

# STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION NASHVILLE, TENNESSEE 37243-0348

INTERCHANGE MODIFICATION STUDY

INTERSTATE ROUTE 75
AT
STATE ROUTE 131 (EMORY ROAD)

KNOX COUNTY

OCTOBER 2002



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# INTERSTATE ROUTE 75 AT STATE ROUTE 131 (EMORY ROAD)

KNOX COUNTY

#### PREPARED FOR

TENNESSEE DEPARTMENT OF TRANSPORTATION BUREAU OF PLANNING AND DEVELOPMENT

BY

TRC INTERNATIONAL, LTD. CONSULTING ENGINEERS BRENTWOOD, TENNESSEE

OCTOBER 2002

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#### **CHAPTER ONE**

#### **INTRODUCTION**

#### A. Purpose of Study

The purpose of this study is to determine the feasibility of modifying the existing interchange at Interstate Route 75 and State Route 131 (Emory Road), in order to improve traffic operations at this location.

This report will review the background, current and future needs, the traffic operational aspects, develop functional plans, estimate the costs of the proposed improvements, and identify any environmental concerns for the proposed project.

#### B. <u>Description of Project Location</u>

The existing interchange is located on Interstate Route 75 at State Route 131 (Emory Road) north of Knoxville in Knox County, Tennessee. (See Area Location Map, Figure 1.) The Project Location Map (Figure 2) shows the subject interchange is located 2.31 miles north of the Callahan Drive interchange and 4.84 miles south of the State Route 170 interchange.

#### C. Background

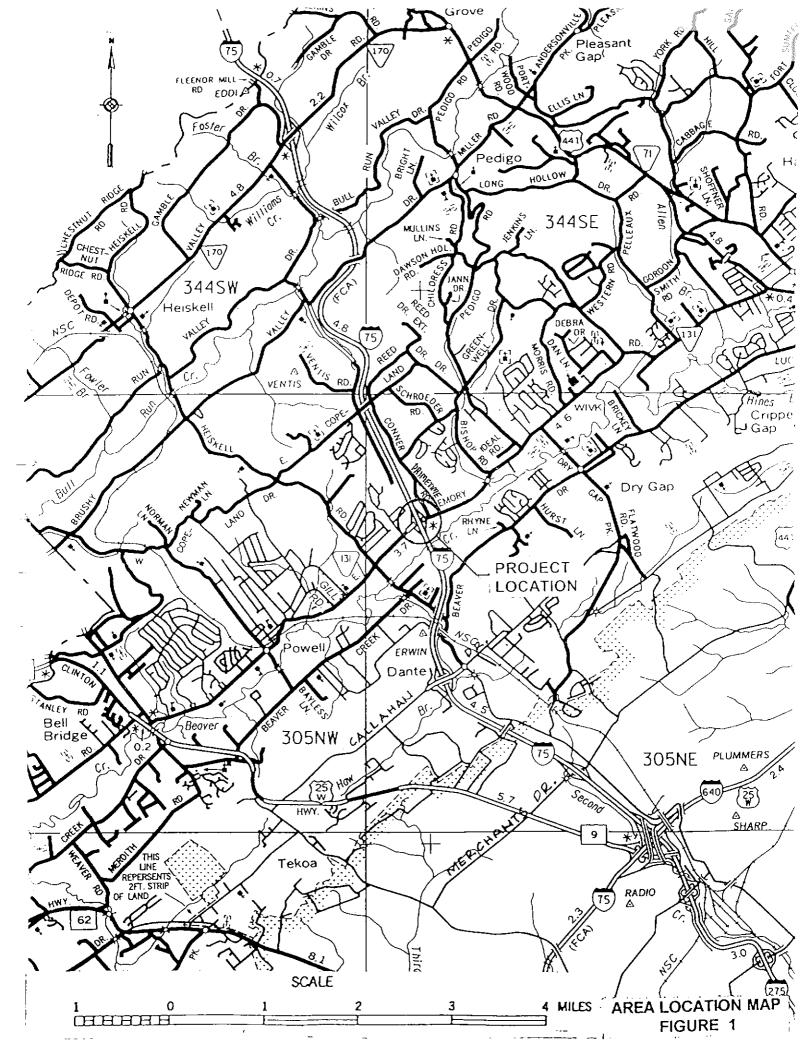
The section of Interstate Route 75 shown on the Project Location Map was completed in 1972. Since its completion the Interstate Route 75 corridor north of Knoxville, particularly the State Route 131 (Emory Road) area has experienced tremendous growth.

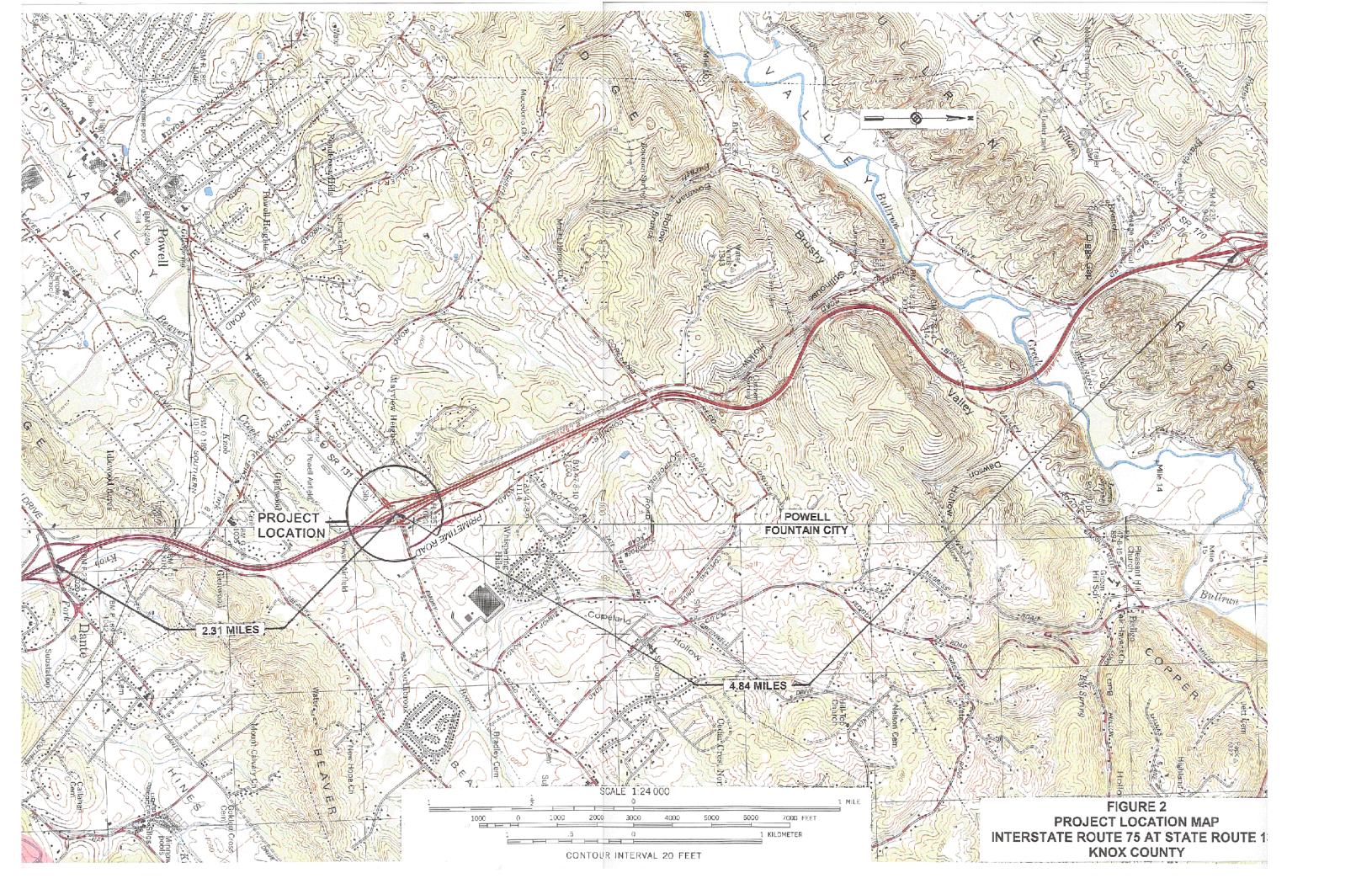
To accommodate the rapid growth, additional traffic lanes have been added to the interstate system. The latest project was the addition of two lanes, one in each direction, between Merchants Drive and Emory Road. This project was completed in 1999.

#### D. Relationship to Other Highway Improvement Plans and Programs

The Knoxville Regional Transportation Planning Organization's 2002-2025 Long Range Transportation Plan Reaffirmation identified the need for a four-lane undivided roadway with a center turn lane to be constructed along the existing alignment of State Route 131 (Emory Road) between U.S. 25 W (State Route 9) and U.S. 441 (State Route 33). The portion of the route between Gill Road and Bishop Road is presently under construction.

As part of the construction project, the portion of SR 131 through the Interstate 75 interchange will be reconstructed to provide a six lane section. Lane





designations for State Route 131 through the interchange in the eastbound direction include a section with two through lanes and an exclusive left turn lane at the I-75 northbound entrance ramp. The westbound lane designations for State Route 131 through the interchange include an exclusive left turn lane, one shared through or left turn lane, and an exclusive through lane at the I-75 southbound entrance ramp. This study refers to the construction project as the existing system, because it will be in place for the base year of study, 2006. Proposed layout sheets from the construction plans are included in Appendix B.

The Knoxville Regional Transportation Planning Organization, by resolution, requested that the Tennessee Department of Transportation prepare a study for constructing a Knoxville Beltway. A corridor location was recently selected. The north end will tie into Interstate 75, 7.2 miles north of the SR-131 interchange, in Anderson County. The south end will tie into Interstate 75 at the Interstate 40 junction in Loudon County. The location of the corridor is shown on the General Location Map-Knoxville Beltway (Figure 3).

The primary purpose of the Knoxville Beltway is to improve traffic service on the Interstate System, State Highways, and local roads now serving the area. It will serve as an alternative route for traffic wanting to bypass the downtown Knoxville area and the congestion generally associated with the urban interstate facilities, especially during peak travel times.

The addition of the Knoxville Beltway is expected to reduce the growth rate of traffic on Interstate Route 75 through the State Route 131 interchange. The reduction in traffic is expected to be greater south of the interchange.



#### **CHAPTER TWO**

#### PRELIMINARY PLANNING DATA

#### A. Land Use

The existing interchange is located north of the Knoxville Urban Boundary. The land area adjacent to the interchange is predominantly commercial, including a private airfield located adjacent to the interstate in the southwest quadrant.

Most of the residential development in the study area has occurred north of State Route 131 (Emory Road) between U.S. 25 W (State Route 9) and U.S. 441 (State Route 33). The residential growth in these areas is expected to continue.

#### B. <u>Traffic Served</u>

Existing State Route 131 (Emory Road) within the project limits is an Urban Minor Arterial Route on the Surface Transportation Program System. Daily volumes for this road are expected to be 19,100 west of the interchange and 28,400 east of the interchange in the base year (2006). In the design year (2026), daily volumes are expected to be 24,820 west of the interchange and 36,920 east of the interchange. Truck volumes on State Route 131 are 3% of total volumes. All volumes are based on the development of the Knoxville Beltway.

The daily volume of traffic expected to be served by I-75 in the design year (2026) is 68,540 south of the interchange and 47,520 north of the interchange. The daily volume that would use I-75 in the base year (2006) is 52,720 south of the interchange and 36,560 north of the interchange. North of the interchange trucks are 28% of the traffic on I-75. South of the interchange trucks are 16% of the traffic on I-75. All volumes are based on the development of the Knoxville Beltway.

Average Daily Traffic (ADT) volumes and Design Hour Volumes (DHV) are shown in the Appendix.

#### C. Design Alternates

Two alternates were studied to determine the more feasible modification of the existing interchange. Brief summaries of these alternates are as follows:

#### Alternate One

This alternate is a "single-point" interchange. To accommodate the left turn movements to and from the interstate, two lanes are proposed for all left turn movements. While this alternate is operationally feasible, the high volume of left turns from SR 131 westbound to I-75 southbound creates two significant, unfavorable impacts. First, widening of the ramp roadways is required to provide adequate capacity. This affects the interstate laneage at the merge and diverge points. Second, significant delays will be felt for other movements in order to provide enough green time for the single movement. Functional layouts, traffic analyses, and cost estimates for this alternate are in the Appendix.

#### Alternate Two

This alternate proposes utilizing the six lane section through the interchange, and for providing a loop ramp in the northwest quadrant to remove the heavy left turn movement from westbound State Route 131 (Emory Road) to southbound I-75.

Due to costs associated with acquiring enough right-of-way for higher design speeds, the loop ramp would have a design speed of 25 mph. To provide for the merge with I-75 southbound, the loop ramp would be constructed as an additional interstate lane.

These two alternates were reviewed and evaluated in meetings with representatives from TDOT's Design Division and Planning Division. While both the alternatives are operationally feasible, Alternate Two was selected as the recommended interchange modification based on comparative benefits and costs.

### D. <u>Proposed Improvement</u>

The specific improvements needed to provide the traffic service and ease of movement are discussed below and are shown on the attached Functional Plans:

 Utilize the westbound left turn lane of the existing SR 131 crosssection for westbound through traffic and designate the outside westbound lane as an exclusive right turn lane for the southbound loop ramp. The proposed SR131 cross-section includes curb and gutter and sidewalks.

- 2. To provide for a more efficient operation at the Primetime Road intersection, the existing signal is to be modified to provide the necessary phasing and timing required at this location.
- 3. A loop ramp is to be constructed in the northwest quadrant to remove the heavy westbound to southbound left turn from State Route 131 (Emory Road). Because of the existing development in this quadrant, the design speed of the loop will be limited to 25 mph. An additional lane on I-75 southbound is required to facilitate the merge.
- 4. Relocate the I-75 southbound off-ramp westward to accommodate the loop ramp. A barrier median is proposed between the two ramps to minimize the required right-of-way.
- 5. Construct a retaining wall along the outside section of the relocated I-75 southbound off ramp that impacts the Shoney's property.
- 6. Add an auxiliary lane to the three existing I-75 northbound lanes south of the interchange in order to reconstruct the off-ramp as a "major junction." This allows for a three-two split to provide for a two lane off ramp. The ramp roadway can then be widened to the three lanes necessary for one exclusive left turn lane and the two exclusive right turn lanes at the junction with State Route 131 (Emory Road). The existing traffic signal is to be modified in order to provide the necessary phasing and timing required at this location.
- 7. Rather than drop a through traffic lane within the interchange as it now exists, it is proposed to extend the third lane northward beyond the I-75 northbound on ramp before transitioning from three lanes to the existing two lanes.
- 8. Widen the bridges over Beaver Creek to accommodate the proposed interstate laneage.
- 9. Due to the proposed loop ramp, the I-75 southbound exit ramp intersection with State Route 131 (Emory Road) has been relocated just west of its current location. A new traffic signal is proposed for this location.
- 10. Minor adjustments in the alignment and grade of the ramps will be required to meet the proposed improvements at the State Route 131 (Emory Road) intersections and also at their junction with the I-75 mainline.

#### E. Environmental Concerns

Beaver Creek is located along the southern periphery of the existing interchange. The existing structures of I-75 over this stream are proposed to be widened.

A blue line stream tributary of Beaver Creek also traverses the interchange from northwest of I-75 and State Route 131 (Emory Road) to Beaver Creek southeast of the interchange.

Any fill material being placed in these areas is governed by U.S. Army Corps of Engineers, Section 404 permitting requirements.

Impacts associated with flood plain encroachment will be limited because the project will be designed to accommodate projected flood waters. Design of the project will utilize current hydrological data to insure flood waters are not impeded.

Erosion controls should be implemented and maintained throughout the construction project.

Underground tanks are located at the Rocky Top Market and Pride Food Mart on the south side of State Route 131 (Emory Road) west of I-75. East of I-75 underground tanks are located at Ken Jo Market on the north side of State Route 131 (Emory Road) and at Pilot Food Mart and Ken Jo Market on the south side. The underground tanks at these locations should not be impacted by any of the improvements proposed for the interchange.

#### CHAPTER THREE

#### **ENGINEERING INVESTIGATIONS**

#### A. Traffic Operations

An analysis was made to determine what impacts the proposed interchange modification would have on Interstate Route 75. For the existing system the three basic lanes in each direction south of the interchange will provide for a Level-of-Service (LOS) C in the Base Year (2006) and will remain at LOS C through the Design Year (2026). North of the interchange the two basic lanes in each direction will provide for a LOS C in the Base Year (2006) and will also remain at LOS C through the Design Year (2026).

The proposed modification will not have any impacts to the basic lane requirements for the interstate system.

Traffic volumes, merge and diverge points, laneage for the proposed improvements, and Level-of-Service (LOS), together with the analysis for both the Base Year (2006) and the Design Year (2026) are shown in Appendix "A".

LOS summary tables for the existing interchange and the two alternates are on the following two pages.

Analysis Summary 2006 Traffic and Existing and Proposed Geometrics

2006 Traffic and Existing and Proposed Geometrics					
Location	Type Analysis Design Hour LOS				
			Existing	Alt. 1	Alt. 2
I-75 Northbound South of	Basic Freeway	AM	В	В	В
Interchange	Segments	PM	В	В	В
I-75 Northbound , South of D-1	Basic Freeway	AM	n.a.	Α	Α
Major Diverge	Segments	PM	n.a.	В	В
D-1, I-75 Northbound Off-ramp	Ramp and Ramp	AM	В	n.a.	n.a.
to SR131	Junctions, Ln. Drop	PM	В	n.a.	n.a.
I-75 Northbound , North of D-1	Basic Freeway	AM	n.a.	Α	Α
Major Diverge	Segments	PM	n.a.	Α	Α
I-75 Northbound Through	Basic Freeway	AM	В	n.a.	n.a.
Interchange	Segments	PM	В	n.a.	n.a.
M-1, I-75 Northbound On-ramp	Ramp and Ramp	AM	В	В	В
from SR 131	Junctions	PM	В	В	В
I-75 Northbound, North of M-1	Ramp and Ramp	AM	n.a.	В	В
On-ramp from SR 131	Junctions	PM	n.a.	В	В
I-75 Northbound North of	Basic Freeway	AM	В	В	В
Interchange	Segments	PM	В	В	В
I-75 Southbound North of	Basic Freeway	AM	В	В	В
Interchange	Segments	PM	В	В	В
I-75 Southbound, North of D-2	Basic Freeway	AM	n.a.	В	
Off-ramp	Segments	PM		В	n.a.
	•	AM	n.a. C	В	n.a. C
D-2, I-75 Southbound Off-ramp	Ramp and Ramp				
to SR 131	Junctions	PM	С	В	С
I-75 Southbound, South of D-2	Basic Freeway	AM	n.a.	A	В
Off-ramp to SR 131	Segments	PM	n.a.	Α	В
I-75 Southbound Through	Basic Freeway	AM	В	n.a.	n.a.
Interchange	Segments	PM	В	n.a.	n.a.
M-2, I-75 Southbound On-ramp		AM	n.a.	В	n.a.
from SR 131	Junctions	PM	n.a.	Α	n.a.
I-75 Southbound, South of M-2,	Basic Freeway	AM	n.a.	n.a.	В
Add Lane On-ramp	Segments	PM	n.a.	n.a.	В
M-3, I-75 Southbound On-ramp	Ramp and Ramp	AM	n.a.	n.a.	С
from SR131	Junctions	PM	n.a.	n.a.	В
I-75 Southbound South of	Basic Freeway	AM	С	С	С
Interchange	Segments	PM	В	В	В
SR 131 West of I-75	Multilane Highways	AM	Α	Α	Α
	g ,	PM	Α	Α	Α
SR 131/I-75 SB Ramps	Signalized	AM	C (26.3)	n.a.	B (12.4)
	Intersections	PM	C (27.8)	n.a.	B (12.6)
SR 131/I-75 Ramps	Signalized Intersection	AM	n.a.	C (32.6)	n.a.
or rom romanipo	J.g. lanesa miorosolion	PM	n.a.	C (36.1)	n.a.
SR 131/I-75 NB Ramps	Signalized	AM	C (30.7)	n.a.	C (33.8)
OK 101/1-10 ND Kamps	Intersections	PM	C (30.7)	n.a.	C (33.8)
SR 131/Primetime Rd.			` ,		
ok isi/riiiieliiie ku.	Signalized	AM	C (29.6)	C (29.6)	C (29.6)
CD 121 Foot of Drimetime Dd	Intersections  Multilens Highways	PM	C (28.1)	C (28.1)	C (28.1)
SR 131 East of Primetime Rd.	Multilane Highways	AM	В	В	В
		PM	В	В	В

Note: The LOS shown for the intersections is the total average intersection delay. The delay in parentheses is in seconds per vehicle.

Analysis Summary 2026 Traffic and Existing and Proposed Geometrics

Lossian Lossian Los						
Location	Type Analysis	Design Hour				
I-75 Northbound South of	Basic Freeway	AM	Existing B	B B	B B	
	Segments	PM	С	С	С	
Interchange I-75 Northbound , South of D-1	,	AM		В	В	
I	Basic Freeway		n.a.		В	
Major Diverge	Segments	PM	n.a.	В		
D-1, I-75 Northbound Off-ramp	Ramp and Ramp	AM	С	n.a.	n.a.	
to SR131	Junctions, Ln. Drop	PM	С	n.a.	n.a.	
I-75 Northbound , North of D-1	Basic Freeway	AM	n.a.	В	В	
Major Diverge	Segments	PM_	n.a.	В	В	
I-75 Northbound Through	Basic Freeway	AM	С	n.a.	n.a.	
Interchange	Segments	PM	С	n.a.	n.a.	
M-1, I-75 Northbound On-ramp	Ramp and Ramp	AM	С	В	В	
from SR 131	Junctions	PM	С	В	В	
I-75 Northbound, North of M-1	Ramp and Ramp	AM	n.a.	В	В	
On-ramp from SR 131	Junctions	PM	n.a.	В	В	
I-75 Northbound North of	Basic Freeway	AM	С	С	С	
Interchange	Segments	PM	С	С	С	
I-75 Southbound North of	Basic Freeway	AM	C	С	С	
Interchange	Segments	PM	С	С	С	
I-75 Southbound, North of D-2	Basic Freeway	AM	n.a.	В	n.a.	
Off-ramp	Segments	PM	n.a.	В	n.a.	
D-2, I-75 Southbound Off-ramp	Ramp and Ramp	AM	С	В	С	
to SR 131	Junctions	PM	D	В	D	
I-75 Southbound, South of D-2	Basic Freeway	AM	n.a.	В	С	
Off-ramp to SR 131	Segments	PM	n.a.	В	С	
I-75 Southbound Through	Basic Freeway	AM	С	n.a.	n.a.	
Interchange	Segments	PM	С	n.a.	n.a.	
M-2, I-75 Southbound On-ramp	Ramp and Ramp	AM	n.a.	В	n.a.	
from SR 131	Junctions	PM	n.a.	Α	n.a.	
I-75 Southbound, South of M-2,	Basic Freeway	AM	n.a.	n.a.	С	
Add Lane On-ramp	Segments	PM	n.a.	n.a.	В	
M-3, I-75 Southbound On-ramp		AM	n.a.	n.a.	C	
from SR131	Junctions	PM	n.a.	n.a.	В	
I-75 Southbound South of	Basic Freeway	AM	C	C	C	
Interchange	Segments	PM	В	В	В	
SR 131 West of I-75	Multilane Highways	AM	В	В	В	
OIX IOI WEST OF I-15	widiliane riignways	PM	В	В	В	
SR 131/I-75 SB Ramps	Signalized	AM	D(49.7)	n.a.	B (13.6)	
OK 101/1-70 OD Kallips	Intersections	PM	D(49.7) D(44.7)			
SR 131/I-75 Ramps	Signalized Intersection	AM		n.a. D(36.1)	B (16.4)	
3K 131/1-73 Kallips	orginalized intersection		n.a.		n.a.	
CD 121/L 75 ND Domns	Cianalizad	PM	n.a.	D(40.9)	n.a.	
SR 131/I-75 NB Ramps	Signalized	AM	D(43.1)	n.a.	D(44.7)	
OD 404/D: 1: D:	Intersections	PM	D(42.5)	n.a.	D(36.4)	
SR 131/Primetime Rd.	Signalized	AM	D(37.7)	D(37.3)	D(37.3)	
00,404 5 4 65 4 5 5	Intersections	PM	D(41.7)	D(44.5)	D(44.5)	
SR 131 East of Primetime Rd.	Multilane Highways	AM	В	В	В	
		PM	С	С	В	

Note: The LOS shown for the intersections is the total average intersection delay. The delay in parentheses is in seconds per vehicle.

#### B. <u>Access Analysis</u>

This study has been undertaken in accordance with the Federal Highway Administration's (FHWA) policy for granting new or modified interstate access. The original policy described in FHWA Docket No. 89-23, "Additional Interchanges to the Interstate System" (Federal Register 55: No. 204, October 22, 1990) has been revised. The effective date of the new policy is February 11, 1998 and is provided in the following paragraphs along with comments for consideration.

It is in the national interest to maintain the Interstate System to provide the highest level of service in terms of safety and mobility. Adequate control of access is critical to provide such service. Therefore, new or revised access points to the existing Interstate System should meet the following requirements:

1. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.

State Route 131 (Emory Road) is a Urban Minor Arterial Route on the Surface Transportation Program System, traversing the northwest quadrant of Knox County. Due to the rapid growth in this area the need for improving this route to a four-lane undivided roadway with a center turn lane was identified and included in the Knox County Long Range Transportation Plan. That portion of the route between Gill Road and Bishop Road, excluding the I-75 interchange, is presently under construction.

By eliminating left turns from State Route 131 to Interstate Route 75 southbound, the loop ramp provides a satisfactory level of service along State Route 131 through the interchange, while also providing a satisfactory level of service for the merge area on Interstate Route 75 southbound. The addition of the Interstate 75 northbound auxiliary lane provides satisfactory merge and diverge areas for the State Route 131 access ramps.

2. All reasonable alternatives for design options, location, and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.

After the two alternates discussed in this study were developed and evaluated in meetings with representatives from TDOT's Design Division and Planning Division, the alternate proposing to provide a loop ramp in the northwest quadrant (Alternate 2) was selected as the preferred alternate.

Park-and-Ride lots, other types of mass transit, and system management type improvements, will continue to be studied in order to alleviate the congestion and to improve the traffic operations in this area.

3. The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on analysis of current and future traffic. The operational analysis for existing conditions shall particulary in an urbanized area, included an analysis of sections of Interstate to and including the first adjacent or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with a new or revised access point.

An analysis was made to determine what impacts the proposed modification would have on the operation of the Interstate facility. Using Base Year volumes (2006), the existing three basic lanes in each direction will provide a Level-of-Service C between Callahan Drive and State Route 131 (Emory Road). The existing two basic lanes in each direction between State Route 131 (Emory Road) and State Route 170 will also provide a Level-of-Service C during the Base Year. Based on the projected traffic volumes for the Design Year (2026), the basic lanes will continue to provide a Level-of-Service C. Due to the distance between adjacent interchanges, 2.31 miles north of Callahan Drive and 4.84 miles south of SR 170 (Raccoon Valley Road), the proposed modification will have no significant impact on the Interstate facility.

Further analysis of the improvements to State Route 131 (Emory Road), which is presently under construction, reveals this route will also operate at a Level-of-Service D or better, including the Primetime Road intersection, through to 2026 Design Year. This assures the local roads and streets have the ability to collect and distribute traffic to and from the modified interchange.

4. The proposed access connects to a public road only and will provide for all turning movements. Less than "full interchanges" for special purpose access for transit vehicles, for HOV's, or into Park-and-Ride lots may be considered on a case-by-case basis. The

proposed access will be designed to meet or exceed current standards for Federal Aid projects on the Interstate System.

The proposal is a modification to the existing "Diamond Type" interchange at I-75 and State Route 131 (Emory Road). The proposed modification is a complete interchange, also a "Diamond Type" design with a loop ramp in the northwest quadrant, and will provide for all traffic movements. The interchange will be designed to meet or exceed all American Association of State Highway and Transportation Officials (AASHTO) criteria. Though the 2001 AASHTO Policy on Geometric Design of Highways and Streets limits the design capacity of a loop ramp to 1200 vph, the Highway Capacity Manual 2000 approximates the capacity of a ramp with free flow speed between 20 and 30 mph to be 1900 vph.

5. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and/or statewide transportation plan, as appropriate, the applicable provisions of 23 CFR part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93.

The proposal is consistent with the Knoxville Regional Transportation Planning Organization's 2002-2025 Long Range Transportation Plan Reaffirmation, a conforming plan. The proposal is also consistent with the applicable provisions of 23 CFR part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93.

6. In areas where the potential exists for future multiple interchange additions, all requests for a new or revised access are supported by a comprehensive Interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan.

The only interchange addition proposed in the area on Interstate Route 75 is for the Knoxville Beltway. It will be located 7.2 miles north of the State Route 131 interchange, in Anderson County.

7. The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and

# related or otherwise required transportation system improvements.

The primary objectives of the proposed modification to the I-75 and State Route 131 (Emory Road) interchange are incorporating the improvements to State Route 131 (Emory Road) presently under construction, improving access to and from the State Route 131 (Emory Road) corridor, and reducing the congestion that currently exists at the interchange. According to this study, the proposed design will meet each objective.

8. The request for a new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal.

Due to the observed low level of environmental consequences, no substantial impacts are anticipated. However, environmental impacts will be assessed with an appropriate document.

### C. Cost

The total estimated project cost for Alternate 1 is \$9,888,000. The total estimated project cost for Alternate 2, the recommended alternate, is \$6,453,000. Detailed estimates for the two alternates are on the following two pages.

# ALTERNATE 1 COST DATA SHEET

Clear and Grubbing	\$	21,000
Earthwork	\$	519,000
Pavement Removal	\$	57,000
Drainage (Includes \$36,000 Erosion Control)	\$	178,000
Structures	\$3	,377,000
Paving		
Sidewalks	\$	14,000
Retaining Walls	\$	0
Maintenance of Traffic	\$	
Topsoil		
Seeding	\$	8,000
Sodding		2,000
Signing		233,000
Signalization (2)		100,000
Fence	\$	12,000
Guardrail (Median Barrier)	\$	
Rip-Rap or Slope Protection	\$	
Other Construction Items (8.5%)		
Mobilization	\$	340,000
Construction Cost	\$8	,082,000
10% Engineering & Contingencies		
Total Construction Cost	\$8	,890,000
10% Preliminary Engineering	<u>\$</u>	808,000
Total Engineering and Construction	\$9	,698,000
District OCM-		
Right-Of-Way		
Land, Improvements and Damages	Φ	400.000
	\$	132,000
Incidentals (9 tracts)	Φ	12,000
· · · · · · · · · · · · · · · · · · ·	<u>\$_</u>	111 000
Total Right-of-Way Cost	Ф	144,000
Utility Relocation		
	\$	9,000
Reimbursable Non-Reimbursable		37,000
Total Adjustment Cost	\$	
. otal / tajaotinone ooot	<u>Ψ</u>	10,000
TOTAL PROJECT COST	\$9	,888,000

# ALTERNATE 2 COST DATA SHEET

	_	
Clear and Grubbing	\$	23,000
Earthwork	\$	252,000
Pavement Removal	\$	52,000
Drainage (Includes \$31,000 Erosion Control)	\$	155,000
Structures		915,000
Paving		,863,000
Sidewalks		15,000
Retaining Walls	\$	180,000
Maintenance of Traffic	\$	409,000
Topsoil	\$	27,000
Seeding		8,000
Signing		233,000
Signalization (3)	\$	150,000
Fence	\$	12,000
Fence	\$	195,000
Rip-Rap or Slope Protection	\$	10,000
Other Construction Items (8.5%)		
Mobilization	\$	225,000
Construction Cost	\$5	,107,000
10% Engineering & Contingencies	\$	511,000
Total Construction Cost	\$5	,618,000
10% Preliminary Engineering		
Total Engineering and Construction	\$6	,129,000
Right-Of-Way		
Land, Improvements and Damages		
2.51 Acres	\$	251,000
Incidentals (9 tracts)		27,000
Relocation Payments		
Total Right-of-Way Cost	\$	278,000
<u>Utility Relocation</u>		
Reimbursable	\$	9,000
Non-Reimbursable		37,000
Total Adjustment Cost	\$	46,000
TOTAL PROJECT COST	\$6	,453,000

#### CHAPTER FOUR

#### **SUMMARY AND CONCLUSIONS**

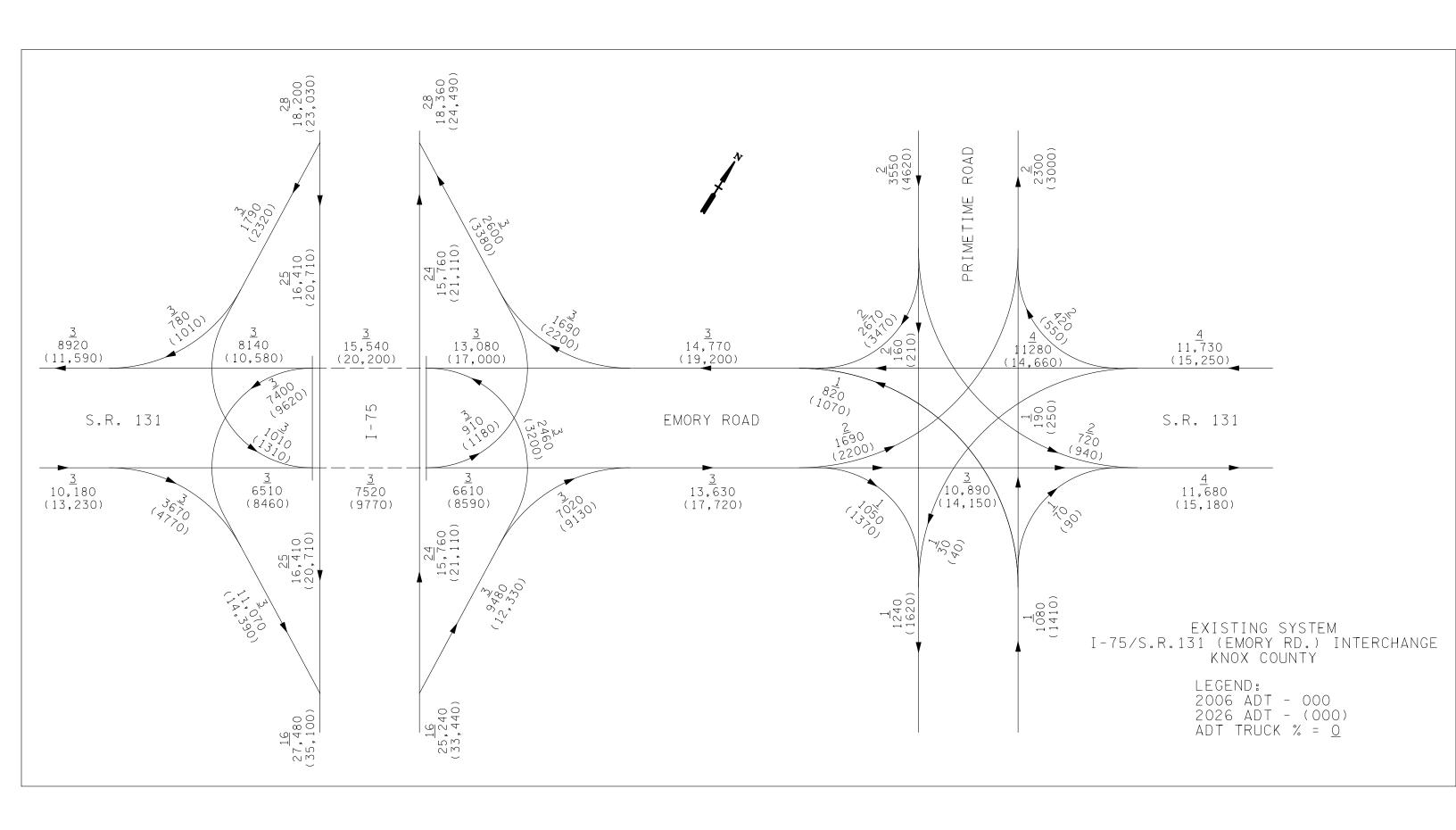
The preceding study was conducted in order to evaluate the justification for modifying the existing access to Interstate Route 75 at State Route 131 (Emory Road) in Knox County, Tennessee.

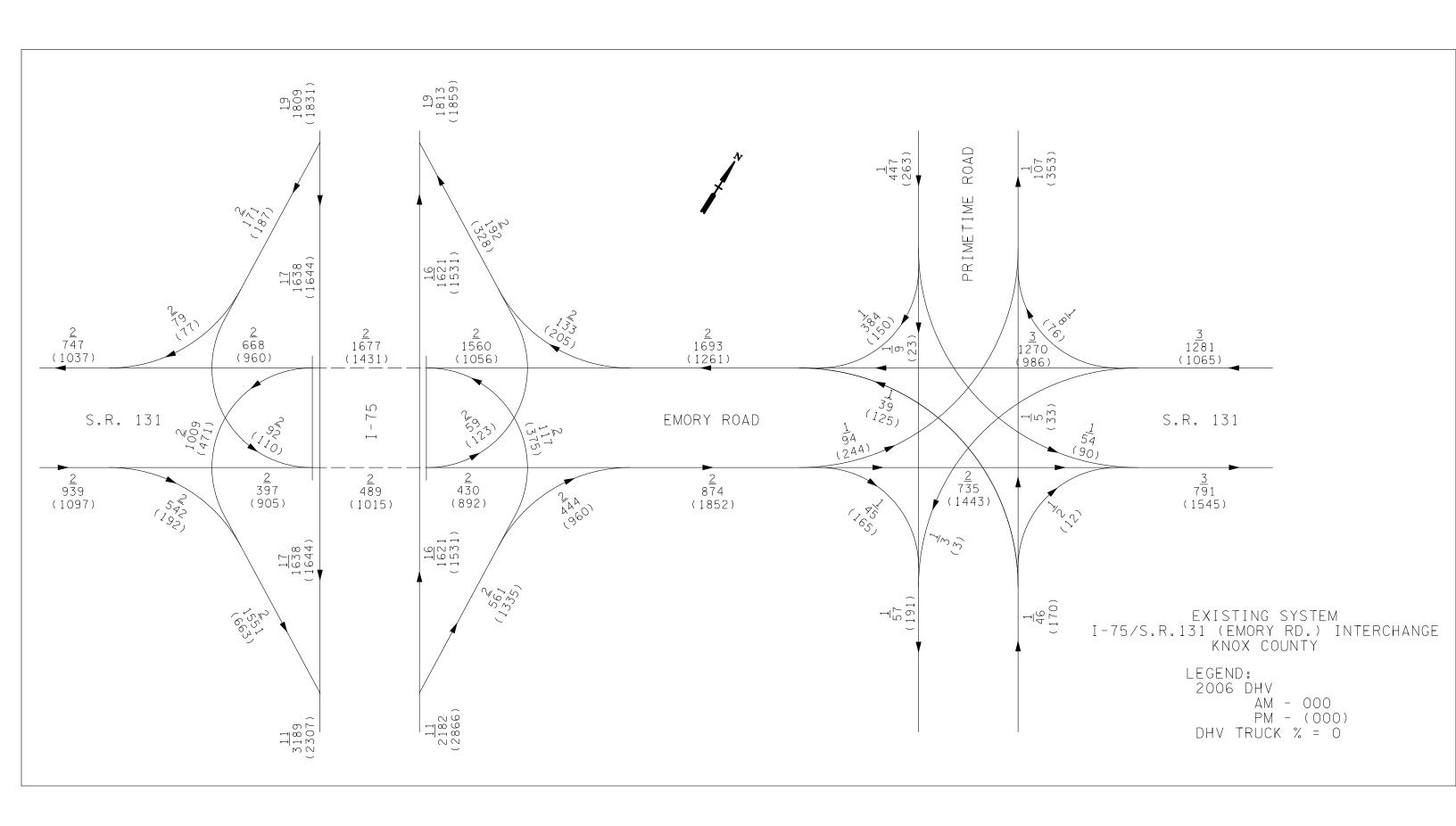
The proposal is consistent with the Knoxville Regional Transportation Planning Organization's 2002-2025 Long Range Transportation Plan Reaffirmation.

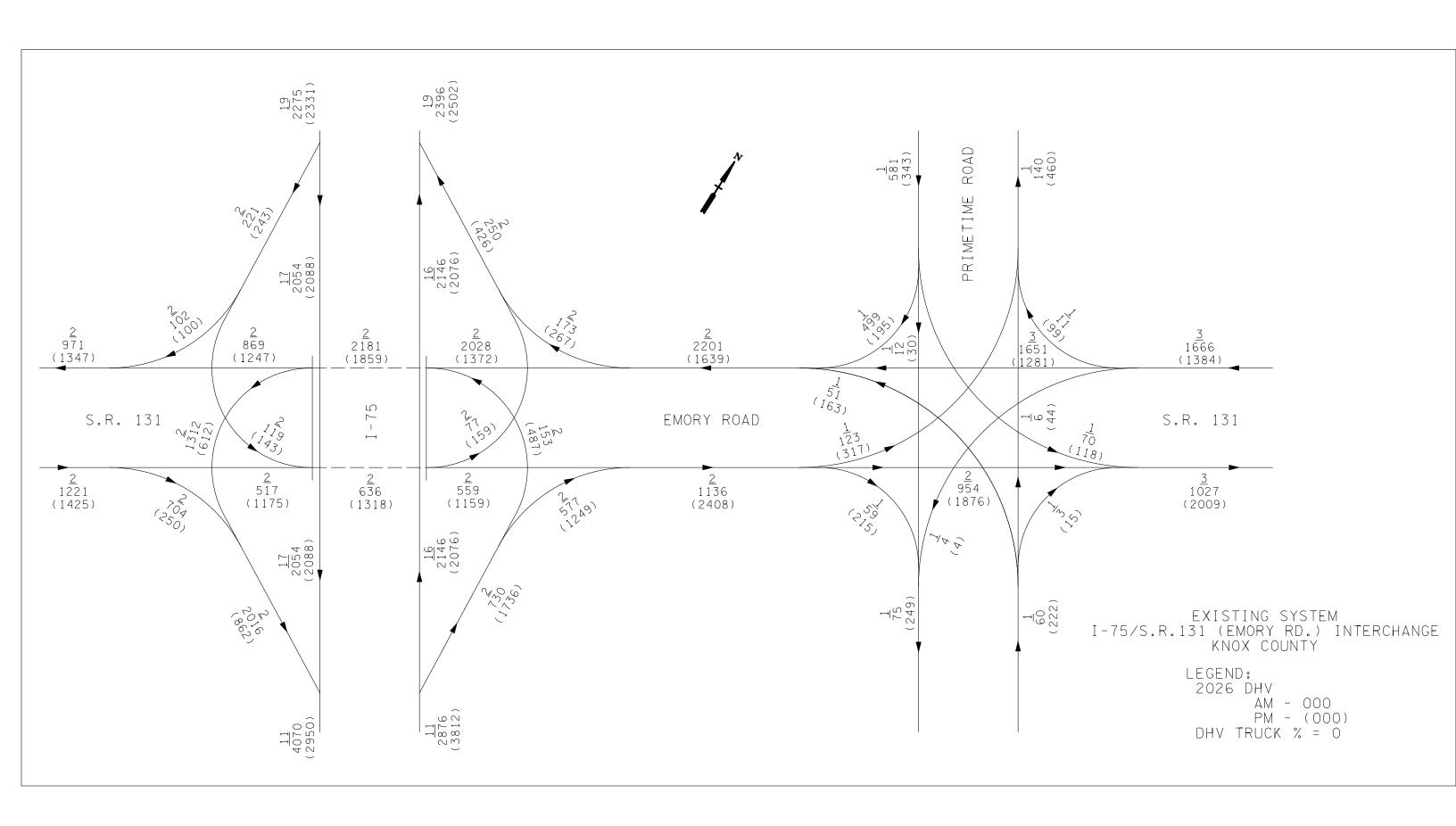
The traffic analysis for this study confirmed that the number of existing basic lanes on Interstate Route 75 are adequate for Design Year (2026) traffic volumes. It further confirmed the six lane section currently under construction on State Route 131 (Emory Road) will provide the required traffic service needed to assure its ability to collect and distribute traffic to and from the interchange.

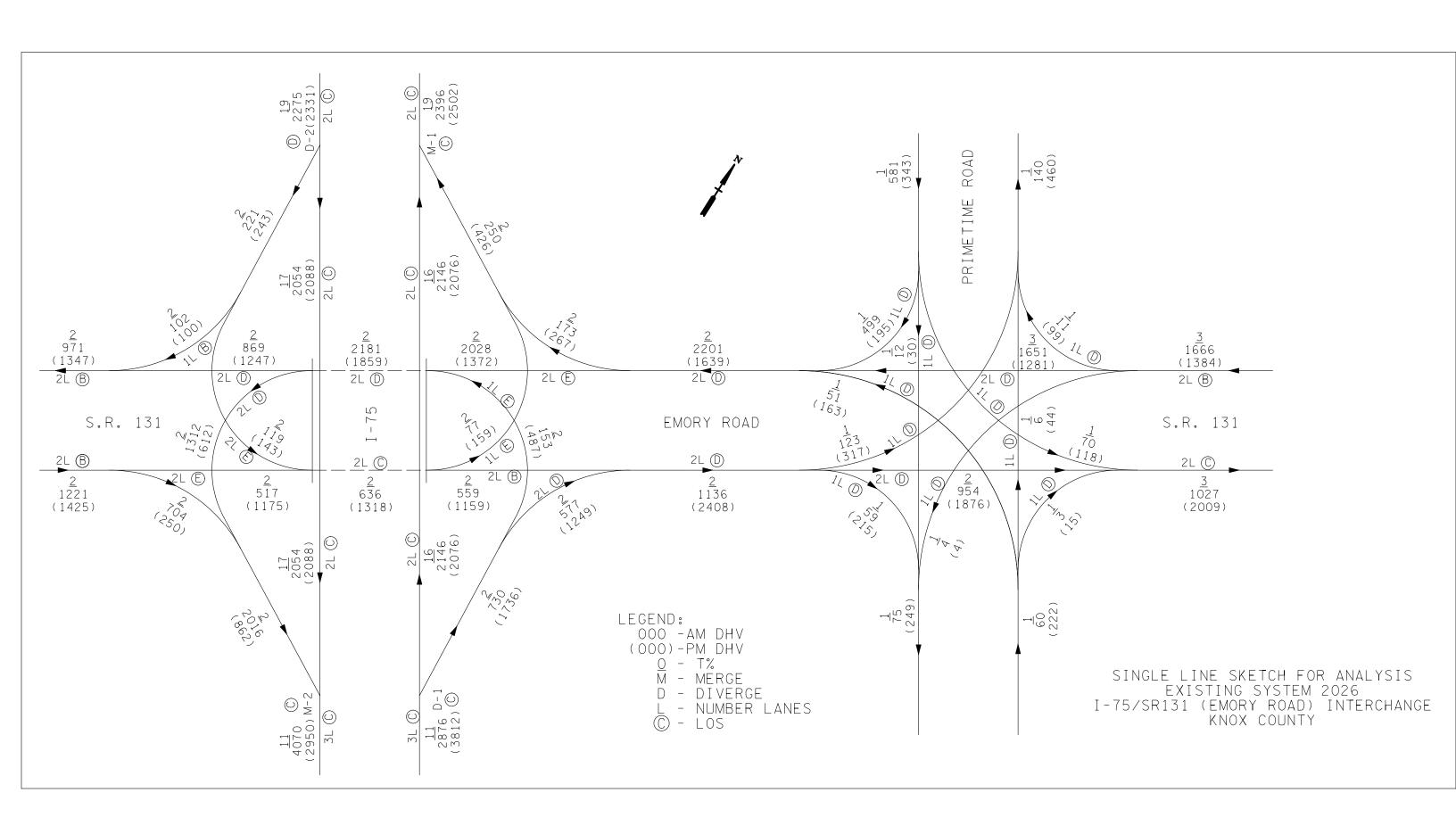
Therefore, it is recommended this study be approved and the specific modifications listed under Proposed Improvements be implemented as soon as funds are available.

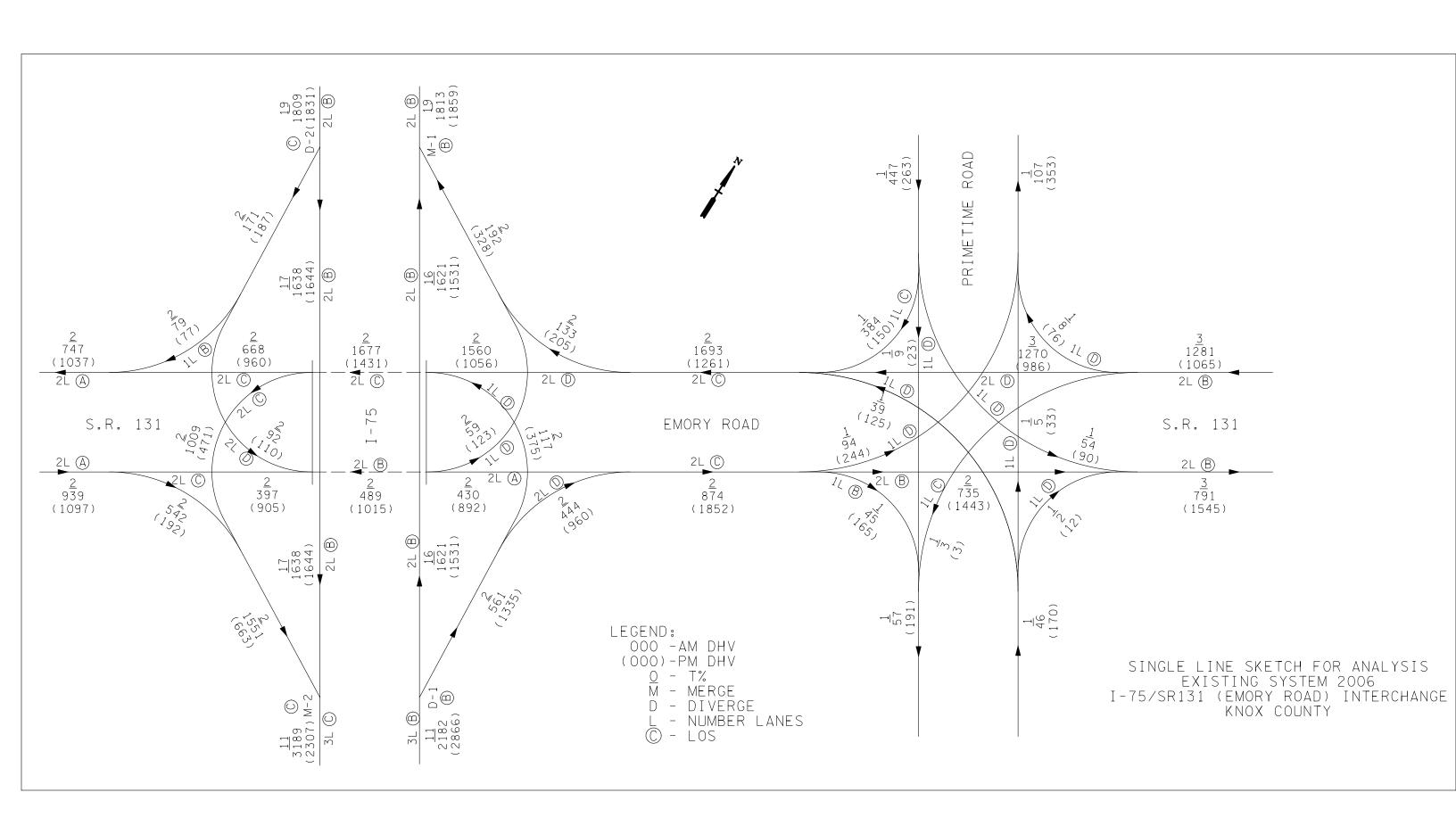
# **APPENDIX A**

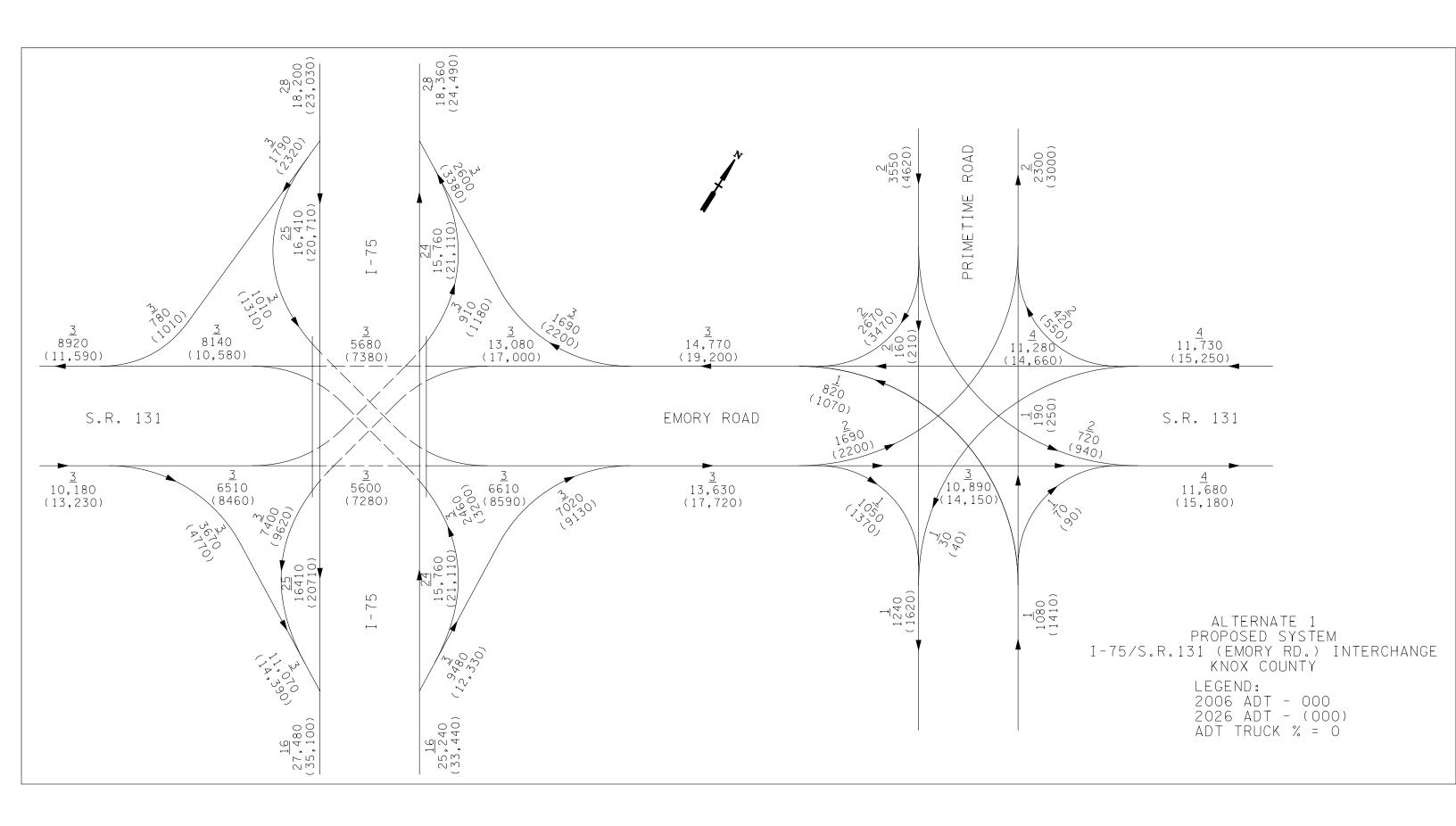


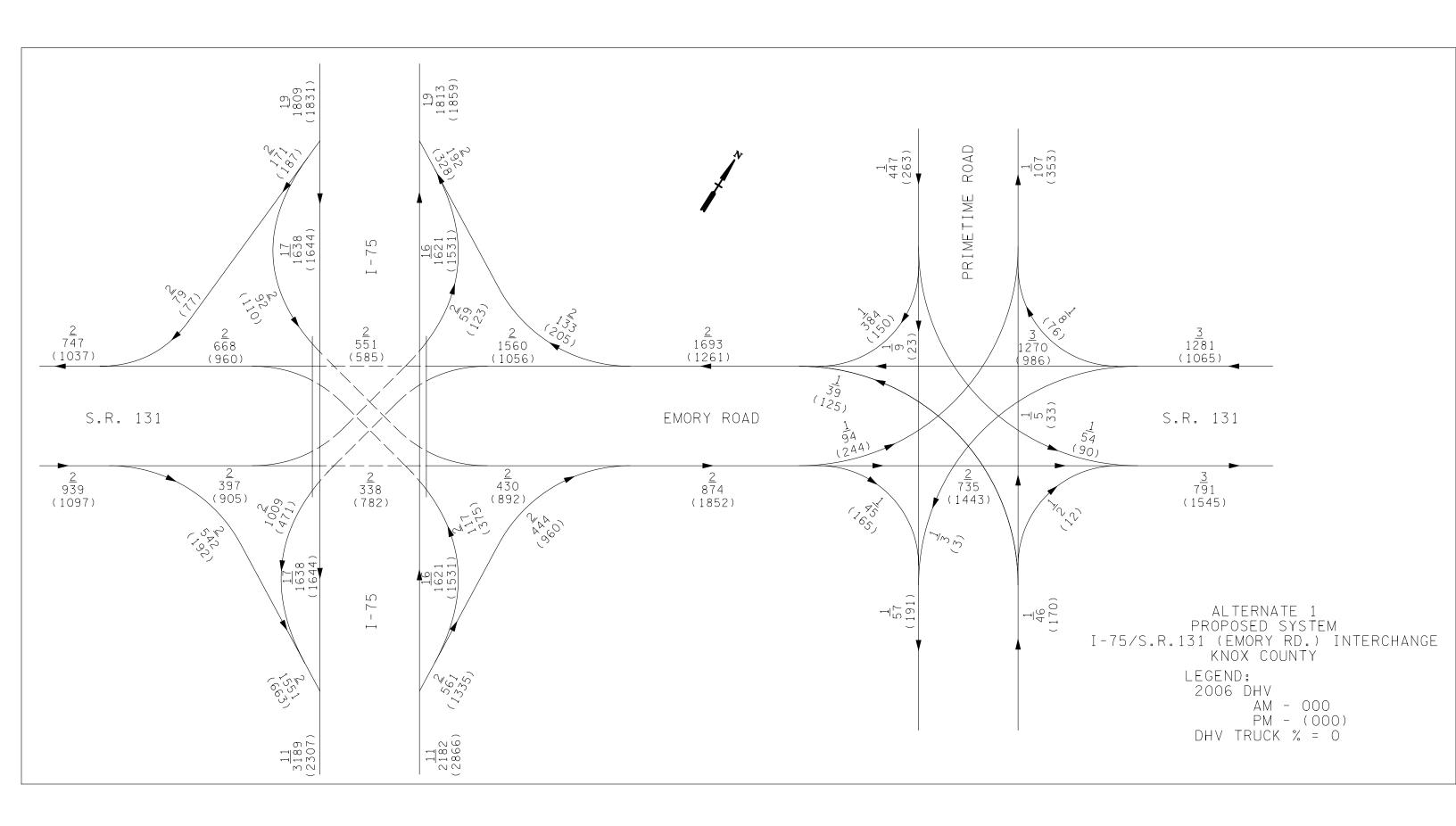


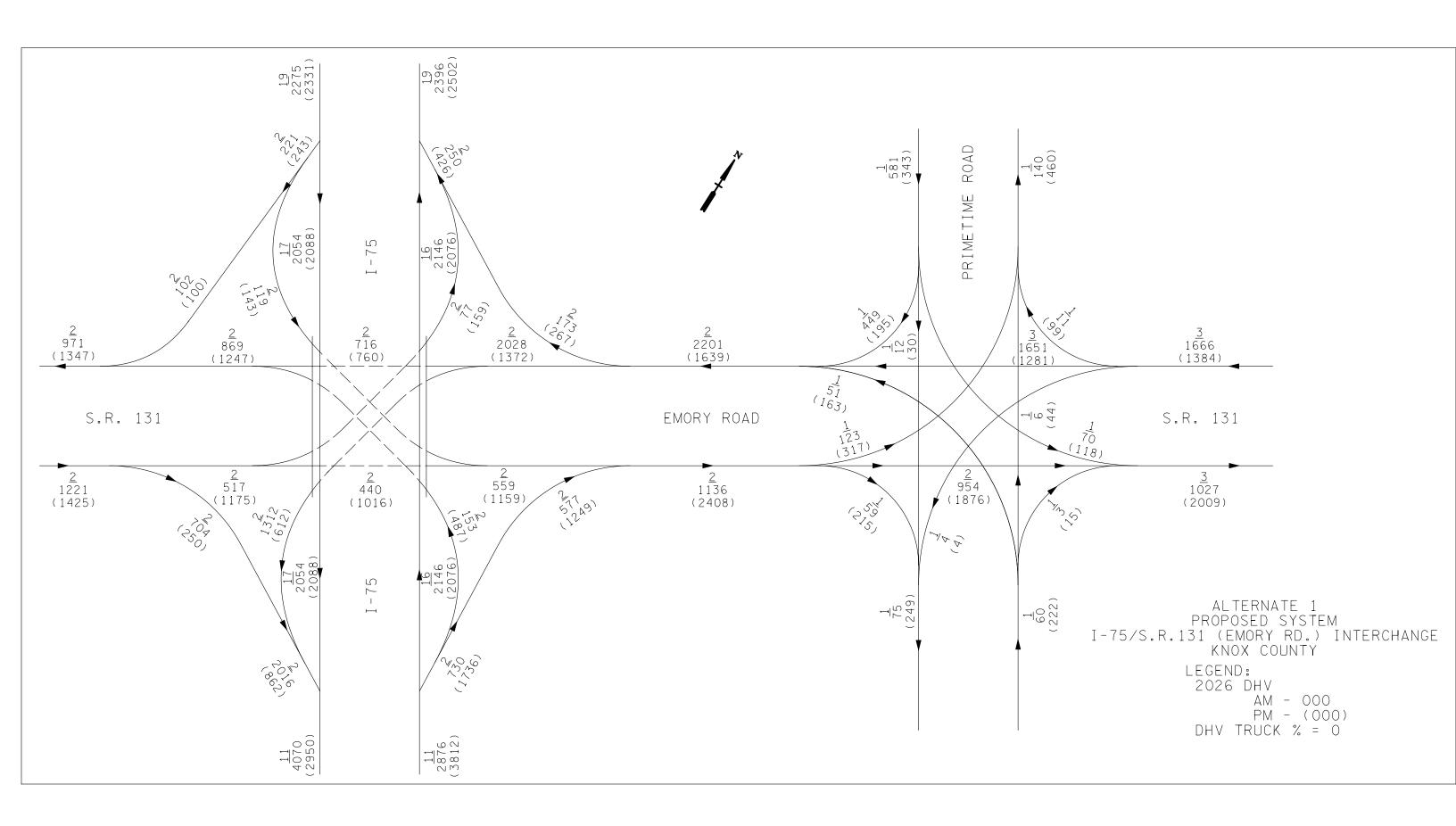


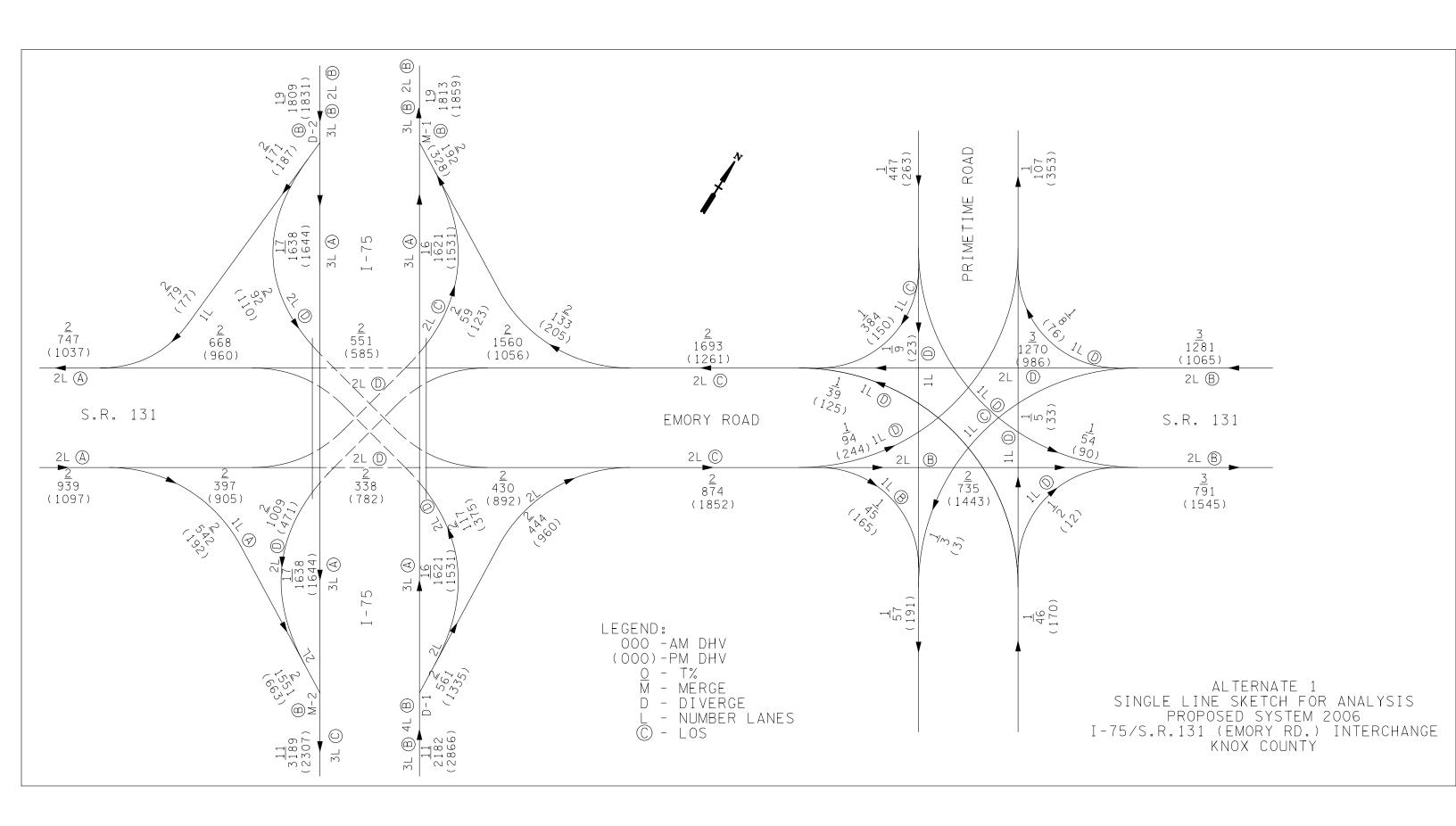


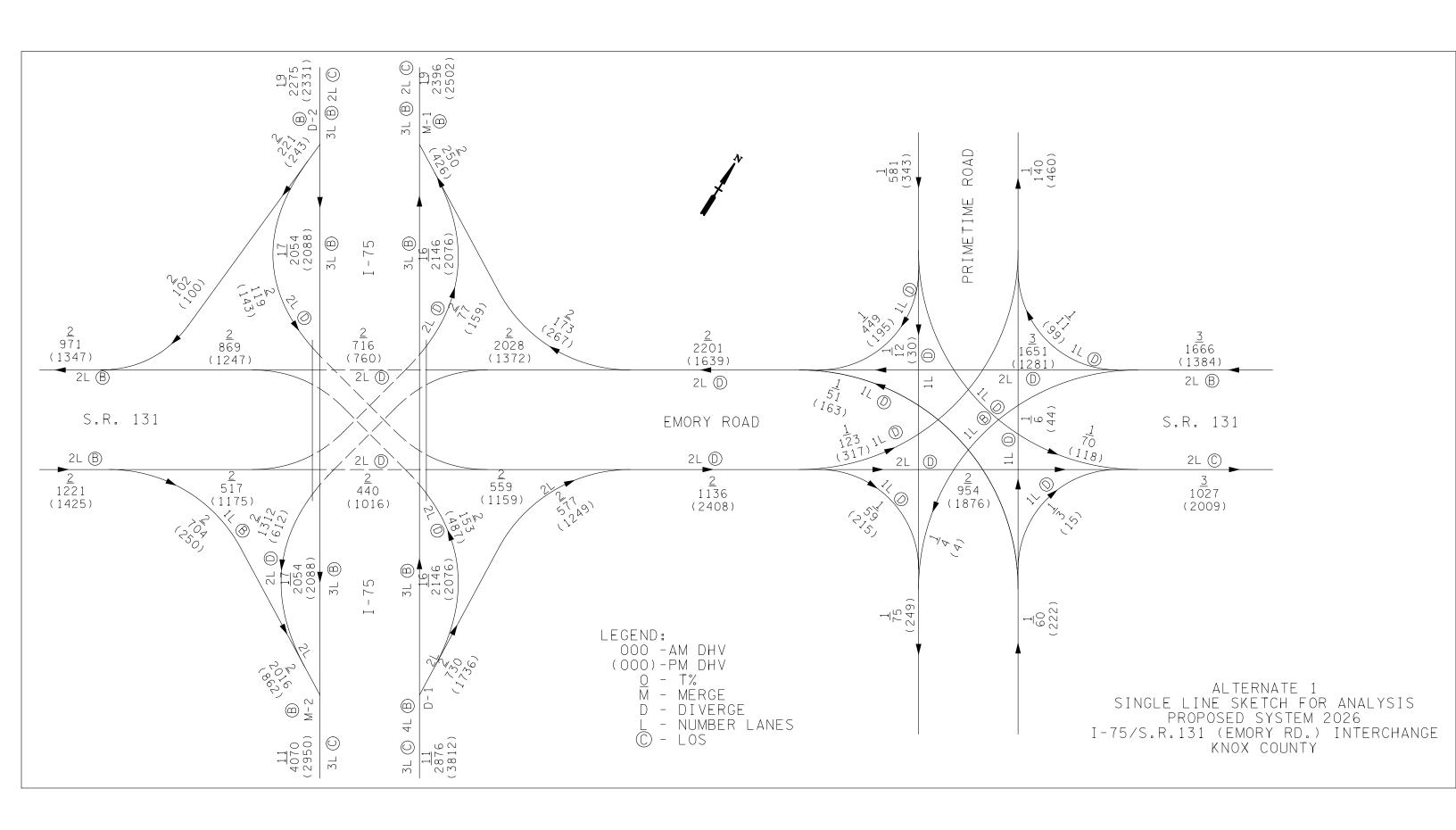


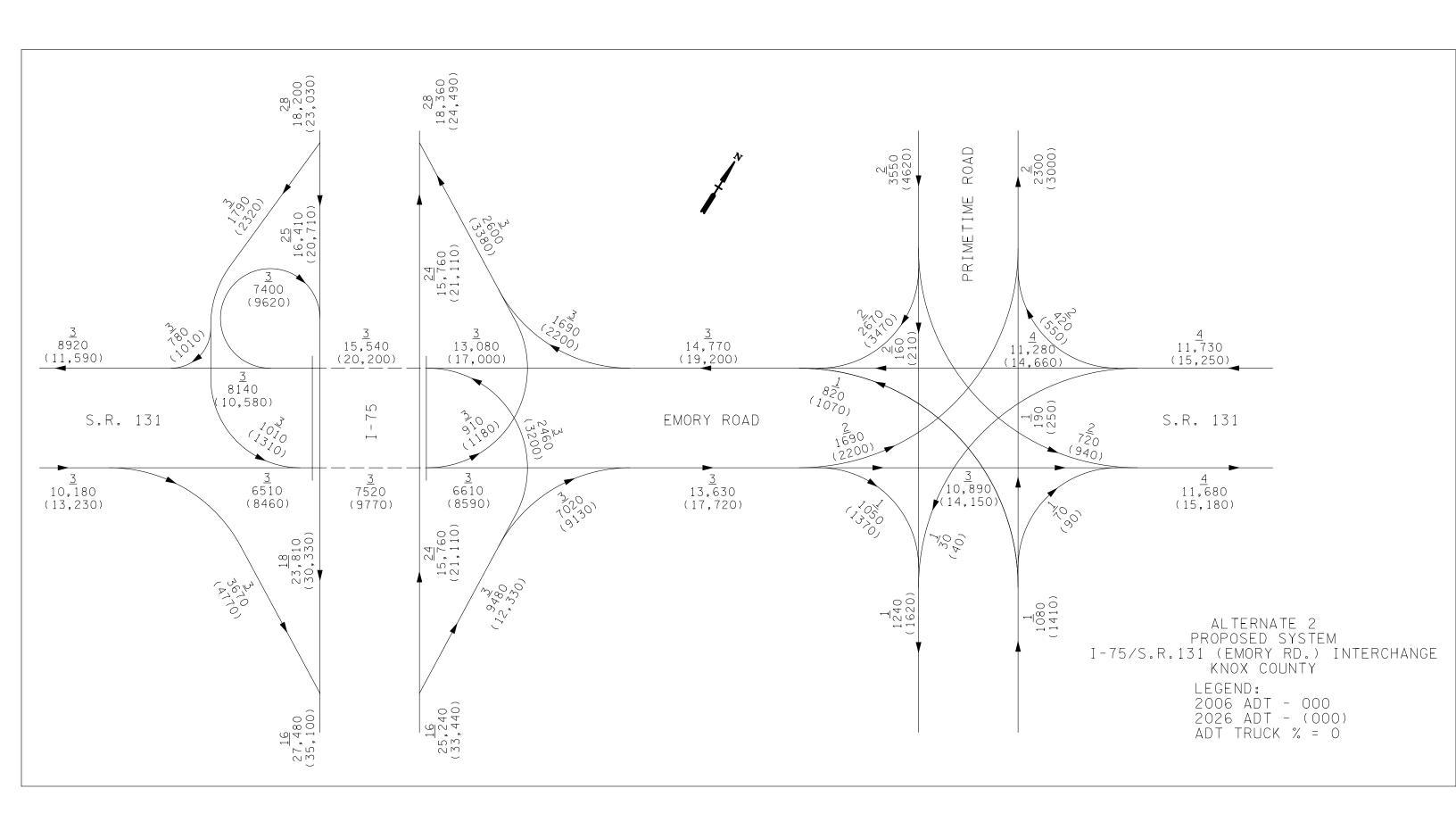


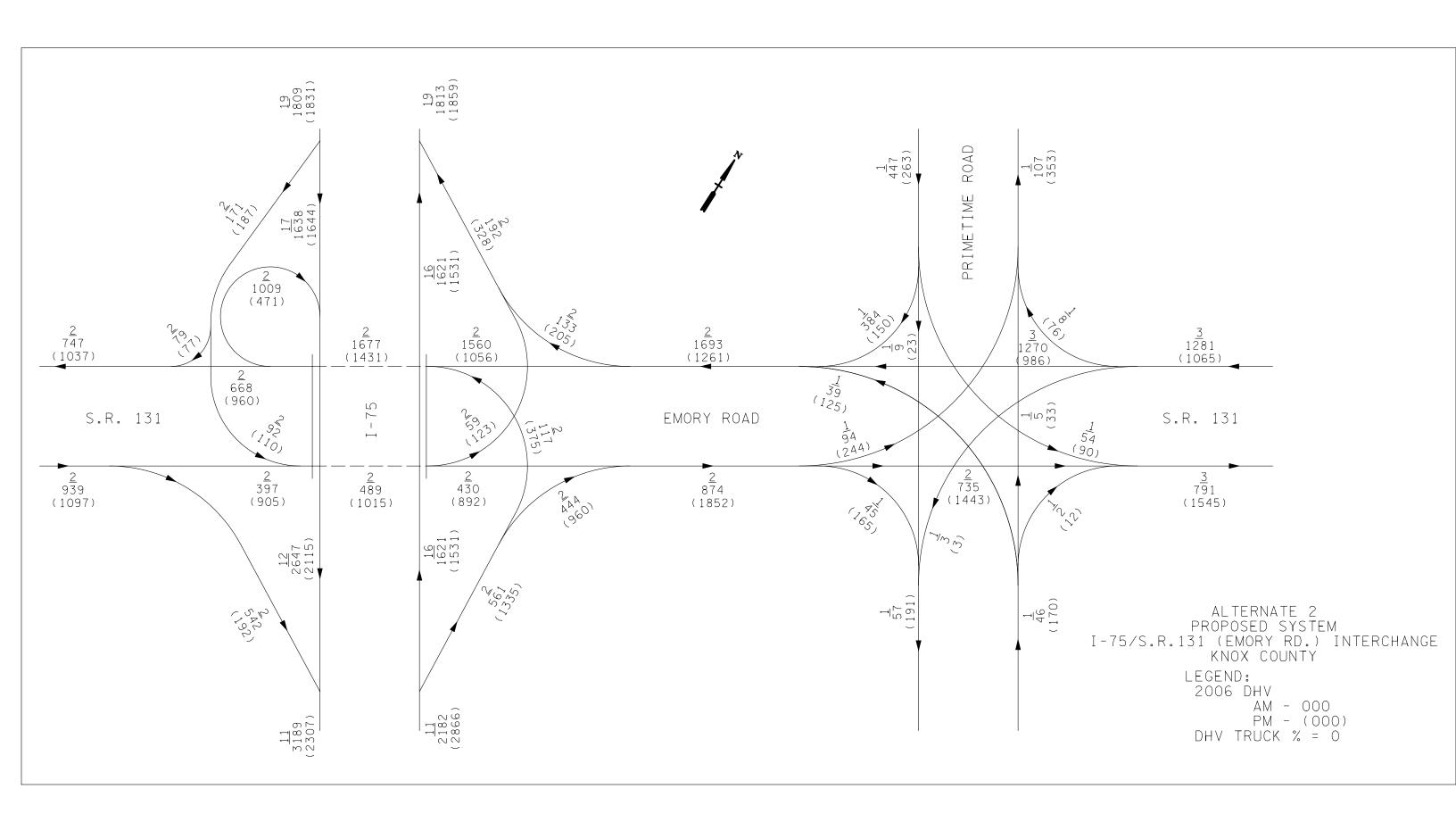


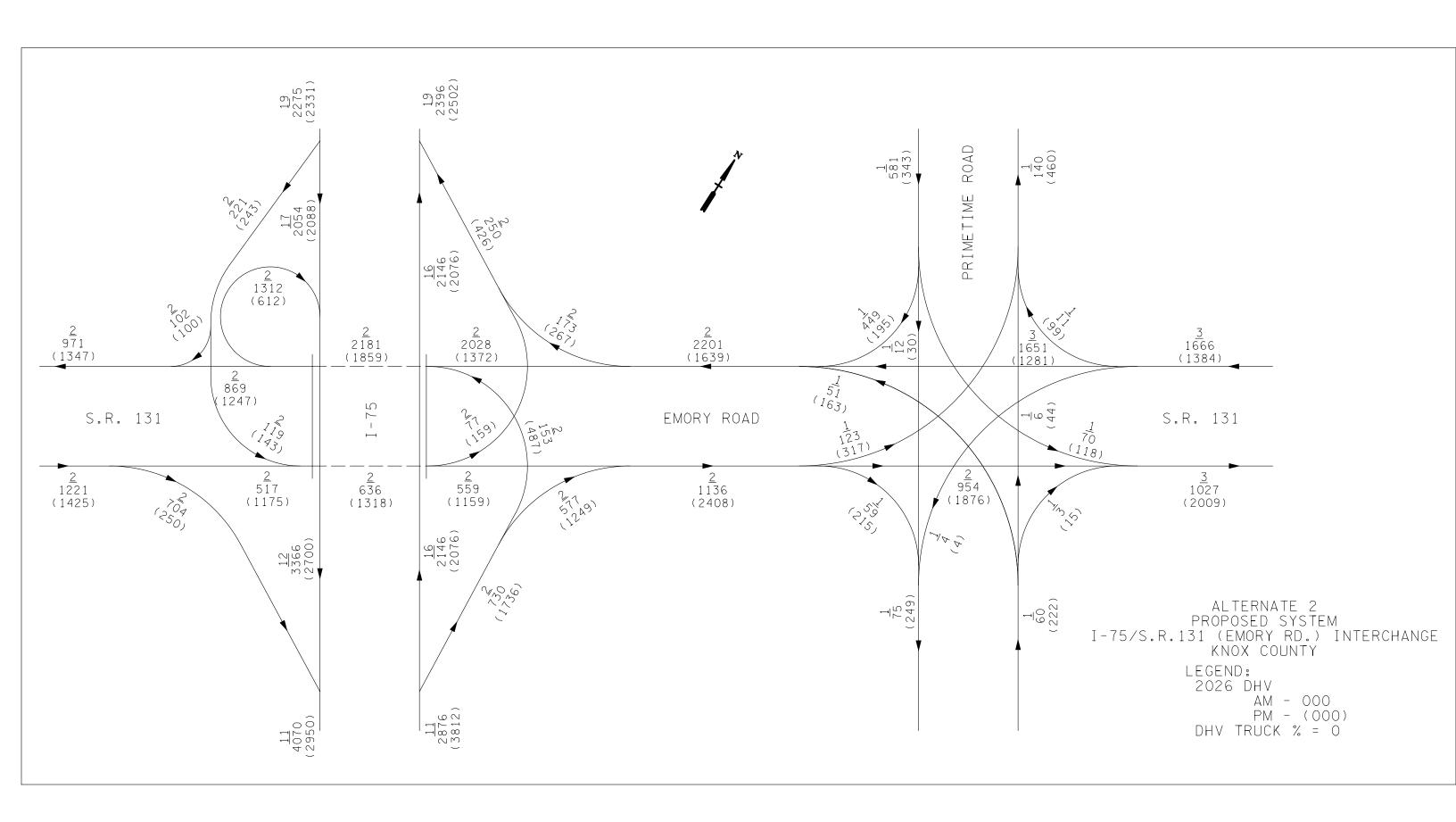


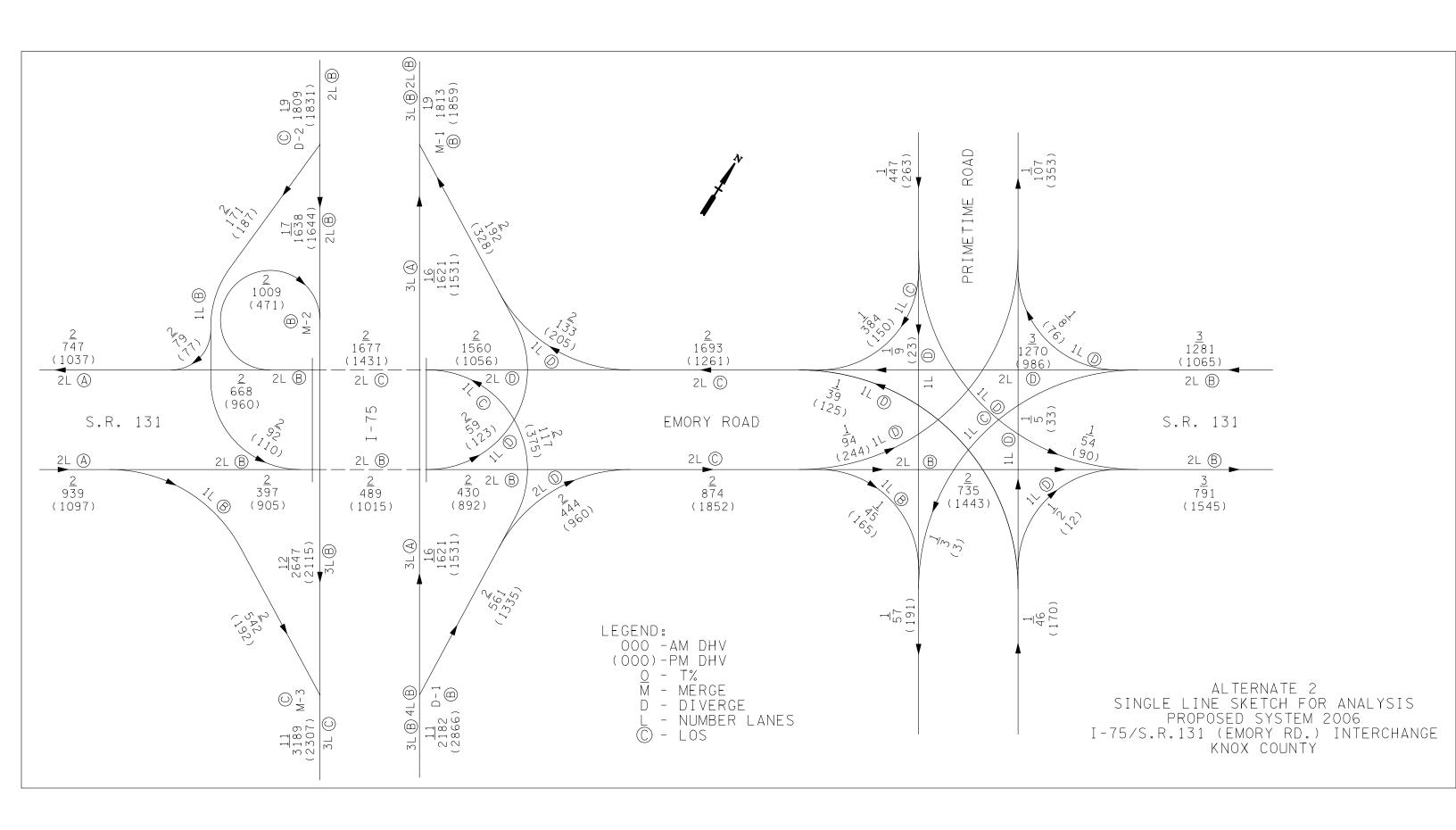


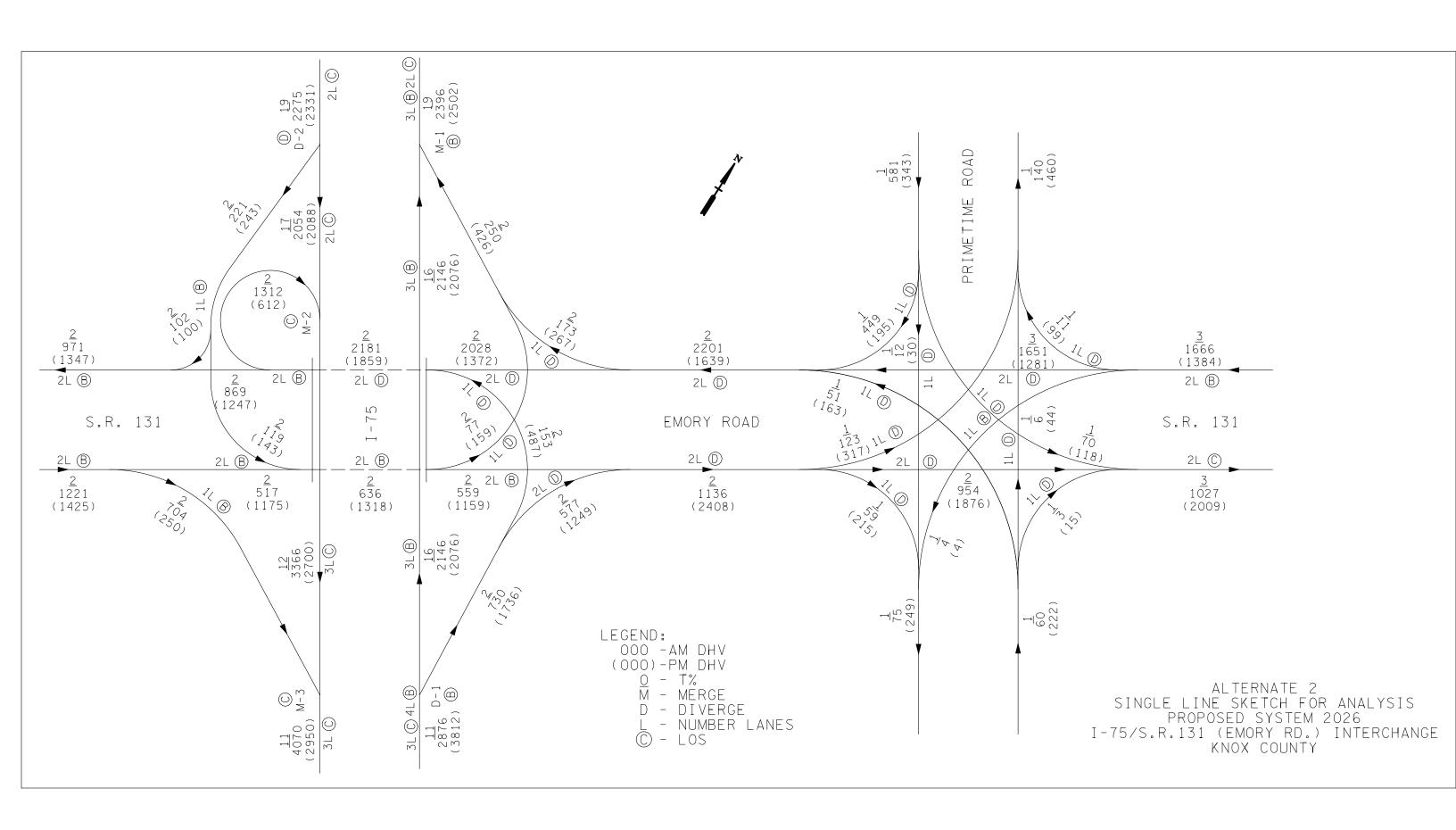












# Analysis Summary 2006 Traffic and Existing Geometrics

Location	Type Analysis	Design Hour	LOS
I-75 Northbound South	Basic Freeway	AM	B
of Interchange	Segments	PM	В
D-1, I-75 Northbound	Ramp and Ramp	AM	В
Off-ramp to SR131	Junctions, Ln. Drop	PM	В
I-75 Northbound	Basic Freeway	AM	В
Through Interchange	Segments	PM	В
M-1, I-75 Northbound	Ramp and Ramp	AM	В
On-ramp from SR 131	Junctions	PM	В
I-75 Northbound North	Basic Freeway	AM	В
of Interchange	Segments	PM	В
I-75 Southbound North	Basic Freeway	AM	В
of Interchange	Segments	PM	В
D-2, I-75 Southbound	Ramp and Ramp	AM	С
Off-ramp to SR 131	Junctions	PM	С
I-75 Southbound	Basic Freeway	AM	В
Through Interchange	Segments	PM	В
M-2, I-75 Southbound	Ramp and Ramp	AM	С
On-ramp from SR 131	Junctions, Add Ln.	PM	В
I-75 Southbound South	Basic Freeway	AM	С
of Interchange	Segments	PM	В
SR 131 West of I-75	Multilane Highways	AM	Α
		PM	Α
SR 131/I-75 SB Ramps		AM	C (26.3)
	Intersections	PM	C (27.8)
SR 131/I-75 NB	Signalized	AM	C (30.7)
Ramps	Intersections	PM	C (27.4)
SR 131/Primetime Rd.	Signalized	AM	C (29.6)
	Intersections	PM	C (28.1)
SR 131 East of	Multilane Highways	AM	В
Primetime Rd.		PM	В

Note: The LOS shown for the intersections is the total average intersection delay. The delay in parentheses is in seconds per vehicle.

\_\_\_\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/20/02
Analysis Time Period:	5/20/02 AM
Freeway/Direction:	175 NB

Entry 13 Time Fer 100.	TOE NO			
Freeway/Direction: From/To:	175 NB	<b>.</b>		
	South of Interc	nange		
Jurisdiction: Analysis Year:				
reactification. Know co.	rvior. JApremi	₽ (1 ¥ °		
	Flow Inputs and	d Adjustments		
Volume: V		5185	veh/h	
Peak-hour factor, PHF	_	0.95		
Peak 15-min volume, v15	j	574	V	
Trucks and buses		1. 1.	7	
Recreational vehicles		0	አ የ	
Terrain type:		Rolling		
Grade		0.00	7.	
Segment length		0.00	mi	
Trucks and buses PCE - E		2.5		
Recreational vehicle PC		5.0		
Heavy vehicle adjustment, fHV		0.858		
Driver population facto	ira vp	1.00		
Flow rate, vp		892	pc/h/ln	
- Vandarah	Speed Inputs a	nd Adjustments		
Lane width		15.0	ft	
Right-shoulder lateral	clearance	b - D	ft	
Interchange: density		0.50	interchange/mi	
Number of lanes, N		3 🖊	-	
Free-flow speed:		Measured		
FFS or BFFS		70.0	mi/h	
Lane width adjustment,	fLW	0.0	mi/h	
Lateral clearance adjus	tment, fLC	0.0	mi/h	
Interchange density adj	ustment, fID	0.0	mi/h	
Number of lanes adjustm		3.0	mi/h	
Free-flow speed, FFS		70-0	mi/h	
		Urban Freeway		
	L0S and Perform	mance Measures		
Flow rate, vp		892	pc/h/ln	
Free-flow speed, FFS		70.0	mi/h	
Average passenger-car s	need. S	70.0	mi/h	
Number of lanes, N	F-4-1 W	3		
Density: D		ī2.7	pc/mi/ln	
Level of service, LOS		В	process man all	
,				

\_\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/20/02
Analysis Time Period:	4: PM /
- 1	'.:_

Freeway/Direction: 175 NB From/To: South of Interchange

Jurisdiction: 500P < Analysis Year:

Description: Knox Co., Exist. System,	DHV	
Flow Inputs an	d Adjustments	
Volume, V	2866 🗸	veh/h
Peak-hour factor, PHF	0.95 /	
Peak 15-min volume, v15	754	V
Trucks and buses	7.7	%
Recreational vehicles		ż.
Terrain type:	Rolling	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
Flow rate, vp	1175	pc/h/ln
Speed Inputs a	ind Adjustments	
Lane width	75.0	ft
Right-shoulder lateral clearance	5.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3 -	
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
The space is the	Urban Freeway	
LOS and Perfor	mance Measures	
flow rate, vp	1172	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	m ± r 11
Density D	16.7	pc/mi/ln
Level of service, LOS	B -	beymry 111
reset of 26LAIC6+ FAZ	R .	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_Operational Analysis\_\_\_ Ken Arnold TRC International Analyst: Agency or Company: Date Performed: 5/20/02

Analysis Time Period: Freeway/Direction: AM ~ 175 NB

From/To: Through Interchange /

Level of service, LOS

Jurisdiction: Analysis Year: 500P

Flow Inputs an	d Adjustments	
Volume <sub>1</sub> V	1651	veh/h
Peak-hour factor, PHF	0.95/	
Peak 15-min volume, v15	427	v
Trucks and buses	l l	<sup>2</sup>
Recreational vehicles		Z
Terrain type:	Rolling	
Grade .	0.00	2,
Segment length	0.00	mî
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
Flow rate, vp	994	pc/h/ln
Speed Inputs a	nd Adjustments	
Lane width	15.0	ft
Right-shoulder lateral clearance	6 · O	ft
Interchange density	0 - 50	interchange/mi
Number of lanes, N	2 🗸	
Free-flow speed:	Measured	
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	4 - 5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freewa	y
LOS and Perfor	mance Measures	
Flow rate, vp	994	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	14.2	pc/mi/ln
10001 -6105	_	• • • •

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

В

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:		Fax: (615)	661-0644
	Operational Analy	sis	
Analyst:	Ken Arnold		
Agency or Company:	TRC International		
	5/20/02		
Analysis Time Period: Freeway/Direction:	175 NB		
	Through Interchang	ie	
Jurisdiction:	-	•	
Analysis Year:	500P		
Description: Knox Co-a	Exist. System: DHV	•	
	Flow Inputs and A	djustments	
Volume: V		1 5 3 1	veh/h
Peak-hour factor: PHF		1531 0-95/	AGIIVII
Peak 15-min volume, v15		u. 13 403	
Trucks and buses			v %
Recreational vehicles		11 D	ž
Terrain type:		-	4.
Grade		Rolling	χ
Segment length		0.00 0.00	~ mi
Trucks and buses PCE, E	-		un T
Recreational vehicle PC		2.5	
Heavy vehicle adjustment		2.0 0.858	
Driver population factor		1.00	
Flow rate, vp	1 νμ	939	pc/h/ln
	Speed Inputs and	Adiustments	•
Lane width	. 1	75.0	ft
Right-shoulder lateral o	learance	P · O	ft
Interchange density		0.50	interchange/mi
Number of lanes, N Free-flow speed:		2	
		Measured	- : //-
FFS or BFFS	74 1.9	70.0	mi/h
Lane width adjustment, (		0.0	mi/h
Lateral clearance adjustment, fLC Interchange density adjustment, fID		0·0 0·0	mi/h mi/h
Number of lanes adjustme		4.5	mi/h
Free-flow speed, FFS	SILT IN	70.0	mi/h
Tree-Trow Speeds 113		Urban Freew	
	LAS and Bonforns		•
	L0S and Performan	ce lleazurez	
Flow rate, vp		939	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
Average passenger-car sp	eed, S	70.0	mi/h
Number of lanes, N		2	
Density: D		13.4	pc/mi/ln
vendity i v			

# HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

	Fax:	(615) 661	-064	4	-
Merg	e Analysis				
7/12/02 VHQ MA 1-75 S.R. 131 (EMO) 2006	RY ROAD)	TE ROUTE	131,	EXISTIN	S SYSTEM
free	eway Data				
vay vay	20.0				
On I			•		
ecel lane decel lane	192 840		mph vph ft ft		
np np	No		vph ft		
ersion to pc/l			ns	1 d i 2 d 2 d 2	
En ER En fHV	1621 0.95 427 16 0 Rolling % mi 2.5 2.0 0.806 1.00	192 0.95 51 2 O Rolling	% mi	Ramp Level	vph v % % %
	KA TRC INTERNATI 9/12/02 AM DHV 1-75 S.R. 131 (EMO) 2006 1-1, N.B. ON R. Free Way Way On  eccl lane decel lane Adjacent Ram Presion to pc/l	Merge Analysis_  KA  TRC INTERNATIONAL 9/12/02 AM DHV I-75 S.R. 131 (EMORY ROAD)  200b 1-1, N.B. ON RAMP FROM STA  Freeway Data  Merge 2 70.0 1521 On Ramp Data Right 1 50.0 192 840 decel lane decel lane decel lane	Merge Analysis  KA TRC INTERNATIONAL 9/12/02 AM DHV 1-75 S.R. 131 (EMORY ROAD)  200b 1-1, N.B. ON RAMP FROM STATE ROUTE  Freeway Data  Merge 2 70.0 1b21 On Ramp Data  Right 1 50.0 192 ecel lane decel lane decel lane Adjacent Ramp Data (if one exists 2 No  np  np  version to pc/h Under Base Condition  Freeway Ramp  1621 0.95 0.95 427 51 16 0 0 Rolling Rolling % mi 1.55 1.56 2.5 2.5 2.5 2.5 3.61 3.7 4.7 3.1 4.7 3.7 4.7 4.7 5.1 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7	Merge Analysis  KA  TRC INTERNATIONAL 9/12/02  AM DHV 1-75  S.R. 131 (EMORY ROAD)  200b 1-1, N.B. ON RAMP FROM STATE ROUTE 131,  Freeway Data  Freeway Data  Merge 2 70.0 mph 1521 vph 200 mph 192 vph 193 vph 194 vph 195 0.95 107 mph 196	TRC INTERNATIONAL 9/12/02 AM DHV 1-75 S.R. 131 (EMORY ROAD)  2006 1-1, N.B. ON RAMP FROM STATE ROUTE 131, EXISTING

```
_Estimation of V12 Merge Areas_
                  L =
                          0.00
                                 (Equation 25-2 or 25-3)
                         1.000 Using Equation 0
                  FM
                  v = v (P) = 2116
                  15 E
                          FΜ
                            ___Capacity Checks_
                          Actual
                                        Maximum
                                                        LOS F?
                          2324
     F0
                                        4800
                                                        No
                          2324
                                        4600
                                                        No
     R12
               __Level of Service Determination (if not F)_
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = R R A
                                                                      pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                         ____Speed Estimation___
Intermediate speed variable.
                                            M = 0.277
Space mean speed in ramp influence area.
                                            2 = P5·5
Space mean speed in outer lanes.
                                             0
Space mean speed for all vehicles,
                                            Z = P5·5
```

,27

## HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

	Fax: (	615) 661·	-0641	<del>1</del>	
Merge	Analysis				
/12/02 M DHV -75 .R. 131 (EMOR' 006	Y ROAD)	E ROUTE I	131,	EXISTING	MBTZYZ
Free	way Data				
y y	Merge 2 70.0 1531				
0n Ra	amp Data				
el lane cel lane	Right 1 50.0 328 840		mph vph		
Adjacent Ramp	Data (if on	e exists			
	No		vph ft		
	Undan Basa	Condition			
rsion to perm			13	Adjacent	
ER fHV fP	0.95	328 0.95 8b 2 0 Rolling 2.5 2.0 0.971 1.00	ሂ mi	Level	vph v % % % mi
	A RC INTERNATION /12/02 M DHV -75 -75 -R. 131 (EMOR'  DOB L, N.B. ON RAN  Freed  Y  On Ro  el lane cel lane Adjacent Ramp  rsion to pc/h	Merge Analysis  A RC INTERNATIONAL /12/02 M DHV -75 -R. 131 (EMORY ROAD)  DOB 1. N.B. ON RAMP FROM STAT Freeway DataOn Ramp DataOn Ramp DataOn Ramp Data (if on No  Right 1 50.8 328 el lane cel lane Adjacent Ramp Data (if on No  rsion to pc/h Under Base Freeway 1531 0.95 403 15 0 Rolling // mi 2.5 ER 2.0	Merge Analysis  A RC INTERNATIONAL /12/02 M DHV -75 -R. 131 (EMORY ROAD)  006 1. N.B. ON RAMP FROM STATE ROUTE:  Freeway Data  Merge 2 70.0 1531  On Ramp Data  Right 1 50.0 328 640 cel lane Adjacent Ramp Data (if one exists)  No  rsion to pc/h Under Base Condition  Freeway Ramp 1531 328 0.95 403 34 154 2 0 0 Rolling Rolling % mi 2.5 ER 2.0 2.5	Merge Analysis  A RC INTERNATIONAL /12/02 M DHV -75 -R. 131 (EMORY ROAD)  DOB L. N.B. ON RAMP FROM STATE ROUTE 131.  Freeway Data  Merge 2 70.0 mph 1531 vph  On Ramp Data  Right 1 50.0 mph 328 vph 6tl lane cel lane Adjacent Ramp Data (if one exists)  No  No  Vph  ft rsion to pc/h Under Base Conditions  Freeway Ramp 1531 328 0.95 0.95 403 86 16 2 0 0 Rolling Rolling % mi mi 2.5 2.5 2.0 2.5	### CINTERNATIONAL //2/02 ### DHV -75 -R. 131 (EMORY ROAD)  ### DOB L. N.B. ON RAMP FROM STATE ROUTE 131, EXISTING Freeway Data  ### Merge 2 7 0.0

```
_Estimation of V12 Merge Areas_
                          0.00
                                  (Equation 25-2 or 25-3)
                  ΕQ
P =
                          1.000 Using Equation 0
                          (P ) = 1998 pc/h
                           ____Capacity Checks__
                           Actual
                                         Maximum
                                                        LOS F?
                                         4800
                           2354
     F0
                                                        No
                                         4600
                          2354
                                                        No
     R12
               __Level of Service Determination (if not F)__
Density: D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = R R 12
                                                              18.4
Level of service for ramp-freeway junction areas of influence B
                          ___Speed Estimation__
                                             M = 0.278
Intermediate speed variable:
Space mean speed in ramp influence area.
                                             Z = P5.5
                                             S = N/A
Space mean speed in outer lanes,
                                             2 = P5·5
Space mean speed for all vehicles.
                                                          mph
```

4

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (635) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold
Agency or Company: TRC International

Agency or Company:
Date Performed:

5/20/02 AM

Analysis Time Period: Freeway/Direction: From/To:

Free-flow speed, FFS

Level of service, LOS

Number of lanes, N

Density, D

Average passenger-car speed,  $\mathbf{Z}$ 

I75 NB North of Interchange

Jurisdiction:

500P

Analysis Year:

Description: Knox Co., Exist. System, DHV

Flow Inputs ar	nd Adjustments	
Volume, V	1813	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	477	v
Trucks and buses	15	%
Recreational vehicles	Ð	%
Terrain type:	Rolling	
Grade	0 00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	O-778	
Driver population factor, vp	1.00	
Flow rate, vp	155P	pc/h/ln
Speed Inputs a	and Adjustments	
Lane width	75-0	ft
Right-shoulder lateral clearance	<b>Ь ∙ D</b>	ft
Interchange <sup>®</sup> density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
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	4 - 5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	
LOS and Perfor	rmance Measures	
Flow rates vp	1556	pc/h/ln
F fl., FFF		-:/5

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

70.0

70.0

2 17.5

В

mi/h

mi/h

pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:			
	Operational Ana	lysis	
Analyst:	Ken Arnold		
Agency or Company:	TRC Internationa	1	
Date Performed:	5/20/02		
Analysis Time Period:	PM		
Freeway/Direction:	I7S NB		
From/To:	North of Interch	ange	
Jurisdiction:		5-	
Analysis Year:	500P		
Description: Knox Co.,		н٧	
	Flow Inputs and	Adjustments	
Volume, V		1813	veh/h
Peak-hour factor, PHF		0.95	
Peak 15-min volume, vl5		477	v
Trucks and buses		19	ž
Recreational vehicles		ā .	ž
Terrain type:		Rolling	••
Grade		0.00	Z
Segment length		0.00	mi
Trucks and buses PCE, E	т	2.5	· · · · ·
Recreational vehicle PCI		5.0	
Heavy vehicle adjustmen		0.778	
Driver population factor		1.00	
Flow rate, vp	1 Vp	1556	pc/h/ln
	Speed Inputs an	d Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6.0	ft
Interchange density	2100. 022	0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed:		Measured	
FFS or BFFS		70.0	mi/h
Lane width adjustment	f∟ฟ	0.0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjustm		4.5	mi/h
Free-flow speed, FFS	S1197 FIT	70.0	mi/h
ivee itom sheens ins		Urban Freeway	
		•	•
<u> </u>	LOS and Perform	ance Measures	<u> </u>
Flow rate, vp		755P	pc/h/ln
· · · · · · <b>/</b>		70.0	mi/h
•			
Free-flow speed, FFS Average passenger-car s	Z rbsec	70.0	mi/h
Free-flow speed, FFS Average passenger-car s	S rbeed	7 <b>0 · 0</b> 2	mi/h
Free-flow speed, FFS	Z rbeed	= =	mi/h pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	Operational Analysis
Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/20/02
Analysis Time Period:	AM

Freeway/Direction: 175 SB

From/To: North of Interchange Jurisdiction:

Analysis Year: 2006
Description: Knox Co., Frist, System, DHV

Flow Inputs an	nd Adjustments	
Volume: V	1809	veh/h
Peak-hour factor: PHF	0.95	_
Peak 15-min volume, v15	476	v
Trucks and buses	19	ž
Recreational vehicles	o ·	%
Terrain type:	Rolling	
Grade .	0.00	%
Segment length	0.00	mi
Trucks and buses P(E, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	7553	pc/h/ln
Speed Inputs a	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:	Measured	
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	4.5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Free	way
LOS and Perfor	mance Measures	
Flow rate, vp	1553	pc/h/ln
•	70.0	mi/h
LL66-110M 2D66Q4 LL7	(8.8	
Free-flow speed, FFS Average passenger-car speed, S	70.0	mi/h

Number of lanes, N 2 17.5 Density, D pc/mi/ln Level of service, LOS

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_\_Operational Analysis\_\_\_ Ken Arnold TRC International Analyst:

Agency or Company: Date Performed: 5/20/02

Analysis Time Period: ΡM Freeway/Direction: I75 SB North of Interchange

From/To: Jurisdiction:

Analysis Year: 2006
Description: Knox Co., Exist. System, DHV

Flow Inputs a	ind Adjustments	41114
Volume, V	1831	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	482	V
Trucks and buses	19	አ የ
Recreational vehicles		%
Terrain type:	Rolling	
Grade .	0.00	%
Segment length	0.00	m i
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate: vp	7539	pc/h/ln
Speed Inputs	and Adjustments_	
Lane width	12.0	ft
Right-shoulder lateral clearance	6·O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	~
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
ane 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	4 - 5	mi/h
ree-flow speed, FFS	70.0	mi/h
	Urban Freev	ay
LOS and Perfo	rmance Measures_	
flow rate, vp	7539	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	s	· <del>-</del> · ·
Pensity, D	17.7	pc/mi/ln
evel of service, LOS	В	F

## HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:	Fax: (	615) 661-	0644		
Dive	rge Analysis_				
Analyst:  Agency/Co.: Date performed: Analysis time period: Analysis time period: Analysis time period: Junction: Junisdiction: Analysis Year: Description: KNOX CO, D-2, S:B. OFF	RY ROAD)	lalı EXIS	TING	ZYZTEM	
Fre	eway Data				
Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway	Diverg 2 70.0 1809		mph vph		
Off	Ramp Data				
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/decel lane Length of second accel/decel lane Adjacent Ram	Right 1 50.0 171 360 up Data (if on	e exists)	mph vph ft ft		
Does adjacent ramp exist? Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp	No		vph ft		
Junction Components	'n Under Base Freeway	Ramp		Adjacent	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade Length Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, fP Flow rate, vp	1809 0.95 476 19 0 Rolling 0.00 % 0.00 mi 2.5 2.0 0.778 1.00 2447	171 0.95 45 2 0 Rolling 0.00 0.00 2.5 2.0 0.971 1.00		Ramp	vph v z z

```
__Estimation of VL2 Diverge Areas__
                 L =
                         0.00
                                (Equation 25-8 or 25-9)
                  ΕQ
                 P =
                         1.000 Using Equation 0
                  FD
                   = v + (v - v ) P = 2447
                  12 R F R FD
                           ___Capacity Checks_
                                                       LOS F?
                          Actual
                                       Maximum
                          2447
                                       4800
                                                       No
     Fi
                          2447
                                       4400
                                                       No
     75
    v = v - v
                          5525
                                       4800
                                                       No
     FO
         F
                          185
                                       5100
                                                       No
               _Level of Service Determination (if not F)_
                      D = 4.252 + 0.0086 v - 0.009 L = R
Density:
                                                            22.1
                                                                    pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
                     ____Speed Estimation___
Intermediate speed variable,
                                            D = 0.250
                                           S = F3
Space mean speed in ramp influence area.
                                                        mph
                                                        mph
Space mean speed in outer lanes,
                                           A \setminus M = Z
                                            0
                                           Z = P3·0
Space mean speed for all vehicles,
                                                        mph
```

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#### HCS2DDO: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

\_\_\_\_\_\_Diverge Analysis\_\_\_

ft

Analyst:

Type of adjacent ramp

Distance to adjacent ramp

ΚA Agency/Co::

TRC INTERNATIONAL

Date performed: Analysis time period:

9/16/02 PM DHV I-75

Freeway/dir or travel: Junction:

(GAOR YROMB) LEL .R.2

Jurisdiction:

500P

Analysis Year:

Description: KNOX CO, D-2, S.B. OFF RAMP TO S.R. 131, EXISTING SYSTEM

	way Data	<del></del>	
Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	70.0	mph	
Volume on freeway	1631	vph	
Off R	amp Data		
Side of freeway	Right		
Number of lanes in ramp	l -		
Free-Flow speed on ramp	50 - 0	mph	
Volume on ramp	187	vph	
Length of first accel/decel lane	360	ft	
Length of second accel/decel lane		ft	
Adjacent Ramp	Data (if one ex	ists)	
Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			

\_\_\_\_Conversion to pc/h Under Base Conditions\_ Adjacent Junction Components Freeway Ramp Ramp Volume, V (vph) 1831 187 vph 0.95 Peak-hour factor, PHF 0.95 49 Peak 15-min volume, v15 482 v 2 Z, 19 Trucks and buses 7. Recreational vehicles 0 0 Rolling Rolling Level Terrain type: 7, 7, 0.00 % Grade 0 - 00 mi 0-00 шi 0.00 Μi Length Trucks and buses PCE, ET 2.5 2.5 Recreational vehicle PCE, ER 5.0 5.0 Heavy vehicle adjustment, fHV . 0.778 0.971 Driver population factor, fP 1.00 1.00 Flow rate, vp 2477 503 pcph

```
_Estimation of Vl2 Diverge Areas_
                 L =
                                 (Equation 25-8 or 25-9)
                         0.00
                 1.000 Using Equation 0
                  FD
                         + (v - v) P = 2477
                                                pc/h
                          F R FD
                            ___Capacity Checks_
                                        Maximum
                                                       LOS F?
                          Actual
                          2477
                                        4800
                                                       Νo
     Fi
                                        4400
                          2477
                                                       No
     15
                                        4800
                                                       Νo
                          2274
     F0
                          503
                                       5100
                                                       No
               _Level of Service Determination (if not F)\_
                      D = 4.252 + 0.0086 v - 0.009 L = 22.3
                                                                    pc/mi/ln
                                         75
Level of service for ramp-freeway junction areas of influence C
                  _____Speed Estimation____
                                            D = 0.251
Intermediate speed variable,
                                            Z
                                            €3 = 2
Space mean speed in ramp influence area,
                                                        mph
                                            R
                                            Z = N \setminus A
Space mean speed in outer lanes,
                                                        mph
                                            0
                                            0.Ed = 2
Space mean speed for all vehicles.
                                                        mph
```

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TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-8644

E-mail:

	Operational An	alysis	
Analyst:	Ken Arnold		
Agency or Company:	TRC Internation	al	
Date Performed:	5/20/02		
Analysis Time Period:	AM		
Freeway/Direction:	175 ZB		
From/To:	Through Interch	ange	
Jurisdiction:			
Analysis Year:	500P		
Description: Knox Co.	Exist System	DHV	
	Flow Inputs an	d Adjustments	
Volume, V		1438	veh/h
Peak-hour factor, PHF		0.95	
Peak 15-min volume, v1!	5	431	V
Trucks and buses		17	%
Recreational vehicles		0	%
Terrain type:		Rolling	
Grade		0.00	%
Segment length		0.00	mi
Trucks and buses PCE, E		2.5	
Recreational vehicle P(		5 · 0	
Heavy vehicle adjustmer		0.797	
Driver population facto	or vp	7 . 00	
Flow rate, vp		1085	pc/h/ln
	Speed Inputs a	nd Adjustments	
Lane width		12.0	ft
Right-shoulder lateral	clearance	6 - D	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
free-flow speed:		Measured	
FFS or BFFS		70.0	mi/h
Lane width adjustment.		0.0	mi/h
Lateral clearance adjus		O <b>- O</b>	mi/h
Interchange density ad:		0.0	mi/h
Number of lanes adjustm	ient, fN	4.5	mi/h
Free-flow speed, FFS		70.0	mi/h
		Urban Freew	ıay
	L0S and Perfor	mance Measures	
		1082	pc/h/ln
Flow rate, vp		70.0	mi/h
•		70.0	mi/h
Free-flow speed, FFS	speed, S	70.0	*** * * * * * * * * * * * * * * * * *
Flow rate; vp Free-flow speed; FFS Average passenger-car s Number of lanes; N	speed, Z	5	711 & F - F 1
Free-flow speed, FFS	speed, S	= =	pc/mi/ln

\_\_\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Ken Arnold Analyst: Agency or Company: TRC International 5/20/02 Date Performed: Analysis Time Period: ΡM 175 SB Freeway/Direction: Through Interchange

From/To: Jurisdiction:

Analysis Year: 500P

Description: Knox Co., Exist. System, DHV

F	low	Inputs	and	Adjustments	
Volume, V				1644	veh/h
Peak-hour factor, PHF				0.95	
Peak 15-min volume, v15				433	V
Trucks and buses				17	ž
Recreational vehicles				Ò	ሂ
Terrain type:				Rolling	
Grade				0.00	%
Segment length				0.00	mi
Trucks and buses PCE, ET				2.5	
Recreational vehicle PCE	ER			5.0	
Heavy vehicle adjustment:				0.797	
Driver population factor:				1.00	
Flow rate: vp				108b	pc/h/ln
2	peed	Input	s and	d Adjustments	

5j	
12.0	ft
b - 0	ft
0.50	interchange/mi
2	
Measured	
70.0	mi/h
<b>0</b> • O	mi/h
0.0	mi/h
0.0	mi/h
4.5	mi/h
70.0	mi/h
Urban Freeway	
	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0 4.5

\_\_\_L0S and Performance Measures\_\_ 1086 pc/h/ln Flow rate, vp mi/h Free-flow speed, FFS 70.0 70.0 mi/h Average passenger-car speed, S Number of lanes, N 15.5 pc/mi/ln Density, D Level of service, LOS В

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615)		Fax: (615) 6	<b>51-064</b> 4
<u> </u>	Operational Analy	ysis	
Analyst:	Ken Arnold		
	TRC International		
Date Performed:	5/20/02		
Agency or Company: Date Performed: Analysis Time Period:	AM 🗸		
Freeway/Direction:	I75 SB ~		
From/To:	South of Interchar	nge –	
Jurisdiction:			
Analysis Year:	50 <b>0</b> P		
Description: Knox Co.	Exist. System. DH	y /	
	Flow Inputs and	Adjustments	
Volume, V		3189/	veh/h
Peak-hour factor, PHF		0.95 /	
Peak 15-min volume, v15	i i	839	V
Trucks and buses		11/	%
Recreational vehicles		٥	ኢ
Terrain type:		Rolling	
Grade		0.00	%
Segment length		0.00	mi
Trucks and buses PCE, E	Τ	2.5	
Recreational vehicle PO		5.0	
Heavy vehicle adjustmer		0.858	
Driver population factor		1.00	
Flow rate, vp	.,	1304	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width		75.0	ft
Right-shoulder lateral	clearance	b · 0	ft
Interchange density		0.50	interchange/mi
Number of lanes N		3	-
Free-flow speed:		Measured	
FFS or BFFS		70 - 0	mi/h
Lane width adjustment:	f L W	0 - 0	mi/h
Lateral clearance adjus		0.0	mi/h
Interchange density adj		0.0	mi/h
Number of lanes adjust		3 - O	mi/h
Free-flow speed, FFS		70.0	mi/h
· • • • •		Urban Freeway	•
	LOS and Performa	nce Measures	
		1304	pc/h/ln
Flow rate, vo		70.0	mi/h
Flow rate: vp Free-flow speed: FFS		1010	
Free-flow speed, FFS	speed, S	70.0	mi/h
Free-flow speed: FFS Average passenger-car :	speed, S		mi/h
Free-flow speed, FFS	speed, Z	70.0	mi/h pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

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Fax: (615) 661-0644

	Operational Analysis
Analyst:	Ken Arnold
Agency or Company:	TRC International

Agency or Company:

Date Performed: 5/20/02 Analysis Time Period: PM Freeway/Direction:

175 SB -

From/To: Jurisdiction: South of Interchange ~

Analysis Year:

-4005

Description: Knox Co., Exist. System, DHV -

_Flow	Inputs	and	Adjustments	S.
-------	--------	-----	-------------	----

Volume, V	2307 ~	veh/h
Peak-hour factor, PHF	0.95/	
Peak 15-min volume, vl5	607	V
Trucks and buses	11	7.
Recreational vehicles	D	7.
Terrain type:	Rolling	
Grade	0.00	7.
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
flow rate, vp	943	pc/h/ln

## \_\_\_\_\_Speed Inputs and Adjustments\_\_\_\_\_\_

Lane width	75.0	ft
Right-shoulder lateral clearance	<b>L</b> .O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
·	Urban Freeway	

#### \_\_\_LOS and Performance Measures\_\_

Flow rate, vp	943	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	13.5	pc/mi/ln
Level of service, LOS	В	•

HCS2000: Multilane Highways Release 4.1b

	OPERATION	IAL ANALYS	I S2		
Analyst: Ken Arnold					
Agency/Co: TRC Interna	tional				
Date: 5/21/02					
Analsis Period: AM 🗸					
Highway: S.R. 131 (E	mory Road	1)			
from/To: Central Ave	./I-75				
Jurisdiction:					
Analysis Year: 2006	ـ ا	,			
Project ID: Knox Co., E	x IST, ∵ら	ystem		•	
	FREE-	FLOW SPEED	)		
Directio	n	ı		а	
ane width		75.0	ft	75.0	ft
ateral clearance:					
Right edge		5.0	ft	2.0	ft
Left edge		P • O	ft	<b>b ⋅ 0</b>	ft
Total lateral clearanc	2	A • O	ft	8 - 0	ft
Access points per mile		5		22	
1edian type		Divided		Divided	
ree-flow speed:		8ase		Base	
FFS or BFFS		<b>6</b> 0-0	mph	PO · O	mph
ane width adjustment, FLW		0 - 0	mph	0 - 0	mph
ateral clearance adjustmen	t, FLC	0.9	mph	0.9	mph
1edian type adjustment. FM		0.0	мрh	0.0	mph
Access points adjustment, f	4	7 · 3	mph	5 - 5	mph
free-flow speed		57.8	mph	53.L	mph
		VOLUME	<del></del>		
Directio	1	1.		г	
Volume: V	,	939 1	vph	747/	vph
Peak-hour factor, PHF		0.95	· p	0.95	· p
Peak 15-minute volume: v15		247		197	
rucks and buses		ā'	Ż.	ē/	7.
Recreational vehicles		ō	Z	ō	7.
errain type		Rolling/	-	Rolling	•
Grade		0 00	%	0.00	7.
Segment length		0.00	mi	0-00	mi
Number of lanes		2 /	<del></del>	5 -	=
river population adjustmen	t ifP	1.00		1.00	
rucks and buses PCE, ET		2.5		2 - 5	
Recreational vehicles PCE,	ER .	5.0		2.0	
Reavy vehicle adjustment, f		0.971		0-971	
low rate, vp		509	pcphpl	404	pcphpl
		RESULTS	**************************************		
Directio	า	. J.		5	
low rate, vp		509	pcphpl	404	pcphpl
ree-flow speed, FFS		57.8	mph	53 b	mph
lvg. passenger-car travel s	Z beed	57.8	mph	53.6	mph
evel of service, LOS		A	p	A	<b>P</b>
east of Secarce, ray		*			

HCS2000: Multilane Highways Release 4.1b

OPER	ZYJANA JANOITA	I S		
Analyst: Ken Arnold Agency/Co: TRC Internation Date: 5/21/02 Analsis Period: PM Highway: S.R. 131 (Emory From/To: Central Ave./I- Jurisdiction: Analysis Year: 2006 Project ID: Knox Co., Exist	Road) 75			
F	FREE-FLOW SPEET	D	11 -	
Nigostica	1		3	-
Direction Lane width Lateral clearance:	75-0 7	ft	15·0 5	ft
Right edge	5.0	ft	5.0	ft
Left edge	F · O	ft	F • O	ft
Total lateral clearance	8.0	ft	8-0	ft
Access points per mile Median type	5		55	
Free-flow speed:	Divided Base		Divided	
FFS or BFFS	PO · O	mph	Base 60.0	mah
Lane width adjustment, FLW	0.0	mph mph	0.0	mph mph
Lateral clearance adjustment, FL		mph	0.9	mph
Median type adjustment. FM	0.0	mph	0.0	mph
Access points adjustment, FA	1.3	mph	5 - 5	mph
Free-flow speed	57.8	mph	23·P	mph
	VOLUME			
•	_			
Volume, V	), 1002 /	- 1	5	
Peak-hour factor, PHF	1097/ 0.95/	vph	1037	vph
Peak 15-minute volume, v15	289		273	
Trucks and buses	5 /	z	5 ~	<sup>2</sup>
Recreational vehicles	Ō	ž	0	ž
Terrain type	Rolling	•	Rolling	•
Grade	0.00	አ የ	0.00	7
Segment <sup>*</sup> length	0.00	шi	0.00	mi
Number of lanes	2 ~		2 ~	
Driver population adjustment, fP			1 - 00	
Trucks and buses PCE, ET	5.5		5.5	
Recreational vehicles PCE, ER Heavy vehicle adjustment, fHV	2.0		2.0	
Flow rate, vp	0.97 <u>1</u> 594	pcphpl	0.971 562	pcphpl
-	RESULTS			
Direction	1		2	
Flow rate, vp	594	pcphpl	562	ncaha!
Free-flow speed, FFS	57.8	wbp hcbubi	53.6	pcphpl mph
Avg. passenger-car travel speed:	S 57.8	mph	53.b	mph
Level of service, LOS	A	<b>P</b>	A .	er per t
Density, D	10.3	pc/mi/ln	* *	pc/mi/ln
Overall results are not comput	ed when free-f	low speed	is less t	han 45 mph.

Inter.: I-75/S.R. 131

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA

Southbound

L

195

3502

1615

Intersection Delay = 26.3

0.50

0.10

0.06

0.44

(sec/veh)

43.3

14.6

В

30.A

Intersection LOS = C

Agency: TRC INTERNATIONAL Area Type: All other areas Date: 8/29/02 Period: AM Jurisd: Year : 2006 / Project ID: KNOX CO, EXISTING SYSTEM < E/W St: S.R. 131 (EMORY ROAD) ~ N/S St: I-75 S.B. RAMPS \_\_SIGNALIZED INTERSECTION SUMMARY Eastbound l Westbound 1 Northbound Southbound 1 L T R I L IL T R L Т R Т 5 / 0 5 2 1, 1 No- Lanes ı 0 0 0 TR-LGConfig LT 1 L R 397 - 542 /11009 668 / - 591 79~ Volume 175 0 75 0 Lane Width 15.0 112.0 15.0 1 RTOR Vol 100 a Duration 0.25 Area Type: All other areas \_Signal Operations\_ Phase Combination 1 2 8 EB Left NΒ Left Thru Thru A Right A Right Peds Peds ₩B Left 28 Left Thru A Thru Right Right Peds Peds NB Right EΒ Right SB Right I WB Right 40.0 30.0 5 - 0 Green 3.0 3.0 3.0 Yellow All Red 5.0 5.0 5.0 Cycle Length: 90-0 Secs \_Intersection Performance Summary\_ Appr/ Lane Adj Sat Ratios Lane Group Approach Flow Rate Lane Group g/C Grp Capacity (5) v/c Delay LOS Delay LOS Eastbound TR 1108 3325 0.80 0.33 31.4 C 31.4 C Westbound 508 1805 0.73 0.44 23.9 L LT 1572 3538 0.75 0.44 9.55 C 53.3 C Northbound

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA

Agency: TRC INTERNATIONAL

Date: 8/29/02

Period: PM

Project ID: KNOX CO, EXISTING SYSTEM

E/W St: S.R. L3L (EMORY ROAD)

Inter.: I-75/S.R. L3L

Area Type: All other areas

Jurisd:
Year : 200b

N/S St: I-75 S.B. RAMPS

<u> </u>		IZI	GNALIZE	INTERSE	CTION	IAMMUZ	RY			
		stbound		ound	Nor	thbou	nd l	Zou.	thboi	und I
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LGConfig	j 1	TR <	I Long	LTZ	1		- 1	L -		R∽l
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Phase Co	mbination	1 1 2	3 3 3	4 1		5	ь	7		}
EB Left				I NB	Left					
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Peds WB Left		4		!	Peds					
ws cert Thru	•	A A		BZ I	Left Thru	A				
Righ		^		i	Right	A				
Peds				i	Peds	^				
NB Righ				I EB	Right					
SB Righ		A		I WB	Right					
Green		38.0 35.0			_	5.0	•			
Yellow										
		3.0 3.0				3.D				
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All Red	Lane	5.0 5.0	ction Pe Rati	erförmanc .os	e Summa Lane (	2.0 Cycl			10.0	secs
All Red Appr/ Lane	Group	Interse Adj Sat Flow Rate	Rati	.05	Lane (	Z.O Cycl ary Group	App	roach		secs
All Red Appr/ Lane		Interse Adj Sat Flow Rate	Rati			Z.O Cycl ary Group	App			secs
All Red Appr/ Lane	Group Capacity	Interse Adj Sat Flow Rate	Rati	.05	Lane (	Z.O Cycl ary Group	App	roach		secs
All Red Appr/ Lane Grp	Group Capacity	Interse Adj Sat Flow Rate	Rati	.05	Lane (	CyclaryGroup	App	roach y LOS		secs
Appr/ Lane Grp Eastboun	Group Capacity d	Interse Adj Sat Flow Rate (s)	Rati v/c	g/C	Lane (	CyclaryGroup	App Dela	roach y LOS		secs
All Red  Appr/ Lane Grp  Eastboun	Group Capacity d	Interse Adj Sat Flow Rate (s)	Rati v/c	g/C	Lane (	CyclaryGroup	App Dela	roach y LOS		secs
Appr/Lane Grp Eastboun TR	Group Capacity d 1262	Z.O Z.O  Interse Adj Sat Rate (s)	Rati	g/C 0.36	Delay	2.0 Cyclary Group LOS	App Dela	roach y LOS C		secs
All Red  Appr/ Lane Grp  Eastboun TR  Westboun L	Group Capacity d 1262 id 752 1514	Interse Adj Sat Adj Sat (s)  348  348	Rati v/c 0.85	g/C 0.36	Delay  32.7	Cyc; ary Group LOS C	App Dela	roach y LOS C		secs
All Red  Appr/ Lane Grp  Eastboun  TR  Westboun L	Group Capacity d 1262 id 752 1514	Interse Adj Sat Adj Sat (s)  348  348	Rati v/c 0.85	g/C 0.36	Delay  32.7	Cyc; ary Group LOS C	App Dela	roach y LOS C		secs
All Red  Appr/ Lane Grp  Eastboun  TR  Westboun L	Group Capacity d 1262 d 752 1514	Interse Adj Sat Flow Rate (s)  3548	Rati v/c 0.85	g/C 0.36	Delay  32.7	Cyc; ary Group LOS C	App Dela	roach y LOS C		secs
All Red  Appr/ Lane Grp  Eastboun  TR  Westboun L LT  Northbou	Group Capacity d 1262 d 752 1514	Interse Adj Sat Adj Sat (s)  348  348	Rati v/c 0.85	g/C 0.36	Delay  32.7	Cyc; ary Group LOS C	App Dela	roach y LOS C		secs
All Red  Appr/ Lane Grp  Eastboun  TR  Westboun LT  Northbou  Southbou	Group Capacity d 1262 d 752 1514 and	Interse Adj Sat Flow Rate (s)  3548  1805 3585	0.85 0.44 0.78	9/C 0.3b 0.42 0.42	32.7 18.8 25.0	Cyclary Group LOS	App Dela	roach y LOS C		secs
All Red  Appr/ Lane Grp  Eastboun TR  Westboun L LT  Northbou	Group Capacity d 1262 d 752 1514 and	Interse Adj Sat Flow Rate (s)  3548	0.85 0.44 0.78	g/C 0.36 0.42 0.42	32.7 18.8 25.0	Cyc; ary Group LOS  C  B  C	App Dela	roach y LOS C		secs

HCC2000: Signalized Intersections Release 4.1b

Analyst: KA
Agency: TRC INTERNATIONAL
Date: 8/29/02
Period: am /
Project ID: KNOX CO, EXISTING SYSTEM /
E/W St: S.R. 131 (EMORY ROAD) / Inter:: I-75/S.R. 131 Area Type: All other areas Jurisd:

Year : 2006

N/S St: I-75 n-B. RAMPS

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Thru Right	-	A A			Thru						
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B Left				,   ZB	Left						
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ellow 11 Red ppr/ L	.ane	3.0 3.0 2.0 2.0 Intersec	tion Po Rat:	erformanc ios	e Summ Lane	3.0 2.0 Cyc ary	le Len	gth: <sup>s</sup>	30·0 		260
ellow 11 Red ppr/ L ane 6	roup	3.0 3.0 2.0 2.0 Intersection Adj Sat Flow Rate	Rat:	ios ———	Lane	3.0 2.0 Cyc ary Group	le Len	roach			zec
ellow 11 Red ppr/ L ane G	roup apacity	3.0 3.0 2.0 2.0 Intersec				3.0 2.0 Cyc ary Group	le Len				sec
ellow 11 Red ppr/ L ane G rp C	roup apacity	3.0 3.0 2.0 2.0 Intersection Adj Sat Flow Rate	Rat:	ios ———	Lane	3.0 2.0 Cyc ary Group	le Len	roach			sec
ellow ll Red  ppr/ L ane G rp G astbound	roup Capacity	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s)	Rat:	g/C	 Delay	3.0 Cyc ary Group	le Len	roach			sec
ppr/ Lane 6	roup apacity 251 2527	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s)		g/C 0.14	Delay 34.6	3.0 Cyc ary Group LOS	Appropriate Approp	roach y LOS			sec
ellow 11 Red ppr/ L	roup apacity 251 2527	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s)		g/C 0.14	Delay 34.6	3.0 Cyc ary Group LOS	Appropriate Approp	roach y LOS A			260
ppr/ Lane 6 rp Castbounce	roup apacity 261 2527 (	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s)	Rat: v/c 0.24 0.18	0.14 0.70	Delay 34.6 4.7	3.0 Cyc ary Group LOS	Delay	roach y LOS A			zec
ellow 11 Red  ppr/ L ane G rp G astbound estbound	roup lapacity 261 2527 1 1791	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s) 1805 3610	Rat: v/c 0.24 0.18	0.14 0.70	34.6 4.7	Group LOS  C A	Delay	roach y LOS A			sec
ellow 11 Red  ppr/ L ane G rp G astbound estbound	roup apacity 261 2527 (	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s)	Rat: v/c 0.24 0.18	0.14 0.70	Delay 34.6 4.7	3.0 Cyc ary Group LOS	Appropriate A-3	roach y LOS A			sec
ellow ll Red  ppr/ L ane 6 irp C astbound	roup lapacity 261 2527 1 1791	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s)	Rat: v/c 0.24 0.18 0.97	0.14 0.70 0.50	Delay  34.6 4.7  36.5	Cycary	Delay	roach y LOS A			Sec
ellow 11 Red  ppr/ L ane G rp C astbound estbound R orthboun	1 2527 1 1791 1 341	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s) 1805 3610	Rat: v/c 0.24 0.18	0.14 0.70	34.6 4.7	Group LOS  C A	Appropriate A-3	roach y LOS A			sec
ellow ll Red  ppr/ L ane G rp G astbound estbound R	1 2527 1 1791 1 341	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s)	Rat: v/c 0.24 0.18 0.97	0.14 0.70 0.50	Delay  34.6 4.7  36.5	Cycary	Appropriate A-3	roach y LOS A			sec
ellow Il Red  opr/ L ane G rp C astbound estbound	1 2527 1 1791 1 341	3.0 3.0 2.0 2.0 Intersect Adj Sat Flow Rate (s)	Rat: v/c 0.24 0.18 0.97	0.14 0.70 0.50	Delay  34.6 4.7  36.5	Cycary	Appropriate A-3	roach y LOS A			260

HCS2000: Signalized Intersections Release 4.1b

Inter:: I-75/S.R. 131 Area Type: All other areas Analyst: KA Agency: TRC INTERNATIONAL Date: 8/29/02
Period: PM ~

Jurisd: Year : 2006′

Project ID: KNOX Co, EXISTING SYSTEM '

( ( dAoR YROMB) /

N/S St: 1-75 N.B. RAMPS ~

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up F	Adj Sat Now Rate	Rati	os	Lane (	ary <u> </u> Group	Appr	oach	70·0 		ec
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up f acity	Adj Sat Flow Rate (s)	Rati v/c	g/C	Delay	ary <u> </u> Group	Appr	oach		S	e c
up facity	Adj Sat Flow Rate (s)	Rati     V/c       C	g/C 0.14	Delay	ary Group LOS	Appr	L0S		5	
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up facity	Adj Sat Flow Rate (s)	Rati     V/c       C	g/C 0.14	Delay	ary Group LOS	Appr	L0S		5	
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up f acity 	Adj Sat Tow Rate (s) 1805 3610	V/c 0.49 0.43	g/C 0.14 0.60	Delay 36.9 9.9	ary Group LOS D A	Appr Delay	LOS B		S	
up f acity 	Adj Sat Tow Rate (s) 1805 3610	V/c 0.49 0.43	g/C 0.14 0.60	Delay 36.9 9.9	ary Group LOS D A	Appr Delay	each LOS B		5	
up f acity L L L L L L L L	Adj Sat Tow Rate (s) 1805 3610	0.49 0.43	9/C 0.14 0.60	Delay  36.9 9.9	LOS D A	Appr Delay	LOS B		5	
	1 L 1123 6 112.0 12 0.25 nation 1	1123	1 L T   1   10   12   12   12   12   12   12	L T	L T	L T	L T	L T	L T	L T

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA
Agency: TRC INTERNATIONAL
Date: 8/29/02
Period: AM Inter:: PRIMETIME ROAD/S.R. 131 Area Type: All other areas Jurisd: Year : 2006

Project ID: KNOX CO, EXISTING SYSTEM < E/W St: S.R. 131 (EMORY ROAD) >

N/S St: PRIMETIME ROAD ~

	1	Eas	tboun	<u>d</u> 1	West	bound		I Nor	thbour	nd I	Sou	thbo	und	ī
	!	L	T	R I	L	T	R	I L	T	R I	L	T	R	ı
No. La: LGConf:		l L ~	7 2 1 TR +	   	1. " L , "	2	0	   1.	1 r		0-	l~	l, r	   
Volume		547				27018		139	5 6		54./	9 -	384 /	i
Lane W:	idth I	15.0	15.0	1	15.0 1	2.0		112.0		1		75.0	12.0	1
RTOR V	ol I			15		3		1	]	. 1			759	1
Duratio	on	0.25		Area T	ype: A	ll ot al Op								
Phase (		ation		5	3	4 1			5	ь	7		В	_
EB Lei	_		Ą			!	NΒ	Left	A					
The			A A	A		!		Thru	A					
Ped	ght		А	A				Right Peds	A					
WB Let	_			A		i	ZB	Left		Α				
The				Ä		i	-	Thru		Â				
Ric	ght			A		j		Right		A				
Ped	ds					- 1		Peds						
NB Rig	ght					1	EΒ	Right						
	ght		A			I	₩B	Right						
Green			57.0	42.0					11.0	77.0				
Yellow	_		3.0	3.0					3.0	3.0				
All Red	3		5.0	5.0					2.0	2.0 e Leng	ath:	1.05 (	] sed	
			Iń	tersec	tion P	erfor	manc	e Zumm		e cen	9 (11)	10.COT	1 26¢	_3
Appr/	Lane			Sat	Rat	ios		Lane	Group	App	roach	1		
Lane	Grou			Rate -\		- 15		N = 1 = · ·		N - 1		<del></del>		
Grp ———	Capa	city	,	s)	v/c	g/C		neray	L02	vela	y Los	•		
Eastbo				_			_	• •	_			•		
L	535 3PJ		1.80 35 <b>8</b>		D 27	0.5		3P·O	D	11 -				
TP		<b>"</b>	370		11.73	0.6	J	8-5	A	11.5	В			
TR	בשב			1										
			300											
Westboo L			660		0.01	0.4	0	19.0	В					
Westboo L	und					0 · 4 0 · 4		19.0 41.1	B D	41.0	D			
TR Westbook L TR Northbo	und 254 144		660		0.01					41.0	D			
Westboo L TR Northbo L	und 264 144 ound 189		180 180	8 5	0.01 0.93	0.4	0	41.1	D D					
Westboo L TR Northbo	744 744 264		3F0 PP0	8 5	0.01 0.93	0.4	0	41.1	D	43.5	D D			
Westboo L TR Northbo L	144 2P4 194 194 194		180 180	8 5	0.01 0.93	0.4	0	41.1	D D					
Westboo L TR Northbo L TR	144 2P4 194 194 194		180 180	8 5 3	0.01 0.93	0.4	0	41.1	D D					
Westboo L TR Northbo L TR Southbo	264 264 244 287 284 2000 291 569	3	180 185 185	8 5 3 1. 5	0.01 0.93 0.22 0.03	0.1	0 0	41.1 43.6 42.3	D D D	43.5	D			

HCS2000: Signalized Intersections Release 4.1b

Inter.: PRIMETIME ROAD/S.R. 131
Area Type: All other areas Analyst: KA Agency: TRC INTERNATIONAL
Date: 8/29/02
Period: PM /
Project ID: KNOX CO, EXISTING SYSTEM /
E/W St: S.R. 131 (EMORY ROAD) -

Jurisd: Year : 2006/

N/S St: PRIMETIME ROAD /

-		GNALIZED INTERS	ECTION SUMMARY	
	I Eastbound		Northbound	I Southbound I
	IL T R	IL TR	IL TR	IL TRI
	1	J	<u> </u>	_
No. Lanes	1 1, 5, 0		1 1 1 0	1 0 1 1 1 1 1
LGConfig			IL' TR'	I LTY RYI
Volume	1244/ 1443/165/	13/ 986/76/	1125~ 33 / 12 /	190~ 23~ 150~1
Lane Width	175.0 75.0	175.0 75.0	175.0 75.0	12.0 12.0 1
RTOR Vol	1 55	1 25	1 4	l 50 l

Dur	ation	0.25	Area	Type:	All ot	her	areas					
				S i	gnal Op	erat	ions					
Pha	se Comb:	ination l	2	3	4 1			5	P.	7	8	
ĖΒ	Left	A			1	NB	Left	A				
	Thru	A	A		1		Thru	A				
	Right	A	A		1		Right	A				
	Peds				1		Peds					
WВ	Left		A		1	28	Left		Α			
	Thru		A		1		Thru		A			
	Right		A		1		Right		Α			
	Peds				1		Peds					
ΝB	Right				1	EΒ	Right					
SB	Right	. <b>A</b>			1	₩B	Right					
Gre		22.	0 37.0				_	13.0	13.0			
Yel	low	3.0	3.0					3.0	3.0			
A 1 1	Red	5.0	2.0					5.0	5.0			
									e Lengt	h:	105-0	secs

		Intersec	tion Pe	rformano	e Summa	rv	,		
Appr/ Lane	Lane Group		Rati	.os					
	Capacity			g/C	Delay	LOZ	Delay	LOZ	
Eastbou	ınd								
L	378	1805	0.68	0.51	43.2	D			
TR	2177	3572	0.75	0.61	<b>TP-3</b>	В	19.9	В	
Westbou	nd								
L	86	244	0.03	0.35	22.5	C			
TR	<b>75</b> P3	3583	0.86	0.35	38.5	D	38.1	D	
Northbo	und								
L	553	1805	0.59	0 · 75	47-7	D			
TR	229	1847	0.19	0 · 75	41.7	D	46.2	D	
Southbo	und	•							
ŁT	556	1952	0.53	0.15	45.4	D	34.3	c	
R	L1.5	1615		0.38					
	Intersec	tion Delay	= 59.7	(sec/ve	h) In	terse	ction (	_0Z =	C

# MCS2000: Multilane Highways Release 4.1b

\_\_OPERATIONAL ANALYSIS\_\_\_\_\_

Analyst: Agency/Co: Date: Analsis Period: Highway: From/To: Jurisdiction: Analysis Year: Project ID:	Ken Arnold TRC International 5/21/02 AM SR 131 (Emory Road) Primetime Road/Bish 2006 - Knox Co Exist.	10p -			
	FREE	-FLOW SPEE	D		
Lane width Lateral clearand Right edge Left edge		₽·0 5·0 75·0 7	ft ft ft	5.0 12.0 5	ft ft ft
Access points pe Median type Free-flow speed: FFS or BFFS	:	A.O lo Divided Base LO.O	ft	8.0 10 Divided Base 60.0	ft mph
Lane width adjust Lateral clearand Median type adjusted Access points ad Free-flow speed	te adjustment, FLC ustment, FM	0.0 0.9 0.0 2.5 56.6	mph mph mph mph mph	0.0 0.9 0.0 2.5 56.6	mph mph mph mph mph
		_VOLUME			
Volume, V Peak-hour factor		1 791 0.95 /	vph	2 1281 0.95′	vph
Peak 15-minute v Trucks and buses Recreational veh Terrain type	;	208 3 0 Rolling	% %	337 3 O Rolling	ž Ž
Grade Segment leng Number of lanes Driver population	nth n adjustment, fP	1.00 0.00 0.00	Ζ mi	1.00 0.00 0.00	% mi
Trucks and buses Recreational veh Heavy vehicle ad Flow rate, vp	icles PCE. ER	2.5 2.0 0.957 435	pcphpl	2.5 2.0 0.957 704	pcphpl
		_RESULTS			
	Direction	, 1		5	
Flow rate, vp Free-flow speed, Avg. passenger-c Level of service Density, D	ar travel speed, S	435 56.6 56.6 A 7.7	pcphpl mph mph pc/mi/ln	704 56.6 56.6 B 12.4	pcphpl mph mph pc/mi/ln
Overall result	s are not computed (	⊌hen free-f	,		•

# HCS2000: Multilane Highways Release 4.1b

OPERATIO	ZYJANA JANG	12		
Analyst: Ken Arnold				
Agency/Co: TRC International				
Date: 5/21/02				
Analsis Period: PM				
Highway: SR 131 (Emory Road)	1			
From/To: Primetime Road/Bish				
Jurisdiction:				
Analysis Year: 2006				
Project ID: Knox Con Exist.	System			
FREE	-FLOW SPEE	D		
Direction	1.		2	•
Lane width	15.0	ft	75.0	ft
Lateral clearance:			26.0	
Right edge	2.0	ft	2.0	ft
Left edge	b · 0	ft	6.0	ft
Total lateral clearance	8-0	ft	8.0	ft
Access points per mile	10	1 4	10	1.6
Median type	Divided		Divided	
Free-flow speed:	8ase		Base	
FFS or BFFS	PO · O	mph	PO · O	
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0 P.0	mph
Median type adjustment, FM	0.0	•	0.0	mph
Access points adjustment, FA	2.5	mph	5.5	mph
Free-flow speed	56.6	mph mph		mph
Special Specia	20.0	mph	5 <b>6</b> • 6	mph
	VOLUME	<del></del>	72	
Direction	1		2	
Volume, V	1.545	vph	1591	vph
Peak-hour factor, PHF	0.95/	νρ	0.95/	* p.,,
Peak 15-minute volume, v15	407		337	
Trucks and buses	3	%	3	7.
Recreational vehicles	ō	Z	ā	ž
Terrain type	Rolling	•	Rolling	·•
Grade	0.00	%	0.00	z
Segment length	0.00	mi	0.00	mi
Number of lanes	5	10 2	2	III I
Driver population adjustment, fP	7.00		1.00	
Trucks and buses PCE, ET	2.5		2.5	
Recreational vehicles PCE, ER	5.0		5.0	
Heavy vehicle adjustment, fHV	0.957			
flow rate: vp	0.137 849	nenhal	0.957	
T TOW T BOOK VP	047	pcphpl	704	pcphpl
	_RESULTS	<u> </u>		
Direction	. 1		2	
flow rate, vp	849	pcphpl	704	pcphpl
Free-flow speed, FFS	5b - b	mph	56 - b	mph
Avg. passenger-car travel speed, \$	56.6	mph	5b · b	mph
Level of service, LOS	8	p	B	P11
Density, D	15.0	pc/mi/ln		pc/mi/ln
Overall results are not computed (	when free-f	low speed	is less t	han 45 mph.

# Analysis Summary 2026 Traffic and Existing Geometric

Location	Type Analysis	Design Hour	LOS
1-75 Northbound South	Basic Freeway	AM	В
of Interchange	Segments	PM	С
D-1, I-75 Northbound	Ramp and Ramp	AM	С
Off-ramp to SR131	Junctions, Ln. Drop	PM	С
I-75 Northbound	Basic Freeway	AM	С
Through Interchange	Segments	PM	С
M-1, I-75 Northbound	Ramp and Ramp	AM	С
On-ramp from SR 131	Junctions	PM	С
I-75 Northbound North	Basic Freeway	AM	С
of Interchange	Segments	PM	С
1-75 Southbound North	Basic Freeway	AM	С
of Interchange	Segments	PM	С
D-2, I-75 Southbound	Ramp and Ramp	AM	С
Off-ramp to SR 131	Junctions	PM	D
I-75 Southbound	Basic Freeway	AM	С
Through Interchange	Segments	РМ	С
M-2, I-75 Southbound	Ramp and Ramp	AM	С
On-ramp from SR 131	Junctions, Add Ln	PM	С
I-75 Southbound South	Basic Freeway	AM	С
of Interchange	Segments	PM	В
SR 131 West of I-75	Multilane Highways	AM	В
		PM	В
SR 131/I-75 SB Ramps	Signalized	AM	D (49.7)
	Intersections	PM	D (44.7)
SR 131/I-75 NB Ramps	Signalized	AM	D (43.1)
	Intersections	PM	D (42.5)
SR 131/Primetime Rd.	Signalized	AM	D (37.7)
	Intersections	PM	D (41.7)
SR 131 East of	Multilane Highways	AM	В
Primetime Rd.		PM	С

Note: The LOS shown for the intersections is the total average intersection delay. The delay in parentheses is in seconds per vehicle.

\_Operational Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold TRC International Agency or Company: Date Performed: 5/20/02 AM ~ Analysis Time Period: 175 NB ~ Freeway/Direction:

From/To:

South of Interchange ~

Jurisdiction: Analysis Year:

S05P~ Description: Knox Co., Exist. System, DHV ~

\_\_\_\_Flow Inputs and Adjustments\_\_

Volume, V	2876	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	757	V
Trucks and buses	11	χ
Recreational vehicles	D D	Z
Terrain type:	Rolling -	•
Grade	0.00	Z
Segment length	0.00	m i
Trucks and buses P(E, ET	2.5	4
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
Flow rate, vp	1176	pc/h/lm
Speed Inputs and	Adjustments	
Lane width	Adjustments	ft
		ft ft
Lane width Right-shoulder lateral clearance Interchange∉density	12.0 6.0 0.50	
Lane width Right-shoulder lateral clearance Interchange∀density Number of lanes, N	75·0	ft
Lane width Right-shoulder lateral clearance Interchange∉density	12.0 6.0 0.50	ft
Lane width Right-shoulder lateral clearance Interchange∀density Number of lanes, N	12.0 6.0 0.50 3	ft
Lane width Right-shoulder lateral clearance Interchange@density Number of lanes, N Free-flow speed:	12.0 6.0 0.50 3 Measured	ft interchange/mi
Lane width Right-shoulder lateral clearance Interchange@density Number of lanes. N Free-flow speed: FFS or BFFS Lane width adjustment. fLW Lateral clearance adjustment. fLC	12.0 6.0 0.50 3 Measured 70.0	ft interchange/mi mi/h
Lane width Right-shoulder lateral clearance Interchange@density Number of lanes. N Free-flow speed: FFS or BFFS Lane width adjustment. fLW Lateral clearance adjustment. fLC Interchange density adjustment. fID	12.0 6.0 0.50 3 Measured 70.0	ft interchange/mi mi/h mi/h
Lane width Right-shoulder lateral clearance Interchange@density Number of lanes. N Free-flow speed: FFS or BFFS Lane width adjustment. fLW Lateral clearance adjustment. fLC	12.0 6.0 0.50 3 Measured 70.0 0.0	ft interchange/mi mi/h mi/h mi/h
Lane width Right-shoulder lateral clearance Interchange@density Number of lanes. N Free-flow speed: FFS or BFFS Lane width adjustment. fLW Lateral clearance adjustment. fLC Interchange density adjustment. fID	12.0 6.0 0.50 3 Measured 70.0 0.0	ft interchange/mi mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral clearance Interchange@density Number of lanes. N Free-flow speed:     FFS or BFFS Lane width adjustment. fLW Lateral clearance adjustment. fLC Interchange density adjustment. fN	12.0 6.0 0.50 3 Measured 70.0 0.0 0.0	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h

\_\_\_\_\_LOS and Performance Measures\_

Flow rate₁ vp 1176 pc/h/ln Free-flow speed, FFS 70.0 mi/h Average passenger-car speed, S 70.0 mi/h Number of lanes, N 7 Density D 16.8 pc/mi/ln Level of service, LOS В

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (6**15**) 661-0644

-	Operational Analysis
Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/20/02
Analysis Time Period:	PM ~
Freeway/Direction:	I75 NB ~
From/To: Jurisdiction:	South of Interchange (
Analysis Year:	505P
Description: Knox Co.	· Exist· System· DHV ~

Flow Inputs	and Adjustments	· · · · · · · · · · · · · · · · · · ·
Volume, V	3812	veh/h
Peak-hour factor: PHF	0.95/	
Peak 15-min volume, v15	1003	v
Trucks and buses	11/	%
Recreational vehicles	Ω	χ.
Terrain type:	Rolling-	
Grade .	0.00	%
Segment length	0.00	шi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
Flow rate, vp	1558	pc/h/ln
Speed Input	s and Adjustments	
Lane width	12.0	ft

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:	Measured	
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	3.0	mi/h
free-flow speed, FFS	70-0	mi/h
	Urban Freeway	

L0S	and P	erformance Measures		
Flow rate, vp Free-flow speed, FFS Average passenger-car speed, Number of lanes, N Density, D Level of service, LOS	Z	1558 70.0 69.6 3 22.4 C	pc/h/ln mi/h mi/h pc/mi/ln	

TRC INTERNATIONAL 217 WARD CIRCLE 8RENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_\_\_\_\_\_Operational Analysis\_\_\_\_\_Analyst: Ken Arnold

Agency or Company: Date Performed: TRC International 5/20/02

Date Performed: Analysis Time Period: Freeway/Direction:

AM I 75 NB

From/To:

Through Interchange

Jurisdiction: Analysis Year:

5056

Description: Knox Co., Exist. System, DHV

Flow Inputs a	nd Adjustments	
Volume, V	2146	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	565	v
Trucks and buses	16 /	%
Recreational vehicles	Ð	%
Terrain type:	Rolling	
Grade	0.00	<u>ሂ</u>
Segment length	0.00	mi
Trucks and buses P(E, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.806	•
Driver population factor: vp	1.00	
Flow rate, vp	1401	pc/h/ln
Speed Inputs	and Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	<b>6</b> • 0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	-
Free-flow speed:	Measured	
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	4.5	mi/h
Free-flow speed, FFS	70-0	mi/h
	Urban Freewa	ay

\_\_\_\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/20/02
Analysis Time Period:	PM

Analysis Time Period: PM
Freeway/Direction: I 75 NB
Free / To:

Freeway/Direction: From/To:	I 75 NB Through Interch	ange	
Jurisdiction:			
Analysis Year:	50SP		
Description: Knox Co.	. Exist. System.	DHV	
	Flow Inputs an	d Adjustments	
Volume, V		2076	veh/h
Peak-hour factor, PHF		0.95	
Peak 15-min volume, vl	\$	54 <b>6</b>	<b>v</b> .
Trucks and buses		ЪЬ	%
Recreational vehicles		0	%
Terrain type:		Rolling	
Grade .		0.00	×_
Segment length Trucks and buses P(E <sub>1</sub>	- <del>-</del>	0.00	mi
Recreational vehicle P		2·5	
Heavy vehicle adjustmen		0.80%	
Driver population factor		1.00	
Flow rate, vp	5 VP	1355	pc/h/ln
		2333	periir III
	Speed Inputs a	nd Adjustments	
Lane width		75.0	ft
Right-shoulder lateral	clearance	F • O	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		2	
Free-flow speed: FFS or BFFS		Measured	
Lane width adjustment.	£ 1 1.)	70.0	mi/h
Lateral clearance adjust		0.0 0.0	mi/h mi/h
Interchange density ad		0.0	mi/n mi/h
Number of lanes adjusts		4.5	mi/h
Free-flow speed, FFS		70-0	mi/h
		Urban Freeway	
	LOS and Perform	•	
	cos and Ferriori	mance neasures	
flow rate, vp		1355	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
Average passenger-car s	speed, 2	70-0	mi/h
Number of lanes, N		5	_
Density D		19.4	pc/mi/ln
Level of service, LOS		C	

## HCS2000: Ramps and Ramp Junctions Release 4.

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979 Fax: (615) 661-8644 E-mail: \_\_\_\_Merge Analysis\_\_\_ ΚA Analyst: TRC International Agency/Co:: Date performed: 9/12/02 Analysis time period: AM DHV Freeway/dir or travel: I-75 S.R. 131 (Emory Road) Junction: Jurisdiction: Analysis Year: 5058 Description: Knox Co., M-l, N.B. on ramp from S.R. 131, Existing System \_\_\_\_Freeway Data\_\_ Type of analysis Merge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 2146 vph \_\_\_\_On Ramp Data\_\_ Side of freeway Right Number of lanes in ramp Free-flow speed on ramp 50.0 mph Volume on ramp 250 vph Length of first accel/decel lane 840 ft Length of second accel/decel lane ft

\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_

Νo

Does adjacent ramp exist? Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp

vph

ft

\_\_Conversion to pc/h Under Base Conditions\_

Junction Components Freeway Ramp Adjacent Ramp Volume, V (vph) 2146 250 vph Peak-hour factor, PHF 0.55 0.95 Peak 15-min volume, v15 · 565 66 v Trucks and buses 16 2 'n. Recreational vehicles Π Ω Z Rolling Rolling Terrain type: Level 'n. Grade 7. 7. Length Мí шi Trucks and buses PCE: ET 2.5 2.5 Recreational vehicle PCE, ER 5.0 5.0 Heavy vehicle adjustment, fHV 0.806 0.971 Driver population factor, fP 1.00 1.00 Flow rate, vp 5901 271 pcph

```
_Estimation of V12 Merge Areas_
                          0.00
                  L =
                                   (Equation 25-2 or 25-3)
                   ΕQ
                          1.000
                                  Using Equation O
                   FΜ
                          (P) =
                                  2801
                                           pc/h
                           FM
                   15
                            ____Capacity Checks_
                                                          LOS F?
                           Actual
                                          Maximum
                           3072
                                          4800
                                                          No
     v
F0
                           3072
                                          4600
                                                          No
      R12
                _Level of Service Determination (if not F)_
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = R R D2 A
                                                                24 - 0
                                                                         pc/mi/ln
Level of service for ramp-freeway junction areas of influence (
                           ___Speed Estimation__
                                              M = 0.35%
Intermediate speed variable:
Space mean speed in ramp influence area:
                                              Z = F3-0
                                                           mph
Space mean speed in outer lanes,
                                              A \setminus M = Z
                                                           mph
                                              0
Space mean speed for all vehicles,
                                              2 = PJ·0
                                                           mph
```

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#### HCS2000: Ramps and Ramp Junctions Release 4.1

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_\_\_\_\_Merge Analysis\_\_\_\_ KA

Analyst:

Agency/Co::

TRC International 9/15/05

Date performed: Analysis time period:

PM DHV

Freeway/dir or travel: Junction:

I-75 S.R. 131 (Emory Road)

Jurisdiction:

5056

Analysis Year:

Description: Knox Co., M-l, N.B. on ramp from

\_\_\_Freeway Data\_ Merge

Type of analysis Number of lanes in freeway Free-flow speed on freeway

70.0

Right

mph

Volume on freeway

2076 vph

\_\_\_\_\_On Ramp Data\_

Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/decel lane Length of second accel/decel lane

50 - 0 426 840

mph vph ft

ft

\_\_\_Adjacent Ramp Data (if one exists)\_\_

Does adjacent ramp exist? Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp

vph '

ft

\_\_\_Conversion to pc/h Under Base Conditions\_\_

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	207L	426	vph
Peak-hour factor, PHF	0.95	0-95	
Peak 15-min volume, v15	546	775	V
Trucks and buses	16	2	%
Recreational vehicles	0	0	%
Terrain type:	Rolling	Rolling	Level
Grade	· '	· '.	%
Length	mi	mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	5.0	2.0	
Heavy vehicle adjustment, fHV	0.806	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2710	462	pcph

\_Estimation of V12 Merge Areas\_\_

0.00 (Equation 25-2 or 25-3)

·	Capacit	y Checks		
V F0	Actual 3172	Maximum 4800	LOS F? No	
K75	3172	4600	No	
Level	of Service Dete	rmination (if n	ot F)	
Density, D = 5.475 + D. R Level of service for ra	R	75	A	pc/mi/ln
	Speed Est	imation		
Intermediate speed varia	able	M = 0.3	30	
Space mean speed in ramp	influence are	S a	3 mph	
Space mean speed in out	er lanes,	S = N/	4 mph	
Space mean speed for all	l vehicles,	S = FB.	5 mph	

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\_\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold Agency or Company: TRC International Date Performed: 5/20/02 Analysis Time Period: ΑM Freeway/Direction: 175 NB

From/To: Jurisdiction:

505P

Analysis Year: Description: Knox Cp., Exist. System, DHV

\_\_\_Flow Inputs and Adjustments\_\_\_\_\_

North of Interchange

Volume, V	2396	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	F37	٧
Trucks and buses	19	%
Recreational vehicles		%
Terrain type:	Rolling	
Grade ,	0.00	Ż.
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	D.778	
Driver population factor, vp	1.00	
Flow rate, vp	7P50	pc/h/ln
Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, vp	0.00 2.5 2.0 0.778 1.00	mi

Speed Inputs and Adjustments			
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed:	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h	
The flow special (1)	Urban Freeway	141714	

\_\_LOS and Performance Measures\_\_

Flow rate, vp	7250	
Free-flow speed, FFS		pc/h/ln
• –	70.0	mi/h
Average passenger-car speed, S	69.3	mi/h
Number of lanes, N	2	
Density D	23.4	pc/mi/ln
Level of service, LOS	C	•

\_\_Operational Analysis\_\_\_\_\_

HCS2000: Basic Freeway Segments Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

Analyst: Ken Arnold		
Agency or Company: TRC Internat	ional	
Date Performed: 5/20/02		
Analysis Time Period: PM		
Freeway/Direction: I75 NB		
From/To: North of Int	erchange ·	
Jurisdiction:		
Analysis Year: 2026		
Description: Knox Cp., Exist. Syste	m <sub>n</sub> DHV	
Flow Inputs	and Adjustments	
Volume, V	2502	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	<b>6</b> 58	v
Trucks and buses	19	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	0.00	×.
Segment length	0.00	mi
Trucks and buses P(E, ET	2.5	
Recreational vehicle PCE, ER	2.0	
teavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	7645	pc/h/ln
Speed Input	s and Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	F · O	ft
Interchange∉density	0.50	interchange/mi
lumber of lanes, N	2	-
ree-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
_ane width adjustment, fLW	Ö•Ö	mi/h
Lateral clearance adjustment, fLC	ō•ō	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5_	mi/h
ree-flow speed, FFS	70.0	mi/h
	Urban Freew	ay
LOS and Per	formance Measures	
low rate, vp	1692	pc/h/ln
ree-flow speed, FFS	70-0	mi/h
verage passenger-car speed, S	68-9	mi/h
lumber of lanes, N	2 .	
Density, D	24.6	pc/mi/ln
evel of service, LOS	c	·

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

Operational An	alysis		
Analyst: Ken Arnold			
	TRC International		
ate Performed: 5/20/02			
analysis Time Period: AM			
reeway/Direction: I75 SB			
From/To: North of Interc Jurisdiction:	nange		
Analysis Year: 2026			
escription: Knox Co., Exist. System	DHV		
Flow Inputs an	d Adjustments		
Volume, V	2275	veh/h	
'eak-hour factor, PHF	0.95		
Peak 15-min volume, v15	599	v	
rucks and buses	<u> 1</u> 9	<sup>2</sup>	
Recreational vehicles	0	z	
Terrain type:	Rolling		
Grade	0.00	አ	
Segment length	0.00	mi	
rucks and buses PCE, ET	2.5		
Recreational vehicle PCE, ER	5.0		
leavy vehicle adjustment, fHV	0.778		
river population factor, vp	1.00	41.43	
low rate, vp	1539	pc/h/ln	
Speed Inputs a	nd Adjustments		
ane width	15.0	ft	
Right-shoulder lateral clearance	<b>Ь.</b> 0	ft	
interchange?density	0.50	interchange/mi	
umber of lanes. N	5		
ree-flow speed:	Measured		
FFS or BFFS	70.0	mi/h	
ane width adjustment, flW	0.0	mi/h	
ateral clearance adjustment, fLC	0.0	mi/h	
nterchange density adjustment, fID umber of lanes adjustment, fN	0.0 4.5	mi/h mi/h	
ree-flow speed, FFS	4.5 70.0	mi/h mi/h	
Lee-Itom Sheed, II 2	vu∙u Urban Freeway		
140 15 4	•		
LOS and Perfor			
low rate, vp	1539	pc/h/ln	
ree-flow speed, FFS	70.0	mi/h	
verage passenger-car speed, S	<u>6</u> 9.7	mi/h	
umber of lanes, N	2		
ensity. D	55·1	pc/mi/ln	
evel of service, LOS			

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	Operational	Analysis_	
	- ,		
Analyst:	Ken Arnold		

Agency or Company:

TRC International

Date Performed: Analysis Time Period: 5/20/02 PM

Freeway/Direction: From/To:

I75 SB North of Interchange

Jurisdiction: Analysis Year:

505P

Description: Knox Co., Exist. System, DHV

Flow Ir	puts and Adjustments
Volume, V	2331 veh/h
Peak-hour factor: PHF	0.95
Peak 15-min volume, v15	613 v
Trucks and buses	19 %
Recreational vehicles	0 %
Terrain type:	Rolling
Grade	0.00 %
Segment length	0.00 mi
Trucks and buses PCE, ET	2.5
Recreational vehicle PCE, ER	5.0
Heavy vehicle adjustment, fHV	0.778
Driver population factor, vp	7 - 00
Flow rate, vp	1576 pc/h/ln

Speed Inputs and Adjustments			
Lane width	15.0	ft	
Right-shoulder lateral clearance	<b>6</b> ⋅ 0	ft	
Interchange@density	0.50	interchange/mi	
Number of lanes, N	2		
Free-flow speed:	Measured		
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	4.5	mi/h	
Free-flow speed, FFS	70.0	mi/h	
•	Urban Freeway		

LOS and Performance Measures				
Flow rate: vp	1576	pc/h/ln		
Free-flow speed, FFS	70.0	mi/h		
Average passenger-car speed, S	<b>69.5</b>	mi/h		
Number of lames, N	2			
Density D	22.7	pc/mi/ln		
Level of service, LOS	C			

## HCS2000: Ramps and Ramp Junctions Release 4.

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:				
	Diver	ge Analysis_		
Date performed: Analysis time period: Freeway/dir or travel: Junction: Jurisdiction:	505P 2·8· 737 (Emor	y Road)	۵، Existing S	System
· · · · · · · · · · · · · · · · · · ·	Free	way Data		
Type of analysis Number of lanes in freew Free-flow speed on freew Volume on freeway		Diverg 2 70.0 2275	mph	
	Off R	amp Data		
Side of freeway Number of lanes in ramp Free-Flow speed on ramp Volume on ramp Length of first accel/de Length of second accel/d		Right 1 50.0 221 360	mph vph ft ft e exists)	
Does adjacent ramp exist Volume on adjacent ramp Position of adjacent ram Type of adjacent ramp Distance to adjacent ram	:? 1p	No	vph ft	
Conv	version to pc/h	Under Base	Conditions	
Junction Components  Volume, V (vph)  Peak-hour factor, PHF  Peak 15-min volume, v15  Trucks and buses  Recreational vehicles		Freeway 2275 0.95 599 19	Ramp 221 0.95 58 2	Adjacent Ramp vph v 2
Terrain type: Grade Length Trucks and buses PCE, E' Recreational vehicle PCE		Rolling 0.00 % 0.00 mi 2.5 2.0	Rolling 0.00 % 0.00 mi 2.5 2.0 0.971	Level % mi

```
__Estimation of V12 Diverge Areas_
                 L =
                         0.00
                               (Equation 25-8 or 25-9)
                  ΕQ
                         1.000
                               Using Equation O
                  FD
                 v = v + (v - v ) P = 3077 pc/h
12 R F R FD
                           ____Capacity Checks__
                          Actual
                                                       LOS F?
                                        Maximum
                          3077
                                        4800
                                                       No
     Fi F
                          3077
                                        4400
                                                       No
     12
                          2837
                                        4800
                                                       Νo
     FO
         F
              R
                          240
                                        5700
                                                       Νo
               __Level of Service Determination (if not F)__
                      D = 4.252 + 0.0086 v - 0.009 L = 27.5
R 12 D
Density 1
                                                                    pc/mi/ln
Level of service for ramp-freeway junction areas of influence C
              _____Speed Estimation____
Intermediate speed variable.
                                            D = 0.255
Space mean speed in ramp influence area.
                                          2 = P3
                                                         mph
Space mean speed in outer lanes:
                                           S = N/A
                                                         mph
Space mean speed for all vehicles,
                                            Z = F5.4
                                                         mph
```

s<sup>2</sup>

#### HCS2000: Ramps and Ramp Junctions Release 4.

\_\_\_\_\_Diverge Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: KA
Agency/Co: TRC International

Date performed: 9/16/02 Analysis time period: PM DHV Freeway/dir or travel: I-75

Junction: S.R. 131 (Emory Road)

Jurisdiction: Analysis Year:

5056

Description: Knox Co., D-2, S.B. off ramp to S.R. 131, Existing System

Type of analysis

Number of lanes in freeway
Free-flow speed on freeway
Volume on freeway

Off Ramp Data

Side of freeway
Number of lanes in ramp
Free-Flow speed on ramp
Volume on ramp
Length of first accel/decel lane
Length of second accel/decel lane

Right

Right
Free-Flow speed on ramp
Free-Flow spee

\_\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_\_\_

No

Does adjacent ramp exist? Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp

vph

ft

\_\_\_\_Conversion to pc/h Under Base Conditions\_ Freeway Ramp Adjacent Junction Components Ramp Volume: V (vph) 243 5337 vph Peak-hour factor, PHF 0.95 0.95 64 673 Peak 15-min volume, v15 19 7 Trucks and buses 2 Recreational vehicles 7. 0 Rolling Rolling Level Terrain type: 7. 0.00 7. × 0.00 Grade mi 0.00 mi мi Length 0.00 Trucks and buses PCE, ET 2.5 2.5 Recreational vehicle PCE, ER 5 - 0 5.0 0.778 0.971 Heavy vehicle adjustment, fHV  $\,$ 1.00 Driver population factor, fP 1.00 pcph 3153 563 Flow rate: vp

\_\_\_\_Estimation of V12 Diverge Areas\_\_\_

L = 
$$0.00$$
 (Equation 25-8 or 25-9)  
EQ  
P =  $1.000$  Using Equation D  
FD  
V = V + (V - V) P = 3153 pc/h  
12 R F R FD

\_\_\_\_Capacity Checks\_ Actual Maximum LOS F? 3153 4800 No Fi F 3153 4400 No 75 0692 4800 No 5P3 5700 No \_\_Level of Service Determination (if not F)\_ D = 4.252 + 0.0086 v - 0.009 L = 28.1 R 12 D pc/mi/ln Level of service for ramp-freeway junction areas of influence  ${\bf D}$ \_\_\_\_Speed Estimation\_ Intermediate speed variable. D = 0.257 Space mean speed in ramp influence area. E4 = 2mph

mph

mph

Space mean speed in outer lanes, S = N/ASpace mean speed for all vehicles, S = L2.8

\_\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/20/02
Analysis Time Period:	AM

Freeway/Direction:

I-75 SB From/To: Through Interchange

Jurisdiction:	•			
Analysis Year: 2026				
Description: Knox Co., Exist. System, DHV				
Flow Inputs and	d Adjustments			
Volume, V	2054	veh/h		
Peak-hour factor, PHF	0.95			
Peak 15-min volume, v15	541	V		
Trucks and buses	<b>ኔ</b> 7			
Recreational vehicles	0	%		
Terrain type:	Rolling			
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	0.797			
Driver population factor, vp	1-00			
flow rate, vp	1357	pc/h/ln		
Speed Inputs ar	nd Adjustments	. <u>-</u>		
Speed Inputs ar	nd Adjustments	ft		
Lane width				
Lane width Right-shoulder lateral clearance	15.0	ft ft		
Lane width	P · O 75 · O	ft		
Lane width Right-shoulder lateral clearance Interchange <sup>4</sup> density	12.0 6.0 0.50	ft ft		
Lane width Right-shoulder lateral clearance Interchange <sup>4</sup> density Number of lanes, N	5 6-20 75-0	ft ft		
Lane width Right-shoulder lateral clearance Interchange <sup>©</sup> density Number of lanes, N Free-flow speed:	12.0 6.0 0.50 2 Measured	ft ft interchange/mi		
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW	12.0 6.0 0.50 2 Measured 70.0	ft ft interchange/mi mi/h		
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC	12.0 6.0 0.50 2 Measured 70.0 0.0	ft ft interchange/mi mi/h mi/h		
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fIC Interchange density adjustment, fID	12.0 6.0 0.50 2 Measured 70.0 0.0	ft ft interchange/mi mi/h mi/h mi/h		
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h		
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fN	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0 0.0	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h		
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fN	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0 0.0 4.5 70.0 Urban Freeway	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h		
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed:         FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fN Free-flow speed, FFS	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0 0.0 4.5 70.0 Urban Freeway	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h		
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fN Free-flow speed, FFS LOS and Perform	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0 4.5 70.0 Urban Freeway	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h		
Lane width  Right-shoulder lateral clearance  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment, fLW  Lateral clearance adjustment, fLC  Interchange density adjustment, fID  Number of lanes adjustment, fN  Free-flow speed, FFS  LOS and Perform  Flow rate, vp  Free-flow speed, FFS	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0 4.5 70.0 Urban Freeway mance Measures	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h		
Lane width  Right-shoulder lateral clearance Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment, fLW  Lateral clearance adjustment, fLC  Interchange density adjustment, fID  Number of lanes adjustment, fN  Free-flow speed, FFS  LOS and Perform  Flow rate, vp  Free-flow speed, FFS  Average passenger-car speed, S	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0 4.5 70.0 Urban Freeway mance Measures 1357 70.0 70.0	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h		
Lane width  Right-shoulder lateral clearance  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment, fLW  Lateral clearance adjustment, fLC  Interchange density adjustment, fID  Number of lanes adjustment, fN  Free-flow speed, FFS  LOS and Perform  Flow rate, vp  Free-flow speed, FFS	12.0 6.0 0.50 2 Measured 70.0 0.0 0.0 4.5 70.0 Urban Freeway mance Measures	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h		

\_\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/20/02
Analysis Time Period:	PM
Freeway/Direction:	I-75 SB
From/To:	Through Interchange

Jurisdiction:

Flow Inputs ar	d Adjustments	
Volume, V	2088	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	549	v
Trucks and buses	17	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade .	0.00	×
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.797	
Driver population factor, vp	l - 00	
Flow rate, vp	1379	pc/h/ln
_ane width		<b>-</b> .
Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW	12.0 6.0 0.50 2 Measured 70.0 0.0	ft ft interchange/mi mi/h mi/h
Right-shoulder lateral clearance Interchange®density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC	6.0 0.50 2 Measured 70.0 0.0 0.0	ft interchange/mi mi/h mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID	6.0 □.50 ≥ Measured 70.0 □.0 □.0	ft interchange/mi mi/h mi/h mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fN	6.0 □.50 ≥ Measured 70.0 □.0 □.0 □.0	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fN	6.0 0.50 2 Measured 70.0 0.0 0.0 0.0 4.5 70.0	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fN	6.0 □.50 ≥ Measured 70.0 □.0 □.0 □.0	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS	6.0 0.50 2 Measured 70.0 0.0 0.0 4.5 70.0 Urban Freewa	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS LOS and Perfor	6.0 0.50 2 Measured 70.0 0.0 0.0 4.5 70.0 Urban Freewa	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS	6.0 0.50 2 Measured 70.0 0.0 0.0 4.5 70.0 Urban Freewa	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS LOS and Perfor	6.0 0.50 2 Measured 70.0 0.0 0.0 4.5 70.0 Urban Freewa mance Measures	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID Number of lanes adjustment, fN Free-flow speed, FFS  LOS and Perfor	6.0 0.50 2 Measured 70.0 0.0 0.0 0.0 4.5 70.0 Urban Freewa mance Measures	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fN Free-flow speed, FFS LOS and Perfor Free-flow speed, FFS Everage passenger-car speed, S	6.0 0.50 2 Measured 70.0 0.0 0.0 4.5 70.0 Urban Freewa mance Measures	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold
Agency or Company: TRC International

Date Performed: 5/20/02 Analysis Time Period: AM Freeway/Direction: 175 SB

From/To: South of Interchange /

justments	1 10 1 10 10 10 10 10 10 10 10 10 10 10
4070 /	veh/h
0.95/	
1071	V
11/	7.
0	×.
Rolling /	
0.00	%
0.00	мi
2.5	
5.0	
0.858	
1.00	
1664	pc/h/ln
ljustments	
75.0	ft
<b>b</b> ⋅ <b>0</b>	ft
0.50	interchange/mi
3 ✓	
Measured	
70.0	mi/h
	mi/h
	mi/h
	mi/h
3.0	mi/h
70.0 Urban Freeway	mi/h
	0.95/ 1071 11/0 Rolling/ 0.00 0.00 2.5 2.0 0.858 1.00 1664 djustments

L0S (	and Performance Measures_	
Flow rate: vp	1664	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed: 1	1-Pd Z	mi/h
Number of lanes, N	3	
Density, D	24.1	pc/mi/ln
Level of service, LOS	C	•

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	Operational	Analysis_
Analyst:	Ken Arnold	

Analyst: Agency or Company:

Ken Arnold TRC International 5/20/02

Date Performed: Analysis Time Period:

PM

Freeway/Direction: From/To:

I75 SB South of Interchange

Jurisdiction: Analysis Year:

9505

Description: Knox Co., Exist. System, DHV

Flow	Inputs	and	Adjustments_
------	--------	-----	--------------

Volume, V Peak-hour factor, PHF	2950 / 0.95	veh/h
Peak 15-min volume, v15	776	V
Trucks and buses	11 ~	%
Recreational vehicles	D	Z.
Terrain type:	Rolling/	
Grade .	0.00	7,
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5 - 0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
flow rate, vp	750P	pc/h/ln

## \_\_\_\_\_Speed Inputs and Adjustments\_\_\_\_\_

Lane width	75.0	ft
Right-shoulder lateral clearance	6 · D	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3~	<del>-</del>
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	

### \_\_\_\_L0S and Performance Measures\_

Flow rate, vp	750P	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	17.2	pc/mi/ln
Level of service, LOS	В	•

# HCS2000: Multilane Highways Release 4.16

<del></del>	OPERATIO	EZYJANA JANO	Z		
Analyst:	Ken Arnold				
Agency/(o:	TRC International				
Date:	2/57/05				
Analsis Period:					
dighway:	SR 131 (Emory Road)	1			
From/To:	Central Ave /I-75				•
Jurisdiction:	7071				
Analysis Year: Project ID:	2026	5 <del>L</del> . m			
- O Ject IV.	Knox Co., Exist. 3	•			
<del></del>		-FLOW SPEED			
_ane width	Direction	12.0		2	<i>.</i>
_ateral clearanc	o:	15.0	ft	75.0	ft
Right edge		5 · 0	£ 2	ח כ	
Left edge		F.0	ft ft	P·0 5·0	ft f+
	al clearance	8.0	ft	8.0	ft
Access points pe		5 · u	1.0	55 0·0	ft
Median type		5 Divided		cc Divided	
ree-flow speed:		Base		Base	
FFS or BFFS		PO · O	mph	6D.O	mph
ane width adjus		0.0	mph	0.0	mph
	e adjustment: FLC	0.9	mph	P.0	mph
1edian type adju		0.0	mph	0.0	mph
ccess points ad		1.3	mph	5.5	mph
ree-flow speed		57-8	mph	53.ь	mph
	. Direction	l.		2	
∕olume, V		1551 🧸	vph	971	vph
Peak-hour factor		0.95 🖊		0.95/	•
Peak 15-minute v		351		256	
Trucks and buses		2 /	%	2 /	Z .
Recreational veh	icles	0	7.	0	Ż.
Terrain type		Rolling 🗸		Rolling ∽	
Grade '		0.00	Z	0.00	½
Segment leng	th	0.00	mi	0 - 00	мi
lumber of lanes		2		2	
river population	n adjustment, fP	7 - 00		1.00	
rucks and buses	PCE: ET	2.5		2.5	
Recreational veh	icies PCE, ER	2.0		2.0	
leavy vehicle ad low rate, vp		0-971 661	ocobol	0.971	nenhn1
, acc, *p			pcphpl	52 <b>L</b>	pcphpl
		_RESULTS			
	Direction	1		2	
low rate; vp		661	pcphpl	526	pcphpl
ree-flow speed:	FFS	57.8	mph	53.L	mph
vg. passenger-ca	ar travel speed, S	57.8	mph	53.6	mph .
evel of service	. L0Z	В	·	A	•
ensity, D		11.4			pc/mi/ln

HCS2000: Multilane Highways Release 4.1b

OPERATIO	ZYJANA JAN	15		
Analyst: Ken Arnold				
Agency/Co: TRC International				
Date: 5/21/02				
Analsis Period: PM				
Highway: SR 131 (Emory Road)				
From/To: Central Ave-/I-75	_	•		
Jurisdiction:				
Analysis Year: 2026/				
Project ID: Knox Co., Fyist	Catana			
	•			
FREE	-FLOW SPEET	·	, <u></u> .	
Direction	1		2	
Lane width	15.0	ft	75.0	ft
Lateral clearance:				
Right edge	2.0	ft	5.0	ft
Left edge	<b>Ь.</b> 0	ft	P · O	ft
Total lateral clearance	8 · O	ft	8 - 0	ft
Access points per mile	5		55_	
Median type	Divided		Divided	
free-flow speed:	Base		Base	
FFS or BFFS	60.0	mph	PO-0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	Ď. 9	mph	0.9	mph
Median type adjustment, FM	D - D	mph	0.0	mph
Access points adjustment, FA	1.3	mph	5.5	mph
Free-flow speed	57.8	mph	53.L	mph
•	3. 3		33.6	mp//
	_VOLUME			
Direction	l		2	
Volume, V	1,425 🗸	vph	1347 /	unh
Peak-hour factor, PHF	0.95 /	V P 11	0.95 /	vph
Peak 15-minute volume, v15	375			
Trucks and buses	5/3	•	354	•,
Recreational vehicles	0	? •	2 /	? •
Terrain type		ž.	0	_ <sup>½</sup> .
Grade	Rolling ~		Rolling -	•.
Segment Tength	0.00	× .	0.00	χ.
lumber of lanes	0.00	mi	0-00	mi
	5		5	
river population adjustment, fP	1.00		1.00	
rucks and buses PCE, ET	2.5		2.5	
Recreational vehicles PCE, ER	5.0		5.0	
leavy vehicle adjustment, fHV	0.971		0.97ኔ	
low rate, vp	772	pcphpl	730	pcphpl
	_RESULTS			
Direction	, <b>1</b>		2	
low rate, vp	772	pcphpl	730	pcphpl
ree-flow speed, FFS	57-8	mby hchuh:	53.F	
vg. passenger-car travel speed, S	57.8	mph		mph
evel of service, LOS	8	шрп	53.6 B	mph
ensity D	13.3	pc/mi/ln	-	pc/mi/ln

Inter.: I-75/S.R. 131

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA

Agency: TRC INTERNATIONAL Area Type: All other areas Date: 8/29/02 Period: AM / Jurisd: Year : 2026 / Project ID: KNOX CO, EXISTING SYSTEM E/W St: S.R. 131 (EMORY ROAD) -N/S St: I-75 S.B. RAMPS ~ SIGNALIZED INTERSECTION SUMMARY
Eastbound | Westbound | " | Southbound I Northbound ΙL T R IL T R 1 L I L Т R Т R 1/ 2 / 0 2 0 2 / 0 No. Lanes 0 TR' וֹ ב' בֿדר 1 レブ 102 / LGConfig 1119/ 517 704 / 11312 869 / 15.0 Lane Width I 175-0 75-0 112-0 15.0 1 RTOR Vol 130 10 Duration 0.25 Area Type: All other areas \_Signal Operations\_ Phase Combination 1 4 1 8 EB Left I NB Left Thru Thru Right A Right Peds Peds Left 28 Left Thru A Thru Right Right Peds Peds Right NB Right I EB SB Right I WB Right 40.0 Green 30.0 5-0 Yellow 3.D 3·0 3.0 2.0 All Red 2.0 5 - 0 Cycle Length: 90.0 26C2 Intersection Performance Summary Appr/ Lane Adj Sat Ratios Lane Group Approach Lane Group Flow Rate v/c Grp q/C Delay LOS Capacity (\$) Delay LOS Eastbound TR 1108 1.04 3325 0.33 ε £ 6.44 66.8 Westbound 508 1805 0.95 0.44 44.1 LT 1572 0.98 3538 0.44 42.0 42.7 D Ð Northbound Southbound 195 3502 0.64 0.06 48.6 33.8 R 0.140.44 14.9 В Intersection Delay = 49.7 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Agency: TRC INTERNATIONAL Date: 8/29/02 Period: PM \* Inter:: I-75/S.R. 131 Area Type: All other areas Jurisd:

Project ID: KNOX CO, EXISTING SYSTEM FOUNDS STREET FOR STREET FOR SYSTEM FOR

E/W St:	Z.R. 131	(EMORY ROA	))-	N/S	St: I-	75 2.	B. RAM	<b>^2</b> 9	
		572	SNAL TZET	D INTERSE	CTTON 5	HMMAR	Y		
	l Eas			bound		hboun		South	bound I
	1 L	T R	l L '				R I		
	1		t		i -	•	1		i
No- Land	es 1 0	5/ 0	1	5 _ 0	i B	0		2 ~	0 1 /
LGConfid	q l	TR/	l L	LT	1	-	1	ہ ا	R - i
Volume	1	1175~250 /	16127 18		1		11	43 /	100 / i
Lane Wid	dth I		175.0 79		i			2.0	12.0
RTOR Vo			1		i		i	0	10 1
Duration		Area '		ll other					
Dh C				al Operat	ions				
EB Left	ombinatior +	11 2	3	4 1	1 - 6 -	5	6	7	å
Thr	-			i NB	Left				
		A		ļ.	Thru				
Righ		A		ļ	Right				
Ped:				!	Peds				
WB Left	-	A		i ZB	Left	A			
Thru		A		!	Thru				
Rigi				!	Right	A			
Peds				!	Peds				
NB Righ				I EB	Right				
SB Rigi	nt .	A		I WB	Right				
Green		35.0 35.0				5.0			
Yellow		3.0 3.0				3.0			
All Red		5.0 5.0				2.0			
		Takasas				Cycl	e Lengi	th: 90	·O secs
Appr/	Lane	Intersed	tion Pe Rati	erformanç Los	e summa		Appro	nach	<del></del>
Lane	Group	Flow Rate							
Grp	Capacity	(5)	v/c	g/C	Delay	L02	Delay	F02	
Eastbour	nd						•		
TR	1384								
		3560	88.0	0.39	47.8	D	47.B	D	
Westbour		3560	88.0	0.39	47.8	D	47.8	D	
Westbour 1	nd						47.B	D	
Westbour L LT		3805 7902 3220	0.98 0.83 8P.0	0.39 0.39 0.39	47.8 32.8 47.2	D C D	47.8	D D	
L	nd 702 1401	1805	0.83	0.39	32.8	C			
L LT	nd 702 1401	1805	0.83	0.39	32.8	C			
L LT Northboo	nd 702 1401 und	1805	0.83	0.39	32.8	C			
L LT Northboo Southboo	nd 702 1401 und	1902 3605	0.83 0.98	0.39 0.39	32·8 47·2	C D			
L LT	nd 702 1401 und	1805	0.83	0.39 0.39	32.8	C	<b>42.9</b>	D	
L LT Northbou Southbou L	nd 702 1401 und 195	1805 3602	0.83 0.98	0.39 0.39	32.8 47.2	C D			
L LT Northboo	nd 702 1401 und 195	1902 3605	0.83 0.98 0.77	0.39 0.39 0.06	32.8 47.2 59.5	C D	<b>42.9</b>	D D	

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA
Agency: TRC INTERNATIONAL
Date: 8/29/02
Period: AM /
Project ID: KNOX CO, EXISTING SYSTEM /
E/W St: S.R. 131 (EMORY ROAD)-Inter:: I-75/S.R. 131 Area Type: All other areas Jurisd: Year : 2026 /

N/S St: I-75 N.B. RAMPS ~

	i Ea:	stbou	nd I	West	bound	1 Nor	thbou	and I	Sout	thbou	nd	
	1 L	T	R I	L	T R	l L	Т	R I	L	T	R	
No. Lanes	i <del>-1</del>	/ 2 .	<del>-</del>		5 0	-¦ <u>1</u> `	70	<del>-2</del> ¦-	0	0	0	
.GConfig	1 4	Т	1		TR T	i L-	-	R - 1	_	_	-	
/olume	1777	559 /	´ I	2	028/173/	1153 /	•	577 /i				
ane Width	112.0		i		2.0	175.0		15.0				
RTOR Vol	ŀ		ĺ	-	58	1		192				i
uration	0.25		Area T		ll other							
hase Comb	ination	n 1.	2	Sign. 3	al Operat 4 I	ions	5		7	A		
B Left		Ā	_	_	I NB	Left	Ā	0	r			
Thru		Â	A		, 110	Thru	^					
Right		-	_		ì	Right	A					
Peds					- '		A					
JB Left					1	Peds						
Thru					i ZB	Left						
			A		ı	Thru						
Right			A		1	Right						
Peds					1	Peds						
IB Right					I EB	Right						
8 Right					I WB	Right						
reen		<b>L</b> • 0	54.0				15.0	]				
rellow		3.0	3.0				~ ~					
			2 · U				3.0					
ll Red		5.0	5.0				5.0					
ill Red		5.0	5.0		•		5.0	:le Leng	th: °	30.0		sec
		2.0 I	2.0 ntersec		erformanc		Z.O Cyc ary			30.0		sec
lppr/ Lai		Z • 0 I 	2.0 ntersec j Sat	tion Po Rat:		e Summ	Z.O Cyc ary		th: <sup>s</sup>	30.0	<del></del>	sec
Appr/ Lai	ne oup oacity	Z·O I Ad Floo	2.0 ntersec				2.0 Cyc ary Group	Appr	oach	30.0		sec
Appr/ Lan Lane Gro Grp Cap	oup	Z·O I Ad Floo	2.0 ntersec j Sat w Rate	Rat	ios ———	Lane	2.0 Cyc ary Group	Appr	oach	30.0		sec
oppr/ Lana Gro	oup pacity	Z·O Ad Floo	2.0 ntersec j Sat w Rate (s)	Rat:	g/C	Lane Delay	LOS	Appr	oach	30.0		sec
ppr/ Lar ane Gro rp Car astbound	oup pacity 20	Z-D Ad Floo	2.0 ntersec j Sat w Rate (s)	V/c 0.68	g/C 0.07	Delay 55.1	2.0 Cyc Group LOS	Delay	LOS	30.0		sec
ppr/ Lar ane Gro rp Car astbound	oup pacity	Z·O Ad Floo	2.0 ntersec j Sat w Rate (s)	Rat:	g/C	Lane Delay	LOS	Appr	oach	30.0		sec
ane Gro Grp Cap Eastbound	oup pacity 20	Z-D Ad Floo	2.0 ntersec j Sat w Rate (s)	V/c 0.68	g/C 0.07	Delay 55.1	2.0 Cyc Group LOS	Delay	LOS	30.0		sec
Appr/ Lane Growing Cap Cap Lastbound Land Land Land Land Land Land Land La	oup pacity 20	Z-D Ad Floo	ontersection in the section is a section in the sec	V/c 0.68	g/C 0.07	Delay 55.1	2.0 Cyc Group LOS	Delay	LOS	30 - 0		sec
Appr/ Lana Grown Cap Cap Cap Castbound Dia Castbound Cap Castbound Cap	oup pacity 	In Add Floor	ontersection in the section is a section in the sec	V/c V/c 0.68 0.23	9/C 0.07 0.72	Delay 55.1 4.2	Cyc ary_ Group LOS	Delay	LOS B	30.0		sec
appr/ Lai ane Gro irp Cag astbound astbound R 21 lorthbound	oup pacity 20 507	II Add Floor 186 363	ontersection Sat was Rate (s)	V/c  0.68 0.23	9/C 0.07 0.72 0.60	55.1 4.2	Cyc ary Group LOS E A	Delay	LOS B	30.0		sec
Appr/ Lai ane Gro irp Cai astbound astbound R 21 Iorthbound	oup pacity 20 507	In Add Floor	ontersection Sat was Rate (s)	V/c V/c 0.68 0.23	9/C 0.07 0.72	Delay 55.1 4.2	Cyc ary_ Group LOS	Delay	P S B	30.0		sec
Appr/ Lane Gro Enp Cap  Lastbound La	oup pacity 20 507 ,49	180 180 180 180	ntersec j Sat w Rate (s)	V/c  0.58 0.23  1.05	0.07 0.07 0.72 0.60	55.1 4.2 52.0	Cycary_Group	Delay	LOS B	30.0		sec
Appr/ Lane Grown Caper C	oup pacity 20 507 ,49	II Add Floor 186 363	ntersec j Sat w Rate (s)	V/c  0.68 0.23	9/C 0.07 0.72 0.60	55.1 4.2	Cyc ary Group LOS E A	Delay	P S B	30.0		Sec
appr/ Lar ane Gro irp Car astbound 20 estbound R 21 lorthbound	oup pacity 20 507 ,49	180 180 180 180	ntersec j Sat w Rate (s)	V/c  0.58 0.23  1.05	0.07 0.07 0.72 0.60	55.1 4.2 52.0	Cycary_Group	Delay	P S B	30.0		Sec
ppr/ Lar ane Gro rp Car astbound 2: estbound R 2: orthbound 3:	oup pacity 20 507 ,49	180 180 180 180	ntersec j Sat w Rate (s)	V/c  0.58 0.23  1.05	0.07 0.07 0.72 0.60	55.1 4.2 52.0	Cycary_Group	Delay	P S B	30.0		sec

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Agency: TRC INTERNATIONAL Date: 8/29/02 Period: PM Inter:: I-75/S.R. 131 Area Type: All other areas Jurisd:

Year : 2026 /

Project ID: KNOX CO, EXISTING SYSTEM / E/W St: S.R. 131 (EMORY ROM).

N/S St: I-75 N.B. RAMPS ~

	7.7.2	GNALT7E	D INTERSE	CTION S	CIIMM A P	v			
	Eastbound		bound		thboun		tuo2	hboun	d I
1		i L		I L	T				R i
No. Lanes I	7 5 0	i 0	5 0	i 1-	0	27 i	Ð	0	'
	L' T'	1	TR-	1 1/		_R _ i	<del></del>	_	- i
	159~ 1159~	l 1	372/267/	1487~	l	249-1			i
Lane Width I	75.0 75.0	1 1	2.0	115.0	1	1 0.5			1
RTOR Vol 1		1	150	I	F	.00 I			1
Duration	0.25 Area		ll other						· · · · ·
Dhann Coultin			al Operat	ions		<del></del>	<del></del>		
Phase Combin EB Left	<del></del>	3	4 1		5	Ь	7	B	
Thru	A A A		i NB	Left	A				
	A A			Thru					
Right Peds			!	Right	A				
WB Left			1	Peds					
Thru	A		i ZB	Left Thru					
Right	Å		-						
Peds	A		!	Right					
NB Right			, ,	Peds					
SB Right			1 EB 1 WB	Right					
Green	10.0 39.0		1 WD	Right	2 <b>6</b> • 0				
Yellow	3.0 3.0				3.0				
All Red	5.0 5.0				2.0				
M11 NCG	L.O E.O					e Leng	th: 91	n . n	secs
	Intersed	ction P	erformanc	e Summa		e cens	,	,	3663
Appr/ Lane		Rat		Lane G		Appr	oach		
Lane Grou							000		
Grp Capa	city (s)	v/c	g/C	Delay	LOS	Delay	LOZ	-	
Eastbound	1405								
L 201 T 216		0.83	0.17	63.7	E		-		
T 216	£ 3610	0.56	0.60	11.5	В	17.5	В		
Westbound									
TR 154	2 3558	1.04	0.43	58.6	E	58·6	Ε		
Northbound									
L 521	1805	0.98	0.29	67.2	Ε				
012			- · <b>-</b> ·		_	50 - 1	D		
R 821 Southbound	2842	E8-0	0.29	37.3	D				

Intersection Delay = 42.5 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA
Agency: TRC INTERNATIONAL
Date: 8/29/02
Period: AM /
Project ID: KNOX CO, EXISTING SYSTEM /
E/W St: S.R. 131 (EMORY ROAD)-Inter.: PRIMETIME ROAD/.... 454
Area Type: All other areas Jurisd:

Year : 2026~

N/S St: PRIMETIME ROAD ~

			GNALIZED	INTERSE	CTION :	SUMMAR	Y			
		tbound	l Westb	ound	I Nor	thboun	d I		hbound	
	I L	TR	IL T	R	! L	T	R!	L	T I	₹ !
No. Lanes	i — 17	2/0	1	2 0	¦	1/	<del></del> ;-	0	1~	i i
LGConfig	16	TR	L	TR	1 L -	TR 🔨	_ I		LT-	R 🗐
Volume				51/11/	151/ 1	5 / 3			15 🔨 49	
Lane Width RTOR Vol	1 175.0	50   75.0	  15.0 75	'•U Lj	132.0 3	7 75-0	I I	ı	1. 1. 0.5.	
					•	Ti .			300	
Duration	0.25	Area 1	ype: Al Signa	l other l Operat	areas ions					
Phase Comb	ination	•	3 .	4		5	Ь	7	a	
EB Left		A		I NB	Left	A				
Thru Right		A A A		1	Thru Right	A A				
Peds		n n		i	Peds	*				
⊎B Left		A		i ZB	Left		A			
Thru		A		1	Thru		A			
Right		A		!	Right		A			
Peds NB Right				I I EB	Peds					
SB Right		A		1 WB	Right Right					
Green	•	14.5 50.0			Kigit	10.0	10.5			
Yellow		3.0 3.0				3.0	3.0			
All Red		5.0 5.0				5.0	5.0			
		Totomoo	0-		- 5		e Leng	gth: 1	:05 - D	26C2
Appr/ La	ne	Incersed Adi Sat	.cion re Rati	rformanc os	Lane (		Appr	oach		
	oup	Flow Rate		03	Cone (	эт очр	ubb.	oacn		
Grp Ca	pacity	(2)	v/c	g/C	Delay	LOZ	Delay	/ F0Z	_	
Eastbound										
	49	1805	0.52	0.14	43.9	D				
TR 2	376	3589 .	0.44	0.66	8 · P	A	12.5	В		
Westbound										
	48	521	0.05	0.48	14.5	В		_		
TR 1	718	3608	7.05	0.48	53.2	D	53.1	D		
Northbound										
	72 74	1805	0.37	0.10	45.4	D D				
112 7	74	1829	0.05	0.10	43.3	D	45.1	D		
Southbound										
LT 1	82	1955	0.48	0.10	46.6	D	42.6	D		
	ьı	1615	0.76	0.29	41.6	D				
I	ntersec	tion Delay	= 37.7	(sec/ve	h) Ir	ntersed	tion	<b>L02</b> =	D	

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA
Agency: TRC INTERNATIONAL
Date: 8/29/02
Period: PM
Project ID: KNOX (0, EXISTING SYSTEM E/W St: S.R. 131 (EMORY ROAD)

SIGNALIZED INTERSECTION SUMMARY

| Eastbound | Westbound | Northbound | Southbound | Southbound

			GNALIZE	D INTERSE	ECTION	AMMUZ	RY			
		stoound		bound		thbou			thboun	
	f L	T R	1 6	T R	1 L	Т	RI	L	T	R I
No. Lan	es i—	/ 2 / O	-1	2 0	-¦ <u>1</u> -	1	! <u>-</u> !		1.	<u> </u>
LGConfi			[	TR'	.i L-"	ŤR -		u	LT	R Ι
Volume		1876 215	14/ 17	281/99 /	11637		15	118/		95 / i
	dth   112.0		112-0 18		115.0	15.0	1	-	15.0 1	
RTOR Vo	1	700	I	50	1		7 1		٩	0 1
Duratio	n 0.25	Area	Type: A	ll other al Operat	areas		,			
Phase C	ombinatio	n 1 2	3.1911	ar oherat	.1005	5	ь	7		
EB Lef		A	-	i NB	Left	Ā	•		G	
Thr	u	A A		1	Thru	Á				
Rig		A A		1	Right	A				
Ped	_			1	Peds					
WB Lef	-	Ą		I ZB	Left		A			
Thr Rig		A		I	Thru		A			
Ped:		A			Right Peds		A			
NB Rigi				I EB	Right					
SB Rigi		A		86 1	Right					
Green	•	21.4 40.6	Ī			12.1	10.9			
Yellow		3.0 3.0				3.0	3.0			
All Red		5.0 5.0				2.0	5.0			
		T		_	_	Cycl	le Leng	th: ]	105.0	26c2
Appr/	1 200	Interse Adj Sat	Ction Pe	erformano						
Lane	Group	Flow Rate	Rati	lus	Lane	Group	Appr	oach		
Grp	Capacity		v/c	g/C	Delay	L0Z	Delay	201		
				J			20109			
Eastboui L	nd 368	1800	0 01	0.30		-				
TR	2284	1805 3579	0.91 5e.0	0.20 0.64	53·1	E C	ח פר	_		
	2207	2311	0.15	U • 15 4	C 2 · P		29.0	C		
Westbour	nd									
L	72	187	0.0P	0.39	20.5	C				
TR	7399	3590	7.07	0.39	58 - 5	Ε	58.4	Ε		
Northboo										
L	509	1805	0.83	0.15	68.7	Ε				
TR	214	1858	0.25	0.75	43.0	D	P5 · 2	Ε		
Southboo	und									
LT	190	1827	0.82	0.10	70.2	Ε	50.8	D		
R	574	1615	0.19	0 · 3 P	53.6	Ċ		-		
	Intersed	tion Delay		(sec/ve	h) I	nterse	ction	L02 =	D	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	OPERATIONAL	ANALYSIS
Analyst:	Ken Arnold	<del></del>

TRC International Agency/Co:

5/21/02 Date:

Analsis Period: AM

Highway: SR 131 (Emory Road) From/To: Primetime Road/Bishop

Jurisdiction:

FREE	-FLOW SPEE	D		
	_		_	
Direction Lane width	l l		2	
Lateral clearance:	75.0	ft	75.0	ft
Right edge	2.0	£ 4.	7 0	٠.
Left edge		ft	5.0	ft
Total lateral clearance	6.0 8.0	ft	6 · O A · O	ft
Access points per mile	7.U	ft		ft
Median type			10	
Free-flow speed:	Divided		Divided	
•	Base	. •	Base	
FFZ or BFFS	PO-0	mph	PO 0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.9	mph	0.9	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.5	mph	2.5	mph
Free-flow speed	56·6	mph	56-6	mph
			•	
	_VOLUME			
Direction	1		2 .	
Volume, V	1057	vph	1666	vph
Peak-hour factor, PHF	0.95		0.95/	
Peak 15-minute volume, v15	270		438	
Trucks and buses	3 -	Z.	3	Ż.
Recreational vehicles	Ö	%	Ō	ž.
Terrain type	Rolling -		Rolling/	•
Grade	0.00	Z	0.00	Ż.
Segment length	0.00	mi	0.00	mi
Number of lanes	5 22		5	III X
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	2.5		2.5	
Recreational vehicles PCE, ER	5.0		5.0	
Heavy vehicle adjustment, fHV	0.957		0.957	
flow rate, vp	564	pcphpl	936	pcphpl
	_RESULTS			
Direction	1.		2	
Flow mate we	F1 1.		017	
low rate, vp	564	pcphpl	41 <i>e</i>	pcphpl
ree-flow speed, FFS	56.6	wbp	56.6	wbp
Avg. passenger-car travel speed, S	56·6	wbp	56.6	mph
evel of service, LOS	·A		В	
Density, D	10 O	pc/mi/ln		pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Density, D

Fax: (615) 661-0644

E-mail:	f a)	x: (PT2)	667-064A	
OPERATI	ONAL ANALYS	rs		
Analyst: Ken Arnold Agency/Co: TRC International Date: 5/21/02 Analsis Period: PM  Highway: SR 131 (Emory Road From/To: Primetime Road/Bisl Jurisdiction: Analysis Year: 2026	hop			
Project ID: Knox Co., Exist.		•		
FREE	E-FLOW SPEED	) <u> </u>		
Direction	1.		2	
Lane width	75.D	ft	15.0	ft
Lateral clearance: Right edge	ם כ	6.	7.0	6.4
Left edge	P·0 5·0	ft ft	P·O S·O	ft
Total lateral clearance	8.0	ft	8.D	ft ft
Access points per mile	70	, .	10	, ,
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
fFS or BFFS	60.0	mph	PO-0	mph
Lane width adjustment, FLW	0 - 0	mph	0 • 0	mph
Lateral clearance adjustment, FLC	0.9	mph	0-9	mph
Median type adjustment, FM	0 - 0	mph	0.0	mph
Access points adjustment, FA	2.5	mph	2.5	mph
Free-flow speed	56.B	mph	56.6	mph
	VOLUME			
Direction	l.		2	
Volume, V	2009	vph	1384/	vph
Peak-hour factor, PHF	0.95		0.95/	· p
Peak 15-minute volume, v15	529		364	
Trucks and buses	3 —	×	3 -	%
Recreational vehicles		Z.	σ	%
Terrain type	Rolling-		Rolling ~	
Grade	0.00	<i>"</i> .	0.00	7
Segment length	0.00	mi	0.00	mi
Number of lanes Driver population adjustment, fP	2 /		5 ~	
Trucks and buses P(E, ET	1.00 2.5		7·00	
Recreational vehicles PCE, ER	5.0		2.5 2.0	
Heavy vehicle adjustment, fHV	0.957		0.957	
flow rate, vp	1104	pcphpl	761	pcphpl
	REŚULTS			
Direction	], 		2	
Flow rate, vp Free-flow speed, FFS	1104 56.6	pcphpl mph	761 56.6	pcphpl mph
Avg. passenger-car travel speed, S	56.6	mph	56.6	mph
evel of service, LOS Density, D	C 1.9.5	nc/mi/ln	В	

19.5 Overall results are not computed when free-flow speed is less than 45 mph.

pc/mi/ln

pc/mi/ln 13-4

# Analysis Summary , Alternate 1 2006 Traffic and Proposed Geometrics

Location Type Analysis Design Hour  I-75 Northbound Basic Freeway AM  South of Interchange Segments PM  I-75 Northbound Basic Freeway AM  South of D-1 Major AM  Sogments PM  AM  PM	B B
South of Interchange Segments PM  I-75 Northbound , Basic Freeway AM  South of D-1 Major	
I-75 Northbound , Basic Freeway AM South of D-1 Major	В
South of D-1 Major	
South of D-1 Major	Α
Divorce   Comments   Did	
Diverge Segments PM	В
I-75 Northbound , Basic Freeway	^
North of D-1 Major	Α
Diverge Segments PM	Α
M-1, I-75 Northbound Ramp and Ramp AM	В
On-ramp from SR 131 Junctions PM	В
1-75 Northbound Ramp and Ramp	D
North of M-1 On-ramp	В
from SR 131 Junctions PM	В
I-75 Northbound North Basic Freeway AM	В
of Interchange Segments PM	В
I-75 Southbound, Basic Freeway AM	В
North of Interchange Segments PM	В
I-75 Southbound, Basic Freeway AM	В
North of D-2 Off-ramp Segments PM	В
D-2, I-75 Southbound Ramp and Ramp AM	В
Off-ramp to SR131 Junctions PM	В
I-75 Southbound, Basic Freeway	^
South of D-2 Off-ramp	A
to SR 131 Segments PM	Α
M-2, I-75 Southbound Ramp and Ramp AM	В
On-ramp from SR131 Junctions PM	Α
I-75 Southbound Basic Freeway AM	С
South of Interchange Segments PM	В
SR 131 west of I-75 Multilane AM	Α
Highways PM	Α
	C(32.6)
	0(36.1)
	(29.6)
	(28.1)
SR 131 east of Multilane AM	В
Primetime Rd. Highways PM	В

Note: The LOS shown for the intersections is the total average intersection delay. The delay in parentheses is in seconds per vehicle.

\_\_\_\_\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction: Analysis Year: Description: KNOX CO	9006-	ERCHANGE ~	
	Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles		2182 0.95 574 11 0	veh/h v %
Terrain type: Grade Segment length Trucks and buses PCE, E Recreational vehicle PC Heavy vehicle adjustmen	Eı ER	Rolling / 0.00 0.00 2.5 2.0 0.858	ζ mi
Driver population facto Flow rate, vp	rı vp	1.00 892	pc/h/ln
	Speed Inputs and	d Adjustments	
Lane width Right-shoulder lateral Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustmere-flow speed FFS	fLW tment, fLC ustment, fID	12.0 6.0 0.50 3 Measured 70.0 0.0 0.0 0.0 3.0 70.0 Urban Freeway	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h
	_LOS and Perform	ance Measures	
		<del></del>	
Flow rate, vp Free-flow speed, FFS Average passenger-car s Number of lanes, N Density, D	peed, S	892 70.0 70.0 3 12.7	pc/h/ln mi/h mi/h pc/mi/ln
Level of service, LOS		В	. 1

\_\_\_Operational Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: KA
Agency or Company: TRC INTERNATIONAL
Date Performed: 10/8/02
Analysis Time Period: 2006 PM DHV

Freeway/Direction: I-75

From/To: N.B. 120. OF INTERCHANGE/

Jurisdiction:		
Analysis Year: 2006		
Description: KNOX CO., PROP. SYSTEM, ALT	IERNAIE 1	
Flow Inputs and	d Adjustments	
Volume, V	5866 <	veh/h
Peak-hour factor, PHF	0.95/	
Peak 15-min volume, v15	754_	v
Trucks and buses	11	%
Recreational vehicles	0	%
Terrain type:	Rolling /	
Grade	0.00	ሂ
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
Flow rate, vp	1172	pc/h/ln
Speed Inputs ar	nd Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	F - D	ft
Interchange <sup>r</sup> density	0.50	interchange/mi
Number of lanes, N	3 /	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0 <b>. 0</b>	mi/h
Lateral clearance adjustment, fLC	D • <b>O</b>	mî/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3 · C	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	
LOS and Perform	nance Measures	
Flow rate, vp	1172	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	16.7	pc/mi/ln
Level of service, LOS	8	•

\_\_\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: KA Agency or Company: TRC INTERNATIONAL Date Performed: 30/8/02 SOOP WW DHA Analysis Time Period: Freeway/Direction: I-75 N.B. ¬SO. OF INTERCHANGE✓

From/To:

Jurisdiction:

Analysis Year: 5001, Description: KNOX CO., PROP. SYSTEM, ALTERNATE 1

Flow Inputs	and Adjustments	
Volume, V	2182 (	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	574	V
Trucks and buses	11-	z
Recreational vehicles	0	Ż.
Terrain type:	Rolling	
Grade .	0.00	7.
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	O-858	
Driver population factor, vp	7.00	
Flow rate, vp	669	pc/h/ln
Speed Inputs	and Adjustments	
Lane width	75.0	ft
Right-shoulder lateral clearance	12.0 6.0	ft ft
Right-shoulder lateral clearance Interchange density Number of lanes, N	<b>5</b> .0	ft
Right-shoulder lateral clearance Interchange density	5.0 0.50	ft
Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS	5.0 0.50 4	ft
Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW	\$.0 0.50 4 ✓ Measured	ft interchange/mi
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment fLW Lateral clearance adjustment fLC	\$.0 0.50 4 ✓ Measured 70.0	ft interchange/mi mi/h
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed:     FFS or BFFS Lane width adjustment fLW Lateral clearance adjustment fIC Interchange density adjustment fID	\$.0 0.50 4 ✓ Measured 70.0 0.0 0.0	ft interchange/mi mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment fLW Lateral clearance adjustment fLC	\$.0 0.50 4 ✓ Measured 70.0 0.0	ft interchange/mi mi/h mi/h mi/h

Urban Freeway \_\_\_LOS and Performance Measures\_

pc/h/ln Flow rate, vp եեց Free-flow speed, FFS 70.0 mi/h Average passenger-car speed, S 70.0 mi/h Number of lanes, N Density, D Level of service, LOS ٩.6 pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

	Operational Ana	alysis	
Analyst:	KA		
Agency or Company:	TRC INTERNATION	NAI	
Date Performed:	10/8/02		
Analysis Time Period:	500P bw DHA ~		
Freeway/Direction:	I-75		
From/To:	N.B. 120. OF INT	FRCHANGE /	
Jurisdiction:			
	500P~		
Description: KNOX CO.,		TERNATE 1 /	
	Flow Inputs and	i Adjustments	
Volume, V		2866 /	veh/h
Peak-hour factor, PHF		0.95	VE11711
Peak 15-min volume, v15		754	V
Trucks and buses		11	ž
Recreational vehicles		0	ż
Terrain type:		Rolling /	<b>7.</b>
Grade		0.00	ž
Segment length		0.00	mi
Trucks and buses PCE, ET	•	2.5	III <u>T</u>
Recreational vehicle PCE		5.0	
Heavy vehicle adjustment		0.858	
		0.030	
Driver population factor	·- un	1. 00	
	'ı Vp	1.00 479	nc/h/ln
	vp     vp	1.00 879	pc/h/ln
Flow rate, vp	·		·
Flow rate, vp  Lane width	_Speed Inputs ar	879	·
Flow rate, vp  Lane width	_Speed Inputs ar	879 and Adjustments	·
Flow rate, vp  Lane width Right-shoulder lateral c Interchange density	_Speed Inputs ar	879  nd Adjustments  12.0	ft
-low rate, vp _ane width Right-shoulder lateral c Interchange density Number of lanes, N	_Speed Inputs ar	879 nd Adjustments 12.0 6.0	ft ft
Flow rate, vp  Lane width Right-shoulder lateral c Interchange density Number of lanes, N Free-flow speed:	_Speed Inputs ar	879 nd Adjustments 12.0 6.0 0.50	ft ft
Flow rate, vp  Lane width Right-shoulder lateral c Interchange density Number of lanes, N Free-flow speed: FFS or BFFS	Speed Inputs ar	879  12.0  6.0  0.50	ft ft
Flow rate, vp  Lane width Right-shoulder lateral c Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f	Speed Inputs ar :learance :LW	879  12.0  1.0  0.50  Measured	ft ft interchange/mi
Flow rate, vp  Lane width  Right-shoulder lateral c  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment, f  Lateral clearance adjust	_Speed Inputs ar learance LW ment, fLC	879  12.0  1.0  0.50  Measured 70.0	ft ft interchange/mi mi/h
Flow rate, vp  Lane width  Right-shoulder lateral c  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment, f  Lateral clearance adjust  Interchange density adju	_Speed Inputs ar learance LW ment, fLC ustment, fID	879  12.0  4.0  0.50  4.0  Measured 70.0	ft ft interchange/mi mi/h mi/h
Flow rate, vp  Lane width  Right-shoulder lateral c  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment, f  Lateral clearance adjust  Interchange density adju	_Speed Inputs ar learance LW ment, fLC ustment, fID	879  12.0  4.0  0.50  4.0  Measured 70.0 0.0	ft ft interchange/mi mi/h mi/h mi/h
-low rate, vp -ane width Right-shoulder lateral content of the lateral content of the lateral content of the lateral content of lane width adjustment, for the lateral clearance adjustment of the laterance adjustmen	_Speed Inputs ar learance LW ment, fLC ustment, fID	879  12.0  12.0  1.0  0.50  4  Measured 70.0  0.0  0.0	ft ft interchange/mi mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width Right-shoulder lateral c Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f Lateral clearance adjust Interchange density adju	_Speed Inputs ar learance LW ment, fLC ustment, fID	879  12.0  12.0  1.0  0.50  4  Measured 70.0  0.0  0.0  1.5	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width  Right-shoulder lateral content of lanes, Normal of lanes, Normal of lanes, Normal of lanes, Normal of lanes, lateral clearance adjust of lanes adjustment, formal of lanes adjustment, formal of lanes adjustment, lateral of lateral	_Speed Inputs ar learance LW ment, fLC ustment, fID	879  12.0  12.0  1.0  0.50  4  Measured  70.0  0.0  0.0  1.5  70.0  Urban Freeway	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width Right-shoulder lateral c Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f Lateral clearance adjust Interchange density adju Number of lanes adjustme Free-flow speed, FFS	_Speed Inputs ar learance LW ment, fLC stment, fID	879  12.0  1.0  0.50  4/  Measured 70.0  0.0  0.0  1.5  70.0  Urban Freeway	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width Right-shoulder lateral c Interchange density Number of lanes, N Free-flow speed:     FFS or BFFS Lane width adjustment, f Lateral clearance adjust Interchange density adju Number of lanes adjustme Free-flow speed, FFS	_Speed Inputs ar learance LW ment, fLC stment, fID	879  id Adjustments  12.0  4.0  0.50  4.0  0.0  0.0  0.0  1.5  70.0  Urban Freeway	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
ane width Right-shoulder lateral content of lanes. No speed: FFS or BFFS ane width adjustment, for a content of lanes adjust of lanes adjustment. Interchange density adjustment of lanes adjustment. The content of lanes adjustment.	_Speed Inputs are learance  LW ment, fLC stment, fID ent, fN LOS and Perform	879  12.0  12.0  1.0  0.50  Measured  70.0  0.0  0.0  1.5  70.0  Urban Freeway  tance Measures  879  70.0	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width Right-shoulder lateral c Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f Lateral clearance adjust Interchange density adju Number of lanes adjustme Free-flow speed, FFS  Flow rate, vp Free-flow speed, FFS  Average passenger-car sp	_Speed Inputs are learance  LW ment, fLC stment, fID ent, fN LOS and Perform	879  12.0  4.0  0.50  4.0  0.0  0.0  0.0  1.5  70.0  Urban Freeway  Mance Measures  70.0  70.0	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral c Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f Lateral clearance adjust Interchange density adju Number of lanes adjustme Free-flow speed, FFS	_Speed Inputs are learance  LW ment, fLC stment, fID ent, fN LOS and Perform	879  12.0  12.0  1.0  0.50  Measured  70.0  0.0  0.0  1.5  70.0  Urban Freeway  tance Measures  879  70.0	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h

\_\_\_\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	KA
Agency or Company:	TRC INTERNATIONAL
Date Performed:	70/8/05
Analysis Time Period:	SOOP AM DHA /
Freeway/Direction:	I-75
From/To:	N.BNO. OF D-1 /
Jurisdiction:	
Analysis Year:	500P~
Banadiahiana PNAV ZA	BOAD SUSTEM ALTERNATE 3 /

Description: KNOX CO., PROP. SYSTEM.ALTERNATE 1

Flow Inpu	uts and Adjustments
Volume, V	1621 / veh/h
Peak-hour factor, PHF	0.95/
Peak 15-min volume, v15	427 v
Trucks and buses	16 - 1
Recreational vehicles	0 %
Terrain type:	Rolling -
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	O-80L
Driver population factor, vp	1.00
Flow rate, vp	705 pc/h/ln

Speed Inputs a	nd Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	6.O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3 /	
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
•	Urban Freewa	a v

LOS and Pe	erformance Measures	
Flow rate, vp	705	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	10.1	pc/mi/ln
Level of service, LOS	A	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

```
___Operational Analysis___
Analyst:
Agency or Company:
                         TRC INTERNATIONAL
                         70/9/0<u>5</u>
Date Performed:
                         500P bw DHA \
Analysis Time Period:
Freeway/Direction:
                         I-75
                         N.B. ,NO. OF D-1/
From/To:
Jurisdiction:
                         5007
Analysis Year:
Description: KNOX CO., PROP. SYSTEM, ALTERNATE 1 /
                      ____Flow Inputs and Adjustments__
Volume, V
                                             1531/
                                                             veh/h
Peak-hour factor, PHF
Peak 15-min volume, v15
                                             403
Trucks and buses
                                             16 /
                                                             Z.
Recreational vehicles
                                             γ,
Terrain type:
                                             Rolling ~
    Grade
                                                             7.
                                             0.00
    Segment length
                                             0.00
Trucks and buses PCE, ET
                                             2.5
Recreational vehicle PCE, ER
                                             5 • 0
Heavy vehicle adjustment, fHV
                                             0.806
Driver population factor, vp
                                             1.00
Flow rate, vp
                                                             pc/h/ln
                                             PPP
                _____Speed Inputs and Adjustments__
Lane width
                                             15.0
                                                             ft
Right-shoulder lateral clearance
                                             6 · D
                                                             ft
Interchange density
                                             0.50
                                                             interchange/mi
Number of lanes, N
                                             3 /
Free-flow speed:
                                             Measured
     FFS or BFFS
                                             70.0
                                                            mi/h
Lane width adjustment, fLW
                                             0.0
                                                            mi/h
Lateral clearance adjustment, fLC
                                             Q • O
                                                             mi/h
Interchange density adjustment, fID
                                                            mi/h
                                             0.0
Number of lanes adjustment, fN
                                             3.0
                                                            mi/h
Free-flow speed, FFS
                                             70.0
                                                            mi/h
                                             Urban Freeway
                  ____LOS and Performance Measures___
Flow rate, vp
                                             PPP
                                                            pc/h/ln
Free-flow speed, FFS
                                             70.0
                                                            mi/h
Average passenger-car speed, S
                                             70.0
                                                            mi/h
Number of lanes, N
Density 1 D
                                             9.5
                                                            pc/mi/ln
Level of service, LOS
                                             Α
```

# HCS20DO: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD. TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_\_Merge Analysis\_\_ Analyst: KA TRC INTERNATIONAL Agency/Co:: 10/8/05 Date performed: Analysis time period: SOOP WW DHA ~ I-75 freeway/dir or travel: Junction: M - ]. Jurisdiction: Analysis Year: 500P

Description: KNOX CO., N.B. ON RAMP FROM S.R. 131, Alt.!

Type of analysis

Number of lanes in freeway
Free-flow speed on freeway

Volume on freeway

On Ramp Data

Side of freeway

Freeway Data

Merge

70.0 mph

vph

On Ramp Data

Side of freeway

Number of lanes in ramp

Free-flow speed on ramp

Volume on ramp

Length of first accel/decel lane

Length of second accel/decel lane

ft

\_\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_\_\_

Does adjacent ramp exist? Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp

Flow rate: vp

vph

pcph

ft

805

\_\_Conversion to pc/h Under Base Conditions\_ Junction Components Freeway Ramp Adjacent Ramp 1257 🧸 192 / Volume, V (vph) vph 0.95 ~ Peak-hour factor: PHF 0.95 / Peak 15-min volume, v15 51/ 427 v 16/ Trucks and buses 7. Recreational vehicles D 7 Rolling ~ % Terrain type: Rolling / Level Grade 7, Z, Length тi шi 2.5 2.5 Trucks and buses PCE, ET Recreational vehicle PCE, ER 2.0 2.0 Heavy vehicle adjustment, fHV 0.806 0.971 Driver population factor fP 1.00 1.00

577P

```
_Estimation of V12 Merge Areas_
                 L =
                         0.00
                                 (Equation 25-2 or 25-3)
                         0.601
                                 Using Equation 1
                  FΜ
                 v = v (P ) = 1272 pc/h
12 F FM
                            ___Capacity Checks_
                                                       LOS F?
                          Actual
                                        Maximum
                          2324
                                        7200
                                                       No
     F0
                          1480
                                        4600
                                                        No
     R12
               __Level of Service Determination (if not F)_
Density: D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 11.7
                                                                     pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                          ___Speed Estimation__
Intermediate speed variable.
                                            M = 0.254
Space mean speed in ramp influence area,
                                            Z = P5.4
Space mean speed in outer lanes,
                                            Z = P9-9
Space mean speed for all vehicles.
                                            S = 64.9
```

7

# HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail: \_\_\_\_Merge Analysis\_ Analyst: KA TRC INTERNATIONAL Agency/Co:: Date performed: 10/8/02 200P bw DHA ~ Analysis time period: Freeway/dir or travel: I-75 M-1 / Junction: Jurisdiction: Analysis Year: 2006 / Description: KNOX CO.-N.B. ON RAMP FROM S.R. 131, Alt.1 \_Freeway Data\_\_\_ Type of analysis Merge Number of lanes in freeway 3 / Free-flow speed on freeway 70.0 mph Volume on freeway 1531 🗸 vph \_On Ramp Data\_ Side of freeway Right Number of lanes in ramp Free-flow speed on ramp 50.0 mph

Volume on ramp 359 ~ vph Length of first accel/decel lane 840 ft Length of second accel/decel lane ft

No

\_\_\_Adjacent Ramp Data (if one exists)\_\_

Does adjacent ramp exist? Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp Distance to adjacent Ramp

vph

ft

\_\_Conversion to pc/h Under Base Conditions\_ Junction Components Freeway Ramp Adjacent Ramp Volume, V (vph) 1531 🗸 328 ~ vph Peak-hour factor, PHF 0.95 / 0.95 / Peak 15-min volume, v15 403 86 v Trucks and buses 16 / 2 ~ 7. Recreational vehicles 0 n 'n. Terrain type: Rolling -Rolling ~ level 7. Grade Z. 'n. Length Мi Мî тi Trucks and buses PCE, ET 2.5 2 - 5 Recreational vehicle PCE, ER 2.0 2.0 Heavy vehicle adjustment, fHV 0.806 0.971 Driver population factor, fP 1.00 1.00 Flow rate: vp 1998 35L pcph

```
_Estimation of Vl2 Merge Areas_
                       0.00
                              (Equation 25-2 or 25-3)
                ΕQ
                       0.60% Using Equation 1
                FM
                v = v (P) = 1201
                                     pc/h
                15
                    F
                       FM
                         ___Capacity Checks_
                                    Maximum
                                                  LOS F?
                        Actual
    v
F0
                        2354
                                    7200
                                                  Νo
                        1557
                                    4600
                                                  Νo
     R12
              _Level of Service Determination (if not F)_
12.2
                                                               pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                        ___Speed Estimation_
Intermediate speed variable,
                                        M = 0.256
Space mean speed in ramp influence area.
                                        Z = P5.8
                                                   mph
Space mean speed in outer lanes,
                                        S = P9.d
                                                   mph
                                        0
Space mean speed for all vehicles,
                                        S = PA·8
                                                   mph
```

er.

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

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E-mail:

Operational Ar	alysis			
Analyst: KA				
Agency or Company: TRC INTERNATIONAL\				
)ate Performed: 10/8/02				
Analysis Time Period: 2006 AM DHV				
reeway/Direction: I-75				
rom/To: N.B., NO. OF IN	TERCHANGE ~			
Jurisdiction:				
Analysis Year: 2006				
Description: KNOX CO., PROP. SYSTEM, A	LIERNAIE 1			
Flow Inputs an	d Adjustments			
Volume, V	1813 🗸	veh/h		
Peak-hour factor, PHF	0.95 ′			
Peak 15-min volume, v15	477	ν		
Trucks and buses	19 ~	%		
Recreational vehicles	a	%		
Terrain type:	Rolling 🗸			
Grade .	0.00	<b>%</b>		
Segment length	0.00	mi		
Trucks and buses PCE, ET	2.5			
Recreational vehicle PCE, ER	5.0			
Heavy vehicle adjustment, fHV	0.778			
Driver population factor, vp	1.00			
flow rate, vp	817	pc/h/ln		
Speed Inputs a	nd Adjustments			
_ane width	75.0	ft		
Right-shoulder lateral clearance	F • D	ft		
Interchange*density	0 <b>- 50</b>	interchange/mi		
Number of lanes, N	3 -			
Free-flow speed:	Measured			
FFS or BFFS	70.0	mî/h		
ane width adjustment, fLW	0.0	mi/h		
_ateral clearance adjustment= fLC	0.0	mi/h		
Interchange density adjustment, fID	0.0	mi/h		
Number of lanes adjustment, fN	3.0	mi/h		
ree-flow speed, FFS	70.0	mi/h		
	Urban Freewa	iy .		
LOS and Perfor	mance Measures			
low rate, vp	817	pc/h/ln		
ree-flow speed, FFS	70.0	mi/h		
lverage passenger-car speed, S	70.0	mi/h		
Number of lanes. N	3			
Density, D	11.7	pc/mi/ln		
_evel of service, LOS	В			

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

fax: (615) 661-0644

E-mail:

Operational An	alysis	
Analyst: KA		
Agency or Company: TRC INTERNATION	ALN	
Date Performed: 10/8/02		
Analysis Time Period: 2006 PM DHV / Freeway/Direction: I-75		
Freeway/Direction: I-75		
From/To: N.B., NO. OF IN	TERCHANGE /	
Jurisdiction:		
Analysis Year: 2006/		
Description: KNOX CO., PROP. SYSTEM, A	LTERNATE 1 -	
Flow Inputs an	d Adjustments	
Volume: V	1859 /	veh/h
Peak-hour factor, PHF	0.95/	
Peak 15-min volume, v15	489	V
Trucks and buses	19 /	%
Recreational vehicles		አ
Terrain type:	Rolling 🖊	
Grade	0.00	2
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	838	pc/h/ln
Speed Inputs a	nd Adjustments	
Lane width	15.0	ft
Right-shoulder lateral clearance	F • O	ft
Interchange"density	0.50	interchange/mi
Number of lanes. N	3 ~	
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70-0	mi/h
	Urban Freewa	зу
LOS and Perfor	mance Measures	
flow rate, vp	838	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 Level of service. LOS	75.0	pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

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<del></del>	Operational Ana	alysis		
Analyst: KA Agency or Company: TRC INTERNATIONAL\ Date Performed: 10/8/02 Analysis Time Period: 2006 AM DHV ✓				
Freeway/Direction: From/To:	I-75 N.B., NO. OF INTERCHANGE			
Jurisdiction: Analysis Year: Description: KNOX CO.,	PROP. SYSTEM, AL	TERNATE 1 -		
	Flow Inputs and	d Adjustments		
Volume, V		1813/	veh/h	
Peak-hour factor, PHF		0.95~		
Peak 15-min volume, vl5	i	477	V	
Trucks and buses		19 /	%	
Recreational vehicles			%	
Terrain type:		Rolling 🗸		
Grade		0.00	2	
Segment length		0.00	mi	
Trucks and buses PCE, E	т	2.5		
Recreational vehicle PC		2.0		
Heavy vehicle adjustmen		0.778		
Driver population facto		1.00		
Flow rate, vp		755P	pc/h/ln	
	Speed Inputs ar	nd Adjustments		
		12.0	ft	
lane width				
	clearance			
Right-shoulder lateral	clearance	b · O	ft	
Right-shoulder lateral Interchange density	clearance	6. <b>0</b> 0.50		
Right-shoulder lateral Interchange density Number of lanes, N	clearance	6·0 D·50 2	ft	
Right-shoulder lateral Interchange density Number of lanes, N	clearance	6.0 0.50 2 / Measured	ft	
Right-shoulder lateral Interchange density Number of lanes: N Free-flow speed: FFS or BFFS		6·0 D·50 2	ft interchange/mi	
Right-shoulder lateral Interchange density Number of lanes: N Free-flow speed: FFS or BFFS Lane width adjustment:	flW	6.0 0.50 2 ∕ Measured 70.0	ft interchange/mi mi/h mi/h	
Right-shoulder lateral Interchange density Number of lanes: N Free-flow speed: FFS or BFFS Lane width adjustment: Lateral clearance adjus	fLW tment, fLC	6.0 0.50 2 ∕ Measured 70.0 0.0 0.0	ft interchange/mi mi/h mi/h mi/h	
Right-shoulder lateral Interchange density Number of lanes: N Free-flow speed: FFS or BFFS Lane width adjustment: Lateral clearance adjus Interchange density adj	fLW tment, fLC ustment, fID	6.0 0.50 2 ∕ Measured 70.0 0.0 0.0 0.0	ft interchange/mi mi/h mi/h mi/h mi/h	
Right-shoulder lateral Interchange density Number of lanes: N Free-flow speed: FFS or BFFS Lane width adjustment: Lateral clearance adjus Interchange density adj Number of lanes adjustm	fLW tment, fLC ustment, fID	6.0 0.50 2 ∕ Measured 70.0 0.0 0.0 0.0 4.5	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h	
Right-shoulder lateral Interchange density Number of lanes: N Free-flow speed:	fLW tment, fLC ustment, fID	6.0 0.50 2 ∕ Measured 70.0 0.0 0.0 0.0	ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h	
Right-shoulder lateral Interchange density Number of lanes: N Free-flow speed: FFS or BFFS Lane width adjustment: Lateral clearance adjus Interchange density adj Number of lanes adjustm	flW tment: fLC justment: fID ent: fN	6.0 □.50 ≥ ∕ Measured 70.0 □.0 □.0 □.0 4.5 70.0	ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h	
Right-shoulder lateral Interchange density Number of lanes N Free-flow speed:	flW tment: fLC justment: fID ent: fN	6.0 □·50 2 ∕ Measured 70.0 □·0 □·0 4.5 70.0 Urban Freewa	ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h	
Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed:	flW tment: fLC justment: fID ent: fN	6.0  0.50  2 /  Measured  70.0  0.0  0.0  4.5  70.0  Urban Freew	ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h ai/h mi/h pi/h	
Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed:	fLW itment, fLC justment, fID ient, fN LOS and Perform	6.0 0.50 2 / Measured 70.0 0.0 0.0 0.0 4.5 70.0 Urban Freewant Free Freewant Free Free Free Free Free Free Free Fre	ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h ai/h mi/h mi/h mi/h	
Lane width adjustment, Lateral clearance adjust Interchange density adj Number of lanes adjustment, Free-flow speed, FFS Flow rate, vp Free-flow speed, FFS Average passenger-car s	fLW itment, fLC justment, fID ient, fN LOS and Perform	6.0 0.50 2 / Measured 70.0 0.0 0.0 0.0 4.5 70.0 Urban Freewant Free Freewant Freewant Free Free Free Free Free Free Free Fre	ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h ai/h mi/h pi/h	
Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed:	fLW itment, fLC justment, fID ient, fN LOS and Perform	6.0 0.50 2 / Measured 70.0 0.0 0.0 0.0 4.5 70.0 Urban Freewant Free Freewant Free Free Free Free Free Free Free Fre	ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h ai/h mi/h mi/h mi/h	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

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Phone: (615) 661-7979 E-mail:		Fax: (615) 66	1-0644
	Operational Analys	sis	
Analyst:	KA		
Agency or Company:	TRC INTERNATIONAL		
Date Performed:	10/8/05		
Analysis Time Period:	DOUG DW MAGN		
Freeway/Direction:	I-75		•
From/To:	N.B. NO. OF INTER	THANGE /	
Jurisdiction:	NO. OF THICK	LIINIUL	
Analysis Year:	5004~		
Description: KNOX CO.		RNATE 1 /	
	Flow Inputs and Ad	djustments	
Volume, V		1859 /	veh/h
Peak-hour factor, PHF		0.95′	
Peak 15-min volume, v15		489	V
Trucks and buses		19/	%
Recreational vehicles			½.
Terrain type:		Rolling /	
Grade		0.00	λ,
Segment length		0.00	mi
Trucks and buses PCE, ET	•	2 - 5	
Recreational vehicle PCE		2.0	
Heavy vehicle adjustment		0.778	
Driver population factor		1.00	
Flow rate, vp		1257	pc/h/ln
	Speed Inputs and A	Adjustments	
Lane width		75.0	ft
Right-shoulder lateral o	learance	6·0	ft
Interchange density		0.50	interchange/mi
Number of lanes, N		5 ~	
Free-flow speed:		Measured	
FFS or BFFS		70 - 0	mi/h
Lane width adjustment, (	f∟W	0.0	mi/h
Lateral clearance adjust	tment, fLC	0 - 0	mi/h
Interchange density adju	ustment, fID	0.0	mi/h
Number of lanes adjustme	ents fN	4.5	mi/h
Free-flow speed, FFS		70.0	mi/h
		Urban Freeway	
	L0S and Performan	ce Measures	
flow rate, vp		1257	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
Average passenger-car s	z rbeed	70.0	mi/h
Number of lanes, N		2	
Density, D		18.0-	pc/mi/ln

\_\_Operational Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

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Fax: (615) 661-0644

Analyst: KΑ

Agency or Company: Date Performed: TRC INTERNATIONAL 10/8/02

Analysis Time Period:

SOOP WW DHAN

Freeway/Direction: I-75 SB. NO. OF INTERCHANGE

From/To: Jurisdiction:

Analysis Year:

500P~ Description: KNOX CO., PROP. SYSTEM, ALTERNATE 1 ~

\_\_\_Flow Inputs and Adjustments\_\_\_\_\_

Volume, V	1809 /	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	476	V
Trucks and buses	19 🖊	%
Recreational vehicles	O O	%
Terrain type:	Rolling 🗸	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	7553	pc/h/ln

\_\_\_\_\_Speed Inputs and Adjustments\_\_\_\_\_

Lane width	75.0	ft
Right-shoulder lateral clearance	P · O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2 🗸	
Free-flow speed:	Measured	
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	mî/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	70.0	mi/h
•	Urban Freeway	,

\_\_L0S and Performance Measures\_\_

Flow rate, vp Free-flow speed, FFS	1223 70.0	pc/h/ln mi/h
Average passenger-car speed: S Number of lanes: N	70.0	mi/h
Density, D Level of service, LOS	17.5 B	pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

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E-mail:

	Operational Ana	alysis		
Analyst: Agency or Company: Date Performed: Analysis Time Period: Freeway/Direction: From/To: Jurisdiction:	KA TRC INTERNATIONAL\ 10/8/02			
Analysis Year: 2006/ Description: KNOX CO., PROP. SYSTEM, ALTERNATE 1/				
	Flow Inputs and	d Adjustments		
Volume, V Peak-hour factor, PHF		1831/	veh/h	
Peak 15-min volume, v15		482	V	
Trucks and buses		19 ~	%	
Recreational vehicles		0	%	
Terrain type:		Rolling /		
Grade .		0.00	%	
Segment length		0.00	mi	
Trucks and buses P(E, E		2.5		
Recreational vehicle PC		5.0		
Heavy vehicle adjustmen		0.778		
Driver population factor	rı vp	1.00		
Flow rate, vp		7539	pc/h/ln	
	Speed Inputs ar	nd Adjustments		
Lane width		12.0	ft	
Right-shoulder lateral	clearance	<b>L</b> ∙ 0	ft	
Interchange density		0.50	interchange/mi	
Number of lanes, N		2 🗸		
Free-flow speed:		Measured		
FFS or BFFS		70.0	mi/h	
Lane width adjustment,		0.0	mi/h	
Lateral clearance adjus		<u> </u>	mi/h	
Interchange density adj		0.0	mi/h	
Number of lanes adjustme	ent, fN	4.5	mi/h	
Free-flow speed, FFS		70.0	mi/h	
		Urban Freeway		
	L0S and Perform	ance Measures		
Flow rate, vp		1238	pc/h/ln	
Free-flow speed, FFS		70.0	mi/h	
Average passenger-car s	peed, S	70.0	mi/h	
Number of lanes, N		5		
Density, D		17.7	pc/mi/ln	
Level of service, LOS	·	8	•	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

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Abei actiniat Wi	alysis	
Analyst: KA ,		
Agency or Company: TRC INTERNATION	IALN	
Date Performed: 10/8/02		
Analysis Time Period: 2005 AM DHV	•	
Freeway/Direction: I-75	encuries /	
From/To: \$8., NO. OF INT	ERCHANGE	
Jurisdiction: Analysis Year: 2006 /		
Rnalysis tear: Edub Description: KNOX CO., PROP. SYSTEM, A	LTERNATE 1 -	
Flow Inputs ar	d Adjustments	
Volume, V	1809 %	veh/h
Peak-hour factor, PHF	0.95	· · · · · · ·
Peak 15-min volume, v15	476	v
Trucks and buses	19 /	ž
Recreational vehicles	ō.	ž
Terrain type:	Rolling ~	
Grade	0.00	2
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	97P	pc/h/ln
Speed Inputs a	ınd Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	b - 0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3 🖊	
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freewa	зу
LOS and Perfor	mance Measures	
Flow rate, vp	876	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	_
m 1. m	11.7	pc/mi/ln
Density, D Level of service, LOS	B	p 47 m 27 211

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

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__Operational Analysis_____
Analyst:
Agency or Company:
                        TRC INTERNATIONALN
                        70/8/05
Date Performed:
                        500P bw DHA <
Analysis Time Period:
Freeway/Direction:
                        I-75
From/To:
                        SB-1 NO. OF INTERCHANGE
Jurisdiction:
Analysis Year:
                        500P ~
Description: KNOX CO., PROP. SYSTEM, ALTERNATE 1 -
                      ____Flow Inputs and Adjustments___
Volume, V
                                             1831 🦯
                                                            veh/h
                                             0.95/
Peak-hour factor, PHF
Peak 15-min volume, v15
                                             482
Trucks and buses
                                             19 -
Recreational vehicles
                                             П
Terrain type:
                                             Rolling ~
    Grade
                                                            7
                                             0.00
    Segment length
                                             0.00
Trucks and buses PCE: ET
                                             2.5
Recreational vehicle PCE, ER
                                             5.0
Heavy vehicle adjustment, fHV
                                             0.778
Driver population factor, vp
                                             1.00
Flow rate, vp
                                                            pc/h/ln
                                             85P
                      ____Speed Inputs and Adjustments_
Lane width
                                             75.0
                                                            ·ft.
Right-shoulder lateral clearance
                                             F • D
Interchange density
                                             0.50
                                                            interchange/mi
Number of lanes, N
                                             3 ~
Free-flow speed:
                                             Measured
     FFS or BFFS
                                                            mi/h
                                             70.0
Lane width adjustment, fLW
                                             0 - 0
                                                            mi/h
Lateral clearance adjustment, fLC
                                             0.0
                                                            mi/h
Interchange density adjustment, fID
                                             0.0
                                                            mi/h
                                                            mi/h
Number of lanes adjustment, fN
                                             3.0
Free-flow speed, FFS
                                             70.0
                                                            mi/h
                                             Urban Freeway
                     ____L0S and Performance Measures_
Flow rate₁ 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
                                             11.8
                                                            pc/mi/ln
Level of service, LOS
```

# HCS2000: Ramps and Ramp Junctions Release 4.1b

\_\_\_\_Diverge Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: KA
Agency/Co: TRC INTERNATIONAL
Date performed: 10/8/02
Analysis time period: 2006 AM DHV

Freeway/dir or travel: I-75
Junction: D-2

Jurisdiction:

Analysis Year: 2006

Description: KNOX CO. S.B. OFF RAMP, PROP. SYSTEM, ALT. I

\_\_Freeway Data\_ Type of analysis Diverge 3 Number of lanes in freeway Free-flow speed on freeway 70.0 mph 1809 4 Volume on freeway vph \_\_\_Off Ramp Data\_ Side of freeway Right Number of lanes in ramp Free-Flow speed on ramp 50.0 mph Volume on ramp 171 vph

Length of second accel/decel lane ft

\_\_\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_\_\_\_

\_\_Conversion to pc/h Under Base Conditions\_

Does adjacent ramp exist? Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp

Length of first accel/decel lane

vph

ft

ft

3P0

No

Junction Components Adjacent Freeway Ramp Ramp 1809 / 171 Volume, V (vph) vph 0.95 / Peak-hour factor, PHF 45 2 / Peak 15-min volume, v15 476 . 19 🗸 7 Trucks and buses % Recreational vehicles 0 0 Terrain type: Rolling/ Rolling ~ Level % 7. 0.00 7 0.00 Grade 0.00 mi 0.00 mi Length Trucks and buses PCE, ET 2.5 2.5 Recreational vehicle PCE, ER 5.0 5.0 0.778 0.971 Heavy vehicle adjustment, fHV Driver population factor, fP 1.00 7.00 Flow rate, vp 2447 185 pcph

```
__Estimation of V12 Diverge Areas_
                  L =
                          0.00
                                  (Equation 25-8 or 25-9)
                  ΕQ
P =
                          0.690 Using Equation 5
                   FD
                  v = v + (v - v ) P = 1746 pc/h
12 R F R FD
                           ____Capacity Checks__
                                                         LOS F?
                           Actual
                                         Maximum
                                                         No
     v = v
                           2447
                                         7200
                           1746
                                         4400
                                                         No
     15
                           55P5
                                         7200
                                                         No
     FQ
                           185
                                         5700
                                                         Νo
               __Level of Service Determination (if not F)__
                       D = 4.252 + 0.00066 v - 0.009 L = R
                                                                      pc/mi/ln
Density
Level of service for ramp-freeway junction areas of influence B
                         ____Speed Estimation___
Intermediate speed variable.
                                             D = 0.250
Space mean speed in ramp influence area.
                                             Z = P3
                                                          mph
                                              R
Space mean speed in outer lanes.
                                             S = 76.8
                                                          mph
Space mean speed for all vehicles.
                                             Z = 66.4
                                                          mph
```

4

### HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 Fax: (615) 661-0644 E-mail: \_\_\_\_Diverge Analysis\_\_\_\_ Analyst: TRC INTERNATIONAL Agency/Co:: 10/8/05 Date performed: Analysis time period: 500P bw DHA < Freeway/dir or travel: I-75 Junction: D-2 ~ Jurisdiction: 5007~ Analysis Year: Description: KNOX CO., S.B. OFF RAMP, PROP. SYSTEM, ALT. I \_\_Freeway Data\_ Type of analysis Diverge 3 🗸 Number of lanes in freeway 70.0 mph Free-flow speed on freeway 1831 🗸 vph Volume on freeway \_\_\_Off Ramp Data\_ Right Side of freeway Number of lanes in ramp 1 -50.0 mph Free-Flow speed on ramp 187/ vph Volume on ramp Length of first accel/decel lane 360 ft Length of second accel/decel lane ft \_Adjacent Ramp Data (if one exists)\_ Does adjacent ramp exist? Νo Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp ft Distance to adjacent ramp \_\_\_\_\_Conversion to pc/h Under Base Conditions\_ Adjacent Junction Components Freeway Ramp Ramp 187/ 1831 ~ vph Volume, V (vph) 0.95 / Peak-hour factor, PHF 0.95 / 482 397 49 Peak 15-min volume, v15 v 2~ % Trucks and buses 7. n n Recreational vehicles Rolling / Rolling / Level Terrain type: 7. 0.00 7. 0.00 Grade mi 0.00 0.00 mi mi Length Trucks and buses PCE, ET 2.5 2.5 Recreational vehicle PCE, ER 5.0 5.0 0.971 Heavy vehicle adjustment, fHV 0.778 1.00 1.00 Driver population factor, fP 203 Flow rate, vp 2477 pcph

```
_Estimation of Vl2 Diverge Areas__
                  L ≈
                          0.00
                                 (Equation 25-8 or 25-9)
                  _EQ
P =
                          0.689 Using Equation 5
                  FD
                         + (v - v) P = 1769 pc/h
                        R
                            F R FD
                  15
                             ___Capacity Checks__
                           Actual
                                        Maximum
                                                        LOS F?
                           2477
                                         7200
                                                        Νo
                           1769
                                         4400
                                                        No
     75
                           2274
                                         7200
                                                        No
     F0
                           203
                                         5700
                                                        No
               __Level of Service Determination (if not F)__
                       D = 4.252 + 0.0086 v - 0.009 L
R 12 D
Density:
                                                                      pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                          ____Speed Estimation_
Intermediate speed variable,
                                             D = 0.251
                                             2
                                            Z = P3
Space mean speed in ramp influence area,
                                                         mph
                                             R
                                            S = 76-8
Space mean speed in outer lanes,
                                                         mph
                                             0
                                             2 = 66.4
Space mean speed for all vehicles,
                                                         mph
```

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\_\_\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: TRC INTERNATIONAL 10/8/02 Agency or Company: Date Performed: 2006 MM DHV / Analysis Time Period: Freeway/Direction: I-75 From/To: S.B., SOUTH OF D~2

Flow Inputs a	nd Adjustments	
Volume: V	1638 ~	veh/h
Peak-hour factor, PHF	0.55	
Peak 15-min volume, v15	431	V
Trucks and buses	17 🔨	%
Recreational vehicles	0	<b>%</b>
Terrain type:	Rolling/	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.797	
Driver population factor, vp	1.00	
Flow rate, vp	721	pc/h/ln
Speed Inputs	and Adjustments	
Lane width	75.0	ft
Right-shoulder lateral clearance	<b>6</b> ⋅0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3 🗸	
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freew	ay
LOS and Perfo	rmance Measures	
Flow rate, vp	721	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	<del>-</del> •

Number of lanes, N Density, D 10.3 pc/mi/ln Level of service, LOS

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

```
Phone: (615) 661-7979
                                             Fax: (615) 661-0644
E-mail:
                        __Operational Analysis___
Analyst:
Agency or Company:
                        TRC INTERNATIONAL
                        10/8/02
Date Performed:
                        500P bw DHA <
Analysis Time Period:
Freeway/Direction:
                        I-75
                        2-d 40 HTU02..8.2
From/To:
Jurisdiction:
                        S00P~
Analysis Year:
Description: KNOX CO., PROP. SYSTEM, ALTERNATE 1 /
                      ____Flow Inputs and Adjustments___
                                             16447
0.957
Volume, V
                                                             veh/h
Peak-hour factor, PHF
Peak 15-min volume, v15
                                             433
                                             17/
                                                             7.
Trucks and buses
Recreational vehicles
                                             0
                                             Rolling -
Terrain type:
                                             0.00
                                                             7.
    Grade
                                             0.00
    Segment length
                                                             шį
Trucks and buses PCE, ET
                                             2.5
Recreational vehicle PCE, ER
                                             5 • 0
Heavy vehicle adjustment, fHV
                                             0.797
Driver population factor, vp
                                             1.00
Flow rate, vp
                                             724
                                                             pc/h/ln
                    ____Speed Inputs and Adjustments__
Lane width
                                             15.0
                                                             ft
Right-shoulder lateral clearance
                                             h . O
                                                             ft
Interchange density
                                             0.50
                                                             interchange/mi
                                             3 🗸
Number of lanes, N
Free-flow speed:
                                             Measured
     FFS or BFFS
                                             70.0
                                                             mi/h
                                             0.0
                                                             mi/h
Lane width adjustment, fLW
                                                             mi/h
Lateral clearance adjustment, fLC
                                             0.0
                                                             mi/h
Interchange density adjustment, fID
                                             0.0
Number of lanes adjustment, fN
                                             3.0
                                                             mi/h
                                             70 - 0
Free-flow speed, FFS
                                                             mi/h
                                             Urban Freeway
                       ___LOS and Performance Measures__
                                             724
                                                             pc/h/ln
Flow rate, vp
                                             70.0
Free-flow speed, FFS
                                                             mi/h
                                             70.0
Average passenger-car speed, S
                                                             mi/h
Number of lanes, N
Density D
                                             10.3
                                                             pc/mi/ln
Level of service, LOS
                                             A
```

# HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:		Fax: (	615) PPJ-	0644	
	Merge	Analysis			
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/dir or travel: Junction: Jurisdiction: Analysis Year: Description: KNOX CO	I-75 M-2		YSTEM,	AL.	τ. (-
	free	way Data			
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway		Merge 3 70.0 1638	-	mph vph	
	0n R	amp Data			
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/de Length of second accel/de	decel lane	Right 2 50.0 1551 600 600		mph vph ft ft	
	Adjacent Ramp	Data (if on	e exists	)	
Does adjacent ramp exist Volume on adjacent Ramp Position of adjacent Ram Type of adjacent Ramp Distance to adjacent Ram	qπ	No		vph ft	
Can	version to pc/h	Under Base	Condition	15	
Junction Components  Volume: V (vph)  Peak-hour factor: PHF  Peak 15-min volume: v15  Trucks and buses  Recreational vehicles  Terrain type:		Freeway 1538 0.95 431 17 0 Rolling	Ramp 1551/ 0.95/ 408 2/ 0 Rolling	V	
Grade Length Trucks and buses PCE, E Recreational vehicle PCI Heavy vehicle adjustmen Driver population factor Flow rate, vp	E, ER t, fHV	% mi 2.5 2.0 0.797 1.00 2164	2.5 2.0 0.971 1.00 1682	Ζ mi	% mi pcph

```
__Estimation of V12 Merge Areas__
                  L =
                                  (Equation 25-2 or 25-3)
                          0.00
                  ΕQ
P =
                          0.555 Using Equation 0
                  FM
                    = v (P ) = 1201 pc/h
                  12 F
                          FΜ
                           ____Capacity Checks__
                                                         LOS F?
                           Actual
                                         Maximum
                           3846
                                         7200
      F٥
                           2883
                                         4600
                                                         No
     R12
               __Level of Service Determination (if not F)__
Density: D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.9

R R 12 A
                                                                       pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                         ____Speed Estimation_
Intermediate speed variable,
                                             W = 0.517
Space mean speed in ramp influence area.
                                             S = P4 \cdot I
Space mean speed in outer lanes,
                                             E \cdot B d = 2
                                                          mph
Space mean speed for all vehicles,
                                             Z = F2-7
```

-7

HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	136	rge Analysis		
Analyst:	KA			
Agency/Co::	TRC INTERNAT	TIONAL		
Date performed:	10/8/02	_		
Analysis time period:	SOOP BW DHA			
Freeway/dir or travel:				
Junction:	M-2 /			
Jurisdiction:				
Analysis Year:	500P	_		
Description: KNOX CO1	1-2-2-1	RAMP. PROP. SYS:	rem, ALT. L	
		•	•	
	F.	reeway Data		
		· —		
T 6 1				
Type of analysis		Merge		
Number of lanes in free	ıay	Merge 3		
Number of lanes in freed Free-flow speed on freed	ıay	Merge 3 70.0	mph	
Number of lanes in free	ıay	Merge 3	mph ∨ph	
Number of lanes in freed Free-flow speed on freed	aay aay	Merge 3 70.0	vph	
Number of lanes in freed Free-flow speed on freed Volume on freeway	aay aay	Merge 3 / 70.0 1644/	vph	
Number of lanes in freed Free-flow speed on freed Volume on freeway  Side of freeway	aay aay	Merge 3' 70.0 1644' n Ramp Data	vph	
Number of lanes in freed Free-flow speed on freed Volume on freeway  Side of freeway Number of lanes in ramp	aay aay	Merge 3' 70.0 1644' n Ramp Data Right	vph	
Number of lanes in freed Free-flow speed on freed	aay aay	Merge 3/ 70.0 1644/ n Ramp Data Right 2/	vph	
Number of lanes in freed Free-flow speed on freed Volume on freeway  Side of freeway  Number of lanes in ramp Free-flow speed on ramp	uay uay0	Merge 3/ 70.0 1644/ n Ramp Data Right 2/ 50.0	vph mph	

Does adjacent ramp exist?

Volume on adjacent Ramp

Position of dadjacent Ramp

Type of adjacent Ramp

Distance to adjacent Ramp

Conversion to pc/h Under Base Conditions

\_\_Adjacent Ramp Data (if one exists)\_

Adjacent Junction Components Freeway Ramp Ramp **ЬЬЗ** ✓ Volume, V (vph) 3644 🗸 vph Peak-hour factor, PHF 0.95 / 0.95/ 433 17 イ 274 Peak 15-min volume, v15 ٧ Trucks and buses 7. Recreational vehicles П 0 Z. Rolling ~ Rolling 🗸 Terrain type: Level Z, 7. Grade Length mi Мi шi Trucks and buses PCE, ET 2.5 2.5 Recreational vehicle PCE, ER 5.0 5.0 Heavy vehicle adjustment, fHV 0.797 0.971 Driver population factor: fP 1.00 1.00 2172 Flow rate, vp 719 pcph

```
_Estimation of V12 Merge Areas_
                                  (Equation 25-2 or 25-3)
                          0.00
                  EQ
                  P =
                          0.555 Using Equation 0
                  FM
                  v = v (P) = 1205 \text{ pc/h}
                   15
                      F FM
                           ____Capacity Checks_
                                                         LOS F?
                           Actual
                                         Maximum
                                         7200
                                                         Νo
                           2891
     F0
                                         4600
                                                         Νo
                           1924
      R12
               ___Level of Service Determination (if not F)__
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = R R B2 A
                                                                       pc/mi/ln
Level of service for ramp-freeway junction areas of influence A
                     _____Speed Estimation__
                                             M = 0.168
Intermediate speed variable,
Space mean speed in ramp influence area.
                                             E \cdot 2d = 2
                                                          mph
                                             E - 84 = 2
Space mean speed in outer lanes.
                                                           mph
                                             2 = PP·3
                                                          mph
Space mean speed for all vehicles.
```

e r

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

	Analysis	
Analyst: KA		
Agency or Company: TRC INTERNATION	DNAL	
Date Performed: 10/8/02	/	
Analysis Time Period: 2006 AM DHV		
Freeway/Direction: I-75		
From/To: S.B.,20. OF I	NTERCHANGE "	
Jurisdiction:		
Analysis Year:	ALTERENATE 1 🗸	
Flow Inputs		
W-1 II	3189 🗸	veh/h
Volume: V	0.95/	A SILL II
Peak-hour factor, PHF	U.73/	v
Peak 15-min volume, v15	11	\ %
Trucks and buses	ריר. יויר	ž
Recreational vehicles		<i>'</i> •
Terrain type:	Rolling∕ 0.00	z
Grade	0.00	ni
Segment length	2.5	tu T
Trucks and buses PCE, ET	5.0	
Recreational vehicle PCE, ER	D-858	
Heavy vehicle adjustment, fHV	7.00	
Driver population factor, vp	1304	pc/h/ln
Flow rate, vp	דטכע	pe/ii/ Iii
Speed Inputs	and Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	F - O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freew	ay
LOS and Perf	ormance Measures	
flow rate, vp	1304	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	18-6	pc/mi/ln
Level of service, LOS	c -	•

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

```
___Operational Analysis____
Analyst:
                       KA
Agency or Company:
                       TRC INTERNATIONAL
                       10/8/02
Date Performed:
Analysis Time Period:
                       500P bw phA ~
Freeway/Direction:
                       I-75
                       S.B., SO. OF INTERCHANGE
From/To:
Jurisdiction:
                       500P
Analysis Year:
Description: KNOX CO., PROP. SYSTEM, ALTERENATE 1
```

\_\_\_\_Flow Inputs and Adjustments\_\_\_\_ 2307 / Volume: V veh/h Peak-hour factor, PHF ь07 11 Peak 15-min volume, v15 7 Trucks and buses 0 Recreational vehicles Rolling ~ Terrain type: 7. 0.00 Grade 0.00 Segment length mi Trucks and buses PCE, ET 2.5 2.0 Recreational vehicle PCE - ER 0.858 Heavy vehicle adjustment, fHV 1.00 Driver population factor, vp pc/h/ln Flow rate, vp 943

Speed Inputs and	Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance Interchange density	6.0 0.50	ft interchange/mi
Number of lanes, N	3 ~	1110C1 C11011gC11
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0 Urban Freeway	mi/h

LOS and Pe	rformance Measures_	
Flow rate, vp Free-flow speed, FFS	943 70•0	pc/h/ln mi/h
Average passenger-car speed, S Number of lanes, N	70.0 3	mi/h
Density, D Level of service, LOS	13·5 8	pc/mi/ln

# HCS2000: Multilane Highways Release 4-1b

#### \_OPERATIONAL ANALYSIS\_ Ken Arnold Analyst: Agency/Co: TRC International 5/21/02 Date: Analsis Period: AM S-R. 131 (Emory Road) Highway: From/To: Central Ave-/I-75 Jurisdiction: Analysis Year: 500P Project ID: Knox Co., Prop. System , Alt. | \_FREE-FLOW SPEED\_ Direction Lane width 12.0 ft 12.0 ft Lateral clearance: Right edge 2.0 5.0 ft fţ Left edge P - O ft P · O ft Total lateral clearance 8.0 8.0 ft ft Access points per mile 25 Median type Divided Divided Free-flow speed: Base Base FFS or BFFS 60.0 60.0 mph mph Lane width adjustment, FLW 0.00.0 mph mph Lateral clearance adjustment, FLC 0.9 0.9 mph mph Median type adjustment, FM 0.0 0.0 mph mph Access points adjustment, FA 1 - 3 mph 5.5 mph Free-flow speed 57.8 53.Ь mph mph VOLUME Direction 939 < 747-Volume: V voh vph 0.95/ 0.95 / Peak-hour factor, PHF Peak 15-minute volume, v15 247 197 Trucks and buses 2 / Z. 2 ~ 'n. Recreational vehicles Ω Ð Z Z Terrain type Rolling -Rolling ~ Grade Z 0.00 Z n nSegment length 0.000.00 Μì Number of lanes 2 / 2 — 1.00 Driver population adjustment, fP 1.00 Trucks and buses PCE, ET 2.5 2.5 Recreational vehicles PCE, ER 5.0 2.0 Heavy vehicle adjustment, fHV 0.971 0.971 Flow rate, vp 509 pcphpl 404 pcphpl RESULTS\_ Direction · 1 5 509 404 Flow rate, vp pcphpl pcphpl Free-flow speed, FFS 53.6 57.A mph mph Avg. passenger-car travel speed, S 57.8 mph 53.b mph Level of service, LOS Density, D 8.8 pc/mi/ln 7.5 pc/mi/ln

HCS2000: Multilane Highways Release 4-1b

	OPERATIO	NAL ANALYSI	I Z	· : · · · · · · · · · · · · · · · · · ·	
	Ken Arnold				
	TRC International				
	5/21/02				
Analsis Period:∷ Highway:	en S.R. 131 (Emory Road	al 1			
	central Ave./I-75	υ,			
Jurisdiction:	Central Ave./1-/3				
	500P ~				
	Knox Co., Prop. Sys	tem, Alt	1		
		-FLOW SPEET			
	Direction	l		2	
Lane width	MI ECCION	75.0	ft	15.0	ft
Lateral clearanc	e <b>:</b>	~ C - U	. •		. •
Right edge	_	2.0	ft	2.0	ft
Left edge		F 0	ft	6.0	ft
-	al clearance	8.0	ft	8-0	ft
Access points pe	r mile	5		25	
Median type		Divided		Divided	
Free-flow speed:		Base		Base	
FFS or BFFS		PO - O	mph	<b>60</b> ⋅0	mph
Lane width adjus		0.0	mph	0-0	wbp
	e adjustment, FLC	0.9	wbp	0.9	wbp
Median type adju		0.0	mph	0.0	mph
Access points ad	justment, FA	1.3	mph	5-5	mph
Free-flow speed		57.8	mph	53.6	mph
		_VOLUME		_	
	Direction			2	
Volume, V	Direction	1 1097 ~	vph	1037	vph
Peak-hour factor	. PHF	0.95/	Vpii	0.95	VPII
Peak 15-minute v		P85		273	
Trucks and buses	514mc1 545	ر ج	Ż.	5 -	7,
Recreational veh	icles	Õ	ž	ō	Ż.
Terrain type		Rolling ~		Rolling -	
Grade		0.00	%	0.00	አ የ
Segmenť leng	th	0.00	mi	0.00	mi
Number of lanes		2 /		5 ~	
Driver population	n adjustment, fP	1.00		1 - 00	
Trucks and buses		2 • 5		2 - 5	
Recreational veh		5.0		2.0	
Heavy vehicle ad	justment, fHV	0-971	, -	0.971	
Flow rate, vp		594	pcphpl	562	pcphpl
		_RESULTS			
	Direction	7		2	
Flow rate, vp		594	pcphpl	562	pcphp1
Free-flow speed:		57.8	πph	53.6	mph
Avg passenger-c	ar travel speed, S	57-8	mph	53·6	mph
Level of service	- L0Z	A		A	
Density, D		70-3	pc/mi/ln	30 6	pc/mi/ln

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Inter.:

Agency: TRC International Date: 10/08/02
Period: AM Area Type: All other areas

Jurisd:

Year : 2006

Project ID: Knox Co., Prop. System, Alt. 1 E/W St: S.R. 131 (Emory Road) N/S N/S St: I 75 Ramps

	l Ea	stboun			D INTERSE bound		thbour	_	Sou	thbound	<u> </u>
	ļ L	T	R I		T R	I L	T	R I	L	T I	٦ !
No· Lar "GConfi Volume "ane Wi RTOR Vo	g   L   159  dth   112.0	T 338	I	2 L 1009 5 12.0 1		2   L  117  12.0	0	- 1	2 L 12 12 12	0 (	' 3 i 1
uratio	n 0.25		Area T		ll other						
hase (	ombinatio	n l	2	3 319n	al Operat 4 i	.10/15	5	Ь	7	8	
EB Lef		Α	_	_	I NB	Left	Ā	-			
Thr	`u	A			1	Thru					
Rig	jht .				1	Right					
Ped	İs				I	Peds					
WB Lef	t		A		1 ZB	Left	A				
Thr	`u		A		1	Thru					
Rig					ı	Right					
Ped					!	Peds					
NB Rig	•				! EB	Right					
SB Rig	ht	20.0			1 WB	Right	22.0				
Green		30.0 3.0	48.0 3.0				27.0 3.0				
Yellow All Rec	1	5.0	3.0				5.0				
all Nec	ı	C • U	E.D					o len	ath:	150.0	sec
		In	tersec	tion P	erformand	e Summa			g • · · ·		
Appr/	Lane		Sat	Rat		Lane		App	roach		
Lane	Group		Rate								
Grp	Capacity	(	5)	v/c	g/C	Delay	ΓÓΖ	Dela	y LOS		
Fasthor	ind										
		350	2	0.07	0.25	34.4	c				
Ĺ	476 476 E08	350 361		0.07	0.25	34 - 4 37 - 7	C D	37.2	D		
L T	478 E0P							37.2	D		
Eastbou t T Westbou	458 E0P bnu	361	0	0.39	0.25	37-7	D	37.2	D		
L T Westbou L	876 903 und 1401	361 350	0	0.39 0.76	0.40	37.7	D C				
T T	458 E0P bnu	361	0	0.39	0.25	37-7	D	37.2	D C		
L T Westbou L T	87 <u>6</u> 903 200 1401 1444	361 350	0	0.39 0.76	0.40	37.7	D C				
i T Westbou L T Northbo	87 <u>6</u> 903 200 1401 1444	361 350	0 2 0	0.39 0.76	0.40	37.7	D C				
L T Westbou L T Northbo L	975 903 1401 1444 Dund 788	350 361	0 2 0	0.39 0.76 0.40	0.25 0.40 0.40	37.7 33.4 25.9	D C C	30-8	C		
L T Westbou L	975 903 1401 1444 Dund 788	350 361	0 0	0.39 0.76 0.40	0.25 0.40 0.40	37.7 33.4 25.9	D C C	30-8 37-4	C D		
L T Westbou L T Northbo L	876 903 1401 1444 Dund 788	350 350	0 0	0.39 0.76 0.40	0.25 0.40 0.40	37.7 33.4 25.9	D C C	30-8	C		
Jestbou T T Northbo	876 903 1401 1444 288 ound 788	350 350 350 350	0 2 2	0.39 0.76 0.40 0.16	0.25 0.40 0.40	37.7 33.4 25.9 37.4	D C C C D D	30-8 37-4	C D	= (	

HCS2000: Signalized Intersections Release 4.1b

Inter:: Area Type: All other areas

Analyst: KA Intractional Are Agency: TRC International Are Date: 10/08/02 Jur Period: PM Year Project ID: Knox Co., Prop. System, Alt. 1 E/W St: S.R. 131 (Emory Road) N/S Jurisd: Year : 2006

N/S St: I 75 Ramps

<del></del>	I Ea	Sl stbound	.GNALIZED i Westb	INTERSE		SUMMAR		2011	thbou	n d	
	į L	T R	I L T		I L			L	T	R	į
No. Lanes LGConfig Volume Lane Widt RTOR Vol	1753   F	T 782	2   L  471 58  112.0 12	-	1 2 1 L 1375 112-0	0	I	75·0 710 F	0	0	_
Duration	0.25	Area		l other l Operat				-	· · · · ·		
Phase Cor EB Left Thru Right Peds WB Left Thru Right Peds NB Right SB Right Green Yellow All Red	t t	A A A A A A A A A A A A A A A A A A A	3	1 NB	Left Thru Right Peds Left Thru Right Peds Right Right	5 A A A 30.0 3.0 2.0	Ь.	7	8		
		Interse		rformanc		3ry		gth:	<u> </u>		s
Lane (	Lane Group	` Adj Sat Flow Rate			Lane 6			roach	_		
Grp (	Capacity	(5)	v/c	g/C	Delay	L02	Dela	y LOS			
Eastbound L T	7503 77 <u>6</u> 3	3P10 3205	0.11 0.68	0.33 EE.O	27.7 36.2	C D	35.0	+ D			
Westbound						_					
L T	1021	3670 3205	0.49 0.58	P5.0 P5.0	35.4 37.1	D D	36.4	D			
Northbour L	876	3502	0.45	0.25	38.4	D	38.4	D			
Southbour L	ոd <b>87</b> ե	3502	0 - 1 3	0.25	35.0-	c	35.0	- c			
	Interse	ction Delay	= 36.1	(sec/ve	h) Ir	iterse	ction	L <b>0</b> S :	= D		

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA

Agency: TRC INTERNATIONAL

Date: 8/29/02

Period: AM

Project ID: KNOX CO, PROP. SYSTEM, ALT.!

E/W St: S.R. 131 (EMORY ROAD)

Inter.: PRIMETIME ROAD/S.

Area Type: All other area

Jurisd:
Year : 2006

Year : 2006

N/S St: PRIMETIME ROAD Inter:: PRIMETIME ROAD/S.R. 131
Area Type: All other areas

		7.7	CMALTZE1	) INTERSE	CTTAN 1	C 1 1 M M A D				
***************************************		stbound	l Westi	oound	1 Nort	thboun	id I		thbour	
	l L	T R	! L 7	Γ R	<b>L</b>	T	RI	L	T	₹ I
No. Lane LGConfig Volume Lane Wid RTOR Vol	1947 1947 Ith 112.0	TR ~ 735~ 45 ~ 12.0	1 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	2 0 TR / ?70 8 / ?•0	1/   L+  12.0   	TR-	0		LT 9 / 3 12.0 )	1   R   384     12.0
Duration	0.25	Area		l other		•				
Phase Co	mbinatio	n 1 2	3 ana	al Operat 4	1005	5	ь	7	В	
EB Left		A	,	INB	Left	A	-	'		
Thru	1	A A		1	Thru	A				
Righ	t	A A		1	Right	A				
Peds				1	Peds					
WB Left		A		1 28	Left		A			
Thru		A		!	Thru		A			
Righ Peds		A		!	Right		A			
NB Righ				I EB	Peds					
SB Righ		A		1 WB	Right Right					
Green		21.0 42.0		, wo	Kigiic	11.0	11.0			
Yellow		3.0 3.0								
		3.0 3.0				3.0	3.0			
All Red		5.0 5.0				5.0	5.0			
		5.0 5.0				2.0 Cycl	ē.o e Leng	th: :	105.0	secs
All Red		2.0 2.0 Intersed	tion Pe	rformanc		2.0 Cycl ary	2.0 e Leng		105.0	secs
All Red	Lane Group	2.0 2.0 Intersec _ Adj Sat	Rati	erformanc os	e Summa Lane (	2.0 Cycl ary	2.0 e Leng		105.0	secs
All Red Appr/ Lane	Lane Group Capacity	Intersection Adj Sat	Rati	erformanc os g/C		Cycl ary Group	2.0 e Leng	oach		secs
All Red Appr/ Lane Grp	Group Capacity	Intersection Adj Sat	Rati ———	.os	Lane (	Cycl ary Group	e Leng	oach		secs
All Red Appr/ Lane	Group Capacity d	Intersection Adj Sat Flow Rate (s)	Rati v/c	g/C	Delay	Cycl Cycl Group Cuon	e Leng	oach		secs
Appr/ Lane Grp	Group Capacity d 361	Intersection Adj Sat	Rati ———	.os	Delay 36.0	Cycl ary Group	e Leng	oach		secs
Appr/ Lane Grp Eastboun L	Group Capacity d 361 2324	Intersection Adj Sat Flow Rate (s)	Rati v/c	g/C 0.20	Delay	Cycl Cycl Group COU ZOJ	2.0 e Leng Appr Delay	L02		secs
Appr/ Lane Grp  Eastboun L TR	Group Capacity d 361 2324 d	Intersection Adj Sat Flow Rate (s)	Rati v/c 0.27 0.35	g/C 0.20 0.65	Delay  36.0  8.5	Cycl Cycl Broup COS	2.0 e Leng Appr Delay	L02		secs
Appr/ Lane Grp  Eastboun L TR  Westboun L	Group Capacity d 361 2324 d 264	Intersection Adj Sat Flow Rate (s)  LAOS 3589	0.27 0.35	g/C 0.20 0.65	Delay  36.0 8.5	Cyclary Group LOS D A	Appr Delay	L0S		secs
Appr/ Lane Grp  Eastboun L TR	Group Capacity d 361 2324 d	Intersection Adj Sat Flow Rate (s)	Rati v/c 0.27 0.35	g/C 0.20 0.65	Delay  36.0  8.5	Cycl Cycl Broup COS	2.0 e Leng Appr Delay	L02		secs
Appr/ Lane Grp  Eastboun L TR  Westboun L TR	Group Capacity d 361 2324 d 264 1443	Intersection Adj Sat Flow Rate (s)  LAOS 3589	0.27 0.35	g/C 0.20 0.65	Delay  36.0 8.5	Cyclary Group LOS D A	Appr Delay	L0S		secs
Appr/ Lane Grp  Eastboun L TR  Westboun L	Group Capacity d 361 2324 d 264 1443	Intersection Adj Sat Flow Rate (s)  LAOS 3589	0.27 0.35	9/C 0.20 0.65 0.40	36.0 8.5	Cyclary Group LOS D A B D	Appr Delay	L0S		secs
Appr/Lane Grp Eastboun L TR Westboun L TR	Group Capacity d 361 2324 d 264 1443	Intersection Adj Sat Flow Rate (s)  LAGS 3589  LAGS 3589	Rati v/c 0.27 0.35 0.01 0.93	g/C 0.20 0.65	Delay  36.0 8.5	Cyclary Group LOS D A	Appr Delay	L0S		secs
Appr/Lane Grp Eastboun L TR Westboun L TR Northbou	Group Capacity  d 361 2324 d 264 1443 nd 189	Intersec Adj Sat Flow Rate (s) 1805 3589 650 3608	Rati v/c 0.27 0.35 0.01 0.93	9/C 0.20 0.65 0.40 0.40	36.0 8.5 19.0 41.1	Cyclary Cyclar	Appr Delay	A Second		secs
Appr/ Lane Grp  Eastboun L TR  Westboun L TR  Northbou L TR	Group Capacity  d 361 2324 d 264 1443 nd 189 194	Intersect Adj Sat Flow Rate (s)  LAGS 3589  LAGS 3589  LAGS 3589	0.27 0.35 0.01 0.93	9/C 0.20 0.65 0.40 0.40	36.0 8.5 19.0 41.1	Cyclary Froup  D A B D	Appr Delay  11.5	D D		secs
Appr/ Lane Grp  Eastboun L TR  Westboun L TR  Northbou L TR  Southbou	Group Capacity  d 361 2324 d 264 1443 nd 189 194 nd	Intersect Adj Sat Flow Rate (s)  LAOS 3589  LAOS 3589  LAOS 1808	Rati v/c 0.27 0.35 0.01 0.93	9/C 0.20 0.65 0.40 0.40	36.0 8.5 19.0 41.1 43.6 42.3	Cyclary Froup  LOS  D A  B D D	Appr Delay  11.5	A Second		secs
Appr/ Lane Grp  Eastboun L TR  Westboun L TR  Northbou L TR	Group Capacity  d 361 2324  d 264 1443  nd 189 194  nd 191 569	Intersect Adj Sat Flow Rate (s)  LAGS 3589  LAGS 3589  LAGS 3589	0.27 0.35 0.01 0.93 0.22 0.03	9/C 0.20 0.65 0.40 0.40	36.0 8.5 19.0 41.1 43.6 42.3	Cyclary Cyclary Los D A B D D C	Appr Delay  11.5	D C		secs

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA

Agency: TRC INTERNATIONAL

Date: 8/29/02

Period: PM

Project ID: KNOX CO, PROP. SYSTEM, ALT. Inter.: PRIMETIME ROAD/S.R. 131 Area Type: All other areas

N/S St: PRIMETIME ROAD / - (daos ysoms) LEL -S.Z :12 W/3

	l Ea	stbour			D INTERSI bound		thbou		Zor	ithbou	nd I
	] <b>L</b>	Ť	R I	L	T R	! L	Ţ	R I	L	T	R I
No. Lane	s	- 2/		<u> </u>	2/0	-¦ <u>1</u> -	1,	一: `	0	1./	1, -
LGConfig		TR-		L-	TR'	أيآ	TR-			ĹŦŹ	
Volume			<b>165</b> /1		36-76-	1125-			90 🗸		1.50 √i
	th 11,2.0	15.0		75.0 TS	2.0	175.0	15.0	I		15.0	75.0 I
RTOR Vol	1		55 I		25	I	ı	4 1			50 !
Duration	0.25	,	Area T	ype: A	ll other al Operai	areas					,, <u>,,</u>
Phase Co	mbinatio	n li	2	319'''	4   4		5	Ь	7	8	
EB Left		A			I NB	Left	A				
Thru		A	A		I	Thru	A				
Righ		A	A		1	Right	. А				
Peds					1	Peds					
WB Left Thru			A		1 28	Left		A			
Righ			A A		1	Thru		A			
Peds			~		!	Right Peds		A			
NB Righ					1 88	Right					
SB Righ		A			1 MB	Right					
Green		22.0	37.0		נוש ו	Krgiic	13.0	17.0			
								1. 4 ! !			
Yellow		3.0	3.0								
							3 - 0	. 5.0 3.0 13.0			
		3·0 3·0	5 · 0 3 · 0		_		5 · 0 3 · 0	3.0 , 2.0 le Leng	gth:	105.0	secs
All Red	Lane	3.0 2.0	3.0 2.0 tersec		erformand		3.0 2.0 Cyc:	3.0 2.0 le Leng			secs
All Red	Lane Group	3.0 2.0 In	3.0 2.0 tersec	tion Pe Rati			3.0 2.0 Cyc:	3.0 , 2.0 le Leng			secs
All Red Appr/ Lane	Lane Group Capacity	3.0 2.0 In Adj	3.0 2.0 tersec			Lane	3.0 2.0 Cyc: ary Group	3.0 2.0 le Leng	roach		secs
All Red Appr/ Lane Grp	Group Capacity	3.0 2.0 In Adj	3.0 2.0 tersec Sat Rate	Rati	ios	Lane	3.0 2.0 Cyc: ary Group	3.0 , 2.0 le Leng	roach		secs
All Red Appr/ Lane Grp Eastboun	Group Capacity d 378	3.0 2.0 In Adj	3.0 2.0 tersec Sat Rate s)	Rati	ios	Lane	3.0 2.0 Cyc: ary Group	3.0 , 2.0 le Leng	roach		secs
All Red Appr/ Lane Grp Eastboun	Group Capacity d	3.0 2.0 In Adj Flow	3.0 2.0 tersec 2at Rate s)	Rati	ios g/(	Lane Delay	3.0 Cyc: ary Group	3.0 , 2.0 le Leng	roach / LOS		secs
Appr/ Lane Grp Eastboun L	Group Capacity d 378 2177	3.0 2.0 In Adj Flow (	3.0 2.0 tersec 2at Rate s)		g/C 0.21	Lane Delay	3.0 Cyc: Group LoS	3-0 , 2-0 le Leng Appr Delay	roach / LOS		secs
Appr/ Lane Grp Eastboun L TR	Group Capacity d 378 2177	3.0 2.0 In Adj Flow (	3.0 2.0 2.tersed 2at Rate s)		g/C 0.21	Velay 43.2 16.3	3.0 Cyc: ary Group LOS	3-0 , 2-0 le Leng Appr Delay	roach / LOS		secs
Appr/ Lane Grp Eastboun L TR Westboun	Group Capacity d 378 21,77	3.0 2.0 In Adj Flow (	3.0 2.0 2at Rate s)	0-6 0-75	g/C 0.21 0.61	Lane Delay	3.0 Cyc: Group LoS	3-0 , 2-0 le Leng Appr Delay	roach / LOS		secs
Lane Grp Eastboun L TR Westboun L TR	Group Capacity d 378 21,77 d 85 1263	3.0 2.0 In Adj Flow 357	3.0 2.0 tersec 2at Rate s)	0.68 0.75	0.21 0.61 0.35 0.35	Velay 43.2 16.3	3.0 Cyc: ary Group Los	3.0 , 2.0 le Leng Appr Delay	roach y LOS		secs
Appr/Lane Grp Eastboun L TR Westboun L TR Northbou	Group Capacity d 378 21,77 d 85 1263 nd 223	3.0 2.0 In Adj Flow ( 180 357 244 358	3.0 2.0 tersec 2at Rate s) 5	Rat: v/c  0.68 0.75  0.03 0.86	0.21 0.61 0.35 0.35	Velay 43.2 16.3 22.5 38.2	J. D. Cyc: ary Group B B C D	3.0 , 2.0 le Leng Appr Delay	P B		secs
Appr/Lane Grp Eastboun L TR Westboun L TR Northbou	Group Capacity d 378 21,77 d 85 1263	3.0 2.0 In Adj Flow 357	3.0 2.0 tersec 2at Rate s) 5	0.68 0.75	0.21 0.61 0.35 0.35	V3.2 16.3 22.5 38.2	B C	3.0 , 2.0 le Leng Appr Delay	P B		secs
Appr/Lane Grp Eastboun L TR Westboun L TR	Group Capacity d 378 21,77 d 86 1263 nd 223 229	3.0 2.0 In Adj Flow ( 180 357 244 358	3.0 2.0 tersec 2at Rate s) 5	Rat: v/c  0.68 0.75  0.03 0.86	0.21 0.61 0.35 0.35	Velay 43.2 16.3 22.5 38.2	J. D. Cyc: ary Group B B C D	3.0 , 2.0 le Leng Appr Delay	P B		secs
Appr/Lane Grp Eastboun TR Westboun L TR Northbou	Group Capacity d 378 21,77 d 86 1263 nd 223 229	3.0 2.0 In Adj Flow ( 180 357 244 358	3.0 2.0 2at Rate s) 5	Rat: v/c  0.68 0.75  0.03 0.86	0.21 0.61 0.35 0.35	Velay 43.2 16.3 22.5 38.2	J. D. Cyc: ary Group B B C D	3.0 , 2.0 le Leng Appr Delay	P D		secs
Appr/ Lane Grp Eastboun TR Westboun L TR Northbou L TR	Group Capacity d 378 21,77 d 86 1263 nd 223 229	3.0 2.0 In Adj Flow 357 244 358	3.0 2.0 2.at Rate s) 5 2	V/c  0.68 0.75  0.03 0.86  0.59 0.19	0.21 0.41 0.35 0.35 0.12	43.2 16.3 22.5 38.2 47.7	B C D D D	3.0 2.0 le Leng Appr Delay 19.9 38.1	P D		secs

# HCS2000: Multilane Highways Release 4.1b

OPERATI	ONAL ANALYS	213		
Analyst: Ken Arnold				
Agency/Co: TRC International				
Date: 5/21/02				
Analsis Period: AM				
Highway: SR 131 (Emory Road From/To: Primetime Road/Ris	, -			
From/To: Primetime Road/Bis! Jurisdiction:	nop /			
	stom 414			
,	•			
	E-FLOW SPEE	ν <u></u>		
Direction Lane width	l l	<i>a</i> .	2	_
	15.0	ft	15.0	ft
Lateral clearance: Right edge	2.5	<b>.</b> .		
	5.0	ft	5.0	ft
Left edge Total lateral classes	6.0	ft	F · O	ft
Total lateral clearance Access points per mile	8-0	ft	8.0	ft
Median type	70		10	
Free-flow speed:	Divided		Divided	
FFS or BFFS	Base		Base	
Lane width adjustment, FLW	FO.0	mph	PO.0	mph
take width adjustment, Flw	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC Median type adjustment, FM	0.9	mph	0.9	wbp
Access points adjustment, FA	0.0	mph	0.0	wbp
Free-flow speed	2.5	wbp	5 · 5	mph
. ee liom zheen	5h.P	wbp	5b - b	mph
	volume			
Direction	l.		2	
Volume, V	791	vph	1591	vph
Peak-hour factor, PHF	0.95/	Ψμ	0.95 /	vp.ii
Peak 15-minute volume, v15	208		337	
Trucks and buses	3	%	3	Z
Recreational vehicles	Õ	ž	á	ž
Terrain type	Rolling	-	Rolling	-
Grade	0.00	4	0.00	χ.
Segment length	0.00	mi	0 - 00	mi
Number of lanes	ž	<b>-</b>	5	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	2.5		2.5	
Recreational vehicles PCE, ER	2.0		5.0	
Heavy vehicle adjustment, fHV	0.957		0.957	
Flow rate, vp	435	pcphpl	704	pcphpl
	_RESULTS			
Direction	1		5	
Flow rate, vp	435	B#86-1	:70n	b-1
Free-flow speed, FFS	933 56.6	pcphp1	704	pcphpl
Avg. passenger-car travel speed, S	56.6	mph	56 · 6	mph = a b
evel of service, LOS		mph	5b.b	mph
Density D	A 7.7	pc/mi/ln	8 12-4	pc/mi/ln
Overall results are not computed	when free-f	low speed	is less t	han 45 mph.

# HCS2000: Multilane Highways Release 4.1b

\_\_OPERATIONAL ANALYSIS\_\_\_\_

V. CIVALIA	MAL MMACIS.	٠		
Analyst: Ken Arnold				
Agency/Co: TRC International				
Date: 5/21/02				
Analsis Period: PM				
Highway: SR 131 (Emory Road)				
From/To: Primetime Road/Bish	op			
Jurisdiction:				
Analysis Year: 2006				
Project ID: Knox Co., Prop. Sys	tem , A/t.,	ļ		
FREE	-FLOW SPEET	)		
N*			-	
Direction	l 		2	•
Lane width	15.0	ſt	75.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	P - O	ft	<b>Ь.</b> 0	ft
Total lateral clearance	8-0	ft	8.0	ft
Access points per mile	70		70	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	PO · O	mph	FO · O	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.9	mph	0.9	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.5	mph	2.5	mph
Free-flow speed	5b.6	•	56.6	•
se-11om sheep	36.6	mph	30.5	mph
	vornwe	1, 41 101		
Direction	1.		2	
Volume, V	1545	vph	1597	vph
Peak-hour factor: PHF	0.95/		0.95/	
Peak 15-minute volume, v15	407		337	
Trucks and buses	3	%	3	Ż.
Recreational vehicles	Ō	'X	0	½
Terrain type	Rolling		Rolling	
Grade	0.00	7	0.00	2
Segment length	0.00	mi	0-00	тi
Number of lanes	5	III #	5	<u>T</u>
Driver population adjustment, fP	c 1.00		1.00	
Trucks and buses PCE, ET	2.5		2.5	
Recreational vehicles PCE, ER	2.0	•	5.0	
Heavy vehicle adjustment, fHV	0.957		0-957	
flow rate, vp	849	pcphpl	704	pcphpl
	_RESULTS			
Direction	1		a	•
<b>51</b> , 22, 52, 11				
Flow rate, vp	849	pcphpl	704	pcphpl
Free-flow speed, FFS	5b · b	mph	56·b	mph
Avg. passenger-car travel speed, S	5b.b	πph	56.6	mph
Level of service, LOS	B	•	В	•
Density, D	15.0	pc/mi/ln		pc/mi/ln
Overall results are not computed a	when free-f	low speed	is less t	han 45 mph.
,	*	-		-

Analysis Summary , Alternate 1 2026 Traffic and Proposed Geometrics

Location	Type Analysis	Design Hour	LOS
I-75 Northbound South	Basic Freeway	AM	В
of Interchange	Segments	PM	C
I-75 Northbound,	Basic Freeway	0.04	<b>D</b>
South of D-1 Major		AM	В
Diverge	Segments	PM	В
I-75 Northbound , North	Basic Freeway	АМ	В
of D-1 Major Diverge	Segments	PM	В
M-1, I-75 Northbound	Ramp and Ramp	AM	В
On-ramp from SR 131	Junctions	PM	В
I-75 Northbound, North	Ramp and Ramp	AM	В
of M-1 On-ramp from		Alvi	D
SR 131	Junctions	PM	В
I-75 Northbound North	Basic Freeway	AM	C
of Interchange	Segments	PM	С
I-75 Southbound, North	Basic Freeway	AM	С
of Interchange	Segments	PM	С
I-75 Southbound, North	Basic Freeway	AM	B.
of D-2 Off-ramp	Segments	PM	В
D-2, I-75 Southbound	Ramp and Ramp	AM	В
Off-ramp to SR131	Junctions	PM	В
I-75 Southbound,	Basic Freeway	AM	В
South of D-2 Off-ramp		Alvi	В
to SR 131	Segments	PM	
M-2, I-75 Southbound	Ramp and Ramp	AM	В
On-ramp from SR131	Junctions	PM	A
I-75 Southbound South	Basic Freeway	AM	С
of Interchange	Segments	PM	В
SR 131 west of I-75	Multilane	AM	В
	Highways	PM	В
SR 131/I-75 Ramps	Signalized	AM	D(36.1)
	Intersection	PM	D(40.9)
SR 131/Primetime Rd.	Signalized	AM	D (37.3)
	Intersection	PM	D (44.5)
SR 131 east of	Multilane	AM	В
Primetime Rd.	Highways	PM	C

Note: The LOS shown for the intersections is the total average intersection delay. The delay in parentheses is in seconds per vehicle.

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (Ь15) ЬЬ1-ОЬ44

Operational An	alysis				
Analyst: Ken Arnold					
Agency or Company: TRC Internation	al				
Date Performed: 5/21/02					
Analysis Time Period: AM					
Freeway/Direction: I-75/SR 131 (Em					
	N.B.,So. of Inter.				
Jurisdiction:					
Analysis Year: 20%6/	14 1				
Description: Knox Co., Prop. System, A	16.1				
Flow Inputs an	d Adjustments				
Volume, V	2876	veh/h			
Peak-hour factor, PHF	0.95	2 2 11 11			
Peak 15-min volume, v15	<b>7</b> 57	v			
Trucks and buses	11/	ž			
Recreational vehicles	0	ž.			
Terrain type:	Rolling 🗸				
Grade	0.00	አ			
Segment length	0.00	mî			
Trucks and buses PCE, ET	2.5				
Recreational vehicle PCE, ER	2.0				
Heavy vehicle adjustment, fHV	0-858				
Driver population factor, vp	1.00				
Flow rate, vp	1176	pc/h/ln			
Speed Inputs a	nd Adjustments				
Lane width	75.0	ft			
Right-shoulder lateral clearance	6.0	ft			
Interchange density	0.50	interchange/mi			
Number of Panes, N	3 🖊	-			
Free-flow speed:	Measured				
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	3.0	mi/h			
Free-flow speed, FFS	70.0	mi/h			
	Urban Freeway				
LOS and Perfor	mance Measures				
Flow rate, vp	1176	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	16.8	pc/mi/ln			
Level of service, LOS	В				

HCS2000: Basic Freeway Segments Release 4.1b

\_\_\_\_\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/21/02
Analysis Time Period:	PM
Freeway/Direction: From/To: Jurisdiction:	I-75/SR 131 (Emory Road) N.B.,So. of Inter.

2026 ~ Analysis Year:

Flow Inputs a	and Adjustments	
Volume, V	3812 /	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	1003	V
Trucks and buses	11	χ,
Recreational vehicles	ñ	ž
Terrain type:	Rolling/	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
Flow rate, vp	1558	pc/h/ln
Speed Inputs	and Adjustments	
Lane width	15.0	ft
Right-shoulder lateral clearance	<b>5</b> .0	ft
Interchange density	0 . 50	interchange/mi
Number of Tanes, N	3 /	
free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h

LOS and	Performance Measures	
flow rate, vp	1558	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.b	mi/h
Number of lanes, N	3	
Density, D	22.4	pc/mi/ln
Level of service, LOS	C	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Operational	Analysis	
Analyst: Ken Arnold Agency or Company: TRC Internati	1	
Date Performed: 5/21/02	pnaı	
Analysis Time Period: AM		
	[man.   B4)	
freeway/Direction: I-75/SR 131 () From/To: N.B., 20. of I)	emory Road)	
Jurisdiction: W.B.420. Of I	nter.	
Analysis Year: 2026~		
Description: Knox Co., Prop. System,	A ! * 4	
•		
Flow Inputs	and Adjustments	
Volume, V	2876	veh/h
Peak-hour factor, PHF	0.95 🗸	
Peak 15-min volume, v15	757	v
Trucks and buses	11 -	Z
Recreational vehicles	ō	ž
Terrain type:	Rolling ≠	
Grade	۵۰۵۵	χ.
Segment, length	0.00	mi
Trucks and buses PCE, ET	2.5	_
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0-858	
Driver population factor, vp	1.00	
Flow rate, vp	588	pc/h/ln
Speed Inputs	and Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	F · O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4 🗸	inter changer in i
Free-flow speed:	Measured	
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	1.5	mi/h
ree-flow speed, FFS	70.0	mi/h
•	Urban Freew	
LOS and Perfo	irmanco Moasuros	
flow rate, vp	882	pc/h/ln
ree-flow speed, FFS	70.0	mi/h
Average passenger-car speed. S	70 - 0	mi/h
Number of lanes, N	4	
Density, D Level of service, LOS	75 P	pc/mi/ln
	B	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

Analyst:	Ken Arnold		
Agency or Company:	TRC Internation	1	
Date Performed:	5/21/02	191	
Analysis Time Period:	PM ~		
Freeway/Direction:	I-75/SR 131 (Em	ocu Poad)	
rom/To:	N.B.,20. of Int	or v	
Jurisdiction:		· -	
inalysis Year:	5056~		
escription: Knox Co.,	Prop. System, A	1 <b>t</b> _0	
	Flow Inputs an	d Adjustments	
/olume, V		3815	veh/h
Peak-hour factor, PHF		0.95	
Peak 15-min volume, v15		1003	V
Frucks and buses		11	<b>γ</b> .
Recreational vehicles		0	ž
errain type:		Rolling 🗸	
Grade		0.00	%
Segment length		0.00	mi
[rucks and buses PCE, ET		2 · 5	
Recreational vehicle PCE		5 · 0	
Heavy vehicle adjustment		0.858	
river population factor low rate, vp	· vp	1.00	4. 4.
Tow races ob		1164	pc/h/ln
	_Speed Inputs a	nd Adjustments	
ane width		75.0	ft
Right-shoulder lateral c	learance	6 · O	ft
nterchange density		0.50	interchange/mi
umber of Panes, N		4 🖊	-
ree-flow speed:		Measured	
FFS or BFFS		70.0	mi/h
ane width adjustment, f	LW	0.0	mi/h
ateral clearance adjust		0.0	mi/h
nterchange density adju		0.0	mi/h
lumber of lanes adjustme	UC 1 IN	1.5	mi/h
ree-flow speed, FFS		70.0	mi/h
		Urban Freewa	ıy
-	_L0S and Perfor	mance Measures	
low rate, vp		1169	pc/h/ln
roo-flow enand FFC		70.0	mi/h
ise-irom 2bseq 1 tt2	7 .haa	70.0	mi/h
verage passenger-car sp	eed, 3		
ree-flow speed, FFS verage passenger-car sp umber of lanes, N	220, 3	ų	
verage passenger-car sp	2201 3		pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

	Operational An	alysis	
Analyst:	Ken Arnold		
Agency or Company:	TRC Internation	al	
Date Performed:	5/21/02		
Analysis Time Period:	MA		
Freeway/Direction:	I-75/SR 131 (Em	orv Road)	
From/To:	N.8. North of D	- J.	
Jurisdiction:			
Analysis Year:	5058	_	
Description: Knox Co.,	Prop. System, A	It. 1	
	Flow Inputs and	d Adjustments	
Volume, V		2146	veh/h
Peak-hour factor, PHF		0.95 /	
Peak 15-min volume, v15		565	v
Trucks and buses		15	Ż.
Recreational vehicles		0	%
Terrain type:		Rolling	
Grade		0.00	Ż.
Segment length		0.00	mi
Trucks and buses P(E, E)	Γ	2.5	
Recreational vehicle PCE	E, ER	2.0	
Heavy vehicle adjustment	t∍ fHV	0.806	
Driver population factor	-, vp	1.00	
Flow rate, vp			
. Tow races vp		934	pc/h/ln
, , , , , , , , , , , , , , , , , , , ,	Speed Inputs ar		pc/h/ln
, , , , , , , , , , , , , , , , , , , ,	Speed Inputs an		pc/h/ln ft
. , , ,		nd Adjustments	`
Lane width		nd Adjustments	ft
Lane width Right-shoulder lateral of Interchange density Number of Panes, N		nd Adjustments 12.0 6.0	ft ft
Lane width Right-shoulder lateral of Interchange density Number of Panes, N Free-flow speed:		nd Adjustments 12.0 6.0 0.50	ft ft
Lane width Right-shoulder lateral of Interchange density Number of Panes, N Free-flow speed: FFS or BFFS	clearance	12.0 6.0 0.50	ft ft
Lane width Right-shoulder lateral of Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f	clearance fL <b>W</b>	12.0 6.0 0.50 3 Measured	ft ft interchange/mi
Lane width Right-shoulder lateral of Interchange density Number of Panes, N Free-flow speed: FFS or BFFS	clearance fL <b>W</b>	12.0 6.0 0.50 3 Measured 70.0	ft ft interchange/mi mi/h
Lane width Right-shoulder lateral of Interchange density Number of Panes, N Free-flow speed: FFS or BFFS Lane width adjustment, f	clearance fLW tment, fLC	12.0 6.0 0.50 3 Measured 70.0	ft ft interchange/mi mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f Lateral clearance adjust Interchange density adju Number of lanes adjustme	clearance FLW tment, fLC ustment, fID	12.0 6.0 0.50 3 Measured 70.0 0.0	ft ft interchange/mi mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of Panes, N Free-flow speed: FFS or 8FFS Lane width adjustment, f Lateral clearance adjust Interchange density adjustments	clearance FLW tment, fLC ustment, fID	12.0 6.0 6.0 0.50 3 Measured 70.0 0.0	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f Lateral clearance adjust Interchange density adju Number of lanes adjustme	clearance FLW tment, fLC ustment, fID	nd Adjustments	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of Panes, N Free-flow speed:	clearance FLW tment, fLC ustment, fID	Adjustments  12.0  6.0  0.50  3  Measured  70.0  0.0  0.0  0.0  1.0  3.0  70.0  Urban Freeway	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f Lateral clearance adjust Interchange density adju Number of lanes adjustme Free-flow speed, FFS	fLW tment, fLC ustment, fID ent, fN	Adjustments  12.0  6.0  0.50  3  Measured  70.0  0.0  0.0  0.0  1.0  3.0  70.0  Urban Freeway	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, f Lateral clearance adjust Interchange density adju Number of lanes adjustme Free-flow speed, FFS	fLW tment, fLC ustment, fID ent, fN	12.0 6.0 0.50 3 Measured 70.0 0.0 0.0 0.0 Urban Freeway	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of lanes, N Free-flow speed:     FFS or 8FFS Lane width adjustment, of Lateral clearance adjust Interchange density adjust Number of lanes adjustment Free-flow speed, FFS  Flow rate, vp Free-flow speed, FFS	clearance  fLW  tment, fLC  ustment, fID  ent, fN LOS and Perform	nd Adjustments	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of tanes, N Free-flow speed:     FFS or BFFS Lane width adjustment, flateral clearance adjust Interchange density adjustment Number of lanes adjustment Free-flow speed, FFS  Flow rate, vp	clearance  fLW  tment, fLC  ustment, fID  ent, fN LOS and Perform	12.0 6.0 0.50 3 Measured 70.0 0.0 0.0 0.0 Urban Freeway	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of lanes, N Free-flow speed:     FFS or 8FFS Lane width adjustment, flateral clearance adjust Interchange density adjustment of lanes adjustment Free-flow speed, FFS  Flow rate, vp Free-flow speed, FFS Average passenger-car sp	clearance  fLW  tment, fLC  ustment, fID  ent, fN LOS and Perform	nd Adjustments  12.0 6.0 0.50 3 Measured 70.0 0.0 0.0 0.0 Urban Freeway mance Measures  934 70.0 70.0	ft ft interchange/mi  mi/h mi/h mi/h mi/h mi/h mi/h mi/h

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

Operational An	alysis					
Analyst: Ken Arnold Agency or Company: TRC Internation Date Performed: 5/21/02	al					
Analysis Time Period: PM ✓						
Freeway/Direction: I-75/SR 131 (Em	ory Road)					
From/To: N.B., North of D						
Jurisdiction:						
Analysis Year: 2026/	4. 4					
Description: Knox Co., Prop. System	(It-1					
Flow Inputs an	d Adjustments					
Volume, V	2076	veh/h				
Peak-hour factor, PHF	0.95					
Peak 15-min volume, v15	54 <b>b</b>	v				
Trucks and buses	16	λ				
Recreational vehicles	Ō	ž				
Terrain type:	Rolling ~					
Grade	0.00	Z.				
Segment length	0.00	m i				
Trucks and buses PCE, ET	2 · 5					
Recreational vehicle PCE, ER	5.0					
Heavy vehicle adjustment, fHV	O.80L					
Driver population factor, vp	7 - 00					
Flow rate, vp	903	pc/h/ln				
Speed Inputs a	nd Adjustments	**************************************				
Lane width	75.0	ft				
Right-shoulder lateral clearance	6·0	ft				
Interchange_density	0.50	interchange/mi				
Number of lanes, N	3 ✓					
Free-flow speed:	Measured					
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	3.0	mi/h				
Free-flow speed, FFS	70.0	mi/h				
	Urban Freeway	у				
LOS and Perfor	mance Measures					
Flow rate, vp	903	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	12.9	pc/mi/ln				
Level of service, LOS	В					

# HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Driver population factor: fP Flow rate: vp

Fax: (615) 661-0644

<u> </u>	Mer	rge Analysis				
Analyst:	Ken Arnold					
Agency/Co.:	TRC Internat	tional				
Date performed: Analysis time period:	5/21/02					
Freeway/dir or travel:	AM I 75/.R. 131	1				
Junction:	T 13/ 1/4 737	•				
Jurisdiction:						
Analysis Year:	505P					
Description: Knox Co.,		n ramp from S.	R. 131, P	rop.	System	Alt.
<u> </u>	Fr	reeway Data				
Type of analysis		Merge				
Number of lanes in free	vay	3				
Free-flow speed on free:		70.0		mph		
Volume on freeway		2146		vph		
	0r	n Ramp Data				
Side of freeway		Right				
Number of lanes in ramp		ŗ				
Free-flow speed on ramp		50.0		mph		
Volume on ramp		250		vph		
Length of first accel/de		840		ft		
Length of second accel/o	decel lane			ft		
	Adjacent Ra	amp Data (if o	ne exists	<b></b>		
Does adjacent ramp exist	?	No				
Volume on adjacent Ramp				vph		
Position of adjacent Ram	ip q					
Type of adjacent Ramp_						
Distance to adjacent Ram	1p			ft		
Conv	version to po	:/h Under Base	Conditio	ns		
Junction Components		Freeway	Ramp		Adjacent Ramp	t
Volume, V (vph)		2146	250			vph
Peak-hour factor, PHF		0.95	0.95			- 1- 1.
Peak 15-min volume, v15		· 565	66			v
Trucks and buses		<b>7</b> P	5			%
Recreational vehicles		0	0			7.
Terrain type:		Rolling	Rolling		Level	
Grade		ν.		7		/
Length	•	mi		mi		mi
Trucks and buses PCE, E1		2.5	2.5			
Recreational vehicle PCE		5.0	2.0			
Heavy vehicle adjustment Driver population factor		0-806 100	0.971			
verver population tactor	·, IP	h + 1111	1 00			

1.00

2801

1.00 271

pcph

```
_Estimation of Vl2 Merge Areas_
                  L =
                          0.00
                                  (Equation 25-2 or 25-3)
                          0.601
                                  Using Equation 1
                   FM
                         EBdL = (9)
                                          pc/h
                   15
                       F
                            ___Capacity Checks_
                                                         LOS F?
                           Actual
                                         Maximum
     v
F0
                           3072
                                         7200
                                                         Νo
                           1954
                                         4600
                                                         No
      R12
               __Level of Service Determination (if not F)_
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 1.5.3
R R 12
Level of service for ramp-freeway junction areas of influence B
                         ____Speed Estimation__
Intermediate speed variable:
                                             M = 0.265
Space mean speed in ramp influence area:
                                             Z = P5·P
                                                          mph
                                              R
                                             S = 67.8
Space mean speed in outer lanes,
                                                          mph
                                              0
                                             S = 64.4
Space mean speed for all vehicles,
                                                          mph
```

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HCS200D: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

	· Mera	e Analysis				
Analyst:	Ken Arnold					
Agency/Co::	TRC Internation	onal				
Date performed: Analysis time period:	5/21/02 PM					
Freeway/dir or travel:						
Junction:	2					
Jurisdiction:						
Analysis Year:	505P					
Description: Knox Co.,	M-l <sub>1</sub> NB on rai	mp from S.R.	131, Pro	p. 2	ystem, Al	t - 1
	Fre	eway Data				
	• 1 4	cwby bata				
Type of analysis		Merge				
Number of lanes in free		3				
Free-flow speed on free	way	70.0		mph		
Volume on freeway		2076 /		vph		
	0n	Ramp Data				
Side of freeway		Right				
Number of lanes in ramp		l Argue				
free-flow speed on ramp		50.0		mрh		
Volume on ramp		426 /		vph		
Length of first accel/d	ecel lane	840		ft		
Length of second accel/	decel lane			ft		
	Adjacent Ramp	p Data (if or	e exists	<b>&gt;</b>		
Does adjacent ramp exis	t?	No				
Volume on adjacent Ramp				vph		
Position of adjacent Rad	mp					
Type of adjacent Ramp						
Distance to adjacent Ra	m Þ			ft		
Con	version to pc/l	n Under Base	Conditio	ns		
Junction Components		Freeway	Ramp		Adjacent	
·					Ramp	
Volume, V (vph)		207L	426			vph
Peak-hour factor, PHF		0.95 /	0.95 /			
Peak 15-min volume, v15		· 546	775			V
Trucks and buses Recreational vehicles		J. P	5			ž.
Terrain type:		O Pollina	O Pollina		Lough	Z.
Grade		Rolling %	Rolling	×.	Level	%
Length		mi		л. mi		∕. mi
Trucks and buses PCE, E'	Т	2.5	2.5			
Recreational vehicle PC	E, ER	5.0	5.0			
Heavy vehicle adjustment	ta fHV .	0-805	0.971			
Driver population factor		7.00	7.00			
Flow rate, vp		2710	462			pcph

```
_Estimation of Vl2 Merge Areas_
                  L =
                          0.00
                                  (Equation 25-2 or 25-3)
                          D-601 Using Equation 1
                   FΜ
                  v = v (P) = 1629
                                          pc/h
                       F
                             ___Capacity Checks_
                                                         LOS F?
                           Actual
                                         Maximum
     v
FQ
                                         7200
                           3172
                                                         Nο
                           1602
                                         4500
                                                         No
     R12
               __Level of Service Determination (if not F)__
Density: D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = R R B2 A
                                                               16.3
Level of service for ramp-freeway junction areas of influence B
                           ___Speed Estimation___
                                             P45.0 = M
Intermediate speed variable,
Space mean speed in ramp influence area-
                                             2 = F5-2
                                                          mph
Space mean speed in outer lanes,
                                             P.54 = 2
                                                          mph
                                              0
                                             $ = 64.2
Space mean speed for all vehicles,
                                                          mph
```

· ·

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	Operational Analysis	_
Analyst:	Ken Arnold	

Agency or Company: Date Performed:

TRC International

5/21/02 ΑM

Analysis Time Period: Freeway/Direction:

I-75/SR 131 (Emory Road) N.B. North of Inter-

From/To: Jurisdiction: Analysis Year:

5052

Description: Knox Co., Prop. System, Alt. 1

\_\_Flow Inputs and Adjustments\_\_\_\_\_

Volume, V		2396/	veh/h
Peak-hour factor, PHF		0.95/	
Peak 15-min volume, v15		631	V
Trucks and buses		19 /	ሂ
Recreational vehicles		O	X
Terrain type:		Rolling	
Grade		0.00	%
Segment length		0.00	mi
Trucks and buses PCE, ET		2.5	
Recreational vehicle PCE, ER	8	2 • 0	
Heavy vehicle adjustment, ff	4 <b>V</b>	D.778	
Driver population factor, vg	<b>o</b>	1.00	
Flow rate, vp		1080	pc/h/ln

\_\_\_\_Speed Inputs and Adjustments\_\_\_\_

Lane width	75.0	ft
Right-shoulder lateral clearance	b - 0	ft
Interchange density	0 - 50	interchange/mi
Number of lanes, N	3 ✓	-
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	

\_\_\_\_\_LOS and Performance Measures\_\_\_

Flow rate, vp Free-flow speed, FFS	1080	pc/h/ln
Average passenger-car speed, \$	70.0 70.0	mi/h mi/h
Number of lanes: N	3	W(171)
Density D	15.4	pc/mi/ln
Level of service, LOS	В	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, IN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

**************************************	Operational	Analysis_
Analyst:	Ken Arnold	

Analyst:

Ken Arnold TRC International Agency or Company: Date Performed: 2/51/05

Analysis Time Period: ΡM

Freeway/Direction:

From/To: Jurisdiction: I-75/SR 131 (Emory Road) N.B. North of Inter.

505P

Analysis Year:

Description: Knox Co., Prop. System, Alt. 1

Flow Inputs	and Adjustments	
Volume, V	asoa /	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	658	V
Trucks and buses	19 /	χ
Recreational vehicles		2,
Terrain type:	Rolling	
Grade	0.00	χ
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	1158	pc/h/ln
Speed Input	s and Adjustments	
Lane width	75.0	ft
Right-shoulder lateral clearance	£ n	ft

Specto Imputs 8	no Aujustments	· · · · · · · · · · · · · · · · · · ·
Lane width	15.0	ft
Right-shoulder lateral clearance	<b>6</b> · O	ft
Interchange density	0.50	interchange/mi
Number of Tanes, N	3 ~	-
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	O - O	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	3.0	mi/h
Free-flow speed, FFS	70 - 0	mi/h
	Urban Freew	ay

L0S	and	Performance	Measures		

Flow rate, vp	1159	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	16·1	pc/mi/ln
Level of service, LOS	В	·

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

	Operational Analysis
Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/21/02
Analysis Time Period:	AM ′
Freeway/Direction:	I-75/SR 131 (Emory Road)
From/To: Jurisdiction:	N.B. North of Inter.
Analysis Year:	50SP
Description: Knox Co.	Prop. System, Alt. 1
	Flow Inputs and Adjustments

Volume, V	2396/	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	P37	V
Trucks and buses	19/	%
Recreational vehicles	D	ž
Terrain type:	Rolling	•
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	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	1650	pc/h/ln

	na volazementz	
Lane width	75.0	ft
Right-shoulder lateral clearance	۴٠٥ .	ft
Interchange_density	0 - 50	interchange/mi
Number of länes, N	ē 🗸	· · - · - · - · - · - · · - · · - · · - ·
Free-flow speed:	Measured	
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	4.5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freewa	У

LOS and Perf	ormance Measures		
Flow rate, vp Free-flow speed, FFS	1650 70.0	pc/h/ln mi/h	
Average passenger-car speed, S Number of lanes, N	⊾9.3 ⊃	mi/h	
Density, D Level of service, LOS	23.4	pc/mi/ln	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/21/02

5/53/05 PM Date Performed: Analysis Time Period:

Freeway/Direction: From/To: Jurisdiction:

I-75/SR 131 (Emory Road) N.B. North of Inter-

\_\_Operational Analysis\_\_\_

Analysis Year:

Flow Inputs a	nd Adjustments	***************************************
Volume, V	2502 /	veh/h
Peak-hour factor, PHF	0.95 ~	<b>V</b> E
Peak 15-min volume, v15	65A	v
Trucks and buses	19/	½.
Recreational vehicles	0	×
Terrain type:	Rolling	
Grade	0.00	z
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	O-778	
Driver population factor, vp	1 00	
flow rate, vp	1645	pc/h/ln
Speed Inputs	and Adjustments	*
	12.0	ft
Right-shoulder lateral clearance	12.0 6.0	ft ft
Right-shoulder lateral clearance Interchange density	6.0 0.50	
Right-shoulder lateral clearance Interchange density Number of länes, N	6.0 0.50 -2 ∕	ft
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed:	6.0 0.50 -2 ∕ Measured	ft interchange∕mi
Right-shoulder lateral clearance Interchange density Number of länes, N Free-flow speed: FFS or BFFS	6.0 0.50 -2 / Measured 70.0	ft interchange/mi mi/h
Right-shoulder lateral clearance Interchange density Number of länes: N Free-flow speed: FFS or BFFS Lane width adjustment: fLW	6.0 0.50 -2 / Measured 70.0 0.0	ft interchange/mi mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC	6.0 0.50 -2 / Measured 70.0 0.0	ft interchange/mi mi/h mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed:	6.0 0.50 -2 / Measured 70.0 0.0 0.0	ft interchange/mi mi/h mi/h mi/h
Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC	6.0 0.50 -2 / Measured 70.0 0.0	ft interchange/mi mi/h mi/h mi/h

LOS and Performance Measures				
Flow rate, vp	1692	pc/h/ln		
Free-flow speed, FFS	70.0	mi/h		
Average passenger-car speed: S	68.9	mi/h		
Number of lanes, N	2			
Density D	24.6	pc/mi/ln		
Level of service, LOS	<u> </u>	,		

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Oper	ational Analysis	
Date Performed: 5/21/ Analysis Time Period: AM Freeway/Direction: I-75/ From/To: 5.8 Jurisdiction: Analysis Year: 2026	nternational O2 SR 131 (Emory Road) North of Inter-	
Description: Knox Co., Prop.	System, Alf.I	
Flow	Inputs and Adjustments	
Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type: Grade	2275 / 0.95 / 599 19 / 0 Rolling 0.00	veh/h v % % % mi
Segment length Trucks and buses PCE. ET Recreational vehicle PCE. ER Heavy vehicle adjustment. fHV Driver population factor. vp Flow rate. vp	0.00 2.5 2.0 0.77& 1.00 1539	pc/h/ln
Zpee	d Inputs and Adjustments	
Lane width Right-shoulder lateral cleara Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment fLW	12.0 nce	ft ft interchange/mi mi/h mi/h
Lateral clearance adjustment, Interchange density adjustmen Number of lanes adjustment, free-flow speed, FFS	fLC 0.0 t.fID 0.0	mi/h mi/h mi/h mi/h
L0Z	and Performance Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car speed, Number of lanes, N Density, D Level of service, LOS	1539 70.0 69.7 2 22.1 C	pc/h/ln mi/h mi/h pc/mi/ln
Overall results are not com	puted when free-flow speed	is less than 55 mph.

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:

\_\_Operational Analysis\_\_\_ Analyst: Ken Arnold Agency or Company: TRC International 5/21/02 PM Date Performed: Analysis Time Period: Freeway/Direction: I-75/SR 131 (Emory Road) From/To: S-8. North of Inter-Jurisdiction: Analysis Year: 505P Description: Knox Co-+ Prop. System, Alt. ! \_\_\_\_Flow Inputs and Adjustments\_\_\_\_ 5331 / Volume, V veh/h 0.95~ Peak-hour factor, PHF Peak 15-min volume, v15 **613** Trucks and buses 19 Recreational vehicles Π Ż. Terrain type: Rolling 7. Grade 0.00 Segment length 0.00 Trucks and buses PCE, ET 2 . 5 Recreational vehicle PCE, ER 2.0 Heavy vehicle adjustment, fHV 0.778 Driver population factor, vp 1.00 pc/h/ln Flow rate, vp 1576 \_\_\_\_Speed Inputs and Adjustments\_\_ ft Lane width 75.0 Right-shoulder lateral clearance P • 0 ft  $Interchange\_density$ 0.50 interchange/mi Number of lanes, N 2 / Free-flow speed: Measured FFS or BFFS 70.0 mi/h Lane width adjustment, fLW mi/h 0.0 Lateral clearance adjustment, fLC mi/h 0.0 Interchange density adjustment, fID mi/h 0.0 Number of lanes adjustment, fN 4 - 5 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway LOS and Performance Measures\_\_\_ Flow rate, vp 1576 pc/h/ln Free-flow speed, FFS mi/h 70.0 Average passenger-car speed, S 69-5 mi/h Number of lanes, N 2 Density D 22.7 pc/mi/ln Level of service, LOS

\_\_\_\_Operational Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Ken Arnold
TRC International
10/14/02

Analysis Time Period: AM
Freeway/Direction: I 75 SB

From/To:

Jurisdiction:

Analysis Year: 2026

Flow Inputs a	nd Adjustments	
Volume, V	2275 %	veh/h
Peak-hour factor, PHF	0.95	-
Peak 15-min volume, v15	599 /	v
Trucks and buses	19	%
Recreational vehicles	Ō	7.
Terrain type:	Rolling	
Grade .	0.00	
Segment length	0.00	mi
Trucks and buses PCE, ET	5 . 5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	705P	pc/h/ln
ane width	15.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/m:
Number of lanes, N	3	<b>3</b>
Free-flow speed:	Measured	
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 adjustment₁ fN	3.0	mi/h
Free-flow speed, FFS	70-0	mi/h
	Urban Freew	ау
LOS and Perfo	rmance Measures	
Flow rate, vp	105P	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	В	

\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Allulyse	KEN ALIIOTA
Agency or Company:	TRC International
Date Performed:	10/14/02
Analysis Time Period:	PM ′
Freeway/Direction:	I 75 SB /

From/To:

Jurisdiction:		
Analysis Year: 2026		
Description: I 75 Southbound, North of	D-2 off-ramp, Alt	<b></b> [
Flow Inputs and	Adjustments	
Volume, V	2331 ′	veh/h
Peak-hour factor, PHF	0.95	***************************************
Peak 15-min volume, v15		v
Trucks and buses	74 713	ž
Recreational vehicles	ā	%
Terrain type:	Rolling ✓	
Grade .	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	ē · ū	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
flow rate, vp	1051	pc/h/ln
Speed Inputs an	d Adjustments	
Lane width	75.0	ft
Right-shoulder lateral clearance	<b>b</b> · 0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	_
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	
LOS and Perform	ance Measures	
Flow rate, vp	1051	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	15.0	pc/mi/ln
Level of service, LOS	В	

### HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_\_\_\_\_Diverge Analysis\_\_\_\_\_ Analyst: Ken Arnold TRC International Agency/Co:: 10/14/02 Date performed: Analysis time period: AM DHV Freeway/dir or travel: I 75 Southbound Junction: Jurisdiction: Analysis Year: 505P Description: D-2, I-75 Southbound off ramp to S.R. 131, Alt. 1 \_\_\_\_\_Freeway Data\_\_\_\_ Type of analysis Diverge Number of lames in freeway Free-flow speed on freeway 70.0 mph 2275 / Volume on freeway vph \_\_\_\_Off Ramp Data\_\_\_\_ Side of freeway Right Number of lanes in ramp Free-Flow speed on ramp 50.0 mph Volume on ramp 551 vph Length of first accel/decel lane 360 ft Length of second accel/decel lane ft \_\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_ Does adjacent ramp exist? Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft \_\_Conversion to pc/h Under Base Conditions\_ Junction Components Freeway Ramp Adjacent Ramp 2275 🗸 Volume, V (vph) 557 vph Peak-hour factor, PHF 0.95 0.90 Peak 15-min volume, v15 599 61 Trucks and buses 19 / 2 Z Recreational vehicles 0 0 7. Rolling Terrain type: Rolling Level Z. Grade 0.00 0.00 7. 7, Length 0.00 0.00 mi мi mi Trucks and buses P(E, ET 2.5 2.5 Recreational vehicle PCE, ER 2.0 2.0 Heavy vehicle adjustment, fHV 0.778 0.971 Driver population factor, fP 1.00 1.00 Flow rate, vp

3077

253

pcph

```
_Estimation of V12 Diverge Areas__
                 L =
                         0.00
                                 (Equation 25-8 or 25-9)
                         0.671
                                 Using Equation 5
                  FD
                  v = v + (v - v ) P = 2149
                  12 R F R FD
                            ___Capacity Checks_
                          Actual
                                                        LOS F?
                                        Maximum
                          3077
                                        7200
                                                        No
                          2149
                                        4400
                                                        Nο
                          2824
                                        7200
                                                        Nο
     F٥
                          253
                                        5100
                                                        No
     R
            ____Level of Service Determination (if not F)_
                      D = 4.252 + 0.0086 v - 0.009 L = 19.5
R 12 D
Density -
                                                                    pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                       ____Speed Estimation__
Intermediate speed variable:
                                            D = 0.256
                                             Z
Space mean speed in ramp influence area.
                                            Z = P3
                                                        mph
                                             R
Space mean speed in outer lanes,
                                            S = 76.8
                                                        mph
                                            Ð
Space mean speed for all vehicles.
                                            S = PP \cdot 2
                                                        mph
```

### HCS2000: Ramps and Ramp Junctions Release 4.16

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_\_\_\_Diverge Analysis\_\_\_\_\_ Ken Arnold TRC International Analyst: Agency/Co:: Date performed: 10/14/02 Analysis time period: PM DHV Freeway/dir or travel: I 75 Southbound Junction: Jurisdiction: Analysis Year: 5056 Description: D-2, I-75 Southbound off ramp to S.R. 131, Alt. 1 \_\_\_\_Freeway Data\_\_\_ Type of analysis Diverge Number of lanes in freeway

Number of lanes in freeway

Free-flow speed on freeway

Volume on freeway

Off Ramp Data

Side of freeway Right
Number of lanes in ramp 1
Free-Flow speed on ramp 50.0 mph
Volume on ramp 221 vph
Length of first accel/decel lane 350 ft
Length of second accel/decel lane ft

Adjacent Ramp Data (if one exists)\_\_\_\_\_\_

No

Does adjacent ramp exist? Volume on adjacent ramp Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp

vph

ft

\_\_\_\_Conversion to pc/h Under Base Conditions\_ Junction Components Freeway Ramp Adjacent Ramp Volume, V (vph) 2331 / 551 vph 0-95 Peak-hour factor, PHF 0.90 Peak 15-min volume, v15 P**1**3 ь1 v Trucks and buses 19 / 2 7, Recreational vehicles 0 0 7, Terrain type: Rolling Rolling Level Grade 0 - 00 0.00 7 Length 0.00 mi 0.00 шi Μí Trucks and buses PCE, ET 2.5 2.5 Recreational vehicle PCE, ER 2.0 2.0 Heavy vehicle adjustment, fHV 0.778 0.971 Driver population factor, fP 1.00 1.00 Flow rate, vp 3153 253 pcph

```
_Estimation of V12 Diverge Areas_
                 L =
                         0.00
                                 (Equation 25-8 or 25-9)
                  ΕQ
                         0.670
                               Using Equation 5
                  FD
                         + (v - v) P = 2195 pc/h
                  12 R
                            F R FD
                            ___Capacity Checks_
                          Actual
                                        Maximum
                                                       LOS F?
                          3153
                                        7200
                                                       No
                          2195
                                        4400
                                                       No
                          2900
                                        7200
                                                       Νo
         F
                          253
                                        5100
                                                       Nο
               _Level of Service Determination (if not F)_
                      D = 4.252 + 0.8086 v ~ 0.009 L = R
Density
                                                           19.9
                                                                    pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                     _____Speed Estimation__
Intermediate speed variable,
                                            D = 0.256
                                            2
                                           Z = P3
Space mean speed in ramp influence area,
                                                        mph
Space mean speed in outer lanes,
                                           2 = 28.8
                                                        mph
                                            Space mean speed for all vehicles,
                                           S = PP · 2
                                                        mph
```

es.

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	KA
Agency or Company:	TRC International
Date Performed:	10/14/02

Analysis Time Period: AM, DHV
Freeway/Direction: I~75 Southbound

\_\_\_Operational Analysis\_\_\_\_

From/To: Jurisdiction:

Analysis Year: 2026 Pescription: I-75 SB, South of D-2 off

Flow Inputs an	nd Adjustments	
Volume, V	2054	veh/h
Peak-hour factor: PHF	0.95 🗸	
Peak 15-min volume, v15	541	V
Trucks and buses	17 ~	%
Recreational vehicles		%
Terrain type:	Rolling 🗸	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.797	
Driver population factor, vp	1.00	
Flow rate, vp	904	pc/h/ln
Speed Inputs a	ind Adjustments	
Lane width	75.0	ft
Right-shoulder lateral clearance	6·0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	•
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70-0	mi/h
	Urban Freewa	эу
LOS and Perfor	mance Measures	
Flow rate, vp	904	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	12.9	pc/mi/ln
Level of service, LOS	B	p

\_\_\_Operational Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	KA
Agency or Company:	TRC International
Date Performed:	10/14/02
Analysis Time Period:	PM T DHV
Freeway/Direction:	I-75 Southbound
From /To:	

From/To: Jurisdiction:

5057 Analysis Year:

Volume, V Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:         Grade         Segment length Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, vp Flow rate, vp	12.0 6.0 0.50	veh/h  v  k  k  mi  pc/h/ln  ft ft interchange/mi
Peak 15-min volume: v15 Trucks and buses Recreational vehicles Terrain type:     Grade     Segment length Trucks and buses PCE. ET Recreational vehicle PCE. ER Heavy vehicle adjustment. fHV Driver population factor. vp Flow rate. vp	0.95 549 17 0 Rolling 0.00 2.5 2.0 0.797 1.00 919 djustments 12.0 6.0 0.50 3	v % % % % % % % % % % % % % % % % % % %
Trucks and buses Recreational vehicles Terrain type:	\$49 17 0 Rolling 0.00 0.00 2.5 2.0 0.797 1.00 919 djustments	% % mi  pc/h/ln  ft ft
Recreational vehicles Terrain type:     Grade     Segment length Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, vp Flow rate, vp  Speed Inputs and Ac Lane width Right-shoulder lateral clearance Interchange*density Number of lanes, N Free-flow speed:     FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID	17	% % mi  pc/h/ln  ft ft
Terrain type: Grade Segment length Trucks and buses PCE. ET Recreational vehicle PCE. ER Heavy vehicle adjustment. fHV Driver population factor. vp Flow rate. vp  Speed Inputs and Ac Lane width Right-shoulder lateral clearance Interchange*density Number of lanes. N Free-flow speed: FFS or BFFS Lane width adjustment. fLW Lateral clearance adjustment. fLC Interchange density adjustment. fID	0 Rolling 0.00 0.00 2.5 2.0 0.797 1.00 919 djustments 12.0 6.0 0.50	% mi  pc/h/ln  ft ft
Terrain type: Grade Segment length Trucks and buses PCE. ET Recreational vehicle PCE. ER Heavy vehicle adjustment. fHV Driver population factor. vp Flow rate. vp  Speed Inputs and Ac Lane width Right-shoulder lateral clearance Interchange*density Number of lanes. N Free-flow speed: FFS or BFFS Lane width adjustment. fLW Lateral clearance adjustment. fLC Interchange density adjustment. fID	0.00 0.00 2.5 2.0 0.797 1.00 919 djustments 12.0 6.0 0.50	pc/h/ln  ft ft
Segment length Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, vp Flow rate, vp	0.00 0.00 2.5 2.0 0.797 1.00 919 djustments 12.0 6.0 0.50	pc/h/ln  ft ft
Trucks and buses PCE, ET Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, vp Flow rate, vp Speed Inputs and Ac Lane width Right-shoulder lateral clearance Interchange*density Number of lanes, N Free-flow speed:     FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID	2.5 2.0 0.797 1.00 919 djustments 12.0 6.0 0.50	pc/h/ln ft ft
Recreational vehicle PCE, ER Heavy vehicle adjustment, fHV Driver population factor, vp Flow rate, vp	2.0 0.797 1.00 919 djustments 12.0 6.0 0.50	ft ft
Recreational vehicle PCE. ER Heavy vehicle adjustment. fHV Driver population factor. vp Flow rate. vp	2.0 0.797 1.00 919 djustments 12.0 6.0 0.50	ft ft
Heavy vehicle adjustment, fHV Driver population factor, vp Flow rate, vp Speed Inputs and Ad Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed:     FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID	1.00 919 djustments 12.0 6.0 0.50	ft ft
Driver population factor, vp Flow rate, vp Speed Inputs and Act Lane width Right-shoulder lateral clearance Interchange*density Number of lanes, N Free-flow speed:     FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID	1.00 919 djustments 12.0 6.0 0.50	ft ft
Speed Inputs and Action width Right-shoulder lateral clearance Interchange*density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID	12.0 6.0 0.50 3	ft ft
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC Interchange density adjustment, fID	12.0 6.0 0.50 3	ft ft
Free-flow speed, FFS	Measured 70.0 0.0 0.0 0.0 3.0 70.0	mi/h mi/h mi/h mi/h mi/h mi/h
ilea-ilow speedi ila	Urban Freeway	M1/1
LAS and Danfarance	•	
LOS and Performance	neasures	
Flow rate: vp	919	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Number of lanes, N	70.0 3	mi/h
	13·1 B	pc/mi/ln

#### HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Driver population factor: fP

Flow rate, vp

Fax: (615) 661-0644

```
E-mail:
                              _____Merge Analysis_____
Analyst:
                         Ken Arnold
                         TRC International
Agency/Co::
                         10/14/02 /
Date performed:
Analysis time period: AM, DHV Freeway/dir or travel: I 75, Southbound
Junction:
Jurisdiction:
                         505P <
Analysis Year:
Description: M-2, I 75 Southbound on ramp from S.R. 131, A!t. |
                                   __Freeway Data_
Type of analysis
                                               Menge 1
                                               3 ′
Number of lanes in freeway
Free-flow speed on freeway
                                               70.0
                                                               mph
                                               2054 🗸
Volume on freeway
                                                               vph
                                 ___On Ramp Data_
Side of freeway
                                               Right
2
Number of lanes in ramp
Free-flow speed on ramp
                                               50.0
                                                               mph
                                               507P <
Volume on ramp.
                                                               vph
Length of first accel/decel lane
                                               P00
                                                               ft
Length of second accel/decel lane
                                               7500
                                                               f t
                         __Adjacent Ramp Data (if one exists)_
Does adjacent ramp exist?
                                               No
Volume on adjacent Ramp
                                                               vph
Position of adjacent Ramp
Type of adjacent Ramp
Distance to adjacent Ramp
                                                               ft
                    __Conversion to pc/h Under Base Conditions_
Junction Components
                                                      Ramp
                                         Freeway
                                                                   Adjacent
                                                                   Ramp
                                         2054
                                                      5076
Volume, V (vph)
                                                                             vph
                                                      0.95
Peak-hour factor, PHF
                                         0.95
Peak 15-min volume, v15
                                         541
17 /
                                                      531
                                                                             ν
Trucks and buses
                                                      2 ~
                                                                             7.
Recreational vehicles
                                         O
                                                      0
                                                                             2
                                                      Rolling 🗸
                                         Rolling /
Terrain type:
                                                                   Level
                                                              7
                                                 7.
     Grade
                                                                           7
     Length
Trucks and buses PCE, ET
                                         2.5
                                                      2.5
Recreational vehicle PCE, ER
                                         5.0
                                                      2.0
Heavy vehicle adjustment, fHV
                                         0.797
                                                      0.971
```

. 1.00

2713

1.00

5796

pcph

```
_Estimation of Vl2 Merge Areas_
                         0.00
                                 (Equation 25-2 or 25-3)
                  ΕQ
                         0.555 Using Equation 0
                  FΜ
                  v = v (P ) = 1506
                  12 F FM
                           ____Capacity Checks_
                                                        LOS F?
                          Actual
                                        Maximum
                          4899
                                        7200
     F٥
                          3692
                                        4600
                                                        Nο
     R12
               _tevel of Service Determination (if not F)_
Density: D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = R R B2 A
                                                              18.2
                                                                      pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                          ___Speed Estimation__
Intermediate speed variable.
                                            M = 0.237
Space mean speed in ramp influence areas
                                            Z = F3.A
                                                         mph
Space mean speed in outer lanes.
                                            S = L7.5
                                                         mph
                                             0
Space mean speed for all vehicles,
                                            z = 64.3
                                                         mph
```

# HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:		rax: (	9731 PP7.	·U641	ŧ	
	Merge	Analysis				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/dir or travel: Junction: Jurisdiction: Analysis Year: Description: M-2, I 75	I 75, Southbou 2026/ Southbound on	nd ramp from S.	•	↓IŁ.	. (	
	Free	way Data				
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway		Merge 3 70.0 2088		mph vph		
	On R	amp Data				
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/d	ecel lane	Right 2 50.0 862 600 1200		mph vph ft ft		
Does adjacent ramp exis Volume on adjacent Ramp Position of adjacent Ra Type of adjacent Ramp Distance to adjacent Ra	t?	No No	e ext303,	vph ft		
Con-	version to pc/h	Under Base	Condition	15		
Junction Components		Freeway	Ramp 862 ∕		Adjacent Ramp	
Volume, V (vph) Peak-hour factor, PHF Peak 15-min volume, v15 Trucks and buses Recreational vehicles Terrain type:	T E, ER	0.95	0.95/ 227 2/ 0 Rolling 2.5 2.0	ン ス mi	Level	vph v % % %
Driver population factor		1.00 2758	1.00			pcph

```
_Estimation of V12 Merge Areas__
                          0.00
                                  (Equation 25-2 or 25-3)
                  L =
                   ΕQ
                                  Using Equation O
                          0.555
                  FM
                          (P) = 1531
                                          pc/h
                       F
                           FM
                   15
                            ___Capacity Checks_
                                                         LOS F?
                           Actual
                                         Maximum
     v
F0
                           3693
                                         7200
                                                         No
                           2466
                                         4600
                                                         No
      R12
                _Level of Service Determination (if not F)__
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = R R A
                                                               9.2
                                                                       pc/mi/ln
Level of service for ramp-freeway junction areas of influence A
                           ___Speed Estimation__
Intermediate speed variable,
                                             M = 0.327
Space mean speed in ramp influence area:
                                             S = PP.A
                                                          mph
                                              R
                                             S = F3.4
Space mean speed in outer lanes,
                                                          mph
Space mean speed for all vehicles,
                                             Z = PP-9
                                                          mph
```

 $\cdot^{\tilde{\mathcal{T}}}$ 

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

And the state of t	Operational Analysis
Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/21/02
Analysis Time Period:	AM /
Freeway/Direction:	I-75/SR 131 (Emory Road)
From/To: Jurisdiction:	I-75/SR l3l (Emory Road) S.8.,South of Inter.
Analysis Year: Description: Knox Co-	2026 Prop. System, Alt. 1

Flow Input:	s and Adjustments	
Volume, V Peak-hour factor, PHF	4070 / 0.95 /	veh/h
Peak 15-min volume, v15	1071	V
Trucks and buses	11 /	%
Recreational vehicles	0	ž
Terrain type:	Rolling /	•
Grade	0.00	ž
Segment length	0.00	m i
Trucks and buses PCE, ET	2 . 5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0-858	
Driver population factor, vp	1.00	
Flow rate, vp	1664	pc/h/ln
Speed Inpu	ts and Adjustments	
lane width	12.0	(r

Lane width Right-shoulder lateral clearance Interchange density Number of Tanes, N	3* 6-0 13-0	ft ft interchange/mi
Free-flow speed: FFS or BFFS	Measured 70.0	mi/h
Lane width adjustment, fLW Lateral clearance adjustment, fLC	0 · 0 0 · 0	mi/h mi/h
Interchange density adjustment, fID Number of lanes adjustment, fN	0.0 3.0	mi/h mi/h
Free-flow speed, FFS	70.0 Urban Freeway	mi/h

LOS and	Performance Measures	
Flow rate, vp	1654	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	<b>ե</b> զ. 1	mi/h
Number of lanes, N	3	
Density, D	24.1	pc/mi/ln
Level of service, LOS	C	•

\_\_\_\_\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	2/51/05
Analysis Time Period:	P <b>m</b> ~

Freeway/Direction: I-75/SR 131 (Emory Road) From/To: S.B. South of Inter-

Jurisdiction: Analysis Year:

505P Description: Knox Co., Prop. System, Alt. 1

\_\_\_\_\_Flow Inputs and Adjustments\_\_\_ 2950 1 Volume: V veh/h 0.95 Peak-hour factor, PHF Peak 15-min volume, v15 77b Trucks and buses 11 1 7 Recreational vehicles D / Terrain type: Rolling ~ Grade 0.007 Segment length 0.00 шi Trucks and buses P(E, ET 2.5 Recreational vehicle PCE, ER 5 • 0 Heavy vehicle adjustment, fHV 0.858 Driver population factor, vp 1.00 flow rate, vp pc/h/ln 1506

\_\_\_\_\_Speed Inputs and Adjustments\_\_ Lane width 15-0 f t. Right-shoulder lateral clearance 6.O Interchange density 0.50 interchange/mi Number of lanes, N Free-flow speed: Measured 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, fIDmi/h 0 0 Number of lanes adjustment: fN 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway

\_\_\_\_LOS and Performance Measures\_\_\_ Flow rate, vp 750P pc/h/lm Free-flow speed, FFS 70.0 mi/h Average passenger-car speed, S 70.0 mi/h Number of lanes, N 3 Density, D 17.2 pc/mi/ln Level of service, LOS В

# HCS2000: Multilane Highways Release 4.1b

	OPERATIO	NAL ANALYSI	2		
Analyst: Ken A	rnold				
-	International				
Date: 5/21/					
Analsis Period: AM					
_	11 (Emory Road)				
	al Ave-/I-75				
Jurisdiction:	GI MYCEFI 13				
Analysis Year: 2026	/				
	Co., Prop. Sys	tom Alt.			
None and the second		•			
		-FLOW SPEET	) <del> </del>		
	rection			_ 2 _	_
ane width		75.0	ft	75.0	ft
.ateral clearance:					
Right edge		5 · 0	ft	5.0	ft
Left edge		b · 0	ft	Ь-O	ft
Total lateral cl		8.0	ft	8-0	ft
Access points per mil	6	5		22	
ledian type		Divided		Divided	
ree-flow speed:		Base		Base	
FFS or BFFS		PO · O	mph	PO·0	mph
ane width adjustment	. FLW	0.0	mph	0.0	mph
ateral clearance adj		0.9	mph	0.9	mph
ledian type adjustmen		0.0	mph	0.0	mph
Access points adjustm	ent, FA	1.3	mph	5.5	mph
ree-flow speed		57.8	mph	53·b	mph
		_volume			
Di	rection	ı		2	
Volume: V		1551 ~	vph	971	vph
Peak-hour factor, PHF		0.95 -		0.95	- P
Peak 15-minute volume		321		256	
rucks and buses		ءَ عَ	7.	5 -	χ
Recreational vehicles		Õ	z.	ō	ž
errain type		Rolling -		Rolling -	*•
Grade		0.00	z	0.00	ž.
Segment length		0.00	m i	0.00	mi
lumber of lanes		5	W 1	5	III T
river population adj	ustmont. fP	1.00		1.00	
rucks and buses P(E)		2 - 5		2.5	
Recreational vehicles		5.0			
				2.0	
leavy vehicle adjustm	enti inv	0-971		0.971	1 . 1
low rate, vp		661	pcphpl	526	pcphpl
		_RESULTS			,, <del>,, ,, , , ,</del>
Di	rection	ľ		2	
low rate, vp		66 <b>1</b>	pcphpl	256	pcphpl
ree-flow speed, FFS		57.8	mph	53.b	mph
vg. passenger-car tr	7 .heenz leve	57.8	mph	53.b	mph
evel of service, LOS		B	мрп	33.6	mp11
ensity, D		11.4	pc/mi/ln		pc/mi/ln

\_OPERATIONAL ANALYSIS\_

ピロエレエネ・レ人し

Analyst: Ken Arnold Agency/Co: TRC International Date: 5/21/02 Analsis Period: PM Highway: SR 131 (Emory Road) From/To: Central Ave./I-75 Jurisdiction: Analysis Year: 20SP ~ Project ID: Knox Co., Prop. System, Ait. \_\_\_FREE-FLOW SPEED\_ Direction 5 Lane width 15.0 ft 75-0 ft Lateral clearance: Right edge 2.0 ft ft 5.0 Left edge 6.0 ft P • 0 ft Total lateral clearance 8.0 ft 8.0 ft Access points per mile ς 22 Median type Divided Divided Free-flow speed: 8ase Base FFS or BFFS 60.0 mph PO - O mph Lane width adjustment, FLW 0 • 0 mph  $0 \cdot 0$ mph Lateral clearance adjustment, FL( 0.9 0.9 mph mph Median type adjustment, FM 0 - 0 mph 0.0 mph Access points adjustment, FA 1.3 mph 5.5 mph free-flow speed 57.8 mph 53.b mph \_VOLUME Direction ı 2 1425 1347 Volume, V vph vph Peak-hour factor: PHF 0.95 ~ 0.95~ Peak 15-minute volume, v15 375 354 2 / Trucks and buses 2 -Z Recreational vehicles Z 0 Ÿ, Terrain type Rolling \_ Rolling ~ Grade 0.00 7 Ż. 0.00 Segment#length 0.00 mί 0.00 тi 2 -Number of lanes 2 / Driver population adjustment, fP 1.00 1.00 Trucks and buses PCE, ET 2.5 2.5 Recreational vehicles PCE, ER 5.0 0.5 Heavy vehicle adjustment, fHV 0.971 0.971 Flow rate: vp 772 730 pcphpl pcphpl RESULTS Direction l. 2 Flow rate, vp 772 pcphpl 730 pcphpl Free-flow speed, FFS 57 A 53-b mph mph Avg. passenger-car travel speed, S 57.8 53.b mph mph Level of service, LOS В R Density D 13.3 pc/mi/ln 13.6 pc/mi/ln

HCS2000: Signalized Intersections Release 4.1b

Inter.:
Area Type: All other areas

Analyst: KA Agency: TRC International Date: 10/9/02

Period: AM

Jurisd: Year : 2026

Project ID: Knox Co., Prop System, Alternate L E/W St: S.R. 131 (Emory Road) N/S St:

N/S St: I-75 Ramps

Company   Comp	L T R   L T	R I
LGConfig   L' T'   L' T'   L     L     L     L     L     L     L     L     L	LGConfig   L' T'   L' T'   L   L   L   Volume   177' 440'   1312'716'   1153'   1119'   Lane Width   12.0   12.0   12.0   112.0   112.0   112.0   112.0   112.0   L   L   L   L   L   L   L   L   L	0
Volume	Volume   177/ 440/   1312/716/   1153/   1119/ Lane Width   12.0 12.0   12.0   12.0   112.0	
Ane Width	Ane Width   12.0 12.0   12.0	1
Duration   0.25   Area Type: All other areas	Duration 0.25 Area Type: All other areas	1
Signal Operations   Sign		1
Phase Combination 1 2 3 4		
Thru A   Thru Right   Right   Peds	Phase Combination 1 2 3 41 5 6 7 8	}
Right		
Peds		
SB		
Thru		
Right		
Peds NB Right NB Right Green 29.0 52.0 Yellow 3.0 3.0 3.0 3.0 3.0 Yellow 3.0 3.0 3.0 Yellow 3.0 Yellow 3.0 Yellow Yellow 3.0 Yellow Yellow 3.0 Yellow Yello		
NB Right   EB Right		
SB Right   SP-0   S2-0   24-0   3-		
Green 29.0 52.0 24.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2		
All Red		
Intersection Performance Summary	Yellow 3.0 3.0	
Intersection Performance Summary		
Appr/ Lane		) seca
Lane Group Flow Rate Group Capacity (s)	Intersection Performance SummaryApproach	
Eastbound L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D  Westbound L 1518 3502 0.91 0.43 40.3 D T 1564 3610 0.48 0.43 24.6 C 34.8 C  Northbound L 700 3502 0.23 0.20 40.4 D  Southbound L 700 3502 0.18 0.20 39.9 D	Lane Group Flow Rate	
L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D  Westbound L 1518 3502 0.91 0.43 40.3 D T 1564 3610 0.48 0.43 24.6 C 34.8 C  Northbound L 700 3502 0.23 0.20 40.4 D  Southbound L 700 3502 0.18 0.20 39.9 D	Grp Capacity (s) v/c g/C Delay LOS Delay LOS	
T &72 3610 0.53 0.24 40.2 D 39.5 D  Westbound L 1518 3502 0.91 0.43 40.3 D  T 1564 3610 0.48 0.43 24.6 C 34.8 C  Northbound L 700 3502 0.23 0.20 40.4 D  Southbound L 700 3502 0.18 0.20 39.9 D		
Westbound L 1518 3502 0.91 0.43 40.3 D T 1564 3610 0.48 0.43 24.6 C 34.8 C  Northbound L 700 3502 0.23 0.20 40.4 D  YO.4 D  Southbound L 700 3502 0.18 0.20 39.9 D		
L 1518 3502 0.91 0.43 40.3 D T 1564 3610 0.48 0.43 24.6 C 34.8 C  Northbound L 700 3502 0.23 0.20 40.4 D  40.4 D  Southbound L 700 3502 0.18 0.20 39.9 D	L 846 3502 0.10 0.24 35.4 D	
T 1564 3610 0.48 0.43 24.6 C 34.8 C  Northbound L 700 3502 0.23 0.20 40.4 D  40.4 D  Southbound L 700 3502 0.18 0.20 39.9 D	L 846 3502 0.10 0.24 35.4 D	
Northbound L 700 3502 0.23 0.20 40.4 D 40.4 D Southbound L 700 3502 0.18 0.20 39.9 D	L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D Westbound	
L 700 3502 0.23 0.20 40.4 D 40.4 D Southbound L 700 3502 0.18 0.20 39.9 D	L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D Westbound L 1518 3502 0.91 0.43 40.3 D	
40.4 D Southbound L 700 3502 0.18 0.20 39.9 D	L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D Westbound L 1518 3502 0.91 0.43 40.3 D	
Southbound L 700 3502 0.18 0.20 39.9 D	L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D Westbound L 1518 3502 0.91 0.43 40.3 D T 1564 3610 0.48 0.43 24.6 C 34.8 C	
L 700 3502 0.18 0.20 39.9 D	L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D Westbound L 1518 3502 0.91 0.43 40.3 D T 1564 3610 0.48 0.43 24.6 C 34.8 C Northbound L 700 3502 0.23 0.20 40.4 D	
L 700 3502 0-18 0-20 39-9 D	L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D Westbound L 1518 3502 0.91 0.43 40.3 D T 1564 3610 0.48 0.43 24.6 C 34.8 C Northbound L 700 3502 0.23 0.20 40.4 D	
39.9 D	L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D Westbound L 1518 3502 0.91 0.43 40.3 D T 1564 3610 0.48 0.43 24.6 C 34.8 C Northbound L 700 3502 0.23 0.20 40.4 D	
	L 846 3502 0.10 0.24 35.4 D T 872 3610 0.53 0.24 40.2 D 39.5 D  Westbound L 1518 3502 0.91 0.43 40.3 D T 1564 3610 0.48 0.43 24.6 C 34.8 C  Northbound L 700 3502 0.23 0.20 40.4 D  40.4 D	

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Agency: TRC International Date: 10/9/02 Inter.:
Area Type: All other areas

Analyst							er					
Agency: Th		rnatio	nal				a Type	: Ali	other	areas	5	
	1/9/02						isd:	0.31				
Period: PM		_	_				ir : 2	NSP				
Project II					na Al							
EVM ZF: Z	· K • 1737	(Emor	y Koa	d)		N/3	St: I	-75 R	amps			
	<u>-</u>						CTION					
		stboun			boun		1 Nor				thbound	_ :
	ļ L	T	R	1 L	T	R	! L	Т	R!	L	T i	RI
N 1	! <del></del>	<del>/ _ 2</del> /		¦ <del></del>	-5~		-!		<del></del>	_ <u>2</u> _		<del></del> !
No. Lanes	1 2			1 2	T'	0	1 2	0	0 !	. ,~	0 (	ו ס
LGConfig	L'			1 L4	,		1 L'		!	L/ 143/		!
Volume	1159			1275			1487					ļ
Lane Width RTOR Vol	ן ואכים ן	₽≅·U		112.0 ) 1	PG - N		175.0		ì	15.0		1
KIOK VOI	ŀ			1			1		,			
Duration	0.25		Anos	Tunat		than	20020			· · · · · · · · · · · · · · · · · · ·		
Pul atton	0.63		нгеа	Type:	O	nonat	ione					
Phase Comb	sinatio	. 1	2	3,19,	101 0		ions	5	ь	7	a	
EB Left	3 1 11 G C 1 O 1	Ä	_		7	I NB	Left	Ā		r	U	
Thru		Â				1	Thru	~				
Right						;	Right					
Peds						ì	Peds					
⊌B Left			Α			1 ZB	Left	A				
Thru			Ä			1	Thru	-				
Right			~			i	Right					
Peds						i	Peds					
NB Right						i EB	Right					
SB Right						I WB	Right					
Green		41.0	34.5					29.5				
Yellow		3.0	3.0					3.0				
All Red		5.0	5.0					2 - 0				
								Сус	le Len	gth: ]	150.0	secs
		In	iterse	ction	perfo	rmano	e Summ	ary				
Appr/ La	ane		Sat		tios		Lane		App	roach		
Lane Gr	roup	Flow	Rate			_					_	
Grp Ca	apacity	(	2)	v/c	g/	C	Delay	L02	Dela	y LOS		
Eastbound												
	เว็ลว	350		0.14		34	27.4	C				
Т ]	เรียง	361	ıO	0.87	Ü-	34	43.7	Ð	41.5	D		
Westbound					_			_				
	1007	350		0.64		29	38.7	D		_		
Τ ]	r039	361	ıυ	0.77	U.	29	42.7	D	40-9	D		
Northbound		7.55			_	n						
L	561	350	ıç	0-60	□•	25	41.1	D				
									41.1	D		
	_											
Southbound					-	2.5	JF *					
L å	561	350	12	0.18	U •	25	35.8	D	26.4	Τ.		
									35.8	D		
,			No.1	- 110		a = 1	. L. V	-+		105 -	- h	
,	Interse	LLION	neray	- 40.	, ,2	5C/ A6	:117 1	urei.2	ection	r. 7.7 -	- <i>V</i>	

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Inter.: SR 131/Primetime Road Agency: TRC International Ar Date: 5/22/02 Ju Period: AM Ye Project ID: Knox Co., Prop. System Alt. I Area Type: All other areas Jurisd: Year : 2026

E/W St: SR 131 (Emory Road) N/S St: Primetime Road

				) INTERSE							
	l Ea: IL			ound		hbour			thbou		!
	l L.	I K	1 6 1	î R	L	Т	R I	L	Ť	R	1
No. Lan	es l 1	5 0	1,	2 0	i L	ı.		0	l.	l.	1
LGConfi	-		I L	TR	1 L	TR	1		LT		1
Volume		_		51 11	151 1	-			75		1
RTOR Vo	dth   112.0		112.0 <b>1</b> 2	:-U 4	175.0 )	ις.υ 1	, j		75.0	16P 15·0	[ ]
		LO	<u>'</u>	٦	•	1	, ,			тее	•
Duratio	n 0.25	Area		l other al Operat							
	ombinatio	nl 2	3	4 [		5	Ь	7	8		
EB Lef	-	A		INB	Left	A					
Thr	-	A A		!	Thru	A					
Rig Ped		A A		1	Right Peds	A					
WB Lef	•	A		l ZB	Left		A				
Thr	-	Ä		1	Thru		Â				
Rig	ht	A		i	Right		A				
Ped	s			l	Peds						
NB Rig				I EB	Right						
SB Rig	ht	A		I WB	Right						
Green Yellow		14.0 50.0 3.0 3.0				10.5 3.0	10.5 3.0				
All Red		5.0 5.0				2.0	5.0				
							e Leng	th:	105.0	se	C 2
		Interse									
Appr/	Lane	Adj Sat	Rati	DS	Lane 0	roup	Appro	oach			
Lane Grp	Group Capacity	Flow Rate (s)	***************************************	g/C	Delay	20.1	7-1	201			
σιρ	capacity	(2)	v/c	9/(	veray	£02	Delay	F 0.7			
Eastbou	nd						<del></del>			**	
Ĺ	241	1805	0.54	0.13	44.8	D					
TR	23 <u>5</u> 8	3589	0.44	0.66	8-8	A	75-8	В			
Westbou	nd .										
L	248	521	0.02	0.48	14.5	8					
TR	1718	3608	1.02	0.48	53.2	D	53-1	D			
						-					
Northbo											
L	181	1805	0.30	0.10	44.8	D					
TR	183	1859	0.04	0.10	42.8	D	44.5	D			
Southbo	und										
LT	182	1955	0.48	0 10	46.6	D	39.0	D			
R	454	1615	0.46	0.59	36.7	D	7 1.0	ν			
		tion Delay		(sec/ve		-	ction	LOS :	= D		
		,	_								

HCS2000: Signalized Intersections Release 4.1b

HCS2000: Signalized Intersections Release 4.16

Jurisd:

Inter .: SR 131/Primetime Road

Area Type: All other areas

Analyst: KA

Date:

Agency: TRC International

5/22/02

Period: PM Year : 5056 Project ID: Knox Co., Prop. System, Alt. 1 E/W St: SR 131 (Emory Road) N/S St: Primetime Road \_SIGNALIZED INTERSECTION SUMMARY\_ Eastbound I Westbound I Northbound Southbound I L Ŕ T E Т R-R L ΙL Τ Ţ No. Lanes 5 0 2 0 ı 1 0 ı ľ 1 LGConfig 1 L TR 1 L TR TR LT R 1317 1876 215 14 1281 99 195 1163 44 15 1118 30 Lane Width 112.0 12.0 175.0 75.0 175-0 75-0 75.0 JS.0 I RTOR Vol 72 33 Ь5 Duration 0.25 Area Type: All other areas \_Signal Operations\_ Phase Combination 1 7 2 3 4 1 Ь 8 EB Left A Α Left A Thru A A Thru Right A Α Right Peds Peds ⊌B Left Α 28 Left A Thru Α Thru Right Α A Right Peds Peds ΝB Right E8 Right SB Right М8 Right Green 16 - D 42.0 0.0 0.0 14.4 15.6 0.0 n.nYellow 3 • 0 3 · 0 0.0 3 - 0 3 - 0 0 - 0 All Red 5 - 0 2.0 0.0 5 · 0 2.0 0.0Cycle Length: 105.0 secs \_Intersection\*Performance Summary\_ Appr/ Lane Adj Sat Ratios Approach Lane Group Lane Flow Rate Group Grp v/c Capacity (s) g/C Delay LOS Delay LOS Eastbound 381 1805 0.88 0-60 50.9 Ð TR 2143 3572 0.99 40.0 0-60 38.3 D D Westbound 72 181 0.06 0.40 19.7 8 TR 1434 3584 0.99 0.40 52.1 D 52.1 D Northbound L 248 1805 0.69 0.14 51.3 TR 253 1845 0.53 D 48.7 D 0.14 40.8 Southbound LT513 1827 0.12 0.71 54.8 D 41.7 D R 517 1615 0.56 0.32 C 5F • B Intersection Delay = 44.5 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.16

\_\_\_\_OPERATIONAL ANALYSIS\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency/(o:	TRC International
Date:	C/21./D2

Date: 5/21/02 Analsis Period: AM

Highway: SR 131 (Emory Road)
From/To: Primetime Road/Rish From/To: Primetime Road/Bishop

Jurisdiction:

FREE	-FLOW SPEET	·		
Direction	1.		2	
_ane width	15.0	ft	15.0	ft
ateral clearance:				
Right edge	2.0	ft	2.0	ft
Left edge	<b>Ь.</b> □	ft	b - 0	ft
Total lateral clearance	8-0	ft	8.0	ft
Access points per mile	10		10	
1edian type	Divided		Divided	
ree-flow speed:	Base		Base	
FFS or BFFS	60.0	mph	ЬO - O	mph
ane width adjustment. FLW	0.0	mph	0.0	mph
ateral clearance adjustment, FLC	0.9	mph	0.9	mph
1edian type adjustment. FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.5	mph	2.5	mph
ree-flow speed	5Ь-Ь	mph	56.6	mph
·	_volume			
Direction	1		2	
/olume · V	7055	vph	1666	vph
Peak-hour factor, PHF	0.95		0.95	
Peak 15-minute volume, v15	270		438	
rucks and buses	3	7.	3 /	%
Recreational vehicles	Ð	Z.	0	%
errain type	Rolling -		Rolling -	
Grade	0.00	Z.	0.00	%
Segment length	0.00	mí	0.00	mi
lumber of lanes	2 <i>-</i>		2 —	
river population adjustment, fP	7 - 00		1.00	
rucks and buses PCE, ET	2.5		2.5	
Recreational vehicles PCE, ER	5.0		5.0	
leavy vehicle adjustment, fHV	0.957		0.957	
low rate, vp	564	pcphpl	916	pcphpl
	_RESULTS			
Direction	1		2	
low rate, vp	564	pcphpl	916	pcphpl
ree-flow speed, FFS	56 · 6	mph	56.6	mph
vg. passenger-car travel speed, S	5b · b	mph	56.6	mph
evel of service, LOS	-A		B .	mpr:
EAST OF SSUATCRA FAZ				

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37827

Phone: (615) 661-7979 E-mail:	Fa	x: (P];	5) 661-0644	
OPERAT	IONAL ANALYS	2I		
Analyst: Ken Arnold Agency/Co: TRC International Date: 5/21/02 Analsis Period: PM Highway: SR 131 (Emory Roa From/To: Primetime Road/Bi Jurisdiction: Analysis Year: 2026 Project ID: Knox Co., Prop. S	shop	ı		
FR	EE-FLOW SPEE	D	* **	
Direction Lane width Lateral clearance:	15·0 1	ft	75·0 5	ft
Right edge Left edge Total lateral clearance	8.0 6.0	ft ft ft	8·0 8·0	ք Ե ք Ե ք Ե
Access points per mile Median type Free-flow speed:	10 Divided Base		10 Divided Base	
FFS or BFFS Lane width adjustment, FLW Lateral clearance adjustment, FLC		mph mph mph	60.0 0.0 0.9	mph mph mph
Median type adjustment, FM Access points adjustment, FA Free-flow speed	2 + 2 2 + 2 2 + 2	mph mph mph	56.F 5.2	mph mph mph
	VOLUME			
Direction  Volume, V  Peak-hour factor, PHF  Peak 15-minute volume, v15	1 2009 <b>~</b> 0.95- 529	vph	2 1384 / 0.95 / 364	vph
Trucks and buses Recreational vehicles Terrain type Grade	3 - 0 Rolling- 0-00	х х	3 0 Rolling 0.00	χ χ
Segment length Number of lanes Driver population adjustment, fP	7·00 5~ 0·00	mi	1.00	mi

Direction	1.		2	
	RESULTS			
Flow rate, vp	1104	pcphpl	761.	pcphpl
Heavy vehicle adjustment, fHV	0.957		0.957	
Recreational vehicles PCE, ER	5.0		5.0	
Trucks and buses PCE, ET	2.5		2.5	
Driver population adjustment, fP	7 - 00		1.00	
Number of lanes	2 —		2 ~	
Segment length	0.00	mi	0 - 00	mi
Grade	0-00	Z.	0.00	Ż
Terrain type	Rolling-		Rolling	
Recreational vehicles	0	%	Ó	%
Trucks and buses	3 /	7.	3 ~	Ż.
Peak 15-minute volume, v15	529		364	
Peak-hour factor, PHF	0.95-		0.95	

Direc	tion:	1		5	
Flow rate, vp Free-flow speed, FFS Avg. passenger-car trave Level of service, LOS Density, D	el speed, S	1104 56.6 56.6 C 19.5	pcphpl mph mph pc/mi/ln	761 56.6 56.6 B 13.4	pcphpl mph mph pc/mi/ln

Analysis Summary , Alternate 2 2006 Traffic and Proposed Geometrics

	c and Proposed C		
Location	Type Analysis	Design Hour	LOS
I-75 Northbound South	Basic Freeway	AM	В
of Interchange	Segments	PM	В
I-75 Northbound South	Basic Freeway	AM	Α
of D-1 Major Diverge	Segments	PM	В
I-75 Northbound North	Basic Freeway	AM	Α
of D-1 Major Diverge	Segments	PM	Α
M-1, I-75 Northbound	Ramp and Ramp	AM	В
On-ramp from SR 131	Junctions	PM	В
I-75 Northbound, North of M-1 On-ramp from	Basic Freeway	АМ	В
SR131	Segments	РМ	В
I-75 Northbound North	Basic Freeway	AM	В
of Interchange	Segments	PM	В
I-75 Southbound North	Basic Freeway	AM	В
of Interchange	Segments	PM	В
D-2, I-75 Southbound	Ramp and Ramp	AM	С
Off-ramp to SR131	Junctions	PM	С
I-75 Southbound, South of D-2 Off-ramp to	Basic Freeway	АМ	В
SR131	Segments	PM	В
I-75 Southbound, South of M-2, Add Lane On-	Basic Freeway	АМ	В
ramp	Segments	PM	В
M-3, I-75 Southbound	Ramp and Ramp	AM	С
On-ramp from SR131	Junctions	РМ	В
I-75 Southbound South	Basic Freeway	АМ	С
of Interchange	Segments	PM	В
SR 131 West of I-75	Multilane	AM	Α
	Highways	PM	Α
SR 131/I-75 SB Ramps	Signalized	AM	B (12.4)
	Intersections	PM	B (12.6)
SR 131/I-75 NB Ramps	Signalized	AM	C (33.8)
	Intersections	PM	C (27.8)
SR 131/Primetime Rd.	Signalized	AM	C (29.6)
	Intersections	PM	C (28.1)
SR 131 East of	Multilane	AM	В
Primetime Rd.	Highways	PM	В

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Note: The LOS shown for intersections is the total average intersection delay. The delay in parentheses is in seconds per vehicle.

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

	Operational Ana	alysis	
Analyst:	Ken Arnold		
Agency or Company:			
Date Performed:	5/20/02		
Analysis Time Period:	AM  175 Northbound, So. of Interchange		
Freeway/Direction:			
From/To:			
Jurisdiction:			
Analysis Year:	500P		
Description: Knox Co-	Proposed System	DHV, AIT.Z	
	Flow Inputs and	d Adjustments	
Volume, V		5795 ,	veh/h
Peak-hour factor, PHF		0.95/	- <del>-</del>
Peak 15-min volume: v15		574	v
Trucks and buses		11	χ
Recreational vehicles		0	%
Terrain type:		Rolling (	
Grade		0.00	Z
Segment length		0.00	mi
Trucks and buses PCE, E	Ţ	2.5	
Recreational vehicle PC	E, ER	2.0	
Heavy vehicle adjustmer	nt, fHV	0.858	
Driver population facto		1 00	
nitasi bohotarton larrr	ora vp	1.00	
, .	ora vp	268	pc/h/ln
, .	·		pc/h/ln
Flow rate, vp	·	892 nd Adjustments	·
Flow rate, vp  Lane width	Speed Inputs ar	892 and Adjustments 12.0	pc/h/ln  ft ft
Flow rate, vp Lane width Right-shoulder lateral	Speed Inputs ar	892 nd Adjustments 12.0 6.0	ft ft
Flow rate, vp Lane width Right-shoulder lateral Interchange density	Speed Inputs ar	892 and Adjustments 12.0	ft
Flow rate, vp  Lane width Right-shoulder lateral Interchange density Number of lanes, N	Speed Inputs ar	892 nd Adjustments 12.0 6.0 0.50	ft ft
Flow rate, vp  Lane width Right-shoulder lateral Interchange density Number of lanes, N	Speed Inputs ar	892  nd Adjustments  12.0  6.0  0.50  3	ft ft
Flow rate, vp  Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS	Speed Inputs an	892  12.0  6.0  0.50  Measured	ft ft interchange/mi
Flow rate, vp  Lane width  Right-shoulder lateral  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment,  Lateral clearance adjus	Speed Inputs and clearance of the street of	892  12.0  6.0  0.50  Measured 70.0	ft ft interchange/mi mi/h
Flow rate, vp  Lane width  Right-shoulder lateral  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment,  Lateral clearance adjus	Speed Inputs and clearance of the street of	892  and Adjustments  12.0  6.0  0.50  3  Measured 70.0  0.0	ft ft interchange/mi mi/h mi/h
Flow rate, vp  Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed:	Speed Inputs and clearance  fLW stment, fLC justment, fID	892  and Adjustments  12.0  6.0  0.50  3 /  Measured  70.0  0.0	ft ft interchange/mi mi/h mi/h mi/h
Flow rate, vp  Lane width  Right-shoulder lateral  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment,  Lateral clearance adjus  Interchange density adj  Number of lanes adjustm	Speed Inputs and clearance  fLW stment, fLC justment, fID	892  and Adjustments  12.0  6.0  0.50  3 /  Measured  70.0  0.0  0.0	ft ft interchange/mi mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width  Right-shoulder lateral  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment,  Lateral clearance adjus  Interchange density adj  Number of lanes adjustm	Speed Inputs and clearance  fLW stment, fLC justment, fID	892  and Adjustments  12.0  6.0  0.50  3 /  Measured  70.0  0.0  0.0  0.0	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width  Right-shoulder lateral  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment,  Lateral clearance adjus  Interchange density adj  Number of lanes adjustm	Speed Inputs and clearance  fLW stment, fLC justment, fID	892  and Adjustments  12.0 6.0 0.50 3	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width  Right-shoulder lateral  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment,  Lateral clearance adjus  Interchange density adj  Number of lanes adjustment,  Free-flow speed, FFS	Speed Inputs and clearance  fLW stment, fLC justment, fID nent, fN	892  and Adjustments  12.0  6.0  0.50  3 /  Measured  70.0  0.0  0.0  0.0  3.0  70.0  Urban Freewa	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width  Right-shoulder lateral  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment,  Lateral clearance adjus  Interchange density adj  Number of lanes adjustmere-flow speed, FFS  Flow rate, vp	Speed Inputs and clearance  fLW stment, fLC justment, fID nent, fN	892  and Adjustments  12.0  6.0  0.50  3  Measured  70.0  0.0  0.0  0.0  0.0  Urban Freewa	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Flow rate, vp  Lane width Right-shoulder lateral Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, Lateral clearance adjus Interchange density adj Number of lanes adjustm Free-flow speed, FFS  Flow rate, vp Free-flow speed, FFS	Speed Inputs and Clearance  fLW stment, fLC justment, fID nent, fN	892  and Adjustments  12.0  6.0  0.50  3  Measured  70.0  0.0  0.0  70.0  Urban Freewa	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h
Flow rate, vp  Lane width  Right-shoulder lateral  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment,  Lateral clearance adjust  Interchange density adj  Number of lanes adjustm  Free-flow speed, FFS  Flow rate, vp  Free-flow speed, FFS  Average passenger-car s	Speed Inputs and Clearance  fLW stment, fLC justment, fID nent, fN	892  and Adjustments  12.0  6.0  0.50  3  Measured  70.0  0.0  0.0  0.0  0.0  Urban Freewa	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Flow rate, vp  Lane width  Right-shoulder lateral  Interchange density  Number of lanes, N  Free-flow speed:  FFS or BFFS  Lane width adjustment,  Lateral clearance adjust  Interchange density adj  Number of lanes adjustm  Free-flow speed, FFS  Flow rate, vp  Free-flow speed, FFS	Speed Inputs and Clearance  fLW stment, fLC justment, fID nent, fN	892  and Adjustments  12.0  6.0  0.50  3  Measured  70.0  0.0  0.0  0.0  Urban Freewa  mance Measures  70.0  70.0	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:		Fax: (615) 6	61-0644
	Operational Anal	/sis	
Analyst:	Ken Arnold		
Agency or Company:	TRC International		
Date Performed:	5/20/02		
Analysis Time Period:	PM -		
Freeway/Direction:	175		
From/To:	Northbound, So. o	Interchange ~	
Jurisdiction:		,	
Analysis Year:	2006		
Description: Knox Co.,	Proposed System.	ohv, Alt. 2	•
There are a second of the seco	Flow Inputs and a	\djustments	
Volume, V		2866	veh/h
Peak-hour factor: PHF		0.95	¥ € (
Peak 15-min volume, v15		754	v
Trucks and buses		11	ž
Recreational vehicles		G	ž.
Terrain type:		Rolling 🗸	•
Grade		0.00	×
Segment length		0.00	m i
Trucks and buses PCE, E1	r	2.5	Rt 1
Recreational vehicle PCE		5.0	
Heavy vehicle adjustment		0.858	
Driver population factor		1.00	
Flow rate, vp	· •p	1172	pc/h/ln
	Speed Inputs and	Adjustments	
Lane width		75.0	ft
Right-shoulder lateral o	learance	L.O	ft
Interchange density	itea ance	0.50	interchange/mi
Number of lanes, N		3 ~	Three changes mi
Free-flow speed:		Measured	
FFS or BFFS		70.0	mi/h
Lane width adjustment, 1	1 10	0.0	mi/h
Lateral clearance adjust		0.0	mi/h
Interchange density adju		0.0	mi/h
Number of lanes adjustme		3.0	mi/h
Free-flow speed, FFS	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	70.0	mi/h
over visu speed in the		Urban Freeway	
	_LOS and Performar	ice Measures	
Flow rate, vp		1172	pc/h/ln
Free-flow speed, FFS		70.0	mi/h
Average passenger-car sp	peed. 7	70.0	mi/h
Number of lanes, N		3	m 1 / 11
		_	
Density: D		16.7	pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

	Operational Analysis
Analyst:	Ken Arnold
Agency or Company:	TRC International
Bate Performed:	C/20/02

5/20/02 AM Analysis Time Period: Freeway/Direction:

I75 From/To: Northbound, So. of Interchange 1

	10 - 20 - Of Interchange	
Jurisdiction:		
Analysis Year: 2006	50-4 NOV A 14 4	
Description: Knox Co., Proposed	System; DHV, AIC. 2	
Flow Inp	outs and Adjustments	
Volume, V	2182	veh/h
Peak-hour factor, PHF	0.95/	
Peak 15-min volume, v15	574	v
Trucks and buses	77 ~	Z
Recreational vehicles	0	7.
Terrain type:	Rolling 🗸	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
Flow rate, vp	<b>6</b> 69	pc/h/ln
	puts and Adjustments	
Lane width	15.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	<b>-</b> -
Free-flow speed:	Measured	
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, f		mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	70.0	mi/h
·	Urban Freeway	
LOS and	Performance Measures	
Flow rate, vp	<b>5</b> 69	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	18 4 Z 14
Density, D	7-6	pc/mi/ln
Level of service, LOS	7 - 6 A	PC/#1/111
FEAST OF SELATERS FAR	A	

HCS2000: Basic Freeway Segments Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold Agency or Company: TRC International

Date Performed: 5/20/02
Analysis Time Period: PM ~

Freeway/Direction: I75
From/To: Northbound, So. of Interchange

Jurisdiction: Analysis Year:

Free-flow speed, FFS

500P~

\_Operational Analysis\_\_\_

Description: Knox Co., Proposed System, DHV, Aft. 2

\_\_\_\_\_\_Flow Inputs and Adjustments\_

Volume, V	5866	veh/h
Peak-hour factor, PHF	0.95~	
Peak 15-min volume, v15	754	V
Trucks and buses	11 ~	%
Recreational vehicles	0	%
Terrain type:	Rolling /	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, £T	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
Flow rate, vp	879	pc/h/ln
Speed Inputs an	d Adjustments	
Speed Inputs and Lane width	d Adjustments	ft
Lane width	75.0	ft
Lane width Right-shoulder lateral clearance	75.0	ft ft
Lane width Right-shoulder lateral clearance Interchange density	12.0 6.0	ft ft
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N	12.0 6.0 0.50	ft ft
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed:	12.0 6.0 0.50 4 / Measured	ft ft interchange/mi
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS	12.0 6.0 0.50 4 / Measured 70.0	ft ft interchange/mi mi/h
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW	12.0 6.0 0.50 4 / Measured 70.0	ft ft interchange/mi mi/h mi/h
Lane width Right-shoulder lateral clearance Interchange density Number of lanes, N Free-flow speed: FFS or BFFS Lane width adjustment, fLW Lateral clearance adjustment, fLC	12.0 6.0 0.50 4 / Measured 70.0 0.0	ft ft interchange/mi mi/h mi/h mi/h

LOS and Performance Measures
------------------------------

70.0

Urban Freeway

mi/h

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	ц	
Density: D	75.6	pc/mi/ln
Level of service, LOS	В	

\_\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/20/02
Accident Miner Description	1.64

Analysis Time Period: I75

Freeway/Direction: From/To: Northbound, North of D-1

Jurisdiction:

Analysis Year: 5002 Description: Knox Co., Prop. System, DHV, Alt. 2

\_Flow Inputs and Adjustments\_

	4.14 NG JOSE MENES	
Volume, V	1651	veħ/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	427	v
Trucks and buses	16 16	%
Recreational vehicles	O	%
Terrain type:	Rolling	
Grade	۵۰۰۵ م	%
Segment length	0.00	mi
Trucks and buses PCE, ET	5 • 5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, vp	1.00	
Flow rate, vp	705	pc/h/ln
7beed lubuts	and Adjustments	

Lane width	15.0	ft
Right-shoulder lateral clearance	<b>L</b> - O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	•
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
·	Urban Freew	ay

LOS and Pe	erformance Measures	
flow rate, vp	705	pc/h/ln
Free-flow speed, FFS Average passenger-car speed, S	70.0 70.0	mi/h mi/h
Number of lanes, N Density, D	3 10·1	pc/mi/ln
Level of service, LOS	Ā	pc/mi/in

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	Operational Analysis
Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/20/02

Date Performed: 5/20/02
Analysis Time Period: PM

Freeway/Direction: I75
From/To: Northbound North of D-1

Jurisdiction: Analysis Year:

Analysis Year: 2006
Description: Knox Co., Prop. System, DHV, Alt. 2

\_\_\_\_\_Flow Inputs and Adjustments\_\_\_\_

Volume, V	1531	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	403	V
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade .	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, vp	1.00	
Flow rate, vp	666	pc/h/ln

\_\_\_\_\_Speed Inputs and Adjustments\_\_\_\_

Lane width	12.0	ft
Right-shoulder lateral clearance	b - 0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3	-
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
·	Urban Freeway	

\_\_\_\_\_LOS and Performance Measures\_\_\_\_

Flow rate, vp Free-flow speed, FFS	666 70.0	pc/h/ln mi/h
Average passenger-car speed: S	70.0	mi/n mi/h
Number of lanes, N	3	
Density D	9.5	pc/mi/ln
Level of service, LOS	A	

HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

E-mail:						
	Merge	Analysis				
Analyst: Agency/Co.: Date performed: Analysis time period: Freeway/dir or travel: Junction: Jurisdiction: Analysis Year: Description: Knox Co.	1-75/2.R. 131 2006	(Emory Road)		t. 2		
	Free	way Data				
Type of analysis Number of lanes in free Free-flow speed on free Volume on freeway		Merge 3 70.0 1621		mph vph		
<u> </u>		amp Data				
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/d Length of second accel/	ecel lane	Right 1 50.0 192 840	ne exists	mph vph ft ft		
Does adjacent ramp exis Volume on adjacent Ramp Position of adjacent Ra Type of adjacent Ramp Distance to adjacent Ra	t? mp	No		vph ft		
Con	version to pc/h	Under Bäse	Condition	15		
Junction Components  Volume: V (vph) Peak-hour factor: PHF Peak 15-min volume: v15 Trucks and buses Recreational vehicles Terrain type:         Grade         Length Trucks and buses PCE: E Recreational vehicle PC Heavy vehicle adjustmen Driver population facto	T E. ER t. fHV	Freeway  1621  0.95  427  16  0  Rolling  mi  2.5  2.0  0.806  1.00	2.5 2.0 0.971 1.00	% mi	Adjacen Ramp Level	vph v ス ス ス
flow rate, vp		577P	208			pcph

```
_Estimation of V12 Merge Areas_
                 L =
                         0.00
                                 (Equation 25-2 or 25-3)
                         0.601
                                 Using Equation 1
                         (P) = 1272
                      F
                          FΜ
                  15
                           ___Capacity Checks_
                                                        LOS F?
                          Actual
                                        Maximum
    v
F0
                          2324
                                        7200
                                                        Νo
    v
R12
                          1480
                                        4600
                                                        Nο
               _Level of Service Determination (if not F)_
Density D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 11.7
                                                                      pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                          ___Speed Estimation__
Intermediate speed variable:
                                            M = 0.254
                                            Z = P5·J
Space mean speed in ramp influence area:
                                                         mph
Space mean speed in outer lanes,
                                            2 = P8.8
                                                         mph
                                            0
Space mean speed for all vehicles,
                                            P. P. 2
                                                         mph
```

## HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Distance to adjacent Ramp

Fax: (615) 661-0644

ft

Analyst:	KA
Agency/Co.:	TRC International
Date performed:	5/20/02
Analysis time period:	PM
Freeway/dir or travel: Junction: Jurisdiction:	I-75/S.R. 131 (Emory Road)
Analysis Year:	500P
Description: Knox Co.,	M-l, NB, on ramp from S.r. 131, Alt. 2

	_Freeway Data	
Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway	Merge 3 70.0 1531	mph vph
	_On Ramp Data	·
Side of freeway	Picht	
Number of lanes in ramp	Right 1	
Free-flow speed on ramp	50.0	mph
Volume on ramp	-85E	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft
Adjacent	Ramp Data (if one exists	s)
Does adjacent ramp exist?	No	
Volume on adjacent Ramp Position of adjacent Ramp		vph
Type of adjacent Ramp		
		_

Conversion to p	oc/h Under Base	Conditions_	
Junction Components	Freeway	Ramp	Adjacent Ramp
Volume: V (vph)	1531	328	vph
Peak-hour factor, PHF	0.95	0.95	- F
Peak 15-min volume, v15	· 403	86	v
Trucks and buses	3P -	5 ,	%
Recreational vehicles	0	0	%
Terrain type:	Rolling	Rolling	Level
Grade	2.	ž	%
Length	mi	. mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	5.0	5.0	
Heavy vehicle adjustment, fHV	. 0.806	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1998	35⊾	pcph

```
Estimation of Vl2 Merge Areas...
                 L =
                         0.00
                                 (Equation 25-2 or 25-3)
                         0.601
                                 Using Equation 1
                  FΜ
                 v = v (P) = 1201
                                         pc/h
                  12 F
                           FΜ
                           ____Capacity Checks_
                                                        LOS F?
                           Actual
                                        Maximum
                          2354
                                        7200
                                                        No
     F٥
                          1557
                                        4600
                                                        No
     R12
               _Level of Service Determination (if not F)_
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = R
                                                              12.2
                                                                      pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                          ___Speed Estimation___
                                            M = 0.256
Intermediate speed variable,
Space mean speed in ramp influence area.
                                            Z = P5.8
                                                         mph
Space mean speed in outer lanes,
                                            Z = P8·d
                                                         mph
                                            S = 64.8
Space mean speed for all vehicles.
                                                         mph
```

-7

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_Operational Analysis\_\_ Ken Arnold TRC International Analyst: Agency or Company: Date Performed: 5/20/02 Analysis Time Period: AM -Freeway/Direction: I-75/S-R- 131 (Emory Road) From/To: N.B., North of Interchange Jurisdiction: 500P ~ Analysis Year:

Description: Knox Co., Prop. System, DHV Alt.2

\_\_\_\_\_Flow Inputs and Adjustments\_ 1813 ~ Volume, V veh/h Peak-hour factor, PHF 0.95 < Peak 15-min volume, v15 477 19 Trucks and buses 7. Recreational vehicles 'n, Terrain type: Rolling / Grade 0.00 Z, Segment length 0.00 мi Trucks and buses PCE, ET 2 - 5 Recreational vehicle PCE, ER 2.0 Heavy vehicle adjustment, fHV 0.778 Driver population factor, vp 1.00 flow rate, vp 817 pc/h/ln \_\_\_\_Speed Inputs and Adjustments\_ Lane width ft 75.0 Right-shoulder lateral clearance 6.0 ft Interchange density 0 - 50 interchange/mi Number of lanes, N 3 ~ Free-flow speed: Measured FFS or BFFS 70.0 mi/h Lane width adjustment, fLW п.п mi/h Lateral clearance adjustment, fL( 0.0 mi/h Interchange density adjustment, fID 0.0mi/h Number of lanes adjustment, fN 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway \_\_\_\_LOS and Performance Measures\_ 817 pc/h/ln 70.0 mi/h 70.0 mi/h 3 11.7 pc/mi/ln В

Flow rate, vp Free-flow speed, FFS Average passenger-car speed, S Number of lanes, N Density D Level of service, LOS

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold		
Agency or Company:	TRC Internation	al	
Date Performed:	5/20/02		
Analysis Time Period:	PM /		
Freeway/Direction:	I-75/S-R. 131 (	Emory Road)	
From/To:	N.B., North of	Interchange ~	
Jurisdiction:			
Analysis Year:	500P~		
Description: Knox Co.,	Prop. System: D	HV, Alt. 2	
	Flow Inputs an	d Adjustments	
Volume, V		1859 -	veh/h
Peak-hour factor, PHF		0.95 <	
Peak 15-min volume, v15		489	v
Trucks and buses		19/	7.
Recreational vehicles		0	Ż.
Terrain type:		Rolling 🗸	
Grade .		م م م م	%
Segment length		0.00	mi
Trucks and buses PCE, E	T	2.5	
Recreational vehicle PC	En ER	2.0	
Heavy vehicle adjustmen	t, fHV	0.778	
Driver population factor	ra vp	1.00	
Flow rate, vp		838	pc/h/ln
·	Speed Inputs a		pc/h/ln
•	Speed Inputs a	nd Adjustments	
Lane width		nd Adjustments	ft
Lane width Right-shoulder lateral :		nd Adjustments 12.0 6.0	ft ft
Lane width Right-shoulder lateral : Interchange∂density		nd Adjustments	ft
Lane width Right-shoulder lateral : Interchange∂density Number of lanes, N		nd Adjustments 12.0 6.0 0.50	ft ft
Lane width Right-shoulder lateral : Interchange∂density		nd Adjustments 12.0 6.0 0.50 3	ft ft
Lane width Right-shoulder lateral : Interchange∂density Number of lanes N Free-flow speed:	clearance	nd Adjustments 12.0 6.0 0.50 3 Measured	ft ft interchange/mi
Lane width Right-shoulder lateral   Interchange@density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment	clearance fLW	nd Adjustments 12.0 6.0 0.50 3 / Measured 70.0	ft ft interchange/mi mi/h mi/h
Lane width Right-shoulder lateral of Interchange@density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment of Lateral clearance adjust	clearance fLW tment, fLC	nd Adjustments 12.0 6.0 0.50 3 / Measured 70.0	ft ft interchange/mi mi/h
Lane width Right-shoulder lateral   Interchange@density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment	clearance fLW tment, fLC ustment, fID	nd Adjustments 12.0 6.0 0.50 3 / Measured 70.0 0.0	ft ft interchange/mi mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, of Lateral clearance adjust Interchange density adjustment	clearance fLW tment, fLC ustment, fID	12.0 6.0 0.50 3 Measured 70.0 0.0 0.0	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h
Lane width Right-shoulder lateral of Interchange@density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment of Lateral clearance adjust Interchange density adju	clearance fLW tment, fLC ustment, fID	nd Adjustments	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Lane width Right-shoulder lateral of Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment of Lateral clearance adjust Interchange density adjustment of lanes adjustment o	clearance fLW tment, fLC ustment, fID ent, fN	nd Adjustments	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Lane width Right-shoulder lateral of Interchange density Number of lanes of Nerseaflow speed: FFS or BFFS Lane width adjustment of Lateral clearance adjustment of lanes adjustment of lan	clearance fLW tment, fLC ustment, fID	nd Adjustments	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Lane width Right-shoulder lateral of Interchange density Number of lanes. N Free-flow speed: FFS or BFFS Lane width adjustment. Of Lateral clearance adjust Interchange density adjustment Free-flow speed. FFS	clearance fLW tment, fLC ustment, fID ent, fN	nd Adjustments	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Lane width Right-shoulder lateral of Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment of Lateral clearance adjust Interchange density adjustment Free-flow speed FFS Free-flow speed FFS	flw tment, fLC ustment, fID ent, fN LOS and Perform	nd Adjustments	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Lane width Right-shoulder lateral of Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment, to Lateral clearance adjust Interchange density adjustment Free-flow speed, FFS Free-flow speed, FFS Average passenger-car sp	flw tment, fLC ustment, fID ent, fN LOS and Perform	nd Adjustments	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m
Lane width Right-shoulder lateral of Interchange density Number of lanes N Free-flow speed: FFS or BFFS Lane width adjustment of Lateral clearance adjust Interchange density adjustment Free-flow speed FFS Free-flow speed FFS	flw tment, fLC ustment, fID ent, fN LOS and Perform	nd Adjustments	ft ft interchange/mi mi/h mi/h mi/h mi/h mi/h mi/h mi/h m

\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold	
Accord on Company	TPC International	

Agency or Company: Date Performed:

Agency or Company: TRC International Date Performed: 5/20/02
Analysis Time Period: AM I-75/S.R. 131 (Emory Road)

Freeway/Direction:

From/To: Jurisdiction:

Analysis Year:

500P~

Description: Knox Co., Prop. System, DHV, Alt. 2

Flow	Inputs	and	Adjustments.
_1 TOM	TIIhara	anu	Auluzementz

N.B., North of Interchange

Volume, V Peak-hour factor, PHF	1813/	veh/h
Peak 15-min volume, v15	477	v
Trucks and buses	19 🖊	%
Recreational vehicles	0	%
Terrain type:	Rolling 🗸	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	755P	pc/h/ln

## \_\_\_\_\_Speed Inputs and Adjustments\_\_\_\_

Lane width	75.0	ft
Right-shoulder lateral clearance	<b>5 - 0</b>	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2 🗸	-
free-flow speed:	Measured	
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	4.5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	

## \_\_\_\_L0S and Performance Measures\_

Flow rate, vp	1556	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	17.5	pc/mi/ln
Level of service, LOS	В	•

\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 651-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	<b>5</b> /20/02

Analysis Time Period: PM -

Jurisdiction: Analysis Year: 2006 Description: Knox Co., Prop. System.	DHV , AIT. 2	
Flow Inputs a	nd Adjustments	
Volume, V	1859 /	veh/h
Peak-hour factor, PHF	0.95~	
Peak 15-min volume, v15	489	V
Trucks and buses	19 🗸	%
Recreational vehicles	Ð	%
Terrain type:	Rolling ✓	
Grade	0.00	%
Segment length	0 <b>-</b> 0 D	mi
Trucks and buses PCE, ET	2 - 5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	1257	pc/h/ln
Speed Inputs	and Adjustments_	
Lane width	15.0	ft
Right-shoulder lateral clearance	P • O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2 🗸	
Free-flow speed:	Measured	
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	4.5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freed	ıay
LOS and Perfo	rmance Measures_	
Flow rate: vp	1257	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
		W T V 11
Number of lanes, N	2	

Density D 18.0pc/mi/ln Level of service, LOS

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	Operational Anal	ysis
		-
Analyst:	Ken Arnold	

TRC International Agency or Company: Date Performed:

Analysis Time Period:

Freeway/Direction: From/To:

Jurisdiction: Analysis Year:

S/50/05

I-75/S.R. 131 (Emory Road) S.B., North of Interchange

500P << Description: Knox Co., Prop. System, DHV, Alt. 2

\_\_Flow Inputs and Adjustments\_

Volume, V Peak-hour factor, PHF	1809 ~ 0.95 ~	veh/h
Peak 15-min volume, v15	47 <b>L</b>	V
Trucks and buses	19 /	%
Recreational vehicles	0	%
Terrain type:	Rolling-	
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	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	7553	pc/h/ln

hood?	Toouts	and	Adjustments	

Lane width	12-0	ft
Right-shoulder lateral clearance	b • 0	ft
Interchange <sup>®</sup> density	0.50	interchange/mi
Number of lanes, N	2 🗸	-
Free-flow speed:	Measured	
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	4.5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	

#### \_LOS and Performance Measures\_

Flow rate, vp	1223	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	17-5	pc/mi/ln
Level of service, LOS	В	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:	19%. (973)	100 TT
Operational Ar	nalysis	
Analyst: Ken Arnold		
Agency or Company: TRC Internation	nal	
Date Performed: 5/20/02		
Analysis Time Period: PM ∽		
Freeway/Direction: I-75/S-R- 131 (		
From/To: S.B., North of		
Jurisdiction:	-	
Analysis Year: 2006 -		
Description: Knox Co., Prop. System, D	PHV, AIt. 2	
Flow Inputs an	nd Adjustments	
Volume, V	1831	veh/h
Peak-hour factor, PHF	0.95	V = 117 11
Peak 15-min volume, v15	482	V
Trucks and buses	19 🗸	ž
Recreational vehicles	o ,	ž
Terrain type:	Rolling /	<b>.</b>
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	5.2	2
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	1539	pc/h/ln
Speed Inputs a	nd Adjustments	
Lane width	15.0	ft
Right-shoulder lateral clearance	b - 0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2 🗸	3
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
ane width adjustment, fLW	0.0	mi/h
_ateral clearance adjustment, fLC	0 - 0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
free-flow speed, FFS	70.0	mi/h
	Urban Freewa	<b>э</b> у
LOS and Perfor	mance Measures	
flow rate, vp	1238	pc/h/ln
ree-flow speed, FFS	70.0	mi/h
Average passenger-car speed: S	70.0	mi/h
Number of lanes, N	5	•
Density: D	17.7	pc/mi/ln

```
__Diverge Analysis__
Analyst:
                         KΑ
Agency/Co::
                         TRC International
Date performed:
                         2/57/05
                         AM -
Analysis time period:
                        175/S.R. 131 (Emory Road)
Freeway/dir or travel:
Junction:
Jurisdiction:
                         S00P_
Analysis Year:
Description: Knox Co., D-2, SB, offramp to SR 131, Alt. 2
                                   _Freeway Data_
                                              Diverge
2
Type of analysis
Number of lanes in freeway
                                              70.0
Free-flow speed on freeway
                                                             mph
                                              1809 🗸
Volume on freeway
                                                             vph
                                  _Off Ramp Data_
                                              Right
Side of freeway
Number of lanes in ramp
                                              50.0
Free-Flow speed on ramp
                                                             mph
Volume on ramp
                                              171/
                                                              vph
Length of first accel/decel lane
                                              360
                                                              ft
Length of second accel/decel lane
                                                              ft
                        ___Adjacent Ramp Data (if one exists)_
Does adjacent ramp exist?
                                              Νo
Volume on adjacent ramp
                                                             vph
Position of adjacent ramp
Type of adjacent ramp
                                                              ft
Distance to adjacent ramp
                   __Conversion to pc/h Under Base Conditions_
Junction Components
                                                                  Adjacent
                                        Freeway
                                                     Ramp
                                                                  Ramp
                                                     171
                                        1809 /
Volume, V (vph)
                                                                            vph
                                        0.95
                                                     0.95
Peak-hour factor, PHF
                                        475
19
                                                     45
Peak 15-min volume, v15
                                                                            ٧
                                                                            'n.
Trucks and buses
                                                     O.
                                                                            7.
                                        Π
Recreational vehicles
Terrain type:
                                                     Rolling 🗹
                                        Rolling /
                                                                  Level
                                                Z,
                                                             Z.
                                                     0.00
                                                                          %
     Grade
                                        0.00
     Length
                                        0.00
                                                     0.00
                                                                          мi
Trucks and buses PCE, ET
                                        2.5
                                                     2.5
Recreational vehicle PCE, ER
                                        5.0
                                                     2.0
Heavy vehicle adjustment, fHV
                                        0.778
                                                     0.971
                                        7.00
Driver population factor, fP
                                                     1.00
                                                                            pcph
Flow rate: vp
                                        2447
                                                     185
                          _Estimation of V12 Diverge Areas_
                  L =
                           0.00
                                   (Equation 25-8 or 25-9)
                    ΕQ
                  Р
                           1.000
                                   Using Equation O
                    FΦ
                     = v
                           + (v - v)P =
                                           2447
                                                    pc/h
                                      FD
                   75
                        R
                              F R
                               _Capacity Checks_
                                                           LOS F?
                            Actual
                                          Maximum
                            2447
                                           4800
                                                           No
      Fi
                            2447
                                          4400
                                                           No
      75
                            5525
                                           4800
                                                           No
     FO
           F
               R
     v
                            185
                                          5700
                                                           No
      R
```

Level of Service Determinat	ion (if not F)
	- 0.005 L = 22.1 pc.
R Level of service for ramp-freeway junction a	,2
Speed Estimation	rn
Intermediate speed variable,	D = 0.250
Space mean speed in ramp influence area,	rlqm E3 = 2 R
Space mean speed in outer lanes.	S = N/A mph
Space mean speed for all vehicles:	2 = 63-0 mph

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, IN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail: \_\_\_\_Diverge Analysis\_\_\_ Analyst: KA TRC International Agency/Co:: \$/21/02 Date performed: Analysis time period: PM < Freeway/dir or travel: I75/S.R. 131 (Emory Road) Junction: Jurisdiction: Analysis Year: 500P < Description: Knox Co., D-2, SB, offramp to SR 131, Alt. 2 \_\_\_\_Freeway Data\_\_\_ Type of analysis Diverge Number of lanes in freeway Free-flow speed on freeway 70.0 mph Volume on freeway 1831 / vph \_\_\_\_Off Ramp Data\_\_\_ Side of freeway Right Number of lanes in ramp 1 -Free-Flow speed on ramp 50.0 mph Volume on ramp 187/ vph Length of first accel/decel lane ft 3P0 Length of second accel/decel lane ft \_\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_ Does adjacent ramp exist? No Volume on adjacent ramp vph Position of adjacent ramp Type of adjacent ramp Distance to adjacent ramp ft \_\_\_\_Conversion to pc/h Under Base Conditions\_ Junction Components Freeway Ramp Ramp 187 / Volume, V (vph) 1831 < vph Peak-hour factor, PHF 0.95 < 0.95 < 49 Peak 15-min volume, v15 482 Trucks and buses 19~ % Recreational vehicles Ω 0 7. Rolling/ Terrain type: Rolling ~ Level ~ *%* Grade 0.00 % 0.00 % Length 0.00 mi 0.00 шi mi Trucks and buses PCE, ET 2.5 2.5 Recreational vehicle PCE, ER 5.0 5.0 Heavy vehicle adjustment, fHV 0.778 0.971 Driver population factor, fP 1.00 7.00 Flow rate, vp 2477 503 pcph \_\_\_Estimation of Vl2 Diverge Areas\_\_ L = 0.00 (Equation 25-8 or 25-9) ΕQ P = 1.000 Using Equation 0 FD + (v - v) P = 2477 pc/h1.2 R FR FΦ \_\_\_Capacity Checks\_\_\_

Actual

2477

v = v

Fi F

Maximum

4800

LOS F?

No

v 12	2477	4400	No
v = v - v F0 F R	2274	4800	No
v R	203	5100	No

Level of Service Determination (if not F)\_\_\_\_\_ D = 4.252 + 0.0086 v - 0.009 L = 22.3 pc/mi/ln RDensity, Level of service for ramp-freeway junction areas of influence C \_\_\_\_\_Speed Estimation\_\_\_ Intermediate speed variable. D = 0.251 Z = F3 Space mean speed in ramp influence area. mph Space mean speed in outer lanes, S = N/A mph Space mean speed for all vehicles,  $z = P3 \cdot 0$ mph

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\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold TRC International Agency or Company: Date Performed: 5/21/02

Analysis Time Period: AM ~

I-75/S.R. 131 (Emory Road) S-B., South of D-2 Freeway/Direction: From/To:

Jurisdiction:

500P \_ Analysis Year:

Description: Knox Co., Prop. System, Alt. 2 \_\_\_\_\_Flow Inputs and Adjustments\_\_ 1638 Volume: V veh/h Peak-hour factor, PHF Peak 15-min volume: v15 431 17/ Trucks and buses z Recreational vehicles 0 Z. Terrain type: Rolling ~ Grade Z. 0.00 Segment length 0.00 шi Trucks and buses PCE, ET 2.5 Recreational vehicle PCE, ER 5-0 Heavy vehicle adjustment, fHV 0.797 Driver population factor, vp 1.00 Flow rate, vp 7095 pc/h/ln \_\_\_\_\_Speed Inputs and Adjustments\_\_ Lane width ft 15.0 Right-shoulder lateral clearance 6-0 Interchange density 0.50 interchange/mi Number of lanes, N Free-flow speed: Measured 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 4.5 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway \_\_\_\_LOS and Performance Measures\_\_ Flow rate, vp 1095 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 15.5 pc/mi/ln Level of service, LOS R

\_\_Operational Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

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E-mail:

fax: (615) 661-0644

Analyst: Ken Arnold TRC International Agency or Company: Date Performed: 5/21/02 PM ~

Analysis Time Period:

I-75/S.R. 131 (Emory Road) S.B., South of D-2 Freeway/Direction: From/To:

Jurisdiction: Analysis Year:

2001

Analysis Year: 2006 Description: Knox Co., Prop. System	41t. 2	
Flow Inputs an	d Adjustments	
Volume, V	1644	veh/h
Peak-hour factor, PHF	0-95	
Peak 15-min volume, v15	433 <sub></sub>	V
Trucks and buses	17~	%
Recreational vehicles	0	%
Terrain type:	Rolling 🗸	•
Grade	0.00	አ -
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Keavy vehicle adjustment, fHV	· 0.797	
Driver population factor, vp	1.00	
flow rate, vp	709F	pc/h/ln
Speed Inputs a	nd Adjustments	
Lane width	12.O	ft
Right-shoulder lateral clearance	F.0_	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	ē	
Free-flow speed:	_ Measured	
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	4.5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	W & 7 11
LOS and Perform	mance Measures	
Flow rate, vp	1086	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	15.5	pc/mi/ln
Level of service, LOS	B	Permaran

\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold Agency or Company: Date Performed: TRC International 5/21/02

Analysis Time Period: Freeway/Direction: AM -I-75/2.R. 131 (Emory Road)

From/To:	S.B., South of							
Jurisdiction:	2001 /							
Analysis Year: Description: Knox Co.		2006 / Prop. System , Alt.2						
,	•							
	Flow Inputs an	d Adjustments						
Volume, V Peak-hour factor, PHF		2647 / 0.95 /	veh/h					
Peak 15-min volume, vl	.5	<b>6</b> 97	V					
Trucks and buses		12/	%					
Recreational vehicles		Ō	%					
Terrain type:		Rolling						
Grade		a.ao	%					
Segment length		0.00	mi					
Trucks and buses PCE.		2.5						
Recreational vehicle F		5.0						
Heavy vehicle adjustme		0.847						
Driver population fact	or, vp	1.00						
Flow rate, vp		1096	pc/h/ln					
	Speed Inputs a	nd Adjustments						
Lane width		75.0	ft					
Right-shoulder lateral	clearance	£-0	ft					
Interchange"density		0 · so	interchange/mi					
Number of lanes, N		3 🗸						
Free-flow speed:		Measured						
FFS or BFFS		70-0	mi/h					
Lane width adjustment		0.0	mi/h					
Lateral clearance adju		0.0	mi/h					
Interchange density ad		0.0	mi/h					
Number of lanes adjust	ment fN	3.0	mi/h					
Free-flow speed, FFS		70.0	mi/h					
		Urban Freewa	ıy					
	LOS and Perform	mance Measures						
Flow rate, vp		1096	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		15.7	pc/mi/ln					

pc/mi/ln Level of service, LOS

\_\_Operational Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Borformed:	E / 33 / 03

Date Performed: 5/21/02 Analysis Time Period: PM ✓

I-75/S.R. 131 (Emory Road)
S.B., South of M-2 Freeway/Direction: From/To:

Jurisdiction:

Analysis Year: 2006/		
Description: Knox Co., Prop. System A	t. 2	
Flow Inputs and	Adjustments	
Volume, V Peak-hour factor, PHF	2115/	veh/h
Peak 15-min volume, v15	557	V
Trucks and buses	75	ž.
Recreational vehicles	מ	X
Terrain type:	Rolling 🗸	
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	0.847	
Driver population factor, vp	1.00	
Flow rate, vp	87 <b>6</b>	pc/h/ln
Speed Inputs and	d Adjustments	
Lane width	75-0	ft
Right-shoulder lateral clearance	<b>Ь</b> ∙ 0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3 🗸	-
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70 0	mi/h
	Urban Freeway	

\_\_\_\_L02 and Performance Measures\_\_

Flow rate, vp pc/h/ln 876 70.0 Free-flow speed, FFS mi/h Average passenger-car speed, S 70.0 mi/h Number of lanes, N 3 Density 1 D 12.5 pc/mi/ln Level of service, LOS В

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

E-mail:				
TATAL	Mei	rge Analysis		
inalust:		-		
Analyst: Agency/Co.:	Ken Arnold TRC Internat	tional		
Date performed:	5/21/02	CIUNGI		
Analysis time period:				
Freeway/dir or travel:		(Emony Road)		
Junction:	Y 10/2/ 778	temory Road?		
Jurisdiction:				
Analysis Year:	5007 ~			
Description: Knox Co.,		namo from 50	131 AH 2	
Pedel Ipazoni Know Coli	ווט וטג וב וו	Lomb LLom 34	131, MILLE	
	Fr	reeway Data		<u> </u>
Type of analysis		Merge		
Number of lanes in free		3	_	
Free-flow speed on free	way	70.0	mph	
/olume on freeway		2647~	vph	
tali, ta	Or	n Ramp Data		
Side of freeway		Right		
Number of lanes in ramp		1		
Free-flow speed on ramp		50.0	mph	
Volume on ramp		542	vph	
Length of first accel/do	ecel lane	500	ft	-
Length of second accel/			ft	
		amp Data (if o		
Name adjacent as			Exists/	
oes adjacent ramp exist	t?	No		
Volume on adjacent Ramp			vph	
Position of adjacent Ram	пÞ			
Type of adjacent Ramp				
Distance to adjacent Rar	np		ft	
Conv	version to po	:/h Under Base	Conditions	
Junction Components		Freeway	Ramp	Adjacent
		-	,	Ramp
/olume∍ V (vph)		2647	542/	vph
Peak-hour factor, PHF		0.95	0.95 /	•
Peak 15-min volume, v15		697	143	v
Trucks and buses		ī.a /	حَ حَ	ž
Recreational vehicles		Ō	อ	ž
Terrain type:		Rolling/	Rolling 🗸	Level
Grade		7.	2	%
Length		mi	mi	mi
Trucks and buses PCE, E1	г	2.5	2.5	*** 1
Recreational vehicle PCE		5.0	5-0	
leavy vehicle adjustment		0.847	0.971	
river population factor				
low rate, vp	1 15	7.00	]00	عا مسيمة
TOW INCEL VP		388E	588	pcph
	Estimation	of V12 Merge A	lreas	
L = E <i>Q</i>	0.00 (E	quation 25-2 c	or 25-3)	
P = FM	0.591 Us	ing Equation	1.	
v = v	/ (P ) = ], F FM	945 pc/h		
	Capac	ity Checks		
	Actual	Massins	100 50	,
V	387b	Maximum 7200	LOS F?	
FO	3016	LCUU	No	
1 V				

K15 \_\_\_\_Level of Service Determination (if not F)\_\_\_\_ Density: D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 21.8 R 12 A Level of service for ramp-freeway junction areas of influence ( \_\_\_\_Speed Estimation\_ Intermediate speed variable, 0.320Space mean speed in ramp influence area:  $Z = PJ \cdot 0$ Space mean speed in outer lanes, Z = F3.0 mph Space mean speed for all vehicles, z\_ = P3·0 mph

4600

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\_\_\_\_Merge Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

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Phone: (615) 661-7979.
E-mail:
                                                  Fax: (615) 661-0644
```

Ken Arnold Analyst: Agency/Co:: TRC International Date performed: 2/51/05

Analysis time period: PM ~
Freeway/dir or travel: I-75/SR 131 (Emory Road)

Junction: Jurisdiction:

500P < Analysis Year:

Distance to adjacent Ramp

Description: Knox Co., M-3, SB, on ramp from SR 131, Alt.2

Fr	eeway Data	
Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway	Merge 3 ~ 70.0 2115 ~	mph vph
on	Ramp Data	
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/decel lane Length of second accel/decel lane	Right 1 50.0 192 840	mph vph ft ft
Adjacent Ra	mp Data (if one exist	5)
Does adjacent ramp exist? Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp	No	vph

Conversion to pc	/h Under Base	Conditions_	
Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2115 ~	192 / 0.95 /	vph
Peak-hour factor, PHF	0.95~	0.95	
Peak 15-min volume, v15	557	51	V
Trucks and buses	75 🖊	5	%
Recreational vehicles	0	0	%
Terrain type:	Rolling 🗸	Rolling	Level
Grade	7.	7.	%
Length	mi	mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	5.0	5-0	
Heavy vehicle adjustment, fHV	0.847	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2627	208	pcph

\_Estimation of V12 Merge Areas\_\_

L = 0.00 (Equation 25-2 or 25-3) \_EQ P = 0.601 Using Equation 1 FΜ (P ) = 1579 v = v pc/h 12 F FΜ

\_\_Capacity Checks\_

Actual 2835

Maximum 7200

LOS F? No

ft

K15

توع

No

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Density D

Level of service, LOS

Fax: (615) 661-0644

\_\_\_Operational Analysis\_\_\_ Analyst: Ken Arnold Agency or Company: TRC International Date Performed: 2/57/05 Analysis Time Period: AM ~ Freeway/Direction: I75 From/To: Southbound, south of interchange Jurisdiction: Analysis Year: 5006 Description: Knox Co., Proposed System, DHV, Alt. 2 \_\_\_\_\_flow Inputs and Adjustments\_\_ Volume, V 3189 ~ veh/h 0.95~ Peak-hour factor, PHF Peak 15-min volume, v15 839 Trucks and buses 11,~ Recreational vehicles n Terrain type: Rolling 🗸 Grade 0.00 Segment length 0.00 шi Trucks and buses PCE, ET 2 • 5 Recreational vehicle PCE, ER 2.0 Heavy vehicle adjustment, fHV 0-858 Driver population factor, vp 1.00 Flow rate, vp 1304 pc/h/ln \_\_\_\_\_Speed Inputs and Adjustments\_\_ Lane width 75.0 ft Right-shoulder lateral clearance F • 0 f t. Interchange density 0.50 interchange/mi Number of lanes, N 3 ~ Free-flow speed: Measured FFS or BFFS 70.0 mi/h Lane width adjustment, fLW 0.0 mi/h Lateral clearance adjustment, fL( 0.0 mi/h Interchange density adjustment, fID0.0 mi/h Number of lanes adjustment, fN 3.0 mi/h Free-flow speed, FFS 70.0 mi/h Urban Freeway \_\_\_\_LOS and Performance Measures\_\_ Flow rate, vp 1304 pc/h/ln Free-flow speed, FFS 70.0 mi/h Average passenger-car speed: S 70.0 mi/h Number of lanes, N

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

3

18.6

pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Level of service, LOS

E-mail:

Fax: (615) 661-0644

\_\_Operational Analysis\_\_ Analyst: Ken Arnold Agency or Company: TRC International Date Performed: 5/21/02 Analysis Time Period: PM ~ Freeway/Direction: I75 From/To: Southbound, south of interchange Jurisdiction: 5007 Analysis Year: Description: Knox Co., Proposed System, DHV, Alt. 2 \_\_\_\_Flow Inputs and Adjustments\_\_ Volume: V 2307 veh/h 0.95 Peak-hour factor, PHF Peak 15-min volume, v15 607 Trucks and buses 11-7 Recreational vehicles Ω Terrain type: Rolling / Grade 0.00 'n. Segment length 0.00 тi Trucks and buses PCE, ET 2.5 Recreational vehicle PCE, ER 2.0 Heavy vehicle adjustment, fHV 0.858 Driver population factor, vp 1.00 Flow rate, vp 943 pc/h/ln \_\_\_\_\_Speed Inputs and Adjustments\_\_\_ Lane width 15.0 Right-shoulder lateral clearance 6.0 ft Interchange density 0.50 interchange/mi Number of lanes, N 3 / Free-flow speed: Measured FFS or BFFS mi∕h 70.0 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 3.0 mi/h Free-flow speed, FFS 70.0 Urban Freeway \_\_\_\_L0S and Performance Measures\_\_ Flow rate, vp 943 pc/h/ln Free-flow speed, FFS 70.0 mi/h Average passenger-car speed, S 70.0 mi/h Number of lanes, N 7 Density, D

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

13.5

pc/mi/ln

#### HCS2000: Multilane Highways Release 4.1b

#### \_OPERATIONAL ANALYSIS\_

Analyst: Ken Arnold
Agency/Co: TRC International
Date: 5/21/02
Analsis Period: PM

Highway:

S.R. 131 (Emory Road) Central Ave./I-75

From/To: Jurisdiction:

Analysis Year: 2005 ~

FRÉE-	-LFOM Zbeed			
Direction	1.		5	
Lane width	12.0	ft	15.0	ft
Lateral clearance:				
Right edge	2.0	ft	5.0	ft
Left edge	<b>Ь</b> ∙ 0	ft	L · O	ft
Total lateral clearance	8.0	ft	8.0	ft
Access points per mile	5		55	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	PO · O	mph	PO-0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.9	mph	0.9	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	1.3	mph	5.5	mph
Free-flow speed	57.B	mph	53·L	mph
	_volume			
Direction	<b>1</b> ,		2	
Volume, V	1097 T	vph	1037	vph
Peak-hour factor: PHF	0.95′		0.95 ′	
Peak 15-minute volume, v15	289		273	
Trucks and buses	2 ~	7.	2 _	%
Recreational vehicles	0	½	O	%
Terrain type	Rolling ~		Rolling/	
Grade "	0.00	7.	0.00	%
Segment length	0 - 00	mi	0.00	mi
Number of lanes	2 ~		2 ^	
Driver population adjustment, fP	1 - 00		1.00	
Trucks and buses PCE, ET	2.5		2.5	
Recreational vehicles PCE, ER	2.0		5.0	
Heavy vehicle adjustment, fHV	0.971		0-971	
Flow rate, vp	594	pcphp1	562	pcphpl
	_RESULTS			
Direction	1		2	
Flow rate, vp	594	pcphpl	562	pcphpl
		mph	53.b	mph
	31.0			
Free-flow speed, FFS	57.8 57.8	,		•
	57-8 A	mph	4 · E Z	mph

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA
Agency: TRC International
Date: 5/21/02
Period: AM

Project ID: I-75 S.B. Ramps, A|t.2 E/W St: S.R. lal (Emory Road)

Inter:: SR 131/I-75 Area Type: All other areas

Jurisd:

Year : 2006 /

N/S St: I-75 S.B. Ramps

		216	NALIZED	INTERSE	CTION :	SUMMAR	Υ			
		tbound 1				thboun			thbound	1
	1 L	TRI	L T	Ŕ	! L !	T	R I	L	T R	 
No. Lane: LGConfig		2 / 0   TR		2 / O	i 0	0	D	0	l O LTR	i
Volume	1	397 / 542 / 1		8 ~	I			_	1 79	<b>_</b> !
Lane Wid RTOR Vol	th	12.0 0.51 1 175		. 0	1 1		1		5P 7P·0	 
KIOK VOI	I	E (Ti )			<u>'</u>		<u>'</u>			<u>'</u>
Duration	0.25	Area T		l other l Operat						
	mbination	7 S	. 3 _	4 1		5	Ь	7	8	
EB Left Thru		A		I NB	Left Thru					
Righ		A		i	Right					
Peds	·	•		i	Peds					
⊌B Left				I ZB	Left	A				
Thru		A	•	I	Thru	A				
Righ				I	Right	A				
Peds				1	Peds					
NB Righ SB Righ				1 MB	Right Right					
SB Righ Green		26.0		1 WB	Kignt	24.0				
Yellow		3.0				3.0				
All Red		2.0				2.0				
				_			e Leng	th:	PO·0	2662
Appr/	Lane	Adj Sat	tion Pe Rati	rformanc os	Fane (		Appr	oach		
	Group	Flow Rate (s)	v/c	g/C	Dollar.	LOS	Delay	1 0 5		
Grp	Capacity	(5)	V/C	g/C	relay	LV3	Delay	L V 3		
Eastboun	d									
TR	14 <u>1</u> ์3	3520	0 - 50	0.43	75.P	В	75-P	В		
Westboun	d									
Т	1504	3471	0.47	0.43	75.3	В	15.3	В		
Northbou	nd									
Southbou	nd									
LTR	764	1909	0.20	0.40	11.9	В	11.9	В		
		tion Delay	- 17 "	, ,			ction		_	

HCS2000: Signalized Intersections Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA
Agency: TRC International
Date: 5/21/02
Period: PM

Project ID: I-75 S.B. Ramps Alt.2 E/W St: S.R. lal (Emory Road)

Inter:: SR 131/I-75 Area Type: All other areas

Jurisd:

Year : 200b '

N/S St: I-75 S-B. Ramps

	1 Fac	Eastbound		oound		CTION SUMMARY   Northbound			1 Southbound 1		
	i L	T R	j L 1		l L		R		T R		
No. La	nes 1 0	5, 0	_	5 0	.¦	0	<del></del> '	Ö	1 0	¦	
LGConf		TR -	i	T-	i	-	Ĭ	•	LTR	ì	
Volume		905/ 192 -	∕i 96	.o /	ì		11	10/1		- i	
Lane 🛭	idth	12.0	1 16	2 - 0	1		1	]	16·0	- 1	
RTOR V	ol 1	571	1		1		1		56	. 1	
Durati	on 0-25	Area		ll other al Operat							
	Combination	1 1 2	3	4 1		S	Ь	7	8		
EB Le	_			i NB	Left						
Th.		Å		!	Thru						
rı Pe	ght da	A		-	Right Peds						
⊌B Le				l ZB	Left	A					
WD Ze		A		1 35	Thru	Â					
	ght	•		i	Right						
Pe				ĺ	Peds						
NB Ri				I EB	Right						
SB Ri	ght .			1 MB	Right						
Green		58.0				55.0					
		3.0				3.0					
		3.0 3.0				5.0					
		2.0	ection Pe	erformano	e Summ	Cyc:	le Leng	th: {	.O.O	zecz	
All Re		2.0 Inters	ection Pe Rati	erformanc ios	e Summ	Cyci ary			•O•O	zecs	
All Re Appr/	d	2.0	Rati			Cyci ary			• O • O	zecz	
All Re Appr/ Lane	Lane	Inters Adj Sat Flow Rat	Rati			Cyc: ary Group	Appr	oach		secs	
All Re Appr/ Lane Grp	Lane Group Capacity	Inters Adj Sat Flow Rat	Rati e	ios	Lane	Cyc: ary Group	Appr	oach		26C2	
All Re Appr/ Lane Grp Eastbo	Lane Group Capacity	Inters Adj Sat Flow Rat	Rati e	ios	Lane	Cyc: ary Group LOS	Appr	oach		5 <b>e</b> C S	
Appr/ Lane Grp Eastbo	Lane Group Capacity und	Inters Adj Sat Flow Rat (s)	Rati	g/C	Delay	Cyc: ary Group LOS	Appr	pach L0S		secs	
All Re Appr/ Lane	Lane Group Capacity und	Inters Adj Sat Flow Rat (s)	Rati	g/C	Delay	Z.O Cyc: ary_ Group LOS	Appr	pach L0S		5 <b>e</b> C S	
ADDR/ Lane Grp Eastbo TR	Lane Group Capacity und 1620 und	Inters Adj Sat Flow Rat (s) 3471	Rati	g/C g/C 0.47	Delay	Z.O Cyc: ary_ Group LOS	Appr Delay	LOS B		secs	
APPT/ Lane Grp Eastbo TR Westbo T	Lane Group Capacity und 1620 und 1620 ound	Inters Adj Sat Flow Rat (s) 3471	Rati	g/C g/C 0.47	Delay	Z.O Cyc: ary_ Group LOS	Appr Delay	LOS B		secs	
ADPT/ Lane Grp Eastbo TR Westbo T Northb	Lane Group Capacity und 1620 und ound	Inters Adj Sat Flow Rat (s) 3471	0.62	g/C g.47 g.47	Delay	Cyc: ary_ Group LOS	Appr Delay 12.3	B B		5 R C S	
APPT/ Lane Grp Eastbo TR Westbo T	Lane Group Capacity und 1620 und 0und 703	Inters Adj Sat Flow Rat (s) 3471	0.59 0.62	g/C 0.47 0.47	Delay	Cyc: ary Group  LOS  B  B	Appr Delay	each LOS B		5 <b>e</b> C S	

HCS2000: Signalized Intersections Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Agency: TRC International Date: 5/21/02 Period: AM

Inter:: SR 131/I-75
Area Type: All other areas

Jurisd: Year : 2006 /

Project ID: I-75 N.B. Ramps, Alt. 2 E/W St: S.R. 131 (Emory Road)

N/S St: I-75 N.B. Ramps

	I Eastboo			ZED INTE Stbound	RSECTION :	YAAMMUZ thbound	l Sor	ıthbou	ind	1
	I L T	R	ļ L	T R	! L	T R	ļ L	T	R	1
No. Lanes	1 2	0	-¦	2/0	¦ <u>1</u> ~	0 2	-¦	0	0	-¦
LGConfig	1 L - T - 159 - 430	_	1	TR -	3/1117/	R ~ 444 ~	1			- !
Volume Lane Width			 	75·0 72•0,73	175.0 3. 177.	75.0	j			i
RTOR Vol	1		1	44	1	148	1			ŀ

Dur	ation	0.25	A	rea	Type:	All	otl	ner	areas				
					Si	gnal	0 p	erat	ions				
Pha	se Comb	ination	l.	5	3	_	4			5	ь 7	Ð	
E8	Left		A				ļ	NB	Left	Α			
	Thru		A	Α			- 1		Thru				
	Right						1		Right	A			
	Peds						Į.		Peds				
₩B	Left						1	28	l.eft				
	Thru			Α			1		Thru				
	Right			Α			ı		Right				
	Peds						}		Peds				
NB	Right						t	EΒ	Right				
SB	Right						1	WB	Right				
Gre	_	l.	3 · D	45-0	)					17.0			
	low		- 8	3.0						3.0			
	Red		- D	5.0						5.0			
		_	-								Length:	90.0	secs

		Intersec	tion P	erforman	ice Summa	ary		
Appr/ Lane	Lane Group	Adj Sat Flow Rate		ios	Lane (	roup	Appro	oach
Grp	Capacity			g/C	Delay LOS		Delay	ΓQZ
Eastbo	und							
L	25b	1,770	0-24	0-14	34.6	Ç		
T	2477	3539	0.18	0.70	4.7	A	8.3	A
Westbo	und							
TR	1755	3510	0.99	0.50	4 <u>1</u> . <u>1</u> .	D	41.1	D
Northb	a.und							
HOLEUDI	334	1,770	0-37	0.19	32.5	c		
L	224	שיריט	u - 37	דעיט	26.2		34.4	c
R	526	2787	0.59	0.19	35.1	D		•
Southbu		= : = :						

Intersection Delay = 33.8 (sec/veh) Intersection LOS = C

HCS2000: Signalized Intersections Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

## HCS2000: Signalized Intersections Release 4-1b

Analyst: KA Agency: TRC International Date: 5/21/02
Period: PM /

Project ID: I-75 N.B. Ramps, Alt. 2 E/W St: S.R. 131 (Emory Road)

Inter:: SR 131/I-75

Area Type: All other areas

Jurisd:

Year : 2006 ~

N/S St: I-75 N.B. Ramps

			SIGNALIZE	D INTERSE	CTION	RAMMUZ	₹Ү			
	I Eas	tbound		bound		thbour			hboun	
	I L	T R		T R	I L	T	R I	L	Т	R I
No. Lane	es i l	/ 2/ 0	_ i	2 0	i 1/	0	27 i	0	0	i
LGConfid			j	TR	14-	_				1
Volume	1753/	~ SP8	1 1	056 205 -	1375 🔨	•	360 / I			1
Lane Wid				2.0	175.0	J	15-0 I			1
RTOR Vol	1 1		1	68	I	3	320 I			1
Duration	n 0.25	Area	Type: A	ll other al Operat						
Phase Co	ombination	1 1 2	3 3 3 19 11	4 1	.10113	5	ь	7	8	
EB Left		Ā	_	INB	Left	Ā	_	•	_	
Thro	•	A A		1	Thru					
Righ				i	Right	Α				
Peds				1	Peds	••				
WB Left				1 ZB	Left					
Thru		A		1	Thru					
Righ		A		i	Right					
Peds				1	Peds					
NB Righ				1 EB	Right					
SB Righ				I₩B	Right					
Green		15.0 36.	.0		-	27.0				
Yellow		3.0 3.0				3.0				
All Red		5.0 5.0	]			2.0				
						Cycl	le Leng	th: 9	0.0	secs
		Inters	section P			Cycl ary			0.0	secs
Appr/	Lane	Inters Adj Sat	section P		e Summ Lane	Cycl ary	le Leng Appr		0.0	secs
Appr/ Lane Grp	Lane Group Capacity	Inters	section P			Cycl ary Group		oach	- -	secs
Lane Grp Eastbour	Group Capacity nd	Inters Adj Sat Flow Rat (s)	section P Rat e v/c	g/C	Lane Delay	Cycl ary Group  LOS	Appr	oach	O · O 	secs
Lane Grp Eastbour L	Group Capacity nd 235	Inters Adj Sat Flow Rat (s)	section P Rat e v/c	g/C 0.13	Delay	CyclaryGroup	Appr	L02	- -	secs
Lane Grp Eastbour	Group Capacity nd	Inters Adj Sat Flow Rat (s)	section P Rat e v/c	g/C	Lane Delay	Cycl ary Group  LOS	Appr	oach	- -	Sècs
Lane Grp Eastbour L	Group Capacity nd 235 2084	Inters Adj Sat Flow Rat (s)	section P Rat e v/c	g/C 0.13	Delay	CyclaryGroup	Appr	L02	-	Secs
Lane Grp Eastbour L T	Group Capacity nd 235 2084	Inters Adj Sat Flow Rat (s)	section P Rat e v/c	g/C 0.13	Delay	CyclaryGroup	Appr	LOS B	- -	secs
Eastbour L T Westbour	Group Capacity nd 236 2084 nd	Inters Adj Sat Flow Rat (s)  1770 3539	ection Partice V/c	g/C g/C 0.13 0.59	Delay 39.1 10.5	CyclaryGroup	Appr Delay	LOS B	-	Secs
Lane Grp Eastbour L T	Group Capacity nd 236 2084 nd	Inters Adj Sat Flow Rat (s)  1770 3539	ection Partice V/c	g/C g/C 0.13 0.59	Delay 39.1 10.5	CyclaryGroup	Appr Delay	Dos B	-	SèCS
Eastbour L T Westbour TR Northbox	Group Capacity nd 236 2084 nd 1391	Inters Adj Sat Flow Rat (s)  1770 3539	0.55 0.90	9/C 0.13 0.59	39.1 10.5	Cycl ary Group Los B	Appr Delay	LOS B	-	Secs
Eastbour L T Westbour TR Northbou	Group Capacity  nd 236 2084  nd 1391  und 531	Inters Adj Sat Flow Rat (s)  1770 3539  3478	0.74	9/C 0.13 0.59 0.40	39.1 10.5	Cycl	Appr Delay	Dos B	-	Sècs
Eastbour L T Westbour TR Northbou	Group Capacity  nd 236 2084  nd 1391  und 531	Inters Adj Sat Flow Rat (s)  1770 3539  3478	0.74	9/C 0.13 0.59 0.40	39.1 10.5	Cycl	Appr Delay	Dos B	_	Secs

HCS2000: Signalized Intersections Release 4.1b

Intersection Delay = 27.8 (sec/veh) Intersection LOS = C

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Agency: TRC International Date: 5/21/02 Inter:: S.R. 131/ Primetime Road
Area Type: All other areas

Jurisd:

Year : 2006 Period: AM

Project ID: Knox Co., Prop. System, Alt. 2 E/W St: S.R. 131 (Emory Road) N/S N/S St: Primetime Road

	l Eas	stbour			bound		CTION I Nor			Zo	uthbo	und	I
	I L	T	RI	L	Т	R	I L	T	R I	L	T	R	1
No. Lanes		5		<u>_</u>	2	O	.¦	1			1 1	1	¦
No. Lanes LGConfiq	1	TR		i L	TR	U	, "	ŤR		_	Ĺĭ		i
Volume	194	735			1270 A	ı	139	5		54	9	384	i
Lane Width			-	12.0			112.0		l		12.0	12.0	1
RTOR Vol	1		1.5		Ė	<b>:</b>	i		ı ı			159	I
Duration	0.25		Area 1	ype: /									
Phase Comb	.instin		2	S191	nal Op 4 I		:10ns	5			·	А	
rnase como EB Left	Tilario	A	_		i		Left	Ā	Ü	'		_	
Thru		Ä	A		i		Thru	Ä					
Right		Ä	Ä		1		Right	. A					
Peds							Peds						
⊎B Left			A		ŧ	ZB	Left		A				
Thru			A		i		Thru		A				
Right			A		1		Right		A				
Peds					1		Peds						
NB Right						EΒ	Right						
SB Right		A			i	₩B	Right						
•										_			
Green		51.0	42.0					11.0	11.0	j			
		3·0 51·0	42.0 3.0					3·0	3.0 11.0	J			
Yellow								0.E	3.0				
Yellow		5·0 3·0	5·0 3·0					3.0 2.0	3.0 2.0 1e Ler		105	· O s	secs
Yellow All Red	····	3.0 3.0	3.0 2.0 itersed			mano	ie Zumm	3.0 2.0 Cyc	3.0 2.0 :le Ler	ngth:		· 0 :	secs
Yellow All Red Appr/ La	ane	0.E 0.5 Ir	3.0 2.0 ntersed j Sat		Perfor tios	mano	te Summ Lane	3.0 2.0 Cyc	3.0 2.0 :le Ler			· 0 s	secs
Yellow All Red Appr/ La Lane Gr	^oup	3.0 2.0 Ir Ad:	3.0 2.0 ntersed j Sat v Rate	Ra	tios	_	Lane	3.0 2.0 Cyc ary_ Group	3.0 2.0 :le Ler	ngth:	h	.0 :	secs
Yellow All Red Appr/ La Lane Gr		3.0 2.0 Ir Ad:	3.0 2.0 ntersed j Sat			_		3.0 2.0 Cyc ary_ Group	3.0 2.0 :le Ler	ngth:	h	· 0 s	secs
Yellow All Red  Appr/ La Lane Gr Grp Ca Eastbound	roup apacity	3.0 2.0 Ir Ad; Flow	3.0 2.0 ntersed j Sat v Rate (s)	Ra v/c	g/(	-	Lane Delay	3.0 2.0 Cyc Group Group	3.0 2.0 :le Ler	ngth:	h	.0 :	sec:
Yellow All Red Appr/ La Lane Gr Grp Ca Eastbound L	roup apacity	3.0 2.0 Ir Ad: Flow	3.0 2.0 ntersed j Sat v Rate (s)	7 Ra	g/(	: 	Lane Delay	3.0 2.0 Cyc Group Group	3.0 2.0 :le Ler App	ngth: oroac ay L(	:h	.0 :	secs
Yellow All Red Appr/ La Lane Gr Grp Ca Eastbound L	roup apacity	3.0 2.0 Ir Ad; Flow	3.0 2.0 ntersed j Sat v Rate (s)	Ra v/c	g/(	: 	Lane Delay	3.0 2.0 Cyc Group Group	3.0 2.0 :le Ler	ngth: oroac ay L(	:h	.0 :	secs
Appr/ La Lane Gr Grp Ca Eastbound L	roup apacity	3.0 2.0 Ir Ad: Flow	3.0 2.0 ntersed j Sat v Rate (s)	7 Ra	g/(	: 	Lane Delay	3.0 2.0 Cyc Group Group	3.0 2.0 :le Ler App	ngth: oroac ay L(	:h	.0 :	5 e C 5
Yellow All Red  Appr/ La Lane Gr Grp Ca Eastbound L TR  Westbound	roup apacity	3.0 2.0 Ir Ad: Flow	3.0 2.0 ntersed j Sat w Rate (s)	7 Ra	g/( 0.ā	?O	Lane Delay	3.0 2.0 Cyc Group Group	3.0 2.0 :le Ler Dela	ngth: oroac ay L(	) S	.0 :	 secs
Yellow All Red  Appr/ La Lane Gr Grp Ca  Eastbound L TR G  Westbound L	roup apacity 361 2324	3.0 2.0 Ir Add Flow	3.0 2.0 ntersed j Sat v Rate (s)	0.27 0.35	9/0 0.5 0.6		Delay 36.0 8.5	3.0 Cyc Cyc Group LOS	3.0 2.0 :le Ler App	ngth: oroac ay L(	) S	.0 :	
Yellow All Red  Appr/ Lane Gr Grp Ca  Eastbound L TR a  Westbound L TR TR	oup apacity 361 2324 264 1443	3.0 2.0 Ir Add Flow 180 350	3.0 2.0 ntersed j Sat v Rate (s)	0.27 0.35	9/0 0.5 0.6		36.0 8.5	3.0 Cycony Group LOS A	3.0 2.0 :le Ler Dela	ngth: oroac ay L(	) S	.0 :	
Yellow All Red  Appr/ Lane Gr Grp Ca  Eastbound L	oup apacity 361 2324 264 1443	3.0 2.0 Ir Add Flow 180 350	3.0 2.0 ntersed j Sat w Rate (s) 05 39	0.27 0.35	9/0 0.5 0.4		36.0 8.5	3.0 Cycony Group LOS A	3.0 2.0 :le Ler Dela	ngth: oroac ay L(	) S	.0 :	
Yellow All Red  Appr/ Lane Gr Grp Ca  Eastbound L	oup apacity 361 2324 264 1443	3.0 2.0 In Add Flow 180 350	3.0 2.0 ntersed j Sat v Rate (s) 05 39	0.27 0.35 0.01 0.93	9/0 0.5 0.4 0.4	20 55	36.0 8.5 19.0 41.1	3.0 Cyc Quory Quory A A B B	3.0 2.0 :le Ler Dela	oroac by LC	33	.0 ;	
Yellow All Red  Appr/ La Lane Gr Grp Ca  Eastbound L TR Gr Northbound L TR TR	254 2324 244 2443 2443 24443	3.0 2.0 In Add Flow 180 350 350	3.0 2.0 ntersed j Sat v Rate (s) 05 39	Ra v/c 0.27 0.35 0.01 0.93	9/0 0.5 0.4 0.4	20 55	36.0 8.5 19.0 41.1	2.0 Cyc quora Quora A A B D	3.0 2.0 :le Ler Dela 11!	oroac by LC	33	.0 ;	
Yellow All Red  Appr/ La Lane Gr Grp Ca Eastbound L	coup apacity 361 2324 264 1443 d	3.0 2.0 In Ad; Flow 180 350 460 360	3.0 2.0 ntersed j Sat v Rate (s) 39	Ra v/c 0.27 0.35 0.01 0.93	9/0 0.5 0.4 0.4	20	36.0 8.5 19.0 41.1	2.0 Cyc quora Quora A A B D	3.0 2.0 :le Ler Dela 11!	oroac S E	3 3	.0 ;	
Yellow All Red  Appr/ La Lane Gr Grp Ca Eastbound L TR Gr Westbound L TR I Northbound L TR I Southbound	254 2324 244 2443 2443 24443	3.0 2.0 In Add Flow 180 350 350	3.0 2.0 ntersed j Sat w Rate (s) 0.5 3.9	Ra v/c 0.27 0.35 0.01 0.93	9/0 	20 .5	36.0 8.5 19.0 41.1	J.O. Cycory Cyco	3.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2	oroac S E	3 3	.0 ;	

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Agency: TRC International Date: 5/21/02 Period: PM Inter.: SR 131/Primetime Road Area Type: All other areas

Jurisd: Year : 2006

Project ID: Knox Co., Prop. System, Alt. 2 E/W St: S.R. 131 (Emory Road) N/S St: Primetime Road

				INTERSE				5	+ l= h = .	- d 1
		bound T R	l Westb 1 L T		I Nort	thboun T		70r	thbou T	R I
	1		1		1		i_			i
No. Lanes	1 1	5/_0		2 / 0	i 1			0	1~	1/ 1
LGConfig	1 L		L/	TR	1 6	TR	1		~~LJ′	
Volume Lane Width		443/165 / 3	137 78 112.0 12		1125/ 3 112.0 1		۱ کے	- OF		150 ~ I 12 0 I
RTOR Vol	1 17C·G 7		  712-0 72	25	136.0 3 !	4			76-U	50 I
N 1 V N 1 U I	•		•		•		•			
Duration	0.25	Area		l other l Operat						
Phase Comb	ination	7 5	3	4 1	20113	5	Ь	7	В	·
EB Left		A		INB	Left	A				
Thru		A A		1	Thru	A				
Right		A A		ļ.	Right	A				
Peds WB Left				1 ZB	Peds Left					
Thru		A A		1 70	Thru		A A			
Right		Â		i	Right		Â			
Peds		••		i	Peds		••			
NB Right				I EB	Right					
SB Right		A		1 8	Right					
Green		2.0 37.0				73.0	73.0			
Yellow	_	.0 3.0				3·0	3.0			
All Red	۲	.0 5.0				2.0	2.0 e Leng	.+h.	105 0	
				_		CACT	e rend	<i>j</i> (11 -	702-0	seca
		Interser	ction Po	rtormanc	s Summa					
Appr/ Lar	16	Intersed Adi Sat				ary		roach	. <u>-</u>	
		Intersed Adj Sat Flow Rate	tion Pe Rati		Fane (	ary		roach		·
Lane Gro		Adj Sat				ery Group				
Lane Gro Grp Cap	oup	Adj Sat Flow Rate	Rati v/c	g/C	Lane (	ery Group	Appr			
ane Gro Grp Cap Eastbound	oup pacity 	Adj Sat Flow Rate (s)	Rati v/c	g/C 0.21	Lane (Delay	Sroup LOS	Appr	/ L02		
ane Gro Grp Cap Eastbound	oup pacity	Adj Sat Flow Rate (s)	Rati v/c	g/C	Delay	Froup	Appr	/ L02		,
Lane Gro Grp Cap Eastbound L 3 TR 2	oup pacity 78	Adj Sat Flow Rate (s)	Rati v/c	g/C 0.21	Lane (Delay	Sroup LOS	Appr	/ L02		
Lane Gro Grp Cap Eastbound L 3 TR 2 Westbound	oup pacity 78 171	Adj Sat Flow Rate (s) 1805 3561	0.68 0.75	9/C 0.51 0.61	Delay 43.2 16.3	LOS D B	Appr	/ L02		
Lane Gro Grp Cap Eastbound TR 2: Jestbound	oup pacity 78 171	Adj Sat Flow Rate (s) 1805 3561	Rati v/c 0.68 0.75	g/C 0.21	Lane (Delay	Sroup LOS	Appr	/ L02		
Lane Gro Grp Cap Eastbound L 3 TR 2 Westbound L &&	oup pacity 78 171	Adj Sat Flow Rate (s) 1805 3561	0.68 0.75	9/C 0.21 0.61	Value (1)  10  11  11  12  13  14  15  16  16  17  18  18  18  18  18  18  18  18  18	LOS D B	Appr Delay	- B		
Lane Gro Grp Cap  Eastbound TR 2: Westbound L 80 TR 16	oup pacity 78 171 263	Adj Sat Flow Rate (s) 1805 3561 244 3583	Rati v/c 0.68 0.75	9/C 0.21 0.61 0.35 0.35	Pelay 43.2 16.3	D B C D	Appr Delay	- B		
Lane Gro Grp Cap Eastbound TR 2: Westbound L Bi TR 1: Northbound	oup pacity 78 171 263	Adj Sat Flow Rate (s) 1805 3561 244 3583	Rati v/c 0.68 0.75 0.86	9/C 0.21 0.61 0.35 0.35	Pelay  43.2  16.3  22.5  38.2	D B C D	Appr Delay 20.0-	, roz		
Lane Gro Grp Cap Eastbound TR 2: Westbound L Bi TR 1: Northbound	oup pacity 78 171 263	Adj Sat Flow Rate (s) 1805 3561 244 3583	Rati v/c 0.68 0.75	9/C 0.21 0.61 0.35 0.35	Pelay 43.2 16.3	D B C D	Appr Delay	- B		
Lane Gro Grp Cap Eastbound TR 2: Westbound TR 1: Northbound L 2: TR 2:	oup pacity 78 171 263	Adj Sat Flow Rate (s) 1805 3561 244 3583	Rati v/c 0.68 0.75 0.86	9/C 0.21 0.61 0.35 0.35	Pelay  43.2  16.3  22.5  38.2	D B C D	Appr Delay 20.0-	, roz		
Lane Gro Grp Cap Eastbound L 3: TR 2: Westbound L 8: TR 1: Northbound L 2: TR 2: Southbound	oup pacity 78 171 263 29	Adj Sat Flow Rate (s) 1805 3561 244 3583 1805 1847	Rati v/c 0.68 0.75 0.03 0.86	9/C 0.21 0.61 0.35 0.35	Pelay  43.2 16.3  22.5 38.2  47.7 41.7	D B C D D D	Appr Delay 20-0- 38-1	- B		
Lane Gro Grp Cap  Eastbound L 37 TR 27  Westbound L 86 TR 16  Northbound L 26 TR 26  Southbound	oup pacity 78 171 263	Adj Sat Flow Rate (s) 1805 3561 244 3583	Rati v/c 0.68 0.75 0.86	9/C 0.21 0.61 0.35 0.35	Pelay  43.2  16.3  22.5  38.2	D B C D	Appr Delay 20.0-	, roz		

HCS2000: Signalized Intersections Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

## HCS2000: Multilane Highways Release 4.1b

\_OPERATIONAL ANALYSIS\_

#### Analyst: Ken Arnold Agency/Co: TRC International Date: 2/51/05 Analsis Period: AM ~ **Highway:** SR 131 (Emory Road) ~ From/To: Primetime Road/Bishop > Jurisdiction: Analysis Year: Knox Co., Prop. System, Alt. 2 Project ID: FREE-FLOW SPEED Direction 5 15.0 Lane width ft 15.0 ft Lateral clearance: ft 5.0 5.0 Right edge ft Left edge 6.0 **b** · 0 ft ft Total lateral clearance 8.0 8.0 ft Access points per mile 10 70 Median type Divided Divided Free-flow speed: Base Base FFS or BFFS 60.0 60.0 mph mph Lane width adjustment, FLW 0 - 0 0.0 mph mph Lateral clearance adjustment, FLC n.9 0.9 mph mph Median type adjustment, FM 0.0 0.0 mph mph Access points adjustment, FA 2.5 2.5 mph mph Free-flow speed 56.6 mph 56 - 6 mph VOLUME Direction 791 / Volume, V 1581 / vph vph Peak-hour factor, PHF 0.95~ 0.95/ Peak 15-minute volume, v15 208 337 Trucks and buses 3 / 31 Z Z Recreational vehicles 0 0 Ζ. Terrain type Rolling ~ Rolling Grade 🦂 0.00 Z. 0.00 Z. Segment length 0.00 0.00 мi Number of lanes 2 / 5 ~ 1.00 1.00 Driver population adjustment, fP Trucks and buses PCE, ET 2.5 2.5 Recreational vehicles PCE, ER 5.0 5.0 0.957 0.957 Heavy vehicle adjustment, fHV Flow rate, vp 435 pcphpl 704 pcphpl RESULTS\_ Direction ŀ 2 flow rate, vp 435 704 pcphpl pcphpl Free-flow speed, FFS 56 · 6 56 - Ь mph mph Avg. passenger-car travel speed, S Level of service, LOS 56.6 mph 56.6 mph н 7.7 Density, D pc/mi/ln 12.4 pc/mi/ln Overall results are not computed when free-flow speed is less than 45 mph.

HCS2000: Multilane Highways Release 4.1b

OPERATIO	NAL ANALYS	z		
Analyst: Ken Arnold				
Agency/Co: TRC International				
Date: 5/21/02				
Analsis Period: PM /				
Highway: SR l3l (Emory Road)				
From/To: Primetime Road/Bish	ор			
Jurisdiction:	•			
Analysis Year: 2006′		_		
Project ID: Knox Co., Prop. Sys	tem, Alt.	<u>'</u>		
FREE	-FLOW SPEEI	1		<del></del>
Direction	1		5	
Lane width	15.0	ft	75-0	ft
Lateral clearance:				
Right edge	5.0	ft	5 · 0	ft
Left edge	6.0	ft	F • 0	ft
Total lateral clearance	8.0	ft	8.0	ft
Access points per mile	10		70	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	FO·0	mph	PO-0	mph
Lane width adjustment. FLW	0.0	mph	0.0	mph
_ateral clearance adjustment, FLC	0.9	mph	0.9	mph
1edian type adjustment. FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.5	mph	2.5	mph
Free-flow speed	56 <b>-</b> 6	mph	56 - Ь	mph
	_VOLUME			
Direction	1		<b>5</b>	
Volume, V	1 1545	unh	15 <b>8</b> 1/	unh
Peak-hour factor, PHF	0.95	vph	0.95/	vph
Peak 15-minute volume, v15	407		337	
Trucks and buses	3~	%	3 /	z.
Recreational vehicles	<u> </u>	ź	0	ž
Terrain type	Rolling /	4		<b>*</b>
Grade ,4	0.00	<b>%</b>	Rolling/	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2 -	III T	5 ~	m 1
Driver population adjustment, fP	7.00		1.00	
Trucks and buses PCE, ET	2.5		2.5	
Recreational vehicles PCE, ER	5.0		5.0	
Heavy vehicle adjustment, fHV	0.957		0.957	
flow rate, vp	849	ncohol	704	ncoho1
Tow races vp	041	pcphpl	704	pcphp1
	_RESULTS			
Direction	, <b>1</b> ,		5	
low rate, vp	849	pcphpl	704	pcphpl
ree-flow speed, FFS	56·6	mph	56.6	mph
lvg. passenger-car travel speed, S	56.6	mph	5b - b	mph
_evel of service, LOS	B		В	£
Density D	15.0	pc/mi/ln	-	pc/mi/ln
Overall results are not computed (	when free-f	low speed	is less t	han 45 mph•

Analysis Summary , Alternate 2 2026 Traffic and Proposed Geometrics

Location	Type Analysis	Design Hour	LOS
I-75 Northbound South		AM	B
of Interchange	Segments	PM	C
I-75 Northbound South			
Tro Horaisouria oodar	Baciotiosway	AM	В
of D-1 Major Diverge	Segments	PM	В
I-75 Northbound North of D-1 Major	Basic Freeway	AM	В
Diverge	Segments	РМ	В
M-1, I-75 Northbound	Ramp and Ramp	AM	В
On-ramp from SR 131	Junctions	PM	В
I-75 Northbound, North		AM	В
of M-1 On-ramp from			
SR131	Segments	PM	В
I-75 Northbound North	Basic Freeway	AM	C
of Interchange	Segments	PM	С
I-75 Southbound North	Basic Freeway	AM	С
of Interchange	Segments	PM	С
D-2, I-75 Southbound	Ramp and Ramp	AM	С
Off-ramp to SR131	Junctions	PM_	D
I-75 Southbound, South of D-2 Off-ramp	Basic Freeway	АМ	С
to SR131	Segments	РМ	С
I-75 Southbound,	Basic Freeway		
South of M-2, Add	Dadie i ree ii a,	AM	С
Lane On-ramp	Segments	PM	В
M-3, I-75 Southbound	Ramp and Ramp	AM	С
On-ramp from SR131	Junctions	PM	В
I-75 Southbound	Basic Freeway	AM	С
South of Interchange	Segments	PM	В
SR 131 West of I-75	Multilane	AM	В
	Highways	PM	В
SR 131/I-75 SB	Signalized	AM	B (13.6)
Ramps	Intersections	PM	B (16.4)
SR 131/I-75 NB	Signalized	AM	D (44.7)
Ramps	Intersections	PM	D (36.4)
SR 131/Primetime Rd.	Signalized	AM	D (37.3)
	Intersections	PM	D (44.5)
SR 131 East of	Multilane	AM	В
Primetime Rd.	Highways	PM	С

, +2<del>]</del>-

Note: The LOS shown for intersections is the total average intersection delay. The delay in parentheses is in seconds per vehicle.

\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/21/02

Date Performed: Analysis Time Period:

ΑM

I-75/SR 131 (Emory Road) N.B., So. of Inter. Freeway/Direction: From/To:

Jurisdiction: Analysis Year:

2026~ Description: Knox Co., Prop. System, Alt.2

Flow Inputs	and Adjustments
Volume, V	2876 veh/h
Peak-hour factor, PHF	0.95
Peak 15-min volume, v15	757 v
Trucks and buses	11 < %
Recreational vehicles	0 ×
Terrain type:	Rolling <
Grade	0.00 %
Segment length	0.00 mi
Trucks and buses PCE, ET	2.5
Recreational vehicle PCE, ER	5-0
Heavy vehicle adjustment, fHV	0-858
Driver population factor, vp	1.00
flow rate, vp	1176 pc/h/ln
Speed Inputs	and Adjustments

•	•	
Lane width	15.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange: density	0.50	interchange/mi
Number of lanes, N	3 🗸	•
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	

LOS and	Performance Measures	
Flow rate, vp Free-flow speed, FFS Average passenger-car speed, S Number of lanes, N Density, D Level of service, LOS	1176 70.0 70.0 3 16.8 8	pc/h/ln mi/h mi/h pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:	1027 (023)	
Operational An	alysis	
Analyst: Ken Arnold		
Agency or Company: TRC Internation	al	
Date Performed: 5/21/02		
Analysis Time Period: PM /		
Freeway/Direction: I-75/SR 131 (Em	ory Road)	
From/To: N.B., So. of Inte	er.	
Jurisdiction:		
Analysis Year: 2026		
Description: Knox Co., Prop. System, A	It. 2	
Flow Inputs and	d Adjustments	
Volume, V	3812 ~	veh/h
Peak-hour factor, PHF	0.95	• • • • • • • • • • • • • • • • • • • •
Peak 15-min volume, v15	1003	V
Trucks and buses	11	ž
Recreational vehicles	<u>.                                    </u>	ž
Terrain type:	Rolling /	·
Grade	0.00	%
Segment length	0 - 00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0-858	
Driver population factor, vp	1.00	
Flow rate, vp	1558	pc/h/ln
Speed Inputs an	nd Adjustments	
Lane width	15.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3 /	j
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freewa	зу
LOS and Perform	mance Measures	
Flow rate, vp	1.558	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.6	mi/h
Number of lanes, N	3	
Density, D	22.4	pc/mi/ln

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

\_\_\_\_\_Operational Analysis\_\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	\$/21/02
Analysis Time Period:	AM
Freeway/Direction:	I-75/SR 131 (Emory Road)
From/To:	N.B.,So. of Inter.

Jurisdiction:

Analysis Year: 2026/ Description: Knox Co-1 Prop. System , Alt.2

Flow Inputs and	d Adjustments	
Volume, V	2876	veh/h
Peak-hour factor, PHF	0.95	· · · · · · · · · · · · · · · · · · ·
Peak 15-min volume, v15	757	v
Trucks and buses	11	ž
Recreational vehicles	ñ	Z
Terrain type:	Rolling -	-
Grade	0.00	×
Segment length	0.00	mi
Trucks and buses P(E, ET	2.5	<u>-</u>
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.858	
Driver population factor, vp	1.00	
Flow rate, vp	288	pc/h/ln
Speed Inputs ar	nd Adjustments	
Lane width	15.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4 —	, , , , , , , , , , , , , , , , , , ,
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fL(	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freew	ву
LOS and Perform	nance Measures	
Flow rate, vp	8 <b>8</b> 2	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	.,2
Density: D	12.6	pc/mi/ln

\_\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold Agency or Company: Date Performed: TRC International S/21/02 PM✓

Analysis Time Period: Freeway/Direction: I-75/SR 131 (Emory Road) From/To: N.B., So. of Inter.

Jurisdiction:

Analysis Year: 2026 / Description: Knox Co., Prop. System, Alt	. 2	
Flow Inputs and Ac		
Volume: V	3812	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, vl5	1003	V
Trucks and buses	11 ~	%
Recreational vehicles	0	X
Terrain type:	Rolling 🗸	
Grade	0.00	<sup>%</sup> .
Segment length	0.00	mi
Trucks and buses PCE, ET Recreational vehicle PCE, ER	2.5	
Heavy vehicle adjustment, fHV	2.0 0.858	
Driver population factor, vp	1.00	
Flow rate vp	1169	pc/h/ln
, ,	110.	per iii iii
Speed Inputs and A	djustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	b · 0	ft
Interchangedensity	0 · 50	interchange/mi
Number of lanes, N	ч 🗸	
Free-flow speed: FFS or BFFS	Measured	_ : <i>t</i> }_
Lane width adjustment, fLW	70.0 0.0	mi/h mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	
LOS and Performanc	e Measures	
Flow rate, vp	1169	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	16.7	pc/mi/ln
Level of service, LOS	<b>B</b> ·	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

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	Operational	Analysis
		-
Inalvst:	Ken Arnold	

Agency or Company:

5/2]/02 AM Date Performed:

Ken Arnold TRC International

Analysis Time Period: Freeway/Direction:

I-75/SR 131 (Emory Road)

From/To:

N.B. North of D-1 1

Jurisdiction: Analysis Year:
Description: Know Co

2026 - Sustan و لما ا

t.2	
Adjustments	
2146 /	veh/h
0.95	
565	V
16 /	ż
0	z.
Rolling /	
0.00	%
0.00	mi
2.5	
5.0	
0.806	
1.00	
934	pc/h/ln
d Adjustments	
12.0	ft
F · O	ft
0.50	interchange/mi
3 -	
Measured	
70.0	mi/h
0.0	mi/h
0.0	mi/h
0.0	mi/h
3-0	mi/h
70.0	mi/h
Urban Freewa	y
ance Measures	
974	nc/h/ln
934 70.0	pc/h/ln mi/h
934 70•0 70•0	pc/h/ln mi/h mi/h
	0.95 565 16 0 Rolling 0.00 0.00 2.5 2.0 0.806 1.00 934  d Adjustments 12.0 6.0 0.50 3 Measured 70.0 0.0 0.0 0.0 0.0 Urban Freewa

13.3 Density D pc/mi/ln

Level of service, LOS

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	Operational Analysis
Analvst:	Ken Arnold
Agency or Company:	TRC International

Date Performed:

5/21/02 PM Analysis Time Period: I-75/SR 131 (Emory Road)

Freeway/Direction:

From/To: Jurisdiction:

Free-flow speed, FFS

Analysis Year: 5056

Description: Knox Co., Prop. System, Alt. 2

\_\_\_Flow Inputs and Adjustments\_\_

N.B. North of D-1 /

	· · · · · · · · · · · · · · · · · · ·	
Volume, V	2076~	veh/h
Peak-hour factor, PHF	0.95	AGIIVII
Peak 15-min volume: v15	546	N
Trucks and buses	16	v %
Recreational vehicles	U Te	ž
Terrain type:	-	<b>4</b>
Grade	Rolling/	•,
	0.00	×.
Segment length Trucks and buses PCE, ET	0.00	mi
	2.5	
Recreational vehicle PCE ER	5.0	
Heavy vehicle adjustment, fHV	0.90P	
Driver population factor, vp	1 - 00	
Flow rate, vp	903	pc/h/ln
Speed Inputs	and Adjustments	
	ine Adjusements	
Lane width	75.0	ft
Right-shoulder lateral clearance	b - 0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3 🖊	-
Free-flow speed:	Measured	
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	3.0	mi/h
Engo-flow good EEC	30.0	

_L0S	and	Performance	Measures		
------	-----	-------------	----------	--	--

Urban Freeway

mi/h

70.0

flow rate, vp	903	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	12.9	pc/mi/ln
Level of service, LOS	Я	•

HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

\_\_\_\_Merge Analysis\_\_\_\_\_

Analyst: Ken Arnold Agency/Co:: TRC International Date performed: Date performed: 5/21/02
Analysis time period: AM
Freeway/dir or travel: I 75/ SR 131 (Emory Road)

Junction: Jurisdiction:

Analysis Year: 505P

Description: Knox Co., M-l, N.B. on ramp from S.R. 131, Alt. 2

	_Freeway Data		
Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway	Merge 3 70.0 2146	mph vph	
	_On Ramp Data		
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/decel lane Length of second accel/decel lane	Right 1 50.0 250 840	mph vph ft ft	
Adjacent	Ramp Data (if one exi	.sts)	
Does adjacent ramp exist? Volume on adjacent Ramp Position of adjacent Ramp	No	vph	
Type of adjacent Ramp Distance to adjacent Ramp		ft	

Conversion to pc/	h Under Base	Conditions_	
Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	574P	250	vph
Peak-hour factor, PHF	0-95	0.95	•
Peak 15-min volume, vl5	- 565	եե	V
Trucks and buses	16	2	%
Recreational vehicles	0	0	<b>%</b>
Terrain type:	Rolling	Rolling	Level
Grade	2	/	<i>ኢ</i>
Length	mi	mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	2.0	5.0	
Heavy vehicle adjustment, fHV	0.806	0.971	
Driver population factor, fP	7 - 00	1.00	
flow rate, vp	2807	271	pcph

```
__Estimation of Vl2 Merge Areas_
                 L =
                         0.00
                                 (Equation 25-2 or 25-3)
                 0.60% Using Equation 1
                  FΜ
                 v = v (P ) = 1683
                                        pc/h
                  12 F
                         FM
                          ____Capacity Checks_
                          Actual
                                                       LOS F?
                                       Maximum
                          3072
                                                       Νo
     F٥
                          1954
                                       4600
                                                       No
              __Level of Service Determination (if not F)__
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 15.3
R R 12 A
                                                                   pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                        ____Speed Estimation___
Intermediate speed variable:
                                           M = 0.265
                                           Z = P5.P
Space mean speed in ramp influence area.
                                                        mph
Space mean speed in outer lanes,
                                           Z = F3.8
                                                        mph
Space mean speed for all vehicles.
                                           5 = 64.4
                                                        mph
```

y-1

# HCS2000: Ramps and Ramp Junctions Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold
Agency/Co: TRC International

Date performed: 5/21/02 Analysis time period: PM

Freeway/dir or travel: I 75/ SR 131 (Emory Road)

Junction:
Junisdiction:

Analysis Year: 2026

Description: Knox Co., M-l, N.B. on ramp from S.R. 131, Alt. 2

Free	vay Data	·	
Type of analysis Number of lanes in freeway Free-flow speed on freeway Volume on freeway	Merge 3 70.0 2076 /	mph ∨ph	
On Ra	amp Data		
Side of freeway Number of lanes in ramp Free-flow speed on ramp Volume on ramp Length of first accel/decel lane Length of second accel/decel lane	Right 1 50.0 426 / 840	mph vph ft ft	
Adjacent Ramp	Data (if one ex	ists)	
Does adjacent ramp exist? Volume on adjacent Ramp Position of adjacent Ramp Type of adjacent Ramp	No	vph	
Distance to adjacent Ramp		ft	

Conversion to p	c/h Under Base	Conditions_	<del> </del>
Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2076	426	vph
Peak-hour factor, PHF	0.95	0.95	•
Peak 15-min volume, v15	546	115	v
Trucks and buses	16	2	%
Recreational vehicles	G	0	%
Terrain type:	Rolling	Rolling	Level
Grade	7.	7.	%
Length	mi	mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	5.0	5.0	
Heavy vehicle adjustment, fHV	0.806	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate: vp	2710	462	pcph

```
_Estimation of V12 Merge Areas_
                 L =
                         0.00
                                 (Equation 25-2 or 25-3)
                  ΕQ
                         0.601 Using Equation 1
                 P54L = ( P ) = 1629
                                         pc/h
                  12 F
                          FM
                          ____Capacity Checks_
                                                         LOS F?
                          Actual
                                         Maximum
                                         7200
                                                         No
                          3172
     F0
                                        4600
                                                         No
                          1602
     R12
               __Level of Service Determination (if not F)__
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 16.3
R R 12 A
                                                                       pc/mi/ln
Level of service for ramp-freeway junction areas of influence B
                          ___Speed Estimation___
                                             M = 0.5Pa
Intermediate speed variable,
                                             Z = 62.5
Space mean speed in ramp influence area.
                                                          mph
                                                          mph
                                             S = 67.9
Space mean speed in outer lanes,
                                             z = PA \cdot S
Space mean speed for all vehicles.
                                                          mph
```

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

_Operational	Analysis
	-

Analyst: Agency or Company: Ken Arnold

TRC International Date Performed:

5/21/02

Analysis Time Period: Freeway/Direction:

AM I-75/SR 131 (Emory Road)

From/To:

N.B. North of Inter.

Jurisdiction: Analysis Year:

5056~

Description: Knox Co., Prop. System , Alt. 2

\_\_\_\_Flow Inputs and Adjustments\_\_\_

Volume, V Peak-hour factor, PHF	2396 0.95	veh/h
Peak 15-min volume, v15	P37	v
Trucks and buses	19 1	%
Recreational vehicles	.0	7.
Terrain type:	Rolling∕	
Grade	0.00	<u>ሂ</u>
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	1080	pc/h/ln

\_\_\_\_\_Speed Inputs and Adjustments\_\_\_

Lane width	15.0	ft
Right-shoulder lateral clearance	b · 0	ft
Interchange: density	0.50	interchange/mi
Number of lanes, N	3 🗸	-
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	<i>t</i>

\_\_\_\_LOS and Performance Measures\_\_

flow rate, vp	1080	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	15-4	pc/mi/ln
Level of service, LOS	В	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

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\_\_Operational Analysis\_\_\_ Analyst: Ken Arnold

TRC International Agency or Company: 5/21/D2

Date Performed: Analysis Time Period:

I-75/SR 131 (Emory Road) Freeway/Direction: N.B. North of Inter-From/To:

Jurisdiction:

50SP\_ Analysis Year:

Description: Knox Co., Prop. System, Alt. 2

Flow Inputs	and Adjustments	
Volume, V	2502 veh/h	
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	⊾58 v	
Trucks and buses	19 / %	
Recreational vehicles	۵ ٪	
Terrain type:	Rolling ~	
Grade	0.00 %	
Segment length	0.00 mi	
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate: vp	1159 bc/h/lu	
Speed Inputs	s and Adjustments	

	_	
Lane width	75.0	ft
Right-shoulder lateral clearance	ь.O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3 /	
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70.0	mi/h
•	Urban Freeway	

L0S	and P	erformance Measures		
flow rate, vp		1128	pc/h/ln	
Free-flow speed, FFS		70-0	mi/h	
Average passenger-car speed:	Z	70.0	mi/h	
Number of lanes, N		3		
Density, D		16.1	pc/mi/ln	
Level of service, LOS		В		

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

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\_\_Operational Analysis\_\_\_\_\_

Analyst:

Ken Arnold TRC International 5/21/02

Agency or Company: Date Performed: Analysis Time Period: AM 1

I-75/SR 131 (Emory Road) Freeway/Direction: From/To: N.B., North of Inter. /

Jurisdiction:

Level of service, LOS

Analysis Year: 2026

Description: Knox Co., Prop. System, A	It. 2	
Flow Inputs an	d Adjustments	
Volume, V	2396/	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	P3J	V
Trucks and buses	19/	%
Recreational vehicles	0	%
Terrain type:	Rolling 🖊	
Grade	0 - 0 <b>0</b>	7.
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	JP50	pc/h/ln
Speed Inputs a	nd Adjustments	
Lane width	75.0	ft
Right-shoulder lateral clearance	b · 0	ft
Interchange density	0 - 50	interchange/mi
Number of lanes, N	2 🗸	-
Free-flow speed:	Measured	
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	4.5	mi/h
Free-flow speed, FFS	70.0	mi/h
•	Urban Freeway	у
LOS and Perfor	mance Measures	
Flow rate: vp	1620	pc/h/ln
Free-flow speed: FFS	70.0	mi/h
Average passenger-car speed, S	<b>⊾</b> 9.3	mi/h
Number of lanes, N	2	
Density: D	23.4	pc/mi/ln
Deligity i		E =

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979 E-mail:

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\_\_Operational Analysis\_\_

Analyst: Ken Arnold

Agency or Company: TRC International

Date Performed: 5/2]/02 PM Analysis Time Period:

Freeway/Direction: I-75/SR 131 (Emory Road)

From/To: N.B. North of I	ntér. /		
Jurisdiction: Analysis Year: 2026			
Description: Knox Co., Prop. System, Alt. 2			
Flow Inputs an	d Adjustments		
Volume, V Peak-hour factor, PHF	2502 0.95-	veh/h	
Peak 15-min volume, v15	L58	v	
Trucks and buses	19	×	
Recreational vehicles	0 .	ζ.	
Terrain type:	Rolling 🗸		
Grade	0.00	×	
Segment length	0.00	mi	
Trucks and buses PCE, ET	5 · 2		
Recreational vehicle PCE, ER	5.0		
Heavy vehicle adjustment, fHV	0.778		
Driver population factor, vp	7.00		
Flow rate, vp	7845	pc/h/ln	
Speed Inputs a	nd Adjustments		
Lane width	75.0	ft	
Right-shoulder lateral clearance	<b>Ь</b> - O	ft	
Interchange"density	0 - 50	interchange/mi	
Number of lanes, N	·5 /		
Free-flow speed:	Measured		
FFS or BFFS	70 • <b>0</b>	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	4.5	mi/h	
Free-flow speed, FFS	70.0	mi/h	
	Urban Freewa	эу	
LOS and Perfor	mance Measures		
Flow rate, vp	1692	pc/h/ln	
Free-flow speed, FFS	70.0	mi/h	
Average passenger-car speed: S	6A-9	mi/h	

Average passenger-car speed, S mi/h 68.9 Number of lanes, N 24.6 C pc/mi/ln Density, D Level of service, LOS

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_\_\_\_\_Operational Analysis\_\_\_\_\_

Analyst: Ken Arnold
Agency or Company: TRC International

Date Performed: 5/21/02 Analysis Time Period: AM

Freeway/Direction: I-75/SR 131 (Emory Road)
From/To: S.B., North of Inter-

Jurisdiction:

Analysis Year: 2026~

Description: Knox Co., Prop. System, Alt. 2

\_\_Flow Inputs and Adjustments\_\_

Volume, V	2275 1	veh/h
Peak-hour factor, PHF	0.95	
Peak 15-min volume, v15	599	v
Trucks and buses	19	<b>%</b>
Recreational vehicles	0	%
Terrain type:	Rolling/	
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	0.778	
Driver population factor, vp	1.00	
Flow rate, vp	1539	pc/h/ln

Speed Inputs and Adjustments\_\_\_\_

Lane width Right-shoulder lateral clearance Interchange"density Number of lanes, N Free-flow speed:	12.0 6.0 0.50 2 Measured	ft ft interchange/mi
FFS or BFFS Lane width adjustment, fLW	70.0	mi/h mi/h
Lateral clearance adjustment, fLC Interchange density adjustment, fID Number of lanes adjustment, fN	0.0 0.0 4.5	mi/h mi/h mi/h
Free-flow speed, FFS	70.0 Urban Freeway	mi/A mi/h

\_\_\_LOS and Performance Measures\_\_\_

Flow rate, vp	1539	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	Ь <b>9.</b> 7	mi/h
Number of lanes, N	5	
Density, D	55.7	pc/mi/ln
Level of service, LOS	C	•

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

\_\_\_Operational Analysis\_\_\_

Analyst:

Ken Arnold TRC International 5/2]/O2 PM / Agency or Company: Date Performed:

Analysis Time Period: Freeway/Direction: I-75/SR 131 (Emory Road) From/To: S.B. North of Inter.

Jurisdiction: Analysis Year: 2026 — Description: Knox Co., Prop. System   A	it.2	
Flow Inputs an		
Volume, V	5337 /	veh/h
Peak-hour factor, PHF .	0.95~	
Peak 15-min volume, v15	P13	V
Trucks and buses	19 /	%
Recreational vehicles	0	%
Terrain type:	Rolling ∕	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	5 · 8	
Recreational vehicle PCE - ER	5.0	
Heavy vehicle adjustment, fHV	O.778	
Driver population factor, vp	1.00	
Flow rate, vp	1576	pc/h/ln
Speed Inputs a	nd Adjustments	
Lane width	75.0	ft
Right-shoulder lateral clearance	b - 0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2 🗸	-
Free-flow speed:	Measured	
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	4 - 5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	
LOS and Perform	nance Measures	
Flow rate, vp	1576	pc/h/ln
Free-flow speed, FFS	70-0	mi/h
Average passenger-car speed, S	L9.5	mi/h
Number of lanes, N	2	
Density, D	22.7	pc/mi/ln
Level of service, LOS	C	

```
___Diverge Analysis__
Analyst:
                        Ken Arnold
Agency/Co:
                        TRC International
Date performed:
                        5/22/02
Analysis time period:
                        AM √
Freeway/dir or travel: I-75/SR 131 (Emory Road)
Junction:
Jurisdiction:
Analysis Year:
                        50SP.
Description: Knox Co., D-2, SB off ramp to SR 131, Alt. 2
                                 ___Freeway Data__
Type of analysis
                                             Diverge
Number of lanes in freeway
                                             2 ′
Free-flow speed on freeway
                                             70.0
                                                            mph
                                             2275 /
Volume on freeway
                                                            vph
                                __Off Ramp Data_
Side of freeway
                                             Right
Number of lanes in ramp
                                             1 /
Free-Flow speed on ramp
                                             50.0
                                                            mph
                                             557 ~
Volume on ramp
                                                            vph
Length of first accel/decel lane
                                             3P0
                                                            ft
Length of second accel/decel lane
                     ____Adjacent Ramp Data (if one exists)__
Does adjacent ramp exist?
                                             Nο
Volume on adjacent ramp
                                                            vph
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
                                                            ft
                  ___Conversion to pc/h Under Base Conditions_
Junction Components
                                       Freeway
                                                    Ramp
                                                                Adjacent
                                                                Ramp
                                                    557 _
                                       2275 <
Volume, V (vph)
                                                                          vph
                                       0-95 <
Peak-hour factor, PHF
                                                    0.95 4
Peak 15-min volume, v15
                                       599
                                                    SA
Trucks and buses
                                       19
                                                                          Z
Recreational vehicles
                                       0
                                                    0
                                                                          Z,
Terrain type:
                                       Rolling ~
                                                    Rolling ~
                                                                Leve1
                                              Z,
    Grade
                                       0.00
                                                    0.00
                                                                        Z.
    Length
                                       0.00
                                               mi 0.00
                                                            тi
                                                                        шi
Trucks and buses PCE, ET
                                       2.5
                                                    2.5
Recreational vehicle PCE, ER
                                       2.0
                                                    2.0
Heavy vehicle adjustment, fHV
                                       0.778
                                                    0.971
Driver population factor, fP
                                       1.00
                                                    1.00
Flow rate, vp
                                       3077
                                                    240
                                                                          pcph
                        _Estimation of Vl2 Diverge Areas_
                  0.00
                                  (Equation 25-8 or 25-9)
                   ΕQ
                  P =
                          1.000
                                  Using Equation []
                  FD
                          + (v - v) P = 3077
                      R
                             FR
                                     FD
                            ___Capacity Checks_
                           Actual
                                                         LOS F?
                                         Maximum
       = v
     v
                           3077
                                         4800
                                                          No
          F
     Fi
                           3077
     V
                                         4400
                                                          No
     75
                           2837
                                         4800
                                                          No
     FO
          F
    v
                           240
                                         5700
                                                         No
     R
```

Level	of Service Determi	nation (if not	F)
Density,	D = 4-252 + 0.00&6 R	v - 0-009 L	= 27.5
Level of service for r			uence (
	Speed Estima	tion	
Intermediate speed var	iable,	D = 0.255	
Space mean speed in ra	mp influence area.	S = P3	mph
Space mean speed in ra Space mean speed in ou	·	Ed = 2 R A\N = 2 O	mph mph

```
__Diverge Analysis__
Analyst:
                        Ken Arnold
Agency/Co::
                        TRC International
                        $722702
Date performed:
Analysis time period:
                        PM
freeway/dir or travel: I-75/SR 131 (Emory Road)
Junction:
Jurisdiction:
                        50SP <
Analysis Year:
Description: Knox Co., D-2, SB off ramp to SR 131, Alt. 2
                                  _Freeway Data_
Type of analysis
                                             Diverge
Number of lanes in freeway
Free-flow speed on freeway
                                             70.0
                                                            mph
                                             5337 √
Volume on freeway
                                                            vph
                                __Off Ramp Data_
Side of freeway
                                             Right
Number of lanes in ramp
                                             ょっ
Free-Flow speed on ramp
                                             50.0
                                                            mph
                                            243
Volume on ramp
                                                            vph
Length of first accel/decel lane
                                            3P0
                                                            ft
Length of second accel/decel lane
                        __Adjacent Ramp Data (if one exists)_
Does adjacent ramp exist?
                                             No
Volume on adjacent ramp
                                                            vph
Position of adjacent ramp
Type of adjacent ramp
Distance to adjacent ramp
                                                            ft
                ____Conversion to pc/h Under Base Conditions_
Junction Components
                                       Freeway
                                                    Ramp
                                                                Adjacent
                                                                Ramp
                                                    243
                                       5337 /
Volume, V (vph)
                                                                          vph
                                       0.95
                                                   0.95
Peak-hour factor, PHF
                                                    64
2 V
Peak 15-min volume, v15
                                       F13
Trucks and buses
                                       19"
                                                                          Z.
                                                                          Z
Recreational vehicles
                                       0
                                                    0
Terrain type:
                                       Rolling 🗹
                                                   Rolling /
                                                                Level
                                               %
    Grade
                                       0.00
                                                    0.00
                                                            7.
                                                                        Z.
                                               mi 0.00
    Length
                                       0.00
                                                            Μi
                                                                        мi
Trucks and buses PCE, ET
                                       2.5
                                                    2.5
Recreational vehicle PCE, ER
                                       9 . 0
                                                    5.0
Heavy vehicle adjustment, fHV
                                       0.778
                                                    0.971
Driver population factor, fP
                                       1.00
                                                    1.00
Flow rate, vp
                                       3723
                                                    5P3
                                                                          pcph
                        _Estimation of V12 Diverge Areas_
                  L =
                          0.00
                                  (Equation 25-8 or 25-9)
                   ΕQ
                  P =
                          1.000
                                  Using Equation O
                   FD
                  v = v + (v - v ) P = 3153
                       R
                             F R
                                     FD
                             __Capacity Checks_
                           Actual
                                         Maximum
                                                          LOS F?
                                         4800
       = v
                           3153
                                                          Nο
     Fi
                           3153
                                         4400
     V
                                                          No
     12
                           0885
       = v -
                                         4800
                                                          No
     FΟ
                           5P3
                                         5100
     v
                                                          No
     R
```

Level of Service Determin	ation (if not F)			
	•	c/mi/ln		
R 12 D Level of service for ramp-freeway junction areas of influence D				
Speed Estimat	i on			
Intermediate speed variable,	D = 0.257			
Space mean speed in ramp influence areas	S = F3 wbb			
Space mean speed in outer lanes,	S = N/A mph			
Space mean speed for all vehicles,	Z = P5·9 wbp			

A.

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

	Operational Analysis
	•
Analyst:	Ken Arnold
Agency or Company:	TRC International

Agency or Company:

Date Performed:

Analysis Time Period:

Freeway/Direction:

From/To:

Junisdiction:

TRC International

5/21/02

AM

I-75/SR 131 (Emory Road)

S.B. South of D-2

Jurisdiction: Analysis Year:

Analysis Year: 2026 Description: Knox Co., Prop. System, A	lt.2		
Flow Inputs and Adjustments			
Volume, V Peak-hour factor, PHF	2054 / 0-95 /	veh/h	
Peak 15-min volume, v15	541	V	
Trucks and buses	17 🖍	%	
Recreational vehicles	0	z	
Terrain type:	Rolling ✓		
Grade	0 - 00	%	
Segment length	0-00	mi	
Trucks and buses PCE, ET	2.5		
Recreational vehicle PCE, ER	5.0		
Heavy vehicle adjustment, fHV	0.797		
Driver population factor, vp	1 - 00		
Flow rate, vp	1357	pc/h/ln	
Speed Inputs ar	nd Adjustments		
Lane width	12.0	ft	
Right-shoulder lateral clearance	b • 0	ft	
Interchange density	0.50	interchange/mi	
Number of lanes, N	2 🗸		
Free-flow speed:	Measured		
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	4.5	mi/h	
Free-flow speed, FFS	70.0	mi/h	
	Urban Freeway		
L0S and Perform	nance Measures		
Flow rate, vp	1357	pc/h/ln	
Free-flow speed, FFS	70.0	mi/h	
Average passenger-car speed, S	70.0	mi/h	
Number of lanes, N	5		
Density <sub>1</sub> D	1,9.4	pc/mi/ln	
Level of service, LOS	C	•	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979 E-mail:

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\_\_\_Operational Analysis\_\_\_ Analyst: Ken Arnold

Agency or Company:

TRC International 5/21/02 PM

Date Performed: Analysis Time Period: Freeway/Direction:

I-75/SR 131 (Emory Road) S-B-south of D-2

From/To: Jurisdiction:

S05P

Analysis Year: Description: Knox Co., Prop. System, Alt. 2

and a process of the state of t	(, 0 , 2	
Flow Inputs an	d Adjustments	,
Volume, V	2088 /	veh/h
Peak-hour factor, PHF	0.95 🗸	
Peak 15-min volume, v15	549	V
Trucks and buses	17~	%
Recreational vehicles	0 ,	Ż.
Terrain type:	Rolling 🔶 🔪	
Grade	0.00	Z.
Segment length	0.00	mi,
Trucks and buses PCE, ET	2.5	•
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.797	
Driver population factor, vp	7 · 00	
Flow rate, vp	1379	pc/h/ln
Speed Inputs an	nd Adjustments	
Lane width	12.0	ft
Right-shoulder lateral clearance	F · O	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2 /	
Free-flow speed:	Measured	
FFS or BFFS	70.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fL(	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4 - 5	mi/h
Free-flow speed, FFS	70.0	mi/h
	Urban Freeway	1
LOS and Perform	mance Measures	
Flow rate, vp	1379	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	5	10 ± 1 + 1
Density, D	19.7	pc/mi/ln
Level of service, LOS	(	permaran
	~	

\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

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Ken Arnold TRC International Analyst: Agency or Company: Date Performed: 5/21/02

Analysis Time Period: AM-

Freeway/Direction: I-75/SR 131 (Emory Road)

	.B.,South of	M-5,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Jurisdiction:	1021 -			
Analysis Year:	1056	A 14	•	
Description: Knox Co., F	.cob. zazew!	AIL.	<b>L</b>	
	Flow Inputs	and Ac	ljustments	
Volume, V			3366 ~	veh/h
Peak-hour factor, PHF			0.95 🗸	
Peak 15-min volume, v15			886	V
Trucks and buses			75 ~	×
Recreational vehicles			0	7.
Terrain type:			Rolling ~	
Grade			0.00	%
Segment length			0.00	mi
Trucks and buses PCE, ET			2.5	
Recreational vehicle PCE	_		2.0	
Heavy vehicle adjustment			0-847	
Driver population factor.	vp		7.00	
Flow rate, vp			1394	pc/h/ln
	Speed Inputs	and A	djustments	
Lane width			12.0	ft
Right-shoulder lateral cl	earance		<b>6</b> ⋅0	ft
Interchange density			0.50	interchange/mi
Number of lanes, N			3 ~	
Free-flow speed:			Measured	
FFS or BFFS			70.0	mi/h
Lane width adjustment, fl			0 - 0	mi/h
Lateral clearance adjustm			0.0	mi/h
Interchange density adjus			0.0	mi/h
Number of lanes adjustmen	t if N		3.0	mi/h
Free-flow speed, FFS			70-0	mi/h
			Urban Freeway	
	LOS and Perf	ormanc	e Measyres	
Flow rate, vp			1394	pc/h/ln
Free-flow speed, FFS			70.0	mi/h
Average passenger-car spe	ed, Z		70-0	mi/h
Number of lanes, N			3	
Density D			19.9	pc/mi/ln
Level of service, LOS			C	

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

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	Operational An	alysis			
Analyst:	Ken Arnold				
Agency or Company:	TRC Internation	al			
Date Performed:	5/21/02				
Analysis Time Period:	PM 7, 02				
Freeway/Direction:	I-75/SR 131 (Em	ory Road)			
From/To:	S.B. South of M	-2 ·			
Jurisdiction:	2 2 7 7 2 2 2 2 1 7 7 7 7	-			
Analysis Year:	5056~				
Description: Knox Co.	Prop. System, A	.1t.2			
	Flow Inputs an	d Adjustments			
Volume, V		2700	veh/h		
Peak-hour factor, PHF		0.95 /			
Peak 15-min volume, v15		711	V		
Trucks and buses		iż	ž		
Recreational vehicles		0	ž		
Terrain type:		Rolling✓			
Grade .		0.00	አ		
Segment length		0.00	mi		
Trucks and buses PCE, ET	ſ	2.5			
Recreational vehicle PCE	- ER	5 · 0			
Heavy vehicle adjustment	ta fHV	0.847			
Driver population factor	`+ VP	1.00			
Flow rate, vp	•	1118	pc/h/ln		
4	Speed Inputs a	nd Adjustments			
Lane width		12.0	ft		
Right-shoulder lateral o	learance	b - O	ft		
Interchange density		0 - 50	interchange/mi		
Number of lanes, N		3 ~	-		
Free-flow speed:		Measured			
FFS or BFFS		70.0	mi/h		
Lane width adjustment, f	'LW	0.0	mi/h		
Lateral clearance adjust		0.0	mi/h		
Interchange density adju		0.0	mi/h		
Number of lanes adjustme	ent, fN	3.0	mi/h		
Free-flow speed, FFS		70.0	mi/h		
		Urban Freeway			
	_L0S and Perform	mance Measures			
Flow rate, vp		1118	pc/h/ln		
Free-flow speed, FFS		70.0	mi/h		
Average passenger-car sp	eed, S	70-0	mi/h		
Number of lanes, N		3			
Density, D Level of service, LOS		16.0	pc/mi/ln		
reset of Secarce, FAZ		В			

\_Merge Analysis\_\_\_

```
Analyst:
                         Ken Arnold
                         TRC International
Agency/Co::
Date performed:
                         5/21/02
                         AM -
Analysis time period:
Freeway/dir or travel: I-75/SR 131 (Emory Road)
Junction:
Jurisdiction:
                         5057 _
Analysis Year:
Description: Knox Co., M-3, S.B. on ramp from SR 131, Alt. 2
                                   _Freeway Data__
Type of analysis
                                              Merge
Number of lanes in freeway
                                              3
                                              70.0
Free-flow speed on freeway
                                                              mph
                                              33ЬЬ ✓
Volume on freeway
                                                              vph
                                   _On Ramp Data_
Side of freeway
                                              Right
                                              1/
Number of lanes in ramp
Free-flow speed on ramp
                                              50.0
                                                              mph
Volume on ramp
                                              704 /
                                                              vph
Length of first accel/decel lane
                                              840
                                                              ft
                                                              ft
Length of second accel/decel lane
                        ___Adjacent Ramp Data (if one exists)_
Does adjacent ramp exist?
                                              Nο
Volume on adjacent Ramp
                                                              vph
Position of adjacent Ramp
Type of adjacent Ramp
Distance to adjacent Ramp
                                                              ft
                    _Conversion to pc/h Under Base Conditions_
                                                      Ramp
                                                                  Adjacent
Junction Components
                                         Freeway
                                                      704 -
Volume: V (vph)
                                         <u> ззьь 🤸</u>
                                                                             vph
                                         0.95 /
                                                      0.95 <
Peak-hour factor: PHF
                                                     185
Peak 15-min volume, v15
                                         ልልь
                                                                             v
                                         15~
                                                                             7
Trucks and buses
                                         0
                                                      0
Recreational vehicles
                                                      Rolling 🗸
Terrain type:
                                         Rolling✓
                                                                  Level
                                                 %
                                                              Ż.
                                                                           7
     Grade
     Length
                                                 Μi
                                                              тí
                                                                           Μi
                                         2.5
                                                      2 . 5
Trucks and buses PCE, ET
Recreational vehicle PCE, ER
                                                      5 0
                                         2 - 0
                                                      0.971
Heavy vehicle adjustment, fHV
                                         0.847
                                                      1.00
Driver population factor, fP
                                         1.00
                                                      763
                                                                             pcph
Flow rate, vp
                                         4181
                          _Estimation of Vl2 Merge Areas__
                   L =
                           0.00
                                    (Equation 25-2 or 25-3)
                    ΕQ
                   P =
                           0.60%
                                   Using Equation 1
                    FM
                           (P) =
                                    5273
                                            pc/h
                         F
                             FΜ
                    15
                               __Capacity Checks_
                                                            LOS F?
                            Actual
                                           Maximum
                            4944
                                           7200
                                                            Νo
      F0
                            3276
                                           4600
                                                            Nο
      R12
```

## HCS2000: Ramps and Ramp Junctions Release 4.1b

\_\_\_\_Merge Analysis\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold
Agency/Co: TRC International
Date performed: 5/21/02

Analysis time period: PM

Freeway/dir or travel: I 75/ SR 131 (Emory Road)

Junction: Jurisdiction:

Analysis Year: 2026

Description: Knox (o., M-3, S.B. on ramp from S.R. 131, Alt. 2

	_Freeway Data	
Type of analysis	Merge	
Number of lanes in freeway	э -	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2700	vph
· · · · · · · · · · · · · · · · · · ·	_On Ramp Data	
Side of freeway	Right	
Number of lanes in ramp	ı -	
Free-flow speed on ramp	50.0 /	mph
Volume on ramp	250 /	vph
Length of first accel/decel lane	840	ft
Length of second accel/decel lane		ft
Adjacent	Ramp Data (if one exists	)
Does adjacent ramp exist?	No	
Volume on adjacent Ramp Position of adjacent Ramp		vph
Type of adjacent Ramp Distance to adjacent Ramp		ft

Conversion to pc/	h Under Base	Conditions	
Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2700	250 ′	vph
Peak-hour factor, PHF	0.95	0.95	-
Peak 15-min volume, v15	711	PP	V
Trucks and buses	16	2	%
Recreational vehicles	۵	0	×
Terrain type:	Rolling	Rolling	Level
Grade	%	7,	×.
Length	mi	mi	mi
Trucks and buses PCE, ET	2.5	2.5	
Recreational vehicle PCE, ER	5.0	2.0	
Heavy vehicle adjustment, fHV	0.90P	0-971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3524	271,	pcph

```
_Estimation of V12 Merge Areas_
                  L =
                          0.00 (Equation 25-2 or 25-3)
                          0.601 Using Equation 1
                          (b) = 5179
                                          pc/h
                          FM
                           ____Capacity Checks_
                           Actual
                                         Maximum
                                                          LOS F?
                           3795
                                         7200
                                                          Νo
     FO
                           2389
                                         4600
                                                          No
      R12
                __Level of Service Determination (if not F)__
Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = R R 12 A
Level of service for ramp-freeway junction areas of influence 8
                           ___Speed Estimation__
Intermediate speed variable,
                                             M = 0.590
Space mean speed in ramp influence area:
                                             Z = P5·5
                                                          mph
                                             Z = PP-3
Space mean speed in outer lanes,
                                                          mph
Space mean speed for all vehicles,
                                             Z = P3 \cdot 9
                                                          mph
```

. . .

\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, IN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst: Ken Arnold Agency or Company: Date Performed: TRC International

Date Performed: 5/21/02 Analysis Time Period: AM

I-75/SR 131 (Emory Road) Freeway/Direction: From/To: S.B. South of Inter. /

Jurisdiction:

Analysis Year: 2026 / Description: Knox Co., Prop. System, A	1\$.2	
Flow Inputs and		
Volume, V Peak-hour factor, PHF	4070 0.95	veh/h
Peak 15-min volume, v15	1071	V
Trucks and buses	11/	ž
Recreational vehicles	ů.	" %
Terrain type:	Rolling -	<b>'•</b>
Grade	0.00	7,
Segment length	0.00	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	5.0	
Heavy vehicle adjustment, fHV	0-858	
Driver population factor, vp	1.00	
Flow rate, vp	1664	pc/h/ln
		F · · · ·
Speed Inputs an	d Adjustments	
Lane width	15.0	ft
Right-shoulder lateral clearance	b · 0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	3 /	
Free-flow speed:	Measured	
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	3.0	mi/h
Free-flow speed, FFS	70-0	mi/h
	Urban Freeway	
LOS and Perform	ance Measures	
Flow rate, vp	1664	pc/h/ln
Free-flow speed, FFS	70.0	mi/h
Average passenger-car speed, S	69.l	mi/h
Number of lanes, N	3	
Density, D	24.1	pc/mi/ln
Level of service, LOS	C	•

\_\_\_\_\_Operational Analysis\_\_\_\_

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979

E-mail:

Fax: (615) 661-0644

Analyst:	Ken Arnold
Agency or Company:	TRC International
Date Performed:	5/21/02

Date Performed: 5/21/ Analysis Time Period: PM

Freeway/Direction: I-75/SR 131 (Emory Road)
From/To: S.B. South of Inter.

From/To:	2.82outh of Inter. <			
Jurisdiction: Analysis Year:	505P >			
Description: Knox Co.	Prop. System;	Alt.2		
	Flow Inputs a	nd Adjustments		
Volume, V		2950 -	veh/h	
Peak-hour factor, PHF		0.95 /		
Peak 15-min volume, v15	i	776	ν	
Trucks and buses		11 🖊	%	
Recreational vehicles		0	%	
Terrain type:		Rolling∕		
Grade		0.00	%	
Segment length		0.00	m i	
Trucks and buses PCE, E	T	2.5		
Recreational vehicle P(		2.0		
Heavy vehicle adjustmer		0.858		
Driver population facto	ir, vp	1 - 00		
Flow rate, vp		750P	pc/h/ln	
	Speed Inputs	and Adjustments	· ·	
Lane width		75.0	ft	
Right-shoulder lateral	clearance	6.0	ft	
Interchange density		0.50	interchange/mi	
Number of lanes, N		3 /	<del>-</del>	
Free-flow speed:		Measured		
FFS or BFFS		70.0	mi/h	
Lane width adjustment:	fLW	0 - 0	mi/h	
Lateral clearance adjus	tment, fLC	0.0	mi/h	
Interchange density adj		0.0	mi/h	
Number of lanes adjustm	ent, fN	3.D	mi/h	
Free-flow speed, FFS		70.0	mi/h	
		Urban Freeway	<i>t</i>	
	L0S and Perfo	rmance Measures		
Flow rate, vp		750F	pc/h/ln	
Free-flow speed, FFS		70.0	mi/h	
Average passenger-car s	peed, S	70.0	mi/h	
Number of lanes, N	•	3		
Density, D		17.2	pc/mi/ln	
Level of service, LOS		В		

HCS200D: Multilane Highways Release 4.1b

	OPERATIO	NAL ANALYSI	z		
Analyst:	Ken Arnold				
Agency/Co:	TRC International				
Date:	5/21/02				
Analsis Period:	AM				
Highway:	SR 131 (Emory Road)				
From/To:	Central Ave-/I-75				
Jurisdiction:					
	505P				
	Knox Ca., Prop. Sys	tem . Alt.	2		
		-FLOW SPEED			
	Direction	l.		2	
Lane width	DI, ECCION				£ L
Lane width Lateral clearanc	· D. *	15.0	ft	75.0	ft
	· = •	7 0	£ L	3.0	c.
Right edge		2.0	ft	5.0	ft
Left edge	1 3	6.0	ft	6.0	ft
	al clearance	9·0	ft	8.0	ft
Access points pe	r mile	5		55	
Median type		Divided		Divided	
Free-flow speed:		Base		Base	
FFS or BFFS		PO · O	mph	PD · O	mph
Lane width adjus	tment, FLW	0.0	mph	0.0	mph
	e adjustment, FLC	۵۰۹	mph	0.9	mph
Median type adju	stment, FM	0.0	πph	0.0	mph
Access points ad	justment: FA	7.3	mph	5.5	mph
Free-flow speed		57.B	mph	53·b	mph
		_VOLUME			
	Direction	1		5	
Volume, V		7557 _	vph	971 ~	vph
Peak-hour factor	, PHF	0.95/	•	0.95 ~	
Peak 15-minute v	olume, vl5	321		256	
Trucks and buses		2/	%	2 7	7.
Recreational veh	icles	Ō	2	Ō	ž.
Terrain type		Rolling/	••	Rolling/	•
Grade		0.00	z.	0.00	%
Segment leng	th	0.00	mi	0.00	r. mi
Number of lanes		5 ~	III A	5 ~	m I
	n adjustment, fP	1.00			
rucks and buses		5.2 T.OO		7.00	
				2.5	
Zacmastians:	iclas D/C CP				
		5.0		2.0	
Heavy vehicle ad		0-971		0.971	
Heavy vehicle ad			pcphpl		pcphpl
Recreational veh Heavy vehicle ad Flow rate, vp		0-971	pcphpl	0.971	pcphpl
Heavy vehicle ad		0-971 661	pcphpl	0.971	pcphpl
Heavy vehicle ad Flow rate, vp	justment, fHV  Direction	0-971 661 _RESULTS	pcphpl pcphpl	0.971 526	pcphp1
Heavy vehicle ad Flow rate, vp	justment, fHV  Direction	0-971 661 _RESULTS 1		0.971 526 2	
Heavy vehicle ad Flow rate, vp Flow rate, vp Free-flow speed,	justment, fHV  Direction	0-971 661 _RESULTS 1 661	pcphpl mph	0.971 526 2 526	pcphpl mph
Heavy vehicle ad Flow rate, vp Flow rate, vp Free-flow speed,	Justment, fHV  Direction  FFS ar travel speed, S	0.971 661 _RESULTS 1 661 57.8	pcphpl	0.971 526 2 526 53.6	pcphpl

Overall results are not computed when free-flow speed is less than 45 mph.

HCS2000: Multilane Highways Release 4.1b

	OPERATIO	NAL ANALYSI	ZZ		
Analyst:	Ken Arnold				
Agency/Co:	TRC International				
Date:	5/21/02				
Analsis Period:	PM ′				
Highway:	(beon yroma) 131 AZ				
From/To:	Central Ave-/I-75				
Jurisdiction:	·				
	50SP	414	•		
Project ID:	Knox Co., Prop. Sys	tem, AIT.	2		
	FREE	-FLOW SPEED			
	Direction	ľ		2	
_ane width		15.0	ft	<b>7</b> 5·0	ft
_ateral clearanc	e:				
Right edge		5.0	ft	5.0	ft
Left edge		P • 0	ft	L • 0	ft
	al clearance	8-0	ft	8.0	ft
Access points pe	r mile	5		55	
Median type		Divided		Divided	
Free-flow speed:		Base		Base	
FFS or BFFS		60.0	mph	PO-0	mph
ane width adjus		0.0	mph	0.0	mph ≁
	e adjustment, FLC		mph.	0.9	mph
ledian type adju		0.0	mph	0.0	mph
Access points ad	Justment, FA	1.3	mph	5.5	mph
Free-flow speed		57.8	mph	53.6	mph
		_VOLUME			
	Direction	l.		2	
Volume, V	217 0201011	1425 /	vph	1347	vph
Peak-hour factor	, PHF	0.95	- p	0.95	· p
Peak 15-minute v		375		354	
Trucks and buses		2 -	2.	5	2
Recreational veh	icles	Ō	ž	Ō	ž
Terrain type		Rolling -		Rolling -	
Grade		0.00	%	0 00	2
Segment leng	th	0.00	mí	0.00	mi
Number of lanes		2 /		2 /	
Driver population	n adjustment, fP	1.00		1.00	
rucks and buses	PCE, ET	2.5		2.5	
Recreational veh:	icles PCE, ER	2.0		5 · 0	
łeavy vehicle ad	justment, fHV	0-971		0.971	
flow rate, vp		772	pcphpl	730	pcphp1
		_RESULTS			
	Direction	ı		2	
low rate, vp		772	pcphpl	730	pcphpl
ree-flow speed.		57.B	mph	53.6	mph
	ar travel speed, S	57.B	mph	53.6	mph
evel of service	701	В	-	В	•
ensity. D		-		_	

Inter::

Area Type: All other areas

Analyst: KA
Agency: TRC International
Date: 5/22/02
Period: AM

Jurisd:

Project ID: Knox Co., Prop. System, Alt. 2 E/W St: SR 131 (Emory Road) N/S St: T-75 5

N/S St: I-75 SB Ramps

			GNALIZE:	D INTERSE	CTION	IAMMUZ	RY			
		stbound		bound		thbou			bound	
	i L	T R	L. '	r R	L	T	R I	L	r R	į,
No. Lane	s i 0	5 0	¦	5 0	-¦		'-	0	1 0	¦
LGConfig	1	/	1	T/	i	J	i	_	LTR	i
Volume	i i		J 81	59 ×	1			19/1		2 /i
Lane Wid				2.0	1		1	7.6	0	ı
RTOR Vol	ı	352	ı		1		1		34	I
Duration	0.25	Area		ll other al Operat		•				
Phase Co	mbinatio	n 1, 2	3 3 19 116	4	.10115	5	Ь	7	В	-
EB Left				I NB	Left					
Thru		A		1	Thru					
Right	t	A		ļ.	Right					
Peds WB Left					Peds					
Thru		A		1 1 2B	Left Thru	A				
Right	+	^		i	Right	A A				
Peds	•			i	Peds	^				
NB Right	t			i E8	Right					
SB Right				1 WB	Right					
Green		5P·0				24.0				
Yellow		3.0				3.0				
All Red		5.0				2 0				
		Tatanas	D.		·- C··	Cycl	le Leng	th: 60	•0	secs
Appr/ L	Lane	Intersec	Rati	erformanc	Lane (		Appr	nach		
	Group	Flow Rate	Mac.	.03	Lune (	ar oup	KPPI I	Jacii		
	Capacity		v/c	g/C	Delay	FOZ	Delay	LOZ	-	
Eastbound	d									
TR	1469	3390	0.65	0.43	14.0	В	14.0	В		
Westbound	3									
r	1564	3670	0.59	0-43	13.5	В	13.5	В		
Northbour	35			5-,5			٠.٠	J		
.,5, 5,10001	. 🕶									
Southbour	nd									
TR	794	1985	0.25	0.40	75.5	В	75.5	В		
	Intersec	tion Delay	= 13.6	(sec/ve	h) Ir	nterse	ction l	-02 =	В	

Inter.: I-75/SR 131 (Emory

Analyst: KA Agency: TRC International Date: 5/22/02 Period: PM Area Type: All other areas Jurisd: Year : 2026

Project ID: Knox (o., Prop. System, Alt. 2 E/W St: SR 131 (Emory Road) N/S St: I-75 SB Ramps

			GNALIZE	D INTERSE	ECTION	AMMUZ	RY			
		stbound	l West	bound	1 Nor	thbou	nd l		thbound	
	L	T R	L 	<b>T</b> R	I L	T	R I	L	T f	₹
No. Lanes LGConfig		==	; <u> </u>	5 , 0	0	0	''	0	l' (	'   
Volume	1	1175 250 -	1	247 /	j		1	143/		oo 1 i
Lane Widt				2.0	1		1		TP·O _	1
RTOR Vol	1	125	1		1		ı		33	3 1
Duration	0.25			ll other al Operat					# · · · · · · · · · · · · · · · · · · ·	
Phase Com	bination	n 1 2	3 3	4 1		5	Ь	7	å	
EB Left				I NB	Left					
Thru Right	•	A A			Thru					
Peds	•	A			Right Peds					
WB Left				az i	Left	Α				
Thru		A		i	Thru	Ä				
Right	;			1	Right	A				
Peds				1	Peds					
NB Right				I EB	Right					
SB Right Green	•	28.0		I WB	Right	22.0				
Yellow										
IGITOM		3.F								
All Red		5·0 3·0				3.0				
		5.0				3.0 3.0	le Len	gth: E	-0-0	secs
All Red		2.0 Intersed	tion P	erformanc		3.0 2.0 (yc)			-0.0	secs
All Red	ane '	Z-O Intersec Adj Sat	tion Po Rat	erformanc ios	e Summa Lane (	3.0 2.0 (yc)		gth: E	-0.0	secs
All Red  Appr/ L Lane G	ane roup apacity	Intersection  Adj Sat Flow Rate	rtion Pe Rat v/c	erformanc ios g/C		3.0 2.0 Cycl ary Group	App			secs
All Red  Appr/ L Lane G	roup apacity	Intersection  Adj Sat Flow Rate	Rat:	ios ———	Lane (	3.0 2.0 Cycl ary Group	App	roach		secs
Appr/ L Lane G Grp C	roup apacity	Intersection  Adj Sat Flow Rate	Rat:	ios ———	Lane (	3.0 2.0 Cycl ary Group	App	roach y LOS		secs
Appr/ L Lane G Grp C	roup apacity lbb0	Intersection Adj Sat Flow Rate (s)	Rat v/c	g/C	Delay	3.0 2.0 Cyclary Group	App Dela	roach y LOS		Secs
All Red  Appr/ L Lane G Grp C  Eastbound  TR  Westbound	roup apacity lbb0	Intersection Adj Sat Flow Rate (s)	Rat v/c	g/C	Delay	3.0 2.0 Cyclary Group	App Dela	roach y LOS B		Secs
All Red  Appr/ L Lane G Grp C  Eastbound  TR  Westbound	roup apacity 1660	Intersection Adj Sat Flow Rate (s)	Rat v/c 0.82	g/C g/C	Delay	3.0 Cyclary Group LOS	App Dela	roach y LOS B		secs
All Red  Appr/ L Lane G Grp C  Eastbound TR  Westbound	roup apacity 1660 1685 d	Intersection Adj Sat Flow Rate (s)	Rat v/c 0.82	g/C g/C	Delay	3.0 Cyclary Group LOS	App Dela	roach y LOS B		secs
All Red  Appr/ L Lane G Grp C  Eastbound  TR  Westbound  T  Northboun  Southboun	roup apacity lbb0 lb85 d	Intersection Adj Sat Flow Rate (s)  3558	Rat v/c 0.82	0.47	Delay 17.4 15.8	3.0 Cyclary Group LOS	App Dela 17.4	roach y LOS B		Secs
All Red  Appr/ L Lane G Grp C  Eastbound  TR  Westbound  T  Northboun  Southboun	roup apacity 1660 1685 d	Intersection Adj Sat Flow Rate (s)	Rat v/c 0.82	g/C g/C	Delay	3.0 Cyclary Group LOS	App Dela	roach y LOS B		secs

HCS2000: Signalized Intersections Release 4.1b

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Inter.: I-75/Sr 131 (Emory Road) Agency: TRC International
Date: 5/22/02
Period: AM Area Type: All other areas

Jurisd:

Year : 2026 ~

Project ID: Knox Co., Prop. System Alt. 2 E/W St: SR 131 (Emory Road) N/S St: I-75 NB Ramps

l No∙ Lanes ∣ _GConfig ∣	Eastboun L T			bound T R	Nor	thbou T		7001	hbour T	
_GConfig   Volume   _ane Width						•		-	1	•
	77′ 559′ 12.0 12.0	 		2/ 0 TR/ D28/173/ 2·0	1 L / 1 1 5 3 / 1 1 2 · 0		2   R   577   12.0   192	Q	0	
Duration	0.25	Area To	vne: A	ll other						
				al Operat						
Phase Combin IB Left Thru Right Peds	ation 1 A A	A 5	3	4     NB 	Left Thru Right	5 A A	Ь	7	<b>a</b>	
JB Left Thru Right Peds		A A		         	Peds Left Thru Right Peds					
/B Right SB Right Green 'ellow	7 · 0 3 · 0	55.0 3.0		E8   WB	Right Right	15.0 3.0				
ll Red	5.0	2 • 0		·		Cyc	le Leno	th: 9	2.0	secs
	In	tersect	ion Pe	erformanc	≘ Summa	iry <u> </u>				
appr/ Lane .ane Group		Sat Rate	Rati	os	Lane G	roup	Appr	oach		
		s)	v/c	g/C	Delay	LOS	Delay	L02	_	
astbound		_						<del></del>		
. 262) . 137	180. 3614		0 · 59	0.0A 0.73	47.8 4.1	D A	9.4			
lestbound	. 3011	u	0.55	0.73	4.7	А	7.4	A		
R 214;	358	L	1.05	0.60	53.9	D	53.9	D		
orthbound 294	180	5	0.55	0.14	37.5	D				
463 outhboun <b>d</b>	2848	2	0.87	016	54.4	Ď	49.6	D		

HCS2000: Signalized Intersections Release 4.1b

Intersection Delay = 44.7 (sec/veh) Intersection LOS = D

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661~0644

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Inter.: I-75/Sr 131 (Emory Road)

Area Type: All other areas Jurisd:

Agency: TRC International
Date: 5/22/02
Period: PM Year : 2026

Project ID: Knox Co-1 Prop. System, Alt.2 E/W St: SR 131 (Emory Road) N/S St: I-75 NB Ramps

				UZ NOITO	MARY		
	tbound 1		bound	North			bound I
! L	TRI	L.	T R	I L T	R I	L T	RI
No- Lanes   1/	<del>/ 2 / 0  </del> ;	0	2 0	' <del>                                     </del>	<del>, 2</del> /		0 0
LGConfig   L-	T/ 1	_	TR -	L-	r i		i
Volume   1159/		1.	372/267/	1487/	1249 🗥		i
Lane Width 112.0	75.0 i	1 i	2.0	175.0	75.0 i		I
RTOR Vol I	ţ		89	1	P52 I		1
Duration 0.25	Area T		ll other al Operat				714.11
Phase Combination	7 5	3	ar obecar	.1005	5 <b>b</b>	7	
EB Left	Ä Ä	_	I NB	Left A		•	Ü
Thru	A A		1	Thru			
Right			1	Right #	<b>A</b>		
Peds ⊌B Left			1 50	Peds			
Thru	A		l ZB	Left Thru			
Right	Ä		i	Right			
Peds			İ	Peds			
NB Right			I EB	Right			
SB Right Green	7 D 43 D		I MB	Right	_		
	7.0 41.0 3.0 3.0			3.	J - O		
	5.0 5.0			2.			
				_	ycle Len	ath: 91	·0 secs
		tion Pe	erformanc	e Summary	′ <u> </u>		
Appr/ Lane	Adj Sat	Rati	ios	Lane Gro	up App	roach	
Lane Group Grp Capacity	Flow Rate (s)	v/c	g/(	N = 1 = 1 = 0	7.00		
- capacity	(3)	V/C	9/0	Delay LO	7 hera	y LOS	
Eastbound	1.005						
L 263 T 2103	1805 3610	0.63 0.58	0-58 0-58	23.4 (			
	חתפב	u · 30	N • 20	12.4 B	13.7	В	
Westbound							
TR 1599	3548	1.02	0.45	52.7 D	52.7	D	
Northbound							
L 555	1805	0-92	0.31	51.9 D			
R <b>6</b> 74	2842	0.75	0.31	32.1 (	40.8	D	
Southbound	2012	٠,,,	п. п.				

Intersection Delay = 36.4 (sec/veh) Intersection LOS = D

HCS2000: Signalized Intersections Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661~0644

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA	Inter :: SR 131/Primetime Road
Agency: TRC International	Area Type: All other areas
Date: 5/22/02	Jurisd:

Period: AM Year : 2026

Project ID: Knox Co., Prop. System, Alt. 2

E/W St: SR 131 (Emory Road)

N/S St: Primetime Road

c/w st.	י מכח על	emory Road)		N / 3	St: Prl	necime Ki	o a d		
		7.7	GNAL TZET	) TATERSE	UZ NOITO	MMARY			
	I Ea			ound	1 North		l Sout	thbound	T
	i L		I L 1		I L T		l L	T R	i
	i		i -			"	 1	, ,,	i
No. Lane	s i 1	/ 2 / D	1 1	2/_0	1 1 :	1 0 0	i 0	1/1/	,
LGConfig			i L-	TR /		TR .	i	ĹT′ R ✓	í
Volume				51/11/	151/ 6/	``` ₃ ✓	170 - 3	12≥ 1449 ∕	
Lane Wid			112.0 12		115.0 15			15.0 15.0	
RTOR Vol	1		1	4	1		1		i
Duration	0.25	Area		l other					
				al Operat					
	mbinatio		3	4		5 Ь	7	8	
EB <u>L</u> eft		A		INB	Left /	1			
Thru		A A		ı		4			
Righ		A A		I		4			
Peds				1	Peds				
WB Left		A		1 28	Left	A			
Thru		A		1	Thru	A			
Righ		A		ı	Right	A			
Peds				l	Peds				
NB Righ		_		I EB	Right				
SB Righ	t	Α		ΙWΒ	Right				
Green		14.0 50.0				0.5 10.5	5		
Yellow		3.0 3.0				0 3.0			
All Red		5.0 5.0				0 2.0			
		T - h	: B-			lycle Ler	igth: 1	105.0 se	CS
4000/	l ===				e Summary				
	Lane Group	Adj Sat Flow Rate	Rati	.05	Lane Gro	up Apr	roach		
	Capacity		v/c	g/C	Delay LO	<u> </u>	ZOJ VE	_	
	capacity			9/	relay C	, 2 Dele	iy LVS		
Eastboun									
L_	241	1805	0 - 54	0.13	44.8				
TR	2358	3589	0.44	0.66	8-8	12.8	В		
Westboun	d								
L	248	521	0.02	0-48	14.5 E	3			
ŤR	1718	3608	1.05	0.48	53·5 I	53.1	, D		
Northbou	nd								
L	181	1805	0.30	0.10	44.8 I				
ĪR	183	1829	8.04	0.10	42.8		5 D		
140	203	3021	רטיט	0.50	76-0 1	77.5	ν ν		
	nd								
Southbou									
LT	182	2881	0-48	0.10	46.E D	39.0	D D		
		1822 1615			46-6 I		I D		
LT	182 454		0.66	0.28	36.7 D			: p	

HCS2000: Signalized Intersections Release 4.16

HCS2000: Signalized Intersections Release 4.1b

Analyst: KA Inter .: SR 131/Primetime Road Agency: TRC International Date: 5/22/02 Period: PM Area Type: All other areas Jurisd:

Project ID: Knox Co., Prop. System , Alt. 2 E/W St: SR 131 (Emory Road) N/S St: Primot

N/S St: Primetime Road

F\M 7£: 7K	737 (F	mory koad)		N\Z	St: Primet	ime Koa	d	
		SIZ	SNALIZED	INTERSE	CTION SUMMA	RY		
	l Eas			ound	Northbou		South	bound I
	I L	T R I	I L T	· R	I L T	R I		
	1	!			.1	!_		
No. Lanes	1 1, 1	_ S _ D _ I	1-	2/0	1 1 - 1 -	0 1	0	1 1 1
LGConfig	11-			TR	IL TR		_	LT/ R/
Volume		187615151	14 - 12	!81-99 ✓	1163- 44- C	15~ 11	18/ 30	√ 195 <b>′</b> I
Lane Width			15.0 75		175.0 75.0	i	75	·0 75·0 l
RTOR Vol	ı	72 1		33	1 :	5 I		65 I
Duration	0.25	Area 1	ype: Al	l other l Operat	areas			******
Phase Comb	ination	1 5	31911a	u vperac	5	Ь	7	8
EB Left	111461011	ÄÄ	_	, NB	Left A	•	,	0
Thru		Ä Ä		i	Thru A			
Right		A A		i	Right A			
Peds				i	Peds			
WB Left		A		I ZB	Left	A		
Thru		A		1	Thru	A		
Right		A		1	Right	A		
Peds				1	Peds			
NB Right				I EB	Right			
SB Right		Α		I MB	Right			
Green		16.0 42.0		0.0	14.4	75.6	0.0	0.0
Yellow		3.0 3.0	0.0		3.0	3.0	0.0	
All Red	•	5.0 5.0	0.0		5.0	5.0	0.0	
		Intonene	tion De	~ f = ~ = ~ = =		le Leng	th: 10:	5.0 secs
Appr/ La	ne	Incersec Adj Sat	Rati.		e Summary <u> </u>	Anne	nach	<del></del>
	oup	Flow Rate	Keti	03	Cane Group	Appi	00(11	
	pacity	(s)	v/c	g/C	Delay LOS	Delay	701	
					2010, 200			
Eastbound	n 3	1.005						
	81 105	1805	0.88	0.60	50.9 0			
1K 2	143	3572	0.99	0.60	4 E-8E	40.0	D	
Westbound								
L 7	2	181	0.06	0.40	19.7 B			
TR 1	434	3584	0.99	0.40	52·1 D	25 • 7	D	
Northbound								
	48	1805	0.69	0.14	51.3 D			
	53	1845	0.23	0.14	40.8 D	48.7	D	
		10,2	0.25	0.11	10.0	10.1	•	
Southbound								
LT 2	19	1827	0.71	0.15	54.8 D	41.7	D	
	17	1615	0.5P	0 · 32	5P-9 C	= *	=	
I	ntersect	cion Delay	= 44.5	(sec/ve		ction	L = 201	)

HCS2000: Signalized Intersections Release 4.1b

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD: TN 37027

Phone: (615) 661-7979 E-mail:

Fax: (615) 661-0644

_	111.0	•	•	•

Density, D

E-mail:				
OPERATI	ONAL ANALYS	15		
_				
· · · · · · · · · · · · · · · · · · ·				
Agency/Co: TRC International				
Date: 5/21/02				
Analsis Period: AM				
Highway: SR 131 (Emory Road	)			
From/To: Primetime Road/Bis	hop			
Jurisdiction:				
Analysis Year: 2026 ~				
Project ID: Knox Co., Prop. Sy:	stem, AIC.2	2_		
FRE	E-FLOW SPEE	D		<del></del>
Direction	1.		2	
Lane width	15.0	ft	75-0	ft
Lateral clearance:	# C - U		J.C - U	1 6
Right edge	2.0	ft	2.0	f +
Left edge				ft
Total lateral clearance	6.0	ft	F · O	ft
	8.0	ft	8.0	ft
Access points per mile	10		10	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	FO · O	mph	FC · O	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.9	mph	0.9	mph
Median type adjustment: FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.5	mph	2.5	mph
Free-flow speed	56·6	mph	56.6	mph
	VOLUME			
Direction	,		-	-
Direction Volume <sub>n</sub> V	1027	_•	2	
	1057	vph	JPPP	vph
Peak-hour factor, PHF	0.95		0.95	
Peak 15-minute volume, v15	270		438	
Trucks and buses	3 ~	%	3 /	%
Recreational vehicles	0	4	0	%
Terrain type	Rolling/		Rolling ~	
Grade	0.00	%	0.00	γ.
Segment length	0.00	mi	0.00	mi
Number of lanes	2 ~		5 ~	
Driver population adjustment, fP	1. <b>0</b> 0		1.00	
Trucks and buses PCE, ET	2.5		2.5	
Recreational vehicles PCE, ER	2.0		5.0	
leavy vehicle adjustment, fHV	0-957		0.957	
low rate, vp	564	pcphpl	916	pcphpl
	RESULTS			
Direction	1		5	
flow rate, vp	564	pcphpl	916	pcphpl
ree-flow speed, FFS	56.6	mph	56.6	mph
lvg. passenger-car travel speed, S	5b.b	mph	56·6	•
evel of service, LOS	.¥	ייקייי	_	mph
Density. D	10 0	n=/-i/1=	B	4:41

10.0 Overall results are not computed when free-flow speed is less than 45 mph.

pc/mi/ln 16.2

pc/mi/ln

TRC INTERNATIONAL 217 WARD CIRCLE BRENTWOOD, TN 37027

Phone: (615) 661-7979

Fax: (615) 661-0644

E-mail:	-	Fa	ex: (FT2)	661-0644	
	OPERATI	ONAL ANALYS	IZZI		
Agency/Co: Date: Analsis Period: Highway: From/To: Jurisdiction:	Ken Arnold TRC International 5/21/02 PM SR 131 (Emory Road Primetime Road/Bis	) hop			
	Knox Co++ Prop+ Sy	stem, Alt.	2		
	FRE	E-FLOW SPEE	D		- <u>,,,,</u>
	Direction	l.		2	
Lane width		75-0	ft	15.0	ft
Lateral clearance	6:				
Right edge		5.0	ft	2.0	ft
Left edge	-1 -1	F · O	ft	P - 0	ft
	al clearance	8.0	ft	8 · O	ft
Access points per Median type	L wile	10		10	
Free-flow speed:		Divided		Divided	
FFS or BFFS		Base	. 1	Base	
Lane width adjust	tment. FlW	D • O	mph	PO-0	mph
Lateral clearance	e adjustment, FL(	0.9	mph	0.0	mph
Median type adjus	stment. FM	0.0	mph	0.9	mph
Access points ad	iustment. F&	2.5	mph	0.0	mph
Free-flow speed	Justine III I A	56.6	mph mph	2.5 56.6	mph
•	٠.	30.0	pri	20.0	mph
		VOLUME		1212	
Volume, V Peak-hour factor		1 2009 ~ 0 • 95 ~	vph	2 1384 – 0.95 /	vph
Peak 15-minute vo	olume, v15	529		364	
Trucks and buses		3 ′	Z.	3 ~	7.
Recreational vehi	clez	0	%	Ð	%
Terrain type		Rolling'		Rolling _	
Grade	. L.	0.00	<b>%</b> .	0.00	<i>7.</i>
Segment lengt Number of lanes	.11	0.00	mi	0.00	mi
Driver population	andiustment fo	2 /		2 🗸	
Trucks and buses	D/F - FT	7.00		ī · ōo	
Recreational vehi	cles PCF. FR	2.5		2.5	
Heavy vehicle adj	ustment, fAV	2.0 0.957		5.0	
flow rate, vp	103 Ciliette 1 1114	1104	pcphpl	0.957 761	nanka1
			pcpnp1	(PT	pcphp1
		RESULTS			
	Direction	ı		2	
low rate, vp	===	1104	pcphpl	7 <b>61</b>	pcphp1
ree-flow speed,	717	56.6	mph	5b - b.	mph
vg. passenger-ca	r travel speed, S	56 · b	mph	5b·b	mph
evel of service, Density, D	LOZ	·C 19.5	pc/mi/ln	B 13.4	pc/mi/ln

Overall results are not computed when free-flow speed is less than 45 mph.

**APPENDIX B** 

INDEX OF SHEETS (CONST.)

SEE SHEET NO. 1A

# STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION BUREAU OF PLANNING AND DEVELOPMENT

TENIN	YEAR	s
TENN.	2001	
FED. A10 PROJ. NO.	HPP/STP-1310	
STATE PROJ. NO.	47039-3231	

### KNOX COUNTY

S.R. 131 (EMORY ROAD) FROM: SOUTH OF GILL ROAD TO: NORTH OF BISHOP ROAD GRADE, DRAIN, & PAVE

STATE HIGHWAY NO. 131 F.A.H.S. NO. 131



NO EXCLUSIONS NO EQUATIONS

47039-3231-14 END PROJ. NO. HPP/STP-131(12) (CONST.) PAP. LOC. STA. 24+264.000 LOG MILE 16.71

ADJACENT PROJECT N 47039-2230-04 R.O.W. 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.

SCALE = 1:50000

DATE

TRAFFIC DATA ADT (2001) 18660 27940 ADT (2021) DHV 120211 2794 60-40 5 X

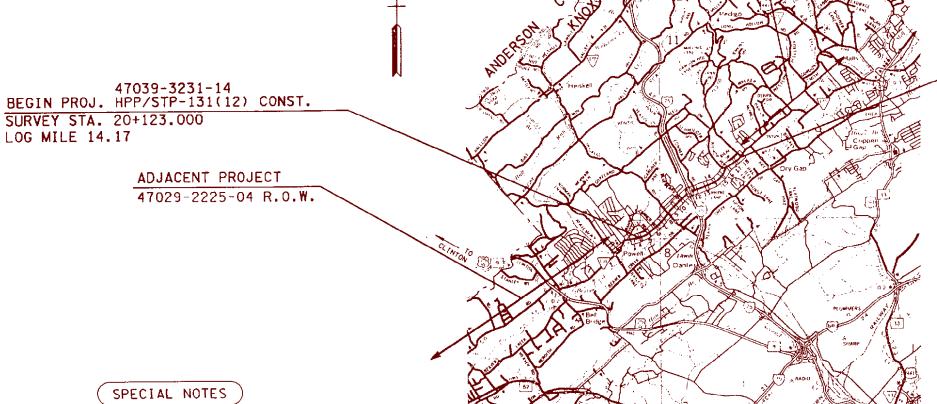
3 %

60 km/h

T (ADT) T (DHV) U.S. DEPARTMENT OF TRANSPORTAT FEDERAL HIGHWAY ADMINISTRATIC

APPROVEO:

DIVISION ADMINISTRATOR





TDOT ROAD SP. SV. 2 GARY HAWK

THE PROPOSAL CONTRACT

\_\_\_\_ CHECKED BY RANDY DUKE DESIGNER JOHN MOORE

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

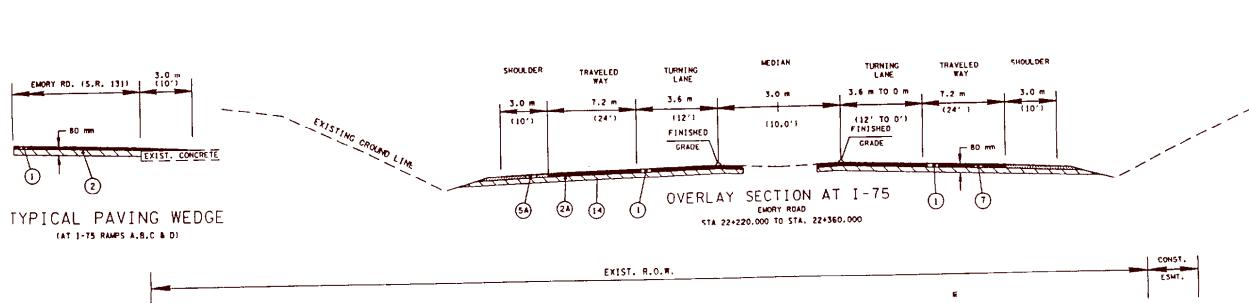
P.E. NO. 47039-1215-04

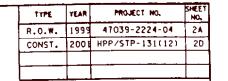
ROADWAY LENGTH BRIDGE LENGTH BOX BRIDGE LENGTH PROJECT LENGTH

KILOMETERS 4.141 KILOMETERS 0.000 0.000 KILOMETERS

KILOMETERS

4.141



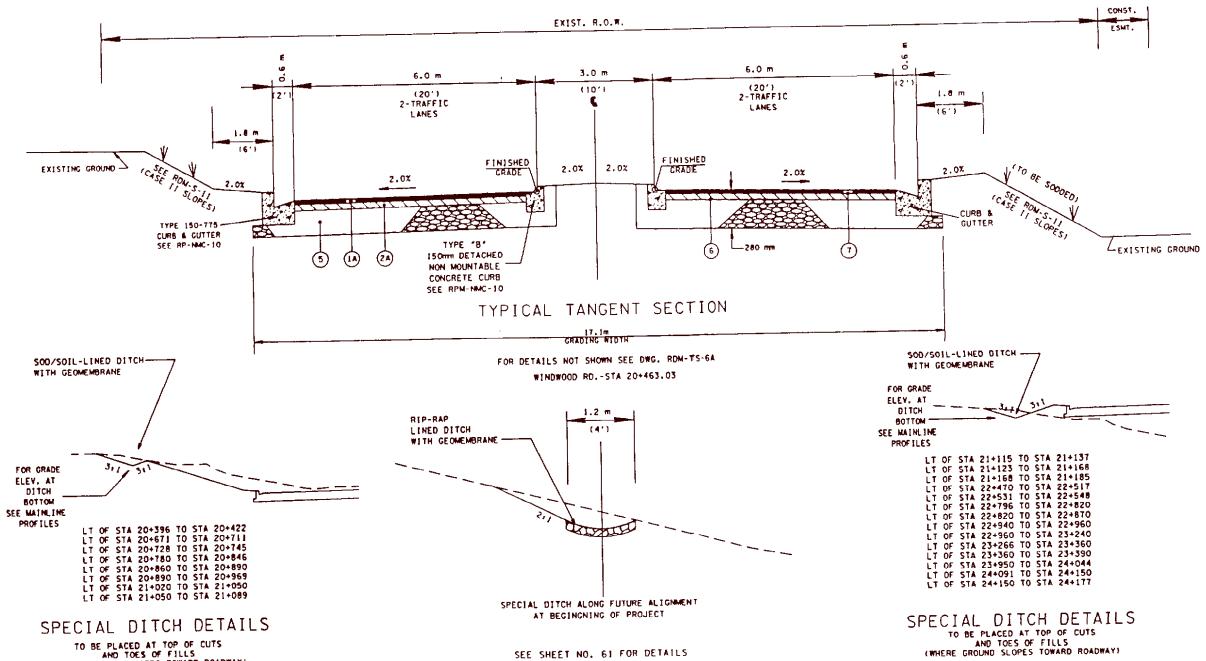


REV.5/28/99: ADJUSTED R.O.W. DIMENSIONS TO UPDATE PLANS

REV. 8/16/01: REVISED TYPICAL TANGENT SECTION FOR DETACHED CURB AND ADDED FOOTNOTE FOR OVERLAY SECTION AT 1-75.

REV. 9/17/01: REVISED CODE NUMBERS & OVERLAY SECTION.

REV. 11/05/01; REVISED CODE NOS. & ADDED OVERALL PAVEMENT THICKNESS FOR ALL TYPICAL SECTIONS.







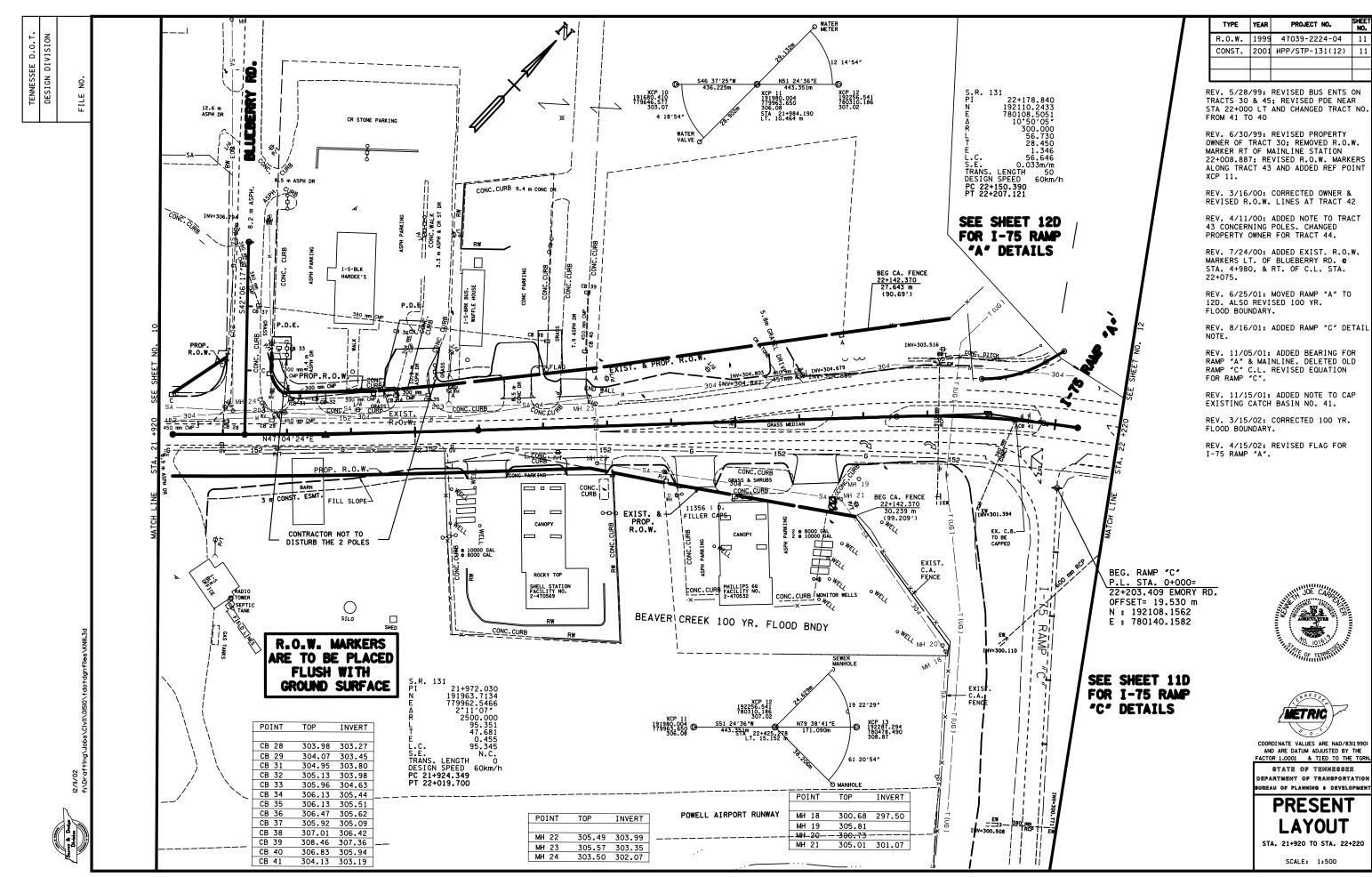
STATE OF TENRESSEE DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS

AND TOES OF FILLS
(WHERE GROUND SLOPES TOWARD ROADWAY)

SEE SHEET NO ST FOR DETAILS

SEE SHEET NO. 61 FOR DETAILS



R.O.W. 1999 47039-2224-04 11 CONST. 2001 HPP/STP-131(12)

REV. 5/28/99: REVISED BUS ENTS ON TRACTS 30 & 45; REVISED PDE NEAR STA 22+000 LT AND CHANGED TRACT NO.

OWNER OF TRACT 30; REMOVED R.O.W.
MARKER RT OF MAINLINE STATION
22+008.887; REVISED R.O.W. MARKERS
ALONG TRACT 43 AND ADDED REF POINT

REV. 7/24/00: ADDED EXIST. R.O.W. MARKERS LT. OF BLUEBERRY RD. @ STA. 4+980, & RT. OF C.L. STA.

REV. 6/25/01: MOVED RAMP "A" TO

REV. 11/05/01: ADDED BEARING FOR RAMP "A" & MAINLINE. DELETED OLD RAMP "C" C.L. REVISED EQUATION FOR RAMP "C".

REV. 4/15/02: REVISED FLAG FOR I-75 RAMP "A".



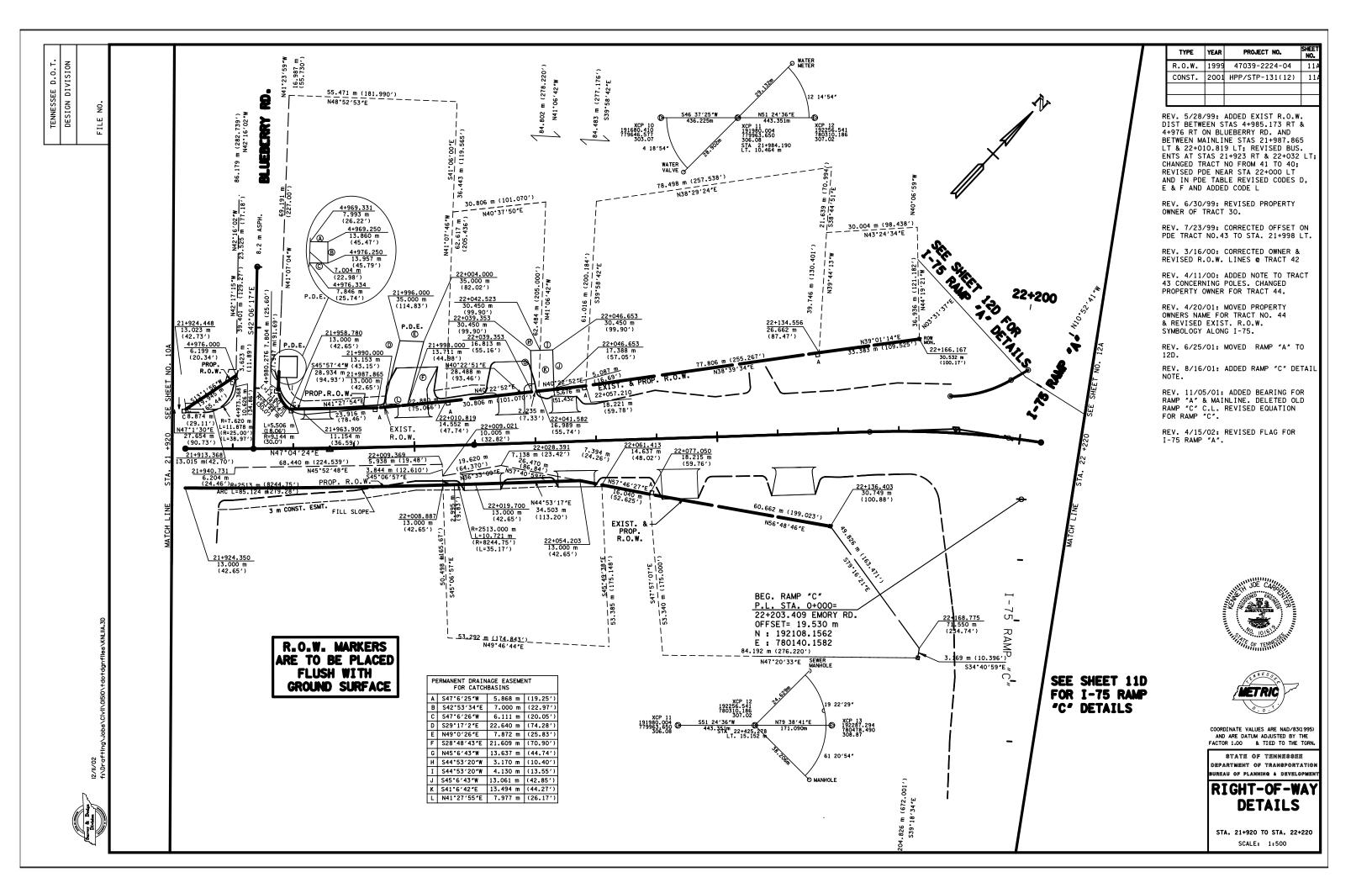


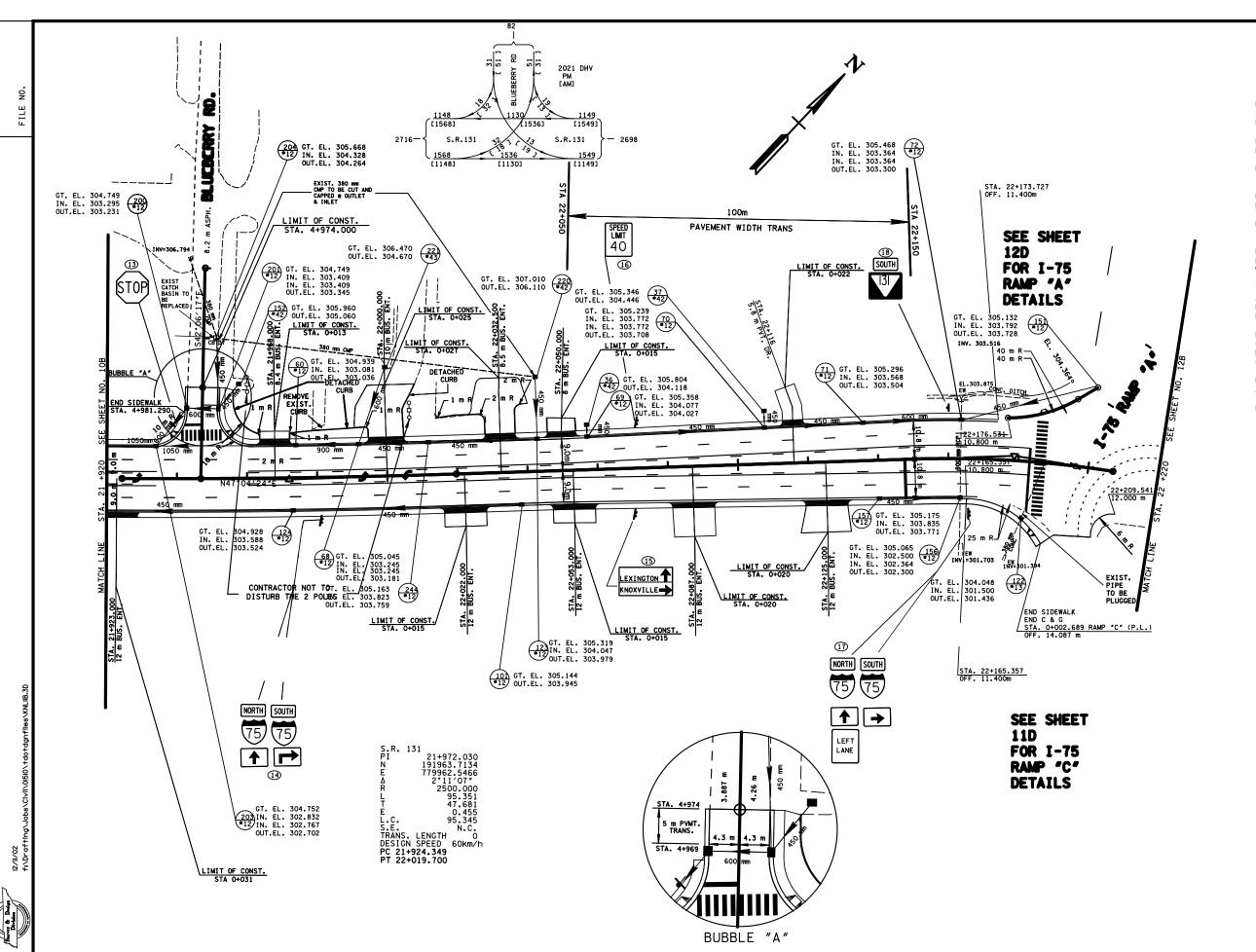
COORDINATE VALUES ARE NAD/83(1990 AND ARE DATUM ADJUSTED BY THE FACTOR 1.0001 & TIED TO THE TGR

STATE OF TENNESSEE

**PRESENT** LAYOUT

STA. 21+920 TO STA. 22+220





TENNESSEE D.O.T.
DESIGN DIVISION

 TYPE
 YEAR
 PROJECT NO.
 SHEET NO.

 R.O.W.
 1999
 47039-2224-04
 11E

 CONST.
 2001
 HPP/STP-131(12)
 11E

REV 5/28/99: REVISED BUS ENTS AT STAS 21+923.000 RT & 22+032.500

REV. 4/11/00: ADDED NOTE TO LIGHT POLES.

REV:6/25/01 MOVED RAMP "A" TO

REV. 8/16/01: ADDED RAMP "C" DETAIL

REV. 9/17/01: ADDED INLET ELEVATION TO CB 68 AND MOVED CB 203.

REV. 11/05/01: ADDED BEARING FOR RAMP "A" & MAINLINE. UPDATED M.L. WIDTH TRANSITIONS AND RADII AT INTERSECTIONS. ADDED BUBBLE "A" TO SHOW BLUEBERRY RD. TRANSITION. ADDED NOTE TO PLUG EXIST. PIPE. DELETED TEXT FOR EXIST. RADIUS ON RAMP "C".

REV. 11/15/01: ADDED STATIONS & OFFSETS FOR CURB AND GUTTER @ BEGINNING OF RADIUS AND END OF CURB AND GUTTER.

REV. 3/15/02: REVISED INLET EL. AND OUTLET EL. FOR CODE 69.

REV. 4/15/02: REVISED FLAG FOR I-75 RAMP "A".



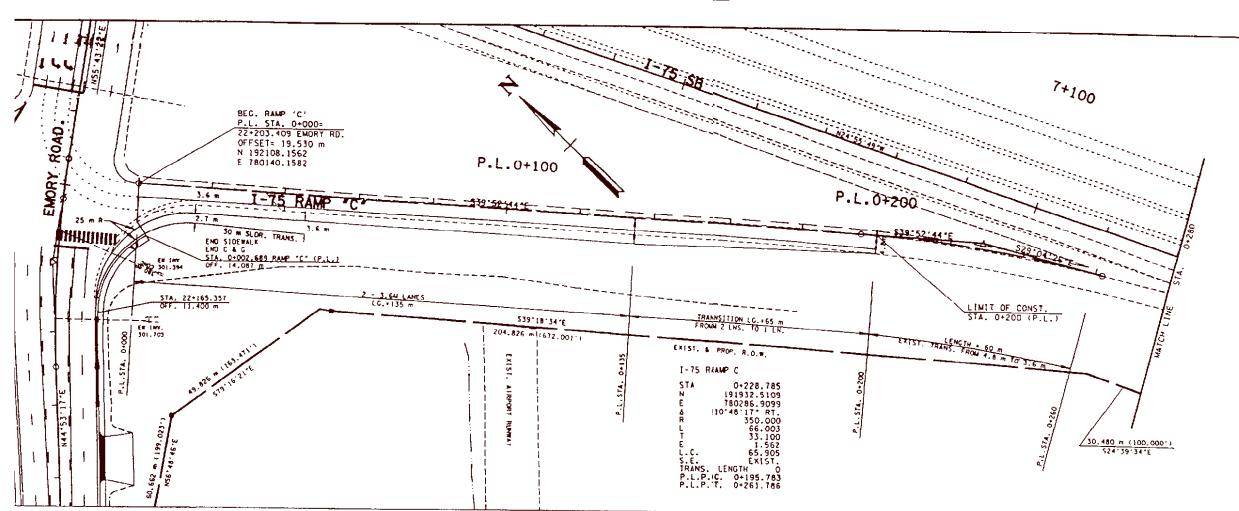


COORDINATE VALUES ARE NAD/83(1990 AND ARE DATUM ADJUSTED BY THE FACTOR 1.0001 & TIED TO THE TGRN.

STATE OF TENNESSEE Department of transportatio Bureau of Planning & Developme

## PROPOSED LAYOUT

STA. 21+920 TO STA. 22+220

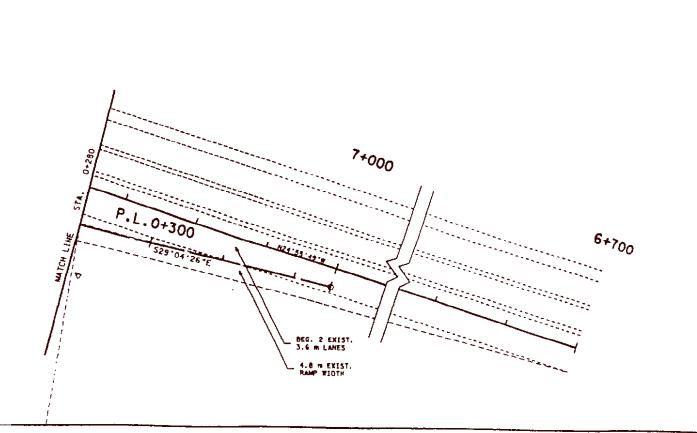


		PROJECT NO.	MO.
R.O.W.	1999	47039-2224-04	110
CONST.	2001	HPP/STP-131(12)	111

REV. 11/05/01:ADDED CODROINATES: UPDATED PYMT. & SHLD. TRANSITIONS & ADDED PROP RADII FOR RAMP 'C'. ADDED BEARINGS FOR 1-75 SB & EMORY RD.

REV. 11/15/01: ADDED STATIONS & OFFSETS FOR CURB AND GUTTER © BEGINNING OF RADIUS & END OF CURB AND GUTTER.

REV. 3/15/01: ADDED CURVE DATA FOR RAMP 101.





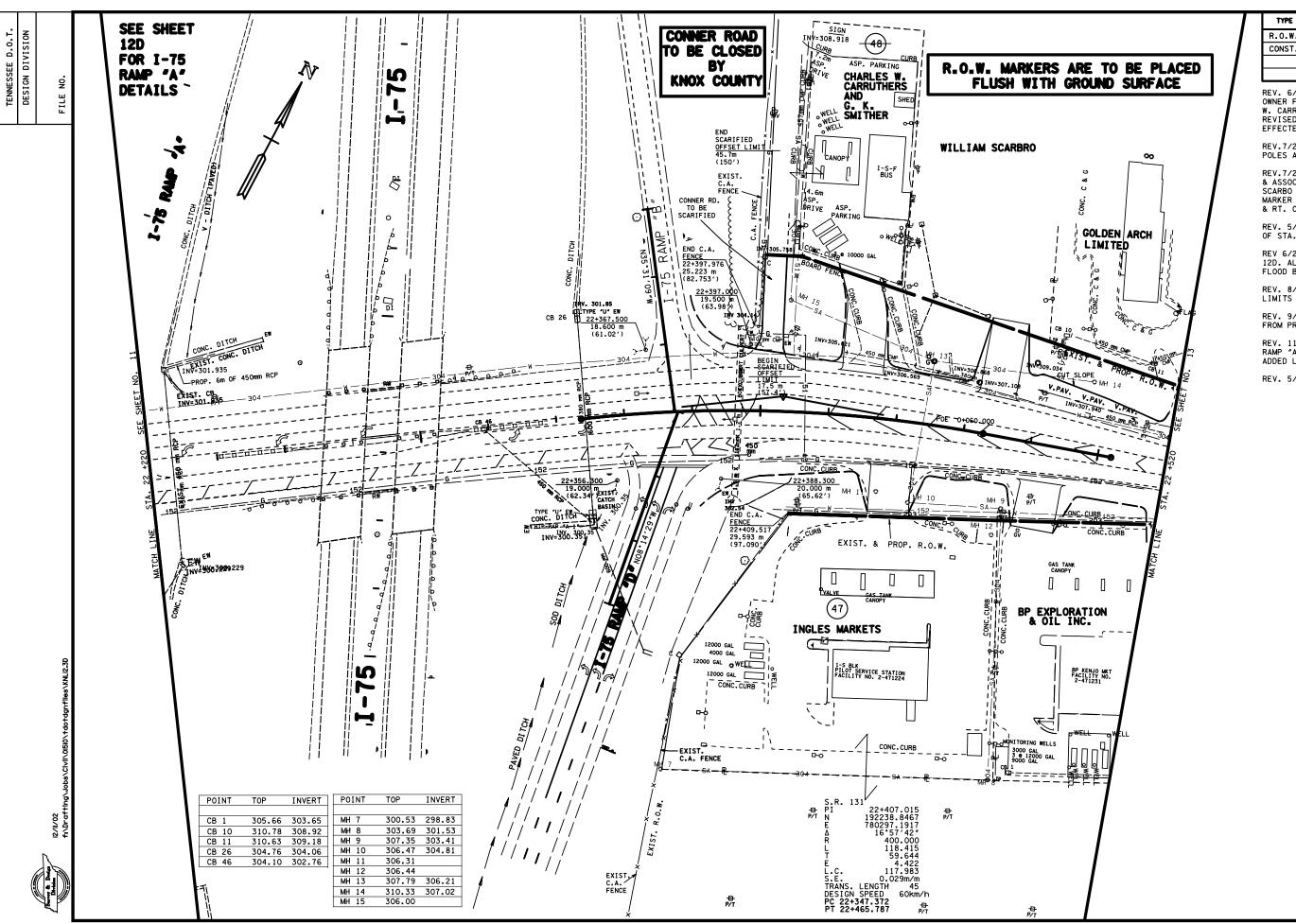




COORDINATE VALUES ARE NAD/83/1990/ AND ARE DATUM ADJUSTED BY THE FACTOR 1,0001 & TIED TO THE TORN.

STATE OF TENMESSEE CEPARTMENT OF TRAMSPORTATION BUREAU OF PLANNING & DEVELOPMENT

PROPOSED LAYOUT RAMP 'C'



TYPE YEAR PROJECT NO. SHEET NO. R.O.W. 1999 47039-2224-04 12 CONST. 2001 HPP/STP-131(12) 12

REV. 6/30/99: CHANGED PROPERTY OWNER FROM ROBERT CORUM TO CHARLES W. CARRUTHERS & G.K. SMITHER ALSO REVISED BUS. ENT, TRACT BOUNDARY & EFFECTED R.O.W. LINES

REV.7/23/99: ADDED EXIST SIGNALS & POLES AT NB OFF-RAMP.

REV.7/24/00: ADDED BUSINESS & ASSOCIATED UTILITIES TO WILLIAM SCARBO TRACT, ADDED EXIST R.O.W. MARKER LT. OF C.L. @ STA. 22+409 & RT. OF C.L. @ STA. 22+475.

REV. 5/21/01: ADDED BUS. ENT. LEFT OF STA. 22+468.

REV 6/25/01: MOVED RAMP "A" TO 12D. ALSO REVISED 100 YR. FLOOD BOUNDARY.

REV. 8/16/01: ADDED SCARIFICATION LIMITS FOR CONNER RD.

REV. 9/17/01: CHANGED TURN ARROWS FROM PROP. TO EXIST. ON RAMP D".

REV. 11/05/01: ADDED BEARING FOR RAMP "A", "B", "D" & MAINLINE; ADDED LABELS FOR RAMP "B" & "D".

REV. 5/10/02: CORRECTED I-75 C.L.



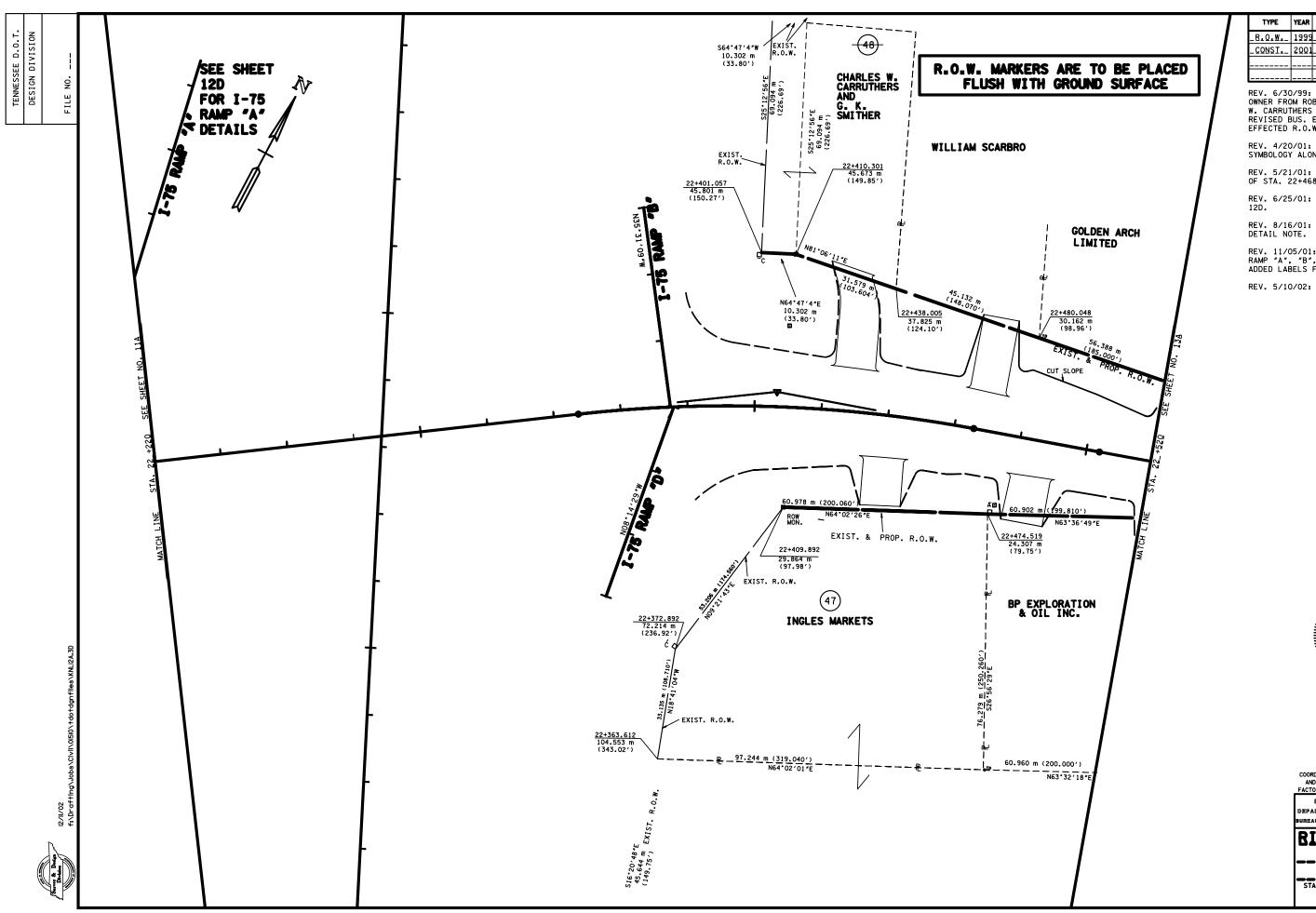


COORDINATE VALUES ARE NAD/83(1990)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.0001 & TIED TO THE TGRN

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
UREAU OF PLANNING & DEVELOPME

PRESENT LAYOUT

STA. 22+220 TO STA. 22+520



REV. 6/30/99: CHANGED PROPERTY OWNER FROM ROBERT CORUM TO CHARLES W. CARRUTHERS & G.K. SMITHER ALSO REVISED BUS. ENT, TRACT BOUNDARY & EFFECTED R.O.W. LINES

REV. 4/20/01: REVISED EXIST. R.O.W. SYMBOLOGY ALONG I-75.

REV. 5/21/01: ADDED BUS. ENT. LEFT OF STA. 22+468.

REV. 6/25/01: MOVED RAMP "A" TO 12D.

REV. 8/16/01: MODIFIED RAMP "A" DETAIL NOTE.

REV. 11/05/01: ADDED BEARING FOR RAMP "A", "B", "D" & MAINLINE; ADDED LABELS FOR RAMP "B" & "D".

REV. 5/10/02: CORRECTED I-75 C.L.



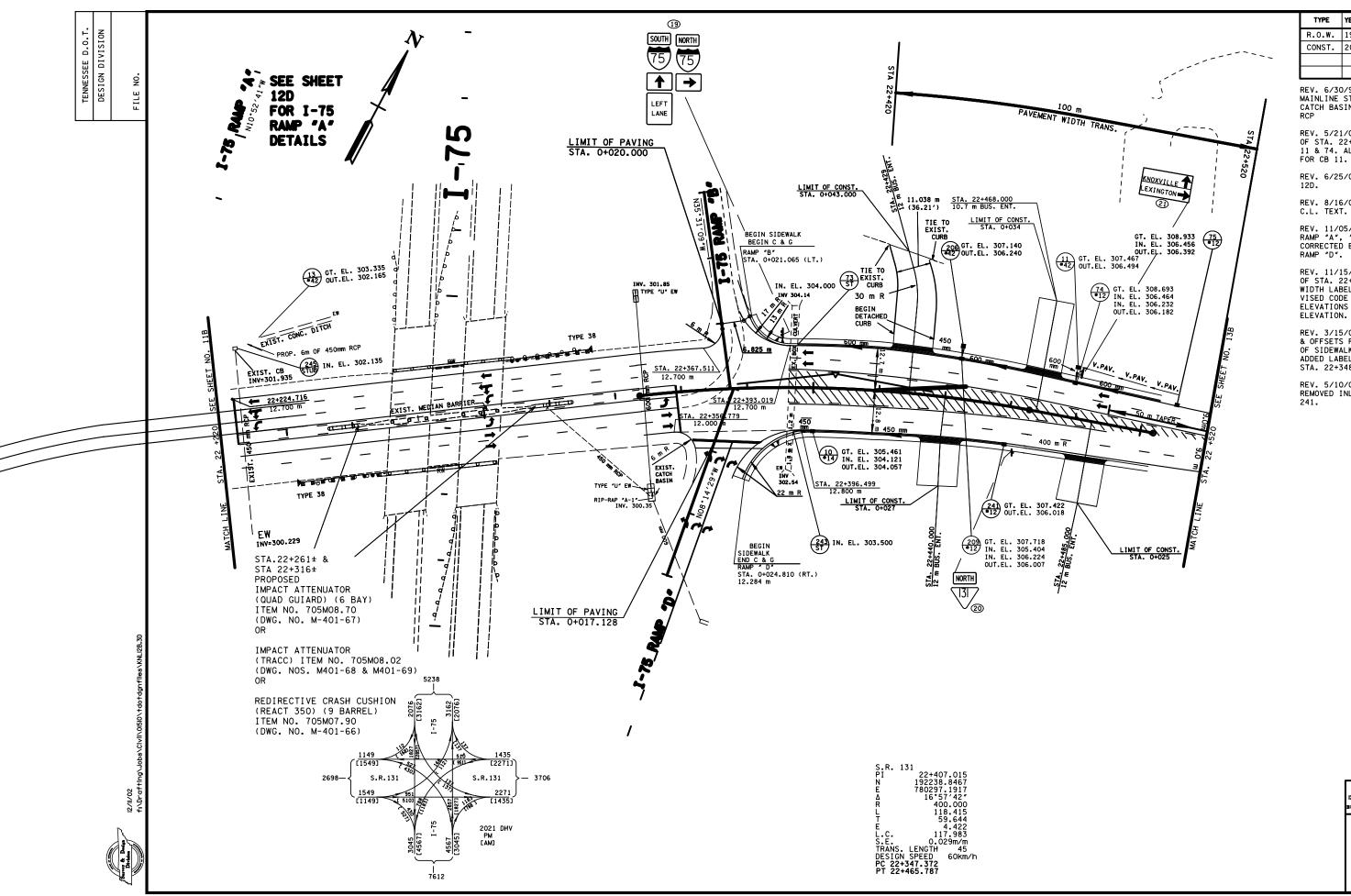


COORDINATE VALUES ARE NAD/83(1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.0001 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATIO

RIGHT-QE-WAY

STA.\_22+220 TO STA. 22+520 SCALE: 1:500



 TYPE
 YEAR
 PROJECT NO.
 SHEET NO.

 R.O.W.
 1999
 47039-2224-04
 12E

 CONST.
 2001
 HPP/STP-131(12)
 12E

REV. 6/30/99: REVISED BUS. ENT AT MAINLINE STA 22+429 LT AND ADDED CATCH BASINS 206 & 209 WITH 450 mm RCP

REV. 5/21/01: ADDED BUS. ENT. LEFT OF STA. 22+468 & ADJUSTED CB NO. 11 & 74. ALSO ADJUSTED DITCH @ CB FOR CR 11

REV. 6/25/01: MOVED RAMP "A" TO

REV. 8/16/01: ADDED STA. 22+300 C.L. TEXT.

REV. 11/05/01: ADDED BEARING FOR RAMP "A", "B", "D" & MAINLINE; CORRECTED EASTING COORDINATE FOR RAMP "D".

REV. 11/15/01: ADDED EWS LT. & RT. OF STA. 22+349, UPDATED PVM'T WIDTH LABEL AT STA. 22+420, RE-VISED CODE NO.74 INLET & OUTLET ELEVATIONS & CODE NO. 209 INLET ELEVATION.

REV. 3/15/02 : REVISED STATIONS & OFFSETS FOR C & G @ BEGINING OF SIDEWALK & END OF RADIUS ADDED LABEL TO EW LT. & RT. OF STA. 22+348.53.

REV. 5/10/02: CORRECTED I-75 C.L. REMOVED INLET EL. FROM CODE NO. 241.





COORDINATE VALUES ARE NAD/83(1990) AND ARE DATUM ADJUSTED BY THE FACTOR 1.0001 & TIED TO THE TGRN.

STATE OF TENNESSEE Department of transportatio Ureau of Planning & Developme

## PROPOSED LAYOUT

STA. 22+220 TO STA. 22+520

#### **PRESENT**

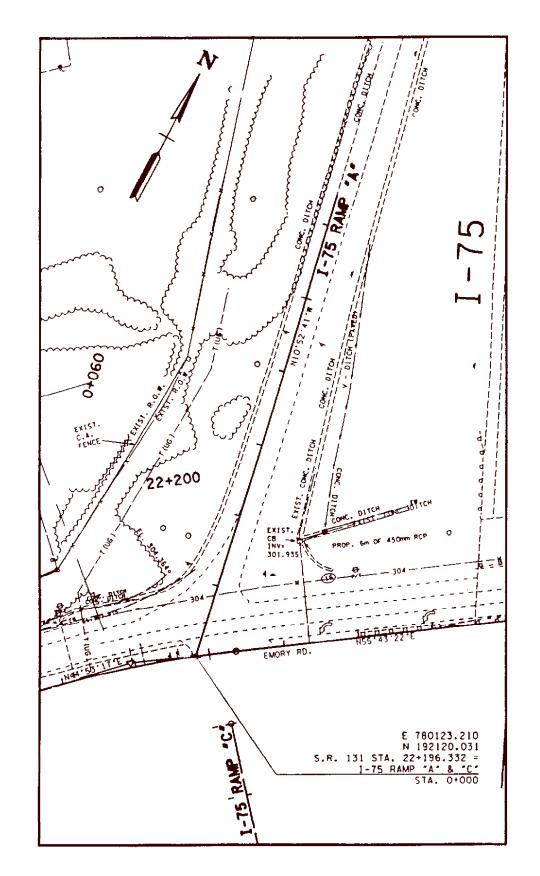
#### PROPOSED

TYPE	YEAR	PROJECT NO.		
R.O.W.	1999	47039-2224-04		
CONST.	2001	HPP/STP-131(12)		

REV. 6/25/01: ADDED SHEET 12D

REV. 11/05/01; ADDED C.B. NOS. & 151 AND BEARING FOR RAMP 'A' MAINLINE. REVISED CURB RADIUS ! ADDED PYMT. RADIUS.

REV. 11/15/01: ADDED STATION AT DEFSET FOR END SIDEWALK LEADER.



	LJMIT OF CONST. STA. 0+128.000	
I.2m OF EXIS PYMT. TO BE WITH 3.5m OF PVMT.	0.108	GAS
WRONG 2.	0.068 	SOUTH 131
72 CT. EL. 305.468 (12) IN. EL. 303.364 IN. EL. 303.364 OUT.EL. 303.300	E 780125.210  N 192120.031  S.R. 131 STA. 22+196.332 = 1-75 RAMP 'A' & "C"	75 SOUTH KNOXVILLE





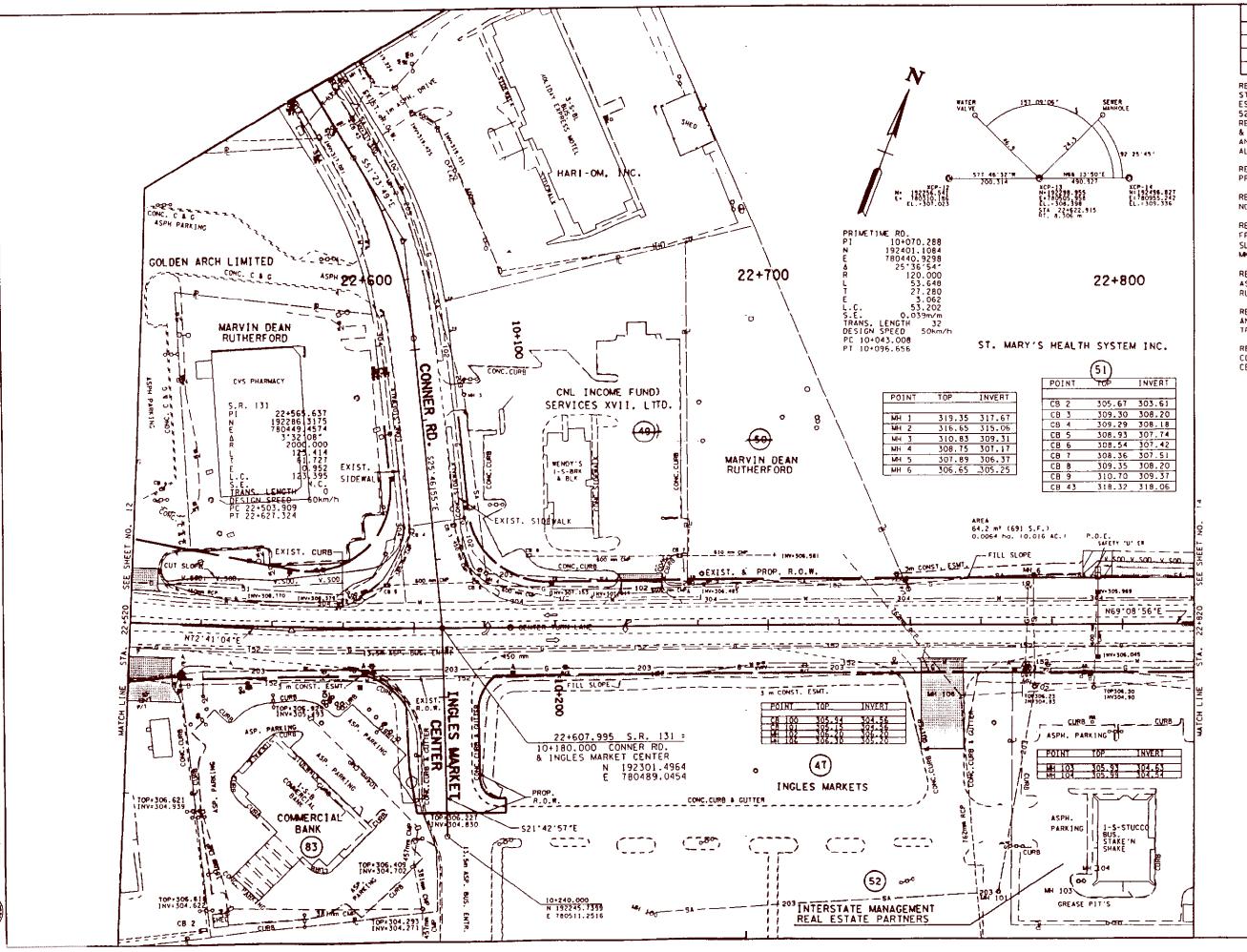
COORDINATE VALUES ARE NAD/83019 AND ARE DATUM ABJUSTED BY THE FACTOR 1.0001 & TIED TO THE TGR

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTA' SUREAM OF PLANISME & DEVELOP

PRESENT AND PROPOSE LAYOUT

RAMP "A" SCALE: 1:500





TYPE YEAR PROJECT NO. SHE NC

R.O.W. 1999 47039-2224-04 1

CONST. 2001 HPP/STP-1311121 1

REV. 5/28/99: REVISED BUS ENT AT STA 22-526.000 RT: ADDED SLOPE ESMT SHADING TO TRACTS 47.51 & 52: ADDED PDE PATTERN ON TRACT 51 REVISED PROP & EXIST R.O.W. LINE & ADDED R.O.W. MARKERS AT TRACT B AND ADDED PROPERTY LINE LABELS TO ALL TRACTS

REV. 6/30/99: CORRECTED EXIST. & PROP R.O.W. LINE ALONG TRACT 83

REV. 12/8/99: L1NED THROUGH TRACT NO. 49.

REV. 2/29/00: REMOVED CONST. ESMT FROM TRACT 49; ADDED PROP. R.O.W. SLOPE & CONST. ESMT. AT INGLES MKT. ENT. NEAR TRACT 83.

REY. 7/24/00: ADDED BUS. & ASSOCIATED TOPO TO MARVIN DEAN RUTHERFORD TRACT ON PRIME TIME RO

REV. 6/6/01: DELETED CONST. ESMT. AND LINED THROUGH TRACT NO. FOR TRACT SO.

REV. 11/15/01: ADDED BEARINGS FOR CONNER RD. AND INGLES MARKET CENTER.

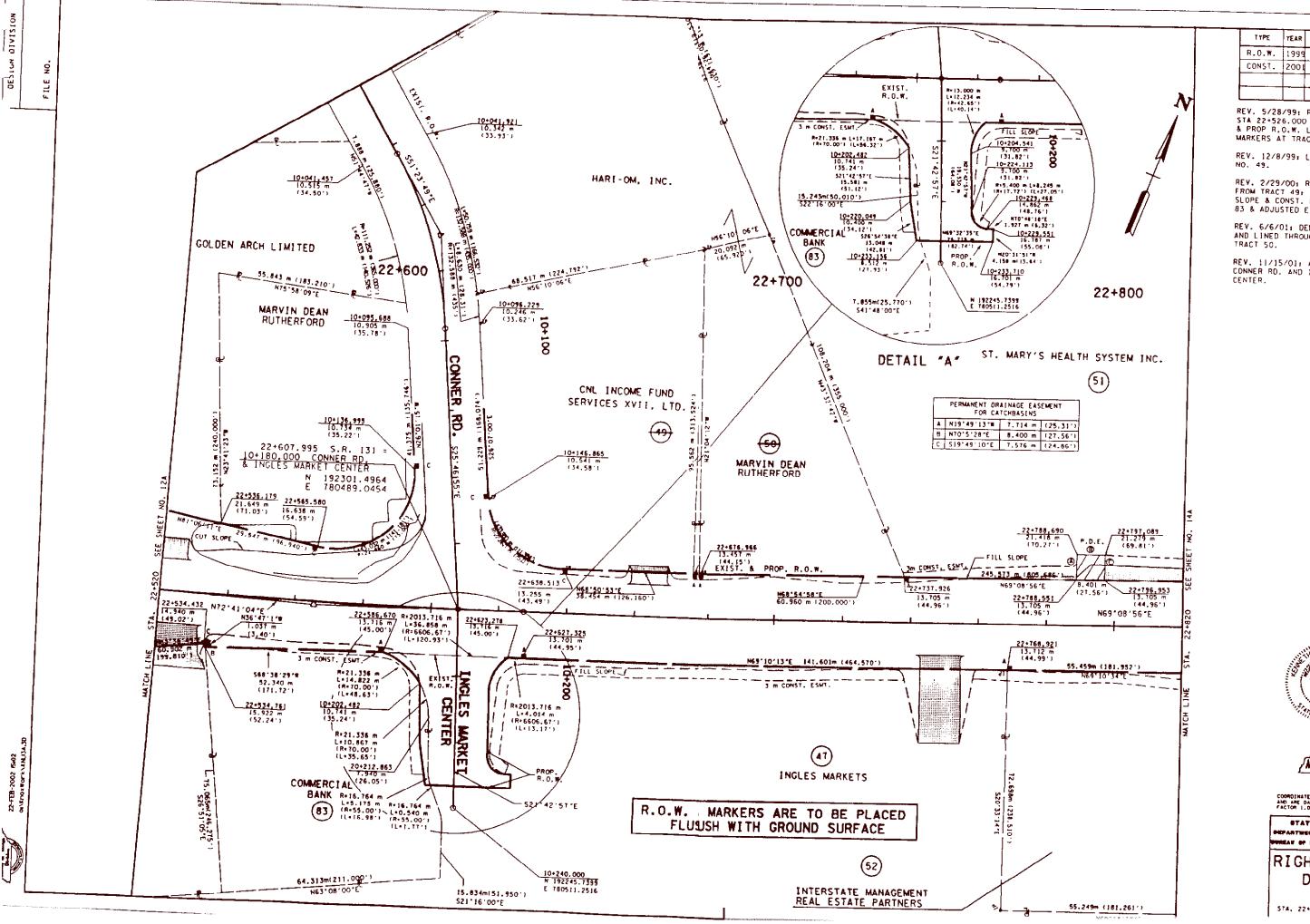
METRIC

COORDINATE VALUES ARE NAD/BRISTS
AND ARE DATUM ADJUSTED BY THE
FACTOR 1,0001 & TIED TO THE TG

STATE OF TEMMESSEE PEPARTMENT OF TRANSPORTATION WEENS OF PLANSES & PEYELSPIES

> PRESENT LAYOUT

STA. 22+520 TO STA. 22+82C



TYPE	YEAR	PROJECT NO.	SHEET NO.	
R.O.W.	1999	47039-2224-04	13A	
CONST.	2001	HPP/STP-131(12)	134	
	$\vdash$			

REV. 5/28/99: REVISED BUS ENT AT STA 22+526.000 RT: REVISED EXIST & PROP R.O.W. LINE & ADDED R.O.W. MARKERS AT TRACT 83.

REV. 12/8/99: LINED THROUGH TRACT NO. 49.

REV. 2/29/001 REMOVED CONST. ESMT FROM TRACT 49: ADDED PROP. R.O.W., SLOPE & CONST. ESMT. NEAR TRACT 83 & ADJUSTED EXIST. R.O.W.

REY. 6/6/01: DELETED CONST. ESMT. AND LINED THROUGH TRACT NO. FOR TRACT 50.

REV. 11/15/01: ADDED BEARINGS FOR CONNER RO. AND INGLES MARKET TENTER



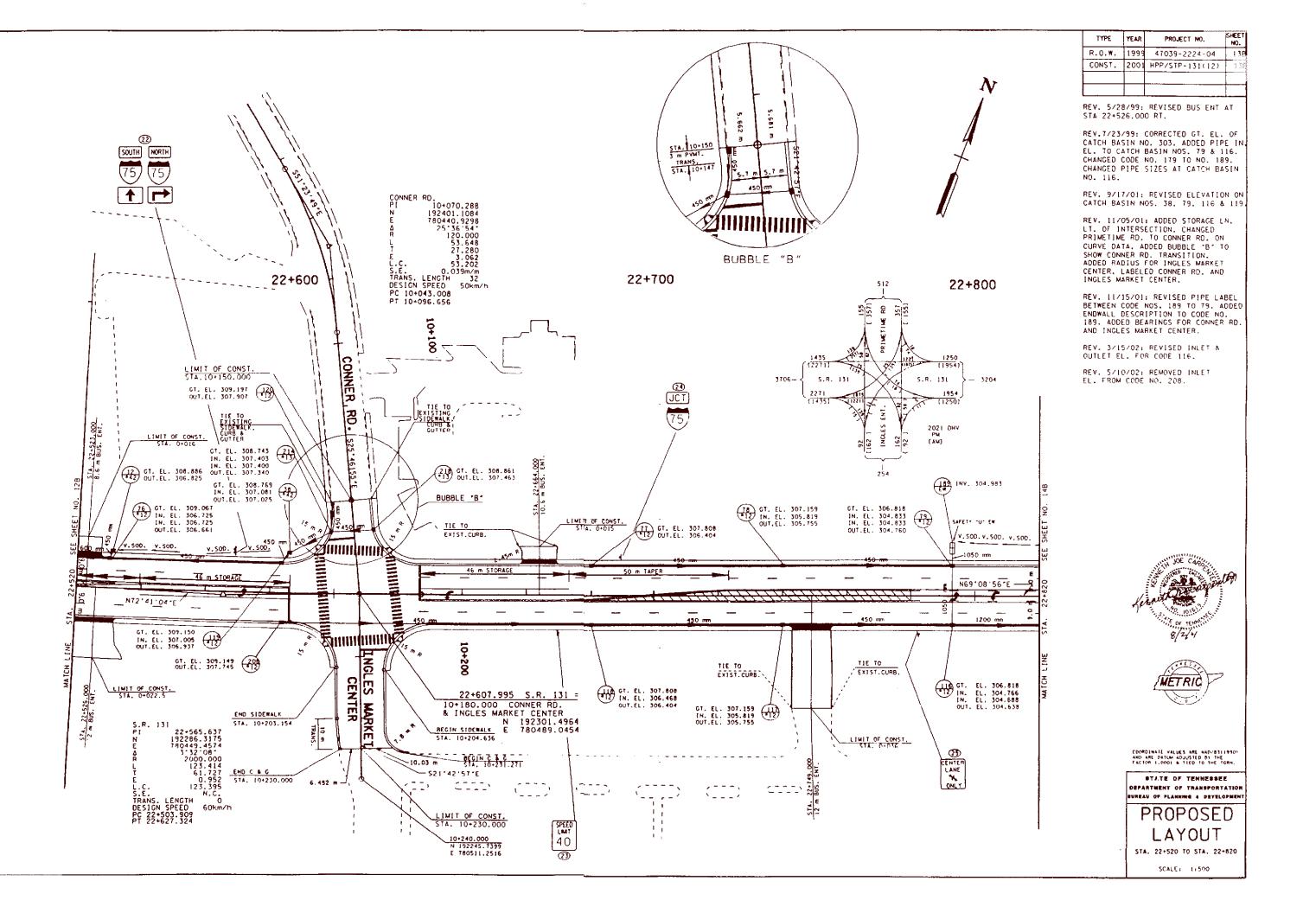


COORDINATE VALUES ARE MAD/83(1990) AND ARE DATUM ADJUSTED BY THE FACTOR 1.0001 & TIED TO THE TERM.

STATE OF TENNESSEE SUPARTMENT OF TRANSPORTATION DUMEAU OF PLANNING & DEVELOPMENT

RIGHT-OF-WAY DETAILS

STA. 22+520 TO STA. 22+820



#### Index of Sheets

SHEET NO. DESCRIPTION

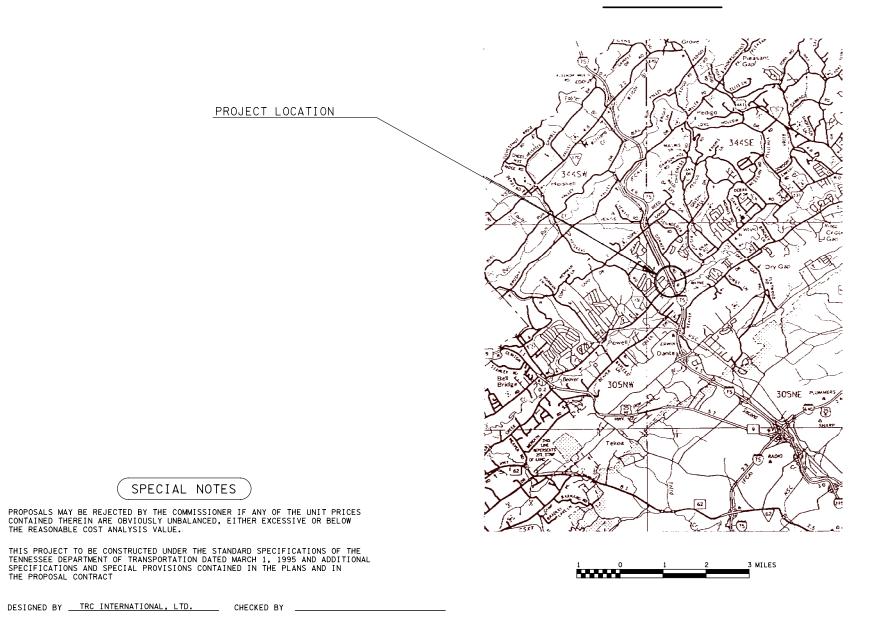
1 ... TITLE SHEET
2 ... TYPICAL SECTION SHEET
3 through 7 ... FUNCTIONAL LAYOUTS

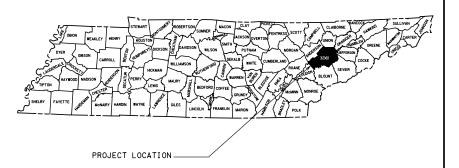
#### STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION BUREAU OF PLANNING AND DEVELOPMENT

TENN.	YEAR	SHEET NO.
I EININ	2001	1
FED. AID PROJ. NO.		
STATE PROJ. NO.		

#### Knox County

INTERCHANGE MODIFICATION
S.R. 131 (EMORY ROAD) AT I-75







APPROVED:

DESIGN DIVISION

DATE:

APPROVED:

COMMISSIONER

TRAFFIC	DATA
ADT (2006)	46,05
ADT (2026)	59,86
DHV (2026)	5,98
D	60-4
T (ADT)	23:
T (DHV)	15
٧	45 MF

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

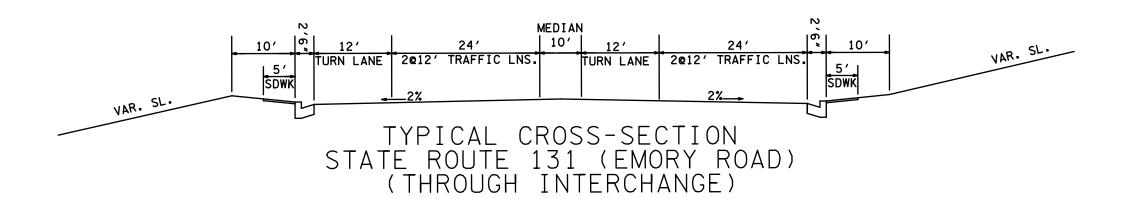
DIVISION ADMINISTRATOR

DATE

	TYPE	YEAR	PROJECT NO.	SHEET NO.
	APR	2002		2
ſ				
Γ				

	18'	12'	36′	16′	36′	0'-12' 12'	_
	DITCH	SHOULDER	3@12' TRAFFIC LANES		<u>0'-12'</u> 3@12' TRAFFIC LANES LANE ADD.	AUX. LANE SHOULDE	ล้
VAR. SL.	6.1	4%	<b></b> 2%	LANE ADD.	2%——	4%	
	6:1		24' EXISTING	40'	24' EXISTING		VAR. SL.
			2012' TRAFFIC LANES	MEDIAN	2012' TRAFFIC LANES		

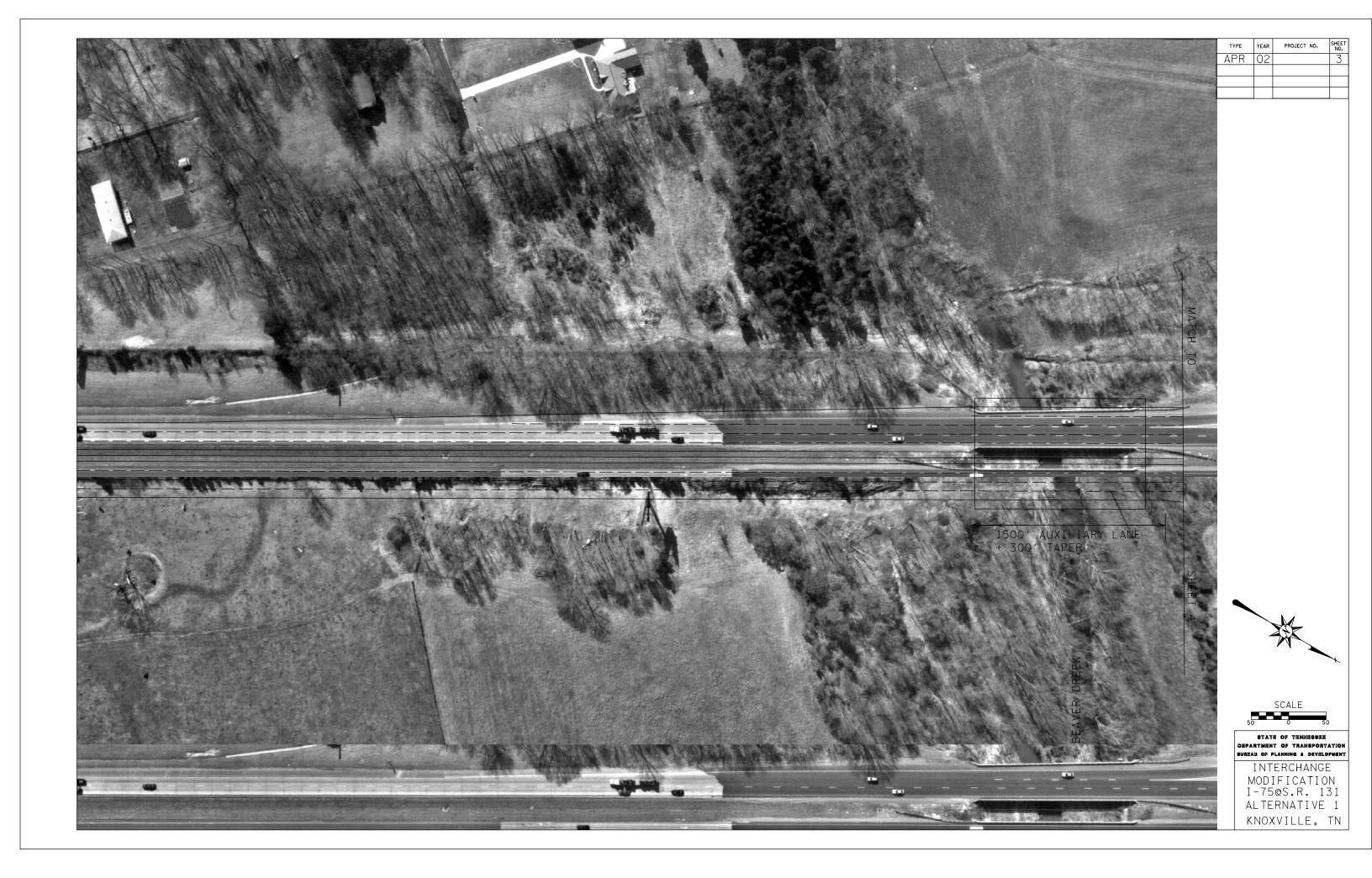
NOTE: FOR LOCATION OF LANE ADDITIONS, AUXILIARY LANES, AND OTHER DETAILS NOT SHOWN, SEE FUNCTIONAL PLANS TYPICAL CROSS-SECTION INTERSTATE ROUTE 75



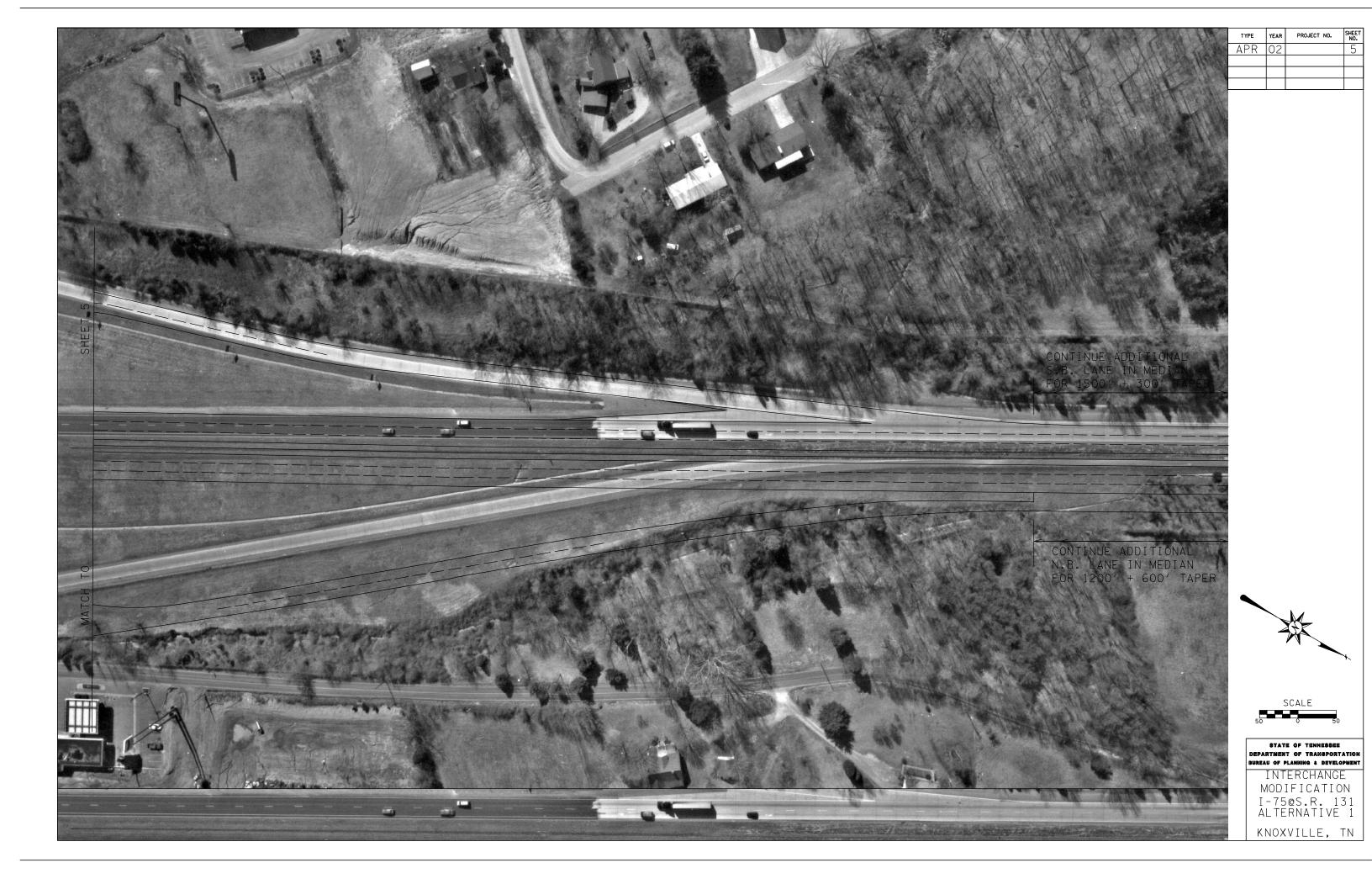
STATE OF TEMMESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

TYPICAL SECTIONS

NOT TO SCALE













SHEET NO.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANKING & DEVELOPMENT

INTERCHANGE
MODIFICATION
I-75es.R. 131
ALTERNATIVE 2
KNOXVILLE, TN



