	0		0	3
8:00 AM	0		2	2				0		0	1	1	0	0		0	3

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

76 West & Hwy 99 E

8:00 AM to 9:00 AM
Wednesday, April 04, 2012

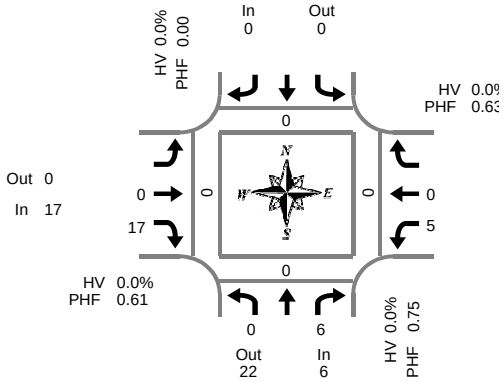


Approach	PHF	HV%	Volume
EB	0.60	8.3%	12
WB	0.63	0.0%	5
NB	0.50	33.3%	6
SB	0.00	0.0%	0
Intersection	0.58	13.0%	23

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



76 West & Hwy 99 E

Wednesday, April 04, 2012
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 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	0		1				0	5		0	0		6	0	1	0	0
4:15 PM	0		0				0	2		0	0		2	0	0	0	0
4:30 PM	0		0				0	2		3	0		5	0	1	0	0
4:45 PM	0		2				0	3		1	0		6	0	0	0	0
5:00 PM	0		2				0	7		1	0		10	0	0	0	0
5:15 PM	0		1				0	4		1	0		6	0	0	0	0
5:30 PM	0		1				0	3		2	0		6	0	0	0	0
5:45 PM	1		0				0	5		0	0		6	0	0	0	0
Total Survey	1		7				0	31		8	0		47	0	2	0	0

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

By Approach	Northbound 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	6	22	28	0	0	0	17	0	17	5	6	11	28	0	0	0	0
%HV	0.0%			0.0%			0.0%			0.0%			0.0%				
PHF	0.75			0.00			0.61			0.63			0.70				

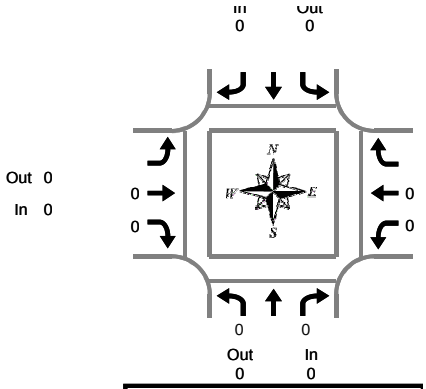
By Movement	Northbound 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	0		6				0	17		5	0		28
%HV	0.0%	NA	0.0%	NA	NA	NA	0.0%	0.0%		0.0%	0.0%	NA	0.0%
PHF	0.00		0.75				0.00	0.61		0.63	0.00		0.70

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

Interval Start Time	Northbound 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	0		3				0	12		4	0		19	0	2	0	0
4:15 PM	0		4				0	14		5	0		23	0	1	0	0
4:30 PM	0		5				0	16		6	0		27	0	1	0	0
4:45 PM	0		6				0	17		5	0		28	0	0	0	0
5:00 PM	1		4				0	19		4	0		28	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



76 West & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 76 West				Southbound 76 West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		0	0	0	0	0		0	0
4:15 PM	0		0	0				0		0	0	0	0	0		0	0
4:30 PM	0		0	0				0		0	0	0	0	0		0	0
4:45 PM	0		0	0				0		0	0	0	0	0		0	0
5:00 PM	0		0	0				0		0	0	0	0	0		0	0
5:15 PM	0		0	0				0		0	0	0	0	0		0	0
5:30 PM	0		0	0				0		0	0	0	0	0		0	0
5:45 PM	0		0	0				0		0	0	0	0	0		0	0
Total Survey	0		0	0				0		0	0	0	0	0		0	0

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound 76 West			Southbound 76 West			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.00			0.00			0.00			0.00			0.00

By Movement	Northbound 76 West				Southbound 76 West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		0	0				0		0	0	0	0	0		0	0
PHF	0.00		0.00	0.00				0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

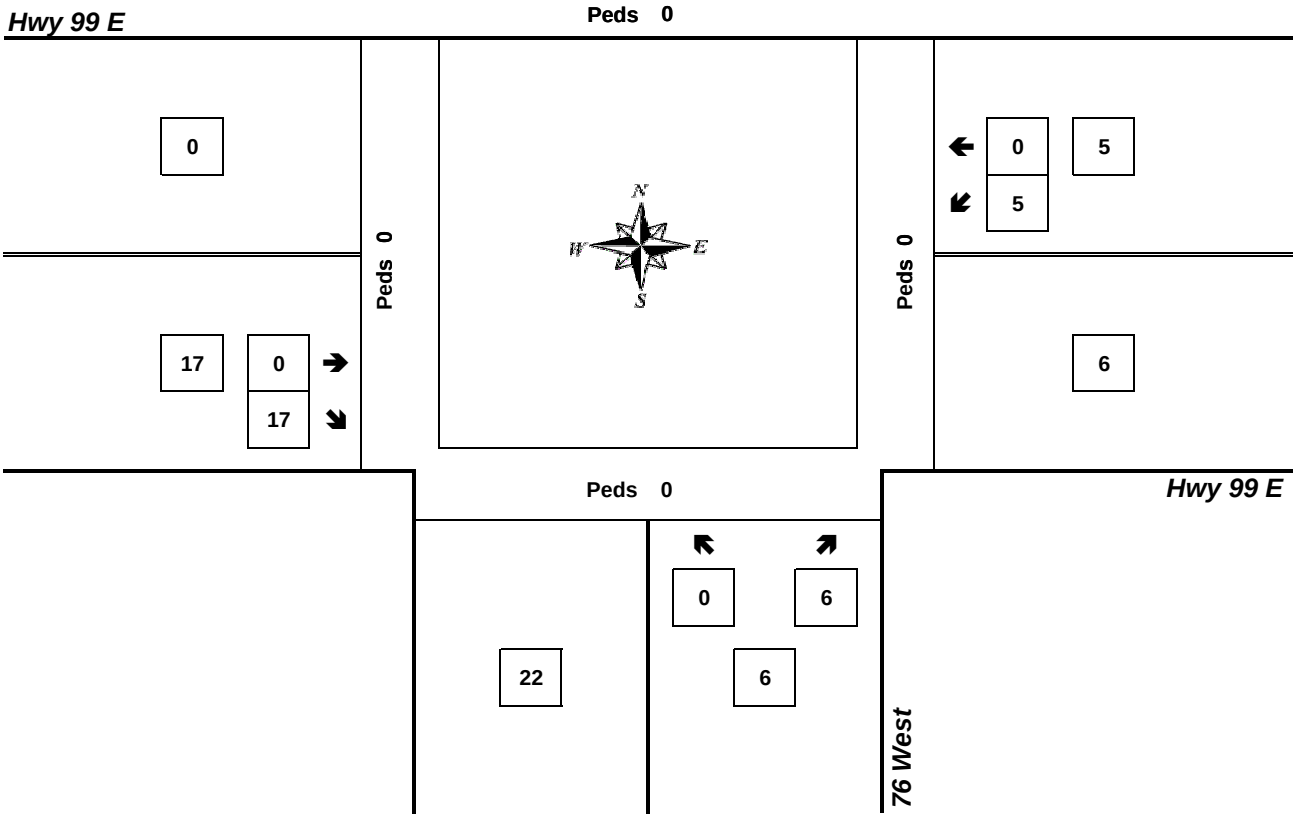
Interval Start Time	Northbound 76 West				Southbound 76 West				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		0	0	0	0	0		0	0
4:15 PM	0		0	0				0		0	0	0	0	0		0	0
4:30 PM	0		0	0				0		0	0	0	0	0		0	0
4:45 PM	0		0	0				0		0	0	0	0	0		0	0
5:00 PM	0		0	0				0		0	0	0	0	0		0	0

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

76 West & Hwy 99 E

4:45 PM to 5:45 PM
Wednesday, April 04, 2012

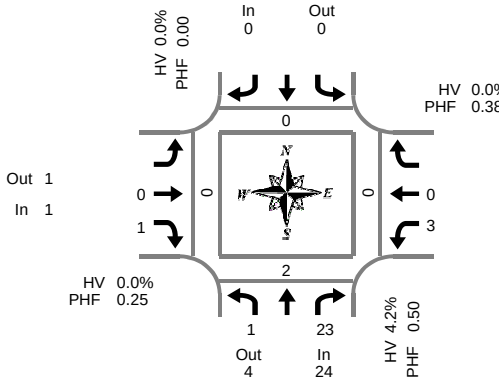


Approach	PHF	HV%	Volume
EB	0.61	0.0%	17
WB	0.63	0.0%	5
NB	0.75	0.0%	6
SB	0.00	0.0%	0
Intersection	0.70	0.0%	28

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:30 AM to 8:30 AM

76 East & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

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

Interval Start Time	Northbound 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	0		2				0	0		0	0		2	0	0	0	0
7:15 AM	0		7				0	0		0	0		7	0	0	0	0
7:30 AM	0		3				0	1		0	0		4	0	1	0	0
7:45 AM	0		3				0	0		1	0		4	0	0	0	0
8:00 AM	1		5				0	0		0	0		6	0	1	0	0
8:15 AM	0		12				0	0		2	0		14	0	0	0	0
8:30 AM	0		2				0	1		0	0		3	0	1	0	0
8:45 AM	0		5				0	0		0	0		5	0	0	0	0
Total Survey	1		39				0	2		3	0		45	0	3	0	0

Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	24	4	28	0	0	0	1	1	2	3	23	26	28	0	2	0	0
%HV	4.2%			0.0%			0.0%			0.0%			3.6%				
PHF	0.50			0.00			0.25			0.38			0.50				

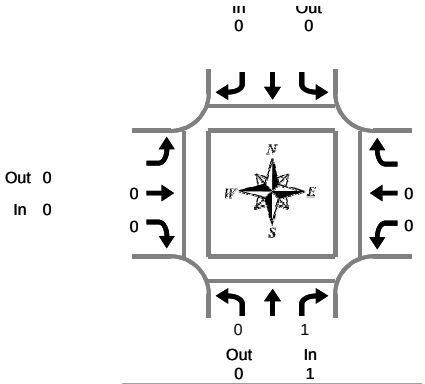
By Movement	Northbound 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	1		23				0	1		3	0		28
%HV	0.0%	NA	4.3%	NA	NA	NA	0.0%	0.0%		0.0%	0.0%	NA	3.6%
PHF	0.25		0.48				0.00	0.25		0.38	0.00		0.50

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
7:00 AM	0		15				0	1		1	0		17	0	1	0	0
7:15 AM	1		18				0	1		1	0		21	0	2	0	0
7:30 AM	1		23				0	1		3	0		28	0	2	0	0
7:45 AM	1		22				0	1		3	0		27	0	2	0	0
8:00 AM	1		24				0	1		2	0		28	0	2	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



76 East & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:30 AM to 8:30 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound 76 East				Southbound 76 East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		0	0	0	0	0		0	0
7:15 AM	0		0	0				0		0	0	0	0	0		0	0
7:30 AM	0		0	0				0		0	0	0	0	0		0	0
7:45 AM	0		0	0				0		0	0	0	0	0		0	0
8:00 AM	0		1	1				0		0	0	0	0	0		0	1
8:15 AM	0		0	0				0		0	0	0	0	0		0	0
8:30 AM	0		0	0				0		0	0	0	0	0		0	0
8:45 AM	0		0	0				0		0	0	0	0	0		0	0
Total Survey	0		1	1				0		0	0	0	0	0		0	1

Heavy Vehicle Peak Hour Summary
7:30 AM to 8:30 AM

By Approach	Northbound 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	0	1	0	0	0	0	0	0	0	1	1	1
PHF	0.25			0.00			0.00			0.00			0.25

By Movement	Northbound 76 East				Southbound 76 East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		1	1				0		0	0	0	0	0		0	1
PHF	0.00		0.25	0.25				0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.25

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

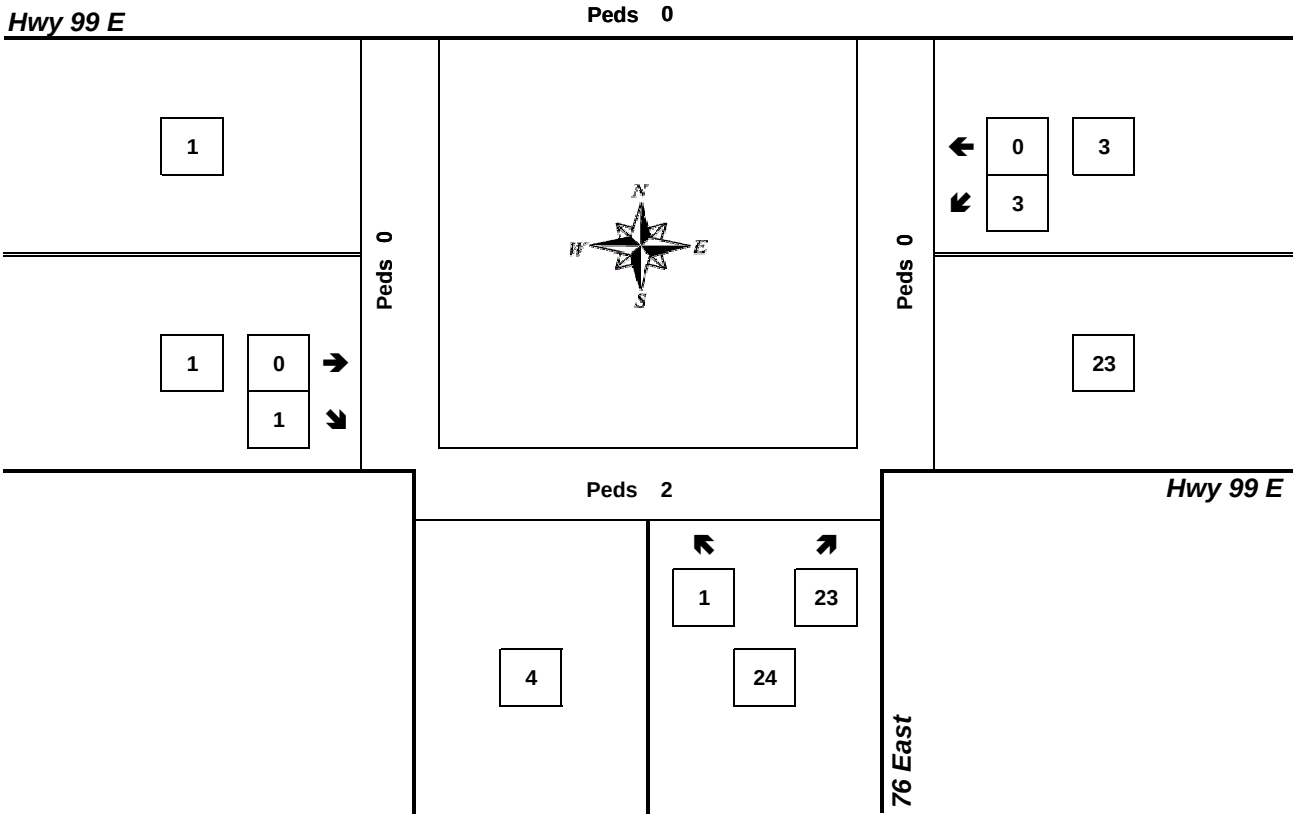
Interval Start Time	Northbound 76 East				Southbound 76 East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		0	0	0	0	0		0	0
7:15 AM	0		1	1				0		0	0	0	0	0		0	1
7:30 AM	0		1	1				0		0	0	0	0	0		0	1
7:45 AM	0		1	1				0		0	0	0	0	0		0	1
8:00 AM	0		1	1				0		0	0	0	0	0		0	1

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

76 East & Hwy 99 E

7:30 AM to 8:30 AM
Wednesday, April 04, 2012

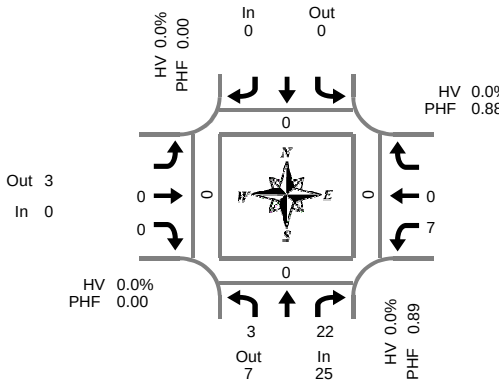


Approach	PHF	HV%	Volume
EB	0.25	0.0%	1
WB	0.38	0.0%	3
NB	0.50	4.2%	24
SB	0.00	0.0%	0
Intersection	0.50	3.6%	28

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



76 East & Hwy 99 E

Wednesday, April 04, 2012
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 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	2		5				0	0		1	0		8	0	1	0	0
4:15 PM	0		5				0	0		2	0		7	0	0	0	0
4:30 PM	0		7				0	0		0	0		7	0	1	0	0
4:45 PM	0		7				0	0		2	0		9	0	0	0	0
5:00 PM	1		5				0	0		1	0		7	0	0	0	0
5:15 PM	0		6				0	0		2	0		8	0	0	0	0
5:30 PM	2		4				0	0		2	0		8	0	0	0	0
5:45 PM	0		6				0	0		0	0		6	0	0	0	0
Total Survey	5		45				0	0		10	0		60	0	2	0	0

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

By Approach	Northbound 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	25	7	32	0	0	0	0	3	3	7	22	29	32	0	0	0	0
%HV	0.0%			0.0%			0.0%			0.0%			0.0%				
PHF	0.89			0.00			0.00			0.88			0.89				

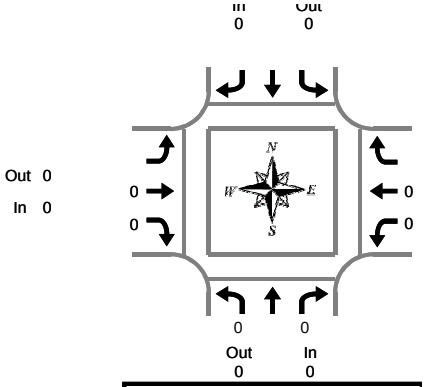
By Movement	Northbound 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R				T	R		L	T		
Volume	3		22				0	0		7	0		32
%HV	0.0%	NA	0.0%	NA	NA	NA	0.0%	0.0%		0.0%	0.0%	NA	0.0%
PHF	0.38		0.79				0.00	0.00		0.88	0.00		0.89

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

Interval Start Time	Northbound 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R				T	R		L	T			North	South	East	West
4:00 PM	2		24				0	0		5	0		31	0	2	0	0
4:15 PM	1		24				0	0		5	0		30	0	1	0	0
4:30 PM	1		25				0	0		5	0		31	0	1	0	0
4:45 PM	3		22				0	0		7	0		32	0	0	0	0
5:00 PM	3		21				0	0		5	0		29	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



76 East & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound 76 East				Southbound 76 East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		0	0	0	0	0		0	0
4:15 PM	0		0	0				0		0	0	0	0	0		0	0
4:30 PM	0		0	0				0		0	0	0	0	0		0	0
4:45 PM	0		0	0				0		0	0	0	0	0		0	0
5:00 PM	0		0	0				0		0	0	0	0	0		0	0
5:15 PM	0		0	0				0		0	0	0	0	0		0	0
5:30 PM	0		0	0				0		0	0	0	0	0		0	0
5:45 PM	0		0	0				0		0	0	0	0	0		0	0
Total Survey	0		0	0				0		0	0	0	0	0		0	0

Heavy Vehicle Peak Hour Summary
4:45 PM to 5:45 PM

By Approach	Northbound 76 East			Southbound 76 East			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.00			0.00			0.00			0.00			0.00

By Movement	Northbound 76 East				Southbound 76 East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		0	0				0		0	0	0	0	0		0	0
PHF	0.00		0.00	0.00				0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

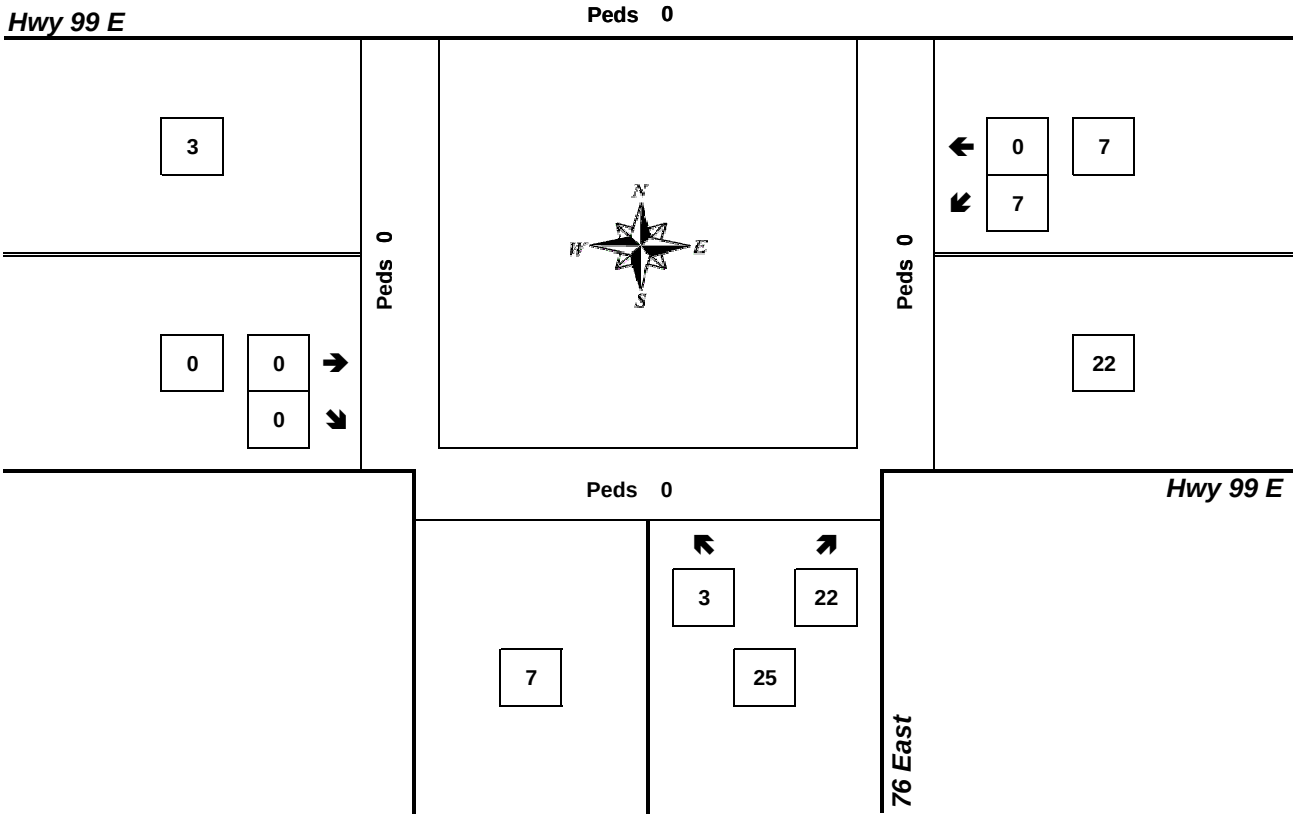
Interval Start Time	Northbound 76 East				Southbound 76 East				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		0	0	0	0	0		0	0
4:15 PM	0		0	0				0		0	0	0	0	0		0	0
4:30 PM	0		0	0				0		0	0	0	0	0		0	0
4:45 PM	0		0	0				0		0	0	0	0	0		0	0
5:00 PM	0		0	0				0		0	0	0	0	0		0	0

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

76 East & Hwy 99 E

4:45 PM to 5:45 PM
Wednesday, April 04, 2012

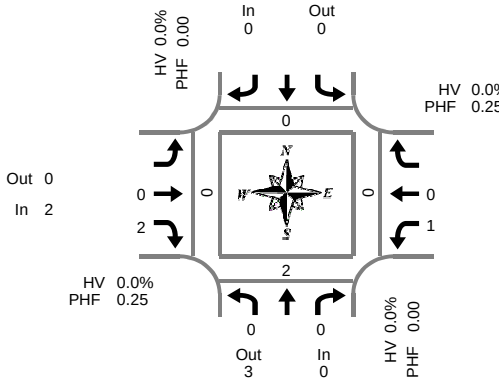


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.88	0.0%	7
NB	0.89	0.0%	25
SB	0.00	0.0%	0
Intersection	0.89	0.0%	32

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Napa & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:45 AM to 8:45 AM

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

Interval Start Time	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R					T	R	L	T			North	South	East	West
7:00 AM	0		0					0	0	0	0		0	0	0	0	0
7:15 AM	0		0					0	0	0	0		0	0	0	0	0
7:30 AM	1		0					0	0	0	0		1	0	1	0	0
7:45 AM	0		0					0	0	0	0		0	0	0	0	0
8:00 AM	0		0					0	0	0	0		0	0	1	0	0
8:15 AM	0		0					0	0	1	0		1	0	0	0	0
8:30 AM	0		0					0	2	0	0		2	0	1	0	0
8:45 AM	0		0					0	0	0	0		0	0	0	0	0
Total Survey	1		0					0	2	1	0		4	0	3	0	0

Peak Hour Summary
7:45 AM to 8:45 AM

By Approach	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	0	3	3	0	0	0	2	0	2	1	0	1	3	0	2	0	0
%HV		0.0%			0.0%			0.0%			0.0%		0.0%				
PHF		0.00			0.00			0.25			0.25		0.38				

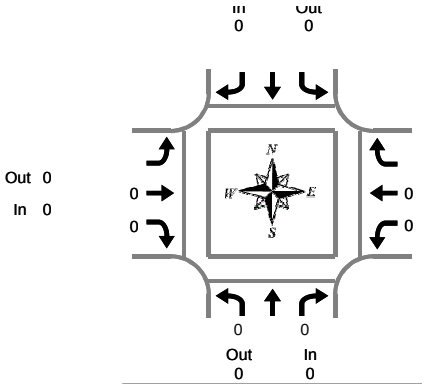
By Movement	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R					T	R	L	T		
Volume	0		0					0	2	1	0		3
%HV	0.0%	NA	0.0%	NA	NA	NA	NA	0.0%	0.0%	0.0%	0.0%	NA	0.0%
PHF	0.00		0.00					0.00	0.25	0.25	0.00		0.38

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R					T	R	L	T			North	South	East	West
7:00 AM	1		0					0	0	0	0		1	0	1	0	0
7:15 AM	1		0					0	0	0	0		1	0	2	0	0
7:30 AM	1		0					0	0	1	0		2	0	2	0	0
7:45 AM	0		0					0	2	1	0		3	0	2	0	0
8:00 AM	0		0					0	2	1	0		3	0	2	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Napa & Hwy 99 E

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:45 AM to 8:45 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound Napa				Southbound Napa				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		0	0	0	0	0		0	0
7:15 AM	0		0	0				0		0	0	0	0	0		0	0
7:30 AM	0		0	0				0		0	0	0	0	0		0	0
7:45 AM	0		0	0				0		0	0	0	0	0		0	0
8:00 AM	0		0	0				0		0	0	0	0	0		0	0
8:15 AM	0		0	0				0		0	0	0	0	0		0	0
8:30 AM	0		0	0				0		0	0	0	0	0		0	0
8:45 AM	0		0	0				0		0	0	0	0	0		0	0
Total Survey	0		0	0				0		0	0	0	0	0		0	0

Heavy Vehicle Peak Hour Summary
7:45 AM to 8:45 AM

By Approach	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.00			0.00			0.00			0.00			0.00

By Movement	Northbound Napa				Southbound Napa				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		0	0				0		0	0	0	0	0		0	0
PHF	0.00		0.00	0.00				0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

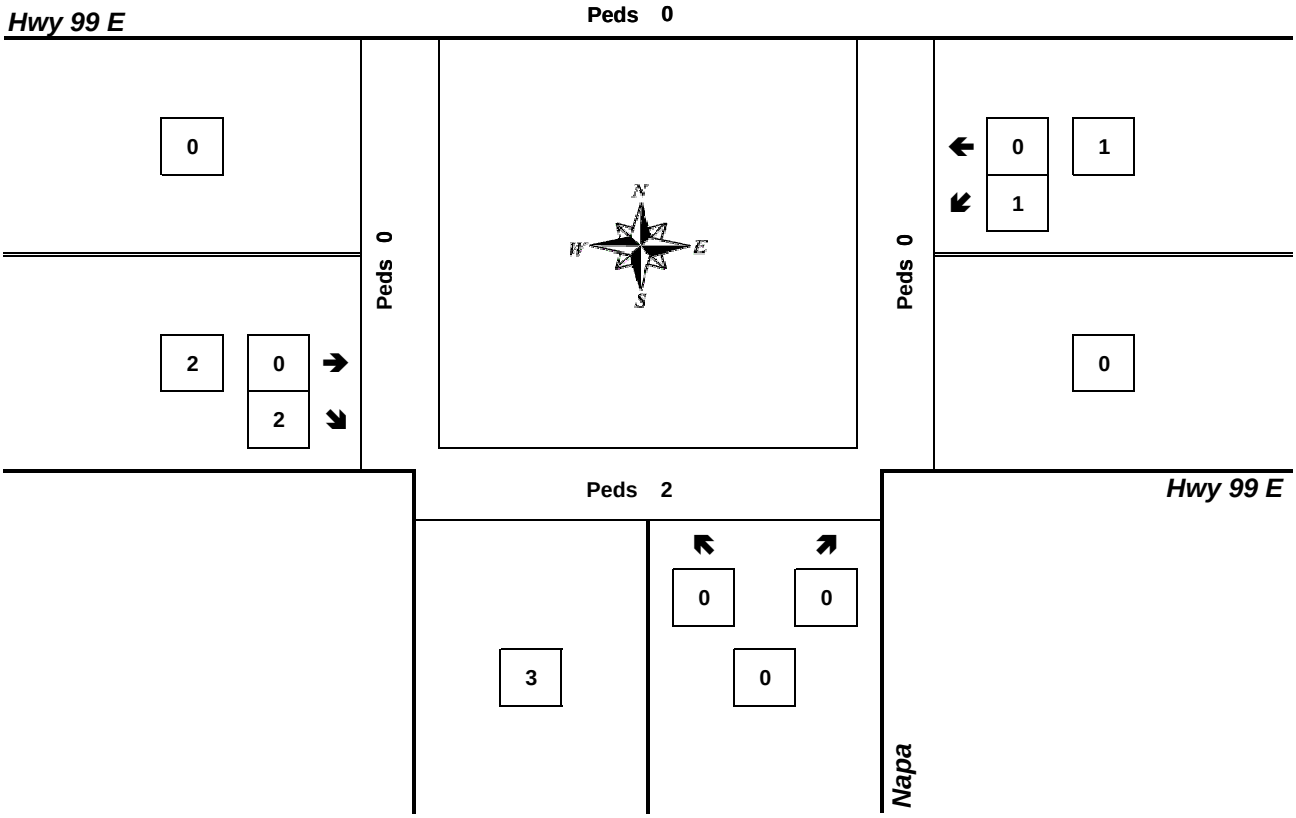
Interval Start Time	Northbound Napa				Southbound Napa				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
7:00 AM	0		0	0				0		0	0	0	0	0		0	0
7:15 AM	0		0	0				0		0	0	0	0	0		0	0
7:30 AM	0		0	0				0		0	0	0	0	0		0	0
7:45 AM	0		0	0				0		0	0	0	0	0		0	0
8:00 AM	0		0	0				0		0	0	0	0	0		0	0

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Napa & Hwy 99 E

7:45 AM to 8:45 AM
Wednesday, April 04, 2012

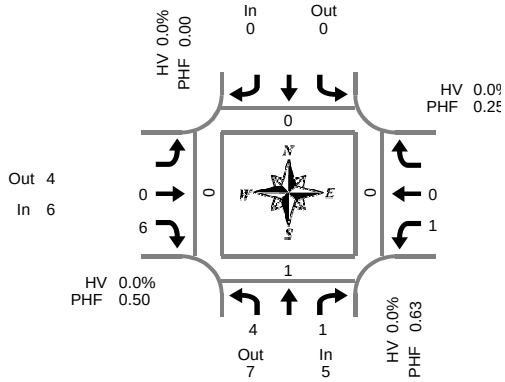


Approach	PHF	HV%	Volume
EB	0.25	0.0%	2
WB	0.25	0.0%	1
NB	0.00	0.0%	0
SB	0.00	0.0%	0
Intersection	0.38	0.0%	3

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

Napa & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Interval Start Time	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R					T	R	L	T			North	South	East	West
4:00 PM	0		1					0	1	1	0		3	0	1	0	0
4:15 PM	0		0					0	0	1	0		1	0	0	0	0
4:30 PM	0		0					0	0	1	0		1	0	3	0	0
4:45 PM	0		0					0	0	0	0		0	0	2	0	0
5:00 PM	2		0					0	3	1	0		6	0	0	0	0
5:15 PM	1		0					0	1	0	0		2	0	0	0	0
5:30 PM	1		0					0	2	0	0		3	0	0	0	0
5:45 PM	0		1					0	0	0	0		1	0	1	0	0
Total Survey	4		2					0	7	4	0		17	0	7	0	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	5	7	12	0	0	0	6	4	10	1	1	2	12	0	1	0	0
%HV	0.0%			0.0%			0.0%			0.0%			0.0%				
PHF	0.63			0.00			0.50			0.25			0.50				

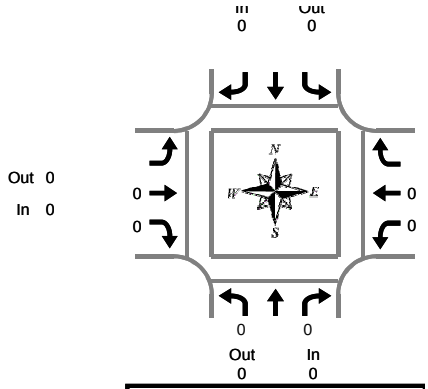
By Movement	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	L		R					T	R	L	T		
Volume	4		1					0	6	1	0		12
%HV	0.0%	NA	0.0%	NA	NA	NA	NA	0.0%	0.0%	0.0%	0.0%	NA	0.0%
PHF	0.50		0.25					0.00	0.50	0.25	0.00		0.50

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

Interval Start Time	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Interval Total	Pedestrians Crosswalk			
	L		R					T	R	L	T			North	South	East	West
4:00 PM	0		1					0	1	3	0		5	0	6	0	0
4:15 PM	2		0					0	3	3	0		8	0	5	0	0
4:30 PM	3		0					0	4	2	0		9	0	5	0	0
4:45 PM	4		0					0	6	1	0		11	0	2	0	0
5:00 PM	4		1					0	6	1	0		12	0	1	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Napa & Hwy 99 E

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

Peak Hour Summary
5:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound Napa				Southbound Napa				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		0	0	0	0	0		0	0
4:15 PM	0		0	0				0		0	0	0	0	0		0	0
4:30 PM	0		0	0				0		0	0	0	0	0		0	0
4:45 PM	0		0	0				0		0	0	0	0	0		0	0
5:00 PM	0		0	0				0		0	0	0	0	0		0	0
5:15 PM	0		0	0				0		0	0	0	0	0		0	0
5:30 PM	0		0	0				0		0	0	0	0	0		0	0
5:45 PM	0		0	0				0		0	0	0	0	0		0	0
Total Survey	0		0	0				0		0	0	0	0	0		0	0

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound Napa			Southbound Napa			Eastbound Hwy 99 E			Westbound Hwy 99 E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.00			0.00			0.00			0.00			0.00

By Movement	Northbound Napa				Southbound Napa				Eastbound Hwy 99 E				Westbound Hwy 99 E				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		0	0				0		0	0	0	0	0		0	0
PHF	0.00		0.00	0.00				0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

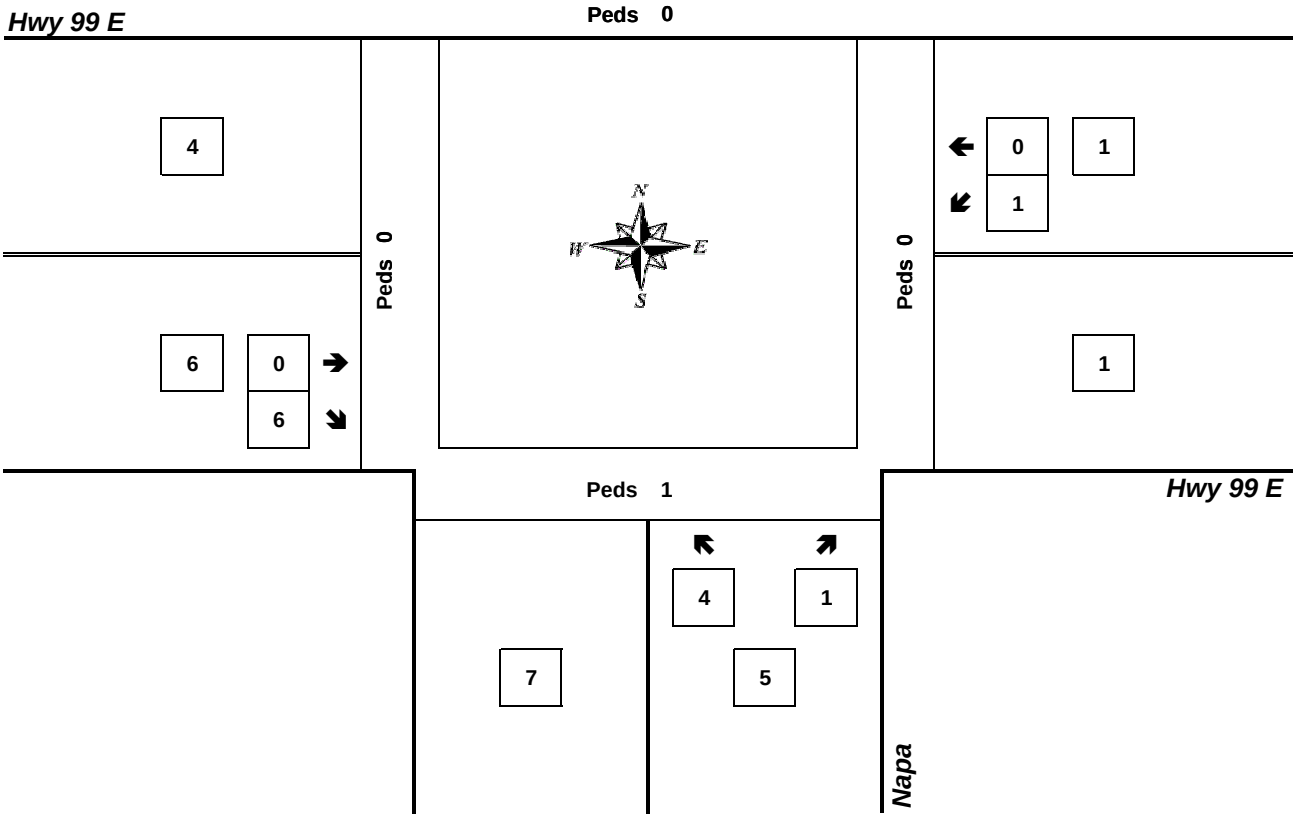
Interval Start Time	Northbound Napa				Southbound Napa				Eastbound Hwy 99 E				Westbound Hwy 99 E				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		0	0	0	0	0		0	0
4:15 PM	0		0	0				0		0	0	0	0	0		0	0
4:30 PM	0		0	0				0		0	0	0	0	0		0	0
4:45 PM	0		0	0				0		0	0	0	0	0		0	0
5:00 PM	0		0	0				0		0	0	0	0	0		0	0

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Napa & Hwy 99 E

5:00 PM to 6:00 PM
Wednesday, April 04, 2012

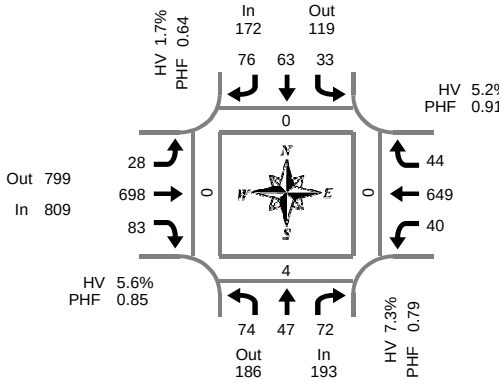


Approach	PHF	HV%	Volume
EB	0.50	0.0%	6
WB	0.25	0.0%	1
NB	0.63	0.0%	5
SB	0.00	0.0%	0
Intersection	0.50	0.0%	12

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:00 AM to 8:00 AM

S Pine St & Hwy 99E

Tuesday, May 21, 2013
7:00 AM to 9:00 AM

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

Interval Start Time	Northbound S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	7	12	25	4	10	18	4	173	13	3	153	5	427	0	0	0	0
7:15 AM	22	8	13	8	25	34	7	163	14	12	177	12	495	0	1	0	0
7:30 AM	22	14	25	8	15	14	11	193	33	9	165	13	522	0	1	0	0
7:45 AM	23	13	9	13	13	10	6	169	23	16	154	14	463	0	2	0	0
8:00 AM	14	14	20	9	6	7	5	148	20	10	124	7	384	0	0	0	1
8:15 AM	12	7	9	10	4	10	4	138	20	10	140	10	374	0	0	0	0
8:30 AM	19	10	13	12	10	17	11	147	16	12	138	10	415	0	2	0	0
8:45 AM	24	9	24	22	13	13	11	145	26	11	149	10	457	0	0	0	1
Total Survey	143	87	138	86	96	123	59	1,276	165	83	1,200	81	3,537	0	6	0	2

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	193	186	379	172	119	291	809	799	1,608	733	803	1,536	1,907
%HV	7.3%			1.7%			5.6%			5.2%			5.2%
PHF	0.79			0.64			0.85			0.91			0.91

Pedestrians Crosswalk			
North	South	East	West
0	4	0	0

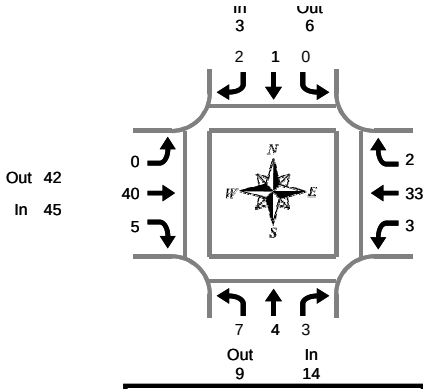
By Movement	Northbound S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	74	47	72	33	63	76	28	698	83	40	649	44	1,907
%HV	9.5%	8.5%	4.2%	0.0%	1.6%	2.6%	0.0%	5.7%	6.0%	7.5%	5.1%	4.5%	5.2%
PHF	0.80	0.84	0.72	0.63	0.63	0.56	0.64	0.90	0.63	0.63	0.92	0.79	0.91

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	74	47	72	33	63	76	28	698	83	40	649	44	1,907	0	4	0	0
7:15 AM	81	49	67	38	59	65	29	673	90	47	620	46	1,864	0	4	0	1
7:30 AM	71	48	63	40	38	41	26	648	96	45	583	44	1,743	0	3	0	1
7:45 AM	68	44	51	44	33	44	26	602	79	48	556	41	1,636	0	4	0	1
8:00 AM	69	40	66	53	33	47	31	578	82	43	551	37	1,630	0	2	0	2

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



S Pine St & Hwy 99E

Tuesday, May 21, 2013
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Pine St				Southbound S Pine St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	2	1	4	0	0	1	1	0	2	1	3	0	10	0	10	18
7:15 AM	2	0	0	2	0	1	0	1	0	10	0	10	2	4	1	7	20
7:30 AM	1	1	2	4	0	0	1	1	0	15	2	17	0	11	0	11	33
7:45 AM	3	1	0	4	0	0	0	0	0	13	2	15	1	8	1	10	29
8:00 AM	3	4	1	8	0	0	1	1	0	12	3	15	1	8	1	10	34
8:15 AM	4	0	0	4	0	0	0	0	0	8	2	10	0	9	0	9	23
8:30 AM	3	0	1	4	0	0	1	1	0	8	2	10	1	12	0	13	28
8:45 AM	3	0	0	3	1	4	0	5	1	13	3	17	1	15	0	16	41
Total Survey	20	8	5	33	1	5	4	10	1	81	15	97	6	77	3	86	226

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	14	9	23	3	6	9	45	42	87	38	43	81	100
PHF	0.22			0.13			0.24			0.25			0.26

By Movement	Northbound S Pine St				Southbound S Pine St				Eastbound Hwy 99E				Westbound Hwy 99E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	7	4	3	14	0	1	2	3	0	40	5	45	3	33	2	38	100
PHF	0.18	0.17	0.25	0.22	0.00	0.06	0.25	0.13	0.00	0.25	0.18	0.24	0.25	0.23	0.25	0.25	0.26

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

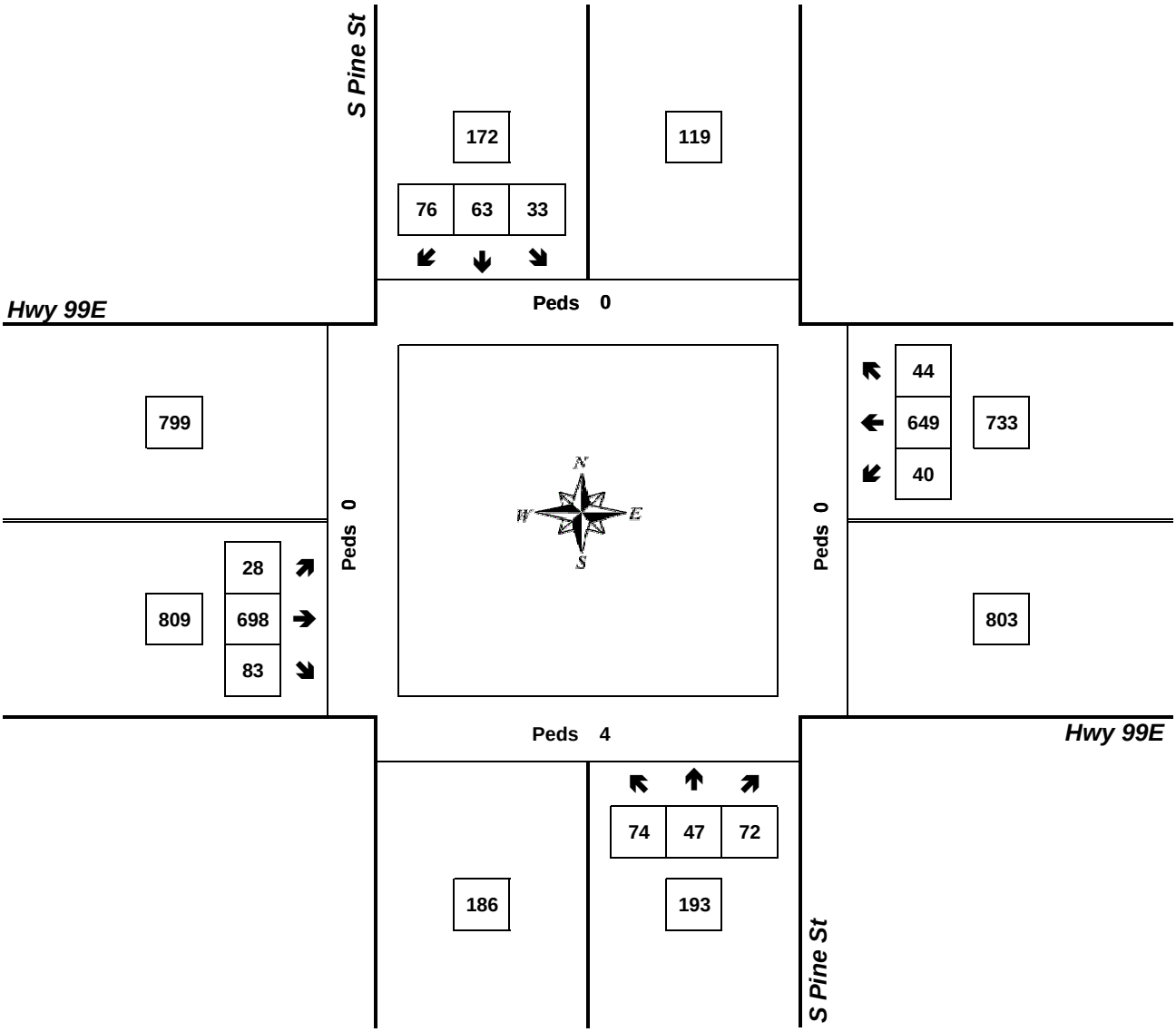
Interval Start Time	Northbound S Pine St				Southbound S Pine St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	7	4	3	14	0	1	2	3	0	40	5	45	3	33	2	38	100
7:15 AM	9	6	3	18	0	1	2	3	0	50	7	57	4	31	3	38	116
7:30 AM	11	6	3	20	0	0	2	2	0	48	9	57	2	36	2	40	119
7:45 AM	13	5	2	20	0	0	2	2	0	41	9	50	3	37	2	42	114
8:00 AM	13	4	2	19	1	4	2	7	1	41	10	52	3	44	1	48	126

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Pine St & Hwy 99E

7:00 AM to 8:00 AM
Tuesday, May 21, 2013

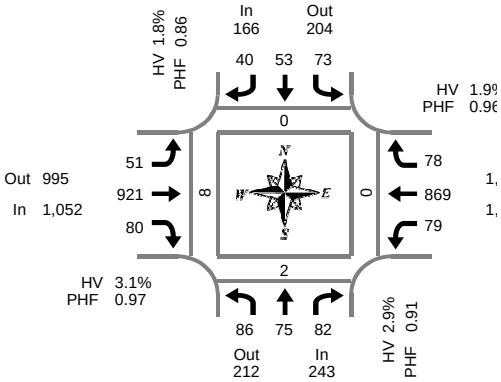


Approach	PHF	HV%	Volume
EB	0.85	5.6%	809
WB	0.91	5.2%	733
NB	0.79	7.3%	193
SB	0.64	1.7%	172
Intersection	0.91	5.2%	1,907

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Pine St & Hwy 99E

Wednesday, May 29, 2013
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 S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	20	18	16	20	13	9	9	194	21	22	182	15	539	0	1	0	1
4:15 PM	19	17	22	16	10	10	13	208	19	19	206	18	577	0	0	0	0
4:30 PM	21	23	16	17	9	8	11	222	15	24	222	21	609	0	2	0	2
4:45 PM	25	18	20	21	11	7	14	227	23	15	202	17	600	0	0	0	4
5:00 PM	25	20	22	16	16	13	11	235	25	21	220	21	645	0	0	0	2
5:15 PM	15	14	24	19	17	12	15	237	17	19	225	19	633	0	0	0	0
5:30 PM	25	20	20	15	18	11	17	216	21	22	202	22	609	0	1	0	1
5:45 PM	20	21	24	13	13	9	12	196	22	24	180	16	550	0	0	0	2
Total Survey	170	151	164	137	107	79	102	1,735	163	166	1,639	149	4,762	0	4	0	12

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

By Approach	Northbound S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	243	212	455	166	204	370	1,052	995	2,047	1,026	1,076	2,102	2,487	0	2	0	8
%HV	2.9%			1.8%			3.1%			1.9%			2.5%				
PHF	0.91			0.86			0.97			0.96			0.96				

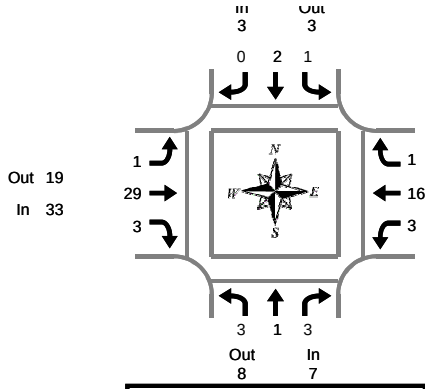
By Movement	Northbound S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	86	75	82	73	53	40	51	921	80	79	869	78	2,487
%HV	3.5%	1.3%	3.7%	1.4%	3.8%	0.0%	2.0%	3.1%	3.8%	3.8%	1.8%	1.3%	2.5%
PHF	0.86	0.82	0.85	0.87	0.78	0.77	0.85	0.97	0.80	0.82	0.97	0.93	0.96

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

Interval Start Time	Northbound S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
4:00 PM	85	76	74	74	43	34	47	851	78	80	812	71	2,325	0	3	0	7
4:15 PM	90	78	80	70	46	38	49	892	82	79	850	77	2,431	0	2	0	8
4:30 PM	86	75	82	73	53	40	51	921	80	79	869	78	2,487	0	2	0	8
4:45 PM	90	72	86	71	62	43	57	915	86	77	849	79	2,487	0	1	0	7
5:00 PM	85	75	90	63	64	45	55	884	85	86	827	78	2,437	0	1	0	5

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Pine St & Hwy 99E

Wednesday, May 29, 2013
4:00 PM to 6:00 PM

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

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound S Pine St				Southbound S Pine St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	1	1	0	1	0	1	0	7	1	8	1	4	0	5	15
4:15 PM	1	0	2	3	1	0	0	1	1	6	0	7	0	5	0	5	16
4:30 PM	0	1	0	1	0	0	0	0	0	8	0	8	2	7	1	10	19
4:45 PM	1	0	1	2	0	0	0	0	0	8	2	10	0	3	0	3	15
5:00 PM	2	0	2	4	0	1	0	1	1	4	1	6	1	5	0	6	17
5:15 PM	0	0	0	0	1	1	0	2	0	9	0	9	0	1	0	1	12
5:30 PM	0	1	1	2	0	0	0	0	0	5	1	6	1	5	0	6	14
5:45 PM	1	0	0	1	0	0	0	0	0	5	0	5	0	2	0	2	8
Total Survey	5	2	7	14	2	3	0	5	2	52	5	59	5	32	1	38	116

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound S Pine St			Southbound S Pine St			Eastbound Hwy 99E			Westbound Hwy 99E			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	8	15	3	3	6	33	19	52	20	33	53	63
PHF	0.25			0.25			0.33			0.25			0.31

By Movement	Northbound S Pine St				Southbound S Pine St				Eastbound Hwy 99E				Westbound Hwy 99E				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	3	1	3	7	1	2	0	3	1	29	3	33	3	16	1	20	63
PHF	0.25	0.25	0.25	0.25	0.25	0.25	0.00	0.25	0.25	0.33	0.25	0.33	0.25	0.25	0.25	0.25	0.31

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

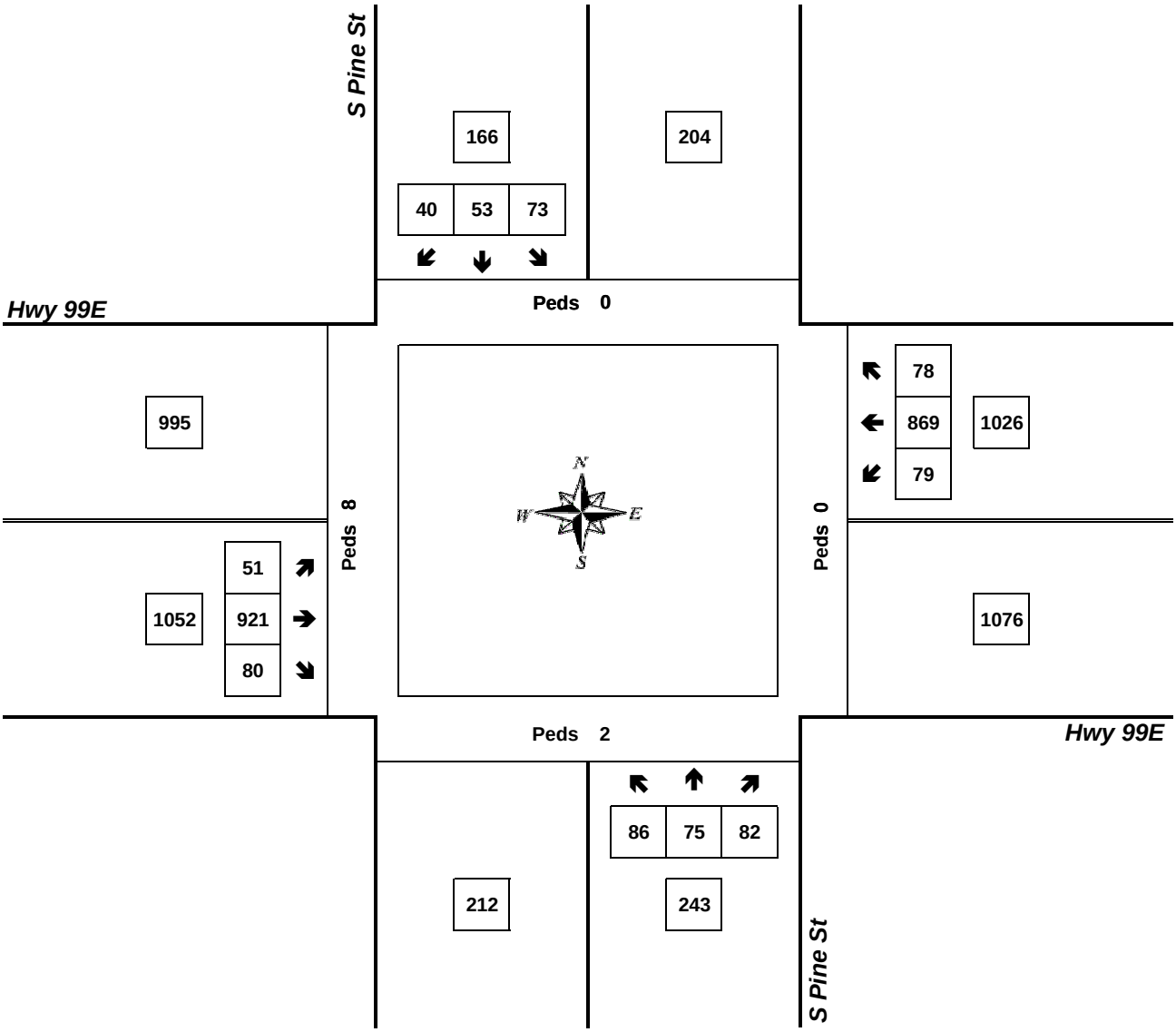
Interval Start Time	Northbound S Pine St				Southbound S Pine St				Eastbound Hwy 99E				Westbound Hwy 99E				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	1	4	7	1	1	0	2	1	29	3	33	3	19	1	23	65
4:15 PM	4	1	5	10	1	1	0	2	2	26	3	31	3	20	1	24	67
4:30 PM	3	1	3	7	1	2	0	3	1	29	3	33	3	16	1	20	63
4:45 PM	3	1	4	8	1	2	0	3	1	26	4	31	2	14	0	16	58
5:00 PM	3	1	3	7	1	2	0	3	1	23	2	26	2	13	0	15	51

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Pine St & Hwy 99E

4:30 PM to 5:30 PM
Wednesday, May 29, 2013

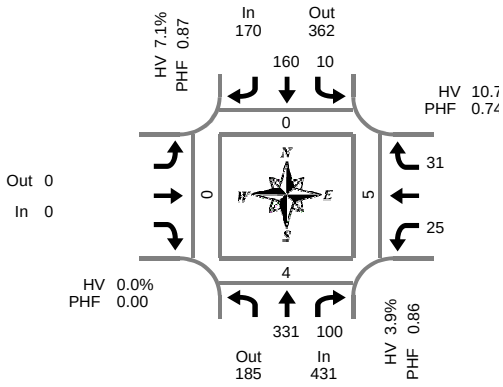


Approach	PHF	HV%	Volume
EB	0.97	3.1%	1,052
WB	0.96	1.9%	1,026
NB	0.91	2.9%	243
SB	0.86	1.8%	166
Intersection	0.96	2.5%	2,487

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

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:00 AM to 8:00 AM

N Ivy St & SE 2nd Ave

Tuesday, May 21, 2013
7:00 AM to 9:00 AM

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

Interval Start Time	Northbound N Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Interval Total	Pedestrians Crosswalk			
		T	R	L	T					L		R		North	South	East	West
7:00 AM		70	20	0	29					3		9	131	0	1	0	0
7:15 AM		76	21	4	42					9		5	157	0	3	3	0
7:30 AM		99	26	5	44					10		9	193	0	0	0	0
7:45 AM		86	33	1	45					3		8	176	0	0	2	0
8:00 AM		54	16	1	45					8		1	125	0	0	2	0
8:15 AM		65	21	0	31					3		2	122	0	0	3	0
8:30 AM		57	13	0	49					7		7	133	1	0	1	0
8:45 AM		93	23	2	71					10		11	210	0	0	0	0
Total Survey		600	173	13	356					53		52	1,247	1	4	11	0

Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound N Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	431	185	616	170	362	532	0	0	0	56	110	166	657	0	4	5	0
%HV	3.9%			7.1%			0.0%			10.7%			5.3%				
PHF	0.86			0.87			0.00			0.74			0.85				

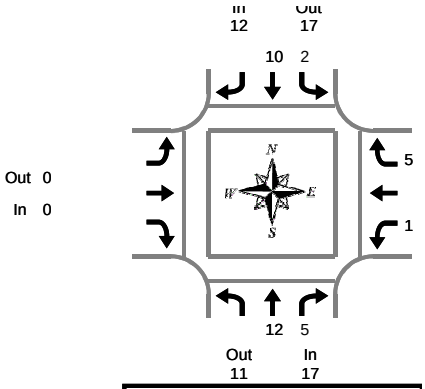
By Movement	Northbound N Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total
		T	R	L	T					L		R	
Volume		331	100	10	160					25		31	657
%HV	NA	3.6%	5.0%	20.0%	6.3%	NA	NA	NA	NA	4.0%	NA	16.1%	5.3%
PHF		0.84	0.76	0.50	0.89					0.63		0.86	0.85

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound N Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Interval Total	Pedestrians Crosswalk			
		T	R	L	T					L		R		North	South	East	West
7:00 AM		331	100	10	160					25		31	657	0	4	5	0
7:15 AM		315	96	11	176					30		23	651	0	3	7	0
7:30 AM		304	96	7	165					24		20	616	0	0	7	0
7:45 AM		262	83	2	170					21		18	556	1	0	8	0
8:00 AM		269	73	3	196					28		21	590	1	0	6	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



N Ivy St & SE 2nd Ave

Tuesday, May 21, 2013
7:00 AM to 9:00 AM

Peak Hour Summary
7:00 AM to 8:00 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound N Ivy St				Southbound N Ivy St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
7:00 AM		2	1	3	0	4		4				0	0		2	2	9
7:15 AM		2	2	4	0	2		2				0	0		1	1	7
7:30 AM		5	1	6	2	4		6				0	1		1	2	14
7:45 AM		3	1	4	0	0		0				0	0		1	1	5
8:00 AM		3	0	3	1	4		5				0	1		1	2	10
8:15 AM		4	1	5	0	0		0				0	0		1	1	6
8:30 AM		2	1	3	0	2		2				0	0		0	0	5
8:45 AM		4	1	5	0	5		5				0	0		1	1	11
Total Survey		25	8	33	3	21		24				0	2		8	10	67

Heavy Vehicle Peak Hour Summary
7:00 AM to 8:00 AM

By Approach	Northbound N Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	17	11	28	12	17	29	0	0	0	6	7	13	35
PHF	0.30			0.25			0.00			0.30			0.29

By Movement	Northbound N Ivy St				Southbound N Ivy St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		12	5	17	2	10		12				0	1		5	6	35
PHF		0.27	0.31	0.30	0.17	0.25		0.25				0.00	0.13		0.31	0.30	0.29

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

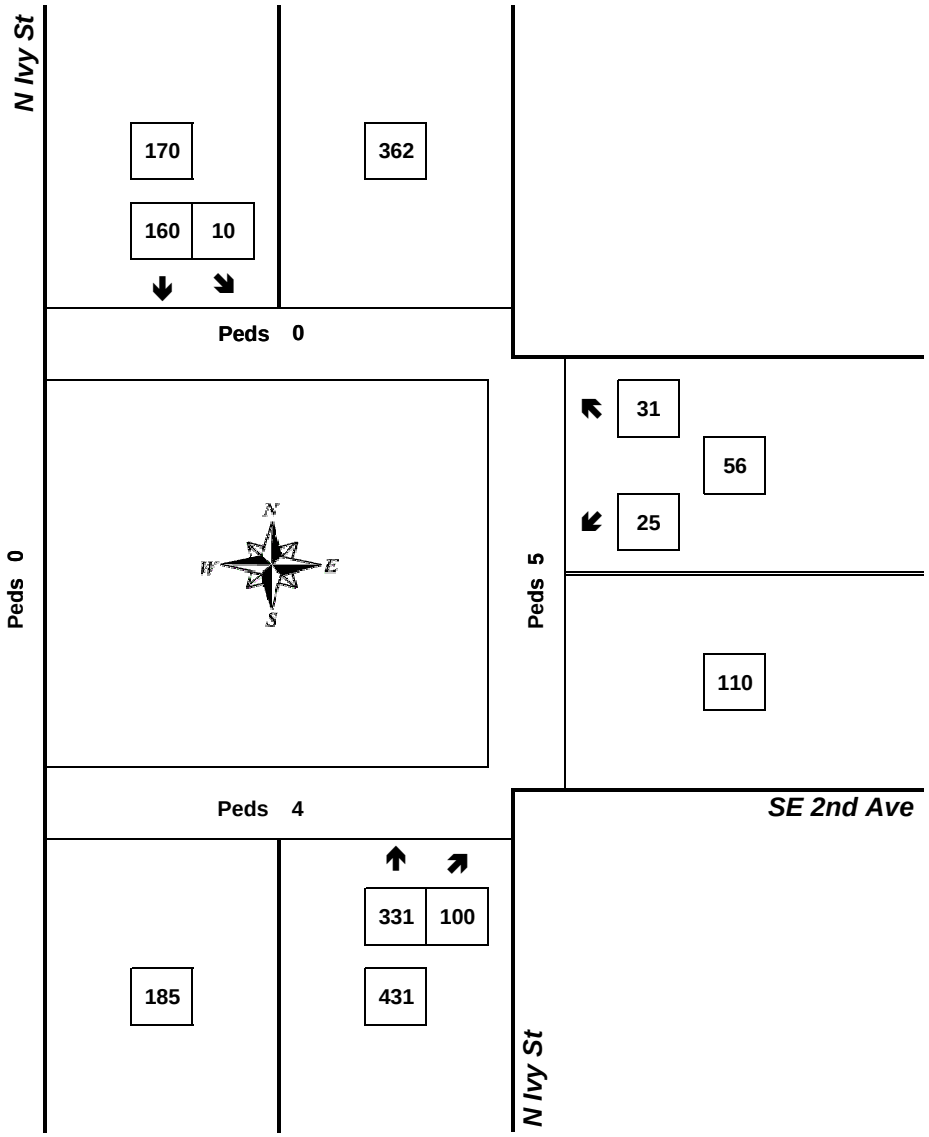
Interval Start Time	Northbound N Ivy St				Southbound N Ivy St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
7:00 AM		12	5	17	2	10		12				0	1		5	6	35
7:15 AM		13	4	17	3	10		13				0	2		4	6	36
7:30 AM		15	3	18	3	8		11				0	2		4	6	35
7:45 AM		12	3	15	1	6		7				0	1		3	4	26
8:00 AM		13	3	16	1	11		12				0	1		3	4	32

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

N Ivy St & SE 2nd Ave

7:00 AM to 8:00 AM
Tuesday, May 21, 2013

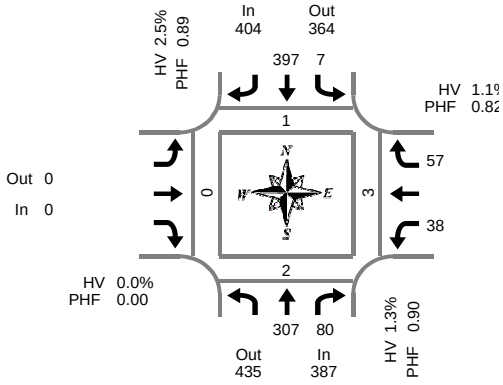


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.74	10.7%	56
NB	0.86	3.9%	431
SB	0.87	7.1%	170
Intersection	0.85	5.3%	657

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



N Ivy St & SE 2nd Ave

Wednesday, May 29, 2013
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 Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Interval Total	Pedestrians Crosswalk			
		T	R	L	T					L		R		North	South	East	West
4:00 PM		80	16	4	77					10		15	202	0	1	0	0
4:15 PM		70	19	2	109					9		12	221	1	0	1	0
4:30 PM		73	20	0	86					9		10	198	0	0	0	0
4:45 PM		80	16	3	97					11		15	222	0	0	2	0
5:00 PM		68	22	1	104					8		13	216	1	2	1	0
5:15 PM		86	22	3	110					10		19	250	0	0	0	0
5:30 PM		73	18	5	73					10		10	189	2	0	0	0
5:45 PM		60	20	2	107					6		9	204	0	0	0	0
Total Survey		590	153	20	763					73		103	1,702	4	3	4	0

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

By Approach	Northbound N Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	387	435	822	404	364	768	0	0	0	95	87	182	886	1	2	3	0
%HV	1.3%			2.5%			0.0%			1.1%			1.8%				
PHF	0.90			0.89			0.00			0.82			0.89				

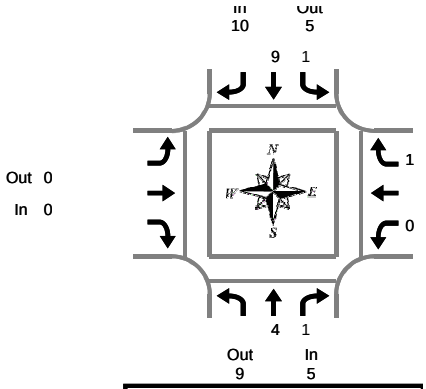
By Movement	Northbound N Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total
		T	R	L	T					L		R	
Volume		307	80	7	397					38		57	886
%HV	NA	1.3%	1.3%	14.3%	2.3%	NA	NA	NA	NA	0.0%	NA	1.8%	1.8%
PHF		0.89	0.91	0.58	0.90					0.86		0.75	0.89

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

Interval Start Time	Northbound N Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Interval Total	Pedestrians Crosswalk			
		T	R	L	T					L		R		North	South	East	West
4:00 PM		303	71	9	369					39		52	843	1	1	3	0
4:15 PM		291	77	6	396					37		50	857	2	2	4	0
4:30 PM		307	80	7	397					38		57	886	1	2	3	0
4:45 PM		307	78	12	384					39		57	877	3	2	3	0
5:00 PM		287	82	11	394					34		51	859	3	2	1	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



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

N Ivy St & SE 2nd Ave

Wednesday, May 29, 2013
4:00 PM to 6:00 PM

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound N Ivy St				Southbound N Ivy St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		2	1	3	0	4		4				0	0		1	1	8
4:15 PM		1	0	1	1	1		2				0	1		0	1	4
4:30 PM		2	0	2	0	3		3				0	0		1	1	6
4:45 PM		1	0	1	1	1		2				0	0		0	0	3
5:00 PM		1	1	2	0	2		2				0	0		0	0	4
5:15 PM		0	0	0	0	3		3				0	0		0	0	3
5:30 PM		0	0	0	0	1		1				0	1		0	1	2
5:45 PM		1	0	1	0	1		1				0	0		0	0	2
Total Survey		8	2	10	2	16		18				0	2		2	4	32

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound N Ivy St			Southbound N Ivy St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	9	14	10	5	15	0	0	0	1	2	3	16
PHF	0.21			0.28			0.00			0.08			0.22

By Movement	Northbound N Ivy St				Southbound N Ivy St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		4	1	5	1	9		10				0	0		1	1	16
PHF		0.20	0.25	0.21	0.13	0.28		0.28				0.00	0.00		0.13	0.08	0.22

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

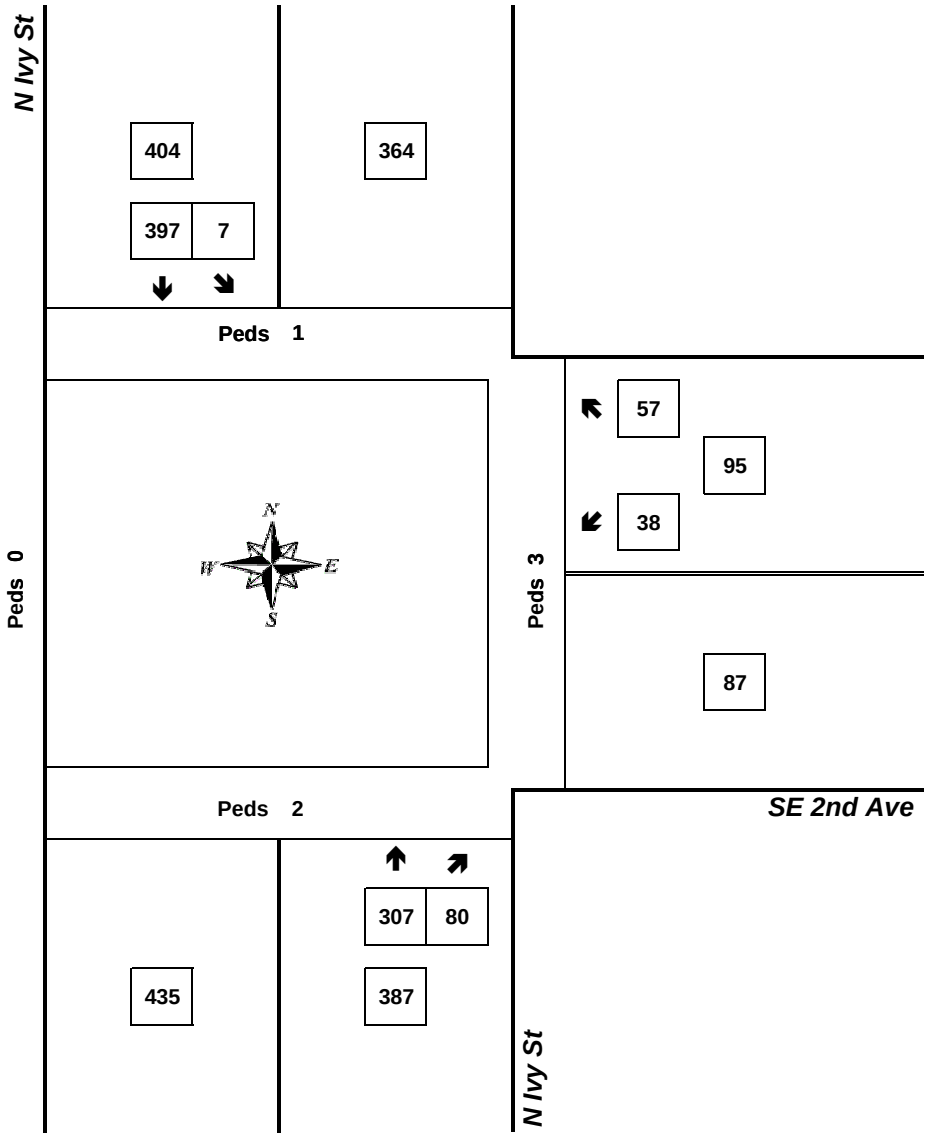
Interval Start Time	Northbound N Ivy St				Southbound N Ivy St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		6	1	7	2	9		11				0	1		2	3	21
4:15 PM		5	1	6	2	7		9				0	1		1	2	17
4:30 PM		4	1	5	1	9		10				0	0		1	1	16
4:45 PM		2	1	3	1	7		8				0	1		0	1	12
5:00 PM		2	1	3	0	7		7				0	1		0	1	11

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

N Ivy St & SE 2nd Ave

4:30 PM to 5:30 PM
Wednesday, May 29, 2013



Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.82	1.1%	95
NB	0.90	1.3%	387
SB	0.89	2.5%	404
Intersection	0.89	1.8%	886

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

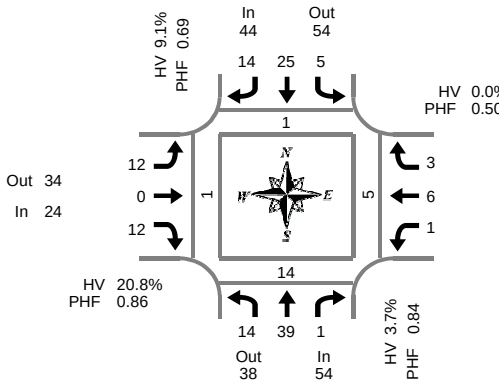
All Traffic Data
15105 SE 17th St.
Vancouver, WA. 98683
503-833-2740

Site Code: 1
SE 2nd Ave E-O Ivy St

Start Time	21-May-1 Tue	EB	WB							Total
12:00 AM		4	3							7
01:00		2	4							6
02:00		0	0							0
03:00		1	2							3
04:00		8	10							18
05:00		17	16							33
06:00		76	48							124
07:00		**109**	**64**							**173**
08:00		86	47							133
09:00		88	42							130
10:00		66	35							101
11:00		70	50							120
12:00 PM		**106**	64							170
01:00		88	52							140
02:00		76	68							144
03:00		106	85							**191**
04:00		84	78							162
05:00		89	**95**							184
06:00		62	72							134
07:00		42	34							76
08:00		29	39							68
09:00		17	16							33
10:00		7	10							17
11:00		6	7							13
Total		1239	941							2180
Percent		56.8%	43.2%							
AM Peak	-	07:00	07:00	-	-	-	-	-	-	07:00
Vol.	-	109	64	-	-	-	-	-	-	173
PM Peak	-	12:00	17:00	-	-	-	-	-	-	15:00
Vol.	-	106	95	-	-	-	-	-	-	191
Grand Total		1239	941							2180
Percent		56.8%	43.2%							
ADT		ADT 2,180		AADT 2,180						

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
7:15 AM to 8:15 AM

S Locust St & SE 2nd Ave

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

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

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	4	12	0	2	5	3	5	0	0	3	1	1	36	1	1	0	0
7:15 AM	5	10	0	0	3	3	3	0	3	0	0	0	27	0	1	0	1
7:30 AM	3	13	0	1	7	4	4	0	1	0	1	0	34	1	3	2	0
7:45 AM	3	7	1	3	2	5	2	0	5	0	3	1	32	0	2	1	0
8:00 AM	3	9	0	1	13	2	3	0	3	1	2	2	39	0	8	2	0
8:15 AM	2	11	1	0	6	0	3	0	1	0	2	0	26	0	0	2	0
8:30 AM	1	13	0	0	3	3	5	0	1	0	1	0	27	0	0	0	0
8:45 AM	2	12	0	1	6	0	3	1	0	0	1	1	27	0	1	0	0
Total Survey	23	87	2	8	45	20	28	1	14	4	11	5	248	2	16	7	1

Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total	Pedestrians Crosswalk			
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West
Volume	54	38	92	44	54	98	24	34	58	10	6	16	132	1	14	5	1
%HV	3.7%			9.1%			20.8%			0.0%			8.3%				
PHF	0.84			0.69			0.86			0.50			0.85				

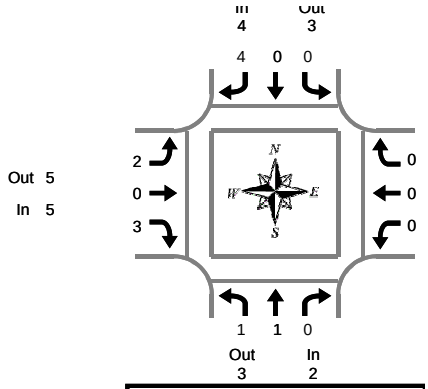
By Movement	Northbound S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	14	39	1	5	25	14	12	0	12	1	6	3	132
%HV	7.1%	2.6%	0.0%	0.0%	0.0%	28.6%	16.7%	0.0%	25.0%	0.0%	0.0%	0.0%	8.3%
PHF	0.70	0.75	0.25	0.42	0.48	0.70	0.75	0.00	0.60	0.25	0.50	0.38	0.85

Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Interval Total	Pedestrians Crosswalk			
	L	T	R	L	T	R	L	T	R	L	T	R		North	South	East	West
7:00 AM	15	42	1	6	17	15	14	0	9	3	5	2	129	2	7	3	1
7:15 AM	14	39	1	5	25	14	12	0	12	1	6	3	132	1	14	5	1
7:30 AM	11	40	2	5	28	11	12	0	10	1	8	3	131	1	13	7	0
7:45 AM	9	40	2	4	24	10	13	0	10	1	8	3	124	0	10	5	0
8:00 AM	8	45	1	2	28	5	14	1	5	1	6	3	119	0	9	4	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Locust St & SE 2nd Ave

Wednesday, April 04, 2012
7:00 AM to 9:00 AM

Peak Hour Summary
7:15 AM to 8:15 AM

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
7:15 AM	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0	2
7:30 AM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	2	2	1	0	1	2	0	0	0	0	4
8:00 AM	1	0	0	1	0	0	0	0	0	0	2	2	0	0	0	0	3
8:15 AM	1	2	0	3	0	1	0	1	2	0	0	2	0	0	0	0	6
8:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	3	3	0	6	0	1	6	7	4	0	3	7	0	0	0	0	20

Heavy Vehicle Peak Hour Summary
7:15 AM to 8:15 AM

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	3	5	4	3	7	5	5	10	0	0	0	11
PHF	0.13			0.25			0.21			0.00			0.21

By Movement	Northbound S Locust St				Southbound S Locust St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	1	0	2	0	0	4	4	2	0	3	5	0	0	0	0	11
PHF	0.13	0.13	0.00	0.13	0.00	0.00	0.25	0.25	0.17	0.00	0.25	0.21	0.00	0.00	0.00	0.00	0.21

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

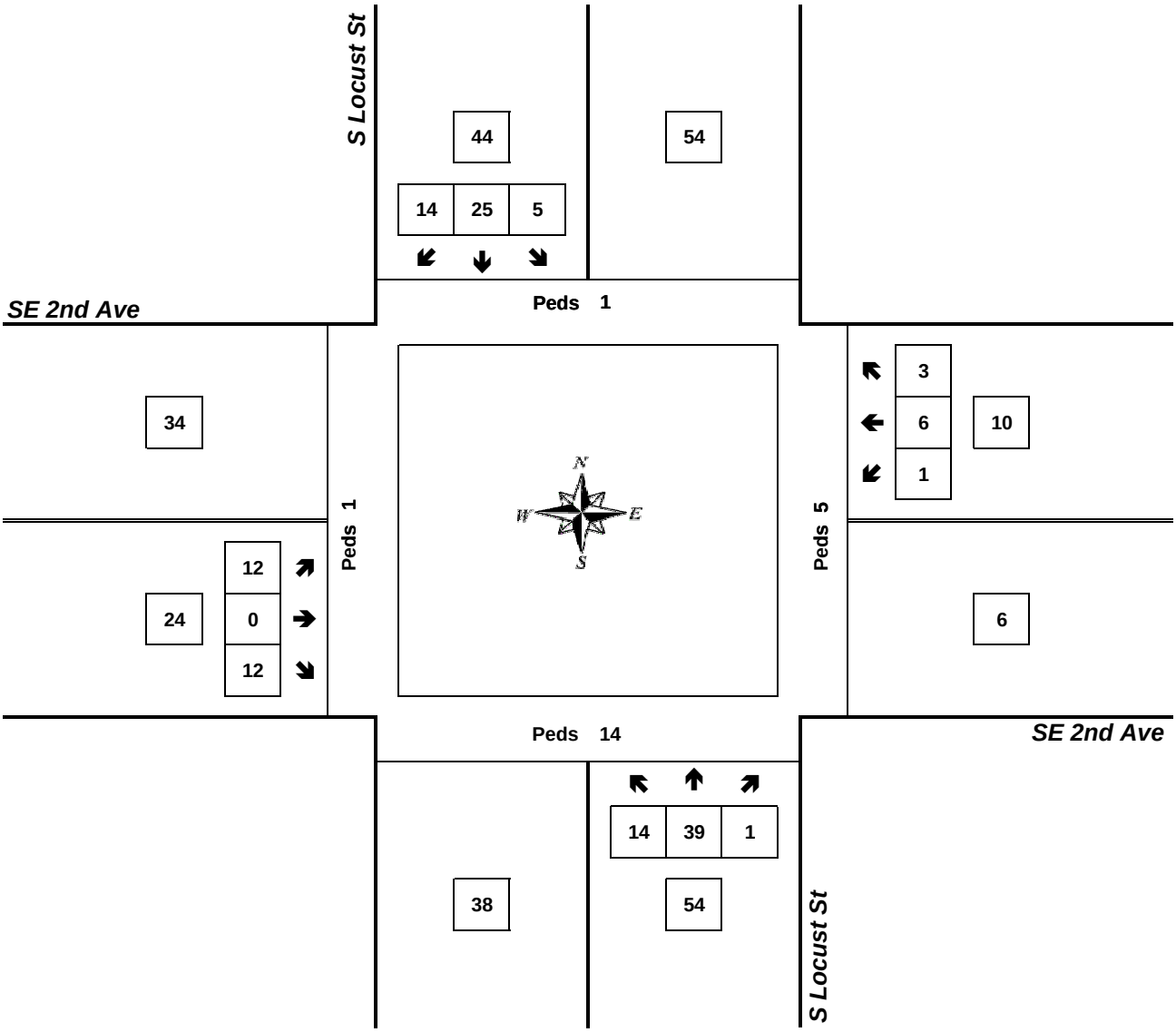
Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	1	1	0	2	0	0	5	5	2	0	1	3	0	0	0	0	10
7:15 AM	1	1	0	2	0	0	4	4	2	0	3	5	0	0	0	0	11
7:30 AM	2	2	0	4	0	1	4	5	3	0	3	6	0	0	0	0	15
7:45 AM	2	2	0	4	0	1	3	4	3	0	3	6	0	0	0	0	14
8:00 AM	2	2	0	4	0	1	1	2	2	0	2	4	0	0	0	0	10

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Locust St & SE 2nd Ave

7:15 AM to 8:15 AM
Wednesday, April 04, 2012

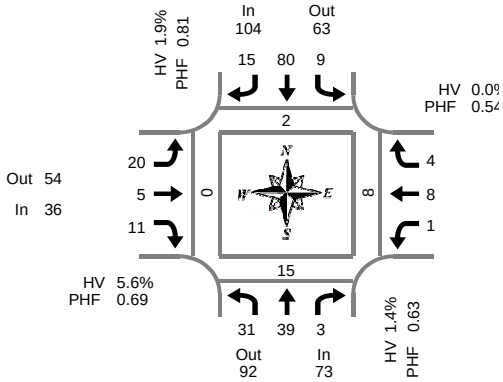


Approach	PHF	HV%	Volume
EB	0.86	20.8%	24
WB	0.50	0.0%	10
NB	0.84	3.7%	54
SB	0.69	9.1%	44
Intersection	0.85	8.3%	132

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Locust St & SE 2nd Ave

Wednesday, April 04, 2012
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 S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Interval Total
	L	T	R	L	T	R	L	T	R	L	T	R	
4:00 PM	1	9	0	4	17	5	2	2	1	1	4	1	47
4:15 PM	3	6	0	1	15	3	8	0	2	0	1	1	40
4:30 PM	15	12	2	3	16	6	3	1	2	1	4	0	65
4:45 PM	5	10	0	2	22	1	8	1	4	0	1	1	55
5:00 PM	6	8	1	3	22	7	7	2	3	0	0	0	59
5:15 PM	5	9	0	1	20	1	2	1	2	0	3	3	47
5:30 PM	12	7	2	3	23	5	5	0	4	1	1	0	63
5:45 PM	3	9	0	2	20	2	2	1	7	0	1	1	48
Total Survey	50	70	5	19	155	30	37	8	25	3	15	7	424

Pedestrians Crosswalk			
North	South	East	West
0	5	3	0
1	10	0	2
0	4	3	0
0	5	1	0
2	4	3	0
0	2	1	0
2	2	0	3
0	3	1	0
5	35	12	5

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

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	73	92	165	104	63	167	36	54	90	13	17	30	226
%HV	1.4%			1.9%			5.6%			0.0%			2.2%
PHF	0.63			0.81			0.69			0.54			0.87

Pedestrians Crosswalk			
North	South	East	West
2	15	8	0

By Movement	Northbound S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	31	39	3	9	80	15	20	5	11	1	8	4	226
%HV	3.2%	0.0%	0.0%	0.0%	1.3%	6.7%	5.0%	0.0%	9.1%	0.0%	0.0%	0.0%	2.2%
PHF	0.52	0.81	0.38	0.75	0.91	0.54	0.63	0.63	0.69	0.25	0.50	0.33	0.87

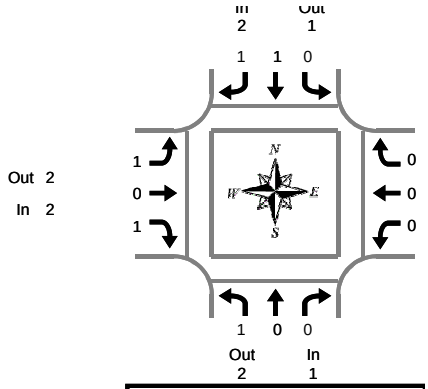
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Interval Total
	L	T	R	L	T	R	L	T	R	L	T	R	
4:00 PM	24	37	2	10	70	15	21	4	9	2	10	3	207
4:15 PM	29	36	3	9	75	17	26	4	11	1	6	2	219
4:30 PM	31	39	3	9	80	15	20	5	11	1	8	4	226
4:45 PM	28	34	3	9	87	14	22	4	13	1	5	4	224
5:00 PM	26	33	3	9	85	15	16	4	16	1	5	4	217

Pedestrians Crosswalk			
North	South	East	West
1	24	7	2
3	23	7	2
2	15	8	0
4	13	5	3
4	11	5	3

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



S Locust St & SE 2nd Ave

Wednesday, April 04, 2012
4:00 PM to 6:00 PM

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

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	2
4:30 PM	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
5:30 PM	0	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	0	0	1	0	3	1	4	3	0	1	4	0	0	0	0	9

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound S Locust St			Southbound S Locust St			Eastbound SE 2nd Ave			Westbound SE 2nd Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	2	3	2	1	3	2	2	4	0	0	0	5
PHF	0.25			0.25			0.17			0.00			0.25

By Movement	Northbound S Locust St				Southbound S Locust St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	0	1	0	1	1	2	1	0	1	2	0	0	0	0	5
PHF	0.25	0.00	0.00	0.25	0.00	0.13	0.25	0.25	0.13	0.00	0.25	0.17	0.00	0.00	0.00	0.00	0.25

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

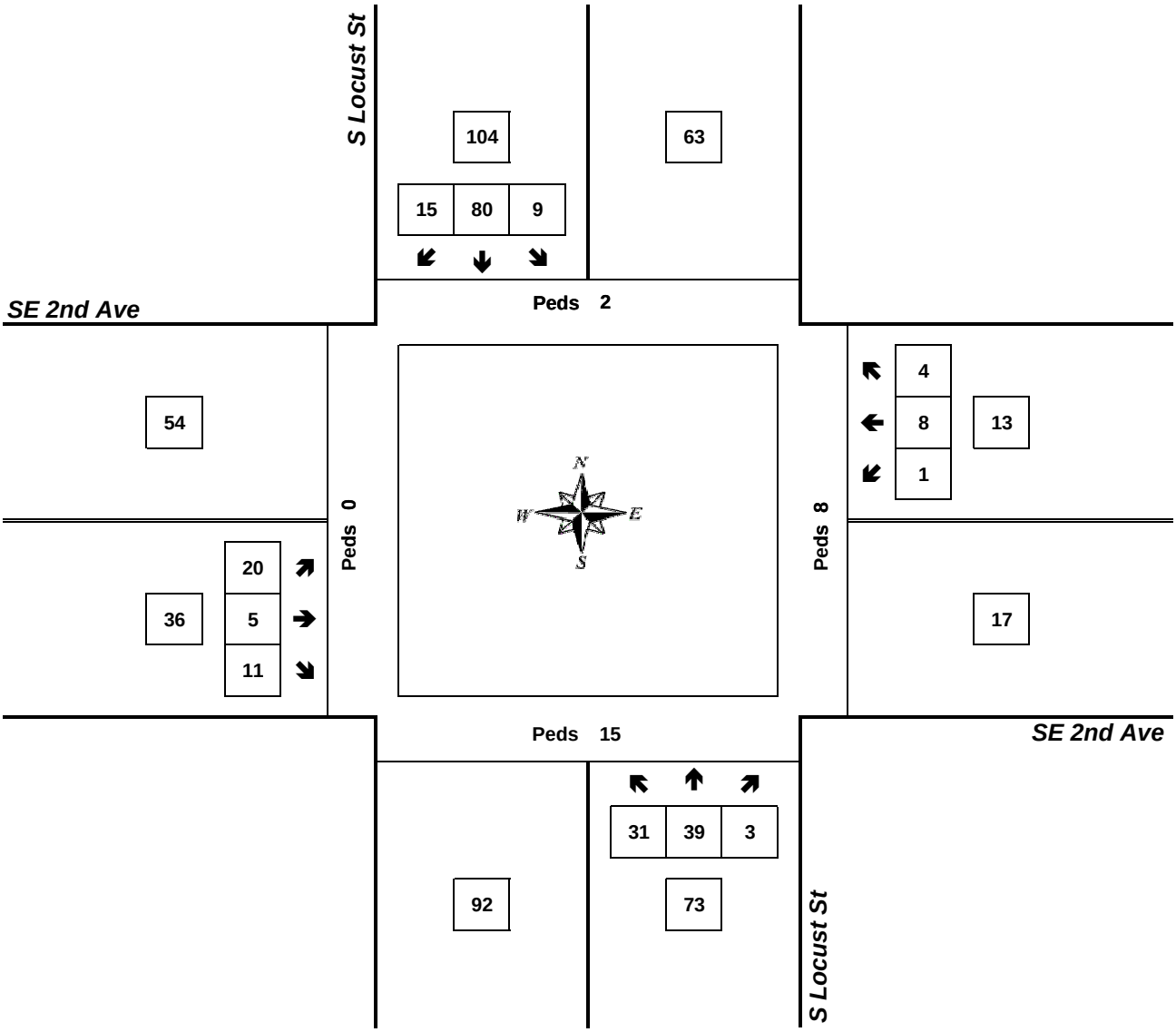
Interval Start Time	Northbound S Locust St				Southbound S Locust St				Eastbound SE 2nd Ave				Westbound SE 2nd Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	0	0	1	0	2	0	2	1	0	0	1	0	0	0	0	4
4:15 PM	1	0	0	1	0	2	1	3	2	0	0	2	0	0	0	0	6
4:30 PM	1	0	0	1	0	1	1	2	1	0	1	2	0	0	0	0	5
4:45 PM	0	0	0	0	0	1	1	2	2	0	1	3	0	0	0	0	5
5:00 PM	0	0	0	0	0	1	1	2	2	0	1	3	0	0	0	0	5

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

S Locust St & SE 2nd Ave

4:30 PM to 5:30 PM
Wednesday, April 04, 2012



Approach	PHF	HV%	Volume
EB	0.69	5.6%	36
WB	0.54	0.0%	13
NB	0.63	1.4%	73
SB	0.81	1.9%	104
Intersection	0.87	2.2%	226

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

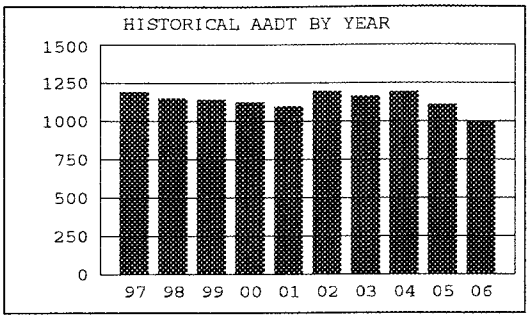
APPENDIX D
SEASONAL
ADJUSTMENT

2011 ATR CHARACTERISTIC TABLE (Printed: 10/27/11)										
SEASONAL TRAFFIC TREND	**AREA TYPE**	**# OF LANES**	**WEEKLY TRAFFIC TREND**	**AADT**	**OHP CLASSIFICATION**	**ATR**	**COUNTY**	**HIGHWAY ROUTE, NAME, & LOCATION**	**MP**	**STATE HIGHWAY NUMBER**
COMMUTER	SMALL URBAN	5	WEEKDAY	22500	REGIONAL HIGHWAY	**18-018**	KLAMATH	OR39, KLAMATH FALLS-MALLIN HWY, 0.46 MILES SOUTH OF MAIN STREET	-4.00	50

Location: OR140 MP 44.98, KLAMATH FALLS-LAKEVIEW HWY, NO. 20 Recorder: BEATTY, 18-017
4.20 miles east of Yellow Jacket Springs Rd Installed: January, 1958

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1997	1192	191	16.4	14.4	13.3	12.8
1998	1151	212	17.5	14.5	13.4	13.0
1999	1143	208	17.9	14.8	13.6	12.9
2000	1125	187	16.1	13.8	12.9	12.7
2001	1098	190	16.3	14.2	13.3	12.6
2002	1196	187	15.6	13.8	13.1	12.6
2003	1163	196	16.6	13.8	12.7	12.5
2004	1191	182	30.8	13.5	12.7	12.3
2005	1107	181	15.4	13.5	13.0	12.5
2006	997	183	16.2	14.0	13.3	12.7



2006 TRAFFIC DATA

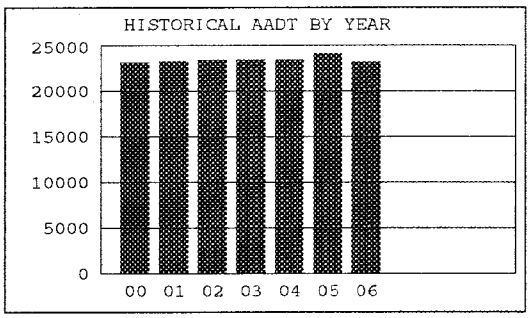
	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	709	71	656	66
February	817	82	784	79
March	793	80	751	75
April	881	88	859	86
May	1042	105	1043	105
June	1280	128	1255	126
July	1323	133	1324	133
August	1330	133	1311	131
September	1270	127	1274	128
October	1158	116	1152	116
November	822	82	823	83
December	770	77	732	73

Classification Breakdown	Percent of ADT
Passenger Cars	21.4
Other 2 axle 4 tire vehicles	55.0
Single Unit 2 axle 6 tire	6.9
Single Unit 3 axle	5.0
Single Unit 4 axle or more	0.1
Single Trailer Truck 4 axle or less	0.0
Single Trailer Truck 5 axle	7.8
Single Trailer Truck 6 axle or more	0.3
Dbl-Trailer Truck 5 axle or less	1.1
Dbl-Trailer Truck 6 axle	0.0
Dbl-Trailer Truck 7 axle or more	0.9
Triple Trailer Trucks	0.0
Buses	1.2
Motorcycles & Scooters	0.3

Location: OR39/US97B MP -4.00, K FALLS-MALIN HWY, NO. 50 Recorder: KLAMATH FALLS, 18-018
0.46 mile south of Main St Installed: November, 1999

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	23138	125	11.2	10.6	10.4	10.2
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	****	****	****	****



2006 TRAFFIC DATA

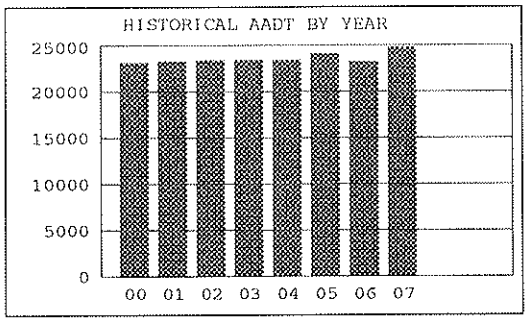
	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	20828	90	18771	81
February	22785	98	20484	88
March	22480	97	20266	87
April	24249	105	21924	94
May	26591	115	24629	106
June	27692	119	25314	109
July	26358	114	24319	105
August	26707	115	24153	104
September	29745	128	26831	116
October	29335	126	26431	114
November	25510	110	23051	99
December	23965	103	22245	96

Classification Breakdown	Percent of ADT
Passenger Cars	39.5
Other 2 axle 4 tire vehicles	56.4
Single Unit 2 axle 6 tire	1.8
Single Unit 3 axle	0.4
Single Unit 4 axle or more	0.0
Single Trailer Truck 4 axle or less	0.0
Single Trailer Truck 5 axle	0.7
Single Trailer Truck 6 axle or more	0.1
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.0
Dbl-Trailer Truck 7 axle or more	0.1
Triple Trailer Trucks	0.0
Buses	0.7
Motorcycles & Scooters	0.3

Location: OR39-US97BUS MP -4.00, K-FALLS-MALIN HWY, NO. 50 Recorder: KLAMATH FALLS, 18-018
0.46 miles south of Main St Installed: November, 1999

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	23138	125	11.2	10.6	10.4	10.2
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	****	****	****	****
2007	24757	131	11.6	10.6	10.5	10.4



2007 TRAFFIC DATA

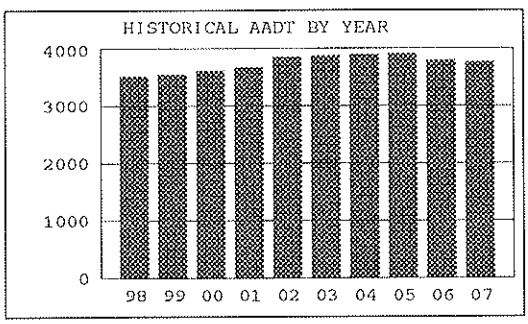
	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	24507	99	22528	91
February	25040	101	22880	92
March	26201	106	24001	97
April	28470	115	25708	104
May	28797	116	26142	106
June	29643	120	26920	109
July	27687	112	25242	102
August	28088	113	25452	103
September	28861	117	26166	106
October	29132	118	26324	106
November	27012	109	24426	99
December	23211	94	21294	86

Classification Breakdown	Percent of ADT
Passenger Cars	67.6
Other 2 axle 4 tire vehicles	28.5
Single Unit 2 axle 6 tire	1.4
Single Unit 3 axle	0.4
Single Unit 4 axle or more	0.1
Single Trailer Truck 4 axle or less	0.3
Single Trailer Truck 5 axle	0.5
Single Trailer Truck 6 axle or more	0.1
Dbl-Trailer Truck 5 axle or less	0.0
Dbl-Trailer Truck 6 axle	0.0
Dbl-Trailer Truck 7 axle or more	0.1
Triple Trailer Trucks	0.0
Buses	0.6
Motorcycles & Scooters	0.5

Location: US97 MP 291.73, THE DALLES-CALIFORNIA HWY, NO. 4 Recorder: MIDLAND, 18-019
At the Oregon-California State Line Installed: January, 1955

HISTORICAL TRAFFIC DATA

Year	Average Daily Traffic	Percent_of_ADT Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1998	3515	160	14.3	12.0	11.6	11.2
1999	3544	162	13.2	12.0	11.3	11.0
2000	3616	163	12.9	11.6	11.2	10.9
2001	3669	150	14.6	12.1	11.7	11.4
2002	3848	162	14.8	12.8	11.8	11.5
2003	3869	159	14.3	12.4	11.7	11.3
2004	3884	154	13.3	12.3	11.5	11.2
2005	3901	170	20.1	13.0	12.1	11.8
2006	3786	169	16.7	12.1	11.5	11.3
2007	3755	147	14.0	12.2	11.8	11.5



2007 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	2807	75	2769	74
February	2734	73	2810	75
March	3233	86	3350	89
April	3590	96	3662	98
May	3967	106	3973	106
June	4377	117	4528	121
July	4557	121	4774	127
August	4511	120	4726	126
September	4159	111	4156	111
October	3840	102	3857	103
November	3504	93	3565	95
December	2810	75	2893	77

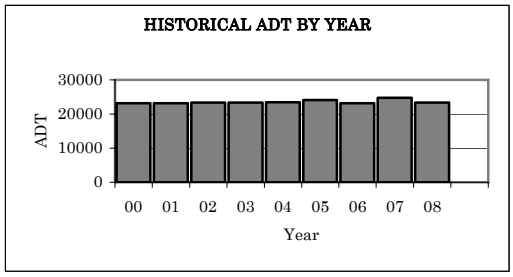
Classification Breakdown	Percent of ADT
Passenger Cars	34.8
Other 2 axle 4 tire vehicles	27.6
Single Unit 2 axle 6 tire	8.6
Single Unit 3 axle	1.4
Single Unit 4 axle or more	0.0
Single Trailer Truck 4 axle or less	2.5
Single Trailer Truck 5 axle	23.3
Single Trailer Truck 6 axle or more	0.3
Dbl-Trailer Truck 5 axle or less	0.2
Dbl-Trailer Truck 6 axle	0.3
Dbl-Trailer Truck 7 axle or more	0.0
Triple Trailer Trucks	0.0
Buses	0.3
Motorcycles & Scooters	0.7

Location: OR39; MP -4.00; KLAMATH FALLS-MALIN HIGHWAY NO. 50; 0.46 mile south of Main Street

Site Name: Klamath Falls (18-018)
Installed: November, 1999

HISTORICAL TRAFFIC DATA

			Percent of AADT			
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	23138	125	11.2	10.6	10.4	10.2
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	***	***	***	***
2007	24757	131	11.6	10.6	10.5	10.4
2008	23409	131	10.8	10.4	10.3	10.2



2008 TRAFFIC DATA

	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	22166	95	20556	88
February	24464	105	21574	92
March	25172	108	22751	97
April	26888	115	24295	104
May	26774	114	24622	105
June	26491	113	24285	104
July	25518	109	22807	97
August	25267	108	22927	98
September	26814	115	24978	107
October	29187	125	26905	115
November	27376	117	25210	108
December	23000	98	20000	85

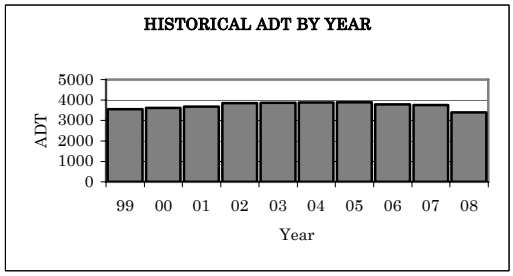
Classification Breakdown	Percent of AADT
Motorcyles	0.5
Passenger cars	67.6
Light Trucks	28.5
Buses	0.6
Single unit trucks (2 axles)	1.4
Single unit trucks (3 axles)	0.4
Single unit trucks (4 or more axles)	0.1
Single trailer trucks (4 or less axles)	0.3
Single trailer trucks (5 axles)	0.5
Single trailer trucks (6 or more axles)	0.1
Multi trailer trucks (5 or less axles)	0.0
Multi trailer trucks (6 axles)	0.0
Multi trailer trucks (7 or more axles)	0.1

Location: US97; MP 291.73; THE DALLES-CALIFORNIA HIGHWAY NO. 4; At the Oregon-California State Line

Site Name: Midland (18-019)
Installed: January, 1955

HISTORICAL TRAFFIC DATA

			Percent of AADT			
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
1999	3544	162	13.2	12.0	11.3	11.0
2000	3616	163	12.9	11.6	11.2	10.9
2001	3669	150	14.6	12.1	11.7	11.4
2002	3848	162	14.8	12.8	11.8	11.5
2003	3869	159	14.3	12.4	11.7	11.3
2004	3884	154	13.3	12.3	11.5	11.2
2005	3901	170	20.1	13.0	12.1	11.8
2006	3786	169	16.7	12.1	11.5	11.3
2007	3755	147	14.0	12.2	11.8	11.5
2008	3402	159	15.1	13.0	12.1	11.7



2008 TRAFFIC DATA

	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	2201	65	2194	64
February	2576	76	2519	74
March	2982	88	3084	91
April	3079	91	3174	93
May	3593	106	3582	105
June	4000	118	4120	121
July	4324	127	4395	129
August	4152	122	4300	126
September	3778	111	3796	112
October	3768	111	3742	110
November	3247	95	3327	98
December	2619	77	2591	76

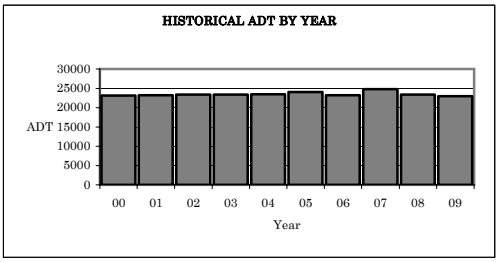
Classification Breakdown	Percent of AADT
Motorcyles	0.7
Passenger cars	33.7
Light Trucks	27.5
Buses	0.3
Single unit trucks (2 axles)	9.9
Single unit trucks (3 axles)	0.9
Single unit trucks (4 or more axles)	0.0
Single trailer trucks (4 or less axles)	2.6
Single trailer trucks (5 axles)	23.7
Single trailer trucks (6 or more axles)	0.3
Multi trailer trucks (5 or less axles)	0.2
Multi trailer trucks (6 axles)	0.3
Multi trailer trucks (7 or more axles)	0.0

Location: OR39; MP -4.00; KLAMATH FALLS-MALIN HIGHWAY NO. 50; 0.46 mile south of Main Street

Site Name: Klamath Falls (18-018)
Installed: November, 1999

HISTORICAL TRAFFIC DATA

			Percent of ADT			
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	23138	125	11.2	10.6	10.4	10.2
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	***	***	***	***
2007	24757	131	11.6	10.6	10.5	10.4
2008	23409	131	10.8	10.4	10.3	10.2
2009	22965	128	12.6	10.2	10.1	10.0



2009 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	26336	115	24425	106
February	26400	115	24500	107
March	24395	106	22076	96
April	26366	115	23979	104
May	25925	113	23749	103
June	26022	113	23827	104
July	25165	110	22537	98
August	25082	109	22781	99
September	24666	107	22445	98
October	25456	111	23374	102
November	24003	105	21674	94
December	22810	99	20209	88

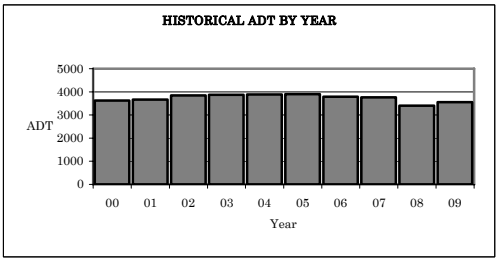
Classification Breakdown	Percent of ADT
Motorcyles	0.48
Passenger cars	67.62
Light Trucks	28.50
Buses	0.58
Single unit trucks (2 axles)	1.38
Single unit trucks (3 axles)	0.41
Single unit trucks (4 or more axles)	0.05
Single trailer trucks (4 or less axles)	0.32
Single trailer trucks (5 axles)	0.46
Single trailer trucks (6 or more axles)	0.13
Multi trailer trucks (5 or less axles)	0.01
Multi trailer trucks (6 axles)	0.00
Multi trailer trucks (7 or more axles)	0.06

Location: US97; MP 291.73; THE DALLES-CALIFORNIA HIGHWAY NO. 4; At the Oregon-California State Line

Site Name: Midland (18-019)
Installed: January, 1955

HISTORICAL TRAFFIC DATA

			Percent of ADT			
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2000	3616	163	12.9	11.6	11.2	10.9
2001	3669	150	14.6	12.1	11.7	11.4
2002	3848	162	14.8	12.8	11.8	11.5
2003	3869	159	14.3	12.4	11.7	11.3
2004	3884	154	13.3	12.3	11.5	11.2
2005	3901	170	20.1	13.0	12.1	11.8
2006	3786	169	16.7	12.1	11.5	11.3
2007	3755	147	14.0	12.2	11.8	11.5
2008	3402	159	15.1	13.0	12.1	11.7
2009	3550	157	14.5	12.9	12.2	11.8



2009 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	2483	70	2540	72
February	2525	71	2564	72
March	2842	80	2969	84
April	3308	93	3408	96
May	3734	105	3754	106
June	4258	120	4403	124
July	4503	127	4624	130
August	4421	125	4559	128
September	3976	112	4019	113
October	3702	104	3785	107
November	3255	92	3241	91
December	2783	78	2729	77

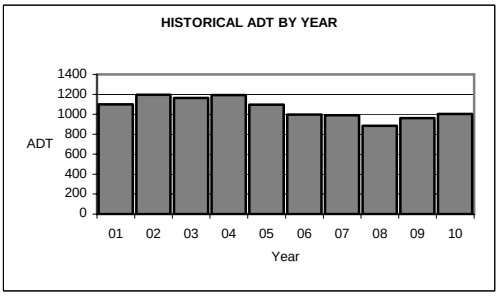
Classification Breakdown	Percent of ADT
Motorcyles	0.62
Passenger cars	32.93
Light Trucks	28.34
Buses	0.31
Single unit trucks (2 axles)	11.88
Single unit trucks (3 axles)	0.48
Single unit trucks (4 or more axles)	0.02
Single trailer trucks (4 or less axles)	2.77
Single trailer trucks (5 axles)	21.94
Single trailer trucks (6 or more axles)	0.23
Multi trailer trucks (5 or less axles)	0.23
Multi trailer trucks (6 axles)	0.24
Multi trailer trucks (7 or more axles)	0.01

Location: OR140; MP 44.98; KLAMATH FALLS-LAKEVIEW HIGHWAY NO. 20; 4.20 miles east of Yellow Jacket Springs Road at Beatty

Site Name: Beatty (18-017)
Installed: December, 1969

HISTORICAL TRAFFIC DATA

		Percent of ADT				
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2001	1098	190	16.3	14.2	13.3	12.6
2002	1196	187	15.6	13.8	13.1	12.6
2003	1163	196	16.6	13.8	12.7	12.5
2004	1191	182	30.8	13.5	12.7	12.3
2005	1095	183	15.5	13.6	13.1	12.6
2006	997	183	16.2	14.0	13.3	12.7
2007	991	179	16.3	14.3	13.2	12.9
2008	884	173	17.9	13.9	13.2	12.9
2009	962	***	***	***	***	***
2010	1004	***	***	***	***	***



2010 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	600	60	600	60
February	650	65	650	65
March	700	70	700	70
April	750	75	750	75
May	950	95	950	95
June	1293	129	1314	131
July	1455	145	1416	141
August	1407	140	1391	139
September	1396	139	1396	139
October	1200	120	1226	122
November	946	94	910	91
December	774	77	740	74

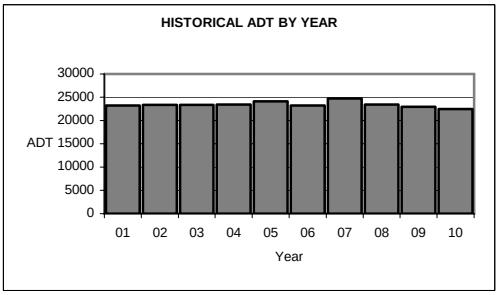
Classification Breakdown	Percent of ADT
Motorcyles	1.98
Passenger cars	43.11
Light Trucks	25.51
Buses	0.95
Single unit trucks (2 axles)	16.01
Single unit trucks (3 axles)	0.74
Single unit trucks (4 or more axles)	0.00
Single trailer trucks (4 or less axles)	6.96
Single trailer trucks (5 axles)	3.78
Single trailer trucks (6 or more axles)	0.39
Multi trailer trucks (5 or less axles)	0.35
Multi trailer trucks (6 axles)	0.04
Multi trailer trucks (7 or more axles)	0.18

Location: OR39/US97Bus MP -4.00; KLAMATH FALLS-MALIN HIGHWAY NO. 50; 0.46 mile south of Main Street

Site Name: Klamath Falls (18-018)
Installed: November, 1999

HISTORICAL TRAFFIC DATA

		Percent of ADT				
Year	Average Daily Traffic	Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2001	23222	127	11.3	10.6	10.4	10.4
2002	23376	125	10.9	10.5	10.4	10.3
2003	23385	127	10.5	10.3	10.1	10.0
2004	23432	125	10.5	10.1	10.0	9.9
2005	24085	129	11.0	10.4	10.3	10.1
2006	23202	***	***	***	***	***
2007	24757	131	11.6	10.6	10.5	10.4
2008	23409	131	10.8	10.4	10.3	10.2
2009	22965	128	12.6	10.2	10.1	10.0
2010	22496	130	10.8	10.4	10.3	10.2



2010 TRAFFIC DATA

	Average Weekday Traffic	Percent of ADT	Average Daily Traffic	Percent of ADT
January	23817	106	21051	94
February	24463	109	22506	100
March	24357	108	22047	98
April	25705	114	23267	103
May	25837	115	23701	105
June	25903	115	23704	105
July	24906	111	22644	101
August	24941	111	22627	101
September	25327	113	22972	102
October	26589	118	24336	108
November	23887	106	21344	95
December	22340	99	19758	88

Classification Breakdown	Percent of ADT
Motorcyles	0.81
Passenger cars	70.34
Light Trucks	25.17
Buses	0.33
Single unit trucks (2 axles)	1.96
Single unit trucks (3 axles)	0.24
Single unit trucks (4 or more axles)	0.02
Single trailer trucks (4 or less axles)	0.26
Single trailer trucks (5 axles)	0.71
Single trailer trucks (6 or more axles)	0.10
Multi trailer trucks (5 or less axles)	0.00
Multi trailer trucks (6 axles)	0.00
Multi trailer trucks (7 or more axles)	0.06

ODOT SEASONAL ADJUSTMENT FACTOR (SAF) CALCULATION									
ATR 18-018	2006	2007	2008	2009	2010	MAX	MIN	AVERAGE	SAF
Peak Month (Month)	115% (Sep)	120% (Jun)	125% (Oct)	115% (Feb)	125% (Oct)	125%	115%	120%	
Count Month (May)	115%	116%	114%	113%	115%				
Count Month (June)	119%	120%	113%	113%	115%				**103.9%**
Count Month (May-June Average)	117%	118%	114%	113%	115%	118%	113%	115%	

APPENDIX E
IN-PROCESS TRAFFIC

MEMORANDUM

720 SW Washington St.
Suite 500
Portland, OR 97205
503.243.3500
www.dksassociates.com

DATE: April 25, 2013

TO: Bryan Brown, City of Canby

FROM: Chris Maciejewski, PE, PTOE
Steve Boice, EIT
Julie Sosnovske, PE

SUBJECT: **Canby Pro-Active Warehouse Expansion Traffic Analysis** P#11010-021-000

This memorandum summarizes the potential transportation impacts associated with the proposed expansion of the Pro-Active Sports Warehouse in Canby, Oregon. This memorandum has been prepared through our on-call services contract. The proposed warehouse expansion would add 12,000 square feet of warehouse space to the existing 23,000 square foot building. The additional warehouse space is intended to store sporting goods that are to be distributed from the facility. The project would also add 38 parking spaces, for a total of 71 on site spaces.

The project site is located at 1200 SE 2nd Avenue. The 2.21 acre site is zoned CM (Commercial/Manufacturing) and the intended use is consistent with the zoning. Existing vehicle access to the site is from SE 2nd Avenue at SE Pine Street. A second access is proposed along SE 3rd Avenue by means of a 30 foot access agreement with the property located to the east. This access is intended for the use of trucks to access the proposed loading dock associated with the expansion. It was determined that the proposed expansion would not generate enough traffic to warrant an off-site transportation impact analysis, however, estimated project trip generation and a review of site access and circulation are documented below.

Project Trip Generation

The amount of new vehicle trips generated by the proposed warehouse expansion was estimated using trip generation estimates published in the ITE Trip Generation Manual for similar land use type[1]. Trip generation estimates for the proposed warehouse expansion are provided for daily, morning and the evening peak hours and are summarized in Table 1. The applicant has indicated that the expansion would be associated with an increase of 2-3 employees at the site[2] (included in the warehouse trip generation estimate). Since the additional morning and evening peak hour trip generation is relatively low (less than 5 trips during each peak hour), no off-site impacts were evaluated.

---

[1] Trip Generation Manual, Institute of Transportation Engineers, 9th Edition.
[2] Preapplication submittal, VLMK Consulting Engineers, February 15, 3013.

Table 1: Proposed Project Trip Generation Estimate

Land Use/ ITE Code	Period	Trip Rate	Trips In	Trips Out	Total Trips
12.0 KSF* Warehouse ITE Code 150	Daily	3.56/KSF	22	21	43
	AM Peak Hour	0.30/KSF	3	1	4
	PM Peak Hour	0.32/KSF	1	3	4

* KSF = thousand square feet

Site Access and Circulation Review

The proposed shared access located on SE 3rd Street is intended for the use of trucks to access the proposed warehouse loading dock. Trucks are proposed to enter the site from SE 3rd Street and exit onto SE 2nd Street. These accesses were evaluated for safety. A site visit was made to ensure that adequate intersection sight distance is provided and that all vision triangles are clear from any obstructions. SE 3rd Street and SE Pine Street are both posted at 25 miles per hour (mph). Table 2 summarizes sight distance requirements at both the site access to SE 3rd Avenue and the SE 2nd Avenue/SE Pine Street intersection. Both accesses meet sight distance requirements based on the posted speed of 25 mph.

Table 2: Intersection Sight Distance at Project Accesses to SE Pine Street and to SE 3rd Avenue

Access	Posted Speed	Turning	Sight Distance Required[3]	Sight Distance Provided	Sight Distance Adequate?
SE 2nd Avenue at SE Pine Street (Existing Access)	25 mph	Left	280 ft.	280 ft	Yes
		Right	240 ft.	280 ft	Yes
Proposed Shared Access at SE 3rd Street	25 mph	Left	280 ft.	400 ft	Yes
		Right	240 ft.	400 ft	Yes

Internal circulation for trucks accessing and leaving the loading dock was also examined to ensure that there is adequate accessibility within the site as well as at the site access points to the public street system. Design vehicle turning templates were provided by the applicant for a 65 foot truck and are attached. It is our understanding that although the proposed project would utilize medium sized trucks, there is the potential for large tractor-trailer trucks

[3] A Policy on Geometric Design of Highways and Streets, AASHTO, 2011, Intersection Sight Distance, based on posted speed of 25 mph.

to access the site in the future. Based on the turning templates provided by the applicant, it appears that the site could accommodate larger trucks (65 foot) entering from SE 3rd Street via the proposed access easement with the property to the east and exiting via SE 2nd Avenue to Pine Street. However; it should be noted that due to truck overtracking, there would not be adequate width at the two site access points (access to SE 2nd Avenue and access easement with the property located to the east) to accommodate continuous two-way traffic within the site. Therefore, opposing vehicles would need to yield to trucks entering/exiting (or trucks would need to wait for opposing vehicles to clear) at these two locations.

A review of truck turning movements was not completed at the proposed access easement where it intersects with SE 3rd Avenue, which is a connection to a collector roadway. Driveway width and curb radius at this location should be reviewed by the City Engineer to determine if width and curb radius standards are met and if improvements would be required.

If you have any questions, please feel free to call or email.

EXISTING BLAC

EXISTING (12.0'

N 00°03'00"W 270.48'

S.E. 2ND AVENUE

PROPOSED ADD'N.

12,000 SF.

160'

200'

20'

35'

76'

75'

PARCEL 3
PARTITION PLAT
NO. 1997-077

FUTURE OFFICE

O/W

VAN

6"DEC

4"DEC

LARGEST TRUCK 65.0'

10' R.

30' R.

20' R.

29.2'

30'

270.48'

GV

CP

TMP

TP

S 89°57'00"W 355.60'

PVC STUB 2X2.5"

Canby Library
Transportation Impact Analysis

Prepared for:

City of Canby

Prepared by:

DKS

February 2013

DKS

DATE: February 27, 2013

TO: Bill Harper, Francis C. Berg / Architect P.C.

FROM: Chris Maciejewski, P.E., DKS
Steve Boice, DKS
Kevin Chewuk, DKS

SUBJECT: Canby Library Transportation Impact Analysis

Dear Bill,

DKS is pleased to submit this transportation impact analysis for the proposed Canby Public Library, to be located in the block bounded by NW 2nd Avenue to the north, NW 1st Avenue to the south, N Ivy Street to the east and N Holly Street to the west. This report meets the guidelines defined by the City of Canby for Transportation Impact Analysis.

Please contact either Steve Boice or myself with questions regarding this report.

Sincerely,

Chris Maciejewski, P.E.
Principal

720 SW Washington Street, Suite 500
Portland, OR 97205
(503) 243-3500 **Phone**
(503) 243-1934 **Fax**
www.dksassociates.com

Contents

Tables

Figures

Introduction

The purpose of this transportation impact study is to identify potential transportation system impacts (and potential mitigations) triggered by the proposed Canby Public Library. The proposed Canby Public Library will be located in the block bounded by NW 2nd Avenue to the north, NW 1st Avenue to the south, N Ivy Street to the east and N Holly Street to the west. The project site is located in Downtown Canby and is currently occupied by the City Hall/Council Chamber building, City Administrative building, Canby Area Transit building, and the old Police Station building.

As proposed, the City Hall/Council Chamber building would be renovated, while the remaining structures would be removed and replaced with a 22,600 square foot library. The employees and services currently occupying City Hall, the City Administrative building, and Canby Area Transit building will be relocated off-site.

Recommendations

Based upon the analysis presented in this report, the proposed project was found to not generate significant off-site traffic impacts. Therefore, no off-site mitigation is recommended for the proposed project as a result of traffic impacts. However, there are several site-access and circulation related conditions we recommend addressing to improve traffic flow and safety, including:

- Install "Do not enter" signage (MUTCD R5-1) at the exiting end of the one-way internal driveways, a "Right turn only" sign (MUTCD R3-5) to alert drivers leaving the driveway on the east side of the Canby Utility Board building, and a "No right turn" sign (MUTCD R3-1) to alert drivers leaving the book-drop window driveway.

- Provide a curb or buffer along the north side of the proposed east-west internal site driveway and the south building frontage of City Hall and the proposed Library.

- Consider prohibiting on-street parking along N Holly Street and NW 1st Avenue within 20-feet of site access locations, as recommended in the Manual on Uniform Traffic Control Devices (MUTCD) to improve intersection sight distance.

- Provide guide signing to the Library book-drop window from adjacent side streets (NW 1st Avenue and N Holly Street)

- Have the site designer/engineer verify the turn templates and internal circulation routes for the proposed design vehicle to ensure adequate on-site circulation.

Existing Conditions

The following section summarizes the existing transportation conditions within the study area. Included is an inventory of the existing transportation network, analysis of the recent study area collision history, and an operational analysis of study intersections.

Study Area

The study area is generally bounded by NW 3rd Avenue to the north, Highway 99E to the south, N Grant Street to the west, and N Ivy Street to the east. The following ten intersections have been identified as study area intersections, with their control listed:

- Highway 99E/N Grant Street (traffic signal)
- Highway 99E/N Ivy Street (traffic signal)
- N Ivy Street/NW 1st Avenue (three way stop)
- N Ivy Street/NW 2nd Avenue (all way stop)
- N Ivy Street/NW 3rd Avenue (two way stop)
- N Holly Street/NW 1st Avenue (all way stop)
- N Holly Street/NW 2nd Avenue (all way stop)
- N Grant Street/NW 1st Avenue (three way stop)
- N Grant Street/NW 2nd Avenue (all way stop)
- N Grant Street/NW 3rd Avenue (three way stop)

Pedestrian/Bicycle Facilities

An inventory of existing pedestrian and bicycle facilities was conducted to determine the current locations of sidewalks and bicycle lanes within the study area. For the purpose of this inventory, "bike lanes" included areas on roadways where shoulders were specifically designated for bicycle use through pavement markings, as well as other paved shoulders of at least five feet in width that could be used for bicycle travel. Table 2-1 shows the study area roadways with pedestrian and bicycle facilities.

Table 2-1: Existing Pedestrian and Bicycle Characteristics

Roadway	Sidewalks	Bike Facilities
Highway 99E (N Grant Street to N Ivy Street)	Both Sides	None
N Grant Street (Highway 99E to NW 3rd Avenue)	Both Sides	Bike lanes north of NW 3rd Avenue and south of Highway 99E
N Holly Street (NW 1st Avenue to NW 3rd Avenue)	Both Sides	None
N Ivy Street (Highway 99E to NW 3rd Avenue)	Both Sides	Bike lanes north of NW 1st Avenue and south of Highway 99E
NW 1st Avenue (N Grant Street to N Ivy Street)	Both Sides	None
NW 2nd Avenue (N Grant Street to N Ivy Street)	Both Sides	None
NW 3rd Avenue (N Grant Street to N Ivy Street)	Both Sides	Bike lanes east of N Ivy Street

Pedestrian and bicycle count data was also collected during the evening peak period at study area intersections. The highest hourly pedestrian activity during the evening peak period occurred at study intersections along N Grant Street between NW 2nd Avenue and NW 3rd Avenue and along N Ivy Street between Highway 99E and NW 2nd Street, with over 17 observed pedestrian crossings at each intersection in a single one-hour period between 4 and 6 p.m. [1] The highest hourly pedestrian activity levels at the study intersections during the evening peak period are displayed in Figure 2-1.

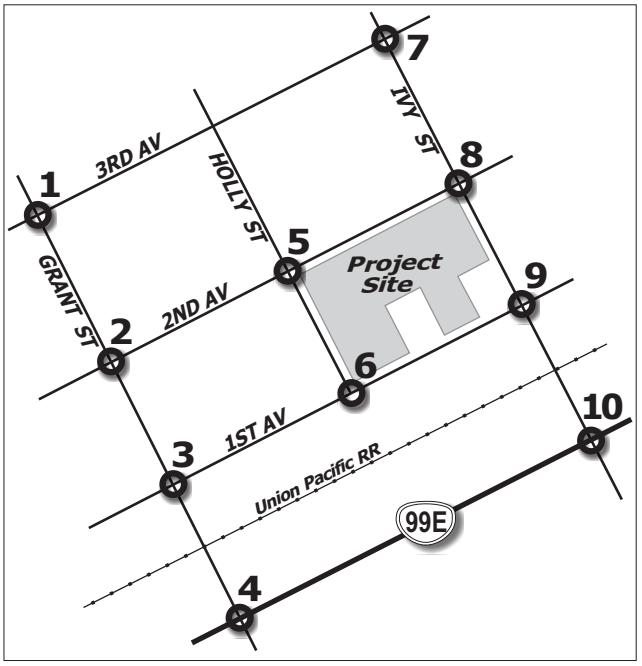
Bicycle activity within the study area is generally low during the evening peak period, with no bicyclists observed at several of the study intersections between 4 and 6 p.m.[2] The highest volumes occurred at study intersections along N Ivy Street and NW 1st Avenue, with hourly volumes ranging between one and two cyclists. The highest hourly bicycle activity levels at study intersections during the evening peak period are displayed in Figure 2-1.

Transit Facilities

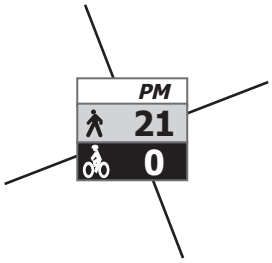
Canby Area Transit (CAT) provides commuter bus service between Oregon City and Woodburn. The route, referred to as the Orange Line-Route 99E, connects the study area to Oregon City, Woodburn, Hubbard and Aurora. Users within the study area can access the route via the Canby Transit Center, located one block to the east along NE 1st Avenue. Service is provided along the route between 5 a.m. and 8:30 p.m. with headways of approximately 1 to 1.5 hours, Monday through Friday.

Recent budget cuts led to the elimination of two local fixed bus routes within the city and a commuter connection to Wilsonville. However, all residents have access to a dial-a-ride service that will take them to any location within the urban growth boundary with 24-hour notice.

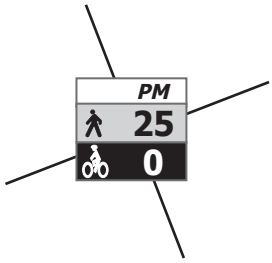
[1] Based on counts conducted during February 2013.
[2] Ibid



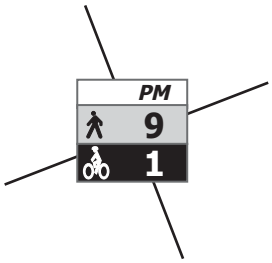
1. Grant St. & 3rd Ave.



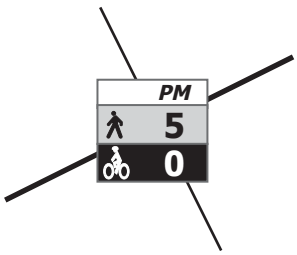
2. Grant St. & 2nd Ave.



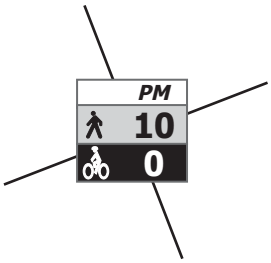
3. Grant St. & 1st Ave.



4. Grant St. & OR 99E



5. Holly St. & 2nd Ave.



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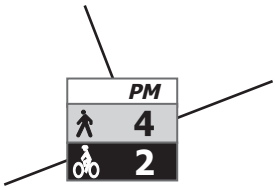
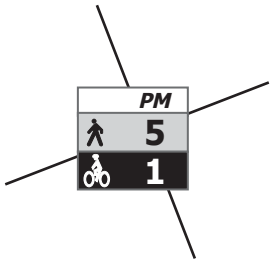


7. Ivy St. & 3rd. Ave.



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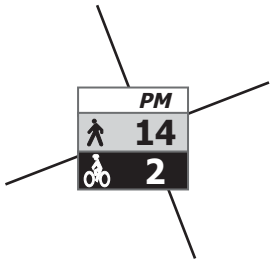
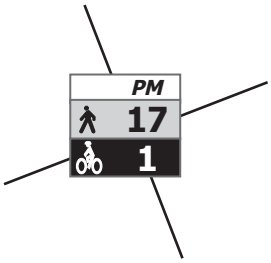
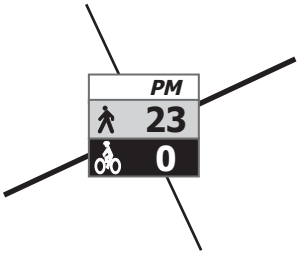


9. Ivy St. & 1st Ave.



10. Ivy St & OR 99E



LEGEND

#O - Study Intersection & Reference Number

PM
00 - Pedestrian Counts
00 - Bicycle Counts

DKS

No Scale

Figure **2-1**

PEDESTRIAN & BICYCLE PM PEAK HOUR VOLUMES

Motor Vehicle Facilities

Characteristics of the major roadways in the study area were documented and presented in Table 2-2. Data collected included functional classification, roadway cross-section, posted speed limits, and on-street parking.[3]

Highway 99E is the major roadway in the study area, running east-west connecting the study area to Oregon City and Woodburn. It is classified by the State as a Regional Highway, and has special transportation area (STA) and truck route designations.

N Grant and N Ivy Streets form the primary north-south travel routes through the study area. These roadways are classified by Canby as Arterials and generally maintain two-lane cross-sections (i.e. one through lane in each direction) through the study area, providing adequate motor vehicle circulation between Highway 99E and the neighborhoods north of the study area. All remaining roadways in the study area also have a two-lane cross-section.

Table 2-2: Existing Roadway Characteristics

Roadway	Jurisdiction	Canby/ ODOT Classification	Special Designations	Cross Section	Posed Speed (mph)	On-Street Parking
Highway 99E (N Grant Street to N Ivy Street)	ODOT	Regional Highway	Truck Route; Special Transportation Area	5 lanes	35	None
N Grant Street (Highway 99E to NW 3rd Avenue)	Canby	Arterial Roadway	None	2 lanes	25	Angled on both sides north of NW 1st Avenue
N Holly Street (NW 1st Avenue to NW 3rd Avenue)	Canby	Neighborhood Route	None	2 lanes	25	Both sides
N Ivy Street (Highway 99E to NW 3rd Avenue)	Canby	Arterial Roadway	Local Truck Route	2 lanes	25	Varies
NW 1st Avenue (N Grant Street to N Ivy Street)	Canby	Local Street	None	2 lanes	25	Both sides
NW 2nd Avenue (N Grant Street to N Ivy Street)	Canby	Local Street	None	2 lanes	25	Angled on both sides
NW 3rd Avenue (N Grant Street to N Ivy Street)	Canby	Collector Roadway	None	2 lanes	25	Both sides

[3] Based on a site visit by DKS staff on February 13, 2013

Existing Intersection Operations

This section covers the existing intersection operating conditions in the study area. Included is a description of the intersection performance measures, jurisdictional operational standards, and existing traffic operational analysis.

Intersection Performance Measures

Level of service (LOS) and volume-to-capacity (V/C) ratios are two commonly used performance measures that provide a gauge of intersection operations. In addition, they are often incorporated into agency mobility standards. Descriptions are given below:

- **Level of service (LOS):** A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.
- **Volume-to-capacity (V/C) ratio:** A decimal representation (between 0.00 and 1.00) of the proportion of capacity that is being used (i.e., the saturation) at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

Jurisdictional Operating Standards

All study intersections must operate at or below the operating standards or mitigation may be necessary to approve future growth. The intersection performance measures vary by jurisdiction of the roadways. The two study intersections under ODOT jurisdiction (Highway 99E/N Grant Street and Highway 99E/N Ivy Street) must comply with the v/c targets in the Oregon Highway Plan (OHP). The OHP specifies a v/c target of 1.00 for the study area.[4]

All non-state roadways within the study area are under the jurisdiction of the City of Canby. The City operating standards require that a level of service D or better and a volume to capacity ratio equal to or less than 0.85 be maintained for all study area intersections.

[4] Table 6, Oregon Highway Plan, December 2011. Based on a Regional Highway, with an STA designation.

Existing Traffic Volumes

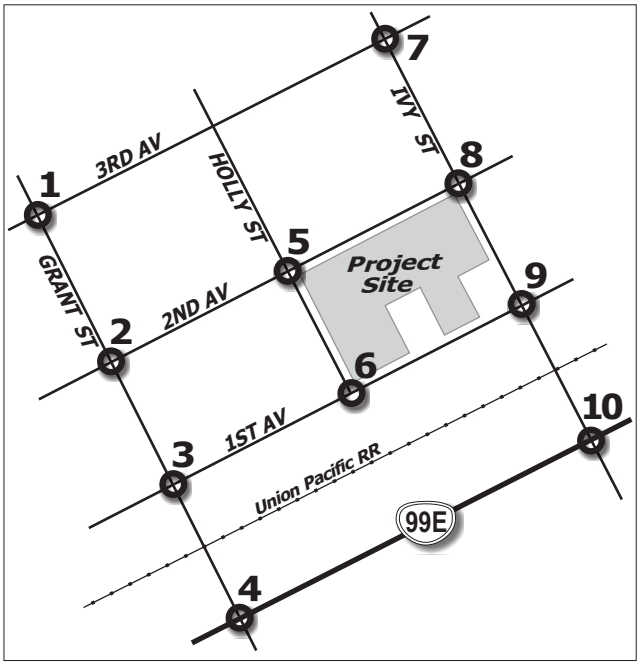
Traffic count data collected for this study was taken during an off peak time of the year and therefore was adjusted to account for seasonal variations in travel. For this study, the methodology from the ODOT Analysis Procedures Manual[5] was applied to determine the 30th highest annual hour volume (30 HV) for the study intersections. The 30 HV is commonly used for design purposes and represents the level of congestion that is typically encountered during the peak travel month.

To determine when the 30th highest annual hour volumes occur, data is examined from Automatic Traffic Recorder (ATR) stations that record highway traffic volumes year-round. If no on-site ATR is present, one with similar characteristics can be identified using ODOT's ATR Characteristics Table. If these do not produce a similar ATR with average annual daily traffic volumes (AADT) within 10% of study area volumes, the seasonal trend method should be used. The seasonal trend method averages seasonal trend groupings from the ATR Characteristics Table.

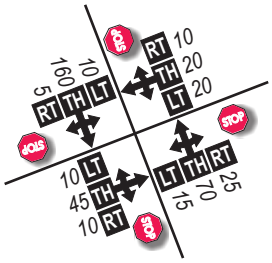
For the study area, no ATR's are located on-site, and the ATR Characteristics Table did not produce matches within 10% of the study area AADT volumes. Therefore, the seasonal trend method was utilized to develop the seasonal factor.

Using the "commuter" trend, a seasonal factor of 1.11 was developed, resulting in an 11 percent increase to the February counts collected. The adjusted weekday p.m. peak hour volumes developed for the study intersections are displayed in Figure 2-2. The raw traffic count data is included in the appendix.

[5] Analysis Procedures Manual, Oregon Department of Transportation, July 2009.



1. Grant St. & 3rd Ave.



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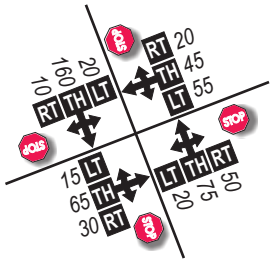

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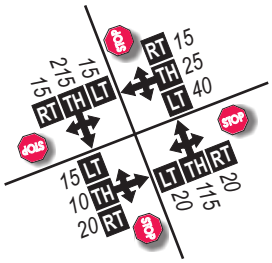

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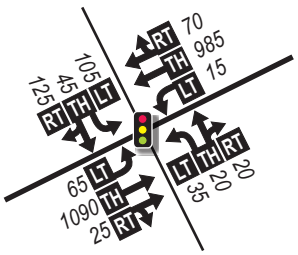
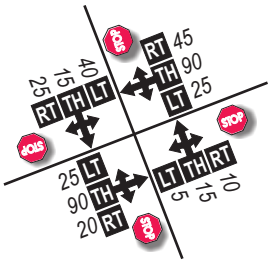


5. Holly St. & 2nd Ave.



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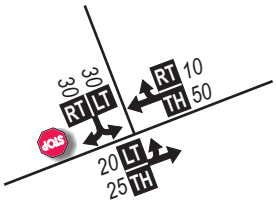
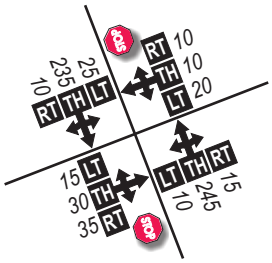
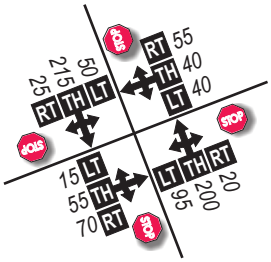


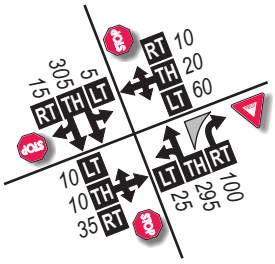
7. Ivy St. & 3rd. Ave.



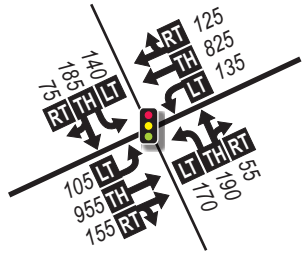
8. Ivy St. & 2nd. Ave.



9. Ivy St. & 1st Ave.



10. Ivy St & OR 99E



LEGEND

#O - Study Intersection & Reference Number

STOP - Stop Sign

YIELD - Yield Sign

Traffic Signal

← - Lane Configuration

000 - PM Peak Hour Traffic Volume

LT TH RT - Volume Turn Movement
Left • Thru • Right

DKS

No Scale

Figure **2-2**

EXISTING PM PEAK HOUR TRAFFIC VOLUMES

Existing Operating Conditions

The existing traffic operating conditions at the study intersections was determined for the p.m. peak hour based on the 2000 Highway Capacity Manual methodology[6] for signalized intersections and 2010 Highway Capacity Manual methodology[7] for unsignalized intersections. The conditions include the estimated average delay, level of service (LOS), and volume-to-capacity (V/C) ratio of the study intersections.

Weekday p.m. peak hour intersection operations can be seen in Table 2-3.[8] During the p.m. peak hour, all study area intersections operate within the adopted mobility targets. Most of the intersections operate with v/c ratios of 0.63 or less, indicating that they have a significant amount of reserve capacity to accommodate future growth. The Highway 99E/Ivy Street intersection is operating with the highest v/c ratio at 0.93, within seven percent of the mobility target (1.00 v/c).

Table 2-3: Existing PM Peak Hour Intersection Operations

Intersection	Mobility Target	PM Peak		
		Delay	LOS	v/c**
Highway 99E/N Grant Street	1.00 v/c	16.0	B	0.59
Highway 99E/N Ivy Street	1.00 v/c	44.8	D	0.93
N Ivy Street/NW 1st Avenue*	0.85 v/c; LOS D	12.4	B	0.63
N Ivy Street/NW 2nd Avenue	0.85 v/c; LOS D	12.3	B	0.50
N Ivy Street/NW 3rd Avenue	0.85 v/c; LOS D	15.4	C	0.18
N Holly Street/NW 1st Avenue	0.85 v/c; LOS D	9.4	A	0.09
N Holly Street/NW 2nd Avenue	0.85 v/c; LOS D	8.4	A	0.22
N Grant Street/NW 1st Avenue*	0.85 v/c; LOS D	9.1	A	0.33
N Grant Street/NW 2nd Avenue	0.85 v/c; LOS D	9.4	A	0.30
N Grant Street/NW 3rd Avenue	0.85 v/c; LOS D	8.4	A	0.25

*The northbound approach was modified to stop-control to allow for HCM capacity analysis. These intersections currently operate with three-way stop control.

**Volume to capacity ratio for unsignalized intersections reported for the worst stop controlled movement

[6] *2000 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2000.
[7] *2010 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2010.
[8] Detailed intersection analysis worksheets are attached in the appendix.

Existing Vehicle Queuing

During field observations, southbound vehicle queues were observed backing up from the Highway 99E/N Ivy Street intersection over 200 feet extending through the N Ivy Street/NW 1st Avenue intersection. Drivers would generally avoid stopping on the at-grade rail crossing, reducing the available storage between Highway 99E and NW 1st Avenue by approximately 60 feet. No additional vehicle queuing issues were seen within the study area during the p.m. peak period.

Safety Analysis

The most recent three years (2009 – 2011) of available collision data for the study area was obtained from ODOT and used to evaluate the collision history.[9] The individual collision types at study intersections were examined to see if any patterns would emerge. Table 2-4 breaks down the collision types and severities experienced, with amounts of each shown. Of the 42 collisions at study intersections most involved rear-end (18 collisions), or angle (11 collisions) type collisions. Injuries were involved in over half of the collisions (24 collisions) although severities are typically low, with about 32 of the 41 collisions involving only minor injuries or property damage (likely due to the low posted speed along study area roadways). There were no fatal collisions and only 2 major injuries at the study intersections during this three year period.

There were five pedestrian and two bicycle related crashes during the three-year time span. Most of the pedestrian and bicycle collisions were a result of a motorist failing to yield right-of-way. Of the two bicycle collisions, both cyclists were struck while crossing 2nd Avenue, once each at the Holly Street and Ivy Street intersections.

Collision rates at study intersections were also calculated to identify problem areas in need of mitigation. The total number of crashes experienced at an intersection is typically proportional to the number of vehicles entering it. Therefore, a crash rate describing the frequency of crashes per million entering vehicles (MEV) is used to evaluate the intersection. This crash rate (referred to as the observed crash rate) is compared to the critical crash rate, which is unique to each intersection and is a factor of crash rates at similar sites within the study area, traffic volume, and a statistical confidence level. Intersections with an observed crash rate greater than the critical crash rate warrant further review. The crash rates calculated (based on the past three years of collision data) for the study intersections can be seen in Table 2-4.

As shown, the crash rate at the N Ivy Street/ NW 3rd Avenue intersection was high when compared to similar intersections in the city. This intersection was evaluated to see if any collision trends exist.

- The N Ivy Street/ NW 3rd Avenue intersection is unsignalized, with NW 3rd Avenue yielding the right-of-way. The intersection lacks left-turn lanes, therefore drivers traveling on N Ivy Street and wanting to turn left onto NW 3rd Avenue must stop in the travel lane when yielding to oncoming traffic. Half of the collisions at this intersection were rear-end type along N Ivy Street, indicating that drivers may be

[9] ODOT reported collisions for January 1, 2009 through December 31, 2011.

caught off guard by stopped vehicles. The severities of the collisions were generally low, with all involving property damage only (no injuries) or minor injuries.

There were two pedestrian related collisions at the intersection, one caused by driver striking a pedestrian in dark clothing and the other caused by a driver failing to yield the right of way when turning left.

Table 2-4: Summary of Intersection Collision History (2009-2011)

Intersection	Total Collisions	Collision Type				Collision Severity			Critical Crash Rate (per MEV*)	Observed Crash Rate (per MEV*)
		Rear-end	Angle	Turning	Ped./ Bike	Property Damage Only	Minor Injury	Major Injury		
Highway 99E/ N Grant Street	9	6	1	1	1	3	5	1	0.31	0.19
Highway 99E/ N Ivy Street	8	6	1	1	0	2	6	0	0.29	0.14
N Ivy Street/ NW 1st Avenue	1	0	1	0	0	1	0	0	0.63	0.06
N Ivy Street/ NW 2nd Avenue	6	0	3	0	3	3	2	1	0.63	0.37
N Ivy Street/ NW 3rd Avenue	12	6	3	1	2	6	6	0	0.69	**1.00**
N Holly Street/ NW 1st Avenue	0	0	0	0	0	0	0	0	1.23	0.00
N Holly Street/ NW 2nd Avenue	2	0	0	1	1	1	1	0	0.83	0.27
N Grant Street/ NW 1st Avenue	2	0	2	0	0	0	2	0	0.75	0.21
N Grant Street/ NW 2nd Avenue	1	0	0	1	0	1	0	0	0.73	0.10
N Grant Street/ NW 3rd Avenue	0	0	0	0	0	0	0	0	0.83	0.00

Bolded Red and Shaded indicates a high crash rate compared to other similar intersections in the City

*MEV=Million entering vehicles

Assumptions and Methodologies

The following section outlines key assumptions and methodologies associated with the proposed project that were used to analyze future conditions and identify any potential impacts at study intersections. Areas of interest covered in this section are trip generation, trip distribution, and background traffic growth.

Project Description

The proposed Canby Public Library will be located in the block bounded by NW 2nd Avenue to the north, NW 1st Avenue to the south, N Ivy Street to the east and N Holly Street to the west. The project site is located in Downtown Canby and is currently occupied by the City Hall/Council Chamber building, City Administrative building, Canby Area Transit building, and the old Police Station building.

As proposed, the City Hall/Council Chamber building would be renovated, while the remaining structures would be removed and replaced with a 22,600 square foot library. The employees and services currently occupying City Hall, the City Administrative building, and Canby Area Transit building will be relocated off-site.

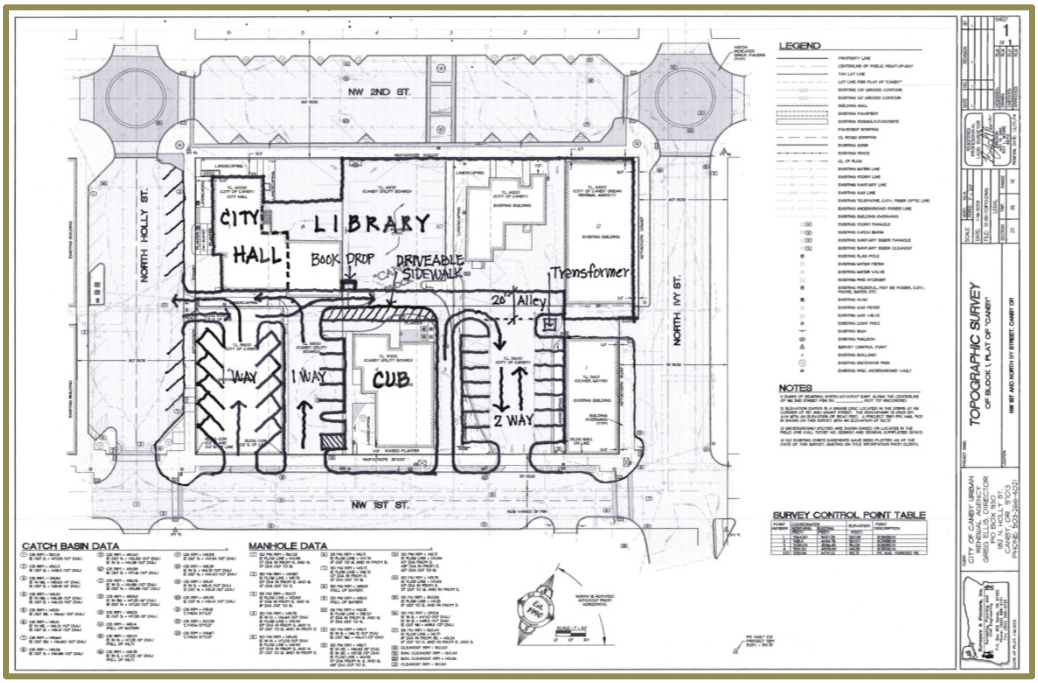


Figure 3-1 Site Plan

The project site is zoned Downtown Commercial (C-1), which allows for development of a library outright. The site is proposing to add one full access on N Holly Street and one entrance only access on NW 1st Avenue. The site is also proposing to maintain three existing accesses on NW 1st Avenue. The site plan can be seen in Figure 3-1.

Trip Generation

Trip generation is the method used to estimate the number of vehicles that are added to the surrounding roadway network as a result of proposed project. The trip generation analysis for the proposed Library was estimated using similar land uses as reported by the Institute of Transportation Engineers (ITE)[10]. Since the proposed site would add a 22,600 square foot library, the potential trip generation was conducted for the p.m. peak hour using the Library (ITE Code 590) land use.

Table 3-1: Trip Generation for Proposed Library

ITE Land Use	ITE Code	Size (square feet)	Daily Trips	PM Peak Hour		
				In	Out	Total
Library	590	22,600	1,271	79	86	165
Total Project Trips			**1,271**	**79**	**86**	**165**

The proposed site is expected to generate 165 (79 in, 86 out) p.m. peak hour trips, and 1,271 daily trips. Table 3-1 summarizes the trip generation for the proposed site.

The proposed project assumes that the employees and services currently occupying City Hall, the City Administrative building, and Canby Area Transit building will be relocated off-site. As a conservative approach, this study did not reduce the proposed site generated trips to account for the relocated services and employees. All site generated trips were assumed be new to the street network.

Book Drop Window

Of the 1,271 daily trips generated by the proposed Library, approximately 75 trips (or six percent of the daily trips) are expected to be drivers dropping off books at the book-drop window.[11] Therefore, it was assumed that six percent of the p.m. peak hour trips generated by the project site would be related to the book-drop window. As the site plan currently indicates, drivers wishing to access the book-drop window would enter via the driveway off N Holly Avenue or via two accesses on NW 1st Avenue (through surface parking lots) and exit via the eastern most driveway on NW 1st Avenue.

[10] Institute of Transportation Engineers (ITE) manual, Trip Generation, 9th Edition.
[11] Based on City staff conversation with the director of the Canby Library

Trip Distribution

Trip distribution involves estimating how site generated traffic will leave and arrive at the proposed site and what roads those trips will take. The trip distribution for the proposed Library was estimated based on City of Canby Travel Forecast Tool.[12]

It is estimated that 19 percent of the project traffic would arrive from the south using S Ivy Street and S Grant Street, 31 percent from the west along Highway 99E, 1st Avenue, 2nd Avenue and 3rd Avenue, 22 percent from the north along N Grant Street, N Holly Street and N Ivy Street, and 28 percent from the east via Highway 99E and 3rd Avenue. The assumed trip distribution can be seen in Figure 3-2.

Background Traffic

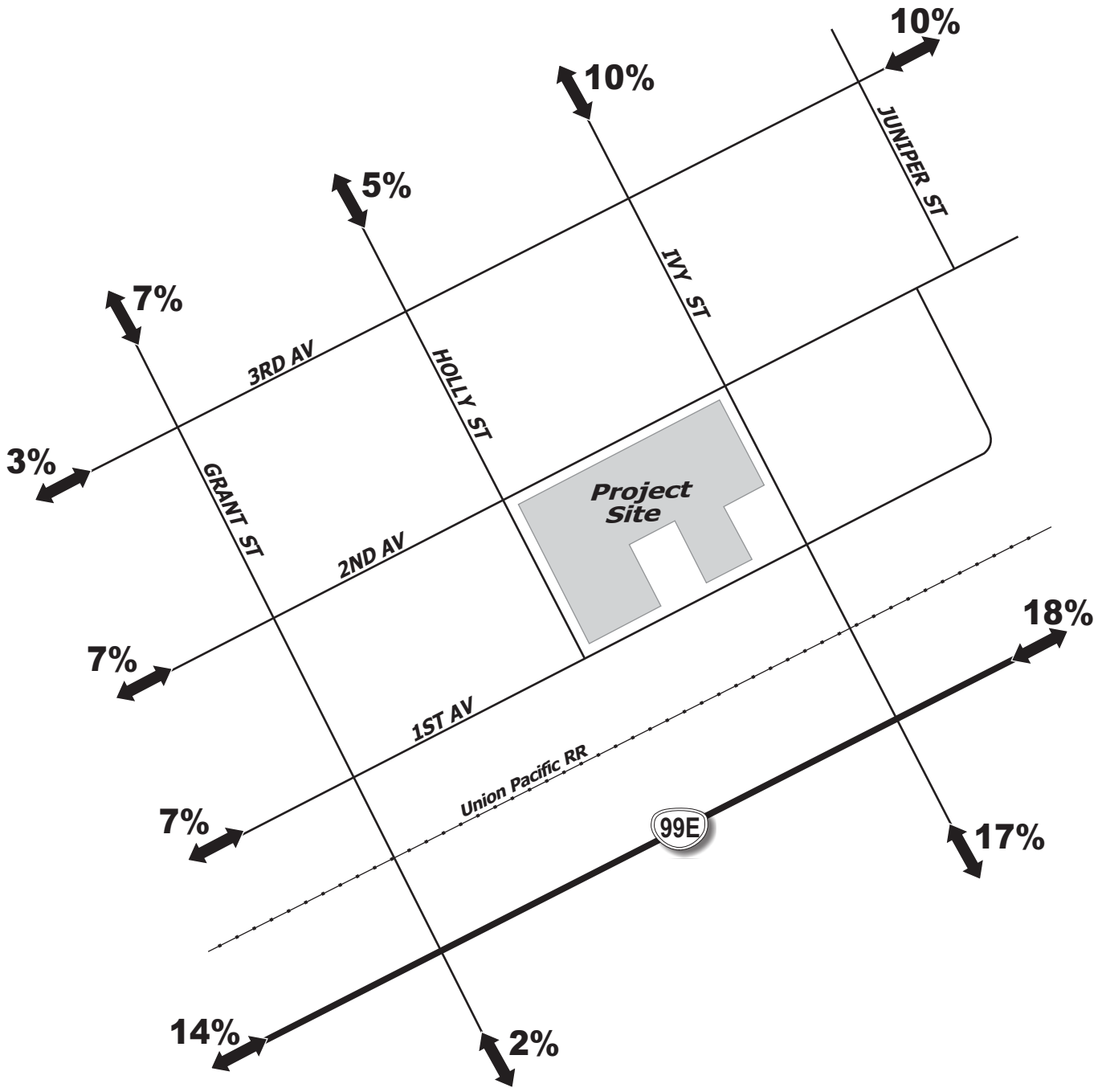
In addition to the trips generated from the proposed Library, background traffic growth was documented in the form of citywide and regional growth to represent a worst case scenario. Although the City does not currently have any in-process developments that would significantly impact the study area, the background traffic growth would cover those that could potentially occur before the expected build-out of the Library. The background traffic growth was estimated by comparing the existing 2013 and forecasted 2030[13] p.m. peak traffic volumes on N Ivy Street. The data suggests that the traffic volumes will increase approximately 2.0 percent annually. The data used to determine the growth rate is summarized in Table 3-2.

Table 3-2: Background Traffic Growth Rate Calculation

Location	Count Data (PM Peak)		Annual Growth Rate
	2013	2030*	
N Ivy Street, south of NW 1st Avenue	820	1,190	2.0%

*Source: 2010 Canby Transportation System Plan

[12] Canby Travel Forecast Tool, Canby Transportation System Plan, DKS Associates
[13] Canby Transportation System Plan, 2030 No-Build PM Peak Traffic Volumes



LEGEND

0% - Trip Distribution Percentage

DKS

No Scale

Figure **3-2**

TRIP DISTRIBUTION

Future Conditions

The following section summarizes the future p.m. peak hour transportation operating conditions for the expected opening year of the Canby Library in 2014. Future traffic operating conditions were analyzed at the study intersections to determine if the transportation network can support traffic generated by the proposed Library. If City of Canby or ODOT operating standards are not met then mitigations may be necessary to improve network performance.

2014 Intersection Operations

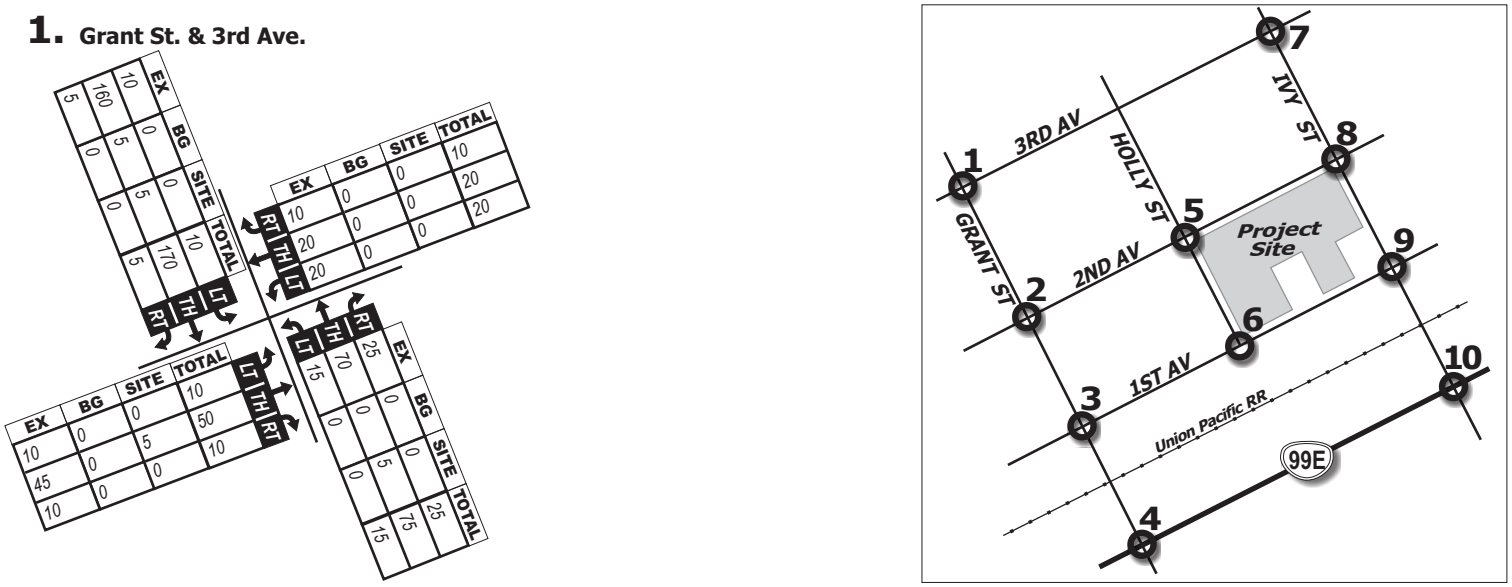
The study area intersection operations were evaluated for both the Without Project and With Project scenarios to determine if the proposed project would cause any additional intersections to not meet jurisdictional standard beyond those that did not meet the standards under the Without Project scenario. The Without Project scenario in 2014 includes the existing traffic volumes and growth in background traffic. The With Project scenario also includes the existing traffic volumes and growth in background traffic, but includes traffic added by the proposed Canby Library. The 2014 traffic volumes for each scenario are shown in Figure 4-1.

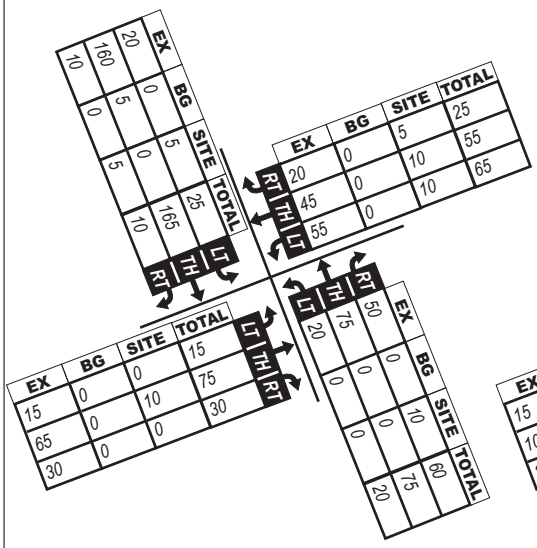
Table 4-1 shows the future 2014 intersection operations at study area intersections under both scenarios. As shown, all intersections would meet mobility targets during the p.m. peak hour. The proposed project is expected to have little impact on the study intersections as operating conditions would remain relatively unchanged with and without site generated trips.

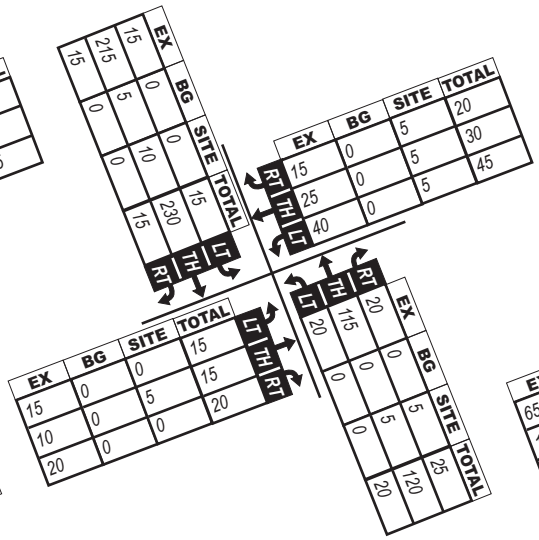
Table 4-1: 2014 PM Peak Hour Intersection Operations

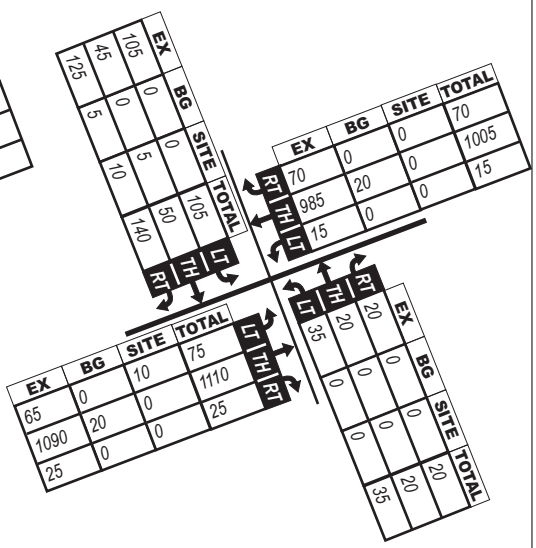
Intersection	Mobility Target	2014 Without Project			2014 With Project		
		Delay	LOS	v/c	Delay	LOS	v/c
Highway 99E/ N Grant Street	1.00 v/c	16.1	B	0.60	16.7	B	0.61
Highway 99E/ N Ivy Street	1.00 v/c	46.9	D	0.95	48.7	D	0.95
N Ivy Street/ NW 1st Avenue*	0.85 v/c; LOS D	12.6	B	0.64	13.8	B	0.69
N Ivy Street/ NW 2nd Avenue	0.85 v/c; LOS D	12.5	B	0.51	13.5	B	0.56
N Ivy Street/ NW 3rd Avenue	0.85 v/c; LOS D	15.6	C	0.18	16.5	C	0.20
N Holly Street/ NW 1st Avenue	0.85 v/c; LOS D	9.4	A	0.09	9.6	A	0.10
N Holly Street/ NW 2nd Avenue	0.85 v/c; LOS D	8.4	A	0.22	8.9	A	0.27
N Grant Street/ NW 1st Avenue*	0.85 v/c; LOS D	9.2	A	0.34	9.4	A	0.36
N Grant Street/ NW 2nd Avenue	0.85 v/c; LOS D	9.5	A	0.31	9.8	A	0.33
N Grant Street/ NW 3rd Avenue	0.85 v/c; LOS D	8.5	A	0.26	8.6	A	0.26

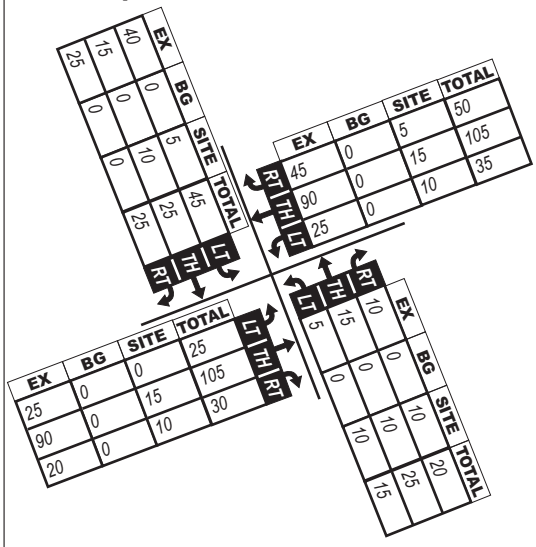
*The northbound approach was modified to stop-control to allow for HCM capacity analysis. These intersections currently operate with three-way stop control.

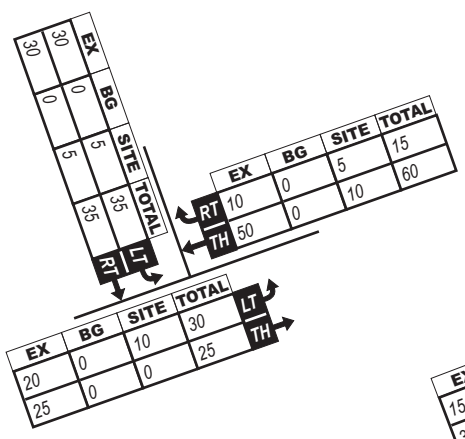


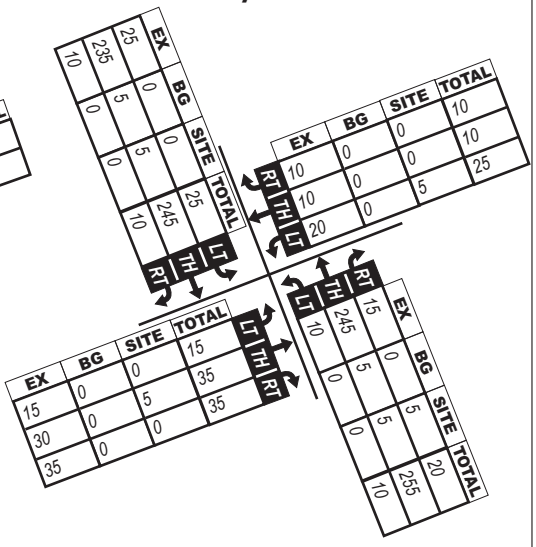












LEGEND

#O - Study Intersection & Reference Number

000 - PM Peak Hour Traffic Volume

EX - 2013 Existing Traffic
BG - Background Traffic
SITE - Site Traffic
TOTAL - Total Traffic

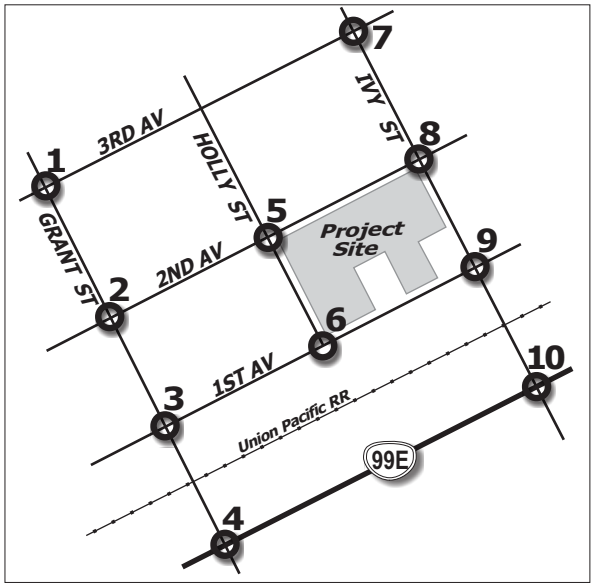
RT - Right Turn Movement
TH - Through Movement
LT - Left Turn Movement

DKS

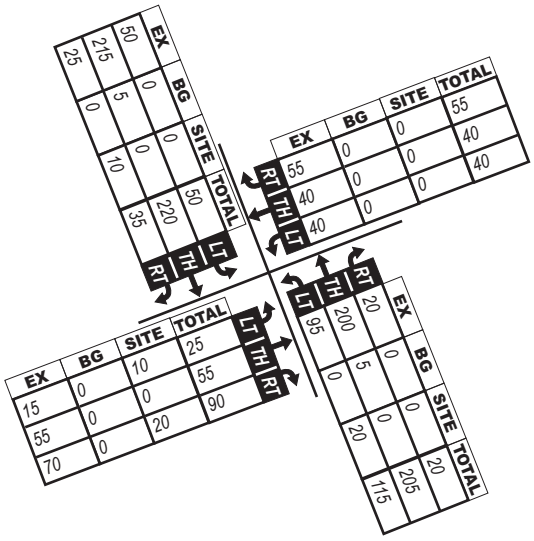
No Scale

Figure **4-1a**

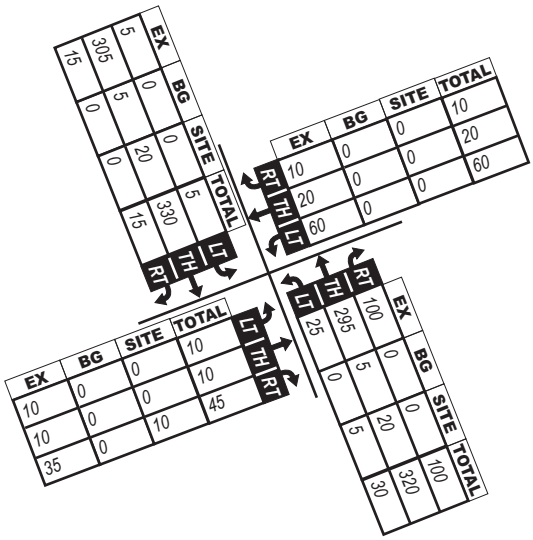
2014 FUTURE PM PEAK HOUR TRAFFIC VOLUMES



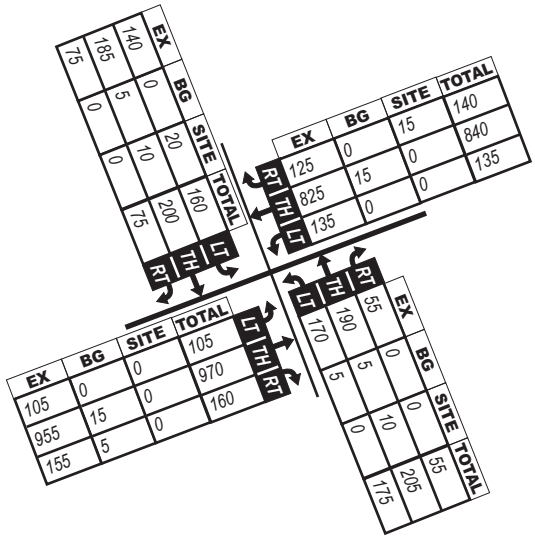
8. **Ivy St. & 2nd. Ave.**



9. **Ivy St. & 1st Ave.**



10. **Ivy St & OR 99E**



LEGEND

- Study Intersection & Reference Number

000 - PM Peak Hour Traffic Volume

EX - 2013 Existing Traffic
BG - Background Traffic
SITE - Site Traffic
TOTAL - Total Traffic

RT - Right Turn Movement
TH - Through Movement
LT - Left Turn Movement

DKS

No Scale

Figure **4-1b**

2014 FUTURE PM PEAK HOUR TRAFFIC VOLUMES

Vehicle Queuing

An estimate of the 95th percentile vehicle queues for each of the signalized intersection approach movements under both the Without Project and With Project scenarios was made using SimTraffic modeling software. This value estimates the queue length that would not be exceeded in 95 percent of the queues formed during the peak hour. When vehicle queues extend past available storage bays, turning queues can block through movements and through movements can block upstream intersections. The result is an increased potential for rear-end collisions and a significant loss in system capacity. Queuing results are summarized in Table 4-2 and included in the appendix

The queues from the southbound approaches to the Highway 99E/ N Ivy Street intersection would still be expected to reach the N Ivy Street/ NW 1st Avenue intersection. While the estimated queues experienced here are not very long, the storage to accommodate these queues is relatively short given the limited block spacing and the at-grade railroad crossing.

The eastbound and westbound left-turn movements at the Highway 99E/ N Ivy Street intersection and the eastbound left-turn movement at the Highway 99E/ N Grant Street intersection experiences vehicle queues longer than can be accommodated given existing turn pocket storage lengths under both the Without Project and With Project scenarios. However, additional storage is available for these approaches via continuous two-way left-turn lanes.

Overall, the project site is generally expected to have minimal impact at the Highway 99E/ N Grant Street and Highway 99E/ N Ivy Street intersections, increasing the 95th percentile vehicle queues by less than twenty feet beyond that experienced under the Without Project scenario in 2014.

Table 4-2: 2014 PM Peak Hour Motor Vehicle Queuing

Intersection	Movement	Available Storage	95th Percentile Queue	
			Without Project	With Project
Highway 99E/ N Grant Street	Eastbound Left	100 feet	**120 feet**	**140 feet**
	Westbound Left	110 feet	60 feet	60 feet
	Northbound Left	50 feet	**80 feet**	**80 feet**
	Southbound Left	140 feet	100 feet	100 feet
	Southbound Through/right	140 feet	100 feet	100 feet
Highway 99E/ N Ivy Street	Eastbound Left	100 feet	**140 feet**	**140 feet**
	Westbound Left	90 feet	**140 feet**	**140 feet**
	Northbound Left	150 feet	**220 feet**	**220 feet**
	Southbound Left	150 feet	120 feet	120 feet
	Southbound Through/right	150 feet	100 feet	100 feet

Bolded Red and Shaded indicates estimated queue is expected to exceed available storage.

Site Access

The project is proposing to add one full access on N Holly Street and one entrance only access on NW 1st Avenue. The project is also proposing to maintain three existing accesses on NW 1st Avenue. N Holly Street is classified as a neighborhood route and NW 1st Avenue a local street by the City of Canby,[14] with posted speeds of 25 miles per hour. The following sections discuss the evaluation of sight distance and access spacing at the proposed site accesses, and emergency vehicle access to the site.

Intersection Sight Distance

The proposed site accesses should meet American Association of State Highway and Transportation Officials (AASHTO) intersection sight distance requirements for safe egress as measured from 15 feet back from the edge of the travelled way[15]. The site accesses would require a minimum of 280 feet of intersection sight distance based on a 25 mph posted speed. In addition, the sight distance triangles should be clear of permanent objects (large signs, landscaping, etc.) that could potentially limit vehicle sight distance.

Since 280 feet is greater than the block spacing downtown, and would result in a line of sight extending beyond nearby intersections, the existing and proposed site accesses were reviewed to ensure adequate sight distance was available to the nearest intersection.

During a site visit (February 2013) it was found that adequate sight distance would likely be available under current conditions from the existing and proposed site accesses. The required intersection sight distance is shown on the site plan in Figure 4-2 (the red line is the required line of sight). However, at both access locations, sight distance could be partially obscured by vehicles parking on the street within the line of site. The Manual of Uniform Traffic Control Devices[16] (MUTCD) recommends prohibiting on-street parking within 20-feet of intersections, which would reduce the impact of on-street parking on sight distance. Therefore, we recommending considering prohibiting on-street parking along N Holly Street and NW 1st Avenue within 20-feet of site access locations.

[14] Functional Classification, Figure 7-1, Canby Transportation System Plan.
[15] Geometric Design of Highways and Streets, AASHTO, Exhibit 9-55.
[16] Manual on Uniform Traffic Control Devices for Streets and Highways, 2009 Edition, USDOT/FHWA

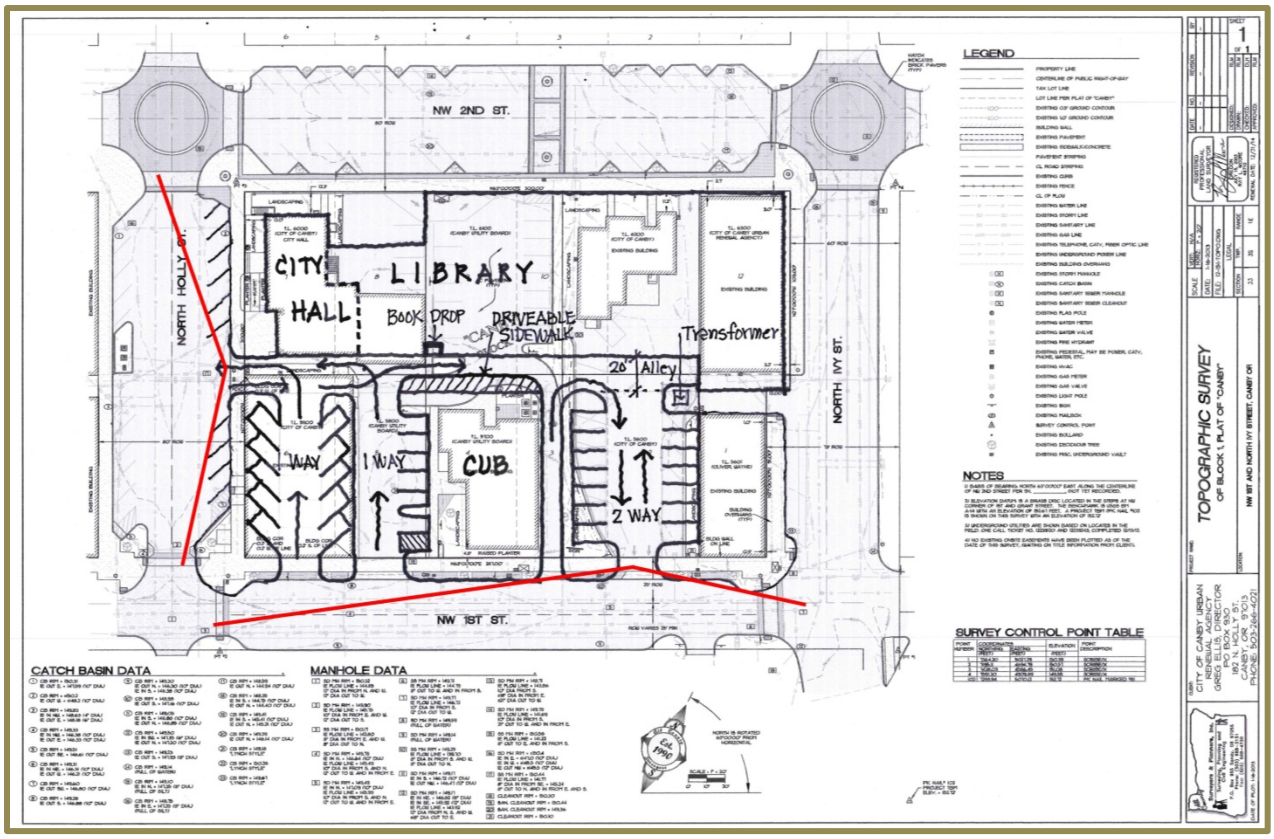


Figure 4-2 Intersection Sight Distance

Access Spacing

N Holly Street is classified as a neighborhood route and NW 1st Avenue a local street, therefore, minimum access spacing standards[17] require driveway spacing of at least 50 feet from intersections and ten feet from other driveways. The proposed site access to N Holly Street would be approximately 100 feet south, and 130 feet north of the nearest roadways, complying with the City minimum standard for spacing on neighborhood routes. Four site accesses are proposed to NW 1st Avenue (three existing and one new access). These proposed site accesses would be at least 70 feet from the nearest intersection, and at least 40 feet from the nearest driveway, complying with the City minimum standard for spacing on local streets.

[17] Access Spacing Standards for City Street Facilities, Table 7-2, Canby Transportation System Plan

Motor Vehicle Circulation

Internal motor vehicle circulation and stacking was reviewed to ensure that adequate accessibility and circulation routes are provided. The project site proposes several one-way internal driveways. Motor vehicle circulation to and from these driveways will need to be clarified with "Do not enter" signage at the exiting end of the one-way internal driveways, a "Right Turn Only" sign to alert drivers leaving the driveway on the east side of the Canby Utility Board building, and a "No right-turn" sign to alert drivers leaving the book-drop window driveway (see Figure 4-3).

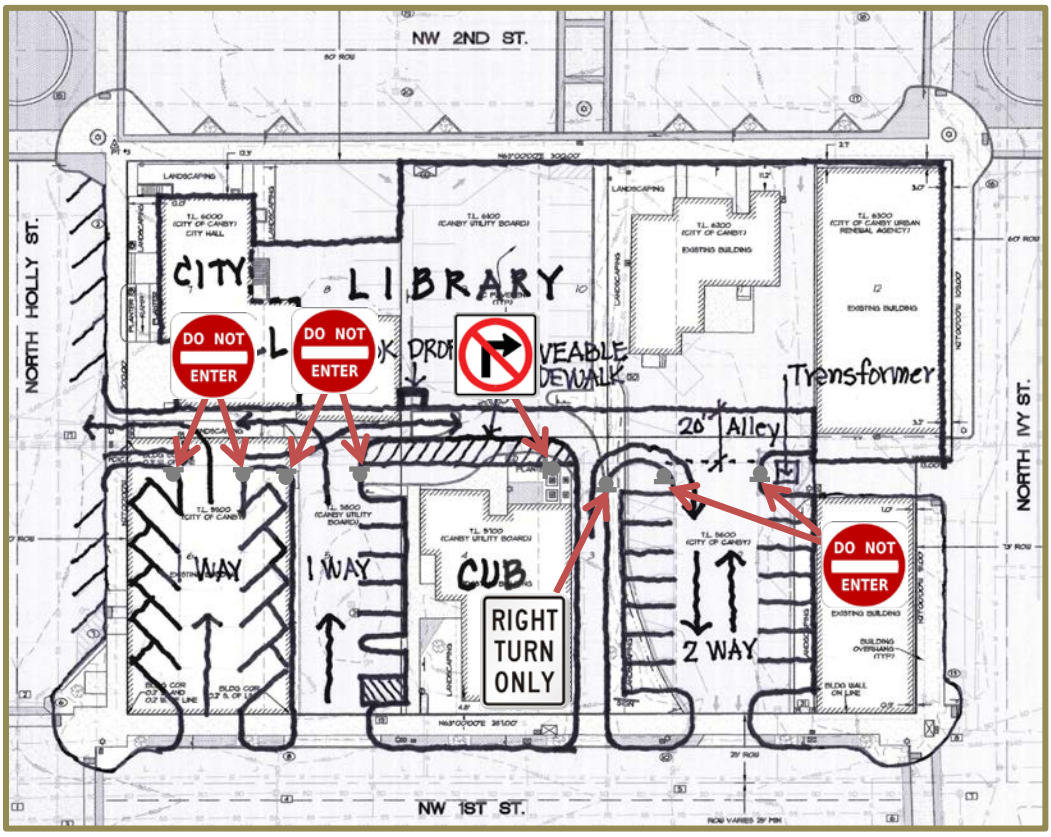


Figure 4-3 Internal Signage for Motor Vehicle Circulation

In addition, the turn templates and internal circulation routes for the proposed surface parking areas, delivery vehicles, emergency vehicles, and motor vehicle traffic will need to be provided to ensure adequate circulation.

Pedestrian and Bicycle Circulation

Sidewalks are currently available around the perimeter of the block, providing a continuous connection between the surface parking along NW 1st Street, with the main Library entrance on NW 2nd Street. Internally, the site plan does not show any additional sidewalks (with the exception of a drivable sidewalk just to the south of the proposed book-drop). Pedestrians wishing to access the main Library entrance via a sidewalk may have to cross an internal access roadway, however, the roadway is expected to have minimal traffic so crossing safely is not expected to be a major issue. The streets surrounding the proposed site could also function as shared roadways for bicycles as volumes and speeds will be low, providing adequate bicycle connections to Library. Bicycle parking is currently available at locations surrounding the site, including near the proposed entrance.

Recommendations

Based upon the analysis presented in this report, the proposed project was found to not generate significant off-site traffic impacts. Therefore, no off-site mitigation is recommended for the proposed project as a result of traffic impacts. However, there are several site-access and circulation related conditions we recommend addressing to improve traffic flow and safety, including:

- Install "Do not enter" signage (MUTCD R5-1) at the exiting end of the one-way internal driveways, a "Right turn only" sign (MUTCD R3-5) to alert drivers leaving the driveway on the east side of the Canby Utility Board building, and a "No right turn" sign (MUTCD R3-1) to alert drivers leaving the book-drop window driveway.

- Provide a curb or buffer along the north side of the proposed east-west internal site driveway and the south building frontage of City Hall and the proposed Library.

- Consider prohibiting on-street parking along N Holly Street and NW 1st Avenue within 20-feet of site access locations, as recommended in the Manual on Uniform Traffic Control Devices (MUTCD) to improve intersection sight distance.

- Provide guide signing to the Library book-drop window from adjacent side streets (NW 1st Avenue and N Holly Street)

- Have the site designer/engineer verify the turn templates and internal circulation routes for the proposed design vehicle to ensure adequate on-site circulation.

Appendix

Traffic Count Data

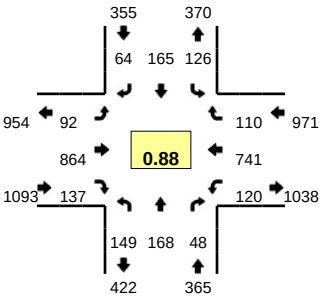
Type of peak hour being reported: User-Defined

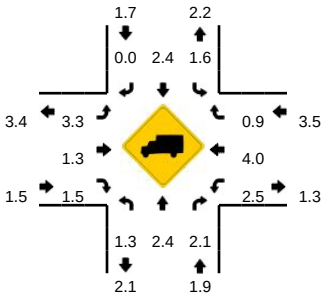
Method for determining peak hour: Total Entering Volume

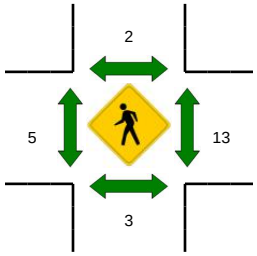
LOCATION: N Ivy St -- OR 99E
CITY/STATE: Canby, OR

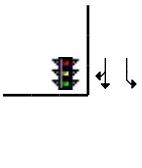
QC JOB #: 10890101
DATE: Tue, Feb 05 2013

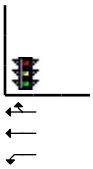
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

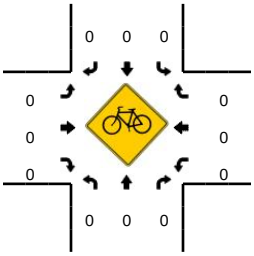


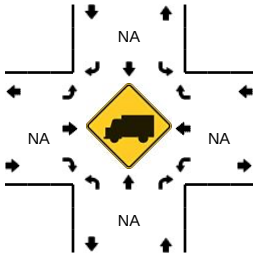


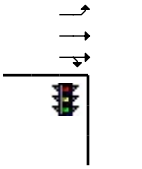


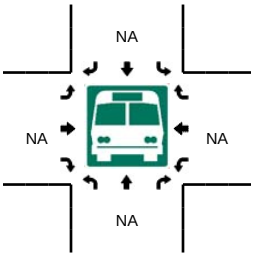












5-Min Count Period Beginning At	N Ivy St (Northbound)				N Ivy St (Southbound)				OR 99E (Eastbound)				OR 99E (Westbound)				Total	Hourly Totals
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4:05 PM	14	19	3	0	10	8	6	0	6	80	10	0	9	59	15	0	239	
4:10 PM	9	15	6	0	11	18	8	0	17	61	5	0	9	49	5	0	213	
4:15 PM	8	12	7	0	5	6	5	0	8	80	12	0	5	70	10	0	228	
4:20 PM	11	11	4	0	10	8	4	0	6	67	7	0	15	56	7	0	206	
4:25 PM	19	17	3	0	10	14	7	0	10	59	4	0	6	46	10	0	205	
4:30 PM	14	18	4	0	14	7	6	0	7	65	10	0	10	63	12	0	230	
4:35 PM	9	19	6	0	10	10	3	0	5	55	11	0	9	60	8	0	205	
4:40 PM	15	10	4	0	7	10	6	0	4	82	11	0	5	77	8	0	239	
4:45 PM	17	14	6	0	9	15	8	0	7	63	22	0	12	40	7	0	220	
4:50 PM	12	17	2	0	10	16	1	0	8	70	9	0	13	75	19	0	252	
4:55 PM	8	6	3	0	9	9	4	0	7	41	8	0	14	47	6	0	162	2563
5:00 PM	11	14	4	0	14	13	5	0	8	110	12	0	10	67	7	0	275	2674
5:05 PM	14	17	5	0	8	17	9	0	8	65	13	0	15	79	13	0	263	2698
5:10 PM	13	10	3	0	15	19	3	0	6	87	14	0	7	70	8	0	255	2740
5:15 PM	10	12	6	0	8	21	6	0	13	86	11	0	7	40	4	0	224	2736
5:20 PM	7	14	2	0	12	14	6	0	9	81	12	0	12	77	8	0	254	2784
5:25 PM	15	7	1	0	9	6	6	0	12	62	10	0	16	49	12	0	205	2784
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5:50 PM	12	16	2	0	10	19	8	0	8	48	11	0	13	53	7	0	207	2703
5:55 PM	11	8	5	0	9	8	3	0	9	62	15	0	8	50	7	0	195	2736

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	152	164	48	0	148	196	68	0	88	1048	156	0	128	864	112	0	3172
Heavy Trucks	4	0	0		0	4	0		8	8	4		0	20	0		48
Pedestrians		8				8				16				8			40
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: N Grant St -- OR 99E
CITY/STATE: Canby, OR

QC JOB #: 10890102
DATE: Tue, Feb 05 2013

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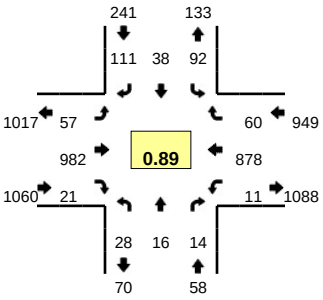
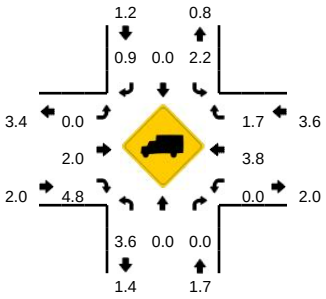
Peak 15-Min: 5:00 PM -- 5:15 PM





Quality Counts
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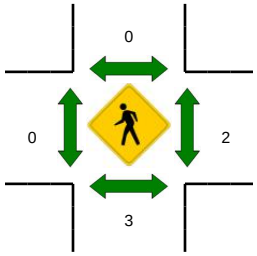

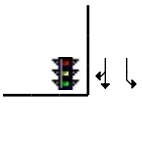

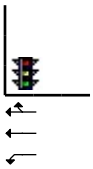

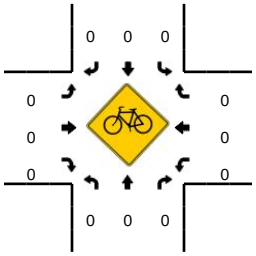

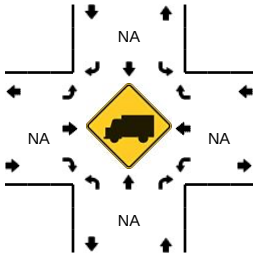

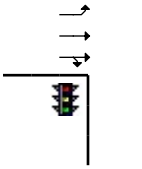

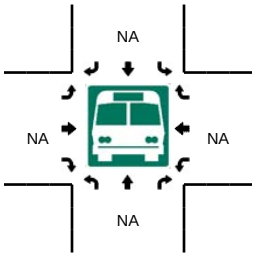

5-Min Count Period Beginning At	N Grant St (Northbound)				N Grant St (Southbound)				OR 99E (Eastbound)				OR 99E (Westbound)				Total	Hourly Totals
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4:10 PM	1	1	0	0	6	8	6	0	4	70	3	0	0	61	7	0	167	
4:15 PM	2	3	2	0	6	5	11	0	5	76	1	0	0	63	4	0	178	
4:20 PM	2	5	1	0	5	4	3	0	4	70	1	0	3	71	6	0	175	
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5:45 PM	0	3	0	0	5	1	4	0	3	75	2	0	0	74	3	0	170	2294
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5:55 PM	1	1	1	0	3	2	6	0	2	70	1	0	0	62	4	0	153	2238

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	44	16	20	0	92	48	108	0	64	1100	20	0	16	1016	52	0	2596
Heavy Trucks	0	0	0		4	0	0		0	24	4		0	24	0		56
Pedestrians		8				0				0				8			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: N Grant St -- NW 3rd Ave

QC JOB #: 10890110

CITY/STATE: Canby, OR

DATE: Tue, Feb 05 2013

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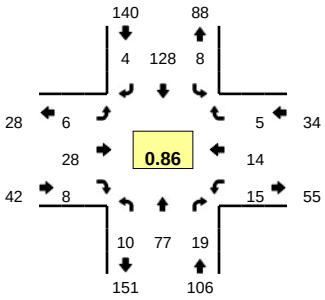
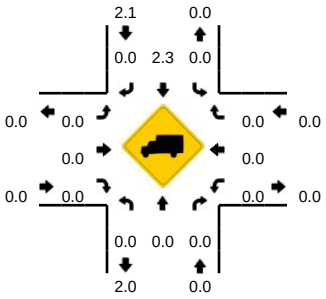
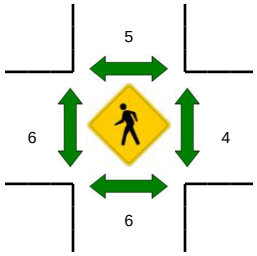
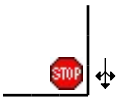
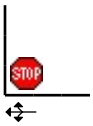
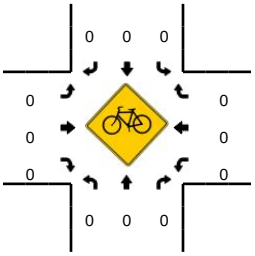


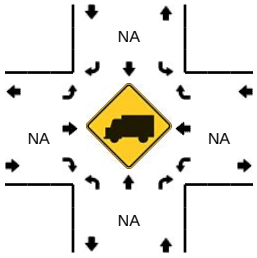


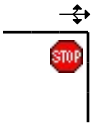


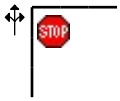


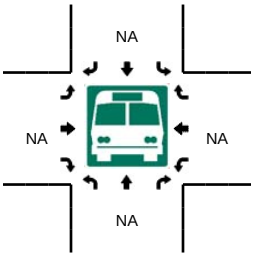












5-Min Count Period Beginning At	N Grant St (Northbound)				N Grant St (Southbound)				NW 3rd Ave (Eastbound)				NW 3rd Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	2	0	0	0	3	1	0	0	4	3	0	1	2	0	0	16	
4:05 PM	1	9	0	0	1	6	2	0	1	5	4	0	2	1	0	0	32	
4:10 PM	1	7	2	0	1	10	1	0	0	2	3	0	2	1	1	0	31	
4:15 PM	1	6	3	0	1	9	0	0	0	2	1	0	4	1	0	0	28	
4:20 PM	0	4	1	0	1	5	0	0	0	2	2	0	4	0	0	0	19	
4:25 PM	1	8	2	0	1	14	0	0	0	4	0	0	2	0	0	0	32	
4:30 PM	1	5	2	0	0	12	0	0	1	3	0	0	1	1	0	0	26	
4:35 PM	1	4	2	0	2	11	0	0	1	1	0	0	2	3	0	0	27	
4:40 PM	0	5	1	0	1	13	0	0	1	2	1	0	0	1	0	0	25	
4:45 PM	1	7	1	0	1	9	1	0	0	3	0	0	1	0	0	0	24	
4:50 PM	0	5	0	0	1	12	0	0	1	0	1	0	1	1	1	0	23	
4:55 PM	1	8	4	0	0	6	0	0	0	2	1	0	0	1	1	0	24	307
5:00 PM	0	10	1	0	0	11	0	0	0	8	1	0	3	2	1	0	37	328
5:05 PM	2	7	0	0	2	10	1	0	1	2	1	0	1	2	0	0	29	325
5:10 PM	2	9	3	0	0	9	0	0	0	0	1	0	2	1	1	0	28	322
5:15 PM	1	7	2	0	0	13	0	0	1	1	1	0	2	2	0	0	30	324
5:20 PM	0	2	1	0	0	8	2	0	0	2	1	0	0	0	1	0	17	322
5:25 PM	0	4	2	0	0	11	0	0	0	1	0	0	2	2	1	0	23	313
5:30 PM	1	6	2	0	0	14	0	0	1	1	0	0	0	1	0	0	26	313
5:35 PM	0	8	2	0	0	8	1	0	0	3	0	0	2	0	1	0	25	311
5:40 PM	0	6	2	0	2	2	1	0	0	2	1	0	0	1	0	0	17	303
5:45 PM	0	7	0	0	2	6	0	0	1	0	1	0	0	0	0	0	17	296
5:50 PM	0	3	0	0	2	13	0	0	0	1	0	0	0	3	0	0	22	295
5:55 PM	1	5	2	0	1	5	0	0	0	1	1	0	1	1	0	0	18	289

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	104	16	0	8	120	4	0	4	40	12	0	24	20	8	0	376
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		12				0				0				8			20
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

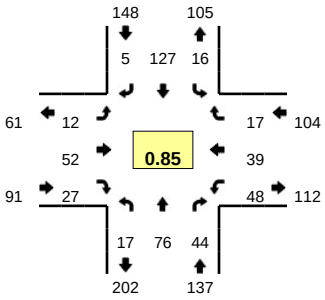
LOCATION: N Grant St -- 2nd Ave

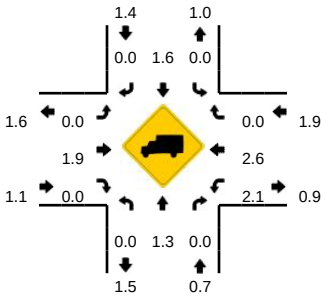
CITY/STATE: Canby, OR

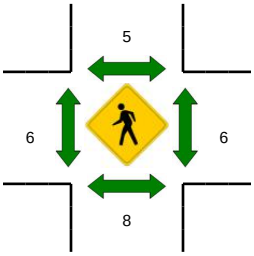
QC JOB #: 10890109

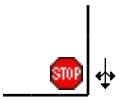
DATE: Tue, Feb 05 2013

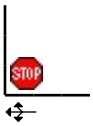
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

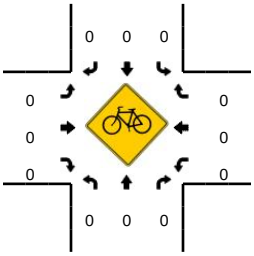


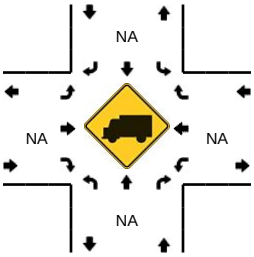


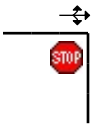


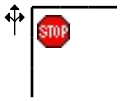


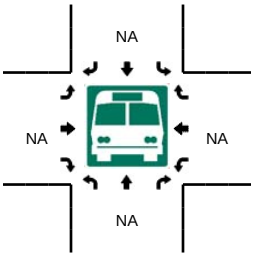












5-Min Count Period Beginning At	N Grant St (Northbound)				N Grant St (Southbound)				2nd Ave (Eastbound)				2nd Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	3	0	0	3	5	1	0	0	6	2	0	3	10	1	0	34	
4:05 PM	3	8	4	0	4	7	0	0	2	5	4	0	2	4	1	0	44	
4:10 PM	3	5	5	0	0	15	2	0	2	5	6	0	3	7	4	0	57	
4:15 PM	1	3	6	0	1	11	0	0	2	6	3	0	1	4	3	0	41	
4:20 PM	0	4	5	0	1	11	0	0	2	3	3	0	7	4	1	0	41	
4:25 PM	1	10	5	0	2	13	0	0	0	4	0	0	1	2	3	0	41	
4:30 PM	2	5	4	0	1	12	0	0	0	2	3	0	6	1	2	0	38	
4:35 PM	0	4	5	0	3	9	0	0	0	4	4	0	3	6	0	0	38	
4:40 PM	3	3	5	0	1	13	0	0	1	2	2	0	2	5	1	0	38	
4:45 PM	2	5	4	0	2	6	0	0	2	7	2	0	6	7	2	0	45	
4:50 PM	2	3	0	0	1	11	2	0	0	5	2	0	3	4	2	0	35	
4:55 PM	1	8	2	0	1	5	1	0	3	4	1	0	5	0	3	0	34	486
5:00 PM	3	9	4	0	1	13	1	0	1	9	7	0	6	3	2	0	59	511
5:05 PM	3	6	3	0	1	10	1	0	1	7	0	0	6	3	0	0	41	508
5:10 PM	0	14	3	0	1	10	0	0	1	4	2	0	3	2	1	0	41	492
5:15 PM	0	5	5	0	0	17	0	0	2	3	1	0	3	3	1	0	40	491
5:20 PM	0	4	4	0	2	8	0	0	1	1	3	0	4	3	0	0	30	480
5:25 PM	2	7	3	0	0	12	0	0	2	6	3	0	3	4	0	0	42	481
5:30 PM	1	7	2	0	1	11	1	0	1	5	1	0	2	3	2	0	37	480
5:35 PM	2	6	1	0	1	12	0	0	1	3	1	0	2	5	3	0	37	479
5:40 PM	1	7	1	0	0	3	0	0	1	4	1	0	2	2	1	0	23	464
5:45 PM	1	6	1	0	1	5	0	0	0	2	3	0	4	4	0	0	27	446
5:50 PM	2	3	2	0	0	12	1	0	0	3	3	0	3	3	1	0	33	444
5:55 PM	0	6	0	0	0	6	0	0	2	4	0	0	2	3	0	0	23	433

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	24	116	40	0	12	132	8	0	12	80	36	0	60	32	12	0	564
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	4	0		8
Pedestrians		0				0				4				4			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

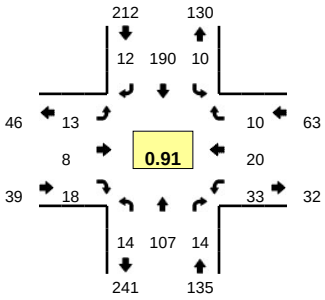
LOCATION: N Grant St -- NW 1st Ave

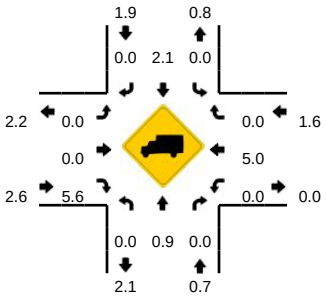
CITY/STATE: Canby, OR

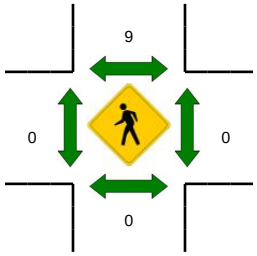
QC JOB #: 10890108

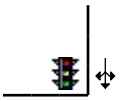
DATE: Tue, Feb 05 2013

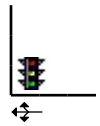
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

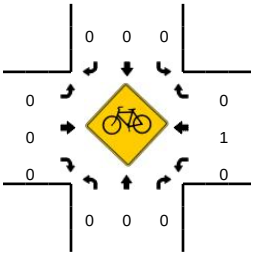


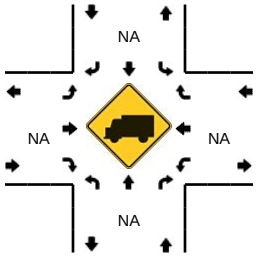


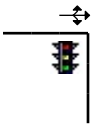


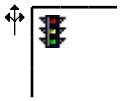


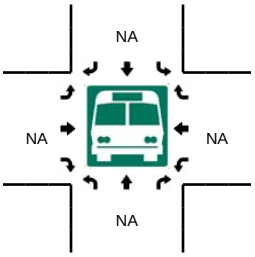












5-Min Count Period Beginning At	N Grant St (Northbound)				N Grant St (Southbound)				NW 1st Ave (Eastbound)				NW 1st Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	3	0	0	1	11	0	0	0	1	0	0	1	3	0	0	23	
4:05 PM	6	14	1	0	0	13	0	0	0	1	0	0	0	0	0	0	35	
4:10 PM	2	10	2	0	0	20	1	0	0	2	1	0	1	2	2	0	43	
4:15 PM	1	9	2	0	0	18	0	0	0	0	1	0	1	1	1	0	34	
4:20 PM	2	10	0	0	0	12	2	0	1	1	1	0	0	4	1	0	34	
4:25 PM	0	15	2	0	1	16	1	0	0	1	0	0	1	1	0	0	38	
4:30 PM	0	6	4	0	2	16	2	0	1	1	0	0	3	2	1	0	38	
4:35 PM	1	9	1	0	1	17	1	0	0	1	1	0	3	4	0	0	39	
4:40 PM	1	8	0	0	1	16	1	0	2	0	1	0	5	1	0	0	36	
4:45 PM	2	10	2	0	0	14	1	0	0	0	2	0	2	0	0	0	33	
4:50 PM	1	6	2	0	1	17	0	0	2	0	2	0	2	2	1	0	36	
4:55 PM	2	10	0	0	0	12	0	0	0	1	3	0	5	1	0	0	34	423
5:00 PM	1	7	1	0	1	19	1	0	3	2	2	0	2	1	3	0	43	443
5:05 PM	1	9	1	0	1	17	1	0	2	1	2	0	1	2	0	0	38	446
5:10 PM	2	11	0	0	2	12	1	0	1	1	2	0	3	4	3	0	42	445
5:15 PM	3	9	0	0	0	20	0	0	2	0	3	0	1	1	1	0	40	451
5:20 PM	0	7	1	0	0	14	3	0	0	0	0	0	5	1	1	0	32	449
5:25 PM	1	6	1	0	0	17	1	0	2	1	1	0	0	1	3	0	34	445
5:30 PM	3	8	2	0	1	13	1	0	1	1	3	0	4	0	0	0	37	444
5:35 PM	2	6	1	0	0	14	1	0	1	0	1	0	0	2	0	0	28	433
5:40 PM	0	7	1	0	2	7	0	0	2	0	2	0	1	1	0	0	23	420
5:45 PM	2	7	0	0	0	9	1	0	1	2	1	0	1	1	0	0	25	412
5:50 PM	3	6	0	0	0	15	0	0	1	0	3	0	1	1	0	0	30	406
5:55 PM	0	7	0	0	0	7	1	0	0	0	2	0	1	1	0	0	19	391

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	108	8	0	16	192	12	0	24	16	24	0	24	28	24	0	492
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

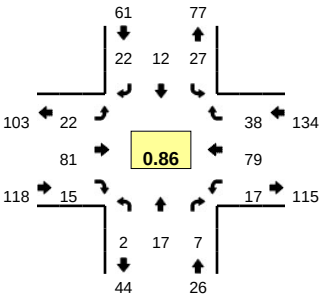
Type of peak hour being reported: User-Defined

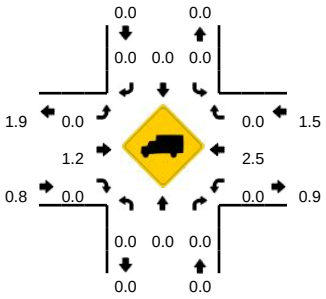
Method for determining peak hour: Total Entering Volume

LOCATION: N Holly St -- 2nd Ave
CITY/STATE: Canby, OR

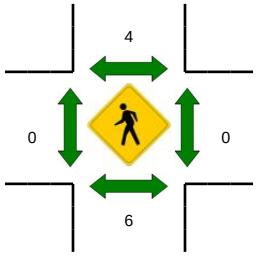
QC JOB #: 10890107
DATE: Tue, Feb 05 2013

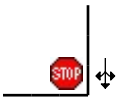
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

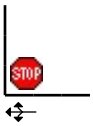


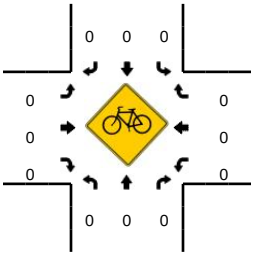


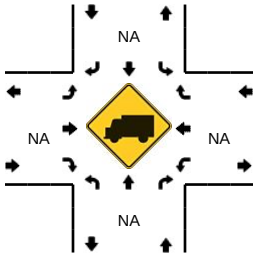
Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

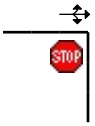


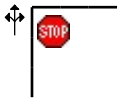


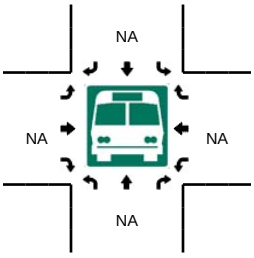












5-Min Count Period Beginning At	N Holly St (Northbound)				N Holly St (Southbound)				2nd Ave (Eastbound)				2nd Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	1	0	1	0	2	0	2	8	0	0	0	10	1	0	25	
4:05 PM	0	0	1	0	1	0	2	0	2	11	0	0	1	8	3	0	29	
4:10 PM	0	0	1	0	5	0	7	0	4	7	1	0	1	8	4	0	38	
4:15 PM	1	0	0	0	2	0	2	0	2	11	0	0	1	9	7	0	35	
4:20 PM	0	0	1	0	3	1	2	0	3	3	1	0	1	6	0	0	21	
4:25 PM	0	3	1	0	1	0	1	0	3	7	1	0	0	8	4	0	29	
4:30 PM	1	2	1	0	1	3	1	0	1	4	0	0	1	7	3	0	25	
4:35 PM	0	1	0	0	1	0	2	0	1	8	1	0	0	6	1	0	21	
4:40 PM	0	0	0	0	2	0	2	0	2	6	1	0	1	9	3	0	26	
4:45 PM	0	2	1	0	1	0	4	0	0	7	3	0	2	5	6	0	31	
4:50 PM	0	1	0	0	4	0	4	0	4	4	1	0	1	7	6	0	32	
4:55 PM	0	0	1	0	3	1	0	0	2	4	1	0	2	6	2	0	22	334
5:00 PM	0	4	1	0	4	4	2	0	2	11	2	0	0	9	5	0	44	353
5:05 PM	0	2	0	0	3	1	3	0	1	11	3	0	4	4	1	0	33	357
5:10 PM	1	1	0	0	0	0	2	0	2	4	0	0	2	4	1	0	17	336
5:15 PM	0	0	1	0	4	1	0	0	3	6	1	0	1	8	3	0	28	329
5:20 PM	0	1	1	0	3	2	1	0	1	9	1	0	3	6	3	0	31	339
5:25 PM	1	2	0	0	1	0	1	0	2	8	0	0	1	8	4	0	28	338
5:30 PM	0	3	0	0	2	0	1	0	1	7	0	0	0	4	2	0	20	333
5:35 PM	1	1	0	0	3	1	1	0	3	2	1	0	0	6	3	0	22	334
5:40 PM	0	0	0	0	1	3	1	0	0	4	0	0	1	5	3	0	18	326
5:45 PM	0	1	0	0	2	3	2	0	2	2	0	0	0	7	3	0	22	317
5:50 PM	1	1	0	0	2	1	0	0	0	6	0	0	1	4	0	0	16	301
5:55 PM	0	0	0	0	1	2	0	0	0	2	2	0	0	4	4	0	15	294

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	24	8	0	40	24	20	0	20	104	24	0	24	76	32	0	396
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	4	0		8
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

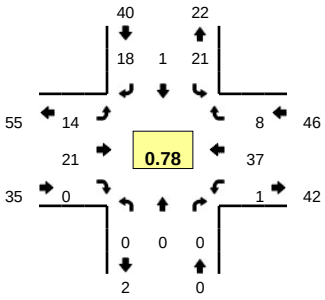
LOCATION: N Holly St -- NW 1st Ave

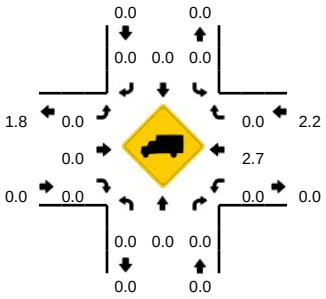
QC JOB #: 10890106

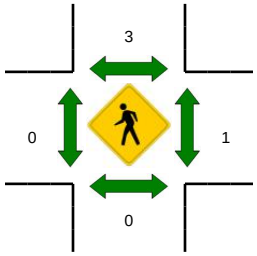
CITY/STATE: Canby, OR

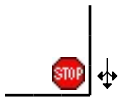
DATE: Tue, Feb 05 2013

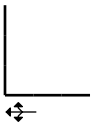
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

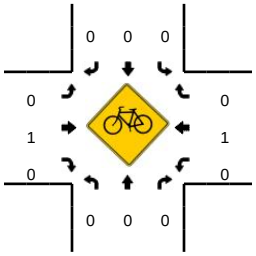


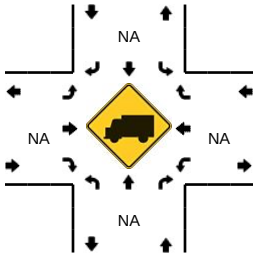


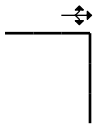


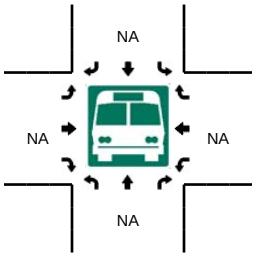












5-Min Count Period Beginning At	N Holly St (Northbound)				N Holly St (Southbound)				NW 1st Ave (Eastbound)				NW 1st Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0	0	6	
4:05 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	
4:10 PM	0	0	0	0	3	0	1	0	1	3	0	0	0	2	1	0	11	
4:15 PM	0	0	0	0	0	0	1	0	1	1	0	0	0	2	0	0	5	
4:20 PM	0	0	0	0	1	0	3	0	1	0	0	0	0	4	0	0	9	
4:25 PM	0	0	0	0	0	1	0	0	2	2	0	0	0	1	2	0	8	
4:30 PM	0	0	0	0	2	0	1	0	2	4	0	0	0	4	1	0	14	
4:35 PM	0	0	0	0	1	0	0	0	1	2	0	0	0	6	0	0	10	
4:40 PM	0	0	0	0	2	0	2	0	0	1	0	0	0	1	0	0	6	
4:45 PM	0	0	0	0	2	0	2	0	2	1	0	0	1	0	0	0	8	
4:50 PM	0	0	0	0	1	0	1	0	0	4	0	0	0	5	1	0	12	
4:55 PM	0	0	0	0	2	0	2	0	0	1	0	0	0	3	1	0	9	100
5:00 PM	0	0	0	0	1	0	1	0	3	3	0	0	0	4	2	0	14	108
5:05 PM	0	0	0	0	6	0	1	0	1	2	0	0	0	3	0	0	13	119
5:10 PM	0	0	0	0	0	0	3	0	2	1	0	0	0	6	0	0	12	120
5:15 PM	0	0	0	0	2	0	1	0	0	0	0	0	0	1	0	0	4	119
5:20 PM	0	0	0	0	2	0	4	0	1	0	0	0	0	3	1	0	11	121
5:25 PM	0	0	0	0	2	0	0	0	0	1	0	0	0	2	2	0	7	120
5:30 PM	0	0	0	0	0	0	1	0	2	3	0	0	0	2	1	0	9	115
5:35 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	3	108
5:40 PM	0	0	0	0	1	0	2	0	0	2	0	0	0	2	0	0	7	109
5:45 PM	0	0	0	0	2	0	2	0	1	1	0	0	0	0	0	0	6	107
5:50 PM	0	0	0	0	1	0	1	0	0	0	0	0	0	3	0	0	5	100
5:55 PM	0	0	0	0	1	0	2	0	0	0	0	0	0	1	0	0	4	95

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	28	0	20	0	24	24	0	0	0	52	8	0	156
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

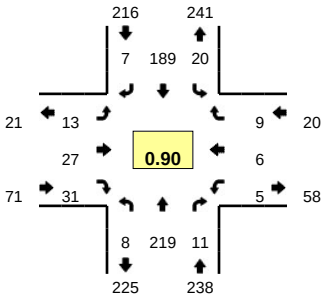
Type of peak hour being reported: User-Defined

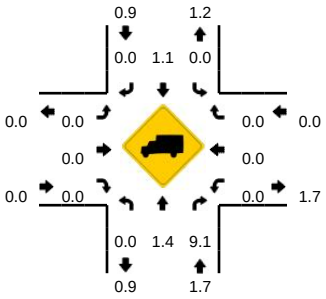
Method for determining peak hour: Total Entering Volume

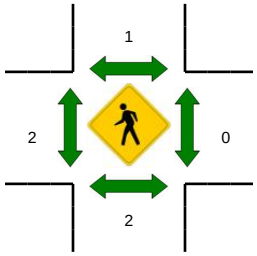
LOCATION: N Ivy St -- NW 3rd Ave
CITY/STATE: Canby, OR

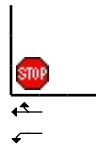
QC JOB #: 10890105
DATE: Tue, Feb 05 2013

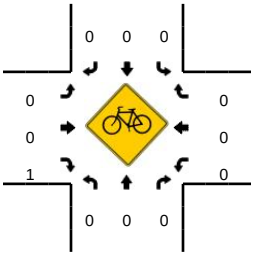
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

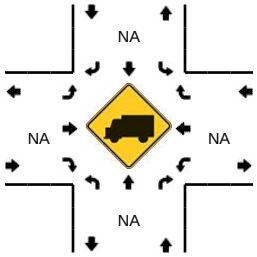


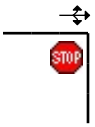


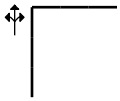


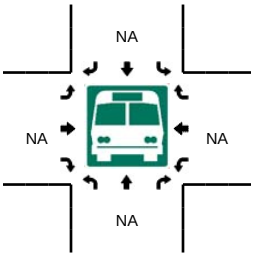












5-Min Count Period Beginning At	N Ivy St (Northbound)				N Ivy St (Southbound)				NW 3rd Ave (Eastbound)				NW 3rd Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	11	1	0	2	10	1	0	1	1	1	0	0	0	0	0	29	
4:05 PM	0	19	5	0	0	7	0	0	0	2	4	0	0	0	0	0	37	
4:10 PM	3	21	2	0	2	15	0	0	0	3	8	0	0	1	1	0	56	
4:15 PM	2	24	0	0	4	14	1	0	0	2	4	0	0	0	0	0	51	
4:20 PM	1	17	0	0	3	14	1	0	1	1	3	0	0	1	0	0	42	
4:25 PM	1	18	2	0	1	14	2	0	1	3	5	0	1	0	1	0	49	
4:30 PM	0	22	1	0	3	14	1	0	2	5	2	0	0	0	0	0	50	
4:35 PM	0	17	0	0	2	15	0	0	1	1	2	0	1	0	0	0	39	
4:40 PM	0	9	0	0	1	16	0	0	2	1	3	0	0	0	1	0	33	
4:45 PM	0	20	0	0	3	16	0	0	1	4	2	0	0	0	1	0	47	
4:50 PM	1	24	0	0	0	17	1	0	0	3	0	0	0	3	0	0	49	
4:55 PM	1	11	3	0	0	16	1	0	2	4	4	0	1	1	0	0	44	526
5:00 PM	0	19	1	0	1	8	0	0	3	2	8	0	0	0	1	0	43	540
5:05 PM	2	25	0	0	3	21	1	0	0	1	2	0	1	2	1	0	59	562
5:10 PM	1	18	2	0	2	20	0	0	1	1	1	0	0	0	2	0	48	554
5:15 PM	2	15	1	0	3	18	0	0	0	1	2	0	1	0	1	0	44	547
5:20 PM	0	21	1	0	1	14	1	0	0	1	0	0	0	0	1	0	40	545
5:25 PM	3	22	1	0	1	14	1	0	0	1	4	0	0	0	0	0	47	543
5:30 PM	0	9	1	0	2	11	0	0	2	0	1	0	1	0	0	0	27	520
5:35 PM	0	15	2	0	3	7	0	0	0	1	4	0	2	0	0	0	34	515
5:40 PM	0	18	1	0	1	10	1	0	2	5	2	0	1	0	1	0	42	524
5:45 PM	1	8	0	0	0	14	0	0	1	2	4	0	0	1	0	0	31	508
5:50 PM	1	19	2	0	1	20	0	0	0	1	3	0	0	0	0	0	47	506
5:55 PM	1	12	0	0	4	11	3	0	1	0	0	0	1	0	0	0	33	495

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	232	12	0	32	236	4	0	4	12	20	0	8	8	16	0	604
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

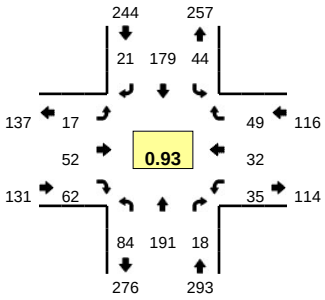
Type of peak hour being reported: User-Defined

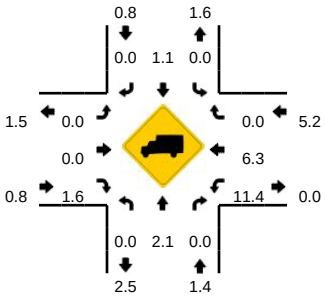
Method for determining peak hour: Total Entering Volume

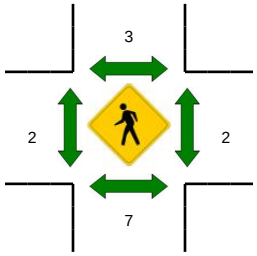
LOCATION: N Ivy St -- 2nd Ave
CITY/STATE: Canby, OR

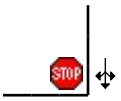
QC JOB #: 10890104
DATE: Tue, Feb 05 2013

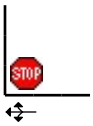
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

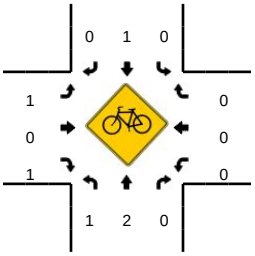


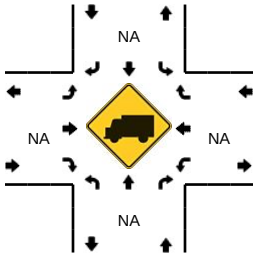


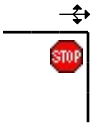


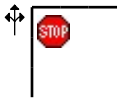


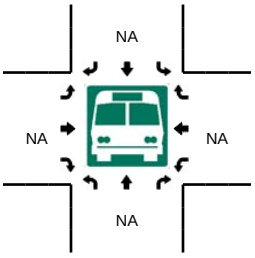












5-Min Count Period Beginning At	N Ivy St (Northbound)				N Ivy St (Southbound)				2nd Ave (Eastbound)				2nd Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	6	1	0	1	6	2	0	3	3	4	0	2	3	3	0	39	
4:05 PM	7	26	2	0	2	10	1	0	0	4	4	0	5	1	3	0	65	
4:10 PM	9	21	0	0	2	16	5	0	3	5	6	0	5	3	4	0	79	
4:15 PM	7	17	1	0	5	11	2	0	2	5	9	0	3	4	5	0	71	
4:20 PM	1	8	0	0	1	14	1	0	2	4	3	0	3	2	7	0	46	
4:25 PM	9	20	2	0	6	18	1	0	0	6	3	0	3	4	2	0	74	
4:30 PM	8	22	2	0	1	13	2	0	0	4	1	0	6	3	0	0	62	
4:35 PM	9	11	2	0	4	9	2	0	2	3	2	0	0	3	6	0	53	
4:40 PM	12	8	1	0	4	15	4	0	1	7	5	0	4	5	2	0	68	
4:45 PM	4	19	2	0	1	15	2	0	1	3	5	0	3	2	5	0	62	
4:50 PM	7	22	3	0	5	17	1	0	0	7	4	0	1	3	3	0	73	
4:55 PM	5	9	0	0	6	14	0	0	1	3	4	0	4	1	6	0	53	745
5:00 PM	7	15	1	0	4	13	3	0	2	2	12	0	3	3	2	0	67	773
5:05 PM	6	18	4	0	3	19	2	0	4	6	10	0	4	1	7	0	84	792
5:10 PM	7	14	1	0	4	18	1	0	2	2	4	0	1	1	4	0	59	772
5:15 PM	4	16	0	0	5	16	2	0	2	5	4	0	3	4	5	0	66	767
5:20 PM	6	17	0	0	1	12	1	0	2	4	8	0	3	2	7	0	63	784
5:25 PM	4	20	1	0	6	14	1	0	0	6	4	0	3	4	1	0	64	774
5:30 PM	4	6	0	0	1	12	2	0	0	4	5	0	6	3	0	0	43	755
5:35 PM	6	12	0	0	4	11	2	0	2	3	4	0	0	3	6	0	53	755
5:40 PM	8	14	0	0	3	13	5	0	1	6	4	0	4	5	2	0	65	752
5:45 PM	5	9	2	0	1	13	2	0	1	3	5	0	3	2	5	0	51	741
5:50 PM	5	18	0	0	4	23	1	0	0	7	6	0	1	3	3	0	71	739
5:55 PM	5	13	2	0	6	11	0	0	1	3	2	0	4	1	6	0	54	740

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	80	188	24	0	44	200	24	0	32	40	104	0	32	20	52	0	840
Heavy Trucks	0	0	0		0	0	0		0	0	4		4	4	0		12
Pedestrians		12				4				8				0			24
Bicycles	1	2	0		0	1	0		0	0	0		0	0	0		4
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: N Ivy St -- NW 1st Ave

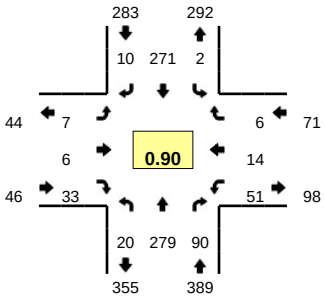
CITY/STATE: Canby, OR

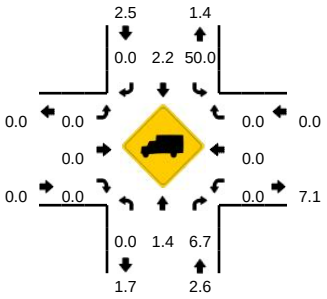
QC JOB #: 10890103

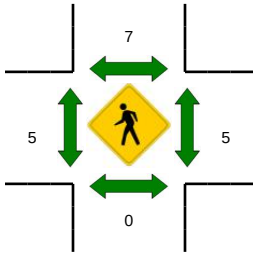
DATE: Tue, Feb 05 2013

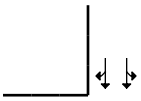
Peak-Hour: 4:25 PM -- 5:25 PM

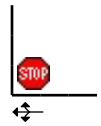
Peak 15-Min: 5:00 PM -- 5:15 PM

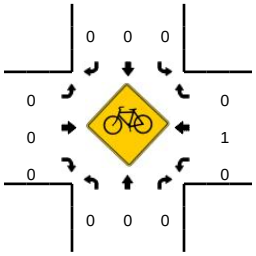


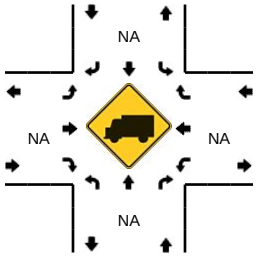


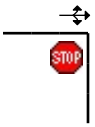


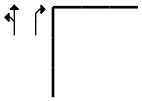


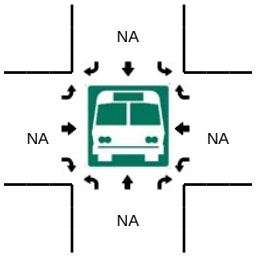












5-Min Count Period Beginning At	N Ivy St (Northbound)				N Ivy St (Southbound)				NW 1st Ave (Eastbound)				NW 1st Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	10	2	0	0	11	1	0	2	0	2	0	2	4	0	0	35	
4:05 PM	1	33	10	0	0	19	0	0	0	1	1	0	2	0	0	0	67	
4:10 PM	3	29	5	0	0	24	1	0	0	2	2	0	3	0	2	0	71	
4:15 PM	1	24	8	0	1	23	2	0	0	0	2	0	1	0	0	0	62	
4:20 PM	3	11	2	0	0	18	0	0	0	0	0	0	3	0	0	0	37	
4:25 PM	1	33	12	0	0	23	0	0	0	0	3	0	1	1	0	0	74	
4:30 PM	1	29	10	0	0	23	1	0	0	2	3	0	5	3	2	0	79	
4:35 PM	1	20	11	0	0	10	2	0	1	1	2	0	6	3	0	0	57	
4:40 PM	0	21	4	0	0	23	0	0	1	1	1	0	2	1	0	0	54	
4:45 PM	1	21	6	0	0	22	0	0	1	0	2	0	8	0	0	0	61	
4:50 PM	3	32	8	0	0	21	3	0	0	0	4	0	2	0	1	0	74	
4:55 PM	0	12	5	0	0	11	0	0	2	0	3	0	5	3	1	0	42	713
5:00 PM	3	22	11	0	1	35	2	0	0	2	3	0	1	0	0	0	80	758
5:05 PM	1	29	5	0	0	26	1	0	1	0	4	0	4	0	1	0	72	763
5:10 PM	5	15	4	0	1	28	1	0	0	0	3	0	6	2	1	0	66	758
5:15 PM	1	17	9	0	0	23	0	0	1	0	2	0	7	0	0	0	60	756
5:20 PM	3	28	5	0	0	26	0	0	0	0	3	0	4	1	0	0	70	789
5:25 PM	1	25	5	0	0	19	0	0	0	1	2	0	1	0	0	0	54	769
5:30 PM	2	8	5	0	0	21	0	0	1	1	0	0	2	1	0	0	41	731
5:35 PM	2	19	9	0	1	17	0	0	0	1	0	0	4	0	0	0	53	727
5:40 PM	1	21	6	0	0	17	1	0	1	0	1	0	4	0	0	0	52	725
5:45 PM	0	15	2	0	0	20	0	0	1	0	3	0	2	0	0	0	43	707
5:50 PM	2	23	7	0	0	30	0	0	0	0	0	0	6	0	0	0	68	701
5:55 PM	1	19	4	0	1	15	1	0	0	1	1	0	5	0	0	0	48	707

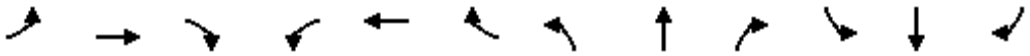
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	36	264	80	0	8	356	16	0	4	8	40	0	44	8	8	0	872
Heavy Trucks	0	0	8		4	4	0		0	0	0		0	0	0		16
Pedestrians		0				12				20				4			36
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments: Need these done on 2/5/13

Report generated on 2/13/2013 1:29 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

HCM Capacity Analysis Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	1090	25	15	985	70	35	20	20	105	45	125
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.93		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3245		1662	3169		1599	1619		1630	1528	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3245		1662	3169		1599	1619		1630	1528	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	73	1225	28	17	1107	79	39	22	22	118	51	140
RTOR Reduction (vph)	0	1	0	0	4	0	0	21	0	0	111	0
Lane Group Flow (vph)	73	1252	0	17	1182	0	39	23	0	118	80	0
Confl. Peds. (#/hr)			3	3			2					2
Heavy Vehicles (%)	0%	2%	5%	0%	4%	2%	4%	0%	0%	2%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	8.0	64.9		2.8	59.7		5.5	4.5		12.3	11.3	
Effective Green, g (s)	8.0	64.9		2.8	59.7		5.5	4.0		12.3	10.8	
Actuated g/C Ratio	0.08	0.65		0.03	0.60		0.06	0.04		0.12	0.11	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	3.5		4.0	3.5	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	133	2106		47	1892		88	65		200	165	
v/s Ratio Prot	c0.04	0.39		0.01	c0.37		0.02	0.01		c0.07	c0.05	
v/s Ratio Perm												
v/c Ratio	0.55	0.59		0.36	0.62		0.44	0.35		0.59	0.49	
Uniform Delay, d1	44.3	10.0		47.7	13.0		45.8	46.7		41.5	42.0	
Progression Factor	1.01	0.82		1.06	0.83		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.8		1.3	0.8		2.1	1.9		3.3	1.3	
Delay (s)	46.5	9.0		52.1	11.5		47.8	48.7		44.8	43.3	
Level of Service	D	A		D	B		D	D		D	D	
Approach Delay (s)		11.1			12.1			48.3			43.9	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

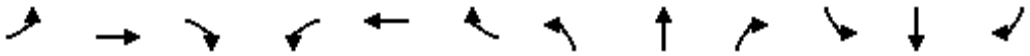
Description: 4. Grant St -- Hwy 99E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	955	155	135	825	125	170	190	55	140	185	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1614	3206		1630	3135		1646	1650		1630	1634	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1614	3206		1630	3135		1646	1650		1630	1634	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	119	1085	176	153	938	142	193	216	62	159	210	85
RTOR Reduction (vph)	0	13	0	0	12	0	0	11	0	0	15	0
Lane Group Flow (vph)	119	1248	0	153	1068	0	193	267	0	159	280	0
Confl. Peds. (#/hr)	2		3	3		2	13		5	5		13
Heavy Vehicles (%)	3%	1%	2%	2%	4%	1%	1%	2%	2%	2%	2%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	11.5	40.5		10.3	38.8		12.4	17.8		13.9	19.3	
Effective Green, g (s)	12.5	41.5		10.3	39.3		12.9	17.8		14.4	19.3	
Actuated g/C Ratio	0.12	0.42		0.10	0.39		0.13	0.18		0.14	0.19	
Clearance Time (s)	5.0	5.0		4.0	4.5		4.5	4.0		4.5	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.5	2.3	
Lane Grp Cap (vph)	202	1330		168	1232		212	294		235	315	
v/s Ratio Prot	0.07	c0.39		0.09	c0.34		c0.12	0.16		0.10	c0.17	
v/s Ratio Perm												
v/c Ratio	0.59	0.94		0.91	0.87		0.91	0.91		0.68	0.89	
Uniform Delay, d1	41.3	28.0		44.4	27.9		43.0	40.3		40.6	39.3	
Progression Factor	0.76	0.70		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.8	12.2		44.2	8.3		37.8	29.6		6.8	25.1	
Delay (s)	34.1	31.8		88.6	36.3		80.8	69.9		47.4	64.4	
Level of Service	C	C		F	D		F	E		D	E	
Approach Delay (s)		32.0			42.8			74.4			58.4	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM Average Control Delay	44.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
Description: 5. Ivy St -- Hwy 99 E			

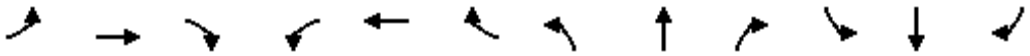
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	10	35	60	20	10	25	295	100	5	305	15
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)	11	11	39	67	22	11	28	328	111	6	339	17

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	61	100	467	175	186
Volume Left (vph)	11	67	28	6	0
Volume Right (vph)	39	11	111	0	17
Hadj (s)	-0.35	0.07	-0.09	0.08	-0.03
Departure Headway (s)	5.7	6.0	4.9	5.5	5.4
Degree Utilization, x	0.10	0.17	0.63	0.27	0.28
Capacity (veh/h)	539	526	717	626	639
Control Delay (s)	9.3	10.2	15.7	9.4	9.3
Approach Delay (s)	9.3	10.2	15.7	9.3	
Approach LOS	A	B	C	A	

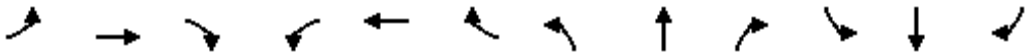
Intersection Summary				
Delay	12.4			
HCM Level of Service	B			
Intersection Capacity Utilization	57.9%	ICU Level of Service	B	
Analysis Period (min)	15			
Description: 17. N Ivy St -- NW 1st Ave				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	15	55	70	40	40	55	95	200	20	50	215	25
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	16	59	75	43	43	59	102	215	22	54	231	27

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	151	145	339	312
Volume Left (vph)	16	43	102	54
Volume Right (vph)	75	59	22	27
Hadj (s)	-0.26	-0.10	0.04	0.00
Departure Headway (s)	5.7	5.8	5.3	5.3
Degree Utilization, x	0.24	0.24	0.50	0.46
Capacity (veh/h)	554	539	636	639
Control Delay (s)	10.4	10.6	13.5	12.7
Approach Delay (s)	10.4	10.6	13.5	12.7
Approach LOS	B	B	B	B

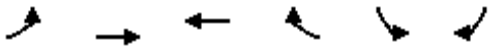
Intersection Summary				
Delay	12.3			
HCM Level of Service	B			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	30	35	20	10	10	10	245	15	25	235	10
Sign Control		Stop			Stop			Free			Free	
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	33	39	22	11	11	11	272	17	28	261	11
Pedestrians					2			2			1	
Lane Width (ft)					12.0			12.0			12.0	
Walking Speed (ft/s)					4.0			4.0			4.0	
Percent Blockage					0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	643	635	269	685	633	284	272			291		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	643	635	269	685	633	284	272			291		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	91	95	93	97	99	99			98		
cM capacity (veh/h)	366	386	774	315	387	758	1303			1280		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	89	44	300	300
Volume Left	17	22	11	28
Volume Right	39	11	17	11
cSH	488	390	1303	1280
Volume to Capacity	0.18	0.11	0.01	0.02
Queue Length 95th (ft)	16	10	1	2
Control Delay (s)	14.0	15.4	0.4	0.9
Lane LOS	B	C	A	A
Approach Delay (s)	14.0	15.4	0.4	0.9
Approach LOS	B	C		

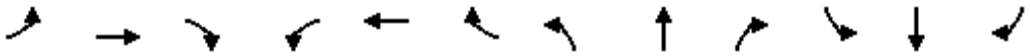
Intersection Summary				
Average Delay			3.2	
Intersection Capacity Utilization			35.4%	ICU Level of Service
Analysis Period (min)			15	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	20	25	50	10	30	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	26	32	64	13	38	38
Pedestrians		1			3	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	80				157	75
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	80				157	75
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				95	96
cM capacity (veh/h)	1527				823	989

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	58	77	77
Volume Left	26	0	38
Volume Right	0	13	38
cSH	1527	1700	899
Volume to Capacity	0.02	0.05	0.09
Queue Length 95th (ft)	1	0	7
Control Delay (s)	3.4	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	3.4	0.0	9.4
Approach LOS			A

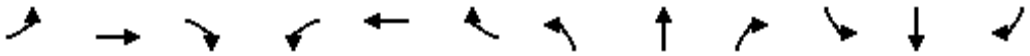
Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	25	90	20	25	90	45	5	15	10	40	15	25
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	29	105	23	29	105	52	6	17	12	47	17	29

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	157	186	35	93
Volume Left (vph)	29	29	6	47
Volume Right (vph)	23	52	12	29
Hadj (s)	-0.04	-0.12	-0.17	-0.09
Departure Headway (s)	4.4	4.3	4.6	4.6
Degree Utilization, x	0.19	0.22	0.04	0.12
Capacity (veh/h)	793	806	713	717
Control Delay (s)	8.4	8.5	7.8	8.3
Approach Delay (s)	8.4	8.5	7.8	8.3
Approach LOS	A	A	A	A

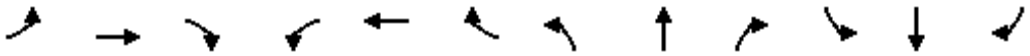
Intersection Summary			
Delay	8.4		
HCM Level of Service	A		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	15	10	20	40	25	15	20	115	20	15	215	15
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	16	11	22	44	27	16	22	126	22	16	236	16

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	49	88	170	269
Volume Left (vph)	16	44	22	16
Volume Right (vph)	22	16	22	16
Hadj (s)	-0.15	0.01	-0.04	0.01
Departure Headway (s)	4.9	5.0	4.5	4.5
Degree Utilization, x	0.07	0.12	0.21	0.33
Capacity (veh/h)	660	653	760	774
Control Delay (s)	8.2	8.7	8.7	9.7
Approach Delay (s)	8.2	8.7	8.7	9.7
Approach LOS	A	A	A	A

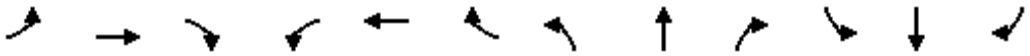
Intersection Summary			
Delay	9.1		
HCM Level of Service	A		
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		
Description: 16. N Grant St -- NW 1st Ave			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	15	65	30	55	45	20	20	75	50	20	160	10
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	18	76	35	65	53	24	24	88	59	24	188	12

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	129	141	171	224
Volume Left (vph)	18	65	24	24
Volume Right (vph)	35	24	59	12
Hadj (s)	-0.12	0.03	-0.17	0.02
Departure Headway (s)	5.0	5.1	4.7	4.8
Degree Utilization, x	0.18	0.20	0.22	0.30
Capacity (veh/h)	658	646	710	697
Control Delay (s)	9.0	9.3	9.1	9.9
Approach Delay (s)	9.0	9.3	9.1	9.9
Approach LOS	A	A	A	A

Intersection Summary			
Delay	9.4		
HCM Level of Service	A		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	45	10	20	20	10	15	70	25	10	160	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	12	52	12	23	23	12	17	81	29	12	186	6

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	76	58	128	203
Volume Left (vph)	12	23	17	12
Volume Right (vph)	12	12	29	6
Hadj (s)	-0.06	-0.04	-0.11	0.03
Departure Headway (s)	4.7	4.7	4.3	4.4
Degree Utilization, x	0.10	0.08	0.15	0.25
Capacity (veh/h)	709	701	790	783
Control Delay (s)	8.2	8.1	8.1	8.8
Approach Delay (s)	8.2	8.1	8.1	8.8
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.4			
HCM Level of Service	A			
Intersection Capacity Utilization	24.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Vehicle Queuing

Intersection: 1: Grant St & Highway 99E

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	122	564	575	89	348	379	74	118	91	95
Average Queue (ft)	68	328	345	18	160	179	31	38	71	73
95th Queue (ft)	125	618	622	56	290	308	69	87	101	103
Link Distance (ft)		680	680		694	694		165	82	82
Upstream Blk Time (%)		1	1						20	17
Queuing Penalty (veh)		4	5						28	25
Storage Bay Dist (ft)	99			99			45			
Storage Blk Time (%)	5	31		0	20		9	9		
Queuing Penalty (veh)	30	20		1	3		4	3		

Intersection: 2: Ivy St & Highway 99E

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	123	719	722	124	321	331	175	262	101	112
Average Queue (ft)	86	591	609	106	282	287	157	215	77	89
95th Queue (ft)	141	854	845	147	360	354	211	249	112	101
Link Distance (ft)		694	694		300	300		193	85	85
Upstream Blk Time (%)		11	13		28	24	0	58	36	64
Queuing Penalty (veh)		66	77		155	131	0	240	73	130
Storage Bay Dist (ft)	99			99			150			
Storage Blk Time (%)	9	50		43	32		20	52		
Queuing Penalty (veh)	44	53		184	43		52	91		

Intersection: 1: Grant St & Highway 99E

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	123	655	666	95	409	408	69	145	87	92
Average Queue (ft)	77	380	398	18	177	191	37	45	67	76
95th Queue (ft)	134	669	671	58	323	339	73	105	104	100
Link Distance (ft)		680	680		694	694		165	82	82
Upstream Blk Time (%)		1	2					0	17	21
Queuing Penalty (veh)		7	9					0	25	31
Storage Bay Dist (ft)	99			99			45			
Storage Blk Time (%)	10	32		0	21		12	9		
Queuing Penalty (veh)	55	24		0	3		5	3		

Intersection: 2: Ivy St & Highway 99E

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	123	725	720	123	320	364	175	256	102	108
Average Queue (ft)	90	602	617	110	298	302	151	207	83	89
95th Queue (ft)	144	846	839	141	348	354	216	241	109	101
Link Distance (ft)		694	694		300	300		193	85	85
Upstream Blk Time (%)		11	14		39	30	0	57	44	65
Queuing Penalty (veh)		69	85		217	163	0	235	96	141
Storage Bay Dist (ft)	99			99			150			
Storage Blk Time (%)	11	50		52	29		17	56		
Queuing Penalty (veh)	55	52		224	38		43	98		

APPENDIX F
CRASH DATA AND
CALCULATIONS

COLLISION RATE CALCULATIONS

Highway 99E (SE 1st Avenue) / Site Access (Domino's East Driveway)

2012 Existing PM Peak Hour Total Entering Volume (TEV) = 2,366 vehicles

Million Entering Vehicles (MEV) per Year =

$$\left(\frac{ADT * 365}{1{,}000{,}000}\right) \approx \left(\frac{Peak\,Hour\,TEV * 10 * 365}{1{,}000{,}000}\right) = \left(\frac{2{,}366 * 10 * 365}{1{,}000{,}000}\right) = 8.64$$

Collision Rate per Year (using ODOT data Jan. 2006 – Dec. 2010) =

$$\left(\frac{\left(Total\ number\ of\ collisions \,/\, Number\ of\ Years\right)}{MEV\ per\ Year}\right) = \left(\frac{2\,collisions \,/\, 5\,years}{8.64\,MEV\ per\ Year}\right) = \mathbf{0.05}$$

Highway 99E (SE 1st Avenue) / S. Locust Street

2012 Existing PM Peak Hour Volume = 2,420 vehicles

Million Entering Vehicles (MEV) per Year =

$$\left(\frac{ADT * 365}{1{,}000{,}000}\right) \approx \left(\frac{Peak\,Hour\,TEV * 10 * 365}{1{,}000{,}000}\right) = \left(\frac{2{,}420 * 10 * 365}{1{,}000{,}000}\right) = 8.83$$

Collision Rate per Year (using ODOT data Jan. 2006 – Dec. 2010) =

$$\left(\frac{\left(Total\ number\ of\ collisions \,/\, Number\ of\ Years\right)}{MEV\ per\ Year}\right) = \left(\frac{7\,collisions \,/\, 5\,years}{8.83\,MEV\ per\ Year}\right) = \mathbf{0.16}$$

COLLISION RATE CALCULATIONS

S. Locust Street / SE 2nd Avenue

2012 Existing PM Peak Hour Volume = 224 vehicles

Million Entering Vehicles (MEV) per Year =

$$\left(\frac{ADT * 365}{1{,}000{,}000}\right) \approx \left(\frac{Peak\,Hour\,TEV * 10 * 365}{1{,}000{,}000}\right) = \left(\frac{224 * 10 * 365}{1{,}000{,}000}\right) = 0.82$$

Collision Rate per Year (using ODOT data Jan. 2006 – Dec. 2010) =

$$\left(\frac{\left(Total\ number\ of\ collisions \,/\, Number\ of\ Years\right)}{MEV\ per\ Year}\right) = \left(\frac{2\,collisions \,/\, 5\,years}{0.82\,MEV\ per\ Year}\right) = \mathbf{0.49}$$

081 PACIFIC HIGHWAY EAST

Pacific Highway East (Hwy 081) MP 20.52 to MP 21.24
January 1, 2006 through December 31, 2010

SER# / INVEST	SPEED	ALCOHOL	DRUGS	SCHOOL BUS	WORK ZONE	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG TYP / MILEPNT	FC / CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF-CNTL	OFFRD RNDBT / DRVWY	WTHR / LIGHT	SURF / CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
03333	N	N	N			08/31/2008	CLACKAMAS	1 14		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										13
NONE						Sun	CANBY	0 0	PACIFIC HY 99E	UN	(NONE)	UNKNOWN	N	DRY	SS-O		PRVTE	SW NE									000	00
						9A	CANBY UA	20.89	PINE ST	06			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	49	M	OR-Y		045	000	13
											(04)														OR<25			
																02	NONE 0	STRGHT										
																	PRVTE	SW NE									000	00
																	PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		000	000	00
																								OR<25				
01572	N	N	N	N	N	05/15/2010	CLACKAMAS	1 14		ALLEY		N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY						Sat	CANBY	0 0	PACIFIC HY 99E	UN	(NONE)	NONE	N	DRY	TURN		PRVTE	SW NE									000	00
						9A	CANBY UA	20.91	SE LOCUST ST	06			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	23	F	OR-Y		000	000	00
											(04)														OR<25			
																02	NONE 0	TURN-R										
																	PRVTE	SE NE									018	00
																	PSNGR CAR		01	DRVR	NONE	87	F	OR-Y		028	000	02
																								OR<25				
02271	N	N	N			05/28/2006	CLACKAMAS	1 14		STRGHT		N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										08
CITY						Sun	CANBY	0 0	PACIFIC HY 99E	NE	(NONE)	UNKNOWN	N	DRY	TURN		PRVTE	SW NE									000	00
						10A	CANBY UA	20.91	SE LOCUST ST	03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y		000	000	00
											(04)														OR<25			
																02	NONE 0	TURN-L										
																	PRVTE	NE SE									019	00
																	PSNGR CAR		01	DRVR	NONE	85	F	OR-Y		004	000	08
																								OR<25				
01399	N	N	N			04/05/2007	CLACKAMAS	1 14		INTER	3-LEG	N	N	CLR	BIKE	01	NONE 0	TURN-R										05
CITY						Thu	CANBY	+ 0 0	SE LOCUST ST	SE		STOP SIGN	N	DRY	TURN		PRVTE	SE NE									000	00
						6P	CANBY UA	20.92	PACIFIC HY 99E	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	73	M	OR-Y		000	026	00
																								OR<25				
																		STRGHT	01	BIKE	INJC	14	M			039	042	05
																		NE SW										
04731	N	N	N	N	N	12/06/2008	CLACKAMAS	1 14		INTER	3-LEG	N	N	CLR	BIKE	01	NONE 0	TURN-R										18,02
CITY						Sat	CANBY	+ 0 0	SE LOCUST ST	SE		STOP SIGN	N	DRY	TURN		PRVTE	SE NE									015	00
						3P	CANBY UA	20.92	PACIFIC HY 99E	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y		000	000	00
																								OR<25				
																		STRGHT	01	BIKE	INJC	38	M		03	054,028,047	034	18,02,01
																		NE SW										
03279	N	N	N	N	N	08/29/2008	CLACKAMAS	1 14		INTER	3-LEG	N	N	CLR	BIKE	01	NONE 0	STRGHT										02
CITY						Fri	CANBY	+ 0 0	SE LOCUST ST	S		STOP SIGN	N	DRY	ANGL		PRVTE	S N									000	00
						6A	CANBY UA	20.92	PACIFIC HY 99E	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		027,028	000	02
																								OR<25				
																		STRGHT	01	BIKE	INJB	35	M		01	000	000	00
																		W E										

NOT IN STUDY AREA

SITE ACCESS

SITE ACCESS

INTERSECTION

INTERSECTION

INTERSECTION

081 PACIFIC HIGHWAY EAST

Pacific Highway East (Hwy 081) MP 20.52 to MP 21.24
January 1, 2006 through December 31, 2010

SER# / INVEST	SPEED	ALC	SCHL	WRK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / MLG TYP / MILEPNT	FC / COMPNT / CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00824	N	N	N		02/26/2007	CLACKAMAS	1 14		INTER	CROSS	N		N RAIN	ANGL-OTH	01	NONE 0	STRGHT										02
CITY					Mon	CANBY	0 0	SE LOCUST ST	CN		STOP SIGN		N WET	TURN		PRVTE	SW NE									000	00
					7A	CANBY UA	20.92	PACIFIC HY 99E	03	0			N DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y OR<25		000	000	00
							INTERSECTION								02	NONE 0	TURN-L										
																PRVTE	SE SW									000	00
																PSNGR CAR		01	DRVR	NONE	28	M	OR-Y OR<25		028	000	02
01701	N	N	N		05/09/2009	CLACKAMAS	1 14		INTER	3-LEG	N		N CLR	ANGL-OTH	01	NONE 0	TURN-L										02
NONE					Sat	CANBY	0 0	SE LOCUST ST	CN		STOP SIGN		N DRY	TURN		PRVTE	SE SW									015	00
					7P	CANBY UA	20.92	PACIFIC HY 99E	03	0			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OTH-Y N-RES		028	000	02
							INTERSECTION								02	NONE 0	STRGHT										
																PRVTE	NE SW									000	00
																PSNGR CAR		01	DRVR	INJC	38	M	OTH-Y OR<25		000	000	00
00167	N	N	N	N	01/13/2009	CLACKAMAS	1 14		INTER	3-LEG	N		N CLR	S-1TURN	01	NONE 0	TURN-R										08,02
CITY					Tue	CANBY	0 0	SE LOCUST ST	CN		STOP SIGN		N DRY	TURN		PRVTE	SW SE									000	00
					5P	CANBY UA	20.92	PACIFIC HY 99E	04	0			N DLIT	INJ		PSNGR CAR		01	DRVR	INJC	76	F	OR-Y OR<25		006,028	000	08,02
							INTERSECTION								02	NONE 0	STRGHT										
																PRVTE	SW NE									000	00
																PSNGR CAR		01	DRVR	INJC	29	M	OTH-Y N-RES		000	000	00
02072	N	N	N		05/20/2006	CLACKAMAS	1 14		STRGHT		N		N RAIN	O-1TURN	01	NONE 0	STRGHT										08
NO RPT					Sat	CANBY	0 0	PACIFIC HY 99E	SE	(NONE)	UNKNOWN		N WET	TURN		PRVTE	NW SE									000	00
					10A	CANBY UA	20.94	SE LOCUST ST	06	(04)			N DAY	PDO		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y OR<25		000	000	00
NOT IN STUDY AREA															02	NONE 0	TURN-L										
																PRVTE	SE SW									019	00
																PSNGR CAR		01	DRVR	NONE	85	F	OR-Y OR<25		004	000	08
02682	N	N	N		06/28/2006	CLACKAMAS	1 14		STRGHT		N		N CLR	S-STRGHT	01	NONE 0	STRGHT										13
STATE					Wed	CANBY	0 0	PACIFIC HY 99E	UN	(NONE)	UNKNOWN		N DRY	SS-O		PRVTE	SW NE									000	00
					1P	CANBY UA	21.00	SW 4TH AVE	03	(04)			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	F	OR-Y OR<25		045	000	13
NOT IN STUDY AREA															02	NONE 0	STRGHT										
																PRVTE	SW NE									000	00
																PSNGR CAR		01	DRVR	NONE	57	F	OR-Y OR<25		000	000	00
																		02	PSNG	INJC	53	F			000	000	00

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

CITY OF CANBY, CLACKAMAS COUNTY

SE 2nd Avenue from S. Knott Street to East of Locust Street

January 1. 2006 through December 31, 2010

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
03178	N	N	N	N	N	08/22/2008	19	SE LOCUST ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
CITY						Fri	0 +	SE 2ND AVE	CN		STOP SIGN	N	DRY	ANGL		PRVTE	E W									000		00
						2P		INTERSECTION	01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	69	M	OR-Y OR<25		028	000		02
															02	NONE 0	STRGHT											
																PRVTE	N S									000		00
																PSNGR CAR		01	DRVR	INJC	24	M	OR-Y OR<25		000	000		00
04015	Y	N	N			10/24/2008	19	SE LOCUST ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											01,04
CITY						Fri	0 +	SE 2ND AVE	CN		UNKNOWN	N	DRY	ANGL		PRVTE	N S									000		00
						10A		INTERSECTION	04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	47	F	OR-Y OR<25		000	000		00
															02	NONE 0	STRGHT											
																PRVTE	W E									000		00
																PSNGR CAR		01	DRVR	NONE	23	M	OR-Y OR<25		047,021	000		01,04

APPENDIX G
TRIP SURVEYS

FRED MEYER FUEL FACILITY TRIP SURVEY AT SANDY, OREGON

Sandy Fred Meyer Fuel
4/11/12

WEEKDAY AM PEAK HOUR TRIP COUNTS							
		Enter		Exit		Total	
Start Time	End Time	15-Min Total	60-Min Total	15-Min Total	60-Min Total	15-Min Total	60-Min Total
7:00	7:15	10	--	7	--	17	--
7:15	7:30	10	--	12	--	22	--
7:30	7:45	17	--	14	--	31	--
7:45	8:00	15	52	16	49	31	101
8:00	8:15	16	58	16	58	32	116
8:15	8:30	15	63	16	62	31	125
8:30	8:45	14	60	18	66	32	126
8:45	9:00	22	67	27	77	49	144
	Totals	119	--	126	--	245	--

WEEKDAY PM PEAK HOUR TRIP COUNTS							
		Enter		Exit		Total	
Start Time	End Time	15-Min Total	60-Min Total	15-Min Total	60-Min Total	15-Min Total	60-Min Total
4:00	4:15	31	--	28		59	--
4:15	4:30	41	--	37		78	--
4:30	4:45	34	--	40		74	--
4:45	5:00	38	144	30	135	68	279
5:00	5:15	34	147	40	147	74	294
5:15	5:30	35	141	33	143	68	284
5:30	5:45	35	142	32	135	67	277
5:45	6:00	39	143	35	140	74	283
	Totals	287	--	275	--	562	--

FRED MEYER FUEL FACILITY TRIP SURVEY AT OAK GROVE, OREGON

Oak Grove Fred Meyer Fuel
4/11/12

WEEKDAY AM PEAK HOUR TRIP COUNTS							
		Enter		Exit		Total	
Start Time	End Time	15-Min Total	60-Min Total	15-Min Total	60-Min Total	15-Min Total	60-Min Total
7:00	7:15	21	--	17	--	38	--
7:15	7:30	25	--	24	--	49	--
7:30	7:45	25	--	25	--	50	--
7:45	8:00	26	97	27	93	53	190
8:00	8:15	20	96	19	95	39	191
8:15	8:30	22	93	23	94	45	187
8:30	8:45	13	81	17	86	30	167
8:45	9:00	24	79	21	80	45	159
	Totals	176	--	173	--	349	--

WEEKDAY PM PEAK HOUR TRIP COUNTS							
		Enter		Exit		Total	
Start Time	End Time	15-Min Total	60-Min Total	15-Min Total	60-Min Total	15-Min Total	60-Min Total
4:00	4:15	39	--	37		76	--
4:15	4:30	36	--	31		67	--
4:30	4:45	39	--	40		79	--
4:45	5:00	27	141	30	138	57	279
5:00	5:15	25	127	31	132	56	259
5:15	5:30	39	130	26	127	65	257
5:30	5:45	40	131	40	127	80	258
5:45	6:00	38	142	38	135	76	277
	Totals	283	--	273	--	556	--

FRED MEYER FUEL FACILITY - TRIP GENERATION CALCULATIONS

WEEKDAY AM PEAK HOUR TRIP GENERATION					
Data Source	Vehicle Fueling Positions (VFP)	Site Trips			Trip Generation Rate per VFP
		Enter	Exit	Total	
Sandy Fred Meyer Fuel	14	67	77	144	10.29
		47%	53%	100%	
Oak Grove Fred Meyer Fuel	14	96	95	191	13.64
		50%	50%	100%	
Survey Averages	14	48%	52%	100%	11.96
ITE Rates (Land Use Code 944)	4 to 12	51%	49%	100%	12.16

WEEKDAY PM PEAK HOUR TRIP GENERATION					
Data Source	Vehicle Fueling Positions (VFP)	Site Trips			Trip Generation Rate per VFP
		Enter	Exit	Total	
Sandy Fred Meyer Fuel	14	147	147	294	21.00
		50%	50%	100%	
Oak Grove Fred Meyer Fuel	14	141	138	279	19.93
		51%	49%	100%	
Survey Averages	14	50%	50%	100%	20.46
ITE Rates (Land Use Code 944)	4 to 16	50%	50%	100%	13.87

GROUP MACKENZIE

RiverEast Center | 1515 SE Water Avenue, Suite 100 | Portland, OR 97214
P.O. Box 14310 | Portland, OR 97293
Tel: 503.224.9560 Web: www.grpmack.com Fax: 503.228.1285

Group Mackenzie, Incorporated

Architecture
Interiors
Structural Engineering
Civil Engineering
Land Use Planning
Transportation Planning
Landscape Architecture

Locations:
Portland, Oregon
Seattle, Washington
Vancouver, Washington

February 7, 2012

Fred Meyer
Attention: James Coombes
PO Box 42121
Portland, OR 97242-0121

Re: **Fred Meyer Wood Village**
Fuel Facility Trip Surveys
Project Number 2100074.01

Dear Mr. Coombes:

This letter presents a summary of the customer surveys conducted by Group Mackenzie staff at the Gresham and Sandy, Oregon Fred Meyer fuel facility locations. The purpose of the surveys was to determine the number of each trip type, percentage of shared trips and use of rewards cards. Copies of the surveys are attached.

The Gresham, Oregon fuel facility has 10 fueling positions and is located in the main store parking lot along Burnside Street. The survey was conducted between 4:00 PM – 6:00 PM on Wednesday, January 18, 2012. Weather conditions were cold and overcast, normal for this time of year at this location. It is believed the weather had no impact on normal customer behavior.

The Sandy, Oregon fuel facility has 14 fueling positions and is located adjacent to the main store along Industrial Way. The survey was conducted between 4:00 PM – 6:00 PM on Thursday, January 19, 2012. Weather conditions were cold and rainy, normal for this time of year at this location. It is believed the weather had no impact on normal customer behavior.

TRIP TYPES

The surveys were designed to identify the trip type (primary, pass-by or diverted) and if the trip was shared with another use at the site. Shared trips are made by customers who also visit one or more other uses at the site. We further identified if purchasing fuel or visiting another use was the primary reason for the trip.

The following table presents the trip type results for both locations.

TABLE 1 – SURVEY TRIP TYPE SUMMARY

Location	Trip Type									
	Primary			Pass-by			Diverted			Total
	External	Shared		External	Shared		External	Shared		
		Fuel	Other		Fuel	Other		Fuel	Other	
Gresham	14(13%)	3(3%)	7(7%)	22(20%)	10(9%)	7(7%)	34(32%)	5(5%)	5(4%)	107
Sandy	15(11%)	4(3%)	6(4%)	55(40%)	24(17%)	17(12%)	10(7%)	5(4%)	3(2%)	139
Average	**12%**	**3%**	**6%**	**30%**	**13%**	**9%**	**20%**	**4%**	**3%**	**100%**

Primary Trips are vehicle trips to the site that immediately return to their point of origin. The two sites have similar Primary Trip characteristics. On the average, 12% of the surveyed trips were primary trips for fuel only. Another 9% were primary trips, but visited more than one use at the site, resulting in a shared trip.

Pass-by Trips are those trips to the site that are already driving by on the adjacent roadways. Trips to the Sandy fuel facility that were already traveling along Highway 26 are considered pass-by trips. The two sites have different Pass-by Trip characteristics. The Gresham site has a much lower percentage of pass-by trips at 20%, which is only half as many as Sandy. One likely reason for this difference is the Gresham location draws fuel customers using their rewards card discounts from the Wood Village Fred Meyer, which does not currently have a fuel facility.

Diverted Linked Trips are from vehicles already traveling in the area, but not on the roadways immediately adjacent to the site, and must change their travel route to get to the site. The Gresham site has a higher percentage of Diverted linked trips, at 32% of the total. This offsets the higher pass-by trip percentage noted at Sandy, and is likely due to trips by customers of other Fred Meyer stores without fuel facilities, notably Wood Village. These customers are already driving in the area, but travel to the Gresham fuel facility specifically to take advantage of the rewards card discount.

SHARED TRIPS

Shared trips are those taking advantage of more than one use at the site in the same trip. These are also referred to as Internal Capture trips, and are presented in the following table along with the external trip percentages. ITE rates for a stand along gas station are presented for comparison.

TABLE 2 – INTERNAL TRIP SUMMARY (%)

Location	Internal	External			
		Total	Primary	Pass-by	Diverted
Gresham	35	65	13	20	32
Sandy	42	58	11	40	7
Average	38	62	12	30	20
ITE (stand–alone gas station)	20	80	11	41.5	27.5

On the average, 38% of the surveyed trips are Internal Capture trips compared to the recommended 20% for retail to retail trips in the ITE Trip Generation Handbook.

REWARDS CARD

A high percentage of fuel customers utilized their rewards cards. Overall, 93% used a card at Gresham with 88% taking a discount, while 91% used a card at Sandy, with 76% taking a discount. The following table presents the rewards card use by trip type.

TABLE 3 – REWARD CARD USE BY TRIP TYPE												
Location	Primary Trips			Pass-by Trips			Diverted Trips			Shared Trips		
	Total	Reward Card	%	Total	Reward Card	%	Total	Reward Card	%	Total	Reward Card	%
Gresham	14	13	93	22	21	95	34	33	97	37	32	93
Sandy	15	10	67	55	52	95	10	10	100	59	55	91
Average			80			95			99			90

The only significant difference in rewards card use between the two sites is a higher percentage of primary trips using the card at Gresham. This may be due to customers from other Fred Meyer stores making a special trip to Gresham to take advantage of a fuel discount.

The following table presents reward card use for shared trips only, identifying if the shared trip was with the Fred Meyer store or another use at the site. The results indicate a very high percentage of Fred Meyer store shoppers use the rewards card for fuel purchases in the same trip. Of those Fred Meyer store shoppers using the rewards card, 78% took advantage of a discount. This compares to 83% of customers taking advantage of a fuel discount when the shared trip is with another use.

TABLE 4 – REWARD CARD USE FOR SHARED TRIPS									
Location	Fred Meyer			Other			Total		
	Total	Rewards Card	%	Total	Used Rewards Card	%	Total	Used Rewards Card	%
Gresham	32	32	100	5	0	0	37	32	86
Sandy	54	50	93	5	5	100	59	55	93
Average			96			50			90

In summary, the surveys indicate a high shared trip percentage, with most customers taking advantage of fuel discounts in the same trip. The Gresham fuel facility has a higher percentage of diverted linked trips, which is likely from customers of other Fred Meyer stores traveling to Gresham to purchase fuel.

If you have any questions about the data or would like more information please do not hesitate to ask.

Sincerely,

Brent Ahrend, PE
Senior Associate | Traffic Engineer

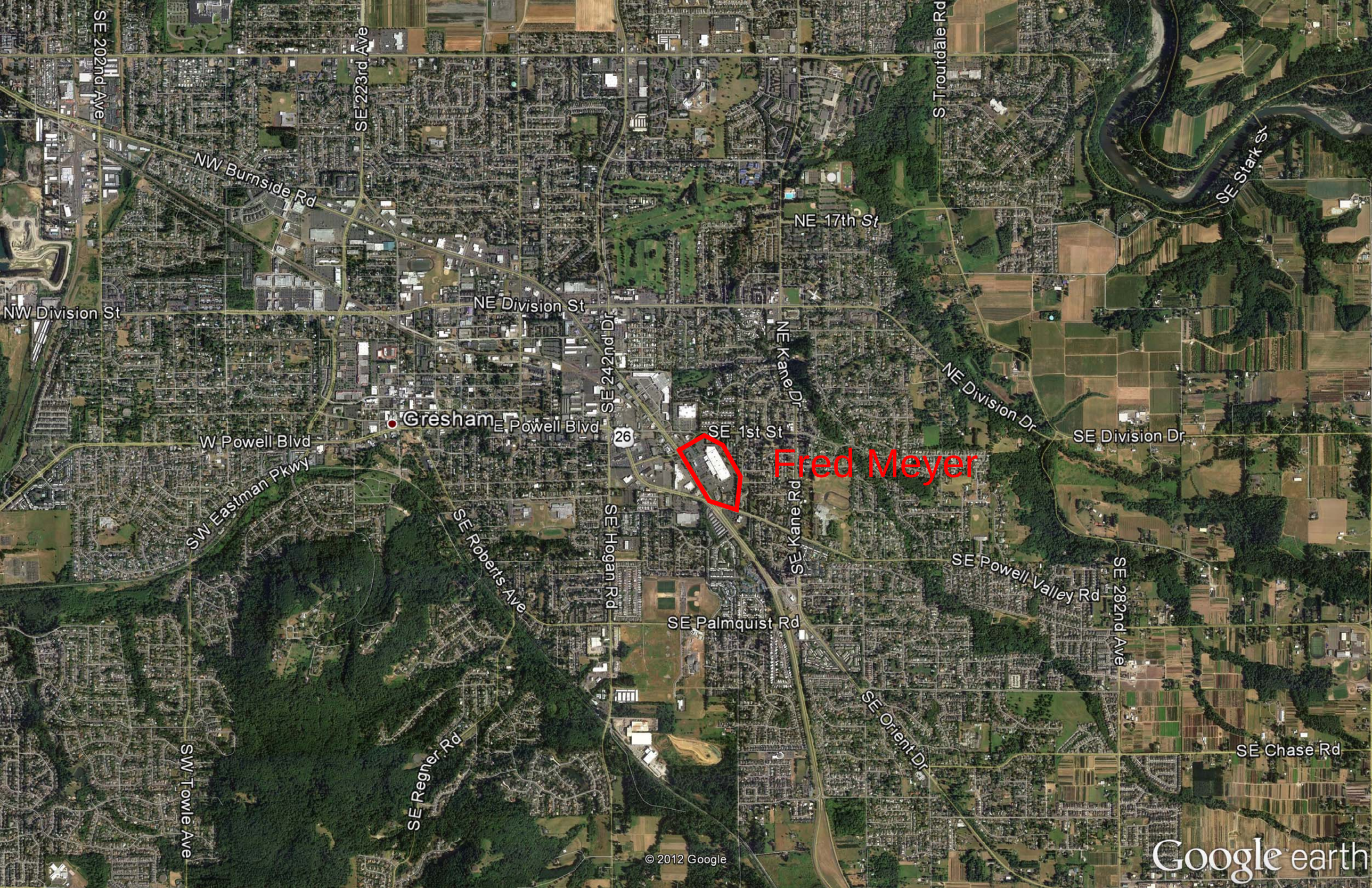
Enclosures: Survey Data Sheets
Vicinity Maps

c: Pam Child – Fred Meyer
Lee Leighton – Westlake Consultants

FRED MEYER SURVEY QUESTIONS

Below are questions for the gas survey that will need to be asked to each of the following customers that approach the fueling station. **Please talk with as many of these customers as you can.** This is very important so we can get the most accurate data we need for our study.

1. I am conducting a trip survey for Fred Meyer. Will you please answer a few questions?
2. Of the following locations, where did your trip begin immediately prior to arriving here? **(i.e. Home/Work/Retail Store/Other)**
3. Will you go directly back there from here? (if yes go to 5)
4. If you had not needed to buy fuel today, would you have been driving by this site anyway? **(Sandy – Hwy 26, 362nd; Gresham – Burnside, Powell Valley, 1st/3rd)**
5. Was purchasing fuel the primary reason for your stop here today?
6. In addition to buying gas, on this visit will you or did you go to any of the other uses on site? [If no, go to 8]
7. Will you or did you go to the Fred Meyer store on this visit?
8. For your gas purchase did you use your rewards card? [If no, done. If yes, go to 9]
9. Did you use your rewards card discount?


Fred Meyer
SE 202nd Ave
SE 223rd Ave
S Troutdale Rd
SE Stark St
NW Burnside Rd
NE 17th St
NW Division St
NE Division St
SE 242nd Dr
NE Kane Dr
NE Division Dr
SE Division Dr
Gresham
E Powell Blvd
W Powell Blvd
SE 1st St
26
SW Eastman Pkwy
SE Roberts Ave
SE Hogan Rd
SE Kane Rd
SE Powell Valley Rd
SE 282nd Ave
SE Palmquist Rd
SE Orient Dr
SE Chase Rd
SE Regner Rd
SW Towle Ave
© 2012 Google
Google earth

Location: Gresham Date: 1/18/12

Project No.: 2100074.01 Surveyor: MTD

Question	1	2	3	4	5	6	7	8	9	10
	Home	✓	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Gym	/	Y/N	Y/N	Y/N	~~Y/N~~	~~Y/N~~	Y/N	Y/N	
	Store	/	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	H	/	Y/N	~~Y/N~~	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	W	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	h	/	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	R	/	Y/N	~~Y/N~~	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	H	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	O	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	H	/	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	H	/	Y/N	~~Y/N~~	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	W	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	H	/	Y/N	~~Y/N~~	Y/N	Y/N	Y/N	Y/N	Y/N	
	H	/	Y/N	~~Y/N~~	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	H	/	Y/N	~~Y/N~~	Y/N	Y/N	Y/N	Y/N	Y/N	
	O	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	H	/	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	H	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	H	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	O	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	O	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	O	/	Y/N	Y/N	Y/N	Y/N	~~Y/N~~	Y/N	Y/N	
	H	/	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	H	/	Y/N	~~Y/N~~	Y/N	Y/N	Y/N	Y/N	Y/N	
	H	/	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	NO		Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	

51

2	3*	4	5	6*	7	8	9		
H	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N		
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / [✓ N]		
O	[✓ Y] / N	~~Y / N~~	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N		
O	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N		
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
O	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N		
H	[✓ Y] / N	~~Y / N~~	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N		
W	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N		
H	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
NO	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N		10
O	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
O	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N		
H	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	~~Y / N~~		
W	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	Y / [✓ N]	~~Y / N~~		
O	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[illegible]	~~Y / N~~		
O	[✓ Y] / N	~~Y / N~~	Y / [✓ N]	Y / [✓ N]	~~Y~~ / N	[✓ Y] / N	[✓ Y] / N		
W	Y / [✓ N]	~~[✓ Y] / N~~	[✓ Y] / N	Y / [✓ N]	~~Y~~ / N	[✓ Y] / N	[✓ Y] / N		
H	Y / [✓ N]	~~[✓ Y]~~ / N	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
W	Y / [✓ N]	~~Y~~ / [✓ N]	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
H	Y / [✓ N]	~~[✓ Y] / N~~	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N		20
W	Y / [✓ N]	~~Y~~ / [✓ N]	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
W	Y / [✓ N]	~~Y~~ / [✓ N]	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
O	Y / [✓ N]	[✓ Y] / ~~N~~	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
H	Y / [✓ N]	~~Y~~ / [✓ N]	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
H	Y / [✓ N]	~~Y / [✓ N]~~	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
H	Y / [✓ N]	~~[✓ Y]~~ / N	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	[✓ Y] / N		
W	Y / [✓ N]	~~Y~~ / [✓ N]	[✓ Y] / N	Y / [✓ N]	~~Y / N~~	[✓ Y] / N	Y / [✓ N]		29
	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N		
	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N		

Location: E BURNSIDE GRESHAM FM Date: 1/18/12

Project No.: 2100074.01 Surveyor: JMH

Question	1	2	3	4	5	6	7	8	9	10
		O /	Y (N)	(Y) / N	(Y) / N	(Y) N	Y (N)	Y (N)	Y / N	.
		W /	Y (N)	Y (N)	(Y) N	Y N	Y N	(Y) N	(Y) N	.
		W /	Y (N)	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	.
		W /	Y (N)	Y (N)	(Y) N	Y (N)	Y (N)	(Y) N	(Y) N	.
		O /	Y (N)	Y (N)	(Y) N	Y (N)	Y (N)	(Y) N	(Y) N	.
		W /	Y (N)	(Y) N	(Y) N	Y (N)	Y (N)	Y N	(Y) N	.
		W /	Y (N)	(Y) N	(Y) N	Y (N)	Y (N)	Y (N)	Y / N	.
		W /	Y (N)	(Y) N	(Y) N	Y (N)	(Y) N	(Y) N	(Y) N	.
		H /	Y (N)	(Y) N	(Y) N	Y (N)	Y (N)	(Y) N	(Y) N	/
		H /	(Y) / N	(Y) N	(Y) N	Y (N)	Y (N)	(Y) N	Y (N)	
		O /	Y (N)	(Y) N	(Y) N	Y (N)	Y (N)	(Y) N	Y N	
		W /	Y (N)	Y (N)	(Y) N	Y (N)	Y (N)	(Y) N	Y N	
		H /	Y (N)	(Y) N	(Y) N	Y (N)	Y / N	(Y) N	Y N	
		H /	Y (N)	(Y) N	(Y) N	Y (N)	Y / N	(Y) N	(Y) N	
		O /	Y (N)	(Y) N	Y (N)	(Y) N	(Y) N	(Y) N	Y (N)	.
		O /	Y (N)	Y (N)	(Y) N	Y (N)	Y (N)	(Y) N	(Y) N	.
		O /	Y (N)	(Y) N	Y (N)	(Y) N	(Y) N	(Y) N	(Y) N	.
		O /	(Y) N	Y (N)	Y (N)	(Y) N	(Y) N	(Y) N	(Y) N	.
		O	Y (N)	(Y) N	Y (N)	(Y) N	(Y) N	(Y) N	Y (N)	.
		H	(Y) N	(Y) N	(Y) N	Y (N)	Y (N)	(Y) N	Y (N)	.
		O	Y (N)	Y (N)	(Y) / N	Y (N)	Y / N	(Y) N	(Y) N	.
		H	(Y) N	Y / N	(Y) N	Y (N)	Y / N	(Y) N	(Y) N	.
		W	(N)	Y (N)	(Y) N	Y (N)	Y / N	(Y) N	(Y) N	.
		O	Y (N)	(Y) N	(Y) N	Y (N)	Y / N	(Y) N	Y (N)	.
		W	Y (N)	(Y) N	(Y) N	Y (N)	Y / N	(Y) N	(Y) N	.
		W	Y (N)	Y (N)	(Y) N	Y (N)	Y / N	(Y) N	(Y) N	.
		O	N	N	Y	N		Y	N	.

60

70

26

	2	3	4	5	6	7	8	9	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N		
H	Y		Y	N		Y	Y		

80

90

100

107

FRED MEYER SURVEY QUESTIONS

Below are questions for the gas survey that will need to be asked to each of the following customers that approach the fueling station. **Please talk with as many of these customers as you can.** This is very important so we can get the most accurate data we need for our study.

1. I am conducting a trip survey for Fred Meyer. Will you please answer a few questions?
2. Of the following locations, where did your trip begin immediately prior to arriving here? **(i.e. Home/Work/Retail Store/Other)**
3. Will you go directly back there from here? (if yes go to 5)
4. If you had not needed to buy fuel today, would you have been driving by this site anyway? **(Sandy – Hwy 26, 362nd; Gresham – Burnside, Powell Valley, 1st/3rd)**
5. Was purchasing fuel the primary reason for your stop here today?
6. In addition to buying gas, on this visit will you or did you go to any of the other uses on site? [If no, go to 8]
7. Will you or did you go to the Fred Meyer store on this visit?
8. For your gas purchase did you use your rewards card? [If no, done. If yes, go to 9]
9. Did you use your rewards card discount?


SE Orient Dr
26
Fred Meyer
Mt Hood Hwy
SE Bluff Rd
Proctor Blvd
Sandy
211
© 2012 Google
Google earth

2	3	4	5	6	7	8	9	
A	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
O	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	.
H	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	.
W	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	.
R	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	.
W	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	.
W	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
R	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
H	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
H	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.
H	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.
	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	

10

20

28

2 3 4 5 6 7 8 9

NO

2	3	4	5	6	7	8	9		
O	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	.	
R	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.	30
R	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	.	
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	.	
O	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
O	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	.	
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	.	
W	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.	
O	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
O	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	.	40
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	.	
R	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
H	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
W	Y / [✓ N]	[✓ Y] / N	Y / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	.	
O	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.	
H	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.	
W	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	.	
W	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	.	50
P	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
H	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
R	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	[✓ Y] / N	.	
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	.	
W	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
W	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	
H	[✓ Y] / N	Y / [✓ N]	[✓ Y] / N	Y / [✓ N]	Y / [✓ N]	[✓ Y] / N	[✓ Y] / N	.	57
2	3	4	5	6	7	4	9		

NO
11

	2	3	4	5	6	7	8	9	
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	. 60
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	. 62
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	2	3	4	5	6	7	8	9	

Location:

Date:

Project No.:

Surveyor:

Question	1	2	3	4	5	6	7	8	9	10
		W	Y / [✓ N]	[✓ Y] / N	~~Y~~ / N	Y / N	Y / N	[✓ Y] / N	[✓ Y] / N	
		[illegible]	Y / [✓ N]	[✓ Y] / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		[illegible]	Y / N	[✓ Y] / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		W	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		W	Y / N	Y / N	Y / N	Y / [✓ N]	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		H	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		W	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		H	[✓ Y] / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		W	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		W	Y / N	Y / N	Y / [✓ N]	Y / N	Y / N	Y / N	[✓ Y] / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
			Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		H	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	
		W	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	

10

20

26

	2	3	4	5	6	7	8	9	
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	. 30
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
R	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	. 40
R	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	. 50
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	. 55

	6	7	8	9				
R	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
C	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
O	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
H	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
W	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	.
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	
	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	

APPENDIX H
TRIP DISTRIBUTION
MODEL

30%

15%

30%

5%

20%

Total
101 Out
93 In

Canby TSP	Canby2009BaseYearModel_v11_r1(BarlowGreens).ver	Created on: 11.04.2012
DKS Associates	2009 PM Peak Hour Volumes	1:6313

APPENDIX I
TRAFFIC SIGNAL PLANS

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC - ROADWAY SECTION

2B044	1	2B	81	21.14
TSSU ID	Region	District	Highway No.	Milepoint

Location: Pacific Highway East (99E) @ Ivy St

County: Clackamas

City: Canby

Main Street Speed: 35 M.P.H.

Side Street Speed: 25 M.P.H.

Railroad P.C.O.I. Time: 15 seconds

Maintenance Response Category (1, 2, or 3):

Agreement No.:

Maintenance By:
(ODOT, County, or City)

Submit copies to State Traffic Engineer and Traffic Systems Services Unit.

Permanent	Temporary	*Indicate simple changes by giving both old and new values* *(Ex: Change Ph 2 Max Green from 45 to 60)* *For more extensive changes submit new sheets* *Ex: New system timing - replace Sheet 7)* *Fill in "Date sheet in effect" on new sheet and attach old sheet with "Date sheet voided" filled in.*		Timing or Timing Revisions By	INSTALLED		
					Date	Time	By
		Preliminary Timing					
		Signal Turn-on					

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

Table Numbers refer to Trafficview & Translink

TABLE 3

Clock, EV and Misc. (C + Key)

Function	Key	
Year	0	Clock Location C + 3 uses Call / Active Display Sunday = 1
Month	1	
Date	2	
Day of Week	3	
Hour	4	
Minute	5	
Second	6	
1/10 Second	7	

		Phase Number							
		1	2	3	4	5	6	7	8
	8								
Start Yellow	9								
EVA Phases	A		X			X			
EVB Phases	B				X			X	
EVC Phases	C	X					X		
EVD Phases	D			X					X
Handicap Ped	E								

TABLE 3

Preemption Data (E+Key)

Function	Key	Parameter	Timing
EVA	0	Delay	
	1	Minimum	1
EVB	2	Delay	
	3	Minimum	1
EVC	4	Delay	
	5	Minimum	1
EVD	6	Delay	
	7	Minimum	1
Overlaps	8	Red Revert	5.0
Railroad	9	Delay	
	A	Minimum	15

		Phase Number							
		1	2	3	4	5	6	7	8
RR Clear Ph	B			X					X
RR Permit	C		X			X	X	X	
RR OL Permit	D								
Nema Hold Ph	E								
	F								

TABLE 6 (also see sheet 6)

Miscellaneous (D + Code)

Function	Code	Value	Notes
Floating Ped	2E		0 = Off 1 = On (Ph. 7 & 8 Not permitted)
ID Number	2F	44	Range 0 to 253 (1)
Coordination Ped Recalls	3E	1	0 = Recall 1 = No Recall
Rest in WALK	3F		0 = Off 1 = ON
Advance Warning End of Green	4E		Extend time for green after sign turns on (2) (5)
Advance Warning Start of Green	4F		Delay time for sign after phase turns yellow (2) (5)
RR Red Clear	5E		Length of all red after RR red flash
RR Clear Color	5F		0 = Green, 1 = Flash Yellow, 2 = Flash Red
NEMA Inputs	66		Non zero value reassigns C1 inputs. (3)
Bus Delay	6D	25.5	Delay time before preemption (4)
Bus Timer # 1	6E		Extension of max green for phases 2 & 6 (Free operation)
Bus Timer # 3	6F		Force off time for Ph 4 & 8 (only in Free operation)
JHK Protocol	76		0 = no 0.1 = yes
JHK Area No. & 1st digit local	7D		Area No. 0 - 7 and Local 001 - 510 (1)
EV minimum timed Start / end of call	7E		0 = at start of call 1 = at end of call
EV On Indicators	7F		0 = Off, 1 = Flash, 5 = solid indication (5)

Notes

(1) JHK ID no. is formed by Area no. (0 to 7) and 3 digit Local no. (001-510). Left most digits entered as x.x in location 7D and rightmost as xx in location 2F

(2) See Sheet 6, Location B+0+E

(3) C1 pins 54, 63, 64, 75, 76, and 77. See sheet 6, Location B+0+D.

(4) Entering 25.5 in this location is the only way of disabling bus preempt.

(5) Ped yellow outputs, C1-35, 36, 37, and 38 are used by Rt. Turn Overlaps, EV on indicators, TOD/DOW programmable outputs, Fiber Optic sign for RR flash yellow clearance, and Advance Warning sign operation.

Phase Rotation Diagram

T. E. O. S. Dwg. Nos:

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E) / Ivy St

TABLE 1 Page 0

Phase Functions (0+Key)

Function	Key	Phase Number *							
		1	2	3	4	5	6	7	8
Veh Recall	0		X				X		
Ped Recall	1								
Red Lock	2								
Yellow Lock	3								
Permit Phase	4	X	X	X	X	X	X	X	X
Ped Phases	5		X		X		X		X
Lead Phases	6	X		X		X		X	
Double Entry	7								
Sequential	8								
Start Green	9								
OLA=	A								
OLB=	B								
OLC=	C								
OLD=	D								
Exclusive	E								
Sim Gap	F		X				X		

TABLE 2 Page 0

Miscellaneous (C+F+Key)

Function	Key	Value	
Page ID	0		Keys 8 through F use Call/Active Display
	1		
	2		
	3		
OLA Red	4		
OLB Red	5		
OLC Red	6		
OLD Red	7		

	Key	Phase Number 1	2	3	4	5	6	7	8
RT OLE	8								
RT OLF	9								
Red Rest	A								
Max Recall	B								
Flash Green	C								
	D								
Advance WALK	E								
Restrictive Ph	F								

* Shown on Call/Active Display

TABLE 1 Page 0

Phase Timing (Ph. No. + Key)

Interval	Key	NB Hwy Left Turn	SB ORE 99E	EB Lt to NB ORE 99E	WB (NB) Ivy	SB Hwy Left Turn	NB ORE 99E	WB Lt to SB ORE 99E	EB (SB) Ivy
		Phase Number							
		1	2	3	4	5	6	7	8
Max Green	0	15	45	15	25	15	45	15	25
Max2 / HFDW	1	12	60	12	29	12	75	18	23
Walk	2		7		7		7		7
Flashing DW	3		12		18		13		19
Max Initial	4	4	13	6	6	4	13	4	6
Min Green	5	4	10	6	6	4	10	4	6
TBR	6	8	10	10	8	8	10	8	8
TTR	7	3	20	5	3	3	20	3	3
Observe Gap	8								
Passage	9	2.3	4.3	2.3	2.3	2.3	4.3	2.3	2.3
Min Gap	A	0.5	2.3	0.5	0.5	0.5	2.3	0.5	0.5
Add per Act	B		1.2				1.2		
Yellow	C	3.5	4.0	3.5	3.5	3.5	4.0	3.5	3.5
Red Clear	D	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Red Revert	E	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Walk 2	F								

To observe timing for an individual phase: Enter C + A + F for Ring A (Phase 1-4) or enter C + B + F for Ring B (Phase 5-8)

Page I.D. 0

Phase Conditions as shown on Free Display

00 Initial Entry	0C Yellow
01 Advance Walk	0d Red Clear
02 Walk	0E Red Revert
03 Flashing DW	11 Gap Out
05 Min Green	12 Force Off
08 Rest	14 Max Out
09 Passage	15 Red Revert Timed out
0b Added Initial	

TABLE 2 Page 0

Miscellaneous (9+Key)

Parameter		Key	Value	Notes
Short Pwr Dn		0		Clock Correction Speed up 1 - 9 Slow down 11 - 19
Long Power Dn		1		
Preemption Delay Types	EVA	2		Preemption Delay Types: Hold 1 Latch 2 Both 3 Neither 0
	EVB	3		
	EVC	4		
	EVD	5		
	RR	6		
Ped Inhibit		7		Usually "0"
OLA	Green	8		Overlap Yellow Time should always be specified
	Yellow	9		
OLB	Green	A		
	Yellow	B		
OLC	Green	C		
	Yellow	D		
OLD	Green	E		
	Yellow	F		

Keyboard Entries when not in Free Display

A Advance	D Column Advance
B Back	E Enter and Advance
C Clear Display	F Free Display

Reinitialization

D + 1 + F + 1 + E

(Use **only** when in flash)

Phase Data Copy

C + x + C + y + D

x From Phase (x cannot be 3 or 8)

y To Phase(s) - up to 3 at a time

SHEET 3

Date sheet in effect:

Date sheet voided:

Location: Pacific Highway East (99E) / Ivy St

TABLE 1 Page 1

Phase Functions (D+C+0+Key)

Function	Key	Phase Number *							
		1	2	3	4	5	6	7	8
Veh Recall	0								
Ped Recall	1								
Red Lock	2								
Yellow Lock	3								
Permit Phase	4	X	X	X	X	X	X	X	X
Ped Phases	5		X		X		X		X
Lead Phases	6	X		X		X		X	
Double Entry	7								
Sequential	8								
Start Green	9								
OLA=	A								
OLB=	B								
OLC=	C								
OLD=	D								
Exclusive	E								
Sim Gap	F		X				X		

TABLE 2 Page 1

Miscellaneous (D+C+B+Key)

Function	Key	Value	
Page ID	0		
	1		Keys 8 through F use Call/Active Display
	2		
	3		
OLA Red	4		
OLB Red	5		
OLC Red	6		
OLD Red	7		

	Key	Phase Number							
		1	2	3	4	5	6	7	8
RT OLE	8								
RT OLF	9								
Red Rest	A								
Max Recall	B								
Flash Green	C								
	D								
Advance WALK	E								
Restrictive Ph	F								

* Shown on Call/Active Display

TABLE 1 Page 1

Phase Timing (D + C + Ph. No. + Key)

Interval	Key	NB Hwy Left Turn	SB ORE 99E	EB Lt to NB ORE 99E	WB (NB) Ivy	SB Hwy Left Turn	NB ORE 99E	WB Lt to SB ORE 99E	EB (SB) Ivy
		Phase Number							
		1	2	3	4	5	6	7	8
Max Green	0	12	60	18	23	12	75	18	23
Max2 / HFDW	1	12	60	15	21	12	75	15	21
Walk	2		7		7		7		7
Flashing DW	3		12		18		13		19
Max Initial	4	4	13	6	6	4	13	4	6
Min Green	5	4	10	6	6	4	10	4	6
TBR	6	8	10	10	8	8	10	8	8
TTR	7	3	20	5	3	3	20	3	3
Observe Gap	8								
Passage	9	2.3	4.3	2.3	2.3	2.3	4.3	2.3	2.3
Min Gap	A	0.5	2.3	0.5	0.5	0.5	2.3	0.5	0.5
Add per Act	B		1.2				1.2		
Yellow	C	3.5	4.0	3.5	3.5	3.5	4.0	3.5	3.5
Red Clear	D	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Red Revert	E	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Walk 2	F								

To observe timing for an individual phase: Enter C + A + F for Ring A (Phase 1-4) or enter C + B + F for Ring B (Phase 5-8)

Page I.D. 1

Phase Conditions as shown on Free Display

00 Initial Entry	0C Yellow
01 Advance Walk	0d Red Clear
02 Walk	0E Red Revert
03 Flashing DW	11 Gap Out
05 Min Green	12 Force Off
08 Rest	14 Max Out
09 Passage	15 Red Revert Timed out
0b Added Initial	

TABLE 2 Page 1

Miscellaneous (D+C+9+Key)

Parameter		Key	Value	Notes
Short Pwr Dn		0		Clock Correction Speed up 1 - 9 Slow down 11 - 19
Long Power Dn		1		
Preemption Delay Types	EVA	2		Preemption Delay Types: Hold 1 Latch 2 Both 3 Neither 0
	EVB	3		
	EVC	4		
	EVD	5		
	RR	6		
Ped Inhibit		7		Usually "0"
OLA	Green	8		Overlap Yellow Time should always be specified
	Yellow	9		
OLB	Green	A		
	Yellow	B		
OLC	Green	C		
	Yellow	D		
OLD	Green	E		
	Yellow	F		

Keyboard Entries when not in Free Display

A Advance	D Column Advance
B Back	E Enter and Advance
C Clear Display	F Free Display

Reinitialization

D + 1 + F + 1 + E

(Use **only** when in flash)

Phase Data Copy

C + x + C + y + D

x From Phase (x cannot be 3 or 8)

y To Phase(s) - up to 3 at a time

Date sheet in effect:

Date sheet voided:

Location: Pacific Highway East (99E) / Ivy St

TABLE 1 Page 2

Phase Functions (D+D+0+Key)									
Function	Key	Phase Number *							
		1	2	3	4	5	6	7	8
Veh Recall	0								
Ped Recall	1								
Red Lock	2								
Yellow Lock	3								
Permit Phase	4								
Ped Phases	5								
Lead Phases	6								
Double Entry	7								
Sequential	8								
Start Green	9								
OLA=	A								
OLB=	B								
OLC=	C								
OLD=	D								
Exclusive	E								
Sim Gap	F								

TABLE 2 Page 2

Miscellaneous (D+D+B+Key)		
Function	Key	Value
Page ID	0	
	1	
	2	
	3	
OLA Red	4	
OLB Red	5	
OLC Red	6	
OLD Red	7	

Keys 8 through F use Call/Active Display

		Phase Number							
		1	2	3	4	5	6	7	8
RT OLE	8								
RT OLF	9								
Red Rest	A								
Max Recall	B								
Flash Green	C								
	D								
Advance WALK	E								
Restrictive Ph	F								

* Shown on Call/Active Display

SHEET 5

TABLE 1 Page 2

Phase Timing (D + D + Ph. No. + Key)									
Interval	Key	Phase Number							
		1	2	3	4	5	6	7	8
Max Green	0								
Max2 / HFDW	1								
Walk	2								
Flashing DW	3								
Max Initial	4								
Min Green	5								
TBR	6								
TTR	7								
Observe Gap	8								
Passage	9								
Min Gap	A								
Add per Act	B								
Yellow	C								
Red Clear	D								
Red Revert	E								
Walk 2	F								

To observe timing for an individual phase: Enter C + A + F for Ring A (Phase 1-4) or enter C + B + F for Ring B (Phase 5-8)

Page I.D. 2

Phase Conditions as shown on Free Display

00 Initial Entry	0C Yellow
01 Advance Walk	0d Red Clear
02 Walk	0E Red Revert
03 Flashing DW	11 Gap Out
05 Min Green	12 Force Off
08 Rest	14 Max Out
09 Passage	15 Red Revert Timed out
0b Added Initial	

TABLE 2 Page 2

Miscellaneous (D+D+9+Key)				
Parameter		Key	Value	Notes
Short Pwr Dn		0		Clock Correction Speed up 1 - 9 Slow down 11 - 19
Long Power Dn		1		
Preemption Delay Types	EVA	2		Preemption Delay Types: Hold 1 Latch 2 Both 3 Neither 0
	EVB	3		
	EVC	4		
	EVD	5		
	RR	6		
Ped Inhibit		7		Usually "0"
OLA	Green	8		Overlap Yellow Time should always be specified
	Yellow	9		
OLB	Green	A		
	Yellow	B		
OLC	Green	C		
	Yellow	D		
OLD	Green	E		
	Yellow	F		

Keyboard Entries when not in Free Display

A Advance	D Column Advance
B Back	E Enter and Advance
C Clear Display	F Free Display

Reinitialization

D + 1 + F + 1 + E

(Use **only** when in flash)

Phase Data Copy

C + x + C + y + D

x From Phase (x cannot be 3 or 8)

y To Phase(s) - up to 3 at a time

SHEET 6

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

TABLE 6 (Also see sheet 2)

Operation (B + 0 + Key)		
Key	Parameter	Value
0	Present Plan	
1	Time of Day Plan	
2	Hardwire Plan	
3	MODEM Plan	
4	Mode (0 - 4 see right)	**1**
5	Master (0 - 4 see right)	
6	Master Cycle Clock	
7	Local Cycle Clock	
8	Local Timer	
9		
A		
B		

0 = Free *3 = Modem*
1 = TBC *4 = TM System*
2 = Hardwire

0 = Off *3 = 1 + 2*
1 = Modem Master *4 = TM Master*
2 = Hardwire Master

OSM ? Y N

OSM Location

		Phase Number							
		1	2	3	4	5	6	7	8
C									
D	NEMA CNA								
E	Adv. Warn.								
F	MRI Phases	X		X	X	X		X	X

TABLE 13 (Also see Sheet 10)

Miscellaneous (E + F + Key)		
Function	Key	Time
Railroad Max 2	0	
Ped Permissive Plan 1	1	
Ped Permissive Plan 2	2	
Ped Permissive Plan 3	3	
Ped Permissive Plan 4	4	
Ped Permissive Plan 5	5	
Ped Permissive Plan 6	6	
Ped Permissive Plan 7	7	
Ped Permissive Plan 8	8	
Ped Permissive Plan 9	9	
Number of Long Powerouts	A	
Number of Short Powerouts	B	
Failed Detector Number	C	
Max 2 On	D	
Fall Daylight Savings	E	**99**
Revision Level	F	

177 = 1st Sunday in November (rev 60C or HC11_32T)

Manual (D + 1 + E)

Function Code Index

Function		Time Clock On	Time Clock Off	Manual On	Manual Off	Notes
Outputs	A	71	81			*Phase 2 ped yellow (C1-35) (1)*
	B	72	82			*Phase 6 ped yellow (C1-36) (1)*
	C	73	83			*Phase 4 ped yellow (C1-37) (1)*
	D	74	84			*Phase 8 ped yellow (C1-38) (1)*
TOD Red Rest		25	24			*See Sheet 10 at B + C + D to set phases*
TOD Max Recall		27	26			*See Sheet 10 at B + A + E to set phases*
TOD Ped Recall		29	28			*See Sheet 10 at B + B + E to set phases*
WALK 2		55	54			*Use WALK 2 times set on Sheets 3, 4, 5*
Plan No.		1 - 18		1 - 18	0	*Sets operation to coordination plans on Sheet 7*
Free		20		20		*Sets operation to fully actuated*
Flash		19 or 33	32	19 or 33	0	*Sets operation to flash*
Max 2		129	128	129	0	*Use Max 2 times set on Sheets 3, 4, 5*
Det. Count 15		131	130			*Log Detector Counts - 15 min. intervals*
Det. Count 60		132	130			*Log Detector Counts - 60 min. intervals*
Clear Det. Ct.		133		133		*Clear Detector Count Log*
Det Diagnostic		136	135			*Enable Detector Diagnostics and log*
Det Diag Test		137	135			*Enable Detector Diagnostics without log*
Clear Det Diag.		138		138		*Clear Detector Diagnostic Log*
Send Real Time		199		199		*Modem master only*
Time Transfer		100		100		*Implements Page 0*
		101		101		*Implements Page 1*
		102		102		*Implements Page 2*
Page Copy				93		*Copies Page 0 data to Pages 1 & 2 Make sure Page 0 is the active Page*
Burn Memory				94		*Places active timing data into backup timing (Use reinitialization to place backup into active)*
Print Out				96	0	*Conect printer to C2 connector*

Note
(1) These C1 pins are used for other functions. See note (5) on Sheet 2.

TABLE 10 (Also see Sheet 12)

For Protected / Permissive Left Turns

(A + 3 + 9)

Sample Detectors (0 = off, 1 = on)

Sampling detectors are assigned using extended input codes on Sheet 11

(A + 3 + A)

Left Turn Type (0, 1, or 2)

0 = Off

1 = Left turn places call on cross street

2 = Left turn is omitted until cross street is serviced

Page 1 (D+A+3+A)

Page 2 (D+A+A+A)

Note: This feature works only with leading left turn phases 1, 3, 5, or 7. It is used to prohibit a green arrow from immediately following a green ball.

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

TABLE 7 (1 of 2)

Hardwire Conversion	Dial Offset	1			2			3		
		1	2	3	1	2	3	1	2	3

Parameter	Key	Coordination Timing (B + Plan No. + Key)									Plan Number
		1	2	3	4	5	6	7	8	9	
Cycle Length	0		95		90	100					
Forceoffs for Phase indicated by Key number	1		15		15	15					
	2										
	3		63		59	63					
	4		48		40	42					
	5		77		73	77					
	6		15		15	15					
	7		63		59	63					
	8		42		40	42					
Offset	9		86		87	98					
Permissive	A		17		17	17					
Max. Dwell	B		32		30	34					

1

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

2

		1	2	3	4	5	6	7	8
C	Lead Phases		X		X	X			X
D	Coord. Phases		X						
E	Perm. 2 Ph.								
F	Min. Recall								

3

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

4

		1	2	3	4	5	6	7	8
C	Lead Phases		X		X	X			X
D	Coord. Phases		X						
E	Perm. 2 Ph.								
F	Min. Recall								

5

		1	2	3	4	5	6	7	8
C	Lead Phases		X		X	X			X
D	Coord. Phases		X				X		
E	Perm. 2 Ph.								
F	Min. Recall								

6

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

7

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

8

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

9

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

TABLE 7 (2 of 2)

Parameter	Key 2	Coordination Timing (B + D + Key 1 + Key 2)									Plan Number
		10	11	12	13	14	15	16	17	18	
		7	8	9	A	B	C	D	E	F	Key 1
Cycle Length	0										
Forceoffs for Phase indicated by Key number	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
Offset	9										
Permissive	A										
Max. Dwell	B										

10

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

11

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

12

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

13

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

14

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

15

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

16

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

17

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

18

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

SHEET 8

Date sheet in effect:

Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

TABLE 5 (1 of 2)

Event Number	Time Clock Control (A+Code) S	M	T	W	T	F	S	Hour	Min.	Func
	1	2	3	4	5	6	7			
1	80							81	82	83
		X	X	X	X	X		05	59	129
2	84							85	86	87
		X	X	X	X	X		08	44	101
3	88							89	8A	8B
		X	X	X	X	X		14	29	128
4	8C							8D	8E	8F
		X	X	X	X	X		18	59	129
5	90							91	92	93
		X	X	X	X	X		20	01	100
6	94							95	96	97
	X	X	X	X	X	X	X	20	02	128
7	98							99	9A	9B
	X							08	59	129
8	9C							9D	9E	9F
							X	07	59	129
9	A0							A1	A2	A3
		X	X	X	X	X		06	00	2
10	A4							A5	A6	A7
		X	X	X	X	X		08	45	4
11	A8							A9	AA	AB
		X	X	X	X	X		14	30	5
12	AC							AD	AE	AF
		X	X	X	X	X		19	00	4
13	B0							B1	B2	B3
	X	X	X	X	X	X	X	20	00	20
14	B4							B5	B6	B7
	X							09	00	2
15	B8							B9	BA	BB
							X	08	00	2
16	BC							BD	BE	BF

Event Number	Time Clock Control (A+Code) S	M	T	W	T	F	S	Hour	Min.	Func
	1	2	3	4	5	6	7			
17	C0							C1	C2	C3
	X	X	X	X	X	X	X	05	15	131
18	C4							C5	C6	C7
	X	X	X	X	X	X	X	22	15	132
19	C8							C9	CA	CB
20	CC							CD	CE	CF
21	D0							D1	D2	D3
22	D4							D5	D6	D7
23	D8							D9	DA	DB
24	DC							DD	DE	DF
25	E0							E1	E2	E3
26	E4							E5	E6	E7
27	E8							E9	EA	EB
28	EC							ED	EE	EF
29	F0							F1	F2	F3
30	F4							F5	F6	F7
31	F8							F9	FA	FB
32	FC							FD	FE	FF

TABLE 5 (2 of 2)

Event Number	Time Clock Control (D+8+Code) S	M	T	W	T	F	S	Hour	Min.	Func
	1	2	3	4	5	6	7			
33	80							81	82	83
34	84							85	86	87
35	88							89	8A	8B
36	8C							8D	8E	8F
37	90							91	92	93
38	94							95	96	97
39	98							99	9A	9B
40	9C							9D	9E	9F
41	A0							A1	A2	A3
42	A4							A5	A6	A7
43	A8							A9	AA	AB
44	AC							AD	AE	AF
45	B0							B1	B2	B3
46	B4							B5	B6	B7
47	B8							B9	BA	BB
48	BC							BD	BE	BF

Event Number	Time Clock Control (D+8+Code) S	M	T	W	T	F	S	Hour	Min.	Func
	1	2	3	4	5	6	7			
49	C0							C1	C2	C3
50	C4							C5	C6	C7
51	C8							C9	CA	CB
52	CC							CD	CE	CF
53	D0							D1	D2	D3
54	D4							D5	D6	D7
55	D8							D9	DA	DB
56	DC							DD	DE	DF
57	E0							E1	E2	E3
58	E4							E5	E6	E7
59	E8							E9	EA	EB
60	EC							ED	EE	EF
61	F0							F1	F2	F3
62	F4							F5	F6	F7
63	F8							F9	FA	FB
64	FC							FD	FE	FF

Event numbers are for reference only.

Local TOD "Free" will override any plan received via an interconnect line.

Date sheet in effect:

Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

Detector Input File (332 Cabinet)

	Slot	1	2	3	4	5	6	7	8	9
"I" File	U	D201 E,C C1-56 (32) D40	D222 E,C C1-39 (11) D42	D242 E,C C1-63 (45) D44	D262 C C1-47 (21) --	D273 E,C C1-58 (34) D47	D294 E,C C1-41 (13) D49	D2B4 E,C C1-65 (47) D4B	D2D4 C C1-49 (23) --	D211 E,C C1-60 (36) D41
	L		D232 E,C C1-43 (15) D43	--2 E C1-76 (62) D45			D2A4 E,C C1-45 (17) D4A	--4 E C1-78 (64) D4C		D283 E,C C1-62 (38) D48
"J" File	U	D305 E,C C1-55 (31) D50	D326 E,C C1-40 (12) D52	D346 E,C C1-64 (46) D54	D366 C C1-48 (22) --	D377 E,C C1-57 (33) D57	D398 E,C C1-42 (14) D59	D3B8 E,C C1-66 (48) D5B	D3D8 C C1-50 (24) --	D315 E,C C1-59 (35) D51
	L		D336 E,C C1-44 (16) D53	--6 E C1-77 (63) D55			D3A8 E,C C1-46 (18) D5A	--8 E C1-79 (65) D5C		D387 E,C C1-61 (37) D58

Detector Input File (336 Cabinet)

	Slot	1	2	3	4	5	6	7	8	9	10
	U	D201 E,C C1-56 (32) D40	D222 E,C C1-39 (11) D42	D273 E,C C1-58 (34) D47	D294 E,C C1-41 (13) D49	D305 E,C C1-55 (31) D50	D326 E,C C1-40 (12) D52	D377 E,C C1-57 (33) D57	D398 E,C C1-42 (14)	D242 E,C C1-63 (45) D44	D2B4 E,C C1-65 (47) D4B
	L	D211 E,C C1-60 (36) D41	D232 E,C C1-43 (15) D43	D283 E,C C1-62 (38) D48	D2A4 E,C C1-45 (17) D4A	D315 E,C C1-59 (35) D51	D336 E,C C1-44 (16) D53	D387 E,C C1-61 (37) D58	D3A8 E,C C1-46 (18) D5A	D346 E,C C1-64 (46) D54	D3B8 E,C C1-66 (48) D5B

DELAY CODE
PHASE
FUNCTIONS
C1 PIN NUMBER
REASSIGNMENT CODE
CARRYOVER CODE

Detector Timing (Code)

Phase	Loop Nos.	Type	Code	Time	Slot 332	Slot (336)
1	18	D	D20		I1	(1U)
		CO	D40	2.0		
1		D	D21		I9U	(1L)
		CO	D41			
2	1	D	D22		I2U	(2U)
		CO	D42	1.0		
2	2	D	D23		I2L	(2L)
		CO	D43	1.0		
2		D	D24		I3U	(9U)
		CO	D44			
2					I3L	
		CO	D45			
2		D	D26		I4	
		Type3*	D46			
3	24	D	D27		I5	(3U)
		CO	D47	2.0		
3		D	D28		I9L	(3L)
		CO	D48			
4	8	D	D29		I6U	(4U)
		CO	D49			
4		D	D2A		I6L	(4L)
		CO	D4A			
4		D	D2B		I7U	(10U)
		CO	D4B			
4					I7L	
		CO	D4C			
4		D	D2D		I8	
		Type3*	D4D			

Detector Timing Continued (Code)

Phase	Loop Nos.	Type	Code	Time	Slot 332	Slot (336)
5	5	D	D30		J1	(5U)
		CO	D50	2.0		
5		D	D31		J9U	(5L)
		CO	D51			
6	14	D	D32		J2U	(6U)
		CO	D52	1.0		
6	15	D	D33		J2L	(6L)
		CO	D53	1.0		
6		D	D34		J3U	(9L)
		CO	D54			
6					J3L	
		CO	D55			
6		D	D36		J4	
		Type3*	D56			
7	11	D	D37		J5	(7U)
		CO	D57	2.0		
7		D	D38		J9L	(7L)
		CO	D58			
8	21	D	D39		J6U	(8U)
		CO	D59			
8		D	D3A		J6L	(8L)
		CO	D5A			
8		D	D3B		J7U	(10L)
		CO	D5B			
8					J7L	
		CO	D5C			
8		D	D3D		J8	
		Type3*	D5D			

* To set Type 3 detection:
0=off, 0.1=on

TABLE 4
← (1 of 2)
(2 of 2) →

Input Functions (D + 9 + 4 + Key)

Key	Function	Value
0	Detector Fail On	
1	Detector Fail Off	
2	Failed Det Backup (0=off, 1=on)	
3	Max 2 in Delay	
4	Max 2 in Carryover	
5	Plan 9 in Delay	
6	Plan 9 in Carryover	
7	Plan 18 in Delay	
8	Plan 18 in Carryover	
9	Time Transfer Page 1 Delay	
A	Time Transfer Page 1 Carryover	
B	Time Transfer Page 2 Delay	
C	Time Transfer Page 2 Delay	
D	NOVRAM (Quick Burn - 0=off, 1=on)	1
E		
F		

Detector Diagnostics (D + 9 + 5 + Key)

Key	Function	Time
0	Det. Fail Phase 1 Min Green	
1	Det. Fail Phase 2 Min Green	
2	Det. Fail Phase 3 Min Green	
3	Det. Fail Phase 4 Min Green	
4	Det. Fail Phase 5 Min Green	
5	Det. Fail Phase 6 Min Green	
6	Det. Fail Phase 7 Min Green	
7	Det. Fail Phase 8 Min Green	
8	Det. Fail Phase 1 Max Green	
9	Det. Fail Phase 2 Max Green	
A	Det. Fail Phase 3 Max Green	
B	Det. Fail Phase 4 Max Green	
C	Det. Fail Phase 5 Max Green	
D	Det. Fail Phase 6 Max Green	
E	Det. Fail Phase 7 Max Green	
F	Det. Fail Phase 8 Max Green	

SHEET 9

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

TABLE 12 Time of Year Events (D + 8 + Key1 + Key2)

Key1 = 0		
Function	K2	Value
1 / Month	0	
1 / Day of Month	1	
1 / Hour On	2	
1 / Minute On	3	
1 / Hour Off	4	
1 / Minute Off	5	
1 / Plan	6	
2 / Month	7	
2 / Day of Month	8	
2 / Hour On	9	
2 / Minute On	A	
2 / Hour Off	B	
2 / Minute Off	C	
2 / Plan	D	
3 / Month	E	
3 / Day of Month	F	

Key1 = 1		
Function	K2	Value
3 / Hour On	0	
3 / Minute On	1	
3 / Hour Off	2	
3 / Minute Off	3	
3 / Plan	4	
4 / Month	5	
4 / Day of Month	6	
4 / Hour On	7	
4 / Minute On	8	
4 / Hour Off	9	
4 / Minute Off	A	
4 / Plan	B	
5 / Month	C	
5 / Day of Month	D	
5 / Hour On	E	
5 / Minute On	F	

Key1 = 2		
Function	K2	Value
5 / Hour Off	0	
5 / Minute Off	1	
5 / Plan	2	
6 / Month	3	
6 / Day of Month	4	
6 / Hour On	5	
6 / Minute On	6	
6 / Hour Off	7	
6 / Minute Off	8	
6 / Plan	9	
7 / Month	A	
7 / Day of Month	B	
7 / Hour On	C	
7 / Minute On	D	
7 / Hour Off	E	
7 / Minute Off	F	

Key1 = 3		
Function	K2	Value
7 / Plan	0	
8 / Month	1	
8 / Day of Month	2	
8 / Hour On	3	
8 / Minute On	4	
8 / Hour Off	5	
8 / Minute Off	6	
8 / Plan	7	
9 / Month	8	
9 / Day of Month	9	
9 / Hour On	A	
9 / Minute On	B	
9 / Hour Off	C	
9 / Minute Off	D	
9 / Plan	E	
Comm. Type	F	

TABLE 13 (Also see sheet 6)

Extended Overlaps (D + 9 + 0 + Key)									
Function	Key	1	2	3	4	5	6	7	8
Overlap H	0								
Overlap J	1								
Overlap K	2								
Overlap L	3								
OLH Switchpack	4								
OLJ Switchpack	5								
OLK Switchpack	6								
OLL Switchpack	7								
	8								
	9								
	A								
	B								
	C								
	D								
	E								
	F								

Overlap Timing (D + 9 + 3 + Key)		
Function	Key	Value
OLH Green	0	
OLH Yellow	1	
OLH Red	2	
OLJ Green	3	
OLJ Yellow	4	
OLJ Red	5	
OLK Green	6	
OLK Yellow	7	
OLK Red	8	
OLL Green	9	
OLL Yellow	A	
OLL Red	B	
Spring Daylight Svg	C	
Reserved	D	
TR-3 Query (IKS)	E	
RTC Clock	F	

5.0 = 2nd Sunday in March (rev 60C or HC11_32T)

Requires TrafficView32 for uploads or downloads. Cells do not autoload.

Comm. Type (protocol):

0 = Wapiti

1 = CRC

Note: This value must be entered manually. It cannot be remotely downloaded. (rev 60C or HC11_32T)

TABLE 8 Bus Priority in Coordination and Miscellaneous

Explanation	(B + A + Key) Plan No.	Timer No.	Key	Value	(B + B + Key) Plan No.	Timer No.	Key	Value	(B + C + Key) Plan No.	Timer No.	Key	Value
Bus Priority Data *Timer #1 is the time Ph 2 & 6 green can be extended past local 0.*	1	1	0		4	1	0		7	1	0	
		2	1			2	1			2	1	
		3	2			3	2			3	2	
Timer #2 sets forceoffs for Ph 4 & 8 (usually lengthened) after Ph 2 & 6 have been extended	2	1	3		5	1	3		8	1	3	
		2	4			2	4			2	4	
		3	5			3	5			3	5	
Timer #3 sets forceoffs for Ph 4 & 8 (usually shorter) when priority call is received before Ph 2 & 6 have been served.	3	1	6		6	1	6		9	1	6	
		2	7			2	7			2	7	
		3	8			3	8			3	8	
Permissive 2: Permissive time for which only the phases defined on Sheet 7 will have calls recognized.	1		9		4		9		7		9	
	2		A		5		A		8		A	
	3		B		6		B		9		B	

Function	Key	1	2	3	4	5	6	7	8
Phase Flash Yellow	C								
Phase Flash Circuit	D								
TOD Max Recall	E								
OLB Switch Pack	F								

Function	Key	1	2	3	4	5	6	7	8
Overlap Flash Yellow	C								
Overlap Flash Circuit	D								
TOD Ped. Recall	E								
OLC Switch Pack	F								

Function	Key	1	2	3	4	5	6	7	8
Coord. Max Recall	C								
TOD Red Rest	D								
OLA Switch Pack	E								
OLD Switch Pack	F								

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

Input Reassignments

Page ID = 0 **TABLE 9**

A + 4 + Key			
Function	C1 Pin	Key	Code
Ph. 2 E & C	39	0	
Ph. 6 E & C	40	1	
Ph. 4 E & C	41	2	
Ph. 8 E & C	42	3	
Ph. 2 E & C	43	4	
Ph. 6 E & C	44	5	
Ph. 4 E & C	45	6	
Ph. 8 E & C	46	7	
Ph. 2 Call Only	47	8	
Ph. 6 Call Only	48	9	
Ph. 4 Call Only	49	A	
Ph. 8 Call Only	50	B	
Ped Inhibit	51	C	
RR Pre-emption	52	D	
Advance Enable	53	E	
unassigned	54	F	

A + 5 + Key			
Function	C1 Pin	Key	Code
Ph. 5 E & C	55	0	
Ph. 1 E & C	56	1	
Ph. 7 E & C	57	2	
Ph. 3 E & C	58	3	
Ph. 5 E & C	59	4	
Ph. 1 E & C	60	5	
Ph. 7 E & C	61	6	
Ph. 3 E & C	62	7	
		8	
		9	
		A	
		B	
Ph. 2 E & C	63	C	
Ph. 6 E & C	64	D	
Ph. 4 E & C	65	E	
Ph. 8 E & C	66	F	

A + 6 + Key			
Function	C1 Pin	Key	Code
Ph. 2 Ped PB	67	0	
Ph. 6 Ped PB	68	1	
Ph. 4 Ped PB	69	2	
Ph. 8 Ped PB	70	3	
EV Channel A	71	4	
EV Channel B	72	5	
EV Channel C	73	6	
EV Channel D	74	7	
unassigned	75	8	
Ph. 2 Ext Only	76	9	
Ph. 6 Ext Only	77	A	
Ph. 4 Ext Only	78	B	
Ph. 8 Ext Only	79	C	
Advance	80	D	
Flash Sense	81	E	
Stop Time	82	F	

Page ID = 1

D + A + 4 + Key			
Function	C1 Pin	Key	Code
Ph. 2 E & C	39	0	
Ph. 6 E & C	40	1	
Ph. 4 E & C	41	2	
Ph. 8 E & C	42	3	
Ph. 2 E & C	43	4	
Ph. 6 E & C	44	5	
Ph. 4 E & C	45	6	
Ph. 8 E & C	46	7	
Ph. 2 Call Only	47	8	
Ph. 6 Call Only	48	9	
Ph. 4 Call Only	49	A	
Ph. 8 Call Only	50	B	
Ped Inhibit	51	C	
RR Pre-emption	52	D	
Advance Enable	53	E	
unassigned	54	F	

D + A + 5 + Key			
Function	C1 Pin	Key	Code
Ph. 5 E & C	55	0	
Ph. 1 E & C	56	1	
Ph. 7 E & C	57	2	
Ph. 3 E & C	58	3	
Ph. 5 E & C	59	4	
Ph. 1 E & C	60	5	
Ph. 7 E & C	61	6	
Ph. 3 E & C	62	7	
		8	
		9	
		A	
		B	
Ph. 2 E & C	63	C	
Ph. 6 E & C	64	D	
Ph. 4 E & C	65	E	
Ph. 8 E & C	66	F	

D + A + 6 + Key			
Function	C1 Pin	Key	Code
Ph. 2 Ped PB	67	0	
Ph. 6 Ped PB	68	1	
Ph. 4 Ped PB	69	2	
Ph. 8 Ped PB	70	3	
EV Channel A	71	4	
EV Channel B	72	5	
EV Channel C	73	6	
EV Channel D	74	7	
unassigned	75	8	
Ph. 2 Ext Only	76	9	
Ph. 6 Ext Only	77	A	
Ph. 4 Ext Only	78	B	
Ph. 8 Ext Only	79	C	
Advance	80	D	
Flash Sense	81	E	
Stop Time	82	F	

Page ID = 2

D + A + B + Key			
Function	C1 Pin	Key	Code
Ph. 2 E & C	39	0	
Ph. 6 E & C	40	1	
Ph. 4 E & C	41	2	
Ph. 8 E & C	42	3	
Ph. 2 E & C	43	4	
Ph. 6 E & C	44	5	
Ph. 4 E & C	45	6	
Ph. 8 E & C	46	7	
Ph. 2 Call Only	47	8	
Ph. 6 Call Only	48	9	
Ph. 4 Call Only	49	A	
Ph. 8 Call Only	50	B	
Ped Inhibit	51	C	
RR Pre-emption	52	D	
Advance Enable	53	E	
unassigned	54	F	

D + A + C + Key			
Function	C1 Pin	Key	Code
Ph. 5 E & C	55	0	
Ph. 1 E & C	56	1	
Ph. 7 E & C	57	2	
Ph. 3 E & C	58	3	
Ph. 5 E & C	59	4	
Ph. 1 E & C	60	5	
Ph. 7 E & C	61	6	
Ph. 3 E & C	62	7	
		8	
		9	
		A	
		B	
Ph. 2 E & C	63	C	
Ph. 6 E & C	64	D	
Ph. 4 E & C	65	E	
Ph. 8 E & C	66	F	

D + A + D + Key			
Function	C1 Pin	Key	Code
Ph. 2 Ped PB	67	0	
Ph. 6 Ped PB	68	1	
Ph. 4 Ped PB	69	2	
Ph. 8 Ped PB	70	3	
EV Channel A	71	4	
EV Channel B	72	5	
EV Channel C	73	6	
EV Channel D	74	7	
unassigned	75	8	
Ph. 2 Ext Only	76	9	
Ph. 6 Ext Only	77	A	
Ph. 4 Ext Only	78	B	
Ph. 8 Ext Only	79	C	
Advance	80	D	
Flash Sense	81	E	
Stop Time	82	F	

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

Output Reassignments

TABLE 10

Page ID=0

A + 0 + Key		
Function	Key	Code
Ph. 4 D/W	0	
Ph. 4 Walk	1	
Ph. 4 Red	2	
Ph. 4 Yellow	3	
Ph. 4 Green	4	
Ph. 3 Red	5	
Ph. 3 Yellow	6	
Ph. 3 Green	7	
Ph. 2 D/W	8	
Ph. 2 Walk	9	
Ph. 2 Red	A	
Ph. 2 Yellow	B	
Ph. 2 Green	C	
Ph. 1 Red	D	
Ph. 1 Yellow	E	
Ph. 1 Green	F	

A + 1 + Key		
Function	Key	Code
Ph. 8 D/W	0	
Ph. 8 Walk	1	
Ph. 8 Red	2	
Ph. 8 Yellow	3	
Ph. 8 Green	4	
Ph. 7 Red	5	
Ph. 7 Yellow	6	
Ph. 7 Green	7	
Ph. 6 D/W	8	
Ph. 6 Walk	9	
Ph. 6 Red	A	
Ph. 6 Yellow	B	
Ph. 6 Green	C	
Ph. 5 Red	D	
Ph. 5 Yellow	E	
Ph. 5 Green	F	

A + 2 + Key		
Function	Key	Code
Ph. 2 Ped Yel.	0	
Ph. 6 Ped Yel.	1	
Ph. 4 Ped Yel.	2	
Ph. 8 Ped Yel.	3	
Ph. 3 Ped Yel.	4	
Ph. 1 Ped Yel.	5	
Flash	6	
Watchdog	7	
Ph. 3 D/W	8	
Ph. 3 Walk	9	
OLD Red	A	
OLD Yellow	B	
OLD Green	C	
OLC Red	D	
OLC Yellow	E	
OLC Green	F	

A + 3 + Key		
Function	Key	Code
Ph. 1 D/W	0	
Ph. 1 Walk	1	
OLB Red	2	
OLB Yellow	3	
OLB Green	4	
OLA Red	5	
OLA Yellow	6	
OLA Green	7	
	8	
Sample Det.	9	
Left Turn Type	A	
	B	
	C	
	D	
	E	
	F	

Page ID=1

D + A + 0 + Key		
Function	Key	Code
Ph. 4 D/W	0	
Ph. 4 Walk	1	
Ph. 4 Red	2	
Ph. 4 Yellow	3	
Ph. 4 Green	4	
Ph. 3 Red	5	
Ph. 3 Yellow	6	
Ph. 3 Green	7	
Ph. 2 D/W	8	
Ph. 2 Walk	9	
Ph. 2 Red	A	
Ph. 2 Yellow	B	
Ph. 2 Green	C	
Ph. 1 Red	D	
Ph. 1 Yellow	E	
Ph. 1 Green	F	

D + A + 1 + Key		
Function	Key	Code
Ph. 8 D/W	0	
Ph. 8 Walk	1	
Ph. 8 Red	2	
Ph. 8 Yellow	3	
Ph. 8 Green	4	
Ph. 7 Red	5	
Ph. 7 Yellow	6	
Ph. 7 Green	7	
Ph. 6 D/W	8	
Ph. 6 Walk	9	
Ph. 6 Red	A	
Ph. 6 Yellow	B	
Ph. 6 Green	C	
Ph. 5 Red	D	
Ph. 5 Yellow	E	
Ph. 5 Green	F	

D + A + 2 + Key		
Function	Key	Code
Ph. 2 Ped Yel.	0	
Ph. 6 Ped Yel.	1	
Ph. 4 Ped Yel.	2	
Ph. 8 Ped Yel.	3	
Ph. 3 Ped Yel.	4	
Ph. 1 Ped Yel.	5	
Flash	6	
Watchdog	7	
Ph. 3 D/W	8	
Ph. 3 Walk	9	
OLD Red	A	
OLD Yellow	B	
OLD Green	C	
OLC Red	D	
OLC Yellow	E	
OLC Green	F	

D + A + 3 + Key		
Function	Key	Code
Ph. 1 D/W	0	
Ph. 1 Walk	1	
OLB Red	2	
OLB Yellow	3	
OLB Green	4	
OLA Red	5	
OLA Yellow	6	
OLA Green	7	
	8	
Sample Det.	9	
Left Turn Type	A	
	B	
	C	
	D	
	E	
	F	

Page ID=2

D + A + 7 + Key		
Function	Key	Code
Ph. 4 D/W	0	
Ph. 4 Walk	1	
Ph. 4 Red	2	
Ph. 4 Yellow	3	
Ph. 4 Green	4	
Ph. 3 Red	5	
Ph. 3 Yellow	6	
Ph. 3 Green	7	
Ph. 2 D/W	8	
Ph. 2 Walk	9	
Ph. 2 Red	A	
Ph. 2 Yellow	B	
Ph. 2 Green	C	
Ph. 1 Red	D	
Ph. 1 Yellow	E	
Ph. 1 Green	F	

D + A + 8 + Key		
Function	Key	Code
Ph. 8 D/W	0	
Ph. 8 Walk	1	
Ph. 8 Red	2	
Ph. 8 Yellow	3	
Ph. 8 Green	4	
Ph. 7 Red	5	
Ph. 7 Yellow	6	
Ph. 7 Green	7	
Ph. 6 D/W	8	
Ph. 6 Walk	9	
Ph. 6 Red	A	
Ph. 6 Yellow	B	
Ph. 6 Green	C	
Ph. 5 Red	D	
Ph. 5 Yellow	E	
Ph. 5 Green	F	

D + A + 9 + Key		
Function	Key	Code
Ph. 2 Ped Yel.	0	
Ph. 6 Ped Yel.	1	
Ph. 4 Ped Yel.	2	
Ph. 8 Ped Yel.	3	
Ph. 3 Ped Yel.	4	
Ph. 1 Ped Yel.	5	
Flash	6	
Watchdog	7	
Ph. 3 D/W	8	
Ph. 3 Walk	9	
OLD Red	A	
OLD Yellow	B	
OLD Green	C	
OLC Red	D	
OLC Yellow	E	
OLC Green	F	

D + A + A + Key		
Function	Key	Code
Ph. 1 D/W	0	
Ph. 1 Walk	1	
OLB Red	2	
OLB Yellow	3	
OLB Green	4	
OLA Red	5	
OLA Yellow	6	
OLA Green	7	
	8	
Sample Det.	9	
Left Turn Type	A	
	B	
	C	
	D	
	E	
	F	

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

Extended Output Reassignments

TABLE 11

Page ID=0

D + B + 0 +Key		
Function	Key	Code
Ph. 5 D/W	0	
Ph. 5 Walk	1	
OLL Red	2	
OLL Yellow	3	
OLL Green	4	
OLK Red	5	
OLK Yellow	6	
OLK Green	7	
Ph. 7 D/W	8	
Ph. 7 Walk	9	
OLJ Red	A	
OLJ Yellow	B	
OLJ Green	C	
OLH Red	D	
OLH Yellow	E	
OLH Green	F	

D + B + 1 + Key		
Function	Key	Code
OLE Green	0	
OLF Green	1	
OLE Yellow	2	
OLF Yellow	3	
Adv. Warning	4	
RR Flash Yellow	5	
Det. Reset	6	
RR On	7	
EVA ON	8	
EVB ON	9	
EVC ON	A	
EVD ON	B	
Ring 1, Bit B	C	
Ring 1, Bit C	D	
Ring 2, Bit B	E	
Ring 2, Bit C	F	

D + B + 2 + Key		
Function	Key	Code
Cycle 2	0	
Cycle 3	1	
Offset 1	2	
Offset 2	3	
Offset 3	4	
	5	
Free	6	
Flash	7	
Coord. Plan 1, 2, 3	8	
Coord. Plan 4, 5, 6	9	
Coord. Plan 7, 8, 9	A	
Coord. Plan 10, 11, 12	B	
Coord. Plan 13, 14, 15	C	
Coord. Plan 16, 17, 18	D	
	E	
	F	

Page ID=1

D + B + 4 +Key		
Function	Key	Code
Ph. 5 D/W	0	
Ph. 5 Walk	1	
OLL Red	2	
OLL Yellow	3	
OLL Green	4	
OLK Red	5	
OLK Yellow	6	
OLK Green	7	
Ph. 7 D/W	8	
Ph. 7 Walk	9	
OLJ Red	A	
OLJ Yellow	B	
OLJ Green	C	
OLH Red	D	
OLH Yellow	E	
OLH Green	F	

D + B + 5 + Key		
Function	Key	Code
OLE Green	0	
OLF Green	1	
OLE Yellow	2	
OLF Yellow	3	
Adv. Warning	4	
RR Flash Yellow	5	
Det. Reset	6	
RR On	7	
EVA ON	8	
EVB ON	9	
EVC ON	A	
EVD ON	B	
Ring 1, Bit B	C	
Ring 1, Bit C	D	
Ring 2, Bit B	E	
Ring 2, Bit C	F	

D + B + 6 + Key		
Function	Key	Code
Cycle 2	0	
Cycle 3	1	
Offset 1	2	
Offset 2	3	
Offset 3	4	
	5	
Free	6	
Flash	7	
Coord. Plan 1, 2, 3	8	
Coord. Plan 4, 5, 6	9	
Coord. Plan 7, 8, 9	A	
Coord. Plan 10, 11, 12	B	
Coord. Plan 13, 14, 15	C	
Coord. Plan 16, 17, 18	D	
	E	
	F	

Page ID=2

D + B + 8 +Key		
Function	Key	Code
Ph. 5 D/W	0	
Ph. 5 Walk	1	
OLL Red	2	
OLL Yellow	3	
OLL Green	4	
OLK Red	5	
OLK Yellow	6	
OLK Green	7	
Ph. 7 D/W	8	
Ph. 7 Walk	9	
OLJ Red	A	
OLJ Yellow	B	
OLJ Green	C	
OLH Red	D	
OLH Yellow	E	
OLH Green	F	

D + B + 9 + Key		
Function	Key	Code
OLE Green	0	
OLF Green	1	
OLE Yellow	2	
OLF Yellow	3	
Adv. Warning	4	
RR Flash Yellow	5	
Det. Reset	6	
RR On	7	
EVA ON	8	
EVB ON	9	
EVC ON	A	
EVD ON	B	
Ring 1, Bit B	C	
Ring 1, Bit C	D	
Ring 2, Bit B	E	
Ring 2, Bit C	F	

D + B + A + Key		
Function	Key	Code
Cycle 2	0	
Cycle 3	1	
Offset 1	2	
Offset 2	3	
Offset 3	4	
	5	
Free	6	
Flash	7	
Coord. Plan 1, 2, 3	8	
Coord. Plan 4, 5, 6	9	
Coord. Plan 7, 8, 9	A	
Coord. Plan 10, 11, 12	B	
Coord. Plan 13, 14, 15	C	
Coord. Plan 16, 17, 18	D	
	E	
	F	

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99 Ivy St

Command Box Outputs

TABLE 15

Page ID=0

D + B + 3 + Key		
Key	Function	Code
0	CB output #1	**53**
1	CB output #2	
2	CB output #3	
3	CB output #4	
4	CB output #5	
5	CB output #6	
6	CB output #7	
7	CB output #8	
8	Flash CB #9	
9	Flash CB #10	
A	Flash CB #11	
B	Flash CB #12	
C		
D		
E		
F		

PED 4 YELLOW

Page ID=1

D + B + 7 + Key		
Key	Function	Code
0	CB output #1	**53**
1	CB output #2	
2	CB output #3	
3	CB output #4	
4	CB output #5	
5	CB output #6	
6	CB output #7	
7	CB output #8	
8	Flash CB #9	
9	Flash CB #10	
A	Flash CB #11	
B	Flash CB #12	
C		
D		
E		
F		

PED 4 YELLOW

Page ID=2

D + B + B + Key		
Key	Function	Code
0	CB output #1	**53**
1	CB output #2	
2	CB output #3	
3	CB output #4	
4	CB output #5	
5	CB output #6	
6	CB output #7	
7	CB output #8	
8	Flash CB #9	
9	Flash CB #10	
A	Flash CB #11	
B	Flash CB #12	
C		
D		
E		
F		

PED 4 YELLOW

Command Box

TABLE 14

(D + 9 + Key 1 + Key 2) (1 of 6)

Key 1 = 8		
K2	Value	notes / meaning
0	**206**	TURN-ON INPUT
1	**26**	RR PREEMPTION
2	**24**	NOT
3	**22**	INPUT TEST
4	**28**	J11U (C1-54)
5	**205**	TURN-ON OUTPUT
6	**1**	PART-TIME RESTRICTION SIGN
7	**22**	INPUT TEST
8	**26**	RR PREEMPTION
9	**206**	TURN-ON INPUT
A	**25**	PED INHIBIT
B	**24**	NOT
C	**22**	INPUT TEST
D	**61**	J11L (C1-75)
E	**206**	Turn on input
F	**63**	J3L (phase 6)

Key 1 = 9		
K2	Value	notes / meaning
0	**24**	if not
1	**25**	in coord plan
2	**20**	free
3	**20**	and
4	**21**	the phase condition of
5	**2**	phase 2 is
6	**5**	min green
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = A		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

(D + 9 + Key 1 + Key 2) (2 of 6)

Key 1 = B		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = C		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = D		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

CONTINUED ON SHEET 15

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E) @ Ivy St

COMMAND BOX CONTINUED

TABLE 14

(D + 9 + Key 1 + Key 2) (2 of 6 continued)

Key 1 = E		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = F		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

(D + E + Key 1 + Key 2) (3 of 6)

Key 1 = 0		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 1		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 2		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 3		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

(D + E + Key 1 + Key 2) (4 of 6)

Key 1 = 4		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 5		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 6		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

CONTINUED ON SHEET 16

Date sheet in effect: Date sheet voided: **Location:** Pacific Highway East (99E) @ Ivy St

COMMAND BOX CONTINUED

TABLE 14

(4 of 6 continued) **(D + E + Key 1 + Key 2)** (5 of 6)

Key 1 = 7		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 8		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 9		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

(D + E + Key 1 + Key 2) (6 of 6)

Key 1 = A		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = B		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = C		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = D		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = E		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = F		
K2	Value	notes / meaning
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East (99E)

Ivy St

Command Box Summary

(Check all that apply)

- ☐ Railroad interconnect (AC isolator)
- ☐ Extend to Call jumpers
- ☐ Temporary Bridge Signal
- ☐ Coordination lagging left turns
- ☐ Pedestrian pushbutton jumpers
- ☐ Other / comment: _____

Command Box Codes

201 → "Jumper an input" Command
XX → Input code of the "from" input
XX → Input code of the "to" input

202 → "Turn on an input" Command
X → Phase to check (1 - 8)
XX → Phase condition (2, 3, 5, 8, 9, 11, 12, 13, or 14)*
XXX → Input code

203 → "Turn on an input" Command
XX → Output code of output to check
XX → Input code

204 → "Turn on an output" Command
X → Phase to check (1 - 8)
XX → Phase condition*
XXX → Output code

205 → "Turn on an output" Command
XX → CB or direct output code + "100"
XX → Test codes (21 - 31)
XX → Test code parameter

206 → "Turn on an input" Command
XX → Input code
XX → Test codes (21 - 31)
XX → Test code parameter

207 → "Fill in blank cells" Command

208 → "Start a timer" Command
X → Timer number (1 - 8)
XX.X → Timer value (0.1 - 25.5)
XX → Test codes (21 - 31)
XX → Test code parameter

209 → "Set a latch" Command
X → Latch number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

210 → "Reset a latch" Command
X → Latch number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

211 → "Omit a phase" Command
X → Phase number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

212 → "Hold a phase" Command
X → Phase number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

213 → "Force a phase" Command
X → Phase number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

214 → "Turn on a coordination plan" Command
X → Plan number (1 - 20)
XX → Test codes (21 - 31)
XX → Test code parameter

219 → "Stop here on flash" Command

TEST CODES:

CODE	MEANING
20	And
21	Phase condition test *
22	Input test
23	Output test
24	Not
25	Current coordination plan test
26	Latch set test
27	Clock running test
28	Phase next
29	Preemption test
30	Low priority preemption test
31	Active page test

***Phase Condition Codes**

2	Walk
3	Flashing D/W
5	Min. Green
8	Rest
9	Passage
11	any green condition
12	any yellow condition
13	any red condition
14	phase on

Date sheet in effect: Date sheet voided:

Location: **Pacific Highway East (99E) @** Ivy St

-- HC11 CONTROLLERS (ver. 32T) --

(this sheet does not autoload and cannot be viewed with Translink)

Flashing Yellow Left Turn Arrow

TABLE 17

FY Plan (D + F + 4 +7 + Key)		
Function	**Key**	**Code**
Coord. Plan 1 FY 1	0	
Coord. Plan 1 FY 3	1	
Coord. Plan 1 FY 5	2	
Coord. Plan 1 FY 7	3	
Coord. Plan 2 FY 1	4	
Coord. Plan 2 FY 3	5	
Coord. Plan 2 FY 5	6	
Coord. Plan 2 FY 7	7	
Coord. Plan 3 FY 1	8	
Coord. Plan 3 FY 3	9	
Coord. Plan 3 FY 5	A	
Coord. Plan 3 FY 7	B	
Coord. Plan 4 FY 1	C	
Coord. Plan 4 FY 3	D	
Coord. Plan 4 FY 5	E	
Coord. Plan 4 FY 7	F	

FY Plan (D + F + 4 + 8 + Key)		
Function	**Key**	**Code**
Coord. Plan 5 FY 1	0	
Coord. Plan 5 FY 3	1	
Coord. Plan 5 FY 5	2	
Coord. Plan 5 FY 7	3	
Coord. Plan 6 FY 1	4	
Coord. Plan 6 FY 3	5	
Coord. Plan 6 FY 5	6	
Coord. Plan 6 FY 7	7	
Coord. Plan 7 FY 1	8	
Coord. Plan 7 FY 3	9	
Coord. Plan 7 FY 5	A	
Coord. Plan 7 FY 7	B	
Coord. Plan 8 FY 1	C	
Coord. Plan 8 FY 3	D	
Coord. Plan 8 FY 5	E	
Coord. Plan 8 FY 7	F	

FY Misc. (D + F + 4 + 9 + Key)		
Function	**Key**	**Code**
Coord. Plan 9 FY 1	0	
Coord. Plan 9 FY 3	1	
Coord. Plan 9 FY 5	2	
Coord. Plan 9 FY 7	3	
Output Code for FY 1	4	
Output Code for FY 3	5	
Output Code for FY 5	6	
Output Code for FY 7	7	
"Free" operation FY 1	8	
"Free" operation FY 3	9	
"Free" operation FY 5	A	
"Free" operation FY 7	B	
Reserved	C	
Reserved	D	
Reserved	E	
Reserved	F	

Output Reassignment Code (where you want the FYA to output)

FY Timing (D + F + 4 + A + Key)		
Function	**Key**	**Value**
FY 1 Min. Serve Time	0	
FY 3 Min. Serve Time	1	
FY 5 Min. Serve Time	2	
FY 7 Min. Serve Time	3	
FY 1 Red Transition	4	
FY 3 Red Transition	5	
FY 5 Red Transition	6	
FY 7 Red Transition	7	
FY 1 Start Delay	8	
FY 3 Start Delay	9	
FY 5 Start Delay	A	
FY 7 Start Delay	B	
Reserved	C	
Reserved	D	
Reserved	E	
Reserved	F	

3.0 to 25.5 seconds

2.0 to 25.5 seconds

0.0 to 25.5 seconds

Use shortest time possible for best efficiency

Left Turn Operation Codes:

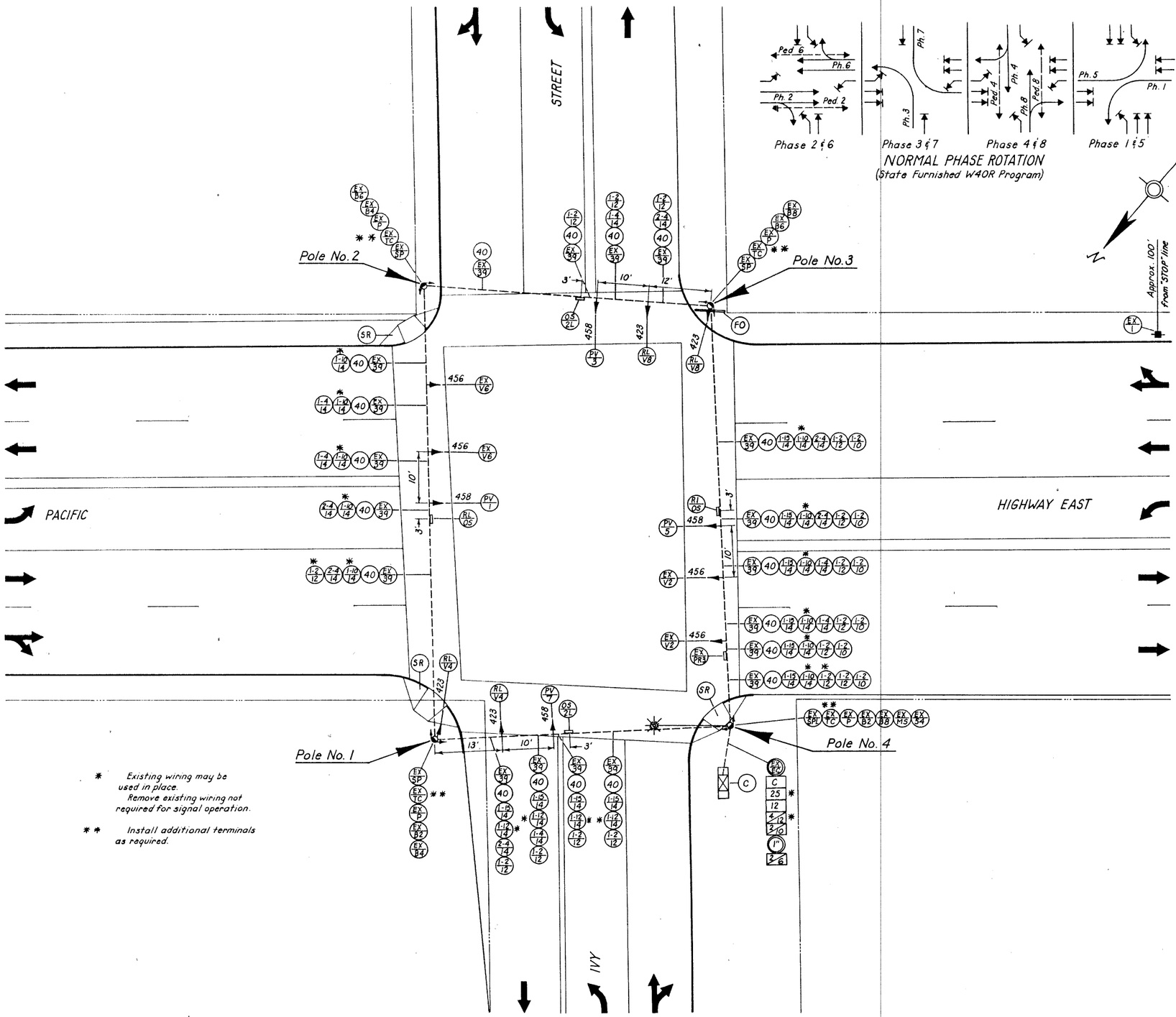
(for "Free" and Coord. Plans above)

0 or 1 = Protected Only
2 = PPLT
3 = Permissive Only

Extended Function Code Index (see Sheet 6)				
FYA phase	Default (Normal)	Protected Only	PPLT	Permissive Only
1	210	211	212	213
3	220	221	222	223
5	230	231	232	233
7	240	241	242	243

SIGNAL PLAN
PACIFIC HIGHWAY EAST AT IVY STREET

SCALE 0 10 20 40 FEET



L E G E N D

- (EX 1) Maintain and protect existing power pole (Existing power source)
- (EX SPL) Maintain and protect existing strain pole with illumination equipment
- (EX SP) Maintain and protect existing strain pole
- (EX Ph) Maintain and protect existing phase (Ph) vehicle signal.
- (EX PRS) Maintain and protect existing "NO RIGHT TURN" part-time restriction sign
- (EX TC) Maintain and protect existing terminal cabinet
- (EX P) Maintain and protect existing pedestrian signal
- (EX Bph) Maintain and protect existing phase (Ph) pedestrian pushbutton and instruction sign
- (EX MS) Maintain and protect existing meter base
- (EX S4) Maintain and protect existing service cabinet-Replace existing breaker with 60 amp breaker
- (EX 39) Maintain and protect existing messenger cable
- (EX EC) Maintain and protect existing electrical conduit
- (RL Vph) Relocate existing phase (Ph) vehicle signal (pole mounted signals will require a new bracket)
- (RL OS) Relocate existing "LEFT TURN SIGNAL" sign
- (C) Install Model 170 controller in Model 332 cabinet-Use existing Type P cabinet foundation with adapter (See Drwg No. 2991-make conduit entrances through adapter as required)
- (PV Ph) Install phase (Ph) programmed vehicle signal
- (OS 2L) Install interior illuminated "LEFT TURN SIGNAL" sign
- (FO) Install fiberoptic sign (See Special Provisions)
- [C] Install one No. 6 type THWN wire (Signal system common)
- [N] Install (N) No. 14 type THWN wires
- [N/G] Install (N) No. (G) type THW wires
- (X-N/G) Install (X)-(N) wire No. (G) control cables
- (40) Install 1/4-inch galvanized steel tether wire
- (S) Install (S) inch electrical conduit
- (SR) Install Portland Cement concrete curb and 4" thick sidewalk ramp; remove existing as required

Ph =	Phase shown	S =	Size shown
X =	Number of cables shown	423 =	12" R, 8" Y, 8" G
N =	Number shown	456 =	12" R, 12" Y, 12" G
G =	AWG size shown	458 =	12" R, 12" Y, 12" GLTA

REGISTERED PROFESSIONAL ENGINEER 1893 H.E. George 9/21/84

DESIGNED BY KRR
CHECKED BY WJG

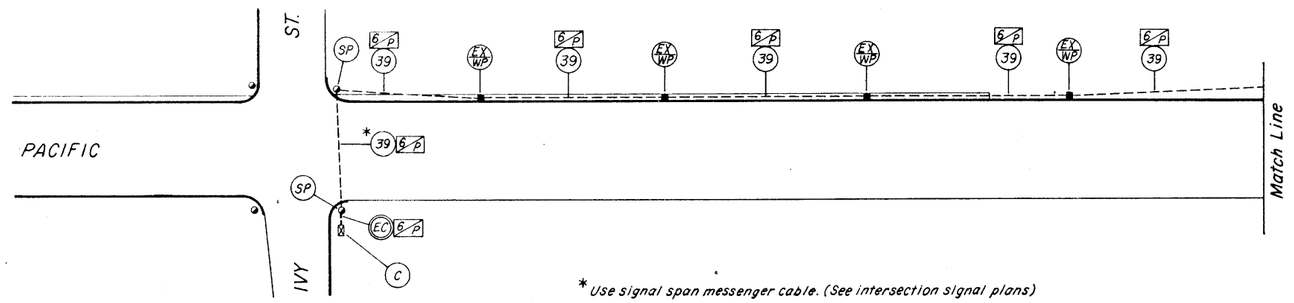
OREGON STATE HIGHWAY DIVISION
TRAFFIC ENGINEERING SECTION

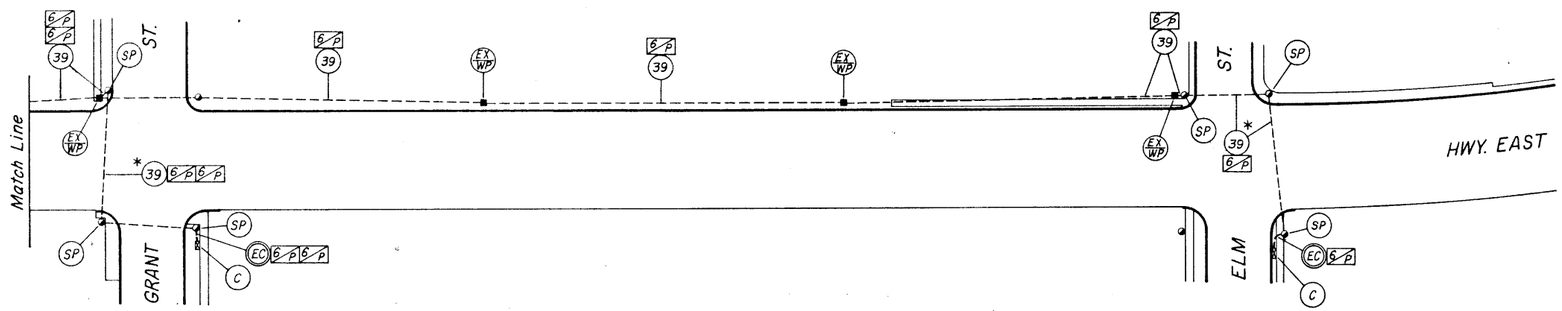
TRAFFIC SIGNAL INSTALLATION
PACIFIC HWY. EAST AT
IVY, GRANT & ELM STREETS (CANBY) SEC.
PACIFIC HWY. EAST
CLACKAMAS COUNTY
September 1984

8816

INTERCONNECT PLAN

SCALE 0 50 100 200 FEET





Note:
Install supervisory circuit cabinets (6" x 8" x 12") on wood poles where required for splicing. Placement is dependent on cable reel lengths. No splicing will be allowed outside of cabinet.

L E G E N D

- EX WP — Maintain and protect existing wood pole
- C — Signal controller - See Signal Plan
- SP — Strain pole - See Signal Pole
- 39 — Install 3/8-inch galvanized steel messenger cable
- 6 P — Install 6 twisted pair interconnect cable
- EC — Electrical conduit - See Signal Plan

REGISTERED PROFESSIONAL ENGINEER 3893 OREGON L. E. GEORGE

9/21/84

OREGON STATE HIGHWAY DIVISION
TRAFFIC ENGINEERING SECTION

TRAFFIC SIGNAL INSTALLATION
PACIFIC HWY. EAST AT
IVY, GRANT & ELM STREETS (CANBY) SEC.
PACIFIC HWY. EAST
CLACKAMAS COUNTY

September 1984

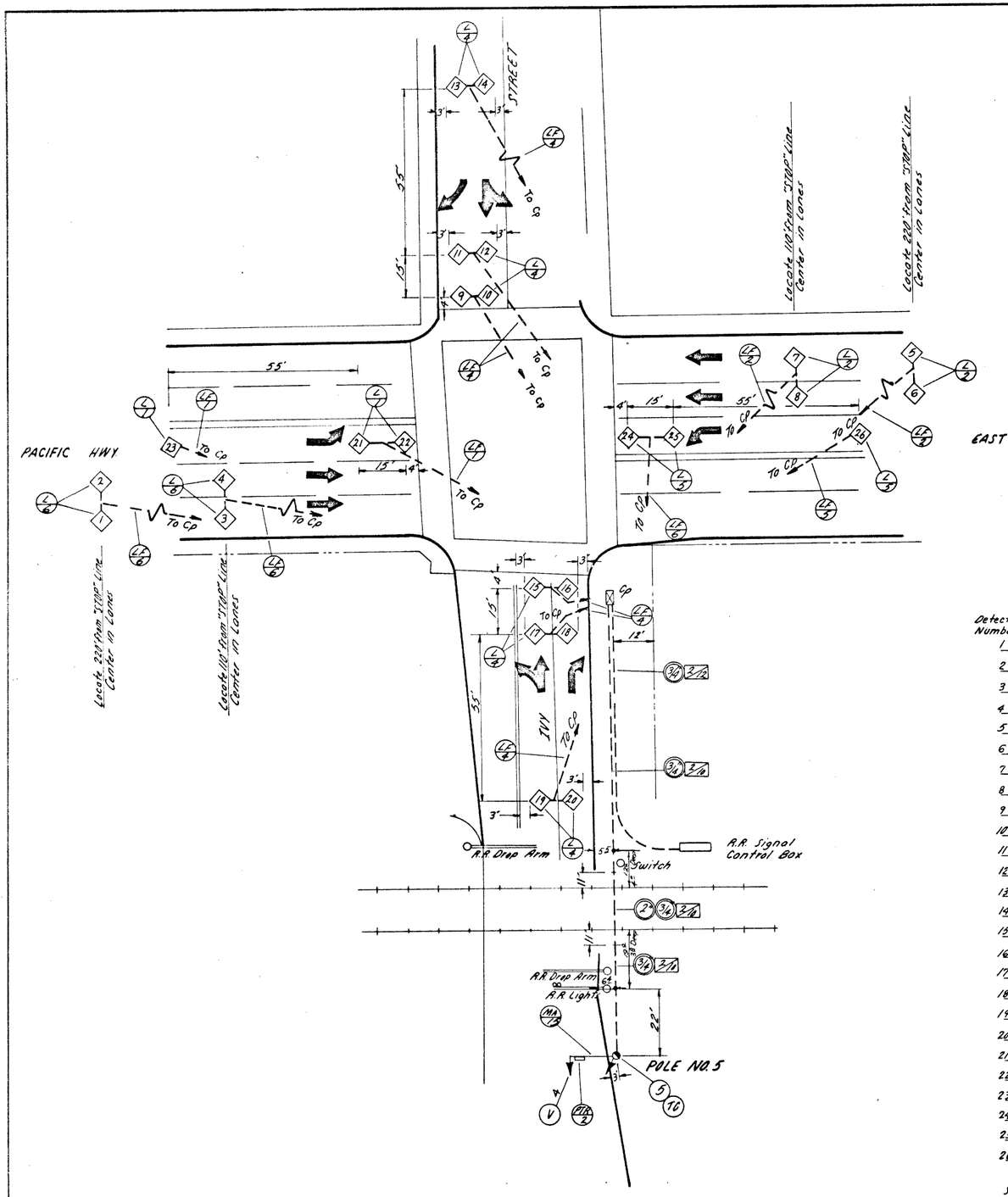
DESIGNED BY: ...
CHECKED BY: ...

ACCOMPANIED BY DWGS. 1470, 1471, 1472, 1473, 1480, 1481, 1488, 20778, 2990, 2991, 35009, 35010 & 8816 Thru 8822

TE DWG. NO. 8815

DETECTOR & PRE-EMPTION EQUIPMENT INSTALLATION PLAN

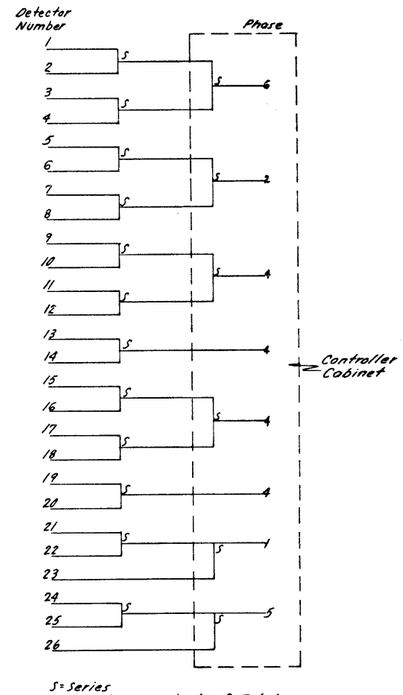
SCALE 0 20 40 80 FEET



LEGEND

- (5) Install traffic signal mast arm pole
- (5") Install (5") galv. rigid conduit
- (N/G) Install (N) No. (G) type TW wire
- (L/PH) Install (PH) phase loop detector
- (LF/PH) Install (PH) phase loop feeder cable
- (MA/15) Install 15 ft. traffic signal mast arm
- (PTR/S) Install part-time restriction "STOP HERE ON RED" sign
- (V) Install single section vehicle signal with backplate

4 = 12" Red
S = Size Shown
N = Number of Conductors
6 = AWG Size Shown
M = Phase Shown



S=Series Amplifiers required - 8 Total

LOOP DETECTOR WIRING DIAGRAM

See TES. 1471 for Loop Installation Details

9/78 "As Constructed"

APPROVED:

TRAFFIC ENGINEER

DATE 7/12/79

OREGON STATE HIGHWAY DIVISION
TRAFFIC ENGINEERING SECTION

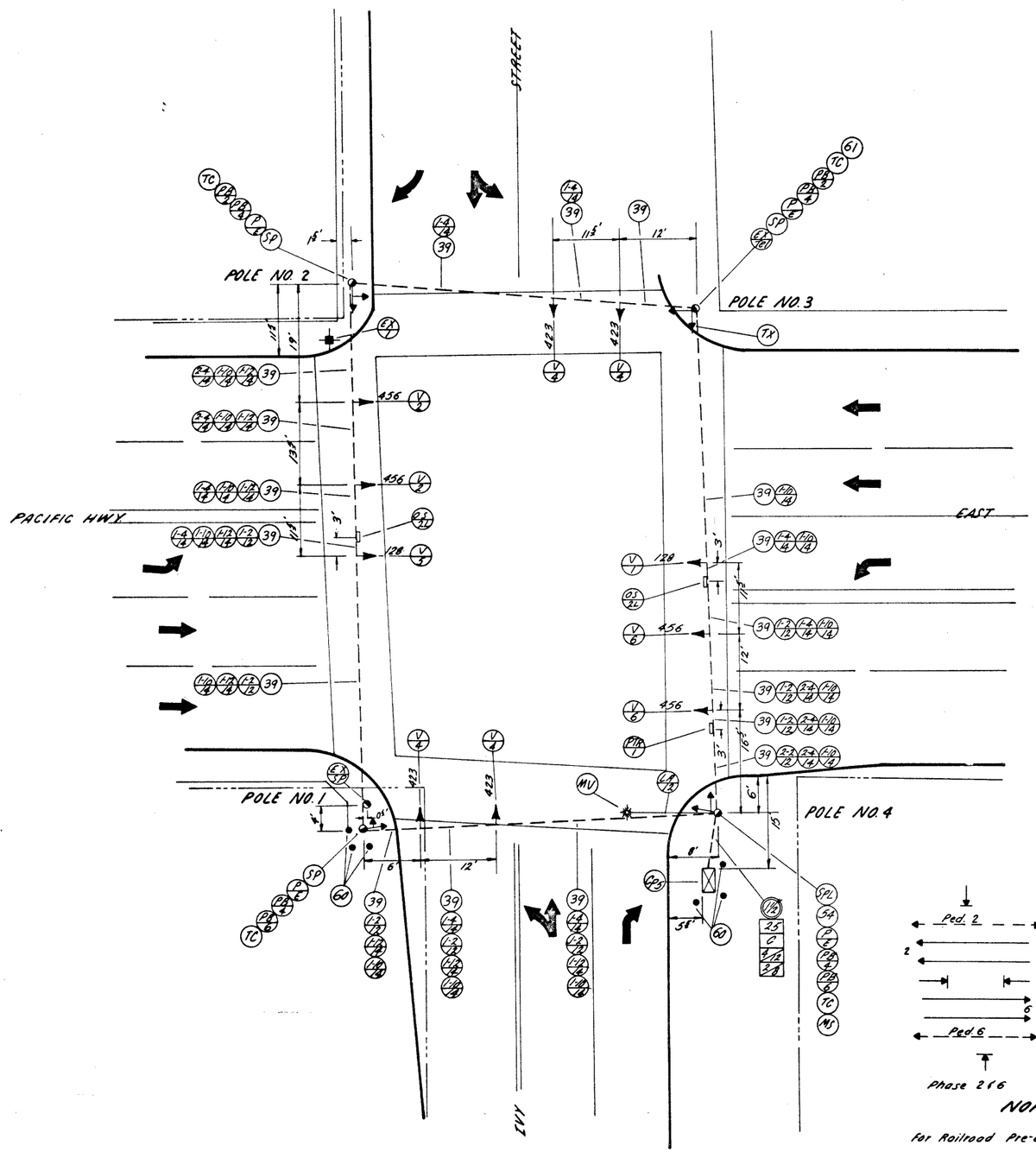
TRAFFIC SIGNAL INSTALLATION
PACIFIC HWY. E. AT IVY ST. (CANBY) SEC.
PACIFIC HIGHWAY EAST
CLACKAMAS COUNTY

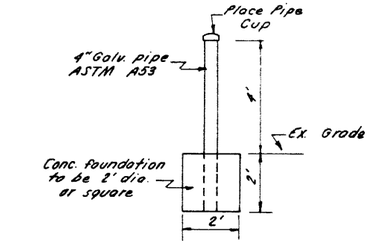
DATE

T.E. DWG. NO. 9142

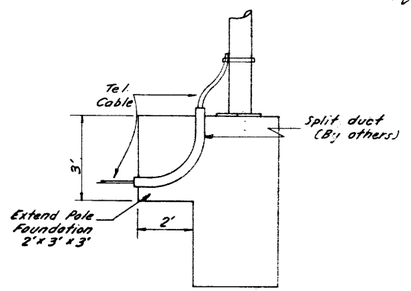
SIGNAL INSTALLATION PLAN

SCALE 0 10 20 40 FEET

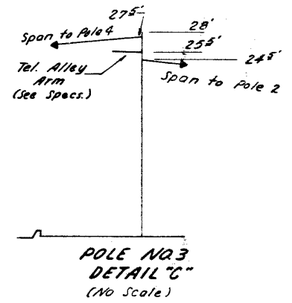




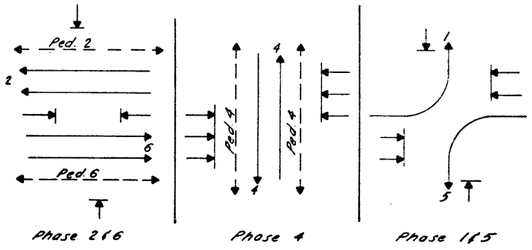
METAL POLE BARRIER DETAIL "A" (No Scale)



POLE NO.3 DETAIL "B" (No Scale)



POLE NO.3 DETAIL "C" (No Scale)



NORMAL OPERATION SEQUENCE (Fully Actuated)

For Railroad Pre-emption Sequence see TES. Drawing No. 4143

L E G E N D

- EP/1 — Existing power pole (power source)
- EP/2 — Existing strain pole
- EP/TP — Remove existing telephone pole (see Specifications)
- 39 — Install 3/8" galv. messenger cable
- 54 — Install service cabinet with 40 amp. S.P.S.T. breaker
- 60 — Install metal pole barrier (detail "A")
- 61 — Modify pole foundation (detail "B")
- S" — Install (S") electrical conduit
- N — Install (N) No. 14 type THWN wire
- N/G — Install (N) No. (G) type TW wire
- C — Install 1 No. 8 type THWN wire (signal common)
- X-N/G — Install (X)-(N) wire No. (G) control cable
- CP/5 — Install 5 phase full-actuated controller in P cabinet
- MS — Install 120 volt meter service
- PI/2L — Install interior illuminated "LEFT TURN SIGNAL" sign
- PI/Ph — Install (Ph) phase pushbutton and sign
- PI/T — Install (T) type pedestrian signal
- PI/PR — Install part time restriction "NO RIGHT TURN" sign
- SP — Install strain pole
- MV — Luminaire (by others)
- L/L — Install (L) foot luminaire arm
- SPL — Install strain pole with street light extension (30' mounting height)
- TC — Install terminal cabinet
- TX — Install telephone alley arm (detail "C")
- V/Ph — Install (Ph) phase vehicle signal

128 = 8" R, 8" Y, 2" GLTA T = Type shown

423 = 12" R, 8" Y, 8" G S = Size shown

456 = 12" R, 12" Y, 12" G N = Number of conductors

X = Number of cables shown G = AWG size shown

Ph = Phase shown

9/78 "As Constructed"

APPROVED

TRAFFIC ENGINEER

2/12/79

DATE

OREGON STATE HIGHWAY DIVISION
TRAFFIC ENGINEERING SECTION

TRAFFIC SIGNAL INSTALLATION
PACIFIC HWY E. AT IVY ST. (CANBY) SEC.
PACIFIC HIGHWAY EAST
CLACKAMAS COUNTY

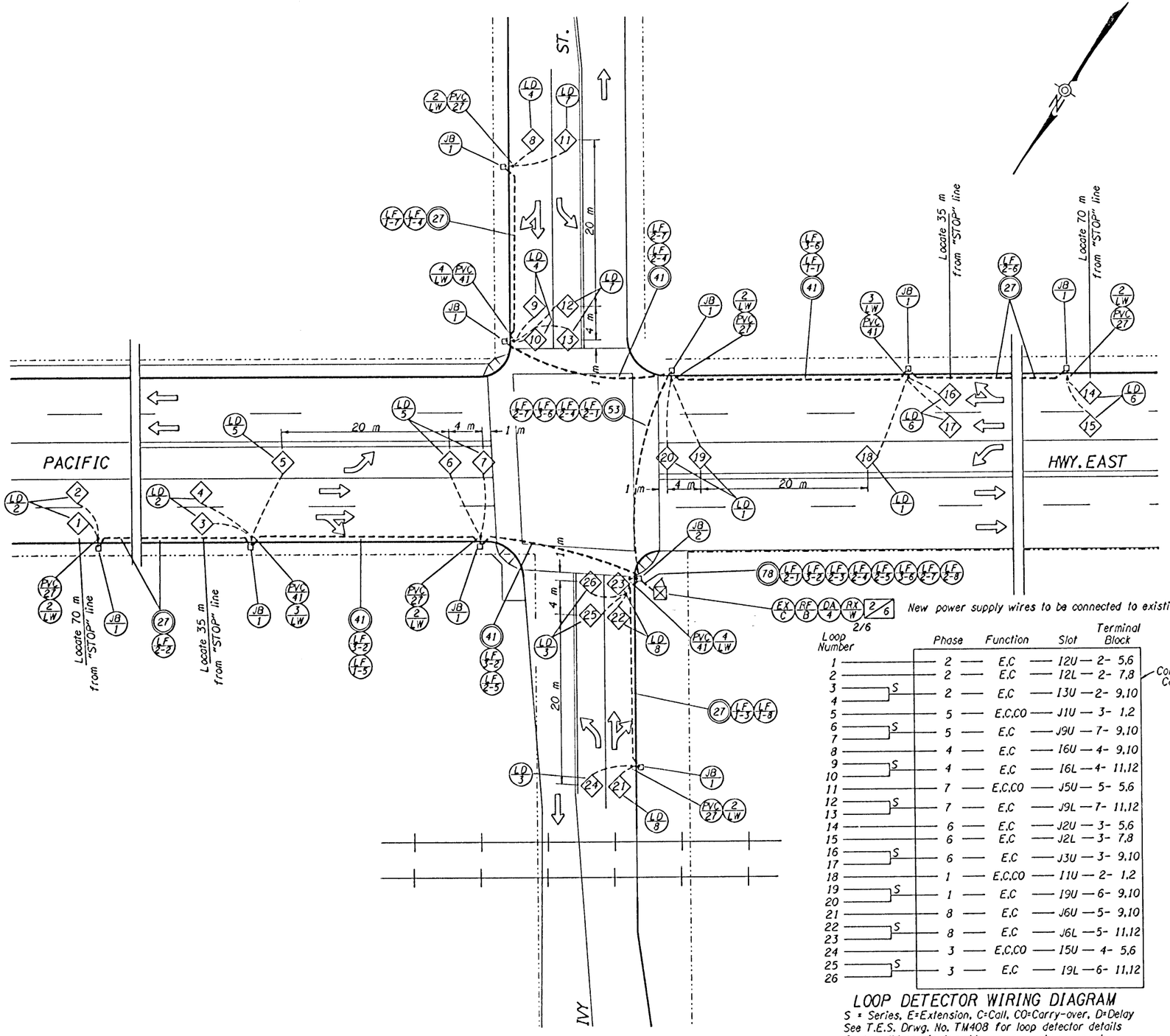
DATE

Accompanied by TES Drwgs. No. 1470, 1471, 1472, 1473, 1480, 1481, 1488, 1489, 4142, 4143 & 51006.

T.E. DWG. NO. 4141

LOOP REPLACEMENT PLAN
PACIFIC HWY. EAST AT IVY STREET
HWY. 1E, M.P. 21.14

SCALE 0 10 20 40 METERS



L E G E N D

- EX/C — Retain and protect existing Model 170 controller and Model 332 cabinet
- RX/W — Remove existing wiring
- RF/T — Install type (T) riser frame under controller cabinet (B=bolted, W=welded)
- DA/N — Install (N) loop detector amplifier in existing controller cabinet
- PVC/S — Install 155 mm diameter x 350 mm PVC conduit sleeve street entrance with (S) mm conduit to junction box
- LD/Ph — Install phase (Ph) 1 m diamond vehicle detector loop
- LF/X-Ph — Install (X) phase (Ph) loop feeder cables
- N/LW — Install (N) pair of loop wires
- S — Install (S) mm electrical conduit
- JB/1 — Install 440 mm x 265 mm x 305 mm (min. dimension) precast concrete junction box
- JB/2 — Install 560 mm x 305 mm x 305 mm (min. dimension) precast concrete junction box
- N/G — Install (N) No. (G) type THWN wires

Ph = Phase shown
X = Number of cables shown
N = Number shown
S = Size shown
G = AWG size shown

Loop Number	Phase	Function	Slot	Terminal Block
1	2	E,C	12U	2- 5,6
2	2	E,C	12L	2- 7,8
3	2	E,C	13U	2- 9,10
4				
5	5	E,C,CO	J1U	3- 1,2
6	5	E,C	J9U	7- 9,10
7				
8	4	E,C	16U	4- 9,10
9	4	E,C	16L	4- 11,12
10				
11	7	E,C,CO	J5U	5- 5,6
12	7	E,C	J9L	7- 11,12
13				
14	6	E,C	J2U	3- 5,6
15	6	E,C	J2L	3- 7,8
16	6	E,C	J3U	3- 9,10
17				
18	1	E,C,CO	11U	2- 1,2
19	1	E,C	19U	6- 9,10
20				
21	8	E,C	J6U	5- 9,10
22	8	E,C	J6L	5- 11,12
23				
24	3	E,C,CO	15U	4- 5,6
25	3	E,C	19L	6- 11,12
26				

Controller Cabinet

LOOP DETECTOR WIRING DIAGRAM

S = Series, E=Extension, C=Call, CO=Carry-over, D=Delay
See T.E.S. Drwg. No. TM408 for loop detector details
Center all loops in travel lanes or as shown on plan

REGISTERED PROFESSIONAL ENGINEER — OREGON — JULY 15, 1982 — KEITH R. RUDISILL
12-197
Exp. 12/31/98

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC MANAGEMENT SECTION

TRAFFIC SIGNAL INSTALLATION
TRAFFIC LOOP REPAIR UNIT 8
VARIOUS HIGHWAYS
CLACKAMAS, MULTNOMAH, AND WASHINGTON COUNTIES

DESIGNED BY: M. Laux
CHECKED BY: H. Naegeli
DRAWN BY: M.Laux/H.Thayer

DATE: May 1998

060191r2.dp1

T.M.S. DWG. NO. 11479

VIEW=B22

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC MANAGEMENT SECTION

2B045	1	2B	81 (1E)	20.62
TSSU ID	Region	District	Highway No.	Milepoint

Location: Pacific Highway East @ Pine St

County: Clackamas

City: Canby

Main Street Speed: 35 M.P.H.

Side Street Speed: 25 M.P.H.

Maintenance Response Category (1, 2, or 3): 1

Agreement No.:

Maintenance By: ODOT (ODOT, County, or City)

Submit copies to State Traffic Engineer and Traffic Signal Services Unit.

Permanent	Temporary	*Indicate simple changes by giving both old and new values (Ex: Change Ph 2 Max Green from 45 to 60) For more extensive changes submit new sheets Ex: New system timing - replace Sheet 7) Fill in "Date sheet in effect" on new sheet and attach old sheet with "Date sheet voided" filled in.*		Timing or Timing Revisions By	INSTALLED Date	Time	By
		Preliminary Timing	-				
		Signal Turn-on	See Previous Sheets				

SHEET 1

SHEET 2

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East @ Pine St

Table Numbers refer to Trafficview & Translink

TABLE 3

Clock, EV and Misc. (C + Key)

Function	Key	
Year		Clock Location C + 3 uses Call / Active Display Sunday = 1
Month	1	
Date	2	
Day of Week	3	
Hour	4	
Minute	5	
Second	6	
1/10 Second	7	

		Phase Number							
		1	2	3	4	5	6	7	8
	8								
Start Yellow	9								
EVA Phases	A		X			X			
EVB Phases	B				X				
EVC Phases	C	X					X		
EVD Phases	D								X
Handicap Ped	E								

TABLE 3

Preemption Data (E+Key)

Function	Key	Parameter	Timing
EVA		Delay	
	1	Minimum	1
EVB	2	Delay	
	3	Minimum	1
EVC	4	Delay	
	5	Minimum	1
EVD	6	Delay	
	7	Minimum	1
Overlaps	8	Red Revert	5.0
Railroad	9	Delay	
	A	Minimum	8

		Phase Number							
		1	2	3	4	5	6	7	8
RR Clear Ph	B								X
RR Permit	C		X			X	X		
RR OL Permit	D								
Nema Hold Ph	E								
	F								

TABLE 6

(also see sheet 6)

Miscellaneous (D + Code)

Function	Code	Value	Notes
Floating Ped	2E		0 = Off 1 = On (Ph. 7 & 8 Not permitted)
ID Number	2F	45	Range 0 to 253 (1)
Coordination Ped Recalls	3E	1	0 = Recall 1 = No Recall
Rest in WALK	3F		0 = Off 1 = ON
Advance Warning End of Green	4E		Extend time for green after sign turns on (2) (5)
Advance Warning Start of Green	4F		Delay time for sign after phase turns yellow (2) (5)
RR Red Clear	5E		Length of all red after RR red flash
RR Clear Color	5F		0 = Green, 1 = Flash Yellow, 2 = Flash Red
NEMA Inputs	66		Non zero value reassigns C1 inputs. (3)
Bus Delay	6D	25.5	Delay time before preemption (4)
Bus Timer # 1	6E		Extension of max green for phases 2 & 6 (Free operation)
Bus Timer # 3	6F		Force off time for Ph 4 & 8 (only in Free operation)
JHK Protocol	76		0 = no 0.1 = yes
JHK Area No. & 1st digit local	7D		Area No. 0 - 7 and Local 001 - 510 (1)
EV minimum timed Start / end of call	7E		0 = at start of call 1 = at end of call
EV On Indicators	7F		0 = Off, 1 = Flash, 5 = solid indication (5)

Notes

(1) JHK ID no. is formed by Area no. (0 to 7) and 3 digit Local no. (001-510). Left most digits entered as x.x in location 7D and rightmost as xx in location 2F

(2) See Sheet 6, Location B+0+E

(3) C1 pins 54, 63, 64, 75, 76, and 77. See sheet 6, Location B+0+D.

(4) Entering 25.5 in this location is the only way of disabling bus preempt.

(5) Ped yellow outputs, C1-35, 36, 37, and 38 are used by Rt. Turn Overlaps, EV on indicators, TOD/DOW programmable outputs, Fiber Optic sign for RR flash yellow clearance, and Advance Warning sign operation.

Phase Rotation Diagram

T. M. S. Dwg. Nos: 10647

Date sheet in effect:

Date sheet voided:

Location: Pacific Highway East @ Pine St

TABLE 1 Page 0

Phase Functions (0+Key)

Function	Key	Phase Number * 1	2	3	4	5	6	7	8
Veh Recall			X				X		
Ped Recall	1								
Red Lock	2								
Yellow Lock	3								
Permit Phase	4	X	X		X	X	X		X
Ped Phases	5		X				X		X
Lead Phases	6	X		X		X		X	
Double Entry	7				X				X
Sequential	8								
Start Green	9								
OLA=	A								
OLB=	B								
OLC=	C								
OLD=	D								
Exclusive	E								
Sim Gap	F		X				X		

TABLE 2 Page 0

Miscellaneous (C+F+Key)

Function	Key	Value	
Page ID			
	1		Keys 8 through F use Call/Active Display
	2		
	3		
OLA Red	4		
OLB Red	5		
OLC Red	6		
OLD Red	7		

	Key	Phase Number 1	2	3	4	5	6	7	8
RT OLE	8								
RT OLF	9								
Red Rest	A								
Max Recall	B								
Flash Green	C								
	D								
Advance WALK	E								
Restrictive Ph	F								

* Shown on Call/Active Display

SHEET 3

TABLE 1 Page 0

Phase Timing (Ph. No. + Key)

Interval	Key	1 NB Hwy Left Turn	2 SB ORE 99E	3	4 NB Pine	5 SB Hwy Left Turn	6 NB ORE 99E	7	8 SB Pine
		Phase Number							
Max Green		15	40		15	15	40		20
Max2 / HFDW	1	20	60		50	20	80		40
Walk	2		7				7		7
Flashing DW	3		17				15		24
Max Initial	4	4	17		6	4	17		6
Min Green	5	4	10		6	4	10		6
TBR	6	8	10		5	8	10		5
TTR	7	3	20		5	3	20		5
Observe Gap	8								
Passage	9	2.3	5.1		2.5	2.3	5.1		2.5
Min Gap	A	0.5	3.1		2.0	0.5	3.1		0.2
Add per Act	B		1.2				1.2		
Yellow	C	3.5	4.7		3.5	3.5	4.0		3.5
Red Clear	D	0.5	0.7		0.5	0.5	0.5		0.5
Red Revert	E	5.0	5.0		5.0	5.0	5.0		5.0
Walk 2	F								

To observe timing for an individual phase: Enter C + A + F for Ring A (Phase 1-4) or enter C + B + F for Ring B (Phase 5-8)

Page I.D. 0

Phase Conditions as shown on Free Display

00 Initial Entry	0C Yellow
02 WALK	0D Red Clear
03 Flashing DW	0E Red Revert
05 Min Green	11 Gap Out
08 Rest	12 Force Off
09 Passage	14 Max Out
0B Added Initial	15 Red Revert Timed out

TABLE 2 Page 0

Miscellaneous (9+Key)

Parameter		Key	Value	Notes
Short Pwr Dn				Clock Correction Speed up 1 - 9 Slow down 11 - 19
Long Power Dn		1		
Preemption Delay Types	EVA	2		Preemption Delay Types: Hold 1 Latch 2 Both 3 Neither 0
	EVB	3		
	EVC	4		
	EVD	5		
	RR	6		
Ped Inhibit		7		Usually should be 0
OLA	Green	8		Overlap Yellow Time should always be specified
	Yellow	9		
OLB	Green	A		
	Yellow	B		
OLC	Green	C		
	Yellow	D		
OLD	Green	E		
	Yellow	F		

Keyboard Entries when not in Free Display

A Advance	D Column Advance
B Back	E Enter and Advance
C Clear Display	F Free Display

Reinitialization

D + 1 + F + 1 + E

(Use **only** when in flash)

Phase Data Copy

C + x + C + y + D

x From Phase (x cannot be 3 or 8)

y To Phase(s) - up to 3

SHEET 4

Date sheet in effect:

Date sheet voided:

Location: Pacific Highway East @ Pine St

TABLE 1 Page 1

Phase Functions (D+C+0+Key)

Function	Key	Phase Number *							
		1	2	3	4	5	6	7	8
Veh Recall									
Ped Recall	1								
Red Lock	2								
Yellow Lock	3								
Permit Phase	4								
Ped Phases	5								
Lead Phases	6								
Double Entry	7								
Sequential	8								
Start Green	9								
OLA=	A								
OLB=	B								
OLC=	C								
OLD=	D								
Exclusive	E								
Sim Gap	F								

TABLE 2 Page 1

Miscellaneous (D+C+B+Key)

Function	Key	Value	
Page ID			
	1		Keys 8 through F use Call/Active Display
	2		
	3		
OLA Red	4		
OLB Red	5		
OLC Red	6		
OLD Red	7		

	Key	Phase Number							
		1	2	3	4	5	6	7	8
RT OLE	8								
RT OLF	9								
Red Rest	A								
Max Recall	B								
Flash Green	C								
	D								
Advance WALK	E								
Restrictive Ph	F								

* Shown on Call/Active Display

TABLE 1 Page 1

Phase Timing (D + C + Ph. No. + Key)

Interval	Key	Phase Number							
		1	2	3	4	5	6	7	8
Max Green									
Max2 / HFDW	1								
Walk	2								
Flashing DW	3								
Max Initial	4								
Min Green	5								
TBR	6								
TTR	7								
Observe Gap	8								
Passage	9								
Min Gap	A								
Add per Act	B								
Yellow	C								
Red Clear	D								
Red Revert	E								
Walk 2	F								

To observe timing for an individual phase: Enter C + A + F for Ring A (Phase 1-4) or enter C + B + F for Ring B (Phase 5-8)

Page I.D. 1

Phase Conditions as shown on Free Display

00 Initial Entry	0C Yellow
02 WALK	0D Red Clear
03 Flashing DW	0E Red Revert
05 Min Green	11 Gap Out
08 Rest	12 Force Off
09 Passage	14 Max Out
0B Added Initial	15 Red Revert Timed out

TABLE 2 Page 1

Miscellaneous (D+C+9+Key)

Parameter		Key	Value	Notes
Short Pwr Dn				Clock Correction Speed up 1 - 9 Slow down 11 - 19
Long Power Dn		1		
Preemption Delay Types	EVA	2		Preemption Delay Types: Hold 1 Latch 2 Both 3 Neither 0
	EVB	3		
	EVC	4		
	EVD	5		
	RR	6		
Ped Inhibit		7		Usually should be 0
OLA	Green	8		Overlap Yellow Time should always be specified
	Yellow	9		
OLB	Green	A		
	Yellow	B		
OLC	Green	C		
	Yellow	D		
OLD	Green	E		
	Yellow	F		

Keyboard Entries when not in Free Display

A Advance	D Column Advance
B Back	E Enter and Advance
C Clear Display	F Free Display

Reinitialization

D + 1 + F + 1 + E

(Use **only** when in flash)

Phase Data Copy

C + x + C + y + D

x From Phase (x cannot be 3 or 8)

y To Phase(s) - up to 3

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East @ Pine St

TABLE 1 Page 2

Phase Functions (D+D+0+Key)									
Function	Key	Phase Number *							
		1	2	3	4	5	6	7	8
Veh Recall									
Ped Recall	1								
Red Lock	2								
Yellow Lock	3								
Permit Phase	4								
Ped Phases	5								
Lead Phases	6								
Double Entry	7								
Sequential	8								
Start Green	9								
OLA=	A								
OLB=	B								
OLC=	C								
OLD=	D								
Exclusive	E								
Sim Gap	F								

TABLE 2 Page 0

Miscellaneous (D+D+B+Key)			
Function	Key	Value	
Page ID			
	1		Keys 8 through F use Call/Active Display
	2		
	3		
OLA Red	4		
OLB Red	5		
OLC Red	6		
OLD Red	7		

		Phase Number							
		1	2	3	4	5	6	7	8
RT OLE	8								
RT OLF	9								
Red Rest	A								
Max Recall	B								
Flash Green	C								
	D								
Advance WALK	E								
Restrictive Ph	F								

* Shown on Call/Active Display

SHEET 5

TABLE 1 Page 2

Phase Timing (D + D + Ph. No. + Key)									
Interval	Key	Phase Number							
		1	2	3	4	5	6	7	8
Max Green									
Max2 / HFDW	1								
Walk	2								
Flashing DW	3								
Max Initial	4								
Min Green	5								
TBR	6								
TTR	7								
Observe Gap	8								
Passage	9								
Min Gap	A								
Add per Act	B								
Yellow	C								
Red Clear	D								
Red Revert	E								
Walk 2	F								

To observe timing for an individual phase:
Enter C + A + F for Ring A (Phase 1-4) or enter C + B + F for Ring B (Phase 5-8)

Page I.D. 2

Phase Conditions as shown on Free Display

00 Initial Entry	0C Yellow
02 WALK	0D Red Clear
03 Flashing DW	0E Red Revert
05 Min Green	11 Gap Out
08 Rest	12 Force Off
09 Passage	14 Max Out
0B Added Initial	15 Red Revert Timed out

TABLE 2 Page 2

Miscellaneous (D+D+9+Key)				
Parameter		Key	Value	Notes
Short Pwr Dn				Clock Correction Speed up 1 - 9 Slow down 11 - 19
Long Power Dn		1		
Preemption Delay Types	EVA	2		Preemption Delay Types: Hold 1 Latch 2 Both 3 Neither 0
	EVB	3		
	EVC	4		
	EVD	5		
	RR	6		
Ped Inhibit		7		Usually should be 0
OLA	Green	8		Overlap Yellow Time should always be specified
	Yellow	9		
OLB	Green	A		
	Yellow	B		
OLC	Green	C		
	Yellow	D		
OLD	Green	E		
	Yellow	F		

Keyboard Entries when not in Free Display

A Advance	D Column Advance
B Back	E Enter and Advance
C Clear Display	F Free Display

Reinitialization
D + 1 + F + 1 + E
(Use **only** when in flash)

Phase Data Copy
C + x + C + y + D
x From Phase (x cannot be 3 or 8)
y To Phase(s) - up to 3

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East

@ Pine St

SHEET 6

TABLE 6 (Also see sheet 2)

Operation (B + 0 + Key)		
Key	Parameter	Value
0	Present Plan	
1	Time of Day Plan	
2	Hardwire Plan	
3	MODEM Plan	
4	Mode (0 - 4 see right)	1
5	Master (0 - 4 see right)	0
6	Master Cycle Clock	
7	Local Cycle Clock	
8	Local Timer	
9		
A		
B		

0 = Free *3 = Modem*
1 = TBC *4 = TM System*
2 = Hardwire

0 = Off *3 = 1 + 2*
1 = Modem Master *4 = TM Master*
2 = Hardwire Master

		Phase Number							
		1	2	3	4	5	6	7	8
C									
D	NEMA CNA								
E	Adv. Warn.								
F	MRI Phases	X			X	X			X

OSM ?	Y	N
		X

OSM Location

@ Redwood / Sequoia

TABLE 13 (Also see Sheet 10)

Miscellaneous (E + F + Key)		
Function	Key	Time
Railroad Max 2	0	
Ped Permissive Plan 1	1	
Ped Permissive Plan 2	2	
Ped Permissive Plan 3	3	
Ped Permissive Plan 4	4	
Ped Permissive Plan 5	5	
Ped Permissive Plan 6	6	
Ped Permissive Plan 7	7	
Ped Permissive Plan 8	8	
Ped Permissive Plan 9	9	
Number of Long Powerouts	A	
Number of Short Powerouts	B	
Failed Detector Number	C	
Max 2 On	D	
No Daylight Savings	E	1
Revision Level	F	10

Manual (D + 1 + E)

Function Code Index

Function		Time Clock On	Time Clock Off	Manual On	Manual Off	Notes
Outputs	A	71	81			*Phase 2 ped yellow (C1-35) (1)*
	B	72	82			*Phase 6 ped yellow (C1-36) (1)*
	C	73	83			*Phase 4 ped yellow (C1-37) (1)*
	D	74	84			*Phase 8 ped yellow (C1-38) (1)*
TOD Red Rest		25	24			*See Sheet 10 at B + C + D to set phases*
TOD Max Recall		27	26			*See Sheet 10 at B + A + E to set phases*
TOD Ped Recall		29	28			*See Sheet 10 at B + B + E to set phases*
WALK 2		55	54			*Use WALK 2 times set on Sheets 3, 4, 5*
Plan No.		1 - 18		1 - 18	0	*Sets operation to coordination plans on Sheet 7*
Free		20		20		*Sets operation to fully actuated*
Flash		19 or 33	32	19 or 33	0	*Sets operation to flash*
Max 2		129	128	129	0	*Use Max 2 times set on Sheets 3, 4, 5*
Det. Count 15		131	130			*Log Detector Counts - 15 min. intervals*
Det. Count 60		132	130			*Log Detector Counts - 60 min. intervals*
Clear Det. Ct.		133				*Clear Detector Count Log*
Det Diagnostic		136	135			*Enable Detector Diagnostics and log*
Det Diag Test		137	135			*Enable Detector Diagnostics without log*
Clear Det Diag.		138				*Clear Detector Diagnostic Log*
Send Real Time		199		199		*Modem master only*
Time Transfer		100		100		*Implements Page 0*
		101		101		*Implements Page 1*
		102		102		*Implements Page 2*
Page Copy				93	---	*Copies Page 0 data to Pages 1 & 2 Make sure Page 0 is the active Page*
Burn EEPROM				94	---	*Places active timing data into backup timing (Use reinitialization to place backup into active)*
Print Out				96	0	*Conect printer to C2 connector*

Note
(1) These C1 pins are used for other functions. See note (5) on Sheet 2.

TABLE 10 (Also see Sheet 12)

(A + 3 + 9)

Sample Detectors (0 = off, 1 = on): 0

Sampling detectors are assigned using extended input codes on Sheet 11

For Protected / Permissive Left Turns

(A + 3 + A)

Left Turn Type (0, 1, or 2): 0

0 = Off

1 = Left turn places call on cross street

2 = Left turn is omitted until cross street is serviced

Note: This feature works only with leading left turn phases 1, 3, 5, or 7. It is used to prohibit a green arrow from immediately following a green ball.

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East @ Pine St

Timing Modification For Temporary Purpose
Per City of Canby (NB Pine St Ph 4)

TABLE 7 (1 of 2)

Hardwire Conversion	Dial	1			2			3		
	Offset	1	2	3	1	2	3	1	2	3

Parameter	Key	Coordination Timing (B + Plan No. + Key)									Plan Number
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
Cycle Length			95			100					
Forceoffs for Phase Indicated by Key No.	1		15			16					
	2										
	3										
	4		52			55					
	5		66			74					
	6		15			16					
	7										
	8		52			55					
Offset	9		48			48					
Permissive	A		17			18					
Max. Dwell	B		32			34					

1

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

2

		1	2	3	4	5	6	7	8
C	Lead Phases		X	X		X		X	
D	Coord. Phases		X				X		
E	Perm. 2 Ph.								
F	Min. Recall								

3

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

4

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

5

		1	2	3	4	5	6	7	8
C	Lead Phases		X	X		X		X	
D	Coord. Phases		X				X		
E	Perm. 2 Ph.								
F	Min. Recall								

6

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

7

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

8

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

9

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

TABLE 7 (2 of 2)

Parameter	Key 2	Coordination Timing (B + D + Key 1 + Key 2)									Plan Number
		10	11	12	13	14	15	16	17	18	
		7	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**	**Key 1**
Cycle Length											
Forceoffs for Phase Indicated by Key No.	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
Offset	9										
Permissive	A										
Max. Dwell	B										

10

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

11

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

12

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

13

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

14

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

15

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

16

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

17

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

18

		1	2	3	4	5	6	7	8
C	Lead Phases								
D	Coord. Phases								
E	Perm. 2 Ph.								
F	Min. Recall								

SHEET 8

TABLE 5 (1 of 2)

Event No.	S 1	M 2	T 3	W 4	T 5	F 6	S 7	Hour	Min.	Func
Time Clock Control (A+Code)										
1								80	81	82	83
		X	X	X	X	X		5	59	129
2								84	85	86	87
	X	X	X	X	X	X	X	18	29	128
3								88	89	8A	8B
	X						X	9	00	129
4								8C	8D	8E	8F
		X	X	X	X	X		6	00	2
5								90	91	92	93
		X	X	X	X	X		8	45	20
6								94	95	96	97
		X	X	X	X	X		14	30	5
7								98	99	9A	9B
		X	X	X	X	X		18	30	20
8								9C	9D	9E	9F
9								A0	A1	A2	A3
10								A4	A5	A6	A7
11								A8	A9	AA	AB
12								AC	AD	AE	AF
13								B0	B1	B2	B3
14								B4	B5	B6	B7
15								B8	B9	BA	BB
16								BC	BD	BE	BF

Event No.	S 1	M 2	T 3	W 4	T 5	F 6	S 7	Hour	Min.	Func
Time Clock Control (A+Code)										
17								C0	C1	C2	C3
	X	X	X	X	X	X	X	5	15	131
18								C4	C5	C6	C7
	X	X	X	X	X	X	X	22	15	132
19								C8	C9	CA	CB
20								CC	CD	CE	CF
21								D0	D1	D2	D3
22								D4	D5	D6	D7
23								D8	D9	DA	DB
24								DC	DD	DE	DF
25								E0	E1	E2	E3
26								E4	E5	E6	E7
27								E8	E9	EA	EB
28								EC	ED	EE	EF
29								F0	F1	F2	F3
30								F4	F5	F6	F7
31								F8	F9	FA	FB
32								FC	FD	FE	FF

TABLE 5 (2 of 2)

Event No.	S 1	M 2	T 3	W 4	T 5	F 6	S 7	Hour	Min.	Func
Time Clock Control (D+8+Code)										
33								80	81	82	83
34								84	85	86	87
35								88	89	8A	8B
36								8C	8D	8E	8F
37								90	91	92	93
38								94	95	96	97
39								98	99	9A	9B
40								9C	9D	9E	9F
41								A0	A1	A2	A3
42								A4	A5	A6	A7
43								A8	A9	AA	AB
44								AC	AD	AE	AF
45								B0	B1	B2	B3
46								B4	B5	B6	B7
47								B8	B9	BA	BB
48								BC	BD	BE	BF

Event No.	S 1	M 2	T 3	W 4	T 5	F 6	S 7	Hour	Min.	Func
Time Clock Control (D+8+Code)										
49								C0	C1	C2	C3
50								C4	C5	C6	C7
51								C8	C9	CA	CB
52								CC	CD	CE	CF
53								D0	D1	D2	D3
54								D4	D5	D6	D7
55								D8	D9	DA	DB
56								DC	DD	DE	DF
57								E0	E1	E2	E3
58								E4	E5	E6	E7
59								E8	E9	EA	EB
60								EC	ED	EE	EF
61								F0	F1	F2	F3
62								F4	F5	F6	F7
63								F8	F9	FA	FB
64								FC	FD	FE	FF

Event numbers are for reference only.

Local TOD "Free" will override any plan received via an interconnect line.

Date sheet in effect:

Date sheet voided:

Location: Pacific Highway East @ Pine St

Date sheet in effect:

Date sheet voided:

Location: Pacific Highway East @ Pine St

Detector Input File (332 Cabinet)

	Slot	1	2	3	4	5	6	7	8	9
"I" File	U	D201 E,C C1-56 (32) D40	D222 E,C C1-39 (11) D42	D242 E,C C1-63 (45) D44	D262 C C1-47 (21) --	D273 E,C C1-58 (34) D47	D294 E,C C1-41 (13) D49	D2B4 E,C C1-65 (47) D4B	D2D4 C C1-49 (23) --	D211 E,C C1-60 (36) D41
	L		D232 E,C C1-43 (15) D43	--2 E C1-76 (62) D45			D2A4 E,C C1-45 (17) D4A	--4 E C1-78 (64) D4C		D283 E,C C1-62 (38) D48
"J" File	U	D305 E,C C1-55 (31) D50	D326 E,C C1-40 (12) D52	D346 E,C C1-64 (46) D54	D366 C C1-48 (22) --	D377 E,C C1-57 (33) D57	D398 E,C C1-42 (14) D59	D3B8 E,C C1-66 (48) D5B	D3D8 C C1-50 (24) --	D315 E,C C1-59 (35) D51
	L		D336 E,C C1-44 (16) D53	--6 E C1-77 (63) D55			D3A8 E,C C1-46 (18) D5A	--8 E C1-79 (65) D5C		D387 E,C C1-61 (37) D58

Detector Input File (336 Cabinet)

	Slot	1	2	3	4	5	6	7	8	9	10
	U	D201 E,C C1-56 (32) D40	D222 E,C C1-39 (11) D42	D273 E,C C1-58 (34) D47	D294 E,C C1-41 (13) D49	D305 E,C C1-55 (31) D50	D326 E,C C1-40 (12) D52	D377 E,C C1-57 (33) D57	D398 E,C C1-42 (14)	D242 E,C C1-63 (45) D44	D2B4 E,C C1-65 (47) D4B
	L	D211 E,C C1-60 (36) D41	D232 E,C C1-43 (15) D43	D283 E,C C1-62 (38) D48	D2A4 E,C C1-45 (17) D4A	D315 E,C C1-59 (35) D51	D336 E,C C1-44 (16) D53	D387 E,C C1-61 (37) D58	D3A8 E,C C1-46 (18) D5A	D346 E,C C1-64 (46) D54	D3B8 E,C C1-66 (48) D5B

DELAY CODE
PHASE
FUNCTIONS
C1 PIN NUMBER
REASSIGNMENT CODE
CARRYOVER CODE

Detector Timing (Code)

Phase	Loop Nos.	Type	Code	Time	Slot 332	(336)
1	15	D	D20		I1	(1U)
		CO	D40	2.0		
1		D	D21		I9U	(1L)
		CO	D41			
2	1	D	D22		I2U	(2U)
		CO	D42	1.0		
2	2	D	D23		I2L	(2L)
		CO	D43	1.0		
2		D	D24		I3U	(9U)
		CO	D44			
2	24				I3L	
		CO	D45	3.0		
2		D	D26		I4	
		Type3*	D46			
3		D	D27		I5	(3U)
		CO	D47			
3		D	D28		I9L	(3L)
		CO	D48			
4	8	D	D29		I6U	(4U)
		CO	D49	2.0		
4		D	D2A		I6L	(4L)
		CO	D4A			
4		D	D2B		I7U	(10U)
		CO	D4B			
4					I7L	
		CO	D4C			
4		D	D2D		I8	
		Type3*	D4D			

Detector Timing Continued (Code)

Phase	Loop Nos.	Type	Code	Time	Slot 332	(336)
5	5	D	D30		J1	(5U)
		CO	D50	2.0		
5		D	D31		J9U	(5L)
		CO	D51			
6	11	D	D32		J2U	(6U)
		CO	D52	1.0		
6	12	D	D33		J2L	(6L)
		CO	D53	1.0		
6		D	D34		J3U	(9L)
		CO	D54			
6	25				J3L	
		CO	D55	1.0		
6		D	D36		J4	
		Type3*	D56			
7		D	D37		J5	(7U)
		CO	D57			
7		D	D38		J9L	(7L)
		CO	D58			
8	18	D	D39	3.0	J6U	(8U)
		CO	D59	2.0		
8	21	D	D3A		J6L	(8L)
		CO	D5A	2.0		
8	19,20	D	D3B	10.0	J7U	(10L)
		CO	D5B			
8					J7L	
		CO	D5C			
8		D	D3D		J8	
		Type3*	D5D			

* To set Type 3 detection 0=off, 0.1=on

TABLE 4
← (1 of 2)
(2 of 2) →

Input Functions (D + 9 + 4 + Key)

Key	Function	Value
	Detector Fail On	
1	Detector Fail Off	
2	Failed Det Backup (0=off, 1=on)	
3	Max 2 in Delay	
4	Max 2 in Carryover	
5	Plan 9 in Delay	
6	Plan 9 in Carryover	
7	Plan 18 in Delay	
8	Plan 18 in Carryover	
9	Time Transfer Page 1 Delay	
A	Time Transfer Page 1 Carryover	
B	Time Transfer Page 2 Delay	
C	Time Transfer Page 2 Delay	
D	NOVRAM (Quick Burn - 0=off, 1=on)	
E		
F		

Detector Diagnostics (D + 9 + 5 + Key)

Key	Function	Time
	Det. Fail Phase 1 Min Green	
1	Det. Fail Phase 2 Min Green	
2	Det. Fail Phase 3 Min Green	
3	Det. Fail Phase 4 Min Green	
4	Det. Fail Phase 5 Min Green	
5	Det. Fail Phase 6 Min Green	
6	Det. Fail Phase 7 Min Green	
7	Det. Fail Phase 8 Min Green	
8	Det. Fail Phase 1 Max Green	
9	Det. Fail Phase 2 Max Green	
A	Det. Fail Phase 3 Max Green	
B	Det. Fail Phase 4 Max Green	
C	Det. Fail Phase 5 Max Green	
D	Det. Fail Phase 6 Max Green	
E	Det. Fail Phase 7 Max Green	
F	Det. Fail Phase 8 Max Green	

SHEET 9

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East @ Pine St

TABLE 12

Time of Year Events (D + 8 + Key1 + Key2)

Key1 = 0		
Function	K2	Value
1 / Month		
1 / Day of Month	1	
1 / Hour On	2	
1 / Minute On	3	
1 / Hour Off	4	
1 / Minute Off	5	
1 / Plan	6	
2 / Month	7	
2 / Day of Month	8	
2 / Hour On	9	
2 / Minute On	A	
2 / Hour Off	B	
2 / Minute Off	C	
2 / Plan	D	
3 / Month	E	
3 / Day of Month	F	

Key1 = 1		
Function	K2	Value
3 / Hour On		
3 / Minute On	1	
3 / Hour Off	2	
3 / Minute Off	3	
3 / Plan	4	
4 / Month	5	
4 / Day of Month	6	
4 / Hour On	7	
4 / Minute On	8	
4 / Hour Off	9	
4 / Minute Off	A	
4 / Plan	B	
5 / Month	C	
5 / Day of Month	D	
5 / Hour On	E	
5 / Minute On	F	

Key1 = 2		
Function	K2	Value
5 / Hour Off		
5 / Minute Off	1	
5 / Plan	2	
6 / Month	3	
6 / Day of Month	4	
6 / Hour On	5	
6 / Minute On	6	
6 / Hour Off	7	
6 / Minute Off	8	
6 / Plan	9	
7 / Month	A	
7 / Day of Month	B	
7 / Hour On	C	
7 / Minute On	D	
7 / Hour Off	E	
7 / Minute Off	F	

Key1 = 3		
Function	K2	Value
7 / Plan		
8 / Month	1	
8 / Day of Month	2	
8 / Hour On	3	
8 / Minute On	4	
8 / Hour Off	5	
8 / Minute Off	6	
8 / Plan	7	
9 / Month	8	
9 / Day of Month	9	
9 / Hour On	A	
9 / Minute On	B	
9 / Hour Off	C	
9 / Minute Off	D	
9 / Plan	E	
	F	

TABLE 13 (Also see sheet 6)

Extended Overlaps (D + 9 + 0 + Key)									
Function	Key	1	2	3	4	5	6	7	8
Overlap H									
Overlap J	1								
Overlap K	2								
Overlap L	3								
OLH Switchpack	4								
OLJ Switchpack	5								
OLK Switchpack	6								
OLL Switchpack	7								
	8								
	9								
	A								
	B								
	C								
	D								
	E								
	F								

Overlap Timing (D + 9 + 3 + Key)		
Function	Key	Value
OLH Green		
OLH Yellow	1	
OLH Red	2	
OLJ Green	3	
OLJ Yellow	4	
OLJ Red	5	
OLK Green	6	
OLK Yellow	7	
OLK Red	8	
OLL Green	9	
OLL Yellow	A	
OLL Red	B	

TABLE 8

Bus Priority in Coordination and Miscellaneous

Explanation	(B + A + Key) Plan No.	Timer No.	Key	Value	(B + B + Key) Plan No.	Timer No.	Key	Value	(B + C + Key) Plan No.	Timer No.	Key	Value
Bus Priority Data *Timer #1 is the time Ph 2 & 6 green can be extended past local 0.* *Timer #2 sets forceoffs for Ph 4 & 8 (usually lengthened) after Ph 2 & 6 have been extended* *Timer #3 sets forceoffs for Ph 4 & 8 (usually shorter) when priority call is received before Ph 2& 6 have been served.*	1	1			4	1			7	1		
		2	1			2	1			2	1	
		3	2			3	2			3	2	
	2	1	3		5	1	3		8	1	3	
		2	4			2	4			2	4	
		3	5			3	5			3	5	
	3	1	6		6	1	6		9	1	6	
		2	7			2	7			2	7	
		3	8			3	8			3	8	
Permissive 2: Permissive time for which only the phases defined on Sheet 7 will have calls recognized.	1		9		4		9		7		9	
	2		A		5		A		8		A	
	3		B		6		B		9		B	

Function	Key	1	2	3	4	5	6	7	8
Phase Flash Yellow	C								
Phase Flash Circuit	D								
TOD Max Recall	E								
OLB Switch Pack	F								

Function	Key	1	2	3	4	5	6	7	8
Overlap Flash Yellow	C								
Overlap Flash Circuit	D								
TOD Ped. Recall	E								
OLC Switch Pack	F								

Function	Key	1	2	3	4	5	6	7	8
Coord. Max Recall	C								
TOD Red Rest	D								
OLA Switch Pack	E								
OLD Switch Pack	F								

SHEET 10

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East @ Pine St

Input Reassignments

TABLE 9

Page ID = 0

A + 4 + Key			
Function	C1 Pin	Key	Code
Ph. 2 E & C	39		
Ph. 6 E & C	40	1	
Ph. 4 E & C	41	2	
Ph. 8 E & C	42	3	
Ph. 2 E & C	43	4	
Ph. 6 E & C	44	5	
Ph. 4 E & C	45	6	
Ph. 8 E & C	46	7	
Ph. 2 Call Only	47	8	
Ph. 6 Call Only	48	9	
Ph. 4 Call Only	49	A	
Ph. 8 Call Only	50	B	
Ped Inhibit	51	C	
RR Pre-emption	52	D	
Advance Enable	53	E	
unassigned	54	F	

A + 5 + Key			
Function	C1 Pin	Key	Code
Ph. 5 E & C	55		
Ph. 1 E & C	56	1	
Ph. 7 E & C	57	2	
Ph. 3 E & C	58	3	
Ph. 5 E & C	59	4	
Ph. 1 E & C	60	5	
Ph. 7 E & C	61	6	
Ph. 3 E & C	62	7	
		8	
		9	
		A	
		B	
Ph. 2 E & C	63	C	
Ph. 6 E & C	64	D	
Ph. 4 E & C	65	E	
Ph. 8 E & C	66	F	

A + 6 + Key			
Function	C1 Pin	Key	Code
Ph. 2 Ped PB	67		
Ph. 6 Ped PB	68	1	
Ph. 4 Ped PB	69	2	
Ph. 8 Ped PB	70	3	
EV Channel A	71	4	
EV Channel B	72	5	
EV Channel C	73	6	
EV Channel D	74	7	
unassigned	75	8	
Ph. 2 Ext Only	76	9	
Ph. 6 Ext Only	77	A	
Ph. 4 Ext Only	78	B	
Ph. 8 Ext Only	79	C	
Advance	80	D	
Flash Sense	81	E	
Stop Time	82	F	

Page ID = 1

D + A + 4 + Key			
Function	C1 Pin	Key	Code
Ph. 2 E & C	39		
Ph. 6 E & C	40	1	
Ph. 4 E & C	41	2	
Ph. 8 E & C	42	3	
Ph. 2 E & C	43	4	
Ph. 6 E & C	44	5	
Ph. 4 E & C	45	6	
Ph. 8 E & C	46	7	
Ph. 2 Call Only	47	8	
Ph. 6 Call Only	48	9	
Ph. 4 Call Only	49	A	
Ph. 8 Call Only	50	B	
Ped Inhibit	51	C	
RR Pre-emption	52	D	
Advance Enable	53	E	
unassigned	54	F	

D + A + 5 + Key			
Function	C1 Pin	Key	Code
Ph. 5 E & C	55		
Ph. 1 E & C	56	1	
Ph. 7 E & C	57	2	
Ph. 3 E & C	58	3	
Ph. 5 E & C	59	4	
Ph. 1 E & C	60	5	
Ph. 7 E & C	61	6	
Ph. 3 E & C	62	7	
		8	
		9	
		A	
		B	
Ph. 2 E & C	63	C	
Ph. 6 E & C	64	D	
Ph. 4 E & C	65	E	
Ph. 8 E & C	66	F	

D + A + 6 + Key			
Function	C1 Pin	Key	Code
Ph. 2 Ped PB	67		
Ph. 6 Ped PB	68	1	
Ph. 4 Ped PB	69	2	
Ph. 8 Ped PB	70	3	
EV Channel A	71	4	
EV Channel B	72	5	
EV Channel C	73	6	
EV Channel D	74	7	
unassigned	75	8	
Ph. 2 Ext Only	76	9	
Ph. 6 Ext Only	77	A	
Ph. 4 Ext Only	78	B	
Ph. 8 Ext Only	79	C	
Advance	80	D	
Flash Sense	81	E	
Stop Time	82	F	

Page ID = 2

D + A + B + Key			
Function	C1 Pin	Key	Code
Ph. 2 E & C	39		
Ph. 6 E & C	40	1	
Ph. 4 E & C	41	2	
Ph. 8 E & C	42	3	
Ph. 2 E & C	43	4	
Ph. 6 E & C	44	5	
Ph. 4 E & C	45	6	
Ph. 8 E & C	46	7	
Ph. 2 Call Only	47	8	
Ph. 6 Call Only	48	9	
Ph. 4 Call Only	49	A	
Ph. 8 Call Only	50	B	
Ped Inhibit	51	C	
RR Pre-emption	52	D	
Advance Enable	53	E	
unassigned	54	F	

D + A + C + Key			
Function	C1 Pin	Key	Code
Ph. 5 E & C	55		
Ph. 1 E & C	56	1	
Ph. 7 E & C	57	2	
Ph. 3 E & C	58	3	
Ph. 5 E & C	59	4	
Ph. 1 E & C	60	5	
Ph. 7 E & C	61	6	
Ph. 3 E & C	62	7	
		8	
		9	
		A	
		B	
Ph. 2 E & C	63	C	
Ph. 6 E & C	64	D	
Ph. 4 E & C	65	E	
Ph. 8 E & C	66	F	

D + A + D + Key			
Function	C1 Pin	Key	Code
Ph. 2 Ped PB	67		
Ph. 6 Ped PB	68	1	
Ph. 4 Ped PB	69	2	
Ph. 8 Ped PB	70	3	
EV Channel A	71	4	
EV Channel B	72	5	
EV Channel C	73	6	
EV Channel D	74	7	
unassigned	75	8	
Ph. 2 Ext Only	76	9	
Ph. 6 Ext Only	77	A	
Ph. 4 Ext Only	78	B	
Ph. 8 Ext Only	79	C	
Advance	80	D	
Flash Sense	81	E	
Stop Time	82	F	

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East

@ Pine St

Output Reassignments

TABLE 10

Page ID=0

A + 0 + Key		
FUNCTION	K	CODE
04 D/W		
04 WALK	1	
04 RED	2	
04 YEL	3	
04 GRN	4	
03 RED	5	
03 YEL	6	
03 GRN	7	
02 D/W	8	
02 WALK	9	
02 RED	A	
02 YEL	B	
02 GRN	C	
01 RED	D	
01 YEL	E	
01 GRN	F	

A + 1 + Key		
FUNCTION	K	CODE
08 D/W		
08 WALK	1	
08 RED	2	
08 YEL	3	
08 GRN	4	
07 RED	5	
07 YEL	6	
07 GRN	7	
06 D/W	8	
06 WALK	9	
06 RED	A	
06 YEL	B	
06 GRN	C	
05 RED	D	
05 YEL	E	
05 GRN	F	

A + 2 + Key		
FUNCTION	K	CODE
02 PED Y		
06 PED Y	1	
04 PED Y	2	
08 PED Y	3	
03 PED Y	4	
01 PED Y	5	
FLASH	6	
WATCHDOG	7	
03 D/W	8	
03 WALK	9	
OLD RED	A	
OLD YEL	B	
OLD GRN	C	
OLC RED	D	
OLC YEL	E	
OLC GRN	F	

A + 3 + Key		
FUNCTION	K	CODE
01 D/W		
01 WALK	1	
OLB RED	2	
OLB YEL	3	
OLB GRN	4	
OLA RED	5	
OLA YEL	6	
OLA GRN	7	
	8	
Sample Det.	9	
Left Turn Type	A	
	B	
	C	
	D	
	E	
	F	

Page ID=1

D + A + 0 + Key		
FUNCTION	K	CODE
04 D/W		
04 WALK	1	
04 RED	2	
04 YEL	3	
04 GRN	4	
03 RED	5	
03 YEL	6	
03 GRN	7	
02 D/W	8	
02 WALK	9	
02 RED	A	
02 YEL	B	
02 GRN	C	
01 RED	D	
01 YEL	E	
01 GRN	F	

D + A + 1 + Key		
FUNCTION	K	CODE
08 D/W		
08 WALK	1	
08 RED	2	
08 YEL	3	
08 GRN	4	
07 RED	5	
07 YEL	6	
07 GRN	7	
06 D/W	8	
06 WALK	9	
06 RED	A	
06 YEL	B	
06 GRN	C	
05 RED	D	
05 YEL	E	
05 GRN	F	

D + A + 2 + Key		
FUNCTION	K	CODE
02 PED Y		
06 PED Y	1	
04 PED Y	2	
08 PED Y	3	
03 PED Y	4	
01 PED Y	5	
FLASH	6	
WATCHDOG	7	
03 D/W	8	
03 WALK	9	
OLD RED	A	
OLD YEL	B	
OLD GRN	C	
OLC RED	D	
OLC YEL	E	
OLC GRN	F	

D + A + 3 + Key		
FUNCTION	K	CODE
01 D/W		
01 WALK	1	
OLB RED	2	
OLB YEL	3	
OLB GRN	4	
OLA RED	5	
OLA YEL	6	
OLA GRN	7	
	8	
Sample Det.	9	
Left Turn Type	A	
	B	
	C	
	D	
	E	
	F	

Page ID=2

D + A + 7 + Key		
FUNCTION	K	CODE
04 D/W		
04 WALK	1	
04 RED	2	
04 YEL	3	
04 GRN	4	
03 RED	5	
03 YEL	6	
03 GRN	7	
02 D/W	8	
02 WALK	9	
02 RED	A	
02 YEL	B	
02 GRN	C	
01 RED	D	
01 YEL	E	
01 GRN	F	

D + A + 8 + Key		
FUNCTION	K	CODE
08 D/W		
08 WALK	1	
08 RED	2	
08 YEL	3	
08 GRN	4	
07 RED	5	
07 YEL	6	
07 GRN	7	
06 D/W	8	
06 WALK	9	
06 RED	A	
06 YEL	B	
06 GRN	C	
05 RED	D	
05 YEL	E	
05 GRN	F	

D + A + 9 + Key		
FUNCTION	K	CODE
02 PED Y		
06 PED Y	1	
04 PED Y	2	
08 PED Y	3	
03 PED Y	4	
01 PED Y	5	
FLASH	6	
WATCHDOG	7	
03 D/W	8	
03 WALK	9	
OLD RED	A	
OLD YEL	B	
OLD GRN	C	
OLC RED	D	
OLC YEL	E	
OLC GRN	F	

D + A + A + Key		
FUNCTION	K	CODE
01 D/W		
01 WALK	1	
OLB RED	2	
OLB YEL	3	
OLB GRN	4	
OLA RED	5	
OLA YEL	6	
OLA GRN	7	
	8	
Sample Det.	9	
Left Turn Type	A	
	B	
	C	
	D	
	E	
	F	

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East

@ Pine St

Extended Output Reassignments

TABLE 11

Page ID=0

D + B + 0 +Key		
FUNCTION	K	V
05 D/W		
05 WALK	1	
OLL Red	2	
OLL Yellow	3	
OLL Green	4	
OLK Red	5	
OLK Yellow	6	
OLK Green	7	
07 DW	8	
07 Walk	9	
OLJ Red	A	
OLJ Yellow	B	
OLJ Green	C	
OLH Red	D	
OLH Yellow	E	
OLH Green	F	

D + B + 1 + Key		
FUNCTION	K	V
OLE Green		
OLF Gren	1	
OLE Yellow	2	
OLF Yellow	3	
Adv Warning	4	
RR Flash Yellow	5	
Det. Reset	6	
RR On	7	
EVA ON	8	
EVB ON	9	
EVC ON	A	
EVD ON	B	
Ring 1, Bit B	C	
Ring 1, Bit C	D	
Ring 2, Bit B	E	
Ring 2, Bit C	F	

D + B + 2 + Key		
FUNCTION	K	V
Cycle 2		
Cycle 3	1	
Offset 1	2	
Offset 2	3	
Offset 3	4	
Unassigned	5	
Free	6	
Flash	7	
Coord. Plan 1,2,3	8	
Coord. Plan 4,5,6	9	
Coord. Plan 7,8,9	A	
Coord. Plan 10,11,12	B	
Coord. Plan 13,14, 15	C	
Coord. Plan 16,17,18	D	
Unassigned	E	
Unassigned	F	

Page ID=1

D + B + 4 +Key		
FUNCTION	K	V
05 D/W		
05 WALK	1	
OLL Red	2	
OLL Yellow	3	
OLL Green	4	
OLK Red	5	
OLK Yellow	6	
OLK Green	7	
07 DW	8	
07 Walk	9	
OLJ Red	A	
OLJ Yellow	B	
OLJ Green	C	
OLH Red	D	
OLH Yellow	E	
OLH Green	F	

D + B + 5 + Key		
FUNCTION	K	V
OLE Green		
OLF Gren	1	
OLE Yellow	2	
OLF Yellow	3	
Adv Warning	4	
RR Flash Yellow	5	
Det. Reset	6	
RR On	7	
EVA ON	8	
EVB ON	9	
EEVC ON	A	
EVD ON	B	
Ring 1, Bit B	C	
Ring 1, Bit C	D	
Ring 2, Bit B	E	
Ring 2, Bit C	F	

D + B + 6 + Key		
FUNCTION	K	V
Cycle 2		
Cycle 3	1	
Offset 1	2	
Offset 2	3	
Offset 3	4	
Unassigned	5	
Free	6	
Flash	7	
Coord. Plan 1,2,3	8	
Coord. Plan 4,5,6	9	
Coord. Plan 7,8,9	A	
Coord. Plan 10,11,12	B	
Coord. Plan 13,14, 15	C	
Coord. Plan 16,17,18	D	
Unassigned	E	
Unassigned	F	

Page ID=2

D + B + 8 +Key		
FUNCTION	K	V
05 D/W		
05 WALK	1	
OLL Red	2	
OLL Yellow	3	
OLL Green	4	
OLK Red	5	
OLK Yellow	6	
OLK Green	7	
07 DW	8	
07 Walk	9	
OLJ Red	A	
OLJ Yellow	B	
OLJ Green	C	
OLH Red	D	
OLH Yellow	E	
OLH Green	F	

D + B + 9 + Key		
FUNCTION	K	V
OLE Green		
OLF Gren	1	
OLE Yellow	2	
OLF Yellow	3	
Adv Warning	4	
RR Flash Yellow	5	
Det. Reset	6	
RR On	7	
EVA ON	8	
EVB ON	9	
EEVC ON	A	
EVD ON	B	
Ring 1, Bit B	C	
Ring 1, Bit C	D	
Ring 2, Bit B	E	
Ring 2, Bit C	F	

D + B + A + Key		
FUNCTION	K	V
Cycle 2		
Cycle 3	1	
Offset 1	2	
Offset 2	3	
Offset 3	4	
Unassigned	5	
Free	6	
Flash	7	
Coord. Plan 1,2,3	8	
Coord. Plan 4,5,6	9	
Coord. Plan 7,8,9	A	
Coord. Plan 10,11,12	B	
Coord. Plan 13,14, 15	C	
Coord. Plan 16,17,18	D	
Unassigned	E	
Unassigned	F	

Date sheet in effect: 5/28/2003 Date sheet voided:

Location: Pacific Highway East @ Pine St

Command Box Outputs

TABLE 15

Page 1D=0

D + B + 3 + key			
K	FUNCTION	Value	
	CB output #1	53	*PED 4 YELLOW*
1	CB output #2		
2	CB output #3		
3	CB output #4		
4	CB output #5		
5	CB output #6		
6	CB output #7		
7	CB output #8		
8	CB output #9		
9	CB output #10		
A	CB output #11		
B	CB output #12		
C			
D			
E			
F			

Page 1D=1

D + B + 7 + key			
K	FUNCTION	Value	
	CB output #1	53	*PED 4 YELLOW*
1	CB output #2		
2	CB output #3		
3	CB output #4		
4	CB output #5		
5	CB output #6		
6	CB output #7		
7	CB output #8		
8	CB output #9		
9	CB output #10		
A	CB output #11		
B	CB output #12		
C			
D			
E			
F			

Page 1D=2

D + B + B + key			
K	FUNCTION	Value	
	CB output #1	53	*PED 4 YELLOW*
1	CB output #2		
2	CB output #3		
3	CB output #4		
4	CB output #5		
5	CB output #6		
6	CB output #7		
7	CB output #8		
8	CB output #9		
9	CB output #10		
A	CB output #11		
B	CB output #12		
C			
D			
E			
F			

Revised for PCOI & VCOI 5/28/03

Command Box

TABLE 14

(1 of 6) **(D + 9 + key 1 + key 2)**

Key 1 = 8		
K2	Value	notes/meaning
	206	TURN-ON INPUT
1	26	RR INPUT
2	24	IF NOT
3	22	INPUT TEST
4	28	C1-54
5	205	TURN-ON OUTPUT
6	1	CB #1
7	22	INPUT TEST
8	26	RR PREEMPTION
9	206	TURN-ON INPUT
A	25	PED INHIBIT INPUT
B	24	INVERT
C	22	INPUT TEST
D	61	J11L-TRUE
E	201	TRANSFER
F	65	J7L

Key 1 = 9		
K2	Value	notes/meaning
	24	J8U
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = A		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

(2 of 6) **(D + 9 + key 1 + key 2)**

Key 1 = B		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = C		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = D		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

CONTINUED ON SHEET 15

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East @ Pine St

TABLE 14

COMMAND BOX CONTINUED

(2 of 6 continued) **(D + 9 + key 1 + key 2)**

(3 of 6) **(D + E + key 1 + key 2)**

Key 1 = E		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = F		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 0		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 1		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 2		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 3		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

(4 of 6) **(D + E + key 1 + key 2)**

Key 1 = 4		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 5		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 6		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

CONTINUED ON SHEET 16

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East @ Pine St

TABLE 14

COMMAND BOX CONTINUED

(4 of 6 continued)

(5 of 6) **(D + E + key 1 + key 2)**

Key 1 = 7		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 8		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = 9		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

(6 of 6) **(D + E + key 1 + key 2)**

Key 1 = A		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = B		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = C		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = D		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = E		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Key 1 = F		
K2	Value	notes/meaning
1		
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E		
F		

Date sheet in effect: Date sheet voided:

Location: Pacific Highway East @ Pine St

Command Box Summary

(Check all that apply)

- [X] Railroad interconnect (AC isolator)
- [X] Extend to Call jumpers
- [ ] Temporary Bridge Signal
- [X] Coordination lagging left turns
- [ ] Pedestrian pushbutton jumpers
- [ ] Other/comment: _____

Command Box Codes

201 → "Jumper" Command
XX → Input code of the "from" input
XX → Input code of the "to" input

202 → "Turn on input" Command
X → Phase (1 - 8)
XX → Phase condition (2,3,5,8,9, 11,12,13,or 14)*
XXX → Input code for/to input

203 → "Turn on input" Command
XX → Output code
XX → Input code

204 → "Turn on output" Command
X → Phase to check (1 - 8)
XX → Phase condition*
XXX → Output

205 → "Turn on an output" Command
XX → CB or direct output
XX → Test codes
XX → Parameter for test codes

206 → "Turn on an input" Command
XX → Input
XX → Test codes (21-31)
XX → Parameter for test codes

207 → "Fill in blank cells" Command

208 → "Start timer" Command
X → Timer number (1 - 8)
XX.X → Timer value (0.1 - 25.5)
XX → Test codes (21 - 31)

209 → "Set a latch" Command
X → Latch number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

210 → "Reset latch" Command
X → Latch number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

211 → "Omit a phase" Command
X → Phase number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

212 → "Hold a phase" Command
X → Phase number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

213 → "Force a phase" Command
X → Phase number (1 - 8)
XX → Test codes (21 - 31)
XX → Test code parameter

214 → "Turn on a coordination plan" Command
X → Plan number (1 - 20)
XX → Test codes (21 - 31)
XX → Test code parameter

215 → "Stop here on flash" Command

TEST CODES

CODE	MEANING
20	And
21	Phase condition test *
22	Input test
23	Output test
24	Not
25	Current coordination plan test
26	Latch set test
27	Clock running test
28	Phase next
29	Preemption test
30	Low priority preemption test
31	Active page test

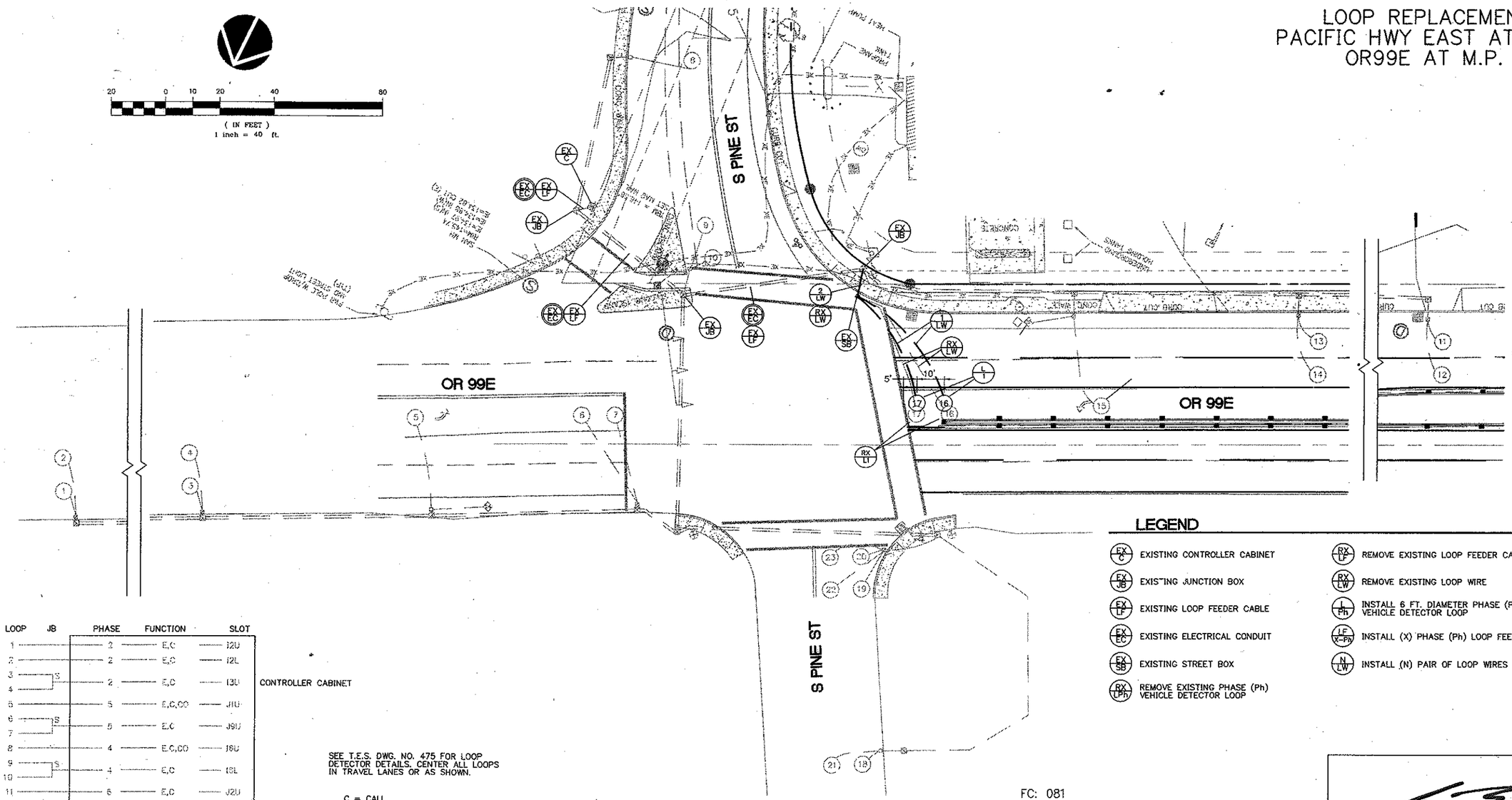
***Phase Condition Codes**

2	WALK
3	Flashing DW
5	Min. Green
8	Rest
9	Passage
11	any green condition
12	any yellow condition
13	any red condition
14	phase on

14923

LOOP REPLACEMENT PLAN
PACIFIC HWY EAST AT S. PINE ST
OR99E AT M.P. 20.62

20 0 10 20 40 80
(IN FEET)
1 inch = 40 ft.



LEGEND

- EX C — EXISTING CONTROLLER CABINET
- EX JB — EXISTING JUNCTION BOX
- EX LF — EXISTING LOOP FEEDER CABLE
- EX EC — EXISTING ELECTRICAL CONDUIT
- EX SB — EXISTING STREET BOX
- RX LPh — REMOVE EXISTING PHASE (Ph) VEHICLE DETECTOR LOOP
- RX LF — REMOVE EXISTING LOOP FEEDER CABLE
- RX LW — REMOVE EXISTING LOOP WIRE
- L Ph — INSTALL 6 FT. DIAMETER PHASE (Ph) VEHICLE DETECTOR LOOP
- LF X-Ph — INSTALL (X) PHASE (Ph) LOOP FEEDER CABLES
- N LW — INSTALL (N) PAIR OF LOOP WIRES

LOOP	JB	PHASE	FUNCTION	SLOT	
1		2	E,C	I2U	
2		2	E,C	I2L	
3	S	2	E,C	I3U	CONTROLLER CABINET
4					
5		5	E,C,CO	J1U	
6	S	5	E,C	J9U	
7					
8		4	E,C,CO	I8U	
9	S	4	E,C	I8L	
10					
11		6	E,C	J2U	
12		6	E,C	J2L	
13	S	6	E,C	J3U	
14					
15		1	E,C,CO	I1U	
16	S	1	E,C	I9U	
17					
18		8	E,C,CO,D	J8U	
19	S	8	E,C,D	J7U	
20					
21		8	E,C,CO	J8L	
22	S	8	E,C	J7L	TRANSFER TO JBU
23					
24		2	E	I3L	
25		6	E	J3L	

LOOP DETECTOR WIRING DIAGRAM

SEE T.E.S. DWG. NO. 475 FOR LOOP DETECTOR DETAILS. CENTER ALL LOOPS IN TRAVEL LANES OR AS SHOWN.

C = CALL

E = EXTENSION

S = SERIES

CO = CARRY OVER

D = DELAY

FC: 081

Str. No. — T.R.S. Dwg No. 14923

ODOT Traffic – Roadway Section Approval

GROUP MACKENZIE

Civil Engineering · Structural Engineering · Transportation Planning · Landscape Architecture
Architecture · Interior Design · Land Use Planning

Portland OR 503.224.9560 · Vancouver WA 360.695.7879 · Seattle WA 206.749.9993

Issue	Date	Rev.
Permit Set	05/23/08	–

REGISTERED PROFESSIONAL ENGINEER #56660 Ralph J.R. Henderson OREGON JULY. 11, 2000 RALPH J.R. HENDERSON

EXPIRES: 6/30/09

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

OR99E: S PINE ST (CANBY)
INTERSECTION MEDIAN IMPROVEMENTS

PACIFIC HIGHWAY EAST
CLACKAMAS COUNTY

Designed By – Ralph Henderson
Drafted By – Megan Zupan

TRAFFIC DETECTION PLAN

SHEET NO. TS1

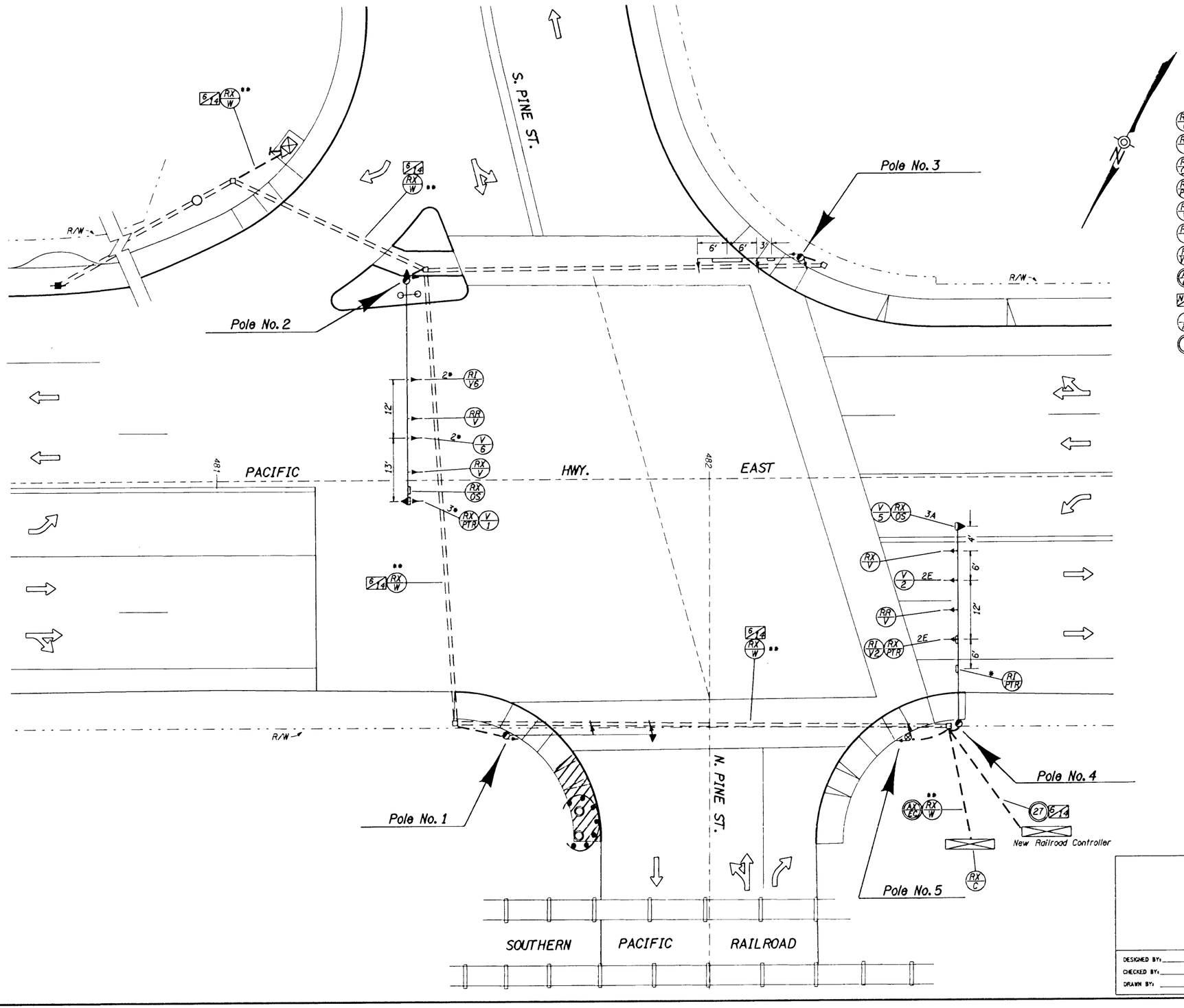
GRPMACK# 2070053

2070053DGN\TS1.DGN 06/17/08 10:46 11:40

11269

SIGNAL PLAN
PACIFIC HIGHWAY EAST AT PINE STREET
HWY. 1E, M.P. 20.6

SCALE 0 10 20 40 FEET



L E G E N D

- RX C — Remove existing controller
- RX V — Remove existing vehicle signal
- RX OS — Remove existing interior illuminated sign
- RX PTR — Remove existing part time restriction sign
- RX W — Remove existing wiring
- RR V — Remove and relocate existing vehicle signal
- RI V Ph — Reinstall existing phase (Ph) vehicle signal
- AX EC — Abandon existing electrical conduit
- N G — Install (N) No. (G) type THWN wires
- V Ph — Install phase (Ph) vehicle signal
- S — Install (S) inch electrical conduit

Ph = Phase shown
N = Number shown
G = AWG size shown
S = Size shown

A = Standard plumbizer
E = Elevator plumbizer
2 = 12"R, 12"Y, 12"G
3 = 12"RLTA, 12"YLTA, 12"GLTA

* Use Astro Bracket
** Remove existing 5/10 from old railroad controller

These Revisions to the As Constructed where designed & submitted by Kittleson & Assoc. Refer to TMS Dwg. #10648 for original As Constructed. If any questions contact Region 1 office.

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC MANAGEMENT SECTION

TRAFFIC SIGNAL INSTALLATION
PACIFIC HWY. EAST AT PINE ST. (CANBY) SEC.
PACIFIC HIGHWAY EAST
CLACKAMAS COUNTY

DESIGNED BY:
CHECKED BY:
DRAWN BY:

DATE December 1999

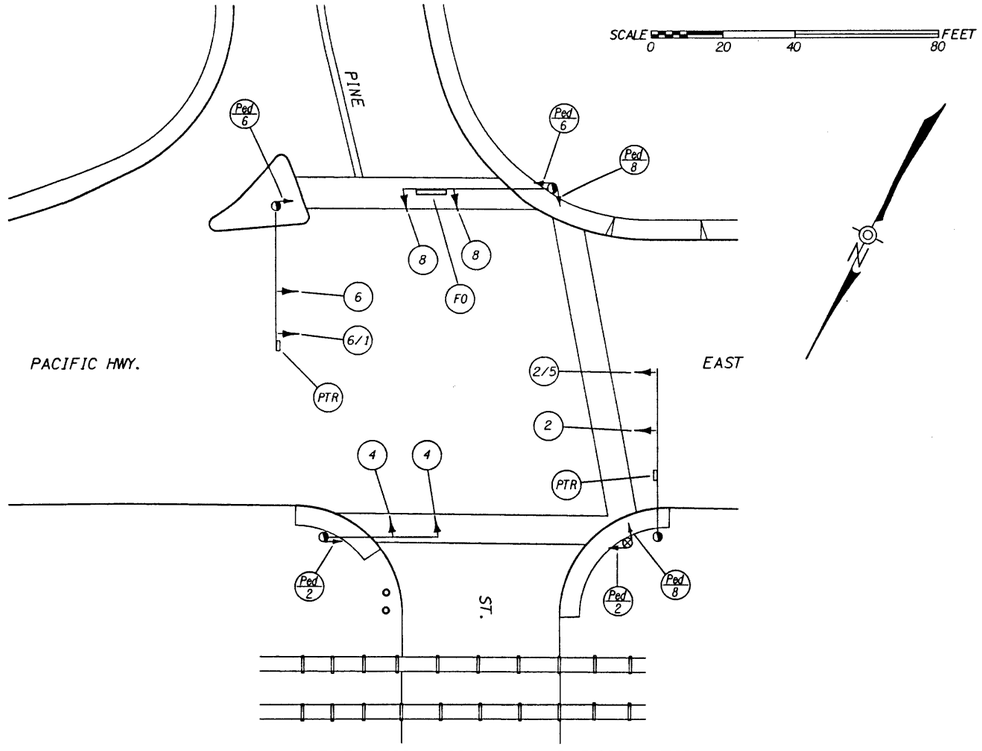
07109TR3.SG1

T.M.S. DRG. NO. 11262

VIEW-AZ

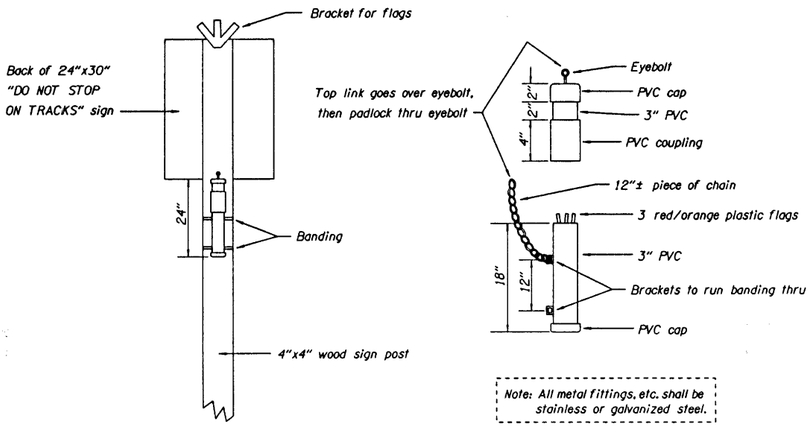
10651

RAILROAD PRE-EMPTION PLAN
PACIFIC HIGHWAY EAST AT PINE ST.
HWY. 1E M.P. 20.6



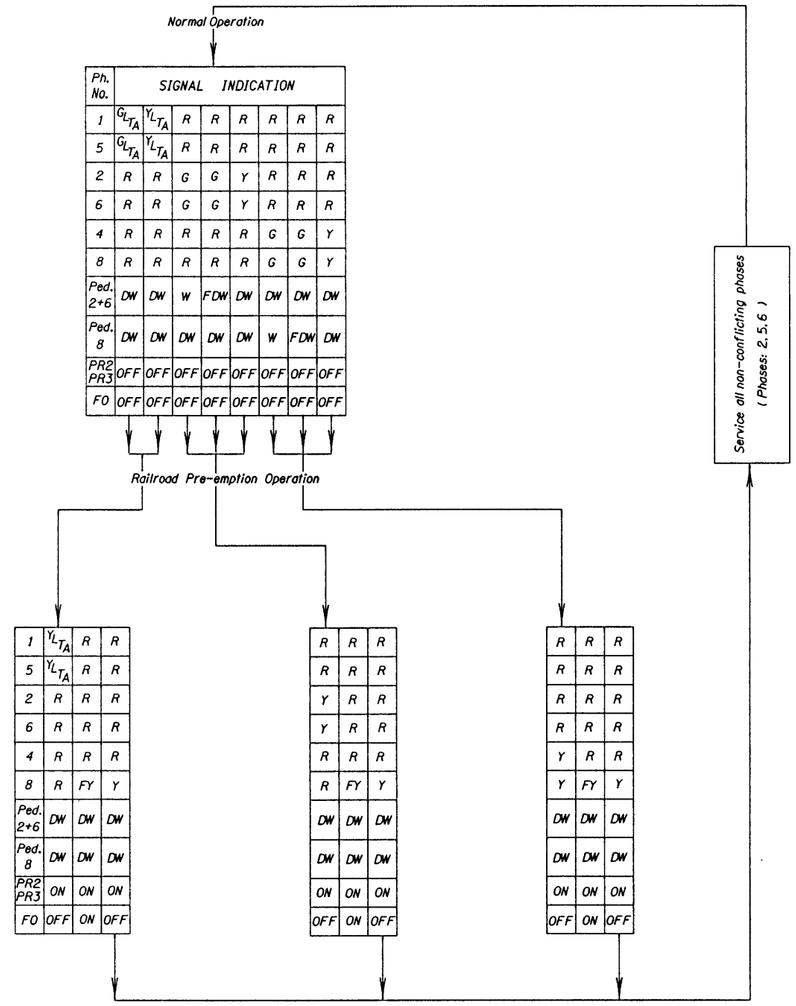
RAILROAD PRE-EMPTION SIGNAL HEAD DESIGNATION

PTR = Part Time Restriction Sign
FO = Fiberoptic Sign



Note: All metal fittings, etc. shall be stainless or galvanized steel.

FLAG CONTAINER DETAIL



Ph. No.	SIGNAL INDICATION							
1	$G_{L_{TA}}$	$Y_{L_{TA}}$	R	R	R	R	R	R
5	$G_{L_{TA}}$	$Y_{L_{TA}}$	R	R	R	R	R	R
2	R	R	G	G	Y	R	R	R
6	R	R	G	G	Y	R	R	R
4	R	R	R	R	R	G	G	Y
8	R	R	R	R	R	G	G	Y
Ped. 2+6	DW	DW	W	FDW	DW	DW	DW	DW
Ped. 8	DW	DW	DW	DW	DW	W	FDW	DW
PR2 PR3	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
FO	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

1	$Y_{L_{TA}}$	R	R
5	$Y_{L_{TA}}$	R	R
2	R	R	R
6	R	R	R
4	R	R	R
8	R	FY	Y
Ped. 2+6	DW	DW	DW
Ped. 8	DW	DW	DW
PR2 PR3	ON	ON	ON
FO	OFF	ON	OFF

R	R	R
R	R	R
Y	R	R
Y	R	R
R	R	R
R	FY	Y
DW	DW	DW
DW	DW	DW
ON	ON	ON
OFF	ON	OFF

R	R	R
R	R	R
R	R	R
R	R	R
Y	R	R
Y	FY	Y
DW	DW	DW
DW	DW	DW
ON	ON	ON
OFF	ON	OFF

RAILROAD PRE-EMPTION MATRIX

10/96 As Constructed (Contract No. 11576)

As constructed drawing signed by Earl Mershon, Project Manager

REGISTERED PROFESSIONAL ENGINEER 12,197 Original signed by KEITH R. RUDISIL JULY 15, 1985

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC MANAGEMENT SECTION

TRAFFIC SIGNAL INSTALLATION
PACIFIC HWY. EAST AT PINE ST. (CANBY) SEC.
PACIFIC HIGHWAY EAST
CLACKAMAS COUNTY

DESIGNED BY: T. Jenkins
CHECKED BY: P. Ward
DRAWN BY: T. Jenkins

DATE Aug. 1994

071091r3.sgl

T.M.S. DWG. NO. 10651

VIEW-HC

10649

DETECTOR PLAN
PACIFIC HIGHWAY EAST AT PINE STREET
HWY. 1E, M.P. 20.6

SCALE 0 20 40 FEET 80

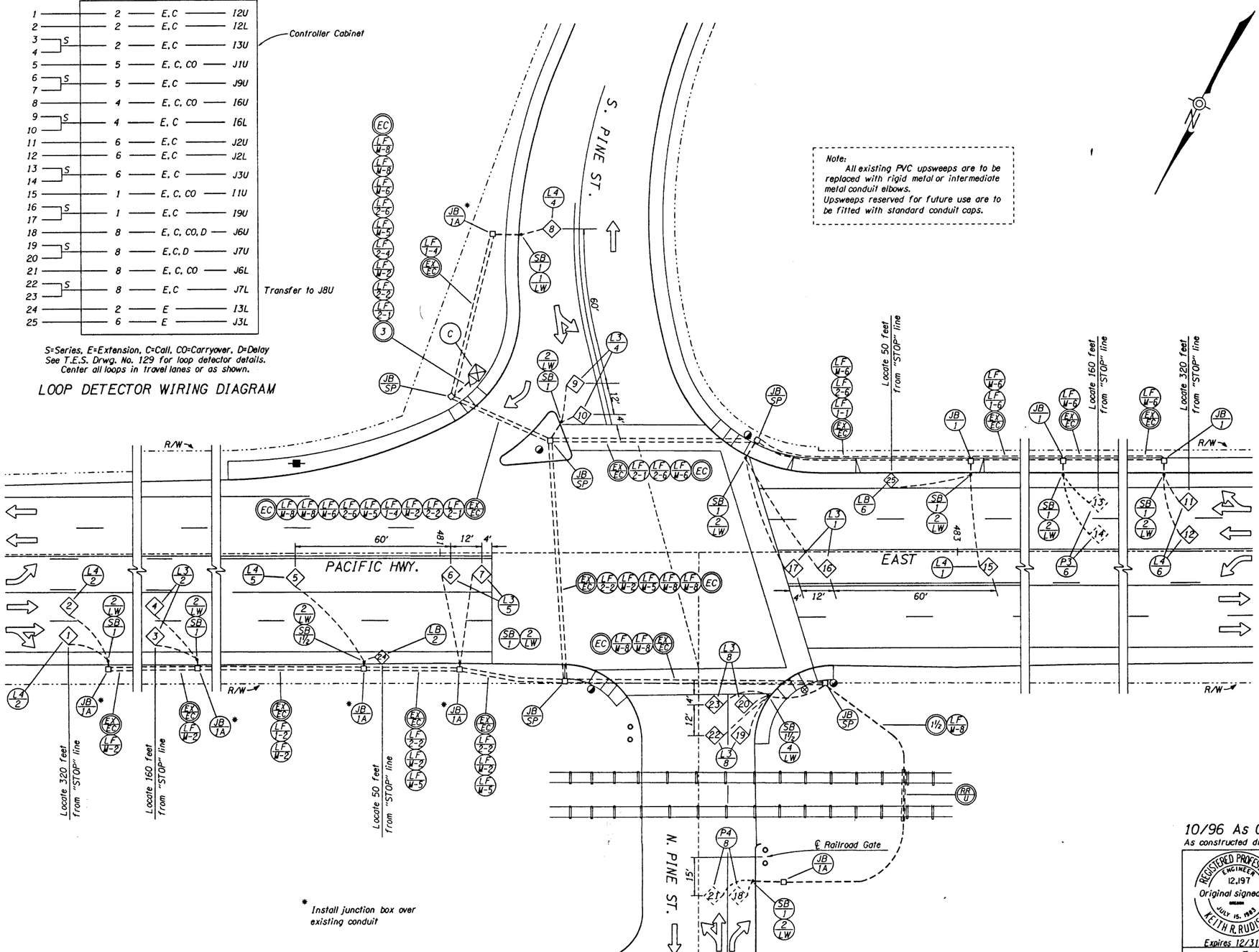
Loop No.	Phase	Function	Slot
1	2	E, C	12U
2	2	E, C	12L
3 S 4	2	E, C	13U
5	5	E, C, CO	J1U
6 S 7	5	E, C	J9U
8	4	E, C, CO	16U
9 S 10	4	E, C	16L
11	6	E, C	J2U
12	6	E, C	J2L
13 S 14	6	E, C	J3U
15	1	E, C, CO	11U
16 S 17	1	E, C	19U
18	8	E, C, CO, D	J6U
19 S 20	8	E, C, D	J7U
21	8	E, C, CO	J6L
22 S 23	8	E, C	J7L
24	2	E	13L
25	6	E	J3L

Controller Cabinet

Transfer to J8U

S=Series, E=Extension, C=Call, CO=Carryover, D=Delay
See T.E.S. Drwg. No. 129 for loop detector details.
Center all loops in travel lanes or as shown.

LOOP DETECTOR WIRING DIAGRAM



L E G E N D

- (EX/EC) Retain and protect existing electrical conduit
- (C) Controller (See Signal Plan)
- (JB/SP) Junction box (See Signal Plan)
- (JB/1) Install 17¼"x10½"x12" precast concrete junction box
- (JB/1A) Install 17"x10"x12"(min. dimension) precast concrete junction box with concrete apron
- (SB/S) Install 4"x4"x4" galv. cast iron street box with (S) inch conduit to junction box
- (L3/Ph) Install phase (Ph) 3ft. diamond vehicle detector loop
- (L4/Ph) Install phase (Ph) 4ft. diamond vehicle detector loop
- (LB/Ph) Install phase (Ph) 2½ft. diamond bicycle detector loop
- (P3/Ph) Install phase (Ph) 3ft. diamond preformed vehicle detector loop
- (P4/Ph) Install phase (Ph) 4ft. diamond preformed vehicle detector loop
- (LF/X-Ph) Install (X) phase (Ph) loop feeder cables
- (LF/N-Ph) Install one multiconductor phase (Ph) loop feeder cable (See Special Provisions)
- (N/LW) Install (N) pair of loop wires
- (S) Install (S) inch electrical conduit
- (EC) Electrical conduit (See Signal Plan)
- (RR/U) Install railroad undercrossing per Southern Pacific standards (3" galv. rigid conduit, 42" below tracks, and caution marker. Bore pit must be a minimum of 20' from centerline of track.)

Ph = Phase shown X = Number of cables shown
N = Number shown S = Size shown

10/96 As Constructed (Contract No. 11576)
As constructed drawing signed by Earl Mershon, Project Manager

REGISTERED PROFESSIONAL ENGINEER 12,197 OREGON Original signed by JULY 15, 1983 KEITH R. RUDISILL
Expires 12/31/94

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC MANAGEMENT SECTION

TRAFFIC SIGNAL INSTALLATION
PACIFIC HWY. EAST AT PINE ST. (CANBY) SEC.
PACIFIC HIGHWAY EAST
CLACKAMAS COUNTY

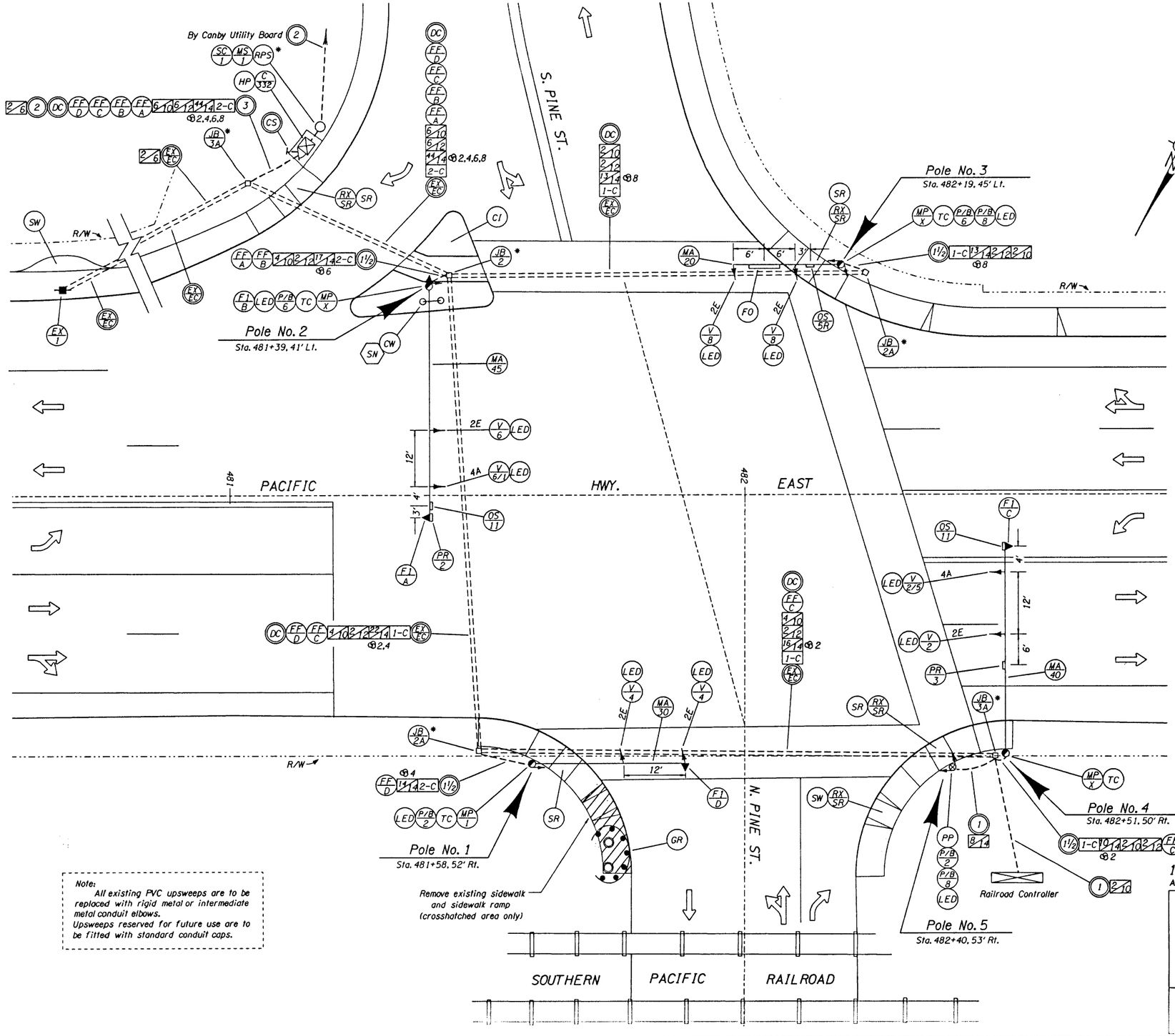
DESIGNED BY: T. Jenkins
CHECKED BY: P. Ward
DRAWN BY: T. Jenkins
DATE August 1994
07109TR3.SG1
T.M.S. DRG. NO. 10649

VIEW-BI

10648

SIGNAL PLAN
PACIFIC HIGHWAY EAST AT PINE STREET
HWY. 1E, M.P. 20.6

SCALE 0 10 20 FEET



* Install over existing conduit

Note:
All existing PVC upsweeps are to be replaced with rigid metal or intermediate metal conduit elbows.
Upsweeps reserved for future use are to be fitted with standard conduit caps.

Note:
Install LED retrofit kits in all vehicle signal red arrow and red ball sections and pedestrian orange wait sections. See Special Provisions for specifications.

10/96 As Constructed (Contract No. 11576)
As constructed drawing signed by Earl Mershon, Project Manager

REGISTERED PROFESSIONAL ENGINEER 12,197 Original signed by KEITH R. RUDISIL JULY 15, 1993 OREGON
Expires 12/31/94

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC MANAGEMENT SECTION

TRAFFIC SIGNAL INSTALLATION
PACIFIC HWY. EAST AT PINE ST. (CANBY) SEC.
PACIFIC HIGHWAY EAST
CLACKAMAS COUNTY

DESIGNED BY: T. Jenkins
CHECKED BY: P. Ward
DRAWN BY: T. Jenkins
DATE August 1994
07109TR3.SGI
T.N.S. ENG. No. 10648

VIEW - A2

10647

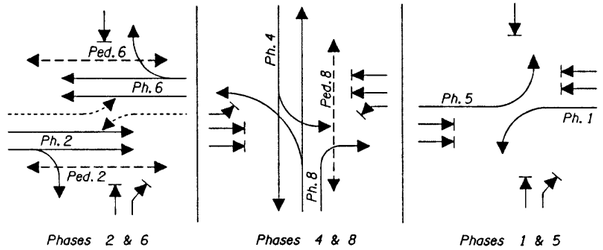
LEGEND AND DETAIL SHEET
PACIFIC HIGHWAY EAST AT PINE STREET
HWY. 1E, M.P. 20.6

L E G E N D

- (EX/I) Retain and protect existing power pole (Power source)
- (EX/EC) Retain and protect existing 2" electrical conduit
- (RX/SR) Remove existing sidewalk ramp
- (C/332) Install model 170 controller in model 332 cabinet with riser frame, orient front (louvered) door as shown
- (HP) Install hard-wired phone line
- (MP/T) Install type (T) standard traffic signal mast arm pole
- (MP/X) Install special (non-standard) traffic signal mast arm pole (See Special Provisions)
- (MA/L) Install (L) ft. traffic signal mast arm
- (PP) Install pedestrian signal pedestal with frangible base
- (V/Ph) Install phase (Ph) vehicle signal
- (P/B/Ph) Install phase (Ph) pedestrian signal, pushbutton and instruction decal
- (TC) Install terminal cabinet
- (RPS) Install remote power service post
- (SC/1) Install service cabinet, 120 volt, for signal system
- (MS/1) Install 120 volt meter base
- (JB/2) Install 22"x12"x12"(min. dimension) precast concrete junction box
- (JB/2A) Install 22"x12"x12"(min. dimension) precast concrete junction box with concrete apron
- (JB/3A) Install 30"x17"x12"(min. dimension) precast concrete junction box with concrete apron
- (OS/5R) Install interior illuminated right arrow "ONLY" sign (30"x36")
- (OS/11) Install interior illuminated "LEFT TURN YIELD ON GREEN ●" (30"x36")
- (FO) Install fiberoptic 72" x 36" sign. See Standard Specifications - Section 2920.61(c)
- (PR/2) Install "NO LEFT TURN" part time restriction sign
- (PR/3) Install "NO RIGHT TURN" part time restriction sign
- (N-C) Install (N) No. 8 type THWN (Signal system common)
- (N/G) Install (N) No. (G) type THWN wires
- (FN/Ch) Install channel(Ch), (N) barrel fire pre-emption detector unit
- (FF/Ch) Install channel (Ch) fire pre-emption detector feeder cable
- (DC) Detector conduit (See Detector Plan)
- (S) Install (S) inch electrical conduit
- (CS) Install 2 inch conduit (For telephone hook-up)
- (Ph) Includes 3 spare wires for phase (Ph) as per table
- (LED) Install LED retrofit kit(s)
- (CW) Install crosswalk barricade
- (SR) Construct sidewalk ramp. See detail this sheet
- (SW) Install concrete sidewalk and curb as directed by the Project Manager
- (CI) Install non-mountable curb (Type C), concrete island and sidewalk cut-through, as shown. See drawing Nos. 2104, 2077A, and detail on this sheet
- (SN) Install sign, see Signing Plan
- (GR) Install guardrail around railroad crossing gate

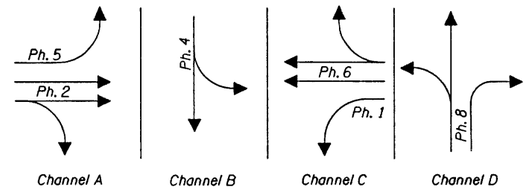
N = Number shown
S = Size shown
G = AWG size shown
T = Type shown
L = Length shown

A = Standard plumbizer
E = Elevator plumbizer
Ph = Phase shown
2 = 12"R, 12"Y, 12"G
4 = 12"R, 12"YLTA, 12"Y, 12"GLTA, 12"G
Ch = Channel shown



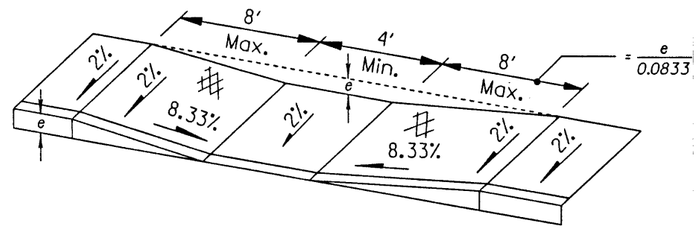
Phases 2 & 6 | Phases 4 & 8 | Phases 1 & 5

NORMAL PHASE ROTATION
(State supplied program)



Channel A | Channel B | Channel C | Channel D

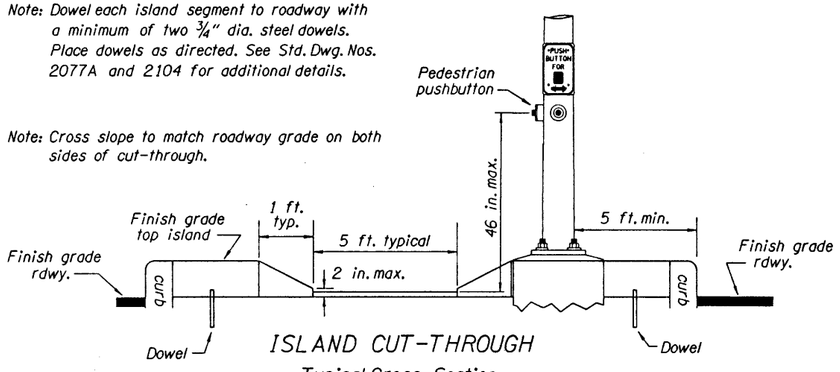
FIRE PRE-EMPTION OPERATION



SIDEWALK RAMP DETAIL (PARALLEL)
(Remove existing sidewalk as required)

Note: Dowel each island segment to roadway with a minimum of two ¾" dia. steel dowels. Place dowels as directed. See Std. Dwg. Nos. 2077A and 2104 for additional details.

Note: Cross slope to match roadway grade on both sides of cut-through.



ISLAND CUT-THROUGH
Typical Cross-Section

10/96 As Constructed (Contract No. 11576)
As constructed drawing signed by Earl Mershon, Project Manager

REGISTERED PROFESSIONAL ENGINEER
12,197
Original signed by
KEITH R. RUDISIL
JULY 15, 1983
Expires 12/31/94

DESIGNED BY: T. Jenkins
CHECKED BY: P. Ward
DRAWN BY: T. Jenkins

OREGON DEPARTMENT OF TRANSPORTATION
TRAFFIC MANAGEMENT SECTION

TRAFFIC SIGNAL INSTALLATION
PACIFIC HWY. EAST AT PINE ST. (CANBY) SEC.
PACIFIC HIGHWAY EAST
CLACKAMAS COUNTY

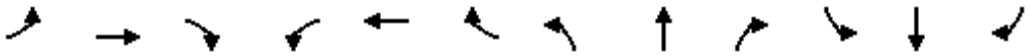
DATE: August 1994
ACCOMPANIED BY DWGS.: TS-120, TS-121, TS-123 thru TS-129, TS-132, TS-133, 2104, 2077A, 2077C, 2115, J0648, J0649, J0650, J0651

07109TR3.SG1

T.M.S. DWG. NO.: 10647

VIEW = AI

APPENDIX J
CAPACITY
CALCULATIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	673	67	38	723	49	185	118	39	56	64	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1568	3094		1568	3107		1599	1615		1599	1556	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1568	3094		1568	3107		1599	1615		1599	1556	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	47	765	76	43	822	56	210	134	44	64	73	74
RTOR Reduction (vph)	0	6	0	0	4	0	0	15	0	0	44	0
Lane Group Flow (vph)	47	835	0	43	874	0	210	163	0	64	103	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	6.6	44.1		5.2	42.7		18.2	16.8		12.4	11.0	
Effective Green, g (s)	6.1	43.6		4.7	42.2		17.7	16.3		11.9	10.5	
Actuated g/C Ratio	0.06	0.46		0.05	0.44		0.19	0.17		0.13	0.11	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	100	1419		77	1380		297	277		200	171	
v/s Ratio Prot	0.03	c0.27		0.03	c0.28		c0.13	c0.10		0.04	0.07	
v/s Ratio Perm												
v/c Ratio	0.47	0.59		0.56	0.63		0.71	0.59		0.32	0.60	
Uniform Delay, d1	42.9	19.1		44.1	20.4		36.2	36.3		37.9	40.2	
Progression Factor	1.00	1.00		0.81	0.71		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.8		5.8	2.1		6.6	2.4		0.5	4.3	
Delay (s)	44.9	19.9		41.7	16.6		42.9	38.7		38.4	44.5	
Level of Service	D	B		D	B		D	D		D	D	
Approach Delay (s)		21.2			17.8			40.9			42.7	
Approach LOS		C			B			D			D	

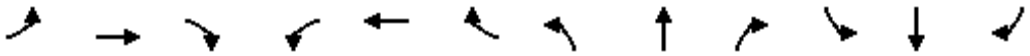
Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	818	0	0	836	0	1	0	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	940	0	0	961	0	1	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		916										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	961			940			1421	1901	470	1432	1901	480
vC1, stage 1 conf vol							940	940		961	961	
vC2, stage 2 conf vol							480	961		471	940	
vCu, unblocked vol	961			545			1118	1690	0	1132	1690	480
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	688			833			342	267	910	268	271	537

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	0	627	313	0	641	320	1	1	0
Volume Left	0	0	0	0	0	0	1	0	0
Volume Right	0	0	0	0	0	0	0	1	0
cSH	1700	1700	1700	1700	1700	1700	342	910	1700
Volume to Capacity	0.00	0.37	0.18	0.00	0.38	0.19	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.6	9.0	0.0
Lane LOS							C	A	A
Approach Delay (s)	0.0			0.0			12.3		0.0
Approach LOS							B		A

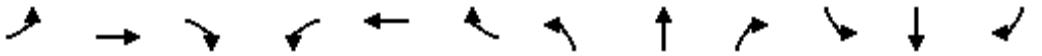
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	35.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	792	25	12	807	2	28	0	30	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	910	29	14	928	2	32	0	34	0	0	0
Pedestrians								5				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								1				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	930			944			1421	1887	475	1446	1900	465
vC1, stage 1 conf vol							930	930		956	956	
vC2, stage 2 conf vol							491	957		490	944	
vCu, unblocked vol	930			582			1143	1691	30	1172	1707	465
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	100	96	100	100	100
cM capacity (veh/h)	707			813			331	262	875	263	263	550

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	607	332	14	618	311	67	0
Volume Left	0	0	0	14	0	0	32	0
Volume Right	0	0	29	0	0	2	34	0
cSH	1700	1700	1700	813	1700	1700	488	1700
Volume to Capacity	0.00	0.36	0.20	0.02	0.36	0.18	0.14	0.00
Queue Length 95th (ft)	0	0	0	1	0	0	12	0
Control Delay (s)	0.0	0.0	0.0	9.5	0.0	0.0	13.5	0.0
Lane LOS				A			B	A
Approach Delay (s)	0.0			0.1			13.5	0.0
Approach LOS							B	A

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	35.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	726	83	40	675	44	74	47	72	33	63	76
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1568	3080		1583	3138			1587	1390		1687	1458
Flt Permitted	0.95	1.00		0.95	1.00			0.73	1.00		0.86	1.00
Satd. Flow (perm)	1568	3080		1583	3138			1189	1390		1468	1458
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)	31	798	91	44	742	48	81	52	79	36	69	84
RTOR Reduction (vph)	0	6	0	0	3	0	0	0	67	0	0	71
Lane Group Flow (vph)	31	883	0	44	787	0	0	133	12	0	105	13
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	7%	7%	7%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	6.9	62.4		5.3	59.9			14.8	14.8		14.8	14.8
Effective Green, g (s)	6.4	61.9		4.8	59.4			14.3	14.3		14.3	14.3
Actuated g/C Ratio	0.07	0.65		0.05	0.63			0.15	0.15		0.15	0.15
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	105	2006		79	1962			178	209		220	219
v/s Ratio Prot	0.02	c0.29		0.03	c0.25							
v/s Ratio Perm								c0.11	0.01		0.07	0.01
v/c Ratio	0.30	0.44		0.56	0.40			0.75	0.06		0.48	0.06
Uniform Delay, d1	42.2	8.1		44.1	8.9			38.6	34.6		36.9	34.6
Progression Factor	0.54	0.37		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.6		5.9	0.6			14.9	0.1		1.2	0.1
Delay (s)	23.5	3.6		50.0	9.5			53.5	34.7		38.1	34.7
Level of Service	C	A		D	A			D	C		D	C
Approach Delay (s)		4.3			11.7			46.5			36.6	
Approach LOS		A			B			D			D	

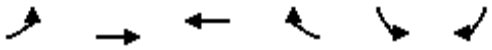
Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	31	331	100	10	160
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	29	36	389	118	12	188
Pedestrians	5		4			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked						
vC, conflicting volume	669	453			512	
vC1, stage 1 conf vol	453					
vC2, stage 2 conf vol	216					
vCu, unblocked vol	669	453			512	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	95	94			99	
cM capacity (veh/h)	568	586			1024	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	66	507	200
Volume Left	29	0	12
Volume Right	36	118	0
cSH	578	1700	1024
Volume to Capacity	0.11	0.30	0.01
Queue Length 95th (ft)	10	0	1
Control Delay (s)	12.0	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	12.0	0.0	0.6
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	23	35	0	0	0
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)	0	26	39	0	0	0
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	39				64	39
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39				64	39
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1503				941	1033

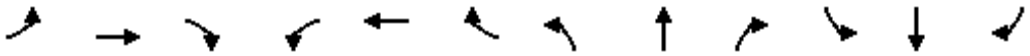
Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	26	39	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1503	1700	1700	1700
Volume to Capacity	0.00	0.02	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS			A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	0	9	3	5	2	15	42	1	6	17	15
Sign Control		Stop			Stop			Free			Free	
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)	16	0	10	3	6	2	17	47	1	7	19	17
Pedestrians		1			3			7			2	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	129	126	35	141	133	52	37			51		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	129	126	35	141	133	52	37			51		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	98	100	99	100	99	100	99			100		
cM capacity (veh/h)	799	731	1000	807	747	1016	1566			1484		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	26	11	64	42
Volume Left	16	3	17	7
Volume Right	10	2	1	17
cSH	867	808	1566	1484
Volume to Capacity	0.03	0.01	0.01	0.00
Queue Length 95th (ft)	2	1	1	0
Control Delay (s)	9.3	9.5	2.0	1.2
Lane LOS	A	A	A	A
Approach Delay (s)	9.3	9.5	2.0	1.2
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	19.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	674	67	38	723	69	185	128	39	71	74	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1568	3094		1568	3096		1599	1619		1599	1564	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1568	3094		1568	3096		1599	1619		1599	1564	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	47	766	76	43	822	78	210	145	44	81	84	74
RTOR Reduction (vph)	0	6	0	0	6	0	0	13	0	0	39	0
Lane Group Flow (vph)	47	836	0	43	894	0	210	176	0	81	119	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	6.6	43.5		5.2	42.1		18.0	17.5		12.3	11.8	
Effective Green, g (s)	6.1	43.0		4.7	41.6		17.5	17.0		11.8	11.3	
Actuated g/C Ratio	0.06	0.45		0.05	0.44		0.18	0.18		0.12	0.12	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	100	1400		77	1355		294	289		198	186	
v/s Ratio Prot	0.03	c0.27		0.03	c0.29		c0.13	c0.11		0.05	0.08	
v/s Ratio Perm												
v/c Ratio	0.47	0.60		0.56	0.66		0.71	0.61		0.41	0.64	
Uniform Delay, d1	42.9	19.5		44.1	21.1		36.4	35.9		38.4	39.9	
Progression Factor	1.00	1.00		0.83	0.71		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.9		5.8	2.4		7.2	2.8		0.8	6.1	
Delay (s)	44.9	20.4		42.3	17.4		43.6	38.8		39.2	46.0	
Level of Service	D	C		D	B		D	D		D	D	
Approach Delay (s)		21.7			18.6			41.3			43.7	
Approach LOS		C			B			D			D	

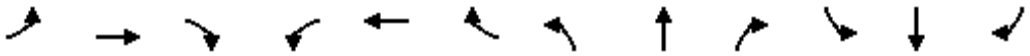
Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	835	0	0	856	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	960	0	0	984	0	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		916										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	984			960			1452	1944	480	1464	1944	492
vC1, stage 1 conf vol							960	960		984	984	
vC2, stage 2 conf vol							492	984		480	960	
vCu, unblocked vol	984			560			1149	1737	0	1163	1737	492
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	674			819			334	260	907	260	264	528

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	0	640	320	0	656	328	0	0	0
Volume Left	0	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.38	0.19	0.00	0.39	0.19	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							A	A	A
Approach Delay (s)	0.0			0.0			0.0		0.0
Approach LOS							A		A

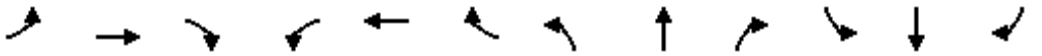
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	808	25	12	827	2	28	0	30	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	929	29	14	951	2	32	0	34	0	0	0
Pedestrians								5				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								1				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	953			962			1451	1929	484	1478	1942	476
vC1, stage 1 conf vol							948	948		979	979	
vC2, stage 2 conf vol							503	980		499	962	
vCu, unblocked vol	953			595			1172	1736	30	1204	1751	476
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			90	100	96	100	100	100
cM capacity (veh/h)	693			800			324	256	871	255	256	540

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	619	338	14	634	319	67	0
Volume Left	0	0	0	14	0	0	32	0
Volume Right	0	0	29	0	0	2	34	0
cSH	1700	1700	1700	800	1700	1700	480	1700
Volume to Capacity	0.00	0.36	0.20	0.02	0.37	0.19	0.14	0.00
Queue Length 95th (ft)	0	0	0	1	0	0	12	0
Control Delay (s)	0.0	0.0	0.0	9.6	0.0	0.0	13.7	0.0
Lane LOS				A			B	A
Approach Delay (s)	0.0			0.1			13.7	0.0
Approach LOS							B	A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	741	84	42	695	44	74	47	73	33	63	76
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1568	3080		1583	3139			1587	1390		1687	1458
Flt Permitted	0.95	1.00		0.95	1.00			0.73	1.00		0.86	1.00
Satd. Flow (perm)	1568	3080		1583	3139			1189	1390		1468	1458
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)	31	814	92	46	764	48	81	52	80	36	69	84
RTOR Reduction (vph)	0	5	0	0	3	0	0	0	68	0	0	71
Lane Group Flow (vph)	31	901	0	46	809	0	0	133	12	0	105	13
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	7%	7%	7%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	6.9	62.4		5.3	59.9			14.8	14.8		14.8	14.8
Effective Green, g (s)	6.4	61.9		4.8	59.4			14.3	14.3		14.3	14.3
Actuated g/C Ratio	0.07	0.65		0.05	0.63			0.15	0.15		0.15	0.15
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	105	2006		79	1962			178	209		220	219
v/s Ratio Prot	0.02	c0.29		0.03	c0.26							
v/s Ratio Perm								c0.11	0.01		0.07	0.01
v/c Ratio	0.30	0.45		0.58	0.41			0.75	0.06		0.48	0.06
Uniform Delay, d1	42.2	8.2		44.1	9.0			38.6	34.6		36.9	34.6
Progression Factor	0.55	0.36		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.6		8.0	0.6			14.9	0.1		1.2	0.1
Delay (s)	24.0	3.6		52.1	9.6			53.5	34.7		38.1	34.7
Level of Service	C	A		D	A			D	C		D	C
Approach Delay (s)		4.3			11.9			46.4			36.6	
Approach LOS		A			B			D			D	

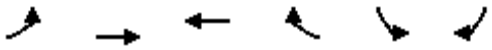
Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	25	31	341	100	10	170
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	29	36	401	118	12	200
Pedestrians	5		4			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked						
vC, conflicting volume	693	465			524	
vC1, stage 1 conf vol	465					
vC2, stage 2 conf vol	228					
vCu, unblocked vol	693	465			524	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	95	94			99	
cM capacity (veh/h)	559	577			1014	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	66	519	212
Volume Left	29	0	12
Volume Right	36	118	0
cSH	569	1700	1014
Volume to Capacity	0.12	0.31	0.01
Queue Length 95th (ft)	10	0	1
Control Delay (s)	12.2	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	12.2	0.0	0.6
Approach LOS	B		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	23	35	0	0	0
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)	0	26	39	0	0	0
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	39				64	39
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39				64	39
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1503				941	1033

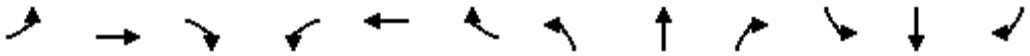
Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	26	39	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1503	1700	1700	1700
Volume to Capacity	0.00	0.02	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS			A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	0	9	3	5	2	15	42	1	6	17	15
Sign Control		Stop			Stop			Free			Free	
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)	16	0	10	3	6	2	17	47	1	7	19	17
Pedestrians		1			3			7			2	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	129	126	35	141	133	52	37			51		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	129	126	35	141	133	52	37			51		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	98	100	99	100	99	100	99			100		
cM capacity (veh/h)	799	731	1000	807	747	1016	1566			1484		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	26	11	64	42
Volume Left	16	3	17	7
Volume Right	10	2	1	17
cSH	867	808	1566	1484
Volume to Capacity	0.03	0.01	0.01	0.00
Queue Length 95th (ft)	2	1	1	0
Control Delay (s)	9.3	9.5	2.0	1.2
Lane LOS	A	A	A	A
Approach Delay (s)	9.3	9.5	2.0	1.2
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	19.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	690	67	38	738	77	185	128	39	79	74	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1568	3095		1568	3092		1599	1619		1599	1564	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1568	3095		1568	3092		1599	1619		1599	1564	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	47	784	76	43	839	88	210	145	44	90	84	74
RTOR Reduction (vph)	0	6	0	0	7	0	0	13	0	0	39	0
Lane Group Flow (vph)	47	854	0	43	920	0	210	176	0	90	119	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	6.6	43.5		5.2	42.1		18.0	17.5		12.3	11.8	
Effective Green, g (s)	6.1	43.0		4.7	41.6		17.5	17.0		11.8	11.3	
Actuated g/C Ratio	0.06	0.45		0.05	0.44		0.18	0.18		0.12	0.12	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	100	1400		77	1353		294	289		198	186	
v/s Ratio Prot	0.03	c0.28		0.03	c0.30		c0.13	c0.11		0.06	0.08	
v/s Ratio Perm												
v/c Ratio	0.47	0.61		0.56	0.68		0.71	0.61		0.45	0.64	
Uniform Delay, d1	42.9	19.7		44.1	21.4		36.4	35.9		38.6	39.9	
Progression Factor	1.00	1.00		0.88	0.71		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.0		5.8	2.7		7.2	2.8		1.0	6.1	
Delay (s)	44.9	20.6		44.5	17.8		43.6	38.8		39.6	46.0	
Level of Service	D	C		D	B		D	D		D	D	
Approach Delay (s)		21.9			19.0			41.3			43.7	
Approach LOS		C			B			D			D	

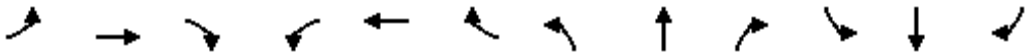
Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	824	35	23	848	0	31	0	23	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	947	40	26	975	0	36	0	26	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		916										
pX, platoon unblocked				0.83			0.83	0.83	0.83	0.83	0.83	
vC, conflicting volume	975			987			1507	1995	494	1528	2015	487
vC1, stage 1 conf vol							967	967		1028	1028	
vC2, stage 2 conf vol							540	1028		500	987	
vCu, unblocked vol	975			573			1201	1788	0	1225	1812	487
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			89	100	97	100	100	100
cM capacity (veh/h)	679			803			320	246	899	236	242	532

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	0	631	356	26	650	325	36	26	0
Volume Left	0	0	0	26	0	0	36	0	0
Volume Right	0	0	40	0	0	0	0	26	0
cSH	1700	1700	1700	803	1700	1700	320	899	1700
Volume to Capacity	0.00	0.37	0.21	0.03	0.38	0.19	0.11	0.03	0.00
Queue Length 95th (ft)	0	0	0	3	0	0	9	2	0
Control Delay (s)	0.0	0.0	0.0	9.6	0.0	0.0	17.6	9.1	0.0
Lane LOS				A			C	A	A
Approach Delay (s)	0.0			0.3			14.0		0.0
Approach LOS							B		A

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	36.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	820	25	15	839	2	31	0	33	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	943	29	17	964	2	36	0	38	0	0	0
Pedestrians								5				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								1				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	967			976			1479	1963	491	1509	1976	483
vC1, stage 1 conf vol							962	962		1000	1000	
vC2, stage 2 conf vol							517	1001		509	976	
vCu, unblocked vol	967			623			1213	1782	52	1249	1797	483
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			89	100	96	100	100	100
cM capacity (veh/h)	684			785			313	248	848	246	248	535

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	628	343	17	643	324	74	0
Volume Left	0	0	0	17	0	0	36	0
Volume Right	0	0	29	0	0	2	38	0
cSH	1700	1700	1700	785	1700	1700	464	1700
Volume to Capacity	0.00	0.37	0.20	0.02	0.38	0.19	0.16	0.00
Queue Length 95th (ft)	0	0	0	2	0	0	14	0
Control Delay (s)	0.0	0.0	0.0	9.7	0.0	0.0	14.2	0.0
Lane LOS				A			B	A
Approach Delay (s)	0.0			0.2			14.2	0.0
Approach LOS							B	A

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	37.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	751	87	42	705	44	76	47	73	33	63	79
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1568	3079		1583	3139			1587	1390		1687	1458
Flt Permitted	0.95	1.00		0.95	1.00			0.73	1.00		0.86	1.00
Satd. Flow (perm)	1568	3079		1583	3139			1187	1390		1468	1458
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)	33	825	96	46	775	48	84	52	80	36	69	87
RTOR Reduction (vph)	0	6	0	0	3	0	0	0	68	0	0	74
Lane Group Flow (vph)	33	915	0	46	820	0	0	136	12	0	105	13
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	7%	7%	7%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.2	62.1		5.3	59.3			15.1	15.1		15.1	15.1
Effective Green, g (s)	6.7	61.6		4.8	58.8			14.6	14.6		14.6	14.6
Actuated g/C Ratio	0.07	0.65		0.05	0.62			0.15	0.15		0.15	0.15
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	110	1996		79	1942			182	213		225	224
v/s Ratio Prot	0.02	c0.30		0.03	c0.26							
v/s Ratio Perm								c0.11	0.01		0.07	0.01
v/c Ratio	0.30	0.46		0.58	0.42			0.75	0.06		0.47	0.06
Uniform Delay, d1	41.9	8.4		44.1	9.3			38.4	34.3		36.7	34.3
Progression Factor	0.58	0.38		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.7		8.0	0.7			14.6	0.1		1.1	0.1
Delay (s)	25.2	3.8		52.1	10.0			53.0	34.4		37.8	34.4
Level of Service	C	A		D	B			D	C		D	C
Approach Delay (s)		4.6			12.2			46.1			36.2	
Approach LOS		A			B			D			D	

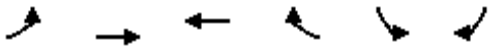
Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	31	341	110	10	170
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	41	36	401	129	12	200
Pedestrians	5		4			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked						
vC, conflicting volume	698	471			536	
vC1, stage 1 conf vol	471					
vC2, stage 2 conf vol	228					
vCu, unblocked vol	698	471			536	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	93	94			99	
cM capacity (veh/h)	556	572			1003	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	78	531	212
Volume Left	41	0	12
Volume Right	36	129	0
cSH	564	1700	1003
Volume to Capacity	0.14	0.31	0.01
Queue Length 95th (ft)	12	0	1
Control Delay (s)	12.4	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	12.4	0.0	0.6
Approach LOS	B		

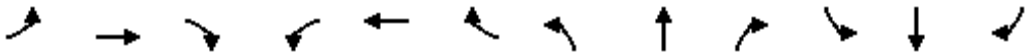
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	23	35	6	8	10
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)	11	26	39	7	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	46				90	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46				90	42
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1494				904	1028

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	37	46	9	11
Volume Left	11	0	9	0
Volume Right	0	7	0	11
cSH	1494	1700	904	1028
Volume to Capacity	0.01	0.03	0.01	0.01
Queue Length 95th (ft)	1	0	1	1
Control Delay (s)	2.3	0.0	9.0	8.5
Lane LOS	A		A	A
Approach Delay (s)	2.3	0.0	8.8	
Approach LOS			A	

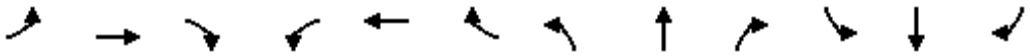
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	0	11	3	5	2	18	42	1	6	17	18
Sign Control		Stop			Stop			Free			Free	
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)	22	0	12	3	6	2	20	47	1	7	19	20
Pedestrians		1			3			7			2	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	137	134	37	152	143	52	40			51		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	137	134	37	152	143	52	40			51		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	97	100	99	100	99	100	99			100		
cM capacity (veh/h)	787	722	998	791	736	1016	1562			1484		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	34	11	68	46
Volume Left	22	3	20	7
Volume Right	12	2	1	20
cSH	851	797	1562	1484
Volume to Capacity	0.04	0.01	0.01	0.00
Queue Length 95th (ft)	3	1	1	0
Control Delay (s)	9.4	9.6	2.2	1.1
Lane LOS	A	A	A	A
Approach Delay (s)	9.4	9.6	2.2	1.1
Approach LOS	A	A		

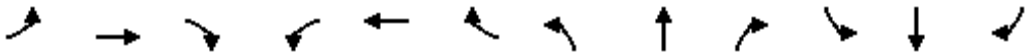
Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	20.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	690	67	38	731	73	192	132	39	79	74	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1568	3095		1568	3094		1599	1621		1599	1564	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1568	3095		1568	3094		1599	1621		1599	1564	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	47	784	76	43	831	83	218	150	44	90	84	74
RTOR Reduction (vph)	0	6	0	0	6	0	0	13	0	0	39	0
Lane Group Flow (vph)	47	854	0	43	908	0	218	181	0	90	119	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	6.6	43.0		5.2	41.6		18.5	17.8		12.5	11.8	
Effective Green, g (s)	6.1	42.5		4.7	41.1		18.0	17.3		12.0	11.3	
Actuated g/C Ratio	0.06	0.45		0.05	0.43		0.19	0.18		0.13	0.12	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	100	1384		77	1338		302	295		201	186	
v/s Ratio Prot	0.03	c0.28		0.03	c0.29		c0.14	c0.11		0.06	0.08	
v/s Ratio Perm												
v/c Ratio	0.47	0.62		0.56	0.68		0.72	0.61		0.45	0.64	
Uniform Delay, d1	42.9	20.0		44.1	21.6		36.1	35.8		38.4	39.9	
Progression Factor	1.00	1.00		0.87	0.71		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.0		5.8	2.7		7.5	3.0		0.9	6.1	
Delay (s)	44.9	21.1		44.1	18.1		43.6	38.8		39.4	46.0	
Level of Service	D	C		D	B		D	D		D	D	
Approach Delay (s)		22.3			19.2			41.3			43.6	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

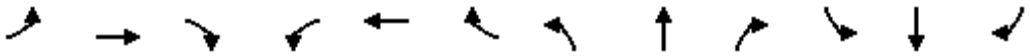
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	824	35	0	868	0	0	0	23	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	947	40	0	998	0	0	0	26	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		916										
pX, platoon unblocked				0.83			0.83	0.83	0.83	0.83	0.83	
vC, conflicting volume	998			987			1466	1965	494	1498	1985	499
vC1, stage 1 conf vol							967	967		998	998	
vC2, stage 2 conf vol							499	998		500	987	
vCu, unblocked vol	998			567			1146	1749	0	1184	1773	499
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	97	100	100	100
cM capacity (veh/h)	666			806			335	258	897	254	259	522

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	631	356	665	333	26	0
Volume Left	0	0	0	0	0	0
Volume Right	0	40	0	0	26	0
cSH	1700	1700	1700	1700	897	1700
Volume to Capacity	0.37	0.21	0.39	0.20	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	2	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.1	0.0
Lane LOS					A	A
Approach Delay (s)	0.0		0.0		9.1	0.0
Approach LOS					A	A

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	820	25	38	816	2	51	0	33	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	943	29	44	938	2	59	0	38	0	0	0
Pedestrians								5				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	940			976			1518	1989	491	1536	2003	470
vC1, stage 1 conf vol							962	962		1026	1026	
vC2, stage 2 conf vol							556	1028		509	976	
vCu, unblocked vol	940			617			1255	1810	45	1275	1825	470
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			81	100	96	100	100	100
cM capacity (veh/h)	701			787			302	237	855	229	232	545

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	628	343	44	625	315	97	0
Volume Left	0	0	0	44	0	0	59	0
Volume Right	0	0	29	0	0	2	38	0
cSH	1700	1700	1700	787	1700	1700	404	1700
Volume to Capacity	0.00	0.37	0.20	0.06	0.37	0.19	0.24	0.00
Queue Length 95th (ft)	0	0	0	4	0	0	23	0
Control Delay (s)	0.0	0.0	0.0	9.8	0.0	0.0	16.7	0.0
Lane LOS				A			C	A
Approach Delay (s)	0.0			0.4			16.7	0.0
Approach LOS							C	A

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	45.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	751	87	42	705	44	76	47	73	33	63	79
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1568	3079		1583	3139			1587	1390		1687	1458
Flt Permitted	0.95	1.00		0.95	1.00			0.73	1.00		0.86	1.00
Satd. Flow (perm)	1568	3079		1583	3139			1187	1390		1468	1458
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)	33	825	96	46	775	48	84	52	80	36	69	87
RTOR Reduction (vph)	0	6	0	0	3	0	0	0	68	0	0	74
Lane Group Flow (vph)	33	915	0	46	820	0	0	136	12	0	105	13
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	7%	7%	7%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.2	62.1		5.3	59.3			15.1	15.1		15.1	15.1
Effective Green, g (s)	6.7	61.6		4.8	58.8			14.6	14.6		14.6	14.6
Actuated g/C Ratio	0.07	0.65		0.05	0.62			0.15	0.15		0.15	0.15
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	110	1996		79	1942			182	213		225	224
v/s Ratio Prot	0.02	c0.30		0.03	c0.26							
v/s Ratio Perm								c0.11	0.01		0.07	0.01
v/c Ratio	0.30	0.46		0.58	0.42			0.75	0.06		0.47	0.06
Uniform Delay, d1	41.9	8.4		44.1	9.3			38.4	34.3		36.7	34.3
Progression Factor	0.57	0.37		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.7		8.0	0.7			14.6	0.1		1.1	0.1
Delay (s)	24.7	3.8		52.1	10.0			53.0	34.4		37.8	34.4
Level of Service	C	A		D	B			D	C		D	C
Approach Delay (s)		4.5			12.2			46.1			36.2	
Approach LOS		A			B			D			D	

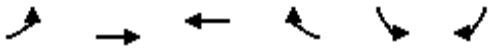
Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	42	341	110	10	170
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	41	49	401	129	12	200
Pedestrians	5		4			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked						
vC, conflicting volume	698	471			536	
vC1, stage 1 conf vol	471					
vC2, stage 2 conf vol	228					
vCu, unblocked vol	698	471			536	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	93	91			99	
cM capacity (veh/h)	556	572			1003	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	91	531	212
Volume Left	41	0	12
Volume Right	49	129	0
cSH	565	1700	1003
Volume to Capacity	0.16	0.31	0.01
Queue Length 95th (ft)	14	0	1
Control Delay (s)	12.6	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	12.6	0.0	0.6
Approach LOS	B		

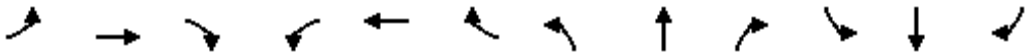
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	23	35	29	28	21
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)	11	26	39	32	31	23
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	71				103	55
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	71				103	55
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				96	98
cM capacity (veh/h)	1462				889	1012

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	37	71	31	23
Volume Left	11	0	31	0
Volume Right	0	32	0	23
cSH	1462	1700	889	1012
Volume to Capacity	0.01	0.04	0.04	0.02
Queue Length 95th (ft)	1	0	3	2
Control Delay (s)	2.3	0.0	9.2	8.6
Lane LOS	A		A	A
Approach Delay (s)	2.3	0.0	9.0	
Approach LOS			A	

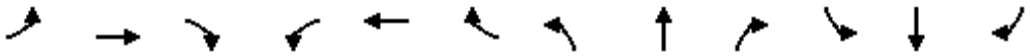
Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	0	11	3	5	2	18	42	1	6	17	41
Sign Control		Stop			Stop			Free			Free	
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)	44	0	12	3	6	2	20	47	1	7	19	46
Pedestrians		1			3			7			2	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	150	147	50	164	169	52	65			51		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150	147	50	164	169	52	65			51		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	94	100	99	100	99	100	99			100		
cM capacity (veh/h)	772	710	982	776	712	1016	1529			1484		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	57	11	68	71
Volume Left	44	3	20	7
Volume Right	12	2	1	46
cSH	809	778	1529	1484
Volume to Capacity	0.07	0.01	0.01	0.00
Queue Length 95th (ft)	6	1	1	0
Control Delay (s)	9.8	9.7	2.2	0.7
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.7	2.2	0.7
Approach LOS	A	A		

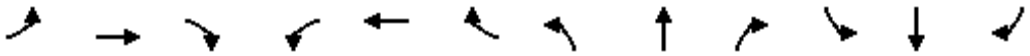
Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	690	67	38	731	73	192	132	39	79	74	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1568	3095		1568	3094		1599	1621		1599	1564	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1568	3095		1568	3094		1599	1621		1599	1564	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	47	784	76	43	831	83	218	150	44	90	84	74
RTOR Reduction (vph)	0	6	0	0	6	0	0	13	0	0	39	0
Lane Group Flow (vph)	47	854	0	43	908	0	218	181	0	90	119	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	6.6	43.0		5.2	41.6		18.5	17.8		12.5	11.8	
Effective Green, g (s)	6.1	42.5		4.7	41.1		18.0	17.3		12.0	11.3	
Actuated g/C Ratio	0.06	0.45		0.05	0.43		0.19	0.18		0.13	0.12	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	100	1384		77	1338		302	295		201	186	
v/s Ratio Prot	0.03	c0.28		0.03	c0.29		c0.14	c0.11		0.06	0.08	
v/s Ratio Perm												
v/c Ratio	0.47	0.62		0.56	0.68		0.72	0.61		0.45	0.64	
Uniform Delay, d1	42.9	20.0		44.1	21.6		36.1	35.8		38.4	39.9	
Progression Factor	1.00	1.00		0.87	0.71		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.0		5.8	2.7		7.5	3.0		0.9	6.1	
Delay (s)	44.9	21.1		44.1	18.1		43.6	38.8		39.4	46.0	
Level of Service	D	C		D	B		D	D		D	D	
Approach Delay (s)		22.3			19.2			41.3			43.6	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

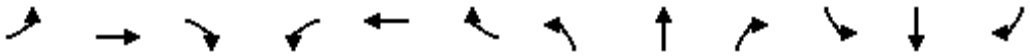
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	859	0	0	868	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	987	0	0	998	0	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		916										
pX, platoon unblocked				0.83			0.83	0.83	0.83	0.83	0.83	
vC, conflicting volume	998			987			1486	1985	494	1491	1985	499
vC1, stage 1 conf vol							987	987		998	998	
vC2, stage 2 conf vol							499	998		494	987	
vCu, unblocked vol	998			567			1170	1773	0	1177	1773	499
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	666			806			327	255	897	255	259	522

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	494	494	665	333	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.29	0.29	0.39	0.20	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	29.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	797	60	38	816	2	51	0	56	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	916	69	44	938	2	59	0	64	0	0	0
Pedestrians								5				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	940			990			1512	1983	498	1549	2016	470
vC1, stage 1 conf vol							956	956		1026	1026	
vC2, stage 2 conf vol							556	1028		522	990	
vCu, unblocked vol	940			601			1224	1787	14	1268	1826	470
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.3			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			81	100	93	100	100	100
cM capacity (veh/h)	701			787			310	240	883	229	232	545

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	611	374	44	625	315	123	0
Volume Left	0	0	0	44	0	0	59	0
Volume Right	0	0	69	0	0	2	64	0
cSH	1700	1700	1700	787	1700	1700	469	1700
Volume to Capacity	0.00	0.36	0.22	0.06	0.37	0.19	0.26	0.00
Queue Length 95th (ft)	0	0	0	4	0	0	26	0
Control Delay (s)	0.0	0.0	0.0	9.8	0.0	0.0	15.4	0.0
Lane LOS				A			C	A
Approach Delay (s)	0.0			0.4			15.4	0.0
Approach LOS							C	A

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	47.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	751	87	42	705	44	76	47	73	33	63	79
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.98	1.00
Satd. Flow (prot)	1568	3079		1583	3139			1587	1390		1687	1458
Flt Permitted	0.95	1.00		0.95	1.00			0.73	1.00		0.86	1.00
Satd. Flow (perm)	1568	3079		1583	3139			1187	1390		1468	1458
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)	33	825	96	46	775	48	84	52	80	36	69	87
RTOR Reduction (vph)	0	6	0	0	3	0	0	0	68	0	0	74
Lane Group Flow (vph)	33	915	0	46	820	0	0	136	12	0	105	13
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	7%	7%	7%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	7.2	62.1		5.3	59.3			15.1	15.1		15.1	15.1
Effective Green, g (s)	6.7	61.6		4.8	58.8			14.6	14.6		14.6	14.6
Actuated g/C Ratio	0.07	0.65		0.05	0.62			0.15	0.15		0.15	0.15
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	110	1996		79	1942			182	213		225	224
v/s Ratio Prot	0.02	c0.30		0.03	c0.26							
v/s Ratio Perm								c0.11	0.01		0.07	0.01
v/c Ratio	0.30	0.46		0.58	0.42			0.75	0.06		0.47	0.06
Uniform Delay, d1	41.9	8.4		44.1	9.3			38.4	34.3		36.7	34.3
Progression Factor	0.57	0.37		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.7		8.0	0.7			14.6	0.1		1.1	0.1
Delay (s)	24.8	3.8		52.1	10.0			53.0	34.4		37.8	34.4
Level of Service	C	A		D	B			D	C		D	C
Approach Delay (s)		4.5			12.2			46.1			36.2	
Approach LOS		A			B			D			D	

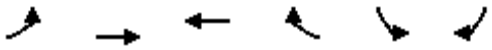
Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	35	42	341	110	10	170
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	41	49	401	129	12	200
Pedestrians	5		4			
Lane Width (ft)	12.0		12.0			
Walking Speed (ft/s)	4.0		4.0			
Percent Blockage	0		0			
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked						
vC, conflicting volume	698	471			536	
vC1, stage 1 conf vol	471					
vC2, stage 2 conf vol	228					
vCu, unblocked vol	698	471			536	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	93	91			99	
cM capacity (veh/h)	556	572			1003	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	91	531	212
Volume Left	41	0	12
Volume Right	49	129	0
cSH	565	1700	1003
Volume to Capacity	0.16	0.31	0.01
Queue Length 95th (ft)	14	0	1
Control Delay (s)	12.6	0.0	0.6
Lane LOS	B		A
Approach Delay (s)	12.6	0.0	0.6
Approach LOS	B		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	23	35	64	51	21
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)	11	26	39	71	57	23
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	110				122	74
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	110				122	74
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				93	98
cM capacity (veh/h)	1414				866	987

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	37	110	57	23
Volume Left	11	0	57	0
Volume Right	0	71	0	23
cSH	1414	1700	866	987
Volume to Capacity	0.01	0.06	0.07	0.02
Queue Length 95th (ft)	1	0	5	2
Control Delay (s)	2.3	0.0	9.4	8.7
Lane LOS	A		A	A
Approach Delay (s)	2.3	0.0	9.2	
Approach LOS			A	

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	63	0	11	3	5	2	18	42	1	6	17	76
Sign Control		Stop			Stop			Free			Free	
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)	70	0	12	3	6	2	20	47	1	7	19	84
Pedestrians		1			3			7			2	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	170	166	69	184	208	52	104			51		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	170	166	69	184	208	52	104			51		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	91	100	99	100	99	100	99			100		
cM capacity (veh/h)	749	692	958	753	678	1016	1480			1484		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	82	11	68	110
Volume Left	70	3	20	7
Volume Right	12	2	1	84
cSH	774	750	1480	1484
Volume to Capacity	0.11	0.01	0.01	0.00
Queue Length 95th (ft)	9	1	1	0
Control Delay (s)	10.2	9.9	2.3	0.5
Lane LOS	B	A	A	A
Approach Delay (s)	10.2	9.9	2.3	0.5
Approach LOS	B	A		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	943	126	120	815	93	129	175	59	98	153	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1614	3162		1630	3201		1646	1659		1630	1625	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1614	3162		1630	3201		1646	1659		1630	1625	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	89	982	131	125	849	97	134	182	61	102	159	76
RTOR Reduction (vph)	0	9	0	0	7	0	0	13	0	0	18	0
Lane Group Flow (vph)	89	1104	0	125	939	0	134	230	0	102	217	0
Confl. Peds. (#/hr)	2		2	2		2	2		6	6		2
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	9.7	41.3		11.5	43.1		13.3	20.0		10.7	17.4	
Effective Green, g (s)	9.2	40.8		11.0	42.6		12.8	19.5		10.2	16.9	
Actuated g/C Ratio	0.09	0.41		0.11	0.43		0.13	0.20		0.10	0.17	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	148	1290		179	1363		210	323		166	274	
v/s Ratio Prot	0.06	c0.35		0.08	c0.29		c0.08	c0.14		0.06	0.13	
v/s Ratio Perm												
v/c Ratio	0.60	0.86		0.70	0.69		0.64	0.71		0.61	0.79	
Uniform Delay, d1	43.6	26.9		42.9	23.3		41.4	37.6		43.0	39.9	
Progression Factor	1.00	1.00		1.18	1.49		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.3	7.4		8.9	2.6		5.1	6.5		5.3	13.8	
Delay (s)	48.9	34.4		59.3	37.4		46.5	44.1		48.3	53.6	
Level of Service	D	C		E	D		D	D		D	D	
Approach Delay (s)		35.4			39.9			45.0			52.0	
Approach LOS		D			D			D			D	

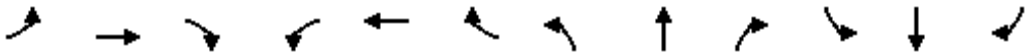
Intersection Summary			
HCM 2000 Control Delay	40.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1132	1	1	995	0	6	0	9	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1179	1	1	1036	0	6	0	9	0	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		916										
pX, platoon unblocked				0.71			0.71	0.71	0.71	0.71	0.71	
vC, conflicting volume	1036			1180			1702	2218	590	1638	2219	518
vC1, stage 1 conf vol							1180	1180		1039	1039	
vC2, stage 2 conf vol							522	1039		599	1180	
vCu, unblocked vol	1036			450			1181	1904	0	1091	1905	518
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	660			790			320	241	774	236	240	502

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	0	786	394	1	691	345	6	9	2
Volume Left	0	0	0	1	0	0	6	0	0
Volume Right	0	0	1	0	0	0	0	9	2
cSH	1700	1700	1700	790	1700	1700	320	774	502
Volume to Capacity	0.00	0.46	0.23	0.00	0.41	0.20	0.02	0.01	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	1	1	0
Control Delay (s)	0.0	0.0	0.0	9.6	0.0	0.0	16.5	9.7	12.2
Lane LOS				A			C	A	B
Approach Delay (s)	0.0			0.0			12.4		12.2
Approach LOS							B		B

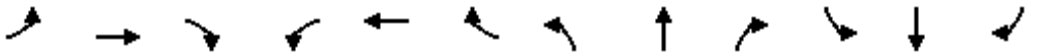
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1075	64	54	971	0	24	0	36	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1120	67	56	1011	0	25	0	38	0	0	0
Pedestrians								2				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.72			0.72	0.72	0.72	0.72	0.72	
vC, conflicting volume	1011			1188			1773	2279	595	1721	2312	506
vC1, stage 1 conf vol							1155	1155		1124	1124	
vC2, stage 2 conf vol							618	1124		597	1188	
vCu, unblocked vol	1011			490			1300	2001	0	1228	2047	506
tC, single (s)	4.2			4.1			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			91	100	95	100	100	100
cM capacity (veh/h)	675			770			290	213	779	197	204	517

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	747	440	56	674	337	62	0
Volume Left	0	0	0	56	0	0	25	0
Volume Right	0	0	67	0	0	0	38	0
cSH	1700	1700	1700	770	1700	1700	465	1700
Volume to Capacity	0.00	0.44	0.26	0.07	0.40	0.20	0.13	0.00
Queue Length 95th (ft)	0	0	0	6	0	0	12	0
Control Delay (s)	0.0	0.0	0.0	10.0	0.0	0.0	13.9	0.0
Lane LOS				B			B	A
Approach Delay (s)	0.0			0.5			13.9	0.0
Approach LOS							B	A

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	52.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	951	86	77	882	79	90	72	86	71	62	43
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1614	3182		1630	3220			1648	1444		1671	1431
Flt Permitted	0.95	1.00		0.95	1.00			0.65	1.00		0.58	1.00
Satd. Flow (perm)	1614	3182		1630	3220			1097	1444		992	1431
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	59	991	90	80	919	82	94	75	90	74	65	45
RTOR Reduction (vph)	0	4	0	0	5	0	0	0	74	0	0	37
Lane Group Flow (vph)	59	1077	0	80	996	0	0	169	16	0	139	8
Confl. Peds. (#/hr)			1	1			7					7
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	12.1	61.1		8.5	56.6			17.9	17.9		17.9	17.9
Effective Green, g (s)	11.6	60.6		8.0	56.1			17.4	17.4		17.4	17.4
Actuated g/C Ratio	0.12	0.61		0.08	0.56			0.17	0.17		0.17	0.17
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	187	1928		130	1806			190	251		172	248
v/s Ratio Prot	0.04	c0.34		0.05	c0.31							
v/s Ratio Perm								c0.15	0.01		0.14	0.01
v/c Ratio	0.32	0.56		0.62	0.55			0.89	0.06		0.81	0.03
Uniform Delay, d1	40.6	11.7		44.5	14.0			40.4	34.5		39.7	34.3
Progression Factor	1.27	1.49		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.8		6.7	1.2			35.7	0.1		23.0	0.0
Delay (s)	51.8	18.2		51.2	15.2			76.0	34.6		62.7	34.3
Level of Service	D	B		D	B			E	C		E	C
Approach Delay (s)		20.0			17.8			61.6			55.7	
Approach LOS		B			B			E			E	

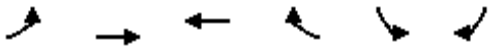
Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	39	57	307	78	12	384
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	44	65	349	89	14	436
Pedestrians	3		2			3
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked	0.92					
vC, conflicting volume	862	399			440	
vC1, stage 1 conf vol	396					
vC2, stage 2 conf vol	466					
vCu, unblocked vol	803	399			440	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	92	90			99	
cM capacity (veh/h)	529	650			1117	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	109	438	450
Volume Left	44	0	14
Volume Right	65	89	0
cSH	595	1700	1117
Volume to Capacity	0.18	0.26	0.01
Queue Length 95th (ft)	17	0	1
Control Delay (s)	12.4	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	12.4	0.0	0.4
Approach LOS	B		

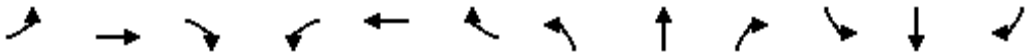
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	39	47	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	44	53	0	0	0
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	53				97	53
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	53				97	53
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1515				903	1015

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	44	53	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1515	1700	1700	1700
Volume to Capacity	0.00	0.03	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS			A	

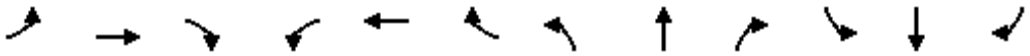
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	22	4	13	1	5	4	28	34	3	9	87	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	25	4	15	1	6	4	31	38	3	10	98	16
Pedestrians		3			5			13			4	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	243	238	122	264	245	49	116			47		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243	238	122	264	245	49	116			47		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	99	98	100	99	100	98			99		
cM capacity (veh/h)	668	630	901	651	638	1017	1481			1555		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	44	11	73	124
Volume Left	25	1	31	10
Volume Right	15	4	3	16
cSH	726	752	1481	1555
Volume to Capacity	0.06	0.01	0.02	0.01
Queue Length 95th (ft)	5	1	2	0
Control Delay (s)	10.3	9.9	3.3	0.6
Lane LOS	B	A	A	A
Approach Delay (s)	10.3	9.9	3.3	0.6
Approach LOS	B	A		

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	29.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	943	126	120	816	108	129	185	59	118	163	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1614	3162		1630	3193		1646	1663		1630	1629	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1614	3162		1630	3193		1646	1663		1630	1629	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	89	982	131	125	850	112	134	193	61	123	170	76
RTOR Reduction (vph)	0	9	0	0	9	0	0	12	0	0	17	0
Lane Group Flow (vph)	89	1104	0	125	953	0	134	242	0	123	229	0
Confl. Peds. (#/hr)	2		2	2		2	2		6	6		2
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	9.4	41.6		11.4	43.6		12.6	18.3		12.2	17.9	
Effective Green, g (s)	8.9	41.1		10.9	43.1		12.1	17.8		11.7	17.4	
Actuated g/C Ratio	0.09	0.41		0.11	0.43		0.12	0.18		0.12	0.17	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	143	1299		177	1376		199	296		190	283	
v/s Ratio Prot	0.06	c0.35		0.08	c0.30		c0.08	c0.15		0.08	0.14	
v/s Ratio Perm												
v/c Ratio	0.62	0.85		0.71	0.69		0.67	0.82		0.65	0.81	
Uniform Delay, d1	43.9	26.7		43.0	23.1		42.1	39.5		42.2	39.7	
Progression Factor	1.00	1.00		1.16	1.53		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.6	7.1		9.6	2.6		7.5	15.3		6.2	14.9	
Delay (s)	50.6	33.8		59.5	37.8		49.5	54.8		48.3	54.6	
Level of Service	D	C		E	D		D	D		D	D	
Approach Delay (s)		35.0			40.3			53.0			52.5	
Approach LOS		D			D			D			D	

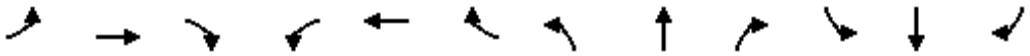
Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1161	1	1	1011	0	0	0	0	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1209	1	1	1053	0	0	0	0	0	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		916										
pX, platoon unblocked				0.72			0.72	0.72	0.72	0.72	0.72	
vC, conflicting volume	1053			1210			1741	2265	605	1660	2266	527
vC1, stage 1 conf vol							1210	1210		1055	1055	
vC2, stage 2 conf vol							531	1055		605	1210	
vCu, unblocked vol	1053			498			1239	1972	0	1126	1973	527
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	651			760			305	233	776	231	232	496

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	0	806	404	1	702	351	0	0	2
Volume Left	0	0	0	1	0	0	0	0	0
Volume Right	0	0	1	0	0	0	0	0	2
cSH	1700	1700	1700	760	1700	1700	1700	1700	496
Volume to Capacity	0.00	0.47	0.24	0.00	0.41	0.21	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	9.7	0.0	0.0	0.0	0.0	12.3
Lane LOS				A			A	A	B
Approach Delay (s)	0.0			0.0			0.0		12.3
Approach LOS							A		B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1095	64	54	987	0	24	0	36	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1141	67	56	1028	0	25	0	38	0	0	0
Pedestrians								2				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.72			0.72	0.72	0.72	0.72	0.72	
vC, conflicting volume	1028			1209			1803	2317	606	1748	2350	514
vC1, stage 1 conf vol							1176	1176		1141	1141	
vC2, stage 2 conf vol							627	1141		608	1209	
vCu, unblocked vol	1028			525			1345	2055	0	1270	2101	514
tC, single (s)	4.2			4.1			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			91	100	95	100	100	100
cM capacity (veh/h)	665			749			281	207	780	192	198	511

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	760	447	56	685	343	62	0
Volume Left	0	0	0	56	0	0	25	0
Volume Right	0	0	67	0	0	0	38	0
cSH	1700	1700	1700	749	1700	1700	456	1700
Volume to Capacity	0.00	0.45	0.26	0.08	0.40	0.20	0.14	0.00
Queue Length 95th (ft)	0	0	0	6	0	0	12	0
Control Delay (s)	0.0	0.0	0.0	10.2	0.0	0.0	14.2	0.0
Lane LOS				B			B	A
Approach Delay (s)	0.0			0.5			14.2	0.0
Approach LOS							B	A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	971	86	78	897	79	91	72	88	71	62	43
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1614	3183		1630	3220			1648	1444		1671	1431
Flt Permitted	0.95	1.00		0.95	1.00			0.65	1.00		0.58	1.00
Satd. Flow (perm)	1614	3183		1630	3220			1099	1444		997	1431
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	59	1011	90	81	934	82	95	75	92	74	65	45
RTOR Reduction (vph)	0	4	0	0	5	0	0	0	76	0	0	37
Lane Group Flow (vph)	59	1097	0	81	1011	0	0	170	16	0	139	8
Confl. Peds. (#/hr)			1	1			7					7
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	12.6	60.9		8.5	55.9			18.1	18.1		18.1	18.1
Effective Green, g (s)	12.1	60.4		8.0	55.4			17.6	17.6		17.6	17.6
Actuated g/C Ratio	0.12	0.60		0.08	0.55			0.18	0.18		0.18	0.18
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	195	1922		130	1783			193	254		175	251
v/s Ratio Prot	0.04	c0.34		0.05	c0.31							
v/s Ratio Perm								c0.15	0.01		0.14	0.01
v/c Ratio	0.30	0.57		0.62	0.57			0.88	0.06		0.79	0.03
Uniform Delay, d1	40.1	12.0		44.5	14.5			40.2	34.3		39.5	34.1
Progression Factor	1.25	1.47		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.8		7.3	1.3			33.9	0.1		20.9	0.0
Delay (s)	50.6	18.4		51.8	15.8			74.1	34.4		60.3	34.2
Level of Service	D	B		D	B			E	C		E	C
Approach Delay (s)		20.1			18.5			60.2			53.9	
Approach LOS		C			B			E			D	

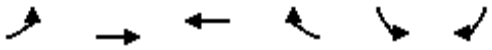
Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	39	57	317	78	12	394
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	44	65	360	89	14	448
Pedestrians	3		2			3
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked	0.90					
vC, conflicting volume	885	411			452	
vC1, stage 1 conf vol	408					
vC2, stage 2 conf vol	477					
vCu, unblocked vol	819	411			452	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	90			99	
cM capacity (veh/h)	521	640			1106	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	109	449	461
Volume Left	44	0	14
Volume Right	65	89	0
cSH	586	1700	1106
Volume to Capacity	0.19	0.26	0.01
Queue Length 95th (ft)	17	0	1
Control Delay (s)	12.5	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	12.5	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	39	47	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	44	53	0	0	0
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	53				97	53
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	53				97	53
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1515				903	1015

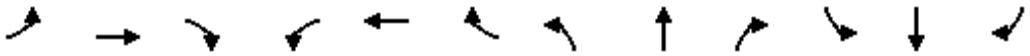
Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	44	53	0	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1515	1700	1700	1700
Volume to Capacity	0.00	0.03	0.00	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	
Approach LOS			A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	7.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	22	4	13	1	5	4	28	34	3	9	87	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	25	4	15	1	6	4	31	38	3	10	98	16
Pedestrians		3			5			13			4	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	243	238	122	264	245	49	116			47		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243	238	122	264	245	49	116			47		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	99	98	100	99	100	98			99		
cM capacity (veh/h)	668	630	901	651	638	1017	1481			1555		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	44	11	73	124
Volume Left	25	1	31	10
Volume Right	15	4	3	16
cSH	726	752	1481	1555
Volume to Capacity	0.06	0.01	0.02	0.01
Queue Length 95th (ft)	5	1	2	0
Control Delay (s)	10.3	9.9	3.3	0.6
Lane LOS	B	A	A	A
Approach Delay (s)	10.3	9.9	3.3	0.6
Approach LOS	B	A		

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	29.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	969	126	120	842	121	129	185	59	131	163	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1614	3163		1630	3188		1646	1663		1630	1629	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1614	3163		1630	3188		1646	1663		1630	1629	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	89	1009	131	125	877	126	134	193	61	136	170	76
RTOR Reduction (vph)	0	9	0	0	10	0	0	12	0	0	17	0
Lane Group Flow (vph)	89	1131	0	125	993	0	134	242	0	136	229	0
Confl. Peds. (#/hr)	2		2	2		2	2		6	6		2
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	8.8	41.3		11.2	43.7		13.1	18.3		12.7	17.9	
Effective Green, g (s)	8.3	40.8		10.7	43.2		12.6	17.8		12.2	17.4	
Actuated g/C Ratio	0.08	0.41		0.11	0.43		0.13	0.18		0.12	0.17	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	133	1290		174	1377		207	296		198	283	
v/s Ratio Prot	0.06	c0.36		0.08	c0.31		0.08	c0.15		c0.08	0.14	
v/s Ratio Perm												
v/c Ratio	0.67	0.88		0.72	0.72		0.65	0.82		0.69	0.81	
Uniform Delay, d1	44.5	27.3		43.2	23.4		41.6	39.5		42.1	39.7	
Progression Factor	1.00	1.00		1.14	1.51		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.3	8.6		10.7	2.9		5.7	15.3		8.3	14.9	
Delay (s)	54.9	35.9		59.8	38.2		47.3	54.8		50.4	54.6	
Level of Service	D	D		E	D		D	D		D	D	
Approach Delay (s)		37.3			40.6			52.2			53.1	
Approach LOS		D			D			D			D	

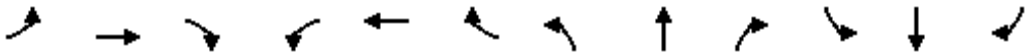
Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1141	60	38	1000	0	50	0	41	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1189	62	40	1042	0	52	0	43	0	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		916										
pX, platoon unblocked				0.70			0.70	0.70	0.70	0.70	0.70	
vC, conflicting volume	1042			1251			1822	2341	626	1758	2372	521
vC1, stage 1 conf vol							1220	1220		1121	1121	
vC2, stage 2 conf vol							602	1121		637	1251	
vCu, unblocked vol	1042			503			1318	2059	0	1227	2103	521
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			82	100	94	100	100	100
cM capacity (veh/h)	657			741			289	214	760	198	203	500

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	0	792	459	40	694	347	52	43	2
Volume Left	0	0	0	40	0	0	52	0	0
Volume Right	0	0	62	0	0	0	0	43	2
cSH	1700	1700	1700	741	1700	1700	289	760	500
Volume to Capacity	0.00	0.47	0.27	0.05	0.41	0.20	0.18	0.06	0.00
Queue Length 95th (ft)	0	0	0	4	0	0	16	4	0
Control Delay (s)	0.0	0.0	0.0	10.1	0.0	0.0	20.2	10.0	12.2
Lane LOS				B			C	B	B
Approach Delay (s)	0.0			0.4			15.6		12.2
Approach LOS							C		B

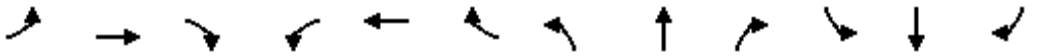
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1116	64	59	1007	0	30	0	41	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1162	67	61	1049	0	31	0	43	0	0	0
Pedestrians								2				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.72			0.72	0.72	0.72	0.72	0.72	
vC, conflicting volume	1049			1231			1845	2370	617	1796	2403	524
vC1, stage 1 conf vol							1198	1198		1172	1172	
vC2, stage 2 conf vol							647	1172		624	1231	
vCu, unblocked vol	1049			555			1404	2129	0	1336	2175	524
tC, single (s)	4.2			4.1			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			88	100	95	100	100	100
cM capacity (veh/h)	653			730			268	198	780	182	188	503

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	775	454	61	699	350	74	0
Volume Left	0	0	0	61	0	0	31	0
Volume Right	0	0	67	0	0	0	43	0
cSH	1700	1700	1700	730	1700	1700	432	1700
Volume to Capacity	0.00	0.46	0.27	0.08	0.41	0.21	0.17	0.00
Queue Length 95th (ft)	0	0	0	7	0	0	15	0
Control Delay (s)	0.0	0.0	0.0	10.4	0.0	0.0	15.1	0.0
Lane LOS				B			C	A
Approach Delay (s)	0.0			0.6			15.1	0.0
Approach LOS							C	A

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	988	90	78	914	79	95	72	88	71	62	47
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1614	3182		1630	3221			1647	1444		1671	1431
Flt Permitted	0.95	1.00		0.95	1.00			0.65	1.00		0.58	1.00
Satd. Flow (perm)	1614	3182		1630	3221			1098	1444		993	1431
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	65	1029	94	81	952	82	99	75	92	74	65	49
RTOR Reduction (vph)	0	4	0	0	5	0	0	0	76	0	0	40
Lane Group Flow (vph)	65	1119	0	81	1029	0	0	174	16	0	139	9
Confl. Peds. (#/hr)			1	1			7					7
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	12.9	60.6		8.5	55.3			18.4	18.4		18.4	18.4
Effective Green, g (s)	12.4	60.1		8.0	54.8			17.9	17.9		17.9	17.9
Actuated g/C Ratio	0.12	0.60		0.08	0.55			0.18	0.18		0.18	0.18
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	200	1912		130	1765			196	258		177	256
v/s Ratio Prot	0.04	c0.35		0.05	c0.32							
v/s Ratio Perm								c0.16	0.01		0.14	0.01
v/c Ratio	0.32	0.59		0.62	0.58			0.89	0.06		0.79	0.03
Uniform Delay, d1	40.0	12.3		44.5	15.0			40.1	34.1		39.2	33.9
Progression Factor	1.24	1.45		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.9		7.3	1.4			34.6	0.1		19.4	0.0
Delay (s)	50.1	18.7		51.8	16.4			74.7	34.2		58.7	33.9
Level of Service	D	B		D	B			E	C		E	C
Approach Delay (s)		20.4			19.0			60.7			52.2	
Approach LOS		C			B			E			D	

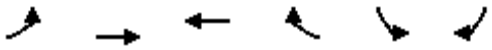
Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	56	57	317	95	12	394
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	64	65	360	108	14	448
Pedestrians	3		2			3
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked	0.90					
vC, conflicting volume	894	420			471	
vC1, stage 1 conf vol	417					
vC2, stage 2 conf vol	477					
vCu, unblocked vol	830	420			471	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	90			99	
cM capacity (veh/h)	518	632			1088	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	128	468	461
Volume Left	64	0	14
Volume Right	65	108	0
cSH	570	1700	1088
Volume to Capacity	0.23	0.28	0.01
Queue Length 95th (ft)	21	0	1
Control Delay (s)	13.1	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	13.1	0.0	0.4
Approach LOS	B		

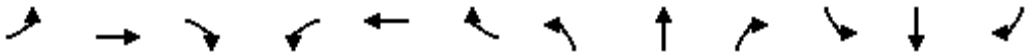
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	17	39	47	10	15	17
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	19	44	53	11	17	19
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	64				140	58
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	64				140	58
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				98	98
cM capacity (veh/h)	1501				842	1007

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	63	64	17	19
Volume Left	19	0	17	0
Volume Right	0	11	0	19
cSH	1501	1700	842	1007
Volume to Capacity	0.01	0.04	0.02	0.02
Queue Length 95th (ft)	1	0	2	1
Control Delay (s)	2.3	0.0	9.4	8.6
Lane LOS	A		A	A
Approach Delay (s)	2.3	0.0	9.0	
Approach LOS			A	

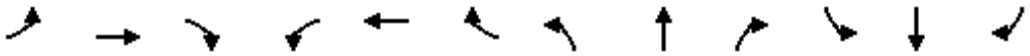
Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	33	4	17	1	5	4	33	34	3	9	87	19
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	37	4	19	1	6	4	37	38	3	10	98	21
Pedestrians		3			5			13			4	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	257	252	124	282	261	49	122			47		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	257	252	124	282	261	49	122			47		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	99	98	100	99	100	97			99		
cM capacity (veh/h)	652	616	898	628	622	1017	1474			1555		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	61	11	79	129
Volume Left	37	1	37	10
Volume Right	19	4	3	21
cSH	710	737	1474	1555
Volume to Capacity	0.09	0.02	0.03	0.01
Queue Length 95th (ft)	7	1	2	0
Control Delay (s)	10.5	10.0	3.6	0.6
Lane LOS	B	A	A	A
Approach Delay (s)	10.5	10.0	3.6	0.6
Approach LOS	B	A		

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	30.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	969	126	120	829	114	142	192	59	131	163	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1614	3163		1630	3191		1646	1664		1630	1629	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1614	3163		1630	3191		1646	1664		1630	1629	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	89	1009	131	125	864	119	148	200	61	136	170	76
RTOR Reduction (vph)	0	9	0	0	9	0	0	11	0	0	17	0
Lane Group Flow (vph)	89	1131	0	125	974	0	148	250	0	136	229	0
Confl. Peds. (#/hr)	2		2	2		2	2		6	6		2
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	8.9	41.0		11.1	43.2		13.5	18.7		12.7	17.9	
Effective Green, g (s)	8.4	40.5		10.6	42.7		13.0	18.2		12.2	17.4	
Actuated g/C Ratio	0.08	0.40		0.11	0.43		0.13	0.18		0.12	0.17	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	135	1281		172	1362		213	302		198	283	
v/s Ratio Prot	0.06	c0.36		0.08	c0.31		c0.09	c0.15		0.08	0.14	
v/s Ratio Perm												
v/c Ratio	0.66	0.88		0.73	0.72		0.69	0.83		0.69	0.81	
Uniform Delay, d1	44.4	27.6		43.3	23.6		41.6	39.4		42.1	39.7	
Progression Factor	1.00	1.00		1.15	1.52		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.4	9.0		11.5	2.9		8.3	16.2		8.3	14.9	
Delay (s)	53.8	36.6		61.1	38.7		49.9	55.5		50.4	54.6	
Level of Service	D	D		E	D		D	E		D	D	
Approach Delay (s)		37.8			41.3			53.5			53.1	
Approach LOS		D			D			D			D	

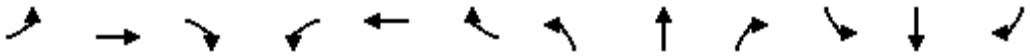
Intersection Summary			
HCM 2000 Control Delay	43.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1141	60	0	1031	0	0	0	41	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1189	62	0	1074	0	0	0	43	0	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		916										
pX, platoon unblocked				0.70			0.70	0.70	0.70	0.70	0.70	
vC, conflicting volume	1074			1251			1759	2294	626	1711	2325	537
vC1, stage 1 conf vol							1220	1220		1074	1074	
vC2, stage 2 conf vol							539	1074		637	1251	
vCu, unblocked vol	1074			497			1224	1989	0	1155	2034	537
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	94	100	100	100
cM capacity (veh/h)	639			743			311	231	758	224	227	488

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	792	459	716	358	43	2
Volume Left	0	0	0	0	0	0
Volume Right	0	62	0	0	43	2
cSH	1700	1700	1700	1700	758	488
Volume to Capacity	0.47	0.27	0.42	0.21	0.06	0.00
Queue Length 95th (ft)	0	0	0	0	4	0
Control Delay (s)	0.0	0.0	0.0	0.0	10.0	12.4
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		10.0	12.4
Approach LOS					B	B

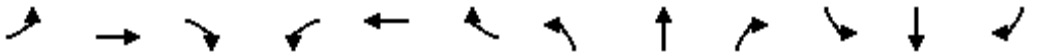
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1116	64	96	970	0	60	0	41	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1162	67	100	1010	0	62	0	43	0	0	0
Pedestrians								2				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.72			0.72	0.72	0.72	0.72	0.72	
vC, conflicting volume	1010			1231			1903	2408	617	1834	2442	505
vC1, stage 1 conf vol							1198	1198		1210	1210	
vC2, stage 2 conf vol							705	1210		624	1231	
vCu, unblocked vol	1010			549			1480	2180	0	1385	2226	505
tC, single (s)	4.2			4.1			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			86			75	100	95	100	100	100
cM capacity (veh/h)	676			732			248	184	779	163	168	518

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	775	454	100	674	337	105	0
Volume Left	0	0	0	100	0	0	62	0
Volume Right	0	0	67	0	0	0	43	0
cSH	1700	1700	1700	732	1700	1700	343	1700
Volume to Capacity	0.00	0.46	0.27	0.14	0.40	0.20	0.31	0.00
Queue Length 95th (ft)	0	0	0	12	0	0	32	0
Control Delay (s)	0.0	0.0	0.0	10.7	0.0	0.0	20.1	0.0
Lane LOS				B			C	A
Approach Delay (s)	0.0			1.0			20.1	0.0
Approach LOS							C	A

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	988	90	78	914	79	95	72	88	71	62	47
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1614	3182		1630	3221			1647	1444		1671	1431
Flt Permitted	0.95	1.00		0.95	1.00			0.65	1.00		0.58	1.00
Satd. Flow (perm)	1614	3182		1630	3221			1098	1444		993	1431
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	65	1029	94	81	952	82	99	75	92	74	65	49
RTOR Reduction (vph)	0	4	0	0	5	0	0	0	76	0	0	40
Lane Group Flow (vph)	65	1119	0	81	1029	0	0	174	16	0	139	9
Confl. Peds. (#/hr)			1	1			7					7
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	12.9	60.6		8.5	55.3			18.4	18.4		18.4	18.4
Effective Green, g (s)	12.4	60.1		8.0	54.8			17.9	17.9		17.9	17.9
Actuated g/C Ratio	0.12	0.60		0.08	0.55			0.18	0.18		0.18	0.18
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	200	1912		130	1765			196	258		177	256
v/s Ratio Prot	0.04	c0.35		0.05	c0.32							
v/s Ratio Perm								c0.16	0.01		0.14	0.01
v/c Ratio	0.32	0.59		0.62	0.58			0.89	0.06		0.79	0.03
Uniform Delay, d1	40.0	12.3		44.5	15.0			40.1	34.1		39.2	33.9
Progression Factor	1.24	1.44		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.9		7.3	1.4			34.6	0.1		19.4	0.0
Delay (s)	50.0	18.6		51.8	16.4			74.7	34.2		58.7	33.9
Level of Service	D	B		D	B			E	C		E	C
Approach Delay (s)		20.3			19.0			60.7			52.2	
Approach LOS		C			B			E			D	

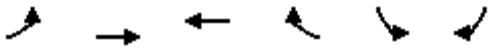
Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	56	77	317	95	12	394
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	64	88	360	108	14	448
Pedestrians	3		2			3
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked	0.90					
vC, conflicting volume	894	420			471	
vC1, stage 1 conf vol	417					
vC2, stage 2 conf vol	477					
vCu, unblocked vol	830	420			471	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	86			99	
cM capacity (veh/h)	518	632			1088	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	151	468	461
Volume Left	64	0	14
Volume Right	88	108	0
cSH	578	1700	1088
Volume to Capacity	0.26	0.28	0.01
Queue Length 95th (ft)	26	0	1
Control Delay (s)	13.4	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	13.4	0.0	0.4
Approach LOS	B		

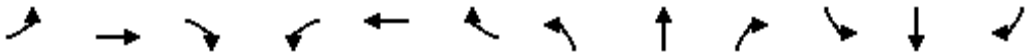
Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	17	39	47	47	45	37
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	19	44	53	53	51	42
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	106				161	79
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	106				161	79
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				94	96
cM capacity (veh/h)	1449				819	981

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	63	106	51	42
Volume Left	19	0	51	0
Volume Right	0	53	0	42
cSH	1449	1700	819	981
Volume to Capacity	0.01	0.06	0.06	0.04
Queue Length 95th (ft)	1	0	5	3
Control Delay (s)	2.4	0.0	9.7	8.8
Lane LOS	A		A	A
Approach Delay (s)	2.4	0.0	9.3	
Approach LOS			A	

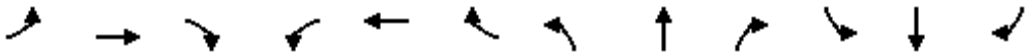
Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	63	4	17	1	5	4	33	34	3	9	87	56
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	71	4	19	1	6	4	37	38	3	10	98	63
Pedestrians		3			5			13			4	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	278	273	145	303	303	49	164			47		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	278	273	145	303	303	49	164			47		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	99	98	100	99	100	97			99		
cM capacity (veh/h)	631	600	875	607	590	1017	1424			1555		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	94	11	79	171
Volume Left	71	1	37	10
Volume Right	19	4	3	63
cSH	667	711	1424	1555
Volume to Capacity	0.14	0.02	0.03	0.01
Queue Length 95th (ft)	12	1	2	0
Control Delay (s)	11.3	10.1	3.7	0.5
Lane LOS	B	B	A	A
Approach Delay (s)	11.3	10.1	3.7	0.5
Approach LOS	B	B		

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	969	126	120	829	114	142	192	59	131	163	73
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1614	3163		1630	3191		1646	1664		1630	1629	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1614	3163		1630	3191		1646	1664		1630	1629	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	89	1009	131	125	864	119	148	200	61	136	170	76
RTOR Reduction (vph)	0	9	0	0	9	0	0	11	0	0	17	0
Lane Group Flow (vph)	89	1131	0	125	974	0	148	250	0	136	229	0
Confl. Peds. (#/hr)	2		2	2		2	2		6	6		2
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	8.9	41.0		11.1	43.2		13.5	18.7		12.7	17.9	
Effective Green, g (s)	8.4	40.5		10.6	42.7		13.0	18.2		12.2	17.4	
Actuated g/C Ratio	0.08	0.40		0.11	0.43		0.13	0.18		0.12	0.17	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.3		2.3	4.3		2.3	2.3		2.3	2.3	
Lane Grp Cap (vph)	135	1281		172	1362		213	302		198	283	
v/s Ratio Prot	0.06	c0.36		0.08	c0.31		c0.09	c0.15		0.08	0.14	
v/s Ratio Perm												
v/c Ratio	0.66	0.88		0.73	0.72		0.69	0.83		0.69	0.81	
Uniform Delay, d1	44.4	27.6		43.3	23.6		41.6	39.4		42.1	39.7	
Progression Factor	1.00	1.00		1.15	1.52		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.4	9.0		11.5	2.9		8.3	16.2		8.3	14.9	
Delay (s)	53.8	36.6		61.1	38.7		49.9	55.5		50.4	54.6	
Level of Service	D	D		E	D		D	E		D	D	
Approach Delay (s)		37.8			41.3			53.5			53.1	
Approach LOS		D			D			D			D	

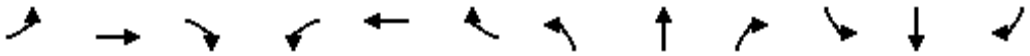
Intersection Summary			
HCM 2000 Control Delay	43.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1201	0	0	1031	0	0	0	0	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1251	0	0	1074	0	0	0	0	0	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)		916										
pX, platoon unblocked				0.70			0.70	0.70	0.70	0.70	0.70	
vC, conflicting volume	1074			1251			1790	2325	626	1699	2325	537
vC1, stage 1 conf vol							1251	1251		1074	1074	
vC2, stage 2 conf vol							539	1074		626	1251	
vCu, unblocked vol	1074			497			1268	2034	0	1139	2034	537
tC, single (s)	4.2			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	639			743			298	227	758	225	227	488

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	626	626	716	358	2
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	2
cSH	1700	1700	1700	1700	488
Volume to Capacity	0.37	0.37	0.42	0.21	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	12.4
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.4
Approach LOS					B

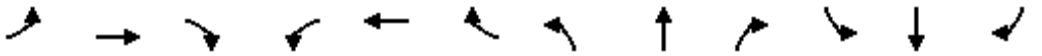
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	46.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1075	123	96	970	0	60	0	82	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	0	1120	128	100	1010	0	62	0	85	0	0	0
Pedestrians								2				
Lane Width (ft)								16.0				
Walking Speed (ft/s)								4.0				
Percent Blockage								0				
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh)					2							
Upstream signal (ft)		1127										
pX, platoon unblocked				0.71			0.71	0.71	0.71	0.71	0.71	
vC, conflicting volume	1010			1250			1891	2396	626	1856	2460	505
vC1, stage 1 conf vol							1186	1186		1210	1210	
vC2, stage 2 conf vol							705	1210		645	1250	
vCu, unblocked vol	1010			524			1431	2146	0	1381	2236	505
tC, single (s)	4.2			4.1			7.6	6.6	7.0	7.5	6.5	6.9
tC, 2 stage (s)							6.6	5.6		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			86			76	100	89	100	100	100
cM capacity (veh/h)	676			733			257	186	762	161	168	518

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	747	501	100	674	337	148	0
Volume Left	0	0	0	100	0	0	62	0
Volume Right	0	0	128	0	0	0	85	0
cSH	1700	1700	1700	733	1700	1700	416	1700
Volume to Capacity	0.00	0.44	0.29	0.14	0.40	0.20	0.36	0.00
Queue Length 95th (ft)	0	0	0	12	0	0	39	0
Control Delay (s)	0.0	0.0	0.0	10.7	0.0	0.0	18.3	0.0
Lane LOS				B			C	A
Approach Delay (s)	0.0			1.0			18.3	0.0
Approach LOS							C	A

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	988	90	78	914	79	95	72	88	71	62	47
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		4.5	5.9			4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1614	3182		1630	3221			1647	1444		1671	1431
Flt Permitted	0.95	1.00		0.95	1.00			0.65	1.00		0.58	1.00
Satd. Flow (perm)	1614	3182		1630	3221			1098	1444		993	1431
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	65	1029	94	81	952	82	99	75	92	74	65	49
RTOR Reduction (vph)	0	4	0	0	5	0	0	0	76	0	0	40
Lane Group Flow (vph)	65	1119	0	81	1029	0	0	174	16	0	139	9
Confl. Peds. (#/hr)			1	1			7					7
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	12.9	60.6		8.5	55.3			18.4	18.4		18.4	18.4
Effective Green, g (s)	12.4	60.1		8.0	54.8			17.9	17.9		17.9	17.9
Actuated g/C Ratio	0.12	0.60		0.08	0.55			0.18	0.18		0.18	0.18
Clearance Time (s)	4.0	4.5		4.0	5.4			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.3	5.1		2.3	5.1			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	200	1912		130	1765			196	258		177	256
v/s Ratio Prot	0.04	c0.35		0.05	c0.32							
v/s Ratio Perm								c0.16	0.01		0.14	0.01
v/c Ratio	0.32	0.59		0.62	0.58			0.89	0.06		0.79	0.03
Uniform Delay, d1	40.0	12.3		44.5	15.0			40.1	34.1		39.2	33.9
Progression Factor	1.24	1.44		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.9		7.3	1.4			34.6	0.1		19.4	0.0
Delay (s)	49.9	18.6		51.8	16.4			74.7	34.2		58.7	33.9
Level of Service	D	B		D	B			E	C		E	C
Approach Delay (s)		20.3			19.0			60.7			52.2	
Approach LOS		C			B			E			D	

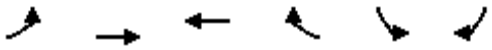
Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	56	77	317	95	12	394
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	64	88	360	108	14	448
Pedestrians	3		2			3
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	4.0		4.0			4.0
Percent Blockage	0		0			0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						256
pX, platoon unblocked	0.90					
vC, conflicting volume	894	420			471	
vC1, stage 1 conf vol	417					
vC2, stage 2 conf vol	477					
vCu, unblocked vol	830	420			471	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	86			99	
cM capacity (veh/h)	518	632			1088	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	151	468	461
Volume Left	64	0	14
Volume Right	88	108	0
cSH	578	1700	1088
Volume to Capacity	0.26	0.28	0.01
Queue Length 95th (ft)	26	0	1
Control Delay (s)	13.4	0.0	0.4
Lane LOS	B		A
Approach Delay (s)	13.4	0.0	0.4
Approach LOS	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	17	39	47	106	86	37
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	19	44	53	119	97	42
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	172				194	112
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	172				194	112
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				88	96
cM capacity (veh/h)	1369				783	941

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	63	172	97	42
Volume Left	19	0	97	0
Volume Right	0	119	0	42
cSH	1369	1700	783	941
Volume to Capacity	0.01	0.10	0.12	0.04
Queue Length 95th (ft)	1	0	11	3
Control Delay (s)	2.4	0.0	10.2	9.0
Lane LOS	A		B	A
Approach Delay (s)	2.4	0.0	9.9	
Approach LOS			A	

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	104	4	17	1	5	4	33	34	3	9	87	115
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	117	4	19	1	6	4	37	38	3	10	98	129
Pedestrians		3			5			13			4	
Lane Width (ft)		12.0			12.0			12.0			16.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	311	306	178	336	369	49	230			47		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	311	306	178	336	369	49	230			47		
tC, single (s)	7.2	6.6	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	80	99	98	100	99	100	97			99		
cM capacity (veh/h)	599	574	838	576	541	1017	1347			1555		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	140	11	79	237
Volume Left	117	1	37	10
Volume Right	19	4	3	129
cSH	622	670	1347	1555
Volume to Capacity	0.23	0.02	0.03	0.01
Queue Length 95th (ft)	22	1	2	0
Control Delay (s)	12.5	10.5	3.8	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	12.5	10.5	3.8	0.4
Approach LOS	B	B		

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	41.3%	ICU Level of Service	A	
Analysis Period (min)	15			

APPENDIX K
QUEUING
CALCULATIONS

Intersection: 11: Ivy Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	105	259	230	88	359	364	202	205	155	193
Average Queue (ft)	38	147	109	37	134	160	123	103	59	89
95th Queue (ft)	86	234	197	76	272	287	199	178	116	159
Link Distance (ft)		726	726		860	860	195	195	368	
Upstream Blk Time (%)							2	1		
Queuing Penalty (veh)							4	3		
Storage Bay Dist (ft)	100			90						215
Storage Blk Time (%)	0	16		1	14					0
Queuing Penalty (veh)	1	7		3	5					0

Intersection: 12: FM Fuel Driveway & Highway 99E (SE 1st Avenue)

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 13: S Locust Street & Highway 99E (SE 1st Avenue)

Movement	EB	WB	WB	NB
Directions Served	TR	L	TR	LTR
Maximum Queue (ft)	10	60	15	108
Average Queue (ft)	0	7	1	40
95th Queue (ft)	8	33	11	87
Link Distance (ft)	99		1554	180
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)		100		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 14: Pine Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	71	221	240	121	267	243	219	125	163	71
Average Queue (ft)	21	63	75	40	109	86	102	26	75	37
95th Queue (ft)	56	160	180	93	206	190	182	109	134	65
Link Distance (ft)		1554	1554		1220	1220	467		299	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			210				50		50
Storage Blk Time (%)		0			1		36	0	26	2
Queuing Penalty (veh)		0			0		27	0	20	2

Intersection: 15: Ivy Street & SE 2nd Avenue

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	82	177	64
Average Queue (ft)	35	19	6
95th Queue (ft)	67	103	34
Link Distance (ft)	923	367	195
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SE 2nd Avenue & FM Fuel Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 17: S Locust Street & SE 2nd Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	66	43	17	6
Average Queue (ft)	20	8	1	0
95th Queue (ft)	52	33	8	6
Link Distance (ft)	92	263	428	180
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 72

Intersection: 11: Ivy Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	83	247	237	163	313	330	210	202	143	205
Average Queue (ft)	31	141	117	43	118	144	119	103	62	90
95th Queue (ft)	70	217	206	104	228	256	199	178	115	165
Link Distance (ft)		726	726		860	860	195	195	368	
Upstream Blk Time (%)							3	1		
Queuing Penalty (veh)							5	2		
Storage Bay Dist (ft)	100			90						215
Storage Blk Time (%)	0	15		1	12					0
Queuing Penalty (veh)	1	6		3	5					0

Intersection: 12: FM Fuel Driveway & Highway 99E (SE 1st Avenue)

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	L	LT	R
Maximum Queue (ft)	4	8	52	69	49
Average Queue (ft)	0	0	11	24	18
95th Queue (ft)	3	5	36	60	47
Link Distance (ft)	860	860		160	160
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			75		
Storage Blk Time (%)	0		0		
Queuing Penalty (veh)	0		0		

Intersection: 13: S Locust Street & Highway 99E (SE 1st Avenue)

Movement	EB	WB	WB	NB
Directions Served	TR	L	TR	LTR
Maximum Queue (ft)	0	39	4	112
Average Queue (ft)	0	6	0	39
95th Queue (ft)	0	27	3	86
Link Distance (ft)	99		1554	180
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)		100		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 14: Pine Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	88	210	233	116	308	253	272	125	182	98
Average Queue (ft)	27	64	76	42	120	96	104	21	73	38
95th Queue (ft)	66	154	175	89	230	208	196	97	136	73
Link Distance (ft)		1554	1554		1220	1220	467		299	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			210				50		50
Storage Blk Time (%)		0			1		35	0	25	3
Queuing Penalty (veh)		0			1		26	0	20	3

Intersection: 15: Ivy Street & SE 2nd Avenue

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	100	177	59
Average Queue (ft)	40	14	6
95th Queue (ft)	75	83	35
Link Distance (ft)	923	367	195
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SE 2nd Avenue & FM Fuel Driveway

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	18	35	35
Average Queue (ft)	1	8	11
95th Queue (ft)	9	33	37
Link Distance (ft)	923	104	104
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S Locust Street & SE 2nd Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	72	34	37	10
Average Queue (ft)	24	10	2	0
95th Queue (ft)	58	35	14	8
Link Distance (ft)	92	263	428	180
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 72

Intersection: 11: Ivy Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	101	288	273	138	301	325	204	205	193	187
Average Queue (ft)	39	151	128	39	127	158	116	112	66	87
95th Queue (ft)	84	245	233	85	245	279	197	195	128	158
Link Distance (ft)		726	726		860	860	195	195	368	
Upstream Blk Time (%)							2	1		
Queuing Penalty (veh)							4	3		
Storage Bay Dist (ft)	100			90						215
Storage Blk Time (%)	1	19		2	14					0
Queuing Penalty (veh)	3	8		6	5					0

Intersection: 12: FM Fuel Driveway & Highway 99E (SE 1st Avenue)

Movement	NB
Directions Served	R
Maximum Queue (ft)	52
Average Queue (ft)	17
95th Queue (ft)	47
Link Distance (ft)	160
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 13: S Locust Street & Highway 99E (SE 1st Avenue)

Movement	EB	WB	NB
Directions Served	TR	L	LTR
Maximum Queue (ft)	7	52	133
Average Queue (ft)	0	16	53
95th Queue (ft)	6	44	102
Link Distance (ft)	112		180
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: Pine Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	97	214	225	119	267	247	234	125	159	70
Average Queue (ft)	32	75	85	42	121	95	109	24	67	34
95th Queue (ft)	77	172	192	93	224	199	196	104	124	62
Link Distance (ft)		1554	1554		1220	1220	467		299	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			210				50		50
Storage Blk Time (%)		0			1		38		22	2
Queuing Penalty (veh)		0			0		28		18	2

Intersection: 15: Ivy Street & SE 2nd Avenue

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	97	147	70
Average Queue (ft)	45	15	8
95th Queue (ft)	83	80	39
Link Distance (ft)	923	367	195
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SE 2nd Avenue & FM Fuel Driveway

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	17	61	52
Average Queue (ft)	1	22	19
95th Queue (ft)	8	54	49
Link Distance (ft)	923	104	104
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S Locust Street & SE 2nd Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	77	34	23	22
Average Queue (ft)	30	10	1	1
95th Queue (ft)	61	36	11	9
Link Distance (ft)	92	263	428	180
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 78

Intersection: 11: Ivy Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	114	295	262	126	300	301	205	197	208	220
Average Queue (ft)	41	150	122	41	129	155	127	104	65	90
95th Queue (ft)	86	244	226	94	255	268	205	174	144	170
Link Distance (ft)		726	726		862	862	195	195	368	
Upstream Blk Time (%)							2	1	0	
Queuing Penalty (veh)							4	2	0	
Storage Bay Dist (ft)	100			90						215
Storage Blk Time (%)	1	17		1	13				0	0
Queuing Penalty (veh)	5	7		5	5				0	0

Intersection: 12: FM Fuel Driveway & Highway 99E (SE 1st Avenue)

Movement	WB
Directions Served	TR
Maximum Queue (ft)	8
Average Queue (ft)	0
95th Queue (ft)	6
Link Distance (ft)	112
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 13: S Locust Street & Highway 99E (SE 1st Avenue)

Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	70	178
Average Queue (ft)	18	65
95th Queue (ft)	50	132
Link Distance (ft)		180
Upstream Blk Time (%)		1
Queuing Penalty (veh)		1
Storage Bay Dist (ft)	100	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 14: Pine Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	81	215	256	124	233	235	229	125	179	104
Average Queue (ft)	25	65	78	43	122	99	106	27	78	38
95th Queue (ft)	61	163	188	95	211	200	197	110	144	75
Link Distance (ft)		1554	1554		1220	1220	467		299	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			210				50		50
Storage Blk Time (%)		0			0		35	0	28	2
Queuing Penalty (veh)		0			0		26	0	22	2

Intersection: 15: Ivy Street & SE 2nd Avenue

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	92	144	73
Average Queue (ft)	42	17	7
95th Queue (ft)	77	104	40
Link Distance (ft)	923	367	195
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SE 2nd Avenue & FM Fuel Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	19	4	67	50
Average Queue (ft)	1	0	29	19
95th Queue (ft)	13	3	57	49
Link Distance (ft)	923	92	104	104
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: S Locust Street & SE 2nd Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	87	39	52	17
Average Queue (ft)	35	8	4	1
95th Queue (ft)	70	33	26	11
Link Distance (ft)	92	263	428	180
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 80

Intersection: 11: Ivy Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	175	457	487	175	536	548	197	210	175	336
Average Queue (ft)	96	286	268	127	284	298	101	165	93	192
95th Queue (ft)	191	419	407	205	455	476	172	238	165	315
Link Distance (ft)		727	727		860	860	195	195	1170	1170
Upstream Blk Time (%)							1	11		
Queuing Penalty (veh)							2	21		
Storage Bay Dist (ft)	100			90						
Storage Blk Time (%)	5	38		24	35					
Queuing Penalty (veh)	25	32		99	42					

Intersection: 12: FM Fuel Driveway & Highway 99E (SE 1st Avenue)

Movement	SB
Directions Served	LTR
Maximum Queue (ft)	35
Average Queue (ft)	3
95th Queue (ft)	18
Link Distance (ft)	81
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 13: S Locust Street & Highway 99E (SE 1st Avenue)

Movement	EB	WB	WB	NB
Directions Served	TR	L	TR	LTR
Maximum Queue (ft)	4	67	2	112
Average Queue (ft)	0	24	0	40
95th Queue (ft)	3	56	1	83
Link Distance (ft)	99		1554	180
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: Pine Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	209	373	422	216	448	447	287	125	194	71
Average Queue (ft)	50	160	181	75	189	178	126	37	99	24
95th Queue (ft)	125	330	364	160	336	331	235	130	171	57
Link Distance (ft)		1554	1554		1220	1220	467		299	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			210				50		50
Storage Blk Time (%)	0	5			6		42	0	38	1
Queuing Penalty (veh)	0	3			5		37	0	16	2

Intersection: 15: Ivy Street & SE 2nd Avenue

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	137	300	102
Average Queue (ft)	49	49	12
95th Queue (ft)	95	190	58
Link Distance (ft)	923	367	195
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SE 2nd Avenue & FM Fuel Driveway

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 17: S Locust Street & SE 2nd Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	72	40	40	7
Average Queue (ft)	27	10	5	0
95th Queue (ft)	61	36	26	5
Link Distance (ft)	92	263	428	180
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 283

Intersection: 11: Ivy Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	174	633	662	175	531	557	199	214	227	449
Average Queue (ft)	98	320	307	138	311	324	107	182	112	192
95th Queue (ft)	191	531	527	208	489	501	190	244	190	360
Link Distance (ft)		727	727		860	860	195	195	1174	1174
Upstream Blk Time (%)		0	0				1	29		
Queuing Penalty (veh)		0	0				2	56		
Storage Bay Dist (ft)	100			90						
Storage Blk Time (%)	8	37		37	37					
Queuing Penalty (veh)	39	32		155	44					

Intersection: 12: FM Fuel Driveway & Highway 99E (SE 1st Avenue)

Movement	EB	WB	WB	WB	NB	NB	SB
Directions Served	TR	L	T	TR	LT	R	LTR
Maximum Queue (ft)	15	65	20	14	104	83	28
Average Queue (ft)	1	23	1	1	43	28	3
95th Queue (ft)	6	56	15	9	85	64	17
Link Distance (ft)	860		99	99	160	160	81
Upstream Blk Time (%)			0				
Queuing Penalty (veh)			0				
Storage Bay Dist (ft)		75					
Storage Blk Time (%)		1					
Queuing Penalty (veh)		3					

Intersection: 13: S Locust Street & Highway 99E (SE 1st Avenue)

Movement	WB	NB
Directions Served	L	LTR
Maximum Queue (ft)	79	166
Average Queue (ft)	26	57
95th Queue (ft)	60	129
Link Distance (ft)		180
Upstream Blk Time (%)		1
Queuing Penalty (veh)		1
Storage Bay Dist (ft)	100	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 14: Pine Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	194	359	380	156	370	358	326	125	223	70
Average Queue (ft)	57	150	170	71	188	168	135	42	98	28
95th Queue (ft)	129	314	340	135	311	300	249	139	179	60
Link Distance (ft)		1554	1554		1220	1220	467		299	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			210				50		50
Storage Blk Time (%)		4		0	6		45	0	33	1
Queuing Penalty (veh)		2		0	5		40	0	15	2

Intersection: 15: Ivy Street & SE 2nd Avenue

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	258	388	150
Average Queue (ft)	88	154	19
95th Queue (ft)	228	412	85
Link Distance (ft)	923	367	195
Upstream Blk Time (%)		9	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SE 2nd Avenue & FM Fuel Driveway

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	27	40	41
Average Queue (ft)	1	14	14
95th Queue (ft)	12	43	42
Link Distance (ft)	923	104	104
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S Locust Street & SE 2nd Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	68	34	35	26
Average Queue (ft)	33	11	3	1
95th Queue (ft)	60	37	20	12
Link Distance (ft)	92	263	428	180
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 396

Intersection: 11: Ivy Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	174	566	582	175	480	522	201	211	228	372
Average Queue (ft)	84	304	295	131	279	305	111	173	105	179
95th Queue (ft)	176	491	483	205	458	481	189	234	193	311
Link Distance (ft)		727	727		860	860	195	195	1172	1172
Upstream Blk Time (%)		0	0				2	17		
Queuing Penalty (veh)		0	0				4	34		
Storage Bay Dist (ft)	100			90						
Storage Blk Time (%)	6	37		28	36					
Queuing Penalty (veh)	30	32		117	43					

Intersection: 12: FM Fuel Driveway & Highway 99E (SE 1st Avenue)

Movement	EB	NB	SB
Directions Served	TR	R	LTR
Maximum Queue (ft)	20	79	27
Average Queue (ft)	1	29	2
95th Queue (ft)	11	63	15
Link Distance (ft)	860	160	81
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: S Locust Street & Highway 99E (SE 1st Avenue)

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LTR
Maximum Queue (ft)	11	121	37	188
Average Queue (ft)	1	45	1	102
95th Queue (ft)	11	95	27	195
Link Distance (ft)	112		1554	180
Upstream Blk Time (%)				13
Queuing Penalty (veh)				14
Storage Bay Dist (ft)		100		
Storage Blk Time (%)		1		
Queuing Penalty (veh)		6		

Intersection: 14: Pine Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	247	378	389	144	377	328	331	125	206	64
Average Queue (ft)	62	163	182	71	195	172	136	36	101	30
95th Queue (ft)	147	336	360	133	334	301	255	128	174	60
Link Distance (ft)		1554	1554		1220	1220	467		299	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			210				50		50
Storage Blk Time (%)	0	5			5		43		37	1
Queuing Penalty (veh)	2	3			4		38		17	2

Intersection: 15: Ivy Street & SE 2nd Avenue

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	253	321	115
Average Queue (ft)	70	77	12
95th Queue (ft)	175	259	62
Link Distance (ft)	923	367	195
Upstream Blk Time (%)		3	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SE 2nd Avenue & FM Fuel Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	28	9	74	73
Average Queue (ft)	2	0	31	23
95th Queue (ft)	16	6	65	56
Link Distance (ft)	923	92	104	104
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: S Locust Street & SE 2nd Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	123	44	58	14
Average Queue (ft)	47	11	11	0
95th Queue (ft)	99	38	42	7
Link Distance (ft)	92	263	428	180
Upstream Blk Time (%)	6			
Queuing Penalty (veh)	5			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 349

Intersection: 11: Ivy Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	175	618	607	175	532	537	207	212	214	402
Average Queue (ft)	93	317	313	124	292	309	108	181	109	206
95th Queue (ft)	188	521	532	204	470	490	189	241	184	354
Link Distance (ft)		727	727		862	862	195	195	1172	1172
Upstream Blk Time (%)		0	1				2	26		
Queuing Penalty (veh)		0	0				5	50		
Storage Bay Dist (ft)	100			90						
Storage Blk Time (%)	8	39		26	36					
Queuing Penalty (veh)	37	34		108	44					

Intersection: 12: FM Fuel Driveway & Highway 99E (SE 1st Avenue)

Movement	SB
Directions Served	LTR
Maximum Queue (ft)	34
Average Queue (ft)	2
95th Queue (ft)	16
Link Distance (ft)	81
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 13: S Locust Street & Highway 99E (SE 1st Avenue)

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LTR
Maximum Queue (ft)	14	117	35	193
Average Queue (ft)	0	48	1	136
95th Queue (ft)	7	95	25	228
Link Distance (ft)	112		1554	180
Upstream Blk Time (%)				25
Queuing Penalty (veh)				35
Storage Bay Dist (ft)		100		
Storage Blk Time (%)		1	0	
Queuing Penalty (veh)		5	0	

Intersection: 14: Pine Street & Highway 99E (SE 1st Avenue)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	142	366	365	212	427	395	347	125	208	71
Average Queue (ft)	44	145	167	70	200	175	141	46	100	26
95th Queue (ft)	105	296	325	154	349	322	250	144	172	59
Link Distance (ft)		1554	1554		1220	1220	467		299	
Upstream Blk Time (%)							0			
Queuing Penalty (veh)							0			
Storage Bay Dist (ft)	200			210				50		50
Storage Blk Time (%)		3			6		44	0	38	1
Queuing Penalty (veh)		2			5		39	0	18	2

Intersection: 15: Ivy Street & SE 2nd Avenue

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	341	386	143
Average Queue (ft)	115	122	15
95th Queue (ft)	347	348	79
Link Distance (ft)	923	367	195
Upstream Blk Time (%)		5	0
Queuing Penalty (veh)		0	1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 16: SE 2nd Avenue & FM Fuel Driveway

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	63	25	123	66
Average Queue (ft)	5	2	49	28
95th Queue (ft)	32	20	98	56
Link Distance (ft)	923	92	104	104
Upstream Blk Time (%)		0	5	0
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: S Locust Street & SE 2nd Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	162	40	104	47
Average Queue (ft)	67	8	20	3
95th Queue (ft)	135	33	74	28
Link Distance (ft)	92	263	428	180
Upstream Blk Time (%)	17			
Queuing Penalty (veh)	21			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

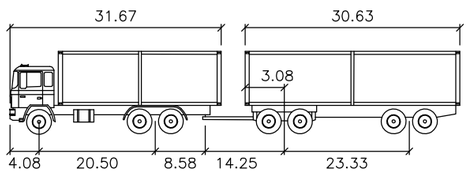
Network wide Queuing Penalty: 404

APPENDIX L
VEHICLE TURNING
PATHS

HIGHWAY 99E / SE 1ST AVENUE)

S LOCUST STREET

SE 2ND AVENUE



Fred Meyer Fuel Tanker

	feet		feet
First Part Width	: 8.53	Lock to Lock Time	: 6.0
Trailer Width	: 8.53	Steering Angle	: 47.7
First Part Track	: 8.53	Articulating Angle	: 70.0
Trailer Track	: 8.53		

SCALE: 1"=30'

TIA - MAY 16, 2012

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 208.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
FUEL DELIVERY TRUCK ENTERING AND EXITING AT HIGHWAY 99E

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

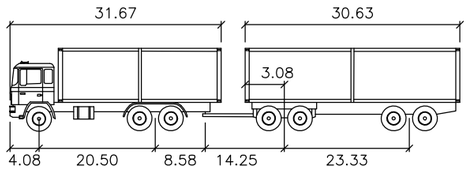
SHEET: A

JOB NO: 2120130.00

HIGHWAY 99E / SE 1ST AVENUE)

S LOCUST STREET

SE 2ND AVENUE



Fred Meyer Fuel Tanker

	feet		feet
First Part Width	: 8.53	Lock to Lock Time	: 6.0
Trailer Width	: 8.53	Steering Angle	: 47.7
First Part Track	: 8.53	Articulating Angle	: 70.0
Trailer Track	: 8.53		

SCALE: 1"=30'

TIA - MAY 16, 2012

212013000\TRAFFIC\FIGURES-TRUCK_TURNING.DWG: FuelTruck-2ndAve DAH 05/16/12 12:37 1:0.00

GROUP MACKENZIE
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Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

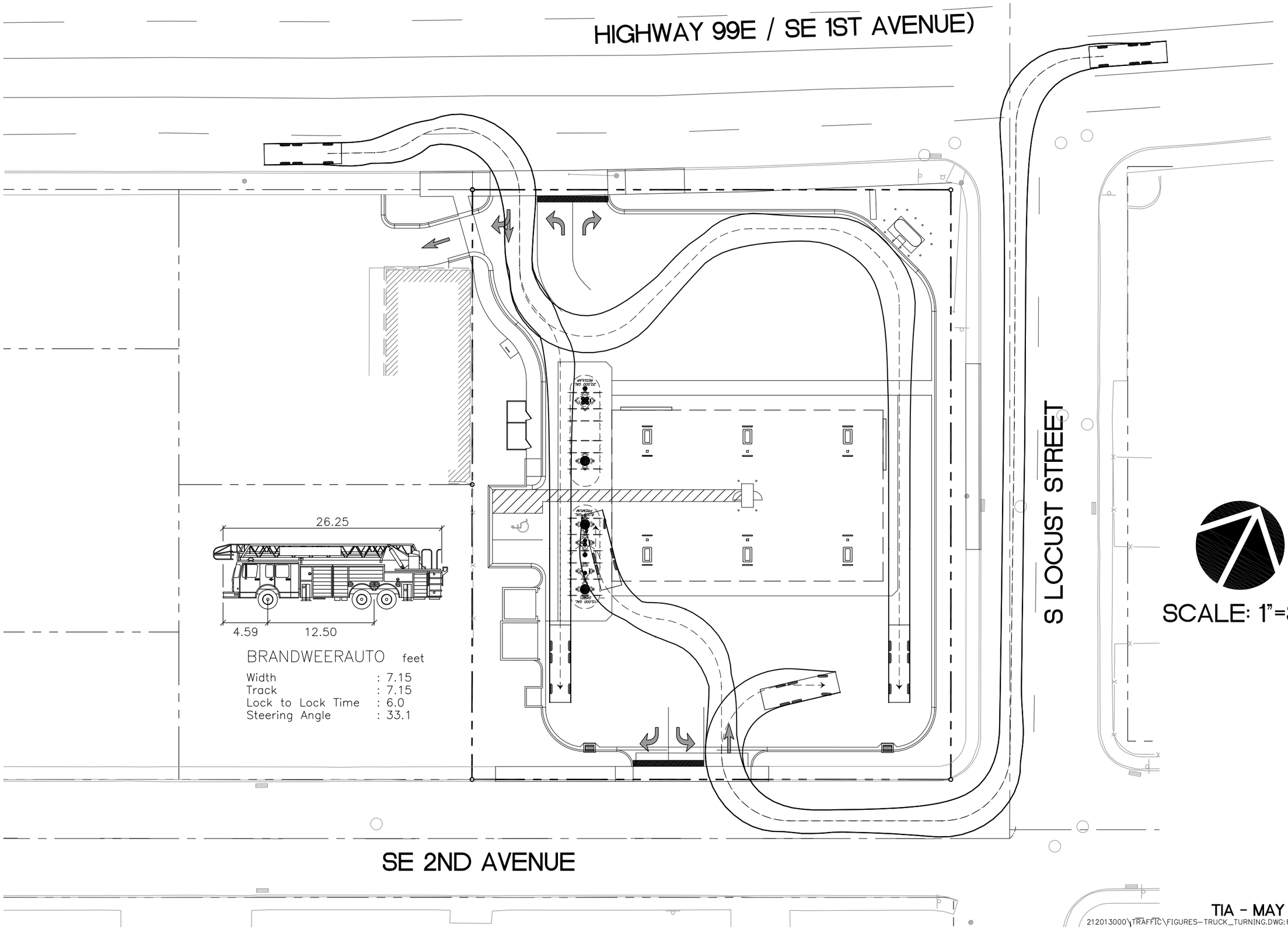
PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
FUEL DELIVERY TRUCK ENTERING AND EXITING AT SE 2ND AVENUE

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: B

JOB NO: 2120130.00



SCALE: 1"=30'

GROUP MACKENZIE
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Architecture
Interior Design
Land Use Planning
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Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

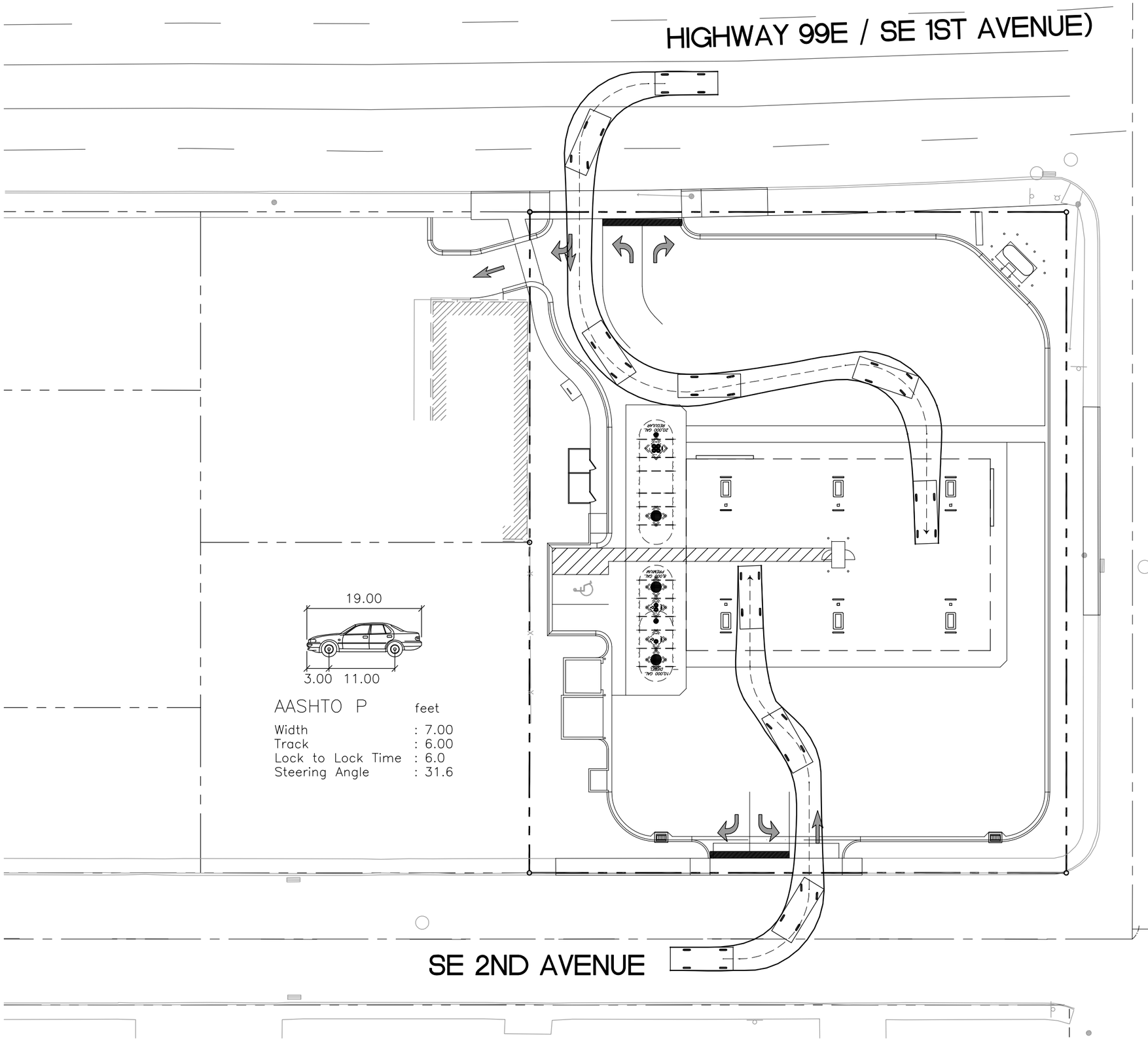
SHEET TITLE:
SAMPLE EMERGENCY VEHICLE (FIRE TRUCK) ROUTES

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: C

JOB NO: 2120130.00

TIA - MAY 16, 2012



SCALE: 1"=30'

GROUP MACKENZIE
Civil Engineering
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Transportation Planning
Landscape Architecture
Architecture
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CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

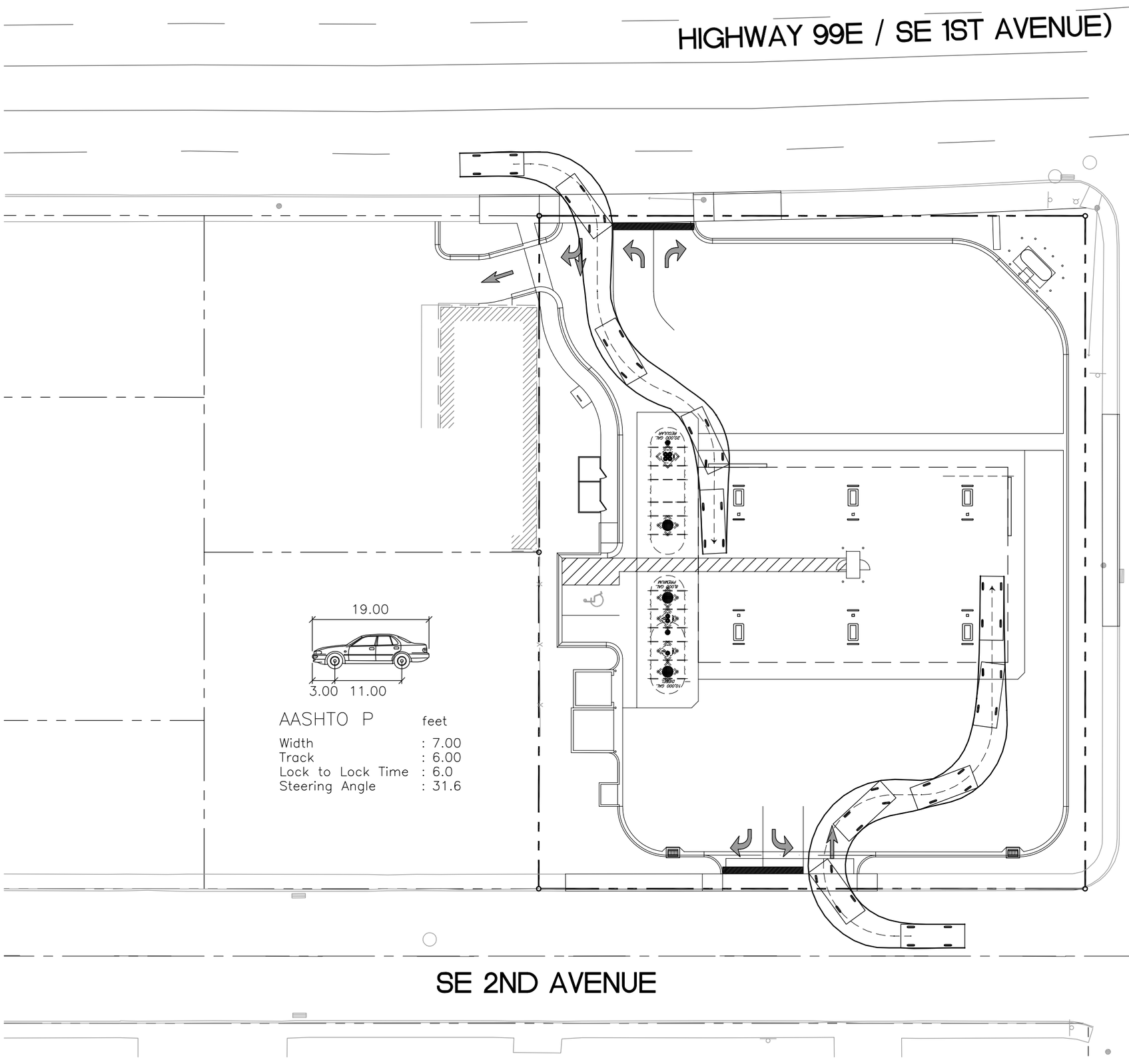
SHEET TITLE:
SAMPLE PASSENGER AUTO ROUTES - ENTERING LEFT TURNS

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: D

JOB NO: 2120130.00

TIA - MAY 16, 2012



SCALE: 1"=30'

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

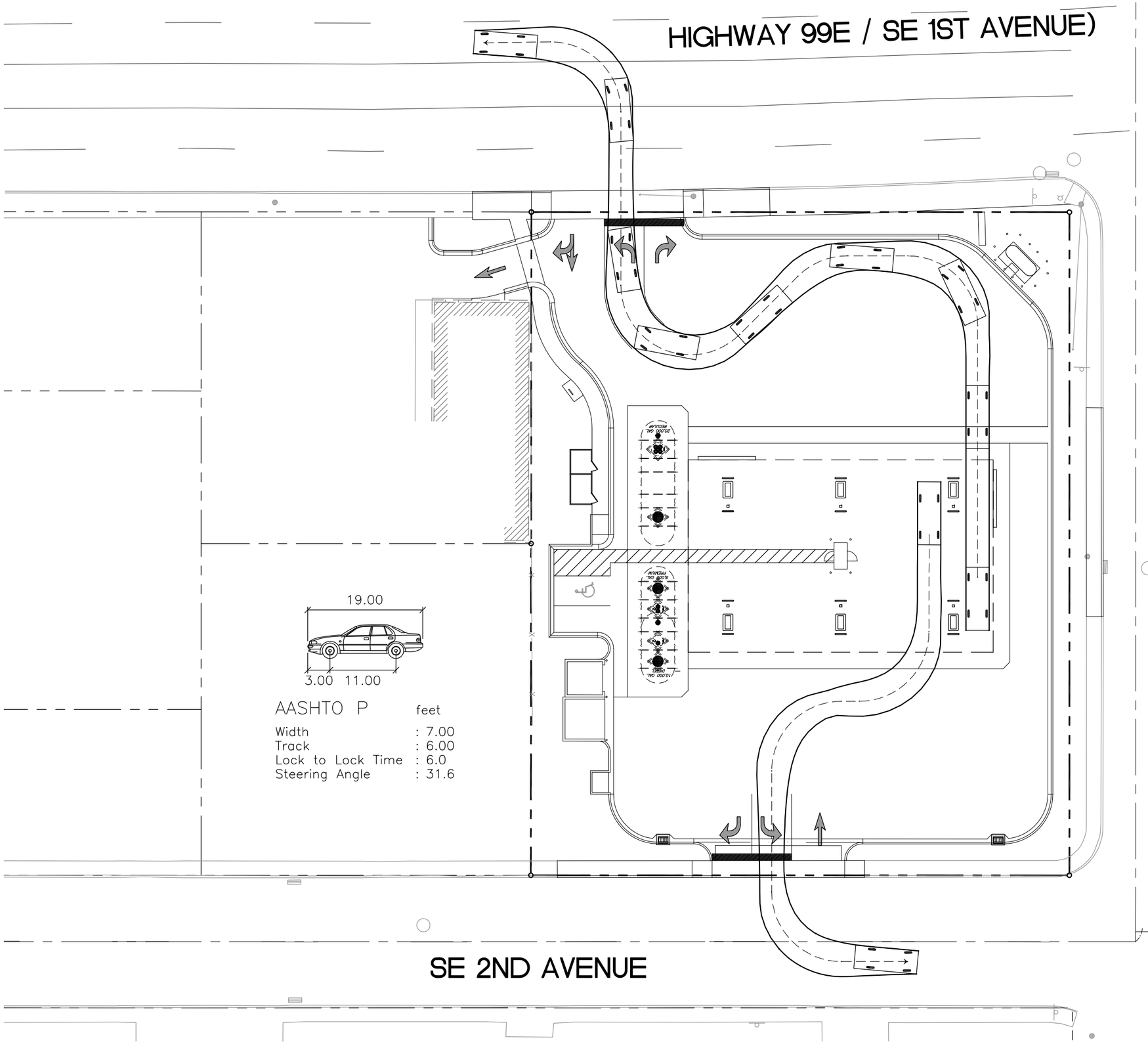
SHEET TITLE:
SAMPLE PASSENGER AUTO ROUTES - ENTERING RIGHT TURNS

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: E

JOB NO: 2120130.00

TIA - MAY 16, 2012



SCALE: 1"=30'

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
SAMPLE PASSENGER AUTO ROUTES - EXITING LEFT TURNS

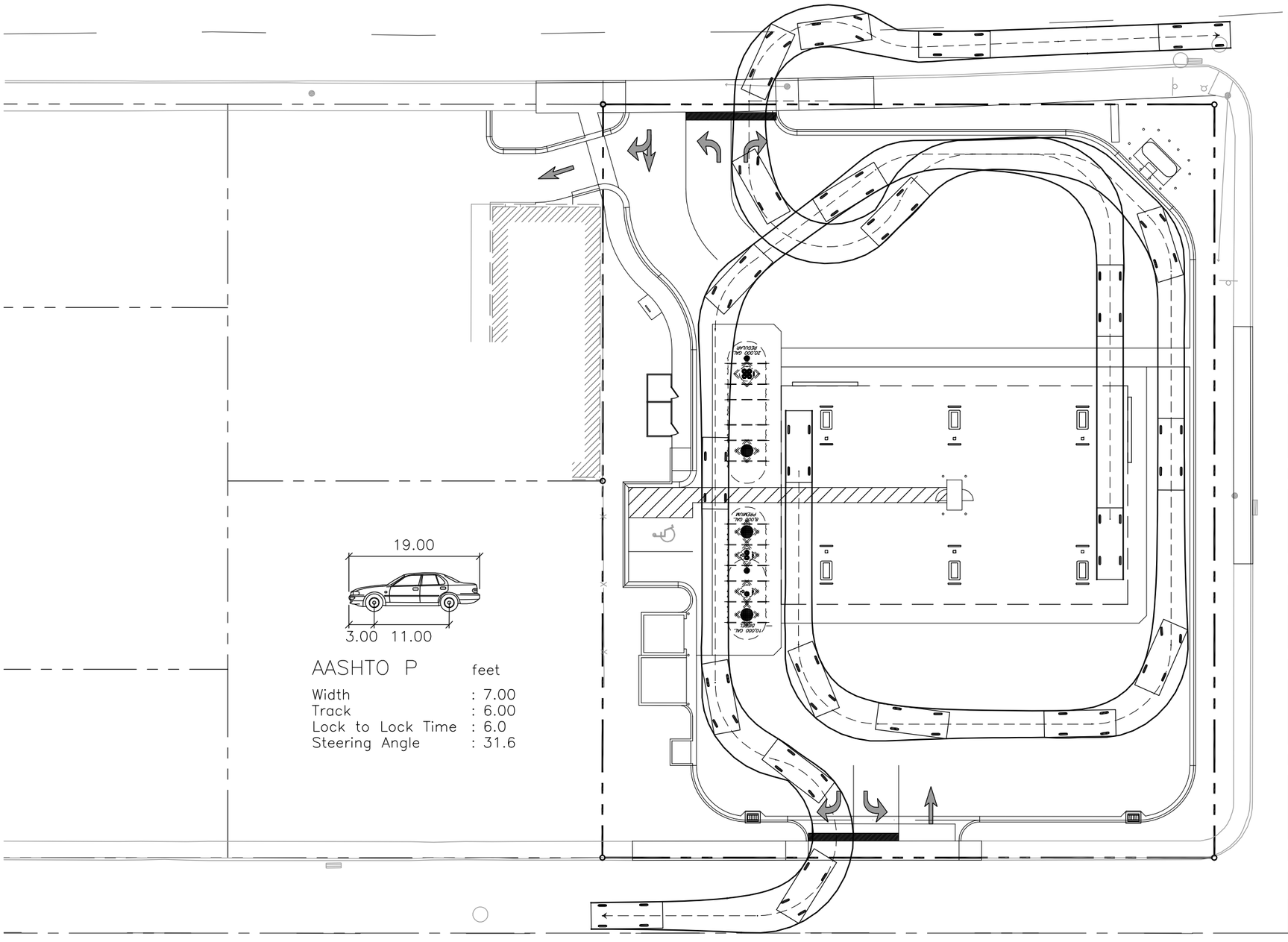
DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: F

JOB NO: 2120130.00

TIA - MAY 16, 2012

HIGHWAY 99E / SE 1ST AVENUE)



S LOCUST STREET

AASHTO P feet

Width	: 7.00
Track	: 6.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.6

SE 2ND AVENUE

SCALE: 1"=30'

TIA - MAY 16, 2012

212013000\TRAFFIC\FIGURES-TRUCK_TURNING.DWG:P-Exiting RT DAH 05/16/12 12:37 1:0.00

GROUP MACKENZIE
Civil Engineering
Structural Engineering
Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
FRED MEYER
3800 SE 22ND AVE.
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
SAMPLE PASSENGER AUTO ROUTES - EXITING RIGHT TURNS

DATE: 05.16.12
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: G

JOB NO: 2120130.00

APPENDIX M
CURB EXTENSION
SKETCH

SCALE: 1"=20'

TIA UPDATE - JUNE 25, 2013

GROUP MACKENZIE
Civil Engineering
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Transportation Planning
Landscape Architecture
Architecture
Interior Design
Land Use Planning
Portland OR 503.224.9560
Vancouver WA 360.695.7879
Seattle WA 206.749.9993

CLIENT:
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3800 SE 22ND AVE
PORTLAND, OR
97202

PROJECT:
CANBY FUEL FACILITY
391 SE 1ST AVE
CANBY, OR 97013

SHEET TITLE:
CURB EXTENSIONS AT SE 2ND AVE. / S. KNOTT ST INTERSECTION - CONCEPT SKETCH

DATE: 06.25.13
DRAWN BY: DAH
CHECKED BY: BTA

SHEET: H

JOB NO: 2120130.00

APPENDIX N
SCOPING

David Holt

From: David Holt
Sent: Friday, April 20, 2012 12:19 PM
To: 'abraham.tayar@odot.state.or.us'; 'brownb@ci.canby.or.us'; 'csm@dksassociates.com'
Cc: Brent Ahrend; Jim Coombes (james.coombes@fredmeyer.com); 'Jake Tate'
Subject: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions
Attachments: Canby 6MPD (Oregon 6) Option_Mar. 13 ,2012.pdf; Trip Gen Calcs - Sandy+Oak Grove.pdf; Select Zone Assignment.pdf

Good morning, Mr. Tayar, Mr. Brown, and Mr. Maciejewski,

We are preparing the transportation impact analysis (TIA) for the Fred Meyer Canby Fuel Facility project at 391 SE 1st Avenue, the southwest corner of the Highway 99E/S Locust Street intersection in Canby. The project proposes to provide 6 pumps (12 fueling positions) and an attendant's kiosk; a copy of the site plan is attached.

We've been asked to circulate this information so you may review the scope and assumptions of the TIA.

TRIP GENERATION

We conducted trip surveys at two existing Fred Meyer Fuel facilities (Sandy and Oak Grove) to estimate the average AM and PM trip generation rates for a fuel facility in Canby.

The facility in Sandy, Oregon (35885 Industrial Way, Sandy, OR 97055) was selected because

- Similar to Canby, it is located in a small urban area just outside the Portland Metro Area.
- It is located near a state highway that serves a high percentage of the area's trips.
- It's unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Sandy. The nearest Fred Meyer store is in Gresham (2497 SE Burnside Road), and this store also has a fuel facility.

The facility in Oak Grove, Oregon (13625 SE McLoughlin Boulevard, Oak Grove, OR 97222) was selected because

- It is located adjacent to a state highway – coincidentally the same highway (99E) that runs through Canby – that serves a high percentage of the area's trips.
- Similar to the Canby site, it is located approximately 0.6 miles away from the associated Fred Meyer store.
- It's unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Oak Grove. The nearest Fred Meyer stores are in Clackamas at 16301 SE 82nd Drive (near Highway 212/224) and in Happy Valley at 8955 SE 82nd Avenue (at Johnson Creek Boulevard). The existing fuel facility at the Johnson Creek store is likely more convenient for patrons of both these stores.

Similar to the Sandy and Oak Grove Fred Meyer Fuel locations, the Canby facility is not likely to see many trips by regular patrons of Fred Meyer stores other than the one in Canby. The nearest Fred Meyer stores are in Wilsonville (30300 SW Boones Ferry Road) and Oregon City (1839 Molalla Avenue), and both these stores have fuel facilities.

A copy of the trip generation calculations from surveys in Sandy and Oak Grove is attached. The average AM peak hour trip generation rate was found to be 11.96 trips per vehicle fueling position (VFP), and the average PM rate was 20.46 trips per VFP. The ITE AM rate of 12.16 is slightly higher, so we will use the ITE AM rate. The ITE PM rate of 13.87 is lower, so we will use the Fred Meyer surveyed rate to estimate the highest potential impact.

TRIP TYPES

Group Mackenzie recently conducted customer surveys at the Sandy and Gresham fuel facilities to determine the types of trips being made. We will apply the average rates determined from these surveys for the following trip types. A copy of the survey results is available upon request.

- Internal/Shared: 38% -- Sandy and Gresham fuel facilities are adjacent to the respective Fred Meyer stores and thus have shared or internal trips between the two operations. For the facility in Canby, "internal" trips will be assigned to travel along Highway 99E directly to/from the Canby Fred Meyer store (1401 SE 1st Avenue).

- Pass-By: 30% -- Pass-by trips will be drawn from existing volumes passing by the site on Highway 99E. Percentages will be based on the existing directional distributions.

- Diverted Linked: 20% -- Diverted linked trips will be drawn from existing volumes moving through the signalized Highway 99E intersection at Ivy Street but not already passing the site. Percentages will be based on the existing directional distributions.

- Primary: 12% -- Primary trips will be distributed according to the assignment model provided by DKS Associates, which is attached for reference.

STUDY SCOPE

The TIA will analyze AM and PM operations at the proposed site accesses:

- Access to Highway 99E
- Access to SE 2nd Avenue

The TIA will analyze AM and PM operations at the adjacent public street intersections:

- Highway 99E (SE 1st Avenue) / S Locust Street
- SE 2nd Avenue / S Locust Street

In addition, an Access Management Plan (AMP) compliant with City of Canby guidelines will be prepared to review conditions at the Highway 99E frontage and nearby existing accesses within 250 feet of the subject property. The AMP will address these potential access scenarios for the Fred Meyer Fuel site:

- No access to Highway 99E
- Restricted movement access to Highway 99E
- Shared access to Highway 99E via the existing development to the west
- Full access to Highway 99E

Please note the current proposed access condition is for full-movement access that consolidates one of the existing accesses for the adjacent development to the west. The proposed access would permit vehicles only to enter the adjacent site, not to exit.

EXISTING TRAFFIC COUNTS

Count data was collected April 4th at the existing study area intersections and at the nearby existing access locations. In accordance with ODOT standard procedures, Highway 99E traffic volumes will be increased by a seasonal adjustment factor, currently estimated at 9.2%, to approximate the existing design hour volumes.

ANALYSIS SCENARIOS

Per the March 29th memo from DKS to the City of Canby, existing volumes will not be increased by a growth factor, nor will any in-process trips be added, to estimate a future background growth scenario. Analysis will include the following scenarios:

- 2012 Existing Conditions (AM & PM)
- 2012 Post-Development Conditions (AM & PM) – which also will include the access alternatives discussed above

Please confirm the scope and analysis assumptions above are appropriate. Please contact Brent Ahrend or me with any questions or comments. Thank you for your time.

Sincerely,

David Holt, P.E.
Transportation/Civil Project Engineer

GROUP MACKENZIE
Architecture | Interior Design | Structural Engineering
Civil Engineering | Landscape Architecture | Land Use Planning | Transportation Planning

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601 Main Street
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David Holt

From: Bryan Brown [BrownB@ci.canby.or.us]
Sent: Friday, April 20, 2012 4:29 PM
To: David Holt; abraham.tayar@odot.state.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: RE: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

All:

I wanted you to all know I did a really quick review of the outlined scope and assumptions today, as I will be out Monday & Tuesday next week. It seems to follow the scope set out by DKS well and makes sense to me – as a none traffic analysis guy. I appreciated hearing of your current driveway proposal regarding 99E and seeing the revised site plan. I'll deferred to any technical comments that Mr. Tayar or Mr. Maciejewski may have. Thanks. Bryan

Bryan Brown
Planning Director
City of Canby
111 NW 2nd Avenue
Canby, OR 97013
Ph: 503-266-7001 ext: 202

From: David Holt [mailto:DHolt@grpmack.com]
Sent: Friday, April 20, 2012 12:19 PM
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David Holt

From: Chris Maciejewski [csm@dksassociates.com]
Sent: Tuesday, April 24, 2012 8:10 AM
To: David Holt
Cc: abraham.tayar@odot.state.or.us; brownb@ci.canby.or.us; Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: Re: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

Please do send the survey information you collected to determine the internal, pass-by, and diverted-linked information. My initial reaction is that diverted-linked trip reductions don't apply to this evaluation given the small study area (i.e., we are not evaluating a large enough network to include the intersections/links that the trips are diverting from). Also, I'm not sure that the internal reductions reasonably apply when the site is not adjacent to the Fred Meyer store...I'll think more about that as I review the survey information.

Thanks,

Chris

--

Christopher S. Maciejewski, P.E., PTOE
DKS *Associates*
TRANSPORTATION SOLUTIONS

720 SW Washington Street, Suite 500
Portland, Oregon 97205
Office: 503.243.3500 | Direct: 503.972.1231 | Mobile: 503.916.9610
csm@dksassociates.com
www.dksassociates.com

On Fri, Apr 20, 2012 at 12:18 PM, David Holt <DHolt@grpmack.com> wrote:

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TRIP GENERATION

David Holt

From: TAYAR Abraham * Avi [Abraham.TAYAR@odot.state.or.us]
Sent: Tuesday, April 24, 2012 4:53 PM
To: David Holt; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: RE: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

ODOT has concern regarding applying diverted and internal trip reductions for this development. ODOT suggests that the analysis follow ITE's Trip Generation Handbook with its recommendation for pass-by trip reduction for the proposed land use for the site.

Avi Tayar, P.E.
Development Review Team Leader
ODOT Region 1
503-731-8221

From: David Holt [mailto:DHolt@grpmack.com]
Sent: Friday, April 20, 2012 12:19 PM
To: TAYAR Abraham * Avi; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
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- It's unlikely many fuel trips are made by regular patrons of Fred Meyer stores other than the one in Oak Grove. The nearest Fred Meyer stores are in Clackamas at 16301 SE 82nd Drive (near Highway 212/224) and in Happy Valley at 8955 SE 82nd Avenue (at Johnson Creek Boulevard). The existing fuel facility at the Johnson Creek store is likely more convenient for patrons of both these stores.

David Holt

From: Brent Ahrend
Sent: Wednesday, April 25, 2012 4:29 PM
To: TAYAR Abraham * Avi; David Holt; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: james.coombes@fredmeyer.com; Jake Tate
Subject: RE: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

Avi & Chris,

Based on your comments, we will treat the diverted trips as primary (appropriate for this small study area).

We know from surveys at Fred Meyer fuel facilities, that many customers utilize their rewards card fuel discount at the same time they shop at the store. This shared trip is internal when the fuel is located adjacent to the store. In this case, with the fuel located about ½ mile away, we expect these shared trips will still occur, but will now be added to the adjacent streets (Hwy 99E). We propose this 38% of fuel trips be treated as primary trips traveling to and from the store.

The 32% primary trips (representing true primary and diverted link) will be assigned per the distribution from the modeling. For comparison, ITE estimates 42% pass-by for a stand-alone fuel facility.

Pass-by trips represent 30% of fuel trips and will be assigned based on the existing volumes on Hwy 99E

We trust this will address your concerns, and believe this best models the expected traffic conditions.

Thanks,

Brent

From: TAYAR Abraham * Avi [mailto:Abraham.TAYAR@odot.state.or.us]
Sent: Tuesday, April 24, 2012 4:53 PM
To: David Holt; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: RE: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

ODOT has concern regarding applying diverted and internal trip reductions for this development. ODOT suggests that the analysis follow ITE's Trip Generation Handbook with its recommendation for pass-by trip reduction for the proposed land use for the site.

Avi Tayar, P.E.
Development Review Team Leader
ODOT Region 1
503-731-8221

From: David Holt [mailto:DHolt@grpmack.com]
Sent: Friday, April 20, 2012 12:19 PM
To: TAYAR Abraham * Avi; brownb@ci.canby.or.us; csm@dksassociates.com
Cc: Brent Ahrend; james.coombes@fredmeyer.com; Jake Tate
Subject: Fred Meyer Canby Fuel Facility - Traffic Impact Study Assumptions

Good morning, Mr. Tayar, Mr. Brown, and Mr. Maciejewski,

DKS Associates
TRANSPORTATION SOLUTIONS

MEMORANDUM

DATE: March 29, 2012

TO: Bryan Brown, City of Canby

FROM: Chris Maciejewski, PE, PTOE

SUBJECT: **Canby Fred Meyer Fuel Station Traffic Impact Study (TIS) Scope**

P11010-015

This memorandum describes the scope of services to evaluate the transportation impacts associated with the proposed Fred Meyer Fuel Station in the City of Canby. This scope of services has been prepared through our on-call services contract and coordination with ODOT staff[1]. The proposed fuel station would consist of twelve fueling stations (6 fuel pumps), a 3,956 square foot covered canopy, a 176 square foot kiosk with bathroom, two underground storage tanks, three employee parking spaces, an air dispenser station, and a 1,000 gallon propone fuel station[2]. No convenience store will be provided.

The project site is located on the southwest corner of the intersection of Highway 99E (SE 1st Ave) and S Locus Street. Highway 99E is a state facility and is classified as a regional highway and state truck route[3]. Both S Locus Street and SE 2nd Avenue are classified as local City streets.

The site is made up of five property lots all of which are currently vacant. All lots are currently designated as Highway Commercial (HC) per the City's Comprehensive Plan and are zoned Highway Commercial (C-2). A service station is an outright permitted development based on the current zoning of the site; therefore no zone change would be required for the proposed application.

Scope of Services

Task 1: Existing Conditions Analysis/Data Collection

An existing conditions analysis will document the existing transportation conditions within the project study area. A description of the surrounding transportation network will be provided

[1] Phone conversation with Abraham Tayar, ODOT, March 14, 2012
[2] Fred Meyer Gas Station Pre-Application Meeting, February 28, 2012.
[3] 1999 Oregon Highway Plan, Appendix D: Highway Classification by Milepoint.

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including functional classification of roadways, roadway cross-sections, posted speed limits, and pedestrian/bicycle/transit facilities.

The study intersections will be reviewed to determine the existing geometry, traffic control, and operations during the peak hours. Existing intersection operating conditions will be analyzed to establish the current peak hour performance. The critical peak periods for this evaluation will be the weekday morning (7:00 to 9:00 am) and evening (4:00 to 6:00 pm). These are the times during a typical weekday when the study area street system would be expected to experience the highest vehicle volumes. DKS will collect vehicle turn movement counts at the study area intersections during each of the identified peak periods.

The study area intersections include the following:

- Highway 99E/S Locust Street
- S Locust Street/SE 2nd Avenue
- Onsite and Offsite study intersections (see Access Management Plan)

Furthermore, collision records at study intersections will be reviewed and summarized in a table.

Preliminary trip generation and distribution estimates indicate that trip levels would not trigger analysis to be conducted at any other intersections based on the City's and ODOT's intersection analysis evaluation guidelines. In addition, it does not appear that a Neighborhood Through-Trip Study would be required[4].

Task 2: Project Trip Generation/Trip Distribution

The amount of new vehicle trips generated by the proposed fuel station to the site will be estimated using traffic counts collected by DKS at one similar land use within the surrounding area. DKS will collect traffic counts (entering/exiting volume) during the critical peak morning (7:00 to 9:00 am) and evening (4:00 to 6:00 pm) periods. The counts collected will be compared to trip generation estimates published in the ITE Trip Generation Manual for similar land use type[5]. The greater trip generation estimate will be used for analysis to evaluate worst case impacts. Trip generation estimates will be provided for daily, morning, and evening peak hour periods. The project trip generation estimate will be summarized in a table, including pass-by trip reductions.

The distribution of site vehicle traffic will be based on the existing travel patterns as determined by traffic counts at surrounding intersections, the City of Canby Travel Forecast Tool, and input from the project team. The project trip distribution will be shown on a study area figure.

[4] City of Canby Transportation System Plan, Chapter 10: Implementation Plan, December 2010
[5] Trip Generation Manual, Institute of Transportation Engineers, 8th Edition.

Task 3: Traffic Impact Analysis

A transportation impact analysis for the proposed project will be conducted in accordance to the City's requirements[6]. The new vehicle trips generated by the proposed project will be added onto the existing traffic volumes to identify the expected traffic operating conditions once the project is built and fully operational. The traffic conditions will be evaluated at the same study intersections as was considered in the Existing Conditions analysis. At this time, there are no significant approved but un-built projects in the study area, so a future background growth scenario will not be evaluated.

Street facilities and intersections that are shown to fall below the minimum acceptable operating thresholds will be identified for possible mitigation measures. Typical mitigation measures can include traffic control strategies, access management plans, intersection widening for turn lanes, and roadway widening. Transportation performance criteria will consider City of Canby and ODOT standards, where applicable.

Task 4: Site Access and Circulation Review

The forecasted site traffic accessing the public road system via the sites access will be evaluated for performance and safety. DKS will collect video recordings during the critical peak morning (7:00 to 9:00 am) and evening (4:00 to 6:00 pm) periods at a similar land use site to assist with estimating vehicle stacking within the proposed site. The video recordings will take place simultaneously with the traffic counts collected as part of Task 2.

Internal circulation routes will be examined using the AutoTURN™ turn simulation software to determine adequacy for serving fuel delivery vehicles, emergency vehicles, and motor vehicle traffic. In addition, site access for non-auto modes of travel (pedestrians and bicyclists) will be evaluated for connectivity to the surrounding transportation system. Any inadequacies discovered during the evaluation will be identified and mitigation measures will be recommended, as needed.

Sight distance will be verified at all site access locations and vision triangles will be checked to ensure that they are clear from any obstructions.

Task 5: Access Management Plan

The preliminary site plan indicates two proposed full accesses to the site. One is located along Highway 99E and the other along SE 2nd Avenue. Proposed access locations will be compared to both ODOT and the City's access spacing requirements. Preliminary review of the proposed site plan reveals that the City's access spacing standards would not be able to be met based on the close proximately of adjacent intersections (S Locust Street). The City's standard requires that accesses be located at least 330 feet away from any street intersection; therefore an access management plan

[6] City of Canby Transportation System Plan, Chapter 10: Implementation Plan, December 2010.

will be prepared per the City's requirements to assess the potential impacts of the proposed access locations[7]. At a minimum the access management plan will include:

- The minimum study area shall include the length of the site's frontage plus 250 feet measured from each property line or access point(s), whichever is greater.
- The potential safety and operational problems associated with the proposed access point. The access management plan shall review both existing and future access for all properties within the study area as defined above.
- A comparison of all alternatives examined. At a minimum, the access management plan shall evaluate the proposed modification to the access spacing standard and the impacts of a plan utilizing the City standard for access spacing. Specifically, the access management plan shall identify any impacts on the operations and/or safety of the various alternatives.
- A list of improvements and recommendations necessary to implement the proposed access modification, specifically addressing all safety and operational concerns identified.
- References to standards or publications used to prepare the access management plan.

The access management plan will examine access alternatives such as the relocation of proposed access locations and the potential for shared use with adjacent accesses (property to the west). The plan will include the following alternative scenarios:

- No Access to Highway 99E
- Shared access to Highway 99E with the development to the west
- Restricted movement access to Highway 99E
- Full Access to Highway 99E

Based on the preliminary access management plan study area, approximately seven access points along Highway 99E and one additional intersection (Highway 99E/S Knott Street) would need to analyzed. DKS will collect traffic counts at these locations during the critical peak morning (7:00 to 9:00 am) and evening (4:00 to 6:00 pm) periods. These counts will be collected in conjunction with those identified in Task 1.

Task 6: Documentation

The findings and recommendations of this traffic impact analysis will be presented in a Draft Report that will be submitted to the City and ODOT (one electronic copy). The report will document data collection, analysis procedure, results, and mitigation measures for the proposed project traffic if necessary. A technical appendix supporting calculations will accompany the report. After the City

[7] City of Canby Transportation System Plan, Chapter 10: Implementation Plan, December 2010.

and ODOT have reviewed the Draft Report, we will make appropriate edits and submit a revised Draft Report. Once comments are received, DKS will make appropriate edits and submit a Final Report (one electronic copy).

Task 7: Meetings

The DKS project manager will attend up to one (1) coordination meeting or hearing as part of this project. Additional meetings as directed by the City will be provided for an additional fee on a time and expenses basis.

Budget

The level of effort for these tasks is up to 130 hours in addition to data collection efforts. Therefore, including expenses, our fee estimate for this effort is $17,000.

If the applicant chooses to utilize another consultant to complete this task, our assistance with forecasting (using the Canby TSP Travel Forecast Tool) and review with written response of the applicant's TIS would be approximately $1,500.

If you have any questions, please feel free to call or email.

M E M O R A N D U M

TO: ***Jake Tate, PE, Project Engineer***

RE: ***Pre-Application Conference for Site and Design Review (Clackamas County Assessor Tax Lot No's: 100, 200, 300, 2200,& 2300 of Tax Map 3-1E33DC at 351, 369, & 391 SE 1st Ave and 360, & 392 SE 2nd Ave).***

FROM: ***Bryan Brown, Planning Director***

DATE: ***February 28, 2011***

APPLICANT:
James Coombes
503-797-3539
3800 SE 22nd Ave, Portland, OR 97202
james.coombes@fredmeyer.com

PREVIOUS FILE NO.:
N/A Vacant

OWNER:
Oliver Lang LLC
PO Box 353
Canby, Oregon 97013
503-266-2715

STAFF:
Bryan Brown
Planning Director

LEGAL DESCRIPTION:
Lots 1, 2, 3, 12, 13, 14 of Albert Lee's Second Addition to the City of Canby, Clackamas County Oregon

DATE OF REPORT:
February 28, 2012

LOCATION:
Southwest Corner of the Intersection of Hwy 99E & S Locust Street – Canby, Oregon

COMP. PLAN DESIGNATION:
Highway Commercial – HC

ZONING DESIGNATION:
Highway Commercial – C-2; Core Commercial (CC) sub area of the Downtown Canby Overlay Zone (DCO).

Proposal: Construct a Six Pump fuel station with an approximate 3,956 square foot covered canopy, attendant 176 square foot kiosk w/bathroom, 2 – proposed access driveways (new) – one from highway and one on 2nd Avenue, 2 underground gasoline

storage tanks, 3 employee parking spaces, an air dispenser station, and a 1,000 gallon propane fuel station.

The project is proposed to be constructed on a 32,560 sq. ft. tract of land abutting Highway 99E in Canby, Oregon. The parcel is currently zoned Highway Commercial (C-2) with a Canby Downtown Overlay district. The parcel is currently owned by Oliver Lang LLC.

Site Development Comments and Issues to Address:

1. We would expect an increase in impact on most City services since the property is currently vacant.
2. Use of sanitary sewer is evident and service connection point should be confirmed with Canby publics works and/or City Engineer.
3. Use of domestic water needs is evident – but minimal for restroom. Service connection should be confirmed with Canby Utility.
4. Evaluation of nearest existing fire hydrant should be determined for fire suppression requirements and whether it is adequately located or whether installation of additional hydrants may be needed.
5. Interior Fire Sprinkler suppression system is NOT likely to be needed for a fuel canopy and one man employee kiosk?
6. Electrical Service needs for the lot must be determined
   - 3 phase - ?
   - Service amps total?
7. Use of Natural Gas Service should be determined and is it available?
8. Will Existing Phone/Cable Service be needed and is it available? Or modify as necessary
9. Storm water runoff must be controlled onsite through either approved existing DEQ registered injection drywell sites or on-site swale/detention facilities as determined through a storm water pre-and post-development drainage analysis.
10. Driveway access to existing property is generally allowed, but coordination with the City & ODOT is very important since a new proposed driveway is involved onto a State Hwy 99E. Driveway separation distance from the Locust Street intersection will likely need to be as far away as possible – with a shared driveway with a neighboring property if possible.
11. Garbage facility needs must be determined, shown on the site plan, and confirmed with Canby disposal as suitable for access and pickup.
12. US Mail service means should be determined and shared with staff.
13. A Traffic Scoping and likely Traffic Impact Study must be completed prior to submittal of your land use application. Increased traffic loads to 99E must be evaluated along with impacts to one or more nearby intersections and site circulation functionality by a registered Transportation engineer.
14. On-site parking needs are minimal based on enclosed kiosk building square footage – presumably the 1 space per 550 square feet indicated by the "all other uses" category in CMC Table 16.10.050.

15. Vision Triangles. Your project must comply with vision triangle requirements at the street intersection and where your driveways intersect with a public street. They are measured along the curb 30 feet in either direction at the street intersection and 15 feet at the driveways. No obstruction is allowed within the vision clearance areas that exceed 30 inches in height. The masonry wall is likely within the designated vision clearance area and would need to be lowered.
16. Pylon Sign. Assuming that you take staff's recommendation to process a Text Amendment to secure approval of your project, your property would be placed in the Outer Highway Subarea of the Downtown Canby Overlay making it subject to Table 3 of the Sign Ordinance. Pole signs are allowed a maximum sign area of 48 square feet per side, and 18 feet in height. The current Core Commercial Subarea only allows a pole sign of 12 feet in height.
17. Access Management Guidelines. The applicable access limitations indicated in CMC 16.46.30 require a minimum driveway separation – measured centerline to centerline – of 330 feet for a proposed driveway onto an arterial street and 10 feet of separation onto a local street. The minimum spacing of a proposed driveway to a street is also 330 feet on an arterial street and 50 feet on a local street.
18. Engineered Traffic Study/Access Management Plan Evaluation shall be submitted through a variance of access spacing policies request when access to a lower classification facility (street) is not feasible. That appears to be the case in your proposed project. The City may allow a driveway not meeting spacing requirements with use of restricted turning movements. Consideration of a joint or shared driveway use must be explored if you do not meet access spacing standards. These do not necessarily need to meet all spacing standards. The city, with ODOT's approval, may waive or modify the joint access requirements if shown to be impractical.
19. Gateway Corridor Plan Compliance. Staff wants you to be aware that the City is currently in the process of completing and working toward the adoption of a 99E Gateway Corridor Plan which may have design considerations which would be applicable to your project. They relate primarily to the sidewalk widths and/or their joint use by bicycles and in some limited instances the need for minor right-of-way dedication to accomplish the vision of the Plan that is likely to be adopted. The exact standards are unknown at this time.

Existing Conditions: The property is currently vacant. The subject development site is a 32,560 sq. ft. in size with potential access to 3 public streets – Hwy 99 E, Locust Street, and SE 2nd Avenue. The site plan indicates two-way access from lot on the South side of Highway 99E between Ivy and Grant Streets. Commercial development exists on the adjacent lot to the west.

Application(s) to Submit: To complete your necessary land use approval for this development project you will need to submit the following:

1. Text Amendment (application fee is $2880); needed to adequately justify conformance with Downtown Canby Overlay design standards by altering the DCO subarea boundary so as to remove this property from the Core Commercial Subarea (CC) and thus adding it to the Outer Highway Commercial Subarea (OHC). I believe staff can and will support such an amendment, but you need to adequately justify making the request to the Planning Commission – as staff does not believe it is appropriate for us to serve as your direct advocate in this request. Staff believes your application will be very weak and difficult to justify conformance with the intent of the purpose and design review criteria within the Core Commercial Subarea.
2. Site and Design Review Type III (application fee currently $1,750 for a 0.75 acre site); application reviewed by the Planning Commission at an advertised public hearing with notice to property owners and residents within a 500 foot radius prepared by the applicant and mailed out by city staff 20 days prior to the hearing date. The process is described in Canby's Municipal Code for Type III applications 16.89.040. The application packet is online. Application must be signed by the property owner.
3. Replat/Existing Platted Lot/Tax Lot Consolidation with possible Final Plat. You do not want to be in the position of risking a building permit denial based on building a structure over an existing property or tax lot line. You need to abandon the existing lot arrangement in favor of a single tract. You will need to contact the County surveyor to obtain advice about the necessary procedure. The City is likely to only be involved should a Final Plat be necessary to implement the lot consolidation. The Final Plat review by the City is ministerial and the cost is $100.

Process: There is a use approval issue with a fuel station at this location due to the Downtown Overlay District and its applicable development standards and site and design review guidelines. The primary use concern arises from the designated Core Commercial Subarea of the Downtown Overlay District in which the property is located. The Downtown Canby Framework Diagram (Figure 7) indicates the boundaries of the three sub-areas and are further described in CMC 16.41.020(A)(1-3). It is planning staff's professional opinion that placing a fuel station within the Core Commercial subarea will pose significant problems in adequately demonstrating compliance with the intent and actual design guidelines. Therefore, staff would suggest that the applicant consider submitting a Development Code Text Amendment to modify Figure 11 and associated explanatory paragraphs in order to modify the boundary between the Core Commercial Subarea and the Outer Highway Commercial Subarea in order to move the property into the more suitable Outer Highway Commercial Subarea. Within this overlay subarea the use may be embraced and compliance or lack thereof with the applicable design guidelines more easily demonstrated.

It is evident to planning staff, that you should consider filing a Site and Design Review Type III application due to the potential inability to specifically meet <u>all</u> development standards. This public hearing process, will allow the applicant to propose the use of alternative methods to meet the intent of the standards for the unique use proposed.

The Site and Design Type II (DR) process is a "quasi-judicial" process which is considered through a public hearing with a decision made by the Planning Commission. This application requires notice to property owners and residents within a 500 foot radius from the outside boundary of the property limits; a neighborhood meeting is required prior to submittal of your application to share the project and garner any possible suggestions for its design. The Type III review process is described in further detail in Canby Municipal Code (CMC) 16.89.050. If appealed, the decision is heard by the City Council.

The DR application form is on the City's website:
http://www.ci.canby.or.us/Departments/communitydev&plan/forms.htm

Zoning: The lot has an underlying Highway Commercial (C-2) zone with an overlay of the Canby Downtown Overlay (DCO) and is within the Core Commercial (CC) subarea. The proposed use is clearly permitted outright within the underlying C-2 zone but as mentioned above, poses problems within the CC subarea of the Canby Downtown Overlay since the intent and development standards of the DCO and CC subarea supersede the base zone standards.

Validity: The information in this Pre-application conference is valid for one year. The Planning Commission's decision is generally valid for one year.

Zoning Standards Applicable to this Application

The following goals, policies, standards and criteria apply and should be addressed either written and/or graphically in the applicant's Text Amendment and Site and Design Review application narrative and/or plans. Without applicant-supplied information, there may be insufficient information to review the application and it could be deemed incomplete causing processing delay.

Applicable Canby Municipal Code Chapters

16.10	Off Street Parking
16.22	C-2 Highway Commercial Zone
16.41	Downtown Canby Overlay Zone
16.43	Outdoor Lighting Standards
16.46.30	Access Management Guidelines for City Streets
16.49	Site and Design Review
16.89.050	Application and Review Procedures Type III Decision

16.10 Off Street Parking

Proposed standard: A fuel station is not a listed use, therefore the applicable parking standard is (All Others: 1.00 spaces per 500 square feet). This appears to imply a

minimum of 1 parking space based on enclosed building area. Practical needs will prevail. The standard is met as proposed. Joint parking or parking reductions are not proposed and are not needed to meet the standard, however a joint parking agreement would not be opposed if planned.

16.28 C-2 Highway Commercial Zone

The DCO is the superseding development Chapter for this proposal. According to this CMC 16.41.030: *Unless modified pursuant to the following Subsection, uses permitted outright in the underlying base zones are permitted outright in the DCO zone, subject to the respective zone district boundaries.... Uses permitted in the C-2 zone are permitted in the DCO zone,*

The base zone, the C-2 is a "stackable" zone in respect to use provisions. Per CMC 16.28.010.A, uses permitted outright in the C-2 Zone includes a fuel station.

All other development standards are contained in the DCO.

16.49.035 Application for Site and Design Review

A. *For projects in the Downtown Canby Overlay Zone, applicants may choose one of the following two processes. Your proposal appears to need the Type III process:*

1. *Type II - If the applicant meets all applicable site and design review standards set forth in Chapters 16.41 and 16.49, applicant shall submit a Type II application for approval pursuant to the approval criteria set forth in 16.49.040.5; or*

2. *Type III - If the applicant proposes the use of alternative methods or materials to meet the intent of the site and design review standards set forth in Section 16.41.070, the applicant shall submit a Type III application for approval pursuant to the approval criteria set forth in 16.49.040.6. The applicant must still meet all applicable requirements of Chapter 16.49.*

16.41 Downtown Overlay Zone

16.41.050 Development standards (selection of primary; others apply)

- Street Setback for OHC Subarea: 10' max. 0' min. other.
- At least 40% of the length of each lot frontage shall be developed with a building(s) built at the minimum setback from the street lot line for the OHC Subarea – more for the CC Subarea.
- FAR: 0.25 for OHC

16.41.060.B.2.A DCO Site And Design Review Guidelines

Existing Core Commercial Sub-Area (CC). The inner highway portion of the Core Commercial area spans the length of Highway 99E between Elm and Locust. In many ways, it serves as an extension of the Downtown Core, just across the highway. Because this area serves as a "gateway" from Highway 99E into the traditional downtown and serves many of the same purposes and types of uses, buildings here should be appropriately scaled, inviting to pedestrians, and demonstrate high-quality architectural design. As a result, architectural standards for this area and the downtown are identical, although some development standards differ as described in section 16.41.050. Staff believes that modification of the subarea boundary would not be particularly detrimental to the objectives of the Downtown Canby Overlay. Changing subarea would also eliminate the parking lot location standards.

16.41.070 DCO Site And Design Review Standards

Refer to the Applicable Subarea design criteria dealing with:
Visible transmittance.
Building Entries and doors Orientation
Transparency
Additional architectural standards/elements Bays, awnings, etc.
Rooftop structures
Parking
Parking and Maneuvering Landscaping
Overall Site Landscaping

16.43 Outdoor Lighting Standards

Planning Comment: See Appendix A. This is in designated Lighting Zone Two (LZ 2). Applicant must submit a photometric plan.

Appendix A
Chapter 16.43
OUTDOOR LIGHTING STANDARDS

Sections:

16.43.010 Purpose.

The purpose of this section is to provide regulations for outdoor lighting that will:

A. Regulate uses of outdoor lighting for nighttime safety, utility, security, productivity, enjoyment and commerce.

B. Minimize glare, particularly in and around public rights-of-way.

C. Minimize light trespass, so that each owner of property does not cause unreasonable light spillover to other property.

D. Preserve the night sky for astronomy and enjoyment.

E. Conserve energy and resources to the greatest extent possible.

16.43.020 Definitions

The following words, phrases and terms as used in this chapter shall have the following meaning:

A. Artificial Sky Glow. The brightening of the night sky attributable to man made sources of light.

B. Candela. The unit of luminous intensity of a lighting source emitted in a given direction.

C. Curfew. A time each night after which certain electric illumination must be turned off or reduced in intensity.

D. Glare. Light that causes visual discomfort, annoyance or disability, or a loss of visual performance.

E. Landscape Lighting. Luminaires mounted in or at grade (not to exceed 3 feet above grade) and used solely for landscape rather than area lighting, or fully shielded luminaires mounted in trees and used solely for landscape or Facade lighting.

F. Light Trespass. Light flowing across the property boundary. See Figure 16.43.1 for illustration.

G. Lumen. The unit of luminous flux: a measure of the amount of light emitted by a lamp.

H. Luminaire. A complete lighting unit consisting of one or more electric lamps, the lamp holder or holders, reflector, lens, diffuser, ballast, and/or other components and accessories.

I. Luminous Flux. A measure of the total light output from a source, the unit being the lumen.

J. Mounting Height. The vertical distance between the lowest part of the luminaire and the ground surface directly below the luminaire. See Figure 16.43.2 for illustration.

K. Photometric Test Report. A report by an independent testing laboratory or one certified by the National Institute of Standards and Technology (NIST) describing the candela distribution, shielding type, luminance, and other optical characteristics of a specific luminaire.

L. External Point of Service. An outdoor service which a business provides some service to a customer, such as drive up food service, a bank transaction, or the like

M. Shielding. A device or technique for controlling the distribution of light. Four levels of shielding are defined as follows:

1. Fully Shielded. A luminaire emitting no luminous flux above the horizontal plane;

2. Shielded. A luminaire emitting less than 2.0 percent of its luminous flux above the horizontal plane;

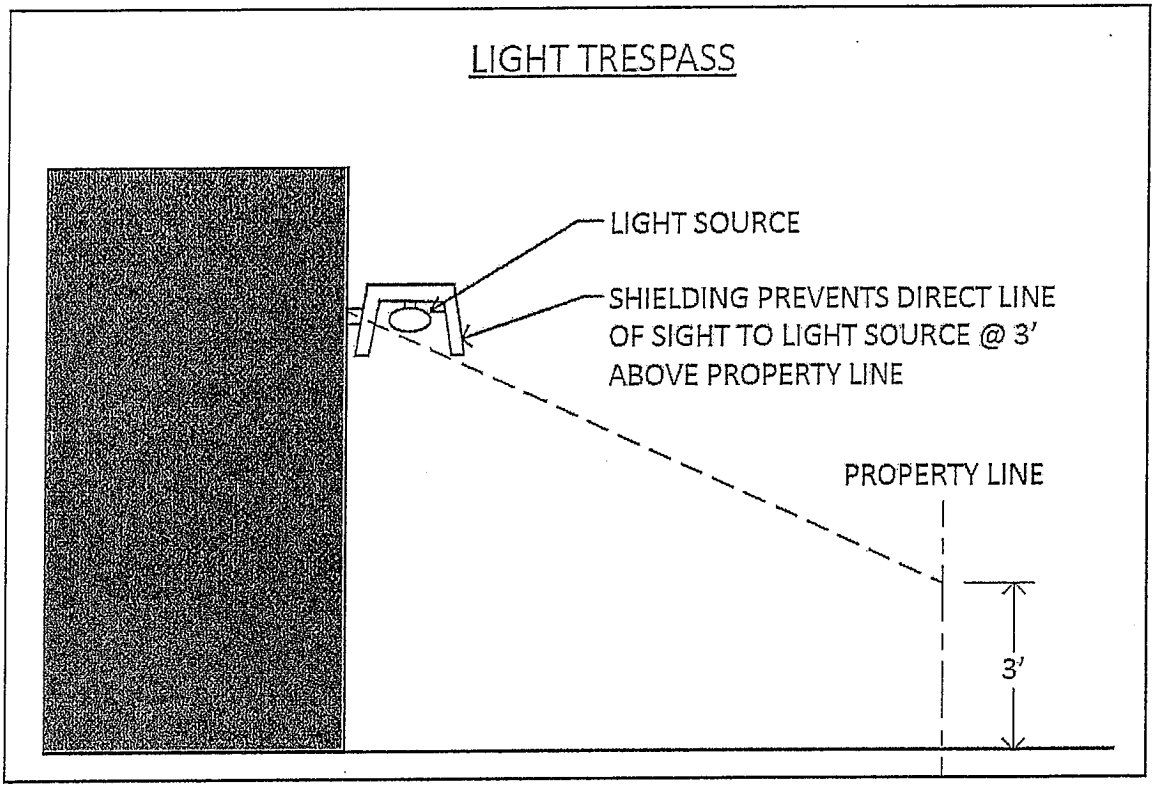
3. Partly Shielded. A luminaire emitting less than 10 percent of its luminous flux above the horizontal plane;

4. Unshielded. A luminaire that may emit its flux in any direction.

N. Spill Light. Lighting from a lighting installation that falls outside of the boundaries of the property on which the installation is sited.

O. Temporary Lighting. Lighting installed with temporary wiring and operated for less than 60 days in any calendar year.

Figure 16.43.1: Light Trespass



16.43.030 Applicability.

The outdoor lighting standards in this section apply to the following:

A. New uses, buildings, and major additions or modifications:

1. For all proposed new land uses, developments, buildings, and structures that require a building permit, all outdoor lighting fixtures shall meet the requirements of this Code.

2. All building additions or modifications of fifty (50) percent or greater in terms of additional dwelling units, gross floor area, or parking spaces, either with a single addition or cumulative additions subsequent to the effective date of this provision, shall invoke the requirements of this Code for the entire property, including previously installed and any new outdoor lighting.

B. Minor additions. Additions or modifications of less than fifty (50) percent to existing uses, as defined in Section A(2) above, and that require a building permit, shall require the submission of a complete inventory and site plan detailing all existing and any proposed new outdoor lighting. Any new lighting on the site shall meet the requirements of this Code with regard to shielding and lamp type. The total outdoor light output after

the modifications are complete shall not exceed that on the site before the modification, or that permitted by this Code, whichever is larger.

16.43.040 Lighting Zones.

A. Zoning districts designated for residential uses (R-1, R-1.5 and R-2) are designated Lighting Zone One (LZ 1). All other zoning districts are designated Lighting Zone Two (LZ 2).

B. The designated Lighting Zone of a parcel or project shall determine the limitations for lighting as specified in this ordinance.

Table 16.43.040 Lighting Zone descriptions

Zone	Ambient Illumination	Representative Locations
LZ 1	Low	Rural areas, low-density urban neighborhoods and districts, residential historic districts. This zone is intended to be the default for residential areas.
LZ 2	Medium	High-density urban neighborhoods, shopping and commercial districts, industrial parks and districts. This zone is intended to be the default condition for commercial and industrial districts in urban areas.

16.43.050 Exempt Lighting.

The following luminaires and lighting systems are exempt from the requirements of this Section.

A. Externally illuminated signs in conformance with provisions in section 16.42.040 of this code.

B. Internal lighting for signs in conformance with provisions in section 16.42.040 of this code.

C. Temporary lighting for theatrical, television, and performance events.

D. Lighting in swimming pools and other water features governed by Article 680 of the National Electrical Code.

E. Code-required exit signs.

F. Code-required lighting for stairs and ramps.

G. Lighting required and regulated by the Federal Aviation Administration, U.S. Coast Guard, or other federal, state, or county agency.

H. Interior lighting.

I. Temporary lights for emergency public or private utility maintenance or public safety.

J. Lighting fixtures existing prior to this ordinance not exceeding 30 watts.

16.43.060 Prohibited Light and Lighting.

A. All outdoor light sources, except street lights, shall be shielded or installed so that there is no direct line of sight between the light source or its reflection at a point 3 feet or higher above the ground at the property line of the source. Light that does not meet this requirement constitutes light trespass. Streetlights shall be fully shielded.

B. The following lighting systems are prohibited from being installed or used except by special use permit:.

1. Aerial Lasers.

2. "Searchlight" style lights.

3. Other very intense lighting, defined as having a light source exceeding 300 watts.

16.43.070 Luminaire Lamp Wattage, Shielding, and Installation Requirements.

A. All outdoor lighting shall comply with the limits to lamp wattage and the shielding requirements in Table 16.43.070 per the applicable Lighting Zone. These limits are the upper limits. Good lighting design will usually result in lower limits.

B. The city may accept a photometric test report, demonstration or sample, or other satisfactory confirmation that the luminaire meets the requirements of the shielding classification.

C. Such shielded fixtures must be constructed and installed in such a manner that all light emitted by the fixture complies with the specification given. This includes all the light emitted by the fixture, either directly from the lamp or by a diffusing element, or indirectly by reflection or refraction from any part of the fixture. Any structural part of the fixture providing this shielding must be permanently affixed.

D. All canopy lighting must be fully shielded. However, indirect upward light is permitted under an opaque canopy provided that no lamp or vertical element of a lens or diffuser is visible from beyond the canopy and such that no direct upward light is emitted beyond the opaque canopy. Landscape features shall be used to block vehicle headlight trespass while vehicles are at an external point of service (i.e. drive-thru aisle).

E. All facade lighting must be restricted to the facade surface. The margins of the facade shall not be illuminated. Light trespass is prohibited. The sides of commercial buildings without a customer entrance shall not be lit.

Table 16.43.070 – Luminaire Maximum Wattage and Required Shielding

Lighting Zone	Fully Shielded	Shielded	Partly Shielded	Unshielded (Shielding is highly encouraged. Light trespass is prohibited.)
LZ 1	150	60	None Permitted	Low voltage landscape lighting and temporary holiday lighting.
LZ 2	450	100	60	Landscape and facade lighting 100 watts or less; ornamental lights of 60 watts or less.

16.43.080 Height Limits.

Pole and surface-mounted luminaires under this section must conform with Section 16.43.070.

A. Lighting mounted onto poles or any structures intended primarily for mounting of lighting shall not exceed a mounting height of 40% of the horizontal distance of the light pole from the property line, nor a maximum height according to Table 16.43.080, whichever is lower. The following exceptions apply:

1. Lighting for residential sports courts and pools shall not exceed 15 feet above court or pool deck surface.

2. Lights specifically for driveways, and then only at the intersection of the road providing access to the site, may be mounted at any distance relative to the property line, but may not exceed the mounting height listed in Table 16.43.080.

3. Mounting heights greater than 40% of the horizontal distance to the property line but no greater than permitted by Table 16.43.080 may be used provided that the luminaire is side-shielded toward the property line.

4. Landscape lighting installed in a tree. See the Definitions section.

5. Street and bicycle path lights.

B. Lighting mounted onto buildings or other structures shall not exceed a mounting height greater than 4 feet higher than the tallest part of the building or structure at the place where the lighting is installed, nor higher than 40% of the horizontal distance of the light from the property line, whichever is less. The following exceptions apply:

1. Lighting attached to single family residences shall not exceed the height of the eave. Lighting for driveways shall conform to Table 16.43.080.

2. Lighting for facades may be mounted at any height equal to or less than the total height of the structure being illuminated regardless of horizontal distance to property line.

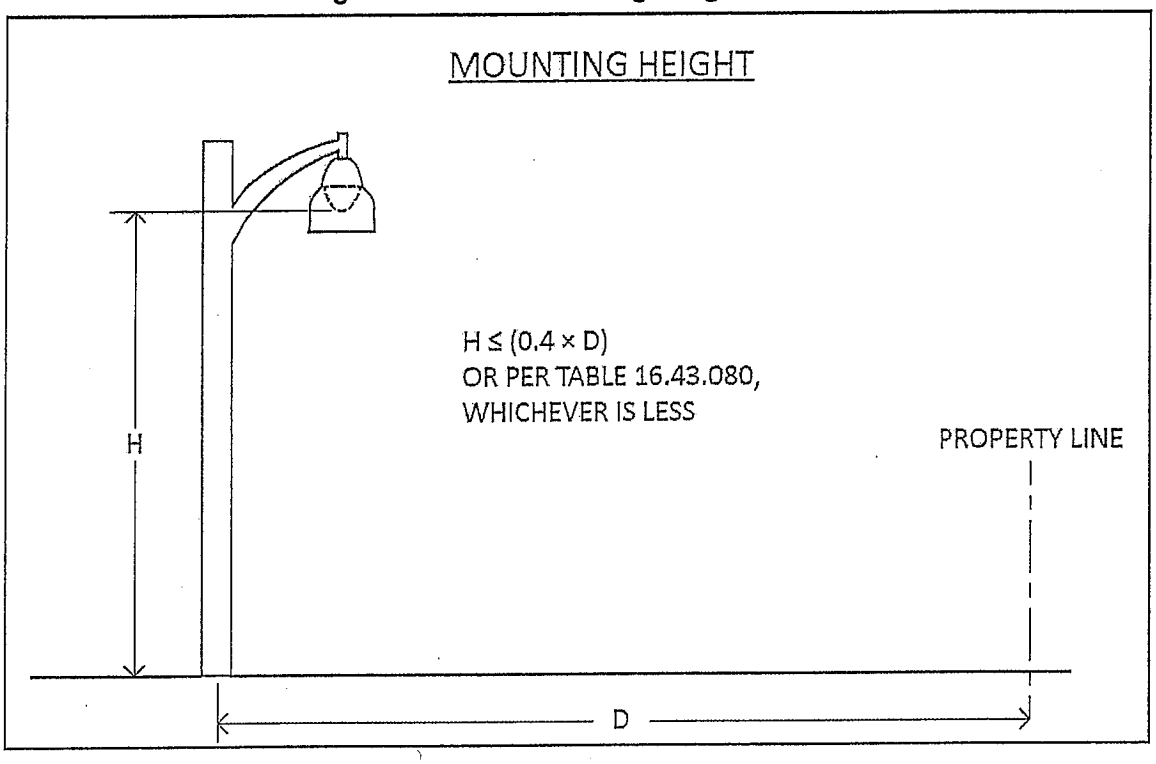
3. For buildings less than 40 feet to the property line, including canopies or overhangs onto the sidewalk or public right of way, luminaires may be mounted to the vertical facade or the underside of canopies at 16 feet or less.

4, The top exterior deck of parking garages should be treated as normal pole mounted lighting rather than as lights mounted to buildings. The lights on the outside edges of such a deck must be side shielded to the property line.

Table 16.43.080 – Maximum Lighting Mounting Height in Feet

Lighting Zone	Lighting for Driveways, Parking and Transit	Lighting for Walkways, Plazas and other Pedestrian Areas	All Other Lighting
LZ 1	35.0	18.0	8.0
LZ 2	37.5	18.0	15.0

Figure 16.43.2: Mounting Height



16.43.090 Lighting Controls

The city strongly recommends the use of timers and/or motion detectors on outdoor lighting, and that motion detectors be set to minimize unnecessary activation. For example, motion detectors for entryway or driveway lights should not activate for off-site pedestrians or cars.

16.43.100 Exceptions to Standards.

A. Exceptions to the lighting standards in this section may be approved by the Planning Director. Lighting systems not complying with the technical requirements of this ordinance but consistent with the intent of the ordinance may be approved for the following:

1. Sport fields.

2. Construction lighting.

3. Industrial lighting for hazardous areas where the heat of the lighting fixture may cause a dangerous situation.

4. National and State Flag lighting with spotlights greater than 40 watts.

B. To obtain such approval of an exception, applicants shall demonstrate that the proposed lighting installation:

1. Has received every reasonable effort to mitigate obtrusive light and artificial sky glow, supported by a signed statement from a registered engineer or by a lighting certified professional describing the mitigation measures.

2. The Planning Director shall review each such application. Approval may be granted if, upon review, the Planning Director believes that the proposed lighting will not create unwarranted glare, sky glow, or light trespass.

16.43.110 Lighting Plan Required

A lighting plan shall be submitted with the development or building permit application and shall include:

A. A site plan showing the location of all buildings and building heights, parking, and pedestrian areas.

B. The location and height (above grade) of all proposed and existing luminaires on the subject property.

C. Luminaire details including type and wattage of each lamp, shielding and cutoff information, and a copy of the manufacturer's specification sheet for each luminaire.

D. Control descriptions including type of control (time, motion sensor, etc.), the luminaire to be controlled by each control type, and the control schedule when applicable.

E. Any additional information necessary to demonstrate compliance with the standards in this section. (Ord.1338, 2010)

I. The property owner and the temporary vendor permit holder shall be jointly and severably responsible for any violation of this section or other applicable sections of the Canby Municipal Code. Any such violation may result in the immediate revocation or non-renewal of a temporary vendor permit, and may result in the denial of any future temporary vendor permit for the site upon which the violation occurred. (Ord 1315, 2009)

16.08.150 Traffic Impact Study (TIS).

A. Purpose. The purpose of this section of the code is to implement Section 660-012-0045(2)(b) of the State Transportation Planning Rule, which requires the city to adopt a process to apply conditions to development proposals in order to minimize adverse impacts to and protect transportation facilities. This section establishes the standards to determine when a proposal must be reviewed for potential traffic impacts; when a Traffic Impact Study must be submitted with a development application in order to determine whether conditions are needed to minimize impacts to and protect transportation facilities: what information must be included in a Traffic Impact Study; and who is qualified to prepare the Study.

B. Initial scoping. During the pre-application conference, the city will review existing transportation data to determine whether a proposed development will have impacts on the transportation system. It is the responsibility of the applicant to provide enough detailed information for the city to make a determination. If the city cannot properly evaluate a proposed development's impacts without a more detailed study, a transportation impact study (TIS) will be required to evaluate the adequacy of the transportation system to serve the proposed development and determine proportionate mitigation of impacts. If a TIS is required, the city will provide the applicant with a "scoping checklist" to be used when preparing the TIS.

C. Determination. Based on information provided by the applicant about the proposed development, the city will determine when a TIS is required and will consider the following when making that determination.

1. Changes in land use designation, zoning designation, or development standard.

2. Changes in use or intensity of use.

3. Projected increase in trip generation.

4. Potential impacts to residential areas and local streets.

5. Potential impacts to priority pedestrian and bicycle routes, including, but not limited to school routes and multimodal street improvements identified in the TSP.

6. Potential impacts to intersection level of service (LOS).

D. TIS General Provisions

1. All transportation impact studies, including neighborhood through-trip and access studies, shall be prepared and certified by a registered Traffic or Civil Engineer in the State of Oregon.

2. Prior to TIS scope preparation and review, the applicant shall pay to the city the fees and deposits associated with TIS scope preparation and review in accordance with the adopted fee schedule. The city's costs associated with TIS scope preparation and review will be charged against the respective deposits. Additional funds may be required if actual costs exceed deposit amounts. Any unused deposit funds will be refunded to the applicant upon final billing.

3. For preparation of the TIS, the applicant may choose one of the following:

a. The applicant may hire a registered Oregon Traffic or Civil Engineer to prepare the TIS for submittal to the city. The city Traffic Engineer will then review the TIS and the applicant will be required to pay to the city any fees associated with the TIS review; or

b. The applicant may request that the city Traffic Engineer prepare the TIS. The applicant will pay to the city any fees associated with preparation of the TIS by the city Traffic Engineer.

4. The TIS shall be submitted with a concurrent land use application and associated with application materials. The city will not accept a land use application for process if it does not include the required TIS.

5. The city may require a TIS review conference with the applicant to discuss the information provided in the TIS once it is complete. This conference would be in addition to any required pre-application conference. If such a conference is required, the city will not accept the land use application for processing until the conference has taken place. The applicant shall pay the TIS review conference fee at the time of conference scheduling, in accordance with the adopted fee schedule.

6. A TIS determination is not a land use action and may not be appealed.

E. TIS Scope. The city shall determine the study area, study intersections, trip rates, traffic distribution, and required content of the TIS based on information provided by the applicant about the proposed development.

1. The study area will generally comprise an area within a ½-mile radius of the development site. If the city determines that development impacts may extend more than ½ mile from the development site, a larger study area may be required. Required study intersections will generally include (in addition to the primary access points) collector/collector and above intersections with an anticipated peak hour traffic increase of five-percent from the proposed project.

2. If notice to ODOT or other agency is required pursuant to noticing requirements in Chapter 16.89, the city will coordinate with those agencies to provide a comprehensive TIS scope. ODOT may also require a TIS directly to support an OR 99E approach permit application.

F. TIS Content. A project-specific TIS checklist will be provided to the applicant by the city once the city has determined the TIS scope. A TIS shall include all of the following elements, unless waived by the city.

1. Introduction and Summary. This section shall include existing and projected trip generation including vehicular trips and mitigation of approved development not built to date; existing level and proposed level of service standard for city and county streets and volume to capacity for state roads; project build year and average growth in traffic between traffic count year and build year; summary of transportation operations; traffic queuing and delays at study area intersections; and proposed mitigation(s).

2. Existing Conditions. This section shall include a study area description, including information about existing study intersection level of service.

3. Impacts. This section should include the proposed site plan, evaluation of the proposed site plan, and a project-related trip analysis. A figure showing the assumed future year roadway network (number and type of lanes at each intersection) also shall be provided. For subdivision and other developments, the future analysis shall be for the year of proposed site build-out. For proposed comprehensive plan and/or zoning map amendments, the future analysis year shall be 20 years from the date of the City's adopted TSP, or 15 years, whichever is greater.

4. Mitigation. This section shall include proposed site and area-wide specific mitigation measures. Mitigation measures shall be roughly proportional to potential impacts. See Subsection K below for rough proportionality determination.

5. Appendix. This section shall include traffic counts, capacity calculations, warrant analysis, and any other information necessary to convey a complete understanding of the technical adequacy of the TIS.

G. TIS Methodology. The City will include the required TIS methodology with the TIS scope.

H. Neighborhood Through-Trip Study. Any development projected to add more than 30 through-vehicles in a peak hour or 300 through-vehicle per day to an adjacent residential local street or neighborhood route will be require assessment and mitigation of residential street impacts. Through-trips are defined as those to and from a proposed development that have neither an origin nor a destination in the neighborhood. The through-trip study may be required as a component of the TIS

or may be a stand-alone study, depending on the level of study required in the scoping checklist. The through-trip study shall include all of the following:

1. Existing number of through-trips per day on adjacent residential local streets or neighborhood routes.

2. Projected number of through-trips per day on adjacent residential local streets or neighborhood routes that will be added by the proposed development.

3. Traffic management strategies to mitigate for the impacts of projected through-trip consistent.

If a residential street is significantly impacted, mitigation shall be required. Thresholds used to determine if residential streets are significantly impacted are:

1. Local residential street volumes should not increase above 1,200 average daily trips

2. Local residential street speeds should not exceed 28 miles per hour (85^{th} percentile speed).

I. Mitigation. Transportation impacts shall be mitigated at the time of development when the TIS identifies an increase in demand for vehicular, pedestrian, bicycle, or transit transportation facilities within the study area. Mitigation measures may be suggested by the applicant or recommended by ODOT or Clackamas County in circumstances where a state or county facility will be impacted by a proposed development. The city shall determine if the proposed mitigation measures are adequate and feasible. ODOT must be consulted to determine if improvements proposed for OR 99E comply with ODOT standards and are supported by ODOT. The following measures may be used to meet mitigation requirements:

1. On-and off-site improvements beyond required standard frontage improvements.

2. Development of a transportation demand management program.

3. Payment of a fee in lieu of construction, if construction is not feasible.

4. Correction of off-site transportation deficiencies within the study area that are substantially exacerbated by development impacts.

5. Construction of on-site facilities or facilities located within the right-of-way adjoining the development site that exceed minimum required standards and that have a transportation benefit to the public.

J. Conditions of Approval. The city may deny, approve, or approve with appropriate conditions a development proposal in order to minimize impacts and protect transportation facilities.

1. Where the existing transportation system will be impacted by the proposed development, dedication of land for streets, transit facilities, sidewalks, bikeways, paths, or accessways may be required to ensure that the transportation system is adequate to handle the additional burden caused by the proposed use.

2. Where the existing transportation system is shown to be burdened by the proposed use, improvements such as paving, curbing, installation or contribution to traffic signals, traffic channelization, construction of sidewalks, bikeways, accessways, paths, or street that serve the proposed use may be required.

3. The city may require the development to grant a cross-over access easement(s) to adjacent parcel(s) to address access spacing standards on arterials and collector roadways or site-specific safety concerns. Construction of shared access may be required at the time of development if feasible, given existing adjacent land use. The access easement must be established by deed.

K. Rough Proportionality Determination. Improvements to mitigate impacts identified in the TIS shall be provided in rough proportion to the transportation impacts of the proposed development.

1. The TIS shall include information regarding how the proportional share of improvements was calculated, using the ratio of development trips to growth trips and the anticipated cost of the full Canby Transportation System Plan. The calculation is provided below:

Proportionate Share Contribution = [Net New Trips/(Planning Period Trips-Existing Trips)] X Estimated Construction Cost

a. Net new trips means the estimated number of new trips that will be created by the proposed development within the study area.

b. Planning period trips means the estimated number of total trips within the study area within the planning period identified in the TSP.

c. Existing trips means the estimated number of existing trips within the study area at the time of TIS preparation.

d. Estimated construction cost means the estimated total cost of construction of identified improvements in the TSP. (Ord 1340, 2011)

16.08.160 Safety and Functionality Standards.

The City will not issue any development permits unless the proposed development complies with the city's basic transportation safety and functionality standards, the purpose of which is to ensure that development does not occur in areas where the surrounding public facilities are inadequate. Upon submission of a development permit application, an applicant shall demonstrate that the development property has or will have the following: