Interchange Justification Report

I-95 Trafton Road Interchange Project
Waterville, Maine

Prepared for MaineDOT on behalf of Trafton Realty LLC.
by Eaton Peabody Consulting Group, LLC and
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Executive Summary

Trafton Realty, LLC. successor-in-interest to Trafton Properties,Inc. (hereinafter "Trafton") in cooperation with the City of Waterville and the Town of Sidney seek to establish a new I-95 interchange at or in the vicinity of Trafton Road near the Waterville-Sidney municipal boundary. An I-95 interchange proposal was previously considered and approved by MaineDOT and FHWA as of January 1987. The project did not proceed at that time. The current proposal reconsiders that prior project but represents a new application governed by the existing joint agreement of MaineDOT and FHWA for interstate access modification.

Working through a I-95 Access Project Advisory Committee established by the City of Waterville in cooperation with the Town of Sidney, the Town of Oakland and Trafton a statement of project purpose and need was drafted by this Committee, reviewed by MaineDOT and approved by the Waterville City Council. The project purpose is to:

1. Improve regional mobility
2. Sustain a level of service on Kennedy Memorial Drive (KMD) sufficient to support existing and planned uses along the corridor
3. Reduce transportation impediments to planned development south of KMD
4. Expand freight and passenger transportation connectivity

The existing access to I-95 in southern Waterville at Kennedy Memorial Drive is forecast to reach unacceptable levels of service before the 2022 design year. There are significant economic development assets in place in the southern Waterville, northern Sidney region that cannot be fully utilized given the current access to I-95. The no build scenario negates the development assets of large tracts of available land with access to public water, sewer and three phase power as well as access to natural gas planned for the future. A no-build scenario also frustrates opportunities to achieve enhanced system connectivity and a more balanced distribution of traffic.

Trafton has assumed the cost of preparation of this IJR and is prepared to finance the cost of securing all permits to proceed to construction. Assuming all permits are secured, then construction of the proposed interchange would be pursued consistent with the terms of a Traffic Movement Permit issued by MaineDOT on November 15, 2011. That permit prescribes the construction of the interchange as one of two alternative mitigation options to be implemented if Trafton adds 225,000 additional square feet of light industrial space on its property.

This IJR addresses the eight policy points prescribed by FHWA/MaineDOT and lays the basis for approval of this request to allow a new I-95 access point at or in the vicinity of Trafton Road.

Introduction

An Interchange Justification Report (IJR) is required to document how a proposed interstate access modification addresses the eight policy points prescribed by the Federal Highway Administration (FHWA) and adhered to by the Maine Department of Transportation (MaineDOT) as most recently enumerated in 74 Federal Register 20679 (August 27, 2009). The eight policy points listed in FHWA's "Interstate System Access Informational Guide" of August 2010 are:

Policy Point 1 – Need for Access Point
Policy Point 2 – Reasonable Alternatives
Policy Point 3 – Operational and Safety Analysis
Policy Point 4 – Access Connections and Design
Policy Point 5 – Land Use and Transportation Plans
Policy Point 6 – Future Interchanges
Policy Point 7 – Transportation System Improvement Coordination
Policy Point 8 – Environmental Review

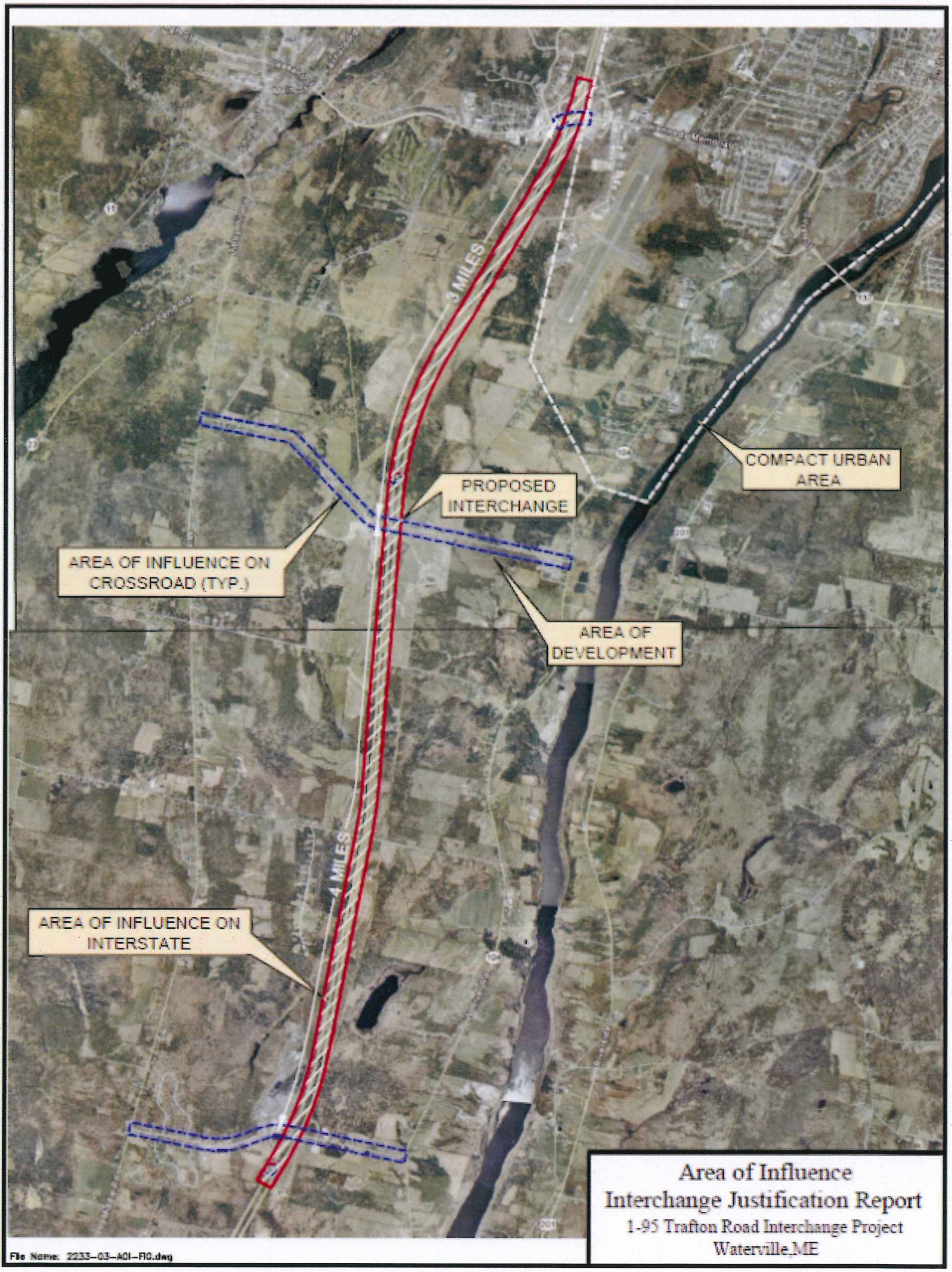
The proposed full access Trafton Road I-95 Interchange would be located in proximity to the Waterville-Sidney municipal boundary. There is an adjacent interchange 3 miles to the north of the proposed interchange that intersects Kennedy Memorial Drive at milepost 127 and 4 miles to the south there is an interchange intersecting the Lyons Road at milepost 120. Trafton Road itself is approximately 25 feet in width and is a local street, providing a connection between State Collectors Route 104 (West River Road) to the east and Middle Road to the west. It currently carries about 600 vehicles per day. I-95 has about 14,000 vehicles per day in each direction under Trafton Road.

Under the preferred alternative, the proposed interchange would utilize the existing two-lane Trafton Road Bridge crossing I-95. That bridge is similar to the Lyons Road Bridge in use at the Lyons Road I-95 interchange. The preferred ramp design for this alternative is a partial cloverleaf occupying the southern quadrants. The year 2036 was selected as the Design Year for this project which is a 20 year horizon from the forecast opening of the project.

This project was originally developed by the City of Waterville and MaineDOT in the mid 1980's with FHWA approval provided in January 1987 and funding provided in MaineDOT's 1988-1989 Biennial Transportation Improvement Plan. In September of 1997, MaineDOT made the project contingent upon development prospects in the vicinity of the proposed interchange. Today, project planning is being financed by the private sector in coordination with the City, MaineDOT and FHWA.

The figure which follows shows the area of Influence for the proposed I-95 Trafton Road Interchange.

I-95 Trafton Road Interchange Project Area of Influence



Methodology and Assumptions

Three different analysis tools were utilized to forecast the operations of the proposed interchange; HCS, SYNCHRO, and SIMTRAFFIC. The Highway Capacity Software (HCS) was utilized for the merge/diverge analysis and the freeway segments along the interstate. HCS was developed by McTrans and implements the procedures in the Highway Capacity Manual (HCM) 2010 Edition. SYNCHRO AND SIMTRAFFIC were utilized to determine the level of service and stacking requirements for intersections.

The following assumptions were used in the report:

- A base free flow speed of 70 mph was used in the analysis which is the posted speed limit for this segment of the Interstate. The ramp free flow speed was 35 mph.
- A peak hour factor (PHF) of 0.94 was utilized along the I-95 mainline for the current and 2036 conditions. The phf utilized on the ramp was 0.90.
- Percent heavy vehicles – based on existing truck percentages for Existing Conditions, as well as based on 30 percent trucks in background development traffic (i.e. industrial/distribution facilities).
- 2011 traffic count data was adjusted to represent peak seasonal conditions from the raw counts by 5 percent along Lyons Road and Trafton Road.
- SimTraffic analyses were based on an average of five 60-minute runs.
- Trip assignments for the projected development were based on prior traffic impact studies completed in the area, and were adjusted as necessary to reflect proposed changes in the roadway network.
- Existing traffic volumes were redistributed for the Trafton Road Interchange build option based on the redistribution methodology used in the Traffic Impact Study for the Trafton Properties development project.
- Level terrain was utilized in the I-95 mainline analysis
- A side clearance value of 6 feet was utilized along the mainline
- Twelve foot lane widths were utilized along the interstate

As Lyons Road, Trafton Road, and Kennedy Memorial Drive are all corridors in their own right, it is important to provide analysis based on these areas as part of the transportation network, as opposed to isolated intersections. An HCM analysis may portray a better or worse picture than actual field operations under congested conditions because this analysis methodology does not take into consideration upstream or downstream effects. Therefore, while the results for delay utilized HCM thresholds, the analyses were completed with the Synchro/SimTraffic analysis program.

The Synchro/SimTraffic program models all vehicles traveling through a roadway network by simulating individual vehicle traffic flow. Inputs to the model include roadway geometrics, lane use, intersection control operation, intersection turning movements, and system traffic volume. As the model runs, the location of each vehicle in the model network is tracked for each second of time. With this location and time data compiled for each vehicle, the model then computes a variety of measures-of-effectiveness (MOE's) for each intersection approach by lane and traffic movement. This comprehensive list of MOE's includes delay per vehicle, along with, 50th percentile, 95th percentile and maximum queue lengths by lane.

The primary benefit of SimTraffic is that it allows the analyst to view traffic simulation flows in real time. This allows the analysis of the effects of different alternatives to be compared and contrasted more easily than with mathematical analysis alone. The model results reported for each alternative are based on an average of results from five random simulations of that alternative.

Capacity is defined as the "maximum sustainable flow rate at which vehicles or persons reasonably can be expected to traverse a point or uniform segment of a lane or roadway during a specific time period under given roadway, geometric, traffic, environmental, and control conditions". Conditions or factors that affect capacity include the number of travel lanes, lane and shoulder width, lateral clearances, alignment, the characteristics of vehicles in the traffic stream, and traffic control and regulations in existence.

Level of Service (LOS) is a qualitative measure describing operational conditions within a traffic stream taking into account a number of variables such as speed and travel time, vehicles maneuverability, traffic interruptions, comfort, and convenience. There are six levels of service from LOS "A" to LOS "F", with LOS "A" representing the best operational condition and LOS "F" representing the worst, often when traffic demands exceed capacity. Each level of service represents a range of operating conditions and the driver's perception of those conditions.

With the exception of the Kennedy Memorial Drive corridor, Gorrill Palmer Consulting Engineers, Inc. collected the traffic counts for the major intersections in the area of influence on May 31, 2011 and June 1, 2011 from 4:00 – 6:00 PM and 7:00 – 9:00 AM respectively. Design hour volumes for 2010 were obtained from VHB from their signal coordination study for the Kennedy Memorial Drive corridor. A summary of the AM and PM peak hour volumes are shown in the Appendix. Truck percentages used in this analysis were obtained from these same counts and these same percentages were utilized in the 2036 analysis. A uniform growth rate of 1.5% has been utilized to forecast the volumes during the analysis year of 2036. This growth rate was based on the Interstate as well as the local roadway system which should be conservative (high) based on the following information:

- Toll revenue growth forecasts for the Maine Turnpike Authority which directly relate to traffic volumes are projected to decline steadily from 1.6% annual growth in 2012 to 1% in 2025 and remaining steady thereafter.
- Dr. Charles Colgan, an economics professor from the University of Southern Maine and a former State Economist, forecasts a return to 2007 levels of employment late in this decade.
- Anticipated rises in motor fuel prices are expected to dampen traffic growth further.

- The availability of passenger transportation shuttles offered through Kennebec Valley Transit between Waterville and Augusta will reduce vehicle volume growth.

Several measures of effectiveness (MOE) were used to compare results between the scenarios. The MOE's used to evaluate operations at a particular intersection include: Level of Service (LOS), Delay, Degree of Saturation (v/c), and queue length. The MOEs used to evaluate operations along the interstate include: LOS, v/c, Density, and Speed.

The proposed interchange is being designed to meet AASHTO and MaineDOT geometric standards.

Finally, in conformity with the Highway Capacity Manual, each of the software programs applies the same LOS criteria based on control delay as shown in the Tables below.

Level of Service Criteria for Un-signalized Intersections

Level of Service	Control Delay per Vehicle (sec)
A	Up to 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

Level of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec)
A	Up to 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	Greater than 80.0

Level of Service Criteria for Freeway Facilities

Level of Service	Density (pass cars/mi/lane)
A	≤11
B	>11 to 18
C	>18 to 26
D	>26 to 35
E	>35 to 45
F	>45 or any component v_d/c ratio > 1.00

Level of Service Criteria for Freeway Merge and Diverge Segments

LOS	Density (pass cars/mi/lane)	Comments
A	≤ 10	Unrestricted Operations
B	> 10-20	Merge/diverge maneuvers noticeable to drivers
C	> 20-28	Influence area speeds begin to decline
D	> 28-35	Influence area turbulence becomes intrusive
E	> 35	Turbulence felt by virtually all drivers
F	Demand Exceeds Capacity	Ramp and freeway queues form

Policy Point 1 – Need for Access Point

An Interchange Justification Report (IJR) is required to document how a proposed interstate access modification addresses the eight policy points prescribed by the Federal Highway Administration (FHWA) and adhered to by the Maine Department of Transportation (MaineDOT) as most recently enumerated in 74 Federal Register 20679 (August 27, 2009). This section addresses the first of the eight policy points listed in FHWA's "Interstate System Access Informational Guide" of August 2010.

The purpose of the project is derived from a purpose and need statement developed in coordination with MaineDOT and FHWA and adopted by the Waterville City Council (1/18/11) based upon the recommendation of the I-95 Access Project Advisory Committee. The purpose of the proposed project is to:

- Improve regional mobility
- Sustain a level of service on Kennedy Memorial Drive (KMD) sufficient to support existing and planned uses along the corridor
- Reduce transportation impediments to planned development south of KMD
- Expand freight and passenger transportation connectivity

The effectiveness of the no build alternative is measured against the proposed alternative favored by the Waterville City Council (1/18/11) as recommended to them by the I-95 Access Project Advisory Committee. This alternative was developed in coordination with MaineDOT and the FHWA within a broader consideration of alternatives. Effectiveness is judged based upon the following need criteria:

- A traffic choke point is forecasted at the I-95/KMD interchange
- Traffic choke points are forecasted on KMD at the intersections with Cool, Colette, West River Road and Carter Memorial
- I-95 access for south Waterville and north Sidney is inadequate to support desired manufacturing, distribution and warehousing employment growth
- Connectivity and balance of area traffic is not optimized
- Emergency response times are not minimized
- Truck freight traffic on Interstate is not maximized
- Waterville Airport, the adjacent Foreign Trade Zone and business park lack sufficient market attraction to realize the potential of these sites
- Reuse of environmentally degraded City Property at the former solid waste facility off Webb Road and the brown field site off West River Road

KMD capacity constraints – Previous traffic projections for KMD indicated that this road would be at capacity by 2015 during the weekday PM peak hour at the I-95 ramps and at the Cool/Colette, West River Road, and Carter Memorial Drive signalized intersections. Those forecasts now extend out to 2021 due to signalization improvements made on KMD. Given differing views on KMD capacity constraints arising from the preparation of this report, KMD capacity forecasts will be revisited including, if necessary, the purpose and need statement as part of future NEPA and

ACOE reviews. Future development out to the design year at and south of KMD may be at risk if that development adds traffic to roads that are at capacity unless capacity limits are addressed. The history of transportation system management on KMD is such that all practical options to mitigate capacity constraints have now been exercised.

Maximizing value of development assets - With the support of the federal government through HUD, public water service was extended to Trafton Road in the 1970's signaling an intent to support economic growth in southern Waterville and in particular the relocated Wyandotte Mill complex. The current owners of the mill complex hold over 900 acres in this vicinity and have recently secured a Maine Traffic Movement permit to double the facility space located on Trafton Road. Recently, sewer service became accessible to southern Waterville, again with federal support, when the Oakland service was connected to the Waterville system along Webb Road. Three phase power is also available at Trafton Road to support current and planned manufacturing businesses located there. These services do not extend further south into the Town of Sidney nor are they available in proximity to the Lyons Road I-95 interchange. The value of these services and available land for development is diminished under the no-build scenario by lack of proximity to an interstate access. Further, the Waterville Airport, the Waterville Airport Business Park and the co-located Foreign Trade Zone all rely exclusively on access to the interstate through KMD. Public access to these development assets from the south, while achievable, is not being pursued under the no-build scenario due to the lack of a proximate interstate connection.

Connectivity and traffic distribution - The value of the relatively new Donald Carter Bridge for balancing traffic distribution and promoting system connectivity remains underutilized in the no-build scenario due to the distance to an alternative to KMD I-95 access. A no-build scenario fails to extend the capacity of KMD or improve connections to I-95 in Winslow and points east. The no-build scenario will not reduce freight travel times and distances from Winslow and points east and similarly will not add value for this area with transit times and distances to the new MaineGeneral hospital now under construction in Augusta. Under Policy Point 3 further information is provided on the current traffic conditions and function of both the Lyons Road interchange in Sidney and the KMD interchange in Waterville.

Policy Point 1 Finding

The existing access to I-95 in southern Waterville is inadequate under the no-build scenario to ease choke points on KMD forecasted to reach unacceptable levels of service before the 2022 design year. The no build scenario negates the myriad assets now present to support development in southern Waterville and northern Sidney. The no-build scenario frustrates opportunities to enhance system connectivity and a more balanced distribution of traffic.

Policy Point 2 – Reasonable Alternatives

The discussion of gaining access to I-95 in southern Waterville has taken place over decades. In the last three years the topic was revisited in a coordinated manner involving the City of Waterville, area communities, MaineDOT and FHWA. In addition to examining the no-build alternative, the following build alternatives were also considered and rejected:

> **Upgrades to KMD and the KMD I-95 interchange** would entail extensive and costly takings of property including existing commercial establishments without material additional improvement to the development prospects of southern Waterville. KMD has received considerable attention and investment in recent years involving the implementation of a series of transportation system management actions, most recently a signalization project. Potential further TSM actions are not apparent.
>
> **A Webb Road interchange,** while proposed in the 1990's was dismissed as inconsistent with FHWA rural interchange spacing guidelines.
>
> **A Town Farm Road interchange** in Sidney was deemed to be relatively removed from development assets including land available for development, posed greater road improvement costs to the host community and impacted relatively more property owners and residences. The Town of Sidney was not a proponent of this alternative.
>
> **An initial interchange concept between Town Farm Road and Trafton Road**, was rejected due to design inconsistencies with other area I-95 interchanges. This concept did not include a new bridge. It was not favored by Waterville or Sidney.
>
> **A diamond interchange at Trafton Road** was considered and rejected since the preliminary opinion of probable cost slightly exceeded that of the preferred alternative principally due to the ramp lengths being slightly longer. This alternative also required an added cost of property acquisition not required under the preferred alternative and it created greater disruption to area residences. The preliminary opinion of cost was set at $8.06 million which included the same improvements to Trafton Road east of the ramps to Route 104 as included in the opinion of probable cost for the preferred alternative set at $7.94 million. The opinion of cost figures are based on 2012 construction costs and do not include costs for right of way, utility relocations, environmental mitigation, etc.
>
> **A roundabout design at Trafton Road** at the terminus of partial clover leaf ramps was considered and rejected as incompatible with MaineDOT desires to locate the interchange in such a way as to accommodate the future relocation of the Trafton Road Bridge to the south of the existing Bridge.

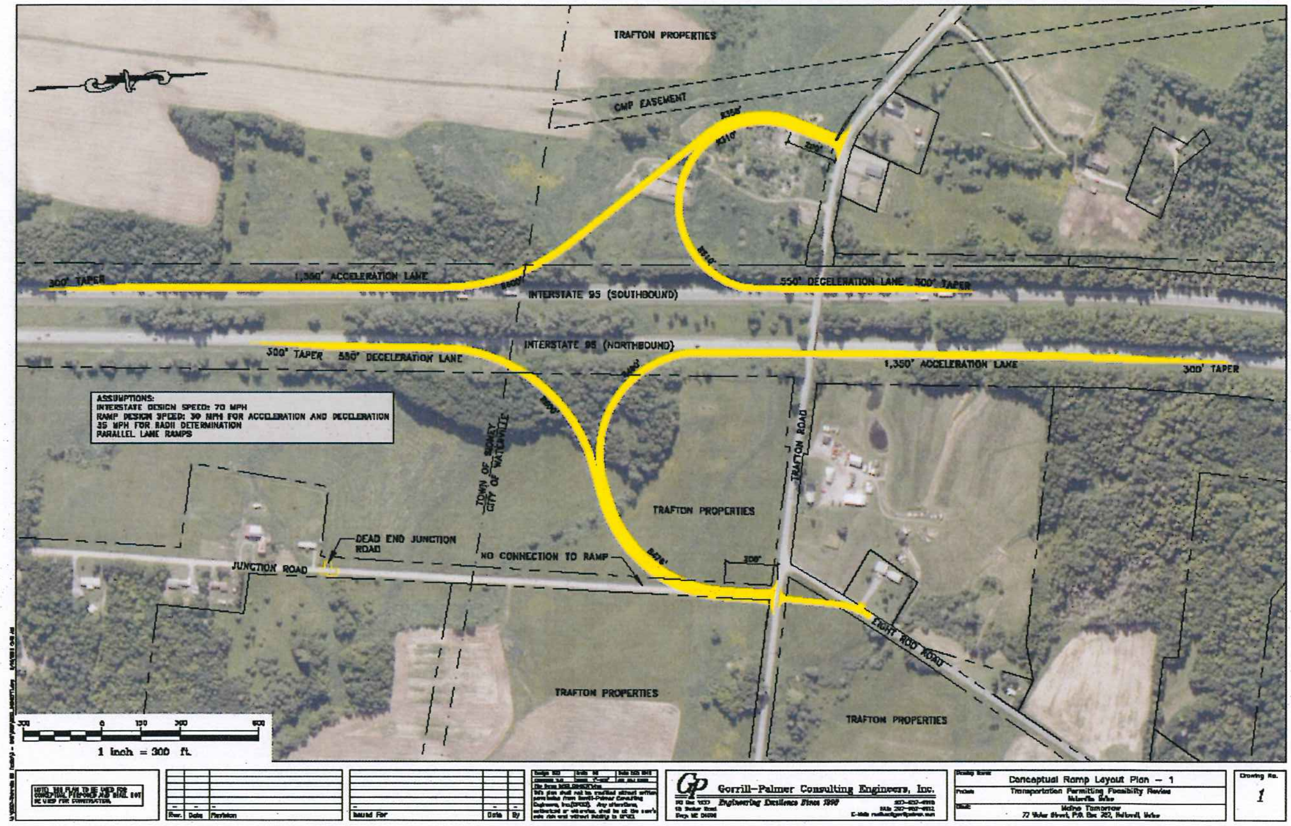
A preferred option selected to advance to the IJR was an interchange at Trafton Road with a partial cloverleaf design occupying the southern quadrants. This preference reflects a consensus of the stakeholders with the understanding that a full alternatives analysis must be completed under NEPA before a final IJR can be concluded.

An alternative to this preferred option that will be carried up through NEPA review involves a diamond interchange located entirely on property owned by Trafton near the Waterville-Sidney municipal boundary. It entails a new bridge crossing over I-95. If the two communities, MaineDOT and Trafton determine that this option, while more costly, offers overriding long term operational and economic development benefits and comparable environmental impacts, it may become the preferred alternative.

Policy Point 2 Finding

Through extensive collaboration at the local level over the course of decades, most recently coordinated with MaineDOT and FHWA, the proposed Trafton Road partial clover leaf interchange (pending a full NEPA review) reflects a consensus determination that it is the best option to fulfill the purpose and need of the project.

Proposed Preferred Alternative for IJR Review



Policy Point 3 – Operational and Collision Analysis

An examination of the expected operational characteristics of the proposed interchange and the existing collision history follows.

The proposed Trafton Road interchange would be located approximately 4 miles to the north of the Lyons Road interchange in Sidney, and approximately 3 miles south of the Kennedy Memorial Drive interchange in Waterville. Trafton Road itself is approximately 25 feet in width and is a local street, providing a connection between State Collectors Route 104 (West River Road) to the east and Middle Road to the west. It currently carries about 600 vehicles per day. I-95 carries about 14,000 vehicles per day in each direction under Trafton Road.

Study Area Intersections for Operational Analysis - Critical to the interchange justification process is the evaluation of operating conditions within the study area relative to future traffic mobility. To assess mobility, capacity and level of service (LOS), analyses were conducted for the intersections listed below.

Lyons Road at I-95 SB Ramps
Lyons Road at I-95 NB Ramps
Lyons Road at West River Road
Trafton Road at Middle Road
Trafton Road at I-95 SB Ramps (proposed)
Trafton Road at I-95 NB Ramps (proposed)
Trafton Road at Eight Rod Road
Trafton Road at West River Road
Kennedy Memorial Drive at First Park Drive
Kennedy Memorial Drive at I-95 SB Ramps
Kennedy Memorial Drive at I-95 NB Ramps
Kennedy Memorial Drive at Washington Street

Development Traffic- A Traffic Movement Permit was issued by the MaineDOT on November 15, 2011 for 225,000 square feet of light industrial space on the property of Trafton that is zoned Industrial. The project is forecast to generate the following additional traffic:

Trip Generation Summary – Land Use Code 110, General Light Industrial

Time Period	Enter	Exit	Total
Weekday	1,630	1,630	**3,260**
AM Peak Hour	376	66	**442**
PM Peak Hour	72	408	**480**

This additional traffic has been added to the 2016 AM and PM peak hour volumes shown in the appendices as Figures 4A, 4B ,5A and 5B respectively and the resultant volumes are shown in Figures 8A through 9B for 2016 and10A through 11B respectively and are also included in the Appendix. A copy of the MaineDOT Traffic Movement Permit is also included in the Appendix.

Analysis Periods - The operational performance was analyzed for the weekday AM and PM peak hours for 2036 without the Trafton Road interchange (no-build) and for 2036 with the Trafton Road interchange. Without the interchange the volumes used for this condition are shown graphically on Figures 10A and 11A for the weekday AM and PM peak hours again in the appendices. The analysis without the interchange also includes the following improvements specified through the Traffic Movement Permit:

1. A 100-foot right-turn lane from West River Road southbound to Lyons Road
2. A 100-foot left-turn lane from West River Road northbound to Trafton Road
3. A 100-foot right-turn lane on West River Road southbound to Trafton Road
4. A separate 100-foot right-turn lane on Trafton Road eastbound to West River Road
5. Separate left and right turn lanes from the proposed driveway northbound onto Trafton Road

With the Interchange the volumes used for this condition are shown graphically in the Appendices as Figures 10B and 11B for the weekday AM and PM peak hours respectively. In addition to consideration of the operational performance of the proposed interchange, the analysis considers intersection improvements at Trafton Road / West River Road as specified through Trafton's MaineDOT Traffic Movement Permit available under separate cover. It provides a 2016 analysis. The only additional improvements considered in the analysis include:

1. A 100-foot right-turn lane on West River Road southbound to Trafton Road
2. A separate 100-foot right-turn lane on Trafton Road eastbound to West River Road
3. Separate left and right turn lanes from the proposed driveway northbound onto Trafton Road

Capacity and Queuing - The following summary tables compare 2036 analysis with and without the interchange for both the weekday AM and PM peak hour conditions.

Lyons Road at West River Road (Un-signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Lyons EB	7	A	100	4	A	50
W. River NB	2	A	25	1	A	25
W. River SB	4	A	25	1	A	0

Lyons Road at West River Road (Un-signalized): 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Lyons EB	8	A	100	5	A	50
W. River NB	2	A	25	1	A	25
W. River SB	5	A	25	1	A	0

The summary tables show the potential interchange results in a minor reduction in delay at the Lyons Road / West River Road intersection.

Lyons Road at I-95 NB Ramps (Un-signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Lyons EB	2	A	50	1	A	25
Lyons WB	1	A	25	1	A	0
Con Way NB	6	A	25	6	A	25
I-95 NB	7	A	125	3	A	75

Lyons Road at I-95 NB Ramps (Un-signalized): 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Lyons EB	1	A	25	1	A	25
Lyons WB	1	A	0	1	A	0
Con Way NB	6	A	50	6	A	50
I-95 SB	7	A	125	5	A	75

The summary tables show the potential interchange results in a minor reduction in delay at the Lyons Road / I-95 NB ramp intersection.

Lyons Road at I-95 SB Ramps (Un-signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Lyons EB	2	A	25	1	A	0
Lyons WB	3	A	50	2	A	50
I-95 NB	5	A	75	4	A	50
Pike SB	5	A	50	6	A	75

Lyons Road at I-95 SB Ramps (Un-signalized): 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Lyons EB	1	A	0	1	A	0
Lyons WB	3	A	50	1	A	22
I-95 NB	7	A	75	4	A	50
Pike SB	5	A	50	4	A	25

The summary tables show the potential interchange results in a minor reduction in delay at the Lyons Road / I-95 SB Ramp intersection.

Trafton Road at West River Road (Un-signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Trafton EB	10	A	100	10	A	100
W. River NB	3	A	100	2	A	50
W. River SB	3	A	25	4	A	0

Trafton Road at West River Road (Un-signalized): 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Trafton EB	13	B	175	12	B	125
W. River NB	2	A	50	2	A	25
W. River SB	2	A	0	4	A	0

The summary tables show the potential interchange will increase the activity at the Trafton Road / West River Road intersection; however, the intersection is still forecast to operate at high levels of service.

Trafton Road at I-95 SB Ramps (Un-signalized): 2036 AM Peak Hour

Approach	*No Interchange*				Interchange		
	V/C	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Trafton EB	NA	NA	NA	NA	1	A	0
Trafton WB	NA	NA	NA	NA	2	A	25
I-95 NB	NA	NA	NA	NA	4	A	50

Trafton Road at I-95 SB Ramps (Un-signalized): 2036 PM Peak Hour

Approach	*No Interchange*				Interchange		
	V/C	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Trafton EB	NA	NA	NA	NA	1	A	0
Trafton WB	NA	NA	NA	NA	1	A	25
I-95 NB	NA	NA	NA	NA	4	A	25

The summary tables show the potential interchange at the SB ramps is forecast to operate at high levels of service.

Trafton Road at 8-Rod/I-95 NB Ramps (Un-signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Trafton EB	1	A	25	2	A	0
Trafton WB	1	A	0	2	A	25
Junction/I-95 NB	1	A	25	5	A	75
8 Rod SB	3	A	25	7	A	25

Trafton Road at 8-Rod/I-95 NB Ramps (Un-signalized): 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Trafton EB	1	A	0	1	A	0
Trafton WB	1	A	0	4	A	50
Junction/I-95 NB	4	A	25	4	A	75
8 Rod SB	3	A	25	3	A	25

The summary tables show the potential interchange at the NB ramps is forecast to operate at high levels of service.

Trafton Road at Middle Road (Un-signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Trafton WB	5	A	100	5	A	75
Middle NB	1	A	0	1	A	0
Middle SB	2	A	25	2	A	50

Trafton Road at Middle Road (Un-signalized): 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
Trafton WB	5	A	100	5	A	75
Middle NB	1	A	0	1	A	0
Middle SB	1	A	25	2	A	50

The summary tables show the potential interchange will increase the activity at the Trafton Road / Middle Road intersection; however, the intersection is still forecast to operate at high levels of service.

Kennedy Memorial Drive at First Park Drive (Signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB LT/TH	3	A	125	2	A	125
KMD WB TH/RT	2	A	125	2	A	40
First Park SB RT	32	C	100	28	C	50
Overall	4	A	---	3	A	---

Kennedy Memorial Drive at First Park Drive (Signalized): 2036 PM Peak Hour

Approach	*No Interchange*			*Interchange*		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB LT/TH	5	A	150	5	A	125
KMD WB TH/RT	4	A	125	4	A	125
First Park SB RT	22	C	100	22	C	100
Overall	5	A	---	5	A	---

The summary tables show the potential interchange will not affect the operation of the KMD / First Park Drive intersection.

Kennedy Memorial Drive at I-95 SB RAMPS (Signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB	7	A	150	6	A	150
KMD WB	2	A	75	1	A	50
I-95 SB	30	C	325	30	C	275
Overall	12	B	---	10	A	---

Kennedy Memorial Drive at I-95 SB RAMPS Node 41 (Signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB	2	A	125	2	A	50
KMD WB	6	A	75	6	A	50
I-95 SB	0	A	50	0	C	0
Overall	4	A	---	3	A	---

Kennedy Memorial Drive at I-95 SB RAMPS (Signalized)Node 66: 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB	1	A	25	1	A	0
KMD WB	2	A	0	1	A	0
I-95 SB	0	A	0	0	A	0
Overall	1	A	---	1	A	---

Kennedy Memorial Drive at I-95 SB Ramps (Signalized): 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB	6	A	125	5	A	125
KMD WB	4	A	125	3	A	125
I-95 SB	18	B	250	17	B	200
Overall	10	A	---	7	A	---

Kennedy Memorial Drive at I-95 SB RAMPS (Signalized) Node 41: 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB	2	A	50	2	A	50
KMD WB	4	A	150	4	A	100
I-95 SB	0	C	0	0	A	0
Overall	3	A	---	3	A	---

Kennedy Memorial Drive at I-95 SB RAMPS (Signalized): Node 66: 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB	2	A	70	1	A	25
KMD WB	2	A	0	2	A	25
I-95 SB	0	A	0	0	A	0
Overall	2	A	---	2	A	---

The summary tables show the potential interchange results in a minor reduction in delay on the KMD / I-95 SB Ramp intersection.

Kennedy Memorial Drive at I-95 NB RAMPS (Signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB LT	10	B	250	7	A	175
KMD WB RT	16	B	250	10	A	175
I-95 NB RT	24	C	150	25	C	125
Overall	14	B	---	11	B	---

Kennedy Memorial Drive at I-95 NB RAMPS (Signalized): 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB LT	15	B	275	9	A	200
KMD WB RT	24	C	400	20	C	325
I-95 NB RT	22	C	200	24	C	175
Overall	21	C	---	17	C	---

The summary tables show the potential interchange results in a reduction in delay on the KMD / I-95 NB Ramp intersection.

Kennedy Memorial Drive at Washington Street (Signalized): 2036 AM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB	10	A	175	12	B	225
KMD WB	22	C	300	20	B	250
Washington NB	30	C	150	35	D	150
Washington SB	31	C	200	30	C	200
Overall	17	B	---	18	B	---

Kennedy Memorial Drive at Washington Street (Signalized): 2036 PM Peak Hour

Approach	*No Interchange*			Interchange		
	Delay (sec)	LOS	95% Queue (ft)	Delay (sec)	LOS	95% Queue (ft)
KMD EB	17	B	275	17	C	275
KMD WB	26	C	425	25	C	400
Washington NB	33	C	200	31	D	200
Washington SB	32	C	225	30	C	175
Overall	30	C	---	23	C	---

The summary tables show the potential interchange results in a reduction in delay on the at the KMD / Washington Street intersection during the PM peak hour.

I-95 Mainline Analysis - In addition to the capacity analysis, the I-95 mainline was analyzed using the HCS 2010, version 6.1 software for both the northbound and southbound direction and included the roadway segments adjacent and just south of the

Lyons Road interchange to just north of the Kennedy Memorial Drive interchange and including the Trafton Road interchange. The analyses were completed for the following conditions:

- Condition A-2016 AM and PM peak hours without the interchange and without any traffic from the proposed Trafton Road development
- Condition B-2036AM and PM peak hours without the interchange but with traffic from the proposed Trafton Road development
- Condition C-2036 AM and PM peak hours both with the interchange and with traffic from the proposed Trafton Road development

Freeway Segment Analyses

The analyses for the freeway segments were completed based on the following conditions:

- Twelve foot lane widths
- Lateral clearance of 6 feet
- Level terrain

A summary of the results is presented below and the detailed printouts are included in the appendices to this report.

	Cond A-2016	Cond A-2016	Cond B-2036	Cond B-2036	Cond C-2036	Cond C-2036
Freeway Segment	AM	PM	AM	PM	AM	PM
S of Lyons-NB	A	B	B	B	B	B
N of Lyons-NB	A	B	A	B	B	B
N of Trafton-NB	NA	NA	NA	NA	A	B
N of KMD-NB	A	B	B	B	B	B
S of Lyons-SB	A	A	A	B	A	B
N of Lyons-SB	A	A	A	B	A	B
N of KMD-SB	A	A	A	B	A	B

The analyses show that all the freeway segments will operate with little delay and that the proposed Trafton Road interchange will not have a significant impact on the upstream or downstream segments.

Merge and Diverge Analysis

The results of the merge and diverge analyses between the freeway segments listed above are summarized in the following table. Detailed printouts are included in the appendices to this report.

	Cond A-2016	Cond A-2016	Cond B-2036	Cond B-2036	Cond C-2036	Cond C-2036
Ramp Location	AM	PM	AM	PM	AM	PM
Lyons-NB off	B	B	B	C	B	C
Lyons-NB on	B	B	B	B	B	C
Lyons-SB off	B	B	B	B	B	C
Lyons-SB on	B	B	B	B	B	B
Trafton Rd-NB off	NA	NA	NA	NA	B	B
Trafton Rd-NB on	NA	NA	NA	NA	A	B
Trafton Rd-SB off	NA	NA	NA	NA	B	B
Trafton Rd-SB on	NA	NA	NA	NA	A	A
KMD NB off	B	B	B	B	B	B
KMD NB on	B	B	B	C	B	C
KMD SB off	B	B	B	B	B	B
KMD SB on (north)	B	B	B	B	B	B
KMD SB on(south)	B	B	B	B	B	B

The analyses show that all the ramps will all operate at an acceptable level of service through 2036 and that the Trafton Road ramp will not have a significant upstream or downstream impact.

Collision Analysis - The most recent crash data for the area of influence is obtained from MaineDOT for the period of 2008-2010. In order to evaluate whether a location has a crash problem, Maine DOT uses two criteria to define High Crash Location (HCL). First, there must be a critical rate factor of 1.00 or more for a three-year period. A Critical Rate Factor {CRF} compares the actual crash rate to the rate for similar intersections in the state. Second, there must be a minimum of eight crashes over a three-year period.

Based on the published history, only I-95 southbound at KMD is classified as a High Crash Location. The crash history is included in the Appendix. The portion of I-95 southbound north of the KMD WB southbound off-ramp is an HCL, with 9 collisions and a CRF of 2.27. A review of MaineDOT collision reports indicates that three vehicles lost control due to driver error and went off the roadway. Two vehicles lost control due to snow, and one due to ice. One truck went off the road due to mechanical failure, and one driver went off the road due to illegal drug usage. The remaining collision occurred when a driver struck a deer crossing the roadway. Based on the reports, it appears that while the curvature of the road may influence the loss of control in poor weather, the drivers were often traveling too quickly. Based on this information, it is not expected that the proposed interchange will impact operations here, as it does not appear that the current interchange is impacting the collision pattern at this HCL.

Along Kennedy Memorial Drive, the overall traffic volumes (based upon peak hour data) are expected to decrease which may result in fewer collisions. Along Trafton Road, the overall traffic volumes (based upon peak hour data) are expected to increase which may result in additional collisions. As any increase in the potential number of crashes is distributed along Trafton Road, it is unlikely that any one area would experience enough of an increase in collisions to be considered a high crash location. Along Lyons Road, the overall traffic volumes (based upon peak hour data) are expected to decrease which may result in fewer collisions. The Lyons Road and Kennedy Memorial Drive interchanges are forecast to see a reduction in volumes (based upon peak hour data) which may result in fewer collisions. As the proposed Trafton Road interchange would be similar to the Lyons Road interchange, it would likely have a similar crash rate.

Other than the construction of the proposed Trafton Road interchange, geometric and signalization changes are not anticipated in the area of influence. As such, the severity of the collisions is not expected to change within the area of influence.

Policy Point 3 Finding

The proposed interchange will operate with little delay and will not significantly affect the upstream or downstream traffic flow in either direction. The proposed interchange will not only allow for convenient and direct access to surrounding land zoned as industrial, but will provide additional local transportation options and connectivity. The proposed interchange is forecast to reduce the traffic utilizing the Lyons Road and Kennedy Memorial Drive interchanges by approximately 5% thus reducing the potential for crashes over what exists today along the corridors served by those interchanges.

Policy Point 4 – Access Connections and Design

The preferred proposed interchange design would utilize the existing two-lane Trafton Road Bridge crossing I-95. That bridge is similar to the Lyons Road Bridge in use at the Lyons Road interchange. The preferred ramp design is a partial cloverleaf occupying the southern quadrants as shown in the concept plan included in this report. There is an adjacent interchange 3 miles to the north of the proposed interchange that intersects Kennedy Memorial Drive at milepost 127 and 4 miles to the south there is an interchange intersecting the Lyons Road at milepost 120.

The new interchange is proposed to utilize typical parallel single lane entrance and exit ramps meeting the requirements in Chapter 9 of the MaineDOT Design Guide. The following assumptions were made:

- A main line interstate design speed of 70 MPH
- A main line assumed to be level
- A ramp design speed for acceleration and deceleration of 30 MPH with the required deceleration length – 550' (Table 9-1) and the required acceleration length – 1,350' (Table 9-4)
- A ramp minimum radii design speed of 35 MPH with the required minimum radii of 310' (Table 9-7)
- A taper length of 15:1 minimum, 25:1 desirable (Figure 9-7, 9-9)

Ramp	Type	Number of Lanes	Proposed Ramp Radii	Proposed Accel/Decel Length	Taper Length	Meets requirement?
NB Off	Parallel	1	600'/476'	550'	300'(25:1)	Yes
NB On	Parallel	1	400'/476'	1,350'	300'(25:1)	Yes
SB Off	Parallel	1	310'	550'	300'(25:1)	Yes
SB On	Parallel	1	358'	1,350'	300'(25:1)	Yes

The existing speed limit on Trafton Road is 45 MPH which is anticipated to be lowered in the vicinity of the intersections with the proposed ramps due to the additional turning traffic at the ramps and at the development driveways along Trafton Road. The ramps were located as far away from the bridge crest as practicable to maximize sight lines. The intersection sight distance for the southbound ramps is 650 feet to the right and approximately 1,000 feet to the left. The sight distance at the northbound ramps is 1,000 feet in both directions. Thus the sight lines available at each ramp exceed the MaineDOT standards with the existing 45 MPH speed limit.

The existing Trafton Road Bridge over Interstate 95 has a curb to curb width of 24 feet.

For I-95 northbound and southbound there is approximately 17 feet between the edge of the existing travel way and the face of the existing bridge columns. It is anticipated that the northbound acceleration lane and southbound deceleration lanes can be constructed within this 17 foot area with barrier construction to sufficiently protect the bridge columns. A cross section of the proposed I-95 roadway section under the ramps is included in the Appendix. The proposed interchange signage will be designed in conformance to the Manual on Uniform Traffic Control Devices (MUTCD) and be similar to the Lyons Road and KMD I-95 interchanges.

Policy Point 4 Finding

The proposed interchange design meets current MaineDOT geometric design criteria with the exception of the shoulder width which will be reduced to 3 feet under the bridge and therefore require a design exception. The partial clover leaf configuration will accommodate all traffic movements and allow for a complete, fully functional interchange and will not significantly impact traffic flow on I-95. MaineDOT has requested that the interchange be located in a manner that will accommodate the location of a replacement to the Trafton Road Bridge in the future to the south of the existing bridge.

Policy Point 5 – Land Use and Transportation Plans

This project was originally developed by the City of Waterville and MaineDOT in the mid 1980's with FHWA approval provided in January 1987 and funding provided in MaineDOT's 1988-1989 Biennial Transportation Improvement Plan. In September of 1997, MaineDOT made the project contingent upon development prospects in the vicinity of the proposed interchange. Today, project planning is being financed by Trafton in coordination with the City, MaineDOT and FHWA.

In revisiting this proposed project in 2009, the City of Waterville requested input from the Mid-Maine Chamber of Commerce, the Central Maine Economic Growth Council and the Waterville Development Corporation. Each organization considered the need for the project and each responded back to the City in writing in March of 2010 urging the City to support a new I-95 access to Trafton Road.

The Town of Sidney Board of Selectmen convened on this topic on two occasions including a meeting open to the public to gather their input. The Town of Sidney Board of Selectmen voted to support further project planning for a new access to the interstate at Trafton Road and designated a representative of the community to serve as a liaison with the City of Waterville. A letter of support was sent on March 29, 2010.

Coordination also occurred with the Towns of Oakland and Winslow.

Following these developments, the Waterville City Council voted unanimously, on April 6, 2010, to support project planning and meetings with MaineDOT and FHWA. On September 7, 2010, the Waterville City Council voted unanimously to support the formation of an I-95 Access Project Advisory Committee. That Committee met on three occasions to draft a purpose and need statement and review build and no-build alternatives. The development of the purpose and need statement and the consideration of alternatives occurred in coordination with MaineDOT and FHWA. The Committee concluded its initial work with a recommendation back to the City Council. The City held a public hearing (with public notice) on the Committee's recommendations on January 11, 2011 and on January 18, 2011 voted to "...accept the recommendations of the I-95 Access Advisory Committee regarding a Purpose and Need statement and Alternatives Analysis and further said recommendations to the Maine Department of Transportation to serve as a basis for further study of the project." The purpose and need and preferred alternative accepted by the City are advanced in this IJR.

With these endorsements, Trafton proceeded to prepare and submit to the MaineDOT a Traffic Movement Permit for a doubling of their facility space on Trafton Road for light manufacturing, distribution and warehousing. A public meeting with public notice to abutters was held at Waterville City Hall on May 24, 2011 to receive public input and comment on the scope of work to be undertaken to complete a traffic movement study to file with MaineDOT. On November 15, 2011 MaineDOT issued a traffic movement permit (ID # 02-00068A-N) approving the expansion conditioned on either the upgrade of existing roads or the creation of a new I-95 interchange access to Trafton Road. The permit is included in the Appendix of this report.

The proposed interchange is recognized in the City of Waterville's Comprehensive Plan. Chapter 13, (Goals, Policies, Strategies), Policy 2 (Promotion), includes strategy "I" which reads:

> Trafton Road Interchange. Work with State DOT to construct an I-95 Interchange at Trafton Road to assist the development of the industrial and commercially zoned areas on and adjacent to Trafton Road

The proposed interchange is recognized in the most recent Kennebec Valley Council of Governments Corridor Management Plan for the Lower Kennebec/Rte 201 Corridor. Page 12 of the Plan lists the following additional strategy for Waterville:

> Add I-95 interchange at Trafton Road, improve Trafton Road, and extend Airport Road to link with Webb Road, in conjunction with rezoning and redevelopment in the area.

The project appears on page 207 of the MaineDOT Statewide Transportation Improvement Program for Federal Fiscal Years 2012-2013-2014-2015 with a PIN of 018129.00. Previously, the project appeared in MaineDOT's plan Connecting Maine Statewide Long Range Transportation Plan released July 2010.

Waterville City officials were provided a briefing on June 28, 2012. The Sidney Board of Selectmen was provided an update on the project on July 9, 2012. The Oakland Town Manager received an update on July 13, 2012.

Related to all of this activity is the financial plan for the project. That plan is as follows:

1. Transportation planning work for the project in cooperation with the City of Waterville, the Town of Sidney, MaineDOT and FHWA including the preparation of the IJR is and will continue to be the financial responsibility of Trafton .
2. Project approvals, including environmental permits and design plan submissions to MaineDOT and FHWA, are the financial responsibility of Trafton.
3. Right of way will be provided by Trafton. This offer assumes that the preferred alternative emerging from NEPA review and approval is for an interchange design located just south of Trafton Road on the property of Trafton.
4. The City of Waterville will assume financial responsibility for the upgrade of Trafton Road from the ramps to Route 104, the West River Road, to a design standard comparable to Lyons Road in Sidney interchanging with I-95. This commitment is contingent upon the attraction of development consistent with the "Light Industrial Development" proposed in the Traffic Movement Permit previously cited or as that permit may be amended in the future with the City's concurrence.
5. The current design advancing through the IJR review is for a partial clover leaf located in the southern two quadrants of the proposed interchange. Based upon discussions with MaineDOT, this design will accommodate the future replacement of the Trafton Road Bridge over I-95 allowing it to be located south

of the existing bridge. However, given the remaining useful life of the existing bridge, it will serve as is for the foreseeable future. The cost of its replacement and ramp realignment under this scenario will be a MaineDOT financial responsibility.

6. Given the position of the City of Waterville (see item 4 above), it is likely that investments in interchange construction will proceed only when development prospects have been secured with sufficient certainty to warrant such investment. Trafton, Waterville, Sidney and MaineDOT reserve their options to consider alternate financial arrangements depending on the scale of economic development investment expected. Furthermore, all financial partners to this initiative reserve the option to secure financing through HUD, EDA and other federal, state and local sources should there not be sufficient initial development secured to warrant the up-front investment in whole or in part.
7. Trafton, MaineDOT, the City of Waterville and the Town of Sidney may mutually agree to build the alternative design concept of a diamond interchange all on Trafton property to the south of Trafton Road with a new bridge replacing both the existing Trafton Road and Town Farm Road bridges accompanied by realignments of Trafton Road and Town Farm Roads to enable connections to the new I-95 bridge.

Policy Point 5 Finding

The process supporting the development of the Trafton Road I-95 access proposal for this IJR provided numerous opportunities for public input. Public participation records are included in the appendices of this Report. The proposed access to I-95 is fully consistent with the applicable adopted land use and transportation plans.

Policy Point 6 – Future Interchanges

There are no planned interchanges in the vicinity of the proposed Trafton Road interchange. In consultation with the transportation planner for the Kennebec Valley Council of Governments and through a review of plans under consideration by MaineDOT, there is no proposal anticipated for a further interchange between I-95 exits 113 in Augusta and 138 in Clinton out to 2032. Additionally, letters to this effect from the City of Waterville and the Town of Sidney are included in the appendices of this report. Therefore, a system analysis anticipating future additional interchanges is not warranted.

Policy Point 6 Finding

There are no future interchanges in the vicinity of the proposed Trafton Road interchange. The proposed interchange is compatible with existing interchanges and connections.

Policy Point 7 – Coordination

The proposed Trafton Road interchange does not require any non-interstate or local roadway improvements for it to operate appropriately. The City of Waterville may upgrade Trafton Road between the I-95 overpass and River Road. Noted in the finding of Policy Point 4 is the intent to coordinate the placement of the partial clover leaf option to accommodate the ultimate replacement of the Trafton Road Bridge by MaineDOT.

Policy Point 7 Finding

There are no other roadway improvements required for the I-95 Trafton Road interchange to function appropriately.

Policy Point 8 – Environmental Process

Final IJR review and approval is conditioned on the completion of the NEPA process including further alternatives analysis. Based upon an initial review of alternatives presented under Policy Point 2 the design option advanced here is an interchange at Trafton Road with a partial clover leaf design occupying the southern quadrants. A preliminary environmental site review based upon this design concept was conducted in the fall of 2011 and a report was issued on January 3, 2012 by A. E. Hodsdon Consulting Engineers. The objective of the preliminary environmental review was to determine if the selected design was likely to pose insurmountable impacts.

Based upon this initial review the proposed design is expected to have minimal environmental impacts. Depending on final alignment, the project could affect 1.65 to 2.2 acres of wetland, wet areas or drainage. Approximately two thirds of the affected areas are on the west side of the interstate and one third of the affected areas are on the east side. One stream with associated wetlands currently crossed by the interstate and Junction Road would be crossed by the ramps.

There are no coastal zones or dunes, fragile mountain areas or wild and scenic rivers near the project site. Noise levels are expected to remain unchanged once the project is completed. No permanent negative effects on water or air quality are anticipated once the project is completed. There are no natural landmarks affected. There are no known endangered species in the immediate area. The proposed project is not located in a documented flood plain. A manure pit and building debris from a demolished barn once on the site would be removed.

There are no residences, businesses or buildings on the site. Land required for the project is under the control and ownership of Trafton and will be donated to the MaineDOT should the project proceed as proposed.

Policy Point 8 Finding

Based upon a preliminary environmental review the likely impacts from the project are deemed minimal and manageable. A conditional approval of this IJR submittal is requested with the understanding that final approval will depend upon satisfactory completion of the NEPA process for the proposed interchange. Trafton will commence the NEPA process once a conditional approval of the IJR is issued by MaineDOT and FHWA.

Summary Findings

Trafton Realty, LLC. in cooperation with the City of Waterville and the Town of Sidney seeks to establish a new I-95 interchange at or in the vicinity of Trafton Road near the Waterville-Sidney municipal boundary. In such a circumstance, an Interchange Justification Report (IJR) is required to document how a proposed interstate access modification addresses eight policy points identified by FHWA and adhered to by MaineDOT. This IJR addresses the eight policy points and establishes the basis for the approval requested of MaineDOT and FHWA.

Working through an I-95 Access Project Advisory Committee established by the City of Waterville in cooperation with the Town of Sidney, the Town of Oakland and Trafton a statement of project purpose and need was drafted by this Committee, reviewed by MaineDOT and approved by the Waterville City Council. The project purpose is to:

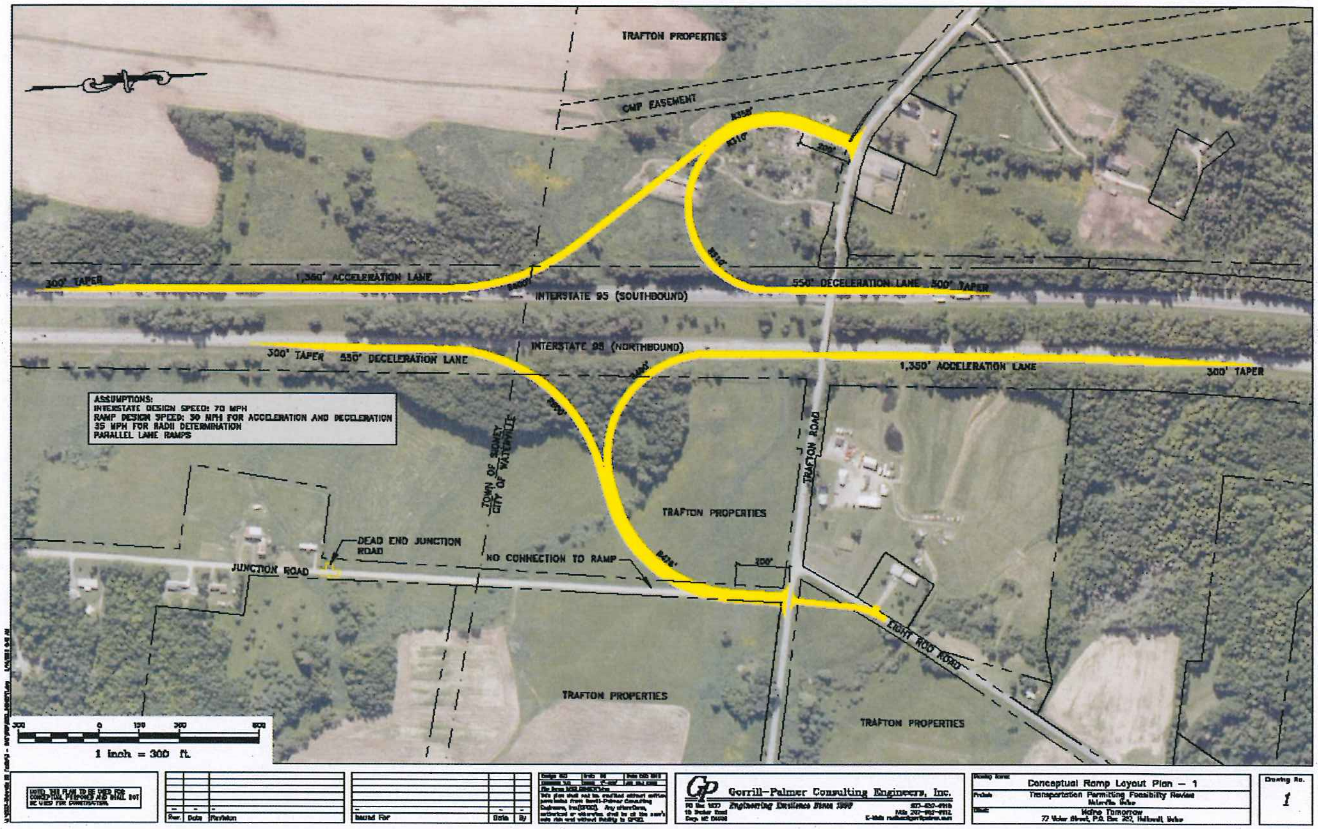
1. Improve regional mobility
2. Sustain a level of service on Kennedy Memorial Drive (KMD) sufficient to support existing and planned uses along the corridor
3. Reduce transportation impediments to planned development south of KMD
4. Expand freight and passenger transportation connectivity

The effectiveness of no build and build alternatives is judged based upon the following project need criteria:

1. A traffic choke point is forecasted at the I-95/KMD interchange
2. Traffic choke points are forecasted on KMD at the intersections with Cool, Colette, West River Road and Carter Memorial Drive
3. I-95 access for south Waterville and north Sidney is inadequate to support desired manufacturing, distribution and warehousing employment growth
4. Connectivity and balance of area traffic is not optimized
5. Emergency response times are not minimized
6. Truck freight traffic on Interstate is not maximized
7. Waterville Airport, the adjacent Foreign Trade Zone and business park lack sufficient market attraction to realize the potential of these sites
8. Reuse of environmentally degraded City Property at the former solid waste facility off Webb Road and the brown field site off West River Road

The proposed build alternative favored by the Waterville City Council as recommended to them by the I-95 Access Project Advisory Committee was developed in coordination with MaineDOT and the FHWA within a broader consideration of alternatives. The preferred alternative locates an interchange at Trafton Road which uses the existing two-lane Trafton Road Bridge crossing I-95. The ramp design is a partial cloverleaf occupying the southern quadrants. The year 2036 was selected as the Design Year for this project which is a 20 year horizon from the forecast opening by Trafton of 225,000 square feet of light industrial space on Trafton Road.

Proposed Preferred Alternative for IJR Review



Eight Policy Point Findings

Need for Access Point: The existing access to I-95 in southern Waterville is inadequate under the no-build scenario to ease choke points on KMD forecasted to reach unacceptable levels of service before the 2022 design year. The no build scenario negates the myriad assets now present to support development in southern Waterville and northern Sidney. The no-build scenario frustrates opportunities to enhance system connectivity and a more balanced distribution of traffic.

Reasonable Alternatives: Through extensive collaboration at the local level over the course of decades, most recently coordinated with MaineDOT and FHWA, the proposed Trafton Road partial clover leaf interchange (pending a full NEPA review) reflects a consensus determination that it is the best option to fulfill the purpose and need of the project.

Operational and Collision Analysis: The proposed interchange will operate with little delay and will not significantly affect the upstream or downstream traffic flow in either direction. The proposed interchange will not only allow for convenient and direct access to surrounding land zoned as industrial, but will provide additional local transportation options and connectivity. The proposed interchange is forecast to reduce the traffic utilizing the Lyons Road and Kennedy Memorial Drive interchanges by approximately

5% thus reducing the potential for crashes over what exists today along the corridors served by those interchanges.

Access Connections and Design: The proposed interchange design meets current MaineDOT geometric design criteria with the exception of the shoulder width which will be reduced to 3 feet under the bridge and therefore require a design exception. The partial clover leaf configuration will accommodate all traffic movements and allow for a complete, fully functional interchange and will not significantly impact traffic flow on I-95. MaineDOT has requested that the interchange be located in a manner that will accommodate the location of a replacement to the Trafton Road Bridge in the future to the south of the existing bridge.

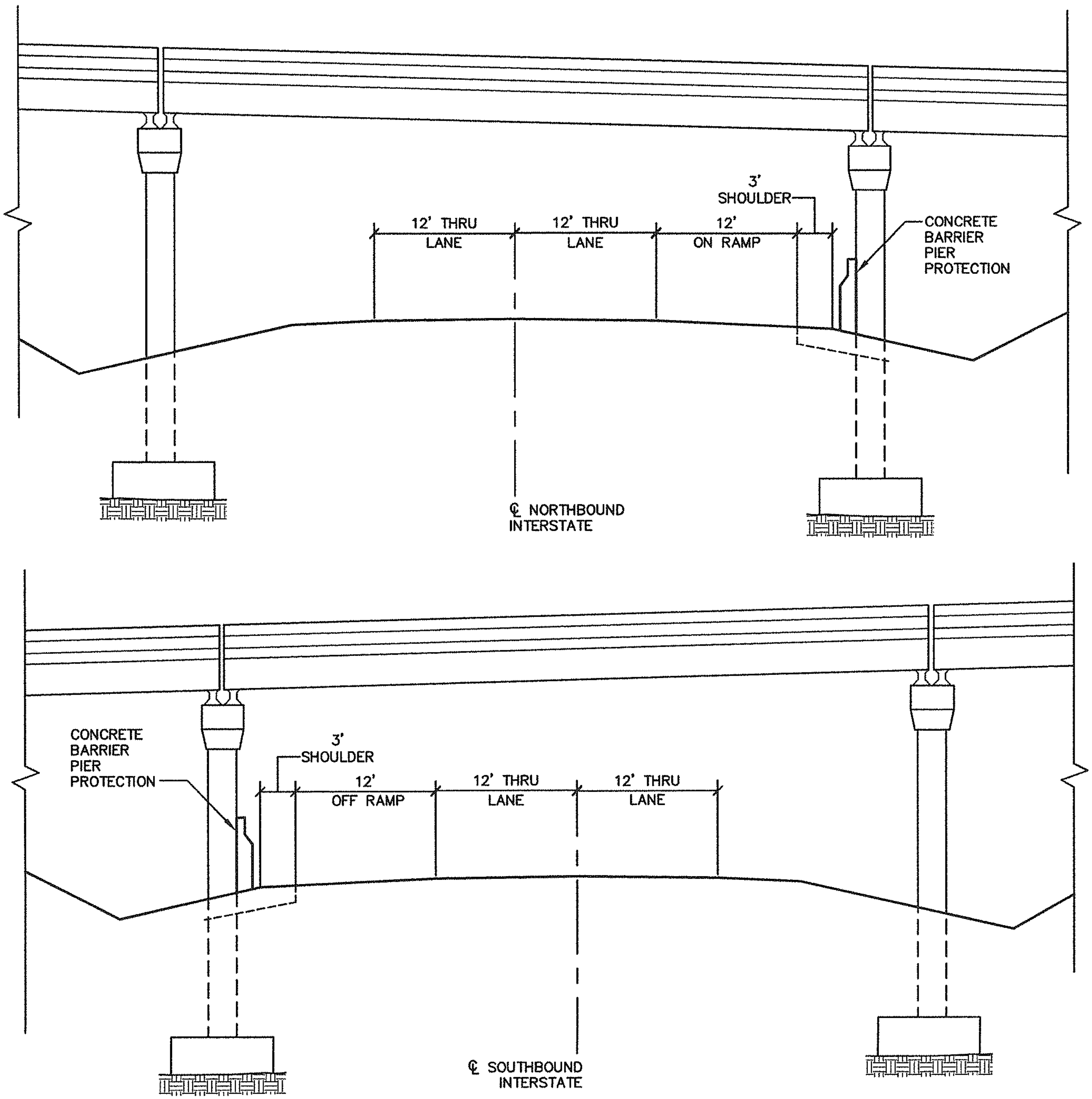
Land Use and Transportation Plans: The process supporting the development of the Trafton Road I-95 access proposal for this IJR provided numerous opportunities for public input. Public participation records are included in the appendices of this Report. The proposed access to I-95 is fully consistent with the applicable adopted land use and transportation plans.

Future Interchanges: There are no future interchanges in the vicinity of the proposed Trafton Road interchange. The proposed interchange is compatible with existing interchanges and connections.

Coordination: There are no other roadway improvements required for the I-95 Trafton Road interchange to function appropriately.

Environmental Process: Based upon a preliminary environmental review the likely impacts from the project are deemed minimal and manageable. A conditional approval of this IJR submittal is requested with the understanding that final approval will depend upon satisfactory completion of the NEPA process for the proposed interchange. The NEPA process will commence once a conditional approval of the IJR is issued by MaineDOT and FHWA.

SECTION UNDER TRAFTON ROAD



Design: TLG	Date: AUG 2012
Draft: CG	Job No.: 2233.03
Checked: TLG	Scale: NTS
File Name: 2233-03-DETAIL.dwg	

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Drawing Name:
Section Under Trafton Road Bridge

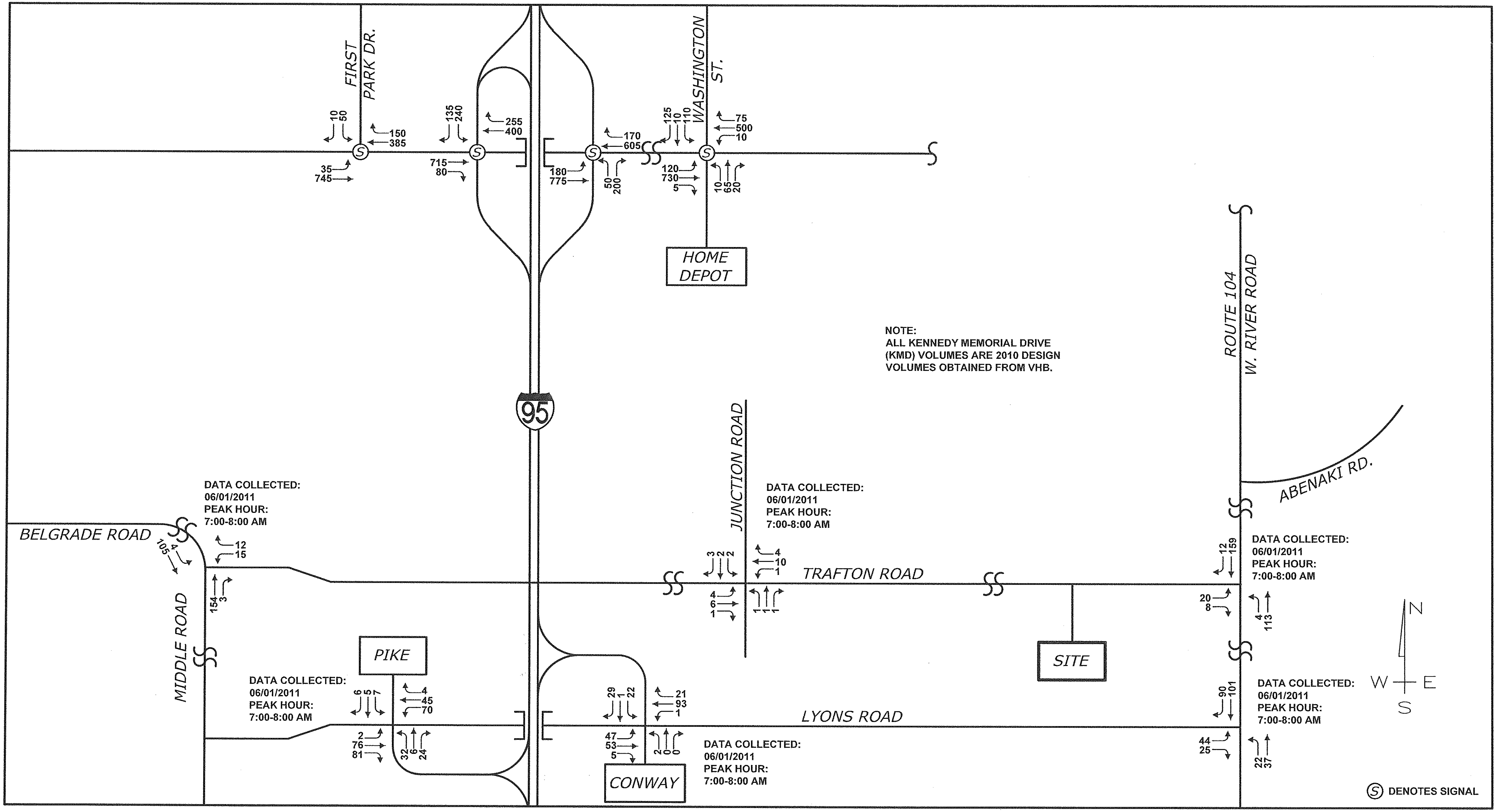
Project:
TRAFTON ROAD INTERCHANGE

Figure No.
1

TURNING MOVEMENT DIAGRAMS

Raw Volumes - AM Peak Hour

Figure No. 2



NOTE:
ALL KENNEDY MEMORIAL DRIVE (KMD) VOLUMES ARE 2010 DESIGN VOLUMES OBTAINED FROM VHB.

TRAFTON PROPERTIES, WATERVILLE, MAINE

Design:	JJB	Scale:	NONE
Draft:	DB	Date:	JUN 2011
Checked:	RED	File Name:	2233-03_TRAFF.dwg

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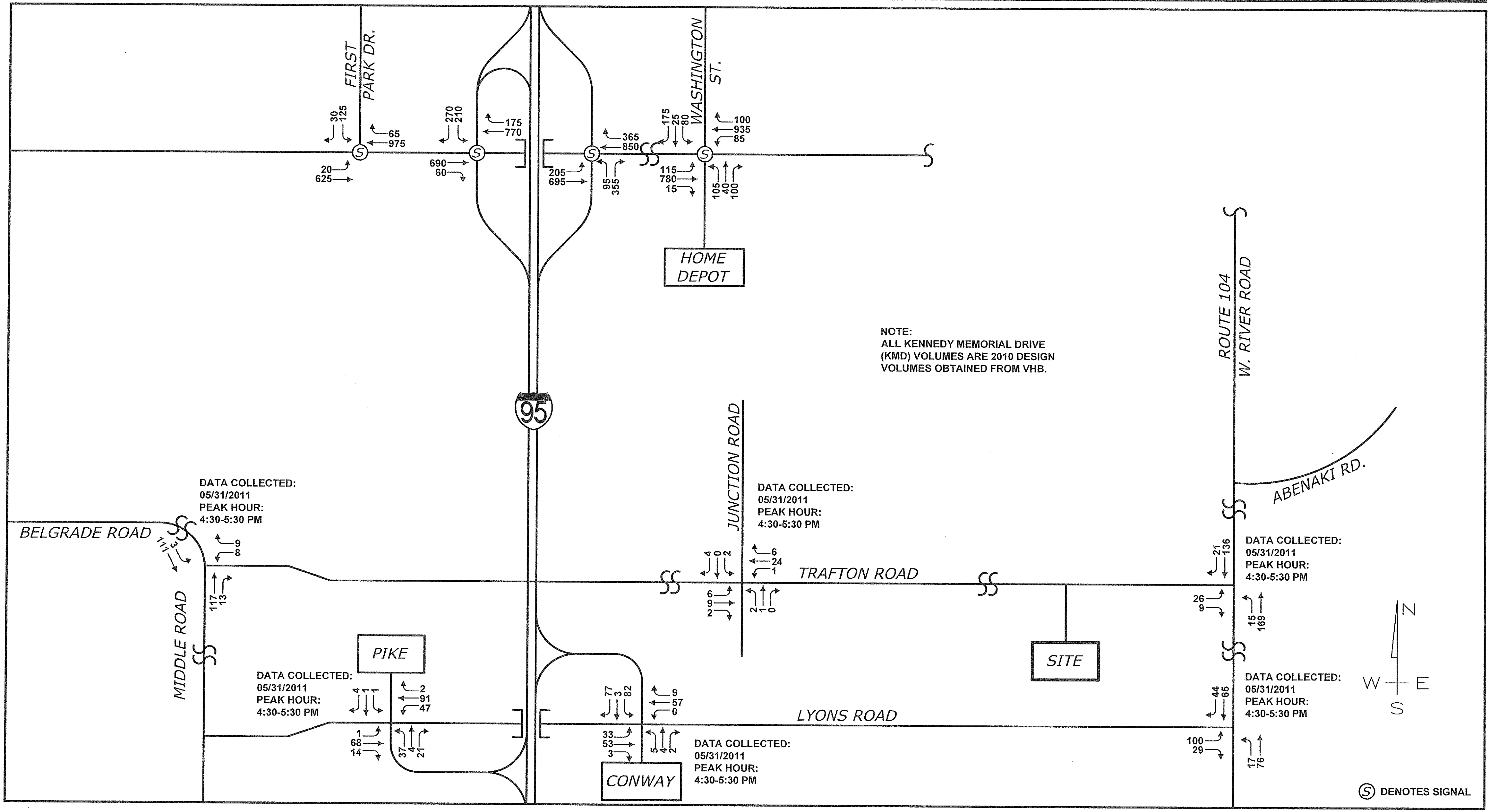
Raw Volumes - PM Peak Hour

Figure No. 3



NOTE:
ALL KENNEDY MEMORIAL DRIVE (KMD) VOLUMES ARE 2010 DESIGN VOLUMES OBTAINED FROM VHB.

DATA COLLECTED:
05/31/2011
PEAK HOUR:
4:30-5:30 PM

DATA COLLECTED:
05/31/2011
PEAK HOUR:
4:30-5:30 PM

DATA COLLECTED:
05/31/2011
PEAK HOUR:
4:30-5:30 PM

DATA COLLECTED:
05/31/2011
PEAK HOUR:
4:30-5:30 PM

DATA COLLECTED:
05/31/2011
PEAK HOUR:
4:30-5:30 PM

DATA COLLECTED:
05/31/2011
PEAK HOUR:
4:30-5:30 PM

TRAFTON PROPERTIES, WATERVILLE, MAINE

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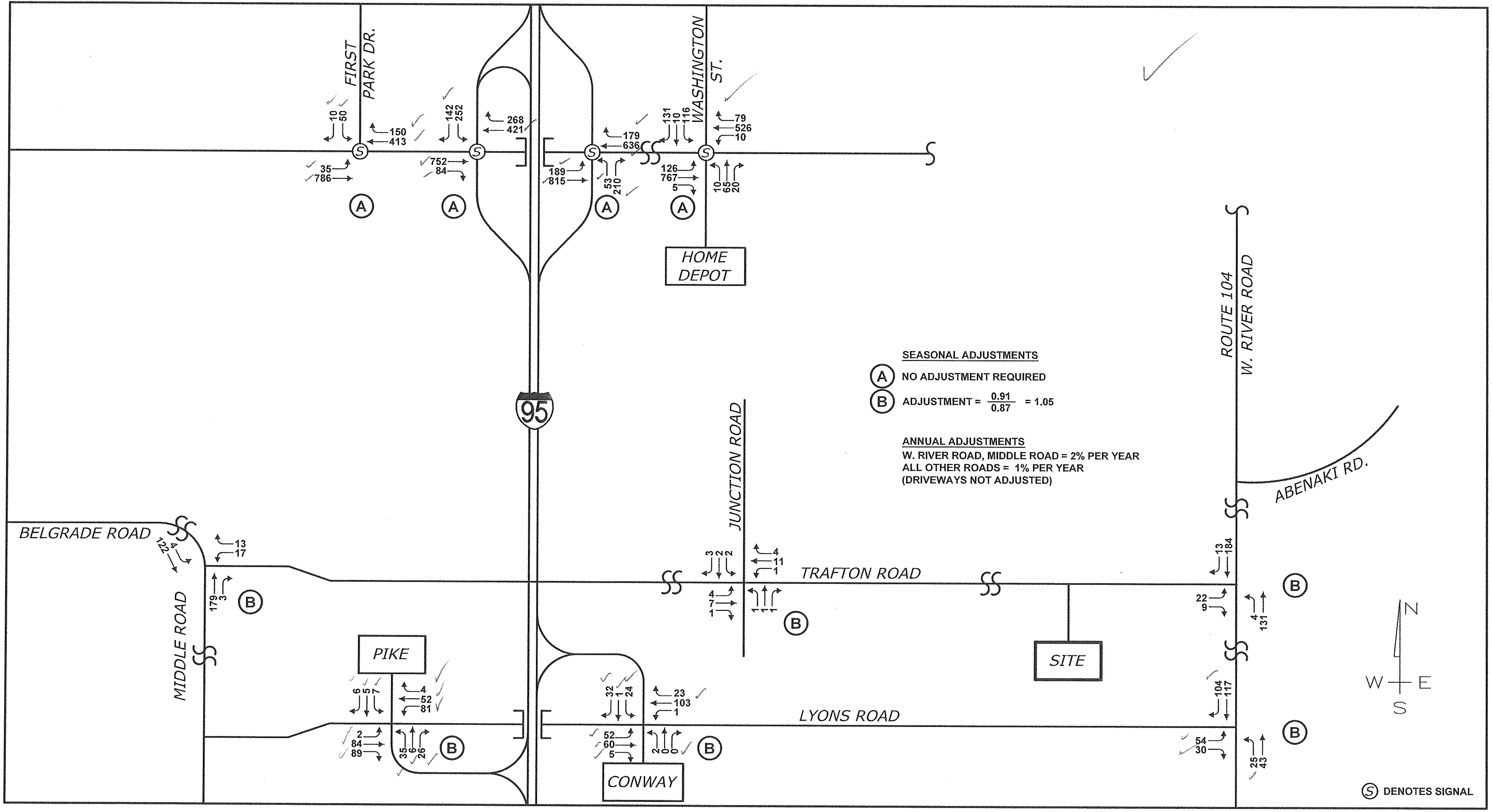
2016 Predevelopment Volumes - AM Peak Hour - without Interchange

Figure No. 4A



SEASONAL ADJUSTMENTS

Ⓐ NO ADJUSTMENT REQUIRED

Ⓑ ADJUSTMENT = $\frac{0.91}{0.87}$ = 1.05

ANNUAL ADJUSTMENTS

W. RIVER ROAD, MIDDLE ROAD = 2% PER YEAR
ALL OTHER ROADS = 1% PER YEAR
(DRIVEWAYS NOT ADJUSTED)

Ⓢ DENOTES SIGNAL

TRAFTON PROPERTIES, WATERVILLE, MAINE

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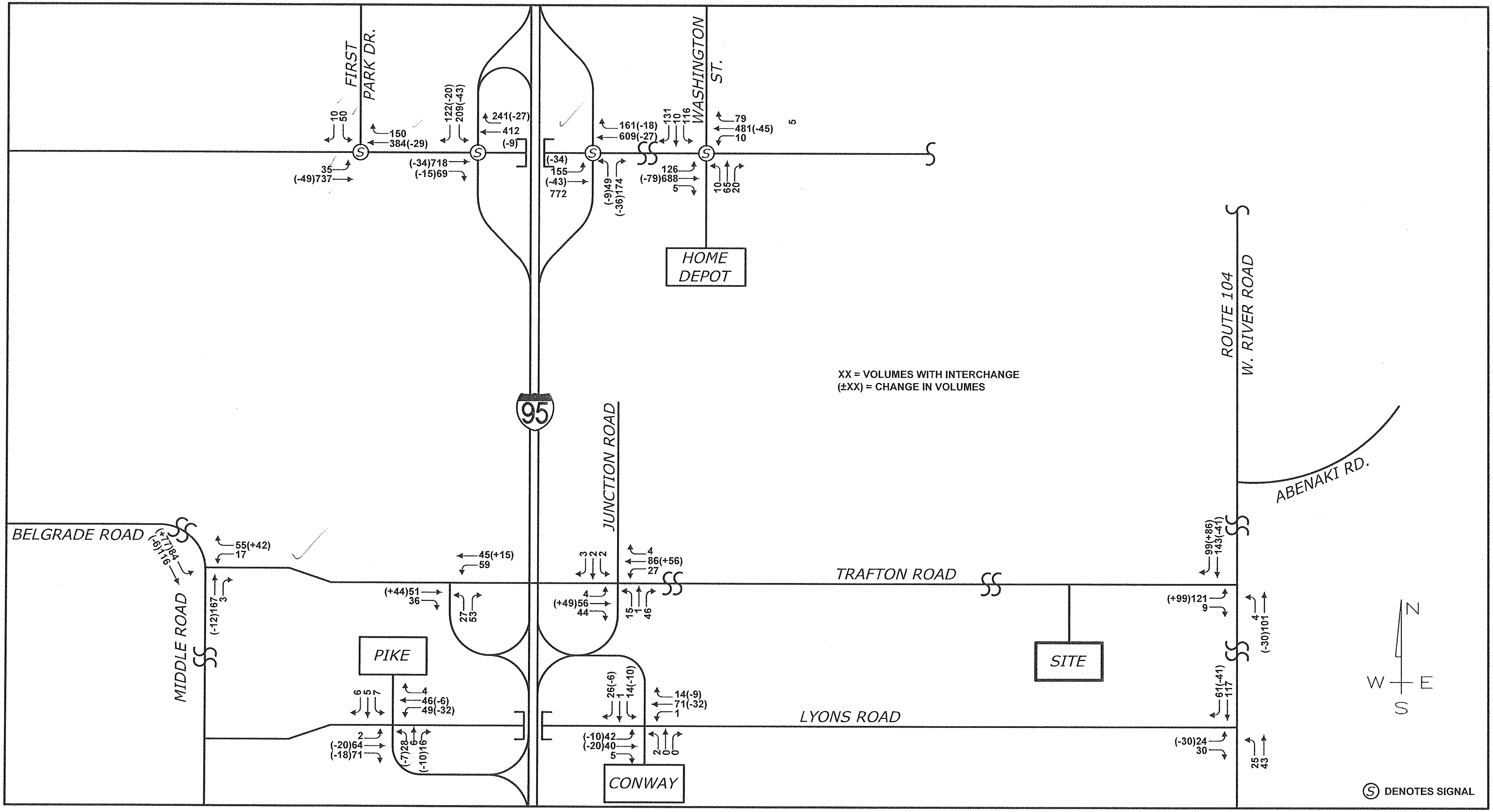
2016 Predevelopment Volumes - AM Peak Hour - with Interchange

Figure No. 4B



TRAFTON PROPERTIES, WATERVILLE, MAINE

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Scale: NONE
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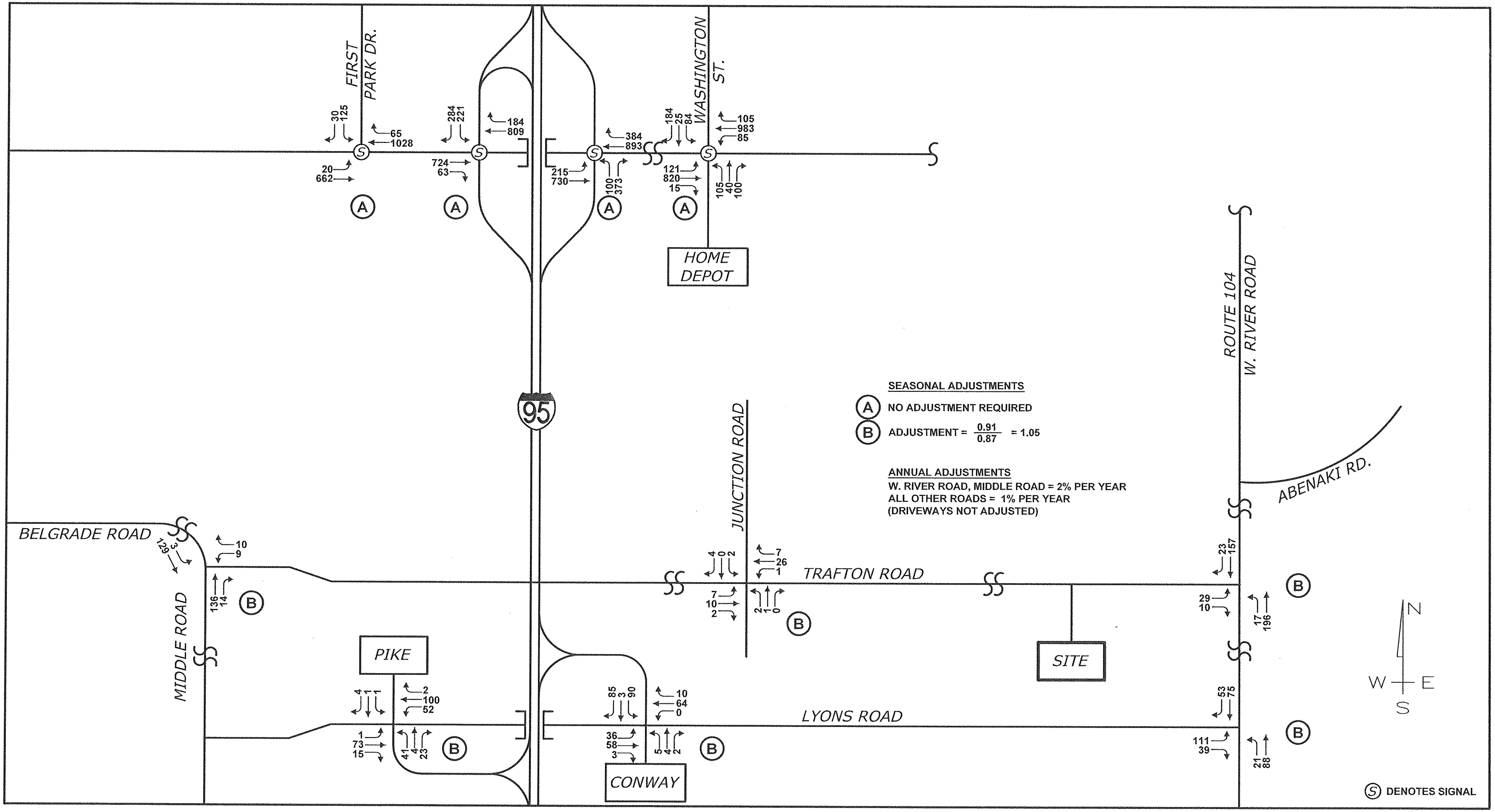
2016 Predevelopment Volumes - PM Peak Hour - without Interchange

Figure No. 5A



TRAFTON PROPERTIES, WATERVILLE, MAINE

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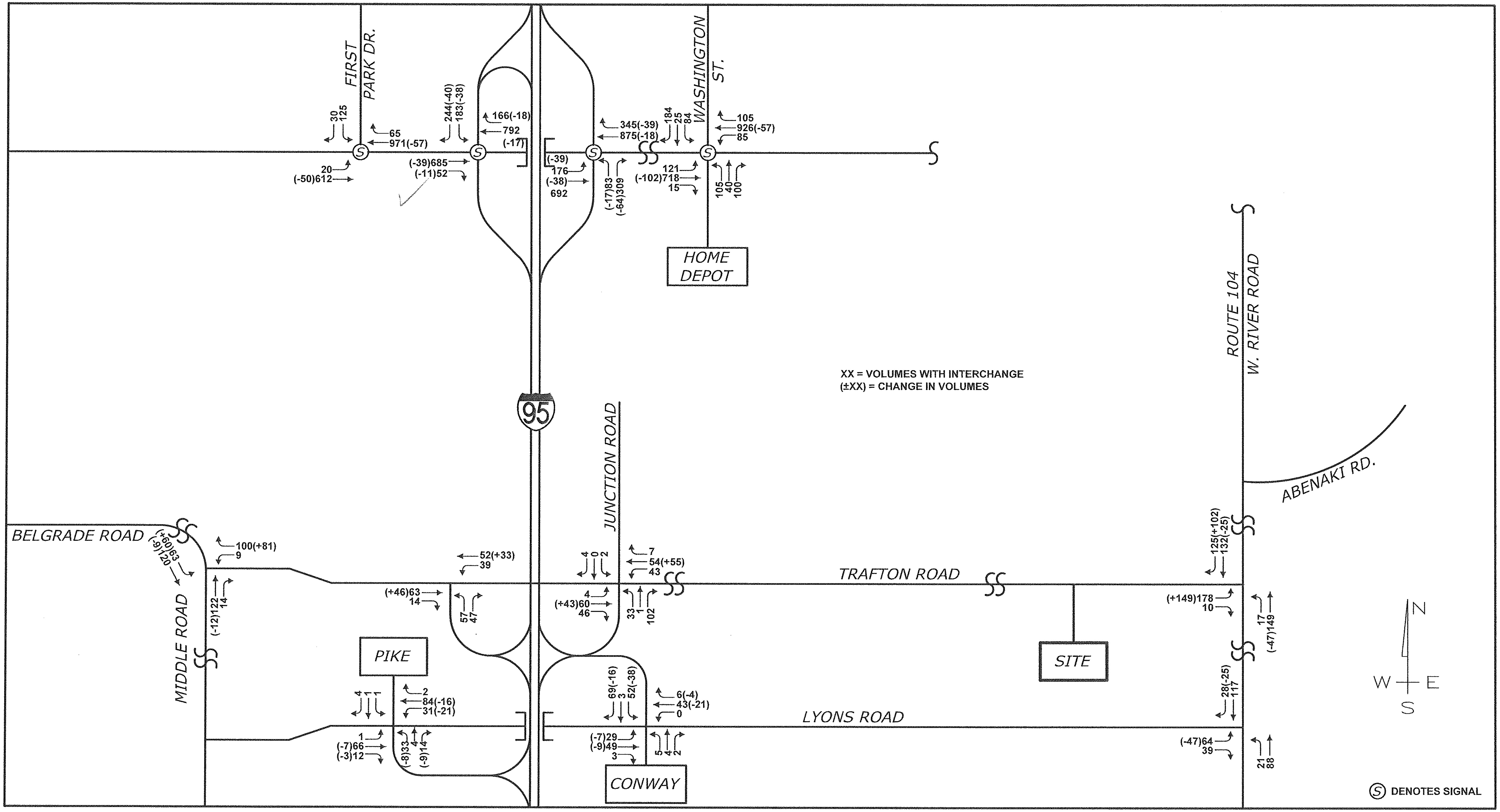
2016 Predevelopment Volumes - PM Peak Hour - with Interchange

Figure No. 5B



TRAFTON PROPERTIES, WATERVILLE, MAINE

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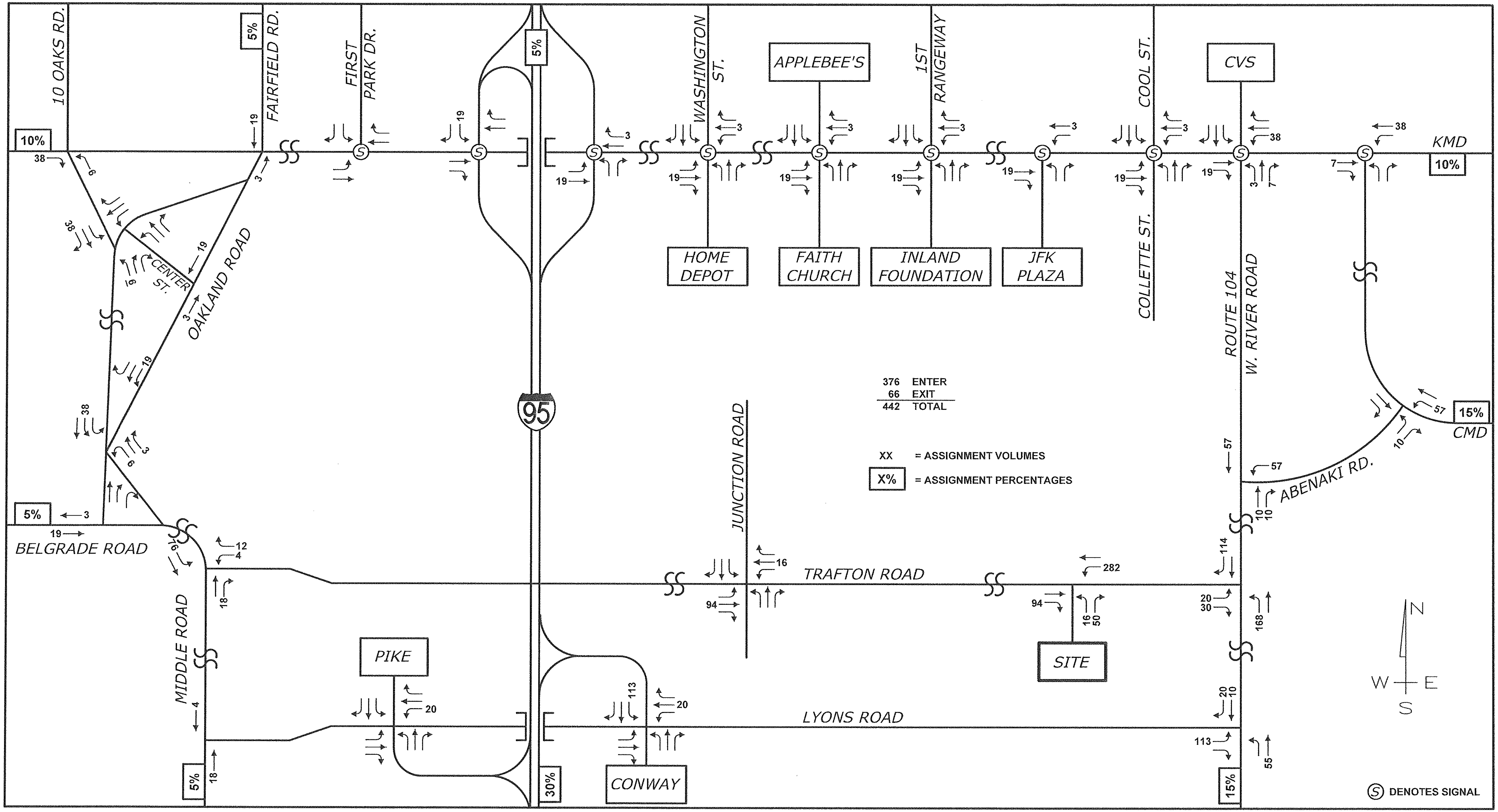
Trip Assignment - AM Peak Hour - without Interchange

Figure No. 6A



TRAFTON PROPERTIES, WATERVILLE, MAINE

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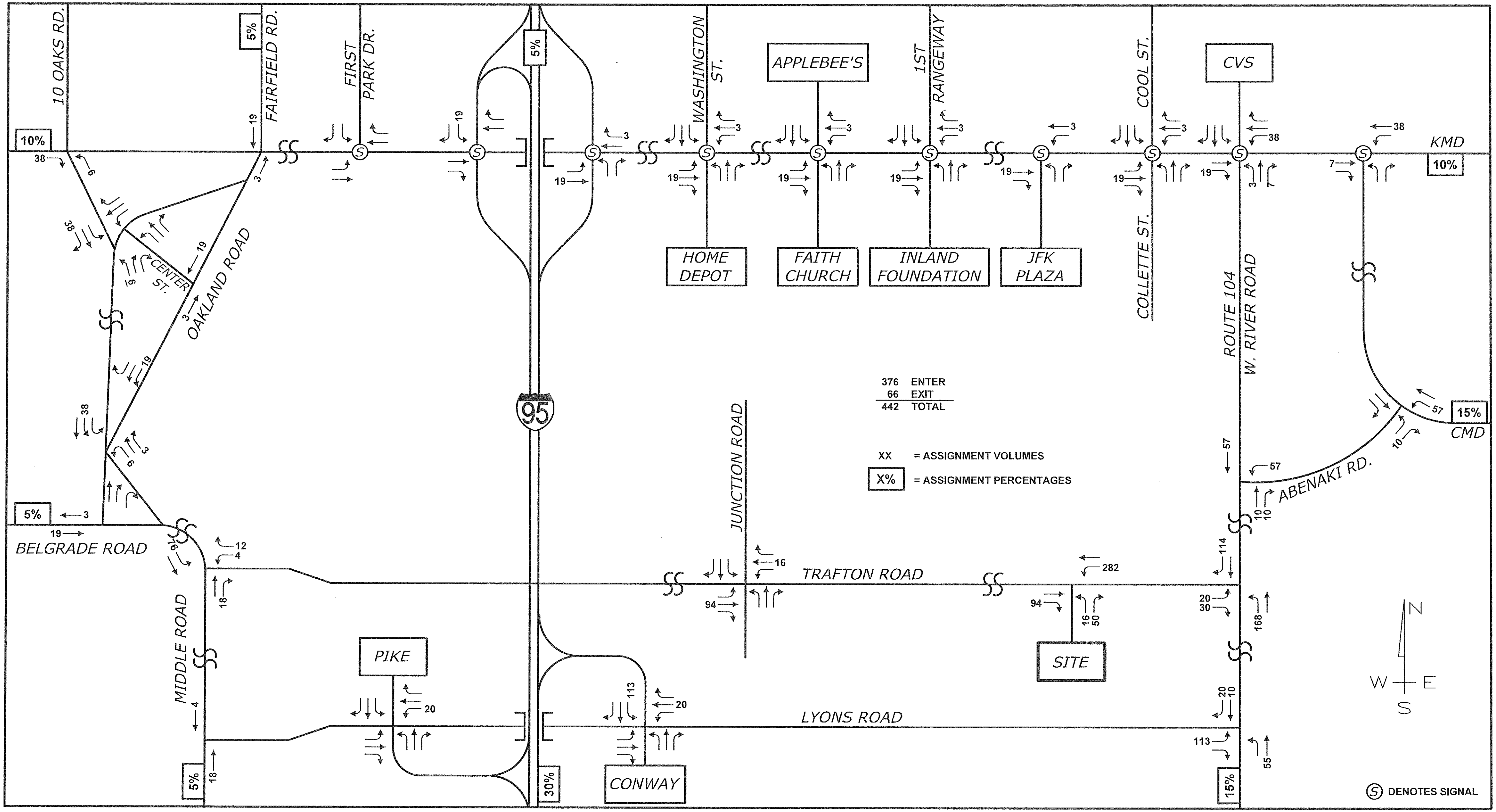
Trip Assignment - AM Peak Hour - without Interchange

Figure No. 6A



TRAFTON PROPERTIES, WATERVILLE, MAINE

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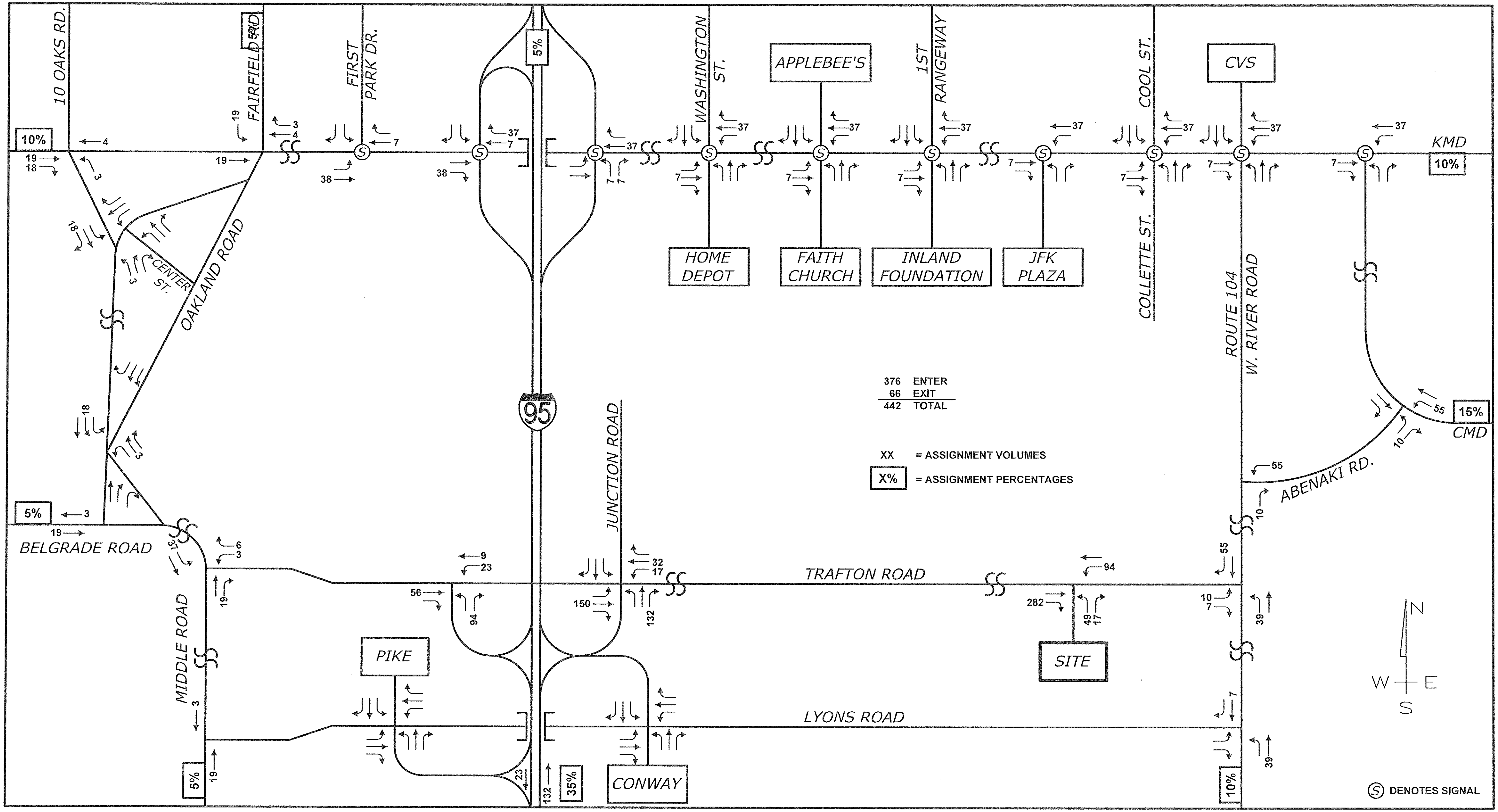
Trip Assignment - AM Peak Hour - with Interchange

Figure No. 6B



TRAFTON PROPERTIES, WATERVILLE, MAINE

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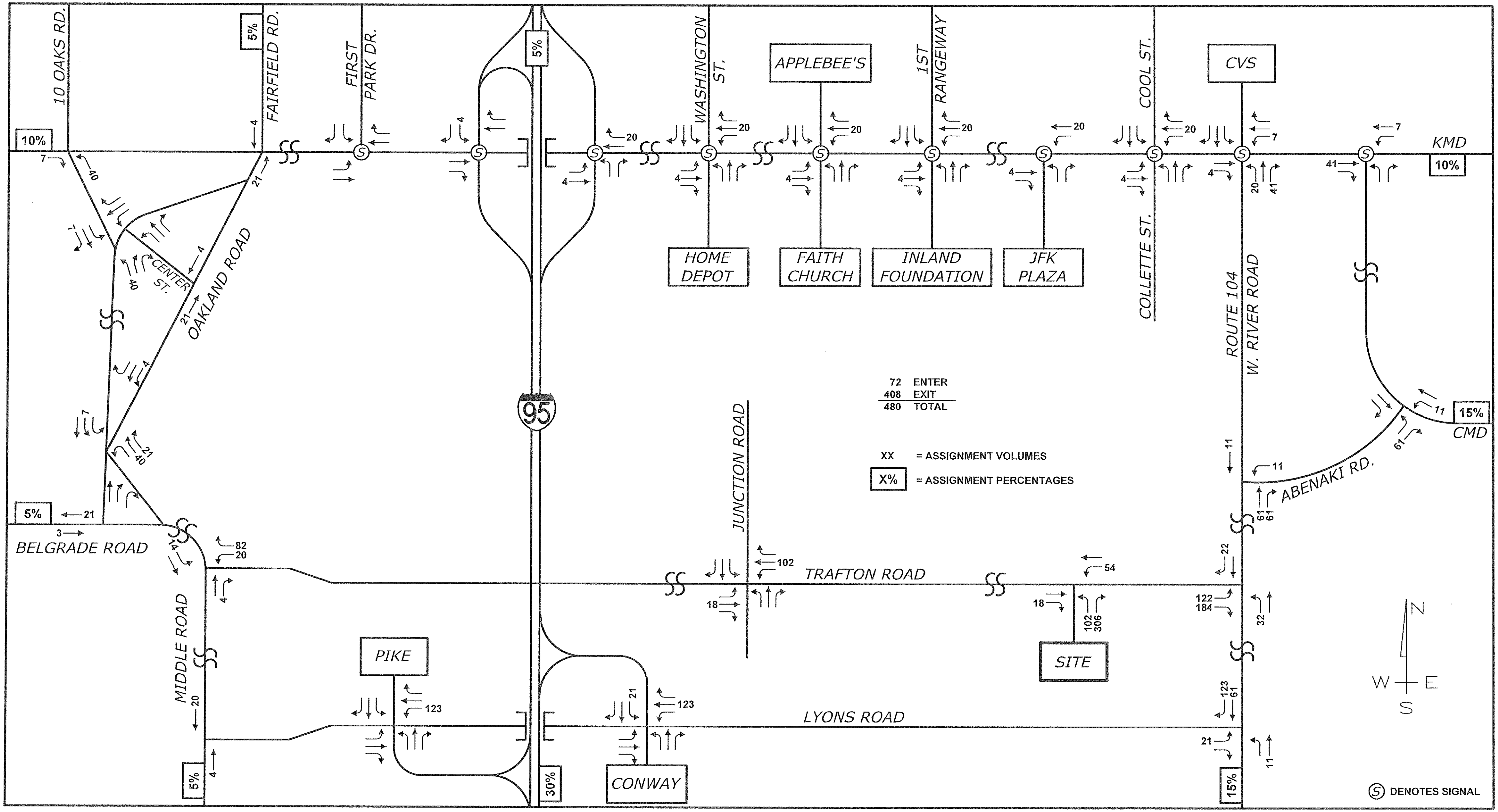
Trip Assignment - PM Peak Hour - without Interchange

Figure No. 7A



TRAFTON PROPERTIES, WATERVILLE, MAINE

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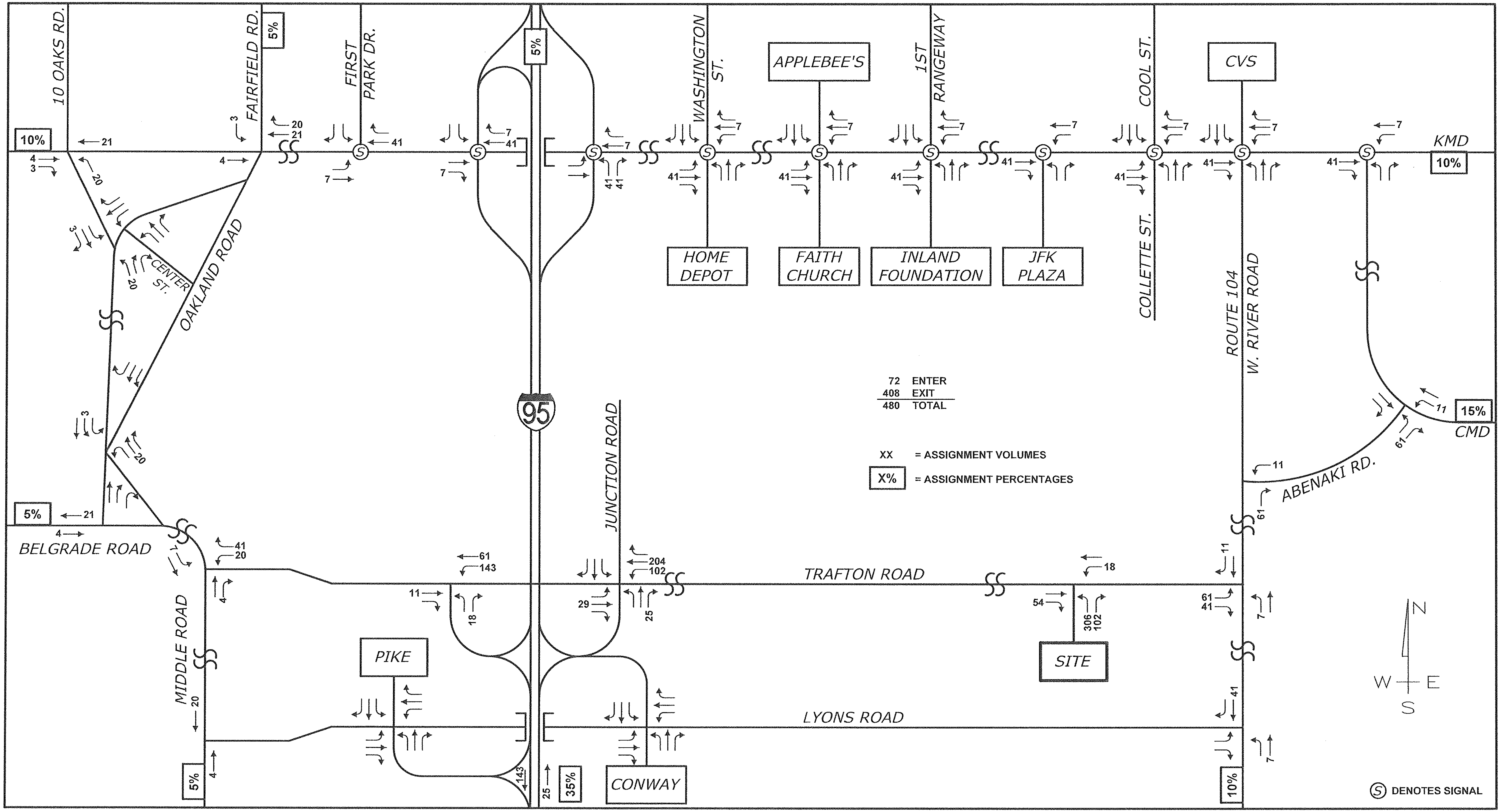
Trip Assignment - PM Peak Hour - with Interchange

Figure No. 7B



TRAFTON PROPERTIES, WATERVILLE, MAINE

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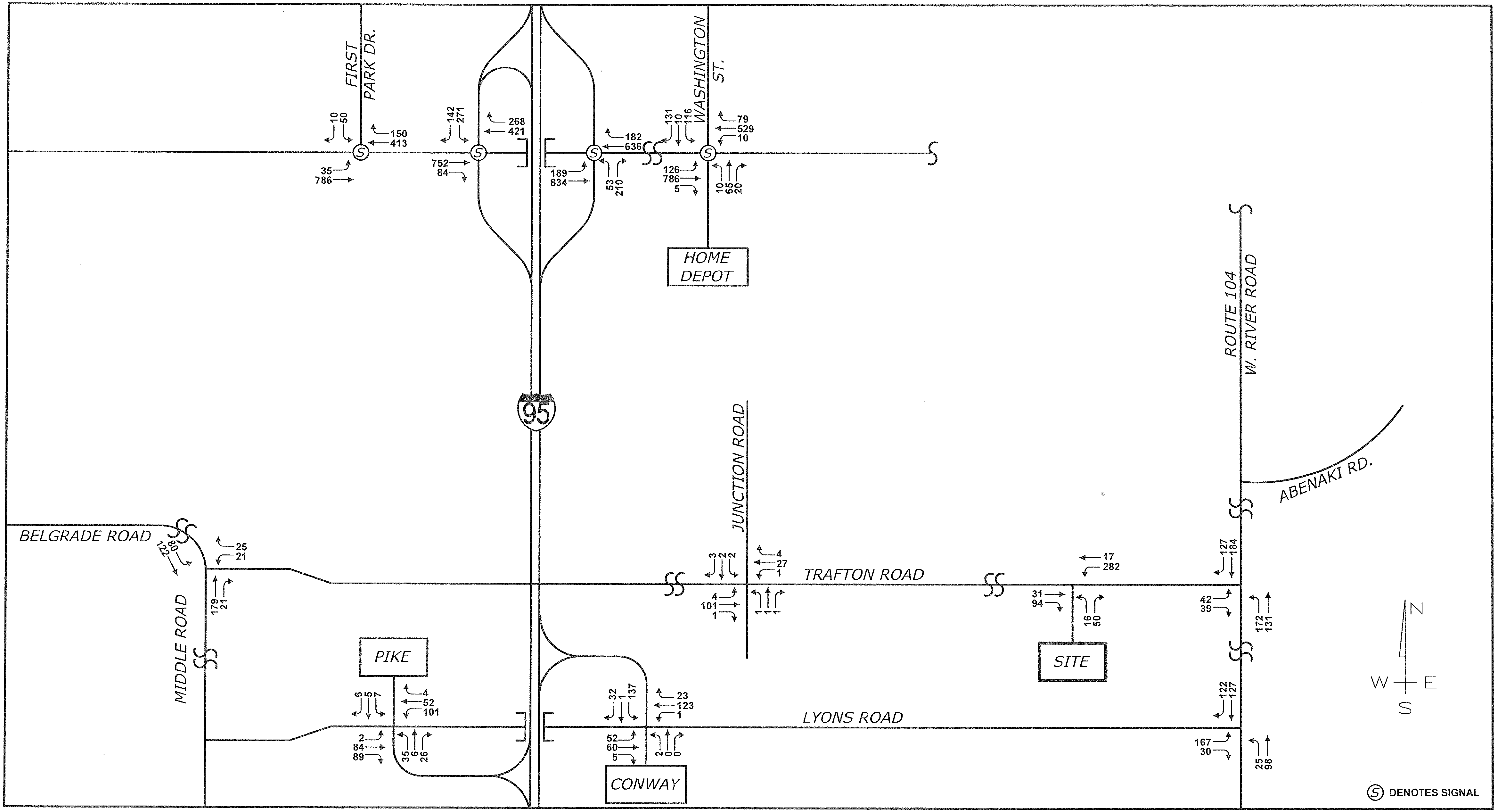
2016 Postdevelopment Volumes - AM Peak Hour - without Interchange

Figure No. 8A



TRAFTON PROPERTIES, WATERVILLE, MAINE

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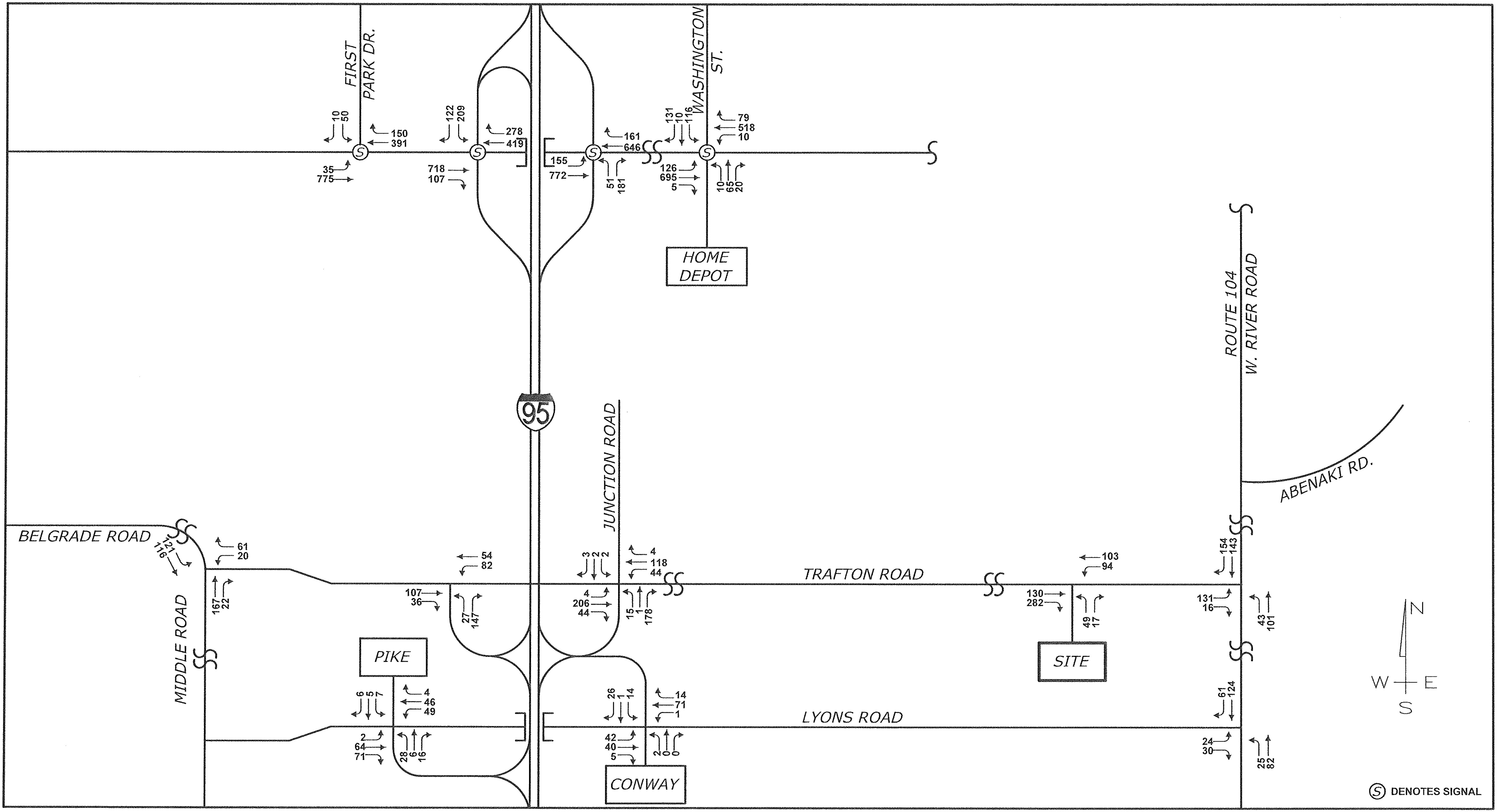
2016 Postdevelopment Volumes - AM Peak Hour - with Interchange

Figure No. 8B



TRAFTON PROPERTIES, WATERVILLE, MAINE

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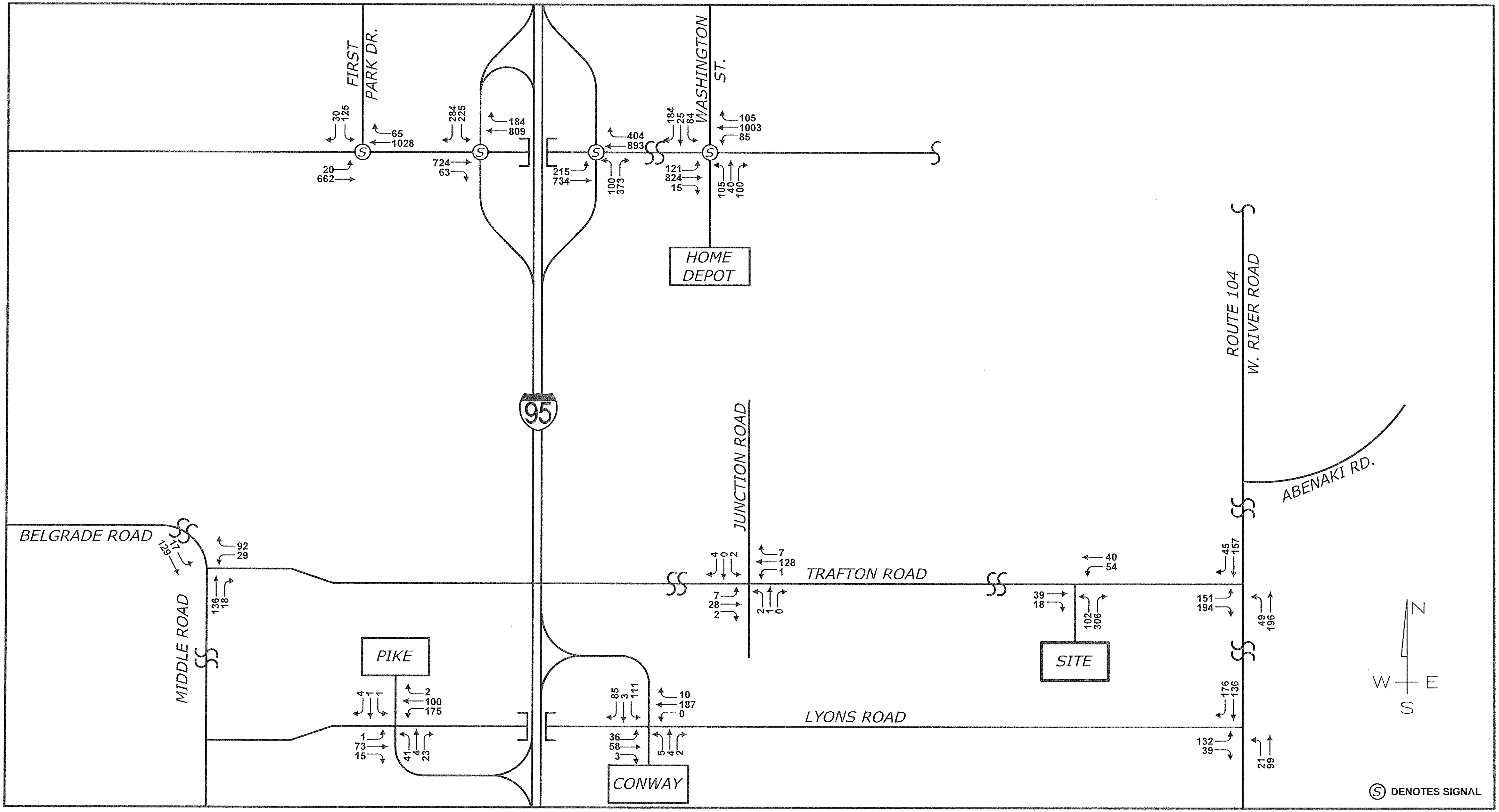
2016 Postdevelopment Volumes - PM Peak Hour - without Interchange

Figure No. 9A



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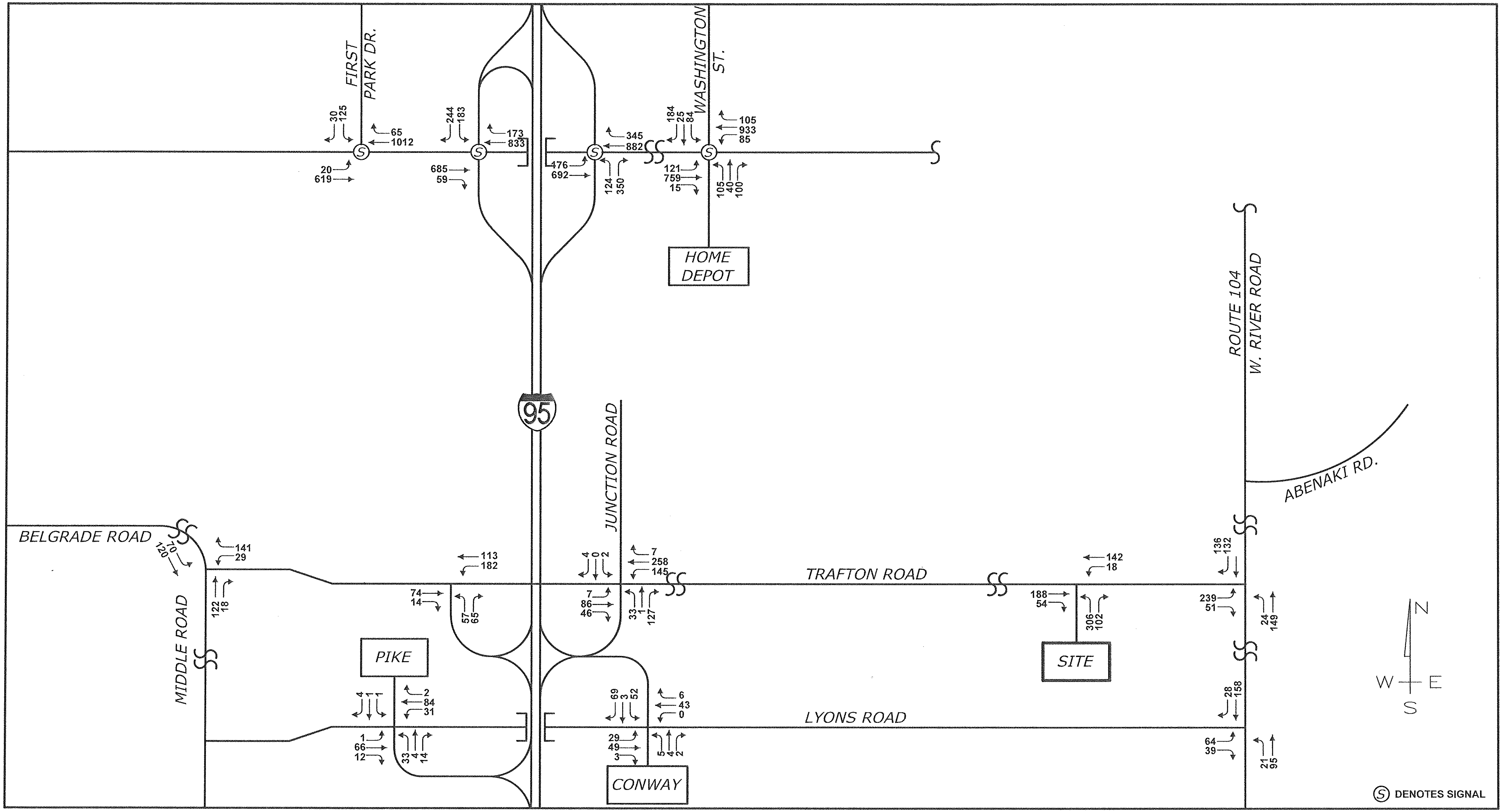
2016 Postdevelopment Volumes - PM Peak Hour - with Interchange

Figure No. 9B



TRAFTON PROPERTIES, WATERVILLE, MAINE

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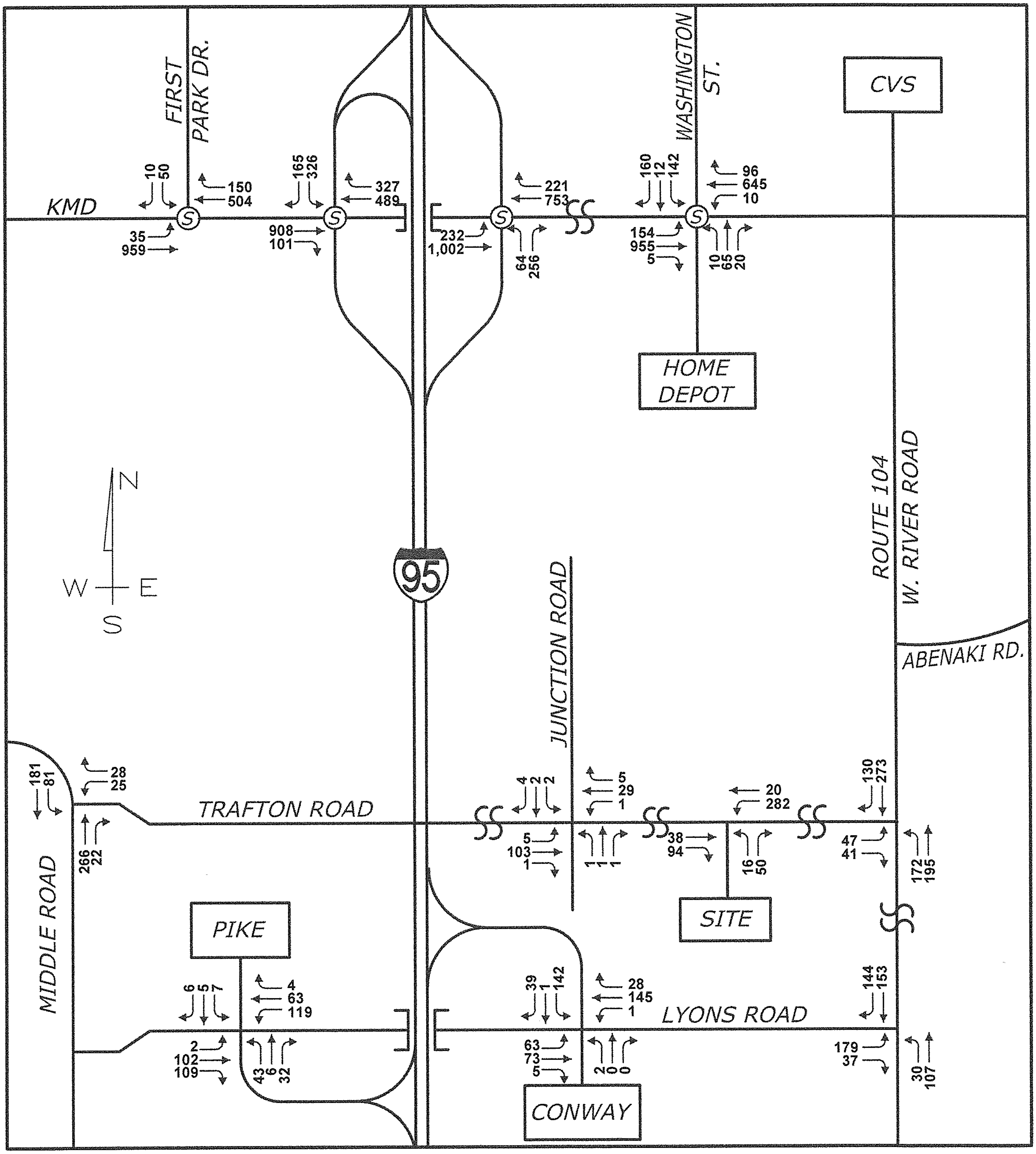
2036 Post Development Volumes
AM Peak Hour without Interchange

Figure No **10A**



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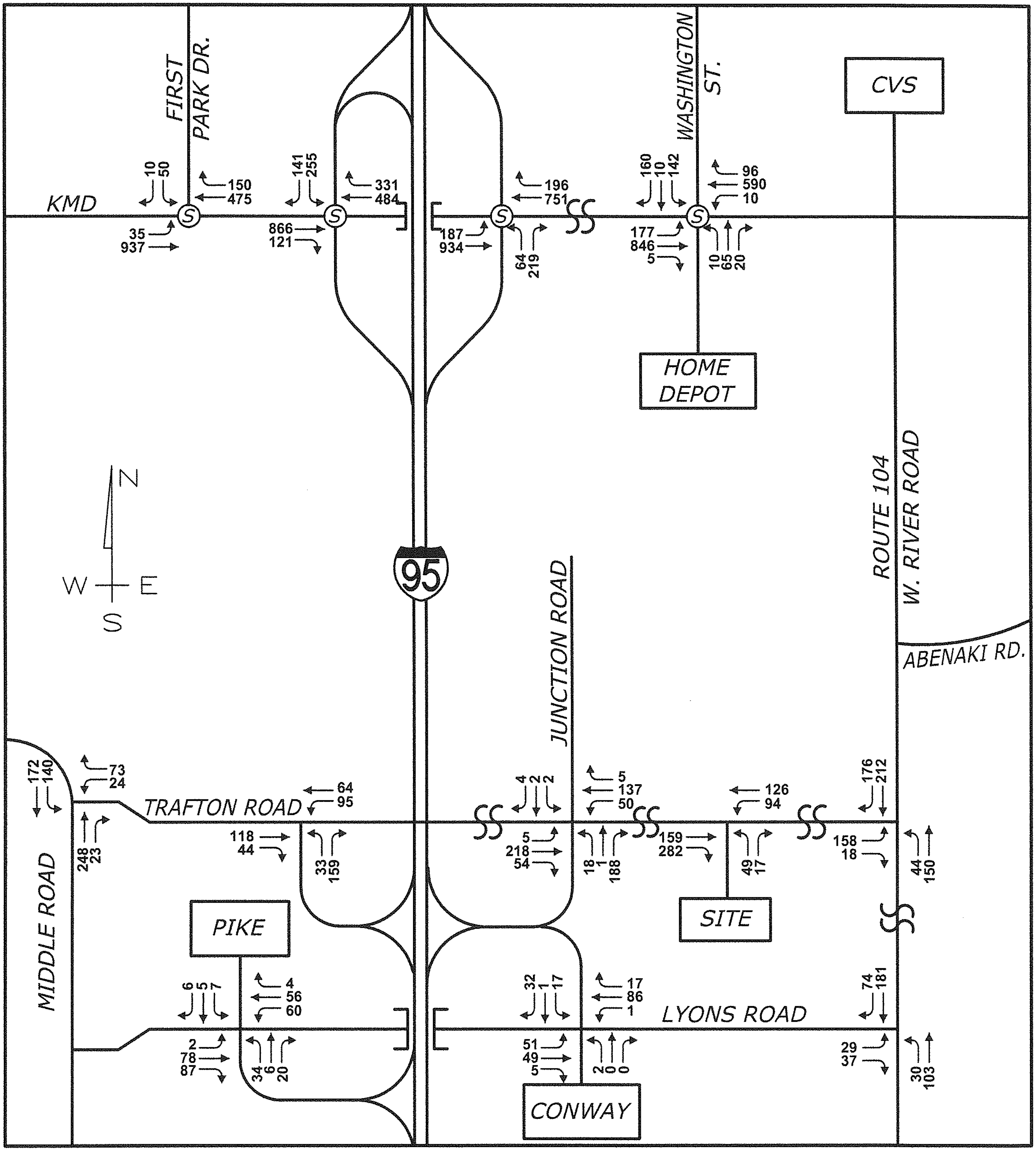
2036 Post Development Volumes
AM Peak Hour with Interchange

Figure No. 10B



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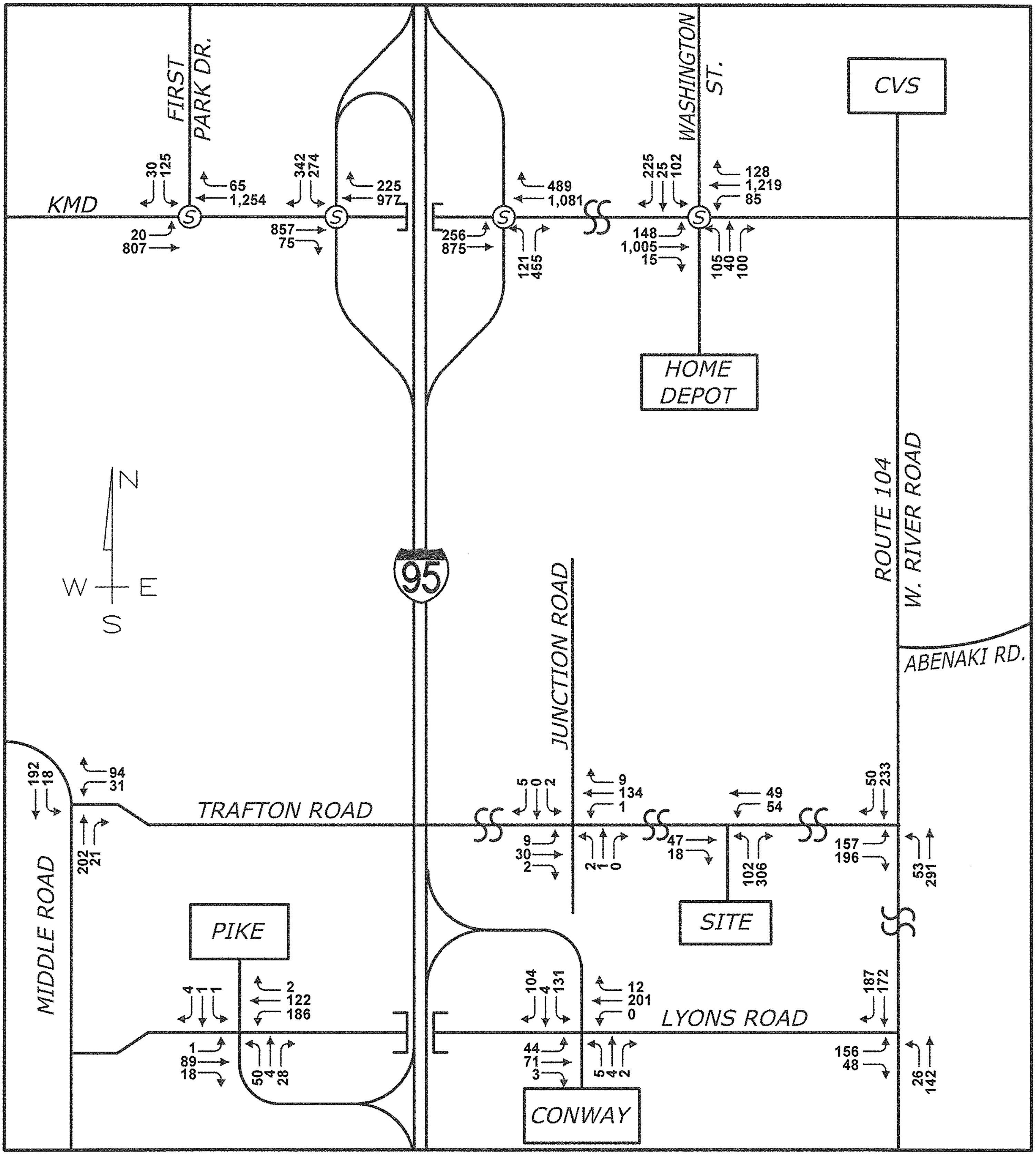
2036 Post Development Volumes
PM Peak Hour without Interchange

Figure No 11A



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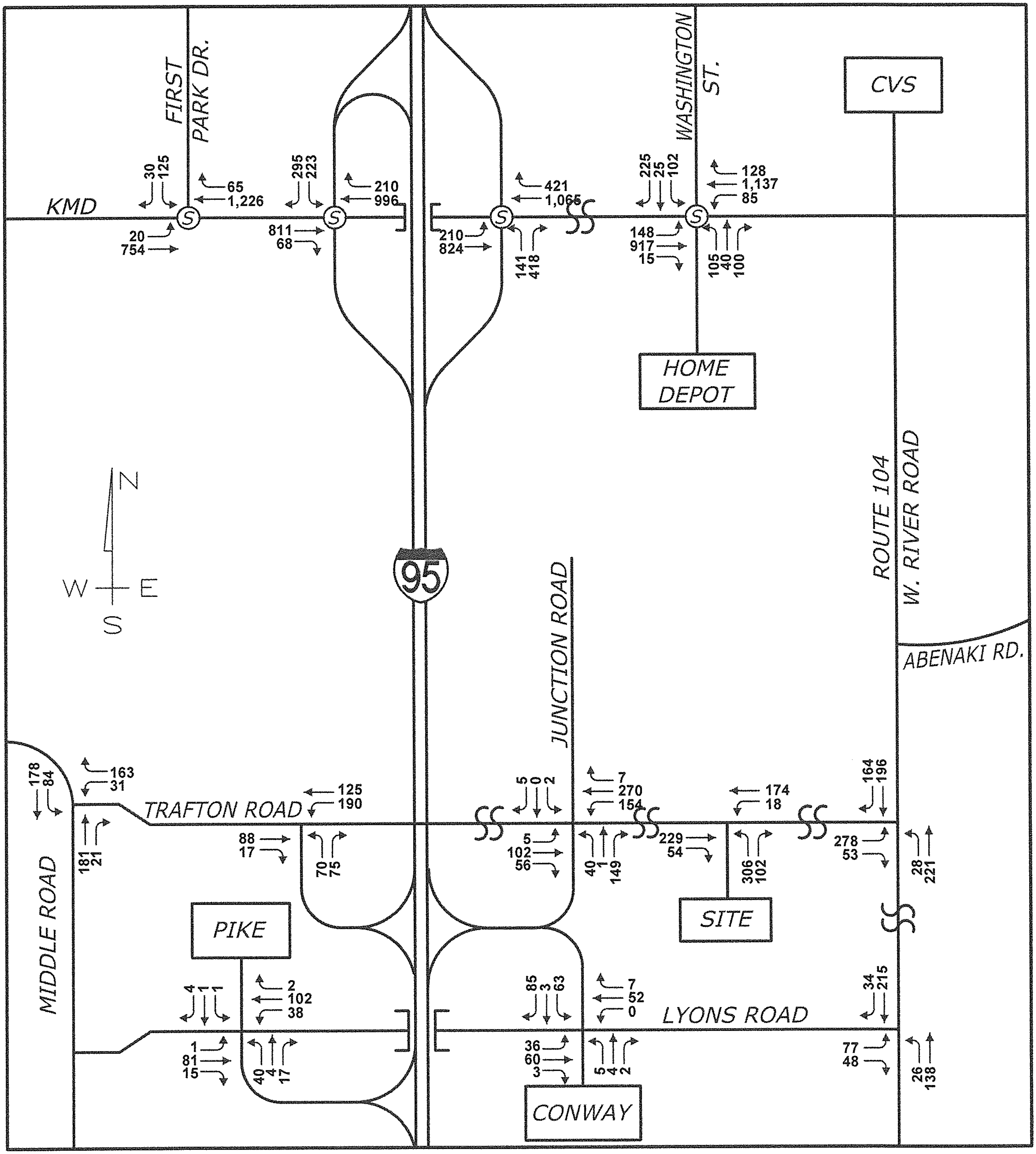
Checked:	TLG	File Name:	2233-03_TRAFF.dwg

2036 Post Development Volumes PM Peak Hour with Interchange

Figure No 11B



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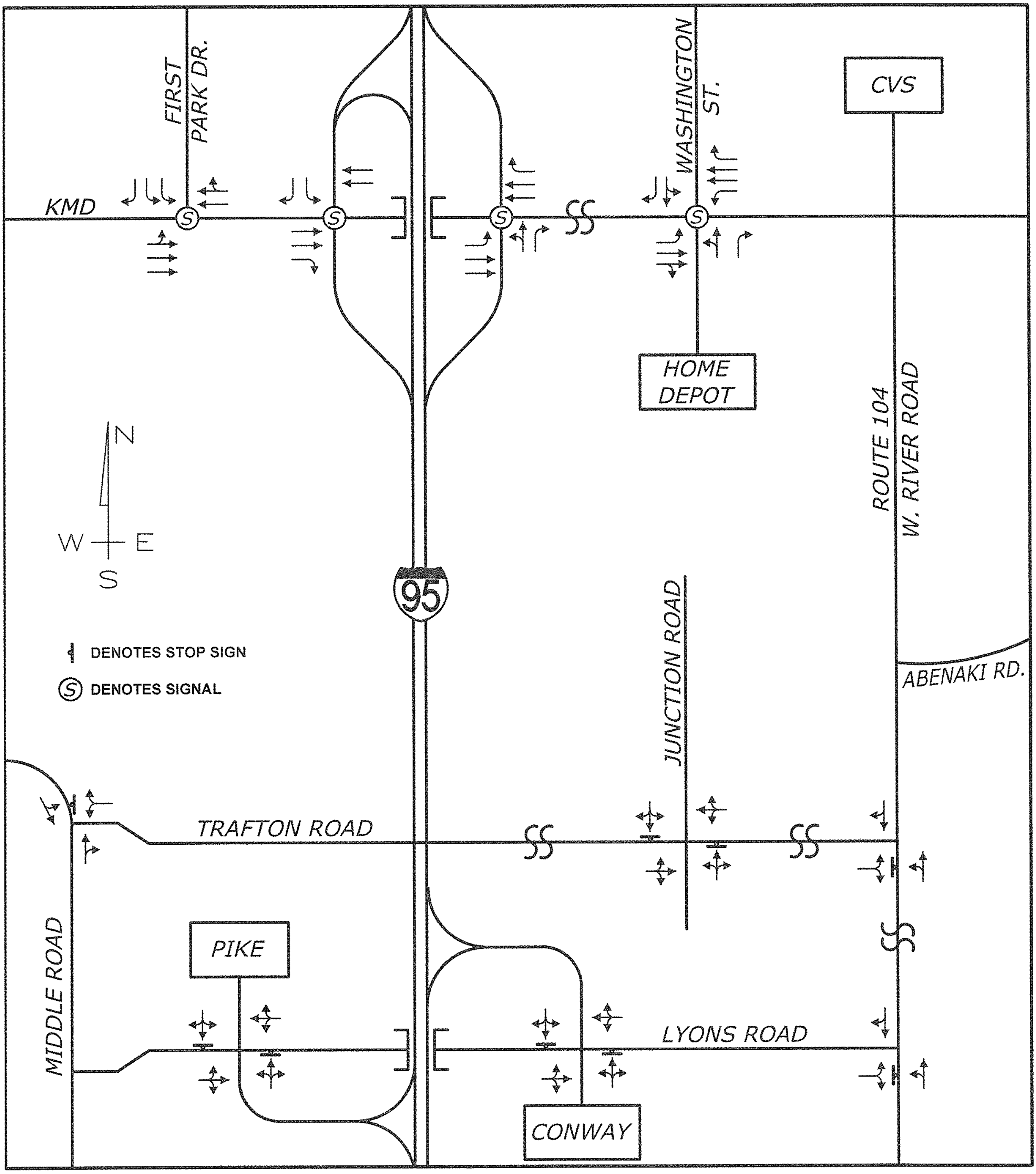
Lane Use - without Interchange



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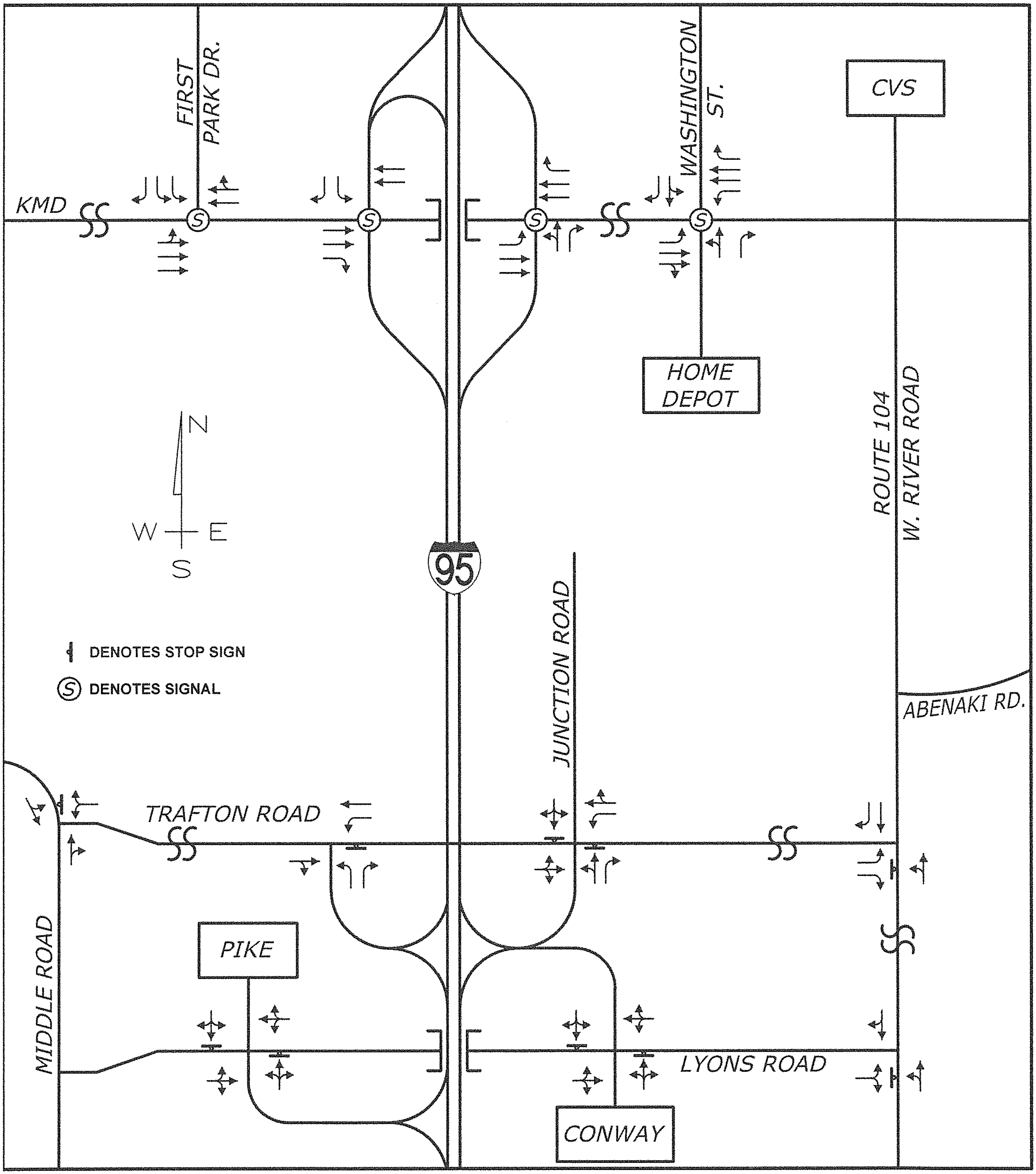
Lane Use - with Interchange

J



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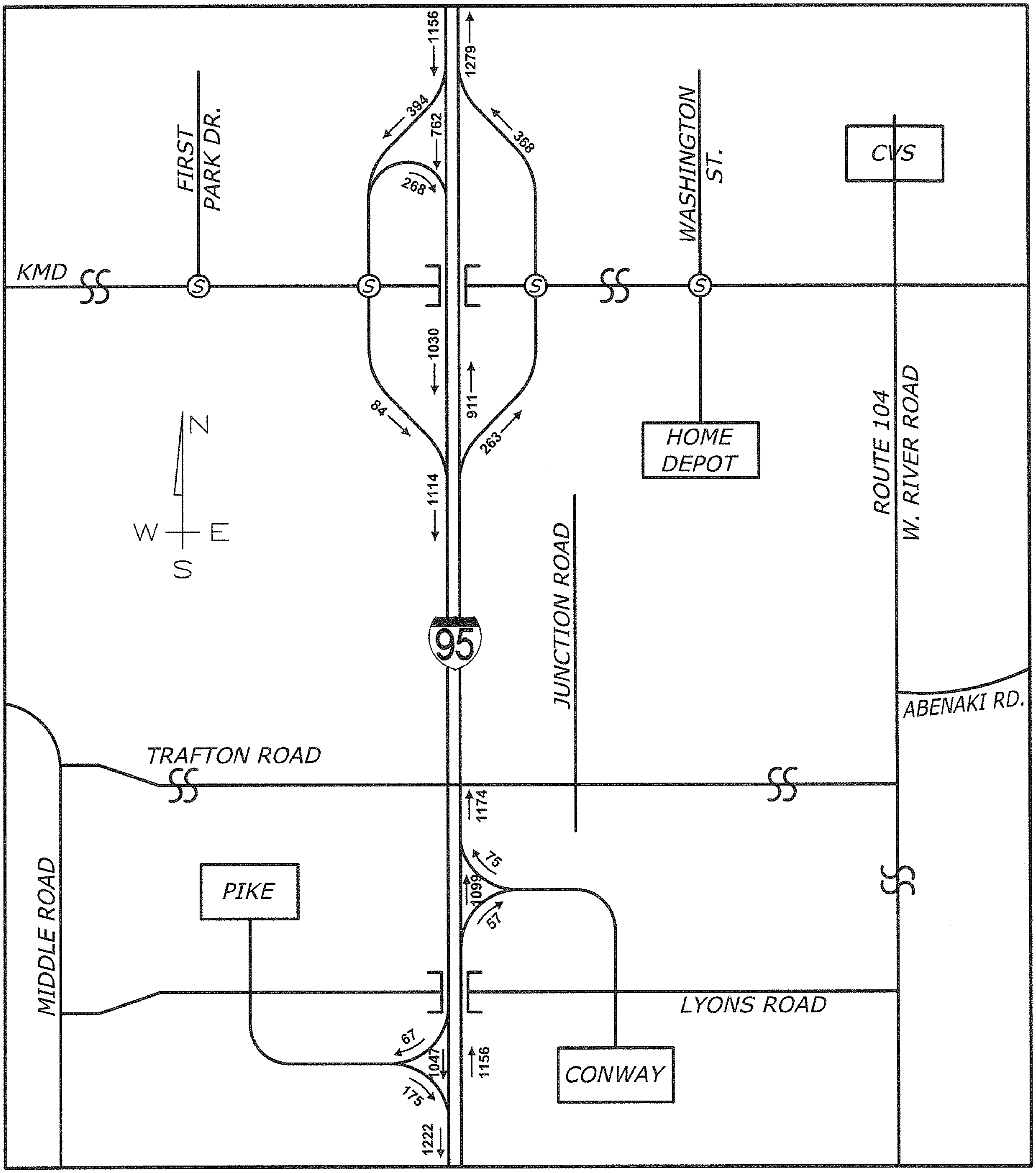
2016 AM Peak Hour Predevelopment without Interchange

Figure No. K



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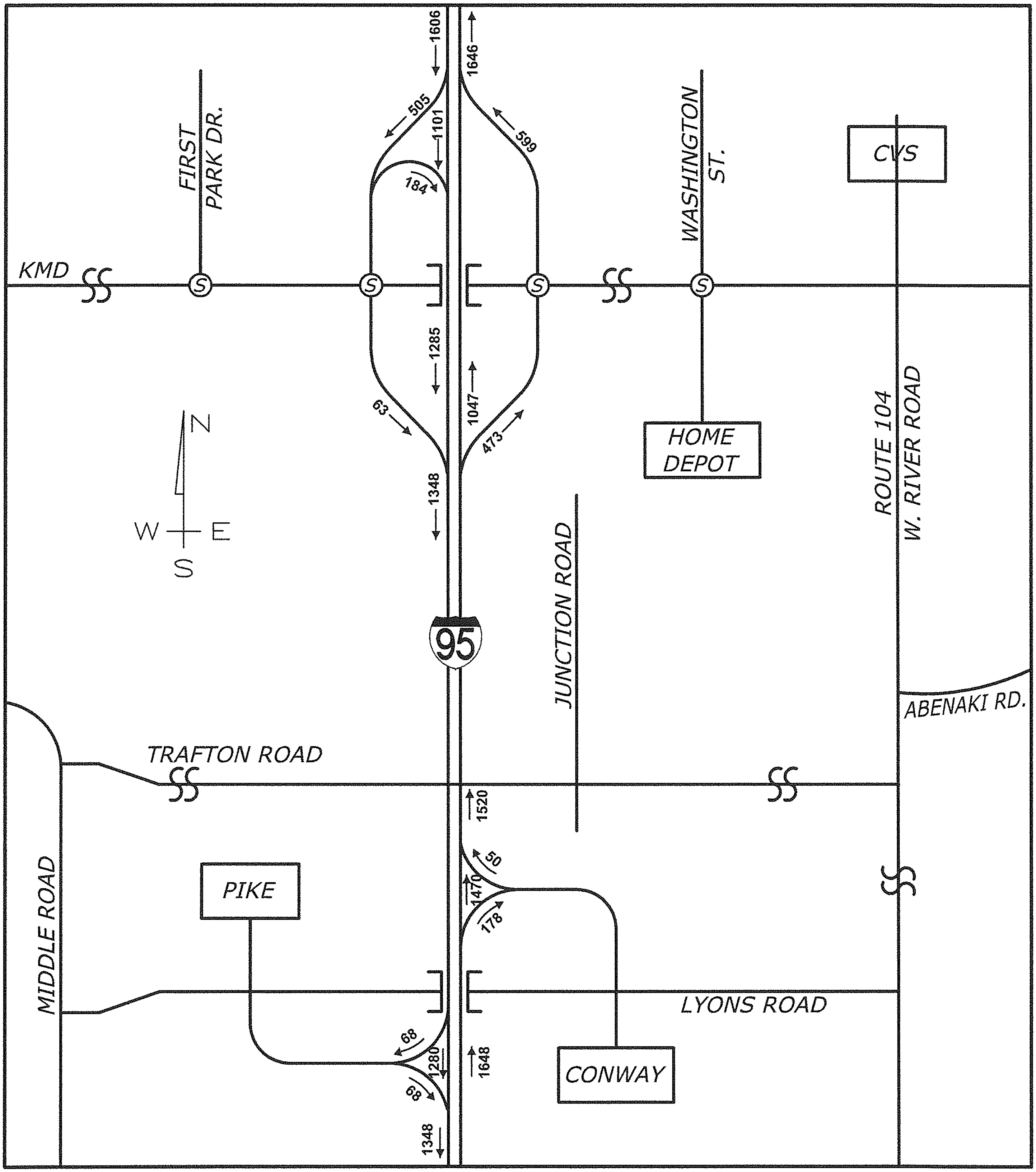
2016 PM Peak Hour Predevelopment without Interchange

Figure No. L



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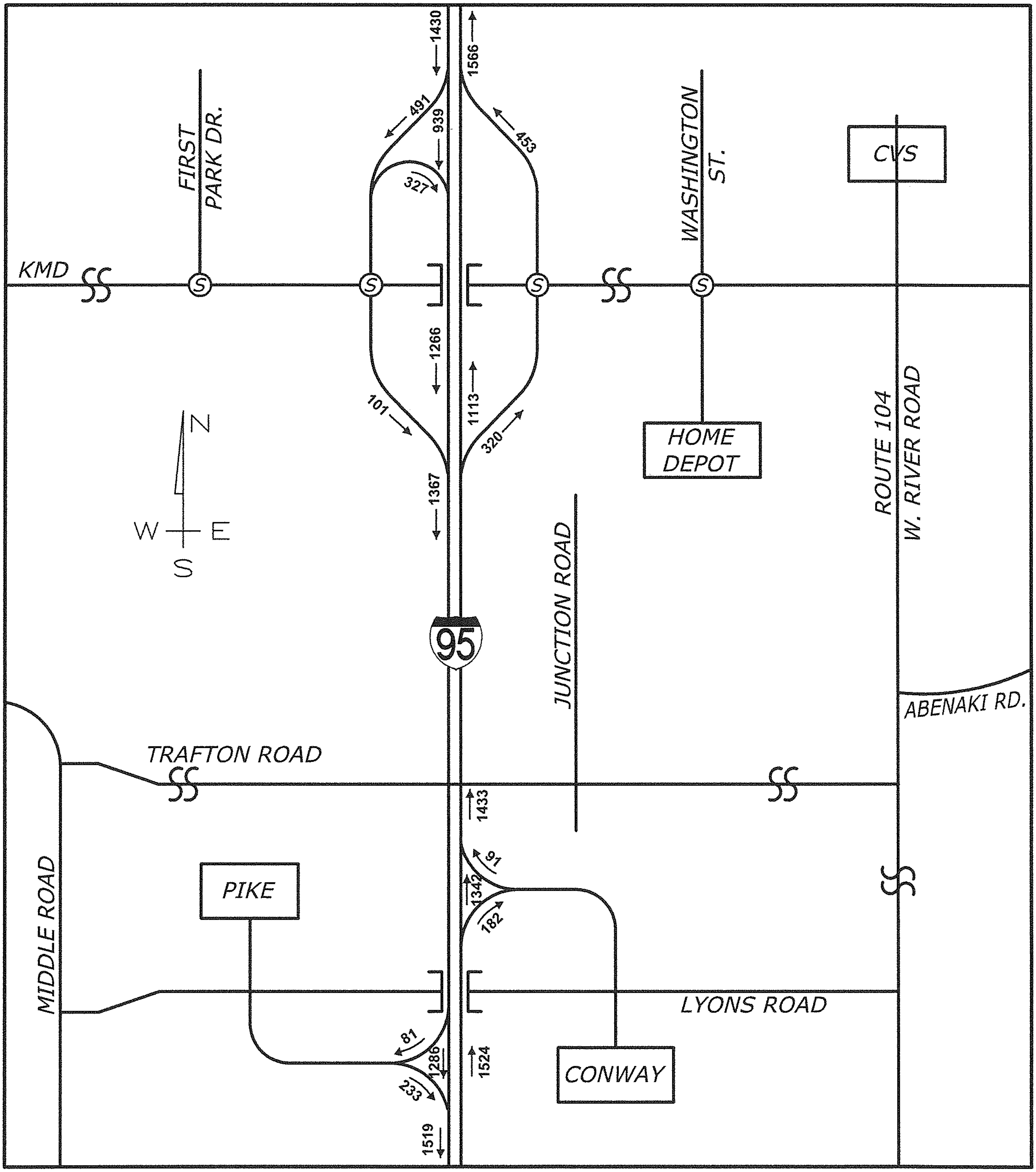
2036 AM Peak Hour Postdevelopment without Interchange

Figure No. M



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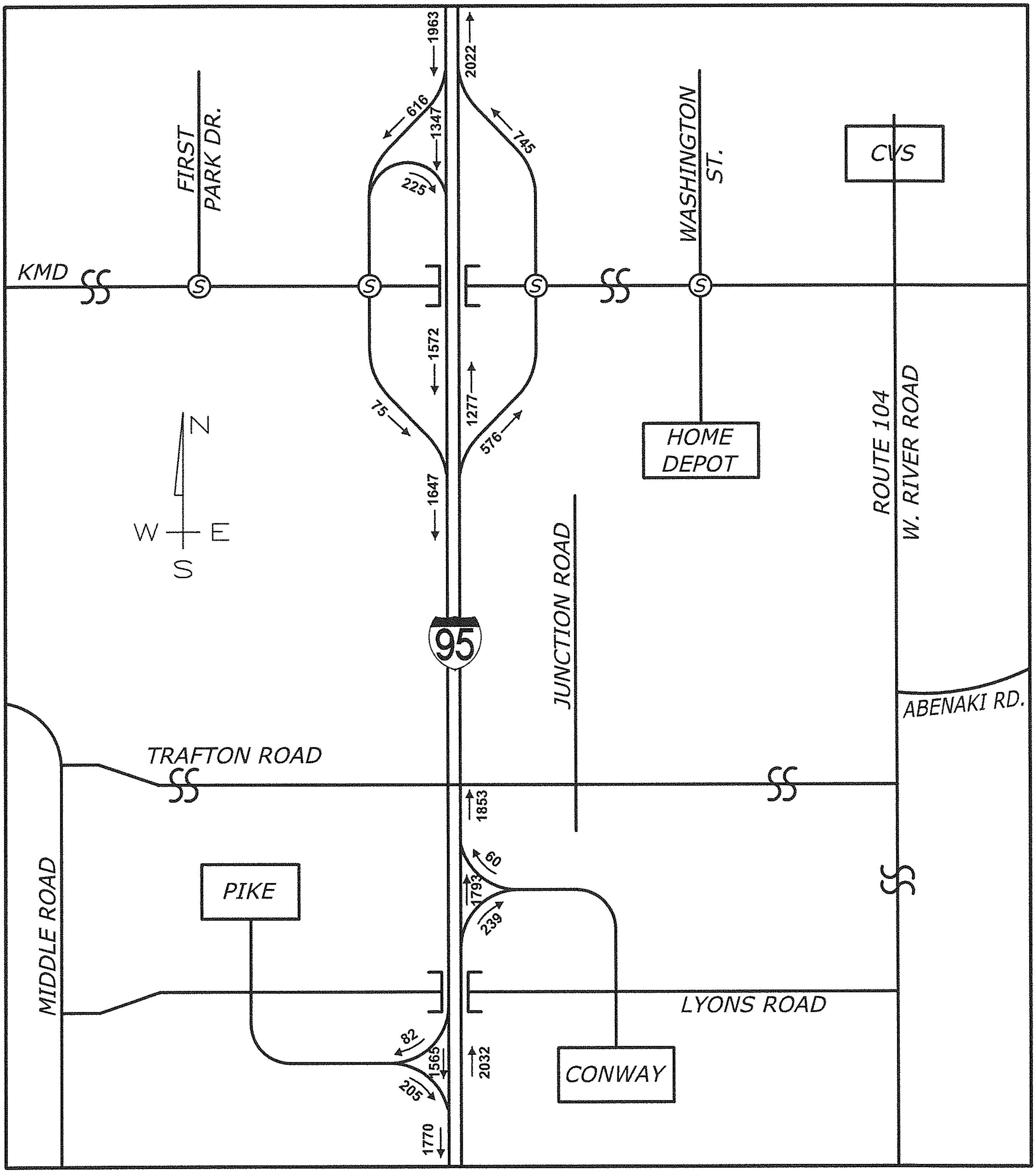
2036 PM Peak Hour Postdevelopment without Interchange

Figure No. N



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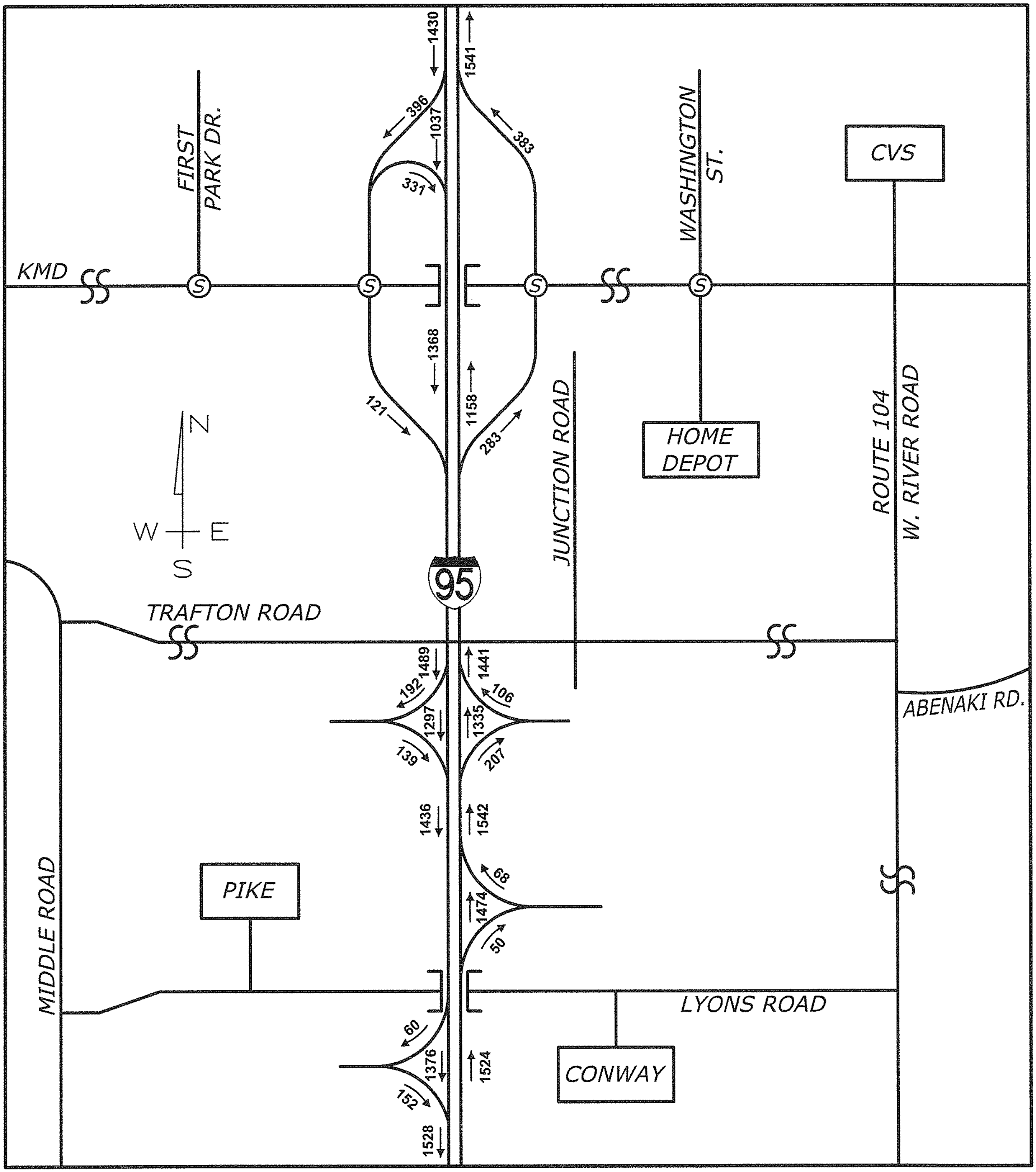
2036 AM Peak Hour Postdevelopment with Interchange

Figure No. O



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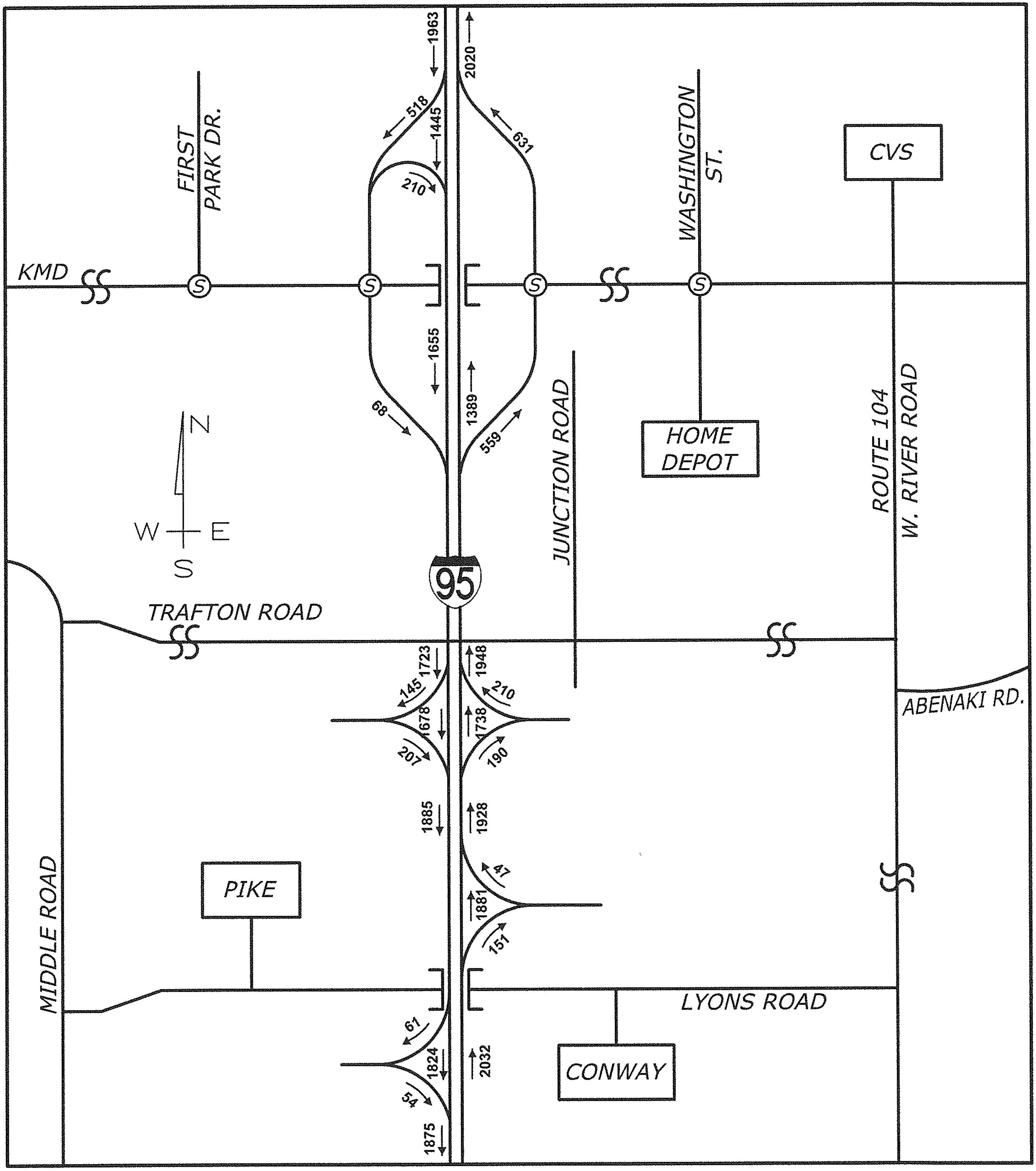
2036 PM Peak Hour Postdevelopment with Interchange

Figure No. P



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TRAFFIC MOVEMENT PERMIT

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0016

Paul R. LePage
GOVERNOR

David Bernhardt
COMMISSIONER

Applicant: Trafton Properties
Project Location: Southern side of the Trafton Road, Waterville
Waterville Tax Map 2, Lot 40
Project: Light Industrial Development
Identification #: Reg. 02-00068A-N
Permit Category: 200+ PCE
Traffic Engineer: Gorrill-Palmer Consulting Engineers, Inc.
Attn: Thomas L Gorrill, PE, PTOE
P.O. Box 1237
15 Shaker Rd.
Gray, Maine 04039
(207) 657-6910

Pursuant to the provision of 23 M.R.S.A. § 704-A and Chapter 305 of MaineDOT's Regulations, the Department of Transportation has considered the application of Trafton Properties with supportive data, agency review and other related materials on file.

PROJECT DESCRIPTION

The applicant proposes 450,000 square feet of light industrial development on the 69.50 acre parcel. The site would be access by a 30 foot wide full movement entrance on Trafton Road and would also be interconnected with the existing adjacent warehouse/shipping facility and its entrances on both the West River Road and Trafton Road. The development is expected to generate 442 AM and 480 PM weekday peak hour trip ends.

Findings

Based on a review of the files and related information, MaineDOT approves the Traffic Movement Permit Application of Trafton Properties subject to the following conditions:

MITIGATION

The following mitigation shall be constructed or implemented to MaineDOT's satisfaction prior to the opening of the facility, unless otherwise approved.

On-Site Mitigation

A. A single full-movement driveway with a single entrance lane, and separate right turn and left turn exit lanes. Install a "Stop" sign, and stop line.

B. Overhead lighting shall be provided at the driveway, if not existing, to illuminate the entrances / intersections. Overhead lighting shall have an average of 0.6 to 1.0 foot candles, with the

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PHONE: (207)624-3000 TTY 888-516-9364 FAX: (207) 624-3001

maximum to minimum lighting ratio of not more than 10:1 and an average to minimum light level of not more than 4:1.

Off-Site Mitigation

A. Construct a 12 foot wide, 100 foot long right turn from Trafton Road onto the West River Road with associated taper. This must also include all necessary signs and pavement marking to meet Department and City standards.
B. Construct a 12 foot wide, 100 foot long right turn from West River Road onto the Trafton Road with associated taper. This must also include all necessary signs and pavement marking to meet Department standards.
C. Construct either;
    a. A full access interchange from Trafton Road to Interstate 95. The permittee would be responsible for developing all necessary plans, and reports for all federal and state approvals needed for such an interchange, or:
    b. Construct the following turn lanes
        1. A 12 foot wide, 100 foot long right turn from southbound West River Road onto the Lyons Road with associated taper. This must also include all necessary signs and pavement marking to meet Department standards.
        2. A 12 foot wide, 100 foot long left turn from northbound West River Road onto the Trafton Road with associated taper and islands. This must also include all necessary signs and pavement marking to meet Department standards.
        3. Construct a 12 foot wide, 100 foot long left turn from West River Road onto the existing industrial driveway, with associated taper and islands. This must also include all necessary signs and pavement marking to meet Department standards.

Overall

A. Provide all necessary auxiliary signs, striping and pavement markings to implement the improvements described herein according to State of Maine and/or National standards.

B. All plantings and signs (existing and/or proposed; permanent and/or temporary) shall be placed and maintained such that they do not block available sight distances and do not violate the State's "Installations and Obstructions" law. No signage or plantings shall be allowed within the "clear zone" if they constitute a deadly fixed object as determined by MaineDOT. All signs shall meet MRSA Title 23, Chapter 21, Section 1914: "On-Premise Signs".

C. If the specific uses identified in this permit are revised or the number of permitted uses is exceeded, the applicant shall request in writing from the department a decision of what impacts those changes will have on the permit. The applicant will then be required to submit those changes for review and approval and additional mitigation as a result of those changes may be required at the expense of the applicant. If the permitted uses are determined to generate less traffic than the permitted traffic, the applicant may request the required mitigation be reevaluated and potentially reduced in size and scope.

D. Because the proposed project affects the state highway and drainage systems and requires improvement to that system, the applicant must obtain approval of the design plans and coordinate work through MaineDOT's State Traffic Engineer, who can be reached at (207)-624-3620 in Augusta.

By:

Stephen Landry, P.E.
Assistant State Traffic Engineer

Date: 11/15/11

COLLISION HISTORY

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑ **Crash Summary I** ☑ **Section Detail** ☑ **Crash Summary II** ☐ **1320 Included** ☐ **1320 & Driver Report Included**

REPORT DESCRIPTION

95N

REPORT PARAMETERS

Year 2008, Start Month 1 through Year 2010 End Month: 12

Route: **0095X** Start Node: **28800** Start Offset: **0** ☐ **Exclude First Node**

End Node: **28913** End Offset: **0** ☐ **Exclude Last Node**

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes					Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
					K	A	B	C	PD					
28800	0095X - 117.65	Non-Int I 95 NB	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.431	0.00 0.04	0.14	0.00
28802	0095X - 119.16	Int of I 95 NB, RAMP OFF TO LYONS RD	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.431	0.00 0.04	0.14	0.00
28803	0095X - 119.30	Int of I 95 NB, RAMP ON FROM LYONS RD	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.194	0.00 0.04	0.14	0.00
28804	0095X - 121.03	BRG 5784, I 95 NB under DRUMMOND RD	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.194	0.00 0.04	0.14	0.00
28805	0095X - 122.13	BRG 5785, I 95 NB under TOWN FARM RD	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.194	0.00 0.04	0.14	0.00
28806	0095X - 122.76	TL - Sidney, Waterville	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.194	0.00 0.04	0.14	0.00
28807	0095X - 122.99	BRG 5812, I 95 NB under TRAFTON RD	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.194	0.00 0.04	0.14	0.00
28886	0095X - 123.92	Non-Int I 95 NB	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.194	0.00 0.04	0.14	0.00
28808	0095X - 124.20	BRG 5813, I 95 NB over WEBB RD	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.194	0.00 0.04	0.14	0.00
28587	0095X - 125.19	Non-Int I 95 NB	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	5.194	0.00 0.04	0.14	0.00
28809	0095X - 125.62	Int of I 95 NB, RAMP OFF TO KENNEDY MEM DR	1	1	0	0	0	0	1	0.0 Statewide Crash Rate:	5.194	0.06 0.04	0.14	0.00
28811	0095X - 126.07	Int of I 95 NB, RAMP ON FROM KENNEDY MEM DR	1	2	0	0	1	0	1	50.0 Statewide Crash Rate:	6.114	0.11 0.04	0.13	0.00
28913	0095X - 126.19	TL - Oakland, Waterville	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	6.114	0.00 0.04	0.13	0.00
Study Years:	3.00	**NODE TOTALS:**		3	0	0	1	0	2	33.3	69.836	0.01	0.07	0.20

Crash Summary I

Sections

Start Node	End Node	Element	Offset	Route - MP	Section Length	U/R	Total Crashes		Injury Crashes			PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
			Begin - End					K	A	B	C						
28800 Non-Int I 95 NB	28802	2656331	0 - 1.51	0095X - 117.65 INT 95 NB	1.51	1	13	0	1	1	1	10	23.1	0.08201 Statewide Crash Rate:	52.84 61.32	99.96	0.00
28802 Int of I 95 NB, RAMP OFF TO LYONS RD	28803	2656289	0 - 0.14	0095X - 119.16 INT 95 NB	0.14	1	1	0	0	0	0	1	0.0	0.00691 Statewide Crash Rate:	48.21 61.32	177.28	0.00
28803 Int of I 95 NB, RAMP ON FROM LYONS RD	28804	2656303	0 - 1.73	0095X - 119.30 INT 95 NB	1.73	1	12	0	0	0	1	11	8.3	0.08986 Statewide Crash Rate:	44.52 61.32	98.32	0.00
28804 BRG 5784, I 95 NB under DRUMMOND RD	28805	206248	0 - 1.10	0095X - 121.03 INT 95 NB	1.10	1	10	0	0	2	1	7	30.0	0.05713 Statewide Crash Rate:	58.34 61.32	107.13	0.00
28805 BRG 5785, I 95 NB under TOWN FARM RD	28806	2656295	0 - 0.63	0095X - 122.13 INT 95 NB	0.63	1	8	0	1	2	0	5	37.5	0.03272 Statewide Crash Rate:	81.49 61.32	120.61	0.00
28806 TL - Sidney, Waterville	28807	2656311	0 - 0.23	0095X - 122.76 INT 95 NB	0.23	1	2	0	0	1	0	1	50.0	0.01195 Statewide Crash Rate:	55.81 61.32	153.92	0.00
28807 BRG 5812, I 95 NB under TRAFTON RD	28886	206251	0 - 0.93	0095X - 122.99 INT 95 NB	0.93	1	6	0	1	0	0	5	16.7	0.04830 Statewide Crash Rate:	41.40 61.32	110.86	0.00
28808 BRG 5813, I 95 NB over WEBB RD	28886	206252	0 - 0.28	0095X - 123.92 INT 95 NB	0.28	1	6	0	0	1	0	5	16.7	0.01454 Statewide Crash Rate:	137.52 61.32	146.43	0.00
28587 Non-Int I 95 NB	28808	2656321	0 - 0.99	0095X - 124.20 INT 95 NB	0.99	1	7	0	0	0	0	7	0.0	0.05142 Statewide Crash Rate:	45.38 61.32	109.44	0.00
28587 Non-Int I 95 NB	28809	206105	0 - 0.43	0095X - 125.19 INT 95 NB	0.43	1	7	0	0	1	0	6	14.3	0.02233 Statewide Crash Rate:	104.47 61.32	131.79	0.00
28809 Int of I 95 NB, RAMP OFF TO KENNEDY MEM DR	28811	2656271	0 - 0.45	0095X - 125.62 INT 95 NB	0.45	1	3	0	0	0	0	3	0.0	0.01680 Statewide Crash Rate:	59.51 61.32	141.25	0.00
28811 Int of I 95 NB, RAMP ON FROM KENNEDY MEM DR	28913	2656333	0 - 0.12	0095X - 126.07 INT 95 NB	0.12	1	2	0	0	0	0	2	0.0	0.00734 Statewide Crash Rate:	90.87 61.32	174.57	0.00
Study Years:	3.00			**Section Totals:**	8.54		77	0	3	8	3	63	18.2	0.44132	58.16	78.47	0.74
				Grand Totals:	8.54		80	0	3	9	3	65	18.8	0.44132	60.42	84.20	0.72

Crash Summary

Section Details

Start Node	End Node	Element	Offset	Route - MP	Total Crashes	Injury Crashes					Crash Report	Crash Date	Crash Mile Point	Injury Degree
			Begin - End			K	A	B	C	PD				
28800	28802	2656331	0 - 1.51	0095X - 117.65	13	0	1	1	1	10	2008-2330	01/28/2008	117.85	PD
											2008-31172	11/30/2008	117.85	PD
											2008-14747	06/13/2008	117.95	PD
											2009-30081	12/23/2009	118.15	B
											2008-4188	02/10/2008	118.15	PD
											2010-17336	08/16/2010	118.40	PD
											2009-18409	08/09/2009	118.44	PD
											2010-138	01/02/2010	118.65	C
											2010-39	01/02/2010	118.65	PD
											2010-1438	01/18/2010	118.66	PD
											2010-25870	11/28/2010	118.96	PD
											2009-11038	05/02/2009	119.05	A
											2008-19883	08/05/2008	119.15	PD
28802	28803	2656289	0 - 0.14	0095X - 119.16	1	0	0	0	0	1	2009-16644	06/26/2009	119.17	PD
28803	28804	2656303	0 - 1.73	0095X - 119.30	12	0	0	0	1	11	2009-30748	12/29/2009	119.60	PD
											2008-13272	05/16/2008	119.60	PD
											2010-26029	11/19/2010	119.64	PD
											2010-30	01/01/2010	119.70	PD
											2008-4506	02/17/2008	119.80	C
											2009-30085	12/24/2009	119.80	PD
											2008-30952	11/12/2008	120.30	PD
											2009-14076	02/20/2009	120.30	PD
											2010-19934	09/08/2010	120.73	PD
											2008-34278	12/21/2008	120.74	PD
											2008-23816	09/28/2008	120.94	PD
											2010-16634	08/10/2010	121	PD

Crash Summary

Section Details

Start Node	End Node	Element	Offset	Route - MP	Total Crashes	Injury Crashes					Crash Report	Crash Date	Crash Mile Point	Injury Degree
			Begin - End			K	A	B	C	PD				
28804	28805	206248	0 - 1.10	0095X - 121.03	10	0	0	2	1	7	2009-5919	03/15/2009	121.28	PD
											2009-30764	12/29/2009	121.53	PD
											2008-4045	02/08/2008	121.53	PD
											2009-2970	02/07/2009	121.59	B
											2008-938	01/02/2008	121.63	C
											2008-3170	02/11/2008	121.63	PD
											2008-3007	02/08/2008	121.63	PD
											2008-29253	11/23/2008	121.78	PD
											2008-27757	11/06/2008	121.93	B
											2008-26445	10/18/2008	121.93	PD
28805	28806	2656295	0 - 0.63	0095X - 122.13	8	0	1	2	0	5	2010-23310	10/24/2010	122.14	B
											2010-33	01/02/2010	122.15	PD
											2010-10685	05/25/2010	122.39	A
											2008-3046	02/11/2008	122.43	B
											2010-824	01/19/2010	122.43	PD
											2008-27762	11/04/2008	122.43	PD
											2010-12717	06/23/2010	122.45	PD
											2010-27692	12/07/2010	122.46	PD
28806	28807	2656311	0 - 0.23	0095X - 122.76	2	0	0	1	0	1	2008-11833	04/25/2008	122.89	B
											2010-27737	12/06/2010	122.98	PD
28807	28886	206251	0 - 0.93	0095X - 122.99	6	0	1	0	0	5	2010-10689	05/26/2010	123.28	PD
											2009-23941	10/29/2009	123.44	PD
											2009-4272	02/22/2009	123.69	PD
											2009-28690	12/07/2009	123.72	PD
											2010-38	01/02/2010	123.79	PD
											2010-20932	09/30/2010	123.82	A
28808	28886	206252	0 - 0.28	0095X - 123.92	6	0	0	1	0	5	2010-13764	07/05/2010	123.97	PD
											2008-8524	03/28/2008	124	PD
											2008-13454	05/23/2008	124.10	B
											2009-29669	12/20/2009	124.10	PD
											2009-25410	10/29/2009	124.10	PD
											2010-10793	05/22/2010	124.12	PD

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes					Crash Report	Crash Date	Crash Mile Point	Injury Degree
						K	A	B	C	PD				
28587	28808	2656321	0 - 0.99	0095X - 124.20	7	0	0	0	0	7	2008-25960	10/26/2008	124.26	PD
											2010-27449	12/08/2010	124.40	PD
											2008-27758	11/10/2008	124.46	PD
											2010-22221	10/15/2010	124.59	PD
											2008-31058	12/09/2008	124.59	PD
											2008-29285	11/28/2008	124.68	PD
											2010-825	01/19/2010	124.77	PD
28587	28809	206105	0 - 0.43	0095X - 125.19	7	0	0	1	0	6	2009-13429	06/17/2009	125.22	PD
											2008-26447	10/18/2008	125.29	PD
											2010-25558	11/22/2010	125.37	PD
											2008-3005	02/08/2008	125.39	PD
											2010-21541	10/04/2010	125.42	B
											2008-12069	05/07/2008	125.59	PD
											2010-1795	01/28/2010	125.61	PD
28809	28811	2656271	0 - 0.45	0095X - 125.62	3	0	0	0	0	3	2009-16743	06/28/2009	125.72	PD
											2008-8521	03/28/2008	125.72	PD
											2008-2761	02/07/2008	125.89	PD
28811	28913	2656333	0 - 0.12	0095X - 126.07	2	0	0	0	0	2	2009-29337	10/14/2009	126.13	PD
											2010-28558	12/22/2010	126.17	PD
				Totals:	77	0	3	8	3	63				

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												PM													
	Hour of Day																									
Day Of Week	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Un	Tot
SUNDAY	0	0	0	0	0	0	0	0	1	0	1	0	0	2	1	2	0	2	1	1	1	1	0	1	0	14
MONDAY	0	2	0	0	0	0	1	1	1	1	1	2	0	1	0	0	0	0	0	0	1	0	0	0	0	11
TUESDAY	2	0	0	0	0	1	0	0	0	0	1	1	0	0	0	2	1	0	1	0	1	1	0	0	0	11
WEDNESDAY	1	0	0	1	0	1	1	0	1	0	0	1	0	0	0	0	0	1	1	0	1	1	1	1	0	12
THURSDAY	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	2	0	0	1	0	0	0	7
FRIDAY	0	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	1	1	0	3	1	4	2	0	0	16
SATURDAY	0	0	1	0	0	0	0	2	0	0	1	1	1	2	0	0	0	0	1	0	0	0	0	0	0	9
Totals	3	2	1	1	0	2	3	4	4	3	4	6	1	5	2	4	2	5	6	4	5	8	3	2	0	**80**

Crashes by Year and Month

Month	2008	2009	2010	Total
JANUARY	2	0	9	11
FEBRUARY	8	3	0	11
MARCH	2	1	0	3
APRIL	1	0	1	2
MAY	3	1	3	7
JUNE	1	3	2	6
JULY	0	0	1	1
AUGUST	1	1	2	4
SEPTEMBER	1	0	2	3
OCTOBER	3	3	3	9
NOVEMBER	8	0	3	11
DECEMBER	2	6	4	12
Total	**32**	**18**	**30**	**80**

Vehicle Counts by Type

Unit Type	Total	Unit Type	Total
1-2 Door	7	32-3 Axle Tractor with Tandem Axle Semi	6
2-4 Door	32	33-3 Axle Tractor with Tridem Axle Semi	0
3-Convertible	0	35-3 Axle Tractor with Single Axle Semi & 2 Axle Trailer	1
4-Station Wagon	4	36-3 Axle Tractor with Tandem Axle Semi & 2 Axle Trailer	0
5-Van	6	37-5 Axle Semi; Split Trailer Tandem	0
6-Pickup Truck	19	38-6 Axle Semi; Split Trailer Tandem with Center Axle	0
7-SUV	25	39-6 Axle; Standard Trailer Tandem with Center Axle	0
10-Truck Tractor Only (Bobtail)	0	40-4 Axle Single Unit	0
12-School Bus	0	42-4 Axle Tractor with Tandem Axle Semi	0
13-Motor Home	0	50-Any Other Axle Configuration	0
14-Motorcycle	0	60-Other Unit	0
15-Moped	0	70-ATV	0
16-Motor Bike	0	81-2 Axle Bus	0
17-Bicycle	0	82-3 Axle Bus	0
18-Snowmobile	0	98-Farm Vehicles / Tractors	0
20-2 Axle Single Unit with Dual Tires	1	99-Unknown	0
21-2 Axle Tractor with Single Axle Semi	0	**Total**	**101**
22-2 Axle Tractor with Tandem Axle Semi	0		
25-2 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0		
30-3 Axle Single Unit	0		
31-3 Axle Tractor with Single Axle Semi	0		

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Apparent Contributing Factor And Driver

Apparent Contributing Factor	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Improper Action	27	15	0	0	0	0	42
Failure to Yield Right of Way	1	1	0	0	0	0	2
Illegal Unsafe Speed	27	3	0	0	0	0	30
Following Too Close	3	1	0	0	0	0	4
Disregard Traffic Control Device	0	0	0	0	0	0	0
Driving Left of Center Not Passing	0	0	0	0	0	0	0
Improper Passing, Overtaking	0	0	0	0	0	0	0
Improper Unsafe Lane Change	3	0	0	0	0	0	3
Improper Parking Start, Stop	0	0	0	0	0	0	0
Improper Turn	0	0	0	0	0	0	0
Unsafe Backing	0	0	0	0	0	0	0
No Signal or Improper Signal	0	0	0	0	0	0	0
Impeding Traffic	0	0	0	0	0	0	0
Driver Inattention, Distraction	9	0	0	0	0	0	9
Driver Inexperience	0	0	0	0	0	0	0
Pedestrian Violation Error	0	0	0	0	0	0	0
Physical Impairment	1	0	0	0	0	0	1
Vision Obscured, Windshield Glass	0	0	0	0	0	0	0
Vision Obscured, Sun, Headlights	0	0	0	0	0	0	0
Other Vision Obscurement	0	0	0	0	0	0	0
Other Human Violation Factor	6	1	0	0	0	0	7
Hit and Run	0	0	0	0	0	0	0
Defective Brakes	0	0	0	0	0	0	0
Defective Tire, Tire Failure	2	0	0	0	0	0	2
Defective Lights	0	0	0	0	0	0	0
Defective Suspension	0	0	0	0	0	0	0
Defective Steering	0	0	0	0	0	0	0
Other Vehicle Defect or Factor	1	0	0	0	0	0	1
Unknown	0	0	0	0	0	0	0
Total	80	21	0	0	0	0	101

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Normal	75	21	0	0	0	0	96
Under the Influence	0	0	0	0	0	0	0
Had Been Drinking	1	0	0	0	0	0	1
Had Been Using Drugs	0	0	0	0	0	0	0
Asleep	2	0	0	0	0	0	2
Fatigued	1	0	0	0	0	0	1
Ill	0	0	0	0	0	0	0
Handicapped	0	0	0	0	0	0	0
Other	1	0	0	0	0	0	1
Total	80	21	0	0	0	0	101

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	9	0	0	0	0	9
20-24	17	0	0	0	0	17
25-29	13	0	0	0	0	13
30-39	23	0	0	0	0	23
40-49	15	0	0	0	0	15
50-59	16	0	0	0	0	16
60-69	7	0	0	0	0	7
70-79	1	0	0	0	0	1
80-Over	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Total	101	0	0	0	0	101

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Fixed Object Struck

Fixed Object Struck	Total
1-Construction, Barricades Equipment, etc.	0
2-Traffic Signal	0
3-R.R. Crossing Device	0
4-Light Pole	0
5-Utility Pole (Tel. Electrical)	0
6-Sign Structure Post	0
7-Mail Boxes or Posts	0
8-Other Poles, posts or supports	1
9-Fire Hydrant/Parking Meter	0
10-Tree or Shrubbery	4
11-Crash Cushion	0
12-Median Safety Barrier	0
13-Bridge Piers (including protective guard rails)	0
14-Other Guardrails	14
15-Fencing (not median barrier)	0
16-Culvert Headwall	0
17-Embankment, Ditch, Curb	14
18-Building, Wall	0
19-Rock Outcrops or Ledge	0
20-Other	2
21-Gate or Cable	0
22-Pressure Ridge	0
Total	**35**

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	0
2-Traffic Flashing	2
3-Overhead Flashers	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	0
6-Yield Sign	2
7-Curve Warning Sign	0
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	0
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	0
13-None	50
14-Other	26
Total	**80**

Road Character

Road Character	Total
1-Level Straight	67
2-Level Curved	5
3-On Grade Straight	7
4-On Grade Curved	1
5-Top of Hill Straight	0
6-Top of Hill Curved	0
7-Bottom of Hill Straight	0
8-Bottom of Hill Curved	0
9-Other	0
Total	**80**

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	3	3
B	9	16
C	3	3
PD	65	0
Total	**80**	**22**

Light

Light	Total
1-Dawn (Morning)	1
2-Daylight	38
3-Dusk (Evening)	1
4-Dark (Street Lights On)	3
5-Dark (No Street Lights)	37
6-Dark (Street Lights Off)	0
7-Other	0
Total	**80**

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five Leg Intersection	Driveways	Bridges	Interchanges	Other	Total
Object in Road	16	0	0	0	0	0	0	1	0	17
Rear End / Sideswipe	14	1	0	0	0	0	0	2	0	17
Head-on / Sideswipe	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0
Ran Off Road	21	1	0	0	0	0	0	0	0	22
All Other Animal	0	0	0	0	0	0	0	0	0	0
Bike	0	0	0	0	0	0	0	0	0	0
Other	1	1	0	0	0	0	0	0	0	2
Jackknife	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0
Rock Thrown	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0
Deer	20	2	0	0	0	0	0	0	0	22
Moose	0	0	0	0	0	0	0	0	0	0
Total	72	5	0	0	0	0	0	3	0	80

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Blowing Sand or Dust											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Clear											
Dark (No Street Lights)	0	14	2	0	0	0	0	0	0	0	16
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	15	0	1	0	0	0	0	0	0	16
Dusk (Evening)	0	1	0	0	0	0	0	0	0	0	1
Other	0	0	0	0	0	0	0	0	0	0	0
Cloudy											
Dark (No Street Lights)	0	4	1	1	0	0	0	0	0	0	6
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	1	1
Dawn (Morning)	0	1	0	0	0	0	0	0	0	0	1
Daylight	0	5	1	0	0	0	0	0	1	0	7
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Fog, Smog, Smoke											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Other											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	5	5
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	1	0	0	0	0	0	0	0	1
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	3	3
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Severe Cross Winds											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Sleet, Hail, Freezing Rain											
Dark (No Street Lights)	0	0	1	0	0	0	0	0	0	0	1
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	1	0	0	0	0	0	0	1
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Snow											
Dark (No Street Lights)	0	0	5	1	0	0	0	3	0	0	9
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	1	0	0	0	0	0	0	0	1
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	4	0	0	0	0	1	6	0	11
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	40	16	4	0	0	0	4	7	9	80

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑Crash Summary I ☑Section Detail ☑Crash Summary II ☐1320 Included ☐1320 & Driver Report Included

REPORT DESCRIPTION

KMD

REPORT PARAMETERS

Year 2008, Start Month 1 through Year 2010 End Month: 12

Route: 0011X	Start Node: 28062	Start Offset: 0	☐Exclude First Node
	End Node: 28765	End Offset: 0	☐Exclude Last Node
Route: 0011S	Start Node: 28863	Start Offset: 0	☑Exclude First Node
	End Node: 60481	End Offset: 0	☑Exclude Last Node
Route: 0011S	Start Node: 28810	Start Offset: 0	☑Exclude First Node
	End Node: 28863	End Offset: 0	☑Exclude Last Node
Route: 0011S	Start Node: 25924	Start Offset: 0	☑Exclude First Node
	End Node: 28810	End Offset: 0	☑Exclude Last Node

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes					Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
					K	A	B	C	PD					
28062	0011X - 144.33	Int of KENNEDY MEM DR, SECOND RANGEWAY	9	8	0	0	0	2	6	25.0	7.126	0.37	1.05	0.00
											Statewide Crash Rate:	0.63		
28864	0011X - 144.35	Int of KENNEDY MEM DR, RAMP ON FROM KENNEDY MEM	1	0	0	0	0	0	0	0.0	6.895	0.00	0.13	0.00
											Statewide Crash Rate:	0.04		
60481	0011X - 144.36	Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR	1	0	0	0	0	0	0	0.0	7.864	0.00	0.25	0.00
											Statewide Crash Rate:	0.10		
28863	0011X - 144.38	Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR, RAMF	9	10	0	0	0	3	7	30.0	8.221	0.41	1.02	0.00
											Statewide Crash Rate:	0.63		
28865	0011X - 144.44	BRG 1460, KENNEDY MEM DR under I 95 SB	1	1	0	0	0	0	1	0.0	4.024	0.08	0.29	0.00
											Statewide Crash Rate:	0.10		
28810	0011X - 144.50	Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR, RAMF	9	14	0	1	2	1	10	28.6	10.362	0.45	0.98	0.00
											Statewide Crash Rate:	0.63		
25924	0011X - 144.52	Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR	2	0	0	0	0	0	0	0.0	6.867	0.00	0.31	0.00
											Statewide Crash Rate:	0.13		
27040	0011X - 144.53	1103853 WAT,KENNEDY MEM DR,JACKSON ST	2	5	0	0	0	2	3	40.0	8.798	0.19	0.29	0.00
											Statewide Crash Rate:	0.13		
28765	0011X - 144.69	1108993 WAT,KMD,WASHINGTON ST,EXT	9	15	0	0	1	2	12	20.0	10.197	0.49	0.98	0.00
											Statewide Crash Rate:	0.63		
60482	0011S - 0.58	Int of KENNEDY MEMORIAL DR, RAMP ON FROM KENNED'	1	3	0	0	0	0	3	0.0	3.483	0.29	0.15	1.89
											Statewide Crash Rate:	0.04		
Study Years: 3.00		NODE TOTALS:		56	0	1	3	10	42	25.0	73.837	0.25	0.46	0.55

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes		Injury Crashes				Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
								K	A	B	C	PD					
28062 Int of KENNEDY MEM DR, SECOND RANGEWAY	28864	2667125	0 - 0.02	0011X - 144.33 ST RTE 11	0.02	1	2	0	0	1	0	1	50.0	0.00151 Statewide Crash Rate:	442.78 117.54	422.39	1.05
60481 Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR	28864	2077496	0 - 0.01	0011X - 144.35 ST RTE 11	0.01	1	0	0	0	0	0	0	0.0	0.00063 Statewide Crash Rate:	0.00 117.54	495.74	0.00
28863 Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR, RAMP OFF TO KENNEDY MEM DR	60481	2077695	0 - 0.02	0011X - 144.36 ST RTE 11	0.02	1	0	0	0	0	0	0	0.0	0.00061 Statewide Crash Rate:	0.00 117.54	497.05	0.00
28863 Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR, RAMP OFF TO KENNEDY MEM DR	28865	206318	0 - 0.06	0011X - 144.38 ST RTE 11	0.06	1	0	0	0	0	0	0	0.0	0.00235 Statewide Crash Rate:	0.00 117.54	379.10	0.00
28810 Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR, RAMP OFF TO KENNEDY MEM DR, RAMP ON	28865	2077698	0 - 0.06	0011X - 144.44 ST RTE 11	0.06	1	0	0	0	0	0	0	0.0	0.00248 Statewide Crash Rate:	0.00 117.54	374.29	0.00
25924 Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR	28810	2077702	0 - 0.02	0011X - 144.50 ST RTE 11	0.02	1	0	0	0	0	0	0	0.0	0.00090 Statewide Crash Rate:	0.00 117.54	469.50	0.00
25924 Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR	27040	203087	0 - 0.01	0011X - 144.52 ST RTE 11	0.01	2	0	0	0	0	0	0	0.0	0.00092 Statewide Crash Rate:	0.00 174.02	639.45	0.00
27040 1103853 WAT,KENNEDY MEM DR,JACKSON ST	28765	204577	0 - 0.16	0011X - 144.53 ST RTE 11	0.16	2	9	0	0	0	2	7	22.2	0.01328 Statewide Crash Rate:	225.90 174.02	331.72	0.00
28863 Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR, RAMP OFF TO KENNEDY MEM DR	60481	2077677	0 - 0.02	0011S - 0.64 ST RTE 11S	0.02	1	1	0	0	0	0	1	0.0	0.00064 Statewide Crash Rate:	520.07 117.54	494.40	1.05
28810 Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR, RAMP OFF TO KENNEDY MEM DR, RAMP ON	60482	2077500	0 - 0.06	0011S - 0.52 ST RTE 11S	0.06	1	0	0	0	0	0	0	0.0	0.00209 Statewide Crash Rate:	0.00 117.54	390.50	0.00
60482 Int of KENNEDY MEMORIAL DR, RAMP ON FROM KENNEDY MEM DR	28863	2077680	0 - 0.06	0011S - 0.58 ST RTE 11S	0.06	1	0	0	0	0	0	0	0.0	0.00152 Statewide Crash Rate:	0.00 117.54	421.16	0.00
25924 Int of KENNEDY MEM DR, KENNEDY MEMORIAL DR	28810	2077497	0 - 0.02	0011S - 0.50 ST RTE 11S	0.02	1	1	0	0	0	0	1	0.0	0.00092 Statewide Crash Rate:	363.87 117.54	468.34	0.00
Study Years: 3.00				Section Totals:	0.52		13	0	0	1	2	10	23.1	0.02785	155.60	248.17	0.63
				Grand Totals:	0.52		69	0	1	4	12	52	24.6	0.02785	825.88	337.10	2.45

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes					Crash Report	Crash Date	Crash Mile Point	Injury Degree
						K	A	B	C	PD				
28062	28864	2667125	0 - 0.02	0011X - 144.33	2	0	0	1	0	1	2010-32704	07/27/2010	144.34	B
											2009-28268	11/16/2009	144.34	PD
60481	28864	2077496	0 - 0.01	0011X - 144.35	0	0	0	0	0	0				
28863	60481	2077695	0 - 0.02	0011X - 144.36	0	0	0	0	0	0				
28863	28865	206318	0 - 0.06	0011X - 144.38	0	0	0	0	0	0				
28810	28865	2077698	0 - 0.06	0011X - 144.44	0	0	0	0	0	0				
25924	28810	2077702	0 - 0.02	0011X - 144.50	0	0	0	0	0	0				
25924	27040	203087	0 - 0.01	0011X - 144.52	0	0	0	0	0	0				
27040	28765	204577	0 - 0.16	0011X - 144.53	9	0	0	0	2	7	2009-31466	12/23/2009	144.54	PD
											2009-5026	02/07/2009	144.61	PD
											2008-26804	09/20/2008	144.63	PD
											2010-15085	06/16/2010	144.67	C
											2009-22185	09/14/2009	144.67	PD
											2009-22986	10/16/2009	144.67	PD
											2010-4616	02/16/2010	144.67	PD
											2009-22184	09/13/2009	144.68	C
											2009-29771	12/15/2009	144.68	PD
28863	60481	2077677	0 - 0.02	0011S - 0.64	1	0	0	0	0	1	2010-11939	06/01/2010	0.65	PD
28810	60482	2077500	0 - 0.06	0011S - 0.52	0	0	0	0	0	0				
60482	28863	2077680	0 - 0.06	0011S - 0.58	0	0	0	0	0	0				
25924	28810	2077497	0 - 0.02	0011S - 0.50	1	0	0	0	0	1	2010-32749	08/30/2010	0.51	PD
				Totals:	13	0	0	1	2	10				

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Day and Hour

	Hour of Day																									
	AM												PM													
Day Of Week	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Un	Tot
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	3	1	0	0	1	0	0	0	0	9
MONDAY	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	1	1	3	1	0	0	0	0	1	0	12
TUESDAY	0	0	0	0	0	0	0	0	1	0	0	2	2	1	0	0	4	1	1	1	1	0	1	0	0	15
WEDNESDAY	1	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	3	2	1	0	0	0	0	0	0	10
THURSDAY	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	1	3	0	0	0	0	0	0	0	7
FRIDAY	0	0	0	0	0	1	0	0	0	0	0	0	3	0	0	3	1	1	0	0	0	0	0	1	0	10
SATURDAY	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	0	1	0	0	0	6
Totals	1	0	0	0	0	1	0	2	2	3	0	4	7	2	5	6	14	11	4	1	2	1	1	2	0	69

Crashes by Year and Month

Month	2008	2009	2010	Total
JANUARY	3	1	2	6
FEBRUARY	3	5	1	9
MARCH	3	0	1	4
APRIL	0	1	1	2
MAY	1	2	2	5
JUNE	0	1	3	4
JULY	2	2	1	5
AUGUST	0	2	5	7
SEPTEMBER	3	5	1	9
OCTOBER	1	2	3	6
NOVEMBER	0	2	1	3
DECEMBER	3	6	0	9
Total	19	29	21	69

Vehicle Counts by Type

Unit Type	Total
1-2 Door	13
2-4 Door	78
3-Convertible	0
4-Station Wagon	2
5-Van	15
6-Pickup Truck	22
7-SUV	2
10-Truck Tractor Only (Bobtail)	0
12-School Bus	0
13-Motor Home	0
14-Motorcycle	2
15-Moped	0
16-Motor Bike	0
17-Bicycle	0
18-Snowmobile	0
20-2 Axle Single Unit with Dual Tires	1
21-2 Axle Tractor with Single Axle Semi	0
22-2 Axle Tractor with Tandem Axle Semi	0
25-2 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0
30-3 Axle Single Unit	0
31-3 Axle Tractor with Single Axle Semi	0

Unit Type	Total
32-3 Axle Tractor with Tandem Axle Semi	1
33-3 Axle Tractor with Tridem Axle Semi	0
35-3 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0
36-3 Axle Tractor with Tandem Axle Semi & 2 Axle Trailer	0
37-5 Axle Semi; Split Trailer Tandem	0
38-6 Axle Semi; Split Trailer Tandem with Center Axle	0
39-6 Axle; Standard Trailer Tandem with Center Axle	0
40-4 Axle Single Unit	0
42-4 Axle Tractor with Tandem Axle Semi	0
50-Any Other Axle Configuration	0
60-Other Unit	0
70-ATV	0
81-2 Axle Bus	0
82-3 Axle Bus	0
98-Farm Vehicles / Tractors	0
99-Unknown	0
Total	136

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Apparent Contributing Factor And Driver

Apparent Contributing Factor	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Improper Action	12	54	1	0	0	0	67
Failure to Yield Right of Way	8	4	0	0	0	0	12
Illegal Unsafe Speed	5	0	0	0	0	0	5
Following Too Close	2	0	0	0	0	0	2
Disregard Traffic Control Device	2	1	0	0	0	0	3
Driving Left of Center Not Passing	0	0	0	0	0	0	0
Improper Passing, Overtaking	0	0	0	0	0	0	0
Improper Unsafe Lane Change	4	0	0	0	0	0	4
Improper Parking Start, Stop	0	0	0	0	0	0	0
Improper Turn	2	0	0	0	0	0	2
Unsafe Backing	1	0	0	0	0	0	1
No Signal or Improper Signal	0	0	0	0	0	0	0
Impeding Traffic	1	0	0	0	0	0	1
Driver Inattention, Distraction	24	4	0	0	0	0	28
Driver Inexperience	1	0	0	0	0	0	1
Pedestrian Violation Error	0	0	0	0	0	0	0
Physical Impairment	1	0	0	0	0	0	1
Vision Obscured, Windshield Glass	1	0	0	0	0	0	1
Vision Obscured, Sun, Headlights	2	0	0	0	0	0	2
Other Vision Obscurement	1	0	0	0	0	0	1
Other Human Violation Factor	1	1	0	0	0	0	2
Hit and Run	0	0	0	0	0	0	0
Defective Brakes	0	1	0	0	0	0	1
Defective Tire, Tire Failure	0	0	0	0	0	0	0
Defective Lights	0	0	0	0	0	0	0
Defective Suspension	0	0	0	0	0	0	0
Defective Steering	0	0	0	0	0	0	0
Other Vehicle Defect or Factor	0	0	0	0	0	0	0
Unknown	1	1	0	0	0	0	2
Total	69	66	1	0	0	0	136

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Normal	67	65	1	0	0	0	133
Under the Influence	2	0	0	0	0	0	2
Had Been Drinking	0	1	0	0	0	0	1
Had Been Using Drugs	0	0	0	0	0	0	0
Asleep	0	0	0	0	0	0	0
Fatigued	0	0	0	0	0	0	0
ill	0	0	0	0	0	0	0
Handicapped	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total	69	66	1	0	0	0	136

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	11	0	0	0	0	11
20-24	28	0	0	0	0	28
25-29	10	0	0	0	0	10
30-39	16	0	0	0	0	16
40-49	21	0	0	0	0	21
50-59	24	0	0	0	0	24
60-69	11	0	0	0	0	11
70-79	10	0	0	0	0	10
80-Over	5	0	0	0	0	5
Unknown	0	0	0	0	0	0
Total	136	0	0	0	0	136

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Fixed Object Struck

Fixed Object Struck	Total
1-Construction, Barricades Equipment, etc.	0
2-Traffic Signal	0
3-R.R. Crossing Device	0
4-Light Pole	0
5-Utility Pole (Tel. Electrical)	0
6-Sign Structure Post	0
7-Mail Boxes or Posts	0
8-Other Poles, posts or supports	0
9-Fire Hydrant/Parking Meter	0
10-Tree or Shrubbery	0
11-Crash Cushion	0
12-Median Safety Barrier	0
13-Bridge Piers (including protective guard rails)	0
14-Other Guardrails	0
15-Fencing (not median barrier)	0
16-Culvert Headwall	0
17-Embankment, Ditch, Curb	0
18-Building, Wall	0
19-Rock Outcrops or Ledge	0
20-Other	1
21-Gate or Cable	0
22-Pressure Ridge	0
Total	1

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	46
2-Traffic Flashing	3
3-Overhead Flashers	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	1
6-Yield Sign	1
7-Curve Warning Sign	0
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	0
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	0
13-None	18
14-Other	0
Total	69

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	1	1
B	4	4
C	12	16
PD	52	0
Total	69	21

Road Character

Road Character	Total
1-Level Straight	29
2-Level Curved	1
3-On Grade Straight	34
4-On Grade Curved	5
5-Top of Hill Straight	0
6-Top of Hill Curved	0
7-Bottom of Hill Straight	0
8-Bottom of Hill Curved	0
9-Other	0
Total	69

Light

Light	Total
1-Dawn (Morning)	1
2-Daylight	45
3-Dusk (Evening)	6
4-Dark (Street Lights On)	16
5-Dark (No Street Lights)	0
6-Dark (Street Lights Off)	1
7-Other	0
Total	69

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five Leg Intersection	Driveways	Bridges	Interchanges	Other	Total
Object in Road	0	0	0	0	0	0	0	0	0	0
Rear End / Sideswipe	8	0	15	19	0	1	0	0	0	43
Head-on / Sideswipe	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	8	10	0	5	0	0	0	23
Pedestrians	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0
Ran Off Road	0	0	0	0	0	0	0	0	0	0
All Other Animal	0	0	0	0	0	0	0	0	0	0
Bike	0	0	0	0	0	0	0	0	0	0
Other	2	0	0	0	0	0	1	0	0	3
Jackknife	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0
Rock Thrown	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0
Deer	0	0	0	0	0	0	0	0	0	0
Moose	0	0	0	0	0	0	0	0	0	0
Total	10	0	23	29	0	6	1	0	0	69

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Blowing Sand or Dust											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Clear											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	1	0	0	0	0	0	0	0	0	1
Dark (Street Lights On)	0	11	0	0	0	0	0	0	0	0	11
Dawn (Morning)	0	1	0	0	0	0	0	0	0	0	1
Daylight	0	24	0	0	0	0	0	0	1	3	28
Dusk (Evening)	0	3	0	0	0	0	0	0	0	0	3
Other	0	0	0	0	0	0	0	0	0	0	0
Cloudy											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	2	0	0	0	0	0	0	0	0	2
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	7	0	0	0	0	0	0	0	4	11
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Fog, Smog, Smoke											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Other											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	1	1
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	6	6
Dusk (Evening)	0	0	1	0	0	0	0	0	0	0	1
Other	0	0	0	0	0	0	0	0	0	0	0
Severe Cross Winds											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Sleet, Hail, Freezing Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Snow											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	2	0	0	2
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	1	1	0	0	0	0	0	0	2
Other	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	49	2	1	0	0	0	2	1	14	69

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑Crash Summary I ☑Section Detail ☑Crash Summary II ☐1320 Included ☐1320 & Driver Report Included

REPORT DESCRIPTION

Lyons Rd

REPORT PARAMETERS

Year 2008, Start Month 1 through Year 2010 End Month: 12

Route: 1102238 Start Node: 25593 Start Offset: 0 ☐Exclude First Node
End Node: 26365 End Offset: 0 ☐Exclude Last Node

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes					Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
					K	A	B	C	PD					
25593	1102238 - 0	Int of LYONS RD, MIDDLE RD	1	1	0	0	1	0	0	100.0	0.991 Statewide Crash Rate:	0.34 0.14	0.53	0.00
28731	1102238 - 0.16	Int of FIELD RD, LYONS RD	1	0	0	0	0	0	0	0.0	0.603 Statewide Crash Rate:	0.00 0.14	0.58	0.00
28347	1102238 - 0.20	Int of BLUE RIDGE W, LYONS RD	1	0	0	0	0	0	0	0.0	0.598 Statewide Crash Rate:	0.00 0.14	0.58	0.00
28349	1102238 - 0.34	Int of BLUE RIDGE E, LYONS RD	1	0	0	0	0	0	0	0.0	0.620 Statewide Crash Rate:	0.00 0.14	0.58	0.00
61608	1102238 - 0.37	Int of FIELD RD, LYONS RD	1	0	0	0	0	0	0	0.0	0.639 Statewide Crash Rate:	0.00 0.14	0.58	0.00
61603	1102238 - 0.58	Non-Int LYONS RD	1	0	0	0	0	0	0	0.0	0.625 Statewide Crash Rate:	0.00 0.14	0.58	0.00
28856	1102238 - 0.90	Int of LYONS RD, RAMP C OFF TO LYONS RD	1	0	0	0	0	0	0	0.0	1.036 Statewide Crash Rate:	0.00 0.04	0.17	0.00
28801	1102238 - 1.19	Int of LYONS RD, RAMP OFF TO LYONS RD	1	1	0	0	0	0	1	0.0	1.003 Statewide Crash Rate:	0.33 0.04	0.17	1.95
62772	1102238 - 1.38	Int of LYONS RD, PERRY DR	1	0	0	0	0	0	0	0.0	0.605 Statewide Crash Rate:	0.00 0.10	0.43	0.00
25630	1102238 - 1.51	Non-Int LYONS RD	1	0	0	0	0	0	0	0.0	0.598 Statewide Crash Rate:	0.00 0.10	0.43	0.00
26365	1102238 - 1.78	1103129 SID,WEST RIVER,LYONS RD	1	2	0	0	0	0	2	0.0	1.048 Statewide Crash Rate:	0.64 0.10	0.40	1.59
Study Years:	3.00	NODE TOTALS:		4	0	0	1	0	3	25.0	8.366	0.16	0.25	0.63

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes					Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
								K	A	B	C	PD					
25593 Int of LYONS RD, MIDDLE RD	28731	202561	0 - 0.16	1102238 - 0 RD INV 11 02238	0.16	1	0	0	0	0	0	0	0.0	0.00094 Statewide Crash Rate:	0.00 184.68	666.37	0.00
28347 Int of BLUE RIDGE W, LYONS RD	28731	205944	0 - 0.04	1102238 - 0.16 RD INV 11 02238	0.04	1	0	0	0	0	0	0	0.0	0.00023 Statewide Crash Rate:	0.00 184.68	793.33	0.00
28347 Int of BLUE RIDGE W, LYONS RD	28349	2226921	0 - 0.14	1102238 - 0.20 RD INV 11 02238	0.14	1	0	0	0	0	0	0	0.0	0.00084 Statewide Crash Rate:	0.00 184.68	683.70	0.00
28349 Int of BLUE RIDGE E, LYONS RD	61608	2226874	0 - 0.03	1102238 - 0.34 RD INV 11 02238	0.03	1	0	0	0	0	0	0	0.0	0.00019 Statewide Crash Rate:	0.00 184.68	770.35	0.00
61608 Int of FIELD RD, LYONS RD	61603	2226875	0 - 0.21	1102238 - 0.37 RD INV 11 02238	0.21	1	0	0	0	0	0	0	0.0	0.00131 Statewide Crash Rate:	0.00 184.68	616.14	0.00
61603 Non-Int LYONS RD	28856	2226862	0 - 0.32	1102238 - 0.58 RD INV 11 02238	0.32	1	2	0	0	0	0	2	0.0	0.00200 Statewide Crash Rate:	332.62 184.68	552.98	0.00
28801 Int of LYONS RD, RAMP OFF TO LYONS RD	28856	206242	0 - 0.29	1102238 - 0.90 RD INV 11 02238	0.29	1	1	0	0	0	0	1	0.0	0.00188 Statewide Crash Rate:	177.02 147.24	474.61	0.00
62772 Int of LYONS RD, PERRY DR	28801	2516505	0 - 0.19	1102238 - 1.19 RD INV 11 02238	0.19	1	0	0	0	0	0	0	0.0	0.00115 Statewide Crash Rate:	0.00 147.24	533.99	0.00
25630 Non-Int LYONS RD	62772	2516504	0 - 0.13	1102238 - 1.38 RD INV 11 02238	0.13	1	0	0	0	0	0	0	0.0	0.00078 Statewide Crash Rate:	0.00 147.24	579.80	0.00
25630 Non-Int LYONS RD	26365	202611	0 - 0.27	1102238 - 1.51 RD INV 11 02238	0.27	1	1	0	0	1	0	0	100.0	0.00161 Statewide Crash Rate:	207.13 147.24	493.54	0.00
Study Years: 3.00				Section Totals:	1.78		4	0	0	1	0	3	25.0	0.01094	121.90	334.15	0.36
				Grand Totals:	1.78		8	0	0	2	0	6	25.0	0.01094	243.80	374.66	0.65

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
25593	28731	202561	0 - 0.16	1102238 - 0	0	0	0	0	0	0				
28347	28731	205944	0 - 0.04	1102238 - 0.16	0	0	0	0	0	0				
28347	28349	2226921	0 - 0.14	1102238 - 0.20	0	0	0	0	0	0				
28349	61608	2226874	0 - 0.03	1102238 - 0.34	0	0	0	0	0	0				
61608	61603	2226875	0 - 0.21	1102238 - 0.37	0	0	0	0	0	0				
61603	28856	2226862	0 - 0.32	1102238 - 0.58	2	0	0	0	0	2	2008-505	01/12/2008	0.68	PD
											2008-22987	09/19/2008	0.70	PD
28801	28856	206242	0 - 0.29	1102238 - 0.90	1	0	0	0	0	1	2009-28682	12/05/2009	1.06	PD
62772	28801	2516505	0 - 0.19	1102238 - 1.19	0	0	0	0	0	0				
25630	62772	2516504	0 - 0.13	1102238 - 1.38	0	0	0	0	0	0				
25630	26365	202611	0 - 0.27	1102238 - 1.51	1	0	0	1	0	0	2010-13489	06/09/2010	1.75	B
				Totals:	4	0	0	1	0	3				

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM						Hour of Day						PM													
Day Of Week	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Un	Tot
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MONDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUESDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEDNESDAY	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
THURSDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
FRIDAY	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
SATURDAY	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
Totals	0	1	0	1	0	2	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	8

Crashes by Year and Month

Month	2008	2009	2010	Total
JANUARY	2	0	0	2
FEBRUARY	0	0	0	0
MARCH	1	0	0	1
APRIL	0	0	0	0
MAY	0	0	0	0
JUNE	0	0	1	1
JULY	0	0	1	1
AUGUST	0	0	0	0
SEPTEMBER	1	0	1	2
OCTOBER	0	0	0	0
NOVEMBER	0	0	0	0
DECEMBER	0	1	0	1
Total	4	1	3	8

Vehicle Counts by Type

Unit Type	Total
1-2 Door	0
2-4 Door	5
3-Convertible	0
4-Station Wagon	0
5-Van	1
6-Pickup Truck	2
7-SUV	2
10-Truck Tractor Only (Bobtail)	0
12-School Bus	1
13-Motor Home	0
14-Motorcycle	0
15-Moped	0
16-Motor Bike	0
17-Bicycle	0
18-Snowmobile	0
20-2 Axle Single Unit with Dual Tires	0
21-2 Axle Tractor with Single Axle Semi	0
22-2 Axle Tractor with Tandem Axle Semi	0
25-2 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0
30-3 Axle Single Unit	0
31-3 Axle Tractor with Single Axle Semi	0

Unit Type	Total
32-3 Axle Tractor with Tandem Axle Semi	0
33-3 Axle Tractor with Tridem Axle Semi	0
35-3 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0
36-3 Axle Tractor with Tandem Axle Semi & 2 Axle Trailer	0
37-5 Axle Semi; Split Trailer Tandem	0
38-6 Axle Semi; Split Trailer Tandem with Center Axle	0
39-6 Axle; Standard Trailer Tandem with Center Axle	0
40-4 Axle Single Unit	0
42-4 Axle Tractor with Tandem Axle Semi	0
50-Any Other Axle Configuration	0
60-Other Unit	0
70-ATV	0
81-2 Axle Bus	0
82-3 Axle Bus	0
98-Farm Vehicles / Tractors	0
99-Unknown	0
Total	11

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Apparent Contributing Factor And Driver

Apparent Contributing Factor	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Improper Action	1	2	1	0	0	0	4
Failure to Yield Right of Way	0	0	0	0	0	0	0
Illegal Unsafe Speed	3	0	0	0	0	0	3
Following Too Close	0	0	0	0	0	0	0
Disregard Traffic Control Device	1	0	0	0	0	0	1
Driving Left of Center Not Passing	0	0	0	0	0	0	0
Improper Passing, Overtaking	0	0	0	0	0	0	0
Improper Unsafe Lane Change	0	0	0	0	0	0	0
Improper Parking Start, Stop	0	0	0	0	0	0	0
Improper Turn	0	0	0	0	0	0	0
Unsafe Backing	0	0	0	0	0	0	0
No Signal or Improper Signal	0	0	0	0	0	0	0
Impeding Traffic	0	0	0	0	0	0	0
Driver Inattention, Distraction	3	0	0	0	0	0	3
Driver Inexperience	0	0	0	0	0	0	0
Pedestrian Violation Error	0	0	0	0	0	0	0
Physical Impairment	0	0	0	0	0	0	0
Vision Obscured, Windshield Glass	0	0	0	0	0	0	0
Vision Obscured, Sun, Headlights	0	0	0	0	0	0	0
Other Vision Obscurement	0	0	0	0	0	0	0
Other Human Violation Factor	0	0	0	0	0	0	0
Hit and Run	0	0	0	0	0	0	0
Defective Brakes	0	0	0	0	0	0	0
Defective Tire, Tire Failure	0	0	0	0	0	0	0
Defective Lights	0	0	0	0	0	0	0
Defective Suspension	0	0	0	0	0	0	0
Defective Steering	0	0	0	0	0	0	0
Other Vehicle Defect or Factor	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0
Total	8	2	1	0	0	0	11

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Normal	6	2	1	0	0	0	9
Under the Influence	1	0	0	0	0	0	1
Had Been Drinking	0	0	0	0	0	0	0
Had Been Using Drugs	0	0	0	0	0	0	0
Asleep	0	0	0	0	0	0	0
Fatigued	0	0	0	0	0	0	0
ill	0	0	0	0	0	0	0
Handicapped	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total	7	2	1	0	0	0	10

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	2	0	0	0	0	2
20-24	2	0	0	0	0	2
25-29	3	0	0	0	0	3
30-39	0	0	0	0	0	0
40-49	3	0	0	0	0	3
50-59	0	0	0	0	0	0
60-69	1	0	0	0	0	1
70-79	0	0	0	0	0	0
80-Over	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Total	11	0	0	0	0	11

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Fixed Object Struck

Fixed Object Struck	Total
1-Construction, Barricades Equipment, etc.	0
2-Traffic Signal	0
3-R.R. Crossing Device	0
4-Light Pole	0
5-Utility Pole (Tel. Electrical)	0
6-Sign Structure Post	0
7-Mail Boxes or Posts	0
8-Other Poles, posts or supports	0
9-Fire Hydrant/Parking Meter	0
10-Tree or Shrubbery	0
11-Crash Cushion	0
12-Median Safety Barrier	0
13-Bridge Piers (including protective guard rails)	0
14-Other Guardrails	3
15-Fencing (not median barrier)	0
16-Culvert Headwall	0
17-Embankment, Ditch, Curb	2
18-Building, Wall	0
19-Rock Outcrops or Ledge	0
20-Other	0
21-Gate or Cable	0
22-Pressure Ridge	0
Total	5

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	0
2-Traffic Flashing	0
3-Overhead Flashers	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	4
6-Yield Sign	0
7-Curve Warning Sign	0
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	1
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	0
13-None	3
14-Other	0
Total	8

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	0	0
B	2	2
C	0	0
PD	6	0
Total	8	2

Road Character

Road Character	Total
1-Level Straight	4
2-Level Curved	0
3-On Grade Straight	2
4-On Grade Curved	1
5-Top of Hill Straight	0
6-Top of Hill Curved	0
7-Bottom of Hill Straight	0
8-Bottom of Hill Curved	1
9-Other	0
Total	8

Light

Light	Total
1-Dawn (Morning)	1
2-Daylight	3
3-Dusk (Evening)	0
4-Dark (Street Lights On)	1
5-Dark (No Street Lights)	3
6-Dark (Street Lights Off)	0
7-Other	0
Total	8

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five Leg Intersection	Driveways	Bridges	Interchanges	Other	Total
Object in Road	1	0	2	0	0	0	0	0	0	3
Rear End / Sideswipe	1	0	1	0	0	0	0	0	0	2
Head-on / Sideswipe	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0
Ran Off Road	0	1	1	0	0	0	0	0	0	2
All Other Animal	0	0	0	0	0	0	0	0	0	0
Bike	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Jackknife	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0
Rock Thrown	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0
Deer	0	1	0	0	0	0	0	0	0	1
Moose	0	0	0	0	0	0	0	0	0	0
Total	2	2	4	0	0	0	0	0	0	8

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Blowing Sand or Dust											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Clear											
Dark (No Street Lights)	0	1	0	0	0	0	0	0	0	0	1
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	1	0	0	0	0	0	0	0	0	1
Daylight	0	1	0	0	0	0	0	0	0	0	1
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Cloudy											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	1	0	0	0	0	0	0	0	0	1
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	1	1
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Fog, Smog, Smoke											
Dark (No Street Lights)	0	0	1	0	0	0	0	0	0	0	1
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Other											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Severe Cross Winds											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Sleet, Hail, Freezing Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Snow											
Dark (No Street Lights)	0	0	0	0	0	0	0	1	0	0	1
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	1	0	0	1
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	4	1	0	0	0	0	2	0	1	8

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑Crash Summary I ☑Section Detail ☑Crash Summary II ☐1320 Included ☐1320 & Driver Report Included

REPORT DESCRIPTION

Trafton Rd

REPORT PARAMETERS

Year 2008, Start Month 1 through Year 2010 End Month: 12

Route: 1102252

Start Node: 25597

End Node: 26370

Start Offset: 0

End Offset: 0

☐Exclude First Node

☐Exclude Last Node

11/29/2011 1:43:05 PM

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes				PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
					K	A	B	C						
25597	1102252 - 0	1102306 OAK,BOG,TRAFTON RD.	1	1	0	0	0	0	1	0.0 Statewide Crash Rate:	1.020	0.33 0.14	0.53	0.00
24940	1102252 - 0.10	Int of COTTLE, TRAFTON RD	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	0.193	0.00 0.12	0.43	0.00
24941	1102252 - 0.62	1101596 TL,WATERVILLE-OAKLAND	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	0.116	0.00 0.12	0.20	0.00
25164	1102252 - 1.64	1101832 WAT,EIGHT ROD,TRAFTON RD.	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	0.194	0.00 0.12	0.43	0.00
25163	1102252 - 1.67	Int of JUNCTION RD, TRAFTON RD	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	0.204	0.00 0.12	0.44	0.00
26370	1102252 - 2.59	1103134 WAT,RTE.104,TRAFTON RD.	1	0	0	0	0	0	0	0.0 Statewide Crash Rate:	1.312	0.00 0.10	0.38	0.00
Study Years:	3.00	NODE TOTALS:		1	0	0	0	0	1	0.0	3.039	0.11	0.36	0.31

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
24940 Int of COTTLE, TRAFTON RD	25597	201539	0 - 0.10	1102252 - 0 RD INV 11 02252	0.10	1	0	0	0	0	0	0	0.0	0.00014 Statewide Crash Rate:	0.00 225.96	932.42	0.00
24940 Int of COTTLE, TRAFTON RD	24941	201538	0 - 0.52	1102252 - 0.10 RD INV 11 02252	0.52	1	0	0	0	0	0	0	0.0	0.00063 Statewide Crash Rate:	0.00 225.96	851.53	0.00
24941 1101596 TL,WATERVILLE-OAKLAND	25164	201541	0 - 1.02	1102252 - 0.62 RD INV 11 02252	1.02	1	1	0	0	0	0	1	0.0	0.00112 Statewide Crash Rate:	296.47 225.96	744.46	0.00
25163 Int of JUNCTION RD, TRAFTON RD	25164	201884	0 - 0.03	1102252 - 1.64 RD INV 11 02252	0.03	1	0	0	0	0	0	0	0.0	0.00004 Statewide Crash Rate:	0.00 225.96	-482.86	0.00
25163 Int of JUNCTION RD, TRAFTON RD	26370	201885	0 - 0.92	1102252 - 1.67 RD INV 11 02252	0.92	1	1	0	0	0	1	0	100.0	0.00206 Statewide Crash Rate:	161.67 225.96	637.48	0.00
Study Years: 3.00				Section Totals:	2.59		2	0	0	0	1	1	50.0	0.00400	166.60	537.73	0.31
				Grand Totals:	2.59		3	0	0	0	1	2	33.3	0.00400	249.91	577.71	0.43

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
24940	25597	201539	0 - 0.10	1102252 - 0	0	0	0	0	0	0				
24940	24941	201538	0 - 0.52	1102252 - 0.10	0	0	0	0	0	0				
24941	25164	201541	0 - 1.02	1102252 - 0.62	1	0	0	0	0	1	2009-33854	01/16/2009	1.22	PD
25163	25164	201884	0 - 0.03	1102252 - 1.64	0	0	0	0	0	0				
25163	26370	201885	0 - 0.92	1102252 - 1.67	1	0	0	0	1	0	2010-11947	06/12/2010	1.87	C
				Totals:	2	0	0	0	1	1				

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												PM													
	Hour of Day																									
Day Of Week	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Un	Tot
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MONDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TUESDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEDNESDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
THURSDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FRIDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2
SATURDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	3

Crashes by Year and Month

Month	2008	2009	2010	Total
JANUARY	0	1	0	1
FEBRUARY	0	0	0	0
MARCH	0	0	0	0
APRIL	0	0	0	0
MAY	0	0	0	0
JUNE	0	0	1	1
JULY	0	0	0	0
AUGUST	0	0	1	1
SEPTEMBER	0	0	0	0
OCTOBER	0	0	0	0
NOVEMBER	0	0	0	0
DECEMBER	0	0	0	0
Total	0	1	2	3

Vehicle Counts by Type

Unit Type	Total	Unit Type	Total
1-2 Door	0	32-3 Axle Tractor with Tandem Axle Semi	0
2-4 Door	3	33-3 Axle Tractor with Tridem Axle Semi	0
3-Convertible	0	35-3 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0
4-Station Wagon	0	36-3 Axle Tractor with Tandem Axle Semi & 2 Axle Trailer	0
5-Van	0	37-5 Axle Semi; Split Trailer Tandem	0
6-Pickup Truck	0	38-6 Axle Semi; Split Trailer Tandem with Center Axle	0
7-SUV	0	39-6 Axle; Standard Trailer Tandem with Center Axle	0
10-Truck Tractor Only (Bobtail)	0	40-4 Axle Single Unit	0
12-School Bus	0	42-4 Axle Tractor with Tandem Axle Semi	0
13-Motor Home	0	50-Any Other Axle Configuration	0
14-Motorcycle	0	60-Other Unit	0
15-Moped	0	70-ATV	0
16-Motor Bike	0	81-2 Axle Bus	0
17-Bicycle	0	82-3 Axle Bus	0
18-Snowmobile	0	98-Farm Vehicles / Tractors	0
20-2 Axle Single Unit with Dual Tires	0	99-Unknown	0
21-2 Axle Tractor with Single Axle Semi	0	Total	3
22-2 Axle Tractor with Tandem Axle Semi	0		
25-2 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0		
30-3 Axle Single Unit	0		
31-3 Axle Tractor with Single Axle Semi	0		

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Apparent Contributing Factor And Driver

Apparent Contributing Factor	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Improper Action	0	0	0	0	0	0	0
Failure to Yield Right of Way	0	0	0	0	0	0	0
Illegal Unsafe Speed	0	0	0	0	0	0	0
Following Too Close	0	0	0	0	0	0	0
Disregard Traffic Control Device	0	0	0	0	0	0	0
Driving Left of Center Not Passing	0	0	0	0	0	0	0
Improper Passing, Overtaking	0	0	0	0	0	0	0
Improper Unsafe Lane Change	0	0	0	0	0	0	0
Improper Parking Start, Stop	0	0	0	0	0	0	0
Improper Turn	0	0	0	0	0	0	0
Unsafe Backing	0	0	0	0	0	0	0
No Signal or Improper Signal	0	0	0	0	0	0	0
Impeding Traffic	0	0	0	0	0	0	0
Driver Inattention, Distraction	2	0	0	0	0	0	2
Driver Inexperience	0	0	0	0	0	0	0
Pedestrian Violation Error	0	0	0	0	0	0	0
Physical Impairment	0	0	0	0	0	0	0
Vision Obscured, Windshield Glass	0	0	0	0	0	0	0
Vision Obscured, Sun, Headlights	0	0	0	0	0	0	0
Other Vision Obscurement	0	0	0	0	0	0	0
Other Human Violation Factor	1	0	0	0	0	0	1
Hit and Run	0	0	0	0	0	0	0
Defective Brakes	0	0	0	0	0	0	0
Defective Tire, Tire Failure	0	0	0	0	0	0	0
Defective Lights	0	0	0	0	0	0	0
Defective Suspension	0	0	0	0	0	0	0
Defective Steering	0	0	0	0	0	0	0
Other Vehicle Defect or Factor	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0
Total	3	0	0	0	0	0	3

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Normal	3	0	0	0	0	0	3
Under the Influence	0	0	0	0	0	0	0
Had Been Drinking	0	0	0	0	0	0	0
Had Been Using Drugs	0	0	0	0	0	0	0
Asleep	0	0	0	0	0	0	0
Fatigued	0	0	0	0	0	0	0
Ill	0	0	0	0	0	0	0
Handicapped	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total	3	0	0	0	0	0	3

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	0	0	0	0	0	0
20-24	3	0	0	0	0	3
25-29	0	0	0	0	0	0
30-39	0	0	0	0	0	0
40-49	0	0	0	0	0	0
50-59	0	0	0	0	0	0
60-69	0	0	0	0	0	0
70-79	0	0	0	0	0	0
80-Over	0	0	0	0	0	0
Unknown	0	0	0	0	0	0
Total	3	0	0	0	0	3

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Fixed Object Struck

Fixed Object Struck	Total
1-Construction, Barricades Equipment, etc.	0
2-Traffic Signal	0
3-R.R. Crossing Device	0
4-Light Pole	0
5-Utility Pole (Tel. Electrical)	0
6-Sign Structure Post	0
7-Mail Boxes or Posts	1
8-Other Poles, posts or supports	0
9-Fire Hydrant/Parking Meter	0
10-Tree or Shrubbery	0
11-Crash Cushion	0
12-Median Safety Barrier	0
13-Bridge Piers (including protective guard rails)	0
14-Other Guardrails	0
15-Fencing (not median barrier)	0
16-Culvert Headwall	0
17-Embankment, Ditch, Curb	2
18-Building, Wall	0
19-Rock Outcrops or Ledge	0
20-Other	0
21-Gate or Cable	0
22-Pressure Ridge	0
Total	3

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	0
2-Traffic Flashing	0
3-Overhead Flashers	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	1
6-Yield Sign	0
7-Curve Warning Sign	0
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	0
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	0
13-None	2
14-Other	0
Total	3

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	0	0
B	0	0
C	1	1
PD	2	0
Total	3	1

Road Character

Road Character	Total
1-Level Straight	3
2-Level Curved	0
3-On Grade Straight	0
4-On Grade Curved	0
5-Top of Hill Straight	0
6-Top of Hill Curved	0
7-Bottom of Hill Straight	0
8-Bottom of Hill Curved	0
9-Other	0
Total	3

Light

Light	Total
1-Dawn (Morning)	0
2-Daylight	1
3-Dusk (Evening)	0
4-Dark (Street Lights On)	0
5-Dark (No Street Lights)	2
6-Dark (Street Lights Off)	0
7-Other	0
Total	3

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five Leg Intersection	Driveways	Bridges	Interchanges	Other	Total
Object in Road	0	0	0	0	0	0	0	0	0	0
Rear End / Sideswipe	0	0	0	0	0	0	0	0	0	0
Head-on / Sideswipe	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0
Ran Off Road	2	0	1	0	0	0	0	0	0	3
All Other Animal	0	0	0	0	0	0	0	0	0	0
Bike	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Jackknife	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0
Rock Thrown	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0
Deer	0	0	0	0	0	0	0	0	0	0
Moose	0	0	0	0	0	0	0	0	0	0
Total	2	0	1	0	0	0	0	0	0	3

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Blowing Sand or Dust											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Clear											
Dark (No Street Lights)	0	1	0	0	0	0	0	0	1	0	2
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	1	0	0	0	0	0	0	0	0	1
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Cloudy											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Fog, Smog, Smoke											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Other											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Severe Cross Winds											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Sleet, Hail, Freezing Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Snow											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	2	0	0	0	0	0	0	1	0	3

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☑Crash Summary I ☑Section Detail ☑Crash Summary II ☐1320 Included ☐1320 & Driver Report Included

REPORT DESCRIPTION

95S

REPORT PARAMETERS

Year 2008, Start Month 1 through Year 2010 End Month: 12

Route: 0095S	Start Node: 28912	Start Offset: 0	☐Exclude First Node
	End Node: 28853	End Offset: 0	☐Exclude Last Node

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Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes					Percent	Annual M	Crash	Critical	CRF
					K	A	B	C	PD	Injury	Ent-Veh	Rate	Rate	
28912	0095S - 177.11	TL - Oakland, Waterville	1	0	0	0	0	0	0	0.0	6.391 Statewide Crash Rate:	0.00 0.04	0.13	0.00
28867	0095S - 177.23	Int of I 95 SB, RAMP OFF TO KENNEDY MEM DR	1	1	0	0	0	0	1	0.0	6.391 Statewide Crash Rate:	0.05 0.04	0.13	0.00
28866	0095S - 177.44	Int of I 95 SB, RAMP ON FROM KENNEDY MEM DR	1	1	0	0	0	0	1	0.0	4.931 Statewide Crash Rate:	0.07 0.04	0.14	0.00
28862	0095S - 177.63	Int of I 95 SB, RAMP ON FROM KENNEDY MEM DR	1	4	0	0	0	0	4	0.0	5.084 Statewide Crash Rate:	0.26 0.04	0.14	1.88
28588	0095S - 178.01	Non-Int I 95 SB	1	0	0	0	0	0	0	0.0	5.084 Statewide Crash Rate:	0.00 0.04	0.14	0.00
28861	0095S - 179.07	BRG 1461, I 95 SB over WEBB ROAD	1	0	0	0	0	0	0	0.0	5.084 Statewide Crash Rate:	0.00 0.04	0.14	0.00
28860	0095S - 180.28	BRG 5812, I 95 SB under TRAFTON RD	1	0	0	0	0	0	0	0.0	5.084 Statewide Crash Rate:	0.00 0.04	0.14	0.00
28859	0095S - 180.51	TL - Sidney, Waterville	1	0	0	0	0	0	0	0.0	5.084 Statewide Crash Rate:	0.00 0.04	0.14	0.00
28858	0095S - 181.14	BRG 5785, I 95 SB under TOWN FARM RD	1	0	0	0	0	0	0	0.0	5.084 Statewide Crash Rate:	0.00 0.04	0.14	0.00
28857	0095S - 182.24	BRG 5784, I 95 SB under DRUMMOND RD	1	0	0	0	0	0	0	0.0	5.084 Statewide Crash Rate:	0.00 0.04	0.14	0.00
28855	0095S - 184.21	Int of I 95 SB, RAMP C OFF TO LYONS RD	1	0	0	0	0	0	0	0.0	5.084 Statewide Crash Rate:	0.00 0.04	0.14	0.00
28854	0095S - 184.33	Int of I 95 SB, RAMP D ON FROM LYONS RD	1	0	0	0	0	0	0	0.0	5.603 Statewide Crash Rate:	0.00 0.04	0.14	0.00
28853	0095S - 185.44	Non-Int I 95 SB	1	0	0	0	0	0	0	0.0	5.603 Statewide Crash Rate:	0.00 0.04	0.14	0.00
Study Years: 3.00		NODE TOTALS:		6	0	0	0	0	6	0.0	69.591	0.03	0.07	0.39

Crash Summary I

Sections

Start Node	End Node	Element	Offset	Route - MP	Section Length	U/R	Total Crashes		Injury Crashes				Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
			Begin - End					K	A	B	C	PD					
28867 Int of I 95 SB, RAMP OFF TO KENNEDY MEM DR	28912	2524334	0 - 0.12	0095S - 177.11 INT 95 SB	0.12	1	9	0	0	0	2	7	22.2	0.00767 Statewide Crash Rate:	391.17 61.32	172.57	2.27
28866 Int of I 95 SB, RAMP ON FROM KENNEDY MEM DR	28867	2656363	0 - 0.21	0095S - 177.23 INT 95 SB	0.21	1	0	0	0	0	0	0	0.0	0.00882 Statewide Crash Rate:	0.00 61.32	166.42	0.00
28862 Int of I 95 SB, RAMP ON FROM KENNEDY MEM DR	28866	2656345	0 - 0.19	0095S - 177.44 INT 95 SB	0.19	1	3	0	0	1	0	2	33.3	0.00937 Statewide Crash Rate:	106.73 61.32	163.85	0.00
28588 Non-Int I 95 SB	28862	2656379	0 - 0.38	0095S - 177.63 INT 95 SB	0.38	1	6	0	0	1	2	3	50.0	0.01932 Statewide Crash Rate:	103.51 61.32	136.48	0.00
28588 Non-Int I 95 SB	28861	2656347	0 - 1.06	0095S - 178.01 INT 95 SB	1.06	1	12	0	2	2	4	4	66.7	0.05390 Statewide Crash Rate:	74.22 61.32	108.39	0.00
28860 BRG 5812, I 95 SB under TRAFTON RD	28861	2524344	0 - 1.21	0095S - 179.07 INT 95 SB	1.21	1	14	0	0	2	3	9	35.7	0.06152 Statewide Crash Rate:	75.85 61.32	105.56	0.00
28859 TL - Sidney, Waterville	28860	2524111	0 - 0.23	0095S - 180.28 INT 95 SB	0.23	1	5	0	0	1	1	3	40.0	0.01169 Statewide Crash Rate:	142.52 61.32	154.76	0.00
28858 BRG 5785, I 95 SB under TOWN FARM RD	28859	2524113	0 - 0.63	0095S - 180.51 INT 95 SB	0.63	1	10	0	1	2	1	6	40.0	0.03203 Statewide Crash Rate:	104.06 61.32	121.19	0.00
28857 BRG 5784, I 95 SB under DRUMMOND RD	28858	2524115	0 - 1.10	0095S - 181.14 INT 95 SB	1.10	1	14	0	1	4	3	6	57.1	0.05593 Statewide Crash Rate:	83.44 61.32	107.59	0.00
28855 Int of I 95 SB, RAMP C OFF TO LYONS RD	28857	2524117	0 - 1.97	0095S - 182.24 INT 95 SB	1.97	1	15	0	0	3	1	11	26.7	0.10016 Statewide Crash Rate:	49.92 61.32	96.45	0.00
28854 Int of I 95 SB, RAMP D ON FROM LYONS RD	28855	2524119	0 - 0.12	0095S - 184.21 INT 95 SB	0.12	1	1	0	0	0	0	1	0.0	0.00593 Statewide Crash Rate:	56.16 61.32	184.41	0.00
28853 Non-Int I 95 SB	28854	2524121	0 - 1.11	0095S - 184.33 INT 95 SB	1.11	1	11	0	0	1	3	7	36.4	0.06219 Statewide Crash Rate:	58.96 61.32	105.34	0.00
Study Years:	3.00			Section Totals:	8.33		100	0	4	17	20	59	41.0	0.42854	77.78	78.72	0.99
				Grand Totals:	8.33		106	0	4	17	20	65	38.7	0.42854	82.45	84.46	0.98

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
28867	28912	2524334	0 - 0.12	0095S - 177.11	9	0	0	0	2	7	2010-4323	02/26/2010	177.13	PD
											2008-956	01/18/2008	177.17	C
											2010-13653	06/29/2010	177.17	PD
											2010-28288	12/16/2010	177.17	PD
											2010-13654	06/29/2010	177.17	PD
											2009-1629	01/27/2009	177.18	C
											2008-2794	02/08/2008	177.18	PD
											2009-8876	04/21/2009	177.21	PD
											2010-1839	01/28/2010	177.21	PD
28866	28867	2656363	0 - 0.21	0095S - 177.23	0	0	0	0	0	0				
28862	28866	2656345	0 - 0.19	0095S - 177.44	3	0	0	1	0	2	2010-27009	11/26/2010	177.45	B
											2010-8282	04/26/2010	177.45	PD
											2010-25858	11/26/2010	177.54	PD
28588	28862	2656379	0 - 0.38	0095S - 177.63	6	0	0	1	2	3	2008-35568	12/07/2008	177.63	PD
											2009-16749	07/25/2009	177.66	B
											2008-4162	02/13/2008	177.71	C
											2009-5466	03/11/2009	177.71	C
											2010-1838	01/28/2010	177.83	PD
											2009-25402	11/05/2009	177.96	PD
28588	28861	2656347	0 - 1.06	0095S - 178.01	12	0	2	2	4	4	2010-1431	01/18/2010	178.02	B
											2009-16996	07/26/2009	178.10	C
											2010-2510	02/04/2010	178.19	A
											2008-34286	12/27/2008	178.20	PD
											2008-28652	11/19/2008	178.54	B
											2010-34	01/02/2010	178.54	C
											2010-820	01/19/2010	178.54	PD
											2008-955	01/18/2008	178.61	PD
											2010-27341	12/06/2010	178.68	C
											2008-13274	05/18/2008	178.71	A
											2008-22958	09/16/2008	178.71	PD
											2010-12276	06/20/2010	179.01	C

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes					Crash Report	Crash Date	Crash Mile Point	Injury Degree
						K	A	B	C	PD				
28860	28861	2524344	0 - 1.21	0095S - 179.07	14	0	0	2	3	9	2008-5992	02/08/2008	179.13	PD
											2009-28688	12/07/2009	179.17	PD
											2008-16229	07/04/2008	179.18	PD
											2008-2762	02/08/2008	179.20	PD
											2009-17001	07/31/2009	179.28	C
											2008-3235	02/13/2008	179.28	PD
											2009-14073	02/04/2009	179.48	PD
											2010-23518	10/27/2010	179.57	C
											2008-21317	08/18/2008	179.60	C
											2008-11872	05/05/2008	179.68	PD
											2010-15410	07/30/2010	179.68	PD
											2010-12277	06/20/2010	179.68	PD
											2008-1322	01/23/2008	180.18	B
											2008-35066	12/27/2008	180.18	B
28859	28860	2524111	0 - 0.23	0095S - 180.28	5	0	0	1	1	3	2008-15919	06/21/2008	180.31	PD
											2009-19000	08/22/2009	180.38	B
											2010-28941	12/22/2010	180.38	PD
											2008-13304	05/12/2008	180.41	C
											2009-14075	02/20/2009	180.41	PD
28858	28859	2524113	0 - 0.63	0095S - 180.51	10	0	1	2	1	6	2010-3238	01/18/2010	180.55	PD
											2009-25127	10/02/2009	180.61	C
											2008-11479	04/26/2008	180.64	B
											2008-2004	01/26/2008	180.64	PD
											2010-10784	06/02/2010	180.66	PD
											2008-14568	06/02/2008	180.74	B
											2010-21739	10/08/2010	180.82	A
											2009-25409	10/29/2009	180.84	PD
											2009-13080	06/08/2009	180.94	PD
											2009-32170	12/28/2009	181.12	PD

Crash Summary

Section Details

Start Node	End Node	Element	Offset	Route - MP	Total Crashes		Injury Crashes				Crash Report	Crash Date	Crash Mile Point	Injury Degree
			Begin - End			K	A	B	C	PD				
28857	28858	2524115	0 - 1.10	0095S - 181.14	14	0	1	4	3	6	2009-18195	08/15/2009	181.24	B
											2008-24878	10/14/2008	181.26	PD
											2010-4664	02/27/2010	181.34	B
											2009-12543	06/04/2009	181.41	C
											2010-26	01/01/2010	181.58	A
											2010-25	01/01/2010	181.58	PD
											2009-13473	06/19/2009	181.68	B
											2010-16551	07/30/2010	181.68	C
											2009-14083	06/24/2009	181.68	PD
											2008-27752	11/15/2008	181.74	C
											2008-2340	02/02/2008	182.14	B
											2010-24623	11/07/2010	182.14	PD
											2010-24624	11/07/2010	182.14	PD
											2010-20431	09/23/2010	182.17	PD
28855	28857	2524117	0 - 1.97	0095S - 182.24	15	0	0	3	1	11	2008-3233	02/08/2008	182.31	PD
											2010-23046	10/16/2010	182.34	PD
											2010-20203	09/23/2010	182.44	PD
											2010-27447	12/08/2010	182.64	PD
											2008-3579	02/10/2008	182.71	PD
											2010-1443	01/20/2010	182.74	B
											2010-10788	05/09/2010	183.21	PD
											2010-13765	07/05/2010	183.51	PD
											2008-18995	07/31/2008	183.66	PD
											2010-11905	06/15/2010	183.66	PD
											2010-14517	07/08/2010	183.85	B
											2010-18199	08/25/2010	183.91	PD
											2010-9690	05/14/2010	184.01	B
											2008-1323	01/23/2008	184.01	C
											2009-32535	12/29/2009	184.01	PD
28854	28855	2524119	0 - 0.12	0095S - 184.21	1	0	0	0	0	1	2009-436	01/13/2009	184.32	PD

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
28853	28854	2524121	0 - 1.11	0095S - 184.33	11	0	0	1	3	7	2009-28150	12/04/2009	184.34	PD
											2008-11481	04/29/2008	184.44	PD
											2008-2779	02/05/2008	184.54	C
											2010-818	01/18/2010	184.64	PD
											2010-971	01/14/2010	184.66	PD
											2008-5997	02/08/2008	184.89	PD
											2008-5238	02/22/2008	184.94	B
											2008-2855	02/08/2008	185.14	C
											2008-2854	02/08/2008	185.14	C
											2008-8207	03/21/2008	185.14	PD
											2008-2763	02/08/2008	185.14	PD
				Totals:	100	0	4	17	20	59				

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												Hour of Day						PM							
Day Of Week	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Un	Tot
SUNDAY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	0	1	1	2	0	0	0	9
MONDAY	0	1	1	0	0	0	1	0	1	2	4	2	1	0	0	0	1	0	0	1	0	0	1	0	0	16
TUESDAY	0	1	0	0	1	0	0	2	0	2	0	2	0	1	0	0	0	3	0	0	0	0	0	0	0	12
WEDNESDAY	0	0	0	0	1	3	1	0	2	0	0	0	1	1	0	1	1	1	1	1	0	1	0	0	0	15
THURSDAY	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	2	0	3	0	1	1	2	0	1	0	13
FRIDAY	0	1	0	0	0	0	1	0	3	2	0	1	3	0	3	6	2	1	2	1	0	1	0	0	0	27
SATURDAY	0	1	1	0	0	0	1	1	0	1	0	0	0	1	0	3	2	0	2	0	0	1	0	0	0	14
Totals	0	4	2	0	2	4	5	3	7	7	4	5	5	3	4	13	7	10	5	5	2	7	1	1	0	106

Crashes by Year and Month

Month	2008	2009	2010	Total
JANUARY	6	2	11	19
FEBRUARY	14	3	3	20
MARCH	1	1	0	2
APRIL	2	1	1	4
MAY	4	0	2	6
JUNE	2	4	6	12
JULY	2	3	4	9
AUGUST	1	2	1	4
SEPTEMBER	1	0	2	3
OCTOBER	1	2	3	6
NOVEMBER	2	1	5	8
DECEMBER	4	4	5	13
Total	40	23	43	106

Vehicle Counts by Type

Unit Type	Total	Unit Type	Total
1-2 Door	7	32-3 Axle Tractor with Tandem Axle Semi	5
2-4 Door	55	33-3 Axle Tractor with Tridem Axle Semi	1
3-Convertible	0	35-3 Axle Tractor with Single Axle Semi & 2 Axle Trailer	0
4-Station Wagon	4	36-3 Axle Tractor with Tandem Axle Semi & 2 Axle Trailer	0
5-Van	8	37-5 Axle Semi; Split Trailer Tandem	0
6-Pickup Truck	24	38-6 Axle Semi; Split Trailer Tandem with Center Axle	0
7-SUV	26	39-6 Axle; Standard Trailer Tandem with Center Axle	0
10-Truck Tractor Only (Bobtail)	0	40-4 Axle Single Unit	0
12-School Bus	0	42-4 Axle Tractor with Tandem Axle Semi	0
13-Motor Home	0	50-Any Other Axle Configuration	0
14-Motorcycle	2	60-Other Unit	0
15-Moped	0	70-ATV	0
16-Motor Bike	0	81-2 Axle Bus	0
17-Bicycle	0	82-3 Axle Bus	1
18-Snowmobile	0	98-Farm Vehicles / Tractors	0
20-2 Axle Single Unit with Dual Tires	3	99-Unknown	1
21-2 Axle Tractor with Single Axle Semi	0	Total	139
22-2 Axle Tractor with Tandem Axle Semi	1		
25-2 Axle Tractor with Single Axle Semi & 2 Axle Trailer	1		
30-3 Axle Single Unit	0		
31-3 Axle Tractor with Single Axle Semi	0		

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Apparent Contributing Factor And Driver

Apparent Contributing Factor	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Improper Action	25	20	2	2	2	1	52
Failure to Yield Right of Way	4	0	0	0	0	0	4
Illegal Unsafe Speed	48	0	1	0	0	0	49
Following Too Close	5	1	0	0	0	0	6
Disregard Traffic Control Device	1	0	0	0	0	0	1
Driving Left of Center Not Passing	0	0	0	0	0	0	0
Improper Passing, Overtaking	0	1	0	0	0	0	1
Improper Unsafe Lane Change	3	0	0	0	0	0	3
Improper Parking Start, Stop	0	0	1	0	0	0	1
Improper Turn	0	0	0	0	0	0	0
Unsafe Backing	0	0	0	0	0	0	0
No Signal or Improper Signal	0	0	0	0	0	0	0
Impeding Traffic	0	0	0	0	0	0	0
Driver Inattention, Distraction	10	1	0	0	0	0	11
Driver Inexperience	2	0	0	0	0	0	2
Pedestrian Violation Error	0	0	0	0	0	0	0
Physical Impairment	1	0	0	0	0	0	1
Vision Obscured, Windshield Glass	0	0	0	0	0	0	0
Vision Obscured, Sun, Headlights	0	0	0	0	0	0	0
Other Vision Obscurement	0	0	0	0	0	0	0
Other Human Violation Factor	2	0	0	0	0	0	2
Hit and Run	0	0	0	0	0	0	0
Defective Brakes	0	0	0	0	0	0	0
Defective Tire, Tire Failure	0	0	0	0	0	0	0
Defective Lights	0	0	0	0	0	0	0
Defective Suspension	0	0	0	0	0	0	0
Defective Steering	0	0	0	0	0	0	0
Other Vehicle Defect or Factor	5	0	0	0	0	0	5
Unknown	0	1	0	0	0	0	1
Total	106	24	4	2	2	1	139

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Normal	101	24	4	2	2	1	134
Under the Influence	1	0	0	0	0	0	1
Had Been Drinking	0	0	0	0	0	0	0
Had Been Using Drugs	1	0	0	0	0	0	1
Asleep	1	0	0	0	0	0	1
Fatigued	1	0	0	0	0	0	1
ill	0	0	0	0	0	0	0
Handicapped	0	0	0	0	0	0	0
Other	1	0	0	0	0	0	1
Total	106	24	4	2	2	1	139

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	10	0	0	0	0	10
20-24	22	0	0	0	0	22
25-29	16	0	0	0	0	16
30-39	26	0	0	0	0	26
40-49	30	0	0	0	0	30
50-59	18	0	0	0	0	18
60-69	12	0	0	0	0	12
70-79	4	0	0	0	0	4
80-Over	0	0	0	0	0	0
Unknown	1	0	0	1	0	2
Total	139	0	0	1	0	140

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Fixed Object Struck

Fixed Object Struck	Total
1-Construction, Barricades Equipment, etc.	1
2-Traffic Signal	0
3-R.R. Crossing Device	0
4-Light Pole	0
5-Utility Pole (Tel. Electrical)	0
6-Sign Structure Post	1
7-Mail Boxes or Posts	0
8-Other Poles, posts or supports	0
9-Fire Hydrant/Parking Meter	0
10-Tree or Shrubbery	12
11-Crash Cushion	0
12-Median Safety Barrier	2
13-Bridge Piers (including protective guard rails)	0
14-Other Guardrails	14
15-Fencing (not median barrier)	0
16-Culvert Headwall	0
17-Embankment, Ditch, Curb	14
18-Building, Wall	0
19-Rock Outcrops or Ledge	0
20-Other	1
21-Gate or Cable	0
22-Pressure Ridge	0
Total	45

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	0
2-Traffic Flashing	2
3-Overhead Flashers	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	0
6-Yield Sign	3
7-Curve Warning Sign	0
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	0
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	0
13-None	70
14-Other	31
Total	106

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	4	4
B	17	20
C	20	26
PD	65	0
Total	106	50

Road Character

Road Character	Total
1-Level Straight	92
2-Level Curved	11
3-On Grade Straight	3
4-On Grade Curved	0
5-Top of Hill Straight	0
6-Top of Hill Curved	0
7-Bottom of Hill Straight	0
8-Bottom of Hill Curved	0
9-Other	0
Total	106

Light

Light	Total
1-Dawn (Morning)	5
2-Daylight	62
3-Dusk (Evening)	4
4-Dark (Street Lights On)	4
5-Dark (No Street Lights)	30
6-Dark (Street Lights Off)	1
7-Other	0
Total	106

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five Leg Intersection	Driveways	Bridges	Interchanges	Other	Total
Object in Road	11	1	0	0	0	0	2	3	0	17
Rear End / Sideswipe	21	0	0	0	0	0	0	2	0	23
Head-on / Sideswipe	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	0	0	0	0	0	1	0	1
Pedestrians	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0
Ran Off Road	33	2	0	0	0	0	0	1	0	36
All Other Animal	1	0	0	0	0	0	0	0	0	1
Bike	0	0	0	0	0	0	0	0	0	0
Other	4	0	0	0	0	0	0	0	0	4
Jackknife	0	0	0	0	0	0	0	0	0	0
Rollover	1	0	0	0	0	0	0	0	0	1
Fire	3	0	0	0	0	0	0	0	0	3
Submersion	0	0	0	0	0	0	0	0	0	0
Rock Thrown	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0
Deer	15	1	0	0	0	0	0	0	0	16
Moose	3	1	0	0	0	0	0	0	0	4
Total	92	5	0	0	0	0	2	7	0	106

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Blowing Sand or Dust											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Clear											
Dark (No Street Lights)	0	14	0	0	0	0	0	0	0	0	14
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	2	1	0	0	0	0	0	0	0	3
Dawn (Morning)	0	2	0	0	0	0	0	0	0	0	2
Daylight	0	21	1	1	0	0	0	0	1	0	24
Dusk (Evening)	0	1	0	0	0	0	0	0	0	0	1
Other	0	0	0	0	0	0	0	0	0	0	0
Cloudy											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	1	0	0	0	0	0	0	1	0	2
Daylight	0	5	0	0	0	0	0	0	0	1	6
Dusk (Evening)	0	0	0	1	0	0	0	0	0	0	1
Other	0	0	0	0	0	0	0	0	0	0	0
Fog, Smog, Smoke											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Other											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Rain											
Dark (No Street Lights)	0	0	0	1	0	0	0	0	0	0	1
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	1	1
Daylight	0	0	0	0	0	0	0	0	0	8	8
Dusk (Evening)	0	0	0	0	0	0	0	0	0	1	1
Other	0	0	0	0	0	0	0	0	0	0	0
Severe Cross Winds											
Dark (No Street Lights)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0
Sleet, Hail, Freezing Rain											
Dark (No Street Lights)	0	0	0	0	0	0	0	1	0	0	1
Dark (Street Lights Off)	0	0	0	0	0	0	0	1	0	0	1
Dark (Street Lights On)	0	0	0	0	0	0	0	0	0	0	0
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	1	0	0	0	0	1	0	2
Dusk (Evening)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather Light	Debris	Dry	Ice, Packed Snow, Not Sanded	Ice, Packed Snow, Sanded	Muddy	Oily	Other	Snow Slush, Not Sanded	Snow, Slush, Sanded	Wet	Total
Snow											
Dark (No Street Lights)	0	1	6	0	0	0	0	6	1	0	14
Dark (Street Lights Off)	0	0	0	0	0	0	0	0	0	0	0
Dark (Street Lights On)	0	0	0	0	0	0	0	0	1	0	1
Dawn (Morning)	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	8	0	0	0	0	8	6	0	22
Dusk (Evening)	0	0	1	0	0	0	0	0	0	0	1
Other	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	47	17	4	0	0	0	16	11	11	106

INVESTIGATING AGENCY CODE NUMBER MEMSP0C00

TRAFFIC ACCIDENT REPORT
STATE OF MAINE

SP08-004083

FOR D.P.S. USE ONLY
2008-956

DATE OF ACCIDENT	MONTH	DAY	YEAR	DAY OF WEEK	TIME	TIME REPORTED	TIME ARRIVED
	1	18	2008	Fri	08:50	08:50	08:50

ON ROUTE I95
OR NAME OF STREET OR HIGHWAY
CITY OR TOWN Waterville
CODE NUMBER 11240 [✓ R] U
COUNTY Kennebec
HIT AND RUN ☐

AT BETWEEN NODE NUMBERS 28867 28912
DISTANCE FROM SCENE 0 MILES 06 TNTHS
TO NUMBER 28867
MILES AND TENTHS TO LANDMARK At Oakland Town Line
N W E S CIRCLE ONE

S ↓ UNIT NO. 1 - Vehicle
TOTAL UNITS INV. 1
UNIT NO. - ☐ VEH. 2 ☐ PED. ☐ BIKE

DRIVER

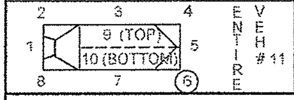
	Unit 1	Unit 2
DRIVER'S LICENSE NUMBER	7369247	
STATE	ME	
LAST NAME / FIRST NAME / MIDDLE	Cote, Emma	
NUMBER AND STREET	12 Kelsey Street	
CITY	Waterville	
STATE	ME 04901	
CODE NUMBER	2 2	
DATE OF BIRTH	12/18/1977	
SEX	F	
LICENSE STATUS	[✓ A] S P N	A S P N
REST/PERM	0	
CLASS	C	

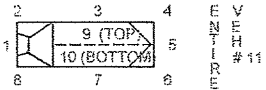
OWNER

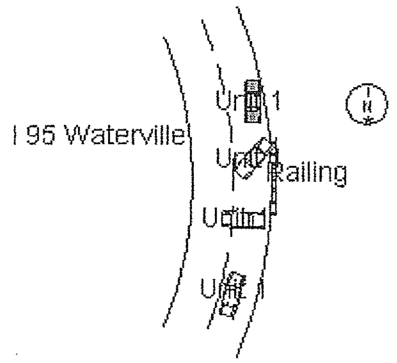
	Unit 1	Unit 2
LAST NAME - OWNER 1 / FIRST NAME / MIDDLE	Cote, Emma	
NUMBER AND STREET	12 Kelsey Street	
CITY	Waterville	
STATE	ME 04901	

VEHICLE

	Unit 1	Unit 2
VEHICLE TYPE	4 Door 2	
YEAR AND MAKE	1997 Dodge 10	
COLOR	9 Purple, Orange,Other	
LICENSE PLATE NUMBER	4960KX	
YEAR	2008	
ISSUE STATE	ME	
NO OCCUP.	1	
VEHICLE IDENTIFICATION NO.	2B3HD46TXVH536216	
INSURANCE CO.	Geico	
POLICY NO.	4051-86-17-24	
TOWED BY:	Na	
DAMAGE CODES	6	
DAMAGE ESTIMATE	$ 1,200.00	$







TOTAL NUMBER OF PERSONS INVOLVED 1

DESCRIPTION: Unit 1 was traveling south on I95 in Waterville near the Oakland town line. Unit 1 was traveling too fast for road conditions and left roadway stricking railing on ditch side. Vehicle received damage to driver side rear

AMBULANCE CODES N/A(1000)

NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY (OTHER THAN VEH.)

NAMES OF ALL PERSONS INVOLVED (DRIVERS - PASSENGERS - WITNESSES - PEDESTRIANS)	25	26	27	28	29	30	31	32	33	34
Cote, Emma (Driver/Owner)	9	2	2	4	1	1	1	1	F	30

LOCAL CODES

1	2
2	1
3	14
4	
5	2
6	2
7	3
8	3
9	2
10	1
11	45
12	1
13	1
14	
15	3
16	
17	
18	
19	1
20	
21	2
23	1
24	

INVESTIGATING OFFICER (SIGNATURE)	OFFICER NUMBER	TROOP OR DEPARTMENT	APPROVED BY:	DATE
	4113	.Maine State Police skowhegan	Sgt. Roderick CharettE	1/27/2008

Tr. Derrick Record

FORM 13:20A
Rev. 4/97

Printed from Maine DOT Data

INVESTIGATING AGENCY CODE NUMBER MEMSP0C00

TRAFFIC ACCIDENT REPORT
STATE OF MAINE

SP08-009363

FOR D.P.S. USE ONLY 2008-2794

DATE OF ACCIDENT	MONTH	DAY	YEAR	DAY OF WEEK	TIME	TIME REPORTED	TIME ARRIVED
	2	08	2008	Fri	09:50	09:50	09:50

ON ROUTE INT 95 SB
OR NAME OF STREET OR HIGHWAY
CITY OR TOWN Waterville
CODE NUMBER 11240 [✓ R] U
COUNTY Kennebec
HIT AND RUN ☐

AT BETWEEN NODE NUMBERS 28867 28912
DISTANCE FROM SCENE 0 MILES 05 TNTHS
TO NUMBER 28867
MILES AND TENTHS TO LANDMARK AT MILE 127.5
N W E S CIRCLE ONE

S ↓ UNIT NO. 1 - Vehicle
TOTAL UNITS INV. 1
UNIT NO. - ☐ VEH. 2 ☐ PED. ☐ BIKE

1 1
2 1
3 14
4
5 14
6 2
7 3
8 8
9 3
10 1
11 65
12 1

13 10
14
15 3
16
17
18
19 1
20
21 2
23 1
24

DRIVER

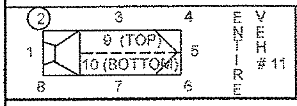
	Unit 1	Unit 2
DRIVER'S LICENSE NUMBER	9936298	
STATE	ME	
LAST NAME / FIRST NAME / MIDDLE	HAYES, NATHANIEL C	
NUMBER AND STREET	37 JAMECO MILL RD	
CITY	Scarborough	
STATE	ME 04074	
CODE NUMBER	2 2	
DATE OF BIRTH	06/28/1989	
SEX	M	
LICENSE STATUS	[✓ A] S P N	A S P N
REST/PERM	0	
CLASS	C	

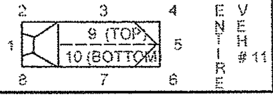
OWNER

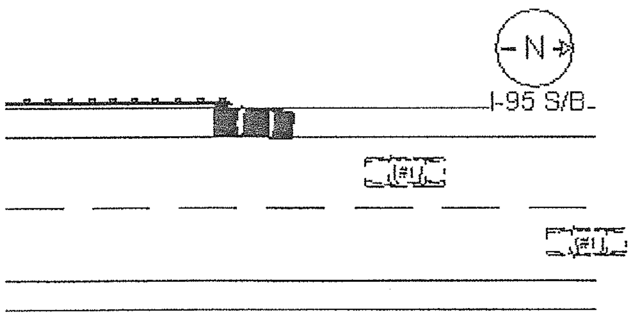
	Unit 1	Unit 2
LAST NAME - OWNER 1 / FIRST NAME / MIDDLE	HAYES, NATHANIEL C	
NUMBER AND STREET	37 JAMECO MILL RD	
CITY	Scarborough	
STATE	ME 04074	

VEHICLE

	Unit 1	Unit 2
VEHICLE TYPE	4 Door 2	
YEAR AND MAKE	1995 Saturn 34	
COLOR	Maroon 11	
LICENSE PLATE NUMBER	757NY	
YEAR	2008	
ISSUE STATE	ME	
NO OCCUP.	1	
VEHICLE IDENTIFICATION NO.	1G8ZJ5278SZ213945	
INSURANCE CO.	METROPOLITAN	
POLICY NO.	1438759691	
TOWED BY:	N/A	
DAMAGE CODES	2	
DAMAGE ESTIMATE	$ 1,200.00	$







DESCRIPTION: UNIT #1 WAS TRAVELING SOUTH ON I-95 IN OAKLAND AND PASSED MY CRUISER GOING 75 MILES PER HOUR, ON THE SNOW COVERED ROAD. I CAUGHT UP TO THE VEHICLE AND TURNED ON MY BLUE LIGHTS TO STOP THE OPERATOR. UNIT #1 TURNED ON IT'S RIGHT SIGNAL, SLOWED DOWN AND EASED INTO THE BREAK DOWN LANE. UNIT #1 SLID ON THE SNOW AND STRUCK THE GUARDRAILS.

AMBULANCE CODES N/A(1000)

NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY (OTHER THAN VEH.)

TOTAL NUMBER OF PERSONS INVOLVED 1

NAMES OF ALL PERSONS INVOLVED (DRIVERS - PASSENGERS - WITNESSES - PEDESTRIANS)	25	26	27	28	29	30	31	32	33	34
HAYES, NATHANIEL C (Driver/Owner)	11	11	2	5	1	1	1	1	M	18

LOCAL CODES

INVESTIGATING OFFICER (SIGNATURE)	OFFICER NUMBER	TROOP OR DEPARTMENT	APPROVED BY:	DATE
	4288	Maine State Police skowhegan	Sgt. Aaron Hayden	2/9/2008

Tr Bruce G. Scott

FORM 13:20A
Rev. 4/97

Printed from Maine DOT Data

INVESTIGATING AGENCY CODE NUMBER MEMSP0C00

TRAFFIC ACCIDENT REPORT

STATE OF MAINE

SP09-006203

FOR D.P.S. USE ONLY 2009-1629

DATE OF ACCIDENT MONTH	DAY	YEAR	DAY OF WEEK	TIME	TIME REPORTED	TIME ARRIVED
1	27	2009	Tue	09:15	09:16	09:30

ON ROUTE	OR NAME OF STREET OR HIGHWAY	CITY OR TOWN	CODE NUMBER	COUNTY	HIT AND RUN
INT 95 SB		Waterville	11240 [✓ R] U	Kennebec	☐

AT BETWEEN NODE NUMBERS		DISTANCE FROM SCENE	TO NUMBER	MILES AND TENTHS TO LANDMARK
28867	28912	0 MILES 05 TNTHS	28867	0.90 To Exit 127 Off-Ramp N W E [✓ S] CIRCLE ONE

S ↓ UNIT NO. 1 - Vehicle TOTAL UNITS INV. 1 UNIT NO. - ☐ VEH. 2 ☐ PED. ☐ BIKE

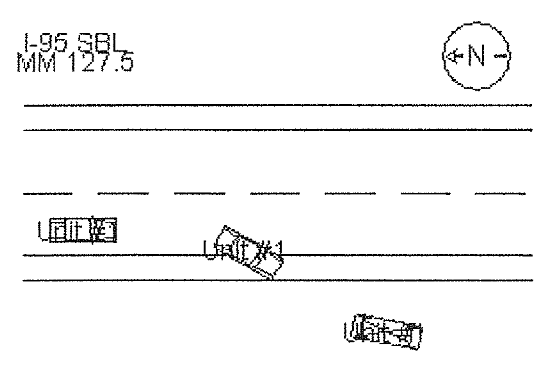
DRIVER	
DRIVER'S LICENSE NUMBER	07FNM88261
STATE	NH
LAST NAME, FIRST NAME, MIDDLE	Filion, Mitchell
NUMBER AND STREET	2 Hidden Ranch
CITY	Hooksett
STATE	NH 03106
CODE NUMBER	2 2
DATE OF BIRTH	07/26/1988
SEX	M
LICENSE STATUS	[✓ A] S P N
REST/PERM	0
CLASS	C

OWNER	
LAST NAME - OWNER 1, FIRST NAME, MIDDLE	Lamper, Matthew K
NUMBER AND STREET	289 Phillips Corner Road
CITY	Pittsfield
STATE	ME 04967

VEHICLE	
VEHICLE TYPE	4 Door 2
YEAR AND MAKE	1993 Saturn 34
COLOR	Maroon 11
LICENSE PLATE NUMBER	2633KN
YEAR	2009
ISSUE STATE	ME
NO OCCUP.	1
VEHICLE IDENTIFICATION NO.	1G8ZJ8573PZ279811
INSURANCE CO.	
POLICY NO.	
TOWED BY:	Arbo's
DAMAGE CODES	9
DAMAGE ESTIMATE	$ 4,000.00

1 2 3 4 5 6 7 8 [✓ 9] (TOP) 10 (BOTTOM) ENTIRE VEH #11

Second unit (DRIVER / OWNER / VEHICLE): DRIVER'S LICENSE NUMBER, STATE, LAST NAME, FIRST NAME, MIDDLE, NUMBER AND STREET, CITY, STATE, CODE NUMBER, DATE OF BIRTH, SEX, LICENSE STATUS A S P N, REST/PERM, CLASS, LAST NAME - OWNER 1, FIRST NAME, MIDDLE, NUMBER AND STREET, CITY, STATE, VEHICLE TYPE, YEAR AND MAKE, COLOR, LICENSE PLATE NUMBER, YEAR, ISSUE STATE, NO OCCUP., VEHICLE IDENTIFICATION NO., INSURANCE CO., POLICY NO., 1 2 3 4 5 6 7 8 9 (TOP) 10 (BOTTOM) ENTIRE VEH #11, TOWED BY:, DAMAGE CODES, DAMAGE ESTIMATE $



DESCRIPTION: Unit #1 southbound on I-95 in Waterville. Driver reached down to retrieve cigarettes and lost control while his eyes were off the road. Unit #1 went off the road to the right and rolled over onto its roof. Driver complained of neck pain but declined medical transport. Vehicle was totalled.

AMBULANCE CODES Delta Amb Corp/Waterville(215)

NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY (OTHER THAN VEH.)

TOTAL NUMBER OF PERSONS INVOLVED 2

NAMES OF ALL PERSONS INVOLVED (DRIVERS - PASSENGERS - WITNESSES - PEDESTRIANS)	25	26	27	28	29	30	31	32	33	34
Filion, Mitchell (Driver)	9	3	2	4	1	1	1	1	M	20
Thurston, David (Witness)						22			M	50

LOCAL CODES

1	1
2	7
3	17
4	
5	13
6	2
7	1
8	1
9	1
10	1
11	65
12	1
13	1
14	
15	14
16	
17	
18	
19	1
20	
21	2
23	1
24	

INVESTIGATING OFFICER (SIGNATURE)	OFFICER NUMBER	TROOP OR DEPARTMENT	APPROVED BY:	DATE
	2703	Maine State Police skowhegan		

Tr. Sean P. Kinney

FORM 13:20A
Rev. 4/97

Printed from Maine DOT Data

INVESTIGATING AGENCY CODE NUMBER MEMSP0C00	TRAFFIC ACCIDENT REPORT STATE OF MAINE	SP09-026051	FOR D.P.S. USE ONLY 2009-8876

DATE OF ACCIDENT	MONTH	DAY	YEAR	DAY OF WEEK	TIME	TIME REPORTED	TIME ARRIVED
	4	21	2009	Tue	17:38	17:38	17:42

ON	ROUTE	OR NAME OF STREET OR HIGHWAY	CITY OR TOWN	CODE NUMBER	COUNTY	HIT AND RUN
	INT 95 SB	I 95 SB	Waterville	11240 [✓ R] U	Kennebec	☐

AT	BETWEEN NODE NUMBERS		DISTANCE FROM SCENE		TO NUMBER	MILES AND TENTHS TO LANDMARK
	28867	28912	0 MILES	02 TNTHS	28867	N W E S CIRCLE ONE

S ↓ UNIT NO. 1 - Vehicle TOTAL UNITS INV. 1 UNIT NO. - ☐ VEH. 2 ☐ PED. ☐ BIKE

DRIVER

DRIVER'S LICENSE NUMBER	5967200
STATE	ME
LAST NAME / FIRST NAME / MIDDLE	Escudie-Browne, Charles G
NUMBER AND STREET	Po BoX 266
CITY	Shawmut
STATE	ME 04975
CODE NUMBER	2 2
DATE OF BIRTH	03/05/1974
SEX	M
LICENSE STATUS	[✓ A] S P N
REST/PERM	0
CLASS	C

OWNER

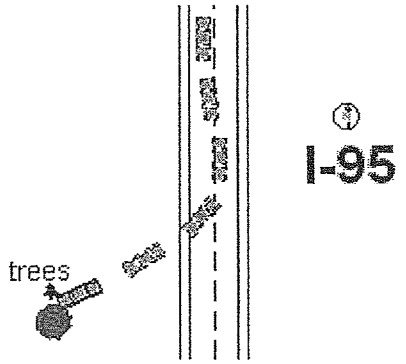
LAST NAME - OWNER 1 / FIRST NAME / MIDDLE	Escudie-Browne, Charles G
NUMBER AND STREET	Po BoX 266
CITY	Shawmut
STATE	ME 04975

VEHICLE

VEHICLE TYPE	4 Door 2
YEAR AND MAKE	1998 Ford 6
COLOR	White 14
LICENSE PLATE NUMBER	769QB
YEAR	2010
ISSUE STATE	ME
NO OCCUP.	1
VEHICLE IDENTIFICATION NO.	2FAFP71W8WX186596
INSURANCE CO.	NORTHEAST INS
POLICY NO.	02180098903
Damage area	② 3 4 1 9 (TOP) 10 (BOTTOM) 5 8 7 6 ENTIRE VEH #11
TOWED BY:	Arbo's
DAMAGE CODES	2
DAMAGE ESTIMATE	$ 1,200.00

Unit 2 (DRIVER, OWNER, VEHICLE): DRIVER'S LICENSE NUMBER; STATE; LAST NAME FIRST NAME MIDDLE; NUMBER AND STREET; CITY STATE CODE NUMBER; DATE OF BIRTH; SEX; LICENSE STATUS A S P N; REST/PERM; CLASS; LAST NAME - OWNER 1 FIRST NAME MIDDLE; NUMBER AND STREET; CITY STATE; VEHICLE TYPE; YEAR AND MAKE; COLOR; LICENSE PLATE NUMBER; YEAR; ISSUE STATE; NO OCCUP.; VEHICLE IDENTIFICATION NO.; INSURANCE CO.; POLICY NO.; 2 3 4 1 9 (TOP) 10 (BOTTOM) 5 8 7 6 ENTIRE VEH #11; TOWED BY:; DAMAGE CODES; $ DAMAGE ESTIMATE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	23	24
1	7	10		13	2	2	2	1	1	65	1	1		30				4		2	1	



DESCRIPTION: Unit 1 was traveling south on I-95 during heavy rain. The driver of unit 1 had been using unlawful inhalents prior to and possibly while driving. Unit 1 drifted to the left and the driver over corrected to the right. Unit 1 left the roadway and struck a tree.

AMBULANCE CODES Delta Amb Corp/Waterville(215)

NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY (OTHER THAN VEH)

TOTAL NUMBER OF PERSONS INVOLVED 2

NAMES OF ALL PERSONS INVOLVED (DRIVERS - PASSENGERS - WITNESSES - PEDESTRIANS)	25	26	27	28	29	30	31	32	33	34
Escudie-Browne, Charles G (Driver/Owner)	11	11	2	5	1	1	1	1	M	35
Pouliot, Janelle (Witness)						22			F	27

LOCAL CODES

INVESTIGATING OFFICER (SIGNATURE)	OFFICER NUMBER	TROOP OR DEPARTMENT	APPROVED BY:	DATE
	0228	Maine State Police skowhegan	S	4/21/2009

Tpr. Jeffrey S. Beach
FORM 13:20A
Rev. 4/97

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INVESTIGATING AGENCY CODE NUMBER MEMSP0C00

TRAFFIC ACCIDENT REPORT
STATE OF MAINE

SP10-006700

FOR D.P.S. USE ONLY 2010-1839

DATE OF ACCIDENT	MONTH	DAY	YEAR	DAY OF WEEK	TIME	TIME REPORTED	TIME ARRIVED
	1	28	2010	Thu	17:10	17:15	17:30

ON
ROUTE: INT 95 SB
OR NAME OF STREET OR HIGHWAY: I 95 SB
CITY OR TOWN: Waterville
CODE NUMBER: 11240 R [✓ U]
COUNTY: Kennebec
HIT AND RUN ☐

AT
BETWEEN NODE NUMBERS: 28867 28912
DISTANCE FROM SCENE: 0 MILES 02 TNTHS
TO NUMBER: 28867
MILES AND TENTHS TO LANDMARK
N W E S CIRCLE ONE

S ↓ UNIT NO. 1 - Vehicle
TOTAL UNITS INV. 1
UNIT NO. - ☐ VEH. 2 ☐ PED. ☐ BIKE

DRIVER

DRIVER'S LICENSE NUMBER: 1008060
STATE: ME
LAST NAME FIRST NAME MIDDLE: Legge, William R
NUMBER AND STREET: 6 Sarah Gould Rd
CITY: Yarmouth
STATE: ME 04096
CODE NUMBER: 2 2
DATE OF BIRTH: 07/28/1934
SEX: M
LICENSE STATUS: [✓ A] S P N
REST/PERM: A
CLASS: C

DRIVER'S LICENSE NUMBER
STATE
LAST NAME FIRST NAME MIDDLE
NUMBER AND STREET
CITY STATE CODE NUMBER
DATE OF BIRTH
SEX
LICENSE STATUS A S P N
REST/PERM
CLASS

OWNER

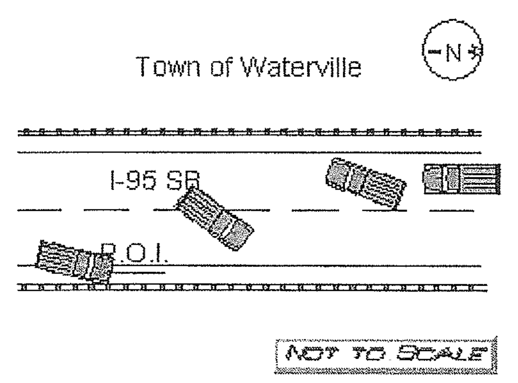
LAST NAME - OWNER 1 FIRST NAME MIDDLE: Legge, William R
NUMBER AND STREET: 6 Sarah Gould Rd
CITY: Yarmouth
STATE: ME 04096

LAST NAME - OWNER 1 FIRST NAME MIDDLE
NUMBER AND STREET
CITY STATE

VEHICLE

VEHICLE TYPE: Pickup Truck 6
YEAR AND MAKE: 2004 Ford 6
COLOR: Black 1
LICENSE PLATE NUMBER: 1093NR
YEAR: 2010
ISSUE STATE: ME
NO OCCUP.: 1
VEHICLE IDENTIFICATION NO. 1FTZR15E54TA06727
INSURANCE CO. GEICO GENERAL INSURANCE COMPANY NAIC: 35882
POLICY NO. 0791548803
① 2 ③ 4 5 6 7 ⑧ 9 (TOP) 10 (BOTTOM) ENTIRE VEH #11
TOWED BY: Arbos Towing
DAMAGE CODES: 1,3,8
DAMAGE ESTIMATE: $ 4,500.00

VEHICLE TYPE
YEAR AND MAKE
COLOR
LICENSE PLATE NUMBER
YEAR
ISSUE STATE
NO OCCUP.
VEHICLE IDENTIFICATION NO.
INSURANCE CO.
POLICY NO.
1 2 3 4 5 6 7 8 9 (TOP) 10 (BOTTOM) ENTIRE VEH #11
TOWED BY:
DAMAGE CODES
DAMAGE ESTIMATE $



DESCRIPTION: Unit #1 was traveling south on Interstate 95 in the city of Waterville. Driver of Unit #1 lost control on the icy roadway and struck a guardrail after the vehicle spun around. Unit #1 sustained significant front end damage with airbag deployment.

AMBULANCE CODES N/A(1000)
NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY (OTHER THAN VEH.)

TOTAL NUMBER OF PERSONS INVOLVED 1

NAMES OF ALL PERSONS INVOLVED (DRIVERS - PASSENGERS - WITNESSES - PEDESTRIANS)	25	26	27	28	29	30	31	32	33	34
Legge, William R (Driver/Owner)	11	11	2	5	12	1	1	1	M	75

LOCAL CODES

1	1
2	1
3	14
4	
5	14
6	5
7	3
8	9
9	1
10	1
11	65
12	1
13	1
14	
15	3
16	
17	
18	
19	1
20	
21	2
23	1
24	

INVESTIGATING OFFICER (SIGNATURE)
OFFICER NUMBER 4475
TROOP OR DEPARTMENT Maine State Police skowhegan
APPROVED BY: Sgt. Aaron Hayden
DATE 1/29/2010

Tpr. Aaron M. Turcotte
FORM 13:20A
Rev. 4/97

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INVESTIGATING AGENCY CODE NUMBER MEMSP0C00

TRAFFIC ACCIDENT REPORT
STATE OF MAINE

SP10-013511

FOR D.P.S. USE ONLY 2010-4323

DATE OF ACCIDENT	MONTH	DAY	YEAR	DAY OF WEEK	TIME	TIME REPORTED	TIME ARRIVED
	2	26	2010	Fri	21:13	21:13	21:25

ON	ROUTE	OR NAME OF STREET OR HIGHWAY	CITY OR TOWN	CODE NUMBER	R/U	COUNTY	HIT AND RUN
	INT 95 SB	I 95 SB	Waterville	11240	[✓ R] U	Kennebec	☐

AT	BETWEEN NODE NUMBERS		DISTANCE FROM SCENE MILES	TNTHS	TO NUMBER	MILES AND TENTHS TO LANDMARK	N W E S CIRCLE ONE
	28867	28912	0	10	28867		

S ↓ UNIT NO. 1 - Vehicle TOTAL UNITS INV. 1 UNIT NO. - ☐ VEH. 2 ☐ PED. ☐ BIKE

DRIVER

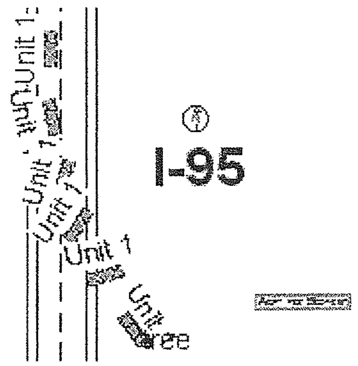
	Unit 1	Unit 2
DRIVER'S LICENSE NUMBER	7649276	
STATE	ME	
LAST NAME FIRST NAME MIDDLE	Abbott, Harold M	
NUMBER AND STREET	738 Levenseller Road	
CITY	Holden	
STATE	ME 04429	
CODE NUMBER	2 2	
DATE OF BIRTH	02/26/1955	
SEX	M	
LICENSE STATUS	[✓ A] S P N	A S P N
REST/PERM	A, I	
CLASS	C	

OWNER

	Unit 1	Unit 2
LAST NAME - OWNER 1 FIRST NAME MIDDLE	Abbott, Harold M	
NUMBER AND STREET	738 Levenseller Road	
CITY	Holden	
STATE	ME 04429	

VEHICLE

	Unit 1	Unit 2
VEHICLE TYPE	4 Door 2	
YEAR AND MAKE	2002 Toyota 14	
COLOR	8 Grey (GY), Silver	
LICENSE PLATE NUMBER	51797	
YEAR	2010	
ISSUE STATE	ME	
NO OCCUP.	2	
VEHICLE IDENTIFICATION NO.	4T1BE32K92U561234	
INSURANCE CO.	State Farm	
POLICY NO.	006 7905 E09 19E	
DAMAGE AREA (1–8, 9 (TOP), 10 (BOTTOM), ENTIRE, VEH #11)	⑤	
TOWED BY:	Arbo's	
DAMAGE CODES	5	
DAMAGE ESTIMATE	$ 5,000.00	$



DESCRIPTION: Unit 1 was traveling south on I-95, which was covered with snow and slush. Unit 1 attempted to change lanes and was traveling too fast for the road conditions. Unit 1 began to skid. Driver was unable to regain control and unit 1 left the roadway and struck a tree.

AMBULANCE CODES Waterville Rescue(987)

NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY (OTHER THAN VEH.)

TOTAL NUMBER OF PERSONS INVOLVED 2

NAMES OF ALL PERSONS INVOLVED (DRIVERS - PASSENGERS - WITNESSES - PEDESTRIANS)	25	26	27	28	29	30	31	32	33	34
Abbott, Harold M (Driver/Owner)	11	11	2	5	1	1	1	1	M	55
Abbott, Tamra L (Passenger)	11	11	2	5	1	1	1	3	F	52

LOCAL CODES

1	1
2	7
3	10
4	
5	13
6	5
7	3
8	8
9	1
10	1
11	65
12	1
13	16
14	
15	3
16	
17	
18	
19	1
20	
21	2
23	1
24	

INVESTIGATING OFFICER (SIGNATURE)	OFFICER NUMBER	TROOP OR DEPARTMENT	APPROVED BY:	DATE
	0228	Maine State Police skowhegan	S	2/26/2010

Tpr. Jeffrey S. Beach
FORM 13:20A
Rev. 4/97

Printed from Maine DOT Data

INVESTIGATING AGENCY CODE NUMBER	TRAFFIC ACCIDENT REPORT STATE OF MAINE		FOR D.P.S. USE ONLY
MEMSP0C00		SP10-045002	2010-13653

DATE OF ACCIDENT	MONTH	DAY	YEAR	DAY OF WEEK	TIME	TIME REPORTED	TIME ARRIVED
	6	29	2010	Tue	09:04	09:04	09:19

ON	ROUTE	OR NAME OF STREET OR HIGHWAY	CITY OR TOWN	CODE NUMBER	COUNTY	HIT AND RUN
	INT 95 SB	I 95 SB	Waterville	11240 [✓ R] U	Kennebec	☐

AT	BETWEEN NODE NUMBERS		DISTANCE FROM SCENE		TO NUMBER	MILES AND TENTHS TO LANDMARK
	28867	28912	0 MILES	06 TNTHS	28867	N W S E CIRCLE ONE

S ↓ UNIT NO. 1 - Vehicle TOTAL UNITS INV. 1 UNIT NO. - ☐ VEH. 2 ☐ PED. ☐ BIKE

DRIVER

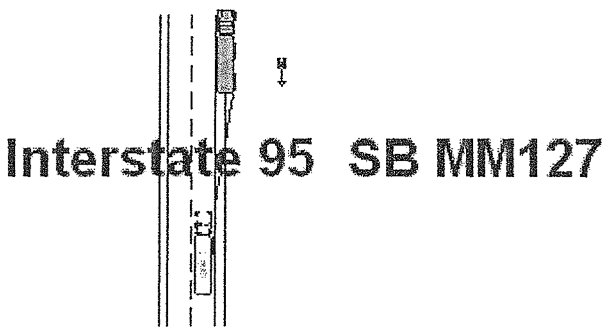
	Unit 1	Unit 2
DRIVER'S LICENSE NUMBER	FAIRB280448006	
STATE	NS	
LAST NAME FIRST NAME MIDDLE	Fairbairn, Stuart G	
NUMBER AND STREET	38 Commodore St.	
CITY	Middle Sackville	
STATE	NS B4E3B2	
CODE NUMBER	6 6	
DATE OF BIRTH	04/28/1948	
SEX	M	
LICENSE STATUS	[✓ A] S P N	A S P N
REST/PERM	A	
CLASS	A	

OWNER

	Unit 1	Unit 2
LAST NAME - OWNER 1 FIRST NAME MIDDLE	Bison Transport Inc.	
NUMBER AND STREET	1051 Sherwin Rd.	
CITY	Winnipeg	
STATE	MB R3h0t8	

VEHICLE

	Unit 1	Unit 2
VEHICLE TYPE	3 Axle Tractor with Tandem Axle Semi 32	
YEAR AND MAKE	2009 Volvo 22	
COLOR	Gold 6	
LICENSE PLATE NUMBER	PBT912	
YEAR	2009	
ISSUE STATE	MB	
NO OCCUP.	1	
VEHICLE IDENTIFICATION NO.	4V4NC9EJ39N276311	
INSURANCE CO.	The Manitoba Public Insurance Corp.	
POLICY NO.	AM1000367030	
DAMAGE AREA (1–8, 9 (TOP), 10 (BOTTOM), ENTIRE, VEH # 11)	4 circled	
TOWED BY:	Boullette's Towing	
DAMAGE CODES	4	
DAMAGE ESTIMATE	$ 1,500.00	$



DESCRIPTION: Unit 1 was traveling south on Interstate 95. Unit 1 advised a passerby pointed to him and then another tractor trailer driver advised him over the radio that his tire was smoking and that he just lost the tires. Unit 1 pulled over to a safe location after losing the rear right dual wheels. The hub was voided of lugnut bolts because they were sheered off and the hub appeared to be leaking fluid. Break marks prior to losing the wheel suggest the rear dual tires locked up and broke off. There was no fire, only smoke.

AMBULANCE CODES Waterville Rescue(987)

NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY (OTHER THAN VEH.)

TOTAL NUMBER OF PERSONS INVOLVED 1

NAMES OF ALL PERSONS INVOLVED (DRIVERS - PASSENGERS - WITNESSES - PEDESTRIANS)	25	26	27	28	29	30	31	32	33	34
Fairbairn, Stuart G (Driver)	11	11	2	5	1	1	1	1	M	62

Code box	Value
1	1
2	10
3	
4	
5	13
6	2
7	1
8	1
9	1
10	1
11	65
12	1
13	1
14	
15	1
16	
17	
18	
19	1
20	
21	2
23	1
24	

LOCAL CODES

INVESTIGATING OFFICER (SIGNATURE)	OFFICER NUMBER	TROOP OR DEPARTMENT	APPROVED BY:	DATE
	3478	Maine State Police skowhegan	Tr. Jonathan Wilson	7/7/2010

Tr. Rick L. Moody

FORM 13:20A
Rev. 4/97

Printed from Maine DOT Data

INVESTIGATING AGENCY CODE NUMBER MEMSP0C00

TRAFFIC ACCIDENT REPORT

STATE OF MAINE

SP10-045075

FOR D.P.S. USE ONLY 2010-13654

DATE OF ACCIDENT MONTH	DAY	YEAR	DAY OF WEEK	TIME	TIME REPORTED	TIME ARRIVED
6	29	2010	Tue	13:41	13:41	13:49

ON ROUTE: INT 95 SB
OR NAME OF STREET OR HIGHWAY: I 95 SB
CITY OR TOWN: Waterville
CODE NUMBER: 11240 [✓ R] U
COUNTY: Kennebec
HIT AND RUN ☐

AT BETWEEN NODE NUMBERS: 28867 28912
DISTANCE FROM SCENE: 0 MILES 06 TNTHS
TO NUMBER: 28867
MILES AND TENTHS TO LANDMARK
N W E S CIRCLE ONE

S ↓ UNIT NO. 1 - Vehicle
TOTAL UNITS INV. 1
UNIT NO. - ☐ VEH. 2 ☐ PED. ☐ BIKE

DRIVER

DRIVER'S LICENSE NUMBER: 3242324
STATE: ME
LAST NAME FIRST NAME MIDDLE: Moody, Keyna M
NUMBER AND STREET: 74 Town Farm Rd.
CITY: Oakland
STATE: ME 04963
CODE NUMBER: 2 2
DATE OF BIRTH: 05/12/1992
SEX: F
LICENSE STATUS: [✓ A] S P N
REST/PERM: 0, I
CLASS: C

DRIVER'S LICENSE NUMBER
STATE
LAST NAME FIRST NAME MIDDLE
NUMBER AND STREET
CITY
STATE
CODE NUMBER
DATE OF BIRTH
SEX
LICENSE STATUS A S P N
REST/PERM
CLASS

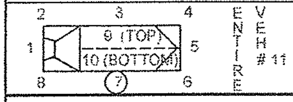
OWNER

LAST NAME - OWNER 1 FIRST NAME MIDDLE: Woodward, Lisa B
NUMBER AND STREET: 74 Town Farm Rd.
CITY: Oakland
STATE: ME 04963

LAST NAME - OWNER 1 FIRST NAME MIDDLE
NUMBER AND STREET
CITY
STATE

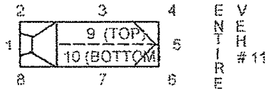
VEHICLE

VEHICLE TYPE: 4 Door 2
YEAR AND MAKE: 1999 Subaru 17
COLOR: Maroon 11
LICENSE PLATE NUMBER: 8706RU
YEAR: 2010
ISSUE STATE: ME
NO OCCUP.: 3
VEHICLE IDENTIFICATION NO. 4S3BG6850X6615999
INSURANCE CO. GEICO INDEMNITY COMPANY NAIC: 22055
POLICY NO. 4160473403

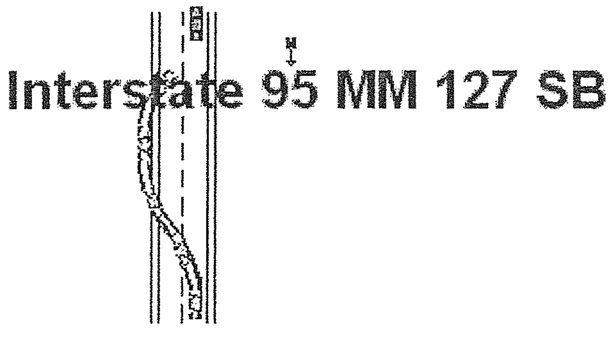


TOWED BY: Not Towed
DAMAGE CODES: 7
DAMAGE ESTIMATE: $ 1,000.00

VEHICLE TYPE
YEAR AND MAKE
COLOR
LICENSE PLATE NUMBER
YEAR
ISSUE STATE
NO OCCUP.
VEHICLE IDENTIFICATION NO.
INSURANCE CO.
POLICY NO.



TOWED BY:
DAMAGE CODES
DAMAGE ESTIMATE $



DESCRIPTION: Unit 1 was traveling south on Interstate 95. Unit 1 attempted to shift to neutral as it approached the MM 127 southbound off ramp. Unit 1 advised she put it in 4th gear by accident. Unit 1 was pulled to the left and off the road. Unit 1 went into a ditch and drove out after scraping the left side of vehicle. No injuries and minor damages to Unit 1.

AMBULANCE CODES Delta Amb Corp/Waterville(215), Waterville Rescue(987)

NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY (OTHER THAN VEH.)

TOTAL NUMBER OF PERSONS INVOLVED 3

NAMES OF ALL PERSONS INVOLVED (DRIVERS - PASSENGERS - WITNESSES - PEDESTRIANS)	25	26	27	28	29	30	31	32	33	34
Moody, Keyna M (Driver)	11	11	2	5	1	1	1	1	F	18
Riddle, Samantha (Passenger)	11	11	2	5	1	1	1	6	F	17
Paci, Nicholas (Passenger)	11	11	2	5	1	1	1	3	M	15

LOCAL CODES

INVESTIGATING OFFICER (SIGNATURE)	OFFICER NUMBER	TROOP OR DEPARTMENT	APPROVED BY	DATE
	3478	Maine State Police skowhegan	Tr. Jonathan Wilson	7/7/2010

Tr. Rick L. Moody

FORM 13:20A
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1	1
2	7
3	17
4	
5	13
6	2
7	1
8	1
9	1
10	1
11	65
12	1

13	1
14	
15	15
16	
17	
18	
19	1
20	
21	2
23	1
24	

INVESTIGATING AGENCY CODE NUMBER MEMSP0C00

TRAFFIC ACCIDENT REPORT
STATE OF MAINE

SP10-091809

FOR D.P.S. USE ONLY 2010-28288

DATE OF ACCIDENT	MONTH	DAY	YEAR	DAY OF WEEK	TIME	TIME REPORTED	TIME ARRIVED
	12	16	2010	Thu	21:15	21:19	21:40

ON — ROUTE: INT 95 SB — OR NAME OF STREET OR HIGHWAY: I 95 SB — CITY OR TOWN: Waterville — CODE NUMBER: 11240 R [✓ U] — COUNTY: Kennebec — HIT AND RUN ☐

AT — BETWEEN NODE NUMBERS: 28867 28912 — DISTANCE FROM SCENE: 0 MILES 06 TNTHS — TO NUMBER: 28867 — MILES AND TENTHS TO LANDMARK — N W [✓ S] E CIRCLE ONE

UNIT NO. 1 - Vehicle — TOTAL UNITS INV. 1 — UNIT NO. - ☐ VEH. 2 ☐ PED. ☐ BIKE

DRIVER

DRIVER'S LICENSE NUMBER: 5697147 — STATE: ME

LAST NAME / FIRST NAME / MIDDLE: NICHOLS, JOSHUA P

NUMBER AND STREET: 534 NORTH WAYNE RD.

CITY: Winthrop — STATE: ME 04364 — CODE NUMBER: 2 2

DATE OF BIRTH: 10/07/1966 — SEX: M — LICENSE STATUS: [✓ A] S P N — REST/PERM: 0 — CLASS: C

OWNER

LAST NAME - OWNER 1 / FIRST NAME / MIDDLE: NICHOLS, JOSHUA P

NUMBER AND STREET: 534 NORTH WAYNE RD.

CITY: Winthrop — STATE: ME 04364

VEHICLE

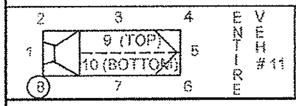
VEHICLE TYPE: SUV 7 — YEAR AND MAKE: 2003 Toyota 14 — COLOR 4: Blue (BL)

LICENSE PLATE NUMBER: 9318RY — YEAR: 2011 — ISSUE STATE: ME — NO OCCUP.: 3

VEHICLE IDENTIFICATION NO.: JTEHD21A930021150

INSURANCE CO.: USAA CASUALTY INS. CO.

POLICY NO.: 00415 14 85C7101 2



TOWED BY: KIMS

DAMAGE CODES: 8 — DAMAGE ESTIMATE: $ 2,000.00

Second unit (blank)

DRIVER'S LICENSE NUMBER — STATE

LAST NAME — FIRST NAME — MIDDLE

NUMBER AND STREET

CITY — STATE — CODE NUMBER

DATE OF BIRTH — SEX — LICENSE STATUS A S P N — REST/PERM — CLASS

LAST NAME - OWNER 1 — FIRST NAME — MIDDLE

NUMBER AND STREET

CITY — STATE

VEHICLE TYPE — YEAR AND MAKE — COLOR

LICENSE PLATE NUMBER — YEAR — ISSUE STATE — NO OCCUP.

VEHICLE IDENTIFICATION NO.

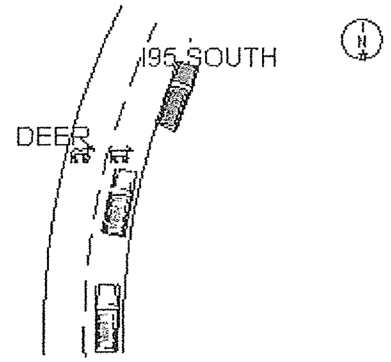
INSURANCE CO.

POLICY NO.

2 3 4 1 9 (TOP) 10 (BOTTOM) 5 8 7 6 ENTIRE VEH # 11

TOWED BY:

DAMAGE CODES — $ DAMAGE ESTIMATE



DESCRIPTION: VEH 1 WAS HEADED SOUTH ON I95. SEVERAL DEER CAME FROM THE MEDIAN. THE DRIVER OF VEH 1 WAS UNABLE TO AVOID THEM. VEH 1 STRUCK A DEER KILLING IT AND CAUSING REPORTABLE DAMAGE TO THE VEHICLE.

AMBULANCE CODES N/A(1000)

NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY (OTHER THAN VEH.)

TOTAL NUMBER OF PERSONS INVOLVED 3

NAMES OF ALL PERSONS INVOLVED (DRIVERS - PASSENGERS - WITNESSES - PEDESTRIANS)	25	26	27	28	29	30	31	32	33	34
NICHOLS, JOSHUA P (Driver/Owner)	11	11	2	5	1	1	1	1	M	44
NICHOLS, DEBORAH P (Passenger)	11	11	2	5	1	1	1	3	F	43
NICHOLS, ZACHARY P (Passenger)	11	11	2	5	1	1	1	6	M	19

LOCAL CODES

1	2
2	17
3	
4	
5	13
6	4
7	1
8	1
9	2
10	1
11	65
12	1
13	1
14	
15	1
16	
17	
18	
19	1
20	
21	2
23	1
24	

INVESTIGATING OFFICER (SIGNATURE)	OFFICER NUMBER	TROOP OR DEPARTMENT	APPROVED BY:	DATE
	0992	Maine State Police skowhegan	Sgt. Roderick P. Charette	12/16/2010

Tpr. Scott E. Dalton

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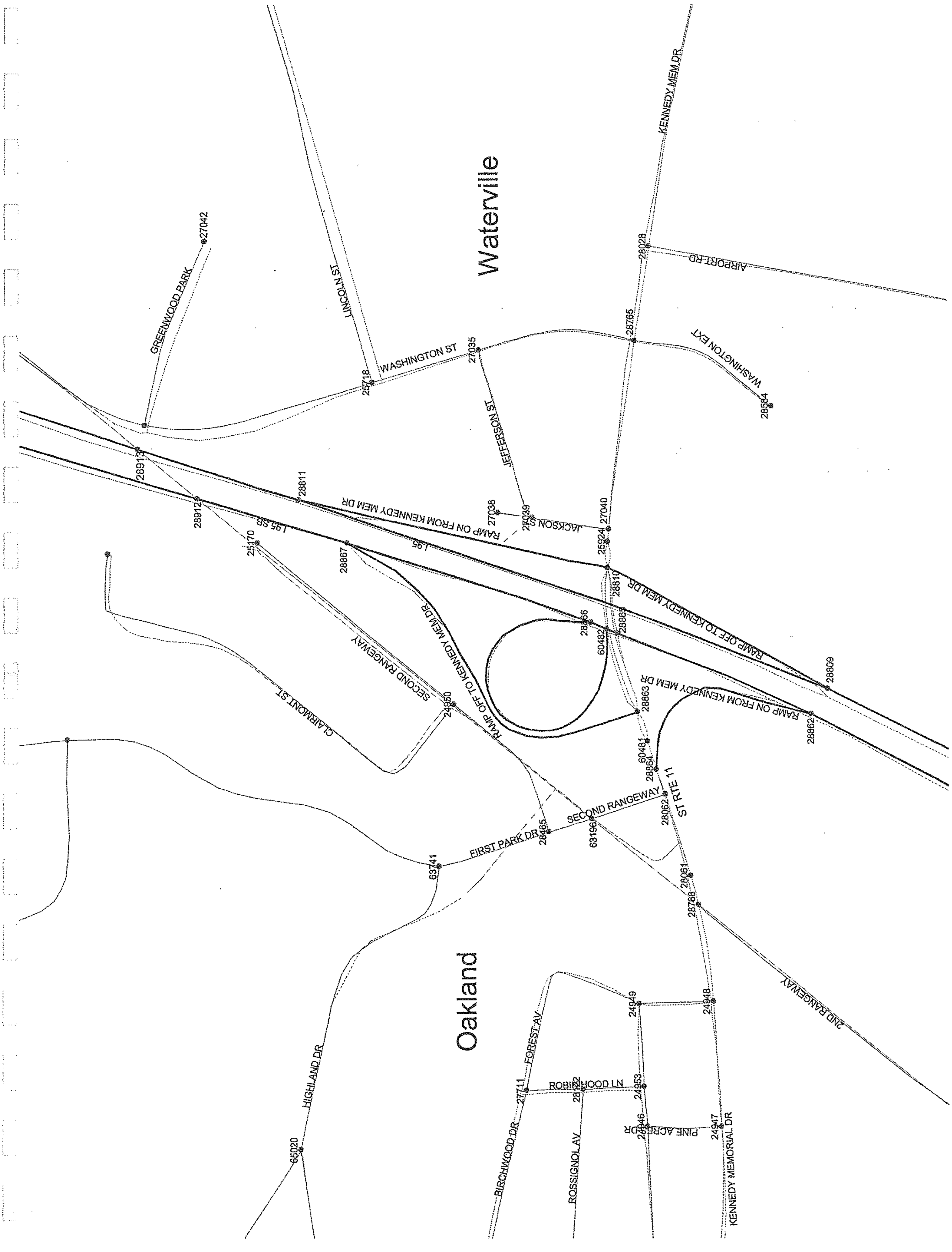
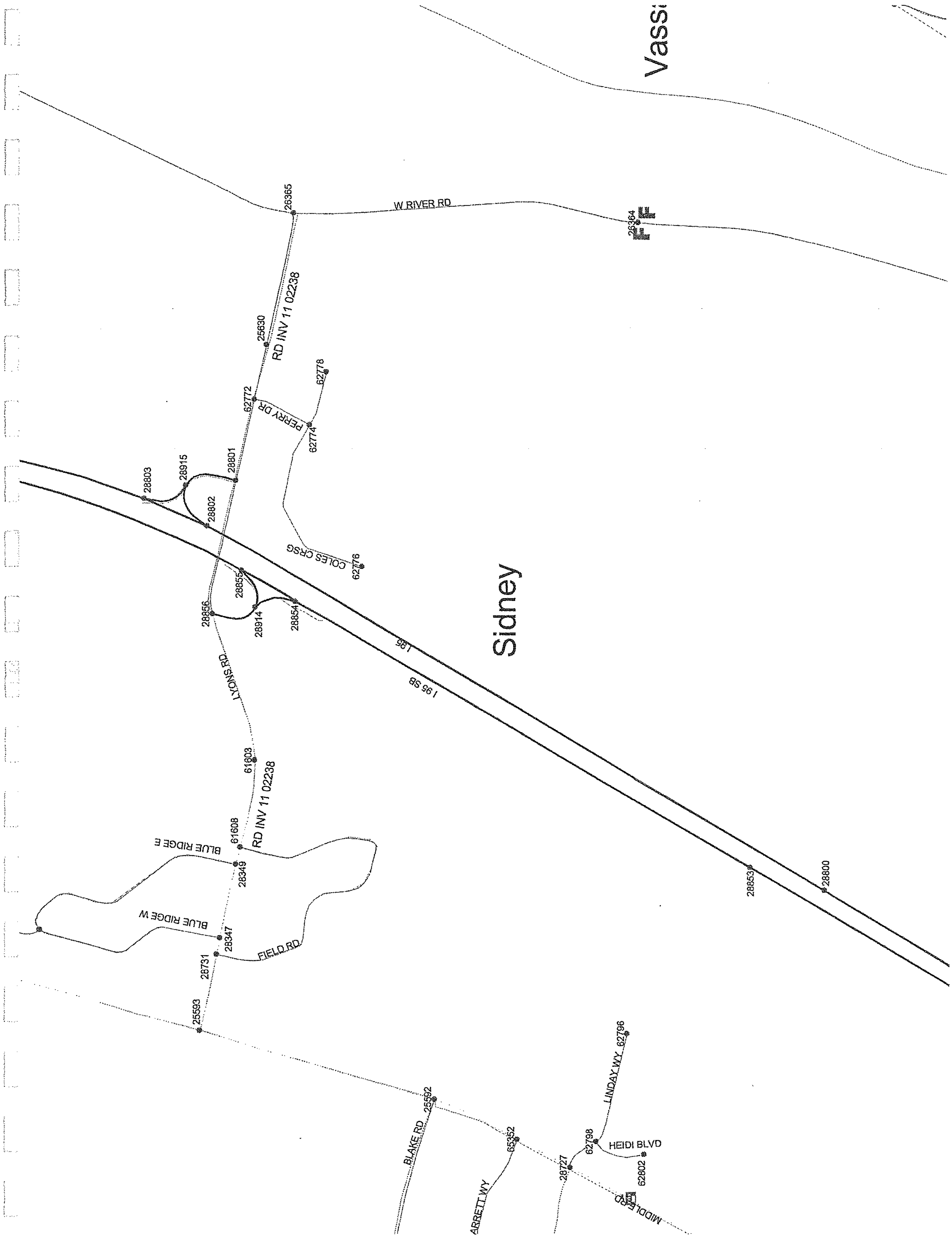
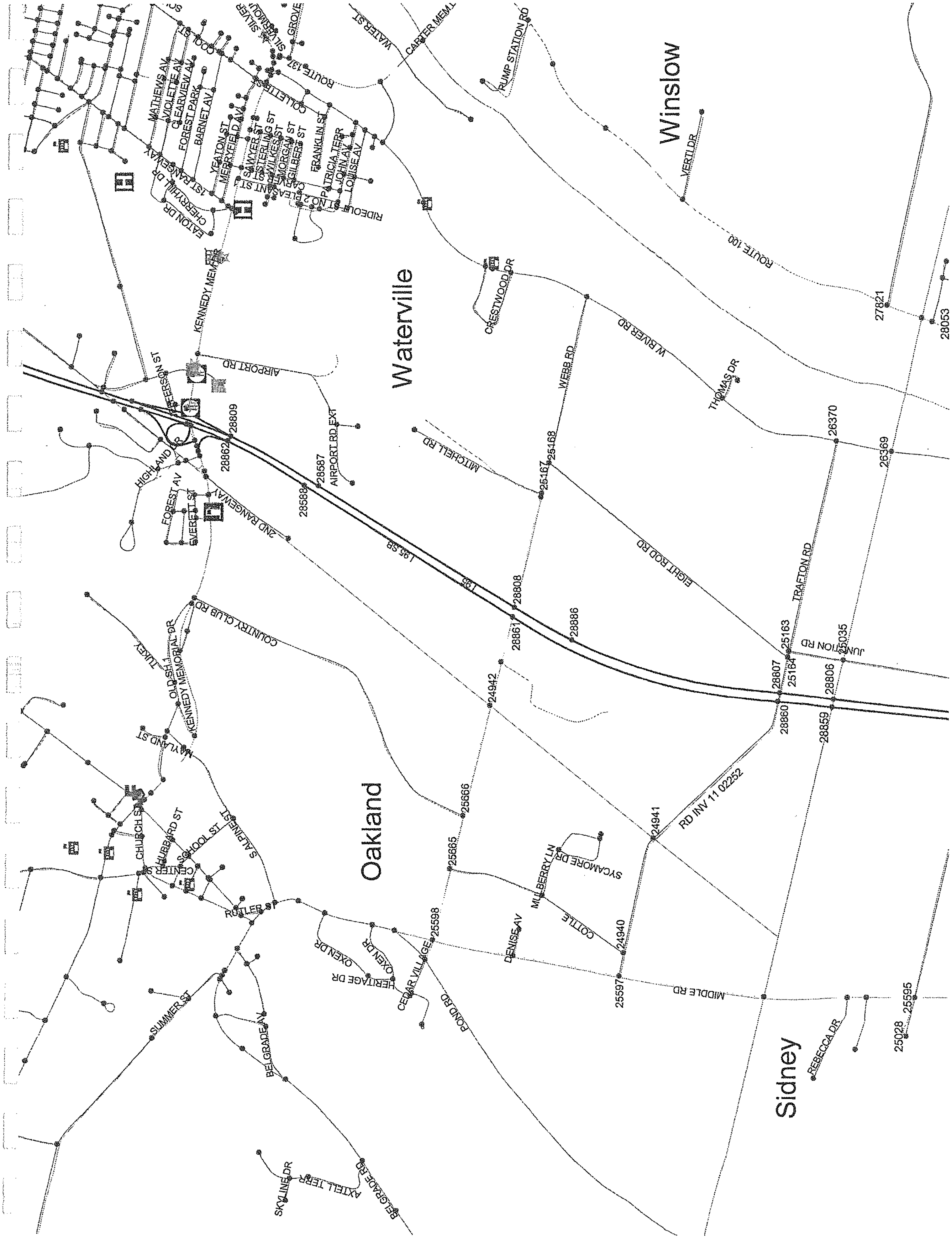

Waterville
Oakland
KENNEDY MEM DR
28028
AIRPORT RD
28765
WASHINGTON EXT
28584
WASHINGTON ST
27035
LINCOLN ST
25718
GREENWOOD PARK
27042
JEFFERSON ST
27038
27039
JACKSON ST
27040
25924
28811
RAMP ON FROM KENNEDY MEM DR
28913
28912
I 95 SB
I 95
25170
28867
28810
RAMP OFF TO KENNEDY MEM DR
28866
60482
28865
28809
28863
RAMP ON FROM KENNEDY MEM DR
28862
60481
28864
RAMP OFF TO KENNEDY MEM DR
SECOND RANGEWAY
24950
CLAIRMONT ST
ST RTE 11
28062
SECOND RANGEWAY
63196
28465
FIRST PARK DR
63741
28061
28768
2ND RANGEWAY
24949
24948
FOREST AV
HIGHLAND DR
27711
ROBINHOOD LN
28122
24953
24946
PINE ACRES DR
24947
65020
BIRCHWOOD DR
ROSSIGNOL AV
KENNEDY MEMORIAL DR


Vass
W RIVER RD
26365
26364
RD INV 11 02238
25830
62772
62778
PERRY DR
62774
28801
28915
28803
28802
COLES CRSG
62776
Sidney
28855
28856
28914
28854
I 95
I 95 SB
LYONS RD
61603
RD INV 11 02238
61608
BLUE RIDGE E
28349
BLUE RIDGE W
28347
FIELD RD
28731
25593
28853
28800
LINDAY WY
62796
25592
BLAKE RD
65352
ARRETT WY
28727
62798
HEIDI BLVD
62802
MIDDLE RD


elgrade
Waterville
Winslow
Sidney
Vassalboro
REBECCA DR
CARI WY
25028
25595
TOWN FARM RD
28859
28806
25035
TR28570ON RD
JUNCTION RD
28658
28805
25631
26369
ROUTE 100
27821
TAYLOR AV
RIVA RIDGE RD
28053
24756
28568
SHERWOOD LN
26368
I 95
STA LN
POND RD
25025
GOODUE RD
MIDDLE RD
28988
ALFALFA DR
25594
DRUMMOND RD
KELLY LN
28081
28857
28804
25034
25033
EIGHT ROD 1
26367
FARM BROOK RD
28346
I 95 SB
BURLEIGH RD
27818
25145
28576
COOK HILL RD
2568
25650
OAK GROVE RD
RIVERSIDE DR
TABER HILL RD
26366
W RIVER RD
TIFFANY RD
BARTLETT RD
25024
28989
28990
62843
28850
BLUE RIDGE W
BLUE RIDGE E
25593
LY28347S RD
RD INV 11 02236
28856
28802
28803
28915
RD INV 11 02236
27816
25139
DUNHAM RD
GETCHELLS CORNER
25142


Waterville
Winslow
Oakland
Sidney
ROUTE 100
ROUTE 137
WATER ST
CARTER MEM'L
PUMP STATION RD
VERTI DR
GROVE
SILVER
COOL ST
COLLETTE ST
MATHEWS AV
VIOLETTE AV
CLEARVIEW AV
FOREST PARK
BARNET AV
1ST RANGEWAY
CHERRYHILL DR
EATON DR
YEATON ST
MERRYFIELD AV
SAWYER ST
STERLING ST
WILKES ST
MORGAN ST
GILBERT ST
FRANKLIN ST
PATRICIA TERR
JOHN AV
LOUISE AV
RIDEOUT
KENNEDY MEM DR
CRESTWOOD DR
AIRPORT RD
AIRPORT RD EXT
W RIVER RD
WEBB RD
THOMAS DR
MITCHELL RD
EIGHT ROD RD
TRAFTON RD
JUNCTION RD
HIGHLAND
FOREST AV
EVERETT ST
2ND RANGEWAY
I-95 SB
I 95
COUNTRY CLUB RD
TUKEY
OLD SH 1
KENNEDY MEMORIAL DR
MAYLAND ST
CHURCH ST
HUBBARD ST
SCHOOL ST
S ALPINE ST
CENTER ST
RUTLER ST
OXEN DR
HERITAGE DR
CEDAR VILLAGE
POND RD
DENISE AV
MULBERRY LN
SYCAMORE DR
COTTLE
MIDDLE RD
REBECCA DR
SUMMER ST
BELGRADE AV
BELGRADE RD
SKYLINE DR
AXTELL TERR
RD INV 11 02252
28809
28862
28587
28588
25168
25167
28808
28861
28886
24942
25666
25665
25598
25597
24941
24940
28807
28860
25163
25164
25035
28806
28859
26370
26369
27821
28053
25595
25028

CAPACITY ANALYSES

2036 TRAFTON/LYONS CORRIDORS WITHOUT INTERCHANGE- AM PEAK HOUR

1: West River Road & Lyons Road Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	0.4	0.1	0.3	0.8
Total Del/Veh (s)	7.3	1.5	4.1	4.6
Speed Delay (hr)	0.4	0.1	0.1	0.6
Speed Del/Veh (s)	7.1	1.3	1.1	3.1
Density (ft/veh)	705	1432	1246	1030

2: ConWay/I-95 NB & Lyons Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.1	0.0	0.0	0.4	0.5
Total Del/Veh (s)	1.9	0.9	5.9	7.1	3.4
Speed Delay (hr)	0.1	0.0	0.0	0.4	0.5
Speed Del/Veh (s)	1.9	0.7	5.8	6.9	3.3
Density (ft/veh)	1298	1222		474	1001

3: I-95 SB/Pike & Lyons Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.1	0.1	0.1	0.0	0.4
Total Del/Veh (s)	1.5	2.6	5.1	5.3	2.6
Speed Delay (hr)	0.1	0.1	0.1	0.0	0.4
Speed Del/Veh (s)	1.3	2.6	4.9	5.2	2.5
Density (ft/veh)	902	972			1280

5: West River Road & Trafton Road Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	0.3	0.3	0.3	1.0
Total Del/Veh (s)	10.0	3.4	2.7	3.9
Speed Delay (hr)	0.3	0.3	0.3	0.9
Speed Del/Veh (s)	9.9	3.4	2.4	3.8
Density (ft/veh)	1209	839	465	748

7: Junction Road & Trafton Road Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.1	0.0	0.0	0.1
Total Del/Veh (s)	1.2	0.6	0.8	1.1
Speed Delay (hr)	0.0	0.0	0.0	0.0
Speed Del/Veh (s)	0.6	0.4	0.8	0.6
Density (ft/veh)				

2036 TRAFTON/LYONS CORRIDORS WITHOUT INTERCHANGE- AM PEAK HOUR

8: Trafton Road & 8 Rod Road Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.9	0.2	2.7	0.8
Speed Delay (hr)	0.0	0.0	0.0	0.0
Speed Del/Veh (s)	0.8	0.1	2.6	0.7
Density (ft/veh)	2086			2634

11: Middle Road & Trafton Road Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	0.1	0.1	0.1	0.3
Total Del/Veh (s)	4.8	1.0	2.1	1.8
Speed Delay (hr)	0.1	0.1	0.1	0.3
Speed Del/Veh (s)	4.7	0.8	1.8	1.6
Density (ft/veh)		755	821	1093

12: Trafton Road Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.2	0.6	0.1	0.8
Total Del/Veh (s)	4.2	5.5	2.7	4.9
Speed Delay (hr)	0.2	0.5	0.1	0.8
Speed Del/Veh (s)	4.2	5.3	2.6	4.7
Density (ft/veh)		416		572

Total Network Performance

Total Delay (hr)	4.8
Total Del/Veh (s)	5.2
Speed Delay (hr)	4.3
Speed Del/Veh (s)	4.7
Density (ft/veh)	703

2036 TRAFTON/LYONS CORRIDORS WITHOUT INTERCHANGE- AM PEAK HOUR

Intersection: 1: West River Road & Lyons Road

Movement	EB	NB	SB
Directions Served	LR	LT	R
Maximum Queue (ft)	106	41	13
Average Queue (ft)	47	7	1
95th Queue (ft)	88	29	6
Link Distance (ft)	1248	978	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: ConWay/I-95 NB & Lyons Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LR	LTR
Maximum Queue (ft)	57	6	26	136
Average Queue (ft)	10	0	2	66
95th Queue (ft)	37	4	17	109
Link Distance (ft)	1444	1252	628	1066
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: I-95 SB/Pike & Lyons Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	13	69	77	65
Average Queue (ft)	1	23	35	17
95th Queue (ft)	6	57	62	53
Link Distance (ft)	1252	1444	703	1056
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

2036 TRAFTON/LYONS CORRIDORS WITHOUT INTERCHANGE- AM PEAK HOUR

Intersection: 5: West River Road & Trafton Road

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	125	109	52	36
Average Queue (ft)	48	48	3	2
95th Queue (ft)	89	93	51	16
Link Distance (ft)	1092		670	966
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)		1		
Queuing Penalty (veh)		2		

Intersection: 7: Junction Road & Trafton Road

Movement	EB	NB
Directions Served	TR	LR
Maximum Queue (ft)	30	20
Average Queue (ft)	1	1
95th Queue (ft)	13	10
Link Distance (ft)	74	1028
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Trafton Road & 8 Rod Road

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	5	52
Average Queue (ft)	0	6
95th Queue (ft)	4	27
Link Distance (ft)	3699	1068
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

2036 TRAFTON/LYONS CORRIDORS WITHOUT INTERCHANGE- AM PEAK HOUR

Intersection: 11: Middle Road & Trafton Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	76	52
Average Queue (ft)	30	16
95th Queue (ft)	59	43
Link Distance (ft)	1422	1317
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: Trafton Road

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	75	78	34	45
Average Queue (ft)	38	45	12	23
95th Queue (ft)	61	68	36	44
Link Distance (ft)	38	1092	315	315
Upstream Blk Time (%)	8			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 2

2036 TRAFTON/LYONS CORRIDORS WITHOUT INTERCHANGE PM PEAK

1: West River Road & Lyons Road Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	0.4	0.1	0.5	1.0
Total Del/Veh (s)	7.7	1.5	4.7	4.7
Speed Delay (hr)	0.4	0.1	0.1	0.6
Speed Del/Veh (s)	7.5	1.3	1.4	3.0

2: ConWay/I-95 NB & Lyons Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.0	0.1	0.0	0.5	0.6
Total Del/Veh (s)	1.4	1.1	6.1	7.0	3.8
Speed Delay (hr)	0.0	0.1	0.0	0.5	0.6
Speed Del/Veh (s)	1.4	0.9	6.0	6.8	3.6

3: I-95 SB/Pike & Lyons Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.0	0.3	0.2	0.0	0.5
Total Del/Veh (s)	0.7	2.9	7.1	4.7	3.1
Speed Delay (hr)	0.0	0.3	0.2	0.0	0.5
Speed Del/Veh (s)	0.6	2.8	6.9	4.6	3.1

5: West River Road & Trafton Road Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	1.3	0.2	0.1	1.7
Total Del/Veh (s)	12.7	2.4	1.8	6.1
Speed Delay (hr)	1.3	0.1	0.1	1.6
Speed Del/Veh (s)	12.5	1.3	1.6	5.6

7: Junction Road & Trafton Road Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.1	0.4	3.6	0.4
Speed Delay (hr)	0.0	0.0	0.0	0.0
Speed Del/Veh (s)	0.1	0.3	3.5	0.3

8: Trafton Road & 8 Rod Road Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	0.7	0.2	2.9	0.4
Speed Delay (hr)	0.0	0.0	0.0	0.0
Speed Del/Veh (s)	0.6	0.1	2.8	0.3

9: Trafton Road Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.1	0.1	0.5	0.8
Total Del/Veh (s)	6.3	5.2	4.7	5.0
Speed Delay (hr)	0.1	0.1	0.5	0.8
Speed Del/Veh (s)	6.2	5.2	4.5	4.8

11: Middle Road & Trafton Road Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	0.2	0.1	0.1	0.3
Total Del/Veh (s)	4.6	1.1	1.0	1.9
Speed Delay (hr)	0.2	0.1	0.0	0.3
Speed Del/Veh (s)	4.4	0.9	0.8	1.7

Total Network Performance

Total Delay (hr)	5.6
Total Del/Veh (s)	6.0
Speed Delay (hr)	5.0
Speed Del/Veh (s)	5.3

Intersection: 1: West River Road & Lyons Road

Movement	EB	NB	SB
Directions Served	LR	LT	R
Maximum Queue (ft)	115	38	14
Average Queue (ft)	48	6	1
95th Queue (ft)	89	26	7
Link Distance (ft)	1248	978	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: ConWay/I-95 NB & Lyons Road

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	42	68	158
Average Queue (ft)	8	15	74
95th Queue (ft)	31	51	123
Link Distance (ft)	1444	628	1066
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: I-95 SB/Pike & Lyons Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	4	62	117	58
Average Queue (ft)	0	18	41	11
95th Queue (ft)	3	51	79	40
Link Distance (ft)	1252	1444	703	1056
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: West River Road & Trafton Road

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	220	46
Average Queue (ft)	92	11
95th Queue (ft)	169	35
Link Distance (ft)	982	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Junction Road & Trafton Road

Movement	NB
Directions Served	LR
Maximum Queue (ft)	27
Average Queue (ft)	3
95th Queue (ft)	15
Link Distance (ft)	1028
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Trafton Road & 8 Rod Road

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	15	6	43
Average Queue (ft)	0	0	6
95th Queue (ft)	8	4	26
Link Distance (ft)	3699	74	1068
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Trafton Road

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	68	54	54	95
Average Queue (ft)	31	31	31	51
95th Queue (ft)	55	44	45	79
Link Distance (ft)	176	982	351	351
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: Middle Road & Trafton Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	88	33
Average Queue (ft)	41	3
95th Queue (ft)	70	19
Link Distance (ft)	1422	1317
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

2036 KMD CORRIDOR WITHOUT INTERCHANGE AM PEAK HOUR

1: KMD & First Park Drive Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.7	0.4	0.6	1.7
Total Del/Veh (s)	2.6	2.4	32.3	3.6
Speed Delay (hr)	0.7	0.4	0.5	1.7
Speed Del/Veh (s)	2.6	2.3	30.8	3.6
Density (ft/veh)	245	317	1686	605

2: KMD & I-95 SB Ramps Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	1.6	0.2	4.1	5.9
Total Del/Veh (s)	6.6	1.6	29.9	11.5
Speed Delay (hr)	1.6	0.2	3.7	5.5
Speed Del/Veh (s)	6.6	1.6	27.1	10.8
Density (ft/veh)	147	610	138	199

3: I-95 NB Off Ramp/I-95 NB Ramps & KMD Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	3.2	4.6	2.1	9.9
Total Del/Veh (s)	9.5	16.4	24.3	14.1
Speed Delay (hr)	3.2	4.4	1.7	9.3
Speed Del/Veh (s)	9.5	15.8	19.9	13.3
Density (ft/veh)	181	305	362	275

4: Washington Street & KMD Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	3.4	4.7	0.9	2.7	11.7
Total Del/Veh (s)	9.9	21.7	30.4	31.1	17.3
Speed Delay (hr)	3.4	4.7	0.8	2.4	11.4
Speed Del/Veh (s)	9.9	21.7	29.2	27.6	16.8
Density (ft/veh)	288	222	453	146	254

41: SB On-Ramp & KMD Performance by approach

Approach	EB	WB	All
Total Delay (hr)	0.6	1.1	1.7
Total Del/Veh (s)	2.0	6.1	3.5
Speed Delay (hr)	0.5	1.1	1.6
Speed Del/Veh (s)	1.9	6.1	3.5
Density (ft/veh)	369	190	283

66: KMD & I-95 SB On-Ramp Performance by approach

Approach	EB	WB	All
Total Delay (hr)	0.3	0.3	0.6
Total Del/Veh (s)	0.9	1.5	1.1
Speed Delay (hr)	0.3	0.3	0.6
Speed Del/Veh (s)	0.9	1.5	1.1
Density (ft/veh)	347	358	352

Total Network Performance

Total Delay (hr)	34.8
Total Del/Veh (s)	37.1
Speed Delay (hr)	33.3
Speed Del/Veh (s)	35.5
Density (ft/veh)	261

2036 KMD CORRIDOR WITHOUT INTERCHANGE AM PEAK HOUR

Intersection: 1: KMD & First Park Drive

Movement	EB	EB	EB	B76	B76	WB	WB	SB	SB	SB
Directions Served	LT	T	T	T	T	T	TR	L	L	R
Maximum Queue (ft)	121	108	59	80	58	110	115	90	127	72
Average Queue (ft)	66	50	11	7	3	25	53	18	49	15
95th Queue (ft)	122	100	40	37	27	76	108	62	100	54
Link Distance (ft)	46	46	46	1784	1784	114	114		421	
Upstream Blk Time (%)	10	5	0			0	0			
Queuing Penalty (veh)	0	0	0			0	1			
Storage Bay Dist (ft)								300		300
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 2: KMD & I-95 SB Ramps

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	126	133	79	85	344	252
Average Queue (ft)	87	88	17	22	196	66
95th Queue (ft)	136	138	58	66	315	175
Link Distance (ft)	101	101	214	214	331	
Upstream Blk Time (%)	7	6			0	0
Queuing Penalty (veh)	30	28			0	0
Storage Bay Dist (ft)						300
Storage Blk Time (%)					1	0
Queuing Penalty (veh)					1	0

Intersection: 3: I-95 NB Off Ramp/I-95 NB Ramps & KMD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	262	90	106	270	294	220	114	159
Average Queue (ft)	148	26	38	86	155	57	44	75
95th Queue (ft)	241	70	86	191	257	174	93	136
Link Distance (ft)	248	248	248	903	903		515	
Upstream Blk Time (%)	1							
Queuing Penalty (veh)	4							
Storage Bay Dist (ft)						275		200
Storage Blk Time (%)					1			0
Queuing Penalty (veh)					2			0

2036 KMD CORRIDOR WITHOUT INTERCHANGE AM PEAK HOUR

Intersection: 4: Washington Street & KMD

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	LT	R
Maximum Queue (ft)	205	218	256	42	240	317	118	166	68	215	197
Average Queue (ft)	88	69	91	9	112	176	36	70	18	107	56
95th Queue (ft)	166	149	173	30	210	283	85	141	54	193	137
Link Distance (ft)		903	903		314	314	314	224		225	
Upstream Blk Time (%)						0		0		1	
Queuing Penalty (veh)						0		0		0	
Storage Bay Dist (ft)	750			200					100		125
Storage Blk Time (%)					0			6	0	8	0
Queuing Penalty (veh)					0			1	0	13	1

Intersection: 41: SB On-Ramp & KMD

Movement	EB	EB	EB	WB	WB
Directions Served	T	T	R	T	T
Maximum Queue (ft)	114	112	34	10	77
Average Queue (ft)	27	26	1	0	5
95th Queue (ft)	90	85	18	7	36
Link Distance (ft)	114	114	114	101	101
Upstream Blk Time (%)	1	0	0		0
Queuing Penalty (veh)	2	1	0		0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 66: KMD & I-95 SB On-Ramp

Movement	EB
Directions Served	T
Maximum Queue (ft)	32
Average Queue (ft)	1
95th Queue (ft)	14
Link Distance (ft)	214
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 86

Intersection: 1: KMD & First Park Drive

Phase	2	4	6
Movement(s) Served	EBTL	SBL	WBT
Maximum Green (s)	56.5	30.5	56.5
Minimum Green (s)	10.0	5.0	10.0
Recall	Max	None	C-Max
Avg. Green (s)	89.0	7.3	89.0
g/C Ratio	0.77	0.06	0.77
Cycles Skipped (%)	14	13	14
Cycles @ Minimum (%)	0	24	0
Cycles Maxed Out (%)	86	0	86
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): 100.0

Number of Complete Cycles : 35

Intersection: 2: KMD & I-95 SB Ramps

Phase	2	4	6
Movement(s) Served	EBT	SBL	WBT
Maximum Green (s)	44.0	44.0	44.0
Minimum Green (s)	10.0	5.0	10.0
Recall	Max	None	C-Max
Avg. Green (s)	63.4	24.8	63.4
g/C Ratio	0.63	0.25	0.63
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	100	3	100
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): 100.0

Number of Complete Cycles : 35

Intersection: 3: I-95 NB Off Ramp/I-95 NB Ramps & KMD

Phase	2	3	5	6
Movement(s) Served	EBT	NBTL	EBL	WBT
Maximum Green (s)	63.0	25.0	20.0	37.0
Minimum Green (s)	10.0	5.0	5.0	10.0
Recall	Max	None	None	C-Max
Avg. Green (s)	89.6	9.8	20.0	55.0
g/C Ratio	0.82	0.09	0.20	0.55
Cycles Skipped (%)	9	11	0	0
Cycles @ Minimum (%)	0	17	0	0
Cycles Maxed Out (%)	91	0	94	100
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): 100.0

Number of Complete Cycles : 35

Intersection: 4: Washington Street & KMD

Phase	1	2	4	5	6	8
Movement(s) Served	WBL	EBT	SBTL	EBL	WBT	NBTL
Maximum Green (s)	9.5	41.0	30.5	19.5	31.0	30.5
Minimum Green (s)	5.0	10.0	5.0	5.0	10.0	5.0
Recall	None	Max	None	None	C-Max	None
Avg. Green (s)	5.7	65.5	20.0	19.5	42.7	20.0
g/C Ratio	0.02	0.65	0.20	0.19	0.43	0.20
Cycles Skipped (%)	71	0	0	3	0	0
Cycles @ Minimum (%)	20	0	0	0	0	0
Cycles Maxed Out (%)	0	100	11	94	100	11
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): 100.0

Number of Complete Cycles : 35

2036 KMD CORRIDOR WITHOUT INTERCHANGE PM PEAK

1: KMD & First Park Drive Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	1.1	1.4	1.0	3.5
Total Del/Veh (s)	4.9	3.7	21.8	5.4
Speed Delay (hr)	1.1	1.4	0.9	3.4
Speed Del/Veh (s)	4.9	3.7	19.7	5.2
Density (ft/veh)	193	138	923	338

2: KMD & I-95 SB Ramps Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	1.5	1.0	3.2	5.7
Total Del/Veh (s)	6.4	3.6	18.5	8.3
Speed Delay (hr)	1.5	1.0	2.3	4.8
Speed Del/Veh (s)	6.4	3.6	13.5	7.1
Density (ft/veh)	156	237	182	191

3: I-95 NB Off Ramp/I-95 NB Ramps & KMD Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	4.6	10.8	3.4	18.9
Total Del/Veh (s)	14.7	24.5	22.0	20.7
Speed Delay (hr)	4.6	10.7	2.5	17.8
Speed Del/Veh (s)	14.6	24.3	16.1	19.5
Density (ft/veh)	148	148	231	160

4: Washington Street & KMD Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	6.3	10.2	2.2	3.3	22.0
Total Del/Veh (s)	17.2	25.7	33.4	31.8	23.6
Speed Delay (hr)	6.3	10.2	2.1	2.9	21.4
Speed Del/Veh (s)	17.2	25.7	31.1	27.9	23.0
Density (ft/veh)	215	107	178	122	158

41: SB On-Ramp & KMD Performance by approach

Approach	EB	WB	All
Total Delay (hr)	0.4	1.6	2.1
Total Del/Veh (s)	1.7	4.4	3.3
Speed Delay (hr)	0.4	1.6	2.1
Speed Del/Veh (s)	1.6	4.4	3.2
Density (ft/veh)	390	111	216

2036 KMD CORRIDOR WITHOUT INTERCHANGE PM PEAK

66: KMD & I-95 SB On-Ramp Performance by approach

Approach	EB	WB	All
Total Delay (hr)	0.5	0.9	1.4
Total Del/Veh (s)	1.5	2.5	2.1
Speed Delay (hr)	0.5	0.8	1.3
Speed Del/Veh (s)	1.5	2.5	2.0
Density (ft/veh)	348	217	274

Total Network Performance

Total Delay (hr)	59.6
Total Del/Veh (s)	48.2
Speed Delay (hr)	56.9
Speed Del/Veh (s)	46.0
Density (ft/veh)	177

Intersection: 1: KMD & First Park Drive

Movement	EB	EB	EB	B76	B76	WB	WB	SB	SB	SB
Directions Served	LT	T	T	T	T	T	TR	L	L	R
Maximum Queue (ft)	129	110	64	153	81	118	120	95	103	65
Average Queue (ft)	69	53	13	17	4	71	87	36	50	24
95th Queue (ft)	130	98	45	82	41	126	129	76	86	56
Link Distance (ft)	46	46	46	1120	1120	114	114		421	
Upstream Blk Time (%)	18	6	1			0	1			
Queuing Penalty (veh)	0	0	0			2	7			
Storage Bay Dist (ft)								300		300
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 2: KMD & I-95 SB Ramps

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	118	123	132	112	243	263
Average Queue (ft)	76	75	54	39	111	117
95th Queue (ft)	120	118	107	85	188	220
Link Distance (ft)	101	101	214	214	331	
Upstream Blk Time (%)	3	3				0
Queuing Penalty (veh)	13	12				0
Storage Bay Dist (ft)						300
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 3: I-95 NB Off Ramp/I-95 NB Ramps & KMD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	259	125	127	411	511	348	123	209
Average Queue (ft)	159	47	51	198	232	180	54	112
95th Queue (ft)	270	93	96	345	404	343	98	186
Link Distance (ft)	248	248	248	903	903		515	
Upstream Blk Time (%)	6							
Queuing Penalty (veh)	21							
Storage Bay Dist (ft)						275		200
Storage Blk Time (%)					3	3		1
Queuing Penalty (veh)					14	14		1

2036 KMD CORRIDOR WITHOUT INTERCHANGE PM PEAK

Intersection: 4: Washington Street & KMD

Movement	EB	EB	EB	WB	WB	WB	WB	B5	B5	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	T	T	LT	R	LT
Maximum Queue (ft)	215	293	322	222	377	385	114	117	228	231	174	209
Average Queue (ft)	101	145	167	69	250	301	41	5	25	112	58	95
95th Queue (ft)	181	244	268	147	382	426	92	49	110	191	133	170
Link Distance (ft)		903	903		314	314	314	2193	2193	224		225
Upstream Blk Time (%)					2	8				1		0
Queuing Penalty (veh)					0	0				0		0
Storage Bay Dist (ft)	750			200							100	
Storage Blk Time (%)				0	10					16	1	4
Queuing Penalty (veh)				1	9					16	1	9

Intersection: 4: Washington Street & KMD

Movement	SB
Directions Served	R
Maximum Queue (ft)	187
Average Queue (ft)	94
95th Queue (ft)	170
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	125
Storage Blk Time (%)	4
Queuing Penalty (veh)	5

Intersection: 41: SB On-Ramp & KMD

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (ft)	92	95	65	159
Average Queue (ft)	10	8	3	46
95th Queue (ft)	52	45	30	135
Link Distance (ft)	114	114	101	101
Upstream Blk Time (%)	0	0	0	3
Queuing Penalty (veh)	0	0	1	22
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

2036 KMD CORRIDOR WITHOUT INTERCHANGE PM PEAK

Intersection: 66: KMD & I-95 SB On-Ramp

Movement	EB
Directions Served	T
Maximum Queue (ft)	103
Average Queue (ft)	11
95th Queue (ft)	66
Link Distance (ft)	214
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 149

Intersection: 1: KMD & First Park Drive

Phase	2	4	6
Movement(s) Served	EBTL	SBL	WBT
Maximum Green (s)	31.5	15.5	31.5
Minimum Green (s)	10.0	5.0	10.0
Recall	Max	None	C-Max
Avg. Green (s)	42.4	7.5	42.4
g/C Ratio	0.67	0.12	0.67
Cycles Skipped (%)	5	7	5
Cycles @ Minimum (%)	0	34	0
Cycles Maxed Out (%)	95	0	95
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): 60.0

Number of Complete Cycles : 59

Intersection: 2: KMD & I-95 SB Ramps

Phase	2	4	6
Movement(s) Served	EBT	SBL	WBT
Maximum Green (s)	27.0	21.0	27.0
Minimum Green (s)	10.0	5.0	10.0
Recall	Max	None	C-Max
Avg. Green (s)	30.9	17.1	30.9
g/C Ratio	0.51	0.29	0.51
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	100	40	100
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): 60.0

Number of Complete Cycles : 59

Intersection: 3: I-95 NB Off Ramp/I-95 NB Ramps & KMD

Phase	2	3	5	6
Movement(s) Served	EBT	NBTL	EBL	WBT
Maximum Green (s)	35.0	13.0	9.0	20.0
Minimum Green (s)	10.0	5.0	5.0	10.0
Recall	Max	None	None	C-Max
Avg. Green (s)	38.9	11.2	9.0	23.1
g/C Ratio	0.64	0.18	0.15	0.38
Cycles Skipped (%)	2	3	3	0
Cycles @ Minimum (%)	0	5	0	0
Cycles Maxed Out (%)	98	55	97	100
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): 60.0

Number of Complete Cycles : 59

Intersection: 4: Washington Street & KMD

Phase	1	2	4	5	6	8
Movement(s) Served	WBL	EBT	SBTL	EBL	WBT	NBTL
Maximum Green (s)	14.5	56.0	30.5	19.5	51.0	30.5
Minimum Green (s)	5.0	10.0	5.0	5.0	10.0	5.0
Recall	None	Min	None	None	C-Min	None
Avg. Green (s)	9.7	59.5	20.2	17.7	50.5	20.2
g/C Ratio	0.07	0.50	0.17	0.15	0.42	0.17
Cycles Skipped (%)	9	0	0	0	0	0
Cycles @ Minimum (%)	18	0	0	0	0	0
Cycles Maxed Out (%)	0	27	3	12	100	3
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): 120.0

Number of Complete Cycles : 29

2036 TRAFTON/LYONS CORRIDOR WITH INTERCHANGE AM PEAK HOUR

1: West River Road & Lyons Road Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	0.1	0.0	0.1	0.2
Total Del/Veh (s)	4.1	1.2	1.2	1.6
Speed Delay (hr)	0.1	0.0	0.1	0.2
Speed Del/Veh (s)	4.0	1.0	1.0	1.5
Density (ft/veh)	2500	1557	800	1402

2: ConWay/I-95 NB & Lyons Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	1.2	0.6	5.5	3.4	1.5
Speed Delay (hr)	0.0	0.0	0.0	0.0	0.1
Speed Del/Veh (s)	1.2	0.5	5.4	3.3	1.4
Density (ft/veh)	1815	2207		1815	2231

3: I-95 SB/Pike & Lyons Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.0	0.1	0.1	0.0	0.2
Total Del/Veh (s)	1.0	1.5	4.2	5.7	1.9
Speed Delay (hr)	0.0	0.1	0.1	0.0	0.2
Speed Del/Veh (s)	0.8	1.5	4.0	5.6	1.8
Density (ft/veh)	1242	1569			1828

5: West River Road & Trafton Road Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	0.6	0.1	0.5	1.2
Total Del/Veh (s)	9.9	2.1	4.5	5.4
Speed Delay (hr)	0.6	0.1	0.2	0.9
Speed Del/Veh (s)	9.6	1.9	1.6	3.8
Density (ft/veh)	1277	892	973	1073

7: Trafton Road Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.8	0.5	0.1	1.4
Total Del/Veh (s)	6.7	6.4	3.7	6.4
Speed Delay (hr)	0.8	0.5	0.1	1.3
Speed Del/Veh (s)	6.2	6.3	3.6	6.0
Density (ft/veh)	91	560		533

10: I-95 NB/3 & Trafton Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.1	0.1	0.3	0.0	0.6
Total Del/Veh (s)	1.8	2.5	5.2	6.6	3.0
Speed Delay (hr)	0.1	0.1	0.3	0.0	0.5
Speed Del/Veh (s)	1.7	1.0	5.0	6.5	2.5
Density (ft/veh)	722	2045	1411		1380

11: Middle Road & Trafton Road Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	0.1	0.1	0.3	0.5
Total Del/Veh (s)	5.1	1.3	3.0	2.6
Speed Delay (hr)	0.1	0.1	0.2	0.5
Speed Del/Veh (s)	5.0	1.0	2.8	2.4
Density (ft/veh)	1644	804	644	897

22: I-95 SB & Trafton Road Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.1	0.1	0.2	0.3
Total Del/Veh (s)	1.4	1.6	3.9	2.3
Speed Delay (hr)	0.1	0.1	0.2	0.3
Speed Del/Veh (s)	1.2	1.3	3.7	2.1
Density (ft/veh)	1361	2580	1690	1866

Total Network Performance

Total Delay (hr)	5.2
Total Del/Veh (s)	5.2
Speed Delay (hr)	4.6
Speed Del/Veh (s)	4.6
Density (ft/veh)	809

2036 TRAFTON/LYONS CORRIDOR WITH INTERCHANGE AM PEAK HOUR

Intersection: 1: West River Road & Lyons Road

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	66	46
Average Queue (ft)	32	7
95th Queue (ft)	56	29
Link Distance (ft)	1262	978
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: ConWay/I-95 NB & Lyons Road

Movement	EB	NB	SB
Directions Served	LTR	LR	LTR
Maximum Queue (ft)	54	44	65
Average Queue (ft)	5	3	29
95th Queue (ft)	26	23	59
Link Distance (ft)	1444	628	1066
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: I-95 SB/Pike & Lyons Road

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	14	66	70	79
Average Queue (ft)	0	9	30	21
95th Queue (ft)	7	38	57	63
Link Distance (ft)	1252	1444	703	1056
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: West River Road & Trafton Road

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	R
Maximum Queue (ft)	141	83	81	26
Average Queue (ft)	55	16	15	1
95th Queue (ft)	103	50	53	12
Link Distance (ft)	1035		686	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		100
Storage Blk Time (%)	1	0		
Queuing Penalty (veh)	0	0		

Intersection: 7: Trafton Road

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	131	63	47	29
Average Queue (ft)	88	39	23	13
95th Queue (ft)	132	57	44	35
Link Distance (ft)	116	1035	316	316
Upstream Blk Time (%)	2			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10: I-95 NB/3 & Trafton Road

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	L	LT	R	LTR
Maximum Queue (ft)	16	48	56	88	30
Average Queue (ft)	1	10	13	49	8
95th Queue (ft)	9	33	41	77	28
Link Distance (ft)	1738		1022	1022	1148
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 11: Middle Road & Trafton Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	92	72
Average Queue (ft)	36	26
95th Queue (ft)	66	62
Link Distance (ft)	1424	1317
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: I-95 SB & Trafton Road

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	4	46	45	76
Average Queue (ft)	0	10	17	36
95th Queue (ft)	3	33	40	59
Link Distance (ft)	2066		999	999
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

2036 TRAFTON/LYONS COORIDOR WITH INTERCHANGE PM PEAK HOUR

1: West River Road & Lyons Road Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	0.2	0.0	0.1	0.3
Total Del/Veh (s)	5.1	1.0	1.0	1.9
Speed Delay (hr)	0.2	0.0	0.1	0.3
Speed Del/Veh (s)	5.0	0.8	0.8	1.7
Density (ft/veh)	927	1275	844	1005

2: ConWay/I-95 NB & Lyons Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.0	0.0	0.0	0.2	0.2
Total Del/Veh (s)	1.0	0.6	5.9	4.5	2.7
Speed Delay (hr)	0.0	0.0	0.0	0.2	0.2
Speed Del/Veh (s)	1.0	0.5	5.7	4.3	2.6
Density (ft/veh)	2036			598	1513

3: I-95 SB/Pike & Lyons Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.0	0.0	0.1	0.0	0.1
Total Del/Veh (s)	0.7	1.1	3.7	3.6	1.5
Speed Delay (hr)	0.0	0.0	0.1	0.0	0.1
Speed Del/Veh (s)	0.5	1.1	3.5	3.5	1.4
Density (ft/veh)	2225	1273			2153

5: West River Road & Trafton Road Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	1.2	0.1	0.4	1.7
Total Del/Veh (s)	12.5	1.8	4.2	6.5
Speed Delay (hr)	1.2	0.1	0.1	1.4
Speed Del/Veh (s)	12.4	1.6	1.4	5.4
Density (ft/veh)	575	772	1083	772

7: Trafton Road Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.8	0.5	0.8	2.2
Total Del/Veh (s)	10.4	9.1	7.3	8.7
Speed Delay (hr)	0.8	0.5	0.8	2.1
Speed Del/Veh (s)	10.1	9.1	7.0	8.5
Density (ft/veh)	280	566	358	403

10: I-95 NB/8 Rod Road & Trafton Road Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.1	0.5	0.2	0.0	0.8
Total Del/Veh (s)	1.3	4.5	4.4	3.1	3.8
Speed Delay (hr)	0.1	0.2	0.2	0.0	0.5
Speed Del/Veh (s)	1.3	2.1	4.2	3.0	2.4
Density (ft/veh)	1183	854	1542		1383

11: Middle Road & Trafton Road Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	0.3	0.1	0.2	0.5
Total Del/Veh (s)	5.3	1.4	2.1	2.8
Speed Delay (hr)	0.3	0.1	0.1	0.5
Speed Del/Veh (s)	5.1	1.1	1.9	2.6
Density (ft/veh)	841	1033	771	860

22: I-95 SB & Trafton Road Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.0	0.2	0.2	0.4
Total Del/Veh (s)	0.9	2.4	3.9	2.5
Speed Delay (hr)	0.0	0.2	0.1	0.4
Speed Del/Veh (s)	0.7	2.1	3.8	2.2
Density (ft/veh)	1994	1271	2223	1612

Total Network Performance

Total Delay (hr)	7.2
Total Del/Veh (s)	6.6
Speed Delay (hr)	6.4
Speed Del/Veh (s)	5.9
Density (ft/veh)	681

2036 TRAFTON/LYONS COORIDOR WITH INTERCHANGE PM PEAK HOUR

Intersection: 1: West River Road & Lyons Road

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	74	37
Average Queue (ft)	34	4
95th Queue (ft)	57	23
Link Distance (ft)	507	978
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: ConWay/I-95 NB & Lyons Road

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	27	55	102
Average Queue (ft)	2	9	51
95th Queue (ft)	14	37	83
Link Distance (ft)	1444	628	1066
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: I-95 SB/Pike & Lyons Road

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	41	68	31
Average Queue (ft)	4	31	6
95th Queue (ft)	22	58	27
Link Distance (ft)	1444	703	1056
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: West River Road & Trafton Road

Movement	EB	EB	NB	SB
Directions Served	L	R	LT	R
Maximum Queue (ft)	170	117	53	22
Average Queue (ft)	68	28	7	1
95th Queue (ft)	128	75	31	12
Link Distance (ft)	785		686	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		100
Storage Blk Time (%)	3	0		
Queuing Penalty (veh)	1	0		

Intersection: 7: Trafton Road

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	115	69	132	72
Average Queue (ft)	59	37	66	33
95th Queue (ft)	94	55	108	57
Link Distance (ft)	366	785	325	325
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10: I-95 NB/8 Rod Road & Trafton Road

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	L	LT	R	LR
Maximum Queue (ft)	27	69	58	88	28
Average Queue (ft)	2	20	22	43	4
95th Queue (ft)	11	51	51	72	21
Link Distance (ft)	1738		1022	1022	1148
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100			
Storage Blk Time (%)		0			
Queuing Penalty (veh)		0			

Intersection: 11: Middle Road & Trafton Road

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	78	57
Average Queue (ft)	41	15
95th Queue (ft)	65	43
Link Distance (ft)	1424	1317
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: I-95 SB & Trafton Road

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	4	55	56	54
Average Queue (ft)	0	16	27	26
95th Queue (ft)	3	44	46	45
Link Distance (ft)	2066		999	999
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 2

1: KMD & First Park Drive Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.7	0.4	0.5	1.5
Total Del/Veh (s)	2.5	2.0	29.8	3.2
Speed Delay (hr)	0.7	0.3	0.4	1.5
Speed Del/Veh (s)	2.5	1.9	28.6	3.1
Density (ft/veh)	245	334	2031	642

2: KMD & I-95 SB Ramps Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	1.4	0.1	3.4	4.9
Total Del/Veh (s)	5.6	0.8	30.7	9.9
Speed Delay (hr)	1.4	0.1	3.2	4.6
Speed Del/Veh (s)	5.6	0.8	28.2	9.3
Density (ft/veh)	166	642	164	228

3: I-95 NB Off Ramp/I-95 NB Ramps & KMD Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	2.4	2.8	1.9	7.1
Total Del/Veh (s)	7.6	10.2	24.7	10.7
Speed Delay (hr)	2.4	2.6	1.6	6.6
Speed Del/Veh (s)	7.5	9.5	20.7	9.9
Density (ft/veh)	219	390	394	337

4: Washington Street & KMD Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	3.7	3.9	0.8	2.6	11.0
Total Del/Veh (s)	11.5	19.8	32.4	29.3	17.4
Speed Delay (hr)	3.7	3.9	0.8	2.3	10.7
Speed Del/Veh (s)	11.5	19.8	31.3	26.2	16.9
Density (ft/veh)	289	263	471	151	269

41: SB On-Ramp & KMD Performance by approach

Approach	EB	WB	All
Total Delay (hr)	0.5	1.1	1.6
Total Del/Veh (s)	1.5	6.2	3.3
Speed Delay (hr)	0.4	1.1	1.5
Speed Del/Veh (s)	1.5	6.2	3.3
Density (ft/veh)	390	187	289

66: KMD & I-95 SB On-Ramp Performance by approach

Approach	EB	WB	All
Total Delay (hr)	0.3	0.3	0.6
Total Del/Veh (s)	0.9	1.2	1.0
Speed Delay (hr)	0.3	0.3	0.5
Speed Del/Veh (s)	0.9	1.2	1.0
Density (ft/veh)	379	366	373

Total Network Performance

Total Delay (hr)	29.2
Total Del/Veh (s)	32.9
Speed Delay (hr)	27.9
Speed Del/Veh (s)	31.5
Density (ft/veh)	285

Intersection: 1: KMD & First Park Drive

Movement	EB	EB	EB	B76	B76	WB	WB	SB	SB	SB
Directions Served	LT	T	T	T	T	T	TR	L	L	R
Maximum Queue (ft)	127	119	58	56	77	98	109	73	128	65
Average Queue (ft)	65	52	11	6	5	20	38	13	47	14
95th Queue (ft)	123	105	42	36	41	66	88	50	98	52
Link Distance (ft)	46	46	46	1784	1784	114	114		421	
Upstream Blk Time (%)	10	5	1			0	0			
Queuing Penalty (veh)	0	0	0			0	1			
Storage Bay Dist (ft)								300		300
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 2: KMD & I-95 SB Ramps

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	123	122	61	79	296	194
Average Queue (ft)	83	83	6	11	165	57
95th Queue (ft)	138	133	31	46	257	140
Link Distance (ft)	101	101	214	214	331	
Upstream Blk Time (%)	5	4			0	0
Queuing Penalty (veh)	21	19			0	0
Storage Bay Dist (ft)						300
Storage Blk Time (%)					0	
Queuing Penalty (veh)					1	

Intersection: 3: I-95 NB Off Ramp/I-95 NB Ramps & KMD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	230	90	126	159	195	85	120	164
Average Queue (ft)	112	25	41	42	99	9	50	63
95th Queue (ft)	195	65	90	107	173	58	97	116
Link Distance (ft)	248	248	248	903	903		515	
Upstream Blk Time (%)	0							
Queuing Penalty (veh)	2							
Storage Bay Dist (ft)						275		200
Storage Blk Time (%)								0
Queuing Penalty (veh)								0

Intersection: 4: Washington Street & KMD

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	LT	R
Maximum Queue (ft)	191	180	185	50	236	294	114	179	95	224	197
Average Queue (ft)	96	77	96	12	91	148	34	66	19	101	50
95th Queue (ft)	171	149	163	35	173	245	81	138	60	175	119
Link Distance (ft)		903	903		314	314	314	224		225	
Upstream Blk Time (%)						0		0		1	
Queuing Penalty (veh)						0		0		0	
Storage Bay Dist (ft)	750			200					100		125
Storage Blk Time (%)					0			5	0	6	0
Queuing Penalty (veh)					0			1	0	10	0

Intersection: 41: SB On-Ramp & KMD

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (ft)	99	105	20	60
Average Queue (ft)	15	14	1	3
95th Queue (ft)	60	60	14	26
Link Distance (ft)	114	114	101	101
Upstream Blk Time (%)	0	0	0	0
Queuing Penalty (veh)	1	1	0	1
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 66: KMD & I-95 SB On-Ramp

Movement	EB
Directions Served	T
Maximum Queue (ft)	25
Average Queue (ft)	1
95th Queue (ft)	14
Link Distance (ft)	214
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 56

Intersection: 1: KMD & First Park Drive

Phase	2	4	6
Movement(s) Served	EBTL	SBL	WBT
Maximum Green (s)	56.5	30.5	56.5
Minimum Green (s)	10.0	5.0	10.0
Recall	Max	None	C-Max
Avg. Green (s)	88.4	7.5	88.4
g/C Ratio	0.76	0.06	0.76
Cycles Skipped (%)	14	14	14
Cycles @ Minimum (%)	0	24	0
Cycles Maxed Out (%)	86	0	86
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): 100.0

Number of Complete Cycles : 35

Intersection: 2: KMD & I-95 SB Ramps

Phase	2	4	6
Movement(s) Served	EBT	SBL	WBT
Maximum Green (s)	44.0	44.0	44.0
Minimum Green (s)	10.0	5.0	10.0
Recall	Max	None	C-Max
Avg. Green (s)	67.5	21.1	67.5
g/C Ratio	0.67	0.21	0.67
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	0	0
Cycles Maxed Out (%)	100	0	100
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): 100.0

Number of Complete Cycles : 35

Intersection: 3: I-95 NB Off Ramp/I-95 NB Ramps & KMD

Phase	2	3	5	6
Movement(s) Served	EBT	NBTL	EBL	WBT
Maximum Green (s)	66.0	22.0	22.0	38.0
Minimum Green (s)	10.0	5.0	5.0	10.0
Recall	Max	None	None	C-Max
Avg. Green (s)	87.4	9.2	21.9	52.8
g/C Ratio	0.82	0.09	0.22	0.53
Cycles Skipped (%)	6	6	0	0
Cycles @ Minimum (%)	0	20	0	0
Cycles Maxed Out (%)	94	3	94	100
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): 100.0
Number of Complete Cycles : 35

Intersection: 4: Washington Street & KMD

Phase	1	2	4	5	6	8
Movement(s) Served	WBL	EBT	SBTL	EBL	WBT	NBTL
Maximum Green (s)	9.5	41.0	30.5	19.5	31.0	30.5
Minimum Green (s)	5.0	10.0	5.0	5.0	10.0	5.0
Recall	None	Max	None	None	C-Max	None
Avg. Green (s)	5.8	67.2	18.8	19.8	43.5	18.8
g/C Ratio	0.02	0.67	0.19	0.20	0.44	0.19
Cycles Skipped (%)	68	0	0	0	0	0
Cycles @ Minimum (%)	26	0	3	0	0	3
Cycles Maxed Out (%)	0	100	11	100	100	11
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): 100.0
Number of Complete Cycles : 35

1: KMD & First Park Drive Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	1.0	1.3	0.9	3.2
Total Del/Veh (s)	4.8	3.6	21.6	5.2
Speed Delay (hr)	1.0	1.3	0.9	3.1
Speed Del/Veh (s)	4.8	3.5	19.6	5.1
Density (ft/veh)	209	147	942	357

2: KMD & I-95 SB Ramps Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	1.2	0.9	2.5	4.6
Total Del/Veh (s)	5.5	3.3	16.7	7.1
Speed Delay (hr)	1.2	0.9	1.8	4.0
Speed Del/Veh (s)	5.5	3.3	12.5	6.2
Density (ft/veh)	181	240	224	218

3: I-95 NB Off Ramp/I-95 NB Ramps & KMD Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	2.7	8.1	3.6	14.4
Total Del/Veh (s)	9.2	19.5	23.5	16.7
Speed Delay (hr)	2.7	8.0	2.7	13.5
Speed Del/Veh (s)	9.2	19.4	17.7	15.6
Density (ft/veh)	213	177	221	192

4: Washington Street & KMD Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	5.9	9.2	2.2	2.9	20.3
Total Del/Veh (s)	16.8	24.7	30.5	30.0	22.7
Speed Delay (hr)	5.9	9.2	2.1	2.5	19.7
Speed Del/Veh (s)	16.8	24.7	27.9	26.0	22.0
Density (ft/veh)	226	118	176	138	169

41: SB On-Ramp & KMD Performance by approach

Approach	EB	WB	All
Total Delay (hr)	0.4	1.5	1.8
Total Del/Veh (s)	1.4	4.1	3.0
Speed Delay (hr)	0.4	1.5	1.8
Speed Del/Veh (s)	1.4	4.1	3.0
Density (ft/veh)	428	122	236

66: KMD & I-95 SB On-Ramp Performance by approach

Approach	EB	WB	All
Total Delay (hr)	0.3	0.8	1.1
Total Del/Veh (s)	1.0	2.3	1.7
Speed Delay (hr)	0.3	0.8	1.1
Speed Del/Veh (s)	1.0	2.2	1.7
Density (ft/veh)	404	220	294

Total Network Performance

Total Delay (hr)	50.5
Total Del/Veh (s)	43.4
Speed Delay (hr)	48.1
Speed Del/Veh (s)	41.3
Density (ft/veh)	195

Intersection: 1: KMD & First Park Drive

Movement	EB	EB	EB	B76	B76	WB	WB	SB	SB	SB
Directions Served	LT	T	T	T	T	T	TR	L	L	R
Maximum Queue (ft)	128	114	56	131	19	117	133	78	119	83
Average Queue (ft)	67	56	11	11	1	65	84	32	49	22
95th Queue (ft)	123	101	39	67	15	124	127	67	88	62
Link Distance (ft)	46	46	46	1120	1120	114	114		421	
Upstream Blk Time (%)	17	7	1			0	1			
Queuing Penalty (veh)	0	0	0			3	8			
Storage Bay Dist (ft)								300		300
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 2: KMD & I-95 SB Ramps

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	121	117	148	146	192	209
Average Queue (ft)	69	70	49	46	100	98
95th Queue (ft)	114	115	113	111	162	182
Link Distance (ft)	101	101	214	214	331	
Upstream Blk Time (%)	2	2	0	0		
Queuing Penalty (veh)	7	7	0	1		
Storage Bay Dist (ft)						300
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: I-95 NB Off Ramp/I-95 NB Ramps & KMD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	230	98	95	320	372	340	166	204
Average Queue (ft)	111	38	41	166	198	132	72	106
95th Queue (ft)	196	79	79	289	316	292	127	176
Link Distance (ft)	248	248	248	903	903		515	
Upstream Blk Time (%)	0							
Queuing Penalty (veh)	1							
Storage Bay Dist (ft)						275		200
Storage Blk Time (%)					1	1	0	0
Queuing Penalty (veh)					6	5	0	1

Intersection: 4: Washington Street & KMD

Movement	EB	EB	EB	WB	WB	WB	WB	B5	B5	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	T	T	LT	R	LT
Maximum Queue (ft)	180	261	290	249	380	385	151	42	130	232	164	210
Average Queue (ft)	86	142	165	66	228	278	43	2	12	111	55	81
95th Queue (ft)	153	236	257	150	351	405	103	24	66	199	119	159
Link Distance (ft)		903	903		314	314	314	2193	2193	224		225
Upstream Blk Time (%)					1	5				1		0
Queuing Penalty (veh)					0	0				0		0
Storage Bay Dist (ft)	750			200							100	
Storage Blk Time (%)					7					16	1	3
Queuing Penalty (veh)					6					16	1	7

Intersection: 4: Washington Street & KMD

Movement	SB
Directions Served	R
Maximum Queue (ft)	182
Average Queue (ft)	81
95th Queue (ft)	157
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	125
Storage Blk Time (%)	3
Queuing Penalty (veh)	4

Intersection: 41: SB On-Ramp & KMD

Movement	EB	EB	WB	WB
Directions Served	T	T	T	T
Maximum Queue (ft)	92	62	68	159
Average Queue (ft)	5	5	5	30
95th Queue (ft)	37	30	38	100
Link Distance (ft)	114	114	101	101
Upstream Blk Time (%)	0	0	0	1
Queuing Penalty (veh)	0	0	1	7
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 66: KMD & I-95 SB On-Ramp

Movement	EB	WB	WB
Directions Served	T	T	TR
Maximum Queue (ft)	12	11	33
Average Queue (ft)	0	0	1
95th Queue (ft)	6	8	23
Link Distance (ft)	214	248	248
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 82

Intersection: 1: KMD & First Park Drive

Phase	2	4	6
Movement(s) Served	EBTL	SBL	WBT
Maximum Green (s)	31.5	15.5	31.5
Minimum Green (s)	10.0	5.0	10.0
Recall	Max	None	C-Max
Avg. Green (s)	42.6	7.5	42.6
g/C Ratio	0.67	0.12	0.67
Cycles Skipped (%)	5	7	5
Cycles @ Minimum (%)	0	36	0
Cycles Maxed Out (%)	95	2	95
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): 60.0

Number of Complete Cycles : 59

Intersection: 2: KMD & I-95 SB Ramps

Phase	2	4	6
Movement(s) Served	EBT	SBL	WBT
Maximum Green (s)	27.0	21.0	27.0
Minimum Green (s)	10.0	5.0	10.0
Recall	Max	None	C-Max
Avg. Green (s)	32.4	15.6	32.4
g/C Ratio	0.54	0.26	0.54
Cycles Skipped (%)	0	0	0
Cycles @ Minimum (%)	0	2	0
Cycles Maxed Out (%)	100	23	100
Cycles with Peds (%)	0	0	0

Controller Summary

Average Cycle Length (s): 60.0

Number of Complete Cycles : 59

Intersection: 3: I-95 NB Off Ramp/I-95 NB Ramps & KMD

Phase	2	3	5	6
Movement(s) Served	EBT	NBTL	EBL	WBT
Maximum Green (s)	37.0	11.0	9.0	22.0
Minimum Green (s)	10.0	5.0	5.0	10.0
Recall	Max	None	None	C-Max
Avg. Green (s)	40.3	10.0	9.0	25.5
g/C Ratio	0.66	0.16	0.13	0.43
Cycles Skipped (%)	2	3	10	0
Cycles @ Minimum (%)	0	7	0	0
Cycles Maxed Out (%)	98	63	88	100
Cycles with Peds (%)	0	0	0	0

Controller Summary

Average Cycle Length (s): 60.0

Number of Complete Cycles : 59

Intersection: 4: Washington Street & KMD

Phase	1	2	4	5	6	8
Movement(s) Served	WBL	EBT	SBTL	EBL	WBT	NBTL
Maximum Green (s)	14.5	56.0	30.5	19.5	51.0	30.5
Minimum Green (s)	5.0	10.0	5.0	5.0	10.0	5.0
Recall	None	Min	None	None	C-Min	None
Avg. Green (s)	9.4	54.2	19.7	16.2	45.4	19.7
g/C Ratio	0.07	0.45	0.16	0.14	0.37	0.16
Cycles Skipped (%)	9	0	0	0	3	0
Cycles @ Minimum (%)	18	0	0	0	0	0
Cycles Maxed Out (%)	0	17	3	8	97	3
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): 120.0

Number of Complete Cycles : 29

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*TOM GORRILL*
Agency or Company	*GORRILL PALMER*
Date Performed	*9/7/2012*
Analysis Time Period	*AM PEAK*

Site Information

Highway/Direction of Travel	*I-95 NB*
From/To	*SOUTH OF LYONS TO LYONS*
Jurisdiction	
Analysis Year	*2016*

Project Description *TRAFTON IJR-PREDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1156*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.30*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.2*	mph
FFS	*74.2*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*630*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*8.4*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	TOM GORRILL	Highway/Direction of Travel	I-95 NB
Agency or Company	GORRILL PALMER	From/To	NORTH OF LYONS
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM PEAK	Analysis Year	2016

Project Description TRAFTON IJR-PREDEVELOPMENT WO INT

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1174	veh/h	Peak-Hour Factor, PHF	0.94
AADT		veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.976

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f_{LW}	0.0	mph
Number of Lanes, N	2		f_{LC}	0.0	mph
Total Ramp Density, TRD	0.30	ramps/mi	TRD Adjustment	1.2	mph
FFS (measured)		mph	FFS	74.2	mph
Base free-flow Speed, BFFS	75.4	mph			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	640	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	75.0	mph	S		mph
D = v_p / S	8.5	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	A		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information | Site Information

Analyst	TOM GORRILL	Highway/Direction of Travel	I-95 NB
Agency or Company	GORRILL PALMER	From/To	NORTH OF KMD
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM PEAK	Analysis Year	2016

Project Description TRAFTON IJR-PREDEVELOPMENT WO INT

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1279	veh/h	Peak-Hour Factor, PHF	0.94
AADT		veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.976

Speed Inputs | Calc Speed Adj and FFS

Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f_{LW}	0.0	mph
Number of Lanes, N	2		f_{LC}	0.0	mph
Total Ramp Density, TRD	0.30	ramps/mi	TRD Adjustment	1.2	mph
FFS (measured)		mph	FFS	74.2	mph
Base free-flow Speed, BFFS	75.4	mph			

LOS and Performance Measures | Design (N)

Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	697	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	75.0	mph	S	mph
D = v_p / S	9.3	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	A		Required Number of Lanes, N	

Glossary | Factor Location

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume

S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	TOM GORRILL
Agency or Company	GORRILL PALMER
Date Performed	9/7/2012
Analysis Time Period	AM PEAK

Site Information

Highway/Direction of Travel	I-95 SB
From/To	SOUTH OF LYONS
Jurisdiction	
Analysis Year	2016

Project Description TRAFTON IJR-PREDEVELOPMENT WO INT

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1222	veh/h	Peak-Hour Factor, PHF	0.94
AADT		veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.976

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	0.30	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f_{LW}	0.0	mph
f_{LC}	0.0	mph
TRD Adjustment	1.2	mph
FFS	74.2	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	666	pc/h/ln
S	75.0	mph
D = v_p / S	8.9	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information / Site Information

Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2016*

Project Description *TRAFTON IJR-PREDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1114*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.30*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.2*	mph
FFS	*74.2*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*607*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*8.1*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		***Site Information***	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF KMD*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2016*

Project Description *TRAFTON IJR-PREDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1156*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*630*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*8.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*SOUTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2016*

Project Description *TRAFTON IJR-PREDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1648*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*899*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*75.0*	mph	S		mph
D = v_p / S	*12.0*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*B*		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2016*

Project Description *TRAFTON IJR-PREDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1520*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*829*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*11.1*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*TOM GORRILL*
Agency or Company	*GORRILL PALMER*
Date Performed	*9/7/2012*
Analysis Time Period	*PM PEAK*

Site Information

Highway/Direction of Travel	*I-95 NB*
From/To	*NO OF KMD*
Jurisdiction	
Analysis Year	*2016*

Project Description *TRAFTON IJR-PREDEVELOPMENT WO INT-NB*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1646*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.30*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.2*	mph
FFS	*74.2*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*897*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*12.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes

V - Hourly volume

v_p - Flow rate

LOS - Level of service

DDHV - Directional design hour volume

S - Speed

D - Density

FFS - Free-flow speed

BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12

E_T - Exhibits 11-10, 11-11, 11-13

f_p - Page 11-18

LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8

f_{LC} - Exhibit 11-9

TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*SOUTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2016*

Project Description *TRAFTON IJR-PREDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	~~1222~~	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT	1348	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*666*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*8.9*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*TOM GORRILL*
Agency or Company	*GORRILL PALMER*
Date Performed	*9/7/2012*
Analysis Time Period	*PM PEAK*

Site Information

Highway/Direction of Travel	*I-95 SB*
From/To	*NORTH OF LYONS*
Jurisdiction	
Analysis Year	*2016*

Project Description *TRAFTON IJR-PREDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1348*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.30*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.2*	mph
FFS	*74.2*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*735*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*9.8*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes

V - Hourly volume

v_p - Flow rate

LOS - Level of service

DDHV - Directional design hour volume

S - Speed

D - Density

FFS - Free-flow speed

BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12

E_T - Exhibits 11-10, 11-11, 11-13

f_p - Page 11-18

LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8

f_{LC} - Exhibit 11-9

TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*TOM GORRILL*
Agency or Company	*GORRILL PALMER*
Date Performed	*9/7/2012*
Analysis Time Period	*PM PEAK*

Site Information

Highway/Direction of Travel	*I-95 SB*
From/To	*NORTH OF KMD*
Jurisdiction	
Analysis Year	*2016*

Project Description *TRAFTON IJR-PREDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1606*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.30*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.2*	mph
FFS	*74.2*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*876*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*11.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	TOM GORRILL	Highway/Direction of Travel	I-95 NB
Agency or Company	GORRILL PALMER	From/To	SOUTH OF LYONS
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM PEAK	Analysis Year	2036

Project Description TRAFTON IJR-POSTDEVELOPMENT WO INT

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1524	veh/h	Peak-Hour Factor, PHF	0.94
AADT		veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.976

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft			
Rt-Side Lat. Clearance	6.0	ft	f_{LW}	0.0	mph
Number of Lanes, N	2		f_{LC}	0.0	mph
Total Ramp Density, TRD	0.30	ramps/mi	TRD Adjustment	1.2	mph
FFS (measured)		mph	FFS	74.2	mph
Base free-flow Speed, BFFS	75.4	mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	831	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	75.0	mph	S	mph
D = v_p / S	11.1	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	B		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		***Site Information***	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1342*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*732*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*9.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*TOM GORRILL*
Agency or Company	*GORRILL PALMER*
Date Performed	*9/7/2012*
Analysis Time Period	*AM PEAK*

Site Information

Highway/Direction of Travel	*I-95 NB*
From/To	*NORTH OF KMD*
Jurisdiction	
Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1566*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.30*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.2*	mph
FFS	*74.2*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*854*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*11.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		**Site Information**	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*SOUTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1367*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*745*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*9.9*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		**Site Information**	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1367*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*745*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*75.0*	mph	S		mph
D = v_p / S	*9.9*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*A*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF KMD*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1430*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*780*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*10.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*SOUTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2032*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1108*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*74.9*	mph	S	mph
D = v_p / S	*14.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1853*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1010*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*13.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		**Site Information**	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF KMD*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2022*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			**Design (N)**	
			Design (N)	
Operational (LOS)			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1102*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*74.9*	mph	S	mph
D = v_p / S	*14.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information / Site Information

Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*SOUTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1770*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.30*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*1.2*	mph
FFS	*74.2*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*965*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*12.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT WO INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1647*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.30*	ramps/mi	TRD Adjustment	*1.2*	mph
FFS (measured)		mph	FFS	*74.2*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*898*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*12.0*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	TOM GORRILL
Agency or Company	GORRILL PALMER
Date Performed	9/7/2012
Analysis Time Period	PM PEAK

Site Information

Highway/Direction of Travel	I-95 SB
From/To	NORTH OF KMD
Jurisdiction	
Analysis Year	2036

Project Description TRAFTON IJR-POSTDEVELOPMENT WO INT

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1963	veh/h	Peak-Hour Factor, PHF	0.94
AADT		veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.976

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	0.30	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f_{LW}	0.0	mph
f_{LC}	0.0	mph
TRD Adjustment	1.2	mph
FFS	74.2	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1070	pc/h/ln
S	74.9	mph
D = v_p / S	14.3	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information | Site Information

Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*SOUTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1524*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*831*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*11.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		**Site Information**	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1542*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.70*	ramps/mi	TRD Adjustment	*2.4*	mph
FFS (measured)		mph	FFS	*73.0*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*841*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*75.0*	mph	S		mph
D = v_p / S	*11.2*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*B*		Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*TOM GORRILL*
Agency or Company	*GORRILL PALMER*
Date Performed	*9/7/2012*
Analysis Time Period	*AM PEAK*

Site Information

Highway/Direction of Travel	*I-95 NB*
From/To	*NORTH OF TRAFTON*
Jurisdiction	
Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1441*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*786*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*10.5*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF KMD*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1541*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.70*	ramps/mi	TRD Adjustment	*2.4*	mph
FFS (measured)		mph	FFS	*73.0*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)	
			Design (N)	
Operational (LOS)			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*840*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*11.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*SOUTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1528*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*833*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*11.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume

S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information / Site Information

Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1430*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*780*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*10.4*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF TRAFTON*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*AM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1489*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.70*	ramps/mi	TRD Adjustment	*2.4*	mph
FFS (measured)		mph	FFS	*73.0*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*812*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*75.0*	mph	S		mph
D = v_p / S	*10.8*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*A*		Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*TOM GORRILL*
Agency or Company	*GORRILL PALMER*
Date Performed	*9/7/2012*
Analysis Time Period	

Site Information

Highway/Direction of Travel	*I-95 SB*
From/To	*NORTH OF KMD*
Jurisdiction	
Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1430*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*780*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*10.4*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes

V - Hourly volume

v_p - Flow rate

LOS - Level of service

DDHV - Directional design hour volume

S - Speed

D - Density

FFS - Free-flow speed

BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12

E_T - Exhibits 11-10, 11-11, 11-13

f_p - Page 11-18

LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8

f_{LC} - Exhibit 11-9

TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		**Site Information**	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*SOUTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2032*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.70*	ramps/mi	TRD Adjustment	*2.4*	mph
FFS (measured)		mph	FFS	*73.0*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1108*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*74.9*	mph	S	mph
D = v_p / S	*14.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*TOM GORRILL*
Agency or Company	*GORRILL PALMER*
Date Performed	*9/7/2012*
Analysis Time Period	*PM PEAK*

Site Information

Highway/Direction of Travel	*I-95 NB*
From/To	*NORTH OF LYONS*
Jurisdiction	
Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1928*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1051*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*14.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information / Site Information

Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF TRAFTON*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1948*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1062*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*14.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information / Site Information

Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95 NB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF KMD*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2020*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1101*	pc/h/ln
S	*74.9*	mph
D = v_p / S	*14.7*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst TOM GORRILL
Agency or Company GORRILL PALMER
Date Performed 9/7/2012
Analysis Time Period PM PEAK

Site Information

Highway/Direction of Travel I-95SB
From/To SOUTH OF LYONS
Jurisdiction
Analysis Year 2036

Project Description TRAFTON IJR-POSTDEVELOPMENT W INT

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1875	veh/h	Peak-Hour Factor, PHF	0.94
AADT		veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.976

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	0.70	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f_{LW}	0.0	mph
f_{LC}	0.0	mph
TRD Adjustment	2.4	mph
FFS	73.0	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1022	pc/h/ln
S	75.0	mph
D = v_p / S	13.6	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF LYONS*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1885*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft			
Rt-Side Lat. Clearance	*6.0*	ft	f_{LW}	*0.0*	mph
Number of Lanes, N	*2*		f_{LC}	*0.0*	mph
Total Ramp Density, TRD	*0.70*	ramps/mi	TRD Adjustment	*2.4*	mph
FFS (measured)		mph	FFS	*73.0*	mph
Base free-flow Speed, BFFS	*75.4*	mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1028*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*75.0*	mph	S	mph
D = v_p / S	*13.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information / Site Information

Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF TRAFTON*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1723*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*939*	pc/h/ln
S	*75.0*	mph
D = v_p / S	*12.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information / Site Information

Analyst	*TOM GORRILL*	Highway/Direction of Travel	*I-95SB*
Agency or Company	*GORRILL PALMER*	From/To	*NORTH OF KMD*
Date Performed	*9/7/2012*	Jurisdiction	
Analysis Time Period	*PM PEAK*	Analysis Year	*2036*

Project Description *TRAFTON IJR-POSTDEVELOPMENT W INT*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1963*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.976*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Side Lat. Clearance	*6.0*	ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD	*0.70*	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	*75.4*	mph

Calc Speed Adj and FFS

f_{LW}	*0.0*	mph
f_{LC}	*0.0*	mph
TRD Adjustment	*2.4*	mph
FFS	*73.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1070*	pc/h/ln
S	*74.9*	mph
D = v_p / S	*14.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
f_p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3	

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		***Site Information***	
Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp ☑ Yes ☐ On ☐ No ☑ Off L_{up} = 575 ft V_u = 57 veh/h	Number of Lanes, N Acceleration Lane Length, L_A Deceleration Lane Length L_D Freeway Volume, V_F Ramp Volume, V_R Freeway Free-Flow Speed, S_{FF} Ramp Free-Flow Speed, S_{FR}	2 350 1099 75 70.0 35.0	Downstream Adj Ramp ☐ Yes ☐ On ☑ No ☐ Off L_{down} = ft V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1099	0.90	Level	0	0	1.000	1.00	1221
Ramp	75	0.90	Level	0	0	1.000	1.00	83
UpStream	57	0.90	Level	0	0	1.000	1.00	63
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1221 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1304	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1304	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.311 (Exhibit 13-11)

S_R= 61.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / *Site Information*

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	KMD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 2000 ft

V_u = 263 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	911
Ramp Volume, V_R	368
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	911	0.90	Level	0	0	1.000	1.00	1012
Ramp	368	0.90	Level	0	0	1.000	1.00	409
UpStream	263	0.90	Level	0	0	1.000	1.00	292
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1012 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1421	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1421	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 14.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.313 (Exhibit 13-11)

S_R= 61.2 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.1 Generated: 9/9/2012 9:59 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 950 ft

V_u = 394 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 450

Deceleration Lane Length L_D

Freeway Volume, V_F 762

Ramp Volume, V_R 268

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	762	0.90	Level	0	0	1.000	1.00	847
Ramp	268	0.90	Level	0	0	1.000	1.00	298
UpStream	394	0.90	Level	0	0	1.000	1.00	438
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 847 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1145	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1145	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 11.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.302 (Exibit 13-11)

S_R= 61.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP-DOWN
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N	2	☑ Yes ☑ On
☑ No ☐ Off	Acceleration Lane Length, L_A	450	☐ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D		L_{down} = 800 ft
V_u = veh/h	Freeway Volume, V_F	762	V_D = 84 veh/h
	Ramp Volume, V_R	268	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	762	0.90	Level	0	0	1.000	1.00	847
Ramp	268	0.90	Level	0	0	1.000	1.00	298
UpStream								
DownStream	84	0.90	Level	0	0	1.000	1.00	93

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 847 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1145	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1145	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 11.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.302 (Exhibit 13-11)

S_R= 61.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.1 Generated: 9/9/2012 10:09 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-SOUTH RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☑ Yes ☑ On	Number of Lanes, N	2	☐ Yes ☐ On
☐ No ☐ Off	Acceleration Lane Length, L_A	700	☑ No ☐ Off
L_{up} = 200 ft	Deceleration Lane Length L_D		L_{down} = ft
V_u = 268 veh/h	Freeway Volume, V_F	1030	V_D = veh/h
	Ramp Volume, V_R	84	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1030	0.90	Level	0	0	1.000	1.00	1144
Ramp	84	0.90	Level	0	0	1.000	1.00	93
UpStream	268	0.90	Level	0	0	1.000	1.00	298
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1144 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1237	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1237	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 10.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.285 (Exhibit 13-11)

S_R= 62.0 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 62.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS ROAD SB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 600 ft

V_u = 67 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1047
Ramp Volume, V_R	175
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1047	0.90	Level	0	0	1.000	1.00	1163
Ramp	175	0.90	Level	0	0	1.000	1.00	194
UpStream	67	0.90	Level	0	0	1.000	1.00	74
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1163 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1357	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1357	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 13.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.312 (Exibit 13-11)

S_R= 61.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.1 Generated: 9/9/2012 9:54 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 575 ft

V_u = 178 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1470
Ramp Volume, V_R	50
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1470	0.90	Level	0	0	1.000	1.00	1633
Ramp	50	0.90	Level	0	0	1.000	1.00	56
UpStream	178	0.90	Level	0	0	1.000	1.00	198
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1633 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1689	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1689	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 16.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.318 (Exibit 13-11)

S_R= 61.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	KMD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 2000 ft

V_u = 473 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1047
Ramp Volume, V_R	599
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1047	0.90	Level	0	0	1.000	1.00	1163
Ramp	599	0.90	Level	0	0	1.000	1.00	666
UpStream	473	0.90	Level	0	0	1.000	1.00	526
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1163 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1829	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1829	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 17.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.321 (Exhibit 13-11)

S_R= 61.0 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		***Site Information***	
Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 950 ft

V_u = 505 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 450

Deceleration Lane Length L_D

Freeway Volume, V_F 1101

Ramp Volume, V_R 184

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1101	0.90	Level	0	0	1.000	1.00	1223
Ramp	184	0.90	Level	0	0	1.000	1.00	204
UpStream	505	0.90	Level	0	0	1.000	1.00	561
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1223 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1427	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1427	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = 13.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.306 (Exibit 13-11)

S_R= 61.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP-DOWN
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 450

Deceleration Lane Length L_D

Freeway Volume, V_F 1101

Ramp Volume, V_R 184

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 800 ft

V_D = 63 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1101	0.90	Level	0	0	1.000	1.00	1223
Ramp	184	0.90	Level	0	0	1.000	1.00	204
UpStream								
DownStream	63	0.90	Level	0	0	1.000	1.00	70

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1223 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1427	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1427	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.306 (Exibit 13-11)

S_R= 61.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-SOUTH RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 200 ft

V_u = 184 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	700
Deceleration Lane Length L_D	
Freeway Volume, V_F	1285
Ramp Volume, V_R	63
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1285	0.90	Level	0	0	1.000	1.00	1428
Ramp	63	0.90	Level	0	0	1.000	1.00	70
UpStream	184	0.90	Level	0	0	1.000	1.00	204
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1428 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1498	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1498	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.289 (Exibit 13-11)

S_R= 61.9 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS ROAD SB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INT PREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 600 ft

V_u = 68 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 350

Deceleration Lane Length L_D

Freeway Volume, V_F 1280

Ramp Volume, V_R 68

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1280	0.90	Level	0	0	1.000	1.00	1422
Ramp	68	0.90	Level	0	0	1.000	1.00	76
UpStream	68	0.90	Level	0	0	1.000	1.00	76
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1422 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1498	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1498	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 14.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.314 (Exhibit 13-11)

S_R= 61.2 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.1 Generated: 9/9/2012 10:40 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 575 ft

V_u = 182 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1342
Ramp Volume, V_R	91
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1342	0.90	Level	5	2	0.972	1.00	1534
Ramp	91	0.90	Level	5	2	0.972	1.00	104
UpStream	182	0.90	Level	5	2	0.972	1.00	208
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1534 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1638	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1638	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 16.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.317 (Exibit 13-11)

S_R= 61.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.1 Generated: 9/9/2012 11:02 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	KMD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 2000 ft

V_u = 320 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 350

Deceleration Lane Length L_D

Freeway Volume, V_F 1113

Ramp Volume, V_R 453

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1113	0.90	Level	5	2	0.972	1.00	1273
Ramp	453	0.90	Level	5	2	0.972	1.00	518
UpStream	320	0.90	Level	5	2	0.972	1.00	366
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1273 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1791	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1791	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 17.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.320 (Exibit 13-11)

S_R= 61.0 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP UPST
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 950 ft

V_u = 491 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 450

Deceleration Lane Length L_D

Freeway Volume, V_F 939

Ramp Volume, V_R 327

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	939	0.90	Level	5	2	0.972	1.00	1074
Ramp	327	0.90	Level	5	2	0.972	1.00	374
UpStream	491	0.90	Level	5	2	0.972	1.00	561
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1074 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1448	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1448	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 13.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.306 (Exibit 13-11)

S_R= 61.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		*Site Information*	
Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP-DOWN
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W/0 INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	450
Deceleration Lane Length L_D	
Freeway Volume, V_F	939
Ramp Volume, V_R	327
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 800 ft

V_D = 101 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	939	0.90	Level	5	0	0.976	1.00	1069
Ramp	327	0.90	Level	5	0	0.976	1.00	372
UpStream								
DownStream	101	0.90	Level	2	0	0.990	1.00	113

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1069 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1441	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1441	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 13.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.306 (Exibit 13-11)

S_R= 61.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-SOUTH RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM WO INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 200 ft

V_u = 327 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	700
Deceleration Lane Length L_D	
Freeway Volume, V_F	1266
Ramp Volume, V_R	101
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1266	0.90	Level	5	2	0.972	1.00	1447
Ramp	101	0.90	Level	5	2	0.972	1.00	115
UpStream	327	0.90	Level	5	2	0.972	1.00	374
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1447 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1562	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1562	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 13.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.291 (Exibit 13-11)

S_R= 61.9 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS ROAD SB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM WO INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 600 ft

V_u = 81 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 350

Deceleration Lane Length L_D

Freeway Volume, V_F 1286

Ramp Volume, V_R 233

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1286	0.90	Level	5	2	0.972	1.00	1470
Ramp	233	0.90	Level	5	2	0.972	1.00	266
UpStream	81	0.90	Level	5	2	0.972	1.00	93
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1470 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1736	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1736	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 16.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.319 (Exhibit 13-11)

S_R= 61.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 575 ft

V_u = 239 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1793
Ramp Volume, V_R	60
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1793	0.90	Level	5	2	0.972	1.00	2050
Ramp	60	0.90	Level	5	2	0.972	1.00	69
UpStream	239	0.90	Level	5	2	0.972	1.00	273
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2050 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2119	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2119	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = 19.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.329 (Exhibit 13-11)

S_R= 60.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 60.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	KMD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 2000 ft

V_u = 576 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1277
Ramp Volume, V_R	745
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1277	0.90	Level	5	2	0.972	1.00	1460
Ramp	745	0.90	Level	5	2	0.972	1.00	852
UpStream	576	0.90	Level	5	2	0.972	1.00	659
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1460 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2312	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2312	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 20.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.336 (Exhibit 13-11)

S_R= 60.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 60.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP UPST
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 950 ft

V_u = 616 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	450
Deceleration Lane Length L_D	
Freeway Volume, V_F	1347
Ramp Volume, V_R	225
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1347	0.90	Level	5	2	0.972	1.00	1540
Ramp	225	0.90	Level	5	2	0.972	1.00	257
UpStream	616	0.90	Level	5	2	0.972	1.00	704
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1540 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1797	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1797	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 16.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.313 (Exibit 13-11)

S_R= 61.2 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP-DOWN
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W/0 INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	450
Deceleration Lane Length L_D	
Freeway Volume, V_F	1347
Ramp Volume, V_R	225
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 800 ft

V_D = 75 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1347	0.90	Level	5	2	0.972	1.00	1540
Ramp	225	0.90	Level	5	2	0.972	1.00	257
UpStream								
DownStream	75	0.90	Level	2	2	0.986	1.00	85

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1540 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1797	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1797	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 16.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.313 (Exibit 13-11)

S_R= 61.2 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-SOUTH RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM WO INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☐ Off	Acceleration Lane Length, L_A: 700	☑ No ☐ Off
L_{up} = 200 ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = 225 veh/h	Freeway Volume, V_F: 1572	V_D = veh/h
	Ramp Volume, V_R: 75	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1572	0.90	Level	5	2	0.972	1.00	1797
Ramp	75	0.90	Level	5	2	0.972	1.00	86
UpStream	225	0.90	Level	5	2	0.972	1.00	257
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1797 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1883	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1883	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 15.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.298 (Exibit 13-11)

S_R= 61.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS ROAD SB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM WO INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 600 ft

V_u = 82 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1565
Ramp Volume, V_R	205
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1565	0.90	Level	5	2	0.972	1.00	1789
Ramp	205	0.90	Level	5	2	0.972	1.00	234
UpStream	82	0.90	Level	5	2	0.972	1.00	94
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1789 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2023	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2023	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 19.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.326 (Exibit 13-11)

S_R= 60.9 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 60.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 575 ft

V_u = 50 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1474
Ramp Volume, V_R	68
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1474	0.90	Level	5	2	0.972	1.00	1685
Ramp	68	0.90	Level	5	2	0.972	1.00	78
UpStream	50	0.90	Level	5	2	0.972	1.00	57
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1685 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1763	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1763	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = 17.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.319 (Exhibit 13-11)

S_R= 61.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	TRAFTON RD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 900 ft

V_u = 207 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	1350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1335
Ramp Volume, V_R	106
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1335	0.90	Level	5	2	0.972	1.00	1526
Ramp	106	0.90	Level	5	2	0.972	1.00	121
UpStream	207	0.90	Level	5	2	0.972	1.00	237
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1526 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1647	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1647	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 9.8 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.247 (Exibit 13-11)

S_R= 63.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 63.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.1 Generated: 9/9/2012 11:54 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst TOM GORRILL
Agency or Company GORRILL PALMER
Date Performed 9/7/2012
Analysis Time Period AM W INT POSTDEVELOPMENT

Site Information

Freeway/Dir of Travel I-95 NB
Junction KMD NB ON RAMP
Jurisdiction
Analysis Year 2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 2000 ft

V_u = 1158 veh/h

Number of Lanes, N 2
Acceleration Lane Length, L_A 350
Deceleration Lane Length L_D
Freeway Volume, V_F 1158
Ramp Volume, V_R 383
Freeway Free-Flow Speed, S_{FF} 70.0
Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1158	0.90	Level	5	2	0.972	1.00	1324
Ramp	383	0.90	Level	5	2	0.972	1.00	438
UpStream	1158	0.90	Level	5	2	0.972	1.00	1324
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 1324 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1762	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1762	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 16.8 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.319 (Exibit 13-11)
S_R= 61.1 mph (Exhibit 13-11)
S_0= N/A mph (Exhibit 13-11)
S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R= mph (Exhibit 13-12)
S_0= mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP UPST
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 950 ft

V_u = 396 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 450

Deceleration Lane Length L_D

Freeway Volume, V_F 1037

Ramp Volume, V_R 331

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1037	0.90	Level	5	2	0.972	1.00	1186
Ramp	331	0.90	Level	5	2	0.972	1.00	378
UpStream	396	0.90	Level	5	2	0.972	1.00	453
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1186 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1564	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1564	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 14.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.308 (Exhibit 13-11)

S_R= 61.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP-DOWN
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 450

Deceleration Lane Length L_D

Freeway Volume, V_F 1037

Ramp Volume, V_R 331

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 800 ft

V_D = 121 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1037	0.90	Level	5	2	0.972	1.00	1186
Ramp	331	0.90	Level	5	2	0.972	1.00	378
UpStream								
DownStream	121	0.90	Level	2	2	0.986	1.00	136

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1186 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1564	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1564	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 14.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.308 (Exibit 13-11)

S_R= 61.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-SOUTH RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 200 ft

V_u = 331 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 700

Deceleration Lane Length L_D

Freeway Volume, V_F 1368

Ramp Volume, V_R 121

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1368	0.90	Level	5	2	0.972	1.00	1564
Ramp	121	0.90	Level	5	2	0.972	1.00	138
UpStream	331	0.90	Level	5	2	0.972	1.00	378
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1564 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1702	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1702	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 14.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.293 (Exibit 13-11)

S_R= 61.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 1100 ft

V_u = 192 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	1350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1297
Ramp Volume, V_R	139
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1297	0.90	Level	5	2	0.972	1.00	1483
Ramp	139	0.90	Level	5	2	0.972	1.00	159
UpStream	192	0.90	Level	5	2	0.972	1.00	220
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1483 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1642	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1642	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 9.7 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.247 (Exibit 13-11)

S_R= 63.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 63.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 1100 ft

V_u = 192 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	1350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1297
Ramp Volume, V_R	139
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1297	0.90	Level	5	2	0.972	1.00	1483
Ramp	139	0.90	Level	5	2	0.972	1.00	159
UpStream	192	0.90	Level	5	2	0.972	1.00	220
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1483 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1642	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1642	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 9.7 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.247 (Exibit 13-11)

S_R= 63.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 63.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS ROAD SB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 600 ft

V_u = 60 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1376
Ramp Volume, V_R	152
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1376	0.90	Level	5	2	0.972	1.00	1573
Ramp	152	0.90	Level	5	2	0.972	1.00	174
UpStream	60	0.90	Level	5	2	0.972	1.00	69
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1573 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1747	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1747	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 16.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.319 (Exibit 13-11)

S_R= 61.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 575 ft

V_u = 151 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1881
Ramp Volume, V_R	47
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1881	0.90	Level	5	2	0.972	1.00	2151
Ramp	47	0.90	Level	5	2	0.972	1.00	54
UpStream	151	0.90	Level	5	2	0.972	1.00	173
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2151 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2205	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2205	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 20.5 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.332 (Exibit 13-11)

S_R= 60.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 60.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	TRAFTON NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 2000 ft

V_u = 190 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	1350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1738
Ramp Volume, V_R	210
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1738	0.90	Level	5	2	0.972	1.00	1987
Ramp	210	0.90	Level	5	2	0.972	1.00	240
UpStream	190	0.90	Level	5	2	0.972	1.00	217
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1987 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2227	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2227	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 14.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.263 (Exibit 13-11)

S_R= 62.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 62.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	KMD NB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 2000 ft

V_u = 559 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1389
Ramp Volume, V_R	631
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1389	0.90	Level	5	2	0.972	1.00	1588
Ramp	631	0.90	Level	5	2	0.972	1.00	721
UpStream	559	0.90	Level	5	2	0.972	1.00	639
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1588 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2309	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2309	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 21.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.336 (Exibit 13-11)

S_R= 60.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 60.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP UPST
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 950 ft

V_u = 518 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 450

Deceleration Lane Length L_D

Freeway Volume, V_F 1445

Ramp Volume, V_R 210

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1445	0.90	Level	5	2	0.972	1.00	1652
Ramp	210	0.90	Level	5	2	0.972	1.00	240
UpStream	518	0.90	Level	5	2	0.972	1.00	592
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1652 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1892	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1892	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 17.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.315 (Exhibit 13-11)

S_R= 61.2 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-NORTH RAMP-DOWN
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N 2	☑ Yes ☑ On
☑ No ☐ Off	Acceleration Lane Length, L_A 450	☐ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D	L_{down} = 800 ft
V_u = veh/h	Freeway Volume, V_F 1445	V_D = 68 veh/h
	Ramp Volume, V_R 210	
	Freeway Free-Flow Speed, S_{FF} 70.0	
	Ramp Free-Flow Speed, S_{FR} 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1445	0.90	Level	5	2	0.972	1.00	1652
Ramp	210	0.90	Level	5	2	0.972	1.00	240
UpStream								
DownStream	68	0.90	Level	2	2	0.986	1.00	77

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1652 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1892	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1892	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 17.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.315 (Exibit 13-11)

S_R= 61.2 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP-SOUTH RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☐ Off	Acceleration Lane Length, L_A: 700	☑ No ☐ Off
L_{up} = 200 ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = 210 veh/h	Freeway Volume, V_F: 1655	V_D = veh/h
	Ramp Volume, V_R: 68	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1655	0.90	Level	5	2	0.972	1.00	1892
Ramp	68	0.90	Level	5	2	0.972	1.00	78
UpStream	210	0.90	Level	5	2	0.972	1.00	240
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1892 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1970	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1970	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 16.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.300 (Exhibit 13-11)

S_R= 61.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD SB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 1100 ft

V_u = 145 veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A 1350

Deceleration Lane Length L_D

Freeway Volume, V_F 1678

Ramp Volume, V_R 207

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1678	0.90	Level	5	2	0.972	1.00	1919
Ramp	207	0.90	Level	5	2	0.972	1.00	237
UpStream	145	0.90	Level	5	2	0.972	1.00	166
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1919 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2156	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2156	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 13.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.260 (Exibit 13-11)

S_R= 62.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 62.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS ROAD SB ON RAMP
Date Performed	9/7/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES IJR

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 600 ft

V_u = 61 veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	350
Deceleration Lane Length L_D	
Freeway Volume, V_F	1824
Ramp Volume, V_R	54
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1824	0.90	Level	5	2	0.972	1.00	2085
Ramp	54	0.90	Level	5	2	0.972	1.00	62
UpStream	61	0.90	Level	5	2	0.972	1.00	70
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2085 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2147	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2147	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 20.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.330 (Exibit 13-11)

S_R= 60.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 60.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W/O INTPREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	225
Freeway Volume, V_F	1156
Ramp Volume, V_R	57
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 575 ft

V_D = 75 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1156	0.90	Level	5	2	0.972	1.00	1322
Ramp	57	0.90	Level	5	2	0.972	1.00	65
UpStream								
DownStream	75	0.90	Level	5	2	0.972	1.00	86

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1322 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1322	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1257	Exhibit 13-8	4800	No
V_R	65	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1322	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 13.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.434 (Exhibit 13-12)

S_R= 57.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W/O INTPREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	450
Freeway Volume, V_F	1174
Ramp Volume, V_R	263
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 2000 ft

V_D = 368 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1174	0.90	Level	5	2	0.972	1.00	1342
Ramp	263	0.90	Level	5	2	0.972	1.00	301
UpStream								
DownStream	368	0.90	Level	5	2	0.972	1.00	421

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1342 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1342	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1041	Exhibit 13-8	4800	No
V_R	301	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1342	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 11.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.455 (Exhibit 13-12)

S_R= 57.3 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W/O INTPREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	500
Freeway Volume, V_F	1156
Ramp Volume, V_R	394
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 950 ft

V_D = 268 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1156	0.90	Level	5	2	0.972	1.00	1322
Ramp	394	0.90	Level	5	2	0.972	1.00	450
UpStream								
DownStream	268	0.90	Level	5	2	0.972	1.00	306

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1322 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1322	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	872	Exhibit 13-8	4800	No
V_R	450	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1322	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 11.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.469 (Exhibit 13-12)

S_R= 56.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W/O INTPREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	375
Freeway Volume, V_F	1114
Ramp Volume, V_R	67
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 600 ft

V_D = 175 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1114	0.90	Level	5	2	0.972	1.00	1274
Ramp	67	0.90	Level	5	2	0.972	1.00	77
UpStream								
DownStream	175	0.90	Level	5	2	0.972	1.00	200

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1274 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1274	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1197	Exhibit 13-8	4800	No
V_R	77	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1274	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 11.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.435 (Exhibit 13-12)

S_R= 57.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / *Site Information*

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W/O INTPREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	225
Freeway Volume, V_F	1648
Ramp Volume, V_R	178
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 575 ft

V_D = 50 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1648	0.90	Level	5	2	0.972	1.00	1884
Ramp	178	0.90	Level	5	2	0.972	1.00	204
UpStream								
DownStream	50	0.90	Level	5	2	0.972	1.00	57

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1884 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1884	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1680	Exhibit 13-8	4800	No
V_R	204	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1884	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 18.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.446 (Exhibit 13-12)

S_R= 57.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W/O INTPREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A

Deceleration Lane Length L_D 450

Freeway Volume, V_F 1520

Ramp Volume, V_R 473

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 2000 ft

V_D = 599 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1520	0.90	Level	5	2	0.972	1.00	1738
Ramp	473	0.90	Level	5	2	0.972	1.00	541
UpStream								
DownStream	599	0.90	Level	5	2	0.972	1.00	685

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\ (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1738 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1738	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1197	Exhibit 13-8	4800	No
V_R	541	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1738	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 15.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.477 (Exhibit 13-12)

S_R= 56.7 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W/O INTPREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A

Deceleration Lane Length L_D 500

Freeway Volume, V_F 1606

Ramp Volume, V_R 505

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 950 ft

V_D = 184 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1606	0.90	Level	5	2	0.972	1.00	1836
Ramp	505	0.90	Level	5	2	0.972	1.00	577
UpStream								
DownStream	184	0.90	Level	5	2	0.972	1.00	210

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1836 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1836	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1259	Exhibit 13-8	4800	No
V_R	577	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1836	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 15.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.480 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W/O INTPREDEVELOPMENT	Analysis Year	2016

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	375
Freeway Volume, V_F	1348
Ramp Volume, V_R	68
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 600 ft

V_D = 68 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1348	0.90	Level	5	2	0.972	1.00	1541
Ramp	68	0.90	Level	5	2	0.972	1.00	78
UpStream								
DownStream	68	0.90	Level	5	2	0.972	1.00	78

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1541 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1541	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1463	Exhibit 13-8	4800	No
V_R	78	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1541	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 14.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.435 (Exhibit 13-12)

S_R= 57.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst TOM GORRILL
Agency or Company GORRILL PALMER
Date Performed 9/9/2012
Analysis Time Period AM W/O INTPOSTDEVELOPMENT

Site Information

Freeway/Dir of Travel I-95 NB
Junction LYONS RD OFF RAMP
Jurisdiction
Analysis Year 2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Number of Lanes, N 2
Acceleration Lane Length, L_A
Deceleration Lane Length L_D 225
Freeway Volume, V_F 1524
Ramp Volume, V_R 182
Freeway Free-Flow Speed, S_{FF} 70.0
Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 575 ft
V_D = 91 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1524	0.90	Level	5	2	0.972	1.00	1742
Ramp	182	0.90	Level	5	2	0.972	1.00	208
UpStream								
DownStream	91	0.90	Level	5	2	0.972	1.00	104

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1742 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1742	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1534	Exhibit 13-8	4800	No
V_R	208	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1742	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 17.2 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.447 (Exhibit 13-12)
S_R= 57.5 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 57.5 mph (Exhibit 13-13)

HCS2010™ Version 6.1 Generated: 9/9/2012 1:29 PM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst: TOM GORRILL
Agency or Company: GORRILL PALMER
Date Performed: 9/9/2012
Analysis Time Period: AM W/O INTPOSTDEVELOPMENT
Freeway/Dir of Travel: I-95 NB
Junction: KMD RD OFF RAMP
Jurisdiction:
Analysis Year: 2036

Project Description: TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Number of Lanes, N: 2
Acceleration Lane Length, L_A:
Deceleration Lane Length L_D: 450
Freeway Volume, V_F: 1433
Ramp Volume, V_R: 320
Freeway Free-Flow Speed, S_{FF}: 70.0
Ramp Free-Flow Speed, S_{FR}: 35.0

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 2000 ft
V_D = 453 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1433	0.90	Level	5	2	0.972	1.00	1638
Ramp	320	0.90	Level	5	2	0.972	1.00	366
UpStream								
DownStream	453	0.90	Level	5	2	0.972	1.00	518

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1638 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1638	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1272	Exhibit 13-8	4800	No
V_R	366	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1638	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 14.3 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.461 (Exhibit 13-12)
S_R= 57.1 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 57.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W/O INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	500
Freeway Volume, V_F	1430
Ramp Volume, V_R	491
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 950 ft

V_D = 101 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1430	0.90	Level	5	2	0.972	1.00	1635
Ramp	491	0.90	Level	5	2	0.972	1.00	561
UpStream								
DownStream	101	0.90	Level	5	2	0.972	1.00	115

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1635 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1635	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1074	Exhibit 13-8	4800	No
V_R	561	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1635	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = 13.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.478 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W/O INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	225
Freeway Volume, V_F	1367
Ramp Volume, V_R	81
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 575 ft

V_D = 233 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1367	0.90	Level	5	2	0.972	1.00	1563
Ramp	81	0.90	Level	5	2	0.972	1.00	93
UpStream								
DownStream	233	0.90	Level	5	2	0.972	1.00	266

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1563 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1563	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1470	Exhibit 13-8	4800	No
V_R	93	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1563	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 15.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.436 (Exhibit 13-12)

S_R= 57.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W/O INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N	2	☑ Yes ☑ On
☑ No ☐ Off	Acceleration Lane Length, L_A		☐ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D	225	L_{down} = 575 ft
V_u = veh/h	Freeway Volume, V_F	2032	V_D = 60 veh/h
	Ramp Volume, V_R	239	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2032	0.90	Level	5	2	0.972	1.00	2323
Ramp	239	0.90	Level	5	2	0.972	1.00	273
UpStream								
DownStream	60	0.90	Level	5	2	0.972	1.00	69

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2323 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2323	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	2050	Exhibit 13-8	4800	No
V_R	273	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2323	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 22.2 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.453 (Exhibit 13-12)

S_R= 57.3 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W/O INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A

Deceleration Lane Length L_D 450

Freeway Volume, V_F 1853

Ramp Volume, V_R 576

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 2000 ft

V_D = 745 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1853	0.90	Level	5	2	0.972	1.00	2119
Ramp	576	0.90	Level	5	2	0.972	1.00	659
UpStream								
DownStream	745	0.90	Level	5	2	0.972	1.00	852

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2119 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2119	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1460	Exhibit 13-8	4800	No
V_R	659	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2119	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 18.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.487 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		*Site Information*	
Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W/O INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
☐ Yes ☐ On	Acceleration Lane Length, L_A		☑ Yes ☑ On
☑ No ☐ Off	Deceleration Lane Length L_D	500	☐ No ☐ Off
L_{up} = ft	Freeway Volume, V_F	1963	L_{down} = 950 ft
V_u = veh/h	Ramp Volume, V_R	616	V_D = 225 veh/h
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1963	0.90	Level	5	2	0.972	1.00	2244
Ramp	616	0.90	Level	5	2	0.972	1.00	704
UpStream								
DownStream	225	0.90	Level	5	2	0.972	1.00	257

Merge Areas	Diverge Areas
Estimation of v_{12}	***Estimation of v_{12}***
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 13-6 or 13-7)	L_{EQ} = (Equation 13-12 or 13-13)
P_{FM} = using Equation (Exhibit 13-6)	P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = pc/h	V_{12} = 2244 pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)	V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No	Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No	Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2244	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1540	Exhibit 13-8	4800	No
V_R	704	Exhibit 13-10	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2244	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 19.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Speed Determination

D_s = 0.491 (Exhibit 13-12)

S_R= 56.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W/O INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N 2

Acceleration Lane Length, L_A

Deceleration Lane Length L_D 225

Freeway Volume, V_F 1647

Ramp Volume, V_R 82

Freeway Free-Flow Speed, S_{FF} 70.0

Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 575 ft

V_D = 205 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1647	0.90	Level	5	2	0.972	1.00	1883
Ramp	82	0.90	Level	5	2	0.972	1.00	94
UpStream								
DownStream	205	0.90	Level	5	2	0.972	1.00	234

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1883 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1883	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1789	Exhibit 13-8	4800	No
V_R	94	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1883	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 18.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.436 (Exhibit 13-12)

S_R= 57.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	225
Freeway Volume, V_F	1524
Ramp Volume, V_R	50
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 575 ft

V_D = 68 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1524	0.90	Level	5	2	0.972	1.00	1742
Ramp	50	0.90	Level	5	2	0.972	1.00	57
UpStream								
DownStream	68	0.90	Level	5	2	0.972	1.00	78

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1742 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1742	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1685	Exhibit 13-8	4800	No
V_R	57	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1742	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 17.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.433 (Exhibit 13-12)

S_R= 57.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	TRAFTON RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	550
Freeway Volume, V_F	1542
Ramp Volume, V_R	207
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 900 ft

V_D = 106 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1542	0.90	Level	5	2	0.972	1.00	1763
Ramp	207	0.90	Level	5	2	0.972	1.00	237
UpStream								
DownStream	106	0.90	Level	5	2	0.972	1.00	121

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1763 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1763	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1526	Exhibit 13-8	4800	No
V_R	237	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1763	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 14.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.449 (Exhibit 13-12)

S_R= 57.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst TOM GORRILL
Agency or Company GORRILL PALMER
Date Performed 9/9/2012
Analysis Time Period AM W INTPOSTDEVELOPMENT

Site Information

Freeway/Dir of Travel I-95 NB
Junction KMD RD OFF RAMP
Jurisdiction
Analysis Year 2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N 2
Acceleration Lane Length, L_A
Deceleration Lane Length L_D 450
Freeway Volume, V_F 1441
Ramp Volume, V_R 283
Freeway Free-Flow Speed, S_{FF} 70.0
Ramp Free-Flow Speed, S_{FR} 35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 2000 ft

V_D = 383 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1441	0.90	Level	5	2	0.972	1.00	1648
Ramp	283	0.90	Level	5	2	0.972	1.00	324
UpStream								
DownStream	383	0.90	Level	5	2	0.972	1.00	438

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1648 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1648	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1324	Exhibit 13-8	4800	No
V_R	324	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1648	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 14.4 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.457 (Exhibit 13-12)
S_R= 57.2 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 57.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	500
Freeway Volume, V_F	1430
Ramp Volume, V_R	396
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 950 ft

V_D = 331 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1430	0.90	Level	5	2	0.972	1.00	1635
Ramp	396	0.90	Level	5	2	0.972	1.00	453
UpStream								
DownStream	331	0.90	Level	5	2	0.972	1.00	378

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1635 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1635	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1182	Exhibit 13-8	4800	No
V_R	453	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1635	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 13.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.469 (Exhibit 13-12)

S_R= 56.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	TRAFTON RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp ☐ Yes ☐ On ☑ No ☐ Off L_{up} = ft V_u = veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L_A: Deceleration Lane Length L_D: 550 Freeway Volume, V_F: 1489 Ramp Volume, V_R: 192 Freeway Free-Flow Speed, S_{FF}: 70.0 Ramp Free-Flow Speed, S_{FR}: 35.0	Downstream Adj Ramp ☑ Yes ☑ On ☐ No ☐ Off L_{down} = 900 ft V_D = 139 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1489	0.90	Level	5	2	0.972	1.00	1702
Ramp	192	0.90	Level	5	2	0.972	1.00	220
UpStream								
DownStream	139	0.90	Level	5	2	0.972	1.00	159

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1702 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1702	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1482	Exhibit 13-8	4800	No
V_R	220	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1702	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 13.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.448 (Exhibit 13-12)

S_R= 57.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	AM W INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	225
Freeway Volume, V_F	1436
Ramp Volume, V_R	60
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 575 ft

V_D = 152 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1436	0.90	Level	5	2	0.972	1.00	1642
Ramp	60	0.90	Level	5	2	0.972	1.00	69
UpStream								
DownStream	152	0.90	Level	5	2	0.972	1.00	174

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1642 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1642	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1573	Exhibit 13-8	4800	No
V_R	69	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1642	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 16.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.434 (Exhibit 13-12)

S_R= 57.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	225
Freeway Volume, V_F	2032
Ramp Volume, V_R	151
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 575 ft

V_D = 47 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2032	0.90	Level	5	2	0.972	1.00	2323
Ramp	151	0.90	Level	5	2	0.972	1.00	173
UpStream								
DownStream	47	0.90	Level	5	2	0.972	1.00	54

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2323 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2323	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	2150	Exhibit 13-8	4800	No
V_R	173	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2323	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = 22.2 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.444 (Exhibit 13-12)

S_R= 57.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	TRAFTON RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	550
Freeway Volume, V_F	1928
Ramp Volume, V_R	190
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 900 ft

V_D = 210 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1928	0.90	Level	5	2	0.972	1.00	2204
Ramp	190	0.90	Level	5	2	0.972	1.00	217
UpStream								
DownStream	210	0.90	Level	5	2	0.972	1.00	240

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2204 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2204	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1987	Exhibit 13-8	4800	No
V_R	217	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2204	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 18.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.448 (Exhibit 13-12)

S_R= 57.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 NB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	450
Freeway Volume, V_F	1948
Ramp Volume, V_R	559
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 2000 ft

V_D = 631 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1948	0.90	Level	5	2	0.972	1.00	2227
Ramp	559	0.90	Level	5	2	0.972	1.00	639
UpStream								
DownStream	631	0.90	Level	5	2	0.972	1.00	721

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2227 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2227	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1588	Exhibit 13-8	4800	No
V_R	639	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2227	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 19.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.486 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	KMD RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	500
Freeway Volume, V_F	1963
Ramp Volume, V_R	518
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 950 ft

V_D = 210 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1963	0.90	Level	5	2	0.972	1.00	2244
Ramp	518	0.90	Level	5	2	0.972	1.00	592
UpStream								
DownStream	210	0.90	Level	5	2	0.972	1.00	240

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2244 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2244	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1652	Exhibit 13-8	4800	No
V_R	592	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2244	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 19.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.481 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	TRAFTON RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W INT POSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	550
Freeway Volume, V_F	1723
Ramp Volume, V_R	145
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp
☑ Yes ☑ On
☐ No ☐ Off
L_{down} = 900 ft
V_D = 207 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1723	0.90	Level	5	2	0.972	1.00	1970
Ramp	145	0.90	Level	5	2	0.972	1.00	166
UpStream								
DownStream	207	0.90	Level	5	2	0.972	1.00	237

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1970 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1970	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1804	Exhibit 13-8	4800	No
V_R	166	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1970	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 16.2 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.443 (Exhibit 13-12)
S_R= 57.6 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 57.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / *Site Information*

Analyst	TOM GORRILL	Freeway/Dir of Travel	I-95 SB
Agency or Company	GORRILL PALMER	Junction	LYONS RD OFF RAMP
Date Performed	9/9/2012	Jurisdiction	
Analysis Time Period	PM W INTPOSTDEVELOPMENT	Analysis Year	2036

Project Description TRAFTON PROPERTIES

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	225
Freeway Volume, V_F	1885
Ramp Volume, V_R	61
Freeway Free-Flow Speed, S_{FF}	70.0
Ramp Free-Flow Speed, S_{FR}	35.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 575 ft

V_D = 54 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1885	0.90	Level	5	2	0.972	1.00	2155
Ramp	61	0.90	Level	5	2	0.972	1.00	70
UpStream								
DownStream	54	0.90	Level	5	2	0.972	1.00	62

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\ (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2155 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2155	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	2085	Exhibit 13-8	4800	No
V_R	70	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2155	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 20.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.434 (Exhibit 13-12)

S_R= 57.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.8 mph (Exhibit 13-13)

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WATERVILLE AND SIDNEY
ACCESS PLANS

CITY of
Waterville
MAINE
Office of the
City Manager

October 16, 2012

Mr. Herb Thomson, Director
Bureau of Transportation Systems Planning
Maine Department of Transportation
State House Station 16
Augusta, Maine 04333

Dear Mr. Thomson,

In regards to the Trafton Realty, LLC Interchange Justification Report currently under review by your office, I have been made aware that the Department and the Federal Highway Administration seek clarification as to the future intentions of the City of Waterville to seek access to I-95 beyond the current request contained in the IJR now before you.

The City of Waterville is on record supporting the request for a new I-95 interchange at or in the vicinity of Trafton Road. The City has no plans nor is it aware of any regarding any further requests for access within the City to I-95.

Please feel free to contact me should you have any further questions.

Sincerely,

Michael Roy
City Manager

cc: Harry Kojoian, Trafton Properties
Daryl Belz, MDOT
Jeff McEwen, P.E., FHWA
John Melrose

Waterville
CONVERGE & CREATE

City Hall, 1 Common Street, Waterville, ME 04901-6699
Phone: (207) 680-4204 | Fax: (207) 680-4207
mroy@waterville-me.gov | www.waterville-me.gov

Town of Sidney, Maine

2986 Middle Road, Sidney, ME 04330
Phone: 207-547-3340 / 207-547-3159 Fax: 207-547-5054

October 15, 2012

Mr. Herb Thomson, Director
Bureau of Transportation Systems Planning
Maine Department of Transportation
State House Station 16
Augusta, Maine 04333

Dear Mr. Thomson,

In regards to the Trafton Realty, LLC Interchange Justification Report (IJR) currently under review by your office, I have been made aware that the Department and the Federal Highway Administration seek clarification as to the future intentions of the Town of Sidney to seek access to I-95 beyond the current request contained in the IJR now before you. The Town of Sidney is on record supporting the request for a new I-95 interchange at or in the vicinity of Trafton Road. The Town has no plans nor is it aware of any regarding any further requests for access within the Town to I-95.

Sincerely,
Town of Sidney
Board of Selectmen

John Whitcomb, Chairman

Eugley
Doug Eugley

Brent Dugal

Peter Schutte
Peter Schutte

Kelly Couture
Kelly Couture

PUBLIC PARTICIPATION RECORDS

MID-MAINE
CHAMBER OF
COMMERCE
Making the Difference

One Post Office Square • Waterville, ME 04901
Telephone (207) 873-3315 • Fax (207) 877-0087
info@midmainechamber.com
www.midmainechamber.com

Mayor Paul LePage
City of Waterville
One Common Street
Waterville, ME 04901

March 4, 2010

Dear Mayor LePage,

At the February meeting of the Board of Directors of the Mid-Maine Chamber of Commerce, the Board received a presentation from representatives of Trafton Properties. The presentation spoke to the need for improved access to Trafton Road via I-95. As you are well aware, there is an abundance of land development prospects located south of Kennedy Memorial Drive, KMD, including the Waterville Airport Business Park and the unique 900 acre assemblage owned by Trafton Properties. The connection of sewer lines to Oakland now underway adds to the development opportunity in this area. Yet, without improved access to and from I-95, these development prospects will be less likely to materialize.

At present, the I-95 ramps at Kennedy Memorial Drive are approaching full utilization. Meanwhile the mainline capacity of I-95 through Waterville remains underutilized. Another significant transportation asset, the Donald Carter Memorial Bridge also is underutilized but is constrained where it intersects with Kennedy Memorial Drive. I-95 and the Donald Carter Memorial Bridge are two of Waterville's most significant development assets. The Chamber wishes to see these assets employed to a greater degree to spur our economy.

Current traffic projections suggest that KMD will hit capacity in 2015 at the I-95 ramps and at the Cool/Colette, West River Road, Carter Memorial Drive signalized intersections. That forecast extends out to 2021 if signalization improvements now planned are made on KMD. To put the capacity issue in perspective, one additional medium to large grocery store or its equivalent would use up the remaining capacity on KMD. At that point, gaining a traffic movement permit for additional development will become problematic and potentially prohibitive due to the mitigation costs that would likely be imposed. A new Trafton Road interchange would make development to the south of KMD not reliant on KMD and would also lend economic support to Winslow, Oakland and Sidney.

At one time in the 1980's, the City, Maine DOT and FHWA were all on record endorsing a new I-95 Interchange at the Trafton Road. Press reports at that time indicated the project was funded. Procedural delays and declining financial fortunes ultimately stalled the initiative. Our dire need for economic development combined with the forecasted capacity limits on KMD, clearly suggests it is time to revisit the Trafton Road Interchange project. We ask that the City play a leadership role in forging a partnership of interests that can advance this project through the design and permitting stages so we have a project that is ready to go.

In the past, the City and the MaineDOT have indicated a willingness to advance this project to construction if significant development prospects materialize. The problem with that approach is that development will be deterred by the wait involved in getting an interchange designed and permitted. Like a business park that has already been planned, designed and permitted for prospective tenants, Waterville needs to take the delay and risk out of the interstate access issue by having a project that is, as they say, "shovel ready".

We are pleased to learn that Trafton Properties has already engaged the services of local professionals to design and engineer different configurations for a proposed on off ramp and we are pleased with their offer to donate the right of way needed under their preferred interchange design. We believe they have offered other ideas that can materially help in keeping overall project costs down. We note that they have an established track record with the community by filling the long vacant Wyandotte mill with tenants that are now making a substantial tax contribution to the City of Waterville. Finally, we appreciate their willingness to place their marketing priority on attracting manufacturing and transportation related businesses with residential and commercial retail development not being a marketing priority.

In closing, we urge the City of Waterville to reaffirm the City's support for constructing an I-95 interchange at Trafton Road. We further request that the City convene interested parties to identify a strategy for getting this project designed, permitted and built. Thank you for your consideration of the Chamber's position on this matter. Please let us know how we can be of further service in advancing this initiative.

Sincerely,

Mike Crowell
Chair of the board
Mid-Maine Chamber of Commerce

Kind regards,

Kimberly N. Lindlof
President & CEO
Mid-Maine Chamber of Commerce

cc: Michael Roy, city of Waterville
Harry Kojoian, Trafton Properties

Waterville Development Corporation

March 23, 2010

Dear Mayor LePage,

The Waterville Development Corporation met on March 9th and included on the agenda was the topic of developing an Interstate-95 interchange at Trafton Road. At this meeting we heard from three representatives from Trafton properties and received briefing materials prepared by them. The WDC Board had a thorough and lively conversation on this topic that concluded with a unanimous vote of support for this project coupled with a request to the City that it renew its commitment to having an interchange built at this location. We know the City has considered this issue in the past and at times has been very active in its advocacy for such an improvement. A renewed effort would be timely given development interests and the lead times required for a project like this to come to fruition.

Much of the discussion that took place among Board members addressed how this initiative would complement other Waterville economic development activities and assets. The conversation concluded with the belief that this additional investment would enhance Waterville's overall economic development offerings and would improve our competitive position. How well we maximize the benefits from such an investment will rest with the City through its own community planning and development leadership. The WDC stands ready to assist in this regard.

It is understood that transportation capital financing is very tight at the moment. This impediment could be overcome if Waterville was in a position to assure prospective developers that it had secured the necessary local, state and federal approvals to proceed with construction. Construction could then be financed as part of an overall development plan involving a mix of private and public financing. Trafton Properties has indicated a willingness to donate a portion of its land for the interchange. This scenario cannot play out unless approvals are in hand. While the cost of securing such approvals is relatively low compared to overall project costs, the time required to secure approvals is the real obstacle to prospective development. Therefore, we encourage the City to work with interested stakeholders to devise a strategy for securing the necessary approvals to proceed with construction.

Thank you for your consideration of this request.

Doug Cutchin, WDC Chair

cc:
Michael Roy, Waterville City Manager
Harry Kojoian, Trafton Properties

CENTRAL MAINE GROWTH COUNCIL

Four Communities... One Vision!

March 30, 2010

Dear Mayor LePage,

At the March 16th meeting of the Board of Directors of the Central Maine Growth Council, the matter of building a new interstate interchange at Trafton Road was discussed. Representatives of Trafton Properties were on hand to give their perspective. The Board also had for its review copies of the recent letter sent to you from the Mid-Maine Chamber of Commerce which extended their support for this initiative. Following discussion, the Board voted unanimously to support this proposal. Peter Neilsen, the Oakland Town Manager, abstained since he expects his Town Council to take up this matter at a future time.

I will not reiterate the points made to you previously in the letter from the Chamber but I will say that we thought their comments were well considered and on target. On behalf of the region CMGC serves, I would add that this initiative has good potential to expand our land development opportunities and diversify our economy. With a Trafton Road interchange, Waterville will expand capacity to attract business and industry to our area and create good paying jobs. Those businesses and jobs will add customers to our downtowns and retail centers. Neighboring communities will benefit as well.

The benefits of a new interchange to Waterville and the region extend well beyond the prospects for Trafton Properties. However, at the moment they are the principal initiators for getting this conversation going again. Their representatives have done well in establishing relations with our organization and I believe we will work well together in the future to make sure we optimize all of the development assets of our region in a coordinated manner.

The Growth Council thanks you for your consideration of its position in support of the construction of an interchange at Trafton Road. CMGC asks that this matter be brought before the City Council and urges the City to reaffirm its support for this important infrastructure investment.

Regards,

Doug Cutchin, CMGC Board Chair

John Butera, CMGC Executive Director

cc:

Harry Kojoian, Trafton Properties, Mike Roy, Waterville City Manager

One Common Street • Waterville, Maine 04901 • Tel.: 207.680.7300 • Fax: 207.680.4207
info@centralmaine.org • www.centralmaine.org

Town of Sidney, Maine

2986 Middle Road, Sidney, ME 04330
Phone: 207-547-3340/207-547-3159 Fax: 207-547-5054

March 29, 2010

Ms. Nancy Waddell, President
Trafton Properties, Inc.
272 Valley Road, Suite 3
Middletown, RI. 02842

Dear Ms. Waddell,

The Board of Selectmen of the Town of Sidney had the opportunity on two occasions earlier this year to meet with representatives of your company to discuss advancing job creation and business development in our community through the construction of a new I-95 interchange. The proposed interchange would be located at Trafton Road just across the Sidney-Waterville Town line. We understand that a proposed interchange at this location received local, state and federal approvals in the 1980's but languished as financing became more difficult. We support the efforts of Trafton Properties to revive this proposal.

Our support is based on the knowledge that Trafton Properties owns over 900 acres it seeks to develop in proximity to the proposed interchange with roughly half of this property located in Sidney. Your stated intention is to market this property to manufacturers and business prospects other than commercial retail. This has been your approach with the former Wyandotte Mill complex that you own. As we indicated at meetings with your representatives, Sidney seeks to build its tax base and support the creation of decent paying jobs. Your objectives and ours seem to be in alignment.

Since our last meeting it is our understanding that this proposal has been unanimously endorsed by the Mid-Maine Chamber of Commerce, the Central Maine Growth Council and the Waterville Development Corporation. We encourage you to continue to build the base of support for this initiative and certainly hope you will receive a favorable response from the City of Waterville and neighboring communities like Oakland and Winslow who are also likely to be beneficiaries.

We are well aware that this is a complex and time consuming undertaking and that you are only in the early phases of advancing the interchange proposal. We would encourage Trafton Properties to continue to apprise the Town of Sidney of its plans for development. While it is premature to discuss development incentives the Town might consider to attract business and industry to our community, we are willing to entertain that conversation at the appropriate time.

Sincerely,

Jeff Frost

Jeff Frost, Chairman
Town of Sidney
Board of Selectmen

Cc:
Mike Heavener, Winslow Town Manager
Peter Neilsen, Oakland Town Manager
Mike Roy, Waterville City Manager

CITY OF WATERVILLE

REGULAR MEETING **COUNCIL AGENDA** **APRIL 6, 2010**

PUBLIC HEARING

6:45 P.M.
CDBG PUBLIC SERVICE GRANT APPLICATION (EDUCARE)

REGULAR MEETING

7:00 P.M.

APPROVAL OF CONSENT AGENDA

UNFINISHED BUSINESS

NONE

NEW BUSINESS

RESOLUTION NO 38----AUTHORIZING THE ISSUANCE OF A SECONDHAND DEALER LICENSE TO CARRIE ROSSIGNOL D/B/A "VIDEO GAME EXCHANGE"

RESOLUTION NO 39----AUTHORIZING THE ISSUANCE OF A SPECIAL AMUSEMENT PERMIT TO LUCIA HAYWOOD, ROBERT HAYWOOD D/B/A "GLO"

RESOLUTION NO 40----REFERENCE TO THE PLANNING BOARD BY THE CITY COUNCIL AN AMENDMENT TO THE ZONING MAP (PINE CONE SHOP)

RESOLUTION NO 41----AUTHORIZING AN APPLICATION FOR A CDBG PUBLIC SERVICE GRANT (EDUCARE)

RESOLUTION NO 42----AUTHORIZING OUTDOOR DINING FOR DOWNTOWN RESTAURANTS

RESOLUTION NO 43----BID AWARD - FY 10/11 PAVEMENT REHABILITATION PROJECTS

RESOLUTION NO 44----BID AWARD - TRAFFIC PAINT & ACCESSORY SUPPLIES

RESOLUTION NO 45----SUPPORT FOR THE CONSTRUCTION OF INTERSTATE-95 INTERCHANGE AT TRAFTON ROAD

RESOLUTION NO 46----LISTING AGREEMENT FOR AIRPORT BUSINESS PARK LOTS

ORDER NO 09---------TO PURCHASE PROPERTY TO IMPROVE THE FIRST RANGEWAY 5 WAY INTERSECTION

ORDER NO 10---------AUTHORIZATION FOR SPECIAL MUNICIPAL ELECTION TO BE HELD ON JUNE 8 2010 FOR THE WATERVILLE PUBLIC SCHOOL BUDGET REFERENDUM THE CONTINUATION OF THE BUDGET VALIDATION REFERENDUM PROCESS AND THE AOS SCHOOL BUDGET REFERENDUM

ORDER NO 11---------AN ORDER PROVIDING FOR APPROPRIATION OF MUNICIPAL AND SCHOOL OPERATING BUDGETS FOR THE PERIOD OF JULY 1, 2010 THROUGH JUNE 30, 2011

ORDINANCE NO 01-----REPEAL OF ORDINANCE 13-1989 AND ACCEPTANCE OF ZONING ORDINANCE

APPOINTMENTS

WATERVILLE HOUSING AUTHORITY COMMISSIONERS

KIMBERLY E WORKMAN - TERM TO EXPIRE 2012

PUBLIC LIBRARY TRUSTEES

GEORGE MYERS, JR - TERM TO EXPIRE
MARNIE TERHUNE - TERM TO EXPIRE

COMMUNITY NOTES

CITY OF WATERVILLE

CITY COUNCIL

RESOLUTION NO.: 45-2010

A RESOLUTION PROVIDING FOR:

SUPPORT FOR THE CONSTRUCTION OF AN INTERSTATE-95 INTERCHANGE AT TRAFTON ROAD

BE IT RESOLVED by the City Council of the City of Waterville, acting as the municipal officers, as follows:

WHEREAS future growth prospects for Waterville will depend in part on enhanced access to one of the region's most significant economic assets, Interstate-95; and

WHEREAS, despite planned signalization improvements, Kennedy Memorial Drive (KMD) will reach capacity in 2021 at the I-95 ramps and at its intersections with Cool Street, Colette Street, West River Road, and Carter Memorial Drive, at which time potential economic development will be thwarted by traffic mitigation costs, and

WHEREAS, an abundance of vacant land is situated south of KMD, including City-owned land at the Waterville Airport Business Park and 900 acres owned by Trafton Properties off of Trafton Road in Waterville, Sidney, and Oakland; and

WHEREAS, the extension of the sewerage line down Webb Road to Oakland enhances development opportunities south of KMD;

NOW THEREFORE, BE IT RESOLVED that this City Council endorses the construction of an I-95 interchange at Trafton Road to support future development south of Kennedy Memorial Drive.

S/ DANA W. SENNETT
Dana W. Sennett,
Chair, City Council

IN THE CITY COUNCIL

April 6 2010, Read and Adopted.

Eileen Strahan
CITY CLERK

APPROVED, April 8, 2010

Paul LePage
MAYOR

CITY OF WATERVILLE

REGULAR MEETING **COUNCIL AGENDA** **SEPTEMBER 7, 2010**

REGULAR MEETING

7:00 P.M.

APPROVAL OF CONSENT AGENDA

UNFINISHED BUSINESS

ORDER NO 25---------TO APPLY AND ACCEPT FAA GRANT FOR AIRPORT DESIGN
(SECOND READING)

ORDER NO 26---------ACCEPTANCE OF BID (SNOW DUMP)
(SECOND READING)

ORDER NO 27---------ACCEPTANCE OF BID (TWO CENT BRIDGE)
(SECOND READING)

NEW BUSINESS

RESOLUTION NO 117---OPPOSITION TO THE PSAP CONSOLIDATION PROPOSAL

RESOLUTION NO 118---I-95 INTERSTATE ACCESS PROJECT ADVISORY COMMITTEE

RESOLUTION NO 119---REFERENCE TO THE PLANNING BOARD BY THE CITY COUNCIL: AN AMENDMENT TO THE ZONING ORDINANCE (MEDICAL MARIJUANA DISPENSARIES)

RESOLUTION NO 120---ADVANCE AUTHORIZATION TO ACCEPT AND APPROVE LOWEST RESPONSIBLE BID-FY 10/11 HEATING FUEL

ORDER NO 28---------SALE OF CITY PROPERTY (55 SUMMER ST)

ORDER NO 29---------TRANSFER OF FUNDS FROM THE GENERAL FUND TO THE TIF FUND

ORDER NO 30---------ACCEPTANCE OF GRANT FUNDS

ORDER NO 31---------ACCEPTANCE OF GRANT FROM EFFICIENCY MAINE TRUST

SPETEMBER 7, 2010

ORDER NO 32---------	APPROVAL OF AGREEMENT WITH COLBY COLLEGE AND MAINE DOT
RESOLUTION NO 121---	A DECLARATION OF INTENT FOR BOND ISSUANCE AND GENERAL/CAPITAL FUNDS REIMBURSEMENT
ORDER NO 33---------	ACCEPTANCE OF BID FOR PINE RIDGE GOLF COURSE

MANAGER'S REPORT

COMMUNITY NOTES

CITY OF WATERVILLE

CITY COUNCIL

RESOLUTION NO. 118-2010

A RESOLUTION PROVIDING FOR
I-95 INTERSTATE ACCESS PROJECT ADVISORY COMMITTEE

BE IT RESOLVED by the City Council of the City of Waterville, acting as the municipal officers as follows:

THAT, a committee be assembled with representatives from concerned organizations as shown on the attached Purpose Statement to study the growth potential of the southern section of the City adjacent to the I-95 corridor.

Paul R LePage

Paul R LePage
Mayor

IN THE CITY COUNCIL

September 7, 2010, Read and Adopted.

Arlene Strahan

City Clerk

APPROVED September 10, 2010

Paul R LePage

Mayor

TRAFTON ROAD INTERCHANGE STUDY COMMITTEE
WEDNESDAY, OCTOBER 20, 2010
CITY COUNCIL CHAMBERS
4:30PM

AGENDA

1. Welcome and Review of Purpose Statement (Mike Roy)
2. Process Overview (Mike Roy)
3. Explanation of Purpose and Need Statement (John Melrose)
4. Review of Alternative Analysis Process (John Melrose)
5. Election of Chairperson
6. Discussion of Future Meeting Dates

I-95 Interstate Access Project Advisory Committee

On April 8, 2010 the Waterville City Council adopted a resolve endorsing the "construction of an I-95 interchange at Trafton Road to support future development south of Kennedy Memorial Drive". The charge of the I-95 Interstate Access Project Advisory Committee is to assist the City with the planning of this proposed initiative and to make recommendations to the City Council that will advance project implementation.

Specifically, the Council seeks recommendations from the Committee as follows:

- Suggested language for a project purpose and need statement likely to gain state and federal approval under both FHWA and ACOE requirements
- Identification of project alternatives including the no-build alternative to be examined as part of a required state and federal alternatives analysis
- Identification of issues to be considered through the City's current efforts to update the comprehensive plan
- A suggested scope of work for the city to approve in concert with state and federal officials that will advance the work required to secure all necessary local, state and federal approvals

MEMBERSHIP

- City Councilor(s) -- John O'Donnell & Rosemary Winslow
- Peter Nielsen, Town Mgr. Oakland
- Representative from Sidney
- George Spann, Thomas College
- John Butera, Growth Council
- Chris Huck, KVCOG
- Harry Kojoian, Trafton Properties
- Peter McAllister, Mid State Machine
- Paul Mitchell -- Planning Board member

Ex Officio Members

- Ann Beverage, City Planner
- Mark Turner, Director Public Works
- John Melrose, Maine Tomorrow
- Mike Roy, City Manager

REPORTING

It is expected that the Committee would conclude this charge this year but remain in existence to support this initiative as it moves to the next phase of implementation.

Greater Waterville I-95 Access Enhancement Initiative

Prepared for the I-95 Access Project Advisory Committee

October 18, 2010

Overview

Future growth prospects for the greater Waterville region will depend in part on enhanced access to the region's most significant transportation asset for economic development, Interstate 95. At present the I-95 interchange at Kennedy Memorial Drive is approaching full utilization while the mainline capacity of I-95 through Waterville remains underutilized. The Donald Carter Memorial Bridge is another area transportation asset for economic development that is underutilized but constrained where it intersects with Kennedy Memorial Drive.

Projections by traffic engineers suggested that KMD would hit capacity in 2015 at the I-95 ramps and at the Cool/Colette, West River Road, Carter Memorial Drive signalized intersections. That forecast extends out to 2021 with signalization improvements made on KMD. To put the capacity issue in perspective, one additional medium to large grocery store or its equivalent would use up the remaining traffic handling capacity on KMD. At that point, gaining a traffic movement permit through the State for additional development will become problematic and potentially prohibitive due to mitigation costs. This circumstance poses risk to planned developments like FirstPark and the Waterville Airport Business Park.

The current severely limited fiscal capacity of the MaineDOT and U.S. DOT means government is not likely to fix this problem on its own. By default, as is now occurring throughout the state in similar circumstances, developments that add traffic to roads that are at capacity generally are required to fix the problem at their expense or at a minimum share the expense with government. If the costs are too high for developers as might be the case with KMD, future development comes to a halt. When a road hits capacity, the existing development on the ground is often also placed at risk. Commerce generally thrives with high traffic flow but when traffic flow exceeds capacity existing commerce often hits a growth wall.

The functionality of transportation infrastructure is critical to the economic engine lining KMD. It is also critical to the south Waterville, north Sidney area where there is an abundance of land development prospects but poor connectivity to I-95. Improved I-95 access for this area could extend the capacity of KMD while improving the development prospects for south Waterville and north Sidney including the Waterville Airport Business Park, the unusual 900 acre cluster of parcels held for development by Trafton Properties, the retired Waterville solid waste site and the Brownfield site on West River Road also owned by the City of Waterville. Work currently underway connecting sewer service between Oakland and Waterville in this area adds to the development opportunities south of KMD.

Project History

The City of Waterville has attempted over three decades to address this issue most notably through its support for a Trafton Road interchange with I-95. The history of that effort is chronicled here:

- July 1986, Maine DOT completes Trafton Road Interchange Study
- January 1987, FHWA approves Trafton Road Interchange

- Spring 1987, Maine DOT funds Trafton Road Interchange in 1988-1989 BTIP
- September 1987, Maine DOT deems project "contingent upon a firm commitment from the City and private developers toward developing the area this new interchange would serve"
- 1989-1998, City shifts request from Trafton to Webb then back to Trafton Road
- 1998, FHWA issues guidance and procedures on granting new access to the Interstate
- 2009, Trafton Properties retains Maine Tomorrow and Gorrill-Palmer Consulting Engineers to conduct a preliminary feasibility review for a Trafton Road interchange
- March 2010, unanimous project endorsements received from the Mid-Maine Chamber of Commerce, the Waterville Development Corporation and the Central Maine Growth Council
- March 29, 2010, letter of support received from the Town of Sidney
- April 6, 2010, resolution of support passed unanimously by the Waterville City Council
- September 7, 2010, Waterville City Council unanimously supports resolution forming the I-95 Access Project Advisory Committee

Project Process

- Convene the I-95 Project Advisory Committee
- Advisory Committee recommends a NEPA Project Purpose and Need statement to the City of Waterville, Maine DOT and FHWA
- Advisory Committee recommends to the City, MaineDOT and FHWA project alternatives to consider under a NEPA alternatives analysis
- Advisory Committee recommends changes, if needed, to local, regional and state plans to assure consistency with the project initiative and recommendations
- Secure a consensus of the City, MaineDOT and FHWA on a Purpose and Need Statement and on the alternatives to be reviewed under the alternatives analysis
- MaineDOT, FHWA and the City agree on a project study scope of work that when completed would result in a shovel ready project meaning all local, state and federal approvals are secured
- Secure funding to complete the scope of work
- Complete the scope of work working with the Project Advisory Committee in close consultation with MaineDOT and FHWA
- Assuming an acceptable outcome for the key stakeholders, secure financing for the preferred alternative selected by the MaineDOT and FHWA

Committee Representation

Waterville City Councilors John O'Donnell and Rosemary Winslow, Waterville Planning Board Member Paul Mitchell, Oakland Town Manager Peter Nielsen, Town of Sidney representative, John Butera of Central Maine Growth Council, Chris Huck of Kennebec Valley Council of Governments, Harry Kojoian of Trafton Properties, Paul Boghossian of the Waterville Development Corporation, George Spann of Thomas College and Peter McAllister of Mid-State Machine

Greater Waterville I-95 Access Enhancement Initiative

Draft Purpose and Need Statement
October 18, 2010

The following is offered to stimulate discussion and ideas on what a purpose and need statement might entail for a transportation study of this initiative. It is best to get all ideas and suggestions of the Project Advisory Committee surfaced early in this process so collaboration with City, State and Federal officials can be as informed as possible. It is important to keep in mind that the drafting of a purpose and need statement typically involves many stakeholders and the draft usually undergoes many rewrites before a consensus statement emerges. Further, the final decision on content rests with the lead agency which in this case might be jointly shared by FHWA and MaineDOT. The following initial suggestions are offered:

Purposes

1. Reduce transportation impediments to planned development south of KMD.
2. Improve regional mobility.
3. Sustain a level of service on KMD sufficient to support existing and planned uses along the corridor.
4. Expand freight and passenger transportation connectivity.
5.

Needs

1. A traffic choke point is forecasted at the I-95/KMD interchange
2. Traffic choke points are forecasted on KMD at the intersections with Cool, Colette, West River Road and Carter Memorial Drive
3. I-95 access for south Waterville and north Sidney is inadequate to support manufacturing, distribution and warehousing employment growth
4. Connectivity and balance of area traffic is not optimized
5. Emergency response times are not minimized
6. Truck freight movements on the Interstate are not maximized
7.

For discussion purposes only

Preliminary Alternative Interchange Analysis – October 20, 2010

Maine Tomorrow and Gorrill-Palmer Consulting Engineers have evaluated on a very preliminary basis three alternative I-95 interchange access alternatives to serve south Waterville and north Sidney development prospects. These are suggestions for the I-95 Interstate Access Advisory Committee to consider under a NEPA alternatives analysis. Each option requires MaineDOT and FHWA approval to break the current control of access. A sketch for two of these alternatives accompanies this summary.

An alternatives analysis must include consideration of the so-called no build alternative. The no build option represents the status quo and is not elaborated upon further in this summary. Consideration was given to the Webb Road as an alternative but FHWA guidance encourages a minimum interchange spacing of 3 miles in rural areas. The distance from the Kennedy Memorial Drive (KMD) interchange to Webb Road falls well below that minimum so this alternative was dropped.

Trafton Road Interstate Access Alternative – (sketch provided)

- Construct a full movement interchange at Trafton Road using the southerly quadrants owned by Trafton Properties to minimize right of way costs
- Maximize distance from on/off ramps to Trafton Road Bridge to provide safe sight distances
- Widen under the Trafton Road Bridge to accommodate acceleration and deceleration lanes
- Upgrade Trafton Road bridge over I-95 only when it reaches its useful life (current bridge is comparable to the Sidney Lyons Road overpass)
- Upgrade Trafton Road to same standards in place on Lyons Road in Sydney

Town Farm Road Access Alternative

- Construct a full movement interchange at Town Farm Road using the northerly quadrants owned by Trafton Properties to minimize right of way costs.
- Maximize distance from on/off ramps to Town Farm Road Bridge to provide safe sight distances
- Widen under the Town Farm Road Bridge to accommodate acceleration and deceleration lanes
- Upgrade Town Farm Road bridge over I-95 only when it reaches its useful life assuming the current bridge is comparable to the Sidney Lyons Road overpass
- Upgrade Town Farm Road to same standards in place on Lyons Road
- Construct northbound ramps to include likely relocation of Eight Rod Road

Eight Rod Road and West Frontage Road Alternative – (sketch provided)

- Construct a connector road between Trafton Road and Town Farm Road west of I-95
- Reconstruct Eight Rod Road
- Construct southbound on/off ramps to the west connector road and northbound on/off ramps to Eight Rod Road
- Upgrade Trafton Road and Town Farm Road

I-95 ACCESS ADVISORY COMMITTEE

Minutes of Meeting

October 20, 2010

4:30pm – The meeting opened with the following members present:

Paul Mitchell
Ann Beverage
John Butera
Chris Huck
Harry Kojoian
John Melrose
Peter Nielsen
Ann Beverage
Rosemary Winslow
Peter McAllister
George Spann
John O'Donnell
Mark Turner
Mike Roy

Mike Roy welcomed everyone and briefly explained the purpose for the Committee's formation. He gave a brief history of the City's interest in the formation of this Committee. He noted that the Town of Sidney was invited to have a representative on the Committee and is expected to make an appointment by the next meeting.

Mr. Mitchell provided a summary of the City's prior proposals for an I-95 interchange at Trafton Road and Webb Road and explained that the Wyandotte Mill was relocated to Trafton Road as part of a federally funded downtown urban renewal program that also paid for the extension of public water to the new site. Mr. Melrose noted that the Trafton Road interchange was approved by both the State and federal agencies in the late 1980's and, in fact, funded. The project was sidetracked when the City could not decide which road they preferred to align with the interchange.

PURPOSE & NEED

John Melrose helped lead a discussion on developing a Purpose and Need Statement. The Committee reviewed a draft statement dated October 18, 2010, listing project needs and purposes. All agreed that the following purposes are important for this study:

1. Reduce transportation impediments to planned development south of KMD.
2. Improve regional mobility.
3. Sustain a level of service on KMD sufficient to support existing and planned uses along the corridor.
4. Expand freight and passenger transportation connectivity.

Chris Huck suggested consideration be given to the additional purposes of energy savings and air quality improvement through congestion mitigation.

Likewise, the following needs were also identified:

1. A traffic choke point is forecasted at the I-95/KMD interchange
2. Traffic choke points are forecasted on KMD at the intersections with Cool, Colette, West River Road and Carter Memorial Drive
3. 1-95 access for south Waterville and north Sidney is inadequate to support manufacturing, distribution and warehousing employment growth
4. Connectivity and balance of area traffic is not optimized
5. Emergency response times are not minimized
6. Truck freight movements on the Interstate are not maximized

ALTERNATIVE ANALYSIS

The Committee reviewed a preliminary analysis of three (3) alternatives to a Trafton Road interchange. John Melrose explained in detail how this is a required element of any proposed interchange project. Preliminary designs were also reviewed. The Webb Road alternative was not considered as it is within three (3) miles of Kennedy Memorial Drive interchange. Peter Nielsen registered Oakland's concerns for alternatives that would result in a potential loss of commerce on KMD or any new road maintenance burdens that might arise for the Town.

NEXT STEPS

Chris Huck said the interchange concept was mentioned in their regional transportation plan but that it was a lower priority due to current funding constraints. He thought the project was not mentioned in the six year transportation plan that goes to MaineDOT but he was going to check. He urged the group to consider alternative funding options like the U.S. Economic Development Agency. Mike Roy and John Melrose were asked to meet with MDOT officials to further define the process going forward. This will be the subject of the next meeting. There was a discussion around zoning and it is likely this topic will need to be revisited.

NEXT MEETING

It was agreed to meet again on Wednesday, November 17 @ 4:30pm in the City Council Chambers.

Respectfully Submitted,

Mike Roy

TRAFTON ROAD INTERCHANGE STUDY COMMITTEE
WEDNESDAY, NOVEMBER 17, 2010
CITY COUNCIL CHAMBERS
4:30PM

AGENDA

1. Welcome and Introduction of Sidney Representative to Committee
2. Review Minutes of Prior Meeting (See Attached)
3. Report of Meeting with DOT Officials
4. Next Steps
    a. Recommendation on Purpose and Need Statement
    b. Recommendation on Alternatives Analysis
    c. Preliminary Outline of Suggested Scope of Work
5. Election of Chairperson
6. Discussion of Future Meeting Dates

I-95 ACCESS ADVISORY COMMITTEE

Minutes of Meeting
November 17, 2010

4:30pm – The meeting opened with the following members present. Bob Willette was introduced as the new member from Sidney.

Ann Beverage
Chris Huck
Harry Kojoian
John Melrose
Peter Nielsen
Ann Beverage
Rosemary Winslow
Peter McAllister
John O'Donnell
Mark Turner
Mike Roy
Bob Willette

MINUTES: Minutes of the prior meeting were approved as presented.

MEETING WITH D.O.T. OFFICIALS

Mike and John reported on the November 4 meeting with Commissioner David Cole, Kat Beaudoin, Chief of Transportation Systems Planning, Dave Bernhardt, Director of Engineering and Operations and Tom Gorrill of Gorrill Palmer Consulting Engineers. The meeting took about an hour and a half with the Commissioner sitting in for two-thirds of the meeting. Perhaps the most significant part of the meeting was the clear position the Department took that they would not insist on having the Trafton Road Bridge replaced assuming the preferred alternative was the one with ramps coming on to Trafton Road. This determination is critical to arrive at an affordable solution. MaineDOT may want to locate the ramps in such a way as to accommodate the placement of a new bridge just south of the existing one when a replacement is needed. Kat Beaudoin agreed to provide further feedback on the process going forward which she did and that work was presented to the Committee. This feedback is preliminary to a meeting with FHWA to seek their input. In regards to alternatives, the Department may want to include an examination of upgrades to Kennedy Memorial Drive to get more capacity out of that road before building a new interchange. The Director of Engineering and Operations, Dave Bernhardt, who has design experience with KMD, indicated his doubts on the utility of that option. The Department was skeptical on the alternative presented where the ramps lie between Trafton and Town Farm Road hooking into Eight Rod Road and a new road running parallel to I-95 on the west. They did not ask to remove it from consideration but felt FHWA would not look on it favorably. The option of a new bridge between Town Farm Road and Trafton Road that would replace the bridges now on those roads was discussed. While the potential economies are attractive, there was doubt that the concept would be acceptable to the public. Kat Beaudoin noted that the scope of work would have to include early public meetings to allow input on the purpose and need statement and the alternatives to be selected for analysis. MaineDOT would prefer to have the City run those public meetings. It was recommended that KVCOG submit an amendment to their Regional Transportation Assessment (RTA). It turns out that the RTA includes the following priority capital project so this is already covered. That language reads as follows:

> 8. New I-95 Interchange in Southern Waterville – A new interchange for I-95 has been suggested for southern Waterville, south of existing Exit 127. An interchange onto one of Waterville's local roads would open up land for economic development adjacent to or nearby the airport. This project has been discussed and proposed for many years by the City of Waterville.

PURPOSE AND NEED DISCUSSION

The Committee reviewed the purpose and need statement that was provided at the earlier meeting. A discussion followed on adding to the statement a reference to the Waterville Airport and the need to use this capacity for further economic development. It was noted that the land adjacent to the Airport has a Foreign Trade Zone designation. To date this designation has not helped the City with attracting development. A new I-95 interchange could make that asset more useful. The old City solid waste site off Webb Road and the brown field site owned by the City off the West River Road are also in the vicinity. There is a desire to put to better economic use these sites and therefore should be mentioned as well in the purpose and need statement. The Committee requested that the statement be redrafted to incorporate these components.

MEETING WITH FHWA

It was agreed that Mike Roy would meet with MaineDOT and FHWA to refine the process going forward. The Committee's preference was to recommend to the City Council a purpose and need statement and a list of alternatives to be analyzed that the Council, after public input at a public meeting, could act upon in the form of a recommendation to MaineDOT and FHWA. A preference was to forward alternatives the City and Trafton Properties were willing to support rather than examine alternatives they could not support if they were responsible for seeing the project implemented. The hope was to present MaineDOT and FHWA with alternatives that had the least environmental impact, best met purpose and need and were affordable. If MaineDOT or FHWA at that point could suggest a better alternative it would be examined but otherwise it was hoped that the City's preference would be respected.

NEXT MEETING

It was agreed to meet again on Wednesday, December 8 @ 4:30pm in the City Council Chambers.

Respectfully Submitted,

Mike Roy

TRAFTON ROAD INTERCHANGE STUDY COMMITTEE
WEDNESDAY, DECEMBER 8, 2010
CITY COUNCIL CHAMBERS
4:30PM

AGENDA

1. Review and approval of minutes of prior meeting – See attached
2. Report of recent meeting with DOT Officials
3. Review and approval of revised Purpose & Need Statement – See attached
4. Review and approval of alternatives
5. Discussion of next steps
6. Schedule for future meeting dates

WATERVILLE, INCORPORATED 1802 BECAME A CITY 1888

I-95 ACCESS ADVISORY COMMITTEE

Minutes of Meeting
December 8, 2010

4:30pm – The meeting opened with the following members present:

- Harry Kojoian
- John Melrose
- Beth Gibbs
- Rosemary Winslow
- Paul Boghosian
- Ann Beverage
- Bob Willette
- Mark Turner
- Chris Huck
- Peter Nielsen
- Mike Roy

MINUTES

The minutes from the prior meeting were approved as presented.

MEETING WITH MDOT

John & Mike reported on their recent meeting with officials from MDOT and the Federal Highway Administration (FHWA). Both Mike and John are encouraged with what both agencies have said so far.

This project is being viewed by both agencies as an economic development project. An interstate justification report (IJR) will be needed. Trafton Properties and the City would prepare a draft IJR and submit it for concurrent review by MaineDOT and FHWA. Once in a form acceptable to the parties, MaineDOT would accept the IJR to FHWA for their approval subject to NEPA final review. At the meeting, FHWA indicated their review would pay attention to site distances between the ramps and the overpass, access control along Trafton Road near the interchange, compatibility with City plans and how a new interchange relates to existing and future access to I-95. FHWA would defer to MaineDOT on which alternatives will need to be considered. FHWA may have a preference for parallel ramps connecting to the I-95 mainline versus tapered ramps as are common in the area presently. FHWA indicated an interest in having the northbound ramps align with Eight Rod Road causing the relocation of Eight Rod and Junction Roads where they intersect with Trafton Road.

MaineDOT and FHWA agreed to define the project study area in a manner consistent with the Traffic Movement Permit process, probably involving I-95 from Kennedy Memorial Drive to Lyons Road in Sidney. There was discussion on the likely need to reclassify Trafton Road from a local road to a major collector and to downgrade Webb Road from a minor collector to a local road.

The next step involves the City recommending to MaineDOT a purpose and need statement and the alternative interchange configurations it seeks to have analyzed. Then the City, the developer and MaineDOT would prepare a scope of work to complete all the required studies and submittals including the alternatives analysis, the IJR, the NEPA documentation and a Traffic Movement Permit.

It was noted that the City would need to host a public meeting early on in the process to receive public input on the initiative and specifically on the purpose and need statement and any design alternatives of interest.

PURPOSE & NEED STATEMENT

After substantial discussion, the proposed purpose and need statement (see attached) was recommended to the City Council as presented.

ALTERNATIVE ANALYSIS

MDOT and FHWA officials agree that the "no build" alternative must be considered and should involve an analysis of all the costs/impacts associated with development occurring south of KMD into Sidney without any new interchange. Although the project will require a "big picture" view of how and where a proposed interchange fits in with everything else, there will not be a need to spend a lot of time and money on the local level with analysis of options which are not practical or financially feasible. There is general agreement that the primary build alternative to be studied involves placing interchange ramps in the southerly quadrants of the intersection of Trafton Road and I-95.

The Committee agreed to support this approach and recommended it to the City Council.

NEXT MEETING

It was agreed to hold a public meeting on this project on January 11, 2011, at 6:30pm in the City Council Chambers. The Committee will reconvene once the Council takes action on its recommendations.

Respectfully Submitted,

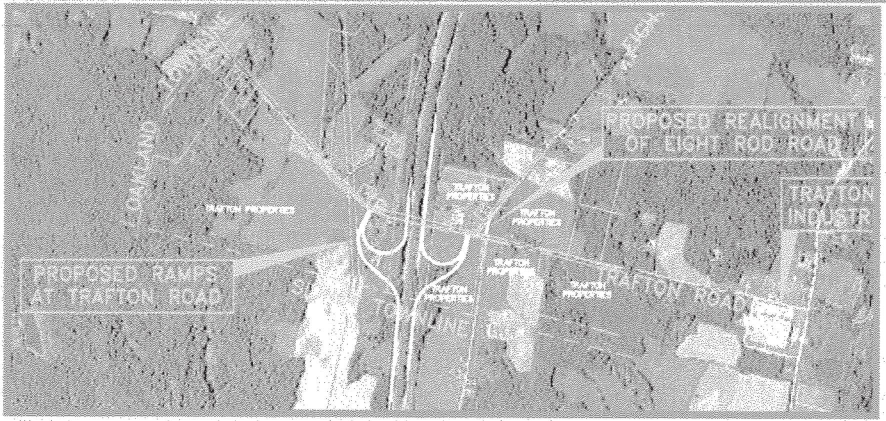
Mike Roy

I-95 PUBLIC MEETING MAILING - JANUARY 7 2011

	OWNER NAME	MAILING ADDRESS	TOWN	STATE	ZIP	PROPERTY LOC.	MAP/LOT
1	CARL QUIRION	524 CUSHMAN ROAD	WINSLOW	ME	04902	SIDNEY	001/008
2	PAUL SIMPSON & ELAINE LUNDGREN	201 WILLEY POINT	OAKLAND	ME	04963	SIDNEY	002/008
3	SCOTT & JENNIFER KADNAR	131 TOWN FARM ROAD	SIDNEY	ME	04330	SIDNEY	002/009
4	LAWRENCE & CANDICE WILLETTE	39 JUNCTION ROAD	SIDNEY	ME	04330	SIDNEY	002/12&13
5	PETER AND MANDY BUCKNAM	65 JUNCTION ROAD	SIDNEY	ME	04330	SIDNEY	002/011
6	LINWOOD PELOTTE	77 JUNCTION ROAD	SIDNEY	ME	04330	SIDNEY	002/007A
7	ANTHONY & JAIME PELOTTE	89 JUNCTION ROAD	SIDNEY	ME	04330	SIDNEY	002/007B
8	FANADO PELOTTE	3944 WEST RIVER ROAD	WATERVILLE	ME	04901	SIDNEY	002/007
	FANADO PELOTTE	229 TRAFTON RD	WATERVILLE	ME	04901-9764	WATERVILLE	010-080-000
	FANADO J PELOTTE	229 TRAFTON RD	WATERVILLE	ME	04901-9764	WATERVILLE	011-020-000
	FANADO PELOTTE	229 TRAFTON RD	WATERVILLE	ME	04901-9764	WATERVILLE	005-040-000
	FANADO PELOTTE	229 TRAFTON RD	WATERVILLE	ME	04901-9764	WATERVILLE	006-030-000
	FANADO PELOTTE	229 TRAFTON RD	WATERVILLE	ME	04901-9764	WATERVILLE	006-060-000
9	DARREN DOUCETTE	102 JUNCTION ROAD	SIDNEY	ME	04330	SIDNEY	002/004
10	LINDA TUTTLE	95 JUNCTION ROAD	SIDNEY	ME	04330	SIDNEY	002/006
11	MICHAEL & ELIZABETH DOYON	217 TOWN FARM ROAD	SIDNEY	ME	04330	SIDNEY	002/002
12	LIONEL AND FRANCES MARCOUX	202 TOWN FARM ROAD	SIDNEY	ME	04330	SIDNEY	009/008
	LIONEL AND FRANCES MARCOUX	202 TOWN FARM ROAD	SIDNEY	ME	04330	SIDNEY	009/009
	LIONEL AND FRANCES MARCOUX	202 TOWN FARM ROAD	SIDNEY	ME	04330	SIDNEY	009/010
13	JAMES & SANDRA ROGERS	236 TOWN FARM ROAD	SIDNEY	ME	04330	SIDNEY	009/012
14	MARK GOULD	162 DRUMMOND ROAD	SIDNEY	ME	04330	SIDNEY	012/004
15	JEAN & THEODORE BROWN	431 TRAFTON RD	OAKLAND	ME	04903-4870	WATERVILLE	010-070-000
	JAMES J & SARA L BROWN	431 TRAFTON RD	OAKLAND	ME	04903-4870	WATERVILLE	010-090-000
	JAMES J & SARA L BROWN	431 TRAFTON RD	OAKLAND	ME	04903-4870	WATERVILLE	011-025-000
	JAMES J & SARA L BROWN	PO BOX 396	OAKLAND	ME	04963-0396	WATERVILLE	005-050-000
16	WILLARD JR & GERALDINE SHIRLEY	501 EIGHT ROD RD	WATERVILLE	ME	04901-9739	WATERVILLE	011-010-000
17	GREGORY G & SANDRA CORMIER	263 TRAFTON RD	WATERVILLE	ME	04901-9764	WATERVILLE	005-030-000
18	TRAFTON PROPERTIES INC	272 VALLEY RD	MIDDLETOWN	RI	02842-5238	WATERVILLE	005-010-000
	TRAFTON PROPERTIES INC	272 VALLEY RD	MIDDLETOWN	RI	02842-5238	WATERVILLE	006-010-000
	TRAFTON PROPERTIES INC	272 VALLEY RD	MIDDLETOWN	RI	02842-5238	WATERVILLE	006-020-000
	TRAFTON PROPERTIES INC	272 VALLEY RD	MIDDLETOWN	RI	02842-5238	WATERVILLE	006-070-000
	TRAFTON PROPERTIES INC	272 VALLEY RD	MIDDLETOWN	RI	02842-5238	WATERVILLE	006-080-000
19	RAYMOND J PELOTTE	599 EIGHT ROD RD	WATERVILLE	ME	04901-9739	WATERVILLE	006-050-000

PUBLIC MEETING NOTICE

GREATER WATERVILLE I-95 ACCESS ENHANCEMENT



The City of Waterville will hold a public meeting on **Tuesday, January 11, at 6:30pm** in the **Waterville City Council Chambers** located at **93 Main Street** (the Center Building), **3rd floor**, to obtain resident input on the proposal to develop a new Interstate 95 interchange at the Trafton Road location.

This is an exciting opportunity for growth in our area and we hope that you can attend to make your views known.

You are welcome to attend and comment on this proposed project. If you are unable to attend, any *written comments* may be addressed to Michael Roy, City Manager, 1 Common Street, Waterville, ME 04901.

OFFICE OF ADMINISTRATION
CITY OF WATERVILLE

Ph 207.680.4204 | **Fx** 207.680.4207
1 Common Street, Waterville, Maine 04901

www.waterville-me.gov

****

REGULAR MEETING OF THE CITY COUNCIL

****

JANUARY 18, 2011

CITY COUNCIL CHAMBERS

CITY COUNCIL CHAMBERS

PRESENT: MIKE ROY, CITY MANAGER

COUNCILORS: CHARLES F. STUBBERT, JR, GEORGE MYERS, JR ROSEMARY WINSLOW, DANA SENNETT, CHAIR, JOHN O'DONNELL, AND KAREN RANCOURT-THOMAS

EXECUTIVE SESSION

6:15 P.M.
TAX ABATEMENT REQUEST #4-2010
CONFIDENTIAL RECORDS 1 M.R.S.A. §405 (6) (F)

INTERVIEWS

6:30 P.M.
COUNCILOR-WARD 6

REGULAR MEETING

7:00 P.M.

APPROVAL OF CONSENT AGENDA

REGULAR MEETING CONSENT AGENDA JANUARY 18, 2011

MINUTES

APPROVAL OF
JANUARY 4, 2011

RESOLUTION NO 12----ROLL OF ACCOUNTS NO 2

RESOLUTION NO.13----AUTHORIZING THE RENEWAL OF A PAWNBROKER LICENSE TO JOHN WEEKS D/B/A "J R'S TRADING & JEWELRY"

O'Donnell Moved to Adopt
Winslow Seconded the Motion
Vote: All in Favor (6-0)

UNFINISHED BUSINESS

RESOLUTION 163-A RESOLUTION PROVIDING FOR POVERTY ABATEMENT #4-2010

BE IT RESOLVED by the City Council of the City of Waterville, acting as the municipal officers, as follows:

THAT, the City Council approves Tax Abatement Request #4-2010 for unpaid taxes, Interest and lien charges for the tax year 2009 In the amount of $492.23. ~~and 2010 in the amount of $625.76.~~

Resolution Read in Full
Winslow Moved to Adopt
O'Donnell Seconded the Motion
Winslow Moved to Amend by Adding a period after $492.23 which would delete "and 2010 in the amount of $625.76" as Shown Above
O'Donnell Seconded the Motion
Vote: All in Favor (6-0)
Vote on Resolution 163-2011 as Amended
Vote: All in Favor: (6-0)

ORDINANCE 11-2011-AN ORDINANCE PROVIDING FOR AMENDMENT TO ARTICLE 5, ZONING DISTRICT REQUIREMENTS, OF THE ZONING ORDINANCE

BE IT ENACTED by the City Council of the City of Waterville, acting as the municipal officers, as follows:

THAT, Article 5, Zoning District Requirements, of the Zoning Ordinance of the City of Waterville, Maine, be amended as follows:

(Underscored language is an addition.)

5.7.4. C-A Prohibited uses.
5.7.4.A. Service, repair, and sale of automobiles.
5.7.4.B. Boat and trailer sales and service.
5.7.4.C. Junk yards, including the storage of inoperative motor vehicles.
5.7.4.D. The following uses are prohibited between Union Street and Spring Street and between Elm Street and the Kennebec River: adult entertainment businesses including pornography, nudity, escort services, and massage parlors, but excluding massage therapists licensed by the state of Maine.

Ordinance Read in Full
Sennett Moved to Accept
Winslow Seconded the Motion
O'Donnell Moved to Postpone to the Next Meeting
Winslow Seconded the Motion
Vote: All in Favor (6-0)

NEW BUSINESS

RESOLUTION 14-2011-A RESOLUTION PROVIDING FOR ISSUANCE OF A VICTUALER LICENSE TO REBECCA & SHANE REAGH, LLC D/B/A "Tim Horton" at 333 Main St.

THAT, the City Council hereby authorize the issuance of a Victualer License to Rebecca & Shane Reagh, LLC d/b/a "Tim Horton" at 333 Main St.

Resolution Read in Full
Winslow Moved to Adopt
O'Donnell Seconded the Motion
Vote: All in Favor (6-0)

RESOLUTION-15-A RESOLUTION PROVIDING FOR APPOINTMENT OF A CITY COUNCILOR (WARD 6)

BE IT RESOLVED by the City council of the City of Waterville, acting as the Municipal Officers, as follows:

THAT, __________________, be appointed to fill the vacancy in Ward 6 Council seat until the next regularly scheduled municipal election.

Resolution Read in Full
Sennett Moved to Appoint Eliza Mathias as Councilor Ward 6
Vote in Favor Stubbert, Myers, Winslow Sennett and Rancourt-Thomas
Vote: (5-0)
O'Donnell Moved to Appoint Dana Hernandez
Winslow Seconded the Motion
Winslow Moved to Cease Nominations
O'Donnell Seconded the Motion
Vote: All in Favor (6-0)
With the Majority of Votes Eliza Mathias has been appointed Councilor for Ward 6

Eliza Mathias has been sworn in as Councilor in Ward 6 and is now ready to take her seat.

RESOLUTION 16- A RESOLUTION PROVIDING FOR DECLARING A VACANCY FOR OFFICE OF MAYOR

BE IT RESOLVED by the City Council of the City of Waterville, acting as the municipal officers, as follows:

THAT, the Office of Mayor is hereby declared vacant due to the resignation of Paul R LePage on January 4, 2011.

Resolution Read in Full
Sennett Moved to Adopt
Myers Seconded the Motion
Vote: All in Favor (7-0)

RESOLUTION -17- A RESOLUTION PROVIDING FOR RECONSIDERATION OF ORDINANCE NO 09-2010

BE IT RESOLVED by the City Council of the City of Waterville as follows:

THAT, Ordinance No 09-2010, Shoreland Amendments to the Zoning Ordinance, be reconsidered.

Resolution Read in Full
Winslow Moved to Adopt
O'Donnell Moved to Second
Vote: All in Favor: (7-0)
Sennett Moved to Accept Ordinance 09-2010

Winslow Seconded the Motion
Vote: All in Favor (7-0)
O'Donnell Moved to Hold Third and Final Reading by Title Only
Winslow Seconded the Motion
Vote: All in Favor (7-0)
Ordinance Read by Title Only
Sennett Moved to Adopt
Winslow Seconded the Motion

Roll Call Vote	Yes	No	Abstain
Charles F Stubbert Jr	1		
George Myers, Jr	2		
Rosemary A Winslow	3		
Dana Sennett	4		
John O'Donnell	5		
Eliza Mathias	6		
Karen Rancourt-Thomas	7		
Vote (7-0)			

RESOLUTION 18- A RESOLUTION PROVIDING FOR REFERENCE TO THE PLANNING BOARD BY THE CITY COUNCIL AN AMENDMENT TO THE ZONING MAP (WATER ST)

BE IT RESOLVED by the City Council of the City of Waterville, acting as the municipal officers and in accordance with Article 7, Section 7.1, of the Zoning Ordinance, to refer to the Planning Board for public hearing and recommendation a proposal for rezoning.

The proposal is to rezone properties on or near Water Street between King Street and Redington Street from Commercial-B (C-B) to Residential-C (R-C). In addition, two parcels on the riverbank would be rezoned from Commercial-B (C-B) to Resource Protection.

Those parcels proposed for rezoning are listed on the attachment and found on the Property Map of the City of Waterville dated April 1, 1992, as updated on April 1, 2010.

Resolution Read in Full
Winslow Moved to Adopt
O'Donnell Seconded the Motion
Vote: All in Favor (7-0)

RESOLUTION 19- A RESOLUTION PROVIDING FOR SUPPORT FOR TRAFTON ROAD INTERCHANGE PROJECT

BE IT RESOLVED by the City Council of the City of Waterville, acting as the municipal officers:

THAT the City Council accept the recommendations of the I-95 Access Advisory Committee (see attached minutes) regarding a Purpose and Need statement and an Alternative Analysis and further that said recommendations be forwarded to Maine Department of Transportation to serve as a basis for further study of the project.

Resolution Read in Full
Winslow Moved to Adopt
Sennett Seconded the Motion
Vote In Favor: Stubbert, Myers, Winslow, Sennett, Mathias and Rancourt-Thomas
Vote to Oppose: O'Donnell
Vote to Abstain: None
Vote: (6-1-0)

The Council Chair announced the appointment of Lawrence Lauzon to the Board of Zoning Appeals. His term will expire in 2014. Vote: All in Favor (7-0) There being no further business the meeting was adjourned.

A True Copy Attest

City Clerk

CITY OF WATERVILLE

CITY COUNCIL

RESOLUTION NO. 19 -2011

A RESOLUTION PROVIDING FOR:

SUPPORT FOR TRAFTON ROAD INTERCHANGE PROJECT

BE IT RESOLVED by the City Council of the City of Waterville, acting as the municipal officers:

THAT the City Council accept the recommendations of the I-95 Access Advisory Committee (see attached minutes) regarding a Purpose and Need statement and an Alternative Analysis and further that said recommendations be forwarded to Maine Department of Transportation to serve as a basis for further study of the project.

Dana W. Sennett
Chair, City Council

IN THE CITY COUNCIL

January 18, 2011, Read and Adopted.

CITY CLERK

APPROVED, January 19, , 2011

MAYOR

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
REGION 2
98 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0098

Paul R. LePage
GOVERNOR

David Bernhardt
COMMISSIONER

COPY

RECEIVED
MAY 11 2011
BY:

May 10, 2011

Ann Beverage, City Planner
City of Waterville
One Common Street
Waterville, Maine 04901

RE: Maine Department of Transportation Scoping Meeting
Trafton Properties, Light Industrial Facility, Waterville, ME

Dear Ms. Beverage:

The Maine Department of Transportation (MDOT) has scheduled a scoping meeting for the above referenced project pursuant to obtaining an MDOT Traffic Movement Permit. The project is estimated to generate 442 one-way trips during the weekday AM peak hour, and 480 one-way trips during the PM peak hour. The project is proposing to access from State Route 104 and Trafton Road.

The scoping meeting will be held at the City of Waterville Counsel's Chambers. The meeting is scheduled for 7:00 p.m. on Tuesday May 24, 2011. You or your staff's input at this meeting would be welcome if you choose to attend. Please share this letter with Town officials, including the police chief, and with staff whom you feel would have relevant input. The meeting is open to the general public, and participation of several abutting property owners is expected.

The applicant is required to perform the following, if not already completed, prior to the scoping meeting:

A. Submit a signed copy of the "Notice of Intent to File" to the Town.

B. Send the same notice to abutting property owners via certified mail, return receipt requested, a minimum of 7 days prior to the scoping meeting.

C. Publish the notice in a local newspaper.

PRINTED ON RECYCLED PAPER

THE MAINE DEPARTMENT OF TRANSPORTATION IS AN AFFIRMATIVE ACTION - EQUAL OPPORTUNITY EMPLOYER
PHONE: (207) 624-8200 TTY 888-516-9364 FAX: (207) 287-4753

Thank you for your cooperation, and if you have any questions or would like to discuss this further please feel free to contact David Allen at 624-8200.

Sincerely,

David P. Allen, P.E.
Mid-Coast Region Traffic Engineer
Maine Department of Transportation

cc: Steve Landry, Assistant State Traffic Engineer
Thomas Gorrill, Gorrill-Palmer Consulting Engineers, Inc.
City of Waterville
KVCOG
Abutting Municipalities
Gerald & Julie Dubios
Christopher & Aimee Gilbert
William & Marry Anne Trafton
File

Meeting Minutes
Trafton Properties MaineDOT Scoping Meeting
Waterville, Maine

Date of Meeting: May 24, 2011
Place of Meeting: Council Chambers Waterville City Hall, Maine
Purpose of Meeting: MaineDOT Scoping Meeting
Attendees: Ann Beverage, City Planner
Greg Brown, City Engineer
Bob Willette, Town of Sidney
Julie Dubois, 101 Trafton Road
Gerard Dubois, 101 Trafton Road
Chris Gilbert, 35 Trafton Road
Aimee Gilbert, 35 Trafton Road
Mary Ann Trafton, 51 Trafton Road
Dave Allen, MaineDOT
Darryl Belz, MaineDOT
Harry Kojoian, Trafton Properties
John Melrose, Eaton Peabody Consulting Group
Tom Gorrill, Gorrill Palmer Consulting Engineers

Prepared by: Tom Gorrill-5-31-11

Summary of Discussions:

1. Dave Allen opened the meeting by explaining that an application for a MaineDOT traffic movement permit has been filed by Trafton Properties and it has been determined to be complete. He explained the purpose of the meeting is to determine the study area and scope of the study to be completed. He explained the format of the meeting would be to ask for comment from Waterville and Sidney followed by the public. He said he would set the scope of the study following these comments.
2. Greg Brown asked how many trips would be generated by the project and what weight trucks were given relative to passenger cars. Dave answered that the project is forecast to generate 442 AM and 480 PM peak hour trip ends respectively. Tom explained that equates to 221 and 240 round trips respectively. Dave explained that one truck counts as two passenger cars for the purpose of the traffic volume determination.
3. Bob Willette said that the Town of Sidney wants to see more industry rather than residences. He said a new interchange on Trafton Road will take the pressure off Lyons Road but some residents are concerned with the additional traffic from an interchange on Trafton Road. He feels that the proposed project will impact Eight Rod Road and asked that this be included in the study. He stated that traffic counters were currently placed in the area and Dave responded that these counts are part of MaineDOT's statewide traffic count program.
4. Several residents agreed with Mr. Willette that Eight Rod Road should be included in the study.

5. Greg pointed out that Silver Street and the bridge are labeled incorrectly on the diagram. He agreed with the residents that Eight Rod Road and Junction Road should be included in the study.
6. Dave set the study areas to include the following intersections in the "without the interchange" analysis:
    - Site driveways
    - Trafton Road/Eight Rod Road and Junction Road
    - Trafton Road and West River Road
    - West River Road and Lyons Road
    - Lyons Road interchanges
    - Trafton Road and Middle Road
    - Church Street, Oak Street and Water Street
    - Oak Street, Main Street and Center Street
    - Main Street, Pleasant Street, Fairfield Street, and KMD- any potential mitigation at this intersection will be limited and proportional to impact
    - KMD interchanges
    - Interconnected signal system on KMD to West River Road
    - Donald Carter Drive and Abenaki Road
7. Dave set the study areas to include the following intersections in the "with the interchange" analysis:
    - Site driveways
    - Trafton Road/Eight Rod Road and Junction Road
    - Trafton Road and West River Road
    - Trafton Road and Middle Road
    - KMD interchanges
    - Interconnected signal system on KMD to West River Road
    - Main Street, Water Street, and Waterville Winslow Bridge
8. Dave requested the counts be completed during a weekday from 7:00 AM to 9:00 AM and again from 4:00 PM to 6:00 PM.
9. Ann Beverage confirmed that there are no other approved or pending projects not yet developed that need to be included in the traffic study as background traffic.