INTERCHANGE MODIFICATION STUDY

Interstate 40 at State Route 222 (Exit 42)
Fayette County, Tennessee

PREPARED BY
TRANSYSTEMS

FOR

THE TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

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1.0 INTRODUCTION

1.1 Study Scope

The scope of this study is to provide a detailed evaluation of potential modifications and/or configurations to better accommodate existing and future traffic for the study interchange of I-40 at S.R. 222 (Exit 42). This study addresses the issues required to obtain Federal Highway Administration (FHWA) approval for an interchange modification, consistent with the Tennessee Department of Transportation's (TDOT) roadway design standards. This report considers existing and future traffic conditions in the project study area to assess the potential traffic impacts on the interstate and connecting roadway system over a twenty (20) year planning horizon.

1.2 Project Need

The request for upgrading the study interchange was initiated by the Tennessee Department of Economic and Community Development (ECD) on behalf of the Tennessee Valley Authority (TVA). In March 2007, the University of Memphis conducted an economic research study on land adjacent to the interchange area referred to as the Memphis-Jackson I-40 Advantage Megasite. The report, *The Potential Economic Impact of an Automobile Assembly Plant: I-40 Advantage Auto Park,* discusses the economic impacts and characteristics of the Megasite totaling approximately 2,000 jobs and evaluates the potential for this location to bring jobs, income, and tax revenue to the citizens of West Tennessee.

TVA's Megasite Program offers sites suitable for large-scale manufacturing that are certified as ready for development. To be certified, a large land parcel must meet the criteria of being ready for sale, accessible to utilities, and physically developable. The proposed improvements for the study interchange are essential to the development of the Megasite located on the north side of I-40 within the study area as shown in ***Figure 1.1***.

The adjacent interchanges as described in ***Section 1.3*** are too far away to adequately serve the Megasite. The local road system is adequate for the current land uses in the vicinity of the study interchange. However, if the Megasite is developed, the local road system and existing interchange will not provide the necessary capacity and the desired access to function adequately. As detailed in ***Section 3.1***, the capacity of the study interchange will be at LOS F if the Megasite is developed without modifications to the interchange.

The existing two (2) lane S.R. 222 bridge is constructed over I-40 on a fifty-two (52) degree skew angle. The latest bridge inspection report was conducted on December 14, 2010. During this inspection, the overall condition of the study bridge was determined to be rated fair with a sufficiency rating of 63.2. TDOT Structures Division has determined that the existing bridge consists of four (4) spans and is not a candidate for retrofit and needs to be replaced for the following reasons:

- Any new bridge would be a two (2) span structure for the safety of motorists travelling on I-40.
- A two (2) span structure would accommodate any future widening of I-40 without additional bridge modifications.
- The cost of widening the existing structure to accommodate the required travel lanes plus full shoulders would be greater than the cost of replacing the entire structure.

The ECD has agreed to provide 100% of the funding for the preparation of the Preliminary Engineering documents for the S.R. 222 construction improvements. Even though there are no confirmed developments for the Megasite, the ECD envisions that all of the paperwork including construction design documents be completed and are shovel-ready projects when a tenant for the Megasite is identified so that the roadway improvements can be in place in conjunction with the opening of the Megasite.

1.3 Description of Project Area

The I-40 at S.R. 222 (Exit 42) study interchange, a traditional diamond interchange, is located in Fayette County near Mile Marker 42. Within the interchange study area, I-40 is a four (4) lane divided, limited access interstate facility and S.R. 222 is a two (2) lane arterial facility that bridges over I-40. S.R. 222, also known as Stanton-Somerville Road, provides direct interstate access to Stanton to the north side and Sommerville to the south. Sommerville is the County Seat for Fayette County.

The nearest interchange to the east along I-40 is located at Exit 47 (Dancyville Road) and the nearest interchange to the west is located at Exit 35 (S.R. 59). These adjacent I-40 interchanges are approximately five (5) miles to the east and seven (7) miles to the west, respectively.

Figure 1.1 depicts the study location and the surrounding area with the proximity of the adjacent interchanges highlighted and the approximate location of the Megasite. ***Figure 1.2*** shows the study interchange area on an aerial photograph. ***Figure 1.3*** and ***Figure 1.4*** depict the northbound and southbound views along S.R. 222, respectively.

Figure 1.1 – Location Map

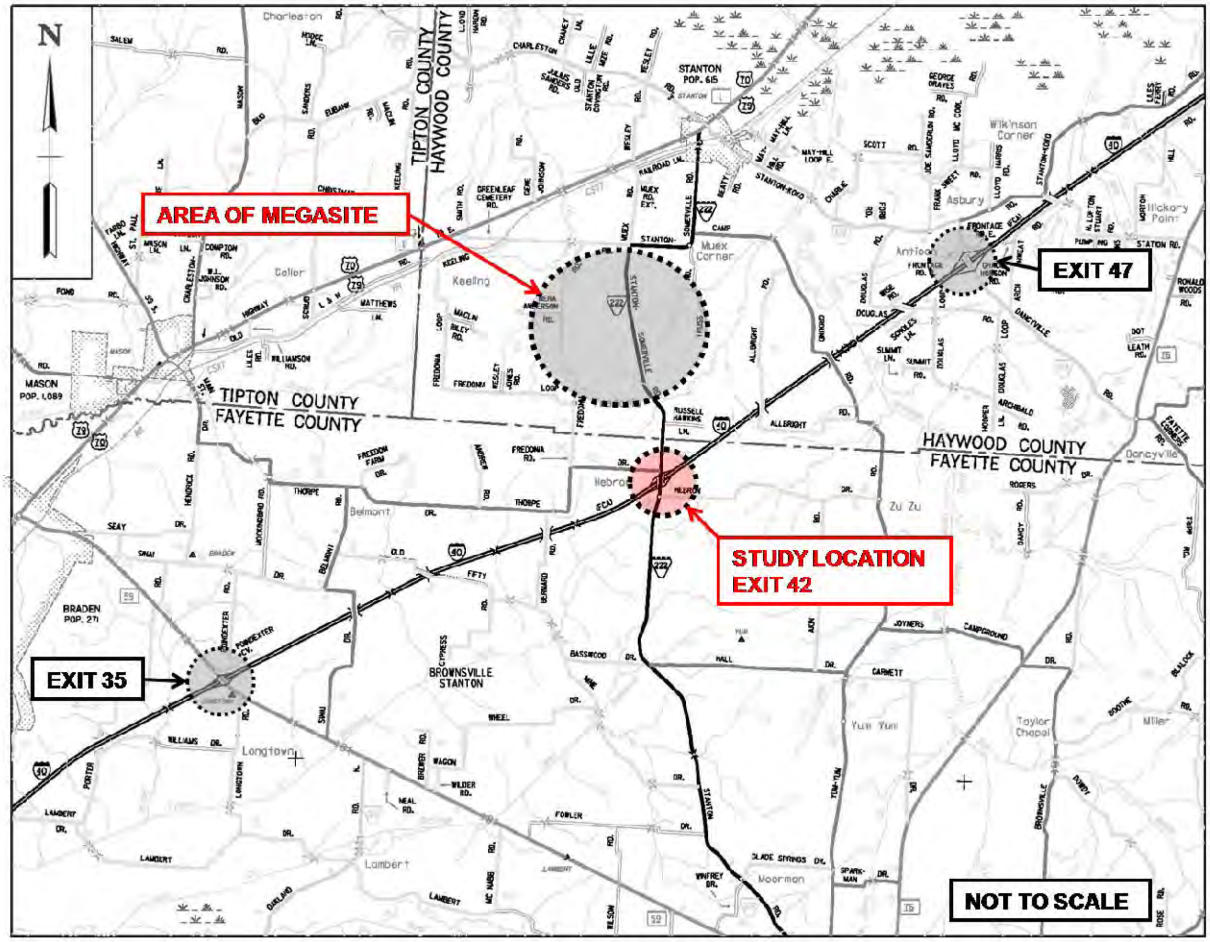


Figure 1.2 – Existing Interchange Overview

Figure 1.3 – Northbound on S.R. 222

Figure 1.4 – Southbound on S.R. 222

Population and Growth

Table 1.1 presents population trends for the area. From the year 1990 to 2009, the population in Fayette County increased by 52% while Haywood County decreased by 3%, respectively. For comparison, the statewide pace increased during the same period by 29%. The difference in growth between Fayette and Haywood Counties is mainly due to the influence of the Memphis suburban growth on the western area of Fayette County, which is approximately twenty (20) miles west of the study interchange. The Megasite development area is entirely in Haywood County and closer to the study interchange (located just south of the county line in Fayette County) than the primary population centers in Fayette County.

Table 1.1 – U.S. Census Population Trends

Year	Fayette County	Haywood County	Tennessee
1990	25,509	19,437	4.9 mil
2000	28,806	19,797	5.7 mil
2009 (Est.)	38,785	18,881	6.3 mil

1.4 Relationship to Other Highway Improvement Plans and Programs

In 2009, Tennessee Governor Phil Bredesen requested the State's General Assembly to include approximately $27 million in next fiscal-year's budget for the construction of roads, bridges, water and sewer lines, and other infrastructure items related to the potential Megasite. The proposed modifications to the I-40 at S.R. 222 (Exit 42) interchange will provide significant transportation significant infrastructure improvements for the Megasite. The request was approved. Currently, the ECD has authorized funding for the preparation of the Preliminary Engineering documents for the S.R. 222 construction improvements in conjunction with this study.

This Interchange Modification Study (IMS) is being prepared in conjunction with other studies, planned projects, and consideration for future needs within the study area. The following summarizes these considerations and efforts:

I-40/I-81 Corridor Feasibility Study

In 2007, Parsons Brinckerhoff prepared an I-40/I-81 Corridor Feasibility Study for TDOT. Based on the findings of the study, the I-40 corridor will merit at least one (1) additional lane in each direction in the future.

S.R. 222 Relocation & System Improvements Feasibility Study

A draft study was prepared in 2009 to evaluate the feasibility of improving S.R. 222 to better meet the needs of the area necessitated if the Megasite is developed. The S.R. 222 study limits extended 5.81 miles from the I-40 interchange in Fayette County to the intersection of S.R. 1 (U.S. 70/U.S. 79) in Haywood County. The feasibility study established the immediate and long-term needs of the study area and assessed various options for meeting these needs in the future. One need is to relocate the alignment of S.R. 222 to allow for the full development of the Megasite area.

The ECD has agreed to provide 100% of the funding for the preparation of the Preliminary Engineering documents for the S.R. 222 construction improvements. Even though there are no confirmed developments for the Megasite, the ECD envisions that all of the paperwork including construction design documents be completed and are shovel-ready projects when a tenant for the Megasite is identified so that the roadway improvements can be in place in conjunction with the opening of the Megasite.

Potential I-40 Interchange Justification Study (IJS)
There is a potential need for a new interchange to the east if the Megasite is developed and demand exceeds the capacity at an improved Exit 42 interchange. A new interchange is solely dependent upon the potential development of the Megasite and the ability to accommodate capacity at the existing Exit 42 interchange. Preliminary analysis was conducted to investigate the viability of providing a new interchange on I-40 between the existing interchanges at Exit 42 (S.R. 222) in Fayette County and Exit 47 (Dancyville Road) in Haywood County. The analysis conceptualized the proposed interchange configuration is a trumpet layout with a bridge over I-40 connecting to a new State Industrial Access (SIA) roadway on the north side of I-40. Auxiliary lanes along I-40 are included in conjunction with the addition of a new interchange.

Potential State Industrial Access (SIA) Road to Connect the Potential I-40 Interchange
Similar to the new interchange, the State Industrial Access (SIA) road is directly dependent upon the potential new interchange and the development of the Megasite. The SIA provides an alternative connection from the Megasite to the potential new interchange on I-40.

Figure 1.5 (Concept Relationship) presents a depiction of how these future (potential and feasibility study) projects relate to the improvements at the I-40/S.R. 222 interchange.

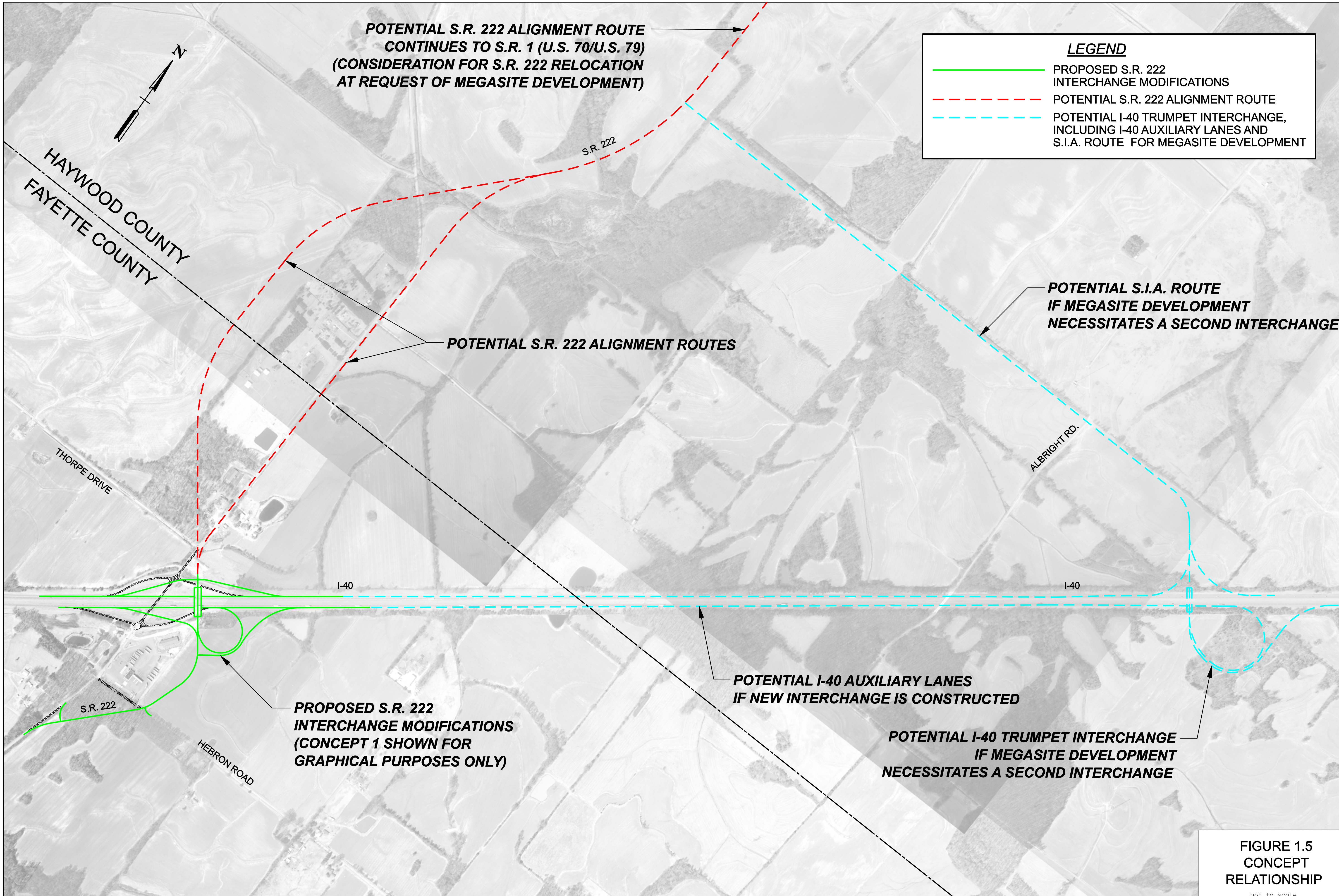


FIGURE 1.5
CONCEPT RELATIONSHIP
not to scale

2.0 PRELIMINARY PLANNING DATA

2.1 Land Use

The land in the vicinity of the study interchange is a mixture of various commercial, residential, agricultural, and institutional land uses. Specific areas adjacent to this interchange are discussed below.

<u>Northeast Quadrant</u>

In the study interchange's northeast quadrant, there is an abandoned service station shown in ***Figure 2.1***. Underground storage tanks (UST's) exist on this abandoned site.

Figure 2.1 – Abandoned Service Station and UST's

<u>Northwest Quadrant</u>

In the study interchange's northwest quadrant, the land use is primarily agricultural with some residential. No commercial development exists in this quadrant.

<u>Southeast Quadrant</u>

In the study interchange's southeast quadrant, there is a truck stop (Pilot Travel Center) and a hotel (Deerfield Inn) shown in ***Figure 2.2*** and ***Figure 2.3***, respectively. The Pilot Travel Center consists of many uses (truck stop/gas station/convenience store). As a result, the truck percentage within the vehicle classification composition on S.R. 222 between I-40 and the Pilot Travel Center is almost half (48%). In addition, there is a waste water treatment facility located adjacent to I-40 that is owned by the Pilot Travel Center and also used by the Deerfield Inn.

Figure 2.2 – Pilot Travel Center

Figure 2.3 – Deerfield Inn

Southwest Quadrant

In the study interchange's southwest quadrant, there is a gas station/convenience store (Exxon) and a church (Bethlehem Hebron Chapel) shown in ***Figure 2.4*** and ***Figure 2.5***, respectively. A cemetery is adjacent to the church.

Figure 2.4 – Exxon Gas Station/Convenience Store

Figure 2.5 – Bethlehem Hebron Chapel Church

<u>Northern Area</u>
The northern area along S.R. 222 contains agricultural and residential land uses along with some commercial land uses, a service station (Earl's Garage) and a motel (America's Best Value Inn).

<u>Southern Area</u>
The southern area along S.R. 222 is primarily undeveloped with some agricultural and residential land uses.

2.2 Environmental Concerns

There are UST's in three (3) of the four (4) quadrants of the study interchange. Other concerns include potential impacts to the waste water treatment facility in the southeast quadrant. Two (2) concepts discussed later in this report include widening S.R. 222 adjacent to the church/cemetery site in the southwest quadrant of the interchange.

As this project progresses in the National Environmental Policy Act (NEPA) planning process, it will be necessary to conduct other studies to determine detailed environmental and historical impacts. TDOT will perform all necessary studies including ecological and historical studies.

2.3 Traffic Served

The traffic volumes used in this study were approved by TDOT on April 14, 2011. A copy of the TDOT approval letter is contained in ***Appendix A***. The following is a summary of the background information utilized in the development of these traffic volumes.

Traffic Volume Data Collection

24-hour traffic counts were obtained from TDOT within the study area. In addition, TDOT provided I-40 ramp counts for each of the twelve (12) entrance/exit ramps within the study area. Turning movement counts (TMC) were also collected at ramp terminal intersections. Truck percentages were provided by TDOT with the exception of the Megasite that was estimated to be 10%. The traffic volume data collected for this study is contained in ***Appendix A***.

Historical Growth Rate Analyses

Historical traffic volumes were obtained from nine (9) traffic count stations within the project study area. Three (3) traffic count stations were located on I-40 and two (2) traffic count stations each were located at the three (3) study interchanges (Exit 35, Exit 42, and Exit 47). All of these traffic count stations are maintained by TDOT. A summary of the historical traffic volumes growth rates at these nine traffic count stations is shown in ***Figure 2.6*** and ***Table 2.1***.

Figure 2.6 – TDOT Traffic Count Stations

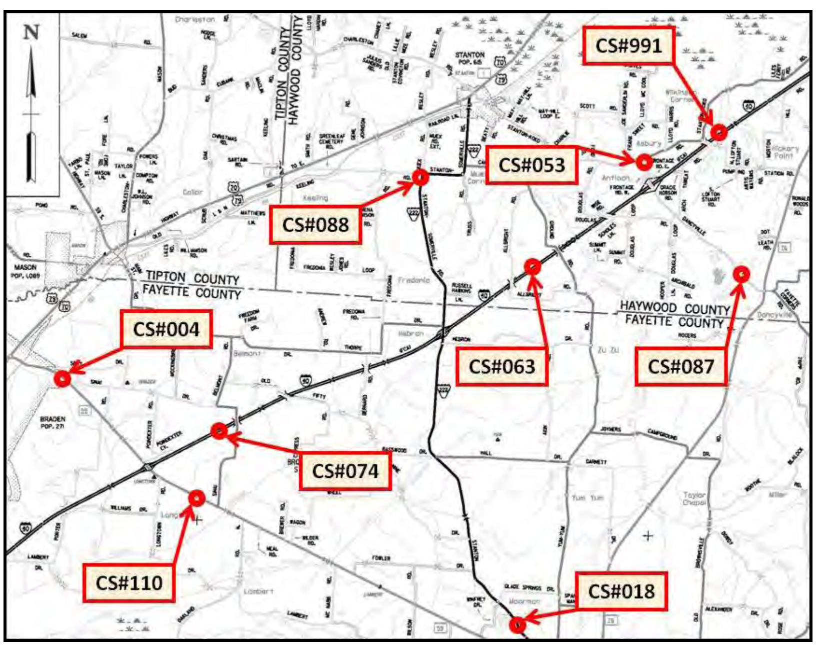


Table 2.1 – Historical Traffic Volumes Growth Rate Summary

Year	Annual Average Daily Traffic (AADT)								
	I-40 Mainline			SR 59 Mainline (Exit 35)		S.R. 222 Mainline (Exit 42)		Dancyville Road Mainline (Exit 47)	
	CS#074	CS#063	CS#991	CS#004	CS#110	CS#088	CS#018	CS#053	CS#087
2010	26,834	26,502	35,613	2738	2695	581	689	459	890
2009	26,568	25,896	34,730	2350	2864	576	743	463	924
2008	26,798	26,580	33,339	2573	2593	573	662	426	886
2007	35,626	37,392	36,856	2779	2804	599	748	463	912
2006	34,253	33,295	36,960	3170	3137	593	692	450	956
2005	36,566	33,382	35,983	2805	2725	644	749	404	972
2004	30,448	31,721	33,168	2494	3070	626	720	396	964
2003	33,943	31,501	31,462	2482	2960	601	686	355	899
2002	30,670	33,972	31,213	2229	4372	536	702	426	956
2001	36,234	34,958	32,109	2209	3137	518	909	433	937
2000	34,030	31,810	31,730	2875		545	632	420	853
10-Year Average Growth Rate	-0.85%	-0.92%	2.37%	2.17%	1.80%	0.69%	1.07%	2.56%	0.13%
2-Year Average Growth Rate	-0.15%	0.07%	2.71%	2.86%	1.75%	0.67%	1.80%	3.20%	0.22%

As shown in ***Table 2.1***, the traffic volumes on the I-40 mainline experienced an overall 20%± reduction between 2007 and 2008. Since 2008, the I-40 traffic volumes have increased at a slow to moderate growth rate. As a result, the historical traffic volumes were analyzed for both a ten (10) year period (2000-2010) and for a two (2) year period (2008-2010). The overall average growth rate for both analyses was calculated using simple linear regression procedures. Relying on engineering judgment and being conservative, it was decided to only use CS#991 for the I-40 mainline growth rate calculations since negligible growth had occurred at the other two (2) traffic count stations and both of these traffic count stations had experienced a greater reduction in traffic since 2008 when compared against CS#991. The final growth rate for each mainline was determined by combining the 2-year (2008-2010) and the 10-year (2000-2010) growth rates, giving two-thirds weight to the 2-year growth rate and one-third weight to the 10-year growth rate. In addition, the final growth rate for each of the side roads (i.e. S.R. 59, S.R. 222, and Dancyville Road) was adjusted to 2.00% if the growth rate was calculated below 2.00%.

The following are the final calculated growth rates for each mainline utilized in this study:

- I-40: 2.60%
- SR 59 (Exit 35): 2.19%
- S.R. 222 (Exit 42): 2.00%
- Dancyville Road (Exit 47): 2.00%

Horizon Years and Time Periods Analyzed

The horizon years were determined to be 2014 and 2034. For both horizon years, the time periods analyzed were AM and PM Design Hour Volumes (DHV) and Annual Average Daily Traffic (AADT).

Traffic Volume Projections

Traffic volumes were projected using the previously described growth rates within the project study area for the horizon years 2014 and 2034 and for each time period AM and PM DHV and AADT. A truck stop, Pilot Travel Center, is located on S.R. 222 (Exit 42) in the southeast quadrant of the I-40/S.R. 222 interchange. This place of business attracts heavy truck volumes not indicative of the other sections along S.R. 222. In order to reduce the interchange traffic volumes down to the S.R. 222 traffic volumes southeast of the Pilot Travel Center, the S.R. 222 intersection with the Pilot Travel Center has been included in the traffic volume projections.

Megasite and Other Assumed Developments

In addition to the traffic volume projections developed for horizon years 2014 and 2034, trips were generated for the megasite and other assumed developments. The number of trips was estimated using the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 7th Edition. The development build-out was assumed to be 2,000 full-time employees for the Industrial Park Land Use Type. In addition, the trips were increased to account for other assumed development around the I-40/S.R. 222 interchange which included four (4) fast food restaurants and two (2) convenience markets with gas pumps. Overall, a total of 17,708 trips were estimated for the Megasite development build-out. ***Table 2.2*** summarizes the trips generated for each land use.

Table 2.2 – Estimated Development Build-Out Trips

Land Use Description		Industrial Park	Convenience Markets with Gas Pumps	Fast Food Restaurant with Drive Thru
ITE Code		130	853	934
Development Size (Each)		2000 Employees	3,000 Gross SF	3,000 Gross SF
Number of Developments		1	2	4
Daily	Average Rate	3.34/Employee (50% In - 50% Out)	845.60/KSF (50% In - 50% Out)	496.12/KSF (50% In - 50% Out)
	Total Estimated Trips	6,680	5,074	5,954
AM Peak Hour	Average Rate	0.47/Employee (86% In - 14% Out)	45.58/KSF (50% In - 50% Out)	53.11/KSF (51% In - 49% Out)
	Total Estimated Trips	940	274	638
PM Peak Hour	Average Rate	0.46/Employee (20% In - 80% Out)	60.61/KSF (50% In - 50% Out)	34.64/KSF (52% In - 48% Out)
	Total Estimated Trips	920	364	416

The trip distribution percentages are contained in ***Appendix A*** along with the development trip assignments for time period analyzed. To be conservative and a worst-case scenario, internal capture and pass-by reductions were not included in the above trip totals in the trip assignments.

Traffic Volume Diagrams
Traffic volume diagrams were prepared for I-40 between Exit 35 and Exit 47 and approved by TDOT on April 14, 2011. These traffic volume diagrams include the AM DHV, the PM DHV and the AADT for the horizon years 2014 and 2034. The traffic volumes include the calculated traffic volume projections and the total generated trips from full build-out of the Megasite and other assumed developments. The traffic volume diagrams are contained in ***Appendix A***.

2.4 Discussion of Interchange Concepts

During the course of this study, a total of six (6) build interchange concepts were developed for evaluation. In addition, a no-build alternative was evaluated to determine the transportation impacts if no construction improvements are made to the study interchange. The following is a summary of the study concepts considered and evaluated include:

Table 2.3 – Description of Interchange Concepts

Concept No.	Description
Concept 1	Partial Traditional Diamond Interchange located to the east of the existing interchange.
Concept 2	Traditional Diamond Interchange located to the east of the existing interchange.
Concept 3	Diverging Diamond Interchange located to the east of the existing interchange.
Concept 4	Traditional Diamond Interchange located at the existing interchange.
Concept 5	Combined Traditional/Tight Diamond Interchange located at the existing interchange.
Concept 6	Traditional Diamond Interchange located to the west of the existing interchange.
-	No-Build Alternative

Cost estimates were prepared for the construction of all six (6) concepts. These cost estimates include the costs to construct a new S.R. 222 bridge over I-40 and the required modifications to S.R. 222 such as providing connections back to S.R. 222 on both the north and south sides of I-40. Concept figures and cost estimates including the breakdown details for the six (6) concepts are contained in ***Appendix B*** and ***Appendix C***, respectively. All concept figures provide full interchange access for all traffic movements and show connections to public roads. The following is a description of these six (6) interchange concepts and the No-Build Alternative:

Concept 1 – Partial Traditional Diamond Interchange East of the Existing Interchange

This concept consists of constructing a new S.R. 222 bridge, perpendicular to I-40, approximately 500 feet east of the existing S.R. 222 bridge structure. A five (5) lane section for S.R. 222 is proposed with this concept that consists of two (2) travel lanes in each direction and a center left turn lane in each direction. An I-40 eastbound loop ramp is located in the southeast quadrant of the interchange for traffic heading north on S.R. 222 and an I-40 eastbound right turn ramp is located in the southwest quadrant of the interchange for traffic heading south on S.R. 222. The S.R. 222 improvements extend approximately 1,100 feet north from the northern ramp terminal intersection and 2,500 feet south from the southern ramp terminal intersection.

The loop ramp provides for improved access to the north side of the interchange for vehicular movements from the west. This is a critical movement for goods and supplies if the Megasite ntial Megasite development. This loop provides separation from other off-ramp movements and eliminates the need for signalization at this ramp terminal. Because of the loop ramp, the I-40 eastbound exit traffic movement will utilize a split along the exit ramp for the north/south direction. The will require an overhead sign truss and two (2) large guide signs that are not included in any of the other concepts.

On the north side of I-40, a field drive would be connected to Thorpe Drive since it is located within the proposed controlled access limits. On the south side of I-40, a separate roadway connection is provided from the existing S.R. 222 roadway to the relocated S.R. 222 roadway for access to the Pilot Travel Center and other nearby destinations. The existing wastewater treatment facility would be relocated with this concept or an alternative system provided. The estimated cost for Concept 1 is $13.1 million.

Concept 2 – Traditional Diamond Interchange East of the Existing Interchange

This concept is similar to Concept 1 with the exception of eliminating the I-40 eastbound loop ramp located in the southeast quadrant of the interchange. As a result, this I-40 eastbound traffic movement must turn left via a signalized intersection in order to head north on S.R. 222. Similar to Concept 1, the existing wastewater treatment facility would need to be relocated or an alternative system provided. The estimated cost for Concept 2 is $12.2 million.

Concept 3 – Diverging Diamond Interchange East of the Existing Interchange

This diverging diamond concept consists of constructing a new S.R. 222 bridge perpendicular to I-40 approximately 500 feet east of the existing S.R. 222 bridge structure. A four (4) lane section for S.R. 222 is proposed with this concept that consists of two (2) travel lanes in each direction separated by barrier. The left turn and right turn movements from both eastbound and westbound ramps consist of two (2) lanes each. The design of the Thorpe Drive intersection is similar to a divided highway intersection because S.R. 222 is divided through this location.

The design speed on S.R. 222 within the vicinity of the I-40 bridge area is reduced to twenty-five (25) miles per hour (mph). This speed restriction could be increased to thirty (30) mph by increasing the right-of-way impacts.

The S.R. 222 improvements extend approximately 1,200 feet north from the northern ramp terminal intersection and 2,500 feet south from the southern ramp terminal intersection. On the north side of I-40, a field drive would be connected to Thorpe Drive since it is located within the proposed controlled access limits. On the south side of I-40, a separate roadway connection is provided from the existing S.R. 222 roadway to the relocated S.R. 222 roadway for access to the Pilot Travel Center and other nearby destinations.

Similar to Concepts 1 and 2, the existing wastewater treatment facility would be relocated with this concept or an alternative system provided. The total estimated cost for Concept 3 is $13.4 million.

<u>Concept 4 – Traditional Diamond Interchange</u>
This concept consists of rebuilding the S.R. 222 bridge at the same location on the same skew angle. Similar to Concept 1, a five (5) lane section for S.R. 222 is proposed with this concept that consists of two (2) travel lanes in each direction and a center left turn lane in each direction. The west side of S.R. 222 remains on the existing location due to the church and cemetery located on the south side of I-40 and all of the widening is along the east side of S.R. 222. Therefore, a separate roadway connection is provided from the existing S.R. 222 roadway for access to the Pilot Travel Center and other destinations on the south side of I-40. The existing businesses along the east side of S.R. 222 and their access to S.R. 222 would be greatly impacted and limited due to the construction of the separate roadway connection. These additional access challenges will require more direct negotiations with the Pilot Station and Deerfield Inn properties.

This concept also includes the widening S.R. 222 adjacent to the church/cemetery site in the southwest quadrant of the interchange. This concept does not eliminate the existing access connections along the west side of S.R. 222 (south side of I-40) currently within the controlled access limits. The S.R. 222 improvements extend approximately 700 feet north from the northern ramp terminal intersection and 1,800 feet south from the southern ramp terminal intersection. On the north side of I-40, a field drive would be connected to Thorpe Drive since it is located within the proposed controlled access limits. Since the proposed bridge is located at the same location of the existing bridge and being constructed under traffic, the estimated costs for the bridge structure include a 25% contingency. The total estimated cost for Concept 4 is $13.8 million.

<u>Concept 5 – Combined Traditional/Tight Diamond Interchange</u>
This concept is similar to Concept 4 with two (2) exceptions: 1) the I-40 eastbound interchange ramp terminal intersection is relocated approximately 150 feet closer towards I-40, and 2) the separate roadway connection providing access to the Pilot Travel Center and other destinations on the south side of I-40 is eliminated. Overall, the I-40 westbound interchange ramp terminal intersection functions as a Traditional Diamond Interchange and the I-40 eastbound interchange ramp terminal intersection functions as a Tight Diamond Interchange. As with Concept 4, the west side of S.R. 222 remains on the existing location due to the church and cemetery located on the south side of I-40 and all of the widening is along the east side of S.R. 222. Similar to Concept 4, the S.R. 222 widening will create additional access challenges and will require more direct negotiations with the Pilot Station and Deerfield Inn properties.

In order to eliminate all access driveways within the controlled access limits, the first (or closest) driveway from I-40 to the Exxon gas station/convenience store is closed and the Deerfield Inn driveway is relocated approximately fifty (50) feet southward. The Exxon gas station/convenience store has a third driveway that has been temporarily closed with bollards. The removal of these bollards would provide for a second driveway replacing the closed driveway.

This concept also includes widening S.R. 222 adjacent to the church/cemetery site in the southwest quadrant of the interchange. A lane add/drop situation occurs at the Hebron Road intersection, thus creating the four-lane typical section northward on S.R. 222. These S.R. 222 improvements reduce the construction impacts on S.R. 222 south of I-40 to approximately 1,400 feet south from the southern ramp terminal intersection. On the north side of I-40, a field drive would be constructed to Thorpe Drive since it is located within the proposed controlled access limits. Similar to Concept 4, the estimated costs for the bridge structure include a 25% contingency since the proposed bridge is located at the same location of the existing bridge and being constructed under traffic. The total estimated cost for Concept 5 is $13.2 million.

Concept 6 – Traditional Diamond Interchange West of the Existing Interchange

This concept consists of constructing a new S.R. 222 bridge perpendicular to I-40, but approximately 1,500 feet west of the existing S.R. 222 bridge structure. The proposed S.R. 222 bridge over I-40 was relocated approximately 1,500 feet west of S.R. 222 in order to avoid the existing cemetery and keep the residential impacts to a minimum. Similar to most of the previous concepts, a five (5) lane section for S.R. 222 is proposed with this concept that consists of two (2) travel lanes in each direction and a center left turn lane in each direction.

The horizontal and vertical alignment geometry would be of concern as a result of the number of turns along the proposed route. The S.R. 222 improvements extend approximately 2,300 feet north from the northern ramp terminal intersection and 2,000 feet south from the southern ramp terminal intersection. On the south side of I-40, a separate roadway connection is provided from the existing S.R. 222 roadway to the relocated S.R. 222 roadway for access to the Pilot Travel Center and other nearby destinations. The total estimated cost for Concept 6 is $11.9 million.

No-Build Alternative

No construction improvements are made to the study interchange. The no-build alternative is being considered as an option if the Megasite is not developed. However, if the Megasite is developed, then the interchange will require the upgrade improvements previously described in Concepts 1-6.

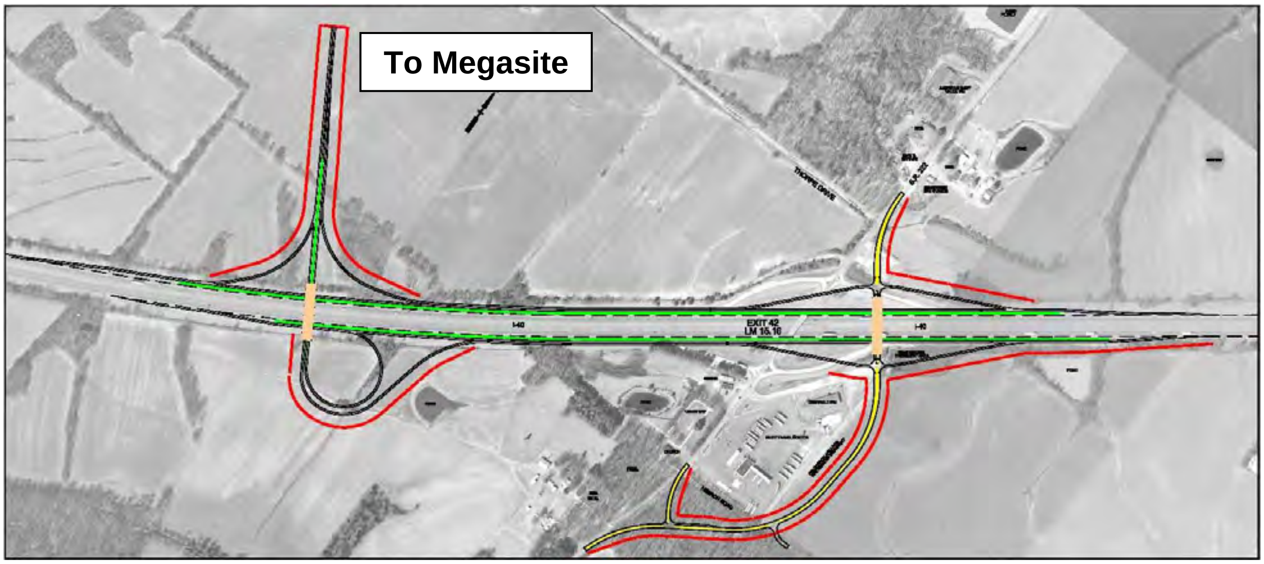
Other Options Considered during the Planning Process

Two other options were considered during the planning process that focused on improving the existing S.R. 222 bridge and also providing direct access to the Megasite area. The following are brief descriptions of two (2) of these options:

Combination Interchange Option (with Shared Frontage Road between Interchanges):

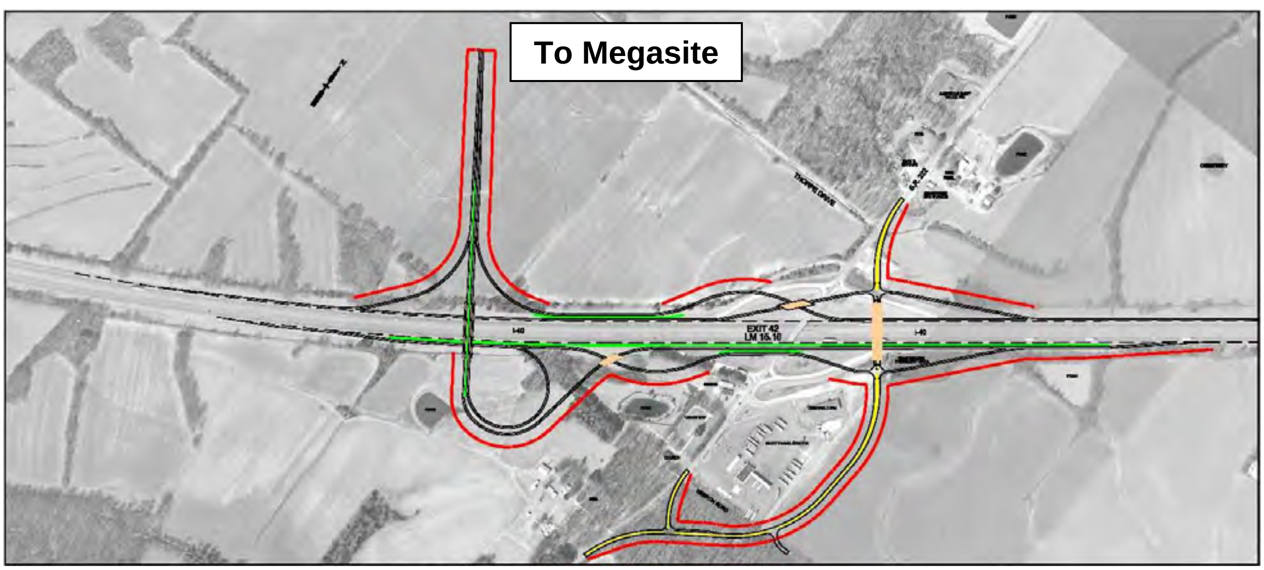
This option, shown in ***Figure 2.7***, consists of constructing a new trumpet interchange approximately two-thirds (⅔) mile west of the existing S.R. 222 interchange in conjunction with Concept 1. With this option, an assumption was made to assign 50% of the development traffic to the new trumpet interchange. As a result of the reduced traffic volume on S.R. 222, a three (3) lane section for S.R. 222 is shown with this option. A separate roadway connection is provided from the existing S.R. 222 roadway to the relocated S.R. 222 roadway for access to the Pilot Travel Center and other destinations on the south side of I-40. This option also consists of constructing auxiliary lanes (barrier separated) to link ramp movements between the new trumpet interchange and the ramps for the new S.R. 222 diamond interchange. The frontage road weave distance between interchanges is 1500 feet (EB) and 2200 feet (WB). Because of the concern regarding the development of the Megasite, plus the extent of construction impacts and the weaving area impacts between interchanges, this option was eliminated from consideration.

Figure 2.7 – Combination Interchange Option (with Shared Frontage Road)



Combination Interchange Option (with Separate Frontage Roads between Interchanges):
This option, shown in ***Figure 2.8***, is similar to the other option with the exception that the new trumpet interchange is located approximately one-half (½) mile west of the existing S.R. 222 interchange and the on/off ramp movements from each interchange are grade separated at the location where the two (2) ramps intersect. This option was eliminated from considerations for the same reasons previously listed in the other option.

Figure 2.8 – Combination Interchange Option (with Separate Frontage Roads)



3.0 ENGINEERING INVESTIGATION

3.1 Traffic Operations

Analysis was made to determine the potential impacts of proposed concept modifications to the existing interchange and the effect these changes may have on the Interstate system.

The capacity of a facility is defined in the Highway Capacity Manual (HCM) as the maximum hourly rate at which vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions. Any change in these conditions will result in a change in the capacity of a facility.

The analysis of highway capacity is a set of procedures used to estimate the traffic-carrying ability of facilities over a range of defined operational conditions known as level-of-service (LOS). LOS is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A LOS definition generally describes these operational conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. ***Table 3.1*** presents general descriptions for each LOS.

Table 3.1 – Level-of-Service (LOS) Description

LOS	Level-of-Service (LOS) Description
A	Free Flow operations. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The general level of physical and psychological comfort provided the driver is high.
B	Reasonably free flow operations. The ability to maneuver within the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided to the driver is high.
C	Flow with speeds at or near free flow. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension because of additional vigilance required for safe operation.
D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is noticeably limited. The driver experiences reduced physical and psychological comfort levels.
E	At the lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little or no room to maneuver. The driver experiences poor levels of physical and psychological comfort.
F	Breakdowns in traffic flow. The number of vehicles entering the highway section exceeds the capacity, or ability of the highway to accommodate that number of vehicles. There is little or no room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Source: Highway Capacity Manual (2000), Transportation Research Board

The Highway Capacity Software (HCS) was used to obtain the capacity analysis LOS results presented in this study for different facility types: Basic Freeway Segments, Freeway Ramp Merges, Freeway Ramp Diverges, Multi-Lane Highways, Two-Lane Highways, Signalized Intersections, and Unsignalized Intersections. The HCS printouts for all of the capacity analyses can be found in ***Appendix C*** of this report.

<u>Traffic Volumes</u>

The project study area Annual Average Daily Traffic (AADT) Volumes and the Design Hour Volumes (DHV) for the horizon years 2014 and 2034 are shown in ***Table 3.2***.

Table 3.2 – Traffic Volumes (Two-Way) and Truck Percentages

Type	Location	Segment	Traffic Volumes 2014	Traffic Volumes 2034	Truck Pct.
AADT	I-40	West of Exit 35	44,420	62,340	35%
		Exit 35 to Exit 42	43,610	60,510	35%
		Exit 42 to Exit 47	38,820	55,560	35%
		East of Exit 47	36,850	53,510	35%
	S.R. 59 (Exit 35)	North of I-40	4290	5780	3%
		South of I-40	4440	5990	3%
	S.R. 222 (Exit 42)	North of I-40	14,490	15,960	10%
		I-40 to PTC[1]	13,220	16,250	48%
		South of PTC[1]	4940	6450	3%
	Dancyville Road (Exit 47)	North of I-40	1700	2040	2%
		South of I-40	2530	3230	2%
DHV AM Peak Period	I-40	West of Exit 35	4256	5992	
		Exit 35 to Exit 42	4125	5706	
		Exit 42 to Exit 47	3629	5194	
		East of Exit 47	3396	4937	
	S.R. 59 (Exit 35)	North of I-40	404	555	
		South of I-40	417	575	
	S.R. 222 (Exit 42)	North of I-40	1485	1503	
		I-40 to PTC[1]	673	791	
		South of PTC[1]	462	544	
	Dancyville Road (Exit 47)	North of I-40	199	250	
		South of I-40	206	263	
DHV PM Peak Period	I-40	West of Exit 35	4353	6133	
		Exit 35 to Exit 42	4275	5935	
		Exit 42 to Exit 47	3845	5503	
		East of Exit 47	3652	5298	
	S.R. 59 (Exit 35)	North of I-40	384	531	
		South of I-40	398	549	
	S.R. 222 (Exit 42)	North of I-40	1327	1343	
		I-40 to PTC[1]	667	815	
		South of PTC[1]	400	500	
	Dancyville Road (Exit 47)	North of I-40	169	210	
		South of I-40	212	273	

1. PTC is Pilot Travel Center.

<u>I-40 Mainline Capacity Analyses</u>
The project study area I-40 mainline capacity analysis results for the horizon years 2014 and 2034 are shown in ***Table 3.3***.

Table 3.3 – I-40 Mainline Capacity Analysis Results (Existing Conditions)

Location	Direction	Peak Period	2014	2034
West of Exit 35 (S.R. 59)	EB	AM	C	D
		PM	C	D
	WB	AM	C	D
		PM	C	D
Exit 35 (S.R. 59) to Exit 42 (S.R. 222)	EB	AM	C	D
		PM	C	D
	WB	AM	B	C
		PM	C	D
Exit 42 (S.R. 222) to Exit 47 (Dancyville Rd.)	EB	AM	B	C
		PM	C	D
	WB	AM	B	C
		PM	C	D
East of Exit 47 (Dancyville Rd.)	EB	AM	B	C
		PM	B	C
	WB	AM	B	C
		PM	B	C

I-40 Merge and Diverge Ramp Capacity Analyses

The I-40 merge/diverge ramp capacity analysis results are shown in ***Table 3.4***.

Table 3.4 – I-40 Merge and Diverge Ramps Capacity Analysis Results (Existing Conditions)

Location	Direction	Peak Period	2014	2034
MERGE RAMPS				
I-40 at Exit 35 (S.R. 59)	EB Entrance Ramp	AM	C	D
		PM	C	D
	WB Entrance Ramp	AM	C	D
		PM	C	E
I-40 at Exit 42 (S.R. 222)	EB Entrance Ramp	AM	C	D
		PM	C	D
	WB Entrance Ramp	AM	C	D
		PM	D	E
I-40 at Exit 47 (Dancyville Rd.)	EB Entrance Ramp	AM	B	C
		PM	C	D
	WB Entrance Ramp	AM	C	D
		PM	C	D
DIVERGE RAMPS				
I-40 at Exit 35 (S.R. 59)	EB Exit Ramp	AM	C	D
		PM	B	C
	WB Exit Ramp	AM	B	C
		PM	C	D
I-40 at Exit 42 (S.R. 222)	EB Exit Ramp	AM	B	C
		PM	B	C
	WB Exit Ramp	AM	B	C
		PM	B	C
I-40 at Exit 47 (Dancyville Rd.)	EB Exit Ramp	AM	B	C
		PM	B	C
	WB Exit Ramp	AM	B	C
		PM	B	C

I-40 Interchange Crossroads Mainline Capacity Analyses

The project study area I-40 interchange crossroads mainline capacity analysis results for the horizon years 2014 and 2034 are shown in ***Table 3.5***.

Table 3.5 – I-40 Interchange Crossroads Mainline Capacity Analysis Results (Existing Conditions)

Crossroad	Location	Direction	Peak Period	2014	2034
S.R. 59 (Exit 35) [Note: Two-Lane Analyses]	North of I-40	Two-Way	AM	C	C
			PM	B	C
	South of I-40	Two-Way	AM	C	C
			PM	C	C
S.R. 222 (Exit 42) [Note: Two-Lane Analyses]	North of I-40	Two-Way	AM	D	D
			PM	D	D
	I-40 to PTC[1]	Two-Way	AM	C	C
			PM	C	C
	South of PTC[1]	Two-Way	AM	C	C
			PM	B	C
S.R. 222 (Exit 42) [Note: Multilane Analyses]	North of I-40	NB	AM	B	B
			PM	A	A
		SB	AM	A	A
			PM	A	A
	I-40 to PTC[1]	NB	AM	A	A
			PM	A	A
		SB	AM	A	A
			PM	A	A
	South of PTC[1]	NB	AM	A	A
			PM	A	A
		SB	AM	A	A
			PM	A	A
Dancyville Road (Exit 47) [Note: Two-Lane Analyses]	North of I-40	Two-Way	AM	B	B
			PM	A	B
	South of I-40	Two-Way	AM	B	B
			PM	B	B

1. PTC is Pilot Travel Center.
2. The multilane capacity analysis results are shown by direction (NB/SB).

Ramp Terminal Intersections

The project study area ramp terminal intersection capacity analysis results were conducted for the horizon years 2014 and 2034. The SR 59 (Exit 35) and the Dancyville Road (Exit 47) intersection capacity analysis results are shown in ***Table 3.6***.

Table 3.6 – S.R. 59 (Exit 35) and the Dancyville Road (Exit 47)
Ramp Terminal Intersections Capacity Analysis Results
(Existing Conditions)

Location	Approach	Peak Period	S.R. 59 (Exit 35)[1]		Dancyville Road (Exit 47)[1]	
			2014	2034	2014	2034
I-40 EB Ramps[2]	Overall	AM	N/A	N/A	N/A	N/A
		PM				
	NB	AM	A	A	A	A
		PM	A	A	A	A
	SB	AM	A	A	A	A
		PM	A	A	A	A
	EB	AM	B	C	A	B
		PM	B	C	A	B
I-40 WB Ramps[3]	Overall	AM	N/A	N/A	N/A	N/A
		PM				
	NB	AM	A	A	A	A
		PM	A	A	A	A
	SB	AM	A	A	A	A
		PM	A	A	A	A
	WB	AM	B	C	B	B
		PM	B	C	B	B

1. Unsignalized capacity analysis results.

The S.R. 222 (Exit 42) capacity analysis results for each concept are shown in ***Table 3.7***. The proposed lanes for each concept are depicted graphically in ***Appendix B***.

Table 3.7 – S.R. 222 (Exit 42) Ramp Terminal Intersections Capacity Analysis Results (Existing and Proposed Conditions)

Location	Approach and Movement		Peak Period	Interchange Types[1]							
				Proposed Conditions						No-Build Alternative (Existing Conditions)	
				Traditional Diamond				Diverging Diamond			
				Concept 1 (Mod. for EB Loop Ramp)		Concepts 2, 4, 5, 6		Concept 3			
				2014	2034	2014	2034	2014	2034	2014	2034
I-40/S.R. 222 EB Off/On-Ramp	Overall		AM	N/A	N/A	(B)	(B)	(B)	(B)	N/A	N/A
			PM			(B)	(B)	(B)	(B)		
	Traffic Movement	NB Thru	AM	A	A	(B)	(B)	(B)	(B)	A	A
			PM	A	A	(B)	(B)	(B)	(B)	A	A
		SB[2]	AM	A	A	(A)	(A)	(B)	(B)	A	A
			PM	A	A	(A)	(A)	(B)	(B)	A	A
		EB Left Turn	AM	N/A[4]	N/A[4]	(B)	(B)	(B)	(B)	F	F
			PM			(B)	(B)	(B)	(B)	F	F
		EB Right Turn	AM	B	B	(B)	(B)	(B)	(B)	---[5]	---[5]
			PM	A	B	(B)	(C)	(B)	(B)		
I-40/S.R. 222 WB Off/On-Ramp	Overall		AM	(B)	(B)	(B)	(B)	(B)	(B)	N/A	N/A
			PM	(B)	(B)	(B)	(B)	(B)	(B)		
	Traffic Movement	NB[3]	AM	(A)	(A)	(A)	(A)	(B)	(C)	A	A
			PM	(A)	(A)	(A)	(A)	(B)	(B)	B	B
		SB Thru	AM	(B)	(B)	(B)	(B)	(B)	(B)	A	A
			PM	(B)	(B)	(B)	(B)	(B)	(B)	A	A
		WB Left Turn	AM	(B)	(B)	(B)	(B)	(B)	(B)	F	F
			PM	(C)	(C)	(C)	(C)	(B)	(B)	F	F
		WB Right Turn	AM	(C)	(C)	(C)	(C)	(B)	(B)	---[5]	---[5]
			PM	(C)	(C)	(C)	(C)	(B)	(B)		

1. The signalized capacity analysis results are shown in parentheses.
2. The capacity analysis results shown represent the SB Left Turn Movement for the Traditional Diamond Interchange/No-Build concepts and the SB Thru Movement for the Diverging Diamond Interchange concept.
3. The capacity analysis results shown represent the NB Left Turn Movement for the Traditional Diamond Interchange/No-Build concepts and the NB Thru Movement for the Diverging Diamond Interchange concept.
4. The EB Left Turn Movement is free-flow utilizing a one-lane loop ramp to S.R. 222 NB.
5. The EB Right Turn Movement is included in the EB Left Turn Movement (Shared Lane) for the No-Build concept.

As shown in ***Table 3.7***, all of the concepts provide LOS C or better capacity results for all traffic movements with the exception of the No-Build Alternative which produced LOS F capacity results.

S.R. 222/Pilot Travel Center Intersection
The project study area intersection capacity analysis results for the S.R. 222/Pilot Travel Center intersection was conducted for the horizon years 2014 and 2034. These intersection capacity analysis results are shown in ***Table 3.8***.

Table 3.8 – S.R. 222/Pilot Travel Center Intersection Capacity Analysis Results (Proposed Conditions)

Location	Approach	Peak Period	2014[1]	2034[1]
S.R. 222 at Pilot Travel Center	Overall	AM	N/A	N/A
		PM		
	NB	AM	A	A
		PM	A	A
	SB	AM	A	A
		PM	A	A
	WB	AM	B	B
		PM	B	B

1. Unsignalized capacity analysis results.
2. Existing geometry for the intersection: 1 NB Thru/Right Turn Shared Lane, 1 SB Left Turn/Thru Shared Lane, and 1 WB Left Turn/Right Turn Shared Lane.

3.2 Crash Analysis

The crash data used in this analysis was provided by TDOT and included reports from 2005 to 2007. A total of twenty-one (21) crashes were reported within the vicinity of the study interchange during this three (3) year period. Of these twenty-one (21) reported crashes, eight (8) occurred along I-40 and thirteen (13) occurred along S.R. 222. A summary of the I-40/S.R. 222 crash data is presented in ***Table 3.9***.

As expected, the predominant types were right angle crashes (7) and rear end crashes (5). The overall severity damage totals included five (5) injury crashes with no incapacitating injury or fatal crashes.

Table 3.9 – I-40/S.R. 222 Crash Data Summary

Description	I-40			S.R. 222			Total	Pct. of Total
	2005	2006	2007	2005	2006	2007		
Rear End	1			2		2	5	23.8%
Right Angle		1		1	1	4	7	33.3%
Overturn			1				1	4.8%
Struck Bridge Rail/Guardrail		2	1	1			4	19.0%
Struck Other Object (Fixed)		1					1	4.8%
Struck Animal in Road			1	1			2	9.5%
Run off the Road				1			1	4.8%
INVOLVEMENT								
All Vehicles	2	5	3	9	2	12	33	
ROAD SURFACE								
Dry (No Adverse Conditions)	1	2	2	5	1	4	15	71.5%
Wet (Rain)			1	1		2	4	19.0%
Snow / Ice		2					2	9.5%
SEVERITY DAMAGE								
Property Damage Only		4	2	5	1	4	16	76.2%
Injury Crashes (No Fatalities)	1		1	1		2	5	23.8%
Incap. Injury Crashes (No Fatalities)							0	-
Fatality Crashes							0	-
Number of Injuries (All Crashes)	2		1	1		2	6	
Number of Fatalities (All Crashes)							0	
CRASH SUMMARY								
Total Crashes	1	4	3	6	1	6	21	100%
Percentage of Total	4.8%	19.0%	14.3%	28.6%	4.8%	28.6%		

3.3 S.R. 222 Bridge Inspection Report

The latest bridge inspection report was conducted on December 14, 2010. During this inspection, the overall condition of the study bridge was determined to be “Fair” and having a sufficiency rating of 63.2. Repairs to correct previously identified deficiencies to the bridge structure and the bridge rails were made in 2008.

3.4 Wastewater Treatment Facility

An existing wastewater treatment facility is located in the southeast quadrant of the I-40 at S.R. 222 interchange adjacent to the Deerfield Inn. This facility is owned by the Pilot Travel Center and serves both the Pilot Travel Center and the Deerfield Inn. This treatment facility consists of a series of septic tanks with sand filters, discharging to a pond adjacent to the right of way for I-40.

Concepts 1, 2, and 3 will require the relocation of this wastewater treatment facility. An area adjacent to the present location is available and noted on each of these three (3) concept figures contained in ***Appendix B***. A representative of the Tennessee Department of Environment and Conservation (TDEC) stated that due to heavy vegetation around the pond and since there is no history of noted problems at this location, the facility is apparently functioning very efficiently and could be relocated with no anticipated problems. If a wastewater treatment system cannot be provided, a worst-case scenario of approximately $7.0 million has been estimated by TDOT for the acquisition of two businesses (Pilot Travel Center and Deerfield Inn). However, this worst-case scenario should not be an issue and should be resolved in design especially with all of the various technologies available.

3.5 Interchange Concept Evaluation Summary

During the course of the study, the six (6) interchange concepts along with the No-Build Alternative, described in ***Section 2.4***, were discussed with TDOT, FHWA, and the ECD. The design criteria considered included, but was not limited to, sight distance at ramp terminals, sufficient storage on the ramps, vertical clearance, pedestrian access through the interchange, length of acceleration/deceleration lanes, length of tapers, spacing between ramps, lane continuity, lane balance, and uniformity in interchange design and operational patterns. Through these discussions, two (2) concepts were determined to be viable while the four (4) others were removed from further consideration for a variety of reasons. A summary of these concepts are included in the following paragraphs.

<u>Viable Concepts</u>
Concepts 1 and 5, shown in ***Figures 3.1 and 3.2*** respectively, were determined viable for this study.

Concept 1 satisfies the travel demands of the interchange especially since the major traffic movement within the interchange (I-40 eastbound to S.R. 222 northbound) would be free-flow via a single lane loop ramp, as compared to Concept 2 that requires the signalization of this traffic movement. The total estimated cost for Concept 1 is $13.1 million.

Concept 5 satisfies the 300 feet of controlled access limits for this interchange and does not include a separate frontage road paralleling S.R. 222, as compared to Concept 4. On the south side of the interchange, direct access to businesses south of I-40 is maintained in Concept 5, but two (2) existing driveways are affected along S.R. 222. These driveways include the closure of the first (or closest) driveway from I-40 to the Exxon gas station/convenience store along the west side of S.R. 222 and the relocation of the Deerfield Inn driveway approximately fifty (50) feet southward along the east side of S.R. 222. Even though this concept includes the widening of S.R. 222 adjacent to the church/cemetery site in the southwest quadrant of the interchange, all of the widening impacts are on the east side of S.R. 222 resulting in no construction impacts to the church/cemetery site. The total estimated cost for Concept 5 is $13.2 million.

The No-Build Alternative was determined viable if the Megasite is not developed. If the Megasite is developed, then the No-Build Alternative is a non-viable concept because the capacity of the existing interchange will not be satisfied (LOS F conditions) in the future 2034 design year.

Between the viable construction concepts, TDOT and ECD both prefer Concept 1 since the I-40 eastbound to S.R. 222 northbound traffic movement would be free-flow via a single lane loop ramp and removed from signalization as required with Concept 5. This traffic movement is the highest turning movement within the interchange totaling 586 vehicles during the 2034 morning peak period.

<u>Non-Viable Concepts</u>
Concept 2 (Traditional Diamond Interchange East of the Existing Interchange) was determined not viable and eliminated because the I-40 eastbound to S.R. 222 northbound traffic movement within the interchange must travel through a signalized intersection at the ramp terminal instead of the single lane free-flow loop ramp provided in Concept 1. This is the highest traffic movement within the study interchange and since it will be controlled through signalization in this concept, it would contain vehicular delays for this movement that would not be present in Concept 1. Safety considerations of this traffic driving through a signalized intersection vs. free-flow were also considered during the elimination process. As a result, this concept was removed from further consideration.

Concept 3 (Diverging Diamond Interchange East of the Existing Interchange) was determined not viable because the traffic patterns do not provide a good fit for a diverging diamond footprint, especially with both of the S.R. 222 left turn traffic volumes being less than 226 vehicles during the 2034 morning and afternoon peak periods. The major traffic movement is the I-40 eastbound to S.R. 222 northbound which would require signalization similar to Concept 2. The motorists speed would require being reduced through their navigation within the interchange. As a result, this concept was removed from further consideration.

Concept 4 (Traditional Diamond Interchange) was determined not viable because the 300 feet of controlled access limits for this interchange could not be achieved. On the south side of the interchange, direct access to businesses south of I-40 is maintained in Concept 4, but the 300 feet of controlled access limits for this interchange cannot be achieved along the west side of S.R. 222 south of the interchange. In order to meet the 300 feet of controlled access limits along the east side of S.R. 222 south of the interchange, a frontage road was developed that parallels S.R. 222 and intersects S.R. 222 about 400 feet south of Hebron Road. This frontage road requires the acquisition of right-of-way along the Pilot Travel Center property adjacent to S.R. 222 which includes business impacts such as parking and truck maneuverability within the site. This interchange concept is the same as Concept 5 with the exception that in Concept 5, the 300 feet of controlled access limits can be achieved with the relocation of the eastbound ramps closer to I-40 in conjunction with the closure/relocation of two (2) existing driveways. As a result, this concept was removed from further consideration.

Concept 6 (Traditional Diamond Interchange West of the Existing Interchange) was determined not viable. The main reason is that the horizontal and vertical alignment geometry would be of concern as a result of the number of turns required along the proposed route. As a result, this concept was removed from further consideration.

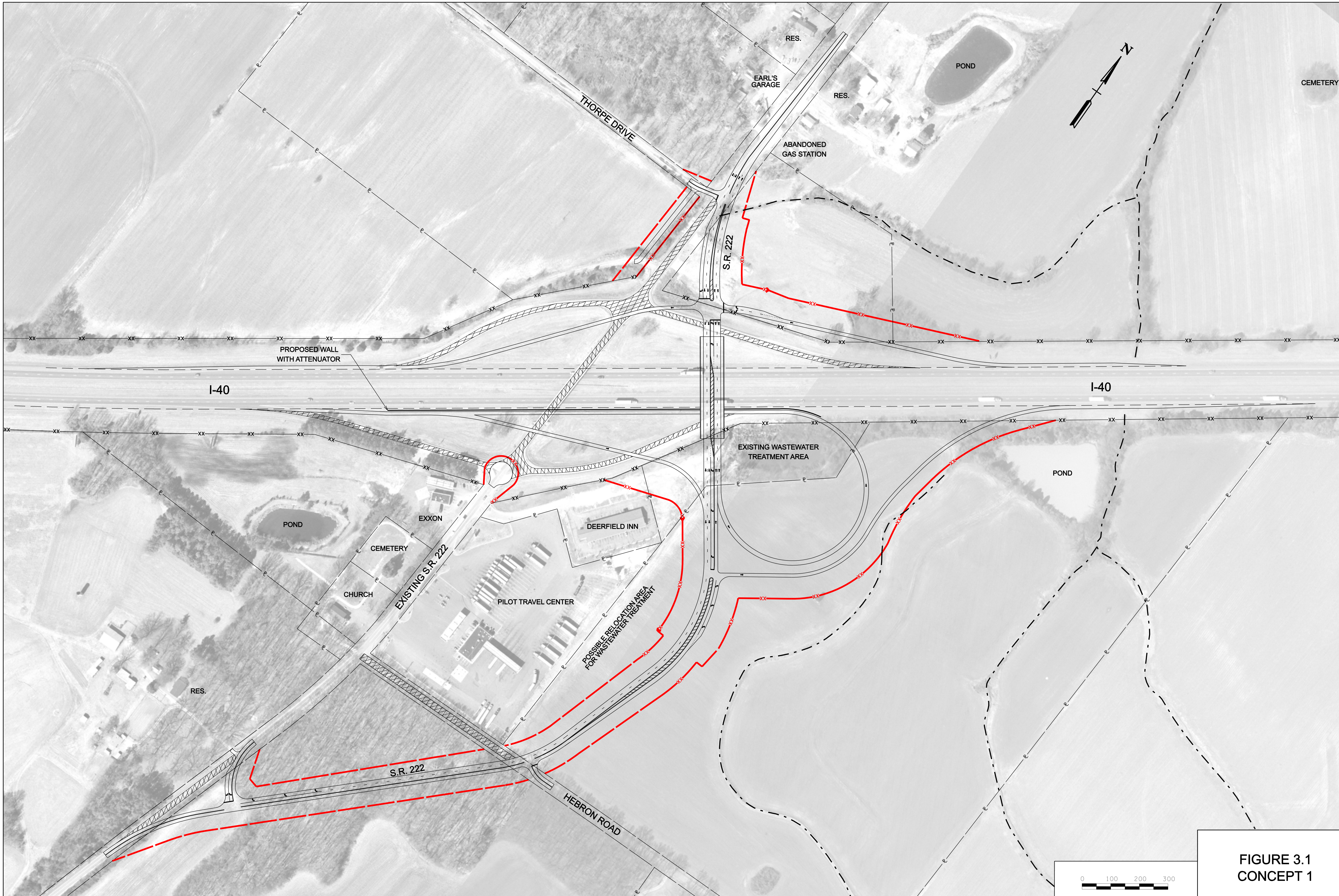


FIGURE 3.1
CONCEPT 1

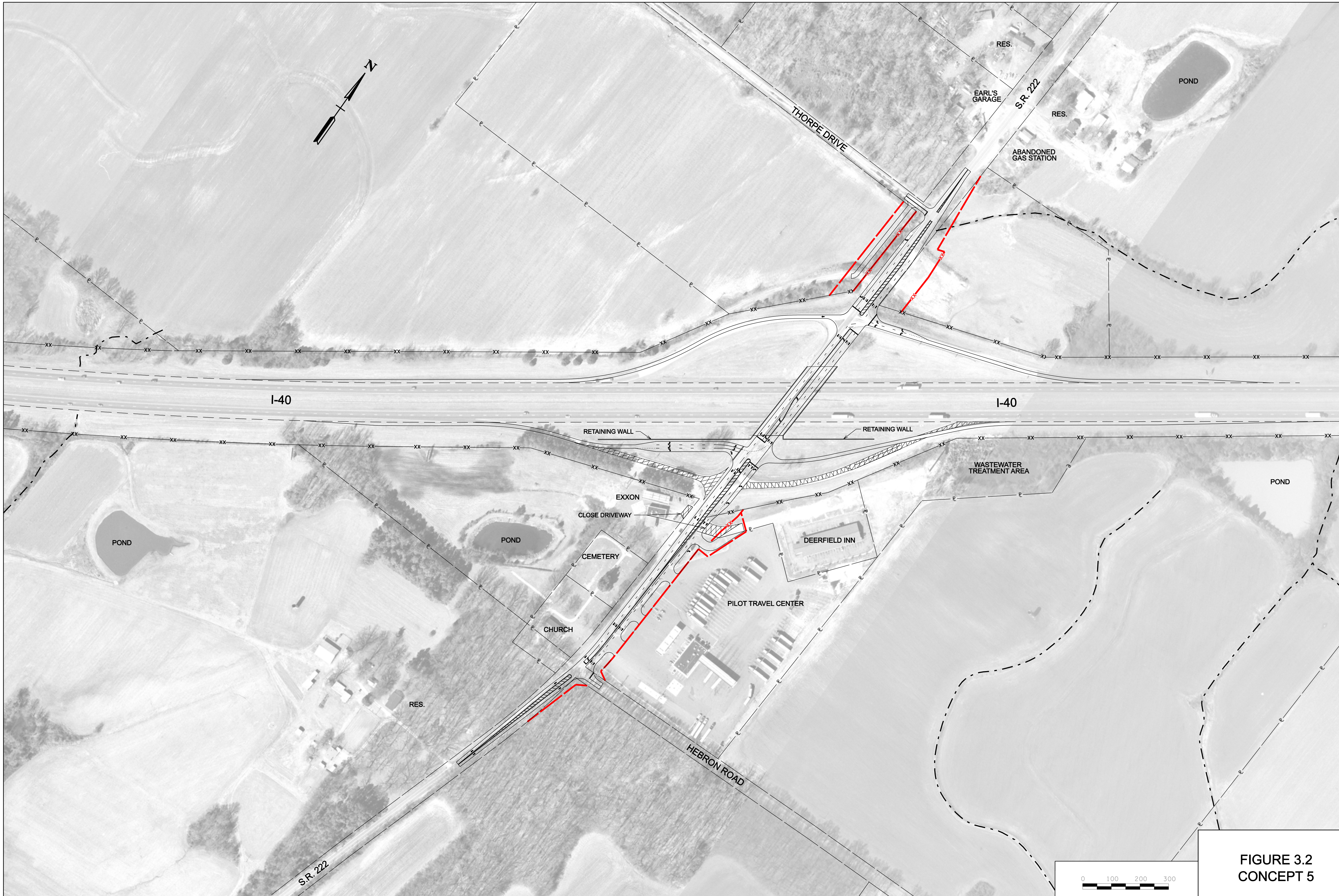


FIGURE 3.2
CONCEPT 5

3.6 Access Analysis (FHWA Eight Policy Points)

This study is undertaken in accordance with the Federal Highway Administration's (FHWA) eight policy points as outlined in the document entitled *"Interstate System Access Informational Guide"*. These eight policy points address the appropriate issues and provide the information necessary to allow the FHWA to make an informed decision considering the potential consequences of a change in access. The eight (8) policy points are listed below in *bulleted italics,* followed by the response as analyzed for this location.

1. *The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).*

The request for upgrading the study interchange was initiated by the Tennessee Department of Economic and Community Development (ECD) on behalf of the Tennessee Valley Authority (TVA). The proposed improvements for the study interchange are essential to the development of the Megasite located on the north side of I-40 within the study area. The expected increases in both population and development activity related to the Megasite will reduce the traffic operating conditions to LOS F with the current interchange configuration (i.e. No-Build Alternative). It is crucial for this development of regional significance that a modified and improved interchange access be considered to preserve efficient traffic operations in the region. The current adjacent interchanges are too far way (approximately five (5) and seven (7) miles to the adjacent interchanges) to accommodate development traffic and the local routes by themselves will not accommodate the travel patterns, nor be the preferred routes, for the employment base, suppliers, and distributors.

During the latest bridge inspection, the overall condition of the study bridge was determined to be rated as fair with a sufficiency rating of 63.2. TDOT Structures Division has determined that the existing bridge consists of four (4) spans and is not a candidate for retrofit and needs to be replaced for the following reasons:

- Any new bridge would be a two (2) span structure for the safety of motorists travelling on I-40.
- A two (2) span structure would accommodate any future widening of I-40 without additional bridge modifications.
- The cost of widening the existing structure to accommodate the required travel lanes plus full shoulders would be greater than the cost of replacing the entire structure.

The ECD has agreed to provide 100% of the funding for the preparation of the Preliminary Engineering documents for the S.R. 222 construction improvements. Even though there are no confirmed developments for the Megasite, the ECD envisions that all of the paperwork including construction design documents be completed and are shovel-ready projects when a tenant for the Megasite is identified so that the roadway improvements can be in place in conjunction with the opening of the Megasite.

If the Megasite is developed, the Megasite will serve a regional need with primary access from I-40 via the Exit 42 interchange. All proposed improvements currently identified in the State/Regional Long Range Transportation Plan (LRTP) have been included in this study. In conjunction with the development of the Megasite, additional improvements to S.R. 222 will be recommended to the north of the interchange study limits.

2. *The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access. The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).*

This study area covered a sufficient area to allow for the evaluation of different types of interchange configurations such as a traditional diamond, a modified traditional diamond containing a loop ramp in one quadrant, a combined traditional/tight diamond, and a diverging diamond. In addition, this study included the evaluation of different intersection configurations such as stop control, signal control, and free right turns. The No-Build Alternative was also included in the analyses.

The location of the study interchange for the two (2) viable concepts is the best location as it is at or in extremely close proximity to the existing interchange location. The proposed improvements do not include pedestrian and bicycle accommodations at this time since such facilities are not currently provided along the existing S.R. 222 roadway system nor typical in this rural area.

Safety issues related to the existing interchange cannot be addressed through Transportation Systems Management (TSM) strategies. There is no mass transit service in the area of the interchange. HOV facilities are not available or planned along the I-40 mainline study area. The widening of I-40 to six (6) lanes may be constructed by the 2034 planning horizon. Even with the addition of I-40 mainline lanes, the functionality of the existing study interchange will be deficient without the proposed improvements.

3. *An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).*

The 2014 and 2034 design traffic volumes analyzed in this study were approved by TDOT and a copy of the approval letter is contained in ***Appendix A***. The capacity analyses conducted in this study utilized Highway Capacity Manual procedures and included the following facility types: Basic Freeway Segments, Freeway Ramp Merges, Freeway Ramp Diverges, Multi-Lane Highways, Two-Lane Highways, Signalized Intersections, and Unsignalized Intersections. The capacity analyses included the Pilot Travel Center intersection with S.R.222 because of the high percentage of trucks (48%) utilizing this facility. Results of the capacity analyses presented in ***Section 3.1*** indicate that no significant traffic operational issues are expected with construction improvements of the viable concepts (Concepts 1 and 5). The No-Build Alternative indicates that if no improvements are made to the study interchange, then LOS F traffic conditions will be expected if the Megasite is developed. All of the proposed improvements for each concept satisfactorily accommodate the 2014 and 2034 design traffic volumes. The results from the capacity analyses are summarized in ***Tables 3.3 to 3.8***.

For the two (2) viable concepts, the proposed access point is either relocated approximately 500 feet eastward on I-40 (Concept 1) or at the same location (Concept 5). The adjacent I-40 interchanges, Exit 35 (S.R. 59) and Exit 47 (Dancyville Road), are approximately seven (7) miles to the west and five (5) miles to the east along I-40.

In addition, a proposed interchange discussed in ***Section 1.4*** is located between the study interchange and Exit 47 (Dancyville Road) approximately 1.1 miles east of the study interchange. As a result of this distance, the existing adjacent interchanges, as they relate to this proposed interchange, are outside the influence of traffic weaving conditions along I-40.

The proposed interchange access provides connections to S.R. 222 and other public roads in the vicinity of the interchange such as Hebron Road and Thorpe Drive and will not require upgrading of those facilities. The proximity of both Hebron Road and Thorpe Drive do not contribute to any safety and operational problems associated with the study interchange. On both the north and south sides of the study interchange, the 300 feet of controlled access limits are satisfied for the two (2) viable concepts (Concepts 1 and 5).

The State Strategic Highway Safety Plan was used as a benchmark on safety for this study. However, as mentioned in Policy Point 2, the proposed improvements do not include pedestrian and bicycle accommodations because such facilities are not currently provided in the existing roadway system. In addition, a conceptual signing plan for Concepts 1 and 5 are contained in ***Appendix B***. The conceptual signing plan for Concept 1 shows that the I-40 eastbound will require the use of A and B exits to distinguish between S.R. 222 northbound and southbound traffic movements.

4. *The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).*

The existing study interchange currently serves, and the proposed improvements will provide for all traffic movements for full interchange access. The proposed improvements secure sufficient ROW by utilizing either available existing ROW or through the acquisition of proposed ROW. Concepts 1 and 5 require the approximate ROW acquisition of 25.5 acres and 2.2 acres, respectively.

As mentioned in Policy Point 3, the proposed interchange access provides connections to S.R. 222 and other public roads in the vicinity of the interchange such as Hebron Road and Thorpe Drive and meets and/or exceeds current design standards for the Interstate System. No design exceptions are anticipated with either Concept 1 or Concept 5. All traffic movements have been analyzed during the 2014 and 2034 design years for each concept and have been summarized in ***Table 3.7***.

5. *The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.*

This study includes coordination with other projects as discussed in ***Section 1.4***. and the proposed improvements are consistent and conform with applicable local, regional, and statewide land use and transportation plans. The study interchange is in the current 2012-14 TIP (TDOT Proposed Comprehensive Multimodal Program) funded for ROW in FY 2013.

The location of the study interchange is not within a Transportation Management Area (TMA) and is not within a non-attainment area for air quality. As mentioned in Policy Point 3, the proposed access point for the two (2) viable concepts is either relocated approximately 500 feet eastward on I-40 (Concept 1) or at the same location (Concept 5).

6. *In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).*

This study does not preclude or affect future access points along I-40 and the proposed improvements satisfy the future needs for the study interchange. However, if the Megasite is developed and the travel demand of the Megasite exceeds the capacity of these proposed interchange improvements, the potential construction of the new interchange near Mile Marker 45, shown in ***Figure 1.5***, could be considered in the future.

7. *When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).*

This study was coordinated with the adjacent Megasite area because of its close proximity to the study interchange. ***Table 2.2*** summarizes the trips generated for the Megasite which were considered conservative and a worst-case scenario. The improvements recommended in this study interchange are integral to adequately accommodating projected traffic volumes and operations if the Megasite is developed.

As mentioned in Policy Point 3, the proposed improvements in this study are compatible and provide adequate tie-in connections to the existing street network. As discussed in ***Section 1.4***, this study has been coordinated with the S.R. 222 Relocation & System Improvements Feasibility Study to ensure that the immediate and long-term needs of the study area will be met. In addition, if the potential interchange near Mile Marker 45 is constructed, a State Industrial Access (SIA) road to the Megasite will be necessary to access S.R. 222 on the north side of the study interchange as shown in ***Figure 1.5***. The location of the SIA road will have no direct impacts to the operations of the study interchange because of their proposed distance apart from each other.

There are no pre-condition contingencies related to the adjacent projects that are required for this study. In addition, this study does not require financial or infrastructure commitments from other agencies, organizations, or private entities.

8. *The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).*

This study was developed in coordination with TDOT and documents the expected impacts and benefits from modifying the existing I-40 interchange at Exit 42 (S.R. 222). If the Megasite is developed and with the proposed modifications contained in this IMS report, the overall traffic operations at the study interchange can be adequately accommodated through the 20-year horizon year (2034).

As mentioned in Policy Point 5, this study is consistent with the current 2012-14 STIP (TDOT Proposed Comprehensive Multimodal Program) funded for ROW in FY 2013. The known environmental issues are provided in ***Section 2.2***. When this study receives a finding of Operational and Engineering Acceptability, it will then be necessary to begin conducting additional environmental studies as outlined in the NEPA planning process.

The FHWA Prompt-List for Reviewing Interstate Access Requests for Concepts 1 and 5 are provided on the following pages.

Prompt List for Review of Interstate System Access Change Requests		
Adequately Addressed?		**FHWA Interstate Access Policy Points**
Yes	No	
X		**Policy Point 1:** The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).
X		**Policy Point 2:** The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).
X		**Policy Point 3:** An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).
X		**Policy Point 4:** The proposed access connects to a public road only and will provide for all traffic movements. Less than ``full interchanges'' may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).
X		**Policy Point 5:** The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.
X		**Policy Point 6:** In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).
X		**Policy Point 7:** When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).
X		**Policy Point 8:** The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).

Concept 1 Review

Policy Point 1: "The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a))."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			Does the access request clearly describe the need and purpose of the proposal and identify project goals and objectives that are specific and measurable?	*Sect. 1.2 and 3.6 (PP1)*
X			Is the proposal in the best interest of the public, or does it merely serve a narrow interest?	*Sect. 1.2 (P1) and 3.6 (PP1)*
X			Is the proposal serving a regional transportation need, or is it merely compensating for deficiencies in the local network of arterials and collectors?	*Sect. 1.2 (P1) and 3.6 (PP1)*
		X	In lieu of granting new access, is there any reasonable alternative consisting of improvements to the existing roadway(s) or adjacent access points that could serve the need and purpose?	*This request is for modification of an existing interchange.*
X			Has the evaluation of existing interchanges and the local road network taken into account all proposed improvements currently identified in the State and/or Regional Long Range Plan?	*Sect. 3.6 (PP5-P1)*
X			Will the proposed change in access result in needed upgrades or improvements to the cross road for a significant distance away from the interchange?	*Sect. 1.4 (SR 222 Study), 2.4, and 3.6 (PP1-P3); Fig. 3.1 and 3.2; App. B*

Policy Point 2: "The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a))."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			Was FHWA actively involved in preliminary studies and decisions? If not, then more detailed information may be required in support of proposed action.	*FHWA attended a design concept meeting at TDOT on 8/23/2010.* *Sect. 3.5 (P1)*
X			Did the study area cover sufficient area to allow for an evaluation of all reasonable alternatives?	*Sect. 1.3 (P3), 2.4 (Traffic Volume Diagrams), and 3.6 (PP2); Fig. 1.1*
X			Was a No-Build Alternative evaluated?	*Sect. 2.4 (P1)(No-Build Alternative), 3.1 (Ramp Terminal Intersections), 3.5 (Viable Concepts), 3.6 (PP2-P1)(PP3-P1), and 4.0 (P1&P2); Tables 2.3 and 3.7*
X			Considering the context of the proposal, is this the best location for the proposed new interchange?	*Sect. 3.5 (P1) and 3.6 (PP2-P2)*
X			Were different interchange configurations (Tight diamond, SPDI, Parclo) considered?	AASHTO Greenbook Chapter 10 *Sect. 2.4 (Concepts) and 3.6 (PP2-P1); Table 2.3*
X			Were pedestrians and bicyclists considered in the alternative evaluation?	*Sect. 3.6 (PP2-P2) and 3.6 (PP3-P4)*
X			Was there an evaluation of different intersection configurations (stop control, signal, roundabout, free right turns, etc?)	*Sect. 3.1 (P4) and 3.6 (PP2-P1); Tables 3.7 and 3.8*
X			Have Transportation Systems Management (i.e. HOV, ITS, Ramp Metering, Transit etc.) options been evaluated as an alternative to a new or modification to an existing interchange?	*This request is for modification of an existing interchange.* *Sect. 3.6 (PP2-P3)*

X			Did the report discuss how TSM alternatives were evaluated and eliminated from consideration?	*Sect. 3.6 (PP2-P3)*
	X		Does the proposal consider any future planned TSM strategies and is the design consistent with the ability to implement the future TSM strategies?	*The design is consistent with future TSM strategies, but none were considered in the study.*
Policy Point 3: "An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d))."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			Does the report demonstrate that a proper traffic operational analysis was conducted? The analysis should include the applicable basic freeway segments, freeway weaving segments, freeway ramp segments, ramp junctions and crossroad intersections related to the proposed access point and at least the two adjacent interchanges.	*Sect. 3.1(P4) and 3.6 (PP3-P1); Tables 3.3-3.8*
X			Does the report include a **safety** analysis of the mainline, ramps and intersections of the proposed access point and the nearest adjacent interchange (provided they are near enough that it is reasonable to assume there may be impacts)?	*Sect. 3.1 (P4), 3.5 (P1), and 3.6 (PP3-P1&P2); Tables 3.3-3.8*
X			Has the design traffic volume been validated?	*Sect. 2.3 (P1) and 3.6 (PP3-P1)*
X			Does the report include verification that the data used in the traffic analysis is consistent with the traffic and air quality models MPOs use to develop their current Transportation Plan (20-year) and Transportation Improvement Program (TIP)?	*Sect. 2.3 (P1); App. A*
X			Does the report include a design period of 20 years commencing at the time of project approval (PS&E approval)?	*Sect. 2.3 (Horizon Years and Time Periods Analyzed)*
X			Does the report include quantitative analyses and results to identify operational differences between alternatives that are heavily congested?	*Sect. 3.1 (Ramp Terminal Intersections) and 3.6 (PP2-P1); Table 3.7*
X			Has a conceptual signing plan been provided?	*Viable Concepts 1&5; Sect. 3.6 (PP3-P4); App. B*
X			Is guidance signing (i.e., way-finding or trail blazing signs) clear and simple?	MUTCD Chapter 2E: Guide Signs – Freeways and Expressways *Sect. 3.6 (PP3-P4)*
	X		Do the results of the operational analysis result in a significant adverse impact to existing or future conditions?	*Sect. 3.1 (Capacity Analysis Results) and 3.6 (PP3-P1); Tables 3.3-3.8*
X			Will the proposed change in access result in needed upgrades or improvements to the cross road for a significant distance away from the interchange? If so, have impacts to the local network been disclosed and fully evaluated?"	*SR 222 would be upgraded as part of the Megasite development.* *Sect. 2.4 (P2) and 3.6 (PP1-P3)*

Concept 1 Review

X			Are the cross roads or adjacent surface level roads and intersections affected by the proposed access point analyzed to the extent (length) where impacts caused or affecting the new proposed access point are disclosed to the appropriate managing jurisdiction?	*Sect. 3.6 (PP3-P3) and 4.1 (Local Agency Letters)*
X			Are pedestrian and/or bicycle facilities included (as appropriate) and do these facilities provide for reasonable accommodation?	*Sect. 3.6 (PP2-P2) and 3.6 (PP3-P4)*
X			Does the proposed access secure sufficient Limits of Access adjacent to the Interchange ramps?	AASHTO's "A Policy on Design Standards Interstate System, 2005" Pg. 2; NCHRP Synthesis 332 *Sect. 2.4 (P2), 3.5 (P4), and 3.6 (PP4-P2)*
X			Does the proximity of the nearest crossroad intersections to the ramps contribute to safety or operational problems? Can they be mitigated??	*Sect. 2.4 (Concepts), 3.1, and 3.6 (PP3-P3)*
		X	In addition to HCS, what analysis tools were employed and were they appropriate?	*HCS only.*
X			Has the proposal distinguished between nominal safety (i.e. adherence to design policies and standards) and substantive safety (actual and expected safety performance)?	*Safety was considered throughout the study in the development of the concepts.* *Fig. 3.1 and 3.2; App. B*
X			Will any individual elements within the recommended alternative be degraded operationally as a result of this action? If yes, are reasons provided to accept them?	*Acceptable LOS were obtained from the capacity analysis results.* *Sect. 3.1 (Capacity Analysis Results) and 3.6 (PP3-P1); Tables 3.3-3.8*
X			In evaluating whether the proposal has a "significant adverse impact" on safety, has the State Strategic Highway Safety Plan been used as a benchmark?	*Safety was considered throughout the study in the development of the concepts.* *Sect. 3.6 (PP3-P4); Fig. 3.1 and 3.2; App. B*
X			Are the proposed interchange design configurations able to satisfactorily accommodate the design year traffic volumes?	*Sect. 3.1 (Capacity Analysis Results) and 3.6 (PP3-P1); Tables 3.3-3.8*
X			If the project is to be built in stages, has the traffic operational and safety analyses considered the interim stages of the proposal?	*Project is being built in one stage.*

Policy Point 4: "The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d))."

Addressed Adequately?			Question	Reference Location
Y	**N**	**N/A**		
X			Does the proposed access connect to a public road?	*Sect. 2.4 (P2), 3.5 (P1), 3.6 (PP3-P3), and 3.6 (PP4-P2); Fig. 3.1 and 3.2; App. B*
X			Are all traffic movements for full interchange access provided?	*Sect. 2.4 (P2), 3.5, and 3.6 (PP4-P1); Fig. 3.1 and 3.2; App. B*
		X	If not, is the proposed access for special purposes such as transit vehicles, HOVs, and/or a park and ride lot?	*Providing for a full interchange.*
		X	If a partial interchange is proposed, is there sufficient justification for providing only a partial interchange?	AASHTO Greenbook 2004 Pg. 821-823 *Providing for a full interchange.*
		X	If a partial interchange is proposed; was a full interchange evaluated as an alternative and is there sufficient justification to eliminate or discard it?	*Providing for a full interchange.*

Concept 1 Review

Policy Point 4: "The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d))."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
		X	Is sufficient ROW available (or being acquired) to provide a full interchange at a future date (staged construction)?	*Providing for a full interchange.*
		X	Are you comfortable with how the missing movements will be accommodated on the surface streets and adjacent interchanges?	*Providing for a full interchange.*
X			Does FHWA support the selection of design controls/criteria and desired operational goals?	*Sect. 2.4 (Concepts), 3.1 (Capacity Analysis Results), 3.5 (P1), and 3.6 (PP4-P2); Tables 3.3-3.8*
X			Does the proposed access meet or exceed current design standards for the Interstate System?	AASHTO's Greenbook and A Policy on Design Standards Interstate System, 2005 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
		X	If not, have anticipated design exceptions been identified and reviewed (at least conceptually)?	*Concept meets current design standards*
		X	If expected design exceptions could have significant operational impacts on the Interstate and/or Crossroad system, are mitigation measures described?	*Concept meets current design standards*
X			Will the length of access control along the crossroad provide for acceptable operations and safety? (100-300' is a minimum. Additional access control is strongly encouraged when needed for safety and operational enhancement)	AASHTO "A Policy on Design Standards Interstate System" 2005 *Sect. 2.4 (P2), 3.5 (P4), and 3.6 (PP4-P2)*
X			Does FHWA support selection of opening and design years?	*Sect. 2.3 (Horizon Year and Time Periods Analyzed)*
X			Has each movement of the proposal been "tested" for ease of operation?	AASHTO Greenbook 2004 Pg. 863 *Sect. 2.4 (Concepts), 3.1 (Capacity Analysis Results), 3.6 (PP3-P1), and 3.6 (PP4-P2); Table 3.7*
Have all design criteria (including but not limited to the following) been adequately addressed?				
X			a. Sight distance at ramp terminals (Don't overlook signal heads obscured by structures.)	AASHTO Greenbook 2004 Pg. 841 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			b. Sufficient storage on ramp to prevent queues from spilling on to the Interstate (based on current and/or future projected traffic demand)	*Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			c. Vertical clearance	AASHTO "A Policy on Design Standards Interstate System" 2005 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			d. Pedestrian access through the interchange	AASHTO Greenbook 2004 Pg. 864 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP2-P2) and 3.6 (PP3-P4)*
X			e. Length of acceleration/deceleration lanes	AASHTO Greenbook 2004 Pg. 823, 847 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*

Concept 1 Review

Policy Point 4: "The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d))."

Addressed Adequately?			Question	Reference Location
Y	N	N/A		
X			f. Length of tapers	AASHTO Greenbook 2004 Pg. 849 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			g. Spacing between ramps	Greenbook pg 843 & Ex. 10-68 and operational analysis *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			h. Lane continuity	AASHTO Greenbook 2004 Pg. 810 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			i. Lane balance	AASHTO Greenbook 2004 Pg. 810 AASHTO Greenbook 2004 Pg. 807 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			j. Uniformity in interchange design and operational patterns (i.e. right-side ramps, exit design consistent w/adjacent interchanges)	*Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*

Policy Point 5: "The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93."

Addressed Adequately?			Question	Reference Location
Y	N	N/A		
X			Does the IJR discuss or include (as appropriate) other project(s), studies or planned actions that may have an effect on the report analysis results?	*Sect. 1.4 (4 Projects Listed) and 3.6 (PP5-P1)*
X			Does the project conform to the local planning, MPO or other related plans?	*Sect. 3.6 (PP5-P1)*
		X	Does the report include an endorsement of land use plans by the appropriate government entity before it is utilized for traffic generation purposes?	*Existing land use is rural agriculture*
X			Is the access request located within a Transportation Management Areas? (TMAs are metropolitan areas of 200,000 or more in population)	http://hepgis.fhwa.dot.gov/hepgis_v2/Urbanboundaries/Map.aspx *Sect. 3.6 (PP5-P2)*
X			Is the access request located within a non-attainment area for air quality? (requests for access in a non-attainment or maintenance areas for air quality must be a part of a conforming transportation plan)	*Sect. 3.6 (PP5-P2)*
X			Is the project included in the TIP/STIP and LRTP?	*Sect. 3.6 (PP5-P1)*
X			Is the access point covered as a part of an Interstate corridor study or plan? *(especially important for areas where the potential exists for construction of future adjacent interchanges)*	*Sect. 3.6 (PP5-P2)*

Policy Point 6: "In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111)."

Addressed Adequately?	Question	Reference Location

Concept 1 Review

Y	N	N/A		
X			Is it possible that new interchange(s) not addressed in the IJR could be added within an area of influence to the proposed access point? (If so, could the proposal preclude or otherwise be affected by any future access points?)	*Sect. 3.6 (PP6-P1&P2)*
		X	Does the IJR report include the traffic volumes generated by any future additional interchanges within a vicinity of influence that are proposed?	*No planned future interchanges.*
X			Does the IJR report fail to include any other proposed interstate access points within a vicinity of influence that are being proposed or are in the current long range construction program?	*Sect. 1.4 (1 Potential Project Listed) and 3.6 (PP6-P1&P2)*

Policy Point 7: "When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d))."

Addressed Adequately?			Question	Reference Location
Y	N	N/A		
X			Does the access request adequately demonstrate that an appropriate effort of coordination has been made with appropriate proposed developments?	*Sect. 2.3 (Megasite and Other Assumed Developments) and 3.6 (PP7-P1); Table 2.2*
X			Are the proposed improvements compatible with the existing street network or are other improvements needed?	*Sect. 2.4 (Concepts), 3.1, and 3.6 (PP3-P3); Fig. 3.1 and 3.2; App. B*
X			Are there any pre-condition contingencies required in regards to the timing of other improvements?	*Sect. 3.6 (PP7-P3)*
X			Have all commitments to improve the local transportation network been included in a TIP/STIP/LRTP prior to the Interstate access approval (final approval of NEPA document)?	*Sect. 1.4 (P1) and 3.6 (PP7-P2)*
		X	If pre-condition contingencies are required, are pertinent parties in agreement with these contingencies and is this documented?	*No pre-conditions are required.*
		X	If the proposed improvements are founded on the need for providing access to new development, are appropriate commitments in place to ensure that the development will likely occur as planned?	*No commitments are required.*
		X	If project is privately funded, are appropriate measures in place to ensure improvements will be completed if the developer is unable to meet financial obligations?	*Project is not privately funded.*
X			If the purpose and need to accommodate new development/traffic demands aren't fully known, is a worst case scenario used for future traffic?	*Sect. 2.3 and 3.6 (PP7-P1); Table 2.2*
X			Does the project require financial or infrastructure commitments from other agencies, organizations, or private entities?	*Sect. 3.6 (PP7-P3)*

Policy Point 8: "The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111)."

Addressed Adequately?			Question	Reference Location
Y	N	N/A		
X			Are there any known social or environmental issues that could affect the proposal?	*Sect. 2.2 (P1&P2) and 3.6 (PP8-P2)*
X			Is the project consistent with the current TIP/STIP and LRTP and/or proposed amendments to the plan?	*Sect. 3.6 (PP5-P1)(PP8-P2)*
X			Although NEPA is a separate action, is an environmental overview for the proposed improvements included?	*Sect. 2.2 (P2) and 3.6 (PP8-P2)*

X			Is it appropriate to emphasize to the project stakeholders that the access approval will be handled as a two-step process? (i.e. Step 1: Engineering and Operational Acceptability and Step 2: Environmental Approvals)	*Sect. 3.6 (PP8-P2)*
X			Are all funding commitments included in a TIP/STIP/LRTP prior to the Interstate access approval (prior to final approval of the NEPA document)?	*Sect. 3.6 (PP5-P1)(PP8-P2)*
X			Are all commitments included in a TIP/STIP/LRTP prior to the Interstate access approval (prior to final approval of the NEPA document)?	*Sect. 3.6 (PP5-P1)(PP8-P2)*

Reference Location Legend: P# = Paragraph Number; PP# = Policy Point Number

Concept 5 Review

Prompt List for Review of Interstate System Access Change Requests		
Adequately Addressed?		**FHWA Interstate Access Policy Points**
Yes	No	
X		**Policy Point 1:** The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).
X		**Policy Point 2:** The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).
X		**Policy Point 3:** An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).
X		**Policy Point 4:** The proposed access connects to a public road only and will provide for all traffic movements. Less than ``full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).
X		**Policy Point 5:** The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.
X		**Policy Point 6:** In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).
X		**Policy Point 7:** When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).
X		**Policy Point 8:** The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).

Concept 5 Review

Policy Point 1: "The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a))."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			Does the access request clearly describe the need and purpose of the proposal and identify project goals and objectives that are specific and measurable?	*Sect. 1.2 and 3.6 (PP1)*
X			Is the proposal in the best interest of the public, or does it merely serve a narrow interest?	*Sect. 1.2 (P1) and 3.6 (PP1)*
X			Is the proposal serving a regional transportation need, or is it merely compensating for deficiencies in the local network of arterials and collectors?	*Sect. 1.2 (P1) and 3.6 (PP1)*
		X	In lieu of granting new access, is there any reasonable alternative consisting of improvements to the existing roadway(s) or adjacent access points that could serve the need and purpose?	*This request is for modification of an existing interchange.*
X			Has the evaluation of existing interchanges and the local road network taken into account all proposed improvements currently identified in the State and/or Regional Long Range Plan?	*Sect. 3.6 (PP5-P1)*
X			Will the proposed change in access result in needed upgrades or improvements to the cross road for a significant distance away from the interchange?	*Sect. 1.4 (SR 222 Study), 2.4, and 3.6 (PP1-P3); Fig. 3.1 and 3.2; App. B*

Policy Point 2: "The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a))."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			Was FHWA actively involved in preliminary studies and decisions? If not, then more detailed information may be required in support of proposed action.	*FHWA attended a design concept meeting at TDOT on 8/23/2010.* *Sect. 3.5 (P1)*
X			Did the study area cover sufficient area to allow for an evaluation of all reasonable alternatives?	*Sect. 1.3 (P3), 2.4 (Traffic Volume Diagrams), and 3.6 (PP2); Fig. 1.1*
X			Was a No-Build Alternative evaluated?	*Sect. 2.4 (P1)(No-Build Alternative), 3.1 (Ramp Terminal Intersections), 3.5 (Viable Concepts), 3.6 (PP2-P1)(PP3-P1), and 4.0 (P1&P2); Tables 2.3 and 3.7*
X			Considering the context of the proposal, is this the best location for the proposed new interchange?	*Sect. 3.5 (P1) and 3.6 (PP2-P2)*
X			Were different interchange configurations (Tight diamond, SPDI, Parclo) considered?	AASHTO Greenbook Chapter 10 *Sect. 2.4 (Concepts) and 3.6 (PP2-P1); Table 2.3*
X			Were pedestrians and bicyclists considered in the alternative evaluation?	*Sect. 3.6 (PP2-P2) and 3.6 (PP3-P4)*
X			Was there an evaluation of different intersection configurations (stop control, signal, roundabout, free right turns, etc?)	*Sect. 3.1 (P4) and 3.6 (PP2-P1); Tables 3.7 and 3.8*
X			Have Transportation Systems Management (i.e. HOV, ITS, Ramp Metering, Transit etc.) options been evaluated as an alternative to a new or modification to an existing interchange?	*This request is for modification of an existing interchange.* *Sect. 3.6 (PP2-P3)*

X			Did the report discuss how TSM alternatives were evaluated and eliminated from consideration?	*Sect. 3.6 (PP2-P3)*
	X		Does the proposal consider any future planned TSM strategies and is the design consistent with the ability to implement the future TSM strategies?	*The design is consistent with future TSM strategies, but none were considered in the study.*

<u>Policy Point 3:</u> “An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).”

Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			Does the report demonstrate that a proper traffic operational analysis was conducted? The analysis should include the applicable basic freeway segments, freeway weaving segments, freeway ramp segments, ramp junctions and crossroad intersections related to the proposed access point and at least the two adjacent interchanges.	*Sect. 3.1(P4) and 3.6 (PP3-P1); Tables 3.3-3.8*
X			Does the report include a **<u>safety</u>** analysis of the mainline, ramps and intersections of the proposed access point and the nearest adjacent interchange (provided they are near enough that it is reasonable to assume there may be impacts)?	*Sect. 3.1 (P4), 3.5 (P1), and 3.6 (PP3-P1&P2); Tables 3.3-3.8*
X			Has the design traffic volume been validated?	*Sect. 2.3 (P1) and 3.6 (PP3-P1)*
X			Does the report include verification that the data used in the traffic analysis is consistent with the traffic and air quality models MPOs use to develop their current Transportation Plan (20-year) and Transportation Improvement Program (TIP)?	*Sect. 2.3 (P1); App. A*
X			Does the report include a design period of 20 years commencing at the time of project approval (PS&E approval)?	*Sect. 2.3 (Horizon Years and Time Periods Analyzed)*
X			Does the report include quantitative analyses and results to identify operational differences between alternatives that are heavily congested?	*Sect. 3.1 (Ramp Terminal Intersections) and 3.6 (PP2-P1); Table 3.7*
X			Has a conceptual signing plan been provided?	*Viable Concepts 1&5; Sect. 3.6 (PP3-P4); App. B*
X			Is guidance signing (i.e., way-finding or trail blazing signs) clear and simple?	<u>MUTCD Chapter 2E: Guide Signs – Freeways and Expressways</u> *Sect. 3.6 (PP3-P4)*
	X		Do the results of the operational analysis result in a significant adverse impact to existing or future conditions?	*Sect. 3.1 (Capacity Analysis Results) and 3.6 (PP3-P1); Tables 3.3-3.8*
X			Will the proposed change in access result in needed upgrades or improvements to the cross road for a significant distance away from the interchange? If so, have impacts to the local network been disclosed and fully evaluated?"	*SR 222 would be upgraded as part of the Megasite development.* *Sect. 2.4 (P2) and 3.6 (PP1-P3)*

X			Are the cross roads or adjacent surface level roads and intersections affected by the proposed access point analyzed to the extent (length) where impacts caused or affecting the new proposed access point are disclosed to the appropriate managing jurisdiction?	*Sect. 3.6 (PP3-P3) and 4.1 (Local Agency Letters)*
X			Are pedestrian and/or bicycle facilities included (as appropriate) and do these facilities provide for reasonable accommodation?	*Sect. 3.6 (PP2-P2) and 3.6 (PP3-P4)*
X			Does the proposed access secure sufficient Limits of Access adjacent to the Interchange ramps?	AASHTO's "A Policy on Design Standards Interstate System, 2005" Pg. 2; NCHRP Synthesis 332 *Sect. 2.4 (P2), 3.5 (P4), and 3.6 (PP4-P2)*
X			Does the proximity of the nearest crossroad intersections to the ramps contribute to safety or operational problems? Can they be mitigated??	*Sect. 2.4 (Concepts), 3.1, and 3.6 (PP3-P3)*
		X	In addition to HCS, what analysis tools were employed and were they appropriate?	*HCS only.*
X			Has the proposal distinguished between nominal safety (i.e. adherence to design policies and standards) and substantive safety (actual and expected safety performance)?	*Safety was considered throughout the study in the development of the concepts.* *Fig. 3.1 and 3.2; App. B*
X			Will any individual elements within the recommended alternative be degraded operationally as a result of this action? If yes, are reasons provided to accept them?	*Acceptable LOS were obtained from the capacity analysis results.* *Sect. 3.1 (Capacity Analysis Results) and 3.6 (PP3-P1); Tables 3.3-3.8*
X			In evaluating whether the proposal has a "significant adverse impact" on safety, has the State Strategic Highway Safety Plan been used as a benchmark?	*Safety was considered throughout the study in the development of the concepts.* *Sect. 3.6 (PP3-P4); Fig. 3.1 and 3.2; App. B*
X			Are the proposed interchange design configurations able to satisfactorily accommodate the design year traffic volumes?	*Sect. 3.1 (Capacity Analysis Results) and 3.6 (PP3-P1); Tables 3.3-3.8*
X			If the project is to be built in stages, has the traffic operational and safety analyses considered the interim stages of the proposal?	*Project is being built in one stage.*

Policy Point 4: "The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d))."

Addressed Adequately?			Question	Reference Location
Y	N	N/A		
X			Does the proposed access connect to a public road?	*Sect. 2.4 (P2), 3.5 (P1), 3.6 (PP3-P3), and 3.6 (PP4-P2); Fig. 3.1 and 3.2; App. B*
X			Are all traffic movements for full interchange access provided?	*Sect. 2.4 (P2), 3.5, and 3.6 (PP4-P1); Fig. 3.1 and 3.2; App. B*
		X	If not, is the proposed access for special purposes such as transit vehicles, HOVs, and/or a park and ride lot?	*Providing for a full interchange.*
		X	If a partial interchange is proposed, is there sufficient justification for providing only a partial interchange?	AASHTO Greenbook 2004 Pg. 821-823 *Providing for a full interchange.*
		X	If a partial interchange is proposed; was a full interchange evaluated as an alternative and is there sufficient justification to eliminate or discard it?	*Providing for a full interchange.*

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Policy Point 4: "The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d))."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
		X	Is sufficient ROW available (or being acquired) to provide a full interchange at a future date (staged construction)?	*Providing for a full interchange.*
		X	Are you comfortable with how the missing movements will be accommodated on the surface streets and adjacent interchanges?	*Providing for a full interchange.*
X			Does FHWA support the selection of design controls/criteria and desired operational goals?	*Sect. 2.4 (Concepts), 3.1 (Capacity Analysis Results), 3.5 (P1), and 3.6 (PP4-P2); Tables 3.3-3.8*
X			Does the proposed access meet or exceed current design standards for the Interstate System?	AASHTO's Greenbook and A Policy on Design Standards Interstate System, 2005 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
		X	If not, have anticipated design exceptions been identified and reviewed (at least conceptually)?	*Concept meets current design standards*
		X	If expected design exceptions could have significant operational impacts on the Interstate and/or Crossroad system, are mitigation measures described?	*Concept meets current design standards*
X			Will the length of access control along the crossroad provide for acceptable operations and safety? (100-300' is a minimum. Additional access control is strongly encouraged when needed for safety and operational enhancement)	AASHTO "A Policy on Design Standards Interstate System" 2005 *Sect. 2.4 (P2), 3.5 (P4), and 3.6 (PP4-P2)*
X			Does FHWA support selection of opening and design years?	*Sect. 2.3 (Horizon Year and Time Periods Analyzed)*
X			Has each movement of the proposal been "tested" for ease of operation?	AASHTO Greenbook 2004 Pg. 863 *Sect. 2.4 (Concepts), 3.1 (Capacity Analysis Results), 3.6 (PP3-P1), and 3.6 (PP4-P2); Table 3.7*
Have all design criteria (including but not limited to the following) been adequately addressed?				
X			a. Sight distance at ramp terminals (Don't overlook signal heads obscured by structures.)	AASHTO Greenbook 2004 Pg. 841 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			b. Sufficient storage on ramp to prevent queues from spilling on to the Interstate (based on current and/or future projected traffic demand)	*Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			c. Vertical clearance	AASHTO "A Policy on Design Standards Interstate System" 2005 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			d. Pedestrian access through the interchange	AASHTO Greenbook 2004 Pg. 864 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP2-P2) and 3.6 (PP3-P4)*
X			e. Length of acceleration/deceleration lanes	AASHTO Greenbook 2004 Pg. 823, 847 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*

Concept 5 Review

Policy Point 4: "The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d))."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			f. Length of tapers	AASHTO Greenbook 2004 Pg. 849 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			g. Spacing between ramps	Greenbook pg 843 & Ex. 10-68 and operational analysis *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			h. Lane continuity	AASHTO Greenbook 2004 Pg. 810 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			i. Lane balance	AASHTO Greenbook 2004 Pg. 810 AASHTO Greenbook 2004 Pg. 807 *Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*
X			j. Uniformity in interchange design and operational patterns (i.e. right-side ramps, exit design consistent w/adjacent interchanges)	*Sect. 2.4 (Concepts), 3.5 (P1), and 3.6 (PP4-P2)*

Policy Point 5: "The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			Does the IJR discuss or include (as appropriate) other project(s), studies or planned actions that may have an effect on the report analysis results?	*Sect. 1.4 (4 Projects Listed) and 3.6 (PP5-P1)*
X			Does the project conform to the local planning, MPO or other related plans?	*Sect. 3.6 (PP5-P1)*
		X	Does the report include an endorsement of land use plans by the appropriate government entity before it is utilized for traffic generation purposes?	*Existing land use is rural agriculture*
X			Is the access request located within a Transportation Management Areas? (TMAs are metropolitan areas of 200,000 or more in population)	http://hepgis.fhwa.dot.gov/hepgis_v2/Urbanboundaries/Map.aspx *Sect. 3.6 (PP5-P2)*
X			Is the access request located within a non-attainment area for air quality? (requests for access in a non-attainment or maintenance areas for air quality must be a part of a conforming transportation plan)	*Sect. 3.6 (PP5-P2)*
X			Is the project included in the TIP/STIP and LRTP?	*Sect. 3.6 (PP5-P1)*
X			Is the access point covered as a part of an Interstate corridor study or plan? *(especially important for areas where the potential exists for construction of future adjacent interchanges)*	*Sect. 3.6 (PP5-P2)*

Policy Point 6: "In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111)."		
Addressed Adequately?	**Question**	**Reference Location**

Concept 5 Review

Y	N	N/A		
X			Is it possible that new interchange(s) not addressed in the IJR could be added within an area of influence to the proposed access point? (If so, could the proposal preclude or otherwise be affected by any future access points?)	*Sect. 3.6 (PP6-P1&P2)*
		X	Does the IJR report include the traffic volumes generated by any future additional interchanges within a vicinity of influence that are proposed?	*No planned future interchanges.*
X			Does the IJR report fail to include any other proposed interstate access points within a vicinity of influence that are being proposed or are in the current long range construction program?	*Sect. 1.4 (1 Potential Project Listed) and 3.6 (PP6-P1&P2)*
Policy Point 7: "When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d))."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			Does the access request adequately demonstrate that an appropriate effort of coordination has been made with appropriate proposed developments?	*Sect. 2.3 (Megasite and Other Assumed Developments) and 3.6 (PP7-P1); Table 2.2*
X			Are the proposed improvements compatible with the existing street network or are other improvements needed?	*Sect. 2.4 (Concepts), 3.1, and 3.6 (PP3-P3); Fig. 3.1 and 3.2; App. B*
X			Are there any pre-condition contingencies required in regards to the timing of other improvements?	*Sect. 3.6 (PP7-P3)*
X			Have all commitments to improve the local transportation network been included in a TIP/STIP/LRTP prior to the Interstate access approval (final approval of NEPA document)?	*Sect. 1.4 (P1) and 3.6 (PP7-P2)*
		X	If pre-condition contingencies are required, are pertinent parties in agreement with these contingencies and is this documented?	*No pre-conditions are required.*
		X	If the proposed improvements are founded on the need for providing access to new development, are appropriate commitments in place to ensure that the development will likely occur as planned?	*No commitments are required.*
		X	If project is privately funded, are appropriate measures in place to ensure improvements will be completed if the developer is unable to meet financial obligations?	*Project is not privately funded.*
X			If the purpose and need to accommodate new development/traffic demands aren't fully known, is a worst case scenario used for future traffic?	*Sect. 2.3 and 3.6 (PP7-P1); Table 2.2*
X			Does the project require financial or infrastructure commitments from other agencies, organizations, or private entities?	*Sect. 3.6 (PP7-P3)*
Policy Point 8: "The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111)."				
Addressed Adequately?			**Question**	**Reference Location**
Y	**N**	**N/A**		
X			Are there any known social or environmental issues that could affect the proposal?	*Sect. 2.2 (P1&P2) and 3.6 (PP8-P2)*
X			Is the project consistent with the current TIP/STIP and LRTP and/or proposed amendments to the plan?	*Sect. 3.6 (PP5-P1)(PP8-P2)*
X			Although NEPA is a separate action, is an environmental overview for the proposed improvements included?	*Sect. 2.2 (P2) and 3.6 (PP8-P2)*

X			Is it appropriate to emphasize to the project stakeholders that the access approval will be handled as a two-step process? (i.e. Step 1: Engineering and Operational Acceptability and Step 2: Environmental Approvals)	*Sect. 3.6 (PP8-P2)*
X			Are all funding commitments included in a TIP/STIP/LRTP prior to the Interstate access approval (prior to final approval of the NEPA document)?	*Sect. 3.6 (PP5-P1)(PP8-P2)*
X			Are all commitments included in a TIP/STIP/LRTP prior to the Interstate access approval (prior to final approval of the NEPA document)?	*Sect. 3.6 (PP5-P1)(PP8-P2)*

Reference Location Legend: P# = Paragraph Number; PP# = Policy Point Number

4.0 SUMMARY AND CONCLUSIONS

As discussed in ***Section 3.5***, this study determined that the following options are considered viable for this interchange location:

- Concept 1 - Partial Traditional Diamond located east of the existing interchange.
- Concept 5 - Combined Traditional/Tight Diamond located at the existing interchange.
- No-Build Alternative.

The No-Build Alternative was determined viable option if the Megasite is not developed. However, if the Megasite is developed, then the No-Build Alternative is a non-viable concept because the capacity of the existing interchange will not be satisfied (LOS F conditions) in the future 2034 design year.

Between the viable construction concepts, TDOT and ECD both prefer Concept 1 since the I-40 eastbound to S.R. 222 northbound traffic movement would be free-flow via a single lane loop ramp and removed from signalization as required with Concept 5. This traffic movement is the highest turning movement within the interchange totaling 586 vehicles during the 2034 morning peak period. The construction cost for both of these concepts are similar with Concept 1 ($13.1 million) being slightly less than Concept 5 ($13.2 million).

At this time, a tenant for the Megasite has not been identified. However, if a tenant is identified and the Megasite is developed, these proposed modifications will be needed to meet the passenger and freight transportation needs and to support the future logical pattern of development within the study area. Without the construction of one of these two (2) viable concepts, the existing level of service (LOS) at the I-40/S.R. 222 interchange will be LOS F which includes the development of the Megasite. The service life of the viable concepts along with the development of the Megasite will exceed the 2034 planning horizon.

4.1 TDOT Design Concurrence Letter and Local Agency Letters of Support

The TDOT Design concurrence letter and three (3) letters of local agency support are included on subsequent pages.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
NASHVILLE, TENNESSEE 37243-0340

MEMORANDUM

TO: Steve Allen, Director, Project Planning Division

FROM: CAS Carolyn Stonecipher, Director, Design Division

DATE: September 9, 2010

SUBJECT: Interchange Modification Study
Interstate 40 at State Route 222 (exit 42)
Fayette County

The subject Interchange Modification Study has been reviewed by my office and we concur with the conceptual plan as shown.

Please advise if this office can be of further assistance.

CAS:rdb

HAYWOOD COUNTY

TELEPHONE (731) 772-1432

OFFICE OF
COUNTY MAYOR

COURTHOUSE
1 NORTH WASHINGTON • BROWNSVILLE, TN 38012

#20448

STATE OF TENNESSEE
DEPT. OF TRANSPORTATION
RECEIVED

JUN 2 2009

CHIEF ENGINEER

May 19, 2009

Paul Degges, P.E.
Chief Engineer
Tennessee Department of Transportation
James K. Polk Building
505 Deaderick Street, Suite 700
Nashville, TN 37243-0349

Dear Mr. Degges:

The purpose of this letter is to support efforts by the Tennessee Department of Transportation to get operational approvals for proposed interchange studies along Interstate 40 in Haywood and Fayette Counties. We appreciate the opportunity to express our preferences on your conceptual drawings of the interchanges and commend your staff for their hard work.

As you know, the interchange at Exit 42 is currently insufficient to serve the I-40 Advantage Auto Park in Haywood County, assuming that a large project decides to locate on this TVA-certified megasite. Improvements to the existing interchange at SR 222, as shown on Concept 1, will add that capability and we respectfully ask you to submit an Interchange Modification Study to the Federal Highway Administration (FHWA).

Furthermore, a new I-40 interchange will be necessary if the megasite develops as expected. Another interchange at about mile marker 44, as shown on Concept 4, would provide additional interstate highway access to an assembly plant and adjoining supplier park. Again, we ask you to submit an Interchange Justification Study to FHWA in conjunction with the aforementioned Modification Study of Exit 42.

Having these interchange studies approved would make the megasite even more attractive to industrial prospects and we appreciate your willingness to seek the operational approvals mentioned above.

Respectfully,

A. Franklin Smith, III
County Mayor

20446

STATE OF TENNESSEE
DEPT. OF TRANSPORTATION
RECEIVED

JUN 2 2009

CHIEF ENGINEER

Town of Stanton

8 MAIN STREET
P.O. BOX 97
STANTON, TENNESSEE 38069
731-548-2565

May 19, 2009

Paul Degges, P.E.
Chief Engineer
Tennessee Department of Transportation
James K. Polk Building
505 Deaderick Street, Suite 700
Nashville, TN 37243-0349

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Having these interchange studies approved would make the megasite even more attractive to industrial prospects and we appreciate your willingness to seek the operational approvals mentioned above.

Respectfully,

Al Sterbinsky

Allan Sterbinsky
Mayor of Stanton

#20447

ESTABLISHED 1824
CITY OF
Brownsville
TENNESSEE

111 North Washington
P.O. Box 375
Brownsville, TN 38012
(731)772-1212

May 26, 2009

Paul Degges, P.E.
Chief Engineer
Tennessee Department of Transportation
James K. Polk Building
505 Deaderick Street, Suite 700
Nashville, TN 37243-0349

Dear Mr. Degges:

The purpose of this letter is to support efforts by the Tennessee Department of Transportation to get operational approvals for proposed interchange studies along Interstate 40 in Haywood and Fayette Counties. We appreciate the opportunity to express our preferences on your conceptual drawings of the interchanges and commend your staff for their hard work.

As you know, the interchange at Exit 42 is currently insufficient to serve the I-40 Advantage Auto Park in Haywood County, assuming that a large project decides to locate on the TVA-certified mega site. Improvements to the existing interchange at SR 222, as shown on Concept 1, will add that capability and we respectfully ask you to submit an Interchange Modification Study to the Federal Highway Administration (FHWA).

Furthermore, a new I-40 interchange will be necessary if the mega site develops as expected. Another interchange at about mile marker 44, as shown on Concept 4, would provide additional interstate highway access to an assembly plant and adjoining supplier park. Again, we ask you to submit an Interchange Justification Study to FHWA in conjunction with the aforementioned Modification Study of Exit 42.

Having these interchange studies approved would make the mega site even more attractive to industrial prospects and we appreciate your willingness to seek the operational approvals mentioned above.

Respectfully,

Webb F Banks

Webb F. Banks, Mayor

APPENDIX A

TRAFFIC DATA

TDOT TRAFFIC VOLUME

APPROVAL LETTER

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION
SUITE 1000, JAMES K. POLK BUILDING
505 Deaderick Street
NASHVILLE, TENNESSEE 37243-0344

John Schroer
Commissioner

Bill Haslam
Governor

April 14, 2011

Mr. Steve Bryan
TranSystems
5500 Franklin Pike Suite 202
Nashville, TN 37220

Subject : Updated Traffic Volume Projections for I-40 between Exit 35 and Exit 47
Fayette and Haywood Counties

Dear Mr. Bryan,

We have checked and reviewed the traffic forecasts you submitted on April 5, 2011 for the subject project. All traffic volumes and DHVs have our approval. If you have any questions, please contact me at (615) 741-5786 or via email at gregory.dyer@tn.gov.

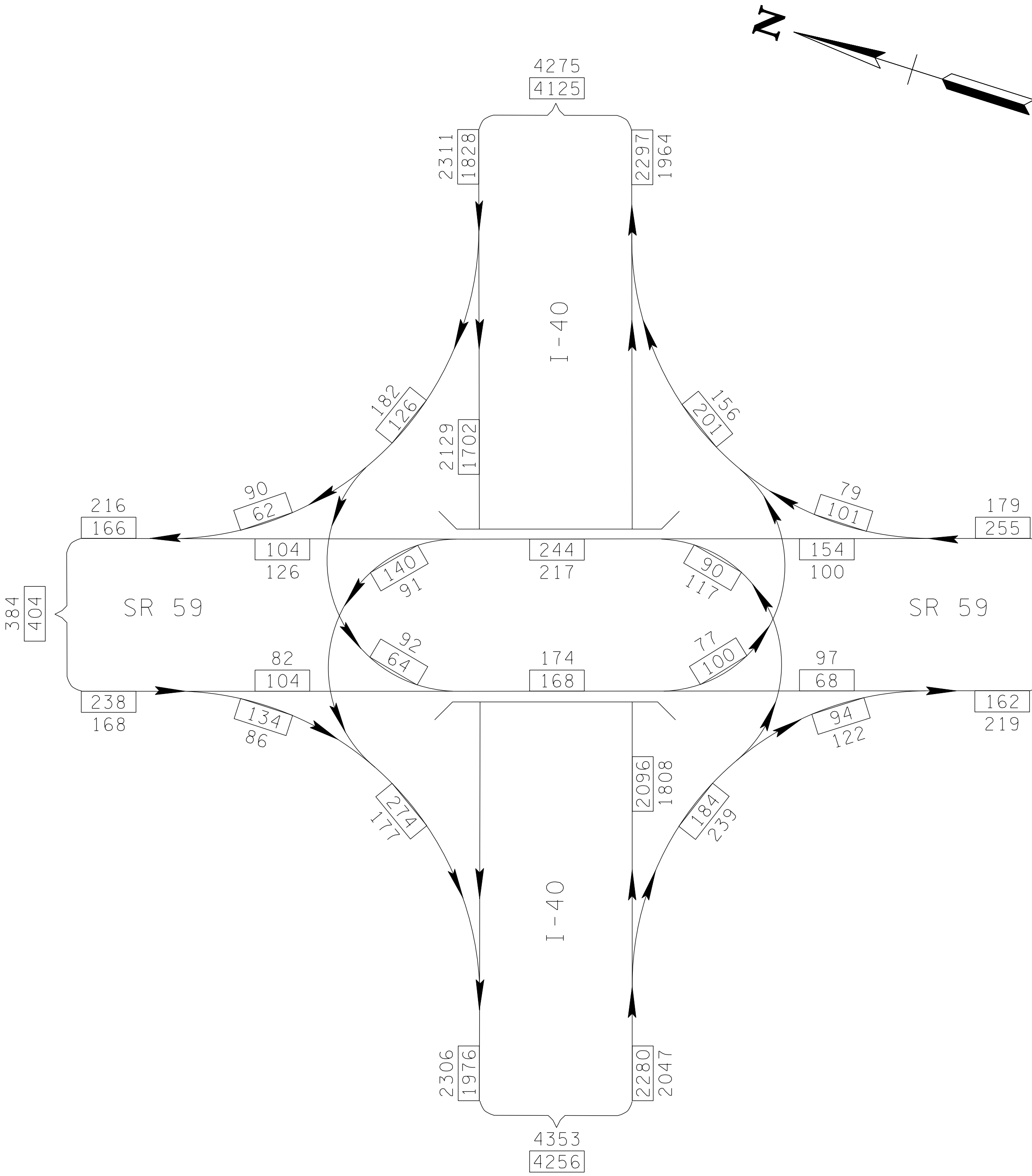
Sincerely,

Greg Dyer
Roadway Specialist 2

CC : Mr. Tony Armstrong

2014 AND 2034

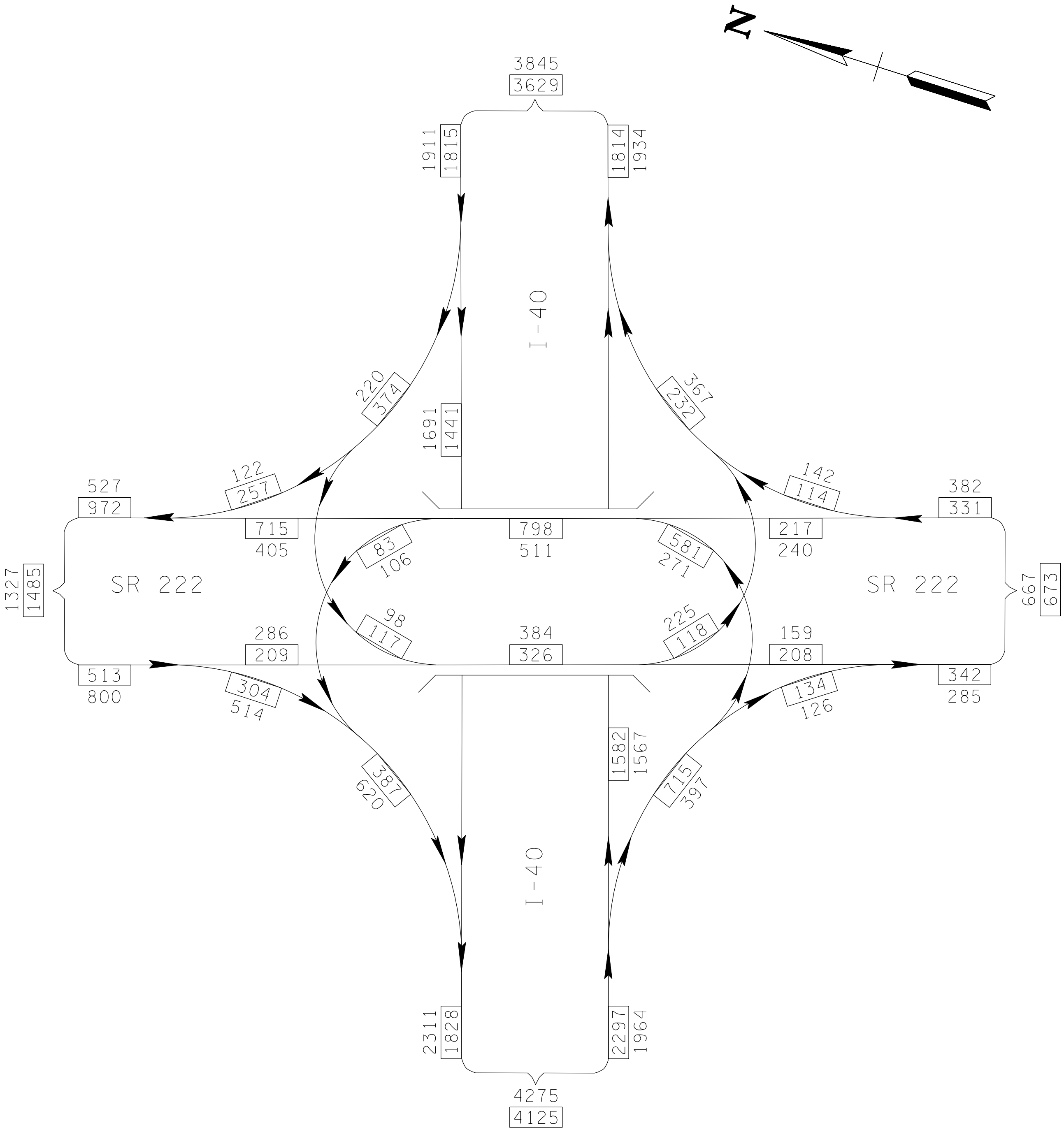
TRAFFIC DIAGRAMS



2014 PM DHV - 000
2014 AM DHV - 000

TDOT

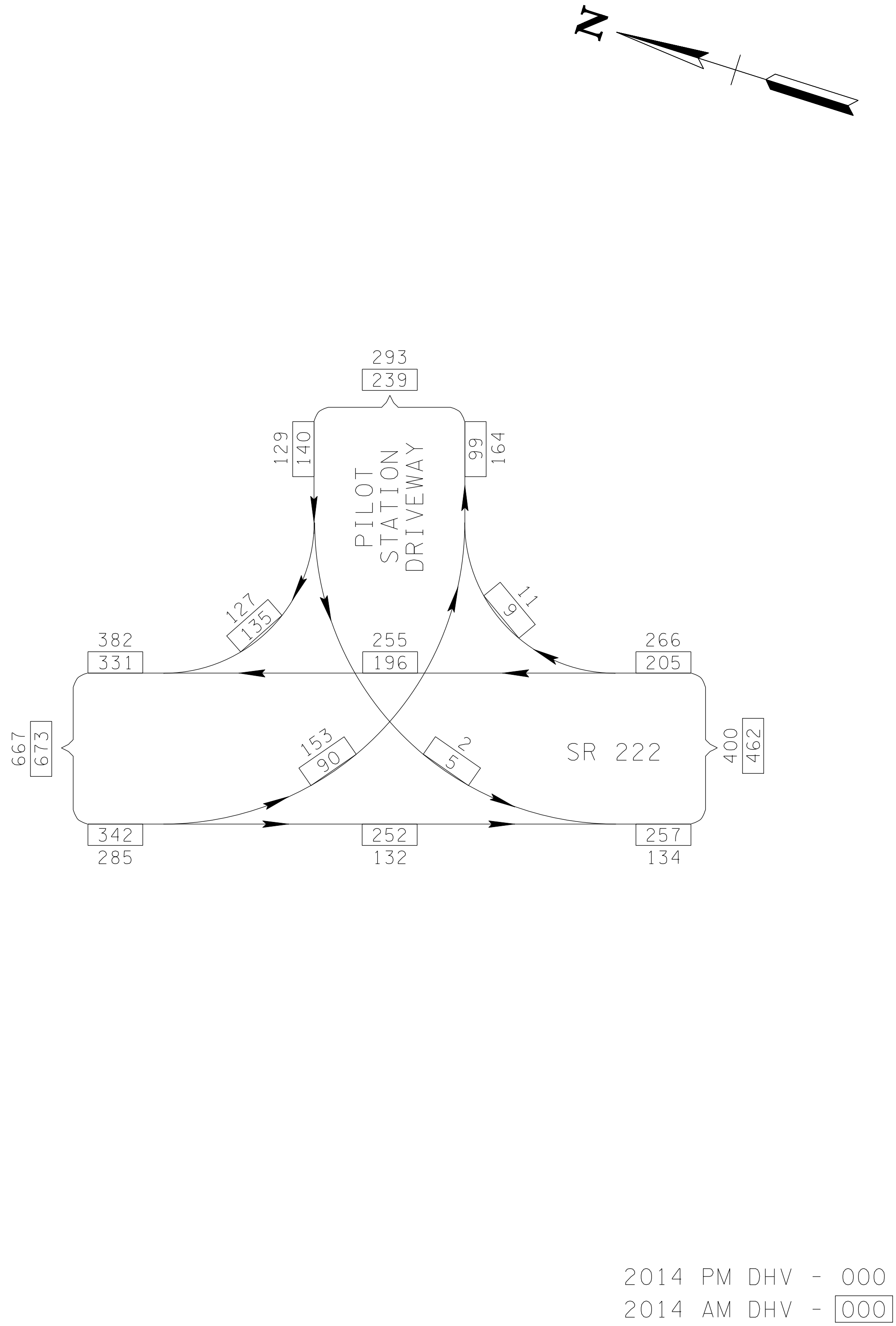
FAYETTE COUNTY
I-40 AT SR 59 (EXIT 35)
2014 DESIGN HOUR VOLUMES



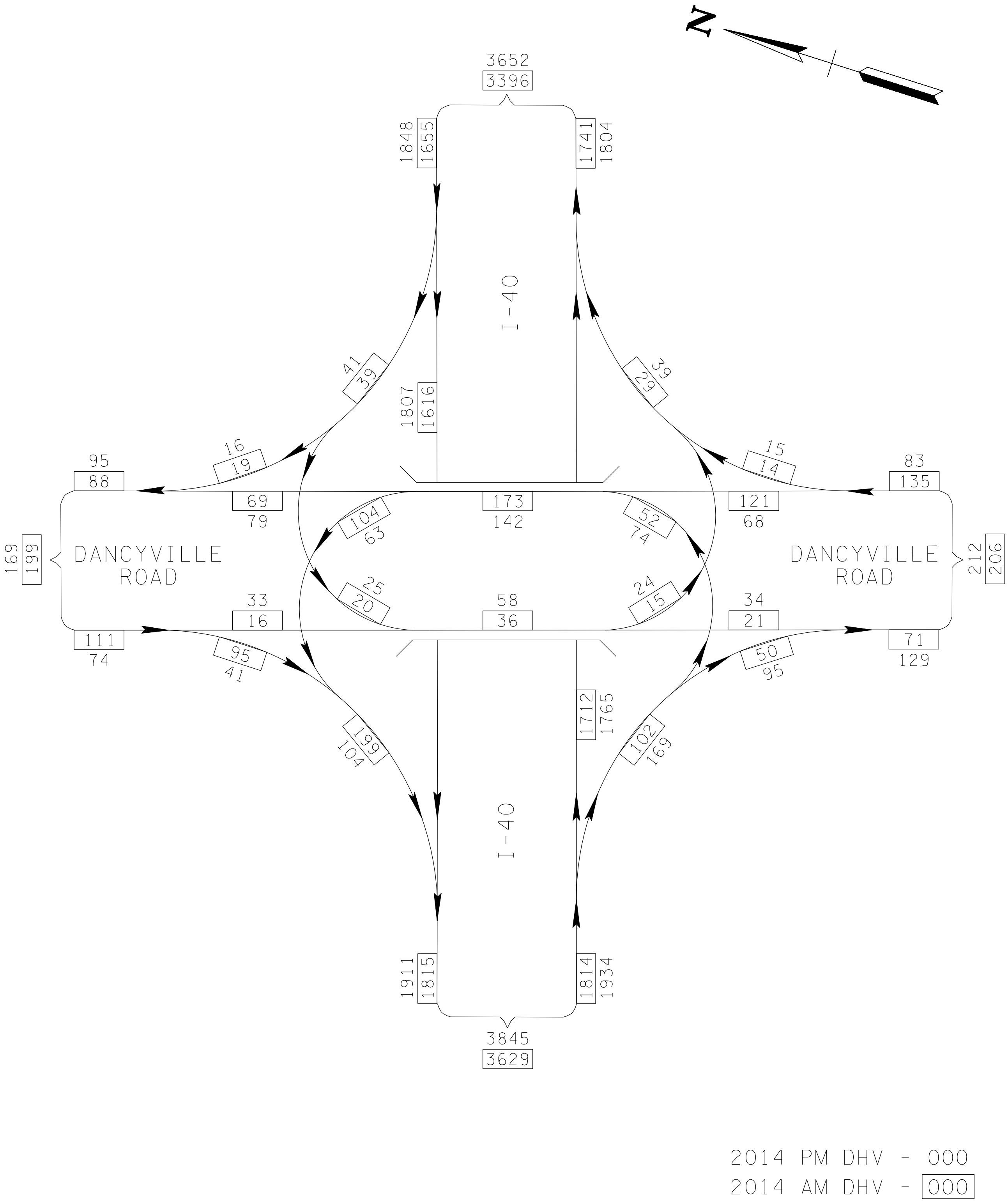
2014 PM DHV - 000
2014 AM DHV - 000

TDOT

FAYETTE COUNTY
I-40 AT SR 222 (EXIT 42)
2014 DESIGN HOUR VOLUMES

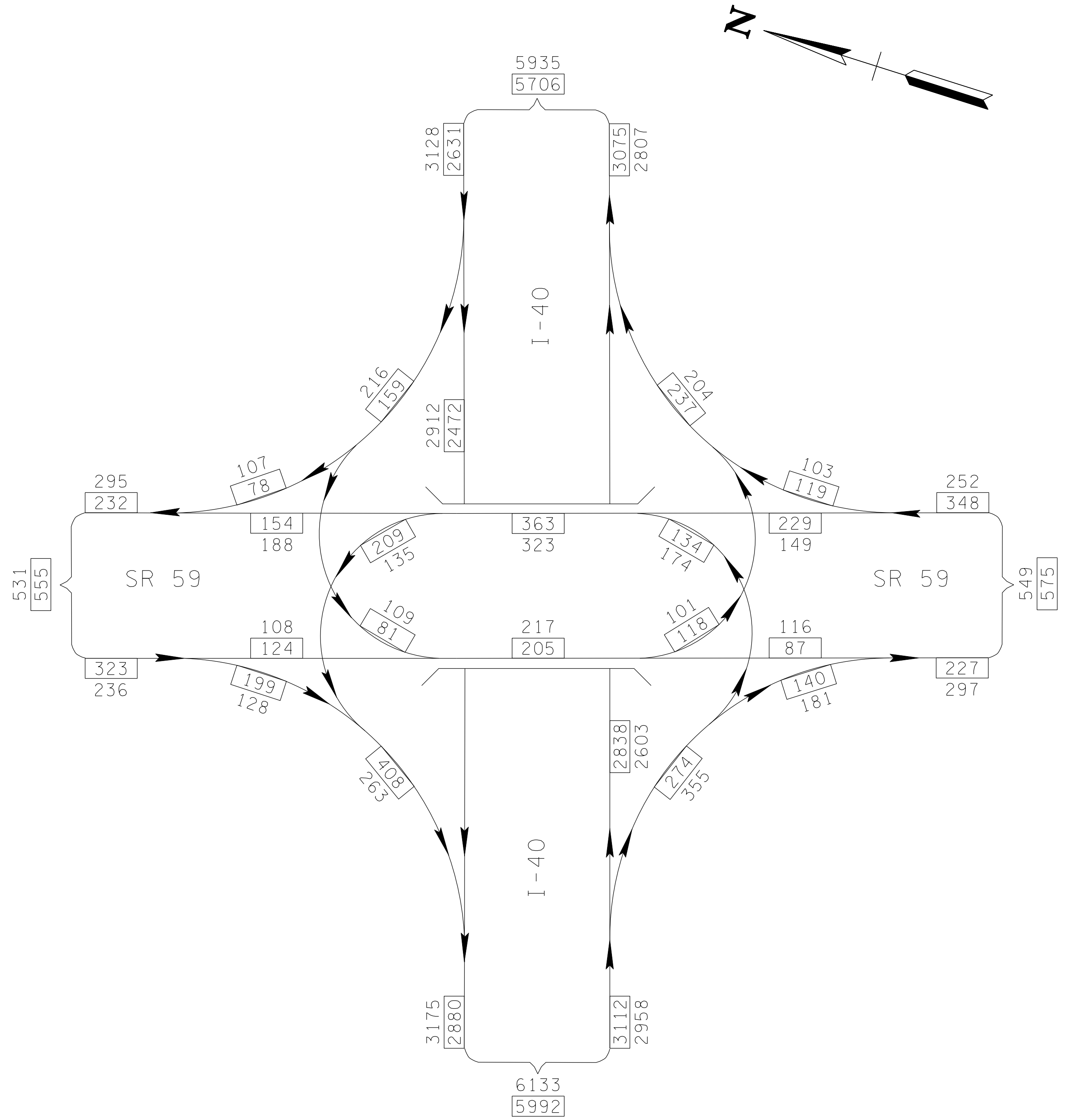


FAYETTE COUNTY
SR 222 AT PILOT STATION DRIVEWAY
2014 DESIGN HOUR VOLUMES



TDOT

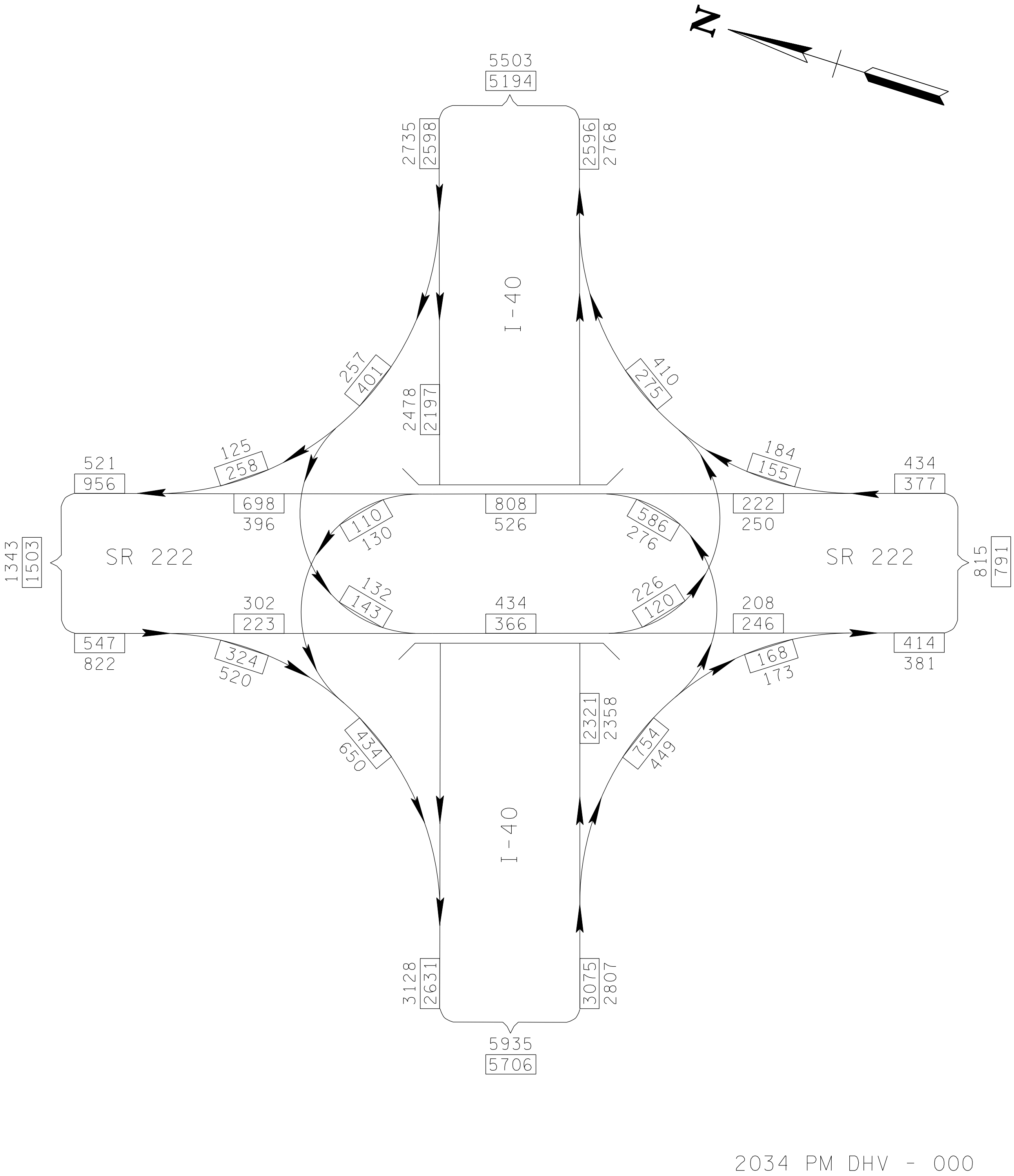
HAYWOOD COUNTY
I-40 AT DANCYVILLE ROAD (EXIT 47)
2014 DESIGN HOUR VOLUMES



2034 PM DHV - 000
2034 AM DHV - $\boxed{000}$

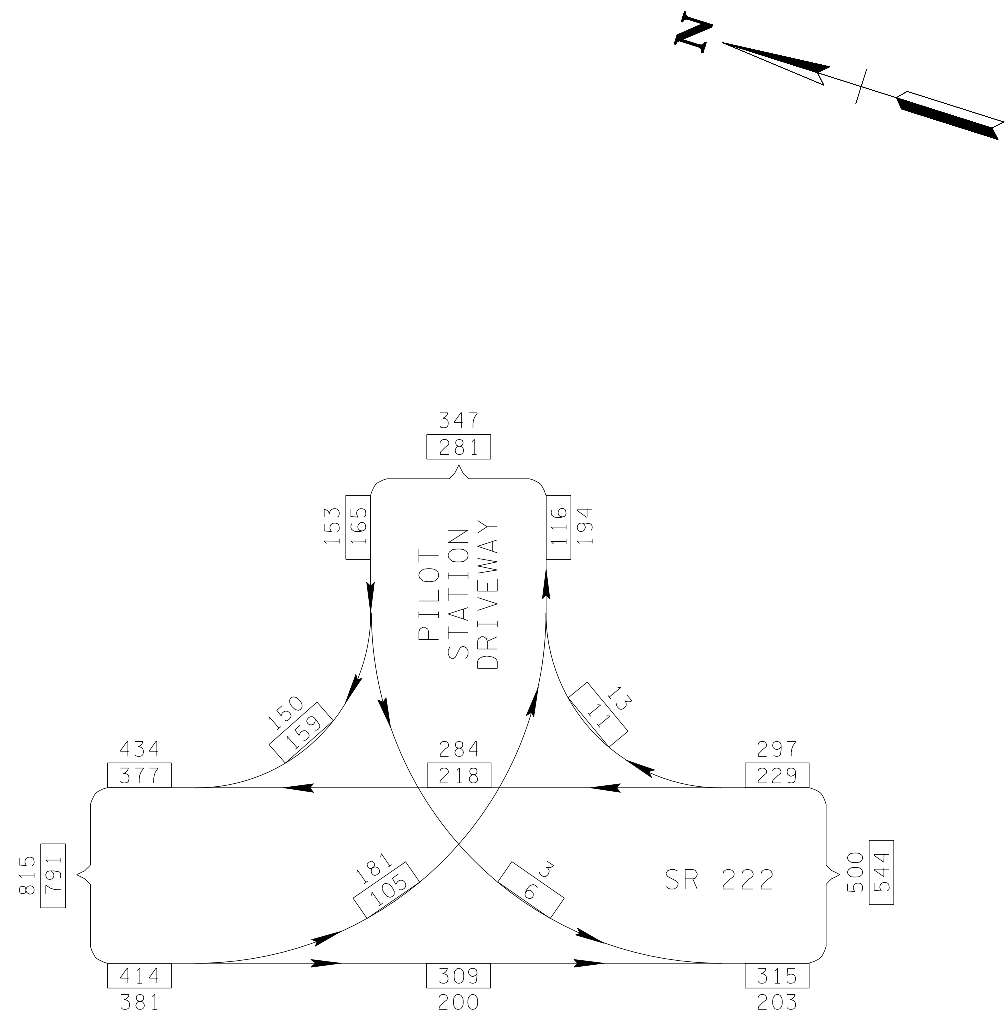
TDOT

FAYETTE COUNTY
I-40 AT SR 59 (EXIT 35)
2034 DESIGN HOUR VOLUMES



TDOT

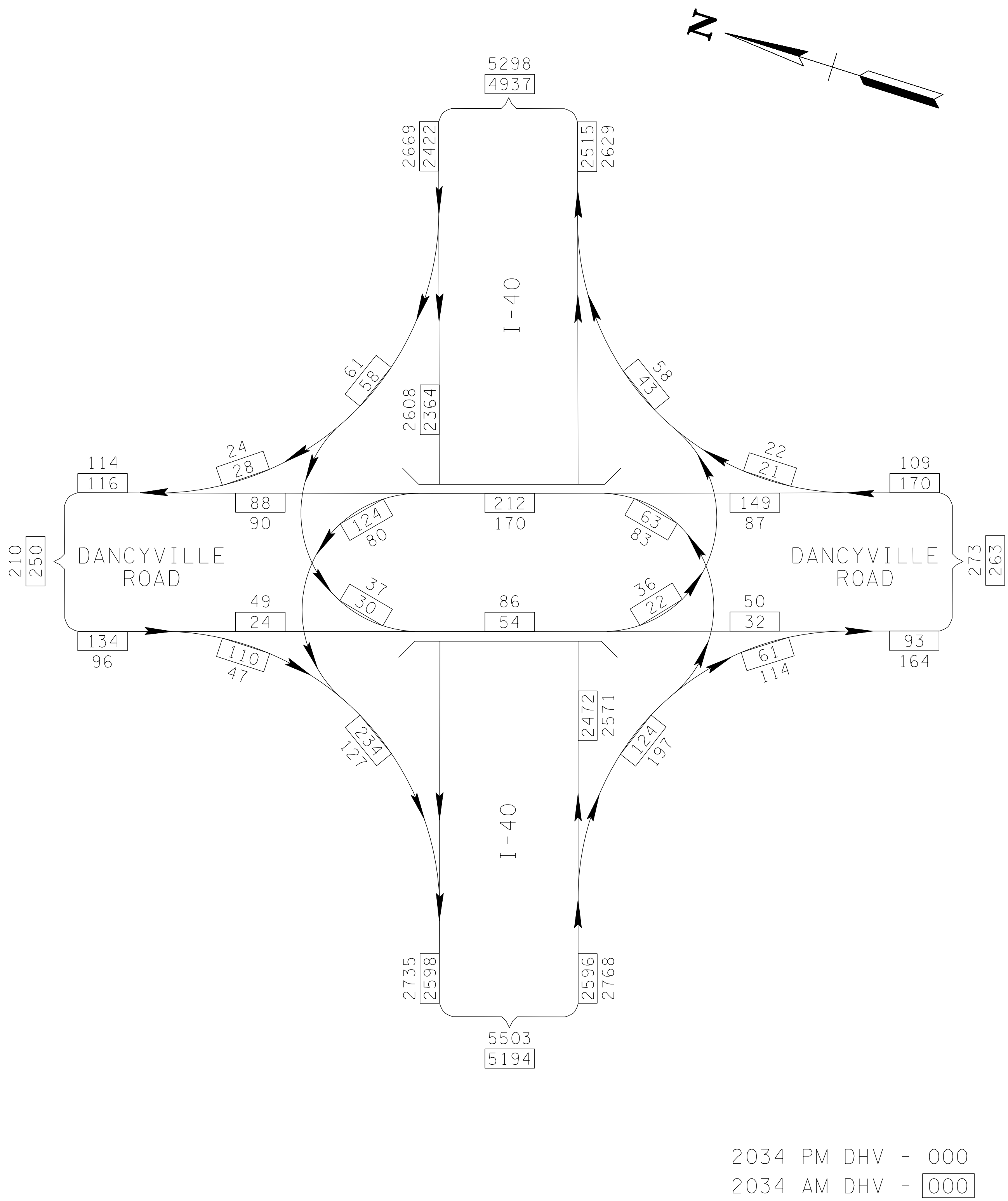
FAYETTE COUNTY
I-40 AT SR 222 (EXIT 42)
2034 DESIGN HOUR VOLUMES



2034 PM DHV - 000
2034 AM DHV - 000

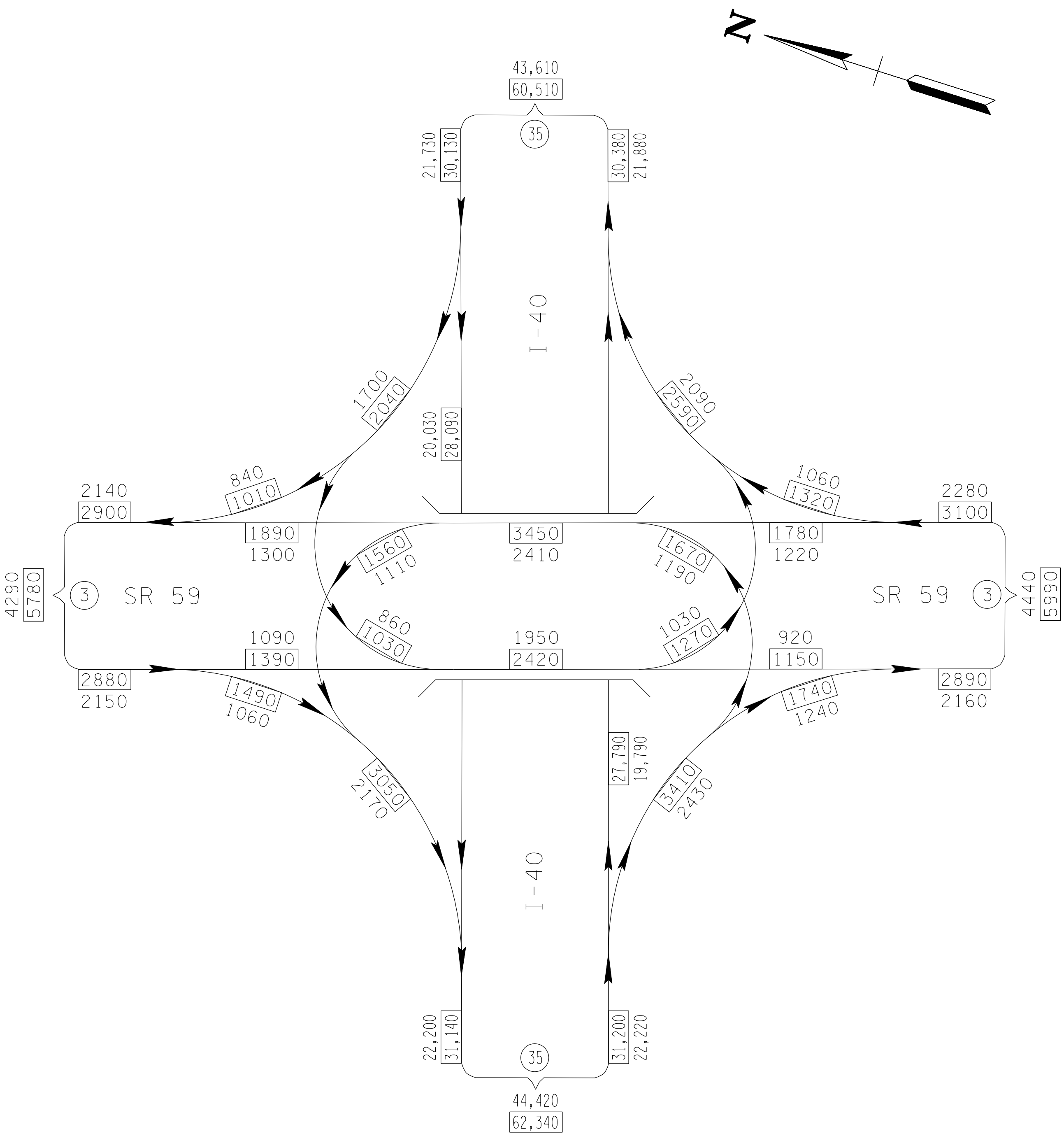
TDOT

FAYETTE COUNTY
SR 222 AT PILOT STATION DRIVEWAY
2034 DESIGN HOUR VOLUMES



TDOT

HAYWOOD COUNTY
I-40 AT DANCYVILLE ROAD (EXIT 47)
2034 DESIGN HOUR VOLUMES



2014 AADT - 000

2034 AADT - 000

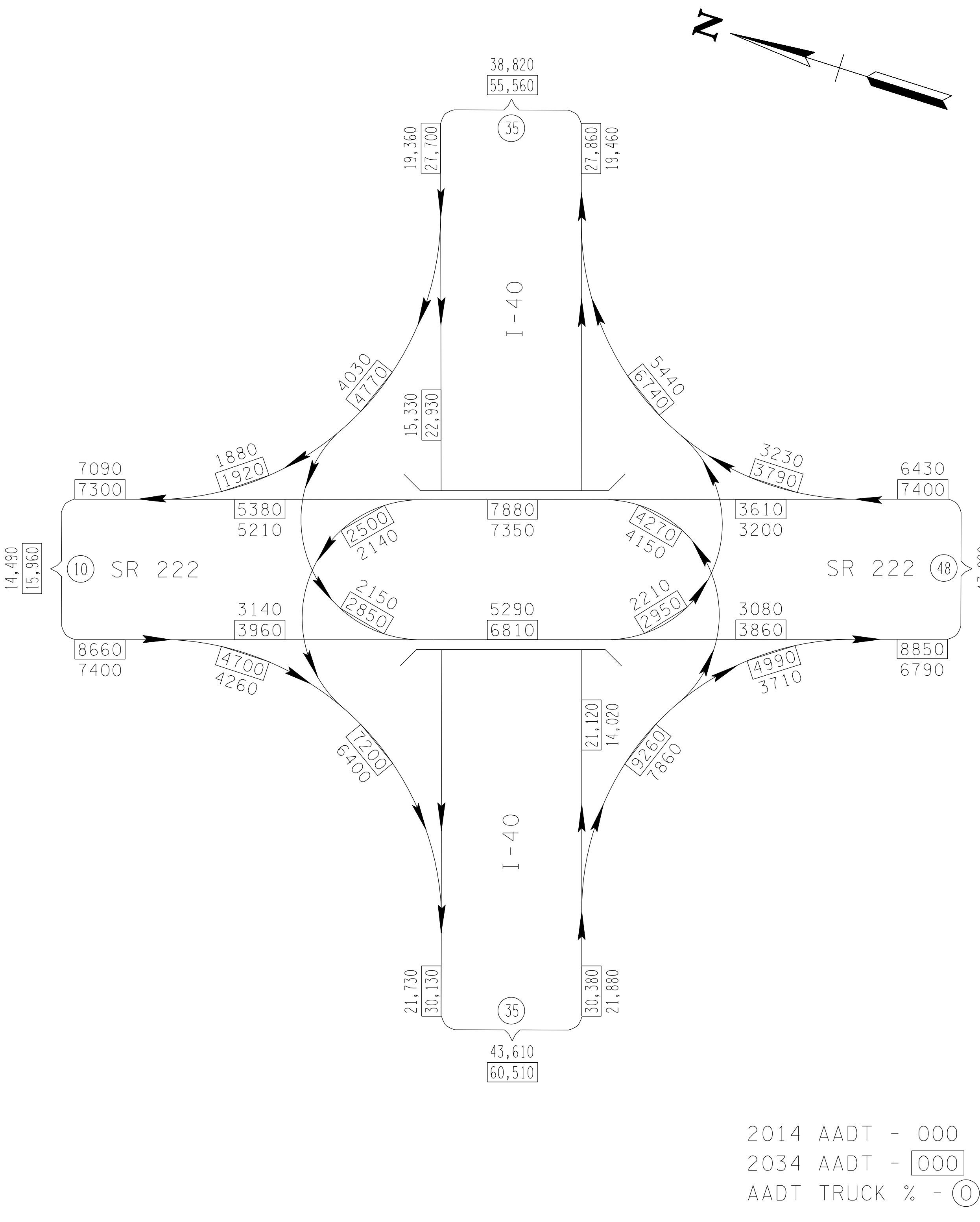
AADT TRUCK % - 0

TDOT

FAYETTE COUNTY

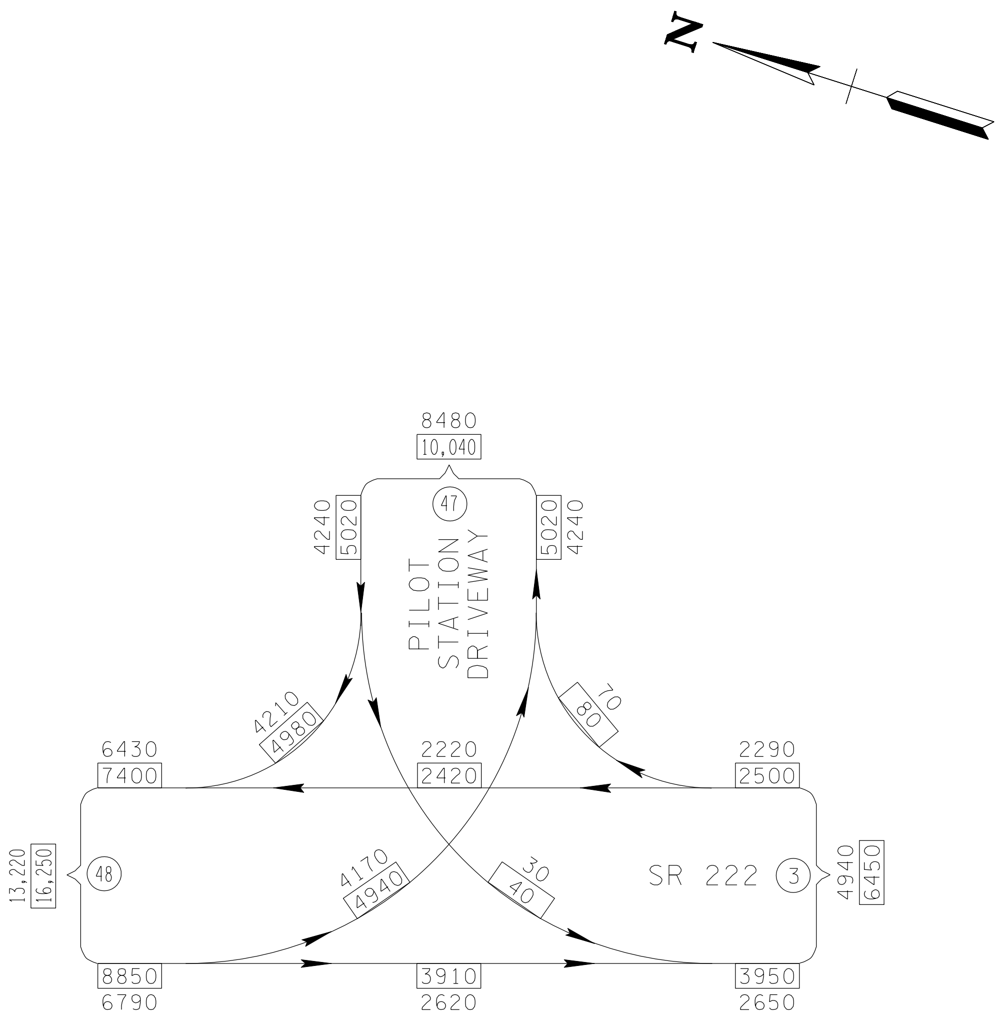
I-40 AT SR 59 (EXIT 35)

2014 AND 2034 AADT'S



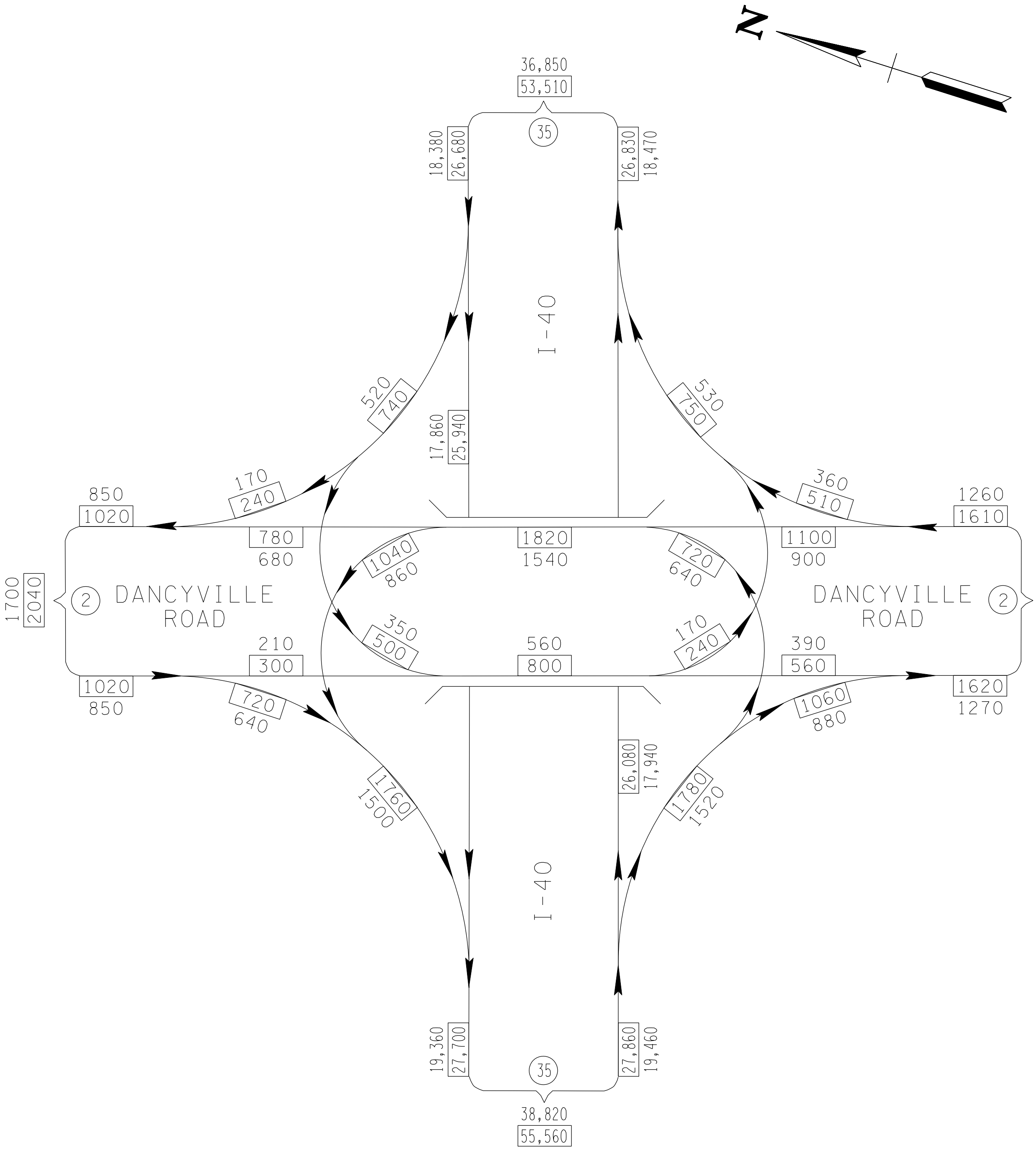
TDOT

FAYETTE COUNTY
I-40 AT SR 222 (EXIT 42)
2014 AND 2034 AADT'S



2014 AADT - 000
2034 AADT - 000
AADT TRUCK % - 0

FAYETTE COUNTY
SR 222 AT PILOT STATION DRIVEWAY
2014 AND 2034 AADT'S



2014 AADT - 000

2034 AADT - 000

AADT TRUCK % - 0

TDOT

HAYWOOD COUNTY

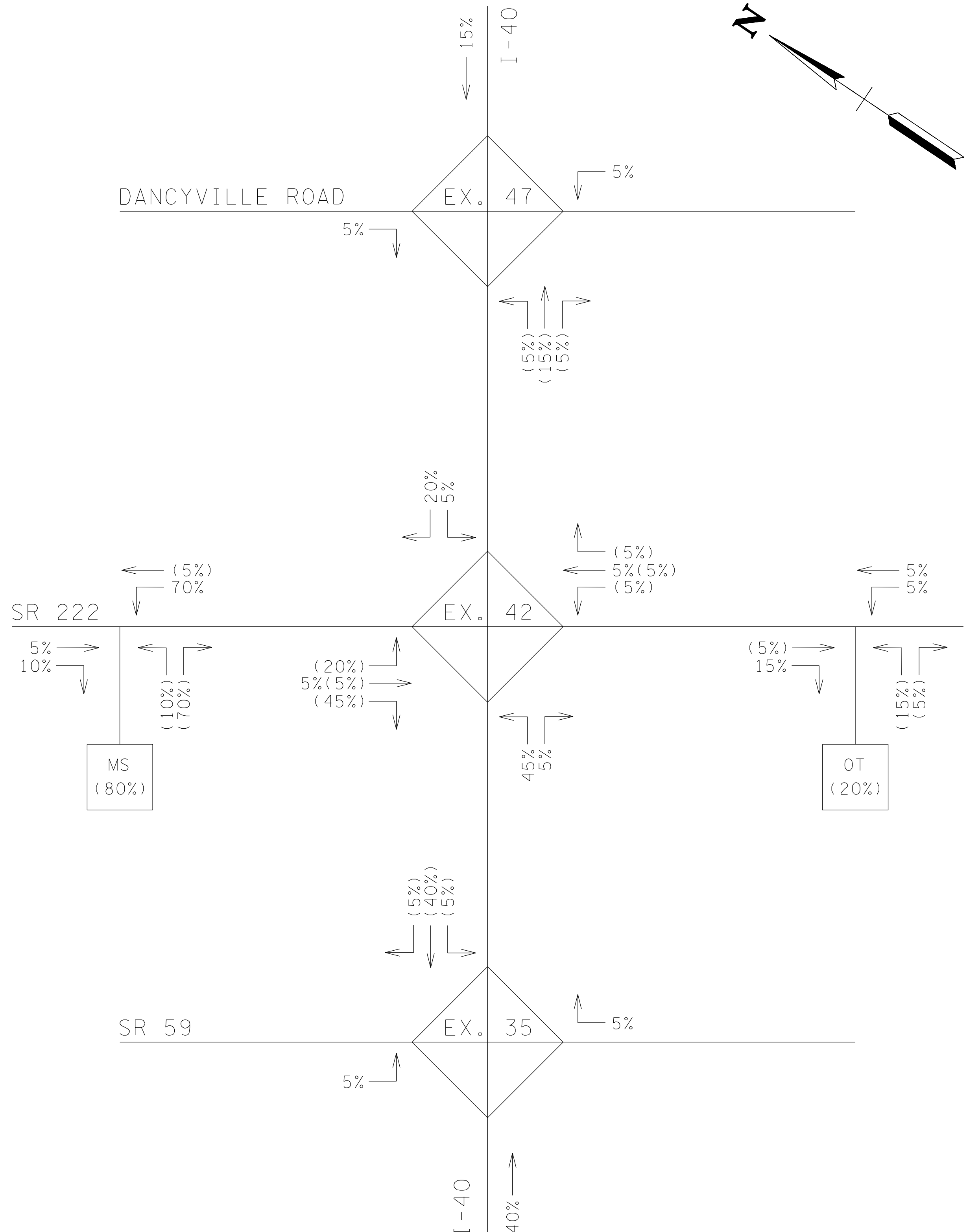
I-40 AT DANCYVILLE ROAD (EXIT 47)

2014 AND 2034 AADT'S

MEGASITE AND OTHER DEVELOPMENTS

TRIP DISTRIBUTION PERCENTAGES

AM/PM PEAK HOUR AND DAILY TRIPS

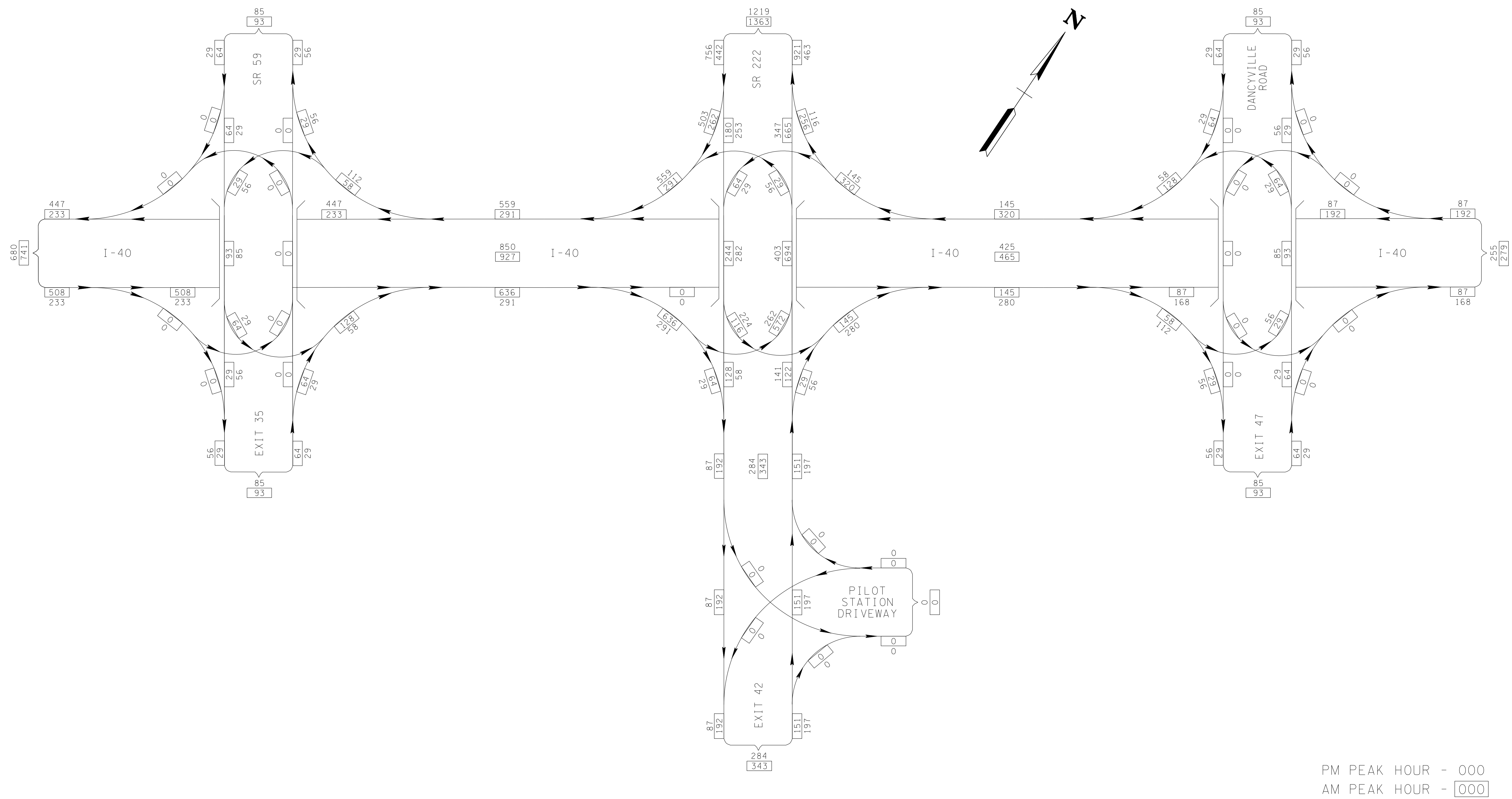


MS = MEGASITE (80% TOTAL TRIPS)
OT = OTHER (20% TOTAL TRIPS)

TRIP PCT. IN - 00%
TRIP PCT. OUT - (00%)

TDOT

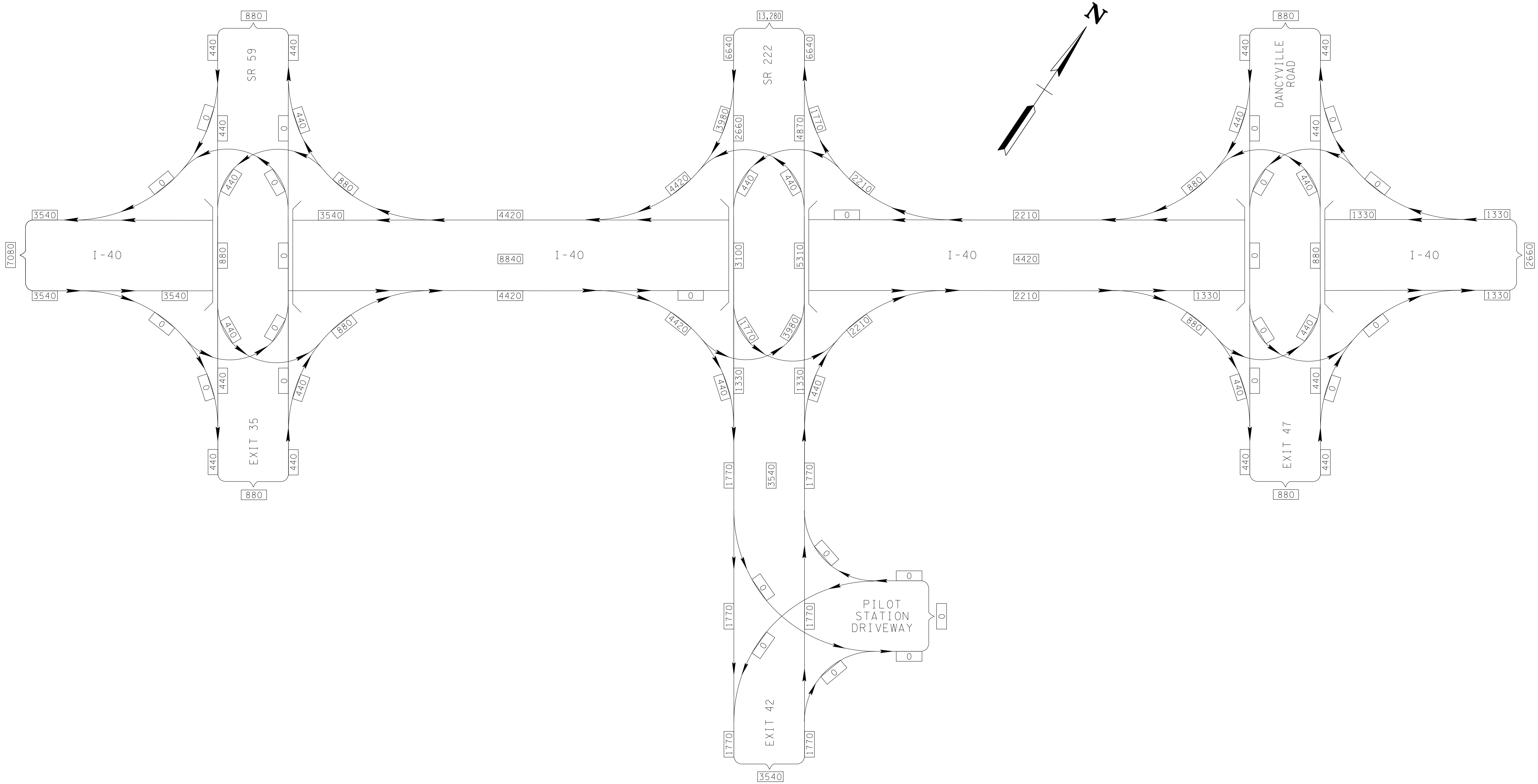
FAYETTE AND HAYWOOD COUNTIES
I-40 BETWEEN SR 59 & DANCYVILLE ROAD
TRIP DISTRIBUTION PERCENTAGES



TDOT

FAYETTE AND HAYWOOD COUNTIES
I-40 BETWEEN SR 59 & DANCYVILLE ROAD

AM / PM PEAK HOUR TRIPS



FAYETTE AND HAYWOOD COUNTIES
I-40 BETWEEN SR 59 & DANCYVILLE ROAD

DAILY TRIPS

SUPPORT DATA

Route: I-40 Station Type: Interstate, Rural Station Out: NO #063

Location: SW OF 842

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
06	1985	22,682	22,001	14,741	0.67	
05	1986	28,020	25,778	15,500	0.67	ACTUAL = 17271
04	1987	22,433		16,684	0.67	
06	1988	29,694		19,699	0.67	
07	1989	29,362		16,525	0.67	2ND COUNT
05	1990	28,180		19,044	0.67	
05	1991	28,102	30,350	20,335	0.67	
05	1992	27,154	28,783	20,148	0.70	
05	1993	32,701	34,663	24,264	0.70	
05	1994	33,982	33,415	23,391	0.70	
06	1995	34,505	31,744	22,220	0.70	
06	1996	34,309	34,309	24,016	0.70	
05	1997	43,315	39,850	27,895	0.70	
06	1998	42,552	39,999	27,999	0.70	
06	1999	40,845	41,662	29,163	0.70	2ND COUNT
05	2000	44,552	45,443	31,810	0.70	
05	2001	48,961	49,940	34,958	0.70	
04	2002	44,525	48,532	33,972	0.70	
07	2003	44,120	45,002	31,501	0.70	
04	2004	43,158	45,315	31,721	0.70	AADT LESS THAN EXPECTED VALUE BASED ON PREVIOUS YEARS DATA
06	2005	45,854	47,688	33,382	0.70	
06	2006	47,093	47,564	33,295	0.70	
05	2007	53,957	53,417	37,392	0.70	
05	2008	0	0	26,580	0.63	RAMP
2	2009	0	0	25,896	0.63	RAMP MOD PROC
1	2010	0	0	26,502	0.00	RAMP MOD PROC

Route: I-40 Station Type: Interstate, Rural Station Out: NO #074

Location: E OF JCT. WITH SR-59

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
05	1985	22,137	21,473	14,387	0.67	
05	1986	22,926	23,843	15,975	0.67	
04	1987	23,474		15,884	0.67	
05	1988	21,736	0	18,000	0.67	ACTUAL = 15875
06	1989	27,045		17,758	0.67	2ND COUNT
04	1990	27,252		19,172	0.67	
04	1991	27,675	29,059	19,469	0.67	
05	1992	27,715	29,452	20,616	0.70	
04	1993	34,290	36,690	25,683	0.70	
05	1994	33,662	35,682	24,977	0.70	
06	1995	41,459	35,240	24,668	0.70	
05	1996	29,805	31,593	25,000	0.70	ACTUAL = 22115
04	1997	41,607	44,519	31,164	0.70	
05	1998	40,165	43,378	30,365	0.70	
05	1999	45,394	48,118	33,683	0.70	
06	2000	47,661	48,614	34,030	0.70	
04	2001	48,377	51,763	36,234	0.70	
02	2002	43,385	43,819	30,670	0.70	EST
04	2003	45,318	48,490	33,943	0.70	
03	2004	47,280	43,497	30,448	0.70	
03	2005	50,715	52,236	36,566	0.70	AADT GREATER THAN EXPECTED VALUE BASED ON PREVIOUS YEARS DATA
04	2006	45,732	48,933	34,253	0.70	
02	2007	47,124	50,894	35,626	0.70	
02	2008	0	0	26,798	0.63	RAMP
2	2009	0	0	26,568	0.63	RAMP MOD PROC
1	2010	0	0	26,834	0.00	RAMP MOD PROC

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO #991

Location: W OF SR-76 INTER. (ATR 41)

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
06	1985	0	0	15,030	0.67	12 MO. AVG.
06	1986	0	0	17,249	0.67	12 MO. AVG.
06	1987	0	0	17,300	0.67	12 MO. AVG.
06	1988	0	0	19,647	0.67	12 MO. AVG.
06	1989	0	0	21,078	0.67	12 MO. AVG.
06	1990	0	0	24,505	0.67	12 MO. AVG.
06	1991	27,144	26,873	19,000	0.67	ACTUAL = 18005
05	1992	27,052	28,675	20,072	0.70	
06	1993	32,274	30,660	21,462	0.70	
06	1994	32,074	31,433	22,003	0.70	
06	1995	36,248	36,248	25,374	0.70	
06	1996	38,252	38,252	26,776	0.70	
05	1997	0	0	27,000	0.70	EST
06	1998	45,903	43,608	30,526	0.70	
06	1999	40,203	41,007	28,705	0.70	
06	2000	44,880	45,329	31,730	0.70	
05	2001	44,971	45,870	32,109	0.70	
04	2002	46,448	44,590	31,213	0.70	
07	2003	46,337	44,946	31,462	0.70	
04	2004	45,127	47,383	33,168	0.70	AADT LESS THAN EXPECTED VALUE BASED ON PREVIOUS YEARS DATA
08	2005	52,994	51,404	35,983	0.70	
08	2006	0	0	36,960	0.70	EST
05	2007	52,130	52,651	36,856	0.70	
05	2008	0	0	33,339	0.70	RAMP
07	2009	0	0	34,730	0.70	ATR MONTHLY AVERAGE
07	2010	0	0	35,613	0.70	ATR WEEKDAY FOR JULY

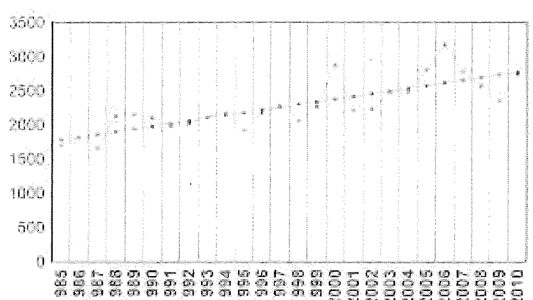
County: Fayette **Station Number:** 000004

Route: SR-59 **Station Type:** Other Rural **Station Out:** NO

Location: NEAR TIPTON COUNTY LINE

#004

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
05	1985	1,725	1,708	1,690	0.99	
05	1986	1,741	1,828	1,810	0.99	
03	1987	1,530		1,651	0.99	
05	1988	2,080		2,122	0.99	
05	1989	2,185		2,142	0.99	
04	1990	2,095		2,095	0.99	
04	1991	1,958	1,997	1,977	0.99	
05	1992	2,079	2,037	2,017	0.99	
04	1993	2,169	2,126	2,104	0.99	
04	1994	2,230	2,185	2,164	0.99	
06	1995	2,173	1,933	1,913	0.99	
05	1996	2,276	2,185	2,163	0.99	
05	1997	2,446	2,299	2,276	0.99	
05	1998	2,188	2,079	2,058	0.99	
05	1999	2,620	2,279	2,256	0.99	
06	2000	3,057	2,904	2,875	0.99	
04	2001	2,277	2,231	2,209	0.99	
02	2002	2,230	2,252	2,229	0.99	
04	2003	2,559	2,507	2,482	0.99	
06	2004	0	0	2,494	0.99	EST
03	2005	2,805	2,833	2,805	0.99	
03	2006	3,234	3,202	3,170	0.99	
02	2007	2,752	2,807	2,779	0.99	
08	2008	2,679	2,599	2,573	0.99	
04	2009	2,666	2,350	2,350	0.99	USED CLASS COUNT
06	2010	2,911	2,765	2,738	0.99	COUNT WAS LOW THE LAST TWO YEARS COUNTED



Trend Line based on years 1985 - 2010

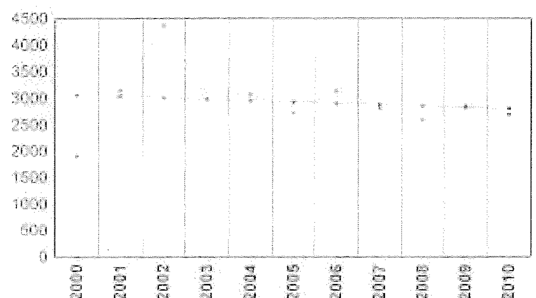
County: Fayette   Station Number: 000110

Route: SR-59   Station Type: Other Rural   Station Out: NO

Location: SE OF I-40

#110

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
06	2000	1,980	1,921	1,902	0.99	SCHOOL OUT
04	2001	3,301	3,169	3,137	0.99	2ND YR CT-SCHOOL IN
03	2002	0	0	4,372	0.99	EST
04	2003	3,051	2,989	2,960	0.99	AADT LESS THAN EXPECTED VALUE BASED ON PREVIOUS YEARS DATA
06	2004	3,231	3,101	3,070	0.99	
03	2005	2,725	2,752	2,725	0.99	
04	2006	3,335	3,168	3,137	0.99	OK - SEE 2004
02	2007	2,804	2,832	2,804	0.99	
08	2008	2,700	2,619	2,593	0.99	
05	2009	3,045	2,893	2,864	0.99	
06	2010	2,865	2,722	2,695	0.99	

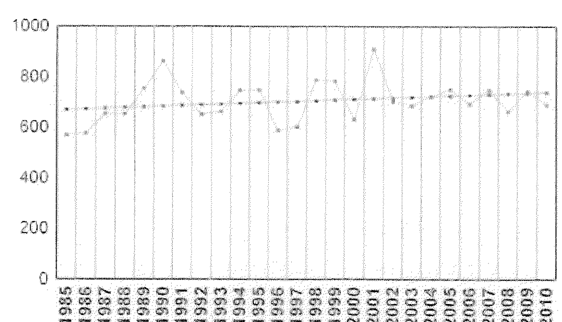


Trend Line based on years 2000 - 2010

Route: SR-222 **Station Type:** Other Rural **Station Out:** NO #018

Location: N OF SOMERVILLE

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
04	1985	563	580	568	0.98	
05	1986	639	588	576	0.98	
04	1987	660	667	653	0.98	
05	1988	739		652	0.98	
06	1989	753		753	0.98	
04	1990	871		862	0.98	
05	1991	759	751	736	0.98	
05	1992	677	663	650	0.98	
04	1993	697	676	662	0.98	
05	1994	785	761	746	0.98	
05	1995	796	764	748	0.98	
05	1996	625	600	588	0.98	
04	1997	640	614	602	0.98	
05	1998	854	803	787	0.98	
05	1999	849	798	782	0.98	
06	2000	665	645	632	0.98	
04	2001	967	928	909	0.98	HIGH SCHOOL IS IN
03	2002	746	716	702	0.98	
04	2003	715	700	686	0.98	
06	2004	0	0	720	0.98	EST
03	2005	749	764	749	0.98	
04	2006	743	706	692	0.98	
02	2007	756	764	748	0.98	
09	2008	751	676	662	0.98	
05	2009	0	0	743	0.98	EST
06	2010	781	703	689	0.97	

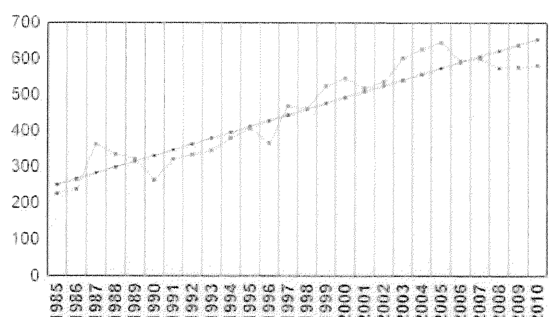


Trend Line based on years 1985 - 2010

Route: SR-222 Station Type: Other Rural Station Out: NO #088

Location: NEAR FAYETTE CO LINE

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
05	1985	232	230	225	0.98	
06	1986	244	242	237	0.98	
04	1987	351		362	0.98	
06	1988	340		334	0.98	
06	1989	322		322	0.98	
04	1990	270		262	0.98	
05	1991	330	327	320	0.98	
05	1992	347	340	333	0.98	
05	1993	362	351	344	0.98	
06	1994	395	387	379	0.98	
06	1995	433	415	406	0.98	
06	1996	387	372	365	0.98	
05	1997	508	478	468	0.98	
05	1998	500	470	461	0.98	
06	1999	550	534	523	0.98	
05	2000	592	556	545	0.98	
05	2001	0	0	518	0.98	EST
04	2002	0	0	536	0.98	EST
06	2003	633	614	601	0.98	
04	2004	659	639	626	0.98	
12	2005	0	0	644	0.98	EST
06	2006	637	605	593	0.98	
04	2007	650	611	599	0.98	
07	2008	603	585	573	0.98	
05	2009	668	588	576	0.98	
06	2010	618	593	581	0.93	



Trend Line based on years 1985 - 2010

Route: SR-179 Station Type: Other Rural Station Out: NO #053

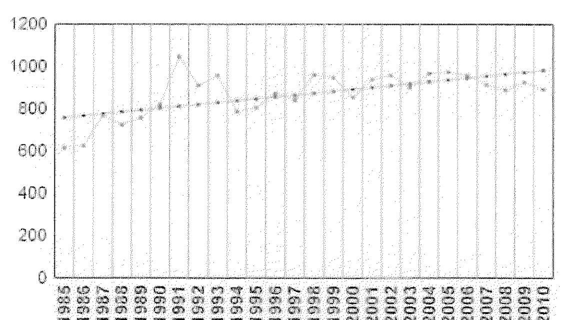
Location: S. ASBURY

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
05	1985	422	409	397	0.97	
06	1986	387	387	375	0.97	
04	1987	365		372	0.97	
06	1988	494		442	0.97	
07	1989	461		447	0.97	
05	1990	450		432	0.97	
05	1991	458	458	444	0.97	
05	1992	487	477	463	0.97	
05	1993	420	407	395	0.97	
07	1994			410	0.97	EST
06	1995	441	418	405	0.97	
06	1996			410	0.97	EST
05	1997	497	432	419	0.97	
05	1998	580	545	529	0.97	
06	1999	508	493	478	0.97	
05	2000	461	433	420	0.97	
05	2001	474	446	433	0.97	
04	2002	448	439	426	0.97	
06	2003	378	366	355	0.97	AADT LESS THAN EXPECTED VALUE BASED ON PREVIOUS YEARS DATA
06	2004	0	0	396	0.97	EST
06	2005	434	417	404	0.97	
06	2006	488	464	450	0.97	
06	2007	0	0	463	0.97	EST
07	2008	491	476	462	0.97	
05	2009	542	477	463	0.97	
06	2010	693	665	459	0.80	ACTUAL = 645

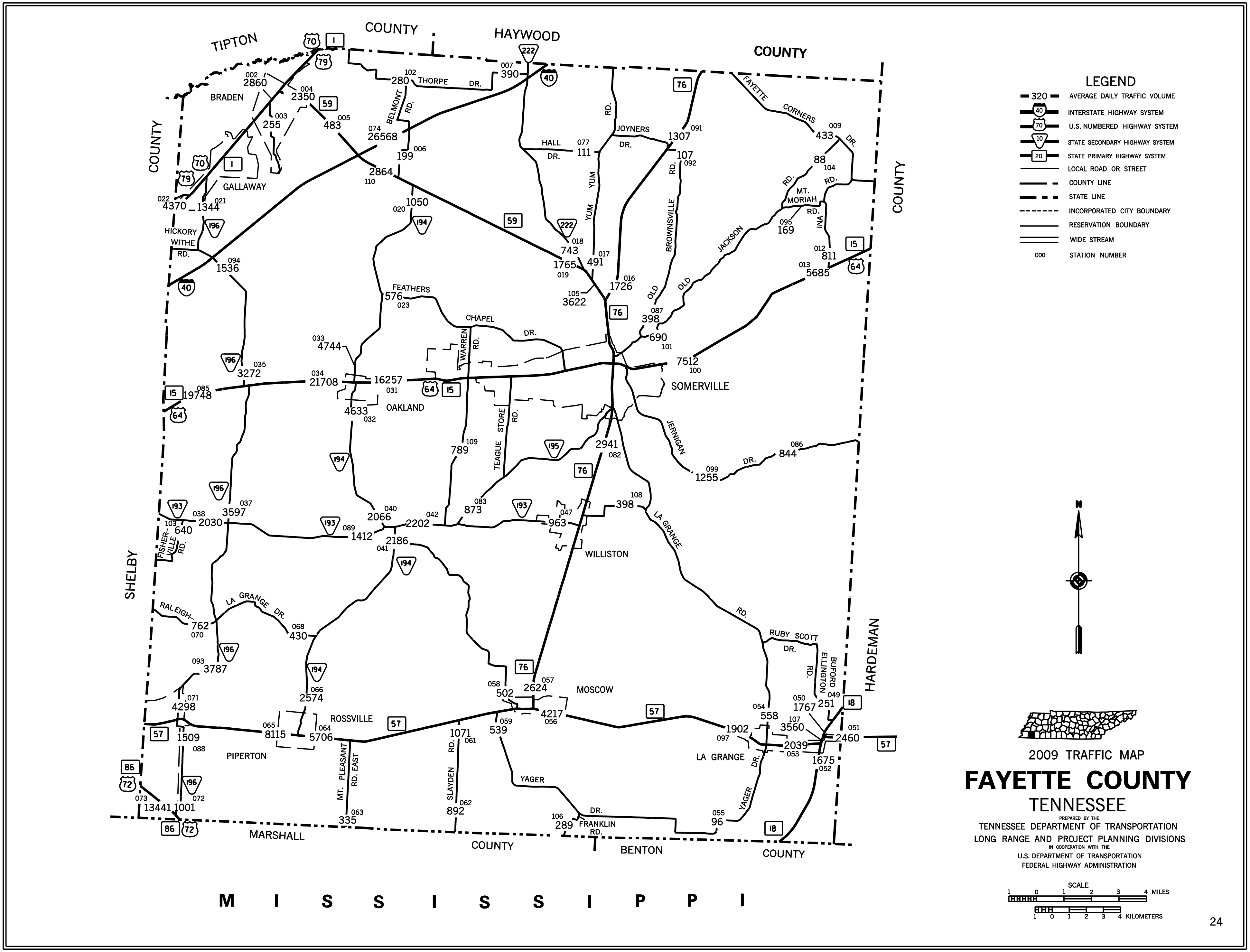
Route: SR-179 Station Type: Other Rural Station Out: NO. #087

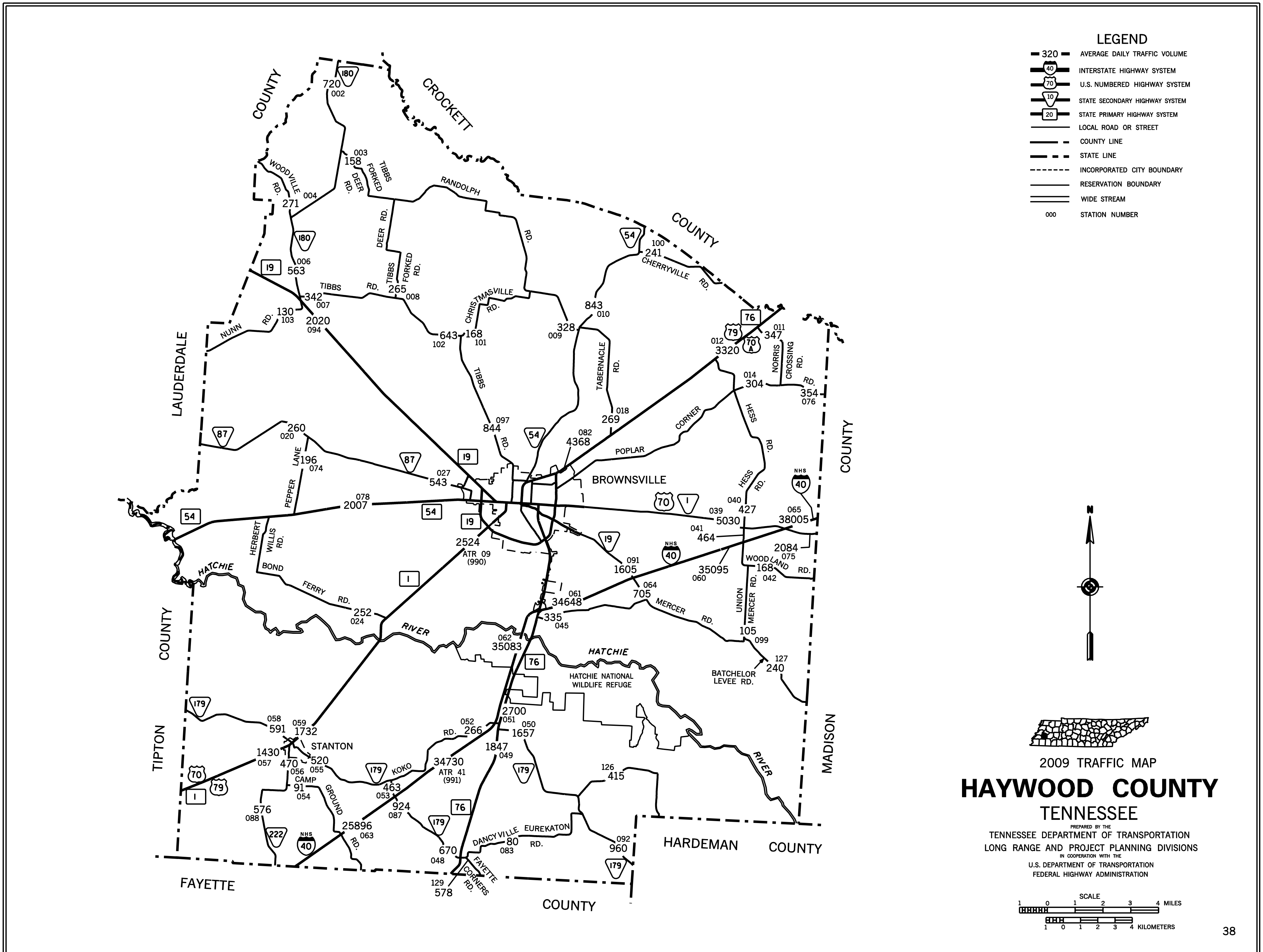
Location: NEAR FAYETTE CO LINE

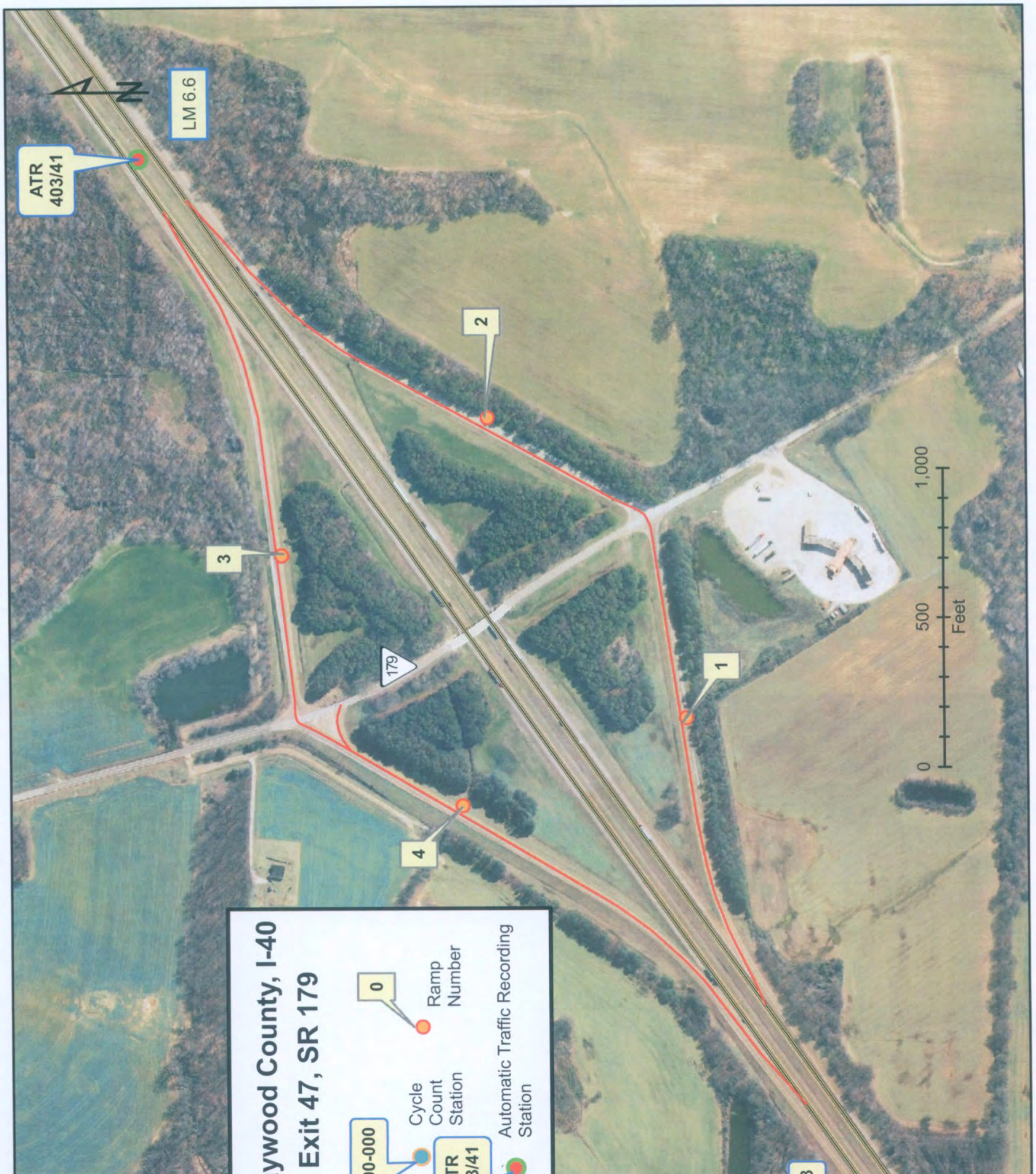
Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
05	1985	652	632	613	0.97	
06	1986	642	642	623	0.97	
04	1987	753		767	0.97	
06	1988	808		722	0.97	
06	1989	778		755	0.97	
05	1990	853		819	0.97	
05	1991	1,088	1,077	1,045	0.97	
05	1992	956	937	909	0.97	
05	1993	1,016	986	956	0.97	
06	1994	834	809	785	0.97	
06	1995	872	828	803	0.97	
06	1996	945	898	871	0.97	
05	1997	996	867	841	0.97	
05	1998	1,052	989	959	0.97	
06	1999	1,005	975	946	0.97	
05	2000	935	879	853	0.97	
05	2001	1,028	966	937	0.97	
03	2002	957	986	956	0.97	
06	2003	956	927	899	0.97	
06	2004	0	0	964	0.97	EST
06	2005	1,044	1,002	972	0.97	
06	2006	1,037	985	956	0.97	
05	2007	1,000	940	912	0.97	
07	2008	942	914	886	0.97	
05	2009	1,082	952	924	0.97	
06	2010	0	0	890	0.89	USED CLASS COUNT



Trend Line based on years 1985 - 2010


2009 TRAFFIC MAP
FAYETTE COUNTY
TENNESSEE
PREPARED BY THE
TENNESSEE DEPARTMENT OF TRANSPORTATION
LONG RANGE AND PROJECT PLANNING DIVISIONS
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
LEGEND
320 AVERAGE DAILY TRAFFIC VOLUME
INTERSTATE HIGHWAY SYSTEM
U.S. NUMBERED HIGHWAY SYSTEM
STATE SECONDARY HIGHWAY SYSTEM
STATE PRIMARY HIGHWAY SYSTEM
LOCAL ROAD OR STREET
COUNTY LINE
STATE LINE
INCORPORATED CITY BOUNDARY
RESERVATION BOUNDARY
WIDE STREAM
000 STATION NUMBER
SCALE
MILES
KILOMETERS
TIPTON COUNTY
HAYWOOD COUNTY
SHELBY COUNTY
HARDEMAN COUNTY
MARSHALL COUNTY
BENTON COUNTY
M I S S I S S I P P I
BRADEN
GALLAWAY
HICKORY WITHE RD.
OAKLAND
SOMERVILLE
WILLISTON
ROSSVILLE
PIPERTON
MOSCOW
LA GRANGE
THORPE DR.
BELMONT RD.
HALL DR.
JOYNERS DR.
YUM YUM RD.
BROWNSVILLE RD.
FAYETTE CORNERS DR.
MT. MORIAH RD.
INA RD.
OLD JACKSON
FEATHERS CHAPEL DR.
WARREN RD.
TEAGUE STORE RD.
JERNIGAN DR.
LA GRANGE RD.
RUBY SCOTT DR.
BUFORD ELLINGTON RD.
FISHERVILLE RD.
RALEIGH-LA GRANGE DR.
MT. PLEASANT RD. EAST
SLAYDEN RD.
YAGER DR.
FRANKLIN RD.
24


LEGEND
320 AVERAGE DAILY TRAFFIC VOLUME
40 INTERSTATE HIGHWAY SYSTEM
70 U.S. NUMBERED HIGHWAY SYSTEM
10 STATE SECONDARY HIGHWAY SYSTEM
20 STATE PRIMARY HIGHWAY SYSTEM
LOCAL ROAD OR STREET
COUNTY LINE
STATE LINE
INCORPORATED CITY BOUNDARY
RESERVATION BOUNDARY
WIDE STREAM
000 STATION NUMBER
CROCKETT COUNTY
LAUDERDALE COUNTY
TIPTON COUNTY
FAYETTE COUNTY
HARDEMAN COUNTY
MADISON COUNTY
BROWNSVILLE
STANTON
HATCHIE RIVER
HATCHIE NATIONAL WILDLIFE REFUGE
WOODVILLE RD.
TIBBS FORKED DEER RD.
RANDOLPH RD.
CHERRYVILLE RD.
TIBBS RD.
CHRISTMASVILLE RD.
NUNN RD.
TABERNACLE RD.
NORRIS CROSSING RD.
HESS RD.
POPLAR CORNER
PEPPER LANE
HERBERT WILLIS RD.
BOND FERRY RD.
WOODLAND RD.
UNION MERCER RD.
MERCER RD.
BATCHELOR LEVEE RD.
KOKO RD.
CAMP GROUND RD.
DANCYVILLE EUREKATON RD.
FAYETTE CORNERS RD.
720 002
158 003
271 004
563 006
342 007
265 008
2020 094
130 103
643 102
168 101
328 009
843 010
241 100
3320 012
347 011
304 014
354 076
269 018
4368 082
844 097
260 020
196 074
543 027
2007 078
5030 039
427 040
38005 065
464 041
2084 075
168 042
2524 ATR 09 (990)
1605 091
35095 060
705 064
34648 061
335 045
252 024
105 099
240 127
35083 062
2700 051
1657 050
266 052
1847 049
591 058
1732 059
1430 057
470 056
520 055
91 054
34730 ATR 41 (991)
463 053
924 087
576 088
25896 063
415 126
670 048
80 083
960 092
578 129
2009 TRAFFIC MAP
HAYWOOD COUNTY
TENNESSEE
PREPARED BY THE
TENNESSEE DEPARTMENT OF TRANSPORTATION
LONG RANGE AND PROJECT PLANNING DIVISIONS
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
1 0 1 2 3 4 MILES
1 0 1 2 3 4 KILOMETERS

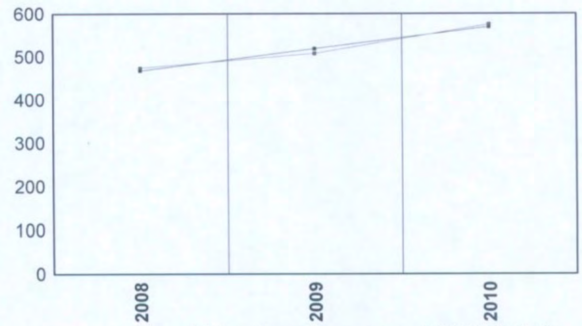

Haywood County, I-40
Exit 47, SR 179
00-000
Cycle Count Station
ATR 403/41
Automatic Traffic Recording Station
0
Ramp Number
ATR 403/41
LM 6.6
N
1
2
3
4
179
38-063
0
500
1,000
Feet

County: Haywood **Station Number:** 000001

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-179

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
07	2008	498	483	473	0.98	
05	2009	512	517	507	0.98	
06	2010	605	587	575	0.98	



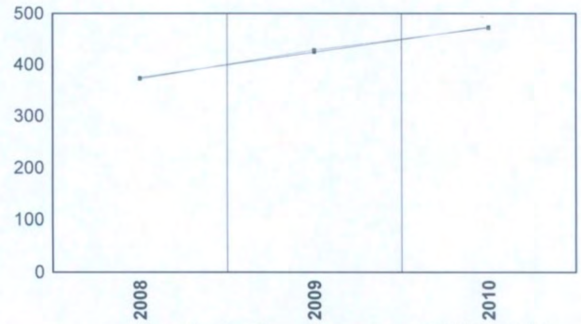
Trend Line based on years 2008 - 2010

County: Haywood **Station Number:** 000002

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-179

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
07	2008	391	379	372	0.98	
05	2009	432	436	428	0.98	
06	2010	495	480	471	0.98	



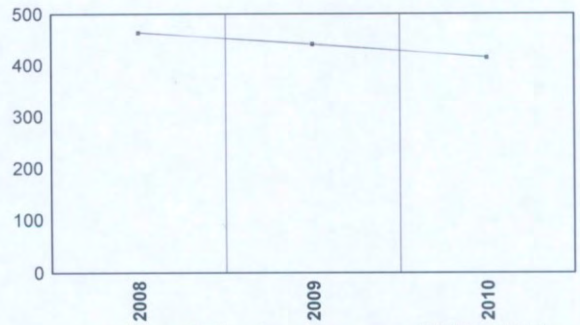
Trend Line based on years 2008 - 2010

County: Haywood **Station Number:** 000003

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-179

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
07	2008	487	472	463	0.98	
05	2009	447	451	442	0.98	
06	2010	503	423	414	0.98	



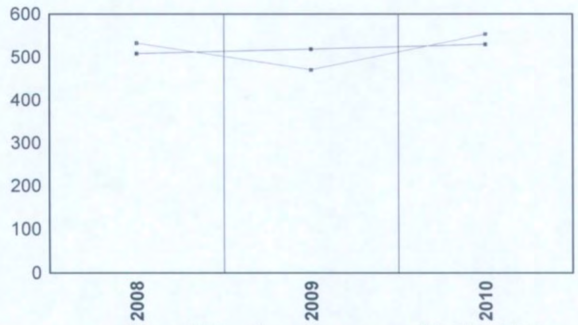
Trend Line based on years 2008 - 2010

County: Haywood **Station Number:** 000004

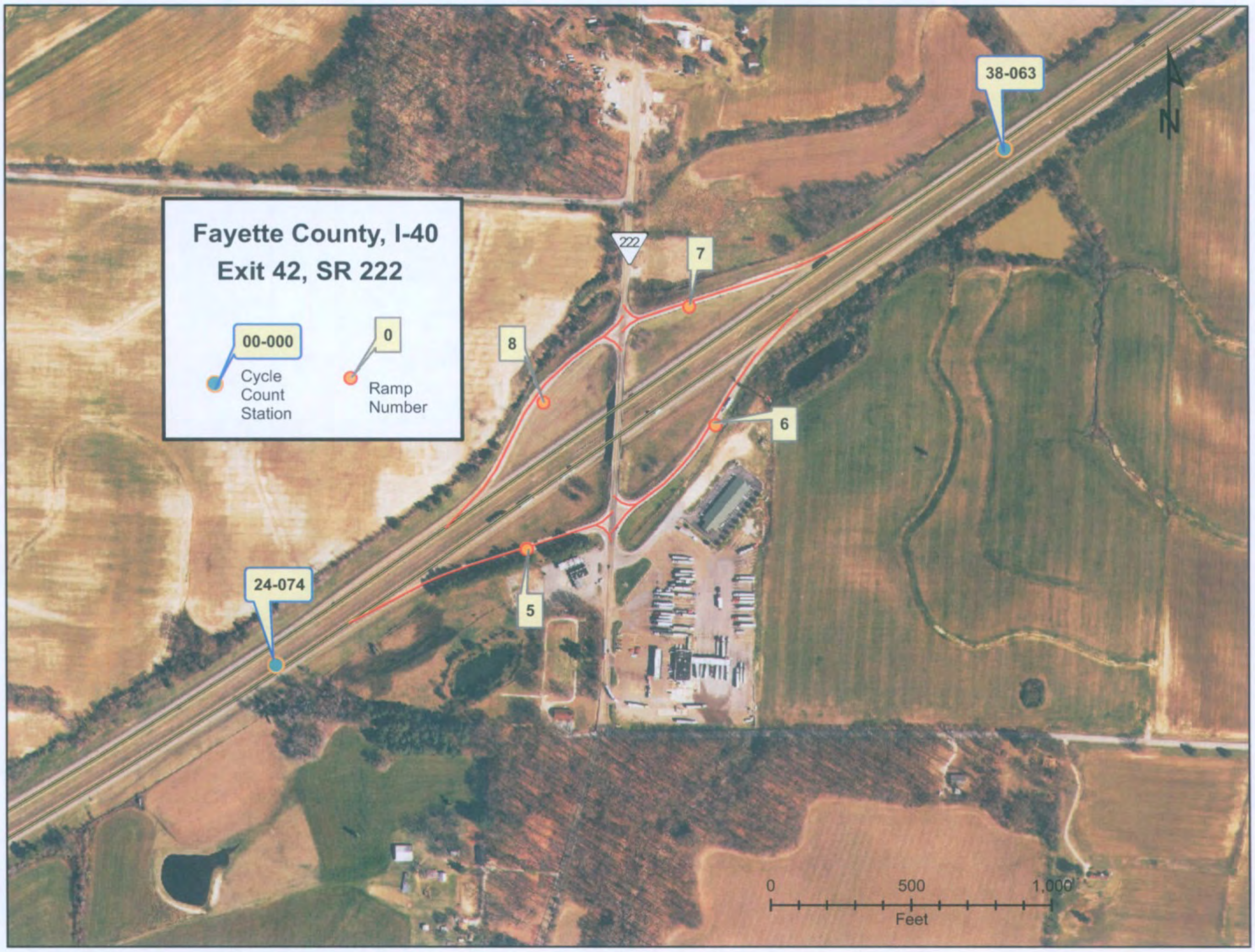
Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-179

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
07	2008	560	543	532	0.98	
05	2009	475	480	470	0.98	
06	2010	582	565	553	0.98	



Trend Line based on years 2008 - 2010



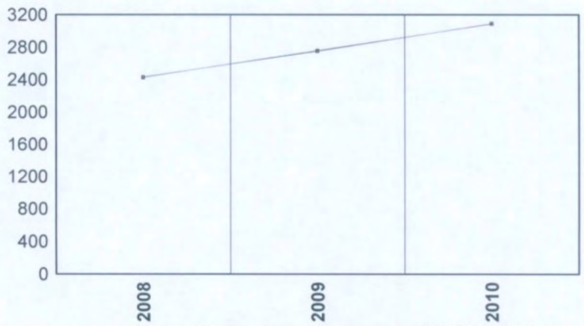
Fayette County, I-40
Exit 42, SR 222
00-000
Cycle Count Station
0
Ramp Number
38-063
24-074
222
5
6
7
8
0
500
1,000
Feet

County: Fayette **Station Number:** 000005

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-222

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
09	2008	2,694	2,478	2,429	0.98	
05	2009	2,922	2,805	2,749	0.98	
06	2010	3,464	3,152	3,089	0.98	



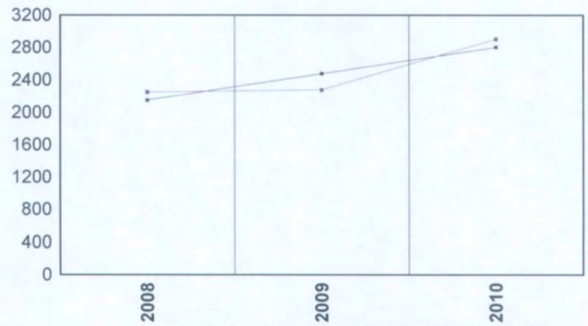
Trend Line based on years 2008 - 2010

County: Fayette **Station Number:** 000006

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-222

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
09	2008	2,496	2,296	2,250	0.98	
05	2009	2,419	2,322	2,276	0.98	
06	2010	3,252	2,959	2,900	0.98	



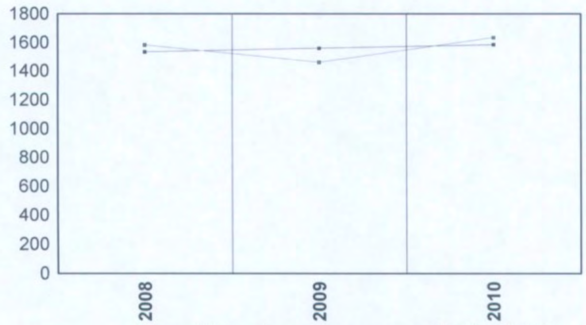
Trend Line based on years 2008 - 2010

County: Fayette **Station Number:** 000007

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-222

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
08	2008	1,630	1,614	1,581	0.98	
05	2009	1,551	1,489	1,459	0.98	
06	2010	1,831	1,666	1,633	0.98	



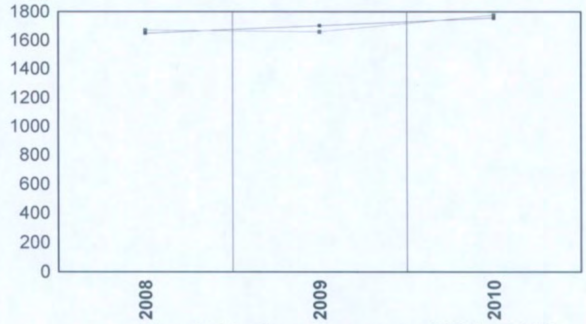
Trend Line based on years 2008 - 2010

County: Fayette **Station Number:** 000008

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-222

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
09	2008	1,852	1,704	1,670	0.98	
05	2009	1,762	1,692	1,658	0.98	
06	2010	1,991	1,812	1,776	0.98	



Trend Line based on years 2008 - 2010

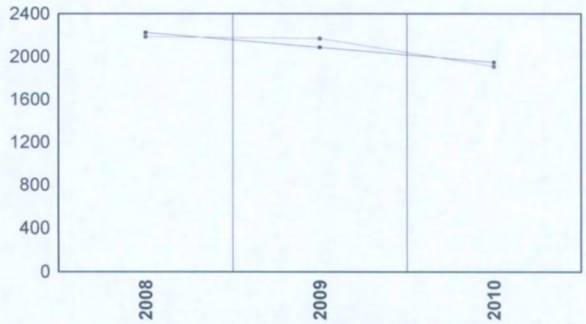

Fayette County, I-40
Exit 35, SR 59
24-081
Mainline Control Station
0
Ramp Number
Detection Loops
24-074
79-1039
LM 29.80
59
1
2
3
4
0
500
1,000
Feet

County: Fayette **Station Number:** 000001

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-59

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
09	2008	2,421	2,227	2,183	0.98	
05	2009	2,302	2,210	2,166	0.98	
06	2010	2,316	1,945	1,907	0.98	



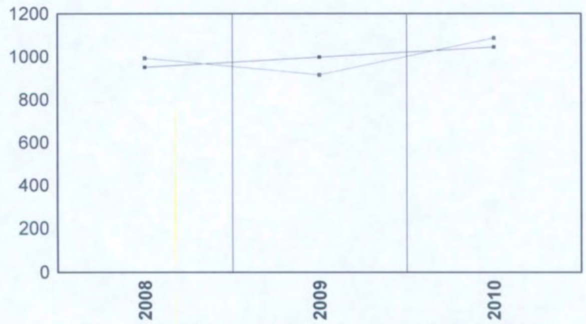
Trend Line based on years 2008 - 2010

County: Fayette **Station Number:** 000002

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-59

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
09	2008	1,100	1,012	992	0.98	
05	2009	972	933	914	0.98	
06	2010	1,218	1,108	1,086	0.98	



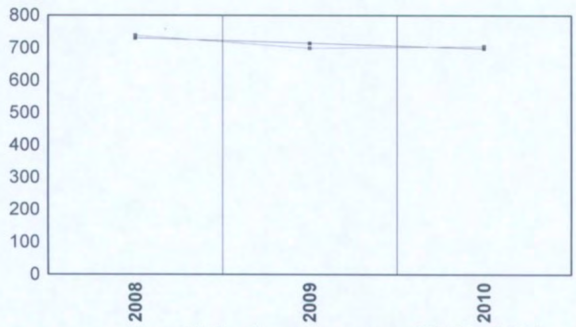
Trend Line based on years 2008 - 2010

County: Fayette **Station Number:** 000003

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-59

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
09	2008	818	753	738	0.98	
05	2009	743	713	699	0.98	
06	2010	791	720	705	0.98	



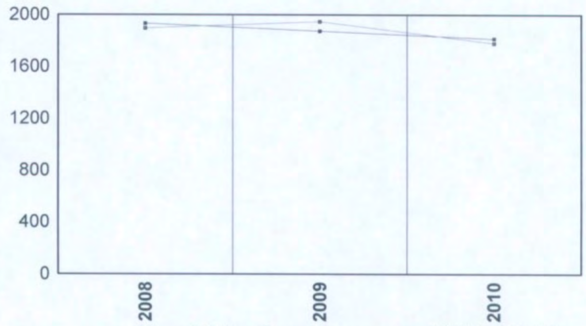
Trend Line based on years 2008 - 2010

County: Fayette **Station Number:** 000004

Route: I-40 **Station Type:** Interstate, Rural **Station Out:** NO

Location: SR-59

Month	Year	Average Weekday Traffic	Average Daily Traffic	Annual Average Daily	Axle Adjustment Factor	Remarks
09	2008	2,101	1,933	1,894	0.98	
05	2009	2,067	1,984	1,945	0.98	
06	2010	1,994	1,815	1,778	0.98	



Trend Line based on years 2008 - 2010

Interstate Traffic Counts - 2007

			[275]	1,568	[276]	1,723		[05]		
								[06]		
								79-1039		
Fayette Co.										
							52,027	[04]		
							54,664	[05]		
							52,243	[06]		
				25,655		24,858	50,513		-1,730	-3.42%
				24,669		24,669	49,337	24-81	-2,906	-5.89%
	Exit 35	SR 59								
			1		4			[04]		
			2		3			[05]		
								[06]		
				25,447		25,447	50,894	24-74		
	Exit 42	SR222								
			5		8					
			6		7					
Haywood Co.										
								[04]		
								[05]		
								[06]		
				26,709		26,709	53,417	38-63		
	Exit 47	SR 179								
			1	473	4	532				
			2	372	3	463		[04]		
								[05]		
								[06]		
				26,326		26,326	52,651	ATR 41		
	Exit 52	Stanton - Koko Road								
			5		8					
			6		7			[04]		
								[05]		
								[06]		
				23,896		23,896	47,792	38-62		
	Exit 56	SR 76								
			9		12			[04]		
			10		11			[05]		
								[06]		
				23,765		23,765	47,529	38-61		

Long Engineering
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File Name : am peak_northern terminal_CB1
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Groups Printed- Autos - Trucks

	SR 222 From North				I-40 WB Off-Ramp From East				SR 222 From South				I-40 WB On-Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
06:00 AM	3	3	0	6	0	0	8	8	0	3	13	16	0	0	0	0	30
06:15 AM	10	4	0	14	0	1	11	12	0	5	10	15	0	0	0	0	41
06:30 AM	5	8	0	13	0	0	11	11	0	1	15	16	0	0	0	0	40
06:45 AM	9	10	0	19	0	0	11	11	0	2	11	13	0	0	0	0	43
Total	27	25	0	52	0	1	41	42	0	11	49	60	0	0	0	0	154
07:00 AM	10	2	0	12	0	0	8	8	0	6	8	14	0	0	0	0	34
07:15 AM	2	6	0	8	1	0	7	8	0	7	14	21	0	0	0	0	37
07:30 AM	4	8	0	12	0	0	16	16	0	1	11	12	0	0	0	0	40
07:45 AM	4	10	0	14	1	0	8	9	0	7	11	18	0	0	0	0	41
Total	20	26	0	46	2	0	39	41	0	21	44	65	0	0	0	0	152
08:00 AM	2	3	0	5	0	0	6	6	0	3	14	17	0	0	0	0	28
08:15 AM	3	2	0	5	0	0	4	4	0	2	7	9	0	0	0	0	18
08:30 AM	1	4	0	5	0	0	5	5	0	5	8	13	0	0	0	0	23
08:45 AM	3	4	0	7	0	0	12	12	0	3	8	11	0	0	0	0	30
Total	9	13	0	22	0	0	27	27	0	13	37	50	0	0	0	0	99
Grand Total	56	64	0	120	2	1	107	110	0	45	130	175	0	0	0	0	405
Apprch %	46.7	53.3	0		1.8	0.9	97.3		0	25.7	74.3		0	0	0		
Total %	13.8	15.8	0	29.6	0.5	0.2	26.4	27.2	0	11.1	32.1	43.2	0	0	0	0	
Autos	55	61	0	116	2	1	52	55	0	40	63	103	0	0	0	0	274
% Autos	98.2	95.3	0	96.7	100	100	48.6	50	0	88.9	48.5	58.9	0	0	0	0	67.7
Trucks	1	3	0	4	0	0	55	55	0	5	67	72	0	0	0	0	131
% Trucks	1.8	4.7	0	3.3	0	0	51.4	50	0	11.1	51.5	41.1	0	0	0	0	32.3

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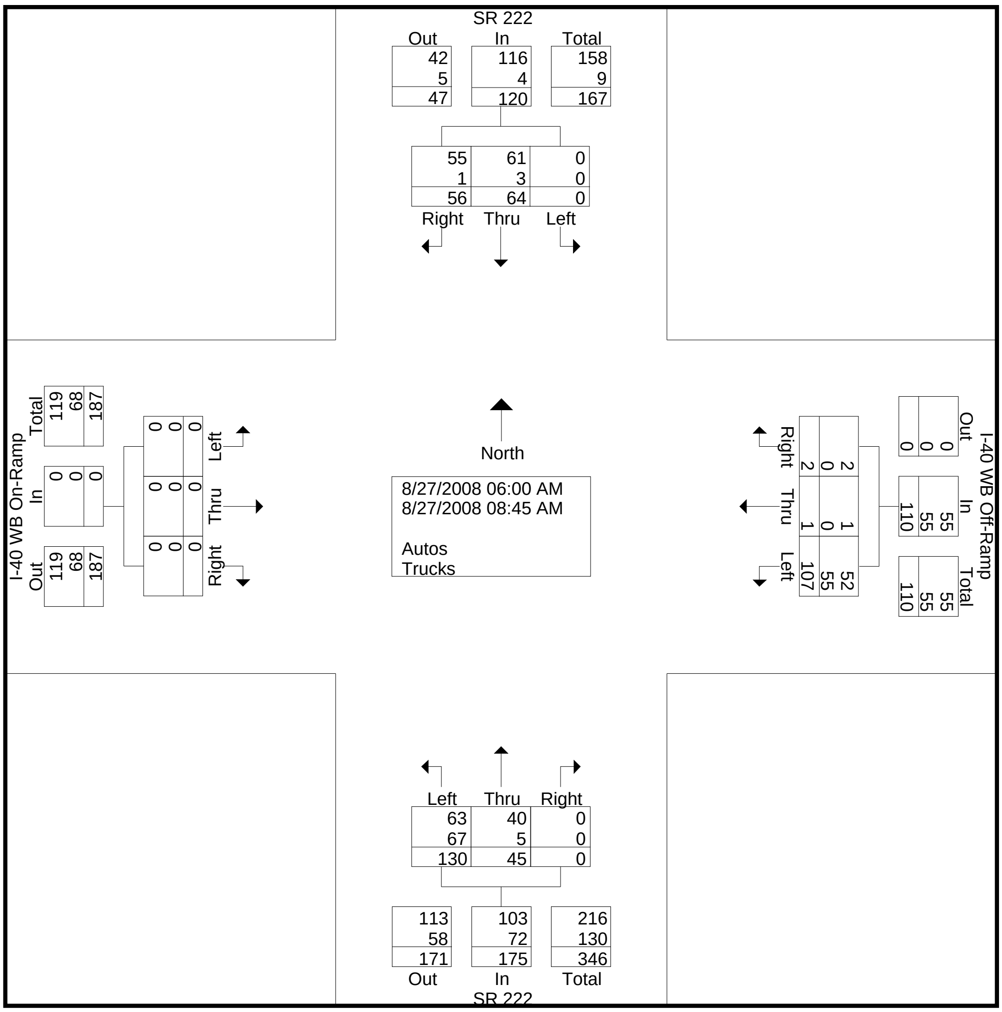

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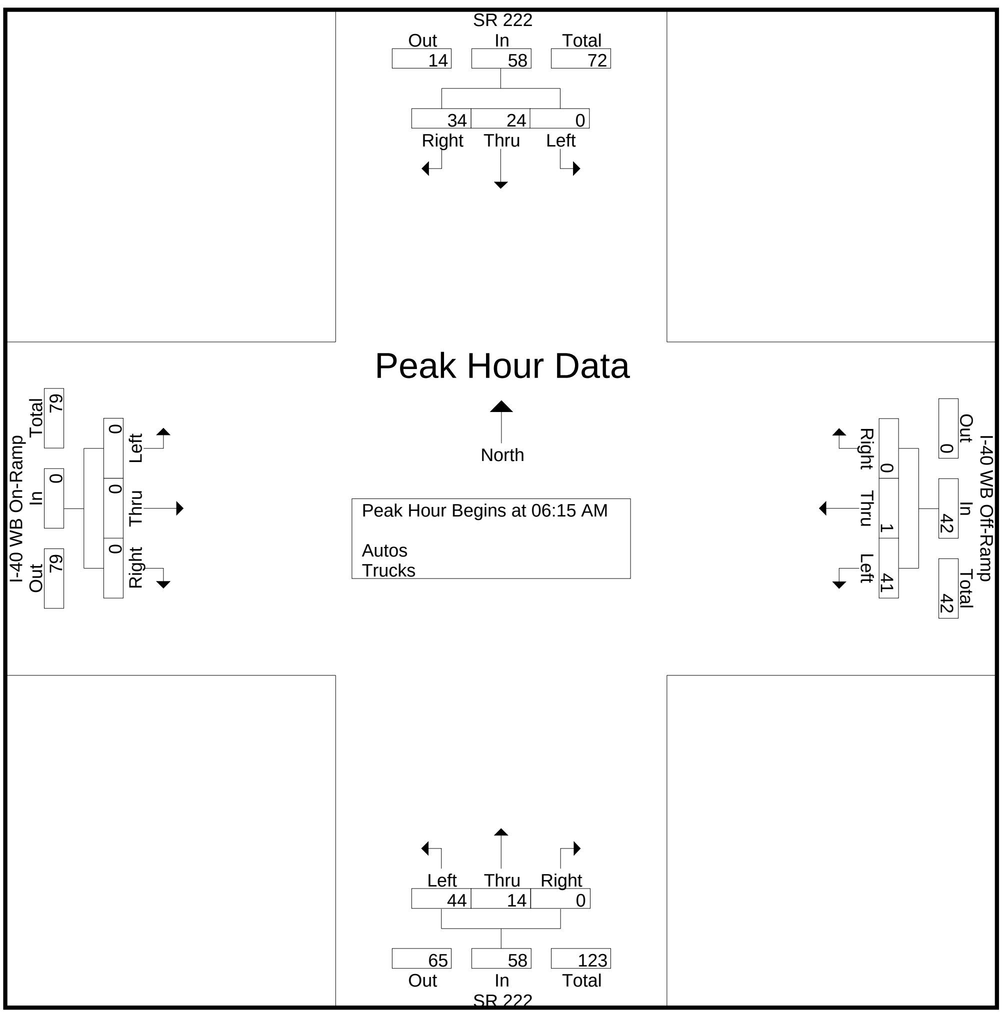
File Name : am peak_northern terminal_CB1
Site Code : Exit 42
Start Date : 8/27/2008

	SR 222 From North				**I-40 WB Off-Ramp From East**				**SR 222 From South**				**I-40 WB On-Ramp From West**				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 06:15 AM																	
06:15 AM	**10**	4	0	14	0	**1**	**11**	**12**	0	5	10	15	0	0	0	0	41
06:30 AM	5	8	0	13	0	0	11	11	0	1	**15**	**16**	0	0	0	0	40
06:45 AM	9	**10**	0	**19**	0	0	11	11	0	2	11	13	0	0	0	0	**43**
07:00 AM	10	2	0	12	0	0	8	8	0	**6**	8	14	0	0	0	0	34
Total Volume	34	24	0	58	0	1	41	42	0	14	44	58	0	0	0	0	158
% App. Total	58.6	41.4	0		0	2.4	97.6		0	24.1	75.9		0	0	0		
PHF	.850	.600	.000	.763	.000	.250	.932	.875	.000	.583	.733	.906	.000	.000	.000	.000	.919



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File Name : am peak_southern terminal_cb2
Site Code : Exit 42
Start Date : 8/27/2008
Page No : 1

Groups Printed- Autos - Trucks

	SR 222 From North					**I-40 EB On-Ramp From East**					**SR 222 From South**					**I-40 EB Off-Ramp From West**					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:00 AM	0	11	0	0	11	0	0	0	0	0	7	17	0	0	24	4	0	2	0	6	41
06:15 AM	0	13	0	0	13	0	0	0	0	0	7	12	0	0	19	8	0	0	0	8	40
06:30 AM	0	16	1	0	17	0	0	0	0	0	13	15	0	0	28	13	0	1	0	14	59
06:45 AM	0	21	0	0	21	0	0	0	0	0	12	14	0	0	26	11	1	0	0	12	59
Total	0	61	1	0	62	0	0	0	0	0	39	58	0	0	97	36	1	3	0	40	199
07:00 AM	0	12	0	0	12	0	0	0	0	0	10	16	0	0	26	9	0	1	0	10	48
07:15 AM	0	11	1	0	12	0	0	0	0	0	26	16	0	0	42	16	0	2	0	18	72
07:30 AM	0	21	1	0	22	0	0	0	0	0	12	13	0	0	25	13	0	2	0	15	62
07:45 AM	0	22	0	0	22	0	0	0	0	0	16	12	0	0	28	16	0	2	0	18	68
Total	0	66	2	0	68	0	0	0	0	0	64	57	0	0	121	54	0	7	0	61	250
08:00 AM	0	12	0	0	12	0	0	0	0	0	15	17	0	0	32	12	0	1	0	13	57
08:15 AM	0	9	0	0	9	0	0	0	0	0	13	10	0	0	23	6	2	1	0	9	41
08:30 AM	0	9	1	0	10	0	0	0	0	0	15	14	0	0	29	15	0	0	0	15	54
08:45 AM	0	10	0	0	10	0	0	0	0	0	14	11	0	0	25	17	0	0	0	17	52
Total	0	40	1	0	41	0	0	0	0	0	57	52	0	0	109	50	2	2	0	54	204
Grand Total	0	167	4	0	171	0	0	0	0	0	160	167	0	0	327	140	3	12	0	155	653
Apprch %	0	97.7	2.3	0		0	0	0	0		48.9	51.1	0	0		90.3	1.9	7.7	0		
Total %	0	25.6	0.6	0	26.2	0	0	0	0	0	24.5	25.6	0	0	50.1	21.4	0.5	1.8	0	23.7	
Autos	0	111	4	0	115	0	0	0	0	0	61	93	0	0	154	58	1	11	0	70	339
% Autos	0	66.5	100	0	67.3	0	0	0	0	0	38.1	55.7	0	0	47.1	41.4	33.3	91.7	0	45.2	51.9
Trucks	0	56	0	0	56	0	0	0	0	0	99	74	0	0	173	82	2	1	0	85	314
% Trucks	0	33.5	0	0	32.7	0	0	0	0	0	61.9	44.3	0	0	52.9	58.6	66.7	8.3	0	54.8	48.1

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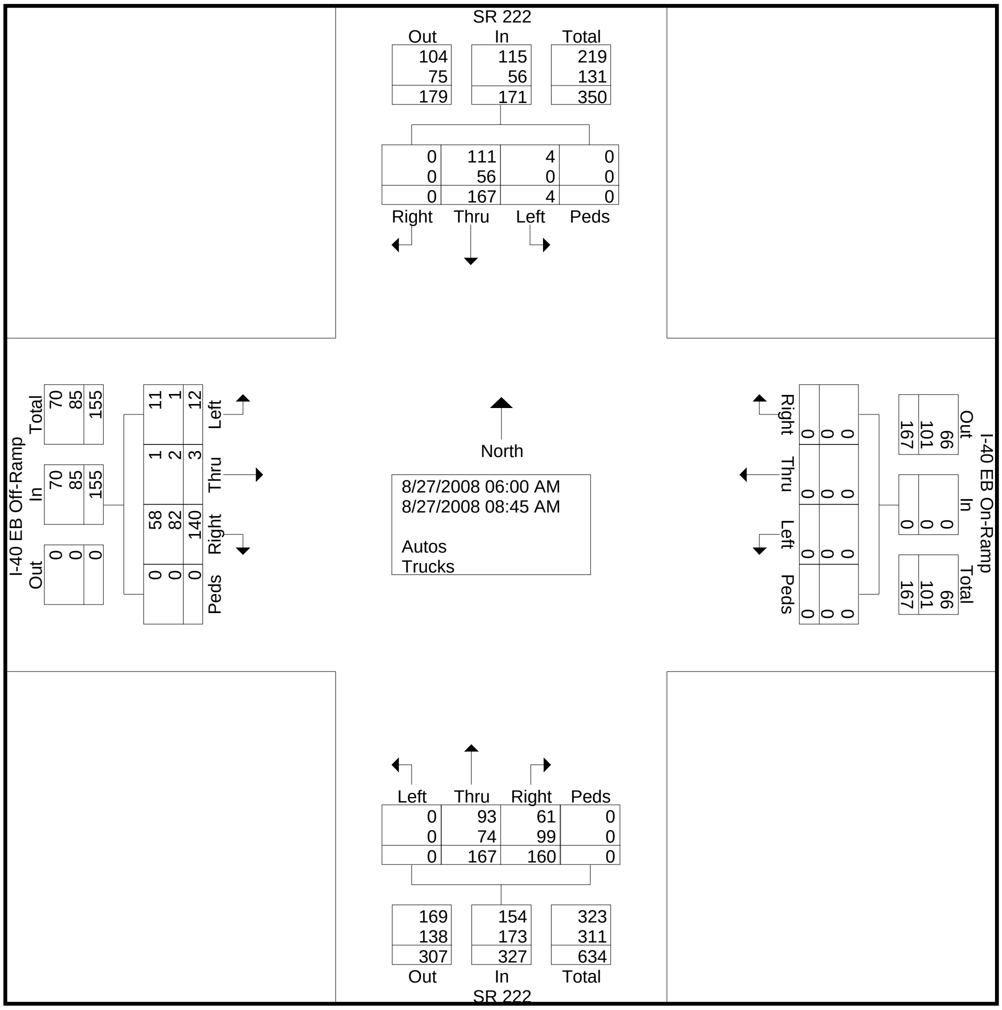

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File Name : am peak_southern terminal_cb2
Site Code : Exit 42
Start Date : 8/27/2008
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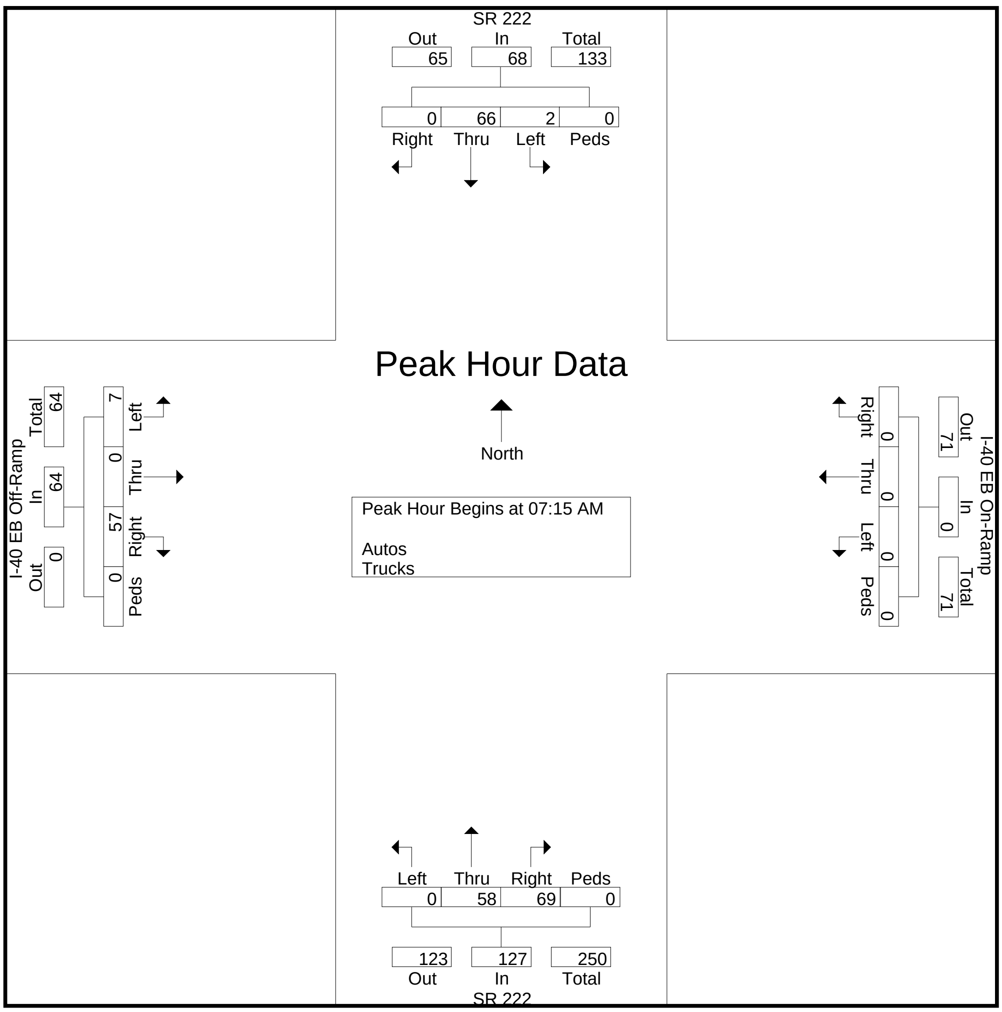
	SR 222 From North					I-40 EB On-Ramp From East					SR 222 From South					I-40 EB Off-Ramp From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	11	**1**	0	12	0	0	0	0	0	**26**	16	0	0	**42**	**16**	0	**2**	0	**18**	**72**
07:30 AM	0	21	1	0	**22**	0	0	0	0	0	12	13	0	0	25	13	0	2	0	15	62
07:45 AM	0	**22**	0	0	22	0	0	0	0	0	16	12	0	0	28	16	0	2	0	18	68
08:00 AM	0	12	0	0	12	0	0	0	0	0	15	**17**	0	0	32	12	0	1	0	13	57
Total Volume	0	66	2	0	68	0	0	0	0	0	69	58	0	0	127	57	0	7	0	64	259
% App. Total	0	97.1	2.9	0		0	0	0	0		54.3	45.7	0	0		89.1	0	10.9	0		
PHF	.000	.750	.500	.000	.773	.000	.000	.000	.000	.000	.663	.853	.000	.000	.756	.891	.000	.875	.000	.889	.899



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File Name : pm peak_northern terminal_cb2
Site Code : Exit 42
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Groups Printed- Autos - Trucks

	SR 222 From North					**I-40 WB Off-Ramp From East**					**SR 222 From South**					**I-40 WB On-Ramp From West**					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:15 PM	5	6	0	0	11	1	1	15	0	17	0	11	8	0	19	0	0	0	0	0	47
04:30 PM	0	8	0	0	8	2	0	14	0	16	0	12	11	0	23	0	0	0	0	0	47
04:45 PM	2	9	0	0	11	0	1	11	0	12	0	16	14	0	30	0	0	0	0	0	53
Total	7	23	0	0	30	3	2	40	0	45	0	39	33	0	72	0	0	0	0	0	147
05:00 PM	2	4	0	0	6	2	0	14	0	16	0	8	8	0	16	0	0	0	0	0	38
05:15 PM	1	7	0	0	8	0	0	11	0	11	0	11	14	0	25	0	0	0	0	0	44
05:30 PM	1	5	0	0	6	0	0	15	0	15	0	10	9	0	19	0	0	0	0	0	40
05:45 PM	3	4	0	0	7	0	0	19	0	19	0	5	13	0	18	0	0	0	0	0	44
Total	7	20	0	0	27	2	0	59	0	61	0	34	44	0	78	0	0	0	0	0	166
06:00 PM	0	6	0	0	6	0	0	10	0	10	0	9	14	0	23	0	0	0	0	0	39
Grand Total	14	49	0	0	63	5	2	109	0	116	0	82	91	0	173	0	0	0	0	0	352
Apprch %	22.2	77.8	0	0		4.3	1.7	94	0		0	47.4	52.6	0		0	0	0	0		
Total %	4	13.9	0	0	17.9	1.4	0.6	31	0	33	0	23.3	25.9	0	49.1	0	0	0	0	0	
Autos	14	47	0	0	61	5	1	43	0	49	0	80	38	0	118	0	0	0	0	0	228
% Autos	100	95.9	0	0	96.8	100	50	39.4	0	42.2	0	97.6	41.8	0	68.2	0	0	0	0	0	64.8
Trucks	0	2	0	0	2	0	1	66	0	67	0	2	53	0	55	0	0	0	0	0	124
% Trucks	0	4.1	0	0	3.2	0	50	60.6	0	57.8	0	2.4	58.2	0	31.8	0	0	0	0	0	35.2

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File Name : pm peak_northern terminal_cb2
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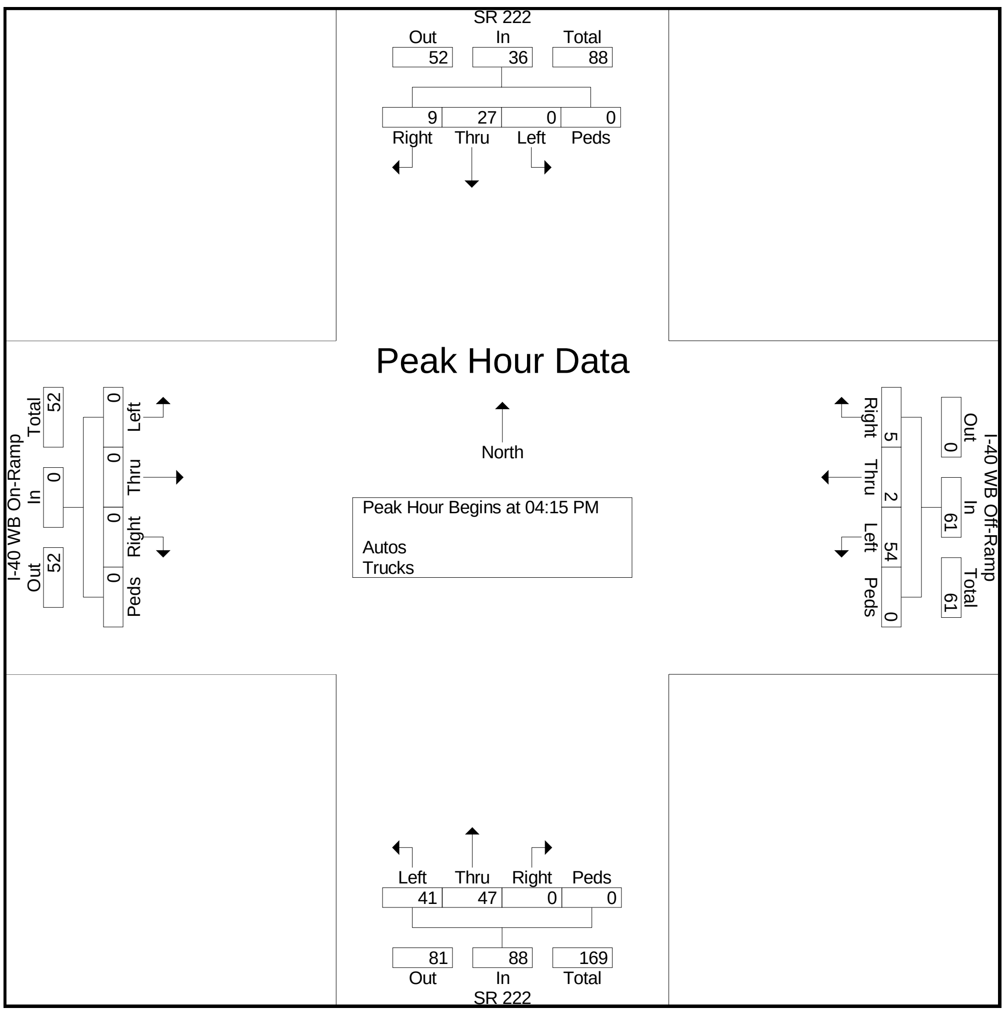
	SR 222 From North					**I-40 WB Off-Ramp From East**					**SR 222 From South**					**I-40 WB On-Ramp From West**					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 06:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	**5**	6	0	0	**11**	1	**1**	**15**	0	**17**	0	11	8	0	19	0	0	0	0	0	47
04:30 PM	0	8	0	0	8	**2**	0	14	0	16	0	12	11	0	23	0	0	0	0	0	47
04:45 PM	2	**9**	0	0	11	0	1	11	0	12	0	**16**	**14**	0	**30**	0	0	0	0	0	**53**
05:00 PM	2	4	0	0	6	2	0	14	0	16	0	8	8	0	16	0	0	0	0	0	38
Total Volume	9	27	0	0	36	5	2	54	0	61	0	47	41	0	88	0	0	0	0	0	185
% App. Total	25	75	0	0		8.2	3.3	88.5	0		0	53.4	46.6	0		0	0	0	0		
PHF	.450	.750	.000	.000	.818	.625	.500	.900	.000	.897	.000	.734	.732	.000	.733	.000	.000	.000	.000	.000	.873



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File Name : pm peak_southern terminal_cb1
Site Code : 00000000
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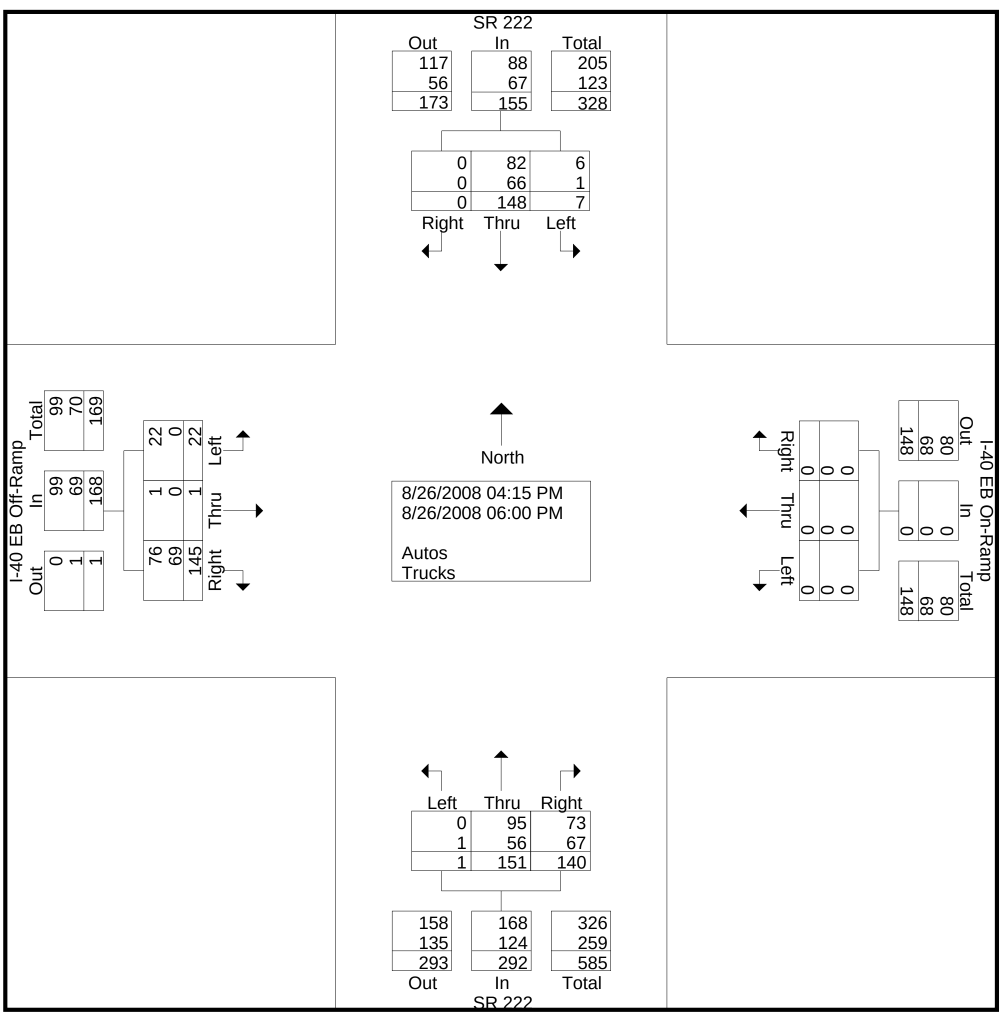
Groups Printed- Autos - Trucks

	SR 222 From North				I-40 EB On-Ramp From East				SR 222 From South				I-40 EB Off-Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:15 PM	0	18	0	18	0	0	0	0	20	14	0	34	21	0	4	25	77
04:30 PM	0	21	2	23	0	0	0	0	22	19	1	42	14	0	5	19	84
04:45 PM	0	16	3	19	0	0	0	0	13	25	0	38	9	0	4	13	70
Total	0	55	5	60	0	0	0	0	55	58	1	114	44	0	13	57	231
05:00 PM	0	18	1	19	0	0	0	0	15	15	0	30	23	0	2	25	74
05:15 PM	0	16	1	17	0	0	0	0	14	24	0	38	19	0	1	20	75
05:30 PM	0	21	0	21	0	0	0	0	19	16	0	35	24	0	2	26	82
05:45 PM	0	24	0	24	0	0	0	0	14	16	0	30	17	1	2	20	74
Total	0	79	2	81	0	0	0	0	62	71	0	133	83	1	7	91	305
06:00 PM	0	14	0	14	0	0	0	0	23	22	0	45	18	0	2	20	79
Grand Total	0	148	7	155	0	0	0	0	140	151	1	292	145	1	22	168	615
Apprch %	0	95.5	4.5		0	0	0		47.9	51.7	0.3		86.3	0.6	13.1		
Total %	0	24.1	1.1	25.2	0	0	0	0	22.8	24.6	0.2	47.5	23.6	0.2	3.6	27.3	
Autos	0	82	6	88	0	0	0	0	73	95	0	168	76	1	22	99	355
% Autos	0	55.4	85.7	56.8	0	0	0	0	52.1	62.9	0	57.5	52.4	100	100	58.9	57.7
Trucks	0	66	1	67	0	0	0	0	67	56	1	124	69	0	0	69	260
% Trucks	0	44.6	14.3	43.2	0	0	0	0	47.9	37.1	100	42.5	47.6	0	0	41.1	42.3



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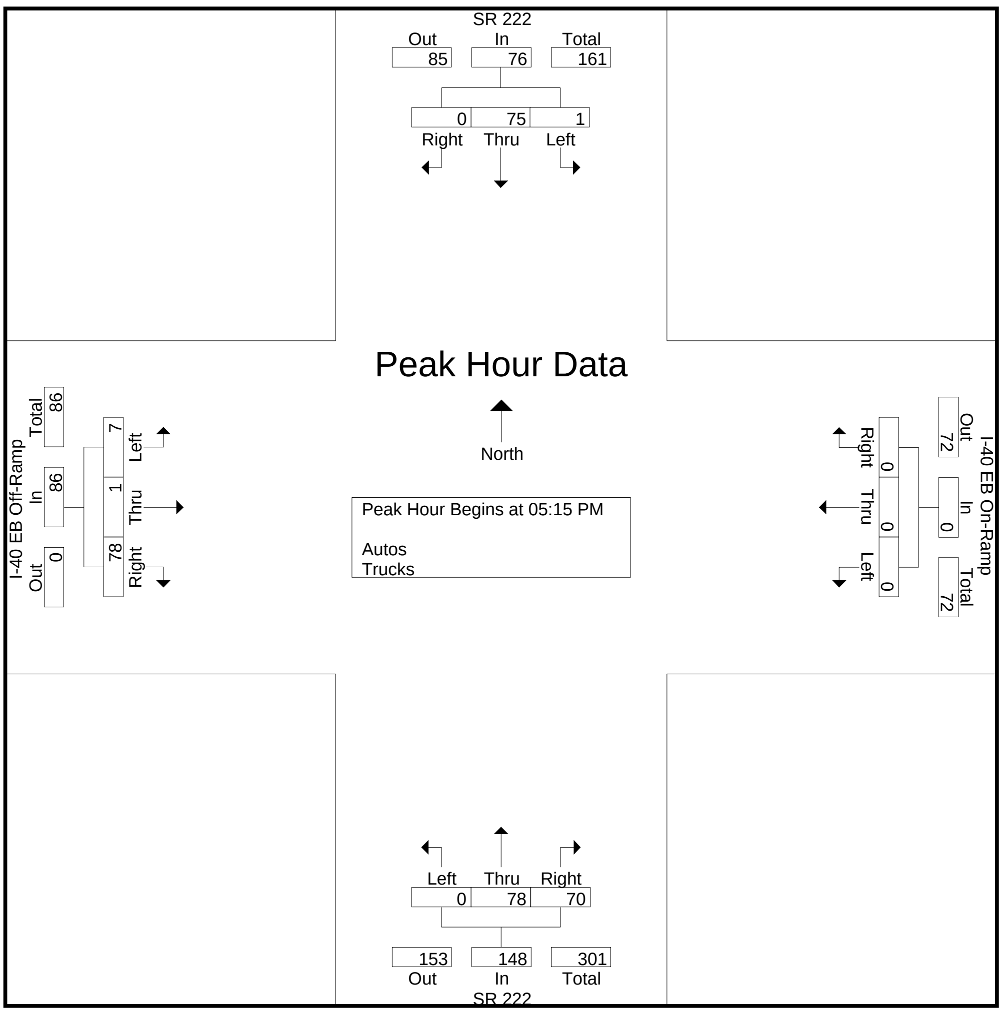
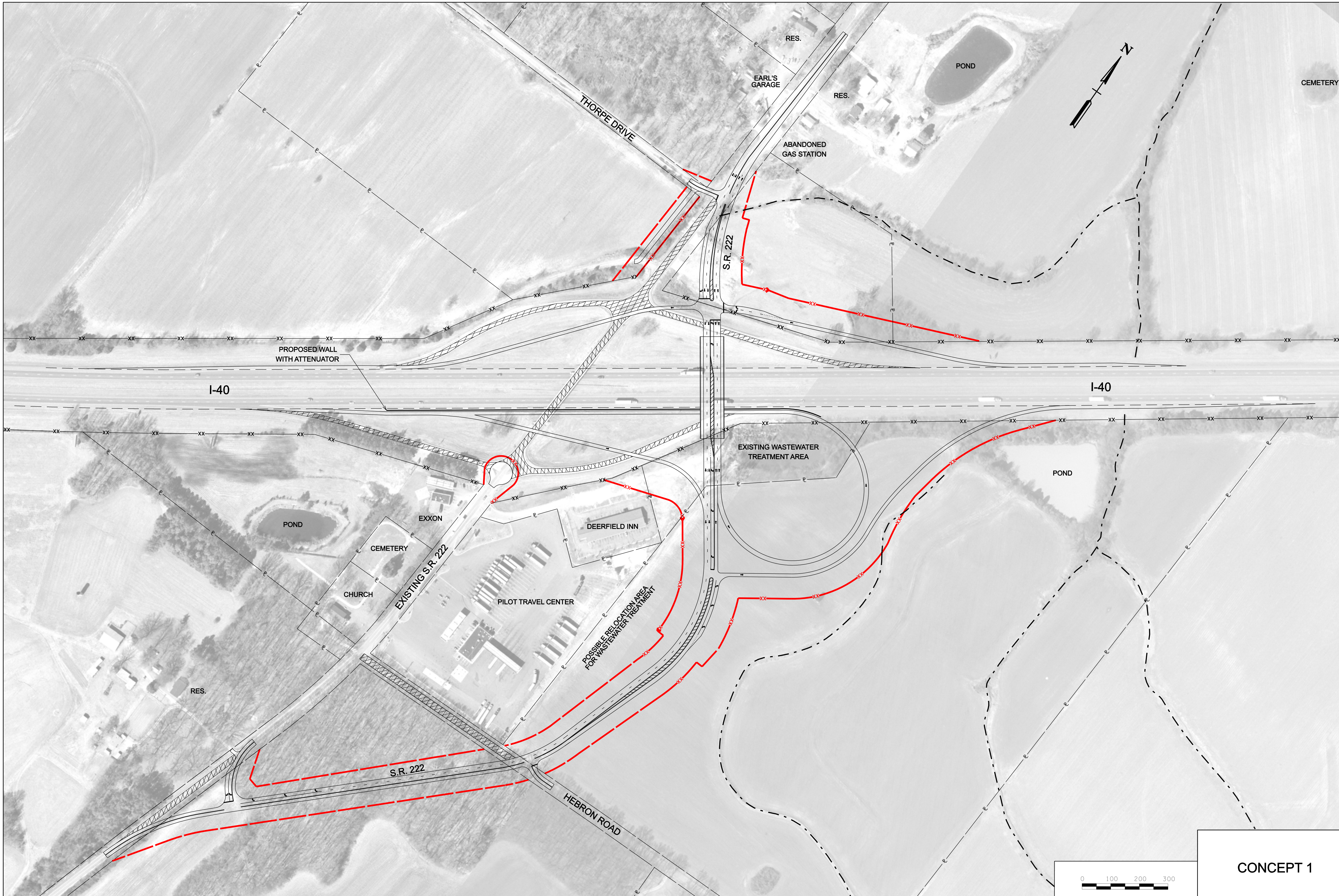
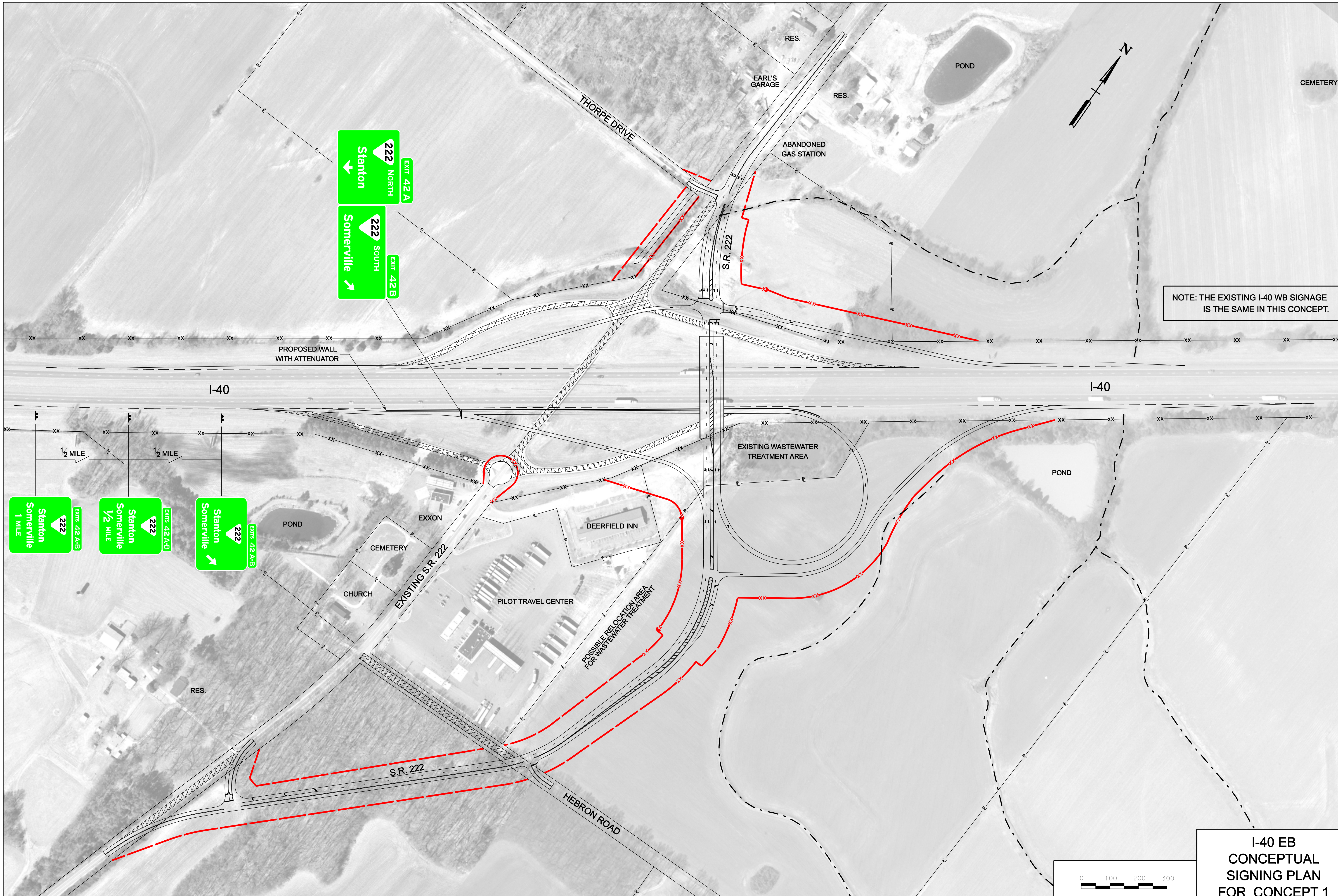
	SR 222 From North				I-40 EB On-Ramp From East				SR 222 From South				I-40 EB Off-Ramp From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 06:00 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:15 PM																	
05:15 PM	0	16	**1**	17	0	0	0	0	14	**24**	0	38	19	0	1	20	75
05:30 PM	0	21	0	21	0	0	0	0	19	16	0	35	**24**	0	**2**	**26**	**82**
05:45 PM	0	**24**	0	**24**	0	0	0	0	14	16	0	30	17	**1**	2	20	74
06:00 PM	0	14	0	14	0	0	0	0	**23**	22	0	**45**	18	0	2	20	79
Total Volume	0	75	1	76	0	0	0	0	70	78	0	148	78	1	7	86	310
% App. Total	0	98.7	1.3		0	0	0		47.3	52.7	0		90.7	1.2	8.1		
PHF	.000	.781	.250	.792	.000	.000	.000	.000	.761	.813	.000	.822	.813	.250	.875	.827	.945



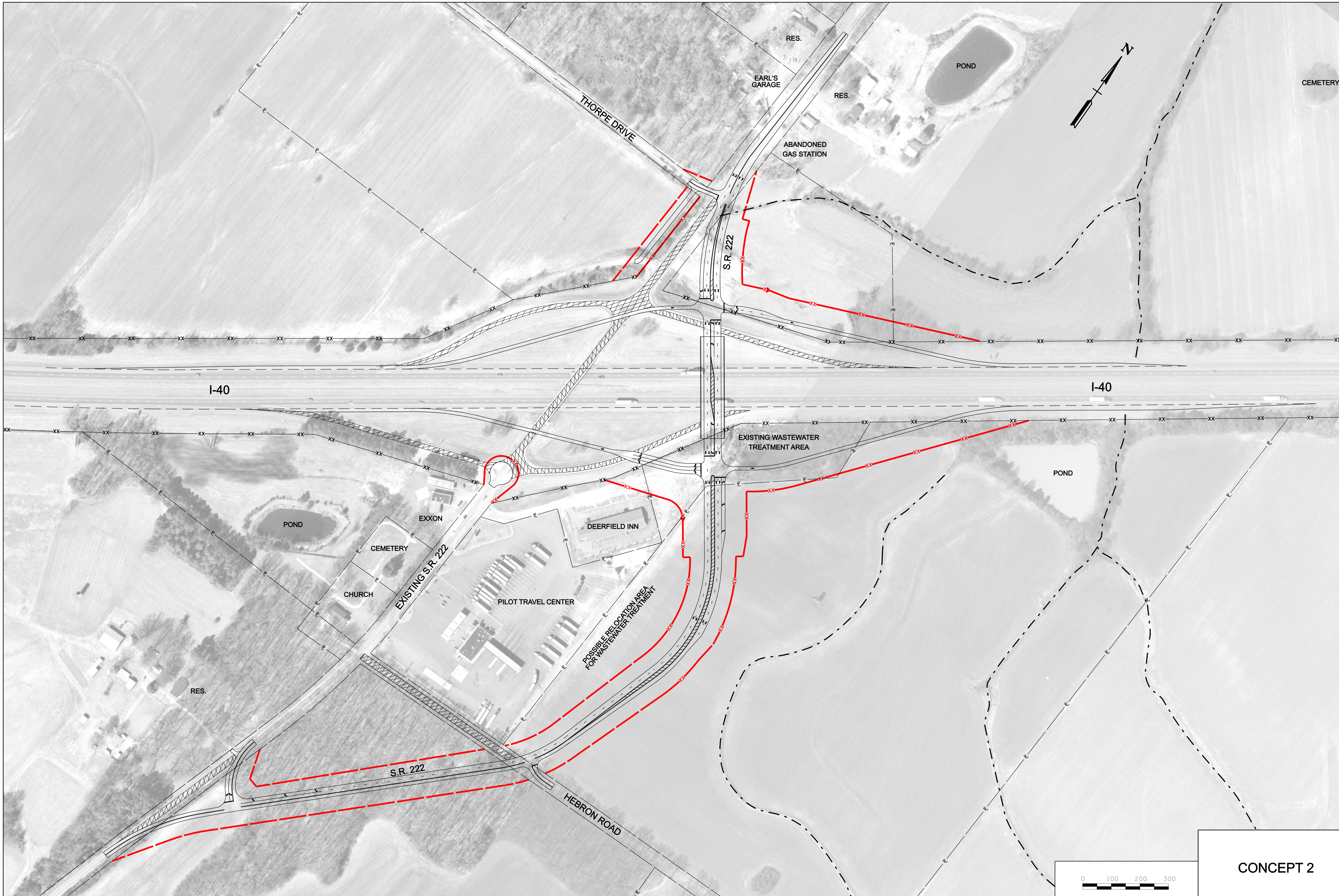
APPENDIX B

CONCEPT FIGURES


RES.
EARL'S GARAGE
POND
RES.
CEMETERY
THORPE DRIVE
ABANDONED GAS STATION
S.R. 222
PROPOSED WALL WITH ATTENUATOR
I-40
I-40
EXISTING WASTEWATER TREATMENT AREA
POND
POND
EXXON
DEERFIELD INN
CEMETERY
EXISTING S.R. 222
CHURCH
PILOT TRAVEL CENTER
POSSIBLE RELOCATION AREA FOR WASTEWATER TREATMENT
RES.
S.R. 222
HEBRON ROAD
0 100 200 300
CONCEPT 1

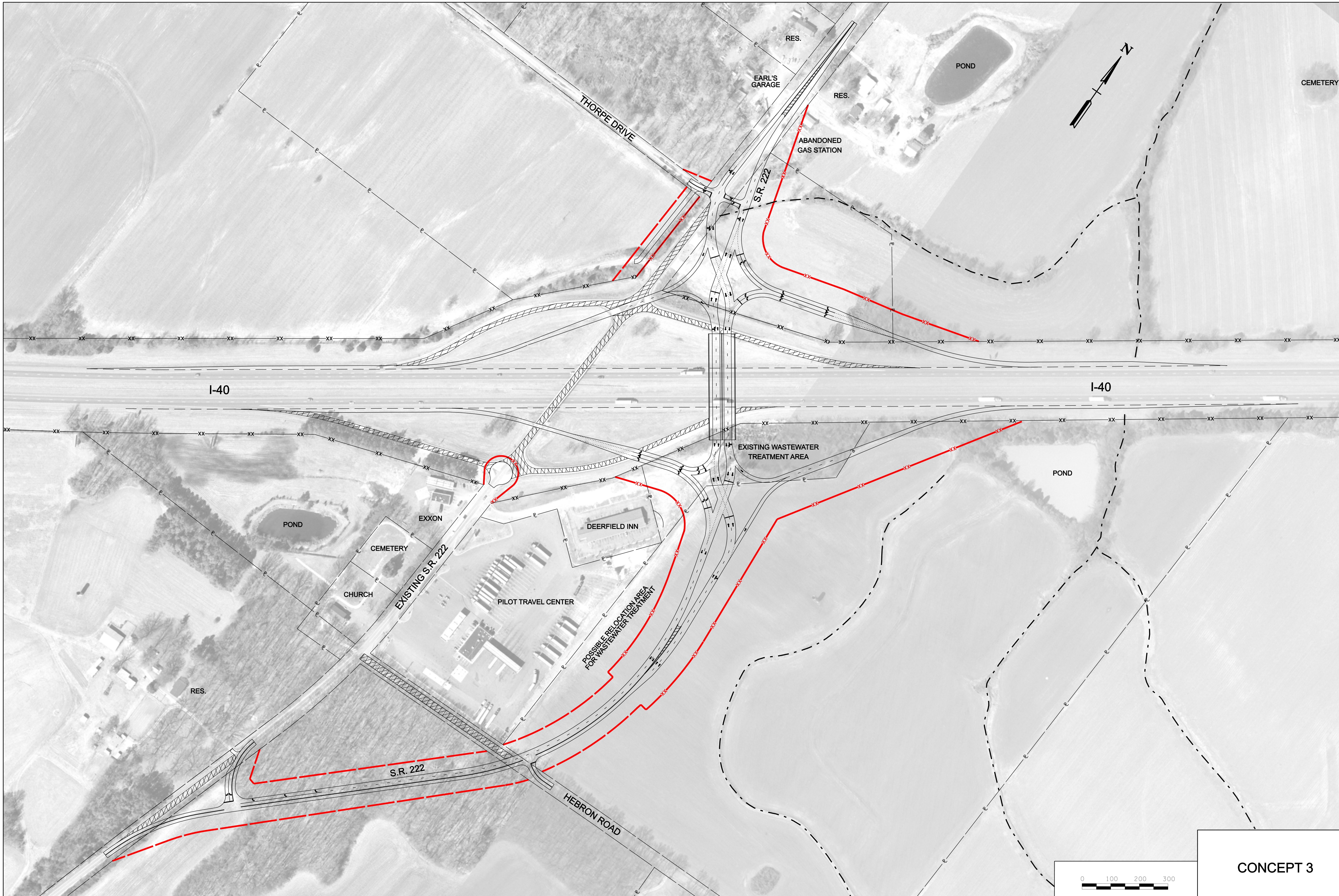


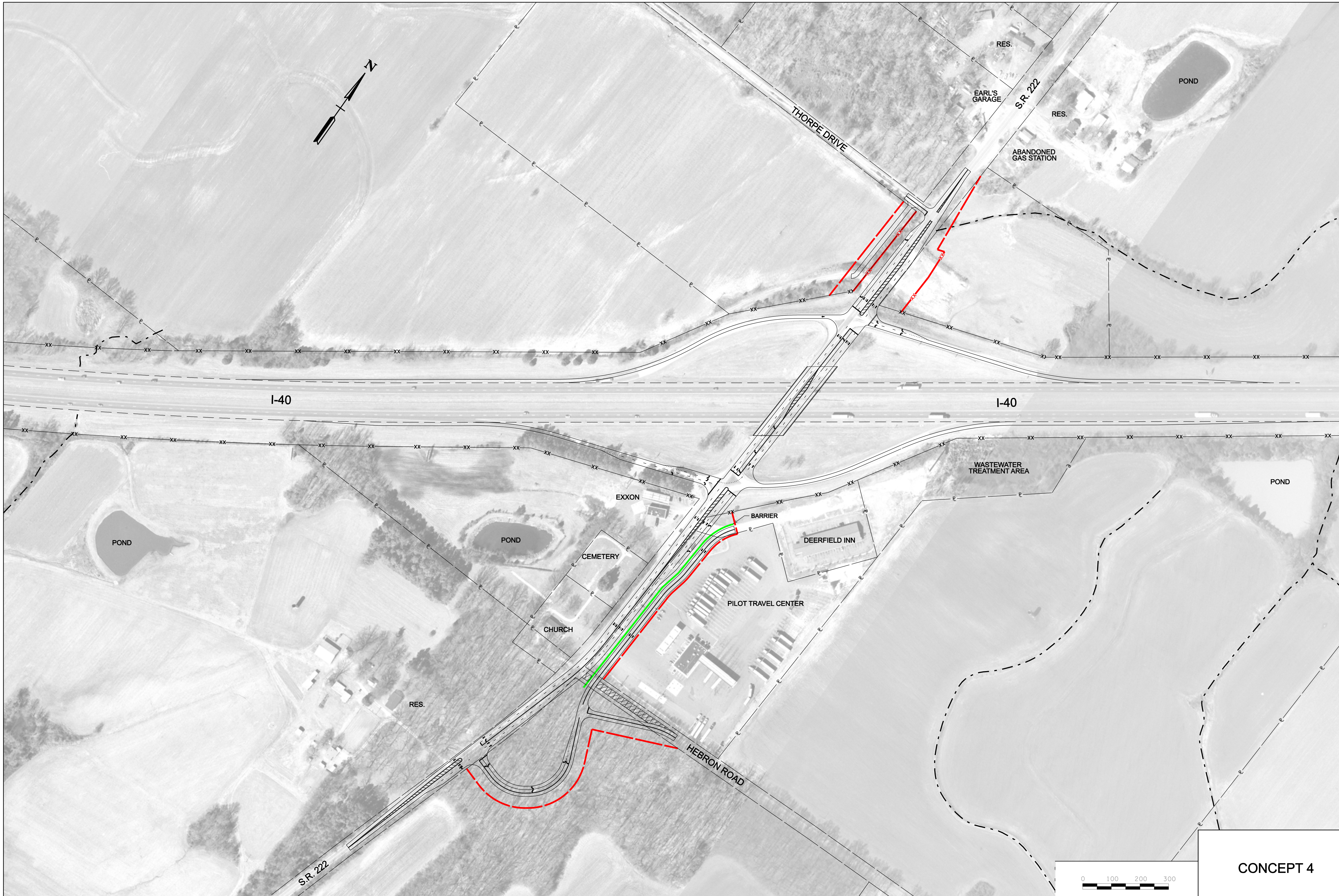
EXIT 42A
222 NORTH
Stanton
EXIT 42B
222 SOUTH
Somerville
EXITS 42 A-B
222
Stanton
Somerville
1 MILE
EXITS 42 A-B
222
Stanton
Somerville
½ MILE
EXITS 42 A-B
222
Stanton
Somerville
½ MILE
½ MILE
I-40
I-40
THORPE DRIVE
S.R. 222
EXISTING S.R. 222
S.R. 222
HEBRON ROAD
RES.
EARL'S GARAGE
RES.
POND
ABANDONED GAS STATION
CEMETERY
NOTE: THE EXISTING I-40 WB SIGNAGE IS THE SAME IN THIS CONCEPT.
PROPOSED WALL WITH ATTENUATOR
EXISTING WASTEWATER TREATMENT AREA
POND
POND
EXXON
CEMETERY
CHURCH
DEERFIELD INN
PILOT TRAVEL CENTER
POSSIBLE RELOCATION AREA FOR WASTEWATER TREATMENT
RES.
0 100 200 300
I-40 EB CONCEPTUAL SIGNING PLAN FOR CONCEPT 1



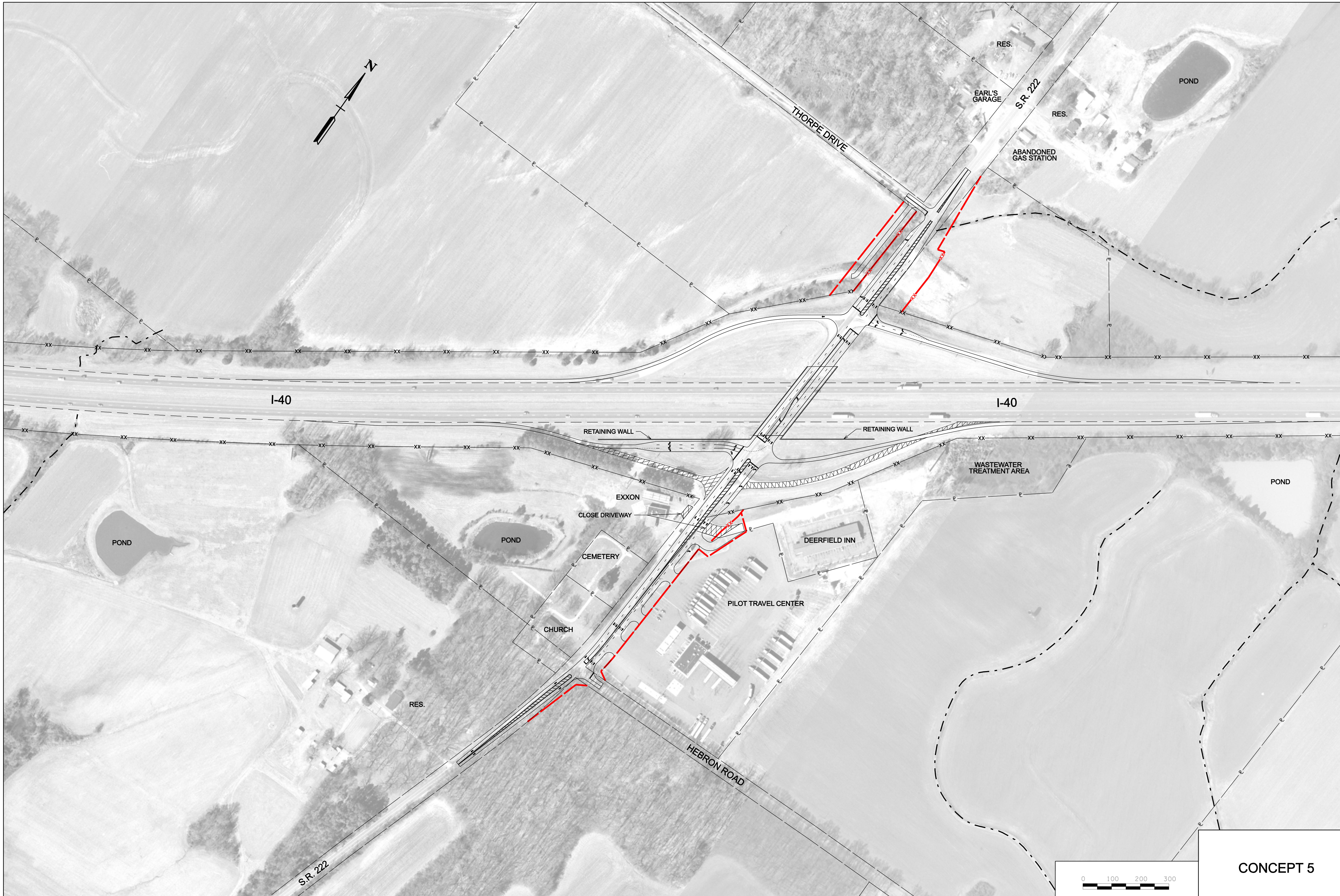
RES.
EARL'S GARAGE
POND
RES.
CEMETERY
N
THORPE DRIVE
ABANDONED GAS STATION
S.R. 222
I-40
I-40
EXISTING WASTEWATER TREATMENT AREA
POND
POND
EXXON
DEERFIELD INN
CEMETERY
EXISTING S.R. 222
CHURCH
PILOT TRAVEL CENTER
POSSIBLE RELOCATION AREA FOR WASTEWATER TREATMENT
RES.
S.R. 222
HEBRON ROAD
0
100
200
300

CONCEPT 2


THORPE DRIVE
RES.
EARL'S GARAGE
RES.
POND
CEMETERY
ABANDONED GAS STATION
S.R. 222
N
I-40
I-40
EXISTING WASTEWATER TREATMENT AREA
POND
POND
EXXON
DEERFIELD INN
CEMETERY
CHURCH
EXISTING S.R. 222
PILOT TRAVEL CENTER
POSSIBLE RELOCATION AREA FOR WASTEWATER TREATMENT
RES.
S.R. 222
HEBRON ROAD
0 100 200 300
CONCEPT 3

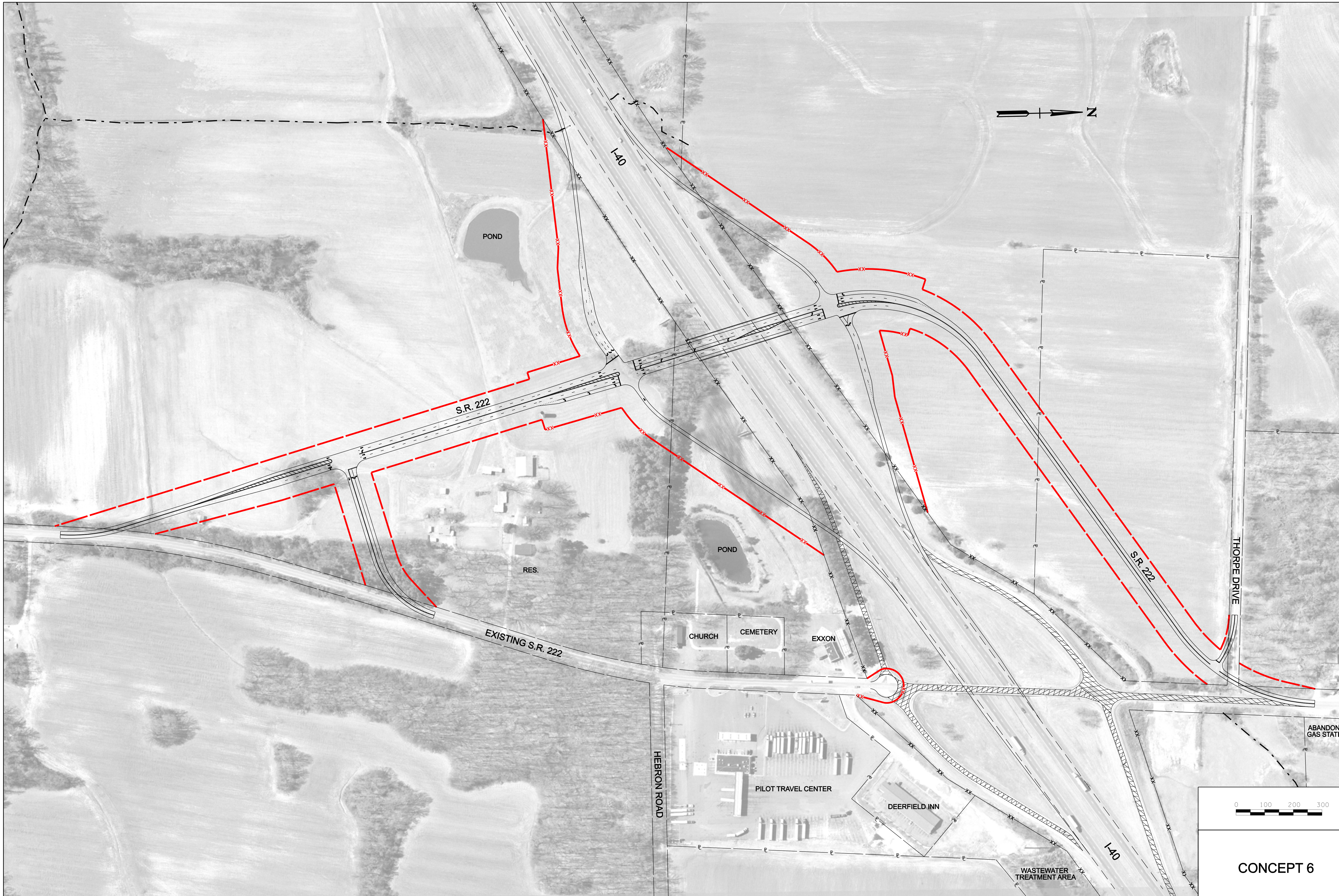

N
THORPE DRIVE
S.R. 222
RES.
EARL'S GARAGE
RES.
ABANDONED GAS STATION
POND
I-40
I-40
EXXON
BARRIER
DEERFIELD INN
WASTEWATER TREATMENT AREA
POND
POND
POND
CEMETERY
PILOT TRAVEL CENTER
CHURCH
RES.
HEBRON ROAD
S.R. 222
0 100 200 300

CONCEPT 4


N
RES.
EARL'S GARAGE
S.R. 222
POND
RES.
THORPE DRIVE
ABANDONED GAS STATION
I-40
I-40
RETAINING WALL
RETAINING WALL
WASTEWATER TREATMENT AREA
POND
EXXON
CLOSE DRIVEWAY
POND
POND
CEMETERY
DEERFIELD INN
PILOT TRAVEL CENTER
CHURCH
RES.
HEBRON ROAD
S.R. 222
0
100
200
300

CONCEPT 5


N
THORPE DRIVE
S.R. 222
RES.
EARL'S GARAGE
RES.
POND
ABANDONED GAS STATION
NOTE: THE EXISTING I-40 WB SIGNAGE IS THE SAME IN THIS CONCEPT.
I-40
I-40
RETAINING WALL
RETAINING WALL
½ MILE
½ MILE
EXIT 42
222
Stanton
Somerville
1 MILE
POND
EXIT 42
222
Stanton
Somerville
½ MILE
EXIT 42
222
Stanton
Somerville
EXXON
CLOSE DRIVEWAY
POND
CEMETERY
CHURCH
WASTEWATER TREATMENT AREA
DEERFIELD INN
PILOT TRAVEL CENTER
POND
RES.
HEBRON ROAD
S.R. 222
0 100 200 300
I-40 EB
CONCEPTUAL
SIGNING PLAN
FOR CONCEPT 5



N
I-40
POND
S.R. 222
RES.
POND
CHURCH
CEMETERY
EXXON
EXISTING S.R. 222
HEBRON ROAD
PILOT TRAVEL CENTER
DEERFIELD INN
WASTEWATER TREATMENT AREA
THORPE DRIVE
ABANDONED GAS STATION
0 100 200 300

CONCEPT 6

APPENDIX C

COST ESTIMATE WORKSHEETS

Modified Exit 42 Interchange
Cost Estimate Summary

ITEM		COST			
Clear & Grubbing:		$53,320	=	$53,000	$53,000
Earthwork:		$1,440,775	=	$1,441,000	$1,494,000
Pavement Removal:		$43,476	=	$43,000	$1,537,000
Erosion Control:		$317,000	=	$317,000	$1,854,000
Drainage:		$41,531	=	$42,000	$1,896,000
Structures:		$4,849,920	=	$4,850,000	$6,746,000
Railroad:		$0	=	$0	$6,746,000
Paving:		$1,327,006	=	$1,327,000	$8,073,000
Retaining Walls:		$0	=	$0	$8,073,000
Maintenance of Traffic:		$250,000	=	$250,000	$8,323,000
Topsoil:		$198,955	=	$199,000	$8,522,000
Seeding:		$52,226	=	$52,000	$8,574,000
Sodding:		$25,000	=	$25,000	$8,599,000
Signing:		$260,000	=	$260,000	$8,859,000
Signalization:		$150,000	=	$150,000	$9,009,000
Fencing:		$76,347	=	$76,000	$9,085,000
Guardrail:		$80,500	=	$81,000	$9,166,000
Rip-Rap:		$25,000	=	$25,000	$9,191,000
Other Construction:		$431,614	=	$432,000	$9,623,000
Sub-Total:		$9,622,669	=	$9,623,000	**$9,623,000**
10% Eng. & Cont.:		$962,267	=	$962,000	$962,000
Sub-Total:		$10,584,936	=	$10,585,000	**$10,585,000**

Total Construction Cost :	Sub-Total	+	Mobil.		
	$10,585,000	+	$450,000	=	**$11,035,000**
			10% Prel. Eng.		
	$11,035,000	+	$962,000	=	**$11,997,000**
	Row Total	+	Utility Total	+	Constr. Total
	$355,000	+	$700,000	+	$11,997,000
TOTAL SECTION COST :					**$13,052,000**

<u>Mobilization Table</u>

$0 to $1,000,000	5%	$	-
$1,000,000 to $5,000,000	$50,000 + 4.5% over $1,000,000	$	-
$5,000,000 to $10,000,000	$230,000 + 4% over $5,000,000	$	-
$10,000,000 to $20,000,000	$430,000 + 3.5% over $10,000,000	$	450,000
$20,000,000 +	$780,000 + 3% over $20,000,000	$	-

Right of Way Cost

Parcel	Area (sf)	Acres	Cost ($/Acre)*1.2 factor	Improvements (1.2 factor)	Land Cost	Total	
	21,730	0.499	$ 13,000.00		$ 6,485.08		North of I-40
	1,469	0.034	$ 13,000.00		$ 438.41		North of I-40
	121,619	2.792	$ 13,000.00		$ 36,295.84		North of I-40
	10,637	0.244	$ 13,000.00		$ 3,174.49		North of I-40
	170,567	3.916	$ 13,000.00		$ 50,903.83		South of I-40
	509,906	11.706	$ 13,000.00		$ 152,175.80		South of I-40
	138,345	3.176	$ 13,000.00		$ 41,287.53		South of I-40
	7,010	0.161	$ 13,000.00		$ 2,092.06		South of I-40
	127,460	2.926	$ 13,000.00		$ 38,039.03		Possible Wastewater Treatment Area
Sub-Total		25.453		$ -	$ 323,968.60	$ 331,000	
Cost of Bldgs.						$ -	
Contengenices					=	$ -	
Total Land & Improvement Costs					=	$ 331,000	(Rounded)
Incidentals	8	X	$ 3,000	Per Tract for Incid	=	$ 24,000	
Replacement Housin	x	X	$ 12,000	Per Unit	=	$ -	
Moving Expenses	x	X	$ 25,000	Per Unit	=	$ -	
TOTAL ROW COSTS					=	$ 355,000	

201-07.05 Removal and Disposal of Brush and Trees (Clear. and Grub.)

Length (ft.)	Width (ft.)(Avg.)	Area (sq.ft./ac.)	Acres	Cost ($/ac.)			
650	120	78,000	1.791	$2,500	$ 4,477	Ramp NE Quad	
0	0	0	0.000	$2,500	$ -	Ramp NW Quad	
230	150	34,500	0.792	$2,500	$ 1,980	Ramp SW Quad	
1180	115	135,700	3.115	$2,500	$ 7,788	Ramp SE Quad	
1050	200	210,000	4.821	$2,500	$ 12,052	Loop Ramp	
1225	130	159,250	3.656	$2,500	$ 9,140	Conn. To SR 222	South
1265	200	253,000	5.808	$2,500	$ 14,520	Conn. To SR 222	Middle
315	186	58590	1.345	$2,500	$ 3,363	Conn. To SR 222	North
				Total	$ 53,320		

Maintenance of Traffic

Drums (Ea.)	Cost ($/drum)		Total		
Signs (s.f.)	Cost ($/s.f.)				
712-06					
712-02.02 Interconnected Portable Barrier Rail					
Lgth.(ft.)	Cost ($/ft.)				
712-07.03 Temporary Barricades					
Lgth.(ft.)	No.		Total Lgth.	Cost ($/ft)	
Total Maintenance of Traffic					**$ 250,000**

Signing

Signs (s.f.)	Cost ($/s.f.)	Total	713-13.03		
Truss for O.H. sign					**$ 50,000**
Other signs					**$ 210,000**
				Total	**$ 260,000**

Utility Relocation Cost

	Lgth (ft)	No. of Poles	Cost ($/pole)	Cost ($/ft)	
6" Water	1500			$50.00	**$75,000**
12" Water				$80.00	**$0**
Utility Poles		25	$15,000.00		**$375,000**
6" Gas				$30.00	**$0**
Wastewater Treatment System					**$250,000**
				Total	**$700,000.00**

203-01 Road and Drain. Exc. (Uncl.)

Length (ft.)	Width (ft.)	Avg. Exc. Depth	Factor	C.Y.	Cost/cy		Total	
1673	65	10	27	40276	$3.50		**$140,965.74**	Ramp NE Quad
2170	65	10	27	52241	$3.50		**$182,842.59**	Ramp NW Quad
1755	65	10	27	42250	$3.50		**$147,875.00**	Ramp SW Quad
2319	65	10	27	55828	$3.50		**$195,397.22**	Ramp SE Quad
2410	65	10	27	58019	$3.50		**$203,064.81**	Loop Ramp
1210	120	10	27	53778	$3.50		**$188,222.22**	Conn. To SR 222 (North of I-40)
2950	100	10	27	109259	$3.50		**$382,407.41**	Conn. To SR 222 (South of I-40)
14,487						**Total**	**$1,440,775.00**	

202-03.01 Pavement Removal

Area (sf)	sf/sy	Cost ($/sy)		
104342	9	$3.75	**Total**	**$43,475.83**

Drainage

Bedding	Length (ft)	cy/ft	Cost ($/cy)		
204-07	700	0.266	$30.00	**$186.20**	
Pipe	Length (ft)	Cost ($/ft)			
607-05.02	700	$40.00		**$28,000.00**	Note: Based on 24" concrete pipe @ 100' per pipe (7 pipes)
Headwall Steel	lbs/wall	# H'walls	Cost ($/lb)		
611-07.02	172	14	$1.30	**$3,130.40**	
Headwall Conc.	cy/wall	# H'walls	Cost ($/cy)		
611-07.01	1.52	14	$480.00	**$10,214.40**	
			Total	**$41,531.00**	

New Structure

Length (ft.)	Width (ft.)	s.f.	Cost/s.f.		Total	
360	88	31680	$150.00		**$4,752,000.00**	
306	32	9792	$10.00		**$97,920.00**	Remove existing bridge over I-40
1525	4.25	6481.25	$125.00		**$190,625.00**	Barrier wall along I-40
				Total	**$4,849,920.00**	

ESTIMATE BREAKDOWN AND QUANTITY SUMMARY

Paving	Area (sq.ft.)	Avg. Width (ft.)	Depth (ft)	/	factor		Mass (lbs/cy)	Total cy or sy	lbs/Tons	Total Tons	Cost ($/ton or cy)	Total
Ramp Conc. Pvm't.												
501-01.02	121611		0.75	/	27			3378.08			$50.00	$ 168,904
Ramp Treated Base												
313-03	121611		0.330	/	9			4459.07			$10.00	$ 44,591
Ramp Base Stone												
303-01	121611		0.330	/	27		2.03			3017.30	$13.50	$ 40,734
P.C. and T.C.												
402-01	121611				9		0.35		231	20.47	$375.00	$ 7,677
402-02	121611				9		12		2000	81.07	$15.00	$ 1,216
Outside Shld'r.												
501-01.02	20572	5	0.75	/	27			571.44			$50.00	$ 28,572
313-03	20572	5	0.330	/	9			754.31			$10.00	$ 7,543
303-01	20572	5	0.25	/	27		2.03			386.68	$13.50	$ 5,220
303-01	20572	2	1.30	/	27		2.03			2010.72	$13.50	$ 27,145
303-01	20572	5.57			27		2.03			8615.17	$13.50	$ 116,305
Conn. To SR 222	Lgth/Area (sq.ft.)		Depth (ft)		factor					Tons		
411-02.10 (Surf.)	192342		0.104	27	3816	2000				1414	$60.00	$ 84,815
307-02.08 (B-M2)	192342		0.167	27	4068	2000				2420	$60.00	$ 145,187
307-02.01 (Gr. 'A')	192342		0.292	27	4140	2000				4306	$60.00	$ 258,354
303-01	192342		0.833	27	2.03					12046	$14.00	$ 168,647
Outside Shld'r.	8320	12	1.255	27	2.03					9421	$14.00	$ 131,889
	8320	4.85	1.115	27	2.03					3383	$14.00	$ 47,359
411-01.07 ('E' Shldr.)	8320	10	0.125	27	3708	2000				714	$60.00	$ 42,848
Access Rd. to Pilot												
411-02.10 (Surf.)	0		0.104	27	3816	2000				0	$60.00	$ -
307-02.08 (B-M2)	0		0.167	27	4068	2000				0	$60.00	$ -
307-02.01 (Gr. 'A')	0		0.292	27	4140	2000				0	$60.00	$ -
303-01	0		0.833	27	2.03					0	$14.00	$ -
Outside Shld'r.	0	12	1.255	27	2.03					0	$14.00	$ -
	0	4.85	1.115	27	2.03					0	$14.00	$ -
411-01.07 ('E' Shldr.)	0	10	0.125	27	3708	2000				0	$60.00	$ -
											Total	$ 1,327,006

Topsoil (203-07)

Based on 4:1 slope and 10' fill with 48' widening

Length (ft.)	Slope Lgth.(ft.)	Thk.(ft.)	cy factor	cy	Cost ($/cy)	Both Sides		
14,487	41.2	0.5	27	11053.0	$9.00	2	**Total**	**$ 198,955**

Seeding (801-01)

Length (ft.)	Slope Lgth.(ft.)	sf	sf/unit	Both Sides	factor	units	Cost ($/unit)		
14,487	41.2	596864	1,000	2	1.25	1492	$35.00	**Total**	**$ 52,226**

Signalization

1 Signal at WB Ramp	**Total**	**$ 150,000**

Fencing

Length (ft.)	707-02.01	Cost ($/ft)		
4491		$17.00	**Total**	**$ 76,347**

Guardrail

(Length (ft)	Cost ($/ft)	(# Anch.)	Cost ($/Anch.)	(# Attn.)	Cost ($/Attn.)		
3000	$17.50	10	$2,500.00	1	$3,000.00		
	$52,500.00		**$25,000.00**		**$3,000.00**	**Total**	**$80,500.00**

ITEM	COST			
Clear & Grubbing:	$24,408	=	$24,000	$24,000
Earthwork:	$1,209,989	=	$1,210,000	$1,234,000
Pavement Removal:	$43,583	=	$44,000	$1,278,000
Erosion Control:	$295,000	=	$295,000	$1,573,000
Drainage:	$41,531	=	$42,000	$1,615,000
Structures:	$4,849,920	=	$4,850,000	$6,465,000
Railroad:	$0	=	$0	$6,465,000
Paving:	$1,268,020	=	$1,268,000	$7,733,000
Retaining Walls:	$0	=	$0	$7,733,000
Maintenance of Traffic:	$250,000	=	$250,000	$7,983,000
Topsoil:	$120,826	=	$121,000	$8,104,000
Seeding:	$31,717	=	$32,000	$8,136,000
Sodding:	$50,000	=	$50,000	$8,186,000
Signing:	$200,000	=	$200,000	$8,386,000
Signalization:	$250,000	=	$250,000	$8,636,000
Fencing:	$77,197	=	$77,000	$8,713,000
Guardrail:	$77,500	=	$78,000	$8,791,000
Rip-Rap:	$25,000	=	$25,000	$8,816,000
Other Construction:	$393,977	=	$394,000	$9,210,000
Sub-Total:	$9,208,668	=	$9,209,000	**$9,210,000**
10% Eng. & Cont.:	$920,867	=	$921,000	$921,000
Sub-Total:	$10,129,535	=	$10,130,000	**$10,131,000**

Total Construction Cost :	Sub-Total	+	Mobil.		
	$10,131,000	+	$435,000	=	**$10,566,000**
			10% Prel. Eng.		
	$10,566,000	+	$921,000	=	**$11,487,000**
	Row Total	+	Utility Total	+	Constr. Total
	$281,000	+	$450,000	+	$11,487,000
TOTAL SECTION COST :					**$12,218,000**

Mobilization Table

$0 to $1,000,000	5%	$	-
$1,000,000 to $5,000,000	$50,000 + 4.5% over $1,000,000	$	-
$5,000,000 to $10,000,000	$230,000 + 4% over $5,000,000	$	-
$10,000,000 to $20,000,000	$430,000 + 3.5% over $10,000,000	$	435,000
$20,000,000 +	$780,000 + 3% over $20,000,000	$	-

Right of Way Cost

Parcel	Area (sf)	Acres	Cost ($/Acre)*1.2 factor	Improvements (1.2 factor)	Land Cost	Total	
	21,730	0.499	$ 13,000.00		$ 6,485.08		North of I-40
	1,469	0.034	$ 13,000.00		$ 438.41		North of I-40
	121,619	2.792	$ 13,000.00		$ 36,295.84		North of I-40
	10,637	0.244	$ 13,000.00		$ 3,174.49		North of I-40
	170,567	3.916	$ 13,000.00		$ 50,903.83		South of I-40
	400,820	9.202	$ 13,000.00		$ 119,620.29		South of I-40
	133,410	3.063	$ 13,000.00		$ 39,814.74		Possible Wastewater Treatment Area
Sub-Total		12.264		$ -	$ 159,435.03	$ 257,000	
Cost of Bldgs.						$ -	
Contengenices							
Total Land & Improvement Costs					=	$ 257,000	(Rounded)
Incidentals	8	X	$ 3,000	Per Tract for Incid	=	$ 24,000	
Replacement Housin	0	X	$ 12,000	Per Unit	=	$ -	
Moving Expenses	0	X	$ 25,000	Per Unit	=	$ -	
TOTAL ROW COSTS					=	$ 281,000	

201-07.05 Removal and Disposal of Brush and Trees (Clear. and Grub.)

Length (ft.)	Width (ft.)(Avg.)	Area (sq.ft./ac.)	Acres	Cost ($/ac.)			
650	120	78,000	1.791	$2,500		$ 4,477	Ramp NE Quad
0	0	0	0.000	$2,500		$ -	Ramp NW Quad
177	150	26,550	0.610	$2,500		$ 1,524	Ramp SW Quad
770	115	88,550	2.033	$2,500		$ 5,082	Ramp SE Quad
315	186	58590	1.345	$2,500		$ 3,363	Conn. To SR 222
135	124	16740	0.384	$2,500		$ 961	Conn. To SR 222
1265	124	156860	3.601	$2,500		$ 9,003	Conn. To SR 222
					Total	$ 24,408	

Maintenance of Traffic

Drums (Ea.)	Cost ($/drum)	Total		
Signs (s.f.)	Cost ($/s.f.)			
712-06				
712-02.02 Interconnected Portable Barrier Rail				
Lgth.(ft.)	Cost ($/ft.)			
712-07.03 Temporary Barricades				
Lgth.(ft.)	No.	Total Lgth.	Cost ($/ft)	
Total Maintenance of Traffic				$ 250,000

Signing

Signs (s.f.)	Cost ($/s.f.)	Total	713-13.03	
				$ 200,000

Utility Relocation Cost

	Lgth (ft)	No. of Poles	Cost ($/pole)	Cost ($/ft)	
6" Water	1500			$50.00	$75,000
12" Water				$80.00	$0
Utility Poles		25	$15,000.00		$375,000
6" Gas				$30.00	$0
				Total	$450,000.00

203-01 Road and Drain. Exc. (Uncl.)

Length (ft.)	Width (ft.)	Avg. Exc. Depth	Factor	C.Y.	Cost/cy		Total	
1673	65	10	27	40276	$3.50		**$140,965.74**	Ramp NE Quad
2170	65	10	27	52241	$3.50		**$182,842.59**	Ramp NW Quad
1650	65	10	27	39722	$3.50		**$139,027.78**	Ramp SW Quad
2095	65	10	27	50435	$3.50		**$176,523.15**	Ramp SE Quad
1210	120	10	27	53778	$3.50		**$188,222.22**	Conn. To SR 222 (North of I-40)
2950	100	10	27	109259	$3.50		**$382,407.41**	Conn. To SR 222 (South of I-40)
8,798						**Total**	**$1,209,988.89**	

202-03.01 Pavement Removal

Area (sf)	sf/sy	Cost ($/sy)		
104600	9	$3.75	**Total**	**$43,583.33**

Drainage

Bedding 204-07	Length (ft) 700	cy/ft 0.266	Cost ($/cy) $30.00	**$186.20**	
Pipe 607-05.02	Length (ft) 700	Cost ($/ft) $40.00		**$28,000.00**	Note: Based on 24" concrete pipe @ 100' per pipe (7 pipes)
Headwall Steel 611-07.02	lbs/wall 172	# H'walls 14	Cost ($/lb) $1.30	**$3,130.40**	
Headwall Conc. 611-07.01	cy/wall 1.52	# H'walls 14	Cost ($/cy) $480.00	**$10,214.40**	
			Total	**$41,531.00**	

New Structure

Length (ft.)	Width (ft.)	s.f.	Cost/s.f.		Total	
360	88	31680	$150.00		**$4,752,000.00**	
306	32	9792	$10.00		**$97,920.00**	Remove existing bridge over I-40
				Total	**$4,849,920.00**	

ESTIMATE BREAKDOWN AND QUANTITY SUMMARY

Paving	Area (sq.ft.)	Avg. Width (ft.)	Depth (ft)	/	factor		Mass (lbs/cy)	Total cy or sy	lbs/Tons	Total Tons	Cost ($/ton or cy)	Total
Ramp Conc. Pvm't.												
501-01.02	97587		0.75	/	27			2710.75			$50.00	$ 135,538
Ramp Treated Base												
313-03	97587		0.330	/	9			3578.19			$10.00	$ 35,782
Ramp Base Stone												
303-01	97587		0.330	/	27		2.03			2421.24	$13.50	$ 32,687
P.C. and T.C.												
402-01	97587				9		0.35		231	16.43	$375.00	$ 6,161
402-02	97587				9		12		2000	65.06	$15.00	$ 976
Outside Shld'r.												
501-01.02	15176	5	0.75	/	27			421.56			$50.00	$ 21,078
313-03	15176	5	0.330	/	9			556.45			$10.00	$ 5,565
303-01	15176	5	0.25	/	27		2.03			285.25	$13.50	$ 3,851
303-01	15176	2	1.30	/	27		2.03			1483.31	$13.50	$ 20,025
303-01	15176	5.57			27		2.03			6355.43	$13.50	$ 85,798
Conn. To SR 222	Lgth/Area (sq.ft.)		Depth (ft)		factor					Tons		
411-02.10 (Surf.)	204480		0.104	27	3816	2000				1503	$60.00	$ 90,168
307-02.08 (B-M2)	204480		0.167	27	4068	2000				2572	$60.00	$ 154,350
307-02.01 (Gr. 'A')	204480		0.292	27	4140	2000				4578	$60.00	$ 274,658
303-01	204480		0.833	27	2.03					12806	$14.00	$ 179,290
Outside Shld'r.	8320	12	1.255	27	2.03					9421	$14.00	$ 131,889
	8320	4.85	1.115	27	2.03					3383	$14.00	$ 47,359
411-01.07 ('E' Shldr.)	8320	10	0.125	27	3708	2000				714	$60.00	$ 42,848
											Total	**$ 1,268,020**

Topsoil (203-07)

Based on 4:1 slope and 10' fill with 48' widening

Length (ft.)	Slope Lgth.(ft.)	Thk.(ft.)	cy factor	cy	Cost ($/cy)	Both Sides		
8,798	41.2	0.5	27	6712.5	$9.00	2	**Total**	**$ 120,826**

Seeding (801-01)

Length (ft.)	Slope Lgth.(ft.)	sf	sf/unit	Both Sides	factor	units	Cost ($/unit)		
8,798	41.2	362478	1,000	2	1.25	453	$35.00	**Total**	**$ 31,717**

Signalization

2 Signals at Ramps	**Total**	**$ 250,000**

Fencing

Length (ft.)	707-02.01	Cost ($/ft)		
4541		$17.00	**Total**	**$ 77,197**

Guardrail

(Length (ft)	Cost ($/ft)	(# Anch.)	Cost ($/Anch.)		
3000	$17.50	10	$2,500.00		
	$52,500.00		**$25,000.00**	**Total**	**$77,500.00**

ITEM	COST			
Clear & Grubbing:	$52,505	=	$53,000	$53,000
Earthwork:	$1,227,852	=	$1,228,000	$1,281,000
Pavement Removal:	$42,882	=	$43,000	$1,324,000
Erosion Control:	$317,000	=	$317,000	$1,641,000
Drainage:	$41,531	=	$42,000	$1,683,000
Structures:	$5,217,720	=	$5,218,000	$6,901,000
Railroad:	$0	=	$0	$6,901,000
Paving:	$1,482,092	=	$1,482,000	$8,383,000
Retaining Walls:	$0	=	$0	$8,383,000
Maintenance of Traffic:	$250,000	=	$250,000	$8,633,000
Topsoil:	$162,465	=	$162,000	$8,795,000
Seeding:	$42,647	=	$43,000	$8,838,000
Sodding:	$25,000	=	$25,000	$8,863,000
Signing:	$200,000	=	$200,000	$9,063,000
Signalization:	$250,000	=	$250,000	$9,313,000
Fencing:	$80,410	=	$80,000	$9,393,000
Guardrail:	$77,500	=	$78,000	$9,471,000
Rip-Rap:	$25,000	=	$25,000	$9,496,000
Other Construction:	$425,188	=	$425,000	$9,921,000
Sub-Total:	$9,919,792	=	$9,920,000	**$9,921,000**
10% Eng. & Cont.:	$991,979	=	$992,000	$992,000
Sub-Total:	$10,911,772	=	$10,912,000	**$10,913,000**

Total Construction Cost :	Sub-Total	+	Mobil.		
	$10,913,000	+	$462,000	=	**$11,375,000**
			10% Prel. Eng.		
	$11,375,000	+	$992,000	=	**$12,367,000**
	Row Total	+	Utility Total	+	Constr. Total
	$322,000	+	$700,000	+	$12,367,000
TOTAL SECTION COST :					**$13,389,000**

Mobilization Table

$0 to $1,000,000	5%	$	-
$1,000,000 to $5,000,000	$50,000 + 4.5% over $1,000,000	$	-
$5,000,000 to $10,000,000	$230,000 + 4% over $5,000,000	$	-
$10,000,000 to $20,000,000	$430,000 + 3.5% over $10,000,000	$	462,000
$20,000,000 +	$780,000 + 3% over $20,000,000	$	-

Right of Way Cost

Parcel	Area (sf)	Acres	Cost ($/Acre)*1.2 factor	Improvements (1.2 factor)	Land Cost	Total	
	21,730	0.499	$ 13,000.00		$ 6,485.08		North of I-40
	1,469	0.034	$ 13,000.00		$ 438.41		North of I-40
	7,492	0.172	$ 13,000.00		$ 2,235.90		North of I-40
	195,390	4.486	$ 13,000.00		$ 58,311.98		North of I-40
	16,715	0.384	$ 13,000.00		$ 4,988.41		North of I-40
	481,901	11.063	$ 13,000.00		$ 143,818.02		Area south of Interstate 40
	172,292	3.955	$ 13,000.00		$ 51,418.64		Area south of Interstate 40
	99,586	2.286	$ 13,000.00		$ 29,720.34		Possible Wastewater Treatment Area
Sub-Total		22.878		$ -	$ 224,957.00	$ 298,000	
Cost of Bldgs.						$ -	
Contengenices							
Total Land & Improvement Costs					=	$ 298,000	
Incidentals	8	X	$ 3,000	Per Tract for Incide	=	$ 24,000	
Replacement Housin	x	X	$ 12,000	Per Unit	=	$ -	
Moving Expenses	x	X	$ 25,000	Per Unit	=	$ -	
TOTAL ROW COSTS					=	$ 322,000	

201-07.05 Removal and Disposal of Brush and Trees (Clear. and Grub.)

Length (ft.)	Width (ft.)(Avg.)	Area (sq.ft./ac.)	Acres	Cost ($/ac.)		Total	
640	200	128,000	2.938	$2,500		$ 7,346	Ramp NE Quad
0	0	0	0.000	$2,500		$ -	Ramp NW Quad
710	285	202,350	4.645	$2,500		$ 11,613	Ramp SE Quad
200	200	40,000	0.918	$2,500		$ 2,296	Ramp SW Quad
440	225	99,000	2.273	$2,500		$ 5,682	Conn. To SR 22 (North)
2475	180	445500	10.227	$2,500		$ 25,568	Conn. To SR 22 (South)
					Total	$ 52,505	

Maintenance of Traffic

Drums (Ea.)	Cost ($/drum)	Total		
Signs (s.f.)	Cost ($/s.f.)			
712-06				
712-02.02 Interconnected Portable Barrier Rail				
Lgth.(ft.)	Cost ($/ft.)			
712-07.03 Temporary Barricades				
Lgth.(ft.)	No.	Total Lgth.	Cost ($/ft)	
Total Maintenance of Traffic				$ 250,000

Signing

Signs (s.f.)	Cost ($/s.f.)	Total	713-13.03	
				$ 200,000

Utility Relocation Cost

	Lgth (ft)	No. of Poles	Cost ($/pole)	Cost ($/ft)	
6" Water	1500			$50.00	$75,000
12" Water				$80.00	$0
Utility Poles		25	$15,000.00		$375,000
6" Gas				$30.00	$0
Wastewater Treatment System					$250,000
				Total	$700,000.00

203-01 Road and Drain. Exc. (Uncl.)

Length (ft.)	Width (ft.)	Avg. Exc. Depth	Factor	C.Y.	Cost/cy		Total	
1750	65	10	27	42130	$3.50		**$147,453.70**	Ramp NE Quad
2205	65	10	27	53083	$3.50		**$185,791.67**	Ramp NW Quad
1985	65	10	27	47787	$3.50		**$167,254.63**	Ramp SE Quad
1690	65	10	27	40685	$3.50		**$142,398.15**	Ramp SW Quad
1250	125	10	27	57870	$3.50		**$202,546.30**	Conn. To SR 22 (North)
2950	100	10	27	109259	$3.50		**$382,407.41**	Conn. To SR 22 (South)
11,830						**Total**	**$1,227,851.85**	

202-03.01 Pavement Removal

Area (sf)	sf/sy	Cost ($/sy)		
102916	9	$3.75	**Total**	**$42,881.67**

Drainage

Bedding	Length (ft)	cy/ft	Cost ($/cy)	
204-07	700	0.266	$30.00	**$186.20**
Pipe	Length (ft)	Cost ($/ft)		
607-05.02	700	$40.00		**$28,000.00**
Headwall Steel	lbs/wall	# H'walls	Cost ($/lb)	
611-07.02	172	14	$1.30	**$3,130.40**
Headwall Conc.	cy/wall	# H'walls	Cost ($/cy)	
611-07.01	1.52	14	$480.00	**$10,214.40**
			Total	**$41,531.00**

New Structure

Length (ft.)	Width (ft.)	s.f.	Cost/s.f.		Total	
371	92	34132	$150.00		**$5,119,800.00**	
306	32	9792	$10.00		**$97,920.00**	Remove old bridge
				Total	**$5,217,720.00**	

Paving	Area (sq.ft.)	Avg. Width (ft.)	Depth (ft)	/	factor		Mass (lbs/cy)	Total cy or sy	lbs/Tons	Total Tons	Cost ($/ton or cy)	Total
Ramp Conc. Pvm't.												
501-01.02	135691		0.75	/	27			3769.19			$50.00	$ 188,460
Ramp Treated Base												
313-03	135691		0.330	/	9			4975.34			$10.00	$ 49,753
Ramp Base Stone												
303-01	135691		0.330	/	27		2.03			3366.64	$13.50	$ 45,450
P.C. and T.C.												
402-01	135691				9		0.35		231	22.84	$375.00	$ 8,566
402-02	135691				9		12		2000	90.46	$15.00	$ 1,357
Outside Shld'r.												
501-01.02	15990	6	0.75	/	27			444.17			$50.00	$ 22,208
313-03	15990	6	0.330	/	9			586.30			$10.00	$ 5,863
303-01	15990	6	0.25	/	27		2.03			300.55	$13.50	$ 4,057
303-01	15990	2	1.30	/	27		2.03			1562.87	$13.50	$ 21,099
303-01	15990	5.57			27		2.03			6696.32	$13.50	$ 90,400
Conn. To SR 222	Lgth/Area (sq.ft.)		Depth (ft)		factor					Tons		
411-02.10 (Surf.)	241031		0.104	27	3816	2000				1771	$60.00	$ 106,285
307-02.08 (B-M2)	241031		0.167	27	4068	2000				3032	$60.00	$ 181,940
307-02.01 (Gr. 'A')	241031		0.292	27	4140	2000				5396	$60.00	$ 323,753
303-01	241031		0.833	27	2.03					15096	$14.00	$ 211,338
Outside Shld'r.	8300	12	1.255	27	2.03					9398	$14.00	$ 131,572
	8300	4.85	1.115	27	2.03					3375	$14.00	$ 47,245
411-01.07 ('E' Shldr.)	8300	10	0.125	27	3708	2000				712	$60.00	$ 42,745
Access Rd. to Pilot												
411-02.10 (Surf.)	0		0.104	27	3816	2000				0	$60.00	$ -
307-02.08 (B-M2)	0		0.167	27	4068	2000				0	$60.00	$ -
307-02.01 (Gr. 'A')	0		0.292	27	4140	2000				0	$60.00	$ -
303-01	0		0.833	27	2.03					0	$14.00	$ -
Outside Shld'r.	0	12	1.255	27	2.03					0	$14.00	$ -
	0	4.85	1.115	27	2.03					0	$14.00	$ -
411-01.07 ('E' Shldr.)	0	10	0.125	27	3708	2000				0	$60.00	$ -
											Total	**$ 1,482,092**

Topsoil (203-07)

Based on 4:1 slope and 10' fill with 48' widening

Length (ft.)	Slope Lgth.(ft.)	Thk.(ft.)	cy factor	cy	Cost ($/cy)	Both Sides		
11,830	41.2	0.5	27	9025.9	$9.00	2	**Total**	**$ 162,465**

Seeding (801-01)

Length (ft.)	Slope Lgth.(ft.)	sf	sf/unit	Both Sides	factor	units	Cost ($/unit)		
11,830	41.2	487396	1,000	2	1.25	1218	$35.00	**Total**	**$ 42,647**

Signalization

2 Signals	**Total**	**$ 250,000**

Fencing

Length (ft.)	707-02.01	Cost ($/ft)		
4730		$17.00	**Total**	**$ 80,410**

Guardrail

(Length (ft)	Cost ($/ft)	(# Anch.)	Cost ($/Anch.)		
3000	$17.50	10	$2,500.00		
	$52,500.00		**$25,000.00**	**Total**	**$77,500.00**

Fayette County	New Interchange Cost Estimate Summary	Concept 4

ITEM	COST			
Clear & Grubbing:	$7,296	=	$7,000	$7,000
Earthwork:	$1,157,593	=	$1,158,000	$1,165,000
Pavement Removal:	$2,631	=	$3,000	$1,168,000
Erosion Control:	$334,000	=	$334,000	$1,502,000
Drainage:	$26,199	=	$26,000	$1,528,000
Structures:	$6,211,070	=	$6,211,000	$7,739,000
Railroad:	$0	=	$0	$7,739,000
Paving:	$1,272,243	=	$1,272,000	$9,011,000
Retaining Walls:	$0	=	$0	$9,011,000
Maintenance of Traffic:	$250,000	=	$250,000	$9,261,000
Topsoil:	$156,766	=	$157,000	$9,418,000
Seeding:	$41,151	=	$41,000	$9,459,000
Sodding:	$50,000	=	$50,000	$9,509,000
Signing:	$200,000	=	$200,000	$9,709,000
Signalization:	$250,000	=	$250,000	$9,959,000
Fencing:	$10,914	=	$11,000	$9,970,000
Guardrail:	$77,500	=	$78,000	$10,048,000
Rip-Rap:	$25,000	=	$25,000	$10,073,000
Other Construction:	$383,629	=	$384,000	$10,457,000
Sub-Total:	$10,455,992	=	$10,456,000	**$10,457,000**
10% Eng. & Cont.:	$1,045,599	=	$1,046,000	$1,046,000
Sub-Total:	$11,501,591	=	$11,502,000	**$11,503,000**

Total Construction Cost :	Sub-Total	+	Mobil.		
	$11,503,000	+	$483,000	=	**$11,986,000**
			10% Prel. Eng.		
	$11,986,000	+	$1,046,000	=	**$13,032,000**
	Row Total	+	Utility Total	+	Constr. Total
	$336,000	+	$450,000	+	$13,032,000
TOTAL SECTION COST :					**$13,818,000**

<u>Mobilization Table</u>

$0 to $1,000,000	5%	$	-
$1,000,000 to $5,000,000	$50,000 + 4.5% over $1,000,000	$	-
$5,000,000 to $10,000,000	$230,000 + 4% over $5,000,000	$	-
$10,000,000 to $20,000,000	$430,000 + 3.5% over $10,000,000	$	483,000
$20,000,000 +	$780,000 + 3% over $20,000,000	$	-

ESTIMATE BREAKDOWN AND QUANTITY SUMMARY

Right of Way Cost

Parcel	Area (sf)	Acres	Cost ($/Acre)*1.2 factor	Improvements (1.2 factor)	Land Cost	Total	
	47,472	1.090	$ 13,000.00		$ 14,167.49		North of I-40
	189,452	4.349	$ 13,000.00		$ 56,539.85		South of I-40
Sub-Total		5.439		$ -	$ 70,707.35	$ 71,000	
Cost of Bldgs.						$ -	
Contengenices					=	$ 250,000	Additional damages to Pilot and Deerfield
Total Land & Improvement Costs					=	$ 321,000	(Rounded)
Incidentals	5	X	$ 3,000	Per Tract for Incid	=	$ 15,000	
Replacement Housir	0	X	$ 12,000	Per Unit	=	$ -	
Moving Expenses	0	X	$ 25,000	Per Unit	=	$ -	
TOTAL ROW COSTS					=	$ 336,000	

201-07.05 Removal and Disposal of Brush and Trees (Clear. and Grub.)

Length (ft.)	Width (ft.)(Avg.)	Area (sq.ft./ac.)	Acres	Cost ($/ac.)				
0	75	0	0.000	$2,500		$ -	Ramp NE	
0	75	0	0.000	$2,500		$ -	Ramp NW	
0	75	0	0.000	$2,500		$ -	Ramp SW	
0	75	0	0.000	$2,500		$ -	Ramp SE	
575	75	43125	0.990	$2,500		$ 2,475	Conn. To SR 222	North of I-40
700	120	84000	1.928	$2,500		$ 4,821	Conn. To SR 222	South of I-40
					Total	$ 7,296		

ESTIMATE BREAKDOWN AND QUANTITY SUMMARY

Maintenance of Traffic

Drums (Ea.)	Cost ($/drum)	Total		
Signs (s.f.)	Cost ($/s.f.)			
712-06				
712-02.02 Interconnected Portable Barrier Rail				
Lgth.(ft.)	Cost ($/ft.)			
712-07.03 Temporary Barricades				
Lgth.(ft.)	No.	Total Lgth.	Cost ($/ft)	
Total Maintenance of Traffic				$ 250,000

Signing

Signs (s.f.)	Cost ($/s.f.)	Total	713-13.03	
				$ 200,000

Utility Relocation Cost

	Lgth (ft)	No. of Poles	Cost ($/pole)	Cost ($/ft)	
6" Water	1500			$50.00	$75,000
12" Water				$80.00	$0
Utility Poles		25	$15,000.00		$375,000
6" Gas				$30.00	$0
				Total	$450,000.00

203-01 Road and Drain. Exc. (Uncl.)

Length (ft.)	Width (ft.)	Avg. Exc. Depth	Factor	C.Y.	Cost/cy		Total	
1430	65	10	27	34426	$3.50		$120,490.74	Ramp NE
2130	65	10	27	51278	$3.50		$179,472.22	Ramp NW
1475	65	10	27	35509	$3.50		$124,282.41	Ramp SW
2065	65	10	27	49713	$3.50		$173,995.37	Ramp SE
4315	100	10	27	159815	$3.50		$559,351.85	Conn. To SR 222
11,415						**Total**	**$1,157,592.59**	

202-03.01 Pavement Removal

Area (sf)	sf/sy	Cost ($/sy)		
6314	9	$3.75	**Total**	**$2,630.83**

Drainage

Bedding 204-07		Length (ft) 300	cy/ft 0.266		Cost ($/cy) $30.00	**$79.80**
Pipe 607-05.02		Length (ft) 300	Cost ($/ft) $40.00			**$12,000.00**
Headwall Steel 611-07.02		lbs/wall 172	# H'walls 6		Cost ($/lb) $1.30	**$1,341.60**
Headwall Conc. 611-07.01		cy/wall 1.52	# H'walls 6		Cost ($/cy) $480.00	**$4,377.60**
Catchbasins	4			$2,100.00		**$8,400.00**
					Total	**$26,199.00**

Note: Based on 24" concrete pipe @ 100' per pipe (3 pipes)

New Structure

Length (ft.)	Width (ft.)	s.f.	Cost/s.f.		Total	
306	106	32436	$187.50		$6,081,750.00	**25% Increase in cost due to being built under traffic**
306	32	9792	$10.00		$97,920.00	**Remove existing bridge**
785			$40.00		$31,400.00	**Barrier Wall**
				Total	**$6,211,070.00**	

Paving	Area (sq.ft.)	Avg. Width (ft.)	Depth (ft)	/	factor		Mass (lbs/cy)	Total cy or sy	lbs/Tons	Total Tons	Cost ($/ton or cy)	Total
Ramp Conc. Pvm't.												
501-01.02	89372		0.75	/	27			2482.56			$50.00	$ 124,128
Ramp Treated Base												
313-03	89372		0.330	/	9			3276.97			$10.00	$ 32,770
Ramp Base Stone												
303-01	89372		0.330	/	27		2.03			2217.42	$13.50	$ 29,935
P.C. and T.C.												
402-01	89372				9		0.35		231	15.05	$375.00	$ 5,642
402-02	89372				9		12		2000	59.58	$15.00	$ 894
Outside Shld'r.												
501-01.02	14200	5	0.75	/	27			394.44			$50.00	$ 19,722
313-03	14200	5	0.330	/	9			520.67			$10.00	$ 5,207
303-01	14200	5	0.25	/	27		2.03			266.91	$13.50	$ 3,603
303-01	14200	2	1.30	/	27		2.03			1387.92	$13.50	$ 18,737
303-01	14200	5.57			27		2.03			5946.70	$13.50	$ 80,280
Conn. To SR 222	Lgth/Area (sq.ft.)		Depth (ft)		factor					Tons		
411-02.10 (Surf.)	211064		0.104	27	3816	2000				1551	$60.00	$ 93,071
307-02.08 (B-M2)	211064		0.167	27	4068	2000				2655	$60.00	$ 159,320
307-02.01 (Gr. 'A')	211064		0.292	27	4140	2000				4725	$60.00	$ 283,501
303-01	211064		0.833	27	2.03					13219	$14.00	$ 185,063
Outside Shld'r.	8630	12	1.255	27	2.03					9772	$14.00	$ 136,803
	8630	4.85	1.115	27	2.03					3509	$14.00	$ 49,123
411-01.07 ('E' Shldr.)	8630	10	0.125	27	3708	2000				741	$60.00	$ 44,445

Total **$ 1,272,243**

Topsoil (203-07)

Based on 4:1 slope and 10' fill with 48' widening

Length (ft.)	Slope Lgth.(ft.)	Thk.(ft.)	cy factor	cy	Cost ($/cy)	Both Sides		
11,415	41.2	0.5	27	8709.2	$9.00	2	**Total**	**$ 156,766**

Seeding (801-01)

Length (ft.)	Slope Lgth.(ft.)	sf	sf/unit	Both Sides	factor	units	Cost ($/unit)		
11,415	41.2	470298	1,000	2	1.25	1176	$35.00	**Total**	**$ 41,151**

Signalization

2 Signals at Ramps	**Total**	**$ 250,000**

Fencing

Length (ft.)	707-02.01	Cost ($/ft)		
642		$17.00	**Total**	**$ 10,914**

Guardrail

(Length (ft)	Cost ($/ft)	(# Anch.)	Cost ($/Anch.)		
3000	$17.50	10	$2,500.00		
	$52,500.00		**$25,000.00**	**Total**	**$77,500.00**

Fayette County

New Interchange
Cost Estimate Summary

Concept 5

ITEM	**COST**			
Clear & Grubbing:	$2,705	=	$3,000	$3,000
Earthwork:	$514,267	=	$514,000	$517,000
Pavement Removal:	$8,966	=	$9,000	$526,000
Erosion Control:	$318,000	=	$318,000	$844,000
Drainage:	$41,898	=	$42,000	$886,000
Structures:	$7,022,295	=	$7,022,000	$7,908,000
Railroad:	$0	=	$0	$7,908,000
Paving:	$801,602	=	$802,000	$8,710,000
Retaining Walls:	$0	=	$0	$8,710,000
Maintenance of Traffic:	$250,000	=	$250,000	$8,960,000
Topsoil:	$90,475	=	$90,000	$9,050,000
Seeding:	$23,750	=	$24,000	$9,074,000
Sodding:	$50,000	=	$50,000	$9,124,000
Signing:	$200,000	=	$200,000	$9,324,000
Signalization:	$250,000	=	$250,000	$9,574,000
Fencing:	$13,600	=	$14,000	$9,588,000
Guardrail:	$77,500	=	$78,000	$9,666,000
Rip-Rap:	$25,000	=	$25,000	$9,691,000
Other Construction:	$264,276	=	$264,000	$9,955,000
Sub-Total:	$9,954,334	=	$9,954,000	**$9,955,000**
10% Eng. & Cont.:	$995,433	=	$996,000	$996,000
Sub-Total:	$10,949,767	=	$10,950,000	**$10,951,000**

Total Construction Cost :	Sub-Total	+	Mobil.		
	$10,951,000	+	$463,000	=	**$11,414,000**
			10% Prel. Eng.		
	$11,414,000	+	$996,000	=	**$12,410,000**
	Row Total	+	Utility Total	+	Constr. Total
	$294,000	+	$450,000	+	$12,410,000
TOTAL SECTION COST :					**$13,154,000**

<u>Mobilization Table</u>

$0 to $1,000,000	5%	$	-
$1,000,000 to $5,000,000	$50,000 + 4.5% over $1,000,000	$	-
$5,000,000 to $10,000,000	$230,000 + 4% over $5,000,000	$	-
$10,000,000 to $20,000,000	$430,000 + 3.5% over $10,000,000	$	463,000
$20,000,000 +	$780,000 + 3% over $20,000,000	$	-

Right of Way Cost

Parcel	Area (sf)	Acres	Cost ($/Acre)*1.2 factor	Improvements (1.2 factor)		Land Cost	Total	
	47,472	1.090	$ 13,000.00			$ 14,167.49		North of I-40
	48,872	1.122	$ 13,000.00			$ 14,585.31		South of I-40
Sub-Total		2.212		$ -		$ 28,752.80	$ 29,000	
Cost of Bldgs.							$ -	
Contengenices						=	$ 250,000	Additional damages to Pilot and Deerfield
Total Land & Improvement Costs						=	$ 279,000	(Rounded)
Incidentals	5	X	$ 3,000	Per Tract for Incid		=	$ 15,000	
Replacement Housir	0	X	$ 12,000	Per Unit		=	$ -	
Moving Expenses	0	X	$ 25,000	Per Unit		=	$ -	
TOTAL ROW COSTS						=	$ 294,000	

201-07.05 Removal and Disposal of Brush and Trees (Clear. and Grub.)

Length (ft.)	Width (ft.)(Avg.)	Area (sq.ft./ac.)	Acres	Cost ($/ac.)			
0	75	0	0.000	$2,500	$ -	Ramp NE	
0	75	0	0.000	$2,500	$ -	Ramp NW	
0	75	0	0.000	$2,500	$ -	Ramp SW	
0	75	0	0.000	$2,500	$ -	Ramp SE	
575	75	43125	0.990	$2,500	$ 2,475	Conn. To SR 222	North of I-40
200	20	4000	0.092	$2,500	$ 230	Conn. To SR 222	South of I-40
				Total	$ 2,705		

Maintenance of Traffic

Drums (Ea.)	Cost ($/drum)	Total		
Signs (s.f.)	Cost ($/s.f.)			
712-06				
712-02.02 Interconnected Portable Barrier Rail				
Lgth.(ft.)	Cost ($/ft.)			
712-07.03 Temporary Barricades				
Lgth.(ft.)	No.	Total Lgth.	Cost ($/ft)	
Total Maintenance of Traffic				**$ 250,000**

Signing

Signs (s.f.)	Cost ($/s.f.)	Total	713-13.03	
				$ 200,000

Utility Relocation Cost

	Lgth (ft)	No. of Poles	Cost ($/pole)	Cost ($/ft)	
6" Water	1500			$50.00	**$75,000**
12" Water				$80.00	**$0**
Utility Poles		25	$15,000.00		**$375,000**
6" Gas				$30.00	**$0**
				Total	**$450,000.00**

203-01 Road and Drain. Exc. (Uncl.)

Length (ft.)	Width (ft.)	Avg. Exc. Depth	Factor	C.Y.	Cost/cy		Total	
633	65	10	27	15239	$3.50		**$53,336.11**	Ramp NE
340	65	10	27	8185	$3.50		**$28,648.15**	Ramp NW
1540	65	10	27	37074	$3.50		**$129,759.26**	Ramp SW
1975	65	10	27	47546	$3.50		**$166,412.04**	Ramp SE
2100	50	10	27	38889	$3.50		**$136,111.11**	Conn. To SR 222
6,588						**Total**	**$514,266.67**	

202-03.01 Pavement Removal

Area (sf)	sf/sy	Cost ($/sy)		
21519	9	$3.75	**Total**	**$8,966.25**

Drainage

Bedding		Length (ft)	cy/ft		Cost ($/cy)		
204-07		600	0.266		$30.00	**$159.60**	
Pipe		Length (ft)	Cost ($/ft)				
607-05.02		600	$40.00			**$24,000.00**	Note: Based on 24" concrete pipe @ 100' per pipe (6 pipes)
Headwall Steel		lbs/wall	# H'walls		Cost ($/lb)		
611-07.02		172	12		$1.30	**$2,683.20**	
Headwall Conc.		cy/wall	# H'walls		Cost ($/cy)		
611-07.01		1.52	12		$480.00	**$8,755.20**	
Catchbasins	3			$2,100.00		**$6,300.00**	
					Total	**$41,898.00**	

New Structure

Length (ft.)	Width (ft.)	s.f.	Height (ft.)	Cost/s.f.		Total	
306	84	25704		$187.50		**$6,024,375.00**	**25% Increase in cost due to being built under traffic**
306	32	9792		$10.00		**$97,920.00**	**Remove existing bridge**
900		9000	10	$100.00		**$900,000.00**	**Retaining Wall along I-40**
					Total	**$7,022,295.00**	

Paving												
	Area (sq.ft.)	Avg. Width (ft.)	Depth (ft)	/	factor		Mass (lbs/cy)	Total cy or sy	lbs/Tons	Total Tons	Cost ($/ton or cy)	Total
Ramp Conc. Pvm't.												
501-01.02	60639		0.75	/	27			1684.42			$50.00	$ 84,221
Ramp Treated Base												
313-03	60639		0.330	/	9			2223.43			$10.00	$ 22,234
Ramp Base Stone												
303-01	60639		0.330	/	27		2.03			1504.52	$13.50	$ 20,311
P.C. and T.C.												
402-01	60639				9		0.35		231	10.21	$375.00	$ 3,828
402-02	60639				9		12		2000	40.43	$15.00	$ 606
Outside Shld'r.												
501-01.02	8976	5	0.75	/	27			249.33			$50.00	$ 12,467
313-03	8976	5	0.330	/	9			329.12			$10.00	$ 3,291
303-01	8976	5	0.25	/	27		2.03			168.72	$13.50	$ 2,278
303-01	8976	2	1.30	/	27		2.03			877.32	$13.50	$ 11,844
303-01	8976	5.57			27		2.03			3758.98	$13.50	$ 50,746
Conn. To SR 222	Lgth/Area (sq.ft.)		Depth (ft)		factor					Tons		
411-02.10 (Surf.)	139838		0.104	27	3816	2000				1028	$60.00	$ 61,663
307-02.08 (B-M2)	139838		0.167	27	4068	2000				1759	$60.00	$ 105,555
307-02.01 (Gr. 'A')	139838		0.292	27	4140	2000				3131	$60.00	$ 187,830
303-01	139838		0.833	27	2.03					8758	$14.00	$ 122,611
Outside Shld'r.	4200	12	1.255	27	2.03					4756	$14.00	$ 66,579
	4200	4.85	1.115	27	2.03					1708	$14.00	$ 23,907
411-01.07 ('E' Shldr.)	4200	10	0.125	27	3708	2000				361	$60.00	$ 21,630
											Total	**$ 801,602**

Topsoil (203-07)

Based on 4:1 slope and 10' fill with 48' widening

Length (ft.)	Slope Lgth.(ft.)	Thk.(ft.)	cy factor	cy	Cost ($/cy)	Both Sides		
6,588	41.2	0.5	27	5026.4	$9.00	2	**Total**	**$ 90,475**

Seeding (801-01)

Length (ft.)	Slope Lgth.(ft.)	sf	sf/unit	Both Sides	factor	units	Cost ($/unit)		
6,588	41.2	271426	1,000	2	1.25	339	$35.00	**Total**	**$ 23,750**

Signalization

2 Signals at Ramps	**Total**	**$ 250,000**

Fencing

Length (ft.)	707-02.01	Cost ($/ft)		
800		$17.00	**Total**	**$ 13,600**

Guardrail

(Length (ft)	Cost ($/ft)	(# Anch.)	Cost ($/Anch.)		
3000	$17.50	10	$2,500.00		
	$52,500.00		**$25,000.00**	**Total**	**$77,500.00**

Fayette County **New Interchange** **Concept 6**

Cost Estimate Summary

ITEM	COST			
Clear & Grubbing:	$73,020	=	$73,000	$73,000
Earthwork:	$1,290,981	=	$1,291,000	$1,364,000
Pavement Removal:	$30,685	=	$31,000	$1,395,000
Erosion Control:	$292,000	=	$292,000	$1,687,000
Drainage:	$47,464	=	$47,000	$1,734,000
Structures:	$4,533,120	=	$4,533,000	$6,267,000
Railroad:	$0	=	$0	$6,267,000
Paving:	$1,340,291	=	$1,340,000	$7,607,000
Retaining Walls:	$0	=	$0	$7,607,000
Maintenance of Traffic:	$250,000	=	$250,000	$7,857,000
Topsoil:	$168,783	=	$169,000	$8,026,000
Seeding:	$44,305	=	$44,000	$8,070,000
Sodding:	$25,000	=	$25,000	$8,095,000
Signing:	$200,000	=	$200,000	$8,295,000
Signalization:	$250,000	=	$250,000	$8,545,000
Fencing:	$68,510	=	$69,000	$8,614,000
Guardrail:	$51,250	=	$51,000	$8,665,000
Rip-Rap:	$25,000	=	$25,000	$8,690,000
Other Construction:	$413,229	=	$413,000	$9,103,000
Sub-Total:	$9,103,639	=	$9,104,000	**$9,103,000**
10% Eng. & Cont.:	$910,364	=	$910,000	$910,000
Sub-Total:	$10,014,003	=	$10,014,000	**$10,013,000**

Total Construction Cost :	Sub-Total	+	Mobil.		
	$10,013,000	+	$430,000	=	**$10,443,000**
			10% Prel. Eng.		
	$10,443,000	+	$910,000	=	**$11,353,000**
	Row Total	+	Utility Total	+	Constr. Total
	$381,000	+	$150,000	+	$11,353,000
TOTAL SECTION COST :					**$11,884,000**

Mobilization Table

$0 to $1,000,000	5%	$	-
$1,000,000 to $5,000,000	$50,000 + 4.5% over $1,000,000	$	-
$5,000,000 to $10,000,000	$230,000 + 4% over $5,000,000	$	-
$10,000,000 to $20,000,000	$430,000 + 3.5% over $10,000,000	$	430,000
$20,000,000 +	$780,000 + 3% over $20,000,000	$	-

Right of Way Cost

Parcel	Area (sf)	Acres	Cost ($/Acre)*1.2 factor	Improvements (1.2 factor)	Land Cost	Total	
	485,923	11.155	$ 13,000.00		$ 145,018.34		North of I-40
	719,620	16.520	$ 13,000.00		$ 214,762.63		South of I-40
Sub-Total		27.675		$ -	$ 359,780.97	$ 360,000	
Cost of Bldgs.						$ -	
Contengenices							
Total Land & Improvement Costs					=	$ 360,000	(Rounded)
Incidentals	7	X	$ 3,000	Per Tract for Incid	=	$ 21,000	
Replacement Housir	0	X	$ 12,000	Per Unit	=	$ -	
Moving Expenses	0	X	$ 25,000	Per Unit	=	$ -	
TOTAL ROW COSTS					=	$ 381,000	

201-07.05 Removal and Disposal of Brush and Trees (Clear. and Grub.)

Length (ft.)	Width (ft.)(Avg.)	Area (sq.ft./ac.)	Acres	Cost ($/ac.)			
530	200	106,000	2.433	$2,500		$ 6,084	Ramp NE Quad
565	170	96,050	2.205	$2,500		$ 5,513	Ramp NW Quad
725	310	224,750	5.160	$2,500		$ 12,899	Ramp SW Quad
790	250	197,500	4.534	$2,500		$ 11,335	Ramp SE Quad
4800	135	648000	14.876	$2,500		$ 37,190	Conn. To SR 222
					Total	$ 73,020	

Maintenance of Traffic

Drums (Ea.)	Cost ($/drum)	Total		
Signs (s.f.)	Cost ($/s.f.)			
712-06				
712-02.02 Interconnected Portable Barrier Rail				
Lgth.(ft.)	Cost ($/ft.)			
712-07.03 Temporary Barricades				
Lgth.(ft.)	No.	Total Lgth.	Cost ($/ft)	
Total Maintenance of Traffic				$ 250,000

Signing

Signs (s.f.)	Cost ($/s.f.)	Total	713-13.03	
				$ 200,000

Utility Relocation Cost

	Lgth (ft)	No. of Poles	Cost ($/pole)	Cost ($/ft)	
6" Water	0			$50.00	$0
12" Water				$80.00	$0
Utility Poles		10	$15,000.00		$150,000
6" Gas				$30.00	$0
				Total	$150,000.00

203-01 Road and Drain. Exc. (Uncl.)

Length (ft.)	Width (ft.)	Avg. Exc. Depth	Factor	C.Y.	Cost/cy		Total	
1560	65	10	27	37556	$3.50		$131,444.44	Ramp NE Quad
1430	65	10	27	34426	$3.50		$120,490.74	Ramp NW Quad
1350	65	10	27	32500	$3.50		$113,750.00	Ramp SW Quad
2320	65	10	27	55852	$3.50		$195,481.48	Ramp SE Quad
5630	100	10	27	208519	$3.50		$729,814.81	Conn. To SR 222
12,290						**Total**	**$1,290,981.48**	

202-03.01 Pavement Removal

Area (sf)	sf/sy	Cost ($/sy)		
73645	9	$3.75	**Total**	**$30,685.42**

Drainage

Bedding	Length (ft)	cy/ft	Cost ($/cy)		
204-07	800	0.266	$30.00	**$212.80**	
Pipe	Length (ft)	Cost ($/ft)			
607-05.02	800	$40.00		**$32,000.00**	Note: Based on 24" concrete pipe @ 100' per pipe (8 pipes)
Headwall Steel	lbs/wall	# H'walls	Cost ($/lb)		
611-07.02	172	16	$1.30	**$3,577.60**	
Headwall Conc.	cy/wall	# H'walls	Cost ($/cy)		
611-07.01	1.52	16	$480.00	**$11,673.60**	
			Total	**$47,464.00**	

New Structure

Length (ft.)	Width (ft.)	s.f.	Cost/l.f.	Cost/s.f.		Total	
336	88	29568		$150.00		$4,435,200.00	I-40 Bridge
306	32	9792		$10.00		$97,920.00	Remove Exist. Bridge
					Total	**$4,533,120.00**	

Paving

	Area (sq.ft.)	Avg. Width (ft.)	Depth (ft)	/	factor		Mass (lbs/cy)	Total cy or sy	lbs/Tons	Total Tons	Cost ($/ton or cy)	Total
Ramp Conc. Pvm't.												
501-01.02	90424		0.75	/	27			2511.78			$50.00	$ 125,589
Ramp Treated Base												
313-03	90424		0.330	/	9			3315.55			$10.00	$ 33,155
Ramp Base Stone												
303-01	90424		0.330	/	27		2.03			2243.52	$13.50	$ 30,288
P.C. and T.C.												
402-01	90424				9		0.35		231	15.22	$375.00	$ 5,709
402-02	90424				9		12		2000	60.28	$15.00	$ 904
Outside Shld'r.												
501-01.02	13320	5	0.75	/	27			370.00			$50.00	$ 18,500
313-03	13320	5	0.330	/	9			488.40			$10.00	$ 4,884
303-01	13320	5	0.25	/	27		2.03			250.37	$13.50	$ 3,380
303-01	13320	2	1.30	/	27		2.03			1301.91	$13.50	$ 17,576
303-01	13320	5.57			27		2.03			5578.17	$13.50	$ 75,305
Conn. To SR 222	Lgth/Area (sq.ft.)		Depth (ft)		factor					Tons		
411-02.10 (Surf.)	212080		0.104	27	3816	2000				1559	$60.00	$ 93,519
307-02.08 (B-M2)	212080		0.167	27	4068	2000				2668	$60.00	$ 160,086
307-02.01 (Gr. 'A')	212080		0.292	27	4140	2000				4748	$60.00	$ 284,866
303-01	212080		0.833	27	2.03					13282	$14.00	$ 185,954
Outside Shld'r.	11260	12	1.255	27	2.03					12750	$14.00	$ 178,494
	11260	4.85	1.115	27	2.03					4578	$14.00	$ 64,094
411-01.07 ('E' Shldr.)	11260	10	0.125	27	3708	2000				966	$60.00	$ 57,989

Total $ 1,340,291

Topsoil (203-07)

Based on 4:1 slope and 10' fill with 48' widening

Length (ft.)	Slope Lgth.(ft.)	Thk.(ft.)	cy factor	cy	Cost ($/cy)	Both Sides		
12,290	41.2	0.5	27	9376.8	$9.00	2	**Total**	**$ 168,783**

Seeding (801-01)

Length (ft.)	Slope Lgth.(ft.)	sf	sf/unit	Both Sides	factor	units	Cost ($/unit)		
12,290	41.2	506348	1,000	2	1.25	1266	$35.00	**Total**	**$ 44,305**

Signalization

2 Signals at Ramps	**Total**	**$ 250,000**

Fencing

Length (ft.)	707-02.01	Cost ($/ft)		
4030		$17.00	**Total**	**$ 68,510**

Guardrail

(Length (ft)	Cost ($/ft)	(# Anch.)	Cost ($/Anch.)		
1500	$17.50	10	$2,500.00		
	$26,250.00		**$25,000.00**	**Total**	**$51,250.00**

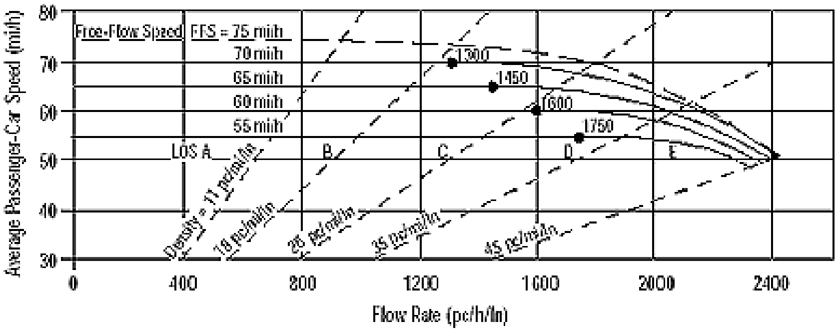
APPENDIX D

HIGHWAY CAPACITY ANALYSIS OUTPUT FILES

Freeway Mainline Segments

Highway Capacity Software Computer Printouts

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Eastbound*
From/To	*West of Exit 35*
Jurisdiction	*Fayette County*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2280*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1425*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*22.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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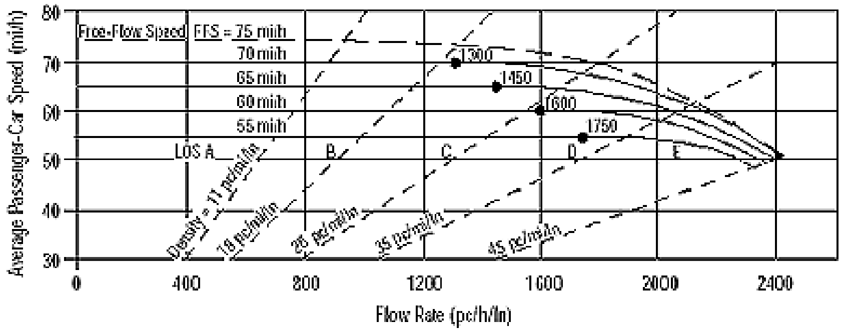
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Eastbound*
From/To	*Exit 35 to Exit 42*
Jurisdiction	*Fayette County*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2297*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1436*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*22.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
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 - Exhibits23-8, 23-10
E_T - Exhibits 23-8, 23-10, 23-11
f_p - Page 23-12
LOS, S, FFS, v_p - Exhibits 23-2, 23-3
f_{LW} - Exhibit 23-4
f_{LC} - Exhibit 23-5
f_N - Exhibit 23-6
f_{ID} - Exhibit 23-7

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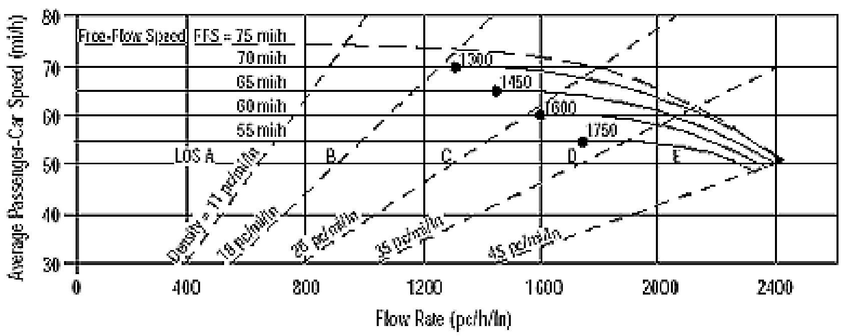
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Eastbound*
From/To	*Exit 42 to Exit 47*
Jurisdiction	*Fayette and Haywood Counties*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1814*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1134*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*17.5*	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
S		mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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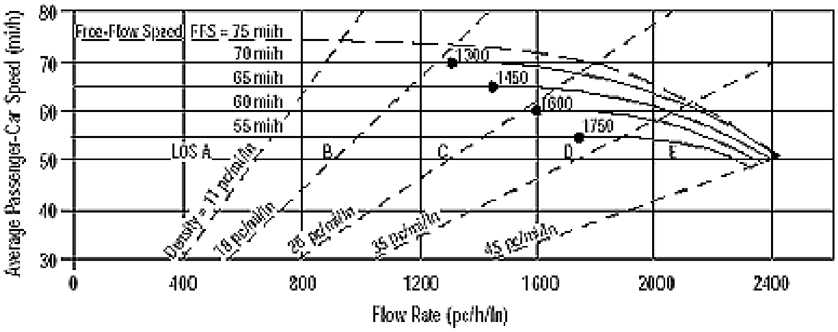
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Eastbound*
From/To	*East of Exit 47*
Jurisdiction	*Haywood County*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1741*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1088*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*16.8*	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
S		mi/h
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 - Exhibits23-8, 23-10
f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11
f_{LC} - Exhibit 23-5
f_p - Page 23-12
f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3
f_{ID} - Exhibit 23-7

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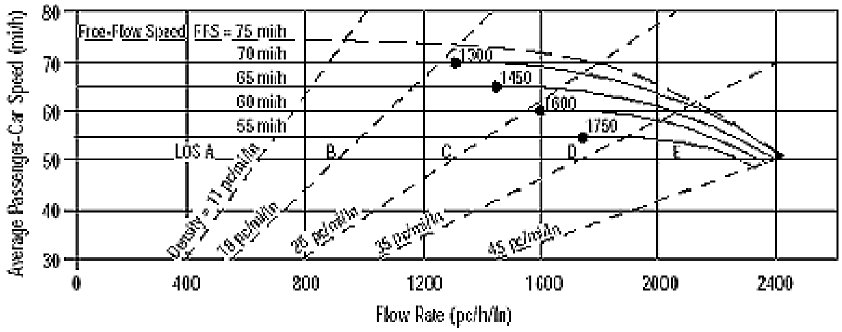
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Eastbound*
Agency or Company	*TDOT/TranSystems*	From/To	*West of Exit 35*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2047*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1279*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.7*	mi/h	S	mi/h
D = v_p / S	*19.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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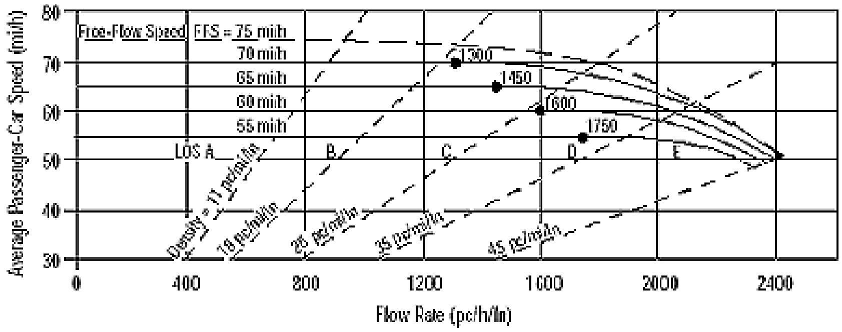
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information / Site Information

General Information		Site Information	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Eastbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 35 to Exit 42*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1964*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs / Calc Speed Adj and FFS

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

LOS and Performance Measures / Design (N)

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)	*1228*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.7*	mi/h	S	mi/h
D = v_p / S	*19.0*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary / Factor Location

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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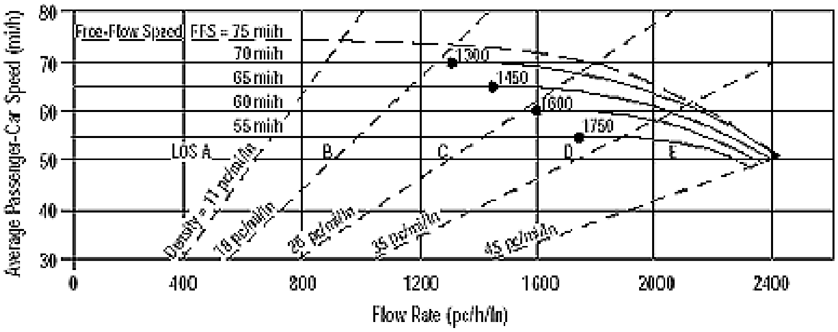
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Eastbound*
From/To	*Exit 42 to Exit 47*
Jurisdiction	*Fayette and Haywood Counties*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1934*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1209*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*18.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
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 - Exhibits23-8, 23-10
E_T - Exhibits 23-8, 23-10, 23-11
f_p - Page 23-12
LOS, S, FFS, v_p - Exhibits 23-2, 23-3
f_{LW} - Exhibit 23-4
f_{LC} - Exhibit 23-5
f_N - Exhibit 23-6
f_{ID} - Exhibit 23-7

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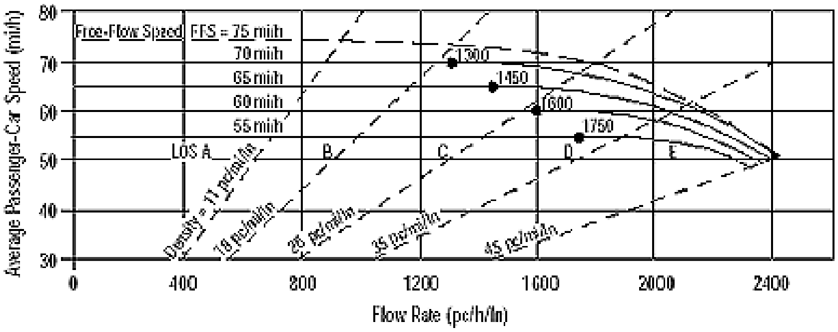
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Eastbound*
From/To	*East of Exit 47*
Jurisdiction	*Haywood County*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1804*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1128*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*17.4*	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
S		mi/h
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 - Exhibits23-8, 23-10
E_T - Exhibits 23-8, 23-10, 23-11
f_p - Page 23-12
LOS, S, FFS, v_p - Exhibits 23-2, 23-3
f_{LW} - Exhibit 23-4
f_{LC} - Exhibit 23-5
f_N - Exhibit 23-6
f_{ID} - Exhibit 23-7

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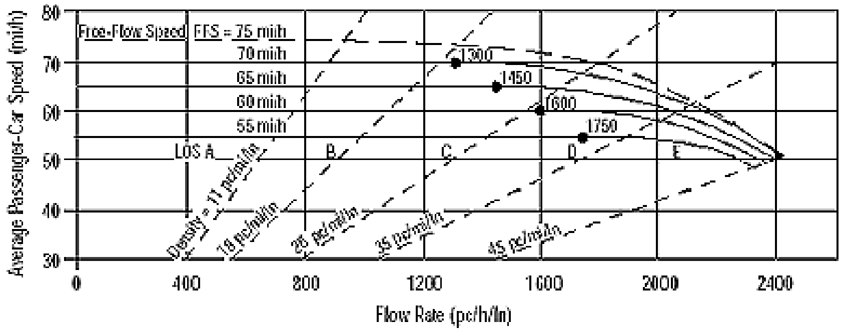
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Westbound*
From/To	*East of Exit 47*
Jurisdiction	*Haywood County*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1655*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1034*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*16.0*	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
S	mi/h
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 - Exhibits23-8, 23-10
f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11
f_{LC} - Exhibit 23-5
f_p - Page 23-12
f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3
f_{ID} - Exhibit 23-7

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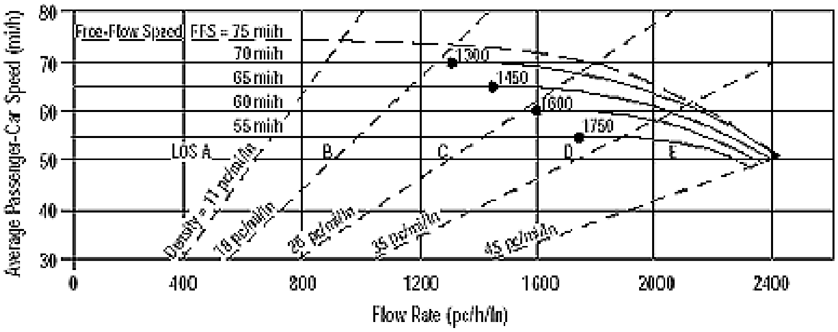
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 42 to Exit 47*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette and Haywood Counties*
Analysis Time Period	*AM Peak Period*	Analysis Year	*2014*

Project Description   Existing Conditions

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

Flow Inputs

Volume, V	*1815*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1134*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.7*	mi/h	S	mi/h
D = v_p / S	*17.5*	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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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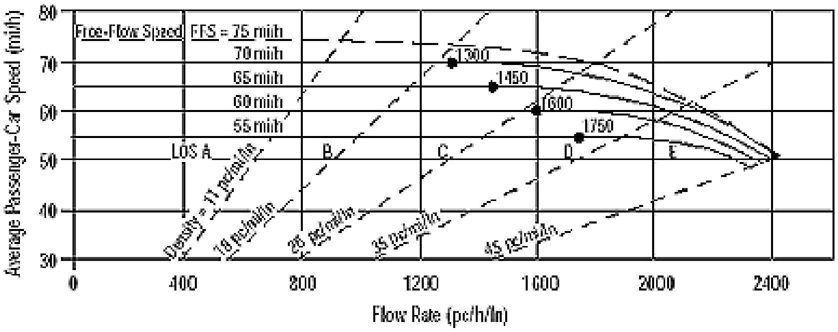
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information / Site Information

Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 35 to Exit 42*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Period*	Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1828*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1143*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*17.7*	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
S		mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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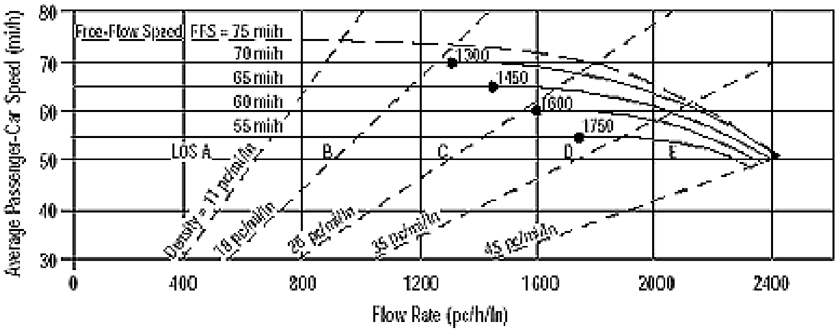
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Westbound*
From/To	*West of Exit 35*
Jurisdiction	*Fayette County*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1976*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1235*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*19.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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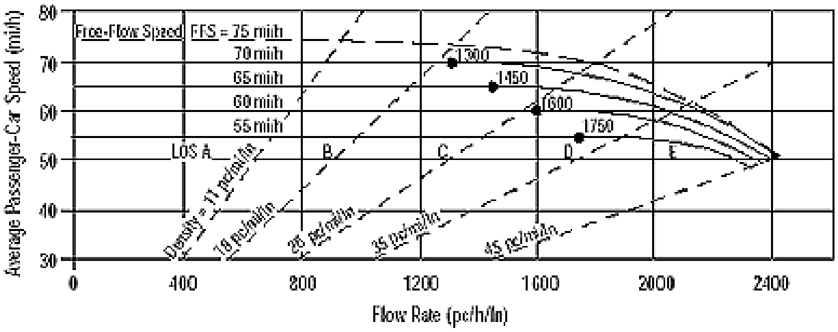
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information / Site Information

Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*East of Exit 47*
Date Performed	*04/18/2011*	Jurisdiction	*Haywood County*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1848*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs / Calc Speed Adj and FFS

Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1155*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*17.8*	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
S		mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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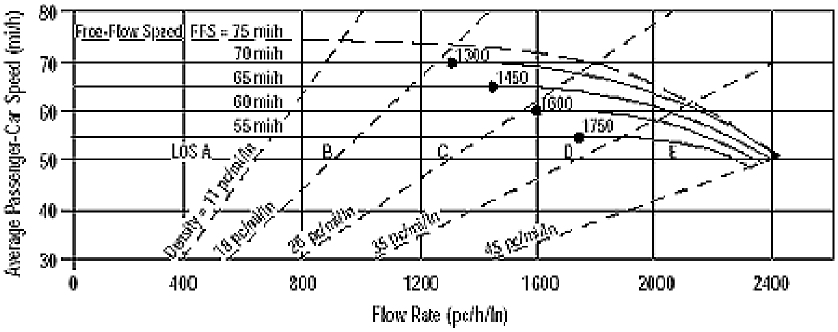
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 42 to Exit 47*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette and Haywood Counties*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*1911*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1194*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.7*	mi/h	S	mi/h
D = v_p / S	*18.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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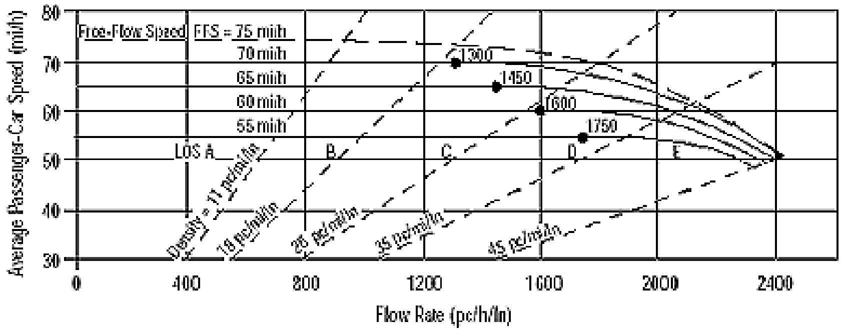
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Westbound*
From/To	*Exit 35 to Exit 42*
Jurisdiction	*Fayette County*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2311*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1444*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*22.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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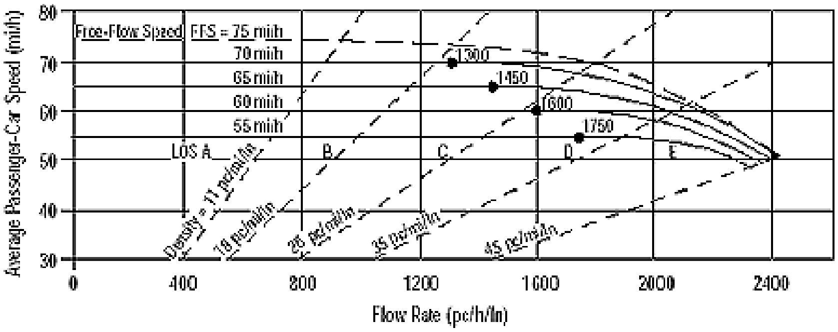
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Westbound*
From/To	*West of Exit 35*
Jurisdiction	*Fayette County*
Analysis Year	*2014*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2306*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1441*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*22.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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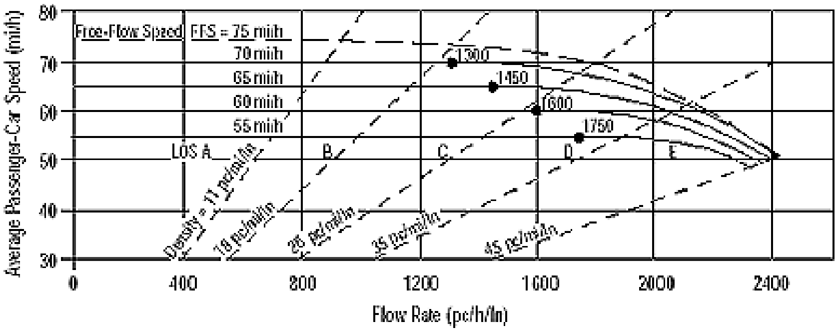
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Eastbound*
Agency or Company	*TDOT/TranSystems*	From/To	*West of Exit 35*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*3112*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1945*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*62.1*	mi/h	S	mi/h
D = v_p / S	*31.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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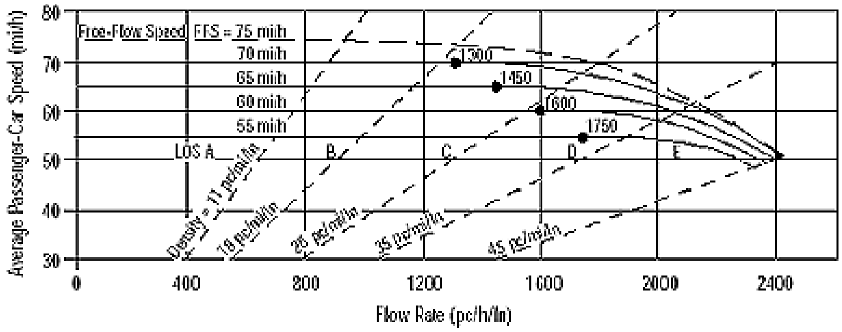
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Eastbound*
From/To	*Exit 35 to Exit 42*
Jurisdiction	*Fayette County*
Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*3075*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1922*	pc/h/ln
S	*62.4*	mi/h
D = v_p / S	*30.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
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 - Exhibits23-8, 23-10
E_T - Exhibits 23-8, 23-10, 23-11
f_p - Page 23-12
LOS, S, FFS, v_p - Exhibits 23-2, 23-3
f_{LW} - Exhibit 23-4
f_{LC} - Exhibit 23-5
f_N - Exhibit 23-6
f_{ID} - Exhibit 23-7

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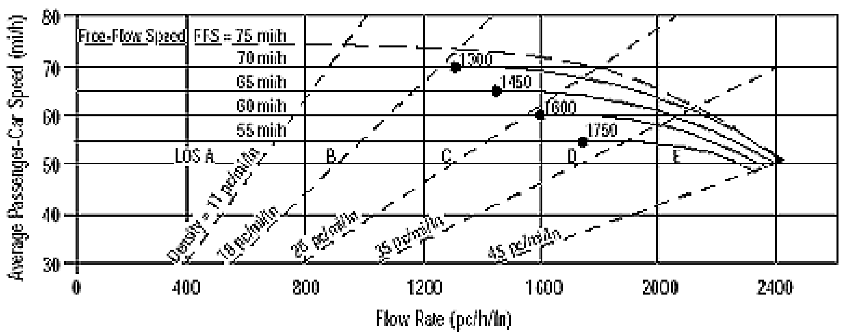
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Eastbound*
From/To	*Exit 42 to Exit 47*
Jurisdiction	*Fayette and Haywood Counties*
Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2596*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1623*	pc/h/ln
S	*64.6*	mi/h
D = v_p / S	*25.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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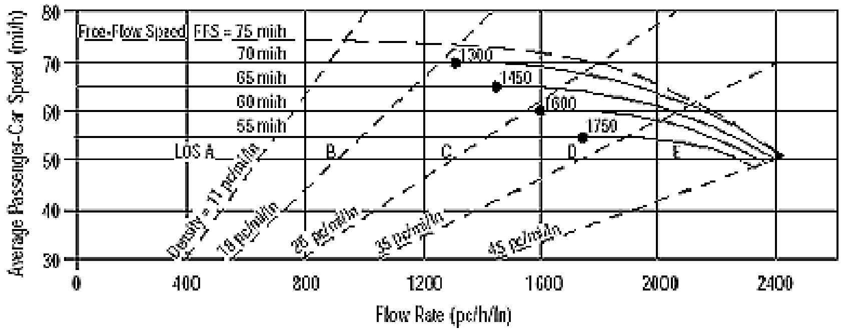
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*		
Agency or Company	*TDOT/TranSystems*		
Date Performed	*04/18/2011*		
Analysis Time Period	*AM Peak Period*		

Site Information

Highway/Direction of Travel	*I-40 Eastbound*
From/To	*East of Exit 47*
Jurisdiction	*Haywood County*
Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2515*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1572*	pc/h/ln
S	*64.7*	mi/h
D = v_p / S	*24.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
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 - Exhibits23-8, 23-10
f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11
f_{LC} - Exhibit 23-5
f_p - Page 23-12
f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3
f_{ID} - Exhibit 23-7

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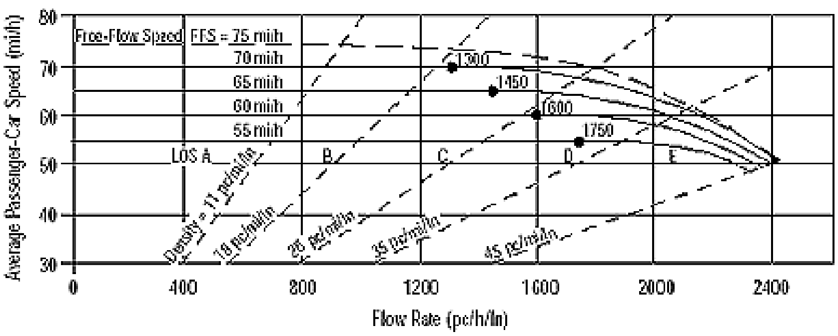

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Eastbound*
Agency or Company	*TDOT/TranSystems*	From/To	*West of Exit 35*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2958*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1849*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*63.2*	mi/h	S	mi/h
D = v_p / S	*29.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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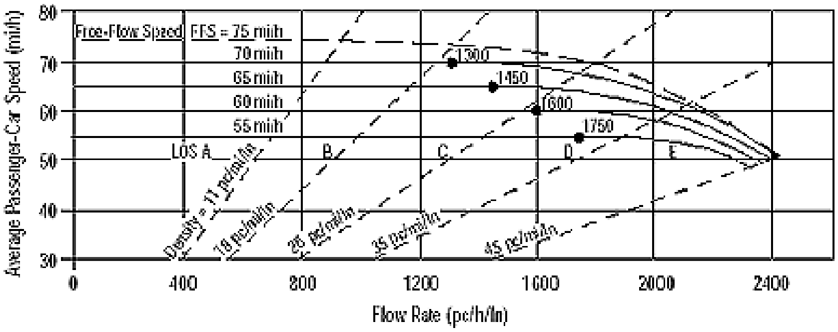
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Eastbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 35 to Exit 42*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs				
Volume, V	*2807*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

LOS and Performance Measures			**Design (N)**	
<u>Operational (LOS)</u>			<u>Design (N)</u>	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1754*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.0*	mi/h	S	mi/h
D = v_p / S	*27.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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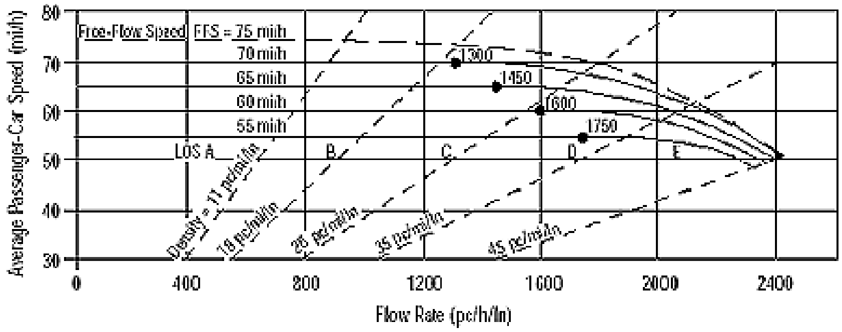
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Eastbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 42 to Exit 47*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette and Haywood Counties*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2034*

Project Description   Existing Conditions

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

Flow Inputs

Volume, V	*2768*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1730*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.1*	mi/h	S	mi/h
D = v_p / S	*27.0*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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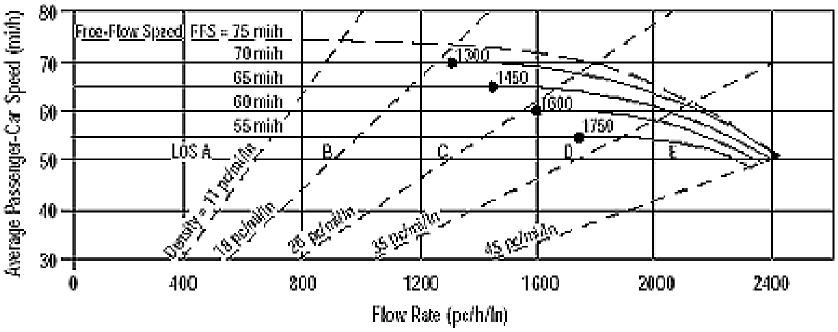
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Eastbound*
Agency or Company	*TDOT/TranSystems*	From/To	*East of Exit 47*
Date Performed	*04/18/2011*	Jurisdiction	*Haywood County*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs				
Volume, V	*2629*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1643*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.5*	mi/h	S	mi/h
D = v_p / S	*25.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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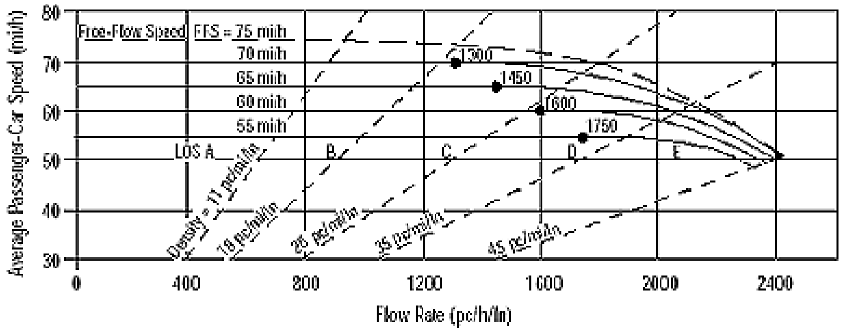
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*East of Exit 47*
Date Performed	*04/18/2011*	Jurisdiction	*Haywood County*
Analysis Time Period	*AM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2422*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1514*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.7*	mi/h	S	mi/h
D = v_p / S	*23.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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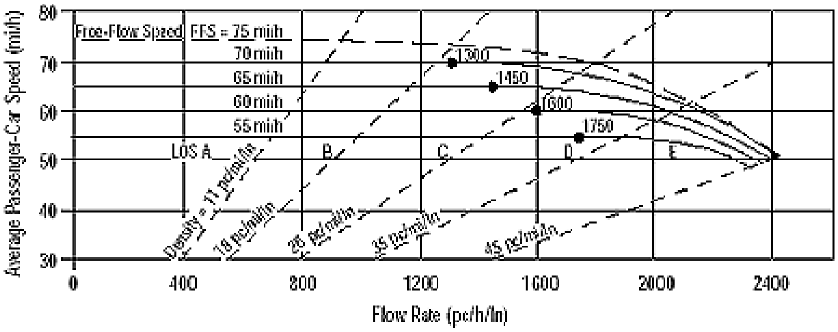
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 42 to Exit 47*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette and Haywood Counties*
Analysis Time Period	*AM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2598*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1624*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.6*	mi/h	S	mi/h
D = v_p / S	*25.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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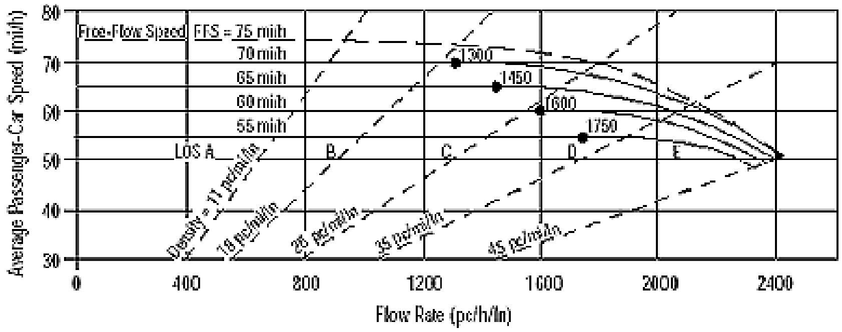
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 35 to Exit 42*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2631*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1644*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*64.5*	mi/h	S	mi/h
D = v_p / S	*25.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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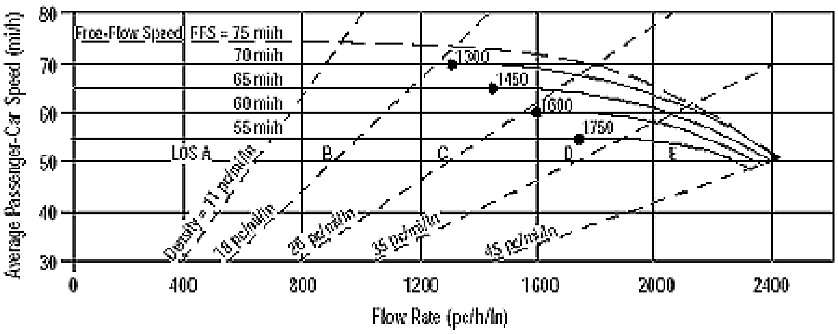
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*West of Exit 35*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2880*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

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)	*1800*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	*63.7*	mi/h	S	mi/h
D = v_p / S	*28.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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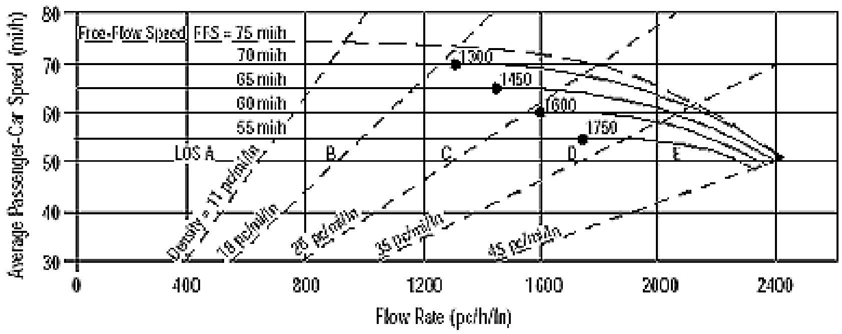
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Westbound*
From/To	*East of Exit 47*
Jurisdiction	*Haywood County*
Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2669*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1668*	pc/h/ln
S	*64.4*	mi/h
D = v_p / S	*25.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
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 - Exhibits23-8, 23-10
E_T - Exhibits 23-8, 23-10, 23-11
f_p - Page 23-12
LOS, S, FFS, v_p - Exhibits 23-2, 23-3
f_{LW} - Exhibit 23-4
f_{LC} - Exhibit 23-5
f_N - Exhibit 23-6
f_{ID} - Exhibit 23-7

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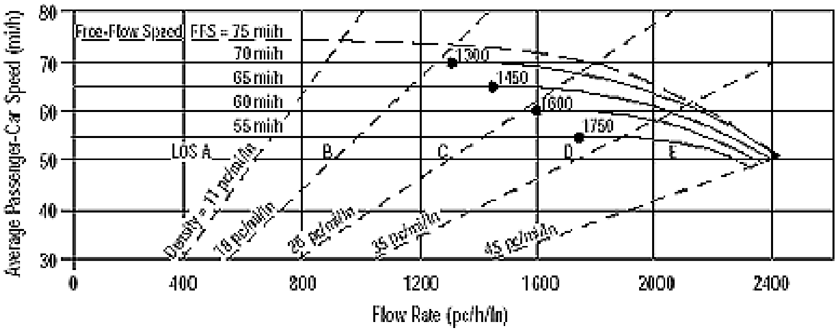
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 42 to Exit 47*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette and Haywood Counties*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*2735*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h			
Base free-flow Speed, BFFS	*70.0*	mi/h	FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1709*	pc/h/ln
S	*64.3*	mi/h
D = v_p / S	*26.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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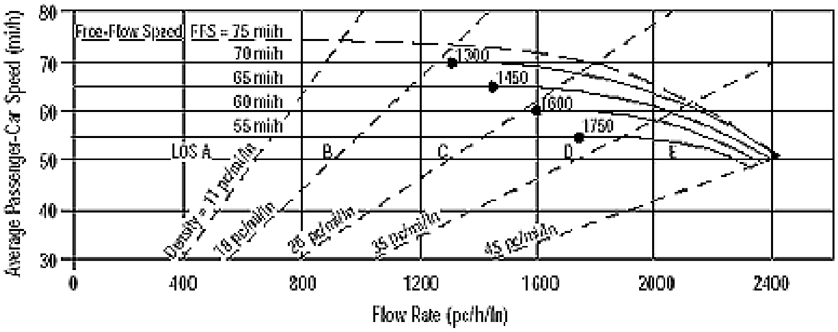
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	*SKB*	Highway/Direction of Travel	*I-40 Westbound*
Agency or Company	*TDOT/TranSystems*	From/To	*Exit 35 to Exit 42*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Period*	Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*3128*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	*12.0*	ft	f_{LW}	*0.0*	mi/h
Rt-Shoulder Lat. Clearance	*6.0*	ft	f_{LC}	*0.0*	mi/h
Interchange Density	*0.65*	I/mi	f_{ID}	*0.8*	mi/h
Number of Lanes, N	*2*		f_N	*4.5*	mi/h
FFS (measured)		mi/h	FFS	*64.7*	mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h			

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1955*	pc/h/ln
S	*62.0*	mi/h
D = v_p / S	*31.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
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 - Exhibits23-8, 23-10
E_T - Exhibits 23-8, 23-10, 23-11
f_p - Page 23-12
LOS, S, FFS, v_p - Exhibits 23-2, 23-3
f_{LW} - Exhibit 23-4
f_{LC} - Exhibit 23-5
f_N - Exhibit 23-6
f_{ID} - Exhibit 23-7

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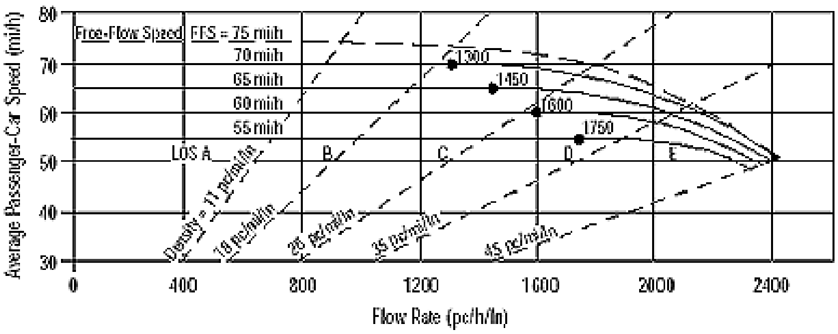
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	*SKB*
Agency or Company	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Highway/Direction of Travel	*I-40 Westbound*
From/To	*West of Exit 35*
Jurisdiction	*Fayette County*
Analysis Year	*2034*

Project Description Existing Conditions

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

Flow Inputs

Volume, V	*3175*	veh/h	Peak-Hour Factor, PHF	*0.90*
AADT		veh/day	%Trucks and Buses, P_T	*25*
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*
Driver type adjustment	*1.00*		Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.889*

Speed Inputs

Lane Width	*12.0*	ft
Rt-Shoulder Lat. Clearance	*6.0*	ft
Interchange Density	*0.65*	I/mi
Number of Lanes, N	*2*	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	*70.0*	mi/h

Calc Speed Adj and FFS

f_{LW}	*0.0*	mi/h
f_{LC}	*0.0*	mi/h
f_{ID}	*0.8*	mi/h
f_N	*4.5*	mi/h
FFS	*64.7*	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1984*	pc/h/ln
S	*61.5*	mi/h
D = v_p / S	*32.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
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 - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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Merge Ramps

Highway Capacity Software Computer Printouts

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 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 x f_{HV} x f_p
Freeway	2297	0.90	Level	25	0	0.889	1.00	2871
Ramp	201	0.90	Level	3	0	0.985	1.00	227
UpStream								
DownStream	184	0.90	Level	3	0	0.985	1.00	208

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2871 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3098	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3098	Exhibit 25-7	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 = 26.4 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.372 (Exibit 25-19)

S_R= 59.6 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 59.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 239 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	1964	0.90	Level	25	0	0.889	1.00	2455
Ramp	156	0.90	Level	3	0	0.985	1.00	176
UpStream								
DownStream	239	0.90	Level	3	0	0.985	1.00	270

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2455 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2631	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2631	Exhibit 25-7	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 = 22.8 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.340 (Exibit 25-19)

S_R= 60.5 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 60.5 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Site Information

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 126 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	1976	0.90	Level	25	0	0.889	1.00	2470
Ramp	274	0.90	Level	3	0	0.985	1.00	309
UpStream								
DownStream	126	0.90	Level	3	0	0.985	1.00	142

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2470 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2779	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2779	Exhibit 25-7	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 = 23.9 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.349 (Exibit 25-19)

S_R= 60.2 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 60.2 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Site Information

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☐ On
☑ No ☐ Off		☐ No ☑ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = 2000 ft
V_u = veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = 182 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	2306	0.90	Level	25	0	0.889	1.00	2883
Ramp	177	0.90	Level	3	0	0.985	1.00	200
UpStream								
DownStream	182	0.90	Level	3	0	0.985	1.00	205

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2883 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3083	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3083	Exhibit 25-7	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 = 26.3 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.371 (Exibit 25-19)

S_R= 59.6 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 59.6 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 274 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	3075	0.90	Level	25	0	0.889	1.00	3844
Ramp	237	0.90	Level	3	0	0.985	1.00	267
UpStream								
DownStream	274	0.90	Level	3	0	0.985	1.00	309

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3844 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4111	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4111	Exhibit 25-7	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 = 34.3 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.524 (Exibit 25-19)

S_R= 55.3 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 55.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Period

Site Information

Freeway/Dir of Travel	I-40 EB
Junction	Exit 35
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 355 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	2807	0.90	Level	25	0	0.889	1.00	3509
Ramp	204	0.90	Level	3	0	0.985	1.00	230
UpStream								
DownStream	355	0.90	Level	3	0	0.985	1.00	400

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3509 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3739	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3739	Exhibit 25-7	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 = 31.4 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.450 (Exibit 25-19)

S_R= 57.4 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☐ On
☑ No ☐ Off		☐ No ☑ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = 2000 ft
V_u = veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = 159 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	2880	0.90	Level	25	0	0.889	1.00	3600
Ramp	408	0.90	Level	3	0	0.985	1.00	460
UpStream								
DownStream	159	0.90	Level	3	0	0.985	1.00	179

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3600 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}	4060	Exhibit 25-7		No

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4060	Exhibit 25-7	4600:All	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F) (Merge)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 33.8 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination (Merge)

M_S = 0.512 (Exibit 25-19)

S_R= 55.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 55.7 mph (Exhibit 25-14)

Speed Determination (Diverge)

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☐ On
☑ No ☐ Off		☐ No ☑ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = 2000 ft
V_u = veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	V_D = 216 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	3175	0.90	Level	25	0	0.889	1.00	3969
Ramp	263	0.90	Level	3	0	0.985	1.00	297
UpStream								
DownStream	216	0.90	Level	3	0	0.985	1.00	244

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3969 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}	4266	Exhibit 25-7		No

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4266	Exhibit 25-7	4600:All	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F) (Merge)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 35.5 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination (Merge)

M_S = 0.564 (Exibit 25-19)

S_R= 54.2 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 54.2 mph (Exhibit 25-14)

Speed Determination (Diverge)

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☐ On
☑ No ☐ Off		☐ No ☑ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = 2000 ft
V_u = veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = 715 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	1814	0.90	Level	25	0	0.889	1.00	2268
Ramp	232	0.90	Level	10	0	0.952	1.00	271
UpStream								
DownStream	715	0.90	Level	10	0	0.952	1.00	834

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2268 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge Areas)

	Actual	Capacity		LOS F?
V_{FO}	2539	Exhibit 25-7		No

Capacity Checks (Diverge Areas)

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2539	Exhibit 25-7	4600:All	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F) (Merge Areas)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.0 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge Areas)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination (Merge Areas)

M_S = 0.335 (Exibit 25-19)

S_R= 60.6 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 60.6 mph (Exhibit 25-14)

Speed Determination (Diverge Areas)

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 397 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	1934	0.90	Level	25	0	0.889	1.00	2418
Ramp	367	0.90	Level	10	0	0.952	1.00	428
UpStream								
DownStream	397	0.90	Level	10	0	0.952	1.00	463

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2418 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2846	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2846	Exhibit 25-7	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 = 24.3 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.353 (Exibit 25-19)

S_R= 60.1 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 60.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 374 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	1828	0.90	Level	25	0	0.889	1.00	2285
Ramp	387	0.90	Level	10	0	0.952	1.00	452
UpStream								
DownStream	374	0.90	Level	10	0	0.952	1.00	436

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2285 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2737	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2737	Exhibit 25-7	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 = 23.5 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.346 (Exibit 25-19)

S_R= 60.3 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 60.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Period

Site Information

Freeway/Dir of Travel	I-40 WB
Junction	Exit 42
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 220 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	2311	0.90	Level	25	0	0.889	1.00	2889
Ramp	620	0.90	Level	10	0	0.952	1.00	723
UpStream								
DownStream	220	0.90	Level	10	0	0.952	1.00	257

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\ (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2889 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3612	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3612	Exhibit 25-7	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 = 30.2 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.430 (Exibit 25-19)

S_R= 57.9 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Period

Site Information

Freeway/Dir of Travel	I-40 EB
Junction	Exit 42
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 754 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	2596	0.90	Level	25	0	0.889	1.00	3245
Ramp	275	0.90	Level	10	0	0.952	1.00	321
UpStream								
DownStream	754	0.90	Level	10	0	0.952	1.00	880

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3245 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3566	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3566	Exhibit 25-7	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 = 30.0 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.424 (Exibit 25-19)

S_R= 58.1 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 58.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☐ On
☑ No ☐ Off		☐ No ☑ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = 2000 ft
V_u = veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = 449 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	2768	0.90	Level	25	0	0.889	1.00	3460
Ramp	410	0.90	Level	10	0	0.952	1.00	478
UpStream								
DownStream	449	0.90	Level	10	0	0.952	1.00	524

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3460 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}	3938	Exhibit 25-7		No

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3938	Exhibit 25-7	4600:All	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F) (Merge)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 32.8 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination (Merge)

M_S = 0.486 (Exibit 25-19)

S_R= 56.4 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 56.4 mph (Exhibit 25-14)

Speed Determination (Diverge)

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 401 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	2631	0.90	Level	25	0	0.889	1.00	3289
Ramp	434	0.90	Level	10	0	0.952	1.00	506
UpStream								
DownStream	401	0.90	Level	10	0	0.952	1.00	468

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3289 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3795	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3795	Exhibit 25-7	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 = 31.7 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.459 (Exibit 25-19)

S_R= 57.1 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.1 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Period

Site Information

Freeway/Dir of Travel	I-40 WB
Junction	Exit 42
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 257 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	3128	0.90	Level	25	0	0.889	1.00	3910
Ramp	650	0.90	Level	10	0	0.952	1.00	758
UpStream								
DownStream	257	0.90	Level	10	0	0.952	1.00	300

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F \,(P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3910 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4668	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4668	Exhibit 25-7	4600:All	Yes

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 = 38.4 (pc/mi/ln)

LOS = E (Exhibit 25-4)

Speed Determination

M_S = 0.701 (Exibit 25-19)

S_R= 50.4 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 50.4 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Site Information

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 102 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	1741	0.90	Level	25	0	0.889	1.00	2176
Ramp	29	0.90	Level	2	0	0.990	1.00	33
UpStream								
DownStream	102	0.90	Level	2	0	0.990	1.00	114

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2176 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2209	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2209	Exhibit 25-7	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 = 19.6 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

M_S = 0.322 (Exibit 25-19)

S_R= 61.0 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 61.0 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☐ On
☑ No ☐ Off		☐ No ☑ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = 2000 ft
V_u = veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = 169 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	1804	0.90	Level	25	0	0.889	1.00	2255
Ramp	39	0.90	Level	2	0	0.990	1.00	44
UpStream								
DownStream	169	0.90	Level	2	0	0.990	1.00	190

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2255 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}	2299	Exhibit 25-7		No

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2299	Exhibit 25-7	4600:All	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F) (Merge)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 20.3 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination (Merge)

M_S = 0.325 (Exibit 25-19)

S_R= 60.9 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 60.9 mph (Exhibit 25-14)

Speed Determination (Diverge)

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☐ On
☑ No ☐ Off		☐ No ☑ Off
L_{up} = ft		L_{down} = 2000 ft
V_u = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = 39 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	1815	0.90	Level	25	0	0.889	1.00	2269
Ramp	199	0.90	Level	2	0	0.990	1.00	223
UpStream								
DownStream	39	0.90	Level	2	0	0.990	1.00	44

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$$V_{12} = V_F \, (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2269 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}	2492	Exhibit 25-7		No

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2492	Exhibit 25-7	4600:All	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F) (Merge)

$$D_R = 5.475 + 0.00734 \, v_R + 0.0078 \, V_{12} - 0.00627 \, L_A$$

D_R = 21.7 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge)

$$D_R = 4.252 + 0.0086 \, V_{12} - 0.009 \, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination (Merge)

M_S = 0.333 (Exibit 25-19)

S_R= 60.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 60.7 mph (Exhibit 25-14)

Speed Determination (Diverge)

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 41 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	1911	0.90	Level	25	0	0.889	1.00	2389
Ramp	104	0.90	Level	2	0	0.990	1.00	117
UpStream								
DownStream	41	0.90	Level	2	0	0.990	1.00	46

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\ (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 2389 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2506	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2506	Exhibit 25-7	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 = 21.8 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.334 (Exibit 25-19)

S_R= 60.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 60.7 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Site Information

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 124 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	2515	0.90	Level	25	0	0.889	1.00	3144
Ramp	43	0.90	Level	2	0	0.990	1.00	48
UpStream								
DownStream	124	0.90	Level	2	0	0.990	1.00	139

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3144 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3192	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3192	Exhibit 25-7	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 = 27.2 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

M_S = 0.381 (Exibit 25-19)

S_R= 59.3 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 59.3 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	PM Peak Period	Analysis Year	2034

Site Information

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 2000 ft

V_D = 197 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	2629	0.90	Level	25	0	0.889	1.00	3286
Ramp	58	0.90	Level	2	0	0.990	1.00	65
UpStream								
DownStream	197	0.90	Level	2	0	0.990	1.00	221

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3286 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3351	Exhibit 25-7		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3351	Exhibit 25-7	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 = 28.4 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

M_S = 0.397 (Exibit 25-19)

S_R= 58.9 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 58.9 mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

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 25-4)

Speed Determination

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☐ On
☑ No ☐ Off		☐ No ☑ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = 2000 ft
V_u = veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = 58 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	2598	0.90	Level	25	0	0.889	1.00	3248
Ramp	234	0.90	Level	2	0	0.990	1.00	263
UpStream								
DownStream	58	0.90	Level	2	0	0.990	1.00	65

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 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM} = 1.000 using Equation (Exhibit 25-5)	P_{FD} = using Equation (Exhibit 25-12)
V_{12} = 3248 pc/h	V_{12} = pc/h
V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)	V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)
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 25-8)	If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}	3511	Exhibit 25-7		No

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3511	Exhibit 25-7	4600:All	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F)

Merge	Diverge
$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$	$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 29.6 (pc/mi/ln)	D_R = (pc/mi/ln)
LOS = D (Exhibit 25-4)	LOS = (Exhibit 25-4)

Speed Determination

Merge	Diverge
M_S = 0.417 (Exibit 25-19)	D_s = (Exhibit 25-19)
S_R= 58.3 mph (Exhibit 25-19)	S_R= mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)	S_0= mph (Exhibit 25-19)
S = 58.3 mph (Exhibit 25-14)	S = mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	PM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☐ Yes ☐ On		☑ Yes ☐ On
☑ No ☐ Off		☐ No ☑ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = 2000 ft
V_u = veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	V_D = 61 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	2735	0.90	Level	25	0	0.889	1.00	3419
Ramp	127	0.90	Level	2	0	0.990	1.00	143
UpStream								
DownStream	61	0.90	Level	2	0	0.990	1.00	68

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$$V_{12} = V_F\ (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 1.000 using Equation (Exhibit 25-5)

V_{12} = 3419 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = using Equation (Exhibit 25-12)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge Areas)

	Actual	Capacity		LOS F?
V_{FO}	3562	Exhibit 25-7		No

Capacity Checks (Diverge Areas)

	Actual	Capacity		LOS F?
V_F		Exhibit 25-14		
$V_{FO} = V_F - V_R$		Exhibit 25-14		
V_R		Exhibit 25-3		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3562	Exhibit 25-7	4600:All	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 25-14		

Level of Service Determination (if not F) (Merge Areas)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 30.1 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge Areas)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Speed Determination (Merge Areas)

M_S = 0.423 (Exibit 25-19)

S_R= 58.1 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 58.1 mph (Exhibit 25-14)

Speed Determination (Diverge Areas)

D_s = (Exhibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-15)

Diverge Ramps

Highway Capacity Software Computer Printouts

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 201 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	2096	0.90	Level	25	0	0.889	1.00	2620
Ramp	184	0.90	Level	3	0	0.985	1.00	208
UpStream	201	0.90	Level	3	0	0.985	1.00	227
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2620 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2620	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2412	Exhibit 25-14	4800	No
V_R	208	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2620	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = 22.3 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.447 (Exhibit 25-19)

S_R= 57.5 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.5 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Site Information

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 156 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	1808	0.90	Level	25	0	0.889	1.00	2260
Ramp	239	0.90	Level	3	0	0.985	1.00	270
UpStream	156	0.90	Level	3	0	0.985	1.00	176
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2260 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2260	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	1990	Exhibit 25-14	4800	No
V_R	270	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2260	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 19.2 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

D_s = 0.452 (Exhibit 25-19)

S_R= 57.3 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.3 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 274 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	1702	0.90	Level	25	0	0.889	1.00	2128
Ramp	126	0.90	Level	3	0	0.985	1.00	142
UpStream	274	0.90	Level	3	0	0.985	1.00	309
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2128 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2128	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	1986	Exhibit 25-14	4800	No
V_R	142	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2128	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = 18.1 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

D_s = 0.441 (Exhibit 25-19)

S_R= 57.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 177 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	2129	0.90	Level	25	0	0.889	1.00	2661
Ramp	182	0.90	Level	3	0	0.985	1.00	205
UpStream	177	0.90	Level	3	0	0.985	1.00	200
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2661 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2661	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2456	Exhibit 25-14	4800	No
V_R	205	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2661	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 22.6 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.446 (Exhibit 25-19)

S_R= 57.5 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.5 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 237 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	2838	0.90	Level	25	0	0.889	1.00	3548
Ramp	274	0.90	Level	3	0	0.985	1.00	309
UpStream	237	0.90	Level	3	0	0.985	1.00	267
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 3548 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3548	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	3239	Exhibit 25-14	4800	No
V_R	309	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3548	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 30.3 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.456 (Exhibit 25-19)

S_R= 57.2 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.2 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
[x] Yes [x] On		[ ] Yes [ ] On
[ ] No [ ] Off		[x] No [ ] Off
L_{up} = 2000 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
V_u = 204 veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	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	2603	0.90	Level	25	0	0.889	1.00	3254
Ramp	355	0.90	Level	3	0	0.985	1.00	400
UpStream	204	0.90	Level	3	0	0.985	1.00	230
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 3254 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

Is V_3 or V_{av34} > 2,700 pc/h? [ ] Yes [x] No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 [ ] Yes [x] No

If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3254	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2854	Exhibit 25-14	4800	No
V_R	400	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3254	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 27.7 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.464 (Exhibit 25-19)

S_R= 57.0 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.0 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 35
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 408 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	2472	0.90	Level	25	0	0.889	1.00	3090
Ramp	159	0.90	Level	3	0	0.985	1.00	179
UpStream	408	0.90	Level	3	0	0.985	1.00	460
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 3090 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3090	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2911	Exhibit 25-14	4800	No
V_R	179	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3090	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 26.3 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.444 (Exhibit 25-19)

S_R= 57.6 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Period

Site Information

Freeway/Dir of Travel	I-40 WB
Junction	Exit 35
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 263 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	2912	0.90	Level	25	0	0.889	1.00	3640
Ramp	216	0.90	Level	3	0	0.985	1.00	244
UpStream	263	0.90	Level	3	0	0.985	1.00	297
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F$ (P_{FM})

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 3640 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3640	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	3396	Exhibit 25-14	4800	No
V_R	244	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3640	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 31.1 (pc/mi/ln)

LOS = D (Exhibit 25-4)

Speed Determination

D_s = 0.450 (Exhibit 25-19)

S_R= 57.4 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.4 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

Yes ☑ On ☑

No ☐ Off ☐

L_{up} = 2000 ft

V_u = 232 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	1582	0.90	Level	25	0	0.889	1.00	1978
Ramp	715	0.90	Level	3	0	0.985	1.00	806
UpStream	232	0.90	Level	3	0	0.985	1.00	262
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 1978 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1978	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	1172	Exhibit 25-14	4800	No
V_R	806	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1978	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\,V_{12} - 0.009\,L_D$$

D_R = 16.8 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

D_s = 0.501 (Exhibit 25-19)

S_R= 56.0 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 56.0 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Period

Site Information

Freeway/Dir of Travel	I-40 EB
Junction	Exit 42
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 367 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	1567	0.90	Level	25	0	0.889	1.00	1959
Ramp	397	0.90	Level	3	0	0.985	1.00	448
UpStream	367	0.90	Level	3	0	0.985	1.00	414
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 1959 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1959	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	1511	Exhibit 25-14	4800	No
V_R	448	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1959	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 16.6 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

D_s = 0.468 (Exhibit 25-19)

S_R= 56.9 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 56.9 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 387 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	1441	0.90	Level	25	0	0.889	1.00	1801
Ramp	374	0.90	Level	3	0	0.985	1.00	422
UpStream	387	0.90	Level	3	0	0.985	1.00	436
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 1801 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1801	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	1379	Exhibit 25-14	4800	No
V_R	422	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1801	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 15.2 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

D_s = 0.466 (Exhibit 25-19)

S_R= 57.0 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.0 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☑ Yes ☑ On ☐ No ☐ Off		☐ Yes ☐ On ☑ No ☐ Off
L_{up} = 2000 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
V_u = 620 veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	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	1691	0.90	Level	25	0	0.889	1.00	2114
Ramp	220	0.90	Level	3	0	0.985	1.00	248
UpStream	620	0.90	Level	3	0	0.985	1.00	699
DownStream								

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2114 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F	2114	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	1866	Exhibit 25-14	4800	No
V_R	248	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2114	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F) (Merge)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 17.9 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination (Merge)

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Speed Determination (Diverge)

D_s = 0.450 (Exhibit 25-19)

S_R= 57.4 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.4 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 275 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	2321	0.90	Level	25	0	0.889	1.00	2901
Ramp	754	0.90	Level	10	0	0.952	1.00	880
UpStream	275	0.90	Level	10	0	0.952	1.00	321
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2901 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2901	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2021	Exhibit 25-14	4800	No
V_R	880	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2901	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 24.7 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.507 (Exhibit 25-19)

S_R= 55.8 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 55.8 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 410 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	2358	0.90	Level	25	0	0.889	1.00	2948
Ramp	449	0.90	Level	3	0	0.985	1.00	506
UpStream	410	0.90	Level	3	0	0.985	1.00	462
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\ (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2948 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2948	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2442	Exhibit 25-14	4800	No
V_R	506	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2948	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 25.1 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.474 (Exhibit 25-19)

S_R= 56.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 56.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2000 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
V_u = 434 veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	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	2197	0.90	Level	25	0	0.889	1.00	2746
Ramp	401	0.90	Level	3	0	0.985	1.00	452
UpStream	434	0.90	Level	3	0	0.985	1.00	489
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2746 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2746	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2294	Exhibit 25-14	4800	No
V_R	452	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2746	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 23.4 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.469 (Exhibit 25-19)

S_R= 56.9 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 56.9 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 42
Date Performed	04/18/2011	Jurisdiction	Fayette County
Analysis Time Period	PM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 650 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	2478	0.90	Level	25	0	0.889	1.00	3098
Ramp	257	0.90	Level	3	0	0.985	1.00	290
UpStream	650	0.90	Level	3	0	0.985	1.00	733
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 3098 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3098	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2808	Exhibit 25-14	4800	No
V_R	290	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3098	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 26.4 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.454 (Exhibit 25-19)

S_R= 57.3 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.3 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2000 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
V_u = 29 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	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	1712	0.90	Level	25	0	0.889	1.00	2140
Ramp	102	0.90	Level	2	0	0.990	1.00	114
UpStream	29	0.90	Level	2	0	0.990	1.00	33
DownStream								

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2140 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F	2140	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2026	Exhibit 25-14	4800	No
V_R	114	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2140	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F) (Merge)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 18.2 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination (Merge)

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Speed Determination (Diverge)

D_s = 0.438 (Exhibit 25-19)

S_R= 57.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.7 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2000 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
V_u = 39 veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	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	1765	0.90	Level	25	0	0.889	1.00	2206
Ramp	169	0.90	Level	2	0	0.990	1.00	190
UpStream	39	0.90	Level	2	0	0.990	1.00	44
DownStream								

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 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM} = using Equation (Exhibit 25-5)	P_{FD} = 1.000 using Equation (Exhibit 25-12)
V_{12} = pc/h	V_{12} = 2206 pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)	V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)
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 25-8)	If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2206	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2016	Exhibit 25-14	4800	No
V_R	190	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2206	Exhibit 25-14	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 25-4)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 18.7 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Speed Determination

D_s = 0.445 (Exhibit 25-19)

S_R= 57.5 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.5 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		**Site Information**	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	AM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2000 ft		L_{down} = ft
V_u = 199 veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D, V_R, V_f)	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	1616	0.90	Level	25	0	0.889	1.00	2020
Ramp	39	0.90	Level	2	0	0.990	1.00	44
UpStream	199	0.90	Level	2	0	0.990	1.00	223
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2020 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2020	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	1976	Exhibit 25-14	4800	No
V_R	44	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2020	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 17.1 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

D_s = 0.432 (Exhibit 25-19)

S_R= 57.9 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.9 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	PM Peak Period	Analysis Year	2014

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 104 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	1807	0.90	Level	25	0	0.889	1.00	2259
Ramp	41	0.90	Level	2	0	0.990	1.00	46
UpStream	104	0.90	Level	2	0	0.990	1.00	117
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 2259 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2259	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2213	Exhibit 25-14	4800	No
V_R	46	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2259	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 19.2 (pc/mi/ln)

LOS = B (Exhibit 25-4)

Speed Determination

D_s = 0.432 (Exhibit 25-19)

S_R= 57.9 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.9 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Period

Site Information

Freeway/Dir of Travel	I-40 EB
Junction	Exit 47
Jurisdiction	Haywood County
Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{up} = 2000 ft

V_u = 43 veh/h

Terrain: Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D, V_R, V_f)

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	2472	0.90	Level	25	0	0.889	1.00	3090
Ramp	124	0.90	Level	2	0	0.990	1.00	139
UpStream	43	0.90	Level	2	0	0.990	1.00	48
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

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 25-4)

Speed Determination

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 3090 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3090	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2951	Exhibit 25-14	4800	No
V_R	139	Exhibit 25-3	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3090	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 26.3 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination

D_s = 0.441 (Exhibit 25-19)

S_R= 57.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 EB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	PM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2000 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
V_u = 58 veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	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	2571	0.90	Level	25	0	0.889	1.00	3214
Ramp	197	0.90	Level	2	0	0.990	1.00	221
UpStream	58	0.90	Level	2	0	0.990	1.00	65
DownStream								

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 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM} = using Equation (Exhibit 25-5)	P_{FD} = 1.000 using Equation (Exhibit 25-12)
V_{12} = pc/h	V_{12} = 3214 pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)	V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)
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 25-8)	If Yes, V_{12a} = pc/h (Equation 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F	3214	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2993	Exhibit 25-14	4800	No
V_R	221	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3214	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

Merge	Diverge
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/mi/ln)	D_R = 27.4 (pc/mi/ln)
LOS = (Exhibit 25-4)	LOS = C (Exhibit 25-4)

Speed Determination

Merge	Diverge
M_S = (Exibit 25-19)	D_s = 0.448 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.5 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S = mph (Exhibit 25-14)	S = 57.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	AM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2000 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
V_u = 234 veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	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	2364	0.90	Level	25	0	0.889	1.00	2955
Ramp	58	0.90	Level	2	0	0.990	1.00	65
UpStream	234	0.90	Level	2	0	0.990	1.00	263
DownStream								

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 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM} = using Equation (Exhibit 25-5)	P_{FD} = 1.000 using Equation (Exhibit 25-12)
V_{12} = pc/h	V_{12} = 2955 pc/h
V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)	V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)
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 25-8)	If Yes,V_{12a} = pc/h (Equation 25-18)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

	Actual	Capacity		LOS F?
V_F	2955	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	2890	Exhibit 25-14	4800	No
V_R	65	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2955	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F)

Merge	Diverge
$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$	$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$
D_R = (pc/mi/ln)	D_R = 25.2 (pc/mi/ln)
LOS = (Exhibit 25-4)	LOS = C (Exhibit 25-4)

Speed Determination

Merge	Diverge
M_S = (Exibit 25-19)	D_s = 0.434 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.9 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S = mph (Exhibit 25-14)	S = 57.9 mph (Exhibit 25-15)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	SKB	Freeway/Dir of Travel	I-40 WB
Agency or Company	TDOT/TranSystems	Junction	Exit 47
Date Performed	04/18/2011	Jurisdiction	Haywood County
Analysis Time Period	PM Peak Period	Analysis Year	2034

Project Description Existing Conditions

Inputs

Upstream Adj Ramp	Terrain: Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2000 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
V_u = 127 veh/h	Sketch (show lanes, L_A, L_D, V_R, V_f)	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	2608	0.90	Level	25	0	0.889	1.00	3260
Ramp	61	0.90	Level	2	0	0.990	1.00	68
UpStream	127	0.90	Level	2	0	0.990	1.00	143
DownStream								

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = using Equation (Exhibit 25-5)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 25-4 or 25-5)

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 25-8)

Estimation of v_{12} (Diverge Areas)

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 using Equation (Exhibit 25-12)

V_{12} = 3260 pc/h

V_3 or V_{av34} 0 pc/h (Equation 25-15 or 25-16)

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 25-18)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 25-7		

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F	3260	Exhibit 25-14	4800	No
$V_{FO} = V_F - V_R$	3192	Exhibit 25-14	4800	No
V_R	68	Exhibit 25-3	2000	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 25-7		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3260	Exhibit 25-14	4400:All	No

Level of Service Determination (if not F) (Merge)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 25-4)

Level of Service Determination (if not F) (Diverge)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 27.8 (pc/mi/ln)

LOS = C (Exhibit 25-4)

Speed Determination (Merge)

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S = mph (Exhibit 25-14)

Speed Determination (Diverge)

D_s = 0.434 (Exhibit 25-19)

S_R= 57.8 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.8 mph (Exhibit 25-15)

Two Lane Segments

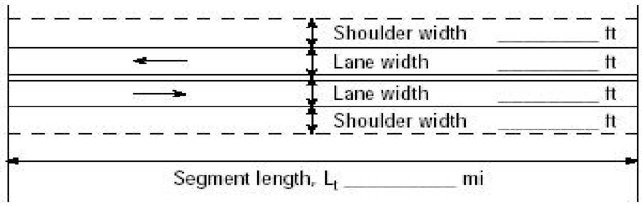
Highway Capacity Software Computer Printouts

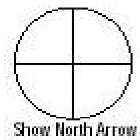
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 59*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*404* veh/h
Directional split	*54 / 46*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses, P_T	*3* %
% Recreational vehicles, P_R	*0*%
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.979*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*458*
v_p * highest directional split proportion[2] (pc/h)	*247*

Free-Flow Speed from Field Measurement			Estimated Free-Flow Speed	
Field Measured speed, S_{FM}		*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f		*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})		*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
			Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.3*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*33.3*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*450*
v_p * highest directional split proportion[2] (pc/h)	*243*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*32.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*23.0*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*55.6*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.14*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*112*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*404*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.4*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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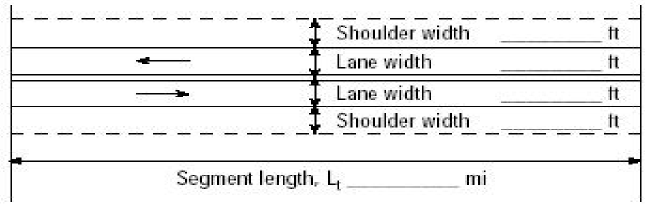
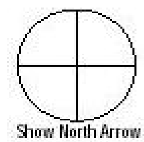
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 59*
Agency or Company	*TDOT/TranSystems*	From/To	*South of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*417* veh/h
Directional split	*61 / 39*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.979*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*473*
v_p * highest directional split proportion[2] (pc/h)	*289*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.3*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*33.2*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*465*
v_p * highest directional split proportion[2] (pc/h)	*284*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*33.6*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*21.8*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*55.3*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.15*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*116*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*417*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.5*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

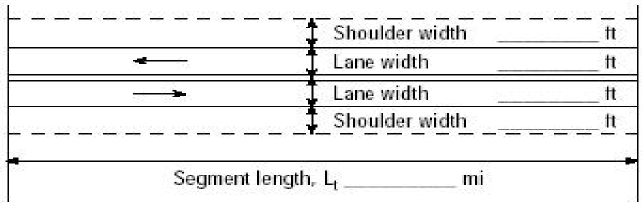
 HCS+[TM] Version 5.4 Generated: 4/20/2011 10:54 AM

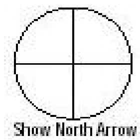
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 59*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*384* veh/h
Directional split	*56 / 44*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.979*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*436*
v_p * highest directional split proportion[2] (pc/h)	*244*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0* *mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3* *mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5* *mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2* *mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.4*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*33.4*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*428*
v_p * highest directional split proportion[2] (pc/h)	*240*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*31.4*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*22.9*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*54.2*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.14*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*107*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*384*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.2*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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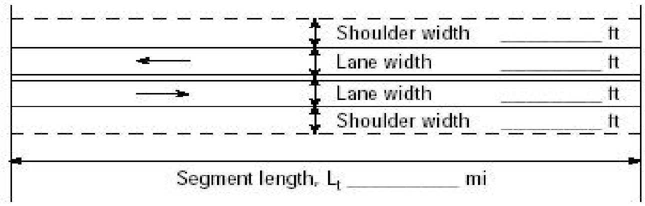
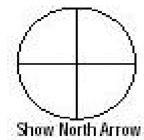
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 59*
Agency or Company	*TDOT/TranSystems*	From/To	*South of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*398* veh/h
Directional split	*55 / 45*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.979*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*452*
v_p * highest directional split proportion[2] (pc/h)	*249*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.3*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*33.3*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*444*
v_p * highest directional split proportion[2] (pc/h)	*244*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*32.3*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*22.9*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*55.2*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.14*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*111*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*398*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.3*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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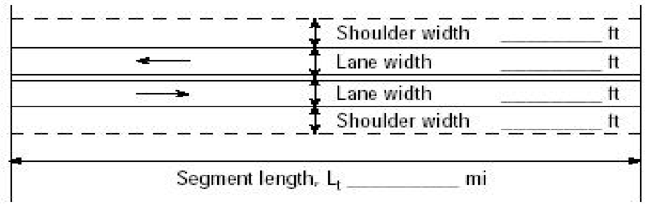
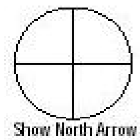
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*SKB*	Highway	*SR 59*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain	☑ Level ☐ Rolling
Two-way hourly volume	*555* veh/h
Directional split	*58 / 42*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3* %
% Recreational vehicles, P_R	*0*%
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.994*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*620*
v_p * highest directional split proportion[2] (pc/h)	*360*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0* mi/h
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3* mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5* mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2* mi/h

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.8*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*32.6*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*619*
v_p * highest directional split proportion[2] (pc/h)	*359*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*42.0*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*20.1*
Percent time-spent-following, PTSF(%)=BPTSF+f $_{d/np}$	*62.0*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.19*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*154*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*555*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.7*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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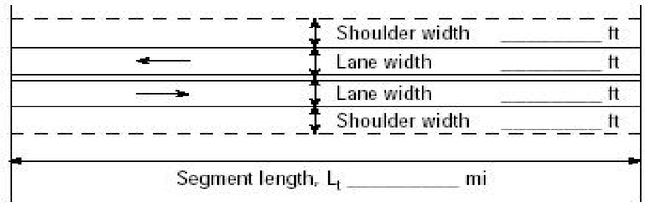
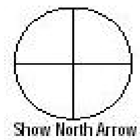
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 59*
Agency or Company	*TDOT/TranSystems*	From/To	*South of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*575* veh/h
Directional split	*61 / 39*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.994*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*643*
v_p * highest directional split proportion[2] (pc/h)	*392*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.7*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*32.5*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*641*
v_p * highest directional split proportion[2] (pc/h)	*391*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*43.1*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*19.4*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*62.5*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.20*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*160*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*575*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.9*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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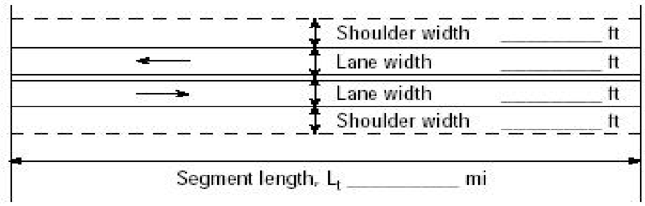
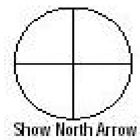
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 59*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*531* veh/h
Directional split	*56 / 44*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.994*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*594*
v_p * highest directional split proportion[2] (pc/h)	*333*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0* mi/h
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3* mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5* mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2* mi/h

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.9*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*32.7*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*592*
v_p * highest directional split proportion[2] (pc/h)	*332*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*40.6*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*20.7*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*61.3*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.19*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*148*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*531*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.5*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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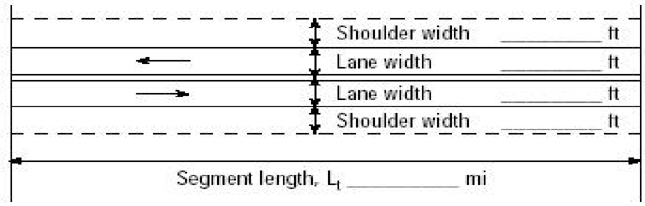
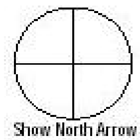
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 59*
Agency or Company	*TDOT/TranSystems*	From/To	*South of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*549* veh/h
Directional split	*54 / 46*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.994*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*614*
v_p * highest directional split proportion[2] (pc/h)	*332*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.8*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*32.6*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*612*
v_p * highest directional split proportion[2] (pc/h)	*330*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*41.6*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*20.2*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*61.9*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.19*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*153*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*549*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.7*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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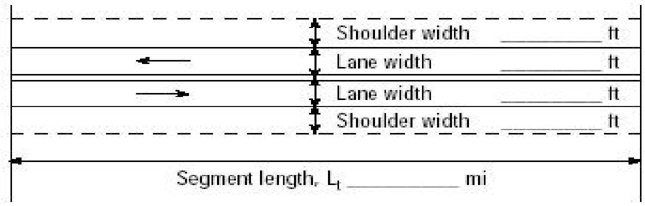
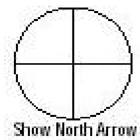
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*1485* veh/h
Directional split	*65 / 35*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*10* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.990*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1667*
v_p * highest directional split proportion[2] (pc/h)	*1084*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.4*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*26.8*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*1.000*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1650*
v_p * highest directional split proportion[2] (pc/h)	*1073*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*76.6*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*6.6*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*83.1*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.52*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*413*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*1485*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*15.4*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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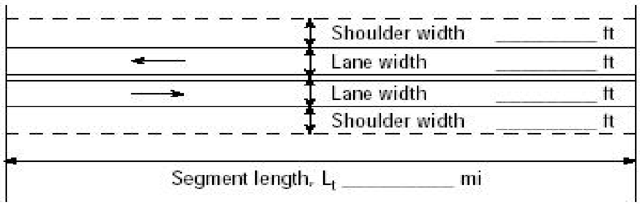
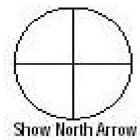
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*I-40 to Pilot Dwy.*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume *673* veh/h
Directional split *51 / 49*
Peak-hour factor, PHF *0.90*
No-passing zone *100*
% Trucks and Buses , P_T *48* %
% Recreational vehicles, P_R *0%*
Access points/ *mi* *10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.912*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*820*
v_p * highest directional split proportion[2] (pc/h)	*418*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.0*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*31.9*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.954*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*784*
v_p * highest directional split proportion[2] (pc/h)	*400*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*49.8*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*15.7*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*65.5*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.26*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*187*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*673*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*5.9*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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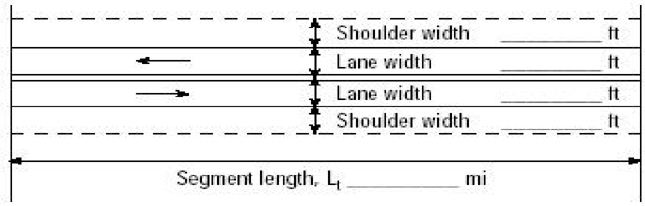
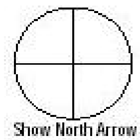
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*South of Pilot Dwy.*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*462* veh/h
Directional split	*56 / 44*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.979*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*524*
v_p * highest directional split proportion[2] (pc/h)	*293*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.1*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*33.0*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*515*
v_p * highest directional split proportion[2] (pc/h)	*288*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*36.4*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*21.7*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*58.1*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.16*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*128*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*462*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.9*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

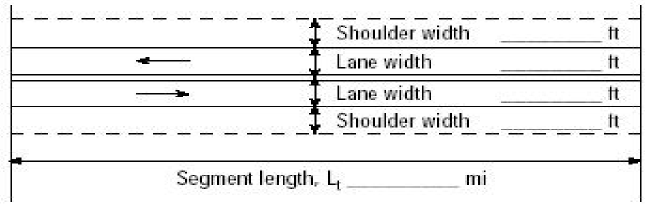
 HCS+™ Version 5.4 Generated: 4/20/2011 11:08 AM

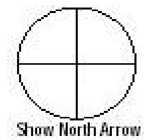
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*1327* veh/h
Directional split	*60 / 40*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*10* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.990*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1489*
v_p * highest directional split proportion[2] (pc/h)	*893*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.6*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*28.0*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1474*
v_p * highest directional split proportion[2] (pc/h)	*884*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*72.6*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*7.6*
Percent time-spent-following, PTSF(%)=BPTSF+f $_{d/np}$	*80.3*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.47*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*369*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*1327*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*13.2*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

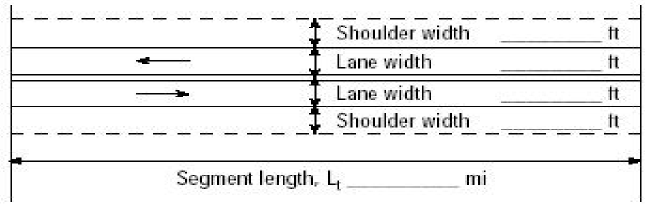
 HCS+™ Version 5.4 Generated: 4/20/2011 11:09 AM

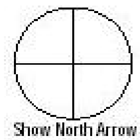
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*I-40 to Pilot Dwy.*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain	☑ Level ☐ Rolling
Two-way hourly volume	*667* veh/h
Directional split	*57 / 43*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*48* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.912*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*812*
v_p * highest directional split proportion[2] (pc/h)	*463*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.0*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*31.9*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.954*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*777*
v_p * highest directional split proportion[2] (pc/h)	*443*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*49.5*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*15.4*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*64.9*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.25*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*185*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*667*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*5.8*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

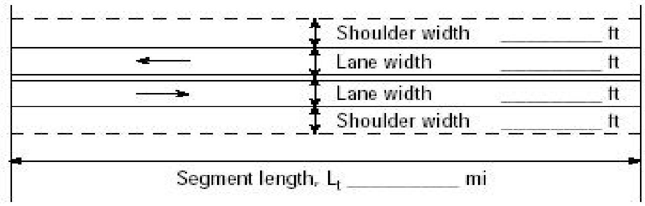
 HCS+[TM] Version 5.4 Generated: 4/20/2011 11:10 AM

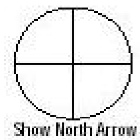
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*South of Pilot Dwy.*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*400* veh/h
Directional split	*64 / 36*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.979*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*454*
v_p * highest directional split proportion[2] (pc/h)	*291*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.3*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*33.3*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*446*
v_p * highest directional split proportion[2] (pc/h)	*285*
Base percent time-spent-following, $BPTSF(\%)=100(1-e^{-0.000879v_p})$	*32.4*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*22.2*
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{d/np}$	*54.6*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, $v/c=V_p/3{,}200$	*0.14*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= $0.25L_t$(V/PHF)	*111*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*400*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*3.3*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

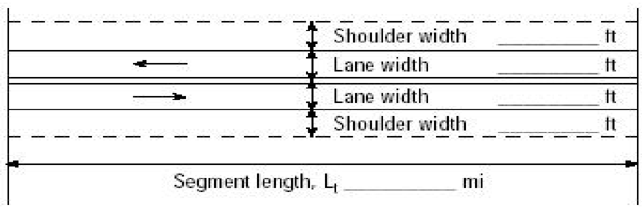
 HCS+™ Version 5.4 Generated: 4/20/2011 11:10 AM

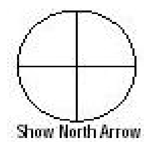
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*1503* veh/h
Directional split	*64 / 36*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*10* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.990*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1687*
v_p * highest directional split proportion[2] (pc/h)	*1080*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.4*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*26.7*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*1.000*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1670*
v_p * highest directional split proportion[2] (pc/h)	*1069*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*77.0*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*6.4*
Percent time-spent-following, PTSF(%)=BPTSF+f $_{d/np}$	*83.4*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.53*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*418*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*1503*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*15.7*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

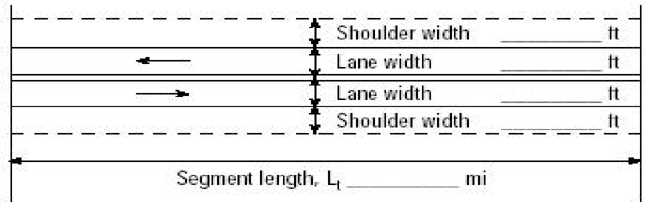
 HCS+[TM] Version 5.4 Generated: 4/20/2011 11:11 AM

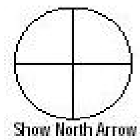
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*I-40 to Pilot Dwy.*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*791* veh/h
Directional split	*52 / 48*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*48* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.912*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*963*
v_p * highest directional split proportion[2] (pc/h)	*501*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.7*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*31.1*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.954*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*921*
v_p * highest directional split proportion[2] (pc/h)	*479*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*55.5*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*13.7*
Percent time-spent-following, PTSF(%)=BPTSF+f $_{d/np}$	*69.2*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.30*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*220*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*791*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*7.1*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

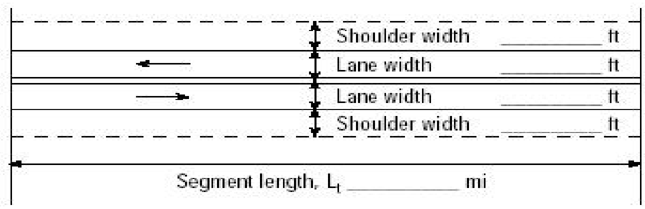
 HCS+™ Version 5.4 Generated: 4/20/2011 11:12 AM

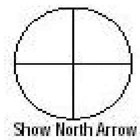
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*South of Pilot Dwy.*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*544* veh/h
Directional split	*58 / 42*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3* %
% Recreational vehicles, P_R	*0*%
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.994*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*608*
v_p * highest directional split proportion[2] (pc/h)	*353*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0* *mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3* *mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5* *mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2* *mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.9*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*32.6*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*606*
v_p * highest directional split proportion[2] (pc/h)	*351*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*41.3*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*20.5*
Percent time-spent-following, PTSF(%)=BPTSF+f $_{d/np}$	*61.8*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.19*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*151*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*544*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.6*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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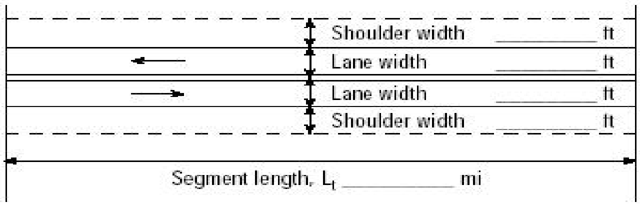
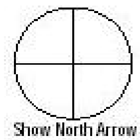
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions (No Build)*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*1343* veh/h
Directional split	*61 / 39*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*10* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.990*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1507*
v_p * highest directional split proportion[2] (pc/h)	*919*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/f_{HV})$	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*1.6*
Average travel speed, ATS (*mi/h*) $ATS=FFS-0.00776v_p-f_{np}$	*27.9*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*1492*
v_p * highest directional split proportion[2] (pc/h)	*910*
Base percent time-spent-following, $BPTSF(\%)=100(1-e^{-0.000879v_p})$	*73.1*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*7.5*
Percent time-spent-following, $PTSF(\%)=BPTSF+f_{d/np}$	*80.6*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*D*
Volume to capacity ratio, $v/c=V_p/3{,}200$	*0.47*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= $0.25L_t$(V/PHF)	*373*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*1343*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*13.4*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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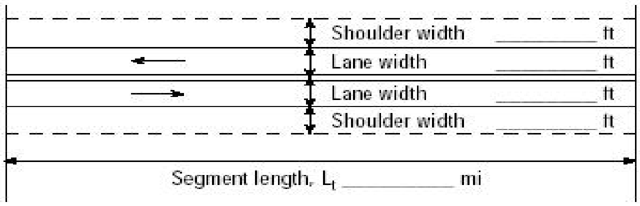
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		*Site Information*	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*I-40 to Pilot Dwy.*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions (No Build)*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*815* veh/h
Directional split	*53 / 47*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*48* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.912*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*992*
v_p * highest directional split proportion[2] (pc/h)	*526*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*2.6*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*30.9*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.954*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*949*
v_p * highest directional split proportion[2] (pc/h)	*503*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*56.6*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*13.3*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*69.9*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.31*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*226*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*815*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*7.3*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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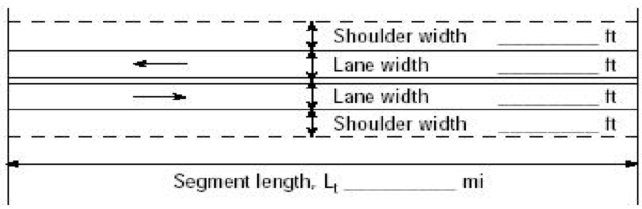
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*SKB*	Highway	*SR 222*
Agency or Company	*TDOT/TranSystems*	From/To	*South of Pilot Dwy.*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions (No Build)*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*500* veh/h
Directional split	*63 / 37*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*3 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.979*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*567*
v_p * highest directional split proportion[2] (pc/h)	*357*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.0*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*32.8*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.997*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*557*
v_p * highest directional split proportion[2] (pc/h)	*351*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*38.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*21.1*
Percent time-spent-following, PTSF(%)=BPTSF+f $_{d/np}$	*59.8*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*C*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.18*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*139*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*500*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*4.2*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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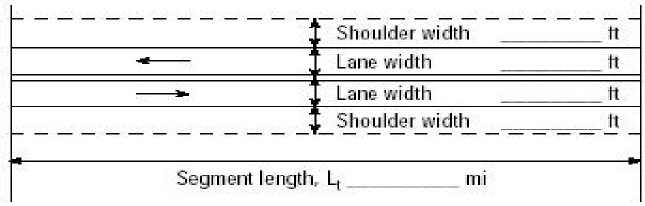
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*SKB*	Highway	*Dancyville Road*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions*

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*199* veh/h
Directional split	*56 / 44*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.986*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*224*
v_p * highest directional split proportion[2] (pc/h)	*125*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.6*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*35.8*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.998*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*222*
v_p * highest directional split proportion[2] (pc/h)	*124*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*17.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*23.0*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*40.7*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.07*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*55*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*199*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*1.5*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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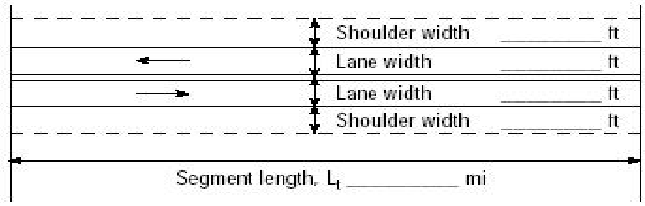
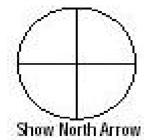
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	*SKB*	Highway	*Dancyville Road*
Agency or Company	*TDOT/TranSystems*	From/To	*South of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*206* veh/h
Directional split	*65 / 35*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.986*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*232*
v_p * highest directional split proportion[2] (pc/h)	*151*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.7*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*35.7*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.998*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*229*
v_p * highest directional split proportion[2] (pc/h)	*149*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*18.2*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*24.3*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*42.6*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.07*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*57*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*206*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*1.6*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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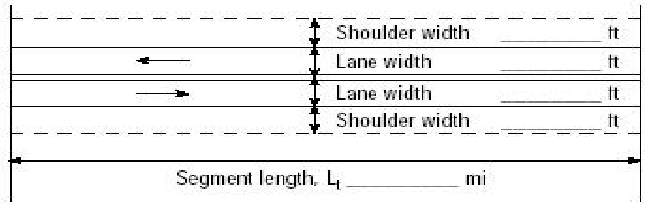
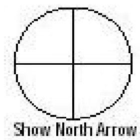
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*Dancyville Road*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*169* veh/h
Directional split	*56 / 44*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.986*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*190*
v_p * highest directional split proportion[2] (pc/h)	*106*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0* *mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3* *mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5* *mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2* *mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.3*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*36.4*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.998*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*188*
v_p * highest directional split proportion[2] (pc/h)	*105*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*15.2*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*22.9*
Percent time-spent-following, PTSF(%)=BPTSF+f $_{d/np}$	*38.2*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*A*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.06*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*47*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*169*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*1.3*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

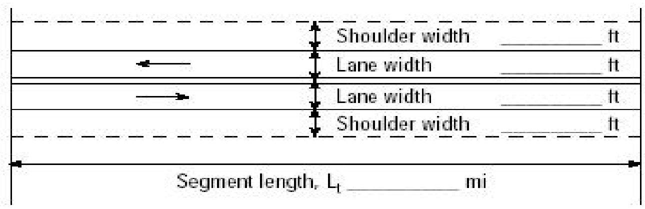
 HCS+™ Version 5.4 Generated: 4/20/2011 11:01 AM

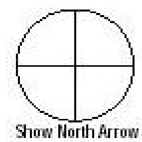
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*Dancyville Road*
Agency or Company	*TDOT/TranSystems*	From/To	*South of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2014*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*212* veh/h
Directional split	*61 / 39*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.986*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*239*
v_p * highest directional split proportion[2] (pc/h)	*146*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0* *mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3* *mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5* *mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2* *mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.7*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*35.7*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.998*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*236*
v_p * highest directional split proportion[2] (pc/h)	*144*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*18.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*23.6*
Percent time-spent-following, PTSF(%)=BPTSF+f $_{d/np}$	*42.3*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.07*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*59*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*212*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*1.7*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

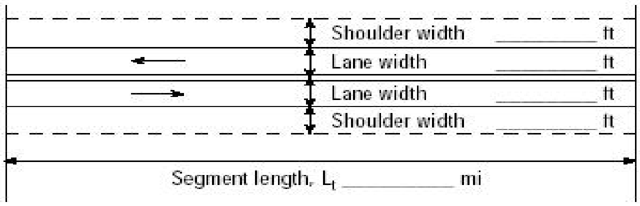
 HCS+™ Version 5.4 Generated: 4/20/2011 11:02 AM

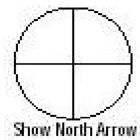
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*Dancyville Road*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*250* veh/h
Directional split	*54 / 46*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.986*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*282*
v_p * highest directional split proportion[2] (pc/h)	*152*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0* *mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3* *mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5* *mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2* *mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.9*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*35.1*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.998*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*278*
v_p * highest directional split proportion[2] (pc/h)	*150*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*21.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*23.0*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*44.7*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.09*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*69*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*250*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*2.0*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

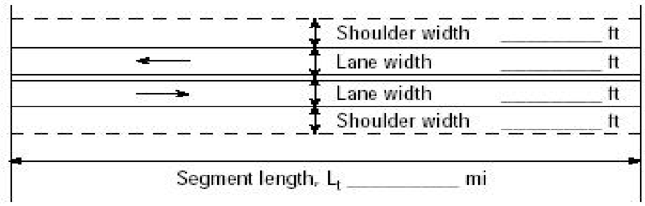
 HCS+[TM] Version 5.4 Generated: 4/20/2011 11:03 AM

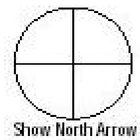
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*Dancyville Road*
Agency or Company	*TDOT/TranSystems*	From/To	*South of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*263* veh/h
Directional split	*65 / 35*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*2* %
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.986*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*296*
v_p * highest directional split proportion[2] (pc/h)	*192*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0* *mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3* *mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5* *mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2* *mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.0*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*34.9*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	*0.998*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*293*
v_p * highest directional split proportion[2] (pc/h)	*190*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*22.7*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*23.7*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*46.4*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.09*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*73*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*263*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*2.1*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

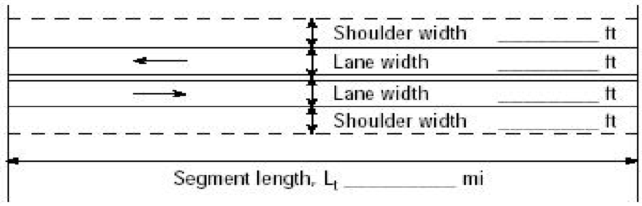
 HCS+™ Version 5.4 Generated: 4/20/2011 11:04 AM

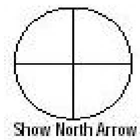
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*Dancyville Road*
Agency or Company	*TDOT/TranSystems*	From/To	*North of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	*210* veh/h
Directional split	*54 / 46*
Peak-hour factor, PHF	*0.90*
No-passing zone	*100*
% Trucks and Buses , P_T	*2 %*
% Recreational vehicles, P_R	*0%*
Access points/ *mi*	*10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.986*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*237*
v_p * highest directional split proportion[2] (pc/h)	*128*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Field Measured speed, S_{FM}	*mi/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Observed volume, V_f	*veh/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*3.7*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*35.7*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.998*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*234*
v_p * highest directional split proportion[2] (pc/h)	*126*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*18.6*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*22.8*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*41.4*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.07*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*58*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*210*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*1.6*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

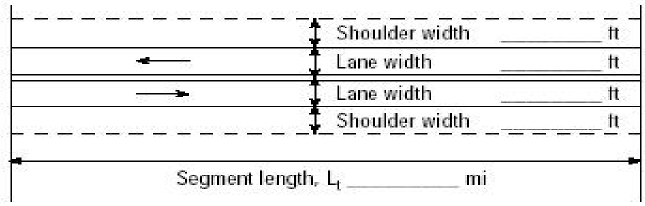
 HCS+™ Version 5.4 Generated: 4/20/2011 11:05 AM

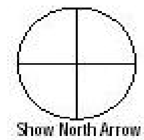
TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*SKB*	Highway	*Dancyville Road*
Agency or Company	*TDOT/TranSystems*	From/To	*South of I-40*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*2034*

Project Description: *Existing Conditions*

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume *273* veh/h
Directional split *60 / 40*
Peak-hour factor, PHF *0.90*
No-passing zone *100*
% Trucks and Buses , P_T *2 %*
% Recreational vehicles, P_R *0%*
Access points/ *mi* *10*

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.986*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*308*
v_p * highest directional split proportion[2] (pc/h)	*185*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	*mi/h*	Base free-flow speed, $BFFS_{FM}$	*45.0 mi/h*
Observed volume, V_f	*veh/h*	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	*1.3 mi/h*
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	*mi/h*	Adj. for access points, f_A (Exhibit 20-6)	*2.5 mi/h*
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*41.2 mi/h*

Adj. for no-passing zones, f_{np} (*mi/h*) (Exhibit 20-11)	*4.0*
Average travel speed, ATS (*mi/h*) ATS=FFS-0.00776v_p-f_{np}	*34.8*

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	*1.00*
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	*1.0*
Heavy-vehicle adjustment factor, f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	*0.998*
Two-way flow rate[1], v_p (pc/h)=V/ (PHF * f_G * f_{HV})	*304*
v_p * highest directional split proportion[2] (pc/h)	*182*
Base percent time-spent-following, BPTSF(%)=100(1-$e^{-0.000879v_p}$)	*23.4*
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	*22.9*
Percent time-spent-following, PTSF(%)=BPTSF+$f_{d/np}$	*46.4*

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	*B*
Volume to capacity ratio, v/c=V_p/ 3,200	*0.10*
Peak 15-min veh-miles of travel, VMT_{15} (veh- *mi*)= 0.25L_t(V/PHF)	*76*
Peak-hour vehicle-miles of travel, VMT_{60}(veh- *mi*)=V*L_t	*273*
Peak 15-min total travel time, TT_{15}(veh-h)= VMT_{15}/ATS	*2.2*

Notes

1. If Vp >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split Vp>= 1,700 pc/h, terminated anlysis-the LOS is F.

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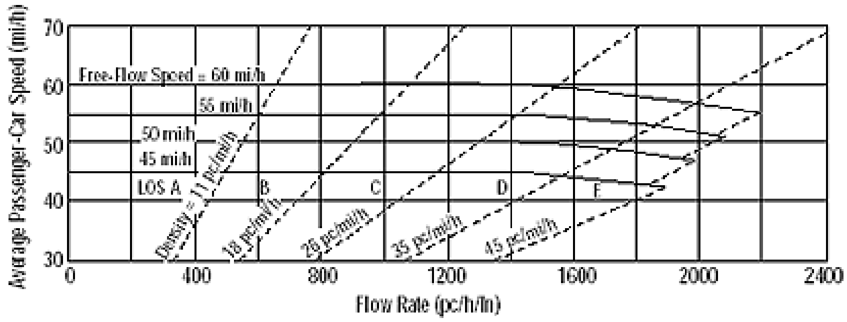
Multilane Segments

Highway Capacity Software Computer Printouts

MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	North of I-40
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	972	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	567
Speed, S (mi/h)	45.0
D (pc/mi/ln)	12.6
LOS	B

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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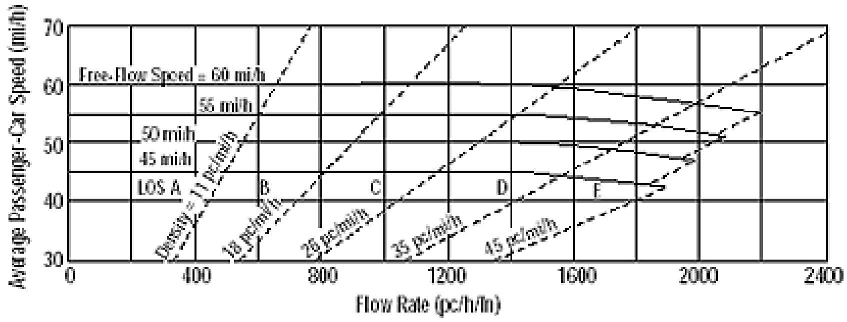
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	North of I-40
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	513	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	299
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.6
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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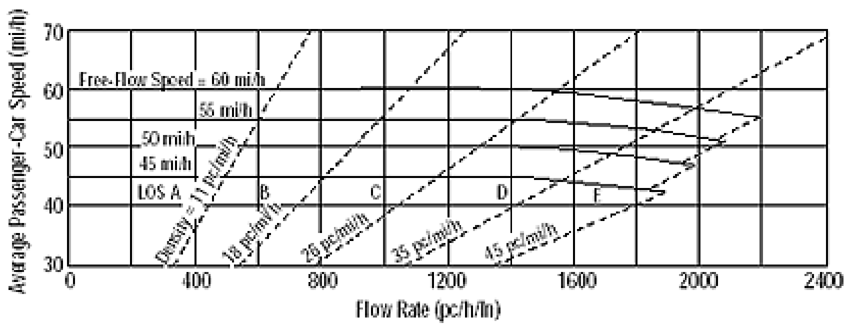
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	I-40 to Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2014

Project Description   Proposed Conditions

☑ Oper.(LOS)   ☐ Des. (N)   ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	331	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	25
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.889

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	206
Speed, S (mi/h)	45.0
D (pc/mi/ln)	4.6
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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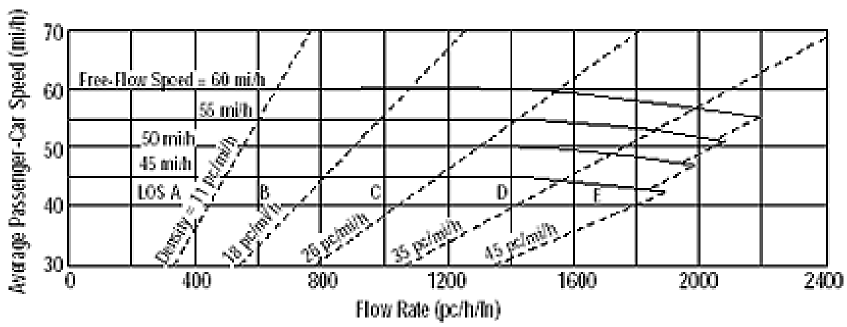
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	I-40 to Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	342	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	25
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.889

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	213
Speed, S (mi/h)	45.0
D (pc/mi/ln)	4.7
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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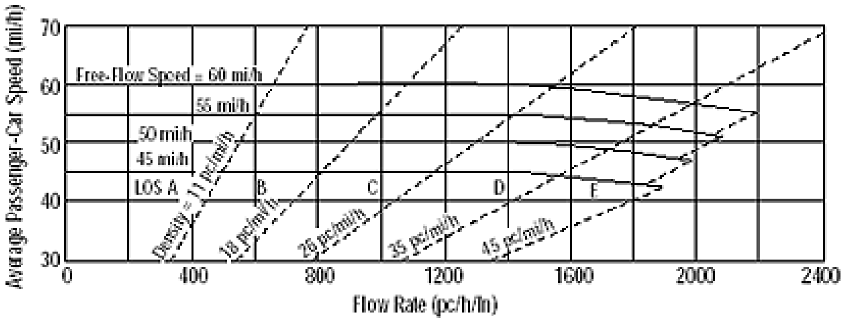
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	South of Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	205	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	115
Speed, S (mi/h)	45.0
D (pc/mi/ln)	2.6
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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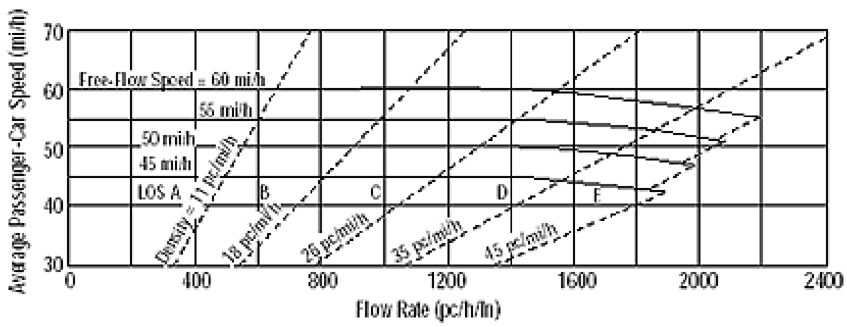
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	South of Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	257	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	144
Speed, S (mi/h)	45.0
D (pc/mi/ln)	3.2
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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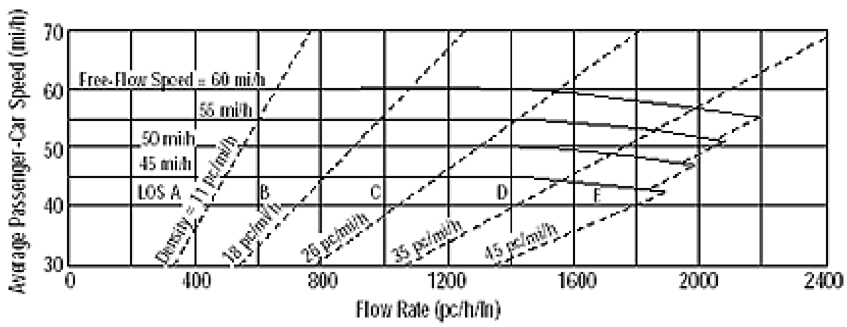
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	North of I-40
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	527	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	307
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.8
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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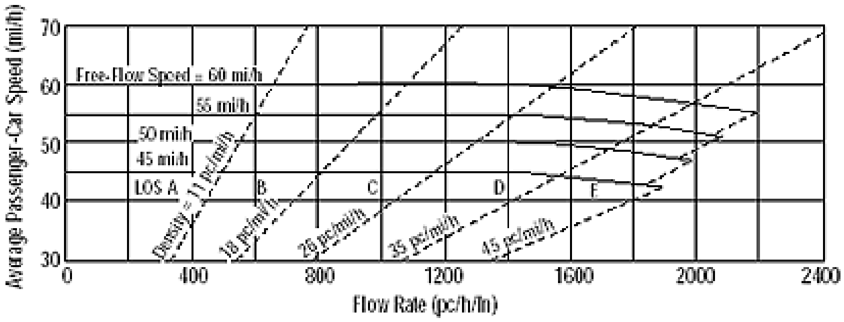
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	North of I-40
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	800	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	466
Speed, S (mi/h)	45.0
D (pc/mi/ln)	10.4
LOS	A

Design

Design (N)

Required Number of Lanes, N

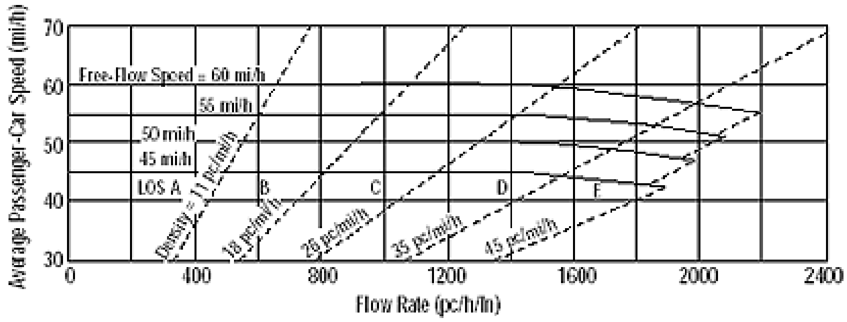
Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

 HCS+™ Version 5.4 Generated: 4/20/2011 11:25 AM

MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	I-40 to Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	382	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	25
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.889

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	238
Speed, S (mi/h)	45.0
D (pc/mi/ln)	5.3
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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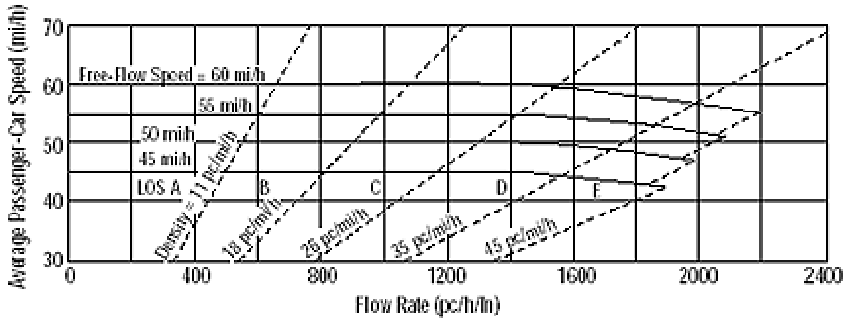
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	I-40 to Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	285	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	25
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.889

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	178
Speed, S (mi/h)	45.0
D (pc/mi/ln)	4.0
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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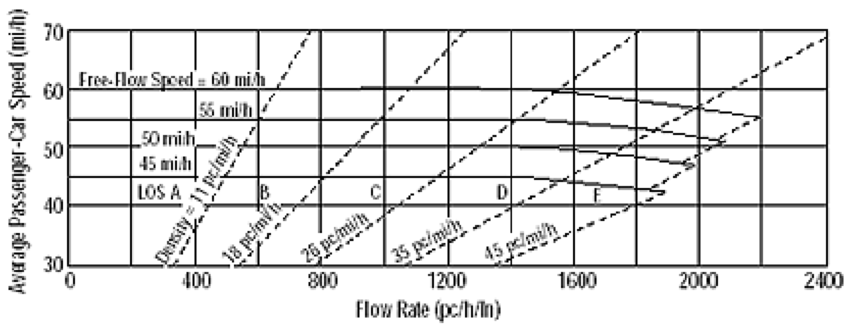
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	South of Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	266	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	149
Speed, S (mi/h)	45.0
D (pc/mi/ln)	3.3
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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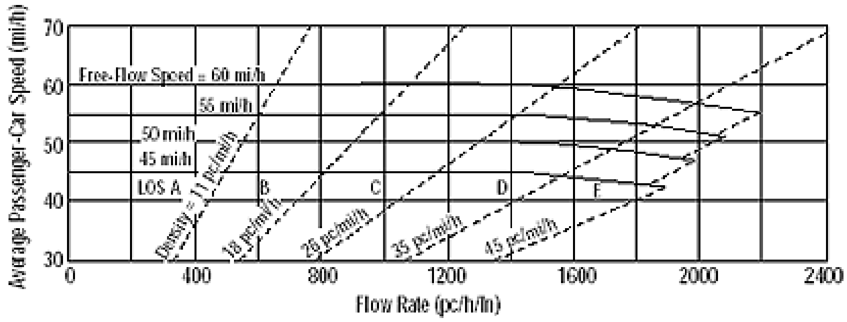
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	South of Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2014

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	134	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	75
Speed, S (mi/h)	45.0
D (pc/mi/ln)	1.7
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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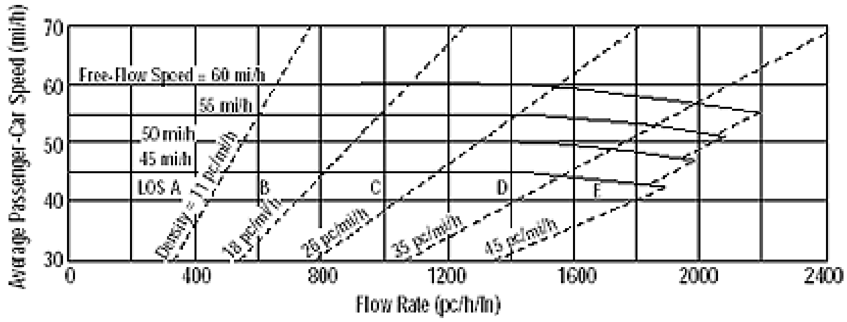
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	North of I-40
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	956	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	557
Speed, S (mi/h)	45.0
D (pc/mi/ln)	12.4
LOS	B

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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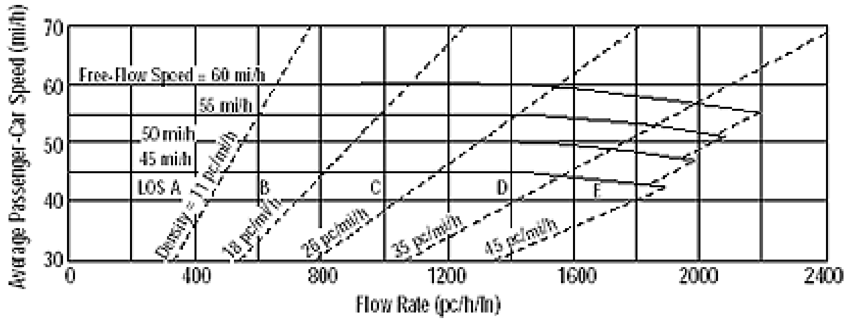
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	North of I-40
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	547	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	319
Speed, S (mi/h)	45.0
D (pc/mi/ln)	7.1
LOS	A

Design

Design (N)

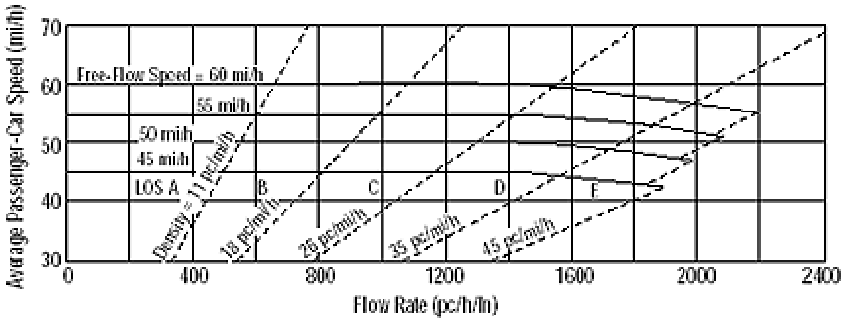
Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	I-40 to Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	377	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	25
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.889

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	235
Speed, S (mi/h)	45.0
D (pc/mi/ln)	5.2
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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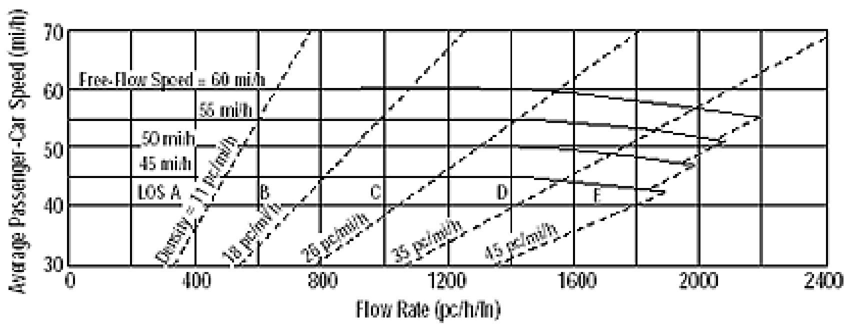
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	I-40 to Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	414	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	25
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.889

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

<u>Operational (LOS)</u>

Flow Rate, v_p (pc/h/ln)	258
Speed, S (mi/h)	45.0
D (pc/mi/ln)	5.7
LOS	A

Design

<u>Design (N)</u>

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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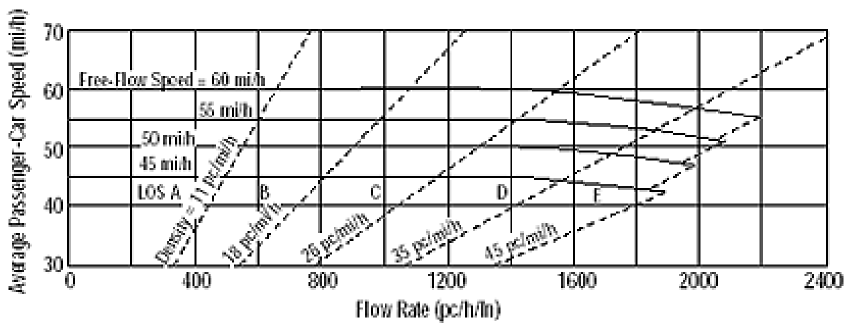
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	South of Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	229	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	129
Speed, S (mi/h)	45.0
D (pc/mi/ln)	2.9
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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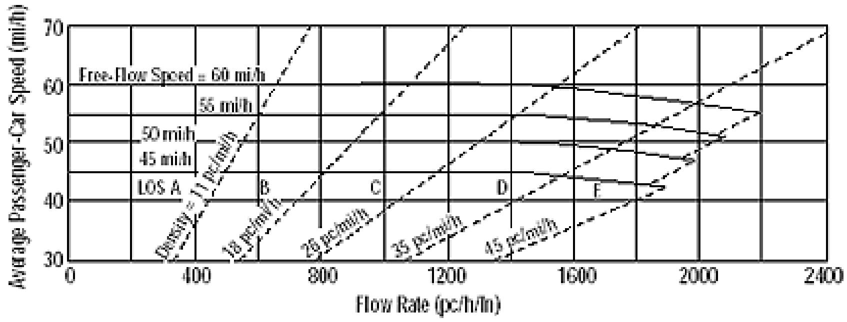
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	AM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	South of Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	315	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	177
Speed, S (mi/h)	45.0
D (pc/mi/ln)	3.9
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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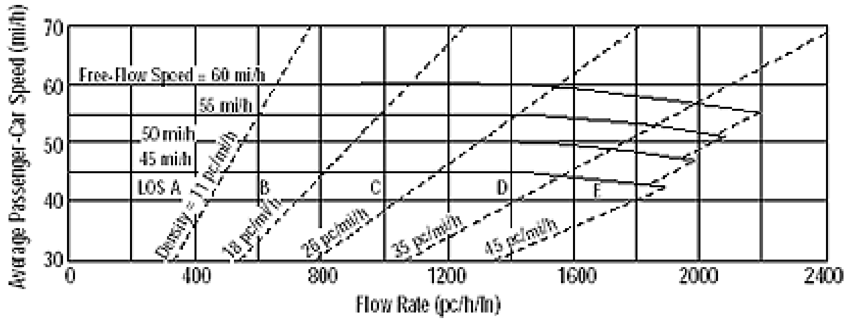
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	North of I-40
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	521	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	303
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.7
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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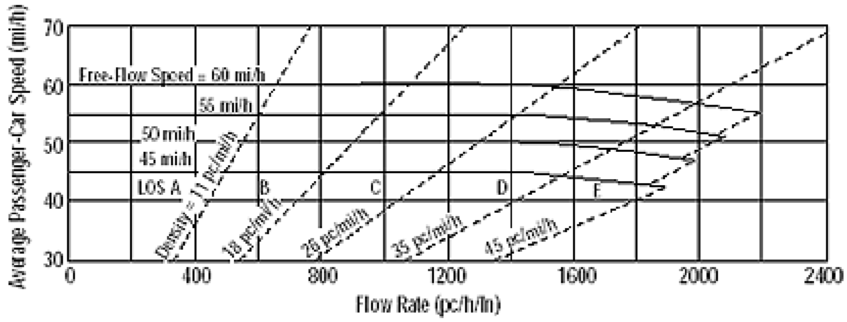
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	North of I-40
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	822	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	10
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.952

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	479
Speed, S (mi/h)	45.0
D (pc/mi/ln)	10.6
LOS	A

Design

Design (N)

Required Number of Lanes, N	
Flow Rate, v_p (pc/h)	
Max Service Flow Rate (pc/h/ln)	
Design LOS	

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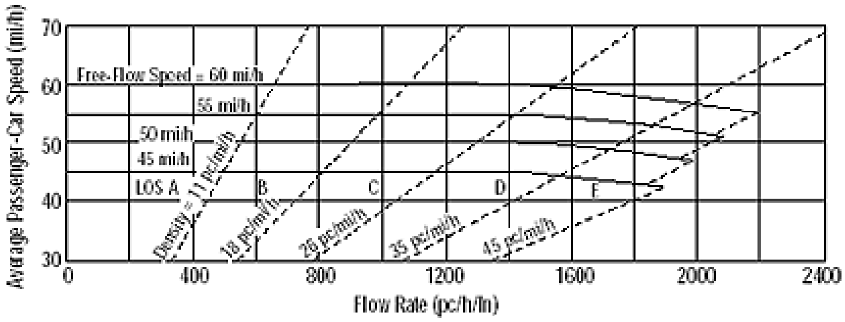
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	I-40 to Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	434	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	25
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.889

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	271
Speed, S (mi/h)	45.0
D (pc/mi/ln)	6.0
LOS	A

Design

Design (N)

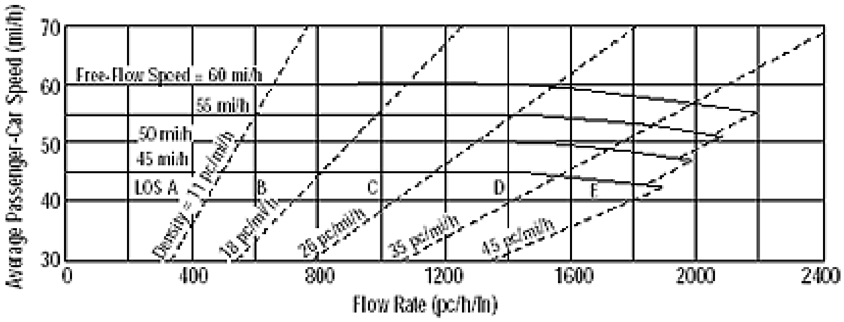
Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	I-40 to Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	381	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	25
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.889

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	238
Speed, S (mi/h)	45.0
D (pc/mi/ln)	5.3
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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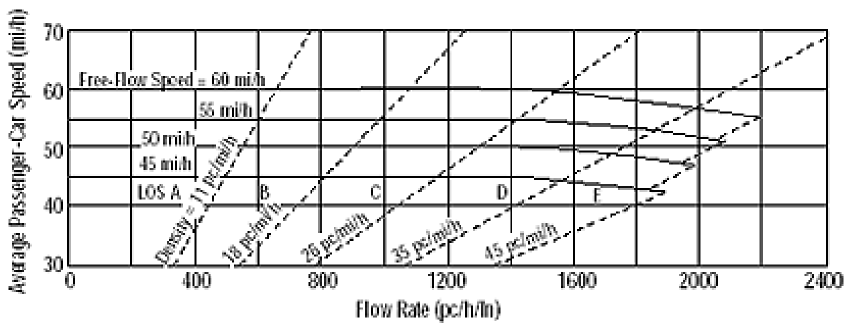
MULTILANE HIGHWAYS WORKSHEET(Direction 1)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	South of Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	297	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	167
Speed, S (mi/h)	45.0
D (pc/mi/ln)	3.7
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

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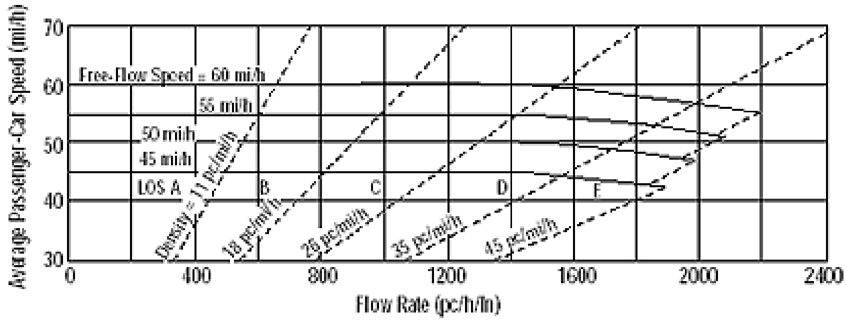
MULTILANE HIGHWAYS WORKSHEET(Direction 2)



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	SKB
Agency or Company	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Hour

Site Information

Highway/Direction to Travel	SR 222
From/To	South of Pilot Dwy.
Jurisdiction	Fayette County
Analysis Year	2034

Project Description Proposed Conditions

☑ Oper.(LOS) ☐ Des. (N) ☐ Plan. (vp)

Flow Inputs

Volume, V (veh/h)	203	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P_T	3
Peak-Hour Prop of AADT (veh/d)		%RVs, P_R	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	f_{HV}	0.985

Speed Inputs

Lane Width, LW (ft)	12.0
Total Lateral Clearance, LC (ft)	12.0
Access Points, A (A/mi)	0
Median Type, M	
FFS (measured)	45.0
Base Free-Flow Speed, BFFS	

Calc Speed Adj and FFS

f_{LW} (mi/h)	
f_{LC} (mi/h)	
f_A (mi/h)	
f_M (mi/h)	
FFS (mi/h)	45.0

Operations

Operational (LOS)

Flow Rate, v_p (pc/h/ln)	114
Speed, S (mi/h)	45.0
D (pc/mi/ln)	2.5
LOS	A

Design

Design (N)

Required Number of Lanes, N

Flow Rate, v_p (pc/h)

Max Service Flow Rate (pc/h/ln)

Design LOS

Unsignalized Intersections

Highway Capacity Software Computer Printouts

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 59 @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions*	
East/West Street: *I-40 EB Ramps*	North/South Street: *SR 59*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*154*	*101*	*100*	*68*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*171*	*112*	*111*	*75*	*0*
Percent Heavy Vehicles	*0*	*--*	*--*	*3*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*90*		*94*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*100*	*0*	*104*	*0*	*0*	*0*
Percent Heavy Vehicles	*3*	*0*	*3*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*111*					*204*	
C (m) (veh/h)		*1274*					*638*	
v/c		*0.09*					*0.32*	
95% queue length		*0.29*					*1.38*	
Control Delay (s/veh)		*8.1*					*13.3*	
LOS		*A*					*B*	
Approach Delay (s/veh)	--	--					*13.3*	
Approach LOS	--	--					*B*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SKB	Intersection	SR 59 @ I-40 EB Ramps
Agency/Co.	TDOT/TranSystems	Jurisdiction	Fayette County
Date Performed	04/18/2011	Analysis Year	2014
Analysis Time Period	PM Peak Period		

Project Description *Existing Conditions*

East/West Street: *I-40 EB Ramps* | North/South Street: *SR 59*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		100	79	77	97	
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	111	87	85	107	0
Percent Heavy Vehicles	0	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	117		122			
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	130	0	135	0	0	0
Percent Heavy Vehicles	3	0	3	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT					LR	
v (veh/h)		85					265	
C (m) (veh/h)		1369					693	
v/c		0.06					0.38	
95% queue length		0.20					1.80	
Control Delay (s/veh)		7.8					13.4	
LOS		A					B	
Approach Delay (s/veh)	--	--				13.4		
Approach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 59 @ I-40 WB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions*

East/West Street: *I-40 EB Ramps* | North/South Street: *SR 59*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*140*	*104*			*104*	*134*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*155*	*115*	*0*	*0*	*115*	*148*
Percent Heavy Vehicles	*3*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*64*		*62*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*71*	*0*	*68*
Percent Heavy Vehicles	*3*	*0*	*3*	*3*	*0*	*3*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*155*			*139*				
C (m) (veh/h)	*1295*			*555*				
v/c	*0.12*			*0.25*				
95% queue length	*0.41*			*0.98*				
Control Delay (s/veh)	*8.2*			*13.6*				
LOS	*A*			*B*				
Approach Delay (s/veh)	--	--	*13.6*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 59 @ I-40 WB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*PM Peak Period*		

Project Description *Existing Conditions*	
East/West Street: *I-40 EB Ramps*	North/South Street: *SR 59*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*91*	*126*			*82*	*86*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*101*	*140*	*0*	*0*	*91*	*95*
Percent Heavy Vehicles	*3*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*92*		*90*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*102*	*0*	*100*
Percent Heavy Vehicles	*3*	*0*	*3*	*3*	*0*	*3*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*101*			*202*				
C (m) (veh/h)	*1382*			*645*				
v/c	*0.07*			*0.31*				
95% queue length	*0.24*			*1.34*				
Control Delay (s/veh)	*7.8*			*13.1*				
LOS	*A*			*B*				
Approach Delay (s/veh)	--	--	*13.1*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 59 @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2034*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions*

East/West Street: *I-40 EB Ramps*	North/South Street: *SR 59*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*229*	*119*	*118*	*87*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*254*	*132*	*131*	*96*	*0*
Percent Heavy Vehicles	*0*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*134*		*140*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*148*	*0*	*155*	*0*	*0*	*0*
Percent Heavy Vehicles	*3*	*0*	*3*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*131*					*303*	
C (m) (veh/h)		*1167*					*538*	
v/c		*0.11*					*0.56*	
95% queue length		*0.38*					*3.46*	
Control Delay (s/veh)		*8.5*					*20.0*	
LOS		*A*					*C*	
Approach Delay (s/veh)	--	--				*20.0*		
Approach LOS	--	--				*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SKB*
Agency/Co.	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Intersection	*SR 59 @ I-40 EB Ramps*
Jurisdiction	*Fayette County*
Analysis Year	*2034*

Project Description *Existing Conditions*

East/West Street: *I-40 EB Ramps*	North/South Street: *SR 59*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*149*	*103*	*101*	*116*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*165*	*114*	*112*	*128*	*0*
Percent Heavy Vehicles	*0*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*174*		*181*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*193*	*0*	*201*	*0*	*0*	*0*
Percent Heavy Vehicles	*3*	*0*	*3*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*112*					*394*	
C (m) (veh/h)		*1278*					*597*	
v/c		*0.09*					*0.66*	
95% queue length		*0.29*					*4.88*	
Control Delay (s/veh)		*8.1*					*22.0*	
LOS		*A*					*C*	
Approach Delay (s/veh)	--	--					*22.0*	
Approach LOS	--	--					*C*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 59 @ I-40 WB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2034*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions*	
East/West Street: *I-40 EB Ramps*	North/South Street: *SR 59*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*209*	*154*			*124*	*199*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*232*	*171*	*0*	*0*	*137*	*221*
Percent Heavy Vehicles	*3*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*81*		*78*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*90*	*0*	*86*
Percent Heavy Vehicles	*3*	*0*	*3*	*3*	*0*	*3*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*232*			*176*				
C (m) (veh/h)	*1195*			*388*				
v/c	*0.19*			*0.45*				
95% queue length	*0.72*			*2.29*				
Control Delay (s/veh)	*8.7*			*21.8*				
LOS	*A*			*C*				
Approach Delay (s/veh)	--	--	*21.8*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 59 @ I-40 WB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2034*
Analysis Time Period	*PM Peak Period*		

Project Description *Existing Conditions*	
East/West Street: *I-40 EB Ramps*	North/South Street: *SR 59*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*135*	*188*			*108*	*128*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*150*	*208*	*0*	*0*	*120*	*142*
Percent Heavy Vehicles	*3*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*109*		*107*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*121*	*0*	*118*
Percent Heavy Vehicles	*3*	*0*	*3*	*3*	*0*	*3*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*150*			*239*				
C (m) (veh/h)	*1296*			*498*				
v/c	*0.12*			*0.48*				
95% queue length	*0.39*			*2.57*				
Control Delay (s/veh)	*8.1*			*18.7*				
LOS	*A*			*C*				
Approach Delay (s/veh)	--	--	*18.7*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ Pilot Dwy.*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions (No Build)*	
East/West Street: *Pilot Dwy.*	North/South Street: *SR 222*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*196*	*9*	*90*	*252*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*217*	*10*	*100*	*280*	*0*
Percent Heavy Vehicles	*0*	*--*	*--*	*25*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*5*		*135*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*5*	*0*	*150*
Percent Heavy Vehicles	*3*	*0*	*3*	*25*	*0*	*25*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*100*		*155*				
C (m) (veh/h)		*1217*		*734*				
v/c		*0.08*		*0.21*				
95% queue length		*0.27*		*0.79*				
Control Delay (s/veh)		*8.2*		*11.2*				
LOS		*A*		*B*				
Approach Delay (s/veh)	*--*	*--*	*11.2*					
Approach LOS	*--*	*--*	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	SKB	Intersection	SR 222 @ Pilot Dwy.
Agency/Co.	TDOT/TranSystems	Jurisdiction	Fayette County
Date Performed	04/18/2011	Analysis Year	2014
Analysis Time Period	PM Peak Period		

Project Description *Existing Conditions (No Build)*

East/West Street: *Pilot Dwy.* North/South Street: *SR 222*

Intersection Orientation: *North-South* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		255	11	153	132	
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	283	12	170	146	0
Percent Heavy Vehicles	0	--	--	25	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				2		127
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	2	0	141
Percent Heavy Vehicles	3	0	3	25	0	25
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		170		143				
C (m) (veh/h)		1146		685				
v/c		0.15		0.21				
95% queue length		0.52		0.78				
Control Delay (s/veh)		8.7		11.6				
LOS		A		B				
Approach Delay (s/veh)	--	--	11.6					
Approach LOS	--	--	B					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions (No Build)*	
East/West Street: *I-40 EB Ramps*	North/South Street: *SR 222*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*217*	*114*	*118*	*208*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*241*	*126*	*131*	*231*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*581*		*134*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*645*	*0*	*148*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*25*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*131*					*793*	
C (m) (veh/h)		*1149*					*344*	
v/c		*0.11*					*2.31*	
95% queue length		*0.38*					*61.00*	
Control Delay (s/veh)		*8.5*					*620.8*	
LOS		*A*					*F*	
Approach Delay (s/veh)	--	--				*620.8*		
Approach LOS	--	--				*F*		

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TWO-WAY STOP CONTROL SUMMARY			
General Information		**Site Information**	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*PM Peak Period*		
Project Description *Existing Conditions (No Build)*			
East/West Street: *I-40 EB Ramps*		North/South Street: *SR 222*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*240*	*142*	*225*	*159*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*266*	*157*	*250*	*176*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*271*		*126*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*301*	*0*	*140*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*25*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*250*					*441*	
C (m) (veh/h)		*1095*					*257*	
v/c		*0.23*					*1.72*	
95% queue length		*0.88*					*28.75*	
Control Delay (s/veh)		*9.3*					*371.8*	
LOS		*A*					*F*	
Approach Delay (s/veh)	--	--				*371.8*		
Approach LOS	--	--				*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SKB*
Agency/Co.	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Intersection	*SR 222 @ I-40 WB Ramps*
Jurisdiction	*Fayette County*
Analysis Year	*2014*

Project Description *Existing Conditions (No Build)*

East/West Street: *I-40 EB Ramps* | North/South Street: *SR 222*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*83*	*715*			*209*	*304*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*92*	*794*	*0*	*0*	*232*	*337*
Percent Heavy Vehicles	*25*	*--*	*--*	*3*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*117*		*257*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*130*	*0*	*285*
Percent Heavy Vehicles	*3*	*0*	*3*	*25*	*0*	*10*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*92*			*415*				
C (m) (veh/h)	*899*			*233*				
v/c	*0.10*			*1.78*				
95% queue length	*0.34*			*28.26*				
Control Delay (s/veh)	*9.5*			*404.2*				
LOS	*A*			*F*				
Approach Delay (s/veh)	--	--		*404.2*				
Approach LOS	--	--		*F*				

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 WB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*PM Peak Period*		

Project Description *Existing Conditions (No Build)*

East/West Street: *I-40 EB Ramps*	North/South Street: *SR 222*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*106*	*405*			*286*	*514*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*117*	*450*	*0*	*0*	*317*	*571*
Percent Heavy Vehicles	*25*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*98*		*122*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*108*	*0*	*135*
Percent Heavy Vehicles	*3*	*0*	*3*	*25*	*0*	*10*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*117*			*243*				
C (m) (veh/h)	*675*			*236*				
v/c	*0.17*			*1.03*				
95% queue length	*0.62*			*9.99*				
Control Delay (s/veh)	*11.4*			*111.3*				
LOS	*B*			*F*				
Approach Delay (s/veh)	--	--	*111.3*					
Approach LOS	--	--	*F*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ Pilot Dwy.*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2034*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions (No Build)*

East/West Street: *Pilot Dwy.*	North/South Street: *SR 222*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*218*	*11*	*105*	*309*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*242*	*12*	*116*	*343*	*0*
Percent Heavy Vehicles	*0*	--	--	*25*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*6*		*159*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*6*	*0*	*176*
Percent Heavy Vehicles	*3*	*0*	*3*	*25*	*0*	*25*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*116*		*182*				
C (m) (veh/h)		*1188*		*701*				
v/c		*0.10*		*0.26*				
95% queue length		*0.32*		*1.04*				
Control Delay (s/veh)		*8.4*		*11.9*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*11.9*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ Pilot Dwy.*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2034*
Analysis Time Period	*PM Peak Period*		

Project Description *Existing Conditions (No Build)*	
East/West Street: *Pilot Dwy.*	North/South Street: *SR 222*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*284*	*13*	*200*	*181*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*315*	*14*	*222*	*201*	*0*
Percent Heavy Vehicles	*0*	--	--	*25*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*3*		*150*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*3*	*0*	*166*
Percent Heavy Vehicles	*3*	*0*	*3*	*25*	*0*	*25*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*222*		*169*				
C (m) (veh/h)		*1112*		*643*				
v/c		*0.20*		*0.26*				
95% queue length		*0.74*		*1.05*				
Control Delay (s/veh)		*9.0*		*12.6*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--	*12.6*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2034*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions (No Build)*	
East/West Street: *I-40 EB Ramps*	North/South Street: *SR 222*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*222*	*155*	*120*	*246*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*246*	*172*	*133*	*273*	*0*
Percent Heavy Vehicles	*0*	*--*	*--*	*10*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*586*		*168*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*651*	*0*	*186*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*25*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*133*					*837*	
C (m) (veh/h)		*1099*					*316*	
v/c		*0.12*					*2.65*	
95% queue length		*0.41*					*69.63*	
Control Delay (s/veh)		*8.7*					*776.2*	
LOS		*A*					*F*	
Approach Delay (s/veh)	--	--				*776.2*		
Approach LOS	--	--				*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2034*
Analysis Time Period	*PM Peak Period*		

Project Description *Existing Conditions (No Build)*	
East/West Street: *I-40 EB Ramps*	North/South Street: *SR 222*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*250*	*184*	*226*	*208*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*277*	*204*	*251*	*231*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*276*		*173*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*306*	*0*	*192*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*25*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*251*					*498*	
C (m) (veh/h)		*1041*					*241*	
v/c		*0.24*					*2.07*	
95% queue length		*0.94*					*37.15*	
Control Delay (s/veh)		*9.6*					*527.2*	
LOS		*A*					*F*	
Approach Delay (s/veh)	--	--				*527.2*		
Approach LOS	--	--				*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SKB*
Agency/Co.	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Intersection	*SR 222 @ I-40 WB Ramps*
Jurisdiction	*Fayette County*
Analysis Year	*2034*

Project Description *Existing Conditions (No Build)*

East/West Street: *I-40 EB Ramps* | North/South Street: *SR 222*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*110*	*698*			*232*	*324*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*122*	*775*	*0*	*0*	*257*	*360*
Percent Heavy Vehicles	*25*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*143*		*258*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*158*	*0*	*286*
Percent Heavy Vehicles	*3*	*0*	*3*	*25*	*0*	*10*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*122*			*444*				
C (m) (veh/h)	*861*			*203*				
v/c	*0.14*			*2.19*				
95% queue length	*0.49*			*34.90*				
Control Delay (s/veh)	*9.9*			*587.9*				
LOS	*A*			*F*				
Approach Delay (s/veh)	--	--	*587.9*					
Approach LOS	--	--	*F*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	SKB
Agency/Co.	TDOT/TranSystems
Date Performed	04/18/2011
Analysis Time Period	PM Peak Period

Site Information

Intersection	SR 222 @ I-40 WB Ramps
Jurisdiction	Fayette County
Analysis Year	2034

Project Description *Existing Conditions (No Build)*

East/West Street: *I-40 EB Ramps* | North/South Street: *SR 222*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	130	396			302	520
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	144	440	0	0	335	577
Percent Heavy Vehicles	25	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				132		125
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR (veh/h)	0	0	0	146	0	138
Percent Heavy Vehicles	3	0	3	25	0	10
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LR				
v (veh/h)	144			284				
C (m) (veh/h)	660			191				
v/c	0.22			1.49				
95% queue length	0.83			17.66				
Control Delay (s/veh)	12.0			290.3				
LOS	B			F				
Approach Delay (s/veh)	--	--	290.3					
Approach LOS	--	--	F					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SKB*
Agency/Co.	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Intersection	*SR 222 @ I-40 EB Ramps*
Jurisdiction	*Fayette County*
Analysis Year	*2014*

Project Description *Traditional Diamond + SE Loop Ramp*

East/West Street: *I-40 EB Ramps*

North/South Street: *SR 222*

Intersection Orientation: *North-South*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*217*	*114*	*118*	*208*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*241*	*126*	*131*	*231*	*0*
Percent Heavy Vehicles	*0*	*--*	*--*	*10*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*	*TR*	*LT*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			*134*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*148*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*25*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*						*R*
v (veh/h)		*131*						*148*
C (m) (veh/h)		*1133*						*865*
v/c		*0.12*						*0.17*
95% queue length		*0.39*						*0.62*
Control Delay (s/veh)		*8.6*						*10.0*
LOS		*A*						*B*
Approach Delay (s/veh)	--	--				*10.0*		
Approach LOS	--	--				*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*PM Peak Period*		

Project Description *Traditional Diamond + SE Loop Ramp*	
East/West Street: *I-40 EB Ramps*	North/South Street: *SR 222*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*240*	*142*	*225*	*159*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*266*	*157*	*250*	*176*	*0*
Percent Heavy Vehicles	*0*	*--*	*--*	*10*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*	*TR*	*LT*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			*126*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*140*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*25*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*						*R*
v (veh/h)		*250*						*140*
C (m) (veh/h)		*1078*						*899*
v/c		*0.23*						*0.16*
95% queue length		*0.90*						*0.55*
Control Delay (s/veh)		*9.3*						*9.7*
LOS		*A*						*A*
Approach Delay (s/veh)	*--*	*--*				*9.7*		
Approach LOS	*--*	*--*				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Fayette County*
Date Performed	*04/18/2011*	Analysis Year	*2034*
Analysis Time Period	*AM Peak Period*		

Project Description *Traditional Diamond + SE Loop Ramp*	
East/West Street: *I-40 EB Ramps*	North/South Street: *SR 222*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*222*	*155*	*120*	*246*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*246*	*172*	*133*	*273*	*0*
Percent Heavy Vehicles	*0*	*--*	*--*	*10*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*	*TR*	*LT*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			*168*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*186*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*25*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*						*R*
v (veh/h)		*133*						*186*
C (m) (veh/h)		*1083*						*841*
v/c		*0.12*						*0.22*
95% queue length		*0.42*						*0.84*
Control Delay (s/veh)		*8.8*						*10.5*
LOS		*A*						*B*
Approach Delay (s/veh)	*--*	*--*				*10.5*		
Approach LOS	*--*	*--*				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SKB*
Agency/Co.	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Intersection	*SR 222 @ I-40 EB Ramps*
Jurisdiction	*Fayette County*
Analysis Year	*2034*

Project Description *Traditional Diamond + SE Loop Ramp*

East/West Street: *I-40 EB Ramps* | North/South Street: *SR 222*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*250*	*184*	*226*	*208*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*277*	*204*	*251*	*231*	*0*
Percent Heavy Vehicles	*0*	--	--	*10*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*	*TR*	*LT*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			*173*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*192*	*0*	*0*	*0*
Percent Heavy Vehicles	*10*	*0*	*25*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*						*R*
v (veh/h)		*251*						*192*
C (m) (veh/h)		*1023*						*865*
v/c		*0.25*						*0.22*
95% queue length		*0.97*						*0.85*
Control Delay (s/veh)		*9.7*						*10.3*
LOS		*A*						*B*
Approach Delay (s/veh)	--	--				*10.3*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*Dancyville Rd @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Haywood County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions*	
East/West Street: *I-40 EB Ramps*	North/South Street: *Dancyville Road*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*121*	*14*	*15*	*21*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*134*	*15*	*16*	*23*	*0*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*52*		*50*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*57*	*0*	*55*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*0*	*2*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*16*					*112*	
C (m) (veh/h)		*1432*					*896*	
v/c		*0.01*					*0.13*	
95% queue length		*0.03*					*0.43*	
Control Delay (s/veh)		*7.5*					*9.6*	
LOS		*A*					*A*	
Approach Delay (s/veh)	--	--				*9.6*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*Dancyville Rd @ I-40 EB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Haywood County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*PM Peak Period*		

Project Description *Existing Conditions*	
East/West Street: *I-40 EB Ramps*	North/South Street: *Dancyville Road*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*68*	*15*	*24*	*34*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*75*	*16*	*26*	*37*	*0*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*72*		*95*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*80*	*0*	*105*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*0*	*2*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*26*					*185*	
C (m) (veh/h)		*1504*					*921*	
v/c		*0.02*					*0.20*	
95% queue length		*0.05*					*0.75*	
Control Delay (s/veh)		*7.4*					*9.9*	
LOS		*A*					*A*	
Approach Delay (s/veh)	--	--				*9.9*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SKB*
Agency/Co.	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Intersection	*Dancyville Rd @ I-40 WB Ramps*
Jurisdiction	*Haywood County*
Analysis Year	*2014*

Project Description *Existing Conditions*

East/West Street: *I-40 EB Ramps*

North/South Street: *Dancyville Road*

Intersection Orientation: *North-South*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*104*	*69*			*16*	*95*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*115*	*76*	*0*	*0*	*17*	*105*
Percent Heavy Vehicles	*2*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*20*		*19*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*22*	*0*	*21*
Percent Heavy Vehicles	*3*	*0*	*3*	*2*	*0*	*2*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*115*			*43*				
C (m) (veh/h)	*1465*			*723*				
v/c	*0.08*			*0.06*				
95% queue length	*0.26*			*0.19*				
Control Delay (s/veh)	*7.7*			*10.3*				
LOS	*A*			*B*				
Approach Delay (s/veh)	--	--	*10.3*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*Dancyville Rd @ I-40 WB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Haywood County*
Date Performed	*04/18/2011*	Analysis Year	*2014*
Analysis Time Period	*PM Peak Period*		

Project Description *Existing Conditions*	
East/West Street: *I-40 EB Ramps*	North/South Street: *Dancyville Road*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*63*	*79*			*33*	*41*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*70*	*87*	*0*	*0*	*36*	*45*
Percent Heavy Vehicles	*2*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*25*		*16*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*27*	*0*	*17*
Percent Heavy Vehicles	*3*	*0*	*3*	*2*	*0*	*2*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*70*			*44*				
C (m) (veh/h)	*1517*			*763*				
v/c	*0.05*			*0.06*				
95% queue length	*0.15*			*0.18*				
Control Delay (s/veh)	*7.5*			*10.0*				
LOS	*A*			*B*				
Approach Delay (s/veh)	--	--	*10.0*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SKB*
Agency/Co.	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*AM Peak Period*

Site Information

Intersection	*Dancyville Rd @ I-40 EB Ramps*
Jurisdiction	*Haywood County*
Analysis Year	*2034*

Project Description *Existing Conditions*

East/West Street: *I-40 EB Ramps* | North/South Street: *Dancyville Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*149*	*21*	*22*	*32*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*165*	*23*	*24*	*35*	*0*
Percent Heavy Vehicles	*0*	*--*	*--*	*2*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*63*		*61*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*70*	*0*	*67*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*0*	*2*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*24*					*137*	
C (m) (veh/h)		*1386*					*845*	
v/c		*0.02*					*0.16*	
95% queue length		*0.05*					*0.58*	
Control Delay (s/veh)		*7.6*					*10.1*	
LOS		*A*					*B*	
Approach Delay (s/veh)	--	--				*10.1*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SKB*
Agency/Co.	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Intersection	*Dancyville Rd @ I-40 EB Ramps*
Jurisdiction	*Haywood County*
Analysis Year	*2034*

Project Description *Existing Conditions*

East/West Street: *I-40 EB Ramps* | North/South Street: *Dancyville Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*87*	*22*	*36*	*50*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*96*	*24*	*40*	*55*	*0*
Percent Heavy Vehicles	*0*	*--*	*--*	*2*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*83*		*114*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*92*	*0*	*126*	*0*	*0*	*0*
Percent Heavy Vehicles	*2*	*0*	*2*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LR*	
v (veh/h)		*40*					*218*	
C (m) (veh/h)		*1468*					*867*	
v/c		*0.03*					*0.25*	
95% queue length		*0.08*					*1.00*	
Control Delay (s/veh)		*7.5*					*10.5*	
LOS		*A*					*B*	
Approach Delay (s/veh)	--	--				*10.5*		
Approach LOS	--	--				*B*		

 HCS+™ Version 5.4 Generated: 4/20/2011 12:39 PM

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*SKB*	Intersection	*Dancyville Rd @ I-40 WB Ramps*
Agency/Co.	*TDOT/TranSystems*	Jurisdiction	*Haywood County*
Date Performed	*04/18/2011*	Analysis Year	*2034*
Analysis Time Period	*AM Peak Period*		

Project Description *Existing Conditions*

East/West Street: *I-40 EB Ramps* | North/South Street: *Dancyville Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*124*	*88*			*24*	*110*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*137*	*97*	*0*	*0*	*26*	*122*
Percent Heavy Vehicles	*2*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*30*		*28*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*33*	*0*	*31*
Percent Heavy Vehicles	*3*	*0*	*3*	*2*	*0*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*137*			*64*				
C (m) (veh/h)	*1434*			*657*				
v/c	*0.10*			*0.10*				
95% queue length	*0.32*			*0.32*				
Control Delay (s/veh)	*7.8*			*11.1*				
LOS	*A*			*B*				
Approach Delay (s/veh)	--	--		*11.1*				
Approach LOS	--	--		*B*				

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*SKB*
Agency/Co.	*TDOT/TranSystems*
Date Performed	*04/18/2011*
Analysis Time Period	*PM Peak Period*

Site Information

Intersection	*Dancyville Rd @ I-40 WB Ramps*
Jurisdiction	*Haywood County*
Analysis Year	*2034*

Project Description *Existing Conditions*

East/West Street: *I-40 EB Ramps* | North/South Street: *Dancyville Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*80*	*90*			*49*	*47*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*88*	*100*	*0*	*0*	*54*	*52*
Percent Heavy Vehicles	*2*	--	--	*3*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*37*		*24*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*41*	*0*	*26*
Percent Heavy Vehicles	*3*	*0*	*3*	*2*	*0*	*2*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LR*				
v (veh/h)	*88*			*67*				
C (m) (veh/h)	*1485*			*705*				
v/c	*0.06*			*0.10*				
95% queue length	*0.19*			*0.31*				
Control Delay (s/veh)	*7.6*			*10.6*				
LOS	*A*			*B*				
Approach Delay (s/veh)	--	--	*10.6*					
Approach LOS	--	--	*B*					

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Signalized Intersections

Highway Capacity Software
Computer Printouts

SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*AM Peak Period*	Analysis Year	*2014*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		1					2	1	1	2	
Lane Group	L		R					T	R	L	T	
Volume (vph)	581		134					217	114	118	208	
% Heavy Vehicles	10		48					48	48	10	10	
PHF	0.90		0.90					0.90	0.90	0.90	0.90	
Pretimed/Actuated (P/A)	A		A					A	A	A	A	
Startup Lost Time	2.0		2.0					2.0	2.0	2.0	2.0	
Extension of Effective Green	2.0		2.0					2.0	2.0	2.0	2.0	
Arrival Type	3		3					3	3	3	3	
Unit Extension	3.0		3.0					3.0	3.0	3.0	3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0		0	0	0	0	0	
Lane Width	12.0		12.0					12.0	12.0	12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0					0	0	0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *25.0*	G =	G =	G =	G = *8.0*	G = *23.0*	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *4*	Y = *5*	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *70.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	646		149					241	127	131	231	
Lane Group Capacity	1138		390					803	358	551	1645	
v/c Ratio	0.57		0.38					0.30	0.35	0.24	0.14	
Green Ratio	0.36		0.36					0.33	0.33	0.51	0.50	
Uniform Delay d_1	18.1		16.7					17.5	17.9	9.1	9.4	
Delay Factor k	0.16		0.11					0.11	0.11	0.11	0.11	
Incremental Delay d_2	0.7		0.6					0.2	0.6	0.2	0.0	
PF Factor	1.000		1.000					1.000	1.000	1.000	1.000	
Control Delay	18.8		17.4					17.7	18.5	9.3	9.5	
Lane Group LOS	B		B					B	B	A	A	
Approach Delay	18.5						18.0			9.4		
Approach LOS	B						B			A		
Intersection Delay	16.2			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Traditional Diamond*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	L		R					T	R	L	T	
Initial Queue/Lane	0.0		0.0					0.0	0.0	0.0	0.0	
Flow Rate/Lane Group	646		149					241	127	131	231	
Satflow/Lane	1641		1091					1283	1091	1071	1727	
Capacity/Lane Group	1138		390					803	358	551	1645	
Flow Ratio	0.2		0.1					0.1	0.1	0.1	0.1	
v/c Ratio	0.57		0.38					0.30	0.35	0.24	0.14	
I Factor	1.000		1.000					1.000	1.000	1.000	1.000	
Arrival Type	3		3					3	3	3	3	
Platoon Ratio	1.00		1.00					1.00	1.00	1.00	1.00	
PF Factor	1.00		1.00					1.00	1.00	1.00	1.00	
Q_1	5.2		2.2					1.8	1.9	1.3	1.3	
k_B	0.4		0.3					0.4	0.3	0.4	0.5	
Q_2	0.6		0.2					0.2	0.2	0.1	0.1	
Q Average	5.8		2.4					2.0	2.1	1.4	1.4	

Percentile Back of Queue (95th percentile)

$f_{B\%}$	1.9		2.0					2.0	2.0	2.1	2.1	
Back of Queue	11.2		4.8					4.0	4.2	2.9	2.8	

Queue Storage Ratio

Queue Spacing	25.0		25.0					25.0	25.0	25.0	25.0	
Queue Storage	0		0					0	0	0	0	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

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SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*PM Peak Period*	Analysis Year	*2014*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*2*		*1*					*2*	*1*	*1*	*2*	
Lane Group	*L*		*R*					*T*	*R*	*L*	*T*	
Volume (vph)	*271*		*126*					*240*	*142*	*225*	*159*	
% Heavy Vehicles	*10*		*48*					*48*	*48*	*10*	*10*	
PHF	*0.90*		*0.90*					*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed/Actuated (P/A)	*A*		*A*					*A*	*A*	*A*	*A*	
Startup Lost Time	*2.0*		*2.0*					*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green	*2.0*		*2.0*					*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type	*3*		*3*					*3*	*3*	*3*	*3*	
Unit Extension	*3.0*		*3.0*					*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Lane Width	*12.0*		*12.0*					*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*		*0*					*0*	*0*	*0*	*0*	
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	EB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *23.0*	G =	G =	G =	G = *8.0*	G = *25.0*	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *4*	Y = *5*	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *70.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*301*		*140*					*267*	*158*	*250*	*177*	
Lane Group Capacity	*1047*		*358*					*873*	*390*	*568*	*1738*	
v/c Ratio	*0.29*		*0.39*					*0.31*	*0.41*	*0.44*	*0.10*	
Green Ratio	*0.33*		*0.33*					*0.36*	*0.36*	*0.54*	*0.53*	
Uniform Delay d_1	*17.4*		*18.1*					*16.2*	*16.9*	*8.8*	*8.2*	
Delay Factor k	*0.11*		*0.11*					*0.11*	*0.11*	*0.11*	*0.11*	
Incremental Delay d_2	*0.2*		*0.7*					*0.2*	*0.7*	*0.5*	*0.0*	
PF Factor	*1.000*		*1.000*					*1.000*	*1.000*	*1.000*	*1.000*	
Control Delay	*17.6*		*18.8*					*16.4*	*17.6*	*9.3*	*8.2*	
Lane Group LOS	*B*		*B*					*B*	*B*	*A*	*A*	
Approach Delay	*18.0*						*16.9*			*8.9*		
Approach LOS	*B*						*B*			*A*		
Intersection Delay	*14.6*			Intersection LOS						*B*		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Traditional Diamond*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	L		R					T	R	L	T	
Initial Queue/Lane	0.0		0.0					0.0	0.0	0.0	0.0	
Flow Rate/Lane Group	301		140					267	158	250	177	
Satflow/Lane	1641		1091					1283	1091	1045	1727	
Capacity/Lane Group	1047		358					873	390	568	1738	
Flow Ratio	0.1		0.1					0.1	0.1	0.2	0.1	
v/c Ratio	0.29		0.39					0.31	0.41	0.44	0.10	
I Factor	1.000		1.000					1.000	1.000	1.000	1.000	
Arrival Type	3		3					3	3	3	3	
Platoon Ratio	1.00		1.00					1.00	1.00	1.00	1.00	
PF Factor	1.00		1.00					1.00	1.00	1.00	1.00	
Q_1	2.2		2.1					2.0	2.3	2.3	0.9	
k_B	0.4		0.3					0.4	0.3	0.4	0.6	
Q_2	0.2		0.2					0.2	0.2	0.3	0.1	
Q Average	2.4		2.3					2.1	2.5	2.7	1.0	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	2.0		2.0					2.0	2.0	2.0	2.1	
Back of Queue	4.8		4.7					4.3	5.1	5.4	2.0	
Queue Storage Ratio												
Queue Spacing	25.0		25.0					25.0	25.0	25.0	25.0	
Queue Storage	0		0					0	0	0	0	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

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SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 WB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*AM Peak Period*	Analysis Year	*2014*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes				1		1	1	2			2	1
Lane Group				L		R	L	T			T	R
Volume (vph)				117		257	83	715			209	304
% Heavy Vehicles				48		10	48	48			10	10
PHF				0.90		0.90	0.90	0.90			0.90	0.90
Pretimed/Actuated (P/A)				A		A	A	A			A	A
Startup Lost Time				2.0		2.0	2.0	2.0			2.0	2.0
Extension of Effective Green				2.0		2.0	2.0	2.0			2.0	2.0
Arrival Type				3		3	3	3			3	3
Unit Extension				3.0		3.0	3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0		0	0	0
Lane Width				12.0		12.0	12.0	12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour				0		0	0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	WB Only	02	03	04	NB Only	NS Perm	07	08
Timing	G = 23.0	G =	G =	G =	G = 8.0	G = 25.0	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 70.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate				130		286	92	794			232	338
Lane Group Capacity				401		482	437	1292			1175	524
v/c Ratio				0.32		0.59	0.21	0.61			0.20	0.65
Green Ratio				0.33		0.33	0.54	0.53			0.36	0.36
Uniform Delay d_1				17.7		19.6	8.0	11.5			15.6	18.8
Delay Factor k				0.11		0.18	0.11	0.20			0.11	0.22
Incremental Delay d_2				0.5		2.0	0.2	0.9			0.1	2.7
PF Factor				1.000		1.000	1.000	1.000			1.000	1.000
Control Delay				18.1		21.6	8.2	12.4			15.6	21.5
Lane Group LOS				B		C	A	B			B	C
Approach Delay				20.5			12.0			19.1		
Approach LOS				C			B			B		
Intersection Delay	16.0			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Traditional Diamond*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group				*L*		*R*	*L*	*T*			*T*	*R*
Initial Queue/Lane				*0.0*		*0.0*	*0.0*	*0.0*			*0.0*	*0.0*
Flow Rate/Lane Group				*130*		*286*	*92*	*794*			*232*	*338*
Satflow/Lane				*1220*		*1468*	*806*	*1283*			*1727*	*1468*
Capacity/Lane Group				*401*		*482*	*437*	*1292*			*1175*	*524*
Flow Ratio				*0.1*		*0.2*	*0.1*	*0.3*			0.1	*0.2*
v/c Ratio				*0.32*		*0.59*	*0.21*	*0.61*			*0.20*	*0.65*
I Factor				*1.000*		*1.000*	*1.000*	*1.000*			*1.000*	*1.000*
Arrival Type				*3*		*3*	*3*	*3*			*3*	*3*
Platoon Ratio				*1.00*		*1.00*	*1.00*	*1.00*			*1.00*	*1.00*
PF Factor				*1.00*		*1.00*	*1.00*	*1.00*			*1.00*	*1.00*
Q_1				*1.9*		*4.6*	*0.8*	*5.7*			*1.6*	*5.5*
k_B				*0.3*		*0.4*	*0.4*	*0.5*			*0.4*	*0.4*
Q_2				*0.2*		*0.5*	*0.1*	*0.7*			*0.1*	*0.7*
Q Average				*2.1*		*5.2*	*0.9*	*6.4*			*1.7*	*6.2*
Percentile Back of Queue (95th percentile)												
$f_{B\%}$				*2.0*		*1.9*	*2.1*	*1.9*			*2.0*	*1.9*
Back of Queue				*4.2*		*10.1*	*1.9*	*12.3*			*3.5*	*11.9*
Queue Storage Ratio												
Queue Spacing				*25.0*		*25.0*	*25.0*	*25.0*			*25.0*	*25.0*
Queue Storage				*0*		*0*	*0*	*0*			*0*	*0*
Average Queue Storage Ratio												
95% Queue Storage Ratio												

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SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 WB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*PM Peak Period*	Analysis Year	*2014*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes				*1*		*1*	*1*	*2*			*2*	*1*
Lane Group				*L*		*R*	*L*	*T*			*T*	*R*
Volume (vph)				*98*		*122*	*106*	*405*			*286*	*514*
% Heavy Vehicles				*48*		*10*	*48*	*48*			*10*	*10*
PHF				*0.90*		*0.90*	*0.90*	*0.90*			*0.90*	*0.90*
Pretimed/Actuated (P/A)				*A*		*A*	*A*	*A*			*A*	*A*
Startup Lost Time				*2.0*		*2.0*	*2.0*	*2.0*			*2.0*	*2.0*
Extension of Effective Green				*2.0*		*2.0*	*2.0*	*2.0*			*2.0*	*2.0*
Arrival Type				*3*		*3*	*3*	*3*			*3*	*3*
Unit Extension				*3.0*		*3.0*	*3.0*	*3.0*			*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*		*0*	*0*	*0*	*0*	*0*		*0*	*0*	*0*
Lane Width				*12.0*		*12.0*	*12.0*	*12.0*			*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour				*0*		*0*	*0*	*0*			*0*	*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	WB Only	02	03	04	NB Only	NS Perm	07	08
Timing	G = *15.0*	G =	G =	G =	G = *8.0*	G = *33.0*	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *4*	Y = *5*	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *70.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate				*109*		*136*	*118*	*450*			*318*	*571*
Lane Group Capacity				*261*		*315*	*490*	*1571*			*1551*	*692*
v/c Ratio				*0.42*		*0.43*	*0.24*	*0.29*			*0.21*	*0.83*
Green Ratio				*0.21*		*0.21*	*0.66*	*0.64*			*0.47*	*0.47*
Uniform Delay d_1				*23.7*		*23.8*	*4.7*	*5.5*			*10.8*	*16.0*
Delay Factor k				*0.11*		*0.11*	*0.11*	*0.11*			*0.11*	*0.36*
Incremental Delay d_2				*1.1*		*1.0*	*0.3*	*0.1*			*0.1*	*8.1*
PF Factor				*1.000*		*1.000*	*1.000*	*1.000*			*1.000*	*1.000*
Control Delay				*24.8*		*24.8*	*4.9*	*5.6*			*10.9*	*24.1*
Lane Group LOS				*C*		*C*	*A*	*A*			*B*	*C*
Approach Delay				*24.8*			*5.4*			*19.4*		
Approach LOS				*C*			*A*			*B*		
Intersection Delay	*15.5*			Intersection LOS						*B*		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Traditional Diamond*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group				*L*		*R*	*L*	*T*			*T*	*R*
Initial Queue/Lane				0.0		0.0	0.0	0.0			0.0	0.0
Flow Rate/Lane Group				109		136	118	450			318	571
Satflow/Lane				1220		1468	747	1283			1727	1468
Capacity/Lane Group				261		315	490	1571			1551	692
Flow Ratio				0.1		0.1	0.2	0.2			0.1	0.4
v/c Ratio				0.42		0.43	0.24	0.29			0.21	0.83
I Factor				1.000		1.000	1.000	1.000			1.000	1.000
Arrival Type				3		3	3	3			3	3
Platoon Ratio				1.00		1.00	1.00	1.00			1.00	1.00
PF Factor				1.00		1.00	1.00	1.00			1.00	1.00
Q_1				1.8		2.3	0.8	2.0			1.9	9.6
k_B				0.3		0.3	0.4	0.5			0.5	0.5
Q_2				0.2		0.2	0.1	0.2			0.1	2.0
Q Average				2.0		2.5	0.9	2.2			2.0	11.6
Percentile Back of Queue (95th percentile)												
$f_{B\%}$				2.0		2.0	2.1	2.0			2.0	1.8
Back of Queue				4.1		5.1	1.9	4.5			4.1	21.0
Queue Storage Ratio												
Queue Spacing				25.0		25.0	25.0	25.0			25.0	25.0
Queue Storage				0		0	0	0			0	0
Average Queue Storage Ratio												
95% Queue Storage Ratio												

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SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*AM Peak Period*	Analysis Year	*2034*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*2*		*1*					*2*	*1*	*1*	*2*	
Lane Group	*L*		*R*					*T*	*R*	*L*	*T*	
Volume (vph)	*586*		*168*					*222*	*155*	*120*	*246*	
% Heavy Vehicles	*10*		*48*					*48*	*48*	*10*	*10*	
PHF	*0.90*		*0.90*					*0.90*	*0.90*	*0.90*	*0.90*	
Pretimed/Actuated (P/A)	*A*		*A*					*A*	*A*	*A*	*A*	
Startup Lost Time	*2.0*		*2.0*					*2.0*	*2.0*	*2.0*	*2.0*	
Extension of Effective Green	*2.0*		*2.0*					*2.0*	*2.0*	*2.0*	*2.0*	
Arrival Type	*3*		*3*					*3*	*3*	*3*	*3*	
Unit Extension	*3.0*		*3.0*					*3.0*	*3.0*	*3.0*	*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*		*0*	*0*	*0*	*0*	*0*	
Lane Width	*12.0*		*12.0*					*12.0*	*12.0*	*12.0*	*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*		*0*					*0*	*0*	*0*	*0*	
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	EB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = *25.0*	G =	G =	G =	G = *8.0*	G = *23.0*	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *4*	Y = *5*	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *70.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*651*		*187*					*247*	*172*	*133*	*273*	
Lane Group Capacity	*1138*		*390*					*803*	*358*	*548*	*1645*	
v/c Ratio	*0.57*		*0.48*					*0.31*	*0.48*	*0.24*	*0.17*	
Green Ratio	*0.36*		*0.36*					*0.33*	*0.33*	*0.51*	*0.50*	
Uniform Delay d_1	*18.2*		*17.5*					*17.6*	*18.7*	*9.1*	*9.5*	
Delay Factor k	*0.17*		*0.11*					*0.11*	*0.11*	*0.11*	*0.11*	
Incremental Delay d_2	*0.7*		*0.9*					*0.2*	*1.0*	*0.2*	*0.0*	
PF Factor	*1.000*		*1.000*					*1.000*	*1.000*	*1.000*	*1.000*	
Control Delay	*18.9*		*18.4*					*17.8*	*19.8*	*9.3*	*9.6*	
Lane Group LOS	*B*		*B*					*B*	*B*	*A*	*A*	
Approach Delay	*18.8*						*18.6*			*9.5*		
Approach LOS	*B*						*B*			*A*		
Intersection Delay	*16.5*			Intersection LOS						*B*		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Traditional Diamond*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*		*R*					*T*	*R*	*L*	*T*	
Initial Queue/Lane	*0.0*		*0.0*					*0.0*	*0.0*	*0.0*	*0.0*	
Flow Rate/Lane Group	*651*		*187*					*247*	*172*	*133*	*273*	
Satflow/Lane	*1641*		*1091*					*1283*	*1091*	*1064*	*1727*	
Capacity/Lane Group	*1138*		*390*					*803*	*358*	*548*	*1645*	
Flow Ratio	*0.2*		*0.2*					*0.1*	*0.2*	*0.1*	0.1	
v/c Ratio	*0.57*		*0.48*					*0.31*	*0.48*	*0.24*	*0.17*	
I Factor	*1.000*		*1.000*					*1.000*	*1.000*	*1.000*	*1.000*	
Arrival Type	*3*		*3*					*3*	*3*	*3*	*3*	
Platoon Ratio	*1.00*		*1.00*					*1.00*	*1.00*	*1.00*	*1.00*	
PF Factor	*1.00*		*1.00*					*1.00*	*1.00*	*1.00*	*1.00*	
Q_1	*5.3*		*2.8*					*1.9*	*2.7*	*1.3*	*1.5*	
k_B	*0.4*		*0.3*					*0.4*	*0.3*	*0.4*	*0.5*	
Q_2	*0.6*		*0.3*					*0.2*	*0.3*	*0.1*	*0.1*	
Q Average	*5.8*		*3.1*					*2.0*	*3.0*	*1.4*	*1.6*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	*1.9*		*2.0*					*2.0*	*2.0*	*2.1*	*2.0*	
Back of Queue	*11.3*		*6.3*					*4.1*	*5.9*	*2.9*	*3.3*	
Queue Storage Ratio												
Queue Spacing	*25.0*		*25.0*					*25.0*	*25.0*	*25.0*	*25.0*	
Queue Storage	*0*		*0*					*0*	*0*	*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

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SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*PM Peak Period*	Analysis Year	*2034*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		1					2	1	1	2	
Lane Group	L		R					T	R	L	T	
Volume (vph)	276		173					250	184	226	208	
% Heavy Vehicles	10		48					48	48	10	10	
PHF	0.90		0.90					0.90	0.90	0.90	0.90	
Pretimed/Actuated (P/A)	A		A					A	A	A	A	
Startup Lost Time	2.0		2.0					2.0	2.0	2.0	2.0	
Extension of Effective Green	2.0		2.0					2.0	2.0	2.0	2.0	
Arrival Type	3		3					3	3	3	3	
Unit Extension	3.0		3.0					3.0	3.0	3.0	3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0		0	0	0	0	0	
Lane Width	12.0		12.0					12.0	12.0	12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0					0	0	0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	EB Only	02	03	04	SB Only	NS Perm	07	08
Timing	G = 23.0	G =	G =	G =	G = 8.0	G = 25.0	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 70.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	307		192					278	204	251	231	
Lane Group Capacity	1047		358					873	390	561	1738	
v/c Ratio	0.29		0.54					0.32	0.52	0.45	0.13	
Green Ratio	0.33		0.33					0.36	0.36	0.54	0.53	
Uniform Delay d_1	17.5		19.2					16.3	17.8	8.8	8.4	
Delay Factor k	0.11		0.14					0.11	0.13	0.11	0.11	
Incremental Delay d_2	0.2		1.6					0.2	1.3	0.6	0.0	
PF Factor	1.000		1.000					1.000	1.000	1.000	1.000	
Control Delay	17.6		20.8					16.5	19.1	9.4	8.4	
Lane Group LOS	B		C					B	B	A	A	
Approach Delay	18.8						17.6			8.9		
Approach LOS	B						B			A		
Intersection Delay	15.2			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Traditional Diamond*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*		*R*					*T*	*R*	*L*	*T*	
Initial Queue/Lane	*0.0*		*0.0*					*0.0*	*0.0*	*0.0*	*0.0*	
Flow Rate/Lane Group	*307*		*192*					*278*	*204*	*251*	*231*	
Satflow/Lane	*1641*		*1091*					*1283*	*1091*	*1033*	*1727*	
Capacity/Lane Group	*1047*		*358*					*873*	*390*	*561*	*1738*	
Flow Ratio	*0.1*		*0.2*					*0.1*	*0.2*	*0.2*	0.1	
v/c Ratio	*0.29*		*0.54*					*0.32*	*0.52*	*0.45*	*0.13*	
I Factor	*1.000*		*1.000*					*1.000*	*1.000*	*1.000*	*1.000*	
Arrival Type	*3*		*3*					*3*	*3*	*3*	*3*	
Platoon Ratio	*1.00*		*1.00*					*1.00*	*1.00*	*1.00*	*1.00*	
PF Factor	*1.00*		*1.00*					*1.00*	*1.00*	*1.00*	*1.00*	
Q_1	*2.3*		*3.0*					*2.1*	*3.1*	*2.4*	*1.2*	
k_B	*0.4*		*0.3*					*0.4*	*0.3*	*0.4*	*0.6*	
Q_2	*0.2*		*0.4*					*0.2*	*0.4*	*0.3*	*0.1*	
Q Average	*2.5*		*3.4*					*2.2*	*3.5*	*2.7*	*1.3*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	*2.0*		*2.0*					*2.0*	*2.0*	*2.0*	*2.1*	
Back of Queue	*5.0*		*6.8*					*4.5*	*7.0*	*5.4*	*2.6*	
Queue Storage Ratio												
Queue Spacing	*25.0*		*25.0*					*25.0*	*25.0*	*25.0*	*25.0*	
Queue Storage	*0*		*0*					*0*	*0*	*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

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SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 WB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*AM Peak Period*	Analysis Year	*2034*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes				*1*		*1*	*1*	*2*			*2*	*1*
Lane Group				*L*		*R*	*L*	*T*			*T*	*R*
Volume (vph)				*143*		*258*	*110*	*698*			*223*	*324*
% Heavy Vehicles				*48*		*10*	*48*	*48*			*10*	*10*
PHF				*0.90*		*0.90*	*0.90*	*0.90*			*0.90*	*0.90*
Pretimed/Actuated (P/A)				*A*		*A*	*A*	*A*			*A*	*A*
Startup Lost Time				*2.0*		*2.0*	*2.0*	*2.0*			*2.0*	*2.0*
Extension of Effective Green				*2.0*		*2.0*	*2.0*	*2.0*			*2.0*	*2.0*
Arrival Type				*3*		*3*	*3*	*3*			*3*	*3*
Unit Extension				*3.0*		*3.0*	*3.0*	*3.0*			*3.0*	*3.0*
Ped/Bike/RTOR Volume	*0*	*0*		*0*	*0*	*0*	*0*	*0*		*0*	*0*	*0*
Lane Width				*12.0*		*12.0*	*12.0*	*12.0*			*12.0*	*12.0*
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour				*0*		*0*	*0*	*0*			*0*	*0*
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	WB Only	02	03	04	NB Only	NS Perm	07	08
Timing	G = *23.0*	G =	G =	G =	G = *8.0*	G = *25.0*	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *4*	Y = *5*	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *70.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate				*159*		*287*	*122*	*776*			*248*	*360*
Lane Group Capacity				*401*		*482*	*430*	*1292*			*1175*	*524*
v/c Ratio				*0.40*		*0.60*	*0.28*	*0.60*			*0.21*	*0.69*
Green Ratio				*0.33*		*0.33*	*0.54*	*0.53*			*0.36*	*0.36*
Uniform Delay d_1				*18.1*		*19.6*	*8.2*	*11.4*			*15.6*	*19.2*
Delay Factor k				*0.11*		*0.18*	*0.11*	*0.19*			*0.11*	*0.26*
Incremental Delay d_2				*0.6*		*2.0*	*0.4*	*0.8*			*0.1*	*3.8*
PF Factor				*1.000*		*1.000*	*1.000*	*1.000*			*1.000*	*1.000*
Control Delay				*18.8*		*21.6*	*8.6*	*12.2*			*15.7*	*22.9*
Lane Group LOS				*B*		*C*	*A*	*B*			*B*	*C*
Approach Delay				*20.6*			*11.7*			*20.0*		
Approach LOS				*C*			*B*			*B*		
Intersection Delay	*16.3*			Intersection LOS						*B*		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Traditional Diamond*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group				L		R	L	T			T	R
Initial Queue/Lane				0.0		0.0	0.0	0.0			0.0	0.0
Flow Rate/Lane Group				159		287	122	776			248	360
Satflow/Lane				1220		1468	792	1283			1727	1468
Capacity/Lane Group				401		482	430	1292			1175	524
Flow Ratio				0.1		0.2	0.2	0.3			0.1	0.2
v/c Ratio				0.40		0.60	0.28	0.60			0.21	0.69
I Factor				1.000		1.000	1.000	1.000			1.000	1.000
Arrival Type				3		3	3	3			3	3
Platoon Ratio				1.00		1.00	1.00	1.00			1.00	1.00
PF Factor				1.00		1.00	1.00	1.00			1.00	1.00
Q_1				2.4		4.7	1.1	5.5			1.8	6.0
k_B				0.3		0.4	0.4	0.5			0.4	0.4
Q_2				0.2		0.6	0.1	0.7			0.1	0.8
Q Average				2.6		5.2	1.3	6.2			1.9	6.8

Percentile Back of Queue (95th percentile)

$f_{B\%}$				2.0		1.9	2.1	1.9			2.0	1.9
Back of Queue				5.3		10.2	2.6	11.9			3.8	13.0

Queue Storage Ratio

Queue Spacing				25.0		25.0	25.0	25.0			25.0	25.0
Queue Storage				0		0	0	0			0	0
Average Queue Storage Ratio												
95% Queue Storage Ratio												

 *HCS+*TM Version 5.4 Generated: 4/20/2011 3:33 PM

SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 WB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*PM Peak Period*	Analysis Year	*2034*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes				1		1	1	2			2	1
Lane Group				L		R	L	T			T	R
Volume (vph)				132		125	130	396			302	520
% Heavy Vehicles				48		10	48	48			10	10
PHF				0.90		0.90	0.90	0.90			0.90	0.90
Pretimed/Actuated (P/A)				A		A	A	A			A	A
Startup Lost Time				2.0		2.0	2.0	2.0			2.0	2.0
Extension of Effective Green				2.0		2.0	2.0	2.0			2.0	2.0
Arrival Type				3		3	3	3			3	3
Unit Extension				3.0		3.0	3.0	3.0			3.0	3.0
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0		0	0	0
Lane Width				12.0		12.0	12.0	12.0			12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour				0		0	0	0			0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	WB Only	02	03	04	NB Only	NS Perm	07	08
Timing	G = 16.0	G =	G =	G =	G = 8.0	G = 32.0	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 70.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate				147		139	144	440			336	578
Lane Group Capacity				279		336	470	1536			1504	671
v/c Ratio				0.53		0.41	0.31	0.29			0.22	0.86
Green Ratio				0.23		0.23	0.64	0.63			0.46	0.46
Uniform Delay d_1				23.7		23.0	5.2	5.9			11.5	17.0
Delay Factor k				0.13		0.11	0.11	0.11			0.11	0.39
Incremental Delay d_2				1.9		0.8	0.4	0.1			0.1	11.1
PF Factor				1.000		1.000	1.000	1.000			1.000	1.000
Control Delay				25.5		23.8	5.6	6.0			11.6	28.1
Lane Group LOS				C		C	A	A			B	C
Approach Delay				24.7			5.9			22.0		
Approach LOS				C			A			C		
Intersection Delay	17.2			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Traditional Diamond*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group				*L*		*R*	*L*	*T*			*T*	*R*
Initial Queue/Lane				*0.0*		*0.0*	*0.0*	*0.0*			*0.0*	*0.0*
Flow Rate/Lane Group				*147*		*139*	*144*	*440*			*336*	*578*
Satflow/Lane				*1220*		*1468*	*732*	*1283*			*1727*	*1468*
Capacity/Lane Group				*279*		*336*	*470*	*1536*			*1504*	*671*
Flow Ratio				*0.1*		*0.1*	*0.2*	*0.2*			0.1	*0.4*
v/c Ratio				*0.53*		*0.41*	*0.31*	*0.29*			*0.22*	*0.86*
I Factor				*1.000*		*1.000*	*1.000*	*1.000*			*1.000*	*1.000*
Arrival Type				*3*		*3*	*3*	*3*			*3*	*3*
Platoon Ratio				*1.00*		*1.00*	*1.00*	*1.00*			*1.00*	*1.00*
PF Factor				*1.00*		*1.00*	*1.00*	*1.00*			*1.00*	*1.00*
Q_1				*2.5*		*2.3*	*1.0*	*2.0*			*2.1*	*10.1*
k_B				*0.3*		*0.3*	*0.4*	*0.5*			*0.5*	*0.5*
Q_2				*0.3*		*0.2*	*0.2*	*0.2*			*0.1*	*2.4*
Q Average				*2.8*		*2.5*	*1.2*	*2.2*			*2.2*	*12.5*

Percentile Back of Queue (95th percentile)

$f_{B\%}$				*2.0*		*2.0*	*2.1*	*2.0*			*2.0*	*1.8*
Back of Queue				*5.7*		*5.1*	*2.5*	*4.6*			*4.5*	*22.4*

Queue Storage Ratio

Queue Spacing				*25.0*		*25.0*	*25.0*	*25.0*			*25.0*	*25.0*
Queue Storage				*0*		*0*	*0*	*0*			*0*	*0*
Average Queue Storage Ratio												
95% Queue Storage Ratio												

 *HCS+*TM Version 5.4 Generated: 4/20/2011 3:35 PM

SHORT REPORT

General Information		Site Information	
Analyst	SKB	Intersection	SR 222 @ I-40 EB Ramps
Agency or Co.	TDOT/TranSystems	Area Type	All other areas
Date Performed	04/18/2011	Jurisdiction	Fayette County
Time Period	AM Peak Period	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		2	2				2				
Lane Group	L		R	L				T				
Volume (vph)	581		134	326				331				
% Heavy Vehicles	10		48	10				48				
PHF	0.90		0.90	0.90				0.90				
Pretimed/Actuated (P/A)	A			A				A				
Startup Lost Time	2.0		2.0	2.0				2.0				
Extension of Effective Green	2.0		2.0	2.0				2.0				
Arrival Type	3		3	3				3				
Unit Extension	3.0		3.0	3.0				3.0				
Ped/Bike/RTOR Volume	0	0	0	0	0		0	0		0	0	
Lane Width	12.0		12.0	12.0				12.0				
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0	0				0				
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	02	03	04	NB Only	06	07	08
Timing	G = 30.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 70.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	646		149	362				368				
Lane Group Capacity	1366		828	1366				1047				
v/c Ratio	0.47		0.18	0.27				0.35				
Green Ratio	0.43		0.43	0.43				0.43				
Uniform Delay d_1	14.3		12.4	12.9				13.5				
Delay Factor k	0.11		0.11	0.11				0.11				
Incremental Delay d_2	0.3		0.1	0.1				0.2				
PF Factor	1.000		1.000	1.000				1.000				
Control Delay	14.6		12.5	13.0				13.7				
Lane Group LOS	B		B	B				B				
Approach Delay	14.2			13.0			13.7					
Approach LOS	B			B			B					
Intersection Delay	13.8			Intersection LOS						B		

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Diverging Diamond Interchange*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*		*R*	*L*				*T*				
Initial Queue/Lane	*0.0*		*0.0*	*0.0*				*0.0*				
Flow Rate/Lane Group	*646*		*149*	*362*				*368*				
Satflow/Lane	*1641*		*1091*	*1641*				*1283*				
Capacity/Lane Group	*1366*		*828*	*1366*				*1047*				
Flow Ratio	*0.2*		*0.1*	*0.1*				*0.2*				
v/c Ratio	*0.47*		*0.18*	*0.27*				*0.35*				
I Factor	*1.000*		*1.000*	*1.000*				*1.000*				
Arrival Type	*3*		*3*	*3*				*3*				
Platoon Ratio	*1.00*		*1.00*	*1.00*				*1.00*				
PF Factor	*1.00*		*1.00*	*1.00*				*1.00*				
Q_1	*4.6*		*1.0*	*2.3*				*2.5*				
k_B	*0.5*		*0.4*	*0.5*				*0.4*				
Q_2	*0.4*		*0.1*	*0.2*				*0.2*				
Q Average	*5.1*		*1.1*	*2.5*				*2.7*				

Percentile Back of Queue (95th percentile)

	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
$f_{B\%}$	*2.0*		*2.1*	*2.0*				*2.0*				
Back of Queue	*9.9*		*2.3*	*5.1*				*5.5*				

Queue Storage Ratio

	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Queue Spacing	*25.0*		*25.0*	*25.0*				*25.0*				
Queue Storage	*0*		*0*	*0*				*0*				
Average Queue Storage Ratio												
95% Queue Storage Ratio												

 *HCS+*TM Version 5.4 Generated: 4/20/2011 3:03 PM

SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*PM Peak Period*	Analysis Year	*2014*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*2*		*2*	*2*				*2*				
Lane Group	*L*		*R*	*L*				*T*				
Volume (vph)	*271*		*126*	*384*				*382*				
% Heavy Vehicles	*10*		*48*	*10*				*48*				
PHF	*0.90*		*0.90*	*0.90*				*0.90*				
Pretimed/Actuated (P/A)	*A*			*A*				*A*				
Startup Lost Time	*2.0*		*2.0*	*2.0*				*2.0*				
Extension of Effective Green	*2.0*		*2.0*	*2.0*				*2.0*				
Arrival Type	*3*		*3*	*3*				*3*				
Unit Extension	*3.0*		*3.0*	*3.0*				*3.0*				
Ped/Bike/RTOR Volume	*0*	*0*	*0*	*0*	*0*		*0*	*0*		*0*	*0*	
Lane Width	*12.0*		*12.0*	*12.0*				*12.0*				
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*		*0*	*0*				*0*				
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	Excl. Left	02	03	04	NB Only	06	07	08
Timing	G = *30.0*	G =	G =	G =	G = *30.0*	G =	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *5*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *70.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*301*		*140*	*427*				*424*				
Lane Group Capacity	*1366*		*828*	*1366*				*1047*				
v/c Ratio	*0.22*		*0.17*	*0.31*				*0.40*				
Green Ratio	*0.43*		*0.43*	*0.43*				*0.43*				
Uniform Delay d_1	*12.6*		*12.3*	*13.2*				*13.8*				
Delay Factor k	*0.11*		*0.11*	*0.11*				*0.11*				
Incremental Delay d_2	*0.1*		*0.1*	*0.1*				*0.3*				
PF Factor	*1.000*		*1.000*	*1.000*				*1.000*				
Control Delay	*12.7*		*12.4*	*13.3*				*14.1*				
Lane Group LOS	*B*		*B*	*B*				*B*				
Approach Delay	*12.6*			*13.3*			*14.1*					
Approach LOS	*B*			*B*			*B*					
Intersection Delay	*13.3*			Intersection LOS						*B*		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Diverging Diamond Interchange*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*		*R*	*L*				*T*				
Initial Queue/Lane	*0.0*		*0.0*	*0.0*				*0.0*				
Flow Rate/Lane Group	*301*		*140*	*427*				*424*				
Satflow/Lane	*1641*		*1091*	*1641*				*1283*				
Capacity/Lane Group	*1366*		*828*	*1366*				*1047*				
Flow Ratio	*0.1*		*0.1*	*0.1*				*0.2*				
v/c Ratio	*0.22*		*0.17*	*0.31*				*0.40*				
I Factor	*1.000*		*1.000*	*1.000*				*1.000*				
Arrival Type	*3*		*3*	*3*				*3*				
Platoon Ratio	*1.00*		*1.00*	*1.00*				*1.00*				
PF Factor	*1.00*		*1.00*	*1.00*				*1.00*				
Q_1	*1.9*		*0.9*	*2.8*				*3.0*				
k_B	*0.5*		*0.4*	*0.5*				*0.4*				
Q_2	*0.1*		*0.1*	*0.2*				*0.3*				
Q Average	*2.0*		*1.0*	*3.0*				*3.3*				
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	*2.0*		*2.1*	*2.0*				*2.0*				
Back of Queue	*4.1*		*2.1*	*6.1*				*6.5*				
Queue Storage Ratio												
Queue Spacing	*25.0*		*25.0*	*25.0*				*25.0*				
Queue Storage	*0*		*0*	*0*				*0*				
Average Queue Storage Ratio												
95% Queue Storage Ratio												

 HCS+™ Version 5.4 Generated: 4/20/2011 3:04 PM

SHORT REPORT	
General Information	**Site Information**
Analyst *SKB* Agency or Co. *TDOT/TranSystems* Date Performed *04/18/2011* Time Period *AM Peak Period*	Intersection *SR 222 @ I-40 WB Ramps* Area Type *All other areas* Jurisdiction *Fayette County* Analysis Year *2014*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2			2		2					2	
Lane Group	L			L		R					T	
Volume (vph)	798			117		257					513	
% Heavy Vehicles	48			48		10					10	
PHF	0.90			0.90		0.90					0.90	
Pretimed/Actuated (P/A)	A			A							A	
Startup Lost Time	2.0			2.0		2.0					2.0	
Extension of Effective Green	2.0			2.0		2.0					2.0	
Arrival Type	3			3		3					3	
Unit Extension	3.0			3.0		3.0					3.0	
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0		0	0	
Lane Width	12.0			12.0		12.0					12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0			0		0					0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	02	03	04	SB Only	06	07	08
Timing	G = 33.0	G =	G =	G =	G = 27.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 70.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	887			130		286					570	
Lane Group Capacity	1116			1116		1002					1269	
v/c Ratio	0.79			0.12		0.29					0.45	
Green Ratio	0.47			0.47		0.39					0.39	
Uniform Delay d_1	15.6			10.3		14.8					16.0	
Delay Factor k	0.34			0.11		0.11					0.11	
Incremental Delay d_2	4.1			0.0		0.2					0.3	
PF Factor	1.000			1.000		1.000					1.000	
Control Delay	19.7			10.4		15.0					16.2	
Lane Group LOS	B			B		B					B	
Approach Delay	19.7			13.6						16.2		
Approach LOS	B			B						B		
Intersection Delay	17.3			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Diverging Diamond Interchange*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*			*L*		*R*					*T*	
Initial Queue/Lane	*0.0*			*0.0*		*0.0*					*0.0*	
Flow Rate/Lane Group	*887*			*130*		*286*					*570*	
Satflow/Lane	*1219*			*1219*		*1468*					*1727*	
Capacity/Lane Group	*1116*			*1116*		*1002*					*1269*	
Flow Ratio	*0.4*			*0.1*		*0.1*					0.2	
v/c Ratio	*0.79*			*0.12*		*0.29*					*0.45*	
I Factor	*1.000*			*1.000*		*1.000*					*1.000*	
Arrival Type	*3*			*3*		*3*					*3*	
Platoon Ratio	*1.00*			*1.00*		*1.00*					*1.00*	
PF Factor	*1.00*			*1.00*		*1.00*					*1.00*	
Q_1	*7.5*			*0.7*		*2.2*					*4.3*	
k_B	*0.4*			*0.4*		*0.4*					*0.5*	
Q_2	*1.5*			*0.1*		*0.2*					*0.4*	
Q Average	*9.0*			*0.8*		*2.3*					*4.7*	

Percentile Back of Queue (95th percentile)

	EB LT	EB TH	EB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	SB LT	SB TH	SB RT
$f_{B\%}$	*1.9*			*2.1*		*2.0*					*2.0*	
Back of Queue	*16.8*			*1.6*		*4.7*					*9.2*	

Queue Storage Ratio

	EB LT	EB TH	EB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	SB LT	SB TH	SB RT
Queue Spacing	*25.0*			*25.0*		*25.0*					*25.0*	
Queue Storage	*0*			*0*		*0*					*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

 *HCS+*TM Version 5.4 Generated: 4/20/2011 3:06 PM

SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 WB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*PM Peak Period*	Analysis Year	*2014*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*2*			*2*		*2*					*2*	
Lane Group	*L*			*L*		*R*					*T*	
Volume (vph)	*511*			*98*		*122*					*800*	
% Heavy Vehicles	*48*			*48*		*10*					*10*	
PHF	*0.90*			*0.90*		*0.90*					*0.90*	
Pretimed/Actuated (P/A)	*A*			*A*							*A*	
Startup Lost Time	*2.0*			*2.0*		*2.0*					*2.0*	
Extension of Effective Green	*2.0*			*2.0*		*2.0*					*2.0*	
Arrival Type	*3*			*3*		*3*					*3*	
Unit Extension	*3.0*			*3.0*		*3.0*					*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*		*0*	*0*	*0*	*0*	*0*		*0*	*0*	
Lane Width	*12.0*			*12.0*		*12.0*					*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*			*0*		*0*					*0*	
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	Excl. Left	02	03	04	SB Only	06	07	08
Timing	G = *30.0*	G =	G =	G =	G = *30.0*	G =	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *5*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *70.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*568*			*109*		*136*					*889*	
Lane Group Capacity	*1015*			*1015*		*1114*					*1410*	
v/c Ratio	*0.56*			*0.11*		*0.12*					*0.63*	
Green Ratio	*0.43*			*0.43*		*0.43*					*0.43*	
Uniform Delay d_1	*15.0*			*12.0*		*12.1*					*15.7*	
Delay Factor k	*0.16*			*0.11*		*0.11*					*0.21*	
Incremental Delay d_2	*0.7*			*0.0*		*0.0*					*0.9*	
PF Factor	*1.000*			*1.000*		*1.000*					*1.000*	
Control Delay	*15.7*			*12.0*		*12.1*					*16.6*	
Lane Group LOS	*B*			*B*		*B*					*B*	
Approach Delay	*15.7*			*12.1*						*16.6*		
Approach LOS	*B*			*B*						*B*		
Intersection Delay	*15.6*			Intersection LOS						*B*		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Diverging Diamond Interchange*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*			*L*		*R*					*T*	
Initial Queue/Lane	*0.0*			*0.0*		*0.0*					*0.0*	
Flow Rate/Lane Group	*568*			*109*		*136*					*889*	
Satflow/Lane	*1219*			*1219*		*1468*					*1727*	
Capacity/Lane Group	*1015*			*1015*		*1114*					*1410*	
Flow Ratio	*0.2*			*0.0*		*0.1*					0.3	
v/c Ratio	*0.56*			*0.11*		*0.12*					*0.63*	
I Factor	*1.000*			*1.000*		*1.000*					*1.000*	
Arrival Type	*3*			*3*		*3*					*3*	
Platoon Ratio	*1.00*			*1.00*		*1.00*					*1.00*	
PF Factor	*1.00*			*1.00*		*1.00*					*1.00*	
Q_1	*4.3*			*0.7*		*0.9*					*7.1*	
k_B	*0.4*			*0.4*		*0.4*					*0.5*	
Q_2	*0.5*			*0.0*		*0.1*					*0.8*	
Q Average	*4.8*			*0.7*		*1.0*					*7.9*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	*2.0*			*2.1*		*2.1*					*1.9*	
Back of Queue	*9.3*			*1.5*		*2.0*					*14.9*	
Queue Storage Ratio												
Queue Spacing	*25.0*			*25.0*		*25.0*					*25.0*	
Queue Storage	*0*			*0*		*0*					*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

 *HCS+*TM Version 5.4 Generated: 4/20/2011 3:07 PM

SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*AM Peak Period*	Analysis Year	*2034*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		2	2				2				
Lane Group	L		R	L				T				
Volume (vph)	586		168	366				377				
% Heavy Vehicles	10		48	10				48				
PHF	0.90		0.90	0.90				0.90				
Pretimed/Actuated (P/A)	A			A				A				
Startup Lost Time	2.0		2.0	2.0				2.0				
Extension of Effective Green	2.0		2.0	2.0				2.0				
Arrival Type	3		3	3				3				
Unit Extension	3.0		3.0	3.0				3.0				
Ped/Bike/RTOR Volume	0	0	0	0	0		0	0		0	0	
Lane Width	12.0		12.0	12.0				12.0				
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0	0				0				
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	02	03	04	NB Only	06	07	08
Timing	G = 30.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 70.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	651		187	407				419				
Lane Group Capacity	1366		828	1366				1047				
v/c Ratio	0.48		0.23	0.30				0.40				
Green Ratio	0.43		0.43	0.43				0.43				
Uniform Delay d_1	14.4		12.7	13.1				13.8				
Delay Factor k	0.11		0.11	0.11				0.11				
Incremental Delay d_2	0.3		0.1	0.1				0.3				
PF Factor	1.000		1.000	1.000				1.000				
Control Delay	14.6		12.8	13.2				14.0				
Lane Group LOS	B		B	B				B				
Approach Delay	14.2			13.2			14.0					
Approach LOS	B			B			B					
Intersection Delay	13.9			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Diverging Diamond Interchange*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*		*R*	*L*				*T*				
Initial Queue/Lane	*0.0*		*0.0*	*0.0*				*0.0*				
Flow Rate/Lane Group	*651*		*187*	*407*				*419*				
Satflow/Lane	*1641*		*1091*	*1641*				*1283*				
Capacity/Lane Group	*1366*		*828*	*1366*				*1047*				
Flow Ratio	*0.2*		*0.1*	*0.1*				*0.2*				
v/c Ratio	*0.48*		*0.23*	*0.30*				*0.40*				
I Factor	*1.000*		*1.000*	*1.000*				*1.000*				
Arrival Type	*3*		*3*	*3*				*3*				
Platoon Ratio	*1.00*		*1.00*	*1.00*				*1.00*				
PF Factor	*1.00*		*1.00*	*1.00*				*1.00*				
Q_1	*4.7*		*1.3*	*2.7*				*3.0*				
k_B	*0.5*		*0.4*	*0.5*				*0.4*				
Q_2	*0.4*		*0.1*	*0.2*				*0.3*				
Q Average	*5.1*		*1.4*	*2.9*				*3.2*				

Percentile Back of Queue (95th percentile)

$f_{B\%}$	*2.0*		*2.1*	*2.0*				*2.0*				
Back of Queue	*10.0*		*2.9*	*5.8*				*6.5*				

Queue Storage Ratio

Queue Spacing	*25.0*		*25.0*	*25.0*				*25.0*				
Queue Storage	*0*		*0*	*0*				*0*				
Average Queue Storage Ratio												
95% Queue Storage Ratio												

 HCS+™ Version 5.4 Generated: 4/20/2011 3:08 PM

SHORT REPORT

General Information		**Site Information**	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 EB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*PM Peak Period*	Analysis Year	*2034*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2		2	2				2				
Lane Group	L		R	L				T				
Volume (vph)	276		173	434				250				
% Heavy Vehicles	10		48	10				48				
PHF	0.90		0.90	0.90				0.90				
Pretimed/Actuated (P/A)	A			A				A				
Startup Lost Time	2.0		2.0	2.0				2.0				
Extension of Effective Green	2.0		2.0	2.0				2.0				
Arrival Type	3		3	3				3				
Unit Extension	3.0		3.0	3.0				3.0				
Ped/Bike/RTOR Volume	0	0	0	0	0		0	0		0	0	
Lane Width	12.0		12.0	12.0				12.0				
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0		0	0				0				
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	02	03	04	NB Only	06	07	08
Timing	G = 30.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 70.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	307		192	482				278				
Lane Group Capacity	1366		828	1366				1047				
v/c Ratio	0.22		0.23	0.35				0.27				
Green Ratio	0.43		0.43	0.43				0.43				
Uniform Delay d_1	12.6		12.7	13.5				12.9				
Delay Factor k	0.11		0.11	0.11				0.11				
Incremental Delay d_2	0.1		0.1	0.2				0.1				
PF Factor	1.000		1.000	1.000				1.000				
Control Delay	12.7		12.8	13.6				13.0				
Lane Group LOS	B		B	B				B				
Approach Delay	12.8			13.6			13.0					
Approach LOS	B			B			B					
Intersection Delay	13.2			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET												

General Information

Project Description *Diverging Diamond Interchange*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*		*R*	*L*				*T*				
Initial Queue/Lane	*0.0*		*0.0*	*0.0*				*0.0*				
Flow Rate/Lane Group	*307*		*192*	*482*				*278*				
Satflow/Lane	*1641*		*1091*	*1641*				*1283*				
Capacity/Lane Group	*1366*		*828*	*1366*				*1047*				
Flow Ratio	*0.1*		*0.1*	*0.2*				*0.1*				
v/c Ratio	*0.22*		*0.23*	*0.35*				*0.27*				
I Factor	*1.000*		*1.000*	*1.000*				*1.000*				
Arrival Type	*3*		*3*	*3*				*3*				
Platoon Ratio	*1.00*		*1.00*	*1.00*				*1.00*				
PF Factor	*1.00*		*1.00*	*1.00*				*1.00*				
Q_1	*1.9*		*1.3*	*3.2*				*1.8*				
k_B	*0.5*		*0.4*	*0.5*				*0.4*				
Q_2	*0.1*		*0.1*	*0.3*				*0.1*				
Q Average	*2.1*		*1.4*	*3.5*				*2.0*				

Percentile Back of Queue (95th percentile)

	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
$f_{B\%}$	*2.0*		*2.1*	*2.0*				*2.0*				
Back of Queue	*4.2*		*3.0*	*7.0*				*4.0*				

Queue Storage Ratio

	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Queue Spacing	*25.0*		*25.0*	*25.0*				*25.0*				
Queue Storage	*0*		*0*	*0*				*0*				
Average Queue Storage Ratio												
95% Queue Storage Ratio												

 *HCS+*TM Version 5.4 Generated: 4/20/2011 3:09 PM

SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 WB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*AM Peak Period*	Analysis Year	*2034*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	*2*			*2*		*2*					*2*	
Lane Group	*L*			*L*		*R*					*T*	
Volume (vph)	*808*			*143*		*258*					*547*	
% Heavy Vehicles	*48*			*48*		*10*					*10*	
PHF	*0.90*			*0.90*		*0.90*					*0.90*	
Pretimed/Actuated (P/A)	*A*			*A*							*A*	
Startup Lost Time	*2.0*			*2.0*		*2.0*					*2.0*	
Extension of Effective Green	*2.0*			*2.0*		*2.0*					*2.0*	
Arrival Type	*3*			*3*		*3*					*3*	
Unit Extension	*3.0*			*3.0*		*3.0*					*3.0*	
Ped/Bike/RTOR Volume	*0*	*0*		*0*	*0*	*0*	*0*	*0*		*0*	*0*	
Lane Width	*12.0*			*12.0*		*12.0*					*12.0*	
Parking/Grade/Parking	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*	*N*	*0*	*N*
Parking/Hour												
Bus Stops/Hour	*0*			*0*		*0*					*0*	
Minimum Pedestrian Time		*3.2*			*3.2*			*3.2*			*3.2*	

Phasing	Excl. Left	02	03	04	SB Only	06	07	08
Timing	G = *33.0*	G =	G =	G =	G = *27.0*	G =	G =	G =
	Y = *5*	Y =	Y =	Y =	Y = *5*	Y =	Y =	Y =
Duration of Analysis (hrs) = *0.25*					Cycle Length C = *70.0*			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	*898*			*159*		*287*					*608*	
Lane Group Capacity	*1116*			*1116*		*1002*					*1269*	
v/c Ratio	*0.80*			*0.14*		*0.29*					*0.48*	
Green Ratio	*0.47*			*0.47*		*0.39*					*0.39*	
Uniform Delay d_1	*15.8*			*10.5*		*14.8*					*16.2*	
Delay Factor k	*0.35*			*0.11*		*0.11*					*0.11*	
Incremental Delay d_2	*4.4*			*0.1*		*0.2*					*0.3*	
PF Factor	*1.000*			*1.000*		*1.000*					*1.000*	
Control Delay	*20.2*			*10.5*		*15.0*					*16.5*	
Lane Group LOS	*C*			*B*		*B*					*B*	
Approach Delay	*20.2*			*13.4*						*16.5*		
Approach LOS	*C*			*B*						*B*		
Intersection Delay	*17.5*			Intersection LOS						*B*		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Diverging Diamond Interchange*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*			*L*		*R*					*T*	
Initial Queue/Lane	*0.0*			*0.0*		*0.0*					*0.0*	
Flow Rate/Lane Group	*898*			*159*		*287*					*608*	
Satflow/Lane	*1219*			*1219*		*1468*					*1727*	
Capacity/Lane Group	*1116*			*1116*		*1002*					*1269*	
Flow Ratio	*0.4*			*0.1*		*0.1*					0.2	
v/c Ratio	*0.80*			*0.14*		*0.29*					*0.48*	
I Factor	*1.000*			*1.000*		*1.000*					*1.000*	
Arrival Type	*3*			*3*		*3*					*3*	
Platoon Ratio	*1.00*			*1.00*		*1.00*					*1.00*	
PF Factor	*1.00*			*1.00*		*1.00*					*1.00*	
Q_1	*7.7*			*0.9*		*2.2*					*4.7*	
k_B	*0.4*			*0.4*		*0.4*					*0.5*	
Q_2	*1.6*			*0.1*		*0.2*					*0.4*	
Q Average	*9.2*			*1.0*		*2.3*					*5.1*	

Percentile Back of Queue (95th percentile)

	EB LT	EB TH	EB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	SB LT	SB TH	SB RT
$f_{B\%}$	*1.9*			*2.1*		*2.0*					*2.0*	
Back of Queue	*17.2*			*2.0*		*4.8*					*9.9*	

Queue Storage Ratio

	EB LT	EB TH	EB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	SB LT	SB TH	SB RT
Queue Spacing	*25.0*			*25.0*		*25.0*					*25.0*	
Queue Storage	*0*			*0*		*0*					*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

 HCS+™ Version 5.4 Generated: 4/20/2011 3:11 PM

SHORT REPORT

General Information		Site Information	
Analyst	*SKB*	Intersection	*SR 222 @ I-40 WB Ramps*
Agency or Co.	*TDOT/TranSystems*	Area Type	*All other areas*
Date Performed	*04/18/2011*	Jurisdiction	*Fayette County*
Time Period	*PM Peak Period*	Analysis Year	*2034*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2			2		2					2	
Lane Group	L			L		R					T	
Volume (vph)	526			132		125					822	
% Heavy Vehicles	48			48		10					10	
PHF	0.90			0.90		0.90					0.90	
Pretimed/Actuated (P/A)	A			A							A	
Startup Lost Time	2.0			2.0		2.0					2.0	
Extension of Effective Green	2.0			2.0		2.0					2.0	
Arrival Type	3			3		3					3	
Unit Extension	3.0			3.0		3.0					3.0	
Ped/Bike/RTOR Volume	0	0		0	0	0	0	0		0	0	
Lane Width	12.0			12.0		12.0					12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0			0		0					0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	02	03	04	SB Only	06	07	08
Timing	G = 30.0	G =	G =	G =	G = 30.0	G =	G =	G =
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 70.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	584			147		139					913	
Lane Group Capacity	1015			1015		1114					1410	
v/c Ratio	0.58			0.14		0.12					0.65	
Green Ratio	0.43			0.43		0.43					0.43	
Uniform Delay d_1	15.2			12.2		12.1					15.8	
Delay Factor k	0.17			0.11		0.11					0.23	
Incremental Delay d_2	0.8			0.1		0.1					1.0	
PF Factor	1.000			1.000		1.000					1.000	
Control Delay	16.0			12.3		12.1					16.9	
Lane Group LOS	B			B		B					B	
Approach Delay	16.0			12.2						16.9		
Approach LOS	B			B						B		
Intersection Delay	15.8			Intersection LOS						B		

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BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Diverging Diamond Interchange*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*			*L*		*R*					*T*	
Initial Queue/Lane	*0.0*			*0.0*		*0.0*					*0.0*	
Flow Rate/Lane Group	*584*			*147*		*139*					*913*	
Satflow/Lane	*1219*			*1219*		*1468*					*1727*	
Capacity/Lane Group	*1015*			*1015*		*1114*					*1410*	
Flow Ratio	*0.2*			*0.1*		*0.1*					0.3	
v/c Ratio	*0.58*			*0.14*		*0.12*					*0.65*	
I Factor	*1.000*			*1.000*		*1.000*					*1.000*	
Arrival Type	*3*			*3*		*3*					*3*	
Platoon Ratio	*1.00*			*1.00*		*1.00*					*1.00*	
PF Factor	*1.00*			*1.00*		*1.00*					*1.00*	
Q_1	*4.4*			*0.9*		*0.9*					*7.4*	
k_B	*0.4*			*0.4*		*0.4*					*0.5*	
Q_2	*0.5*			*0.1*		*0.1*					*0.9*	
Q Average	*5.0*			*1.0*		*1.0*					*8.3*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	*2.0*			*2.1*		*2.1*					*1.9*	
Back of Queue	*9.7*			*2.0*		*2.0*					*15.5*	
Queue Storage Ratio												
Queue Spacing	*25.0*			*25.0*		*25.0*					*25.0*	
Queue Storage	*0*			*0*		*0*					*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

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