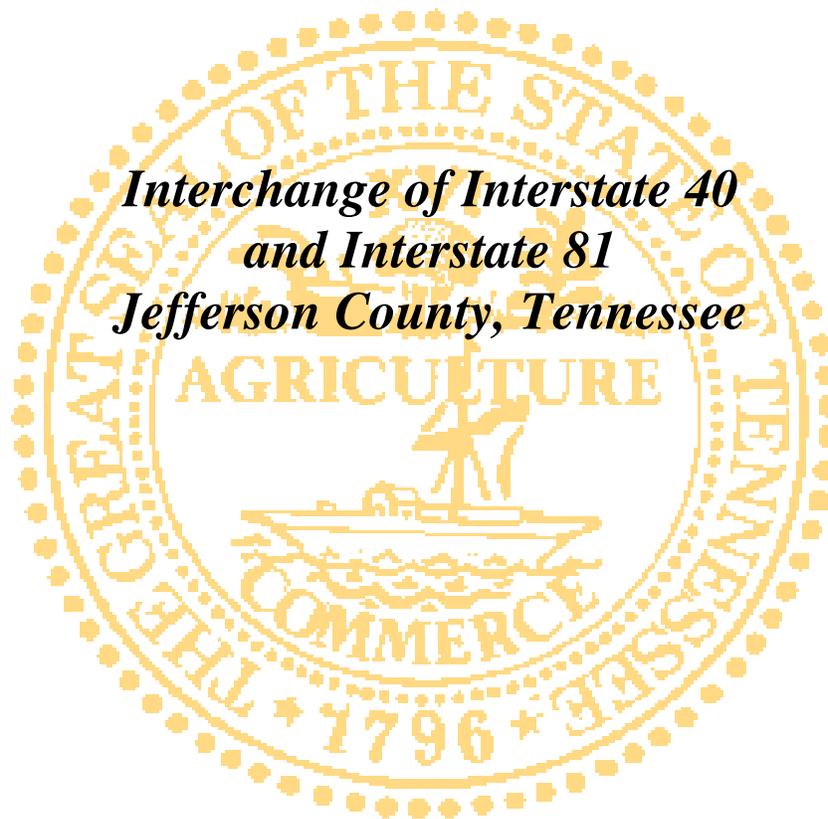


INTERCHANGE MODIFICATION STUDY



***Interchange of Interstate 40
and Interstate 81
Jefferson County, Tennessee***

*PREPARED BY
CLINARD ENGINEERING ASSOCIATES, LLC.
FOR
THE TENNESSEE DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION*

May 2004

INTERCHANGE MODIFICATION STUDY

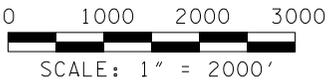
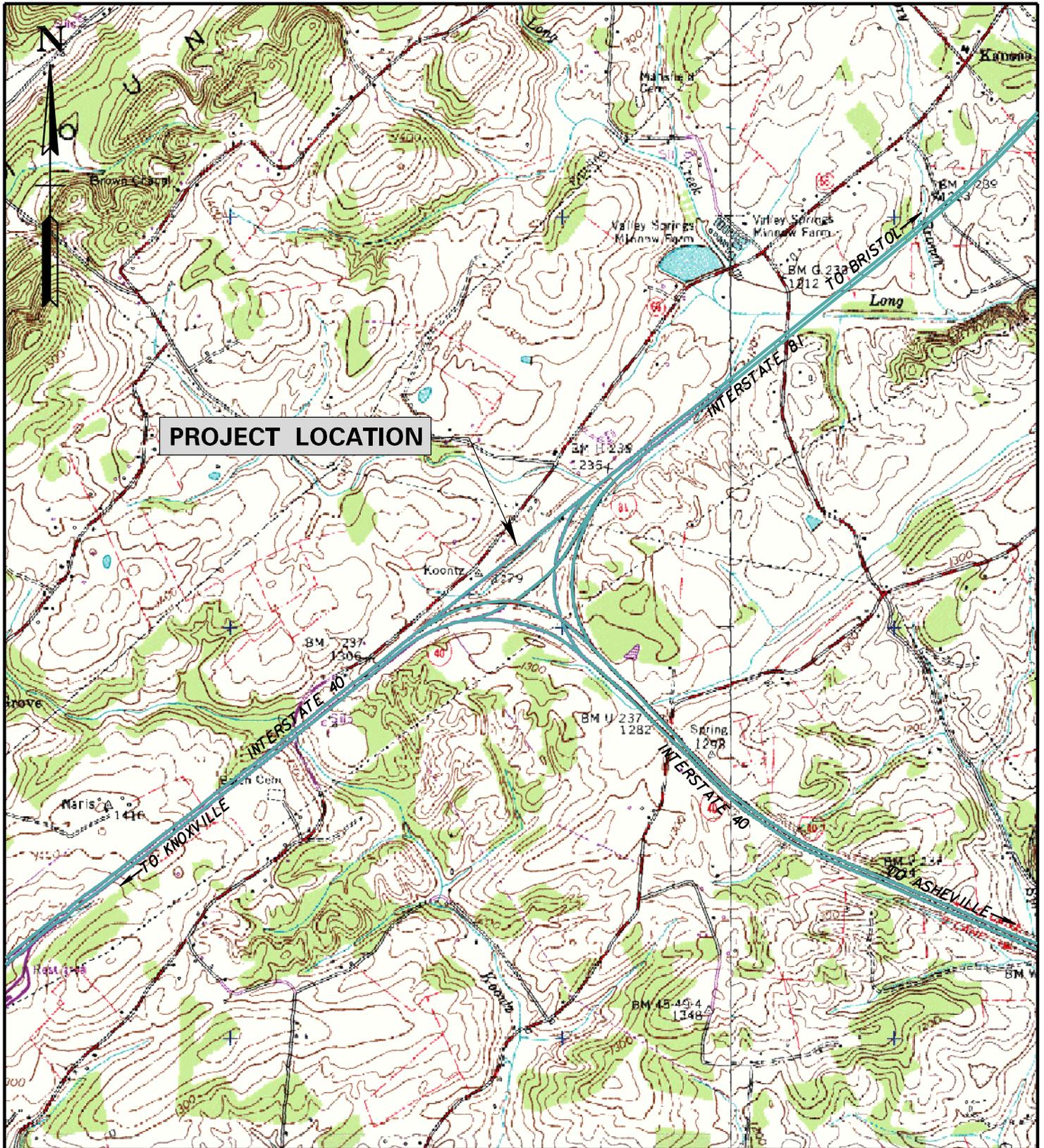
Interchange of Interstate 40 and Interstate 81 Jefferson County, Tennessee

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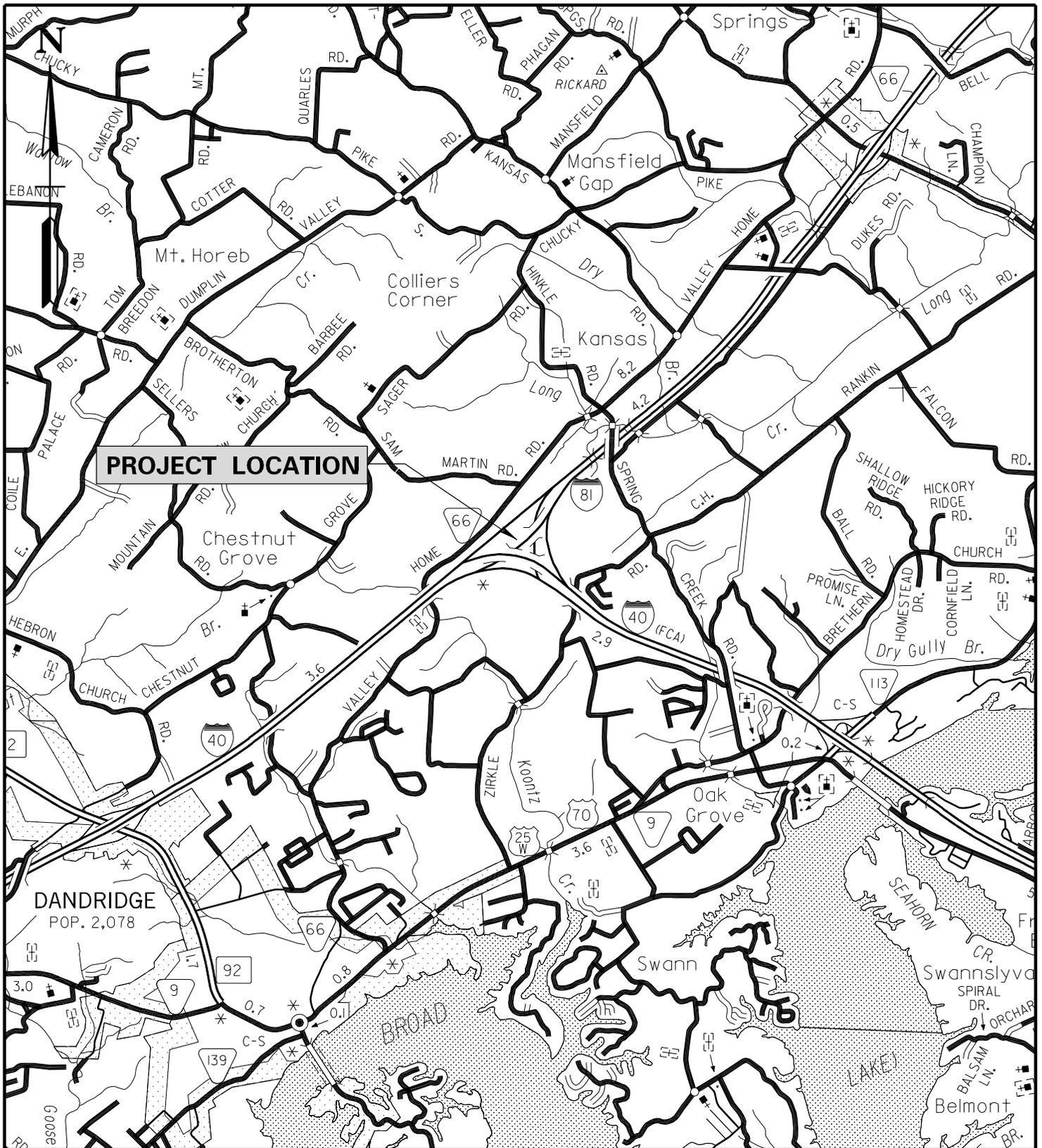
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PROJECT MAP

INTERCHANGE MODIFICATION STUDY
 INTERSTATE 40 AND INTERSTATE 81
 JEFFERSON COUNTY
 USGS "JEFFERSON CITY" QUAD



PROJECT LOCATION



LOCATION MAP

INTERCHANGE MODIFICATION STUDY
 INTERSTATE 40 AND INTERSTATE 81
 JEFFERSON COUNTY

SUMMARY DATA TABLE

<u>ITEM</u>	<u>EXISTING</u>	<u>PROPOSED</u>
Functional Class	Interstate	Interstate
System Class	I.H.S.	I.H.S.
Length (Miles)	N/A	N/A
Cross Section (Feet)	*	*
Present ADT (2008)	48,350	48,350
Future ADT (2028)	77,375	77,375
DHV (2028)	6,964	6,964
% Trucks	29% (ADT) 20% (DHV)	29% (ADT) 20% (DHV)
Estimated Right-of-Way Acquisition (Acres)		0.40
Estimated Right-of-Way Tracts Affected		3
Estimated Family Displacements		0
Estimated Business Displacements		0
Estimated Non-Profit Displacements		0
Estimated Right-of-Way Cost		\$21,000
Estimated Utility Cost Reimbursable		\$0
Estimated Utility Cost Non-Reimbursable		\$20,000
Estimated Construction Cost		\$6,238,000
Estimated Preliminary Engineering Cost		\$566,000
Total Estimated Project Cost		\$6,845,000

* See functional plans for cross-section details.

SUMMARY DATA TABLE

<u>ITEM</u>	<u>I-40 WB to I-81 NB (North of Interchange)</u>	
	<u>EXISTING</u>	<u>PROPOSED</u>
Functional Class	Interstate	Interstate
System Class	I.H.S.	I.H.S.
Length (Miles)	N/A	N/A
Cross Section (Feet)	*	*
Present ADT (2008)	23,400	23,400
Future ADT (2028)	37,400	37,400
DHV (2028)	3,366	3,366
% Trucks	29% (ADT) 20% (DHV)	29% (ADT) 20% (DHV)
Estimated Right-of-Way Acquisition (Acres)		0.20
Estimated Right-of-Way Tracts Affected		1
Estimated Family Displacements		0
Estimated Business Displacements		0
Estimated Non-Profit Displacements		0
Estimated Right-of-Way Cost		\$8,000
Estimated Utility Cost Reimbursable		\$0
Estimated Utility Cost Non-Reimbursable		\$0
Estimated Construction Cost		\$990,000
Estimated Preliminary Engineering Cost		\$90,000
Total Estimated Segment Cost		\$1,088,000

* See functional plans for cross-section details.

SUMMARY DATA TABLE

<u>ITEM</u>	<u>I-81 SB to I-40 EB (East of Interchange)</u>	
	<u>EXISTING</u>	<u>PROPOSED</u>
Functional Class	Interstate	Interstate
System Class	I.H.S.	I.H.S.
Length (Miles)	N/A	N/A
Cross Section (Feet)	*	*
Present ADT (2008)	15,800	15,800
Future ADT (2028)	25,300	25,300
DHV (2028)	2,277	2,277
% Trucks	28% (ADT) 19% (DHV)	28% (ADT) 19% (DHV)
Estimated Right-of-Way Acquisition (Acres)		0.00
Estimated Right-of-Way Tracts Affected		0
Estimated Family Displacements		0
Estimated Business Displacements		0
Estimated Non-Profit Displacements		0
Estimated Right-of-Way Cost		\$0
Estimated Utility Cost Reimbursable		\$0
Estimated Utility Cost Non-Reimbursable		\$10,000
Estimated Construction Cost		\$1,027,000
Estimated Preliminary Engineering Cost		\$93,000
Total Estimated Segment Cost		\$1,130,000

* See functional plans for cross-section details.

SUMMARY DATA TABLE

<u>ITEM</u>	<u>I-81 SB to I-40 EB (North of Interchange)</u>	
	<u>EXISTING</u>	<u>PROPOSED</u>
Functional Class	Interstate	Interstate
System Class	I.H.S.	I.H.S.
Length (Miles)	N/A	N/A
Cross Section (Feet)	*	*
Present ADT (2008)	22,400	22,400
Future ADT (2028)	35,900	35,900
DHV (2028)	6,462	6,462
% Trucks	29% (ADT) 20% (DHV)	29% (ADT) 20% (DHV)
Estimated Right-of-Way Acquisition (Acres)		0.00
Estimated Right-of-Way Tracts Affected		0
Estimated Family Displacements		0
Estimated Business Displacements		0
Estimated Non-Profit Displacements		0
Estimated Right-of-Way Cost		\$0
Estimated Utility Cost Reimbursable		\$0
Estimated Utility Cost Non-Reimbursable		\$0
Estimated Construction Cost		\$1,056,000
Estimated Preliminary Engineering Cost		\$96,000
Total Estimated Segment Cost		\$1,152,000

* See functional plans for cross-section details.

SUMMARY DATA TABLE

<u>ITEM</u>	<u>I-40 WB to I-81 NB (East of Interchange)</u>	
	<u>EXISTING</u>	<u>PROPOSED</u>
Functional Class	Interstate	Interstate
System Class	I.H.S.	I.H.S.
Length (Miles)	N/A	N/A
Cross Section (Feet)	*	*
Present ADT (2008)	17,000	17,000
Future ADT (2028)	27,200	27,200
DHV (2028)	2,448	2,448
% Trucks	28% (ADT) 19% (DHV)	28% (ADT) 19% (DHV)
Estimated Right-of-Way Acquisition (Acres)		0.20
Estimated Right-of-Way Tracts Affected		2
Estimated Family Displacements		0
Estimated Business Displacements		0
Estimated Non-Profit Displacements		0
Estimated Right-of-Way Cost		\$13,000
Estimated Utility Cost Reimbursable		\$0
Estimated Utility Cost Non-Reimbursable		\$10,000
Estimated Construction Cost		\$1,038,000
Estimated Preliminary Engineering Cost		\$94,000
Total Estimated Segment Cost		\$1,155,000

* See functional plans for cross-section details.

SUMMARY DATA TABLE

<u>ITEM</u>	<u>I-40 WB (West of Interchange)</u>	
	<u>EXISTING</u>	<u>PROPOSED</u>
Functional Class	Interstate	Interstate
System Class	I.H.S.	I.H.S.
Length (Miles)	N/A	N/A
Cross Section (Feet)	*	*
Present ADT (2008)	34,600	34,600
Future ADT (2028)	55,400	55,400
DHV (2028)	4,986	4,986
% Trucks	28% (ADT) 19% (DHV)	28% (ADT) 19% (DHV)
Estimated Right-of-Way Acquisition (Acres)		0.00
Estimated Right-of-Way Tracts Affected		0
Estimated Family Displacements		0
Estimated Business Displacements		0
Estimated Non-Profit Displacements		0
Estimated Right-of-Way Cost		\$0
Estimated Utility Cost Reimbursable		\$0
Estimated Utility Cost Non-Reimbursable		\$0
Estimated Construction Cost		\$2,127,000
Estimated Preliminary Engineering Cost		\$193,000
Total Estimated Segment Cost		\$2,320,000

* See functional plans for cross-section details.

PURPOSE OF STUDY

The purpose of this study is to determine the need and feasibility of improving the I-40 and I-81 interchange in Jefferson County, Tennessee. This study was initiated at the request of the Tennessee Department of Transportation’s regional office located in Knoxville. This request was based upon correspondence from citizens regarding the potential safety problems and congestion that occurs at this location. The objectives of this study are to determine the need for improvement, develop a proposed plan for the project, calculate estimated costs, and identify locations of environmental concern.

DEFICIENCIES AND EXISTING CONDITIONS

Geometrics	<u> X </u>	Structures	<u> </u>
Operational	<u> X </u>	R/R Crossing	<u> </u>
Accident Rate	<u> N/A </u>	Statewide Average Rate	<u> N/A </u>

The interchange of I-40 and I-81 is a fully directional interchange which extends to the west towards Knoxville, the east towards Asheville, North Carolina and the north towards Bristol, Tennessee. Currently an average of 49,000 vehicles per day travel through this interchange with volumes projected to increase to nearly 78,000 vehicles per day in the design year (2028).

While the horizontal and vertical alignment of the three legs of this interchange are designed to meet the required speed of seventy (70) miles per hour, various lane tapers within the project vicinity do not currently meet the design parameters as outlined in “A Policy on Geometric Design of Highways and Streets”. Upon a review of the accident data as provided by TDOT, a majority of the accidents that have occurred at this interchange are in close proximity to these travel lane merges and diverges.

In order to determine the current capacity and operation of the interchange, analyses were performed for the mainline capacity of both Interstate 40 and 81 along all three legs as well as the merge and diverge points within the subject interchange.

In the following table (Table 1) a complete summary of the mainline interstate capacity for the three legs of the interchange is shown. This analysis was performed for the base year (2008) and design year (2028) for the morning and afternoon peak hours. This summary shows that for the design year, all three legs will experience some level of service below what is acceptable during the afternoon peak hour.

**TABLE 1
EXISTING MAINLINE CAPACITY**

Description		Year 2008	Year 2028
Mainline Capacity Analysis (Existing)	I-40 WB West of Interchange (AM)	C	E
	I-40 WB West of Interchange (PM)	D	F
	I-40 EB West of Interchange (AM)	C	E
	I-40 EB West of Interchange (PM)	D	F
	I-40 WB East of Interchange (AM)	B	C
	I-40 WB East of Interchange (PM)	C	E
	I-40 EB East of Interchange (AM)	B	C
	I-40 EB East of Interchange (PM)	C	D
	I-81 NB North of Interchange (AM)	C	F
	I-81 NB North of Interchange (PM)	D	F
	I-81 SB North of Interchange (AM)	C	E
	I-81 SB North of Interchange (PM)	D	F

Table 2 as shown below, contains the analysis of the various diverge points within the subject interchange as it is currently configured. The analysis shows the laneage within these diverge locations provides adequate capacity for operation in both the base and design years.

**TABLE 2
EXISTING MAJOR DIVERGE AREAS**

Description		Year 2008	Year 2028
Major Diverge Areas (Existing)	I-40 EB to I-81 NB & I-40 EB (AM)	A	B
	I-40 EB to I-81 NB & I-40 EB (PM)	B	C
	I-40 WB to I-81 NB & I-40 WB (AM)	A	B
	I-40 WB to I-81 NB & I-40 WB (PM)	B	B
	I-81 SB to I-40 WB & I-40 EB (AM)	A	B
	I-81 SB to I-40 WB & I-40 EB (PM)	B	C

While sufficient lane capacity of the major diverge from I-81 Southbound to I-40 Eastbound exists, the current exit ramp taper of 150 feet does not meet the current design standards (See Photo 1 below). A similar ramp taper design is also present for the I-40 Westbound to I-81 Northbound movement.



PHOTO 1: I-81 Southbound with I-40 East & Westbound Diverge

The final operation analysis performed was to evaluate the three major merge points within the subject interchange. These merge areas are defined below:

1. I-81 Southbound to I-40 Eastbound
2. I-40 Westbound to I-81 Northbound
3. I-81 Southbound to I-40 Westbound

For the I-81 Southbound to I-40 Eastbound movement, the capacity analysis shows adequate operation during both peak periods in the base and design years. However; after reviewing the accident data information, it appears several accidents have occurred at this location. Currently the one-lane I-81 Southbound ramp merges with the two I-40 Eastbound travel lanes and tapers approximately 450 feet from the merge point (See Photo 2 below). This ramp merge taper does not currently meet the design standards for typical freeway design. Also note the pavement skid marks which appear in the photograph within the inside lane from I-40 Eastbound.



PHOTO 2: I-40 Eastbound with I-81 Southbound Merge to Left

The existing I-40 Westbound to I-81 Northbound movement provides a similarly short merge as described for the I-81 Southbound to I-40 Eastbound merge. Capacity analysis for this movement shows adequate service life exists until the year 2026.

The final major merge area, I-81 Southbound to I-40 Westbound is a four lane merge, with the outside lane of I-40 Westbound tapering to three travel lanes approximately 1,100 feet west of the merge point. Capacity analysis likewise shows satisfactory operation until the year 2026. It is important to note that while capacity may be adequate for traffic volumes for this movement, the substandard taper (600 feet) to three mainline travel lanes provides the potential for an unsafe situation. This merge also occurs just prior to the SR-66 (Valley Home Road) underpass and at the beginning of an approximate four (4) percent mainline grade (See Photo 3 below).

A detailed summary of these major merge areas for base and design year, including the service life evaluations, is contained in the Appendix of this report.



PHOTO 3: I-40 Westbound Four Lane to Three Lane Taper West of the I-40/81 Interchange

PROPOSED IMPROVEMENTS

In order to improve both the operation and safety of the subject interchange, various lane additions and merge-diverge improvements are recommended. All of the proposed improvements recommended can be accomplished with minimal impact to the existing right-of-way.

IMPROVEMENTS WEST OF INTERCHANGE

In order to provide the required taper design for the I-40 Westbound travel lanes from four to three lanes, the existing structure over SR-66 would need to be widened twelve feet. It was also determined during the field review for the project that extending this lane an additional 5,100 feet to pass the crest of the vertical curve would provide a safe merge point, especially considering the high percentage (29%) of heavy vehicles that travel this corridor on a daily basis. This lane extension was determined based upon the necessary length required to allow these heavy trucks to reach a running speed of sixty (60) miles per hour. The speed-distance charts (Exhibit 3-59 & 3-60) were utilized from the American Association of State Highway and Transportation Officials (AASHTO) "A Policy on Geometric Design of Highways and Streets" and are contained in the appendix of this study.

No improvements are recommended for the I-40 Eastbound side of this leg of the interchange, although one additional eastbound lane would eliminate the level of service F for mainline capacity as shown in Table 3.

**TABLE 3
PROPOSED MAINLINE CAPACITY**

Description		Year 2008	Year 2028
Mainline Capacity Analysis (Proposed)	I-40 WB West of Interchange (AM)	B	C
	I-40 WB West of Interchange (PM)	C	E
	I-40 EB West of Interchange (AM)	C	E
	I-40 EB West of Interchange (PM)	D	F
	I-40 WB East of Interchange (AM)	A	B
	I-40 WB East of Interchange (PM)	B	C
	I-40 EB East of Interchange (AM)	A	B
	I-40 EB East of Interchange (PM)	B	C
	I-81 NB North of Interchange (AM)	B	C
	I-81 NB North of Interchange (PM)	B	D
	I-81 SB North of Interchange (AM)	B	C
	I-81 SB North of Interchange (PM)	B	D

IMPROVEMENTS NORTH OF INTERCHANGE

In order to provide the required taper design for the I-40 Westbound to I-81 Northbound movement, this short merge would be eliminated and become an additional travel lane and extend northward approximately 2,600 feet and then merge with the mainline travel lanes. This taper would end just prior to the Spring Creek Road bridge over I-81.

Similarly, I-81 Southbound would add an inside third travel lane and become the exit lane to I-40 Eastbound. This improvement would replace the short 150 foot exit ramp design that currently exists for motorists wishing to exit I-81 Southbound to I-40 Eastbound. Existing overhead signage would have to be modified for this redesign. Table 4 summarizes the capacity analysis for the major diverge areas with the proposed improvements.

**TABLE 4
PROPOSED MAJOR DIVERGE AREAS**

	Description	Year 2008	Year 2028
Major Diverge Areas (Proposed)	I-40 EB to I-81 NB & I-40 EB (AM)	A	B
	I-40 EB to I-81 NB & I-40 EB (PM)	B	C
	I-40 WB to I-81 NB & I-40 WB (AM)	A	A
	I-40 WB to I-81 NB & I-40 WB (PM)	A	B
	I-81 SB to I-40 WB & I-40 EB (AM)	A	B
	I-81 SB to I-40 WB & I-40 EB (PM)	A	B

IMPROVEMENTS EAST OF INTERCHANGE

To eliminate the remaining short 150 foot ramp taper from I-40 Westbound to I-81 Northbound, it is recommended to develop one additional outside travel lane approximately 2,100 feet east of the interchange to provide sufficient distance for this major diverge. This widening would require the westbound structure over Zirkle Road be widened twelve feet and would require some additional right-of-way. One culvert extension and modification to overhead signage will also be required for this widening.

As mentioned previously and as exhibited in Photo 2, the I-40 Eastbound and I-81 Southbound merge is currently a safety concern and does not meet the standards for freeway design. It is therefore proposed to provide this travel lane from I-81 Southbound as an additional lane and extend it approximately 1,900 feet before tapering to the mainline of I-40 Eastbound. As with the westbound side of I-40, the structure over Zirkle Road will require widening twelve feet. Widening for this lane will occur on the median side of the interstate and will maintain sufficient separation to utilize the existing depressed grass median.

In summary, all of the improvements as recommended should upgrade the deficient merge and diverge points within the study interchange while improving overall safety.

PRIORITY OF IMPROVEMENTS

Upon developing all recommended improvements for the subject interchange, a ranking in order of priority based upon safety benefits was undertaken. It was determined that the merge areas should be the first segments to be improved, with the movements carrying the largest volume of vehicles to be the highest priority. The remaining diverge areas containing the short ramp-type tapers should be scheduled next, with the lane extension along I-40 Westbound from I-81 Southbound being the final priority of improvement. Table 5 contains a summary of the priority rankings and their associated costs.

**TABLE 5
PRIORITY RANKING OF IMPROVEMENTS**

Priority #	Improvement	Cost
1	I-40 WB to I-81 NB (North of Interchange) - Additional travel lane and lane extension	\$1,088,000
2	I-81 SB to I-40 EB (East of Interchange)	\$1,130,000
3	I-81 SB to I-40 EB (North of Interchange)	\$1,152,000
4	I-40 WB to I-81 NB (East of Interchange)	\$1,155,000
5	I-40 WB (West of Interchange)	\$2,320,000

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

There are no recommendations at this time to incorporate any ITS measures with this interchange improvement project.

DISPOSITION OF EXISTING ROUTE

All proposed lane additions and improvements are to be along the existing alignment. No portion of this roadway is proposed to be abandoned.

FIELD INVESTIGATIONS

A field investigation of the site was made by the following individuals on August 6, 2003:

Jeff Turner	TDOT Region I
Bill Hart	TDOT Planning
Ron Baker	TDOT Planning
Thomas M. Clinard	Clinard Engineering Associates, LLC
Charles P. Clinard	Clinard Engineering Associates, LLC

An office meeting regarding the scope and proposed improvements for the project occurred on September 5, 2003 at the Tennessee Division office of the FHWA. The following individuals were in attendance:

Charles Graves	TDOT Functional Design
Ron Baker	TDOT Planning
Ralph Volpe	FHWA
Gary Fottrell	FHWA
Scott McGuire	FHWA
Thomas M. Clinard	Clinard Engineering Associates, LLC
Charles P. Clinard	Clinard Engineering Associates, LLC

CHECK LIST OF DETERMINANTS FOR LOCATION STUDY

If any of the following facilities or ESE categories are located within the project area or corridor, place an "x" in the blank opposite the item. Where more than one alternate is to be considered, place its letter designation in the blank.

- 1. Agricultural land usage X
- 2. Airport (existing or proposed)
- 3. Commercial area, shopping center
- 4. Floodplains
- 5. Forested land X
- 6. Historical, cultural, or natural landmark
- 7. Industrial park, factory
- 8. Institutional usages
 - a. School or other educational institution
 - b. Church or other religious institution
 - c. Hospital or other medical facility
 - d. Public building, e.g., fire station
 - e. Defense installation
- 9. Recreation usages
 - a. Park or recreational area
 - b. Game preserve or wildlife area
- 10. Residential establishment X
- 11. Urban area, town, city, or community
- 12. Waterway, lake, pond, river, stream, spring X
 - (Permit required: Coast Guard
 - Section 404
 - TVA Section 26a review X
 - NPDES
 - Aquatic Resource Alteration
- 13. Other
- 14. Location coordinated with local officials
- 15. Railroad crossings
- 16. Hazardous materials site

TDOT DESIGN CRITERIA FOR LOCATION AND DESIGN PHASE

ROUTE: I-40 and I-81 ALTERNATE: _____ SECTION: _____
 REGION: I COUNTY: Jefferson PROJECT NO.: _____
 LOCATION FROM: _____
 TO: _____

PRESENT ADT (2008)	48,350
FUTURE ADT (2028)	77,375
PERCENT TRUCKS	29% (ADT) 20% (DHV)
DHV (2028)	6,964
FUNCTIONAL CLASSIFICATION	Interstate
MINIMUM DESIGN SPEED	70 MPH
ACCESS CONTROL	Full
MAXIMUM CURVE	Existing
MAXIMUM GRADE	Existing
MINIMUM STOPPING SIGHT DISTANCE	625' to 850'
SURFACE WIDTH	36' to 48' *
NUMBER OF LANES	3 to 4 *
USABLE SHOULDER WIDTH	12' to 18' *
MEDIAN WIDTH	36' to 60' *
MINIMUM RIGHT OF WAY	Varies
SIGNALIZATION	None

REMARKS: * See functional plans for cross-section details

APPENDIX



From I-81 South to I-40 East



I-81 SB east of Interchange



I-40 East ramp to Asheville



I-40 WB west of Interchange

COST DATA SHEET

PROJECT: I-81 & I-40
 LOCATION: Jefferson County
 LENGTH:
 CROSS SECTION: NA

RIGHT-OF-WAY

Land, Improvements & Damages	(# Acres	0.40)	\$6,000
Incidentals	(# Tracts	3)	\$15,000
Relocation Payments	(Residences	0)	\$0
	(Businesses	0)	\$0
	(Non-Profits	0)	\$0
Total Right-Of-Way Cost			\$21,000

UTILITY RELOCATION

Reimbursable	\$0
Non-Reimbursable	\$20,000
Total Utility Adjustment Cost	
\$20,000	

CONSTRUCTION

Clear and Grubbing	\$44,000
Earthwork	\$1,070,000
Pavement Removal	\$163,000
Drainage (Erosion Control =	\$153,000)
Structures (Preserv'n/Demol'n =	\$27,000)
Railroad Crossing	\$0
Paving	\$1,630,000
Retaining Walls	\$0
Maintenance of Traffic	\$185,000
Topsoil	\$32,000
Seeding	\$15,000
Sodding	\$41,000
Signing	\$325,000
Signalization	\$0
Fence	\$17,000
Guardrail	\$72,000
Rip-rap or Slope Protection	\$30,000
Other Construction Items (8.5%)	\$341,000
Mobilization	\$268,000
10% Engineering and Contingencies	\$566,000
Total Construction Cost	
\$6,238,000	
Preliminary Engineering (10% of Constr.)	
\$566,000	

TOTAL ESTIMATED COST **\$6,845,000**

COST DATA SHEET

PROJECT: I-40 WB to I-81 NB (North of Interchange)
 LOCATION: Jefferson County
 LENGTH:
 CROSS SECTION: NA

RIGHT-OF-WAY

Land, Improvements & Damages	(# Acres	0.20)	\$3,000
Incidentals	(# Tracts	1)	\$5,000
Relocation Payments	(Residences	0)	\$0
	(Businesses	0)	\$0
	(Non-Profits	0)	
Total Right-Of-Way Cost			\$8,000

UTILITY RELOCATION

Reimbursable	\$0	
Non-Reimbursable	\$0	
Total Utility Adjustment Cost		\$0

CONSTRUCTION

Clear and Grubbing	\$8,000	
Earthwork	\$210,000	
Pavement Removal	\$32,000	
Drainage (Erosion Control =	\$29,000)	\$73,000
Structures (Preserv'n/Demol'n =	\$0)	\$0
Railroad Crossing	\$0	
Paving	\$315,000	
Retaining Walls	\$0	
Maintenance of Traffic	\$35,000	
Topsoil	\$6,000	
Seeding	\$3,000	
Sodding	\$8,000	
Signing	\$75,000	
Signalization	\$0	
Fence	\$4,000	
Guardrail	\$14,000	
Rip-rap or Slope Protection	\$6,000	
Other Construction Items (8.5%)	\$67,000	
Mobilization	\$44,000	
10% Engineering and Contingencies	\$90,000	
Total Construction Cost		\$990,000
Preliminary Engineering (10% of Constr.)		\$90,000

TOTAL ESTIMATED COST FOR PRIORITY #1 **\$1,088,000**

	<u>Area (ac)</u>	<u>Cost/Acre</u>	<u>Total Cost</u>
Clearing & Grubbing	4	\$2,000	\$8,000

	<u>Length (ft)</u>	<u>Factor</u>	<u>Total (yd³)</u>	<u>Cost / yd³</u>	<u>Total Cost</u>
Earthwork	3,500	11.85	41,475		
			0		
			Total:	41,475	\$5.0
					\$207,375

	<u>Length</u>	<u>Cost/lf</u>	<u>Total Cost</u>
Pavement Removal	3,500	\$9	\$31,500

	<u>Total Cost</u>
Drainage	\$44,000

	<u>Total Cost</u>
Erosion Control	\$29,000

	<u>Area</u>	<u>Cost/sf</u>	<u>Total Cost</u>
Structures	0	0	\$0
			\$65
Bridge Rail	0	ft	\$100.00 per ft.
			\$0
	<u>Area</u>	<u>Cost/sf</u>	<u>Total Cost</u>
	0	0	\$0
		\$15	\$0
		Total Demolition Cost:	
		\$0	
		Total Structure Cost:	
		\$0	

	<u>Length</u>	<u>Cost</u>	<u>Total Cost</u>
Fence	400	\$10	\$4,000

	<u>Cost</u>	<u>Length</u>	<u>Total Cost</u>
Paving	\$90	3,500	\$315,000
			Total Paving Cost:
			\$315,000

		<u>Height</u>	<u>Length</u>	<u>Area</u>	<u>Cost/sf</u>	<u>Total Cost</u>
Retaining Walls	Retaining Wall	0	0	0	35	\$0
						Total
						\$0

	<u>Total Cost</u>
Maintenance of Traffic	\$35,000

	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	<u>Total Cost</u>
Topsoil	3,500	0.452	1,582	\$4.00	\$6,328

Seeding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	3,500	0.049	172	\$16.00	\$2,744

Sodding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	3,500	0.444	1,556	\$5.00	\$7,778
Total Sod					\$7,778

Signing **\$75,000**

Signalization **\$0**

Guardrail	Length of rail	600 ft	<u>Number of Terminals</u>	<u>Cost</u>	<u>Total Cost</u>
			4	\$1,500	\$6,000
					\$7,800
Total Guardrail:					\$13,800

Rip-Rap	<u>Length</u>	400 Tons	<u>Cost</u>	
	400		\$15	\$6,000

Right-of-Way	Total acreage	0.2 acres	Cost/acre	\$10,000	Cost	\$2,000	<u>Total Cost</u>	
	Slope Easmt.	0.0 acres		\$15,000		\$0		
	Const. Easmt.	0.0 acres		\$10,000		\$0		
					Total	\$2,000	Factor 146%	\$2,920
	No. of Tracts	1	Cost/tract	\$5,000			\$5,000	
	Relocate 0 Businesses			0	@	\$100,000	\$0	
	Relocate 0 Residences			0	@	\$10,000	\$0	
					Total Right-of-Way Cost:		\$7,920	

Utilities

Reimbursable

	<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>
12" Steel Gas	0	\$84	\$0
16" Water	0	\$45	\$0
Total Reimbursable			\$0

Non-Reimbursable

	<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>
6" Water	0	\$22	\$0
		<u>Cost/each</u>	
Electric	0 Poles	\$2,000	\$0
Telephone	0 Poles	\$1,400	\$0
Total Non-Reimbursable			\$0
Total Utility Cost:			\$0

COST DATA SHEET

PROJECT: I-81 SB to I-40 EB (East of Interchange)
 LOCATION: Jefferson County
 LENGTH:
 CROSS SECTION: NA

RIGHT-OF-WAY

Land, Improvements & Damages	(# Acres	0.00)	\$0
Incidentals	(# Tracts	0)	\$0
Relocation Payments	(Residences	0)	\$0
	(Businesses	0)	\$0
	(Non-Profits	0)	
Total Right-Of-Way Cost			\$0

UTILITY RELOCATION

Reimbursable	\$0
Non-Reimbursable	\$10,000
Total Utility Adjustment Cost	
	\$10,000

CONSTRUCTION

Clear and Grubbing	\$6,000
Earthwork	\$130,000
Pavement Removal	\$20,000
Drainage (Erosion Control = \$20,000)	\$50,000
Structures (Preserv'n/Demol'n = \$7,875)	\$276,000
Railroad Crossing	\$0
Paving	\$205,000
Retaining Walls	\$0
Maintenance of Traffic	\$25,000
Topsoil	\$4,000
Seeding	\$2,000
Sodding	\$5,000
Signing	\$100,000
Signalization	\$0
Fence	\$0
Guardrail	\$14,000
Rip-rap or Slope Protection	\$4,000
Other Construction Items (8.5%)	\$48,000
Mobilization	\$45,000
10% Engineering and Contingencies	\$93,000
Total Construction Cost	
	\$1,027,000
Preliminary Engineering (10% of Constr.)	
	\$93,000

TOTAL ESTIMATED COST FOR PRIORITY #2 **\$1,130,000**

Cost Estimate

CEA Project No. 01024.07

	<u>Area (ac)</u>	<u>Cost/Acre</u>	<u>Total Cost</u>
Clearing & Grubbing	3	\$2,000	\$6,000

Earthwork	<u>Length (ft)</u>	<u>Factor</u>	<u>Total (yd³)</u>	<u>Cost / yd³</u>	
	2,275	11.85	26,959		
			0		
			Total:	26,959	\$5.0
					\$134,794

Pavement Removal	<u>Length</u>	<u>Cost/lf</u>	
	2,275	\$9	\$20,475

Total Cost

Drainage **\$30,000**

Erosion Control **\$20,000**

Structures

	<u>Area</u>	<u>Cost/sf</u>	<u>Total Cost</u>
	175	22	3,850
		\$65	\$250,250
Bridge Rail	175	ft	\$100.00 per ft.
			\$17,500

	<u>Area</u>	<u>Cost/sf</u>	<u>Total Cost</u>
	175	3	525
		\$15	\$7,875
		Total Demolition Cost:	\$7,875
		Total Structure Cost:	\$267,750

Fence	<u>Length</u>	<u>Cost</u>	
	0	\$10	\$0

Paving	<u>Cost</u>	<u>Length</u>	<u>Total Cost</u>
	\$90	2,275	\$204,750
		Total Paving Cost:	\$204,750

Retaining Walls	Retaining Wall	<u>Height</u>	<u>Length</u>	<u>Area</u>	<u>Cost/sf</u>	
		0	0	0	35	
						\$0
					Total	\$0

Maintenance of Traffic **\$25,000**

Topsoil	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	2,275	0.452	1,028	\$4.00	\$4,113

Seeding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	2,275	0.049	111	\$16.00	\$1,784
Sodding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	2,275	0.444	1,011	\$5.00	\$5,056
				Total Sod	\$5,056
Signing					\$100,000
Signalization					\$0

Guardrail		<u>Number of Terminals</u>	<u>Cost</u>	<u>Total Cost</u>
Length of rail	600 ft	4	\$1,500	\$6,000
			\$13	\$7,800
			Total Guardrail:	\$13,800

Rip-Rap	<u>Length</u>	<u>Cost</u>	
	250 Tons	\$15	\$3,750

Right-of-Way		<u>Cost/acre</u>	<u>Cost</u>	<u>Total Cost</u>
Total acreage	0.0 acres	\$35,000	\$0	
Slope Easmt.	0.0 acres	\$15,000	\$0	
Const. Easmt.	0.0 acres	\$10,000	\$0	
		Total	\$0 Factor 146%	\$0
No. of Tracts	0	Cost/tract	\$5,000	\$0
Relocate 0 Businesses		0	@ \$100,000	\$0
Relocate 0 Residences		0	@ \$10,000	\$0
			Total Right-of-Way Cost:	\$0

Utilities

Reimbursable

	<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>
12" Steel Gas	0	\$84	\$0
16" Water	0	\$45	\$0
			Total Reimbursable
			\$0

Non-Reimbursable

	<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>
6" Water	150	\$22	\$3,300
		<u>Cost/each</u>	
Electric	2 Poles	\$2,000	\$4,000
Telephone	2 Poles	\$1,400	\$2,800
			Total Non-Reimbursable
			\$10,100
			Total Utility Cost:
			\$10,100

COST DATA SHEET

PROJECT: I-81 SB to I-40 EB (North of Interchange)
 LOCATION: Jefferson County
 LENGTH:
 CROSS SECTION: NA

RIGHT-OF-WAY

Land, Improvements & Damages	(# Acres	0.00)	\$0
Incidentals	(# Tracts	0)	\$0
Relocation Payments	(Residences	0)	\$0
	(Businesses	0)	\$0
	(Non-Profits	0)	
Total Right-Of-Way Cost			\$0

UTILITY RELOCATION

Reimbursable	\$0
Non-Reimbursable	\$0
Total Utility Adjustment Cost	
	\$0

CONSTRUCTION

Clear and Grubbing	\$10,000
Earthwork	\$230,000
Pavement Removal	\$35,000
Drainage (Erosion Control =	\$32,000)
Structures (Preserv'n/Demol'n =	\$0)
Railroad Crossing	\$0
Paving	\$347,000
Retaining Walls	\$0
Maintenance of Traffic	\$40,000
Topsoil	\$7,000
Seeding	\$3,000
Sodding	\$9,000
Signing	\$75,000
Signalization	\$0
Fence	\$0
Guardrail	\$0
Rip-rap or Slope Protection	\$6,000
Other Construction Items (8.5%)	\$72,000
Mobilization	\$46,000
10% Engineering and Contingencies	\$96,000
Total Construction Cost	
	\$1,056,000
Preliminary Engineering (10% of Constr.)	
	\$96,000

TOTAL ESTIMATED COST FOR PRIORITY #3 **\$1,152,000**

	<u>Area (ac)</u>	<u>Cost/Acre</u>	<u>Total Cost</u>
Clearing & Grubbing	5	\$2,000	\$10,000

	<u>Length (ft)</u>	<u>Factor</u>	<u>Total (yd³)</u>	<u>Cost / yd³</u>	
Earthwork	3,850	11.85	45,623		
			0		
			Total:	45,623	\$5.0
					\$228,113

	<u>Length</u>	<u>Cost/lf</u>	
Pavement Removal	3,850	\$9	\$34,650

Total Cost

Drainage **\$48,000**

Erosion Control **\$32,000**

Structures

	<u>Area</u>	<u>Cost/sf</u>	<u>Total Cost</u>
	0	\$65	\$0
Bridge Rail	0	ft \$100.00 per ft.	\$0

	<u>Area</u>	<u>Cost/sf</u>	<u>Total Cost</u>
	0	\$15	\$0

Total Demolition Cost:

\$0

Total Structure Cost:

\$0

	<u>Length</u>	<u>Cost</u>	
Fence	0	\$10	\$0

	<u>Cost</u>	<u>Length</u>	<u>Total Cost</u>
Paving	\$90	3,850	\$346,500
	Total Paving Cost:		\$346,500

	<u>Height</u>	<u>Length</u>	<u>Area</u>	<u>Cost/sf</u>	
Retaining Walls	0	0	0	35	\$0
	Total				\$0

Maintenance of Traffic **\$40,000**

	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
Topsoil	3,850	0.452	1,740	\$4.00	\$6,961

Seeding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	3,850	0.049	189	\$16.00	\$3,018

Sodding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	3,850	0.444	1,711	\$5.00	\$8,556
				Total Sod	\$8,556

Signing **\$75,000**

Signalization **\$0**

Guardrail		<u>Number of Terminals</u>	<u>Cost</u>	<u>Total Cost</u>
Length of rail	<input type="text" value="0"/> ft	<input type="text" value="0"/>	\$1,500	\$0
			\$13	\$0
			Total Guardrail:	\$0

Rip-Rap	<u>Length</u>	<u>Cost</u>	
	425 Tons	\$15	\$6,375

Right-of-Way		<u>Cost/acre</u>	<u>Cost</u>	<u>Total Cost</u>
Total acreage	<input type="text" value="0.0"/> acres	\$35,000	\$0	
Slope Easmt.	<input type="text" value="0.0"/> acres	\$15,000	\$0	
Const. Easmt.	<input type="text" value="0.0"/> acres	\$10,000	\$0	
		Total	\$0	Factor 146% \$0
No. of Tracts	<input type="text" value="0"/>	Cost/tract	\$5,000	\$0
Relocate 0 Businesses			0 @ \$100,000	\$0
Relocate 0 Residences			0 @ \$10,000	\$0
			Total Right-of-Way Cost:	\$0

Utilities

<u>Reimbursable</u>	<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>
12" Steel Gas	<input type="text" value="0"/>	\$84	\$0
16" Water	<input type="text" value="0"/>	\$45	\$0
		Total Reimbursable	\$0

<u>Non-Reimbursable</u>	<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>
6" Water	<input type="text" value="0"/>	\$22	\$0
		<u>Cost/each</u>	
Electric	<input type="text" value="0"/> Poles	\$2,000	\$0
Telephone	<input type="text" value="0"/> Poles	\$1,400	\$0
		Total Non-Reimbursable	\$0
		Total Utility Cost:	\$0

COST DATA SHEET

PROJECT: I-40 WB to I-81 NB (East of Interchange)
 LOCATION: Jefferson County
 LENGTH:
 CROSS SECTION: NA

RIGHT-OF-WAY

Land, Improvements & Damages	(# Acres	0.20)	\$3,000
Incidentals	(# Tracts	2)	\$10,000
Relocation Payments	(Residences	0)	\$0
	(Businesses	0)	\$0
	(Non-Profits	0)	
Total Right-Of-Way Cost			\$13,000

UTILITY RELOCATION

Reimbursable	\$0
Non-Reimbursable	\$10,000
Total Utility Adjustment Cost	
	\$10,000

CONSTRUCTION

Clear and Grubbing	\$6,000
Earthwork	\$130,000
Pavement Removal	\$20,000
Drainage (Erosion Control = \$20,000)	\$50,000
Structures (Preserv'n/Demol'n = \$7,875)	\$321,000
Railroad Crossing	\$0
Paving	\$205,000
Retaining Walls	\$0
Maintenance of Traffic	\$25,000
Topsoil	\$4,000
Seeding	\$2,000
Sodding	\$5,000
Signing	\$50,000
Signalization	\$0
Fence	\$10,000
Guardrail	\$22,000
Rip-rap or Slope Protection	\$4,000
Other Construction Items (8.5%)	\$45,000
Mobilization	\$45,000
10% Engineering and Contingencies	\$94,000
Total Construction Cost	
	\$1,038,000
Preliminary Engineering (10% of Constr.)	
	\$94,000

TOTAL ESTIMATED COST FOR PRIORITY #4 **\$1,155,000**

Clearing & Grubbing	<u>Area (ac)</u> 3	<u>Cost/Acre</u> \$2,000		<u>Total Cost</u> \$6,000
Earthwork	<u>Length (ft)</u> 2,275	<u>Factor</u> 11.85	<u>Total (yd³)</u> 26,959 0	<u>Cost / yd³</u> \$5.0
			Total: 26,959	\$134,794
Pavement Removal	<u>Length</u> 2,275	<u>Cost/lf</u> \$9		\$20,475
				<u>Total Cost</u>
Drainage				\$30,000
Erosion Control				\$20,000
Structures				
	<u>Area</u> 175	<u>Cost/sf</u> \$65	<u>Total Cost</u> \$295,750	
Bridge Rail	175	ft	\$100.00 per ft.	\$17,500
	<u>Area</u> 175	<u>Cost/sf</u> \$15	<u>Total Cost</u> \$7,875	
			Total Demolition Cost:	\$7,875
			Total Structure Cost:	\$313,250
Fence	<u>Length</u> 950	<u>Cost</u> \$10		\$9,500
Paving		<u>Cost</u> \$90	<u>Length</u> 2,275	<u>Total Cost</u> \$204,750
			Total Paving Cost:	\$204,750
Retaining Walls	Retaining Wall			
	<u>Height</u> 0	<u>Length</u> 0	<u>Area</u> 0	<u>Cost/sf</u> 35
				\$0
			Total	\$0
Maintenance of Traffic				\$25,000
Topsoil	<u>Length</u> 2,275	<u>Factor</u> 0.452	<u>Total</u> 1,028	<u>Cost per</u> \$4.00
				\$4,113

Seeding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	2,275	0.049	111	\$16.00	\$1,784

Sodding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	2,275	0.444	1,011	\$5.00	\$5,056
				Total Sod	\$5,056

Signing **\$50,000**

Signalization **\$0**

Guardrail		<u>Number of Terminals</u>	<u>Cost</u>	<u>Total Cost</u>
	Length of rail	1,200 ft	4	\$1,500
			\$13	\$15,600
			Total Guardrail:	\$21,600

Rip-Rap	<u>Length</u>	<u>Cost</u>	
	250 Tons	\$15	\$3,750

Right-of-Way		<u>Cost/acre</u>	<u>Cost</u>	<u>Total Cost</u>
	Total acreage	0.2 acres	\$10,000	\$2,000
	Slope Easmt.	0.0 acres	\$15,000	\$0
	Const. Easmt.	0.0 acres	\$10,000	\$0
		Total	\$2,000	Factor 146% \$2,920
	No. of Tracts	2	Cost/tract \$5,000	\$10,000
	Relocate 0 Businesses		0 @ \$100,000	\$0
	Relocate 0 Residences		0 @ \$10,000	\$0
			Total Right-of-Way Cost:	\$12,920

Utilities

Reimbursable		<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>
12" Steel Gas		0	\$84	\$0
16" Water		0	\$45	\$0
			Total Reimbursable	\$0

Non-Reimbursable		<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>
6" Water		150	\$22	\$3,300
			<u>Cost/each</u>	
Electric	2 Poles		\$2,000	\$4,000
Telephone	2 Poles		\$1,400	\$2,800

Total Non-Reimbursable	\$10,100
Total Utility Cost:	\$10,100

COST DATA SHEET

PROJECT: I-40 WB (West of Interchange)
LOCATION: Jefferson County
LENGTH:
CROSS SECTION: NA

RIGHT-OF-WAY

Land, Improvements & Damages	(# Acres	0.00)	\$0
Incidentals	(# Tracts	0)	\$0
Relocation Payments	(Residences	0)	\$0
	(Businesses	0)	\$0
	(Non-Profits	0)	
Total Right-Of-Way Cost			\$0

UTILITY RELOCATION

Reimbursable	\$0
Non-Reimbursable	\$0
Total Utility Adjustment Cost	\$0

CONSTRUCTION

Clear and Grubbing	\$14,000	
Earthwork	\$370,000	
Pavement Removal	\$56,000	
Drainage (Erosion Control =	\$52,000)	\$130,000
Structures (Preserv'n/Demol'n =	\$11,250)	\$459,000
Railroad Crossing	\$0	
Paving	\$558,000	
Retaining Walls	\$0	
Maintenance of Traffic	\$60,000	
Topsoil	\$11,000	
Seeding	\$5,000	
Sodding	\$14,000	
Signing	\$25,000	
Signalization	\$0	
Fence	\$3,000	
Guardrail	\$22,000	
Rip-rap or Slope Protection	\$10,000	
Other Construction Items (8.5%)	\$109,000	
Mobilization	\$88,000	
10% Engineering and Contigencies	\$193,000	
Total Construction Cost	\$2,127,000	
Preliminary Engineering (10% of Constr.)	\$193,000	

TOTAL ESTIMATED COST FOR PRIORITY #5 **\$2,320,000**

	<u>Area (ac)</u>	<u>Cost/Acre</u>	<u>Total Cost</u>
Clearing & Grubbing	7	\$2,000	\$14,000

Earthwork	<u>Length (ft)</u>	<u>Factor</u>	<u>Total (yd³)</u>	<u>Cost / yd³</u>	Total:	Total Cost
	6,200	11.85	73,470			
			0		73,470	\$5.0
						\$367,350

Pavement Removal	<u>Length</u>	<u>Cost/lf</u>	<u>Total Cost</u>
	6,200	\$9	\$55,800

Drainage **\$78,000**

Erosion Control **\$52,000**

Structures

	<u>Area</u>	<u>Cost/sf</u>	<u>Total Cost</u>
	250	26	6,500
		\$65	\$422,500
Bridge Rail	250	ft	\$100.00 per ft.
			\$25,000
	250	3	750
		\$15	\$11,250
	Total Demolition Cost:		\$11,250
	Total Structure Cost:		\$447,500

Fence	<u>Length</u>	<u>Cost</u>	<u>Total Cost</u>
	300	\$10	\$3,000

Paving	<u>Cost</u>	<u>Length</u>	<u>Total Cost</u>
	\$90	6,200	\$558,000
	Total Paving Cost:		\$558,000

Retaining Walls	Retaining Wall	<u>Height</u>	<u>Length</u>	<u>Area</u>	<u>Cost/sf</u>	<u>Total Cost</u>
		0	0	0	35	\$0
						Total \$0

Maintenance of Traffic **\$60,000**

Topsoil	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	<u>Total Cost</u>
	6,200	0.452	2,802	\$4.00	\$11,210

Seeding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	6,200	0.049	304	\$16.00	\$4,861

Sodding	<u>Length</u>	<u>Factor</u>	<u>Total</u>	<u>Cost per</u>	
	6,200	0.444	2,756	\$5.00	\$13,778
Total Sod					\$13,778

Signing **\$25,000**

Signalization **\$0**

Guardrail		<u>Number of Terminals</u>	<u>Cost</u>	<u>Total Cost</u>
	Length of rail	1,200 ft	4	\$1,500
			\$13	\$15,600
Total Guardrail:				\$21,600

Rip-Rap	<u>Length</u>	<u>Cost</u>	
	640 Tons	\$15	\$9,600

Right-of-Way

		<u>Cost/acre</u>	<u>Cost</u>	<u>Total Cost</u>
Total acreage	0.0 acres	\$35,000	\$0	
Slope Easmt.	0.0 acres	\$15,000	\$0	
Const. Easmt.	0.0 acres	\$10,000	\$0	
Total			\$0	Factor 146%
No. of Tracts	0	Cost/tract	\$5,000	\$0
Relocate 0 Businesses			0 @ \$100,000	\$0
Relocate 0 Residences			0 @ \$10,000	\$0
Total Right-of-Way Cost:				\$0

Utilities

Reimbursable

	<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>
12" Steel Gas	0	\$84	\$0
16" Water	0	\$45	\$0
Total Reimbursable			\$0

Non-Reimbursable

	<u>Length (ft)</u>	<u>Cost/ft</u>	<u>Total Cost</u>	
6" Water	0	\$22	\$0	
		<u>Cost/each</u>		
Electric	0 Poles	\$2,000	\$0	
Telephone	0 Poles	\$1,400	\$0	
Total Non-Reimbursable			\$0	
Total Utility Cost:				\$0

**TENNESSEE DEPARTMENT OF TRANSPORTATION
MAPPING AND STATISTICS OFFICE
TRAFFIC AND SAFETY PLANNING SECTION**

(REV. 4/22/02)

PROJECT NO.: _____ ROUTE: I-40 & I-81
 COUNTY: JEFFERSON CITY: _____
 PROJECT PIN NUMBER: _____
 PROJECT DESCRIPTION: I-40 AND I-81

DIVISION REQUESTING:

MAINTENANCE	<input type="checkbox"/>	PAVEMENT DESIGN	<input type="checkbox"/>
PLANNING	<input checked="" type="checkbox"/>	STRUCTURES	<input type="checkbox"/>
PROG. DEVELOPMENT & ADM.	<input type="checkbox"/>	SURVEY & DESIGN	<input type="checkbox"/>
PUBLIC TRANS. & AERO.	<input type="checkbox"/>	TRAFFIC SIGNAL DESIGN	<input type="checkbox"/>
		OTHER _____	<input type="checkbox"/>

YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: _____
 PROJECTED LETTING DATE: _____

TRAFFIC ASSIGNMENT:

	BASE YEAR		DESIGN YEAR				DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS		
	ADT	YEAR	ADT	DHV	%	YEAR	DIR.DIST.	DHV	ADT	FLEX	RIGID
[1]	50,900	2008	81,450	7,330	9	2028	50-50	19	28		
[2]	45,800	2008	73,300	6,597	9	2028	50-50	20	29		

REQUESTED BY: NAME BILL HART DATE 6/18/03
 DIVISION PLANNING
 ADDRESS 900 J.K. POLK BLDG.

REVIEWED BY: TONY ARMSTRONG *Tony Armstrong* DATE 7-1-03
 TRANSPORTATION MANAGER 1
 SUITE 1000, JAMES K. POLK BUILDING

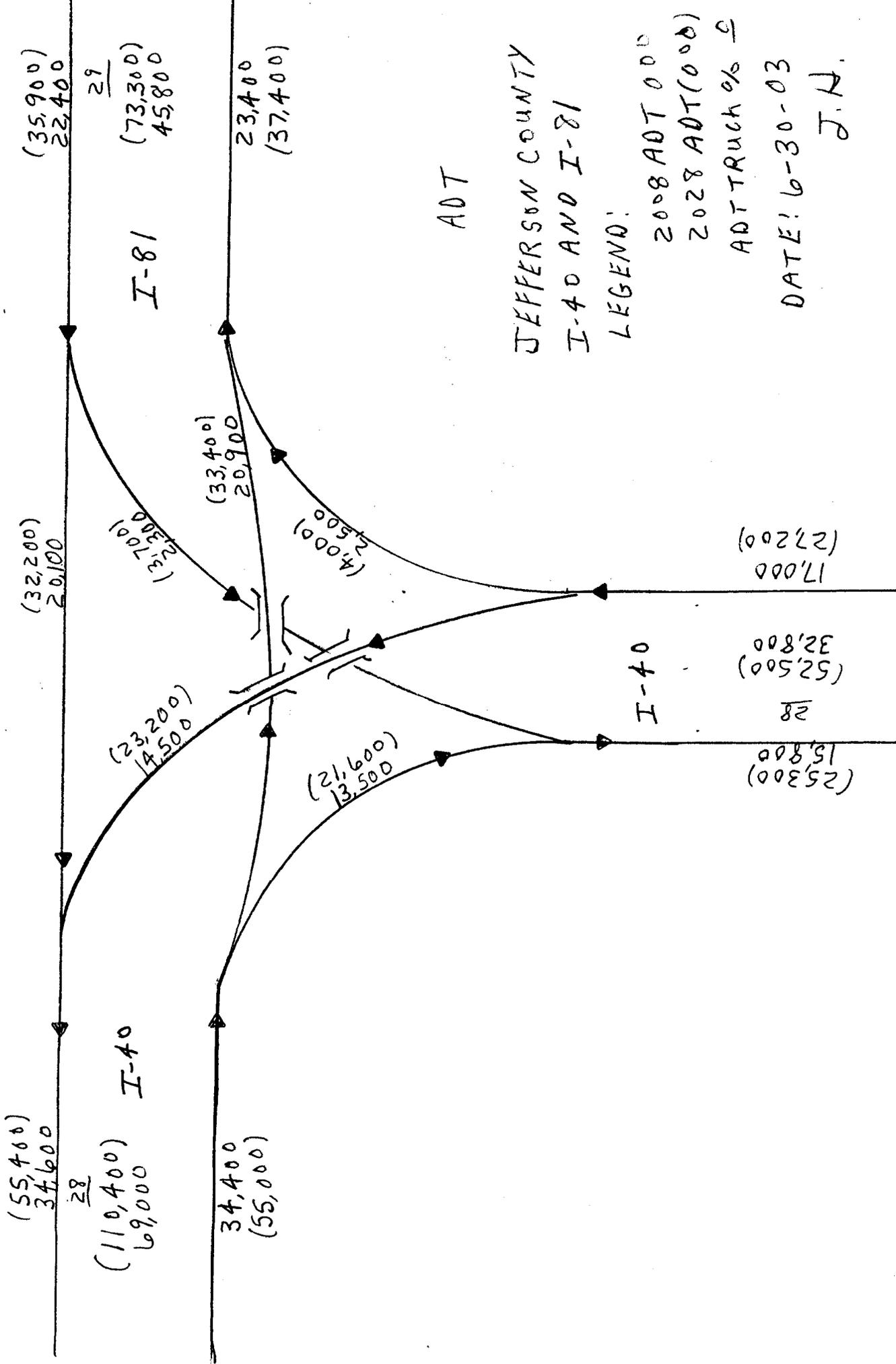
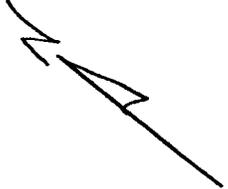
APPROVED BY: STEVE ALLEN *Steve Allen* DATE 7-1-03
 TRANSPORTATION MANAGER 2
 SUITE 1000, JAMES K. POLK BUILDING

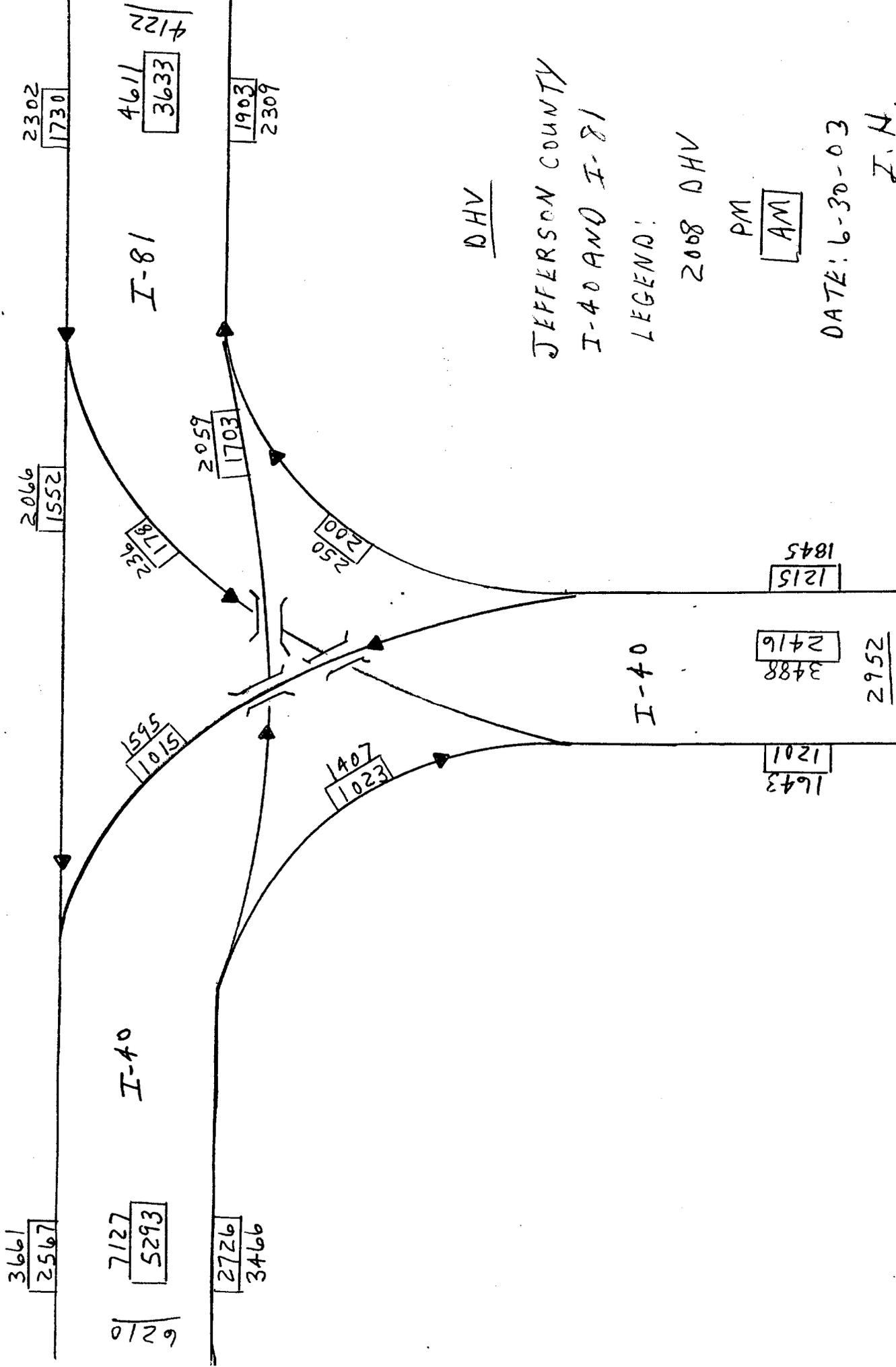
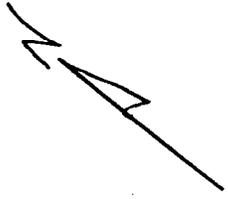
COMMENTS:

- [1] I-40
- [2] I-81

THIS TRAFFIC BASED ON 6-24 HOUR MACHINE COUNTS, 2002 CYCLE COUNTS AND CYCLE COUNT GROWTH TRENDS.

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 ADT.
 NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR ADTs OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.
 SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS.





DHV

JEFFERSON COUNTY
I-40 AND I-81

LEGEND:

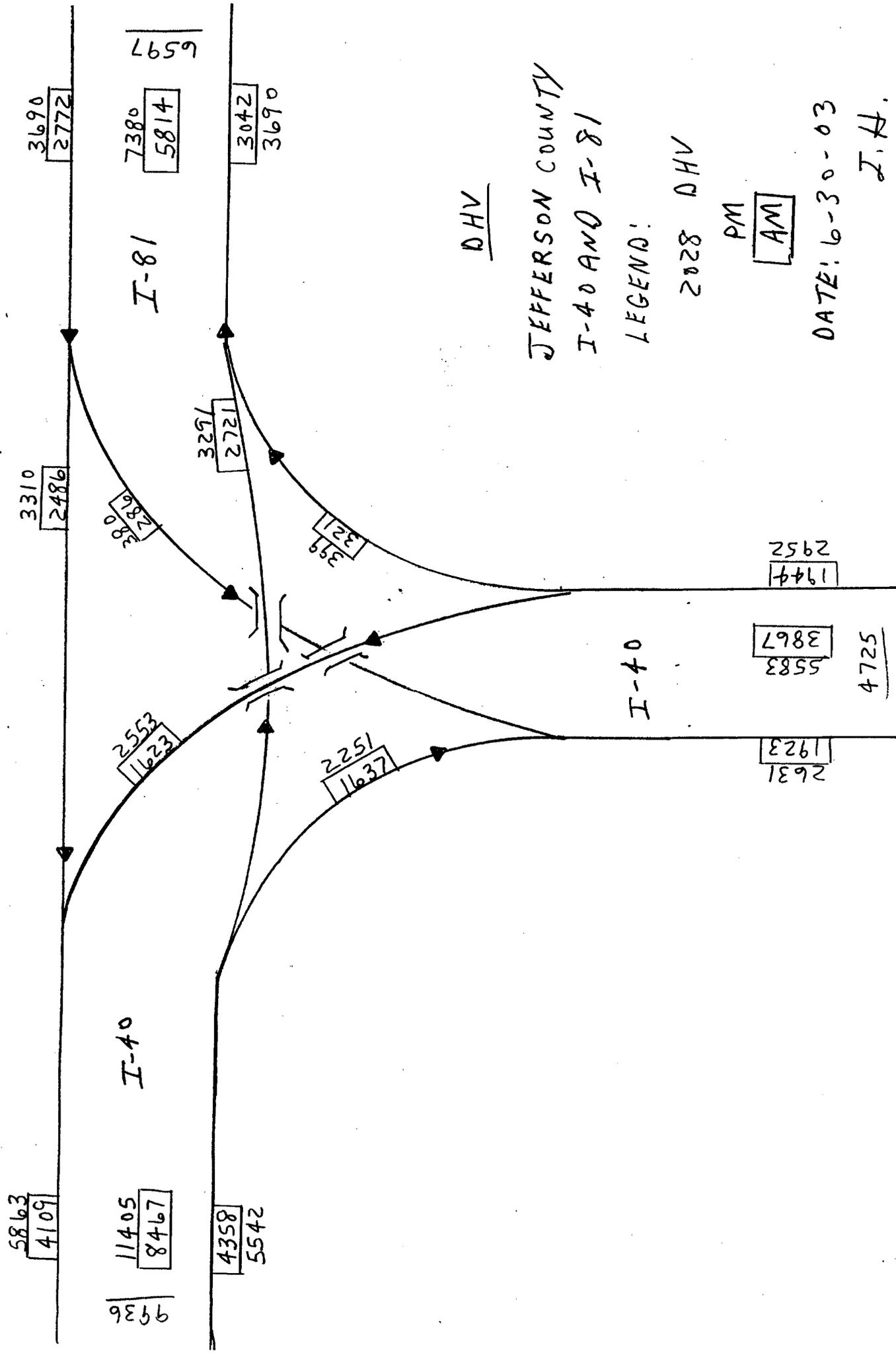
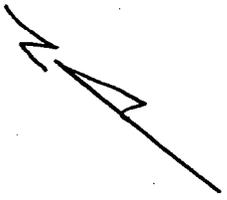
2008 DHV

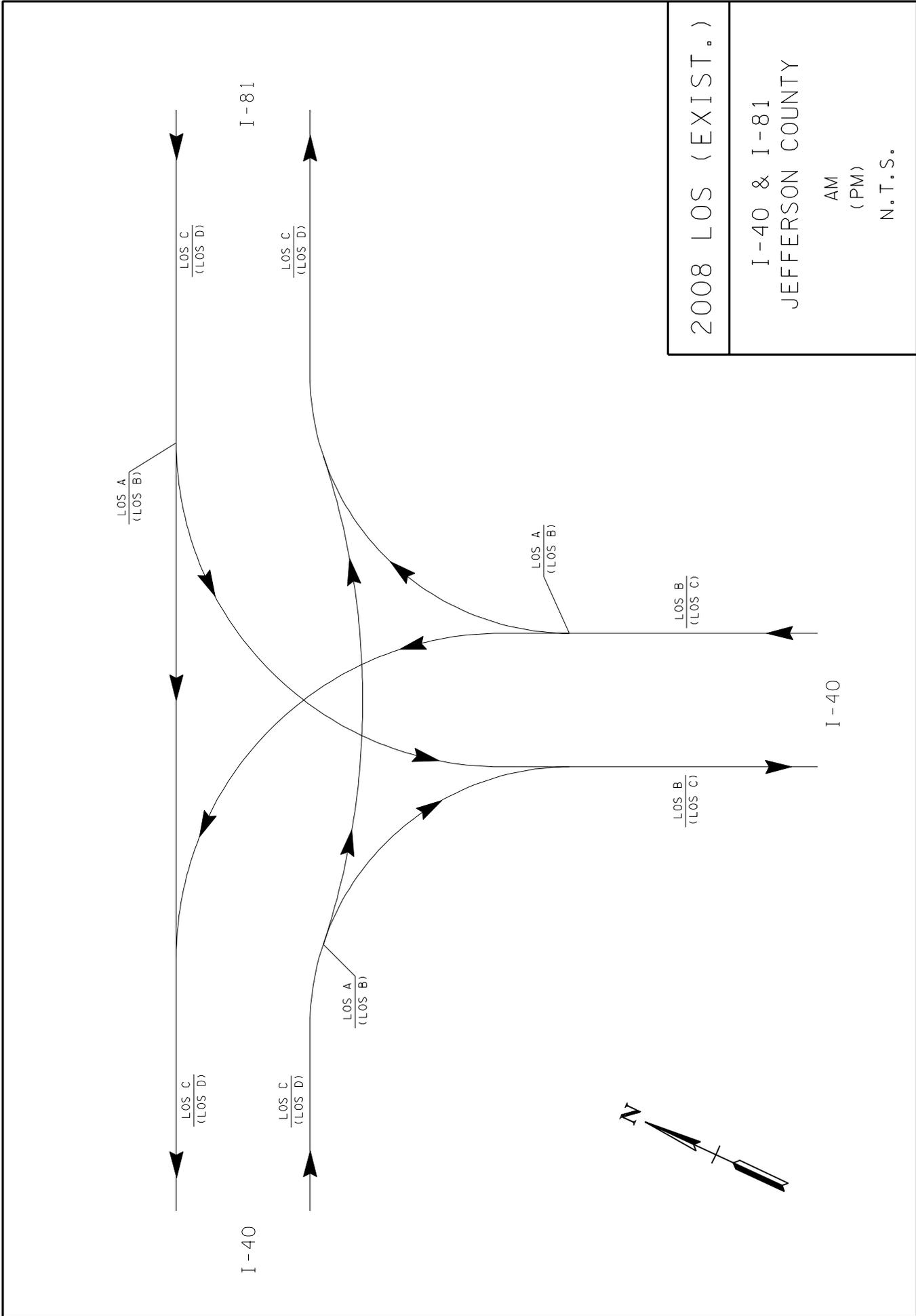
PM

[AM]

DATE: 6-30-03

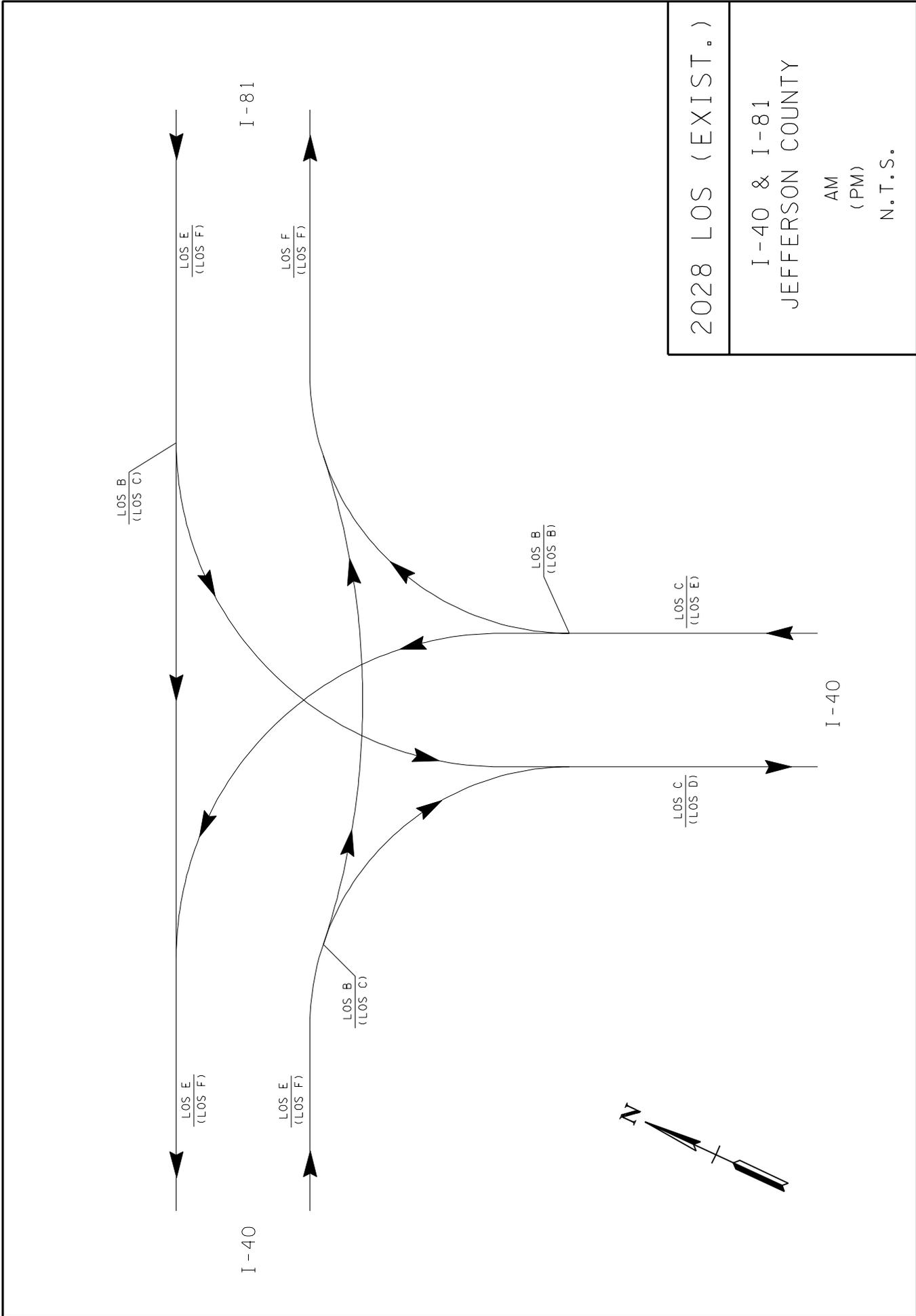
J.H.





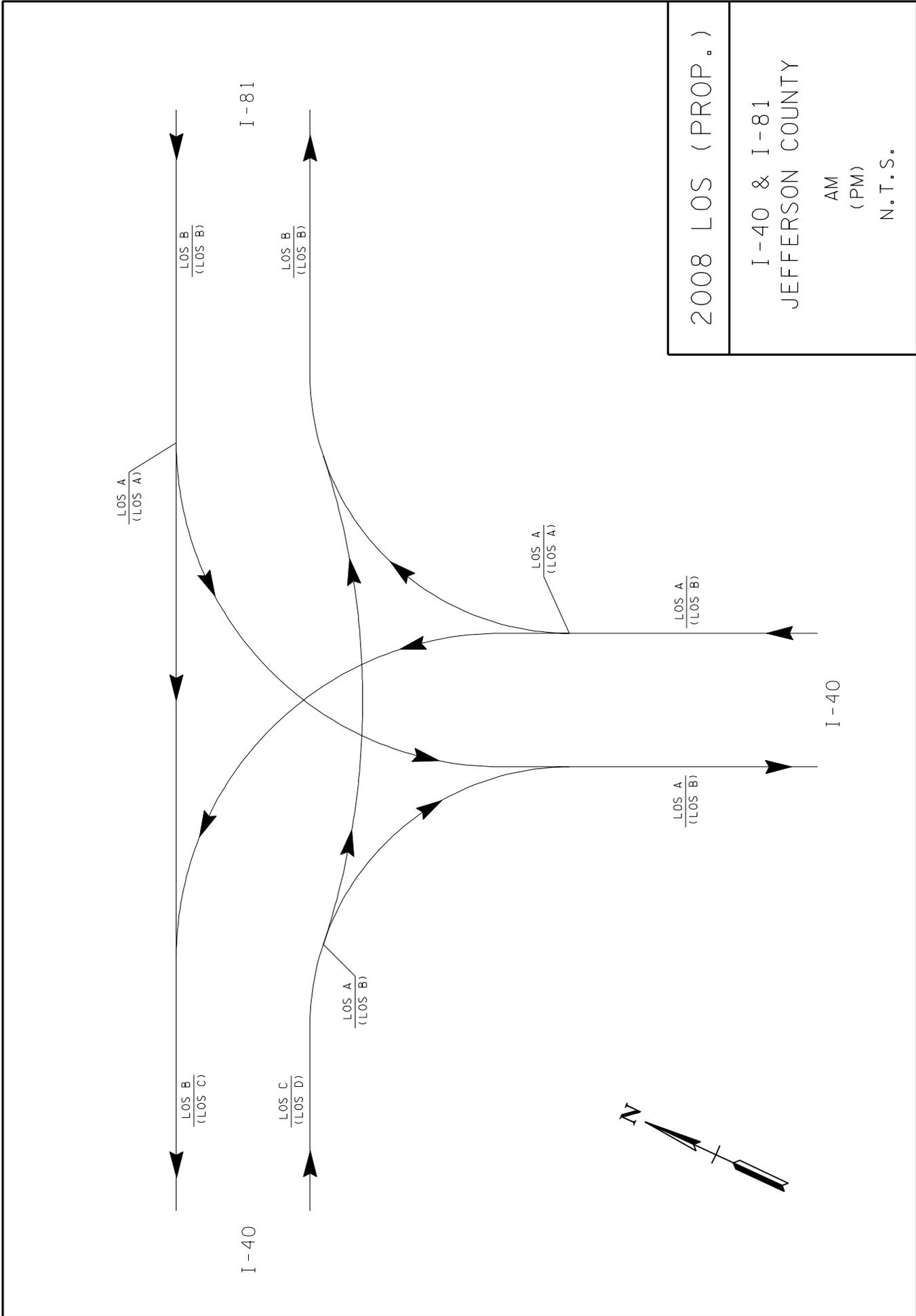
2008 LOS (EXIST.)

I-40 & I-81
 JEFFERSON COUNTY
 AM
 (PM)
 N.T.S.



2028 LOS (EXIST.)

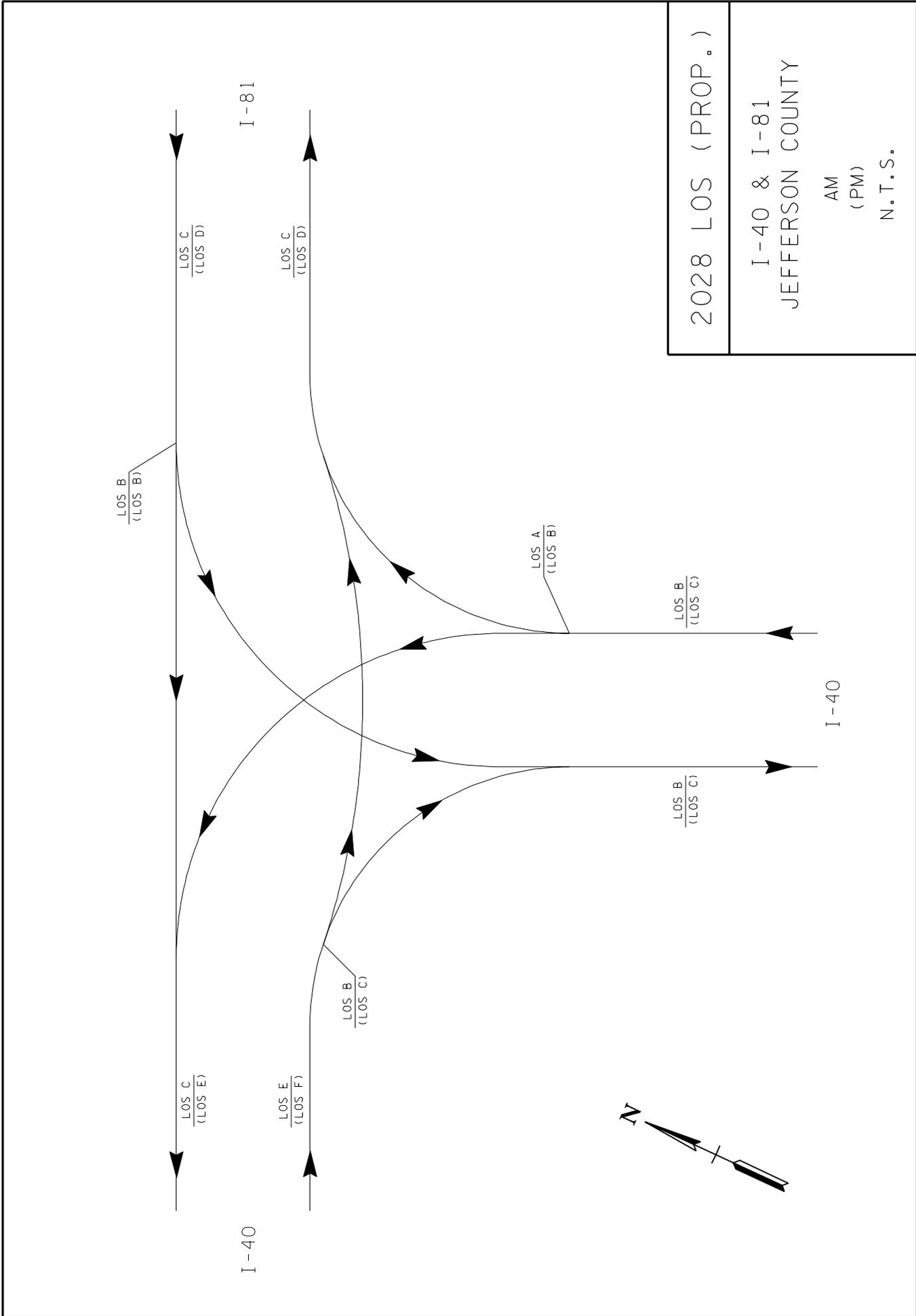
I-40 & I-81
 JEFFERSON COUNTY
 AM
 (PM)
 N.T.S.



2008 LOS (PROP.)

I-40 & I-81
JEFFERSON COUNTY

AM
(PM)
N.T.S.



2028 LOS (PROP.)

I-40 & I-81
 JEFFERSON COUNTY
 AM
 (PM)
 N.T.S.

HCS2000: Basic Freeway Segments Release 4.1d

CEA
 Clinard Engineering Associates
 5210 Maryland way
 Suite 202
 Brentwood, TN 37027
 Phone: (615) 370-6079 Fax: (615) 627-4066
 E-mail:

 Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 WB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	713	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1373	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1373	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	19.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

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E-mail:

Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 EB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	2726	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	757	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1458	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1458	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

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 E-mail:

 Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 WB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	1215	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	338	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	975	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	975	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	13.9	pc/mi/ln
Level of service, LOS	B	

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Clinard Engineering Associates, LLC.
5210 Maryland Way Suite 202
Brentwood, TN 37027

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Fax: (615) 627-4066

E-mail:

 Operational Analysis

Analyst: Brian Gaffney
Agency or Company: Clinard Engineering Associates
Date Performed: 01/22/2004
Analysis Time Period: AM
Freeway/Direction: I-40 EB
From/To: East of interchange
Jurisdiction: Jefferson County
Analysis Year: 2008 Existing
Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	1201	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	334	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	964	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	964	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	13.8	pc/mi/ln
Level of service, LOS	B	

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CEA

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 Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-81 NB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	1903	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	529	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1527	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1527	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.7	mi/h
Number of lanes, N	2	
Density, D	21.9	pc/mi/ln
Level of service, LOS	C	

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 Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-81 SB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	1730	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	481	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1388	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1388	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	19.8	pc/mi/ln
Level of service, LOS	C	

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Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 WB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	3661	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1017	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1959	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1959	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	65.6	mi/h
Number of lanes, N	3	
Density, D	29.9	pc/mi/ln
Level of service, LOS	D	

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Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 EB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	3466	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	963	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1854	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1854	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	67.2	mi/h
Number of lanes, N	3	
Density, D	27.6	pc/mi/ln
Level of service, LOS	D	

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Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 WB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	1845	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	513	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1481	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1481	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.8	mi/h
Number of lanes, N	2	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

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E-mail:

Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 EB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	1643	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	456	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1318	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1318	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	18.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

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Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-81 NB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2309	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	641	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1853	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1853	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	67.2	mi/h
Number of lanes, N	2	
Density, D	27.6	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1d

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 Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-81 SB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2302	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	639	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1847	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1847	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	67.3	mi/h
Number of lanes, N	2	
Density, D	27.4	pc/mi/ln
Level of service, LOS	D	

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Operational Analysis

Analyst: Brian Gaffney
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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 WB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	4109	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1141	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2198	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2198	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	60.2	mi/h
Number of lanes, N	3	
Density, D	36.5	pc/mi/ln
Level of service, LOS	E	

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 Analysis Time Period: AM
 Freeway/Direction: I-40 EB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	4358	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1211	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2331	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	2331	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	55.9	mi/h
Number of lanes, N	3	
Density, D	41.7	pc/mi/ln
Level of service, LOS	E	

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 Freeway/Direction: I-40 WB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	1944	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	540	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1560	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1560	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.6	mi/h
Number of lanes, N	2	
Density, D	22.4	pc/mi/ln
Level of service, LOS	C	

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 Freeway/Direction: I-40 EB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	1923	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	534	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1543	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1543	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.7	mi/h
Number of lanes, N	2	
Density, D	22.1	pc/mi/ln
Level of service, LOS	C	

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 Analysis Time Period: AM
 Freeway/Direction: I-81 NB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	3042	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	845	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2441	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	2441	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-81 SB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2772	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	770	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2224	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	2224	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	59.4	mi/h
Number of lanes, N	2	
Density, D	37.4	pc/mi/ln
Level of service, LOS	E	

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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 WB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	5863	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1629	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	3137	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	3137	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	3	
Density, D		pc/mi/ln
Level of service, LOS	F	

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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 EB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	5542	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1539	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2965	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	2965	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	3	
Density, D		pc/mi/ln
Level of service, LOS	F	

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 Analysis Time Period: PM
 Freeway/Direction: I-40 WB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2952	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	820	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2369	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	2369	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	54.5	mi/h
Number of lanes, N	2	
Density, D	43.4	pc/mi/ln
Level of service, LOS	E	

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 From/To: East of interchange
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 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	2631	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	731	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2111	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2111	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	62.5	mi/h
Number of lanes, N	2	
Density, D	33.8	pc/mi/ln
Level of service, LOS	D	

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 Freeway/Direction: I-81 NB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	3690	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1025	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2961	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	2961	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

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 Jurisdiction: Jefferson County
 Analysis Year: 2028 Existing
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	3690	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1025	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2961	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	2961	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	2	
Density, D		pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 WB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	713	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1030	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1030	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	4	
Density, D	14.7	pc/mi/ln
Level of service, LOS	B	

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Operational Analysis

Analyst: Brian Gaffney
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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 EB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	2726	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	757	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1458	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1458	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 WB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	1215	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	338	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	650	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	650	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	9.3	pc/mi/ln
Level of service, LOS	A	

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Operational Analysis

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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 EB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	1201	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	334	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	643	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	643	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	9.2	pc/mi/ln
Level of service, LOS	A	

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 Operational Analysis

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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-81 NB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	1903	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	529	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1018	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1018	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	14.5	pc/mi/ln
Level of service, LOS	B	

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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-81 SB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	1730	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	481	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	926	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	926	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	13.2	pc/mi/ln
Level of service, LOS	B	

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Operational Analysis

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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 WB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	3661	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1017	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1469	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1469	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	4	
Density, D	21.0	pc/mi/ln
Level of service, LOS	C	

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Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 EB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	3466	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	963	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1854	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1854	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	67.2	mi/h
Number of lanes, N	3	
Density, D	27.6	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

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Operational Analysis

Analyst: Brian Gaffney
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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 WB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	1845	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	513	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	987	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	987	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	14.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Analysis Time Period: PM
 Freeway/Direction: I-40 EB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	1643	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	456	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	879	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	879	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	12.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-81 NB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2309	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	641	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1235	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1235	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	17.6	pc/mi/ln
Level of service, LOS	B	

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Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-81 SB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2008 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2302	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	639	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1232	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1232	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	17.6	pc/mi/ln
Level of service, LOS	B	

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Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 WB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	4109	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1141	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1649	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1649	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.2	mi/h
Number of lanes, N	4	
Density, D	23.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS2000: Basic Freeway Segments Release 4.1d

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Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 EB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	4358	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1211	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2331	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2331	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	55.9	mi/h
Number of lanes, N	3	
Density, D	41.7	pc/mi/ln
Level of service, LOS	E	

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Operational Analysis

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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 WB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	1944	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	540	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1040	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1040	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-40 EB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	1923	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	534	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1029	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1029	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	14.7	pc/mi/ln
Level of service, LOS	B	

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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-81 NB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	3042	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	845	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1627	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1627	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.3	mi/h
Number of lanes, N	3	
Density, D	23.5	pc/mi/ln
Level of service, LOS	C	

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 Date Performed: 01/22/2004
 Analysis Time Period: AM
 Freeway/Direction: I-81 SB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2772	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	770	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1483	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1483	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.8	mi/h
Number of lanes, N	3	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 WB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	5863	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1629	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2352	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2352	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	55.2	mi/h
Number of lanes, N	4	
Density, D	42.6	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 EB
 From/To: West of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	5542	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1539	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	2965	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	2965	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S		mi/h
Number of lanes, N	3	
Density, D		pc/mi/ln
Level of service, LOS	F	

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Operational Analysis

Analyst: Brian Gaffney
 Agency or Company: Clinard Engineering Associates
 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 WB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

Flow Inputs and Adjustments

Volume, V	2952	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	820	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1579	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

LOS and Performance Measures

Flow rate, vp	1579	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.5	mi/h
Number of lanes, N	3	
Density, D	22.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-40 EB
 From/To: East of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	2631	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	731	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1408	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1408	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	20.1	pc/mi/ln
Level of service, LOS	C	

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 Operational Analysis

Analyst: Brian Gaffney
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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-81 NB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	3690	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1025	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1974	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1974	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	65.3	mi/h
Number of lanes, N	3	
Density, D	30.2	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

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 Date Performed: 01/22/2004
 Analysis Time Period: PM
 Freeway/Direction: I-81 SB
 From/To: North of interchange
 Jurisdiction: Jefferson County
 Analysis Year: 2028 Proposed
 Description: I-40 and I-81 Interchange

 Flow Inputs and Adjustments

Volume, V	3690	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1025	v
Trucks and buses	20	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5*	
Recreational vehicle PCE, ER	2.0*	
Heavy vehicle adjustment, fhv	0.769	
Driver population factor, fp	0.90	
Flow rate, vp	1974	pc/h/ln

 Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	70.0	mi/h
Lane width adjustment, flw	0.0	mi/h
Lateral clearance adjustment, flc	0.0	mi/h
Interchange density adjustment, fid	0.0	mi/h
Number of lanes adjustment, fn	0.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Rural Freeway	

 LOS and Performance Measures

Flow rate, vp	1974	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	65.3	mi/h
Number of lanes, N	3	
Density, D	30.2	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

Description		Year 2008	Year 2028
Mainline Capacity Analysis (Existing)	I-40 WB West of Interchange (AM)	C	E
	I-40 WB West of Interchange (PM)	D	F
	I-40 EB West of Interchange (AM)	C	E
	I-40 EB West of Interchange (PM)	D	F
	I-40 WB East of Interchange (AM)	B	C
	I-40 WB East of Interchange (PM)	C	E
	I-40 EB East of Interchange (AM)	B	C
	I-40 EB East of Interchange (PM)	C	D
	I-81 NB North of Interchange (AM)	C	F
	I-81 NB North of Interchange (PM)	D	F
	I-81 SB North of Interchange (AM)	C	E
	I-81 SB North of Interchange (PM)	D	F

Description		Year 2008	Year 2028
Mainline Capacity Analysis (Proposed)	I-40 WB West of Interchange (AM)	B	C
	I-40 WB West of Interchange (PM)	C	E
	I-40 EB West of Interchange (AM)	C	E
	I-40 EB West of Interchange (PM)	D	F
	I-40 WB East of Interchange (AM)	A	B
	I-40 WB East of Interchange (PM)	B	C
	I-40 EB East of Interchange (AM)	A	B
	I-40 EB East of Interchange (PM)	B	C
	I-81 NB North of Interchange (AM)	B	C
	I-81 NB North of Interchange (PM)	B	D
	I-81 SB North of Interchange (AM)	B	C
	I-81 SB North of Interchange (PM)	B	D

		Description	Year 2008	Year 2028
Major Diverge Areas (Existing)	I-40 EB to I-81 NB & I-40 EB (AM)	A	B	
	I-40 EB to I-81 NB & I-40 EB (PM)	B	C	
	I-40 WB to I-81 NB & I-40 WB (AM)	A	B	
	I-40 WB to I-81 NB & I-40 WB (PM)	B	B	
	I-81 SB to I-40 WB & I-40 EB (AM)	A	B	
	I-81 SB to I-40 WB & I-40 EB (PM)	B	C	

		Description	Year 2008	Year 2028
Major Diverge Areas (Proposed)	I-40 EB to I-81 NB & I-40 EB (AM)	A	B	
	I-40 EB to I-81 NB & I-40 EB (PM)	B	C	
	I-40 WB to I-81 NB & I-40 WB (AM)	A	A	
	I-40 WB to I-81 NB & I-40 WB (PM)	A	B	
	I-81 SB to I-40 WB & I-40 EB (AM)	A	B	
	I-81 SB to I-40 WB & I-40 EB (PM)	A	B	

	Description	Year	Time	DHV	pc/h	# of Lanes	Capacity *	Pass/Fail
Major Merge Areas (Existing)	From I-81 SB to I-40 WB	2008	AM	1552	2328	2	4800	Pass
	From I-40 WB to I-40 WB	2008	AM	1015	1523	2	4800	Pass
	I-40 WB West of Interchange	2008	AM	2567	3851	3	7200	Pass
	From I-81 SB to I-40 WB	2008	PM	2066	3099	2	4800	Pass
	From I-40 WB to I-40 WB	2008	PM	1595	2393	2	4800	Pass
	I-40 WB West of Interchange	2008	PM	3661	5492	3	7200	Pass
	From I-81 SB to I-40 WB	2028	AM	2486	3729	2	4800	Pass
	From I-40 WB to I-40 WB	2028	AM	1623	2435	2	4800	Pass
	I-40 WB West of Interchange	2028	AM	4109	6164	3	7200	Pass
	From I-81 SB to I-40 WB	2028	PM	3310	4965	2	4800	Fail
	From I-40 WB to I-40 WB	2028	PM	2553	3830	2	4800	Pass
	I-40 WB West of Interchange	2028	PM	5863	8795	3	7200	Fail
	From I-81 SB to I-40 EB	2008	AM	178	267	1	2400	Pass
	From I-40 EB to I-40 EB	2008	AM	1023	1535	2	4800	Pass
	I-40 EB East of Interchange	2008	AM	1201	1802	2	4800	Pass
	From I-81 SB to I-40 EB	2008	PM	236	354	1	2400	Pass
	From I-40 EB to I-40 EB	2008	PM	1407	2111	2	4800	Pass
	I-40 EB East of Interchange	2008	PM	1643	2465	2	4800	Pass
	From I-81 SB to I-40 EB	2028	AM	286	429	1	2400	Pass
	From I-40 EB to I-40 EB	2028	AM	1637	2456	2	4800	Pass
	I-40 EB East of Interchange	2028	AM	1923	2885	2	4800	Pass
	From I-81 SB to I-40 EB	2028	PM	380	570	1	2400	Pass
	From I-40 EB to I-40 EB	2028	PM	2251	3377	2	4800	Pass
	I-40 EB East of Interchange	2028	PM	2631	3947	2	4800	Pass
	From I-40 WB to I-81 NB	2008	AM	200	300	1	2400	Pass
	From I-40 EB to I-81 NB	2008	AM	1703	2555	2	4800	Pass
	I-81 NB North of Interchange	2008	AM	1903	2855	2	4800	Pass
	From I-40 WB to I-81 NB	2008	PM	250	375	1	2400	Pass
	From I-40 EB to I-81 NB	2008	PM	2059	3089	2	4800	Pass
	I-81 NB North of Interchange	2008	PM	2309	3464	2	4800	Pass
	From I-40 WB to I-81 NB	2028	AM	321	482	1	2400	Pass
	From I-40 EB to I-81 NB	2028	AM	2721	4082	2	4800	Pass
	I-81 NB North of Interchange	2028	AM	3042	4563	2	4800	Pass
	From I-40 WB to I-81 NB	2028	PM	399	599	1	2400	Pass
	From I-40 EB to I-81 NB	2028	PM	3291	4937	2	4800	Fail
	I-81 NB North of Interchange	2028	PM	3690	5535	2	4800	Fail

* Capacity values determined using Exhibit 25-7 on page 25-8 of the Highway Capacity Manual 2000.

	Description	Year	Time	DHV	pc/h	# of Lanes	Capacity *	Pass/Fail
Major Merge Areas (Proposed)	From I-81 SB to I-40 WB	2008	AM	1552	2328	2	4800	Pass
	From I-40 WB to I-40 WB	2008	AM	1015	1523	2	4800	Pass
	I-40 WB West of Interchange	2008	AM	2567	3851	4	9600	Pass
	From I-81 SB to I-40 WB	2008	PM	2066	3099	2	4800	Pass
	From I-40 WB to I-40 WB	2008	PM	1595	2393	2	4800	Pass
	I-40 WB West of Interchange	2008	PM	3661	5492	4	9600	Pass
	From I-81 SB to I-40 WB	2028	AM	2486	3729	2	4800	Pass
	From I-40 WB to I-40 WB	2028	AM	1623	2435	2	4800	Pass
	I-40 WB West of Interchange	2028	AM	4109	6164	4	9600	Pass
	From I-81 SB to I-40 WB	2028	PM	3310	4965	2	4800	Fail
	From I-40 WB to I-40 WB	2028	PM	2553	3830	2	4800	Pass
	I-40 WB West of Interchange	2028	PM	5863	8795	4	9600	Pass
	From I-81 SB to I-40 EB	2008	AM	178	267	1	2400	Pass
	From I-40 EB to I-40 EB	2008	AM	1023	1535	2	4800	Pass
	I-40 EB East of Interchange	2008	AM	1201	1802	3	7200	Pass
	From I-81 SB to I-40 EB	2008	PM	236	354	1	2400	Pass
	From I-40 EB to I-40 EB	2008	PM	1407	2111	2	4800	Pass
	I-40 EB East of Interchange	2008	PM	1643	2465	3	7200	Pass
	From I-81 SB to I-40 EB	2028	AM	286	429	1	2400	Pass
	From I-40 EB to I-40 EB	2028	AM	1637	2456	2	4800	Pass
	I-40 EB East of Interchange	2028	AM	1923	2885	3	7200	Pass
	From I-81 SB to I-40 EB	2028	PM	380	570	1	2400	Pass
	From I-40 EB to I-40 EB	2028	PM	2251	3377	2	4800	Pass
	I-40 EB East of Interchange	2028	PM	2631	3947	3	7200	Pass
	From I-40 WB to I-81 NB	2008	AM	200	300	1	2400	Pass
	From I-40 EB to I-81 NB	2008	AM	1703	2555	2	4800	Pass
	I-81 NB North of Interchange	2008	AM	1903	2855	3	7200	Pass
	From I-40 WB to I-81 NB	2008	PM	250	375	1	2400	Pass
	From I-40 EB to I-81 NB	2008	PM	2059	3089	2	4800	Pass
	I-81 NB North of Interchange	2008	PM	2309	3464	3	7200	Pass
	From I-40 WB to I-81 NB	2028	AM	321	482	1	2400	Pass
	From I-40 EB to I-81 NB	2028	AM	2721	4082	2	4800	Pass
	I-81 NB North of Interchange	2028	AM	3042	4563	3	7200	Pass
From I-40 WB to I-81 NB	2028	PM	399	599	1	2400	Pass	
From I-40 EB to I-81 NB	2028	PM	3291	4937	2	4800	Fail	
I-81 NB North of Interchange	2028	PM	3690	5535	3	7200	Pass	

* Capacity values determined using Exhibit 25-7 on page 25-8 of the [Highway Capacity Manual 2000](#).

Major Merge Area Failures

	Year	Time	DHV	pc/h	Capacity	Pass/Fail
From I-81 SB to I-40 WB (Existing)	2008	PM	2066	3099	4800	Pass
	2009	PM	2128.2	3192	4800	Pass
	2010	PM	2190.4	3286	4800	Pass
	2011	PM	2252.6	3379	4800	Pass
	2012	PM	2314.8	3472	4800	Pass
	2013	PM	2377	3566	4800	Pass
	2014	PM	2439.2	3659	4800	Pass
	2015	PM	2501.4	3752	4800	Pass
	2016	PM	2563.6	3845	4800	Pass
	2017	PM	2625.8	3939	4800	Pass
	2018	PM	2688	4032	4800	Pass
	2019	PM	2750.2	4125	4800	Pass
	2020	PM	2812.4	4219	4800	Pass
	2021	PM	2874.6	4312	4800	Pass
	2022	PM	2936.8	4405	4800	Pass
	2023	PM	2999	4499	4800	Pass
	2024	PM	3061.2	4592	4800	Pass
	2025	PM	3123.4	4685	4800	Pass
	2026	PM	3185.6	4778	4800	Pass
	2027	PM	3247.8	4872	4800	Fail
2028	PM	3310	4965	4800	Fail	

	Year	Time	DHV	pc/h	Capacity	Pass/Fail
I-40 WB West of Interchange (Existing)	2008	PM	3661	5492	7200	Pass
	2009	PM	3771.1	5657	7200	Pass
	2010	PM	3881.2	5822	7200	Pass
	2011	PM	3991.3	5987	7200	Pass
	2012	PM	4101.4	6152	7200	Pass
	2013	PM	4211.5	6317	7200	Pass
	2014	PM	4321.6	6482	7200	Pass
	2015	PM	4431.7	6648	7200	Pass
	2016	PM	4541.8	6813	7200	Pass
	2017	PM	4651.9	6978	7200	Pass
	2018	PM	4762	7143	7200	Pass
	2019	PM	4872.1	7308	7200	Fail
	2020	PM	4982.2	7473	7200	Fail
	2021	PM	5092.3	7638	7200	Fail
	2022	PM	5202.4	7804	7200	Fail
	2023	PM	5312.5	7969	7200	Fail
	2024	PM	5422.6	8134	7200	Fail
	2025	PM	5532.7	8299	7200	Fail
	2026	PM	5642.8	8464	7200	Fail
	2027	PM	5752.9	8629	7200	Fail
2028	PM	5863	8795	7200	Fail	

Major Merge Area Failures

	Year	Time	DHV	pc/h	Capacity	Pass/Fail
From I-40 EB to I-81 NB (Existing)	2008	PM	2059	3089	4800	Pass
	2009	PM	2120.6	3181	4800	Pass
	2010	PM	2182.2	3273	4800	Pass
	2011	PM	2243.8	3366	4800	Pass
	2012	PM	2305.4	3458	4800	Pass
	2013	PM	2367	3551	4800	Pass
	2014	PM	2428.6	3643	4800	Pass
	2015	PM	2490.2	3735	4800	Pass
	2016	PM	2551.8	3828	4800	Pass
	2017	PM	2613.4	3920	4800	Pass
	2018	PM	2675	4013	4800	Pass
	2019	PM	2736.6	4105	4800	Pass
	2020	PM	2798.2	4197	4800	Pass
	2021	PM	2859.8	4290	4800	Pass
	2022	PM	2921.4	4382	4800	Pass
	2023	PM	2983	4475	4800	Pass
	2024	PM	3044.6	4567	4800	Pass
	2025	PM	3106.2	4659	4800	Pass
	2026	PM	3167.8	4752	4800	Pass
	2027	PM	3229.4	4844	4800	Fail
2028	PM	3291	4937	4800	Fail	

	Year	Time	DHV	pc/h	Capacity	Pass/Fail
I-81 NB North of Interchange (Existing)	2008	PM	2309	3464	4800	Pass
	2009	PM	2378.05	3567	4800	Pass
	2010	PM	2447.1	3671	4800	Pass
	2011	PM	2516.15	3774	4800	Pass
	2012	PM	2585.2	3878	4800	Pass
	2013	PM	2654.25	3981	4800	Pass
	2014	PM	2723.3	4085	4800	Pass
	2015	PM	2792.35	4189	4800	Pass
	2016	PM	2861.4	4292	4800	Pass
	2017	PM	2930.45	4396	4800	Pass
	2018	PM	2999.5	4499	4800	Pass
	2019	PM	3068.55	4603	4800	Pass
	2020	PM	3137.6	4706	4800	Pass
	2021	PM	3206.65	4810	4800	Fail
	2022	PM	3275.7	4914	4800	Fail
	2023	PM	3344.75	5017	4800	Fail
	2024	PM	3413.8	5121	4800	Fail
	2025	PM	3482.85	5224	4800	Fail
	2026	PM	3551.9	5328	4800	Fail
	2027	PM	3620.95	5431	4800	Fail
2028	PM	3690	5535	4800	Fail	

Major Merge Area Failures

	Year	Time	DHV	pc/h	Capacity	Pass/Fail
From I-81 SB to I-40 WB (Proposed)	2008	PM	2066	3099	4800	Pass
	2009	PM	2128.2	3192	4800	Pass
	2010	PM	2190.4	3286	4800	Pass
	2011	PM	2252.6	3379	4800	Pass
	2012	PM	2314.8	3472	4800	Pass
	2013	PM	2377	3566	4800	Pass
	2014	PM	2439.2	3659	4800	Pass
	2015	PM	2501.4	3752	4800	Pass
	2016	PM	2563.6	3845	4800	Pass
	2017	PM	2625.8	3939	4800	Pass
	2018	PM	2688	4032	4800	Pass
	2019	PM	2750.2	4125	4800	Pass
	2020	PM	2812.4	4219	4800	Pass
	2021	PM	2874.6	4312	4800	Pass
	2022	PM	2936.8	4405	4800	Pass
	2023	PM	2999	4499	4800	Pass
	2024	PM	3061.2	4592	4800	Pass
	2025	PM	3123.4	4685	4800	Pass
	2026	PM	3185.6	4778	4800	Pass
	2027	PM	3247.8	4872	4800	Fail
	2028	PM	3310	4965	4800	Fail

	Year	Time	DHV	pc/h	Capacity	Pass/Fail
From I-40 EB to I-81 NB (Proposed)	2008	PM	2059	3089	4800	Pass
	2009	PM	2120.6	3181	4800	Pass
	2010	PM	2182.2	3273	4800	Pass
	2011	PM	2243.8	3366	4800	Pass
	2012	PM	2305.4	3458	4800	Pass
	2013	PM	2367	3551	4800	Pass
	2014	PM	2428.6	3643	4800	Pass
	2015	PM	2490.2	3735	4800	Pass
	2016	PM	2551.8	3828	4800	Pass
	2017	PM	2613.4	3920	4800	Pass
	2018	PM	2675	4013	4800	Pass
	2019	PM	2736.6	4105	4800	Pass
	2020	PM	2798.2	4197	4800	Pass
	2021	PM	2859.8	4290	4800	Pass
	2022	PM	2921.4	4382	4800	Pass
	2023	PM	2983	4475	4800	Pass
	2024	PM	3044.6	4567	4800	Pass
	2025	PM	3106.2	4659	4800	Pass
	2026	PM	3167.8	4752	4800	Pass
	2027	PM	3229.4	4844	4800	Fail
	2028	PM	3291	4937	4800	Fail

I-40 Accident Data

nbr_tenn	nbr_rte	accd_log	nbr_case	accd_loc	dte_accd	tot_vhcl	tot_injr	tot_killed	fix_obj	lgt_cond	typ_collisic	typ_invl_1	weather_cond_1
45	I0040	10.01	94770201	5	10/25/1999 11:10:00	2	0	0		2	3	01	2
45	I0040	10.03	62596447	0	3/8/1996 06:35:00	2	0	0		5	3	01	5
45	I0040	10.03	62596489	5	1/24/1996 04:55:00	2	0	0		5	7	01	4
45	I0040	10.03	63050713	6	5/12/1996 01:40:00	2	0	0		6	2	01	2
45	I0040	10.03	97107275	0	9/8/1999 09:30:00	2	0	0		2	2	01	1
45	I0040	10.04	97011037	0	5/8/1999 05:45:00	2	0	0		5	2	01	1
45	I0040	10.05	31772375	0	10/31/1993 00:00:00	4	1	0		2	2	01	2
45	I0040	10.05	52755805	0	1/15/1995 00:00:00	2	1	0		2	2	01	4
45	I0040	10.05	52756005	0	4/25/1995 00:00:00	3	0	0		3	2	01	1
45	I0040	10.05	73352029	0	11/29/1997 18:10:00	2	0	0		5	4	01	2
45	I0040	10.06	7384548	0	11/2/2000 19:09:00	2	1	0		5	4	01	1
45	I0040	10.22	42007179	0	8/28/1994 00:00:00	2	0	0		2	4	01	2
45	I0040	10.24	42305968	0	5/14/1994 00:00:00	3	0	0		2	2	01	1
45	I0040	10.25	41841644	0	3/6/1994 00:00:00	1	0	0		0	7	11	2
45	I0040	10.25	42305603	0	8/8/1994 00:00:00	1	1	0		2	7	11	1
45	I0040	10.25	52754393	0	1/6/1995 00:00:00	1	0	0	15	2	7	12	4
45	I0040	10.25	63051327	0	7/6/1996 11:40:00	3	0	0		2	2	01	1
45	I0040	10.25	63099966	0	12/19/1996 05:50:00	1	0	0	10	5	7	12	5
45	I0040	10.25	63571437	0	7/26/1996 12:30:00	2	0	0		2	2	01	1
45	I0040	10.25	72008401	0	1/11/1997 09:45:00	2	1	0		2	3	01	1
45	I0040	10.25	73115307	0	1/11/1997 11:30:00	3	0	0		2	2	01	1
45	I0040	10.25	83352052	0	1/20/1998 13:40:00	2	0	0		2	4	01	1
45	I0040	10.25	83352931	0	4/20/1998 08:15:00	2	0	0	09	2	4	01	1
45	I0040	10.25	83352932	0	4/20/1998 09:00:00	2	0	0		2	2	01	1
45	I0040	10.25	83498250	0	6/10/1998 17:00:00	2	0	0		2	4	01	1
45	I0040	10.28	42305966	0	5/14/1994 00:00:00	3	0	0		2	3	01	1
45	I0040	10.29	42742902	0	6/24/1994 00:00:00	1	2	0	10	5	7	12	2
45	I0040	10.32	97107175	0	12/19/1999 11:35:00	2	0	0		2	2	01	1
45	I0040	10.35	42754526	0	10/12/1994 00:00:00	2	0	0		1	4	01	2
45	I0040	10.35	63115282	0	11/15/1996 04:55:00	2	1	0		5	4	01	2
45	I0040	10.41	7384580	0	9/21/2000 10:30:00	2	0	0		2	4	01	1
45	I0040	10.41	17242420	0	11/30/2001 16:10:00	2	0	0		2	4	01	1
45	I0040	10.41	17384169	0	8/20/2001 15:30:00	3	4	0		2	2	01	1
45	I0040	10.42	73114418	0	10/13/1997 14:30:00	1	0	0	11	2	7	13	1
45	I0040	10.45	73114420	0	11/4/1997 10:35:00	1	0	0		2	7	13	2
45	I0040	10.45	73115103	0	1/11/1997 08:30:00	2	0	0		2	7	01	1
45	I0040	10.45	73115110	0	1/11/1997 09:10:00	2	0	0		2	2	01	1
45	I0040	10.45	73115111	0	1/11/1997 09:15:00	2	3	0		2	2	01	1
45	I0040	10.45	73352041	0	12/21/1997 18:14:00	1	1	0	09	5	7	12	2
45	I0040	10.5	7384528	0	8/19/2000 19:00:00	2	1	0		2	4	01	1
45	I0040	10.55	74017055	0	10/29/1997 21:15:00	2	0	0		5	3	01	1
45	I0040	10.57	97125380	0	9/10/1999 12:20:00	2	0	0		2	2	01	1
45	I0040	10.61	7383927	0	6/15/2000 00:31:00	2	5	0		5	1	01	1
45	I0040	10.66	7394692	0	7/29/2000 06:55:00	2	1	0		2	2	01	1
45	I0040	10.74	17242356	0	6/24/2001 17:11:00	2	0	0		2	2	01	1
45	I0040	10.74	17326761	0	4/29/2001 12:35:00	2	0	0		2	3	01	1
45	I0040	10.74	97026255	0	3/14/1999 18:30:00	2	3	0		5	3	01	4
45	I0040	10.74	97107244	0	10/1/1999 09:10:00	2	0	0		2	2	01	1
45	I0040	10.76	63114293	0	12/11/1996 12:00:00	2	0	0		2	2	01	2
45	I0040	10.77	60000543	0	7/9/1996 17:17:00	4	3	2		2	3	01	1
45	I0040	10.77	97010928	0	4/20/1999 08:25:00	2	1	0		2	3	01	1
45	I0040	10.78	7385601	0	11/16/2000 18:15:00	2	0	0		5	4	01	4
45	I0040	10.84	17384161	0	6/25/2001 07:20:00	1	0	0	11	2	7	12	1
45	I0040	10.85	42007128	0	8/17/1994 00:00:00	4	0	0		3	7	01	2
45	I0040	10.85	73114409	0	8/9/1997 09:15:00	3	0	0		2	2	01	1
45	I0040	10.86	17242357	4	6/30/2001 15:49:00	1	2	0	10	2	7	12	1
45	I0040	10.86	17395301	3	1/1/2001 23:05:00	1	2	0	10	5	7	12	5
45	I0040	10.86	52755631	3	4/14/1995 00:00:00	2	0	0		2	4	01	1
45	I0040	10.86	63114580	3	5/19/1996 09:20:00	1	0	0	03	2	7	10	1
45	I0040	10.86	73115311	5	1/19/1997 03:03:00	1	0	0	03	5	7	12	2
45	I0040	10.86	73352015	3	12/1/1997 00:38:00	1	0	0	03	5	7	12	4
45	I0040	10.88	17242355	0	6/24/2001 13:50:00	1	0	0	09	2	7	12	1
45	I0040	10.89	73352306	0	10/5/1997 06:10:00	2	0	0		5	4	01	1
45	I0040	10.9	42007157	0	7/31/1994 00:00:00	1	0	0		5	7	12	2
45	I0040	10.9	52596301	0	7/10/1995 00:00:00	1	1	0		1	7	12	1
45	I0040	10.91	17395319	0	8/28/2001 05:30:00	2	0	0	21	5	2	01	1
45	I0040	10.91	87015953	0	11/23/1998 11:00:00	1	0	0		2	7	07	1
45	I0040	10.95	52756035	0	4/1/1995 00:00:00	1	0	0	10	0	7	12	0
45	I0040	11.06	63115217	0	12/26/1996 11:48:00	1	0	0	10	2	7	12	2
45	I0040	11.09	31772613	0	8/17/1993 00:00:00	2	1	0		2	4	01	1
45	I0040	11.09	73114382	0	3/2/1997 03:30:00	1	2	0	10	5	7	12	2
45	I0040	11.09	73498676	0	4/6/1997 13:25:00	1	0	0		2	2	01	2
45	I0040	11.09	73498704	0	4/6/1997 11:50:00	2	0	0	10	2	7	12	2
45	I0040	11.11	17238404	0	5/7/2001 14:00:00	2	0	0		2	4	01	4
45	I0040	11.19	83498298	0	6/26/1998 22:50:00	1	0	0	99	5	7	12	2
45	I0040	11.2	14802446	0	5/11/2001 16:12:00	2	0	0		2	3	01	2
45	I0040	11.2	17238316	0	4/23/2001 09:15:00	2	1	0		2	2	01	1
45	I0040	11.2	97107104	0	10/24/1999 23:05:00	2	0	0		5	4	01	1
45	I0040	11.2	97124948	0	12/13/1999 20:25:00	1	1	0	13	5	7	12	4
45	I0040	11.22	31737805	0	9/11/1993 00:00:00	1	0	0	11	5	7	11	1
45	I0040	11.24	63571565	0	3/13/1996 16:40:00	2	2	0	10	2	4	01	1
45	I0040	11.24	97026270	0	4/19/1999 06:15:00	2	0	0		1	4	01	1
45	I0040	11.24	97107262	0	7/14/1999 09:30:00	2	0	0		2	4	01	1
45	I0040	11.25	73352010	0	11/18/1997 16:35:00	2	0	0		2	2	01	1
45	I0040	11.26	31667092	5	5/17/1993 00:00:00	2	0	0		2	4	01	1

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45	I0040	11.26	31740063	5	1/13/1993 00:00:00	1	0	0	5	7	11	2
45	I0040	11.26	31772278	0	8/20/1993 00:00:00	2	0	0 11	3	4	01	2
45	I0040	11.26	31822366	0	7/17/1993 00:00:00	2	1	0	1	3	01	1
45	I0040	11.26	42007091	0	11/22/1994 00:00:00	2	1	0	2	4	01	1
45	I0040	11.26	42020753	5	4/9/1994 00:00:00	1	0	0 10	5	7	12	1
45	I0040	11.26	42754556	0	10/22/1994 00:00:00	2	0	0	2	2	01	2
45	I0040	11.26	52755717	0	5/10/1995 00:00:00	2	0	0	2	3	01	1
45	I0040	11.26	52756057	0	4/5/1995 00:00:00	3	3	0	2	2	01	1
45	I0040	11.26	83352969	0	6/26/1998 13:00:00	2	0	0	2	4	01	1
45	I0040	11.26	84383847	5	8/1/1998 13:25:00	2	0	0	2	4	01	1
45	I0040	11.27	93055707	0	10/17/1999 05:40:00	1	0	0 11	5	7	13	2
45	I0040	11.27	97107169	0	11/4/1999 18:00:00	2	0	0	3	4	01	1
45	I0040	11.27	97107264	5	7/26/1999 16:10:00	2	0	0	2	4	01	1
45	I0040	11.27	97125604	0	4/22/1999 09:09:00	2	0	0	2	2	01	1
45	I0040	11.27	97125605	0	4/22/1999 09:00:00	2	0	0	2	4	01	1
45	I0040	11.28	7383755	0	10/19/2000 17:45:00	2	0	0	2	3	01	1
45	I0040	11.28	7384542	0	9/29/2000 12:55:00	2	1	0	2	4	01	1
45	I0040	11.28	17242439	0	7/22/2001 08:10:00	2	2	0 11	2	3	01	1
45	I0040	11.28	17242516	5	11/2/2001 15:55:00	2	2	0	2	4	01	1
45	I0040	11.28	42007111	0	7/19/1994 00:00:00	2	3	0	2	4	01	2
45	I0040	11.29	14802237	0	1/6/2001 02:41:00	1	1	0 21	5	7	13	1
45	I0040	11.29	52755655	0	2/24/1995 00:00:00	2	1	0	5	2	01	1
45	I0040	11.29	62596445	5	3/1/1996 21:20:00	2	0	0	5	4	01	2
45	I0040	11.29	62596500	0	3/17/1996 02:30:00	1	0	0	5	7	11	1
45	I0040	11.29	72008402	0	1/11/1997 10:50:00	2	0	0	2	3	01	1
45	I0040	11.29	83498282	5	5/26/1998 18:08:00	2	4	0	2	7	01	2
45	I0040	11.29	84384107	0	10/22/1998 22:30:00	2	0	0	5	4	01	2
45	I0040	11.3	63114596	0	10/2/1996 08:00:00	1	1	0	2	7	11	2
45	I0040	11.3	84398082	5	5/14/1998 23:45:00	2	1	0	5	7	11	1
45	I0040	11.3	97032692	0	1/14/1999 15:00:00	2	0	0	2	4	01	4
45	I0040	11.31	83352933	5	6/29/1998 07:43:00	1	0	0	2	7	11	1
45	I0040	11.32	73114295	0	1/23/1997 18:45:00	2	0	0	5	4	01	2
45	I0040	11.33	82754250	0	5/21/1998 23:45:00	2	0	0	5	4	01	2
45	I0040	11.35	31772291	0	9/12/1993 00:00:00	2	2	0	5	4	01	1
45	I0040	11.39	73114431	0	4/7/1997 18:30:00	2	0	0	2	4	01	1
45	I0040	11.39	82766341	0	4/26/1998 12:50:00	2	0	0	5	5	01	1
45	I0040	11.4	97042088	0	1/31/1999 16:00:00	2	0	0	2	4	01	4
45	I0040	11.41	42755354	0	9/28/1994 00:00:00	2	0	0	2	4	01	2
45	I0040	11.43	7327459	0	5/9/2000 14:30:00	2	0	0	2	4	01	1
45	I0040	11.43	97010929	0	4/28/1999 12:30:00	2	0	0	2	4	01	1
45	I0040	11.43	97011039	0	5/16/1999 18:50:00	2	0	0	2	4	01	1
45	I0040	11.43	97016166	0	3/17/1999 19:50:00	2	0	0	5	4	01	1
45	I0040	11.43	97026156	5	2/18/1999 21:15:00	2	0	0	5	4	01	1
45	I0040	11.43	97026258	0	3/21/1999 13:08:00	2	0	0	2	3	01	1
45	I0040	11.43	97032547	0	3/26/1999 05:20:00	2	0	0	5	4	01	4
45	I0040	11.43	97107261	0	7/14/1999 07:35:00	2	0	0	2	4	01	1
45	I0040	11.43	97125618	0	7/3/1999 12:45:00	1	0	0	2	4	01	1
45	I0040	11.44	7384478	0	7/6/2000 20:35:00	2	0	0	3	4	01	1
45	I0040	11.45	30053933	5	1/11/1993 00:00:00	2	0	0	5	4	01	2
45	I0040	11.45	31772441	5	7/16/1993 00:00:00	2	0	0	2	4	01	1
45	I0040	11.45	32016483	0	10/6/1993 00:00:00	2	1	0	2	4	01	1
45	I0040	11.45	42754544	0	12/10/1994 00:00:00	2	0	0	2	2	01	4
45	I0040	11.45	42789130	0	10/23/1994 00:00:00	2	0	0	2	3	01	1
45	I0040	11.45	42789603	0	12/27/1994 00:00:00	2	0	0	5	4	01	1
45	I0040	11.45	52191026	0	7/18/1995 00:00:00	2	1	0	2	7	13	1
45	I0040	11.45	52596066	0	10/12/1995 00:00:00	2	0	0	2	4	01	1
45	I0040	11.45	52596138	0	6/28/1995 00:00:00	1	0	0 11	2	7	12	1
45	I0040	11.45	52755713	0	4/13/1995 00:00:00	2	2	0	1	2	01	1
45	I0040	11.45	52756003	0	4/17/1995 00:00:00	2	0	0 09	2	2	01	1
45	I0040	11.45	73352322	0	11/16/1997 15:10:00	2	1	0 06	2	4	01	2
45	I0040	11.45	83498240	0	3/20/1998 22:55:00	2	1	0	5	4	01	4
45	I0040	11.45	84017281	0	1/23/1998 05:20:00	1	0	0 06	5	7	12	2
45	I0040	11.45	84323978	5	6/20/1998 00:45:00	2	0	0	5	4	01	1
45	I0040	11.45	84324654	5	6/12/1998 16:13:00	2	0	0	2	4	01	1
45	I0040	11.45	87042684	0	12/12/1998 10:45:00	2	0	0	2	4	01	1
45	I0040	11.47	17242551	0	12/13/2001 18:30:00	2	0	0	5	4	01	4
45	I0040	11.49	42309790	0	5/12/1994 00:00:00	2	0	0	2	4	01	1
45	I0040	11.49	63114727	0	3/5/1996 03:15:00	1	0	0 09	5	7	11	1
45	I0040	11.49	83351851	0	1/13/1998 16:50:00	2	0	0	2	4	01	2
45	I0040	11.49	83498232	0	2/16/1998 18:55:00	2	0	0	5	3	01	1
45	I0040	11.54	7385632	0	6/16/2000 12:57:00	3	0	0	2	2	01	4
45	I0040	11.54	84383897	5	10/30/1998 10:00:00	2	0	0	2	4	01	2
45	I0040	11.54	84383900	0	10/31/1998 10:30:00	2	0	0	2	4	01	1
45	I0040	11.64	17242358	0	7/6/2001 10:45:00	2	0	0	2	2	01	1
45	I0040	11.7	62766315	3	8/2/1996 00:10:00	1	1	0 03	5	7	11	1
45	I0040	11.71	42007087	5	10/23/1994 00:00:00	2	0	0	2	2	01	1
45	I0040	11.8	7385579	0	11/11/2000 16:45:00	2	0	0	2	2	01	1
45	I0040	11.83	97026271	0	4/23/1999 09:15:00	2	0	0	2	4	01	1
45	I0040	11.84	7042111	0	1/12/2000 09:45:00	2	0	0	2	4	01	1
45	I0040	11.84	7383838	0	5/2/2000 02:30:00	1	1	0 06	5	3	12	4
45	I0040	11.84	31746112	5	8/20/1993 00:00:00	1	0	0 10	5	7	13	1
45	I0040	11.84	42305791	5	4/26/1994 00:00:00	1	1	0	2	7	11	1
45	I0040	11.84	42305822	5	2/16/1994 00:00:00	2	1	0	2	4	01	1
45	I0040	11.84	83571474	5	7/5/1998 11:30:00	2	0	0	2	4	01	1
45	I0040	11.84	87032678	0	11/25/1998 17:45:00	2	0	0	5	4	01	1
45	I0040	11.84	92597291	5	3/20/1999 05:20:00	1	0	0	5	7	09	2

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45	I0040	11.85	42305658	0	1/6/1994 00:00:00	2	0	0	2	4	01	2
45	I0040	11.85	42305806	0	1/8/1994 00:00:00	3	0	0	5	2	01	1
45	I0040	11.85	73114437	0	5/8/1997 15:30:00	2	3	0 06	2	7	12	2
45	I0040	11.85	84383902	0	9/12/1998 10:00:00	2	0	0	2	4	01	1
45	I0040	11.85	84384104	0	10/14/1998 17:00:00	4	0	0	2	2	01	1
45	I0040	11.85	84384154	0	8/3/1998 17:00:00	2	0	0	2	4	01	1
45	I0040	11.85	84384210	0	8/5/1998 05:24:00	2	0	0	1	4	01	1
45	I0040	11.85	84397352	0	8/31/1998 23:00:00	2	0	0	5	4	01	1
45	I0040	11.86	87026084	0	11/25/1998 23:35:00	2	4	0	5	2	01	4
45	I0040	11.87	52596178	0	7/6/1995 00:00:00	2	0	0	2	2	01	1
45	I0040	11.87	63571575	5	7/10/1996 06:30:00	2	0	0	2	4	01	2
45	I0040	11.87	84017418	0	7/17/1998 23:04:00	1	0	0	5	7	13	1
45	I0040	11.92	82766361	0	8/21/1998 04:00:00	2	1	0	2	4	01	1
45	I0040	11.95	73115312	0	2/1/1997 14:35:00	1	1	0 10	2	7	11	1
45	I0040	11.96	73280162	0	12/16/1997 06:30:00	1	0	0	1	7	11	1
45	I0040	11.97	42007156	0	8/3/1994 00:00:00	2	0	0	2	4	01	1
45	I0040	12.02	63571436	0	6/7/1996 13:45:00	1	0	0	2	7	11	1
45	I0040	12.03	84384252	0	6/29/1998 04:35:00	1	0	0	5	7	12	1
45	I0040	12.03	97010772	0	11/14/1999 19:15:00	1	2	0 09	5	7	12	1
45	I0040	12.05	7327203	6	4/1/2000 15:15:00	1	3	0 13	2	7	12	1
45	I0040	12.09	32016503	0	9/8/1993 00:00:00	1	1	0 10	2	7	12	1
45	I0040	12.12	7394644	0	5/27/2000 04:55:00	1	1	0	5	7	12	1
45	I0040	12.13	63115137	0	7/21/1996 12:55:00	2	0	0	2	2	01	2
45	I0040	12.15	7143187	3	1/19/2000 22:00:00	2	0	0 11	5	3	01	5
45	I0040	12.15	42754535	3	10/19/1994 00:00:00	2	0	0	2	2	01	4
45	I0040	12.15	52741892	3	2/16/1995 00:00:00	1	1	0 04	5	7	12	4
45	I0040	12.15	62596318	3	2/13/1996 03:45:00	1	0	0 03	5	7	12	2
45	I0040	12.19	42305657	0	1/3/1994 00:00:00	1	0	0 10	2	7	12	4
45	I0040	12.19	93100840	0	7/9/1999 05:10:00	1	0	0	5	7	13	1
45	I0040	12.2	7394562	0	4/27/2000 11:47:00	3	4	0	2	2	01	1
45	I0040	12.21	3099812	0	2/9/2000 05:45:00	1	0	0	5	7	11	1
45	I0040	12.21	97010877	0	3/31/1999 22:30:00	1	0	0	5	7	09	4
45	I0040	12.21	97016061	0	2/4/1999 07:53:00	2	1	0	2	2	01	1
45	I0040	12.21	97026149	0	3/31/1999 22:31:00	1	0	0	5	7	09	4
45	I0040	12.21	97026150	0	3/31/1999 22:31:00	1	0	0	5	7	09	4
45	I0040	12.23	7327343	0	5/23/2000 15:37:00	1	1	0	2	7	12	1
45	I0040	12.23	31791204	0	4/29/1993 00:00:00	1	0	0 10	5	7	12	1
45	I0040	12.23	42754428	0	11/26/1994 00:00:00	2	0	0	2	2	01	2
45	I0040	12.23	42754616	0	10/10/1994 00:00:00	2	0	0	2	7	12	1
45	I0040	12.23	63571444	0	11/1/1996 10:00:00	1	0	0 10	2	7	12	0
45	I0040	12.23	83352072	0	6/13/1998 11:00:00	2	0	0	2	2	01	1
45	I0040	12.23	83498235	0	3/4/1998 07:15:00	1	0	0 10	2	7	12	2
45	I0040	12.23	97016113	0	4/8/1999 20:45:00	3	0	0	5	3	01	4
45	I0040	12.25	7327419	0	8/11/2000 18:45:00	1	0	0	2	7	12	1
45	I0040	12.31	17384176	0	7/20/2001 16:25:00	2	2	0 10	2	4	01	1
45	I0040	12.32	72008404	0	1/11/1997 08:00:00	2	0	0	2	2	01	1
45	I0040	12.36	84383841	0	9/19/1998 06:30:00	1	0	0	5	7	11	2
45	I0040	12.43	83352070	0	5/19/1998 11:15:00	1	1	0 12	2	7	11	1
45	I0040	12.43	84017572	0	8/22/1998 15:00:00	2	0	0	2	4	01	1
45	I0040	12.45	7327372	0	3/18/2000 18:40:00	2	0	0	3	4	01	1

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nbr_tenn_cnty	nbr_rte	cnty_seq	accd_log_mle	accd_loc	dte_accd	tot_vhcl	tot_injr	tot_killed	fix_obj	lgt_cond	typ_collision	typ_invl_1	weather_cond_1	mslink	id_number
45	I0081	1	0.1	0	10/30/2000 09:50:00	2	0	0		2	4	01	1	2732946	45I0081001
45	I0081	1	0.1	0	4/3/1994 00:00:00	2	2	0		2	7	09	4	571711	45I0081001
45	I0081	1	0.1	0	2/10/1998 17:30:00	2	1	0		2	3	01	1	1893700	45I0081001
45	I0081	1	0.16	0	5/6/2001 11:35:00	2	0	0		2	2	01	1	2906643	45I0081001
45	I0081	1	0.16	0	12/22/1994 00:00:00	2	1	0		2	2	01	2	923270	45I0081001
45	I0081	1	0.16	4	10/15/1997 16:40:00	1	0	0	04	2	7	12	1	1843932	45I0081001
45	I0081	1	0.16	4	7/27/1999 16:07:00	1	2	0	03	0	7	12	0	2438715	45I0081001
45	I0081	1	0.19	0	12/19/1998 11:50:00	2	1	0		2	2	01	4	1986304	45I0081001
45	I0081	1	0.2	0	4/29/1993 00:00:00	2	0	0		5	4	01	1	323700	45I0081001
45	I0081	1	0.26	0	7/6/1993 00:00:00	2	0	0		2	2	01	1	153053	45I0081001
45	I0081	1	0.3	0	9/3/2000 12:30:00	1	0	0	10	2	7	12	1	2732987	45I0081001
45	I0081	1	0.3	0	7/11/2001 19:15:00	2	1	0		2	2	01	1	2906704	45I0081001
45	I0081	1	0.36	0	10/4/1997 10:20:00	3	0	0		2	2	01	1	1837216	45I0081001
45	I0081	1	0.38	0	1/22/2000 21:30:00	1	0	0	10	5	7	12	5	2726879	45I0081001
45	I0081	1	0.4	0	11/14/2001 17:45:00	2	0	0		3	4	01	1	2906663	45I0081001
45	I0081	1	0.4	0	2/8/1995 00:00:00	2	0	0		2	2	01	2	1257709	45I0081001
45	I0081	1	0.47	0	1/19/1997 10:50:00	1	0	0	10	2	7	12	5	1739966	45I0081001
45	I0081	1	0.49	5	5/14/2001 19:00:00	2	2	0		2	3	01	1	2906631	45I0081001
45	I0081	1	0.49	0	3/3/2001 04:15:00	1	1	0	09	5	7	12	1	2915446	45I0081001
45	I0081	1	0.49	5	1/31/1998 11:25:00	2	0	0		2	4	01	1	1880006	45I0081001
45	I0081	1	0.49	5	1/31/1998 11:33:00	2	1	0		2	2	01	1	1880007	45I0081001
45	I0081	1	0.49	0	1/30/1998 16:26:00	2	3	0	09	2	7	11	1	1890438	45I0081001
45	I0081	1	0.5	0	4/12/1999 09:40:00	2	0	0		2	2	01	1	2541163	45I0081001
45	I0081	1	0.5	0	8/31/1999 21:40:00	2	0	0		5	4	01	1	2553375	45I0081001
45	I0081	1	0.52	0	1/31/1999 12:20:00	2	0	0		2	4	01	4	2542265	45I0081001
45	I0081	1	0.54	0	12/14/2000 06:55:00	1	0	0	13	1	7	12	1	2733005	45I0081001
45	I0081	1	0.54	0	2/4/2001 17:25:00	1	2	0	10	2	7	12	1	2906633	45I0081001
45	I0081	1	0.54	0	12/7/2001 12:20:00	2	0	0		2	4	01	1	2906669	45I0081001
45	I0081	1	0.54	0	8/26/2001 13:50:00	2	0	0		2	4	01	1	2906688	45I0081001
45	I0081	1	0.54	5	1/2/1994 00:00:00	1	1	0	13	5	7	12	4	686144	45I0081001
45	I0081	1	0.54	5	10/20/1994 00:00:00	2	1	0	10	2	2	01	2	923241	45I0081001
45	I0081	1	0.54	5	10/16/1994 00:00:00	2	1	0		2	2	01	1	923526	45I0081001
45	I0081	1	0.54	0	12/23/1994 00:00:00	2	0	0		5	4	01	2	923625	45I0081001
45	I0081	1	0.54	0	3/15/1996 08:00:00	2	0	0		2	3	01	2	1655163	45I0081001
45	I0081	1	0.54	0	4/4/1996 09:05:00	3	1	0		2	2	01	1	1655173	45I0081001
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45	I0081	1	0.98	0	3/16/1997 00:00:00	1	0	0		5	7	09	1	1729356	45I0081001

Index Of Sheets

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL SECTIONS
3-10	FUNCTIONAL LAYOUT SHEETS

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING

TENN.	YEAR	SHEET NO.
	2004	1
FED. AID PROJ. NO.		
STATE PROJ. NO.		

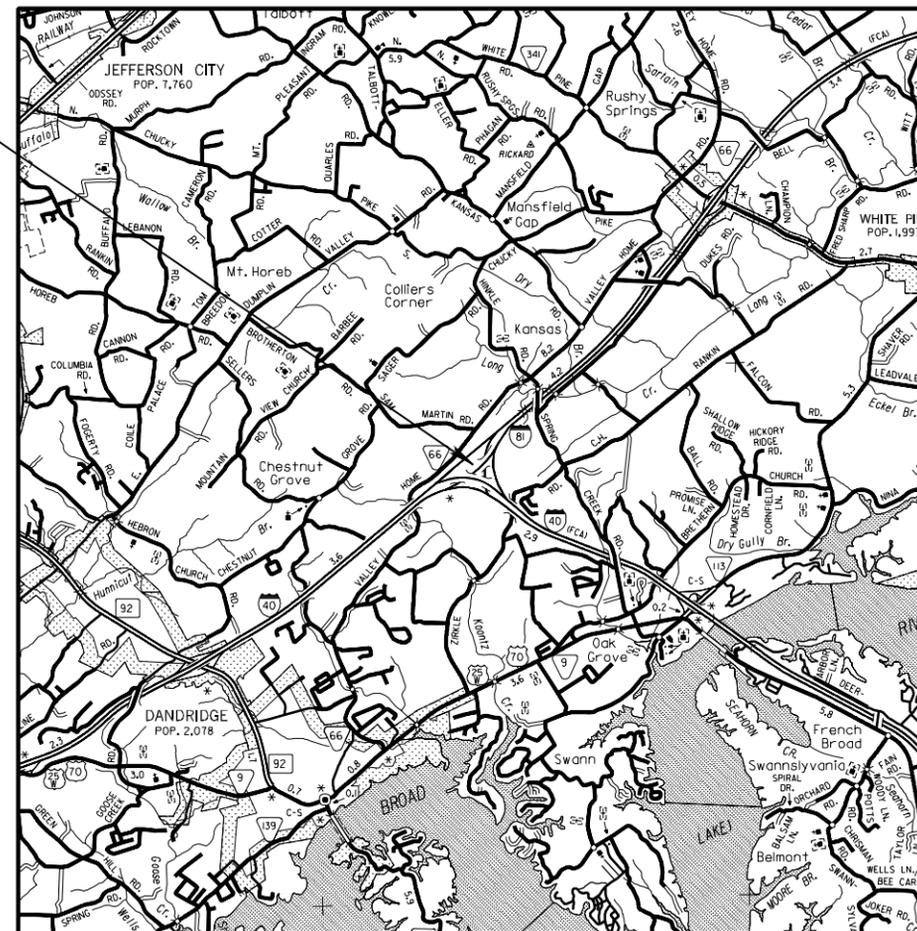
JEFFERSON COUNTY

INTERCHANGE MODIFICATION STUDY
INTERSTATE 40 AND INTERSTATE 81

STATE HIGHWAY NO. F.A.H.S. NO.



PROJECT LOCATION

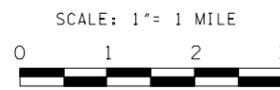


SPECIAL NOTES

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED MARCH 1, 1995 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT

TDOT ROAD SP. SV. 2 _____
DESIGNER _____ CHECKED BY _____
P.E. NO. _____



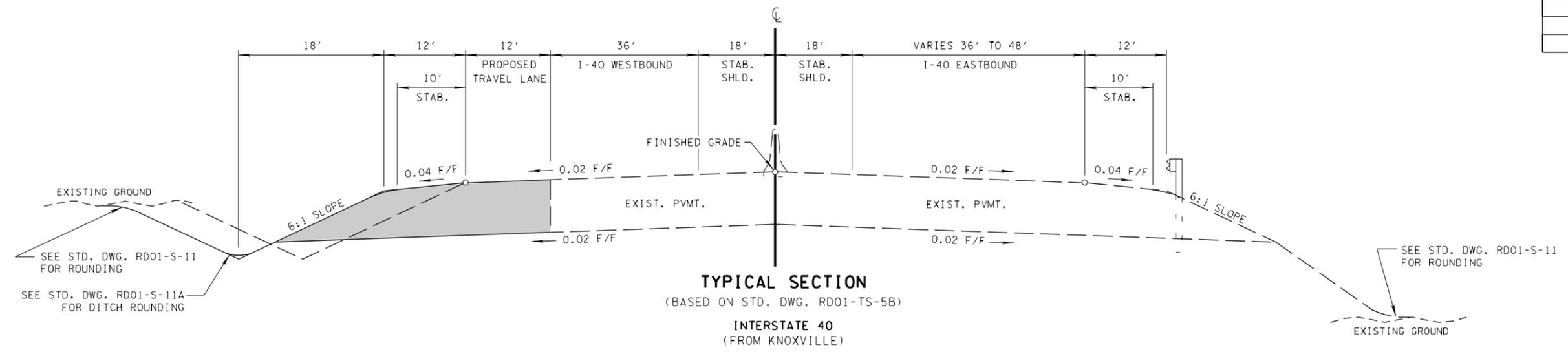
TRAFFIC DATA	
ADT (2008)	48,350
ADT (2028)	77,375
DHV (2028)	6,964
D	50 - 50
T (ADT)	29 %
T (DHV)	20 %
V	70 MPH

APPROVED: _____
DIRECTOR, DESIGN DIVISION
DATE: _____
APPROVED: _____
COMMISSIONER

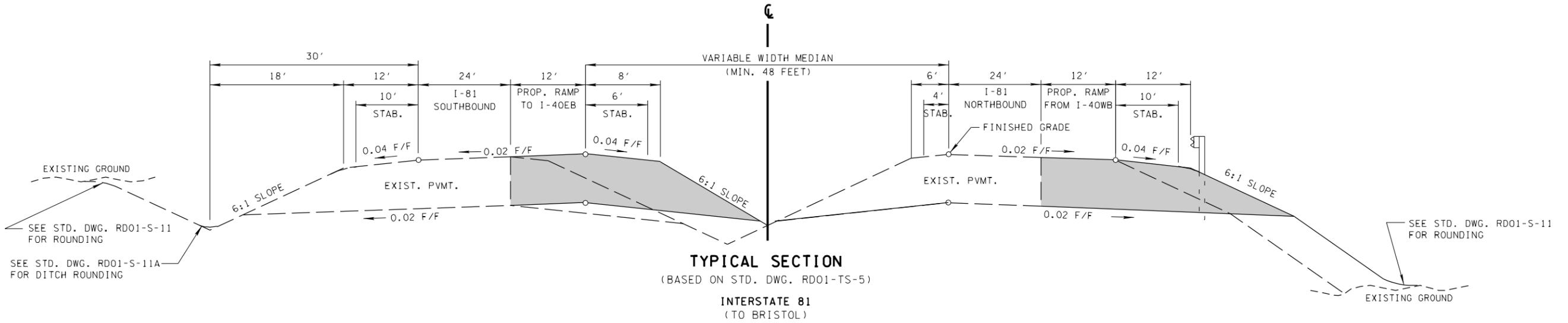
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED: _____
DIVISION ADMINISTRATOR DATE

TYPE	YEAR	PROJECT NO.	SHEET NO.
IMS	2004		2

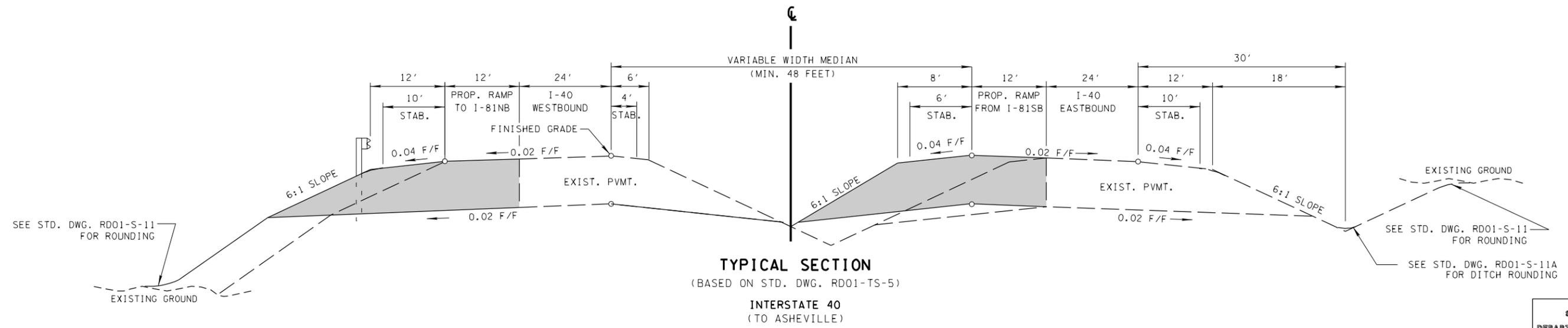
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.



TYPICAL SECTION
(BASED ON STD. DWG. RD01-TS-5B)
INTERSTATE 40
(FROM KNOXVILLE)



TYPICAL SECTION
(BASED ON STD. DWG. RD01-TS-5)
INTERSTATE 81
(TO BRISTOL)



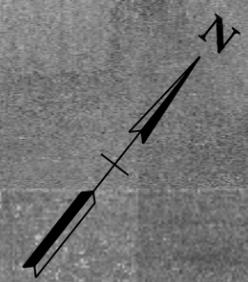
TYPICAL SECTION
(BASED ON STD. DWG. RD01-TS-5)
INTERSTATE 40
(TO ASHEVILLE)

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

**TYPICAL
SECTIONS**

TYPE	YEAR	PROJECT NO.	SHEET NO.
IMS	2004		3

TENNESSEE D. O. T.
 DESIGN DIVISION
 FILE NO.



SEE SHEET NO. 4

MATCH LINE

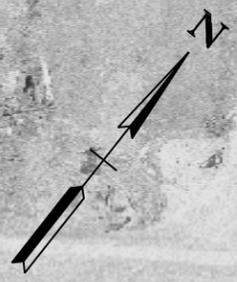


STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

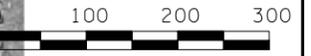
**I-40/I-81
 INTERCHANGE**
 JEFFERSON COUNTY
 SCALE: 1"=100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
IMS	2004		4

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.



SEE SHEET NO. 3
SEE SHEET NO. 5
MATCH LINE
MATCH LINE



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

**I-40/I-81
INTERCHANGE**
JEFFERSON COUNTY
SCALE: 1"=100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
IMS	2004		5



SEE SHEET NO. 4

SEE SHEET NO. 6

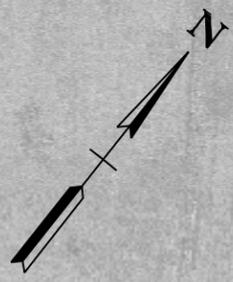


STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

**I-40/I-81
INTERCHANGE**
JEFFERSON COUNTY
SCALE: 1"=100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
IMS	2004		6

TENNESSEE D.O.T.
 DESIGN DIVISION
 FILE NO.



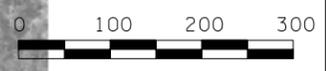
SEE SHEET NO. 7

MATCH LINE

SEE SHEET NO. 5

MATCH LINE

SEE SHEET NO. 9



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

**I-40/I-81
 INTERCHANGE**
 JEFFERSON COUNTY
 SCALE: 1"=100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
IMS	2004		7



SEE SHEET NO. 6

SEE SHEET NO. 8

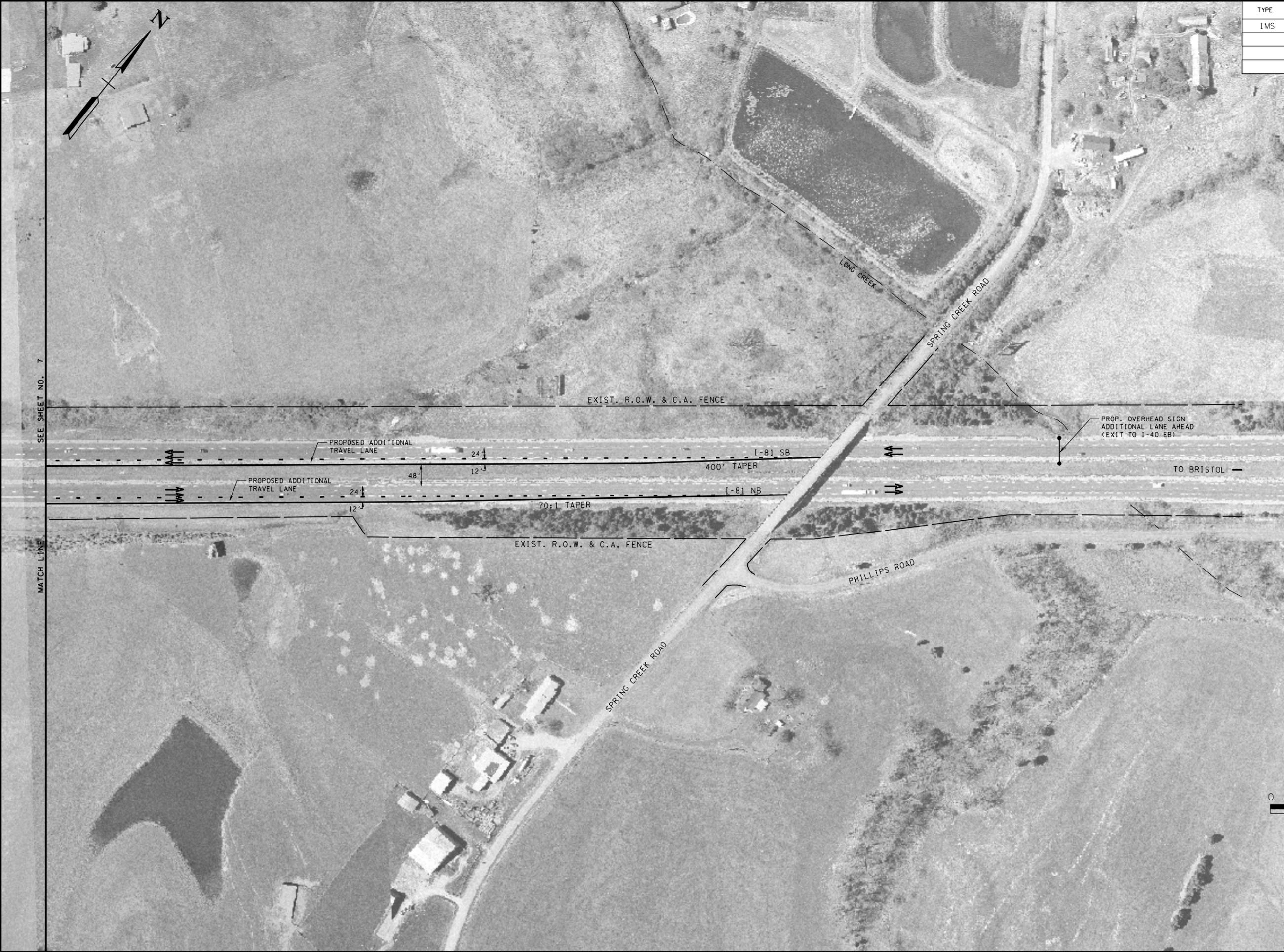
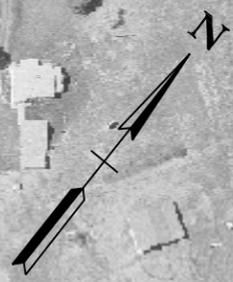


STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

**I-40/I-81
 INTERCHANGE**
 JEFFERSON COUNTY
 SCALE: 1"=100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
IMS	2004		8

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

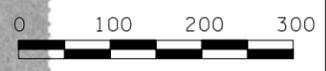
**I-40/I-81
INTERCHANGE**
JEFFERSON COUNTY
SCALE: 1"=100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
IMS	2004		9

TENNESSEE D.O.T.
 DESIGN DIVISION
 FILE NO.



SEE SHEET NO. 6
 SEE SHEET NO. 10



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
**I-40/I-81
 INTERCHANGE**
 JEFFERSON COUNTY
 SCALE: 1"=100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
IMS	2004		10

TENNESSEE D.O.T.
 DESIGN DIVISION
 FILE NO.



SEE SHEET NO. 9

MATCH LINE

TO ASHEVILLE →



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

**I-40/I-81
 INTERCHANGE**
 JEFFERSON COUNTY
 SCALE: 1"=100'