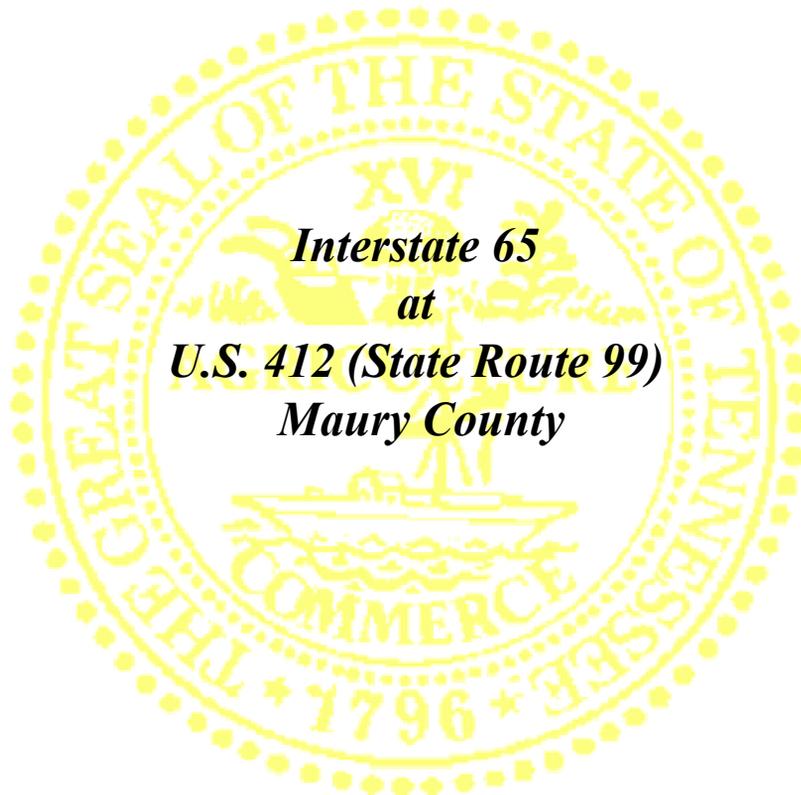


INTERCHANGE MODIFICATION STUDY



***Interstate 65
at
U.S. 412 (State Route 99)
Maury County***

***PREPARED BY
SAIN ASSOCIATES, INC.***

***FOR
THE TENNESSEE DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION***

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Chapter 1

INTRODUCTION

Chapter 1. INTRODUCTION

A. Study Purpose and Scope

The purpose of this study is to provide a detailed evaluation to support a request for modifications to the existing interchange at Interstate 65 and US 412 (State Route 99) in Maury County. The subject interchange is a modified diamond with a loop ramp in the southeast quadrant. US 412 is a two-lane rural minor arterial that provides access to the City of Columbia and the communities of Caney Spring and Chapel Hill.

The proposed modifications include an interim (short-term) improvement and an ultimate improvement. The proposed interim improvement includes the following items:

- addition of a left-turn lane on westbound US 412,
- a traffic signal at the intersection of US 412 and the southbound ramps,
- a shift in the centerline alignment of US 412 to improve sight distance,
- widening of the southbound exit ramp from I-65 to provide a separate right-turn lane,
- lengthening of the northbound and southbound acceleration lanes on I-65 at each entrance ramp, and
- lengthening of the deceleration lane on I-65 at the southbound exit ramp.

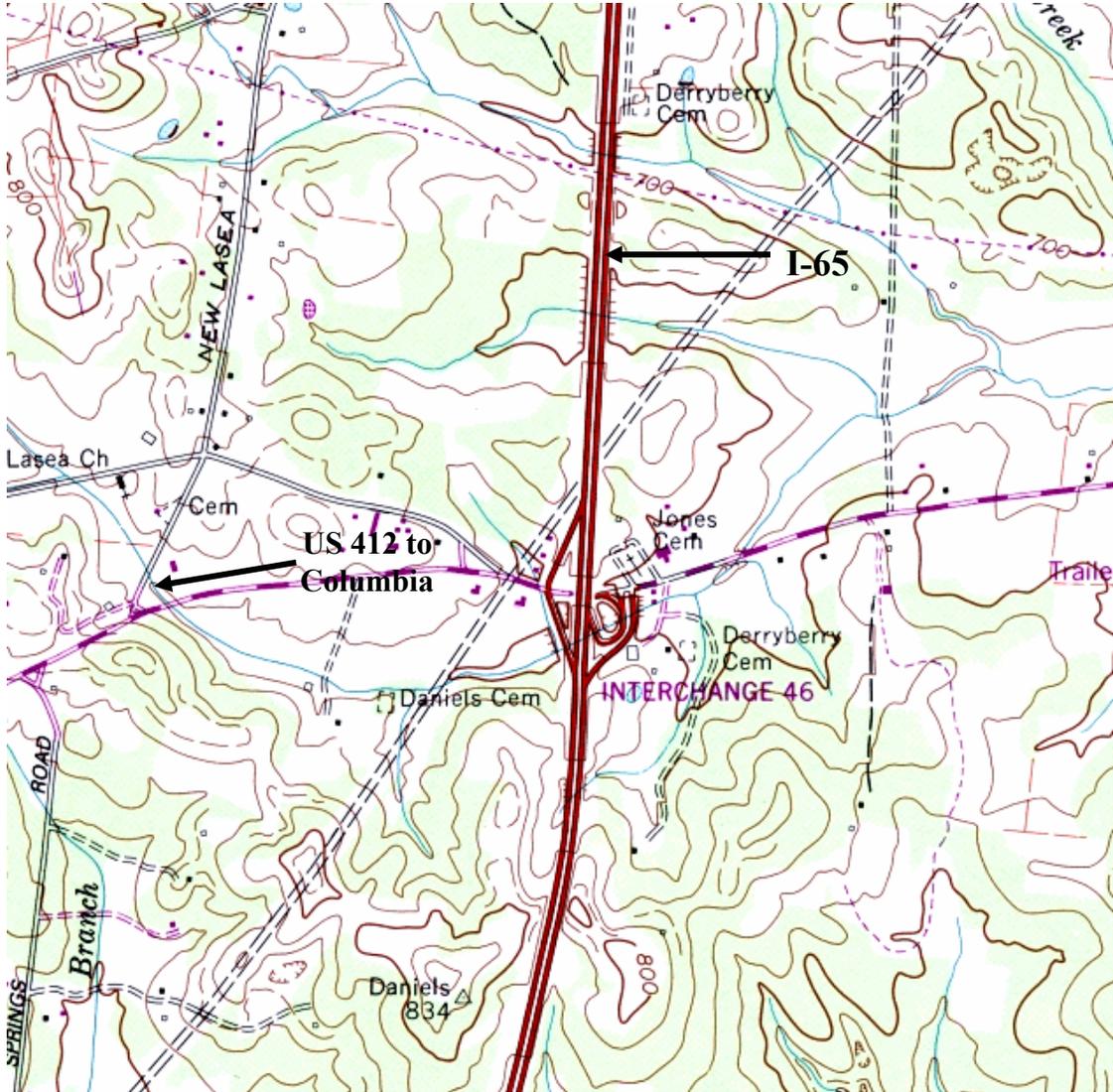
The ultimate improvement plan proposes to improve the geometry of the entrance and exit ramps in the southeast quadrant, widen US 412 to a five-lane cross section through the interchange area, and construct a new westbound to northbound entrance ramp. New interstate bridges will be required to accommodate the ultimate improvement plan.

The factors considered in the modification study for this interchange are traffic operations, right-of-way requirements, construction cost, land use impacts and possible environmental concerns.

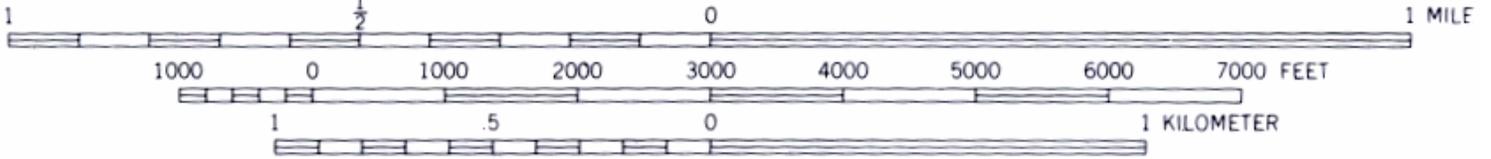
This study was initiated at the request of Representative Bobby Sands based upon operational and safety concerns with regard to sight distance at the ramp terminal intersections and merging onto mainline I-65. A review of the accident history at this interchange revealed higher than average accident rates at both ramp terminal intersections and on mainline I-65. The table below summarizes the calculated rates for the three year period from 1998 through 2000. An explanation of the different rate calculations follows the summary table.

Traffic Accident Rates
1998-2000

Location	Statewide Average	Accident Rates			
		Actual Rate	Critical Rate	Actual/Critical Rate	Severity Index
US 412 @ southbound I-65 ramps	0.17	0.74	0.48	1.54	0.44
US 412 between ramp intersections	0.53	0.36	1.17	0.31	0.33
US 412 @ northbound I-65 ramps	0.17	1.06	0.52	2.04	0.40
I-65 @ US 412 Interchange	0.45	2.77	0.79	3.51	0.33



SCALE 1:24 000



North

PROJECT LOCATION MAP

I-65 at US 412 (State Route 99)
Maury County

Carters Creek, Tennessee (35086-F8-TF-024)

The actual traffic accident rate is determined by dividing the number of accidents that occur at a given location in a specified time period by the amount of vehicular exposure at that location. Exposure is measured in number of vehicle-miles of travel or in number of entering vehicles. Statewide averages for accident rates on comparable roadway segments are provided in the table for comparison. The critical accident rate reflects a statistical control that provides a means of evaluating actual accident rates. If an actual accident rate is higher than the critical accident rate, one can conclude that the accident pattern is most likely not due to chance but to some unfavorable characteristic of the local conditions. The severity index is an expression of the ratio of fatal and injury accidents to the total number of accidents at a given location. The higher the severity index, the more hazardous the location.

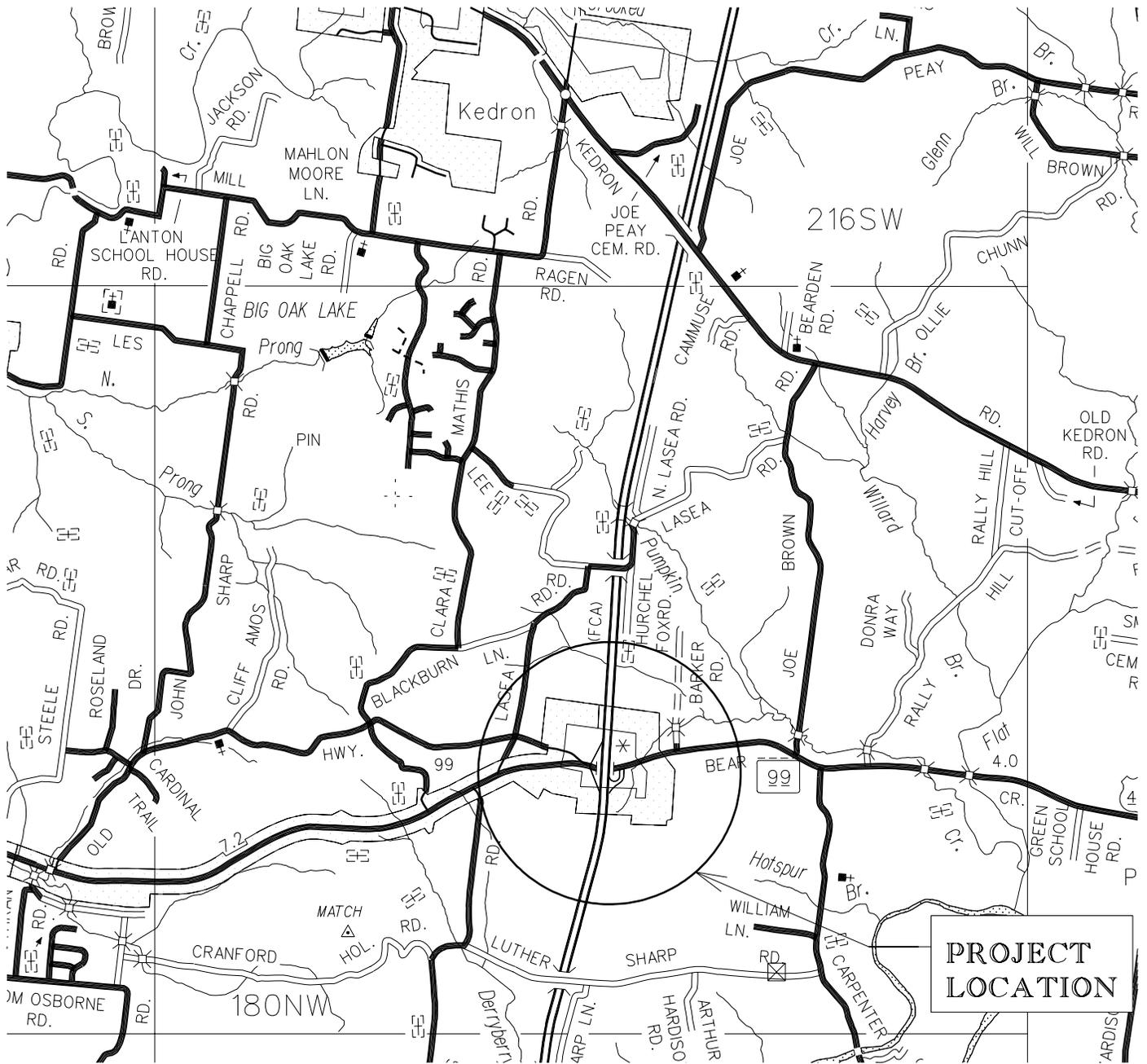
B. Description of the Area

The I-65 and US 412 (SR 99) interchange is located in eastern Maury County within the City Limits of Columbia and approximately ten miles from the central business district. The population in Maury County increased by 26.8% from 1990 to 2000. According to the US Census Bureau, Maury County's population in the year 2000 was 69,498. Similarly, the City of Columbia has experienced a 15.6% increase in population between 1990 and 2000. The year 2000 population within the Columbia City Limits is listed by the Census Bureau as 28,583. As the population in Maury County has grown, land development has spread from the central business district eastward toward the interstate. Within the last few years, there has been an increase in commercial development at the I-65 and US 412 interchange. These new businesses have added to traffic volumes at the interchange and traffic conflicts that are associated with the additional driveways. The heaviest traffic flows at the interchange are from commuter traffic traveling between the west (Columbia) and the north (Nashville).

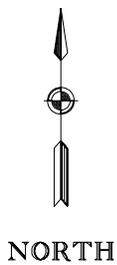
Land uses immediately adjacent to the I-65 and US 412 interchange include gas stations, restaurants, a hotel, a retail store, and a cemetery. The closest interchanges to the north and south on I-65 are located at State Route 396 (Saturn Parkway) which is approximately 6.8 miles to the north, and at State Route 50 which is approximately 8.7 miles to the south.

C. Relationship to Other Highway Improvement Plans and Programs

There are no highway improvements currently planned for I-65 or US 412 in the vicinity of this interchange.



Scale: 1" = 1 Mile



PROJECT AREA MAP
 I-65 at US 412 (State Route 99)
 Maury County

Chapter 2

PRELIMINARY PLANNING DATA

Chapter 2. PRELIMINARY PLANNING DATA

A. Land Use

The existing land use in the study area is primarily commercial and agricultural. There has been increased commercial development immediately adjacent to the interchange in recent years. The commercial land uses include gas stations, restaurants, a hotel, and a retail store. A cemetery is located in the northeast quadrant of the interchange.

B. Traffic Served

Interstate 65 is presently (2003) a four-lane freeway with an anticipated year 2008 average daily traffic volume of 35,720 vehicles north of US 412 with 30% trucks and 28,550 vehicles south of US 412 with 37% trucks. By the design year 2028 these volumes are expected to increase to approximately 58,570 north of US 412 and 45,680 south of US 412. Design hour (2028) traffic on I-65 is expected to reach approximately 5,953 vehicles north of US 412 and 4,664 vehicles south of US 412.

US 412 is a two-lane rural minor arterial roadway with an anticipated year 2008 average daily traffic volume of approximately 10,570 vehicles with 5% being trucks. The average daily traffic volume on US 412 is expected to increase to approximately 19,020 by the design year 2028. Design hour traffic is estimated to be almost 1,902 vehicles by 2028 with 3% trucks.

Present and projected average daily traffic volumes and design hour volumes (DHV) are shown in the Appendix.

Peak direction levels of service on I-65, north of US 412 are "D" / "C" (northbound a.m. / southbound p.m.) for year 2008 design hour volumes and "F" / "F" (northbound a.m. / southbound p.m.) for year 2028 volumes. On I-65 south of US 412, the levels of service for peak direction design hour volumes are "C" / "C" (northbound a.m. / southbound p.m.) for the year 2008 and "D" / "E" (northbound a.m. / southbound p.m.) for 2028. The segment of I-65 north of US 412 is predicted to reach its maximum "D" level of service as a four-lane freeway by the year 2017.

Levels of service at the ramp terminal intersections with US 412 are generally poor with present-day geometry and year 2008 traffic volumes. Specifically, the northbound ramp intersection operates at level of service "D" / "E" (a.m./p.m.) while the southbound ramp intersection operates at a level of service "E" / "F" (a.m./p.m.). Analysis of the ramp terminal intersections with an interim improvement that includes a turn lane on US 412 and signalization at the southbound ramp improves the level of service at the southbound ramp to "D" or better for 2008 design hour volumes. There is no change in level of service at the northbound ramp intersection with interim improvements; however, safety is improved with the added turn lane.

There are deficiencies on the entrance ramps and southbound exit ramp due to inadequate acceleration and deceleration lengths. By improving these acceleration and deceleration lanes with an interim improvement, the 2008 levels of service improve slightly and safety on I-65 at the merge and diverge points will be improved.

The recommended proposed modification to the interchange would add a new entrance ramp to relieve capacity constraints on the existing northbound loop ramp. It would also add capacity to US 412 through provision of two additional through lanes. With the proposed interchange modification, levels of service at the ramp terminal intersections on US 412 improve to “D” or better for all time frames with design year 2028 traffic volumes. Levels of service on the entrance and exit ramps also improve. The only deficient levels of service with the recommended plan are at the northbound entrance ramp during the a.m. peak and at the southbound exit ramps during the p.m. peak. Levels of service at these ramps are constrained by mainline I-65.

Printouts of all capacity analyses and levels of service are included in the Appendix. Summary tables are shown on the following pages.

Capacity Analysis Results with Existing Geometry
Interchange Modification Study
I-65 @ US 412 (State Route 99)

Freeway Segment	2008		2028	
	AM DHV	PM DHV	AM DHV	PM DHV
I-65 Northbound – south of US 412	C	B	D	C
I-65 Northbound – north of US 412	D	B	F ¹	C
I-65 Southbound – north of US 412	B	C	C	F ²
I-65 Southbound – south of US 412	B	C	C	E ³

¹Max volume for LOS “D” is reached by year 2018.

²Max volume by 2017.

³Max volume by 2026.

Ramp Diverge	2008		2028	
	AM DHV	PM DHV	AM DHV	PM DHV
I-65 @ Northbound Exit Ramp	C	B	D	C
I-65 @ Southbound Exit Ramp	B	D	D	F
Ramp Merge				
I-65 @ Northbound Entrance Ramp	C	B	F	C
I-65 @ Southbound Entrance Ramp	B	C	C	D

Ramp Intersection (stop sign control)	Approach & Movement	2008		2028	
		AM DHV	PM DHV	AM DHV	PM DHV
US 412 @ I-65 NB Ramps	Westbound left	B	B	D	C
	Northbound left/right	D	E	F	F
US 412 @ I-65 SB Ramps	Westbound left	B	A	C	B
	Southbound left/right	C	F	F	F

Capacity Analysis Results with Interim Geometry
Interchange Modification Study
I-65 @ US 412 (State Route 99)

Ramp Diverge	2008		2028	
	AM DHV	PM DHV	AM DHV	PM DHV
I-65 @ Northbound Exit Ramp	No changes proposed.			
I-65 @ Southbound Exit Ramp	B	D	C	F
Ramp Merge				
I-65 @ Northbound Entrance Ramp	B	A	F	B
I-65 @ Southbound Entrance Ramp	A	B	B	C

Ramp Intersection (stop sign control)	Approach & Movement	2008		2028	
		AM DHV	PM DHV	AM DHV	PM DHV
US 412 @ I-65 NB Ramps	Westbound left	B	B	D	C
	Northbound left/right	D	E	F	F

Ramp Intersection (signal control)	Approach & Movement	2008		2028	
		AM DHV	PM DHV	AM DHV	PM DHV
US 412 @ I-65 SB Ramps	Eastbound	D	D	F	F
	Westbound	A	A	A	A
	Southbound	C	D	D	F
	Intersection Average	C	C	F	F

Capacity Analysis Results with Recommended Geometry
Interchange Modification Study
I-65 @ US 412 (State Route 99)

Ramp Diverge	2028	
	AM DHV	PM DHV
I-65 @ Northbound Exit Ramp	D	C
I-65 @ Southbound Exit Ramp	C	F*
Ramp Merge		
I-65 @ Northbound Entrance Ramp	F*	A
I-65 @ Southbound Entrance Ramp	B	C

*Ramp fails due to mainline freeway failure.

Ramp Intersection (stop sign control)	Approach & Movement	2028	
		AM DHV	PM DHV
US 412 @ I-65 NB Ramps	Northbound left/right	A	B

Ramp Intersection (signal control)	Approach & Movement	2028	
		AM DHV	PM DHV
US 412 @ I-65 SB Ramps	Eastbound	D	D
	Westbound	A	B
	Southbound	C	D
	Intersection Average	D	C

C. Proposed Improvements

The scope of work for the proposed modification consists of the following:

Interim Improvement

- Item 1: Add a left-turn lane on westbound US 412. This can be accomplished with no modification to the existing interstate bridges. The existing bridges provide 46' between columns, and the existing cross section provides two 12' travel lanes with 10' shoulders and 1' barrier walls. It is proposed to provide two 11' travel lanes, an 11' turn lane, an 8' left shoulder, and a 5' right shoulder. (The varied shoulder widths are necessary due to the proposed centerline shift.)
- Item 2: Install a traffic signal at the intersection of US 412 and the southbound ramps. It should be noted that advance warning of the traffic signal will be needed on the westbound approach since the existing bridge will hide the signal heads from approaching westbound traffic. Since this intersection falls within the city limits of Columbia, the City would be responsible for maintaining the traffic signal equipment.
- Item 3: Shift the centerline alignment of US 412 toward the south to improve sight distance. This shift will allow the stop bar on the southbound ramp to be moved southward, providing a better view of traffic approaching under the bridge.
- Item 4: Widen the southbound exit ramp from I-65 to provide a separate right-turn lane. This auxiliary lane is needed to provide additional capacity for the heavy right turn volume. It is proposed to construct an acceleration lane on westbound US 412 so that traffic from the southbound ramp can flow freely onto US 412.
- Item 5: Lengthen the northbound and southbound acceleration lanes on I-65 at each entrance ramp to comply with current American Association of State Highway and Transportation Officials (AASHTO) standards. Acceleration distances were calculated to account for existing grades on I-65.
- Item 6: Lengthen the deceleration lane on I-65 at the southbound exit ramp to comply with current AASHTO standards.

Recommended Improvement

- Item 1: Improve the geometry of the entrance and exit ramps in the southeast quadrant. The loop ramp is maintained at a 25-mile per hour design speed. The curvature of the northbound exit ramp is proposed to be modified to be consistent with a 30-mile per hour design speed.

- Item 2: Widen US 412 to a five-lane cross section through the interchange area. The two additional travel lanes will address capacity needs of US 412 through the design year (2028) and beyond.
- Item 3: Construct a new westbound to northbound entrance ramp to alleviate capacity deficiencies on the existing loop ramp. It is proposed to construct parallel acceleration lanes for the loop ramp and new ramp and to also construct a barrier wall that would prevent merging with I-65 mainline traffic until a safe merging speed is attained by ramp traffic. A retaining wall is proposed for the new westbound to northbound ramp in order to minimize impacts to Jones cemetery. Minor modification to the cemetery circulation road is recommended to remove its western intersection with US 412 and provide a one-way loop connector to the remaining eastern driveway on US 412.
- Item 4: Construct new interstate bridges to accommodate the ultimate improvement plan. New bridges will be required to accommodate the wider (5-lane) cross section on US 412. The new northbound I-65 bridge will be wider to accommodate the added barrier wall that will separate the loop ramp from mainline traffic. Stage construction is proposed for the bridges.

D. Discussion of Alternatives

Several alternatives were considered in the evaluation of this interchange. The first alternative is to make no changes to the interchange. The existing interchange geometry is deficient in terms of intersection sight distance and acceleration / deceleration lanes. With no improvements, the ramp terminal intersections will exceed capacity by the year 2008 and the higher than average accident rates will continue. Increasing delays at this interchange will result in increased vehicle emissions, on-going safety concerns, and costs from lost productivity.

The second alternative would be to construct only the interim improvement plan. As shown in the capacity analysis, the interim plan will address short term capacity needs through the year 2008. It will also address the most significant safety concerns: sight distance from the southbound ramp intersection, length of acceleration / deceleration lanes, and protected storage for left-turning traffic on US 412. However, the interim plan does not address long-term capacity demands. If only the interim plan is implemented, traffic volumes on the loop ramp in the southeast quadrant will exceed capacity and similar capacity constraints will occur on US 412.

Two minor alternatives to the recommended plans were considered. These alternatives and the reasons they were discounted are summarized as follows:

- Consideration was given to increasing the design speed for the loop ramp from a 25 to a 30-mile per hour design speed. Such a change would significantly increase the radius of the loop, resulting in significant cost and property impacts.

- With the interim plan, an alternative was evaluated that included retrofitting the existing interstate bridge with a retaining wall on the north side to make a closed abutment and presumably increase sight distance. This alternative was rejected in favor of the recommended centerline shift due to cost / benefit concerns.

As mentioned previously in this report, mainline Interstate 65, north of US 412, is expected to drop below a level of service “D” by the year 2017. Consideration should be given by TDOT to develop plans for widening Interstate 65 to a six-lane freeway in the vicinity of US 412.

E. Environmental Concerns

The recommended interchange modification has been designed to minimize impacts to environmentally sensitive areas associated with the gas stations located in the southwest and southeast quadrants. A retaining wall is proposed to be constructed with the new westbound to northbound entrance ramp in order to minimize impacts to the cemetery. Environmental technical studies will be completed at a later date.

CHAPTER 3

ENGINEERING INVESTIGATION

Chapter 3. ENGINEERING INVESTIGATIONS

A. Traffic Operations

Analyses were made to determine what impacts the proposed modifications to the existing interchange would have on the interstate system. The traffic operation analyses contained in the appendices include basic freeway segments, ramp analyses, and intersection analyses.

According to the analyses, I-65 north of US 412 will reach maximum capacity for level of service "D" at about the year 2017. There are deficiencies on the entrance ramps and southbound exit ramp due to inadequate acceleration and deceleration lengths. Levels of service at the ramp terminal intersections with US 412 are generally poor with present-day geometry and year 2008 traffic volumes. Traffic accident rates were calculated for the ramp intersections and merge / diverge points using accident records from 1998 through 2000. In the case of each ramp intersection and along mainline I-65 the accident rates at this interchange are higher than statewide averages.

The proposed modifications to the interchange will improve overall operations and will provide acceptable levels of service during the peak hours through the year 2028 with only two exceptions on the northbound entrance and southbound exit ramp. Levels of service at the ramp terminal intersections will be improved to "D" or better for both a.m. and p.m. design hour (2028) volumes. All ramps are expected to operate at acceptable ("D" or better) levels through the design year except for the northbound entrance ramp during the a.m. peak hour and the southbound exit ramp during the p.m. peak hour. These ramps are expected to reach capacity around the year 2017 when the mainline freeway drops below level of service "D".

The proposed interim and recommended improvement plans are expected to improve the safety of the I-65 and US 412 interchange, thereby reducing traffic accident rates.

B. Access Analysis

This study was undertaken in accordance with the Federal Highway Administration's (FHWA) policy regarding requests for additional or revised access points to the Interstate System. The FHWA policy is described in the Federal Register Notice, Volume 63, No. 28, dated February 11, 1998. This analysis was conducted to demonstrate the impacts of revisions to the studied interchange. The FHWA requirements are provided in bold type with the response to those requirements immediately following.

The FHWA policy statement reads: "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. It is demonstrated that 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.**

US 412 is a rural minor arterial that provides the most direct access to the City of Columbia from I-65. Adjacent interchanges are approximately 7 and 9 miles away in the north and south directions, respectively. Increases in population in Maury County and the City of Columbia have resulted in higher traffic volumes routed through the US 412 interchange. The capacity deficiencies projected for the west-to-north and north-to-west traffic movements cannot be accommodated by local roads or other interchanges. Projected traffic volumes at the existing US 412 and I-65 interchange cannot be accommodated by the current configuration.

- 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.**

The proposed interchange modification is necessary to improve access to the area, provide congestion relief to the surface system it serves, and improve safety through geometric improvements. Safety problems related to the existing interchange cannot be addressed through transportation demand management (TDM) strategies. There is no mass transit service in the area of the interchange and there are no current plans to extend HOV facilities into Maury County.

- 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,**

particularly in urbanized areas include an analysis of sections of interstate to and including at least the first adjacent existing 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 new or revised access points.

An operational analysis of current and future traffic was made for sections of the interstate and all ramps and ramp termini within the limits of the interchange area. The existing adjacent interchanges in relation to the location of the subject interchange are outside the influence of weaving. The subject interchange at US 412 is approximately 7 miles south of the State Route 396 interchange and approximately 9 miles north of the State Route 50 interchange. Considering these observations and the results of the capacity analysis, no adverse impacts are expected from the proposed modification.

- 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.**

This proposal is a modification to the existing interchange at I-65 and US 412 (State Route 99). A diamond-type design that maintains the existing loop ramp in the southeast quadrant will provide for all traffic movements. The proposed interchange design will meet all American Association of State Highway and Transportation Officials (AASHTO) criteria.

- 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 95.**

The study was coordinated with the appropriate state and local officials and is consistent with the land use and transportation plans for Maury County.

- 6. In areas where the potential exists for future multiple interchange additions, all requests for 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.**

Multiple interchange additions are not foreseen for the project study area.

- 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 modifications to the I-65 and US 412 interchange are to improve access to the corridor, reduce congestion, and improve safety at the interchange. The improvement request was not generated by new or expanded development, rather by concerns over traffic safety and efficiency.

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

This report documents the expected benefits from modifying the existing US 412 and I-65 interchange. With the proposed modification, traffic operations at the interchange can be adequately accommodated through the year 2028 with only two exceptions. Design hour traffic on I-65 north of the interchange will perform at level of service "D" until approximately 2017. After 2017, the northbound portion of I-65 and its associated entrance ramp at US 412 will be deficient during the morning peak hour and the southbound portion of I-65 and its exit ramp to US 412 will be deficient during the afternoon peak hour. The recommended improvement has been designed to minimize impacts to environmentally sensitive areas. Detailed environmental technical studies will be conducted at a later date.

C. Cost

The total estimated project cost for the interim plan is \$1,310,000. This estimate includes costs to construct a left-turn lane on US 412, install a traffic signal, widen the southbound exit ramp, and lengthen the acceleration lanes and the southbound deceleration lane on I-65. An estimated cost breakdown for the interim plan follows:

Clear and Grubbing	\$	5,000
Earthwork	\$	10,000
Pavement Removal	\$	20,000
Drainage (includes Erosion Control).....	\$	65,000
Structures	\$	0
Railroad Crossing.....	\$	0
Paving	\$	655,000
Retaining Walls	\$	0
Maintenance of Traffic.....	\$	50,000
Topsoil.....	\$	15,000
Seeding	\$	10,000
Sodding	\$	0
Signing	\$	5,000
Signalization	\$	50,000
Fence	\$	0
Guardrail	\$	0
Rip Rap or Slope Protection	\$	0
Other Construction Items (8.5%).....	\$	80,000
Mobilization	\$	45,000
Sub-Total Construction Cost.....	\$	1,010,000
Engineering & Contingencies (10%).....	\$	105,000
Total Construction Cost	\$	1,115,000
Preliminary Engineering	\$	105,000
Total Engineering and Construction.....	\$	1,220,000
Right-Of-Way		
Land, Improvements, and Damages (0 acres).....	\$	0
Incidentals (0 tracts)	\$	0
Relocation Payments (0 Residences)	\$	0
(0 Businesses)		
(0 Non-Profits)		
Total Right-Of-Way Cost	\$	0
Utility Relocation		
Non-Reimbursable (Local).....	\$	90,000
Reimbursable (State).....	\$	0
Total Utility Cost	\$	90,000
TOTAL PROJECT COST	\$	1,310,000

CHAPTER 4

SUMMARY AND CONCLUSIONS

Chapter 4. SUMMARY AND CONCLUSIONS

The preceding study was conducted to evaluate the current operation of the existing Interstate 65 and US 412 (State Route 99) interchange and the effects of the proposed modification. The analyses revealed that the existing interchange with base condition (2008) traffic is operating with poor level of service (“E” and “F”) at the ramp terminal intersections during peak hours. There are deficiencies on the entrance ramps and southbound exit ramp due to inadequate acceleration and deceleration lengths. Traffic accident rates at each ramp intersection and along mainline I-65 are higher than statewide averages.

With the proposed modifications to the interchange we can substantially improve levels of service to “D” or better through the year 2028 with the only exceptions occurring on the northbound entrance and southbound exit ramp. These ramps are expected to reach capacity around the year 2017 when the mainline freeway drops below level of service “D”. The recommended improvements will reduce congestion on US 412, lower travel time and emissions, and improve safety for motorists. With the proposed modification, the service life of the interchange can be extended to at least the year 2017 and safety can be improved for the traveling public.

Interchange Modification Study for I-65 @ US 412 (SR 99)

APPENDIX

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

(REV. 2/7/02)

PROJECT NO.: _____ ROUTE: I-65 @ S.R. 99 & S.R. 50
 COUNTY: MAURY CITY: COLUMBIA
 PROJECT DESCRIPTION: INTERCHANGE MODIFICATION @ [1] I-65 & S.R. 99 AND [2] I-65 & S.R. 50.

DIVISION REQUESTING:

MAINTENANCE SPECIAL DESIGN
 PLANNING STRUCTURES
 PROG. DEVELOPMENT & ADM. SURVEY & DESIGN
 PUBLIC TRANS. & AERO. OTHER _____
 YEAR PROJECT PROGRAMMED FOR CONSTRUCTION: _____
 PROJECTED LETTING DATE: _____

TRAFFIC ASSIGNMENT:

BASE YEAR	DESIGN YEAR						DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS	
	ADT	YEAR	ADT	DHV	%	YEAR	DIR.DIST.	DHV	ADT	FLEX
[1] 10,570	2008	19,020	1,902	10	2028	55-45	3	5		
[2] 10,010	2008	16,030	1,924	12	2028	60-40	4	6		

REQUESTED BY: NAME MATT ASHBY DATE 12/9/02
 DIVISION PLANNING
 ADDRESS 900 J. K. POLK BUILDING
NASHVILLE TN. 37243

REVIEWED BY: TONY ARMSTRONG *Tony Armstrong* DATE 12-17-02
 TRANSPORTATION MANAGER 1
 SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: STEVE ALLEN *Steve Allen* DATE 12-17-02
 TRANSPORTATION MANAGER 2
 SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

FIND ENCLOSED 4-8 HOUR [NOV. 2002] TURNING MOVEMENT COUNTS DONE BY SAIN ASSOCIATES FOR YOUR USE IN DEVELOPING TRAFFIC DATA.

[1] S.R. 99 TRAFFIC DATA.

[2] S.R. 50 TRAFFIC DATA.

THIS TRAFFIC BASED ON 2002 CYCLE COUNTS AND THE TURNING MOVEMENTS FURNISHED WITH THIS REQUEST. THE FUTURE TRAFFIC IS BASED ON GROWTH TRENDS FROM THE ADAM COMPUTER PROGRAM.

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 ADT.

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

COST ESTIMATE WORKSHEETS

COST ESTIMATE

PROJECT NUMBER	SECTION #	ALT. NAME	SECTION LENGTH (FT)
01-184-6	Interim		1710
(Columbia, TN)			

CLEARING & GRUBBING

COST (\$)

TOTAL (\$)	=	5000	
ROUNDED TOTAL (\$)	=		\$5,000

EARTHWORK

TOTAL (\$)	=	10000	
ROUNDED TOTAL (\$)	=		\$10,000

PAVEMENT REMOVAL

Length (ft)	=	1710	
# of lanes	=	2	
Cost / l.f.	=	5.00	
TOTAL (\$)	=	17100	
ROUNDED TOTAL (\$)	=		\$20,000

DRAINAGE

Shoulder & ditch	<u>length (ft)</u>	<u>cost / l.f. (\$)</u>	<u>total (\$)</u>
Paved ditches	599	15	8978

Cross Drains	<u>pipe size</u>	<u>length (ft)</u>	<u>cost / l.f. (\$)</u>	<u>total (\$)</u>
	18	150	30	4500
	24	150	35	5250
	42	75	50	<u>3750</u>
				13500

Headwalls	<u>number</u>	<u>cost / ea. (\$)</u>	<u>total (\$)</u>
	5	500	2500

Sidedrains (price includes 24" pipe and headwalls)	<u>number</u>	<u>cost / ea. (\$)</u>	<u>total (\$)</u>
Driveways	1	2000	2000
Side roads		2500	<u>0</u>
			2000

TOTAL	26978	
ROUNDED TOTAL		\$30,000

STRUCTURES (N/A)

Description:	<u>length (ft)</u>	<u>width (ft)</u>	<u>cost / s.f. (\$)</u>	<u>total (\$)</u>
			65.00	<u>0</u>
TOTAL (\$)	=			0

ROUNDED TOTAL (\$)	=		\$0
--------------------	---	--	------------

PAVING

DESCRIPTION:	<u>Length (ft)</u>	<u>Cost / l.f. (\$)</u>	<u>Total (\$)</u>	
3-Lane w/ Shoulders	1710	115	196650	
1-Lane Ramps	5450	79	430550	
2-Lane Ramps	250	105	26250	
TOTAL (\$) =			653450	
ROUNDED TOTAL (\$) =				\$655,000

RETAINING WALLS (N/A)

Length (ft) =	0			
Height (ft) =	0			
Cost / s.f. (\$) =	35.00			
TOTAL (\$) =	0			
ROUNDED TOTAL (\$) =				\$0

MAINT. OF TRAFFIC

Length (ft) =	5045			
Cost / mile (\$) =	50000			
TOTAL (\$) =	47775			
ROUNDED TOTAL (\$) =				\$50,000

TOPSOIL

Length (ft.) =	5045			
Width (ft.) =	36			
Depth (ft.) =	0.5			
Volume (cu. yd.) =	3363			
Cost / cu. yd =	3.00			
TOTAL (\$) =	10090			
ROUNDED TOTAL (\$) =				\$15,000

SEEDING

1/2 TOPSOIL	5045			
ROUNDED TOTAL (\$) =				\$10,000

SODDING (N/A)

Length (ft.) =	0			
Width (ft.) =	0			
Area (sq. yd.) =	0			
Cost / sq. yd =	3.00			
TOTAL (\$) =	0			
ROUNDED TOTAL (\$) =				\$0

SIGNING

Length (ft) =	5045			
Cost / mile (\$) =	2000			
TOTAL (\$) =	1911			
ROUNDED TOTAL (\$) =				\$5,000

SIGNALIZATION

DESCRIPTION:	<u>number</u>	<u>Cost / ea. (\$)</u>	<u>Total (\$)</u>	
T-Intersection	1	50000	50000	
TOTAL (\$) =			50000	
ROUNDED TOTAL (\$) =				\$50,000

C.A. FENCE (N/A)

Length (ft)	=	0	
Cost / ft. (\$)	=	4.00	
TOTAL (\$)	=	0	
ROUNDED TOTAL (\$)	=		\$0

GUARDRAIL (N/A)

Length (ft)	=	0	
Cost / l.f. (\$)	=	12.00	
Subtotal	=	0	
End Treatments (#)	=	0	
Cost (each) (\$)	=	2000	
Subtotal	=	0	
TOTAL (\$)	=	0	
ROUNDED TOTAL (\$)	=		\$0

RIP-RAP (N/A)

TOTAL (\$)	=	0	
ROUNDED TOTAL (\$)	=		\$0

SUBTOTAL	=	\$850,000	
OTHER CONST. ITEMS (8.5%)	=	\$76,075	\$80,000
MOBILIZATION (5.0% of total contract amount)	=	\$42,500	\$45,000
EROSION CONTROL (3.5% of Construction Cost Excluding Structures)	=	\$34,125	\$35,000
SUBTOTAL CONST. COST	=		\$1,010,000
10% ENG. & CONT.	=	101000	\$105,000

TOTAL CONST. COST	=	\$1,115,000
PRELIMINARY ENG. (10%)	=	\$105,000
R.O.W. ACQUISITION COST	=	\$0
REIMBURSABLE UTILITY COST	=	\$0
NON-REIMBURSABLE UTILITY COST	=	\$90,000
TOTAL SECTION COST	=	\$1,310,000

Improvement, Land, and Damage Figures

Land:	<u>Acres</u>	<u>Cost/Acre</u>	<u>Total Cost</u>	<u>Rounded Total</u>
	0	6500	0	\$0

Damages:			<u>Total Cost</u>	<u>Rounded Total</u>
			0	\$0

Subtotal \$0

Moving Cost Expenses

<u>Description</u>	<u>Number</u>	<u>Cost/Ea.</u>	<u>Total Cost</u>	<u>Rounded Total</u>
Business	0	20000	0	\$0
Residence	0	22500	0	\$0
Trailer	0	3000	0	\$0

Replacement Housing Cost

<u>Description</u>	<u>Number</u>	<u>Cost/Ea.</u>	<u>Total Cost</u>	<u>Rounded Total</u>
Owner Occupant	0	10000	0	\$0

Incidental Expenses per Tract

	<u>Number</u>	<u>Cost/Ea.</u>	<u>Total Cost</u>	<u>Rounded Total</u>
	0	2500	0	\$0

Contingencies, including condemnation and time adjustment

\$190,000 X 0.43 = 0
 Rounded for Estimate \$0

Total R.O.W. Estimate = **\$0**

SA# 01-184-6

INTERIM PLAN

NON-REIMBURSABLE UTILITY RELOCATION COST

ELECTRIC

<u>DESCRIPTION</u>	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
THREE-PHASE LINE	7	2800.00	19600
TWO-PHASE LINE	6	1700.00	10200
SUBTOTAL			29800

TELEPHONE

<u>DESCRIPTION</u>	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
OWN POLE	0	1200.00	0
JOINT USE POLE	7	700.00	4900
SUBTOTAL			4900

WATER

<u>DESCRIPTION</u>	<u>LENGTH (FT.)</u>	<u>COST/L.F.</u>	<u>COST</u>
6" PVC	1700	12.00	20400
	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
6" VALVE & BOX	2	460.00	920
SUBTOTAL			21320

NATURAL GAS

<u>DESCRIPTION</u>	<u>LENGTH (FT.)</u>	<u>COST/L.F.</u>	<u>COST</u>
2" PVC	640	7.00	4480
30" TRANSMISSION LINE	0	900.00	0
36" TRANSMISSION LINE	0	1200.00	0
	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
GAS VALVES	2	600.00	1200
SUBTOTAL			5680

SANITARY SEWER

<u>DESCRIPTION</u>	<u>LENGTH (FT.)</u>	<u>COST/L.F.</u>	<u>COST</u>
10" PVC	700	39.00	27300
	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
MANHOLES	0	1200.00	0
SUBTOTAL			27300

TOTAL

ROUNDED TOTAL			89000
			\$90,000

<u>ACRES</u>	<u>PRICE</u>	<u>PRICE PER ACRE</u>	<u>DESCRIPTION</u>
79.15	1009163	12750	COMM RURAL
1.00	35500	35500	COMM RURAL
3.45	172500	50000	COMM RURAL
1.39	57546	41400	COMM RURAL
17.70	79650	4500	AGRI SM
		144150	

AVG. PRICE PER ACRE 28830

ROUNDED PRICE / ACRE \$30,000

COST ESTIMATE

PROJECT NUMBER	SECTION #	ALT. NAME	SECTION LENGTH (FT)
01-184-6	Ultimate		3335
(Columbia, TN)			

CLEARING & GRUBBING

COST (\$)

TOTAL (\$)	=	15000	
ROUNDED TOTAL (\$)	=		\$15,000

EARTHWORK

SR-99		Cubic Ft.	Cubic Yards	Cost / c.y. (\$)	Total
	Cut	213440	7905	1.75	13834.07
	Fill	20010	741	4.00	2964.444
RAMPS	Cut	36000	1333	1.75	2333.333
	Fill	673000	24926	4.00	99703.7

TOTAL (\$)	=		118836	
ROUNDED TOTAL (\$)	=			\$120,000

PAVEMENT REMOVAL

Length (ft)	=	850
# of lanes	=	1
Length (ft)	=	3335
# of lanes	=	2
Cost / l.f.	=	5.00
TOTAL (\$)	=	37600
ROUNDED TOTAL (\$)	=	

\$40,000

DRAINAGE

Closed System

Storm Sewer Pipe	<u>pipe size</u>	<u>length (ft)</u>	<u>cost / l.f. (\$)</u>	<u>total (\$)</u>
	18	1668	30	50040
	24	1167	35	40845
	30	500	40	20000

Inlets	<u>number</u>	<u>cost / ea. (\$)</u>	<u>total (\$)</u>
	18	2000	36000

Cross Drains	<u>pipe size</u>	<u>length (ft)</u>	<u>cost / l.f. (\$)</u>	<u>total (\$)</u>
	18	200	30	6000
	24	150	35	5250
	42	200	50	<u>10000</u>
				21250

Subtotal 168135

Other Drainage 16814

TOTAL 184949

ROUNDED TOTAL **\$185,000**

STRUCTURES

Description:	<u>length (ft)</u>	<u>width (ft)</u>	<u>cost / s.f. (\$)</u>	<u>total (\$)</u>
Bridge over SR-99	170	44	65.00	486200
Bridge over SR-99	170	68	65.00	<u>751400</u>
TOTAL (\$)	=			1237600

ROUNDED TOTAL (\$) = **\$1,240,000**

PAVING

DESCRIPTION:	<u>Length (ft)</u>	<u>Cost / l.f. (\$)</u>	<u>Total (\$)</u>
5-Lane C&G w/ Shoulders	3335	215	717025
1-Lane Ramps	11465	79	905735
2-Lane Ramps	250	105	26250
TOTAL (\$) =			1649010
ROUNDED TOTAL (\$) =			\$1,650,000

RETAINING WALLS

Length (ft)	=	800	
Height (ft)	=	15	
Cost / s.f. (\$)	=	35.00	
TOTAL (\$) =		420000	
ROUNDED TOTAL (\$) =			\$420,000

BARRIER WALL

Length (ft)	=	2200	
Cost / ft. (\$)	=	160	
TOTAL (\$) =		352000	
ROUNDED TOTAL (\$) =			\$355,000

MAINT. OF TRAFFIC

Length (ft)	=	11875	
Cost / mile (\$)	=	100000	
TOTAL (\$) =		224905	
ROUNDED TOTAL (\$) =			\$225,000

TOPSOIL

Length (ft.)	=	11875	
Width (ft.)	=	20	
Depth (ft.)	=	0.5	
Volume (cu. yd.)	=	4398	
Cost / cu. yd	=	3.00	
TOTAL (\$) =		13194	
ROUNDED TOTAL (\$) =			\$15,000

SEEDING

TOTAL (\$) =		6597	
ROUNDED TOTAL (\$) =			\$10,000

SODDING

Length (ft.)	=	3335	
Width (ft.)	=	20	
Area (sq. yd.)	=	7411	
Cost / sq. yd	=	3.00	
TOTAL (\$) =		22233	
ROUNDED TOTAL (\$) =			\$25,000

SIGNING

Length (ft)	=	11875	
Cost / mile (\$)	=	7000	
TOTAL (\$) =		15743	
ROUNDED TOTAL (\$) =			\$20,000

SIGNALIZATION

DESCRIPTION:	<u>number</u>	<u>Cost / ea. (\$)</u>	<u>Total (\$)</u>
T-Intersection	1	50000	50000
TOTAL (\$) =			50000
ROUNDED TOTAL (\$) =			\$50,000

C.A. FENCE

<i>Length (ft)</i>	=	610	
<i>Cost / ft. (\$)</i>	=	4.00	
TOTAL (\$)	=	2440	
ROUNDED TOTAL (\$)	=		\$5,000

GUARDRAIL

<i>Length (ft)</i>	=	1125	
<i>Cost / l.f. (\$)</i>	=	12.00	
Subtotal	=	13500	
<i>End Treatments (#)</i>	=	7	
<i>Cost (each) (\$)</i>	=	2000	
Subtotal	=	14000	
TOTAL (\$)	=	27500	
ROUNDED TOTAL (\$)	=		\$30,000

RIP-RAP (N/A)

TOTAL (\$)	=	0	
ROUNDED TOTAL (\$)	=		\$0

SUBTOTAL	=	\$4,405,000	
OTHER CONST. ITEMS (8.5%)	=	\$391,850	\$395,000
MOBILIZATION (\$50,000 plus 4.5% of total contract amount exceeding \$1,000,000)	=	\$203,225	\$205,000
EROSION CONTROL (3.5% of Construction Cost Excluding Structures)	=	\$131,775	\$135,000
SUBTOTAL CONST. COST	=		\$5,140,000
10% ENG. & CONT.	=	514000	\$515,000

TOTAL CONST. COST	=	\$5,655,000
PRELIMINARY ENG. (10%)	=	\$515,000
R.O.W. ACQUISITION COST	=	\$225,000
REIMBURSABLE UTILITY COST	=	\$0
NON-REIMBURSABLE UTILITY COST	=	\$560,000
TOTAL SECTION COST	=	\$6,955,000

SA# 01-184-6

ULTIMATE PLAN

NON-REIMBURSABLE UTILITY RELOCATION COST

ELECTRIC

<u>DESCRIPTION</u>	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
THREE-PHASE LINE	7	2800.00	19600
TWO-PHASE LINE	6	1700.00	10200
SUBTOTAL			29800

TELEPHONE

<u>DESCRIPTION</u>	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
OWN POLE	0	1200.00	0
JOINT USE POLE	7	700.00	4900
SUBTOTAL			4900

WATER

<u>DESCRIPTION</u>	<u>LENGTH (FT.)</u>	<u>COST/L.F.</u>	<u>COST</u>
6" PVC	2900	12.00	34800
	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
6" VALVE & BOX	2	460.00	920
SUBTOTAL			35720

NATURAL GAS

<u>DESCRIPTION</u>	<u>LENGTH (FT.)</u>	<u>COST/L.F.</u>	<u>COST</u>
2" PVC	1240	7.00	8680
30" TRANSMISSION LINE	300	900.00	270000
36" TRANSMISSION LINE	150	1200.00	180000
	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
GAS VALVES	2	600.00	1200
SUBTOTAL			459880

SANITARY SEWER

<u>DESCRIPTION</u>	<u>LENGTH (FT.)</u>	<u>COST/L.F.</u>	<u>COST</u>
10" PVC	700	39.00	27300
	<u>NUMBER</u>	<u>COST/EA.</u>	<u>COST</u>
MANHOLES	0	1200.00	0
SUBTOTAL			27300

TOTAL

ROUNDED TOTAL 557600
\$560,000

Index Of Sheets

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2-2A	TYPICAL SECTIONS
3-5	LAYOUT SHEETS (INTERIM)
3A-5A	LAYOUT SHEETS (ULTIMATE)

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION PLANNING DIVISION

MAURY COUNTY

INTERCHANGE MODIFICATION STUDY
 INTERSTATE 65 @ US-412 (SR-99),
 MAURY COUNTY

STATE HIGHWAY NO. 99 F.A.H.S. NO.

TENN.	YEAR 2003	SHEET NO. 1
FED. AID PROJ. NO.		
STATE PROJ. NO.		



SPECIAL NOTES

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

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

TDOT ROAD SP. SV. 2 _____

DESIGNER SAIN ASSOCIATES, INC CHECKED BY _____

P.E. NO. _____

SCALE: 1" = 1 MILE

TRAFFIC DATA	
ADT (2008)	10,570
ADT (2028)	19,020
DHV (2028)	1,902
D	55 - 45
T (ADT)	5%
T (DHV)	3%
V (INTERIM)	50 MPH
V (ULTIMATE)	50 MPH

APPROVED: _____
 DIRECTOR, DESIGN DIVISION

DATE: _____

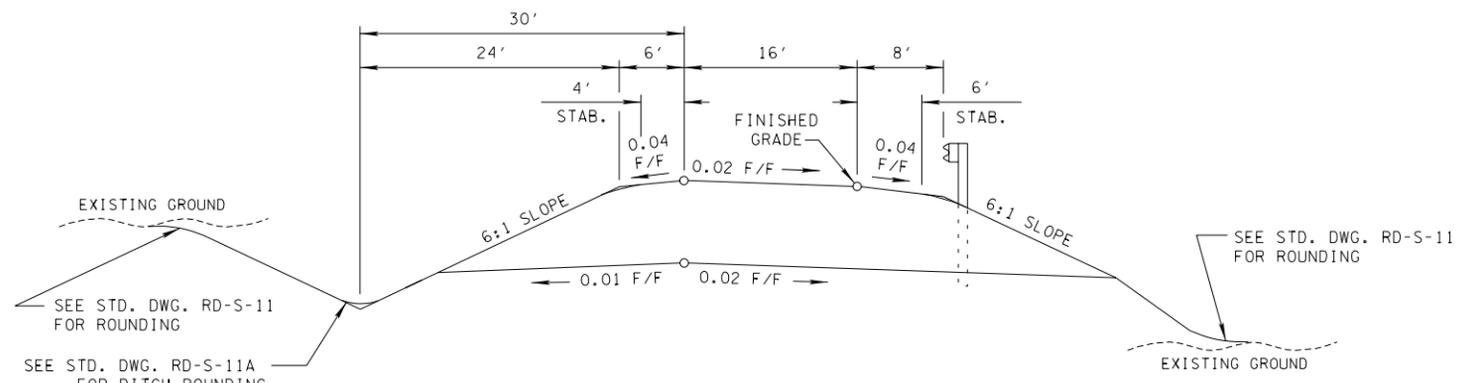
APPROVED: _____
 COMMISSIONER

U.S. DEPARTMENT OF TRANSPORTATION
 FEDERAL HIGHWAY ADMINISTRATION

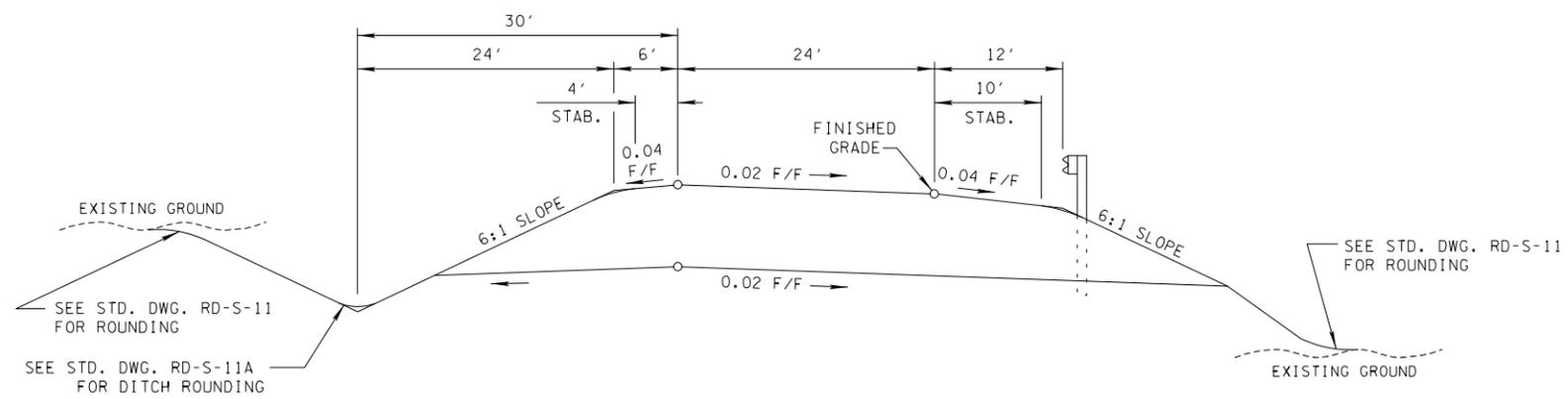
APPROVED: _____
 DIVISION ADMINISTRATOR DATE



TYPE	YEAR	PROJECT NO.	SHEET NO.
APR	2003		2



TYPICAL SECTION
 (BASED ON STD. DWG. RD-TS-4)

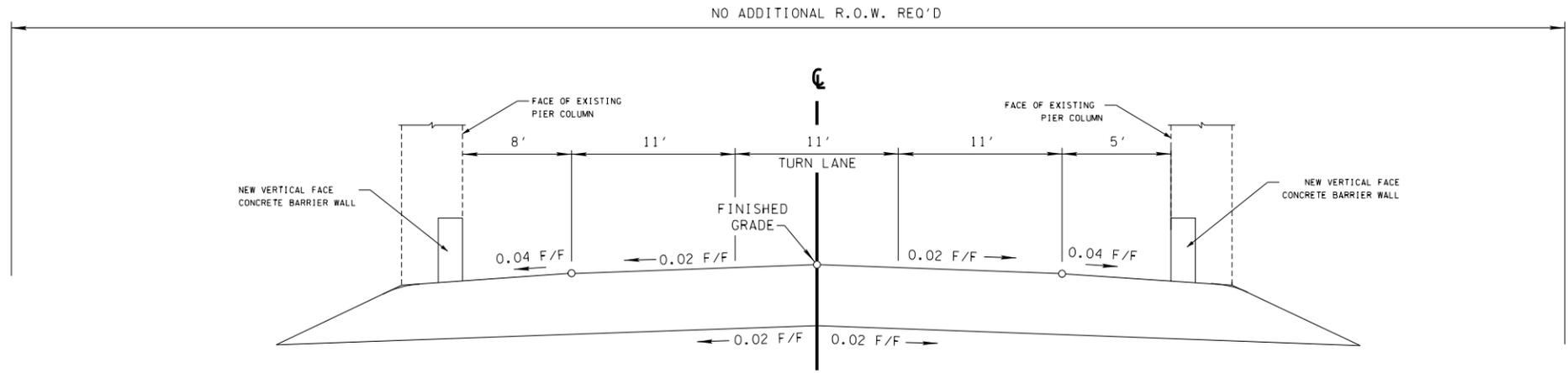


TYPICAL SECTION
 (BASED ON STD. DWG. RD-TS-4)

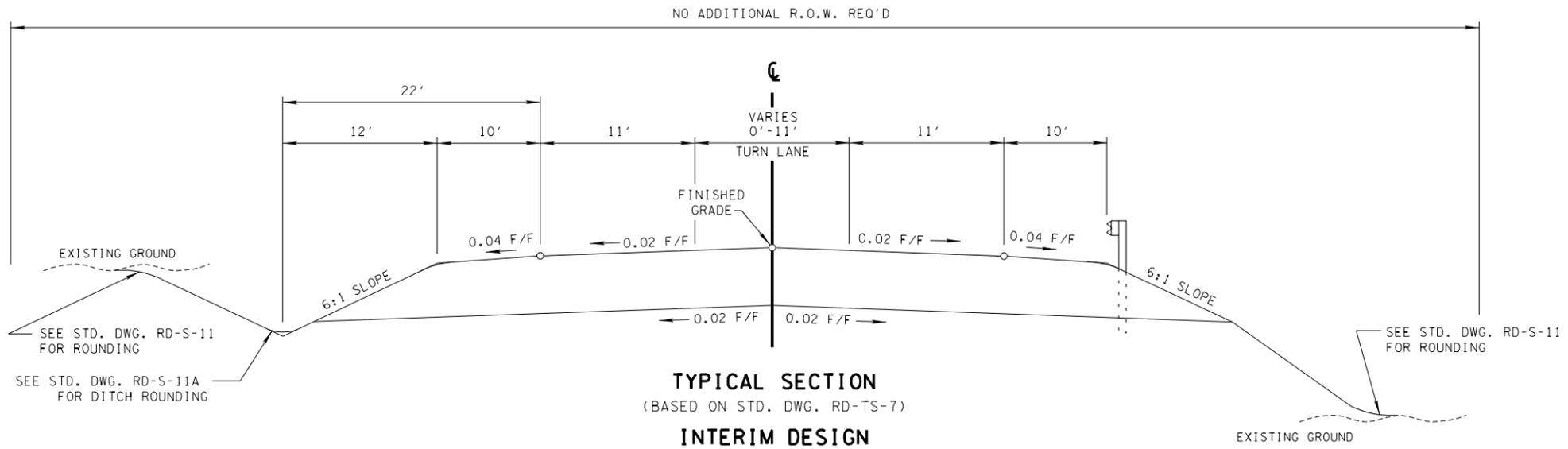
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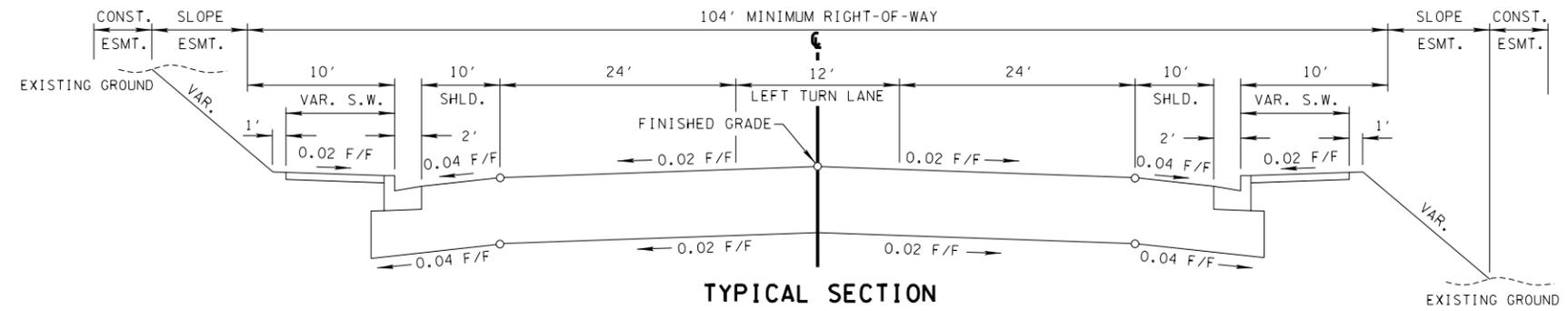
TYPE	YEAR	PROJECT NO.	SHEET NO.
APR	2003		2A



TYPICAL SECTION
 (BASED ON STD. DWG. RD-TS-7)
UNDERNEATH I-65 (INTERIM)



TYPICAL SECTION
 (BASED ON STD. DWG. RD-TS-7)
INTERIM DESIGN



TYPICAL SECTION
 (BASED ON STD. DWG. RD-TS-6)
ULTIMATE DESIGN

\$\$\$\$SYTIME\$\$\$\$
 \$\$\$DGN\$PEC\$



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

TYPE	YEAR	PROJECT NO.	SHEET NO.
APR	2003		3



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STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PLANNING & DEVELOPMENT

MAURY COUNTY
U.S. 412/I65
PROPOSED LAYOUT
INTERIM PLAN

SCALE: 1"=100'

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
APR	2003		3A



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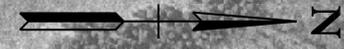


STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PLANNING & DEVELOPMENT

MAURY COUNTY
 U.S. 412/I65
 PROPOSED LAYOUT
 RECOMMENDED PLAN

SCALE: 1"=100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
APR	2003		4



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PLANNING & DEVELOPMENT

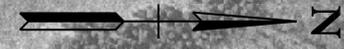
MAURY COUNTY
U.S. 412/I65
PROPOSED LAYOUT
INTERIM PLAN

SCALE: 1"=100'

\$\$\$\$SYTIME\$\$\$\$
 \$\$\$SDONSPEC\$\$\$



TYPE	YEAR	PROJECT NO.	SHEET NO.
	APR 2003		4A



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PLANNING & DEVELOPMENT

MAURY COUNTY
 U.S. 412/I65
 PROPOSED LAYOUT
 RECOMMENDED PLAN

SCALE: 1"=100'

\$\$\$\$SYTIME\$\$\$\$
 \$\$\$SDONSPEC\$\$\$



TRANSITION TO EXISTING SECTION APPROXIMATELY 585' FROM THIS LOCATION

TRANSITION TO EXISTING SECTION APPROXIMATELY 620' FROM THIS LOCATION

SEE SHEET NO. 3A

SEE SHEET NO. 5A

MATCH LINE

MATCH LINE

I-65

I-65

U.S. 412

U.S. 412

OLD HWY 99

HALIFAX DRIVE

HAMPTON INN

EXXON

WAFFLE HOUSE

EXISTING 24" CMP

EXISTING 42" RCP

EXISTING 51" X 31" ARCHED CULVERT

EXISTING 18" RCP

EXISTING 8' X 10' RCBC

EXISTING 24" RCP

EXISTING 24" RCP

EXISTING 18" RCP

PROP. BARRIER WALL

PROP. BRIDGES

EXISTING 18" CMP

EXISTING 18" CMP

EXISTING 18" CMP

BARN

JONES CEMETERY

EXISTING 8' X 10' RCBC

EXISTING 36" RCP

CHEVRON

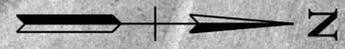
TRAIL WEST

RES.

UST

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
APR	2003		5



SEE SHEET NO. 4
 SR 99
 MATCH LINE

PRESENT R.O.W.

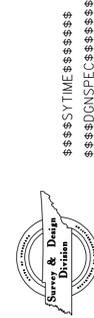
PRESENT R.O.W.



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PLANNING & DEVELOPMENT

MAURY COUNTY
 U.S. 412/I65
 PROPOSED LAYOUT
 INTERIM PLAN

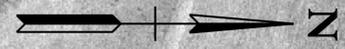
SCALE: 1"=100'



\$\$\$\$SYTIME\$\$\$\$
 \$\$\$DDONSPEC\$\$\$

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
APR	2003		5A



\$\$\$\$SYTIME\$\$\$\$
 \$\$\$DDONSPEC\$\$\$\$



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PLANNING & DEVELOPMENT

MAURY COUNTY
 U.S. 412/I65
 PROPOSED LAYOUT
 RECOMMENDED PLAN

SCALE: 1"=100'

