

**US 411 Connector  
Project EDS-500(5)  
Bartow County  
P.I. NO. 661950**

**TECHNICAL MEMORANDUM**

DATE: September 11, 2008  
TO: EDS-500(5) Project File  
FROM: GDOT, with revisions by FHWA  
SUBJECT: Alternative D-VE Evaluation

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**1. Summary of Project Changes**

As a result of a recent Value Engineering study and ongoing design evaluations, there are several modifications that are being proposed in order to reduce the overall cost of the US 411 Connector project. These evaluations have reduced potential project cost estimates from approximately \$399 million for the original preferred alternative (later reduced to approx. \$341 million after further design, using more refined quantities and unit prices) to less than \$200 million for the modified preferred alternative. The following list represents the modifications determined to be feasible from an engineering perspective while not causing an additional adverse environmental impact; they have therefore been recommended for implementation:

- Reduce median width from 68-feet to 44-feet
- Reduce right-of-way (ROW) from 400-feet to 250-feet
- Use folded diamond interchange rather than full diamond interchange at SR 61
- Related reductions in bridges, retaining walls, drainage systems, paving, erosion control, traffic control, signing/ marking/signals, guardrail, and miscellaneous items
- Use a split diamond connection of US 411 to I-75, which retains a diamond ramp to SR 20 from the south
- More compact interchange at US 41
- Raise design profile, allow 7% grade to accommodate mountainous terrain
- Terminate Clifton Way south of US 411, and connect it to US 411 on north side with an at-grade intersection for gated access to the cell tower

Although some of the project details, including the interchange type and configurations and other construction and engineering details as identified above are being incorporated into the preferred alternative, the alignment of the proposed roadway has not changed from what was presented in the Final Supplemental Environmental Impact Statement (FSEIS). The modified Preferred Alternative is being referred to as *Alternative D-VE* (see **Figure 1: Alternative D-VE Location Map**).

## **2. Preferred Alternative Modifications**

### **Description of Original Preferred Alternative**

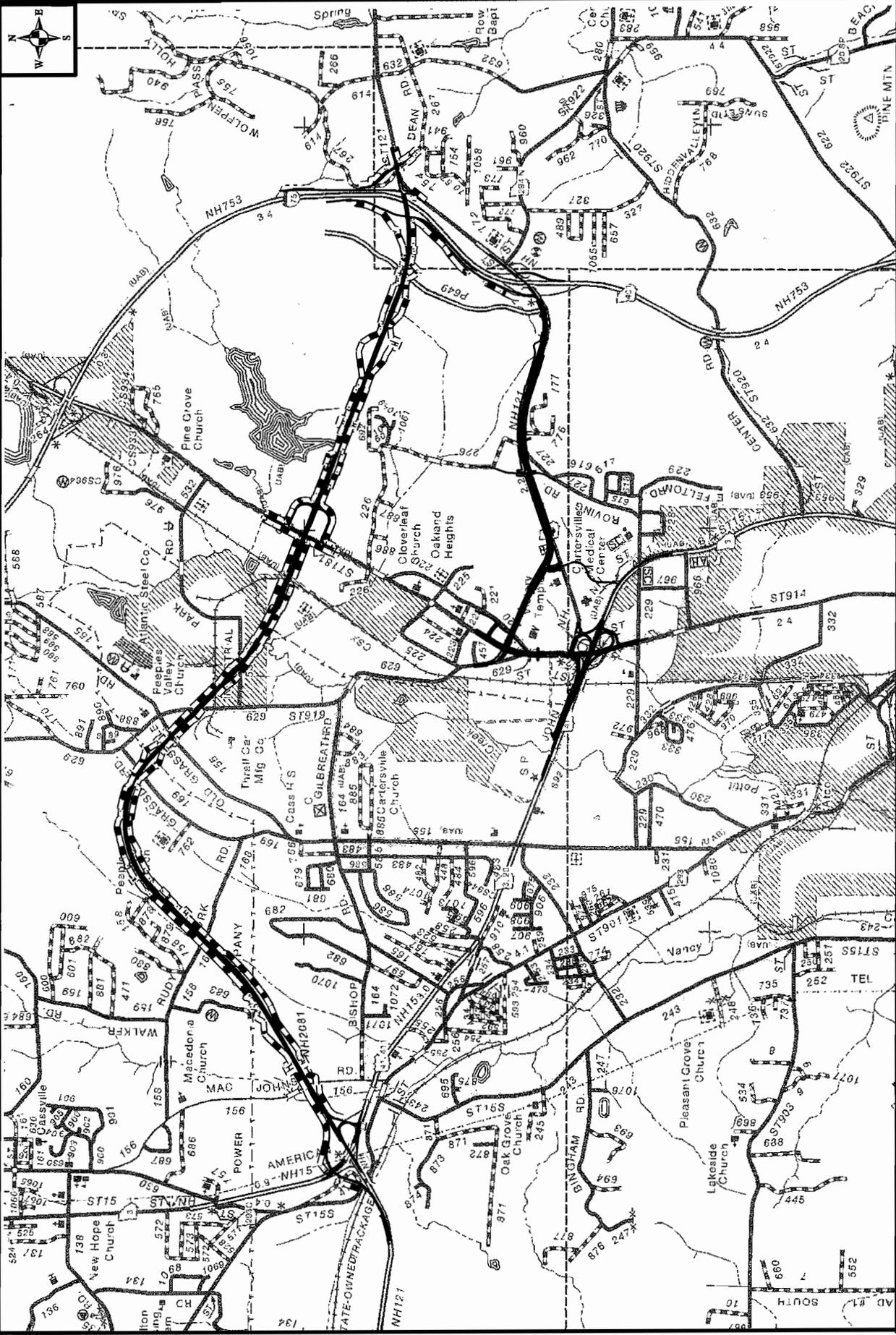
As described in the FSEIS, the Alternative D-Avoidance/Minimization Variation was identified as the Preferred Alternative. This alternative was determined to meet the need and purpose of the proposed project while having the least overall amount of environmental impacts compared to the other alternatives considered. The Preferred Alternative is the only alternative that does not require the use of property from a NRHP eligible historic resource (and hence has no Section 4(f) involvement).

### **Value Engineering**

Over the past several months, GDOT has been continuing with preliminary design work and more refined construction cost estimates of the preferred alternative. Currently GDOT follows a policy that requires all projects with a cost of \$25 million or more (including both ROW and construction) to go through a value engineering process. Because it was estimated during the FSEIS process that the preferred alternative would cost approximately \$399 million (later reduced to approx. \$341 million after further design, using more refined quantities and unit prices), a Value Engineering (VE) study was completed on the US 411 Connector project. The results of the study recommended a series of modifications to the project in order to reduce the overall right-of-way and construction costs while still meeting the project's intended need and purpose. The project modifications suggested by the VE study and combined with other related modifications from the preliminary design process are defined in **Tables 1 and 2**. Each of these proposed modifications have been evaluated by GDOT to determine the feasibility of implementing the modifications, especially from an operational and environmental perspective.

### **Description of Modified Preferred Alternative**

As a result of the VE study and ongoing design efforts in order to reduce the overall cost of the US 411 Connector project, several changes noted in the table have been recommended. The alignment of the proposed roadway has not changed from what was presented in the FSEIS; however, some of the project details, including the interchange type and configurations and other construction and engineering details, are being incorporated into the preferred alternative, which is now being referred to as *Alternative D-VE*.



-  Right of Way
  -  Proposed Pavement
  -  Future State Route 20
- 0 0.25 0.5 1 Miles

# Alternative D-VE



**U.S. 411 Connector**  
 Bartow County  
 EDS-500(6) - P.I. 661950



STATE OF GEORGIA  
 JOHNSON  
 BUILDING

**Table 1 - Value Engineering (VE) and Related Design Recommendations**

Potential Project Modification	Environmental Impact Change	Traffic Operations Change	Approx. Cost Savings Identified by VE Team
Terminate Clifton Way south of US 411, and connect it to US 411 on north side with at grade intersection	No Effect	Minor effect	\$3.3 million
Reduce right-of-way from 400-feet to 250-feet	Reduced impacts due to smaller construction footprint	No effect	\$1.1 million
Raise design profile, allow 7% grade to accommodate mountainous terrain; use 55 mph mainline design speed, 45 mph ramp design speed	No Effect	Reduced travel speed	\$10.0 million
Reduce median width from 68-feet to 44-feet	Reduced impacts due to smaller construction footprint	No effect	\$5.1 million
Use folded diamond interchange rather than full diamond interchange at SR 61	Reduced impacts due to smaller construction footprint	Negligible effect	\$4.0 million
More compact interchange at US 41	Reduced impacts due to smaller construction footprint	Negligible effect	\$11.6 million
Use a split diamond connection of US 411 to I-75, which retains diamond ramps to SR 20 to and from the south	Reduced impacts due to smaller construction footprint <sup>1</sup>	Reduced travel speed	\$41.4 million
<b>Other Related Modifications</b>			
Related reductions in bridges, retaining walls, drainage systems, paving, erosion control, traffic control, signing/ marking/signals, guardrail, and misc items; also includes reductions in ROW needed	Reduced impacts due to smaller construction footprint	No effect	\$83.4 million
<b>Final Cost Comparison</b>			
Alternative D - Avoidance and Minimization (estimate)			\$341 million
Alternative D - VE (estimate)			\$181 million
Approximate Cost Savings			\$160 million

<sup>1</sup> The smaller project footprint would minimize all impacts except for one impaired stream, which was previously relocated as a result of the original construction of I-75.

**Table 2- Value Engineering (VE) Recommendations Not Implemented**

Potential Project Modification	Environmental Impact Change	Traffic Operations Change	Potential Cost Savings Identified by VE Team
Eliminate interchange with SR 61 and replace with at grade intersections	No effect	Reduced travel speed	\$4.1 million
Construct only half of US 411 between SR 61 and US 41	Reduced impacts due to smaller construction footprint	Major adverse effect	\$28.5 million
Terminate Old Grassdale Road on each side of US 411	No effect	Minor effect to local traffic	\$1.1 million
Modify bridges over roads and railroads to use more fill, which reduces bridge deck area	No effect	No effect	\$4.3 million
Eliminate part of Noise Wall No. 1	Increased noise impacts	No effect	\$1.2 million
Use a split diamond connection of US 411 to I-75, which includes free flow access from I-75 NB	Negligible effect	Negligible effect	\$10.2 million

### **Ability of Alternative D-VE to Meet the Project's Need and Purpose**

As stated in the first paragraph of the Executive Summary of the FSEIS, “the purpose of the proposed US 411 Connector is to improve the connection of the US 411/SR 20 corridor to the interstate system by providing a more direct link between US 411 at its interchange with US 41/SR 3 west of Cartersville, and I-75”. The majority of traffic travelling between US 411 and I-75 is currently required to utilize US 41, SR 61, and SR 20. These existing roadways are unable to adequately accommodate the existing traffic demand. This congestion is expected to increase significantly as traffic volumes continue to grow each year. A new roadway connection between US 411 to the west and I-75 to the east is essential to reduce existing congestion, accommodate expected traffic growth, and improve mobility and connectivity in this rapidly growing area of metropolitan Atlanta.

The US 411 Connector, under either the original concept alternative or the new Alternative D-VE, both meet the purpose and need of this project by providing a more direct link between US 411 to the west and I-75 to the east. The original alternate was expected to attract 32,900 vehicles per day (vpd) and Alternative D-VE would attract 24,400 vpd away from the existing roadway network. This is due to the approximately 1-1/2 minute increase in travel time to traverse the corridor. Although Alternative D-VE would attract less daily vehicles than the original alternative, 24,400 vehicles constitutes a substantial number of daily trips that would no longer need to utilize the overburdened existing roadways, and this traffic volume still warrants a four-lane roadway to accommodate traffic. Alternative D-VE would still provide an improved and more direct connection between US 411 to the west and I-75 to the east. Without this additional connection, US 41, SR 61, and SR 20 are expected to experience LOS F conditions in the design year. Under both the original alternative as well as Alternative D-VE, these roadways are expected to experience LOS D or better conditions in the design year.

The D-VE alternative has been designed to meet AASHTO standards. The US 411/I-75 Interchange Traffic Analysis Summary included in Appendix C shows that the interchange will operate at an acceptable level of service in the design year of 2034. Figures 6 and 7 show the Level of Service at each segment of the interchange. A discussion is provided regarding the low level of service on the ramps north of 411 due to the capacity constraints on I-75 and not the interchange design.

The I-75 interchange configuration differences associated with the original concept alternative and Alternative D-VE do not affect this project's ability to improve traffic conditions in the corridor. Alternative D-VE provides the same connectivity on essentially the same alignment and provides similar relief to the existing roadway network. For these reasons, the current proposed design does not represent a significant change from the design concept and scope of the project originally presented in the FSEIS.

### **CAC**

To date there have been six meetings of the CAC, each of which was associated with key project milestones. The meetings were designed to address issues and foster consensus among GDOT,

the consultant team, and the community. A brief synopsis of the main topics discussed at the most recent (sixth) meeting are described below.

The purpose of CAC Meeting #6 (January 29, 2008) was to present the outcome of the Value Engineering Study and discuss the possible changes that were being considered to reduce the overall costs of constructing the D-Avoidance/Minimization Alternative. Nine of the 27-member CAC were in attendance. Some of the comments and concerns expressed at the meeting include the following:

- It was questioned whether the steeper grades would require the trucks to downshift. It was noted that the grades are not steep enough to affect trucks.
- There was a concern regarding safety of the existing truck access onto the US 411 Connector from the Shaw plant immediately west of the project beginning at US 41. It was noted that GDOT had met with Shaw and that they were planning to relocate their access point with a new driveway to enter from the adjacent side street.
- Representatives from Bartow County and the school system both voiced opposition to closing off Old Grassdale Road.
- CAC member questioned how long it would take to construct the project. It was estimated that construction would take from 3 ½ to 4 years.
- A discussion on the cost/benefit analysis of Alternative D-VE questioned whether the northern concepts would be cheaper to build. It was noted that the new alignment concepts had cost estimates in a similar price range. It was questioned whether a benefit of only a "1" as identified for the Preferred Alternative (as reported in the FSEIS) warranted spending over 300 million dollars. It was explained that the cost/benefit analysis was a ratio used by GDOT to help evaluate projects especially during the current funding shortfall. The analysis of Alternative D-VE actually identified a greater benefit than Alternative D Avoidance/Minimization. Refer to **Appendix A** for a copy of GDOT's standard Benefit Cost Analysis Worksheet template.

Summary meeting minutes for each of the CAC meetings - including the most recent Meeting #6 - are on file at GDOT.

### **Agency Meetings**

On February 7, 2008 the project team, including representatives from GDOT and FHWA, met with USFWS, EPA, and the USACE to update the agencies on the proposed reduction in project scope and to report on the corresponding reductions in overall project impacts. A synopsis of the issues discussed at this interagency meeting is described as follows:

- EPA questioned when and what triggered a VE study. GDOT noted that all projects with combined ROW and construction costs exceeding \$25 million were required to undergo a VE study. It was noted that VE studies have typically been completed late in the plan development process because more detailed plans are typically required to complete meaningful VE. This has been moving up in the process especially in light of tighter project funding. FHWA noted that DOT's are typically constrained when they do the VE so as not to prejudice the decision as to a preferred alternative.
- USFWS noted that FWCA coordination for longitudinal stream impacts would need to be updated to reflect the anticipated impacts, which could be done via letter correspondence.
- It was noted that the project limits would be minimized on SR 61 and on US 41 to the extent that the project would not cross the streams where Cherokee darter habitat has been identified. The FSEIS noted that the existing culverts would be replaced with bottomless culverts or a bridge at these two crossings. It was noted that these existing culverts would be left in place since the project has since been minimized in these areas to avoid impacts to streams at these locations. USFWS agreed that the replacement of these culverts would not be necessary; however, he noted that the BO would need to be updated to reflect that the benefit to the watershed would be different than initially proposed.
- It was noted that a Technical Memo was presently being prepared to identify the changes and associated environmental impacts for the new Preferred Alternative (Alternative D-VE). EPA questioned what would trigger a supplemental to the EIS as compared to the presentation of the changes in the ROD. FHWA noted the fact that the alignment has not changed and that environmental impacts are similar or less than previously reported, in most cases, that a supplemental FSEIS was not warranted. However, a Technical Memorandum would be prepared to document the project changes and associated changes in environmental impacts. Therefore, FHWA is proposing to issue a ROD based upon the updated analysis. Several of the interagency members requested a copy of the approved Technical Memorandum when it becomes available.

Copies of all agency meeting minutes are on file at GDOT.

### **Public Information Open Houses (PIOH) and Public Hearing Open House (PHOH)**

A total of four (4) PIOH's and one (1) PHOH have been held to date. For each public open house, input was solicited through comment forms and a court reporter, and attendees were given an opportunity to mail in comments. Additionally, attendees and other stakeholders could submit comments by calling the project hotline voice mail.

The fourth PIOH (February 12, 2008) was held to present the results of the Value Engineering study, which has recommended several project changes aimed at reducing the overall project cost. Three-hundred-sixteen people attended the fourth PIOH, and 54 provided written or oral comments. The main concerns noted from the PIOH include the following:

- The project is taking too long.
- Concerned that GDOT is not listening to the public.
- Concerned about noise impacts.
- Concerned about impacts to the environment.
- Concerned about impacts to personal property.
- Concerned about changes to SR 20 access at I-75.
- Prefer the direct connection between US 411 and I-75 rather than using a portion of existing SR 20.
- Project cost is too high and doesn't provide adequate value to the public.
- Opposition to the proposed cul-de-sacs on Old Grassdale Road.
- Opposition to the proposed cul-de-sac and restricted access on Clifton Way.
- Concerned that the proposed changes creates a project that would no longer meet the need and purpose.

**Table 3** provides a brief summary of the comments received as a result of all open houses held for this project.

**Table 3- Disposition of Comments Received at Open Houses**

PIOH	No. Opposed	No. In Support	Uncommitted	Conditional
#1	16(18 %*)	48 (56%*)	11 (13 %*)	10 (12 %*)
#2	7(14.5 %*)	33 (67.5%*)	1 (2 %*)	8 (16 %*)
#3	29 (21.6%*)	75 (56.0%*)	6 (4.5 %*)	24 (17.9%*)
PHOH	19 (20.9%*)	41 (45.1 %*)	16 (17.5 %*)	15 (16.5 %*)
#4	10 (18.8 %*)	25 (47.1 %*)	8 (15.0 %*)	10 (18.8%*)

Copies of open house handouts, all comments received and the GDOT response letters are on file at GDOT.

### 3. Evaluation of Environmental Impacts

As described above Alternative D-VE follows the same alignment as the D-Avoidance Minimization Alternative as presented in the FSEIS. Alternative D-VE would be constructed with a 44-foot median as compared to a 68-foot median, within a 250-foot right-of-way as compared to a 400-foot right-of-way. The project team has evaluated the proposed modifications that define Alternative D-VE, and in most cases, the impacts to the environment are actually less than what was reported for Alternative D-Avoidance Minimization. Other modifications include the more compact interchange configurations at US 41, SR 61, and at I-75. This condensed footprint reduces direct impacts to environmental resource areas. For example, the more compact interchanges have reduced the limits of transition required to connect to the existing roadway network, which has eliminated impacts to both streams and wetlands that would no longer be crossed or filled. In addition, the narrower roadway section would require a smaller area of fill to cross existing streams and wetlands, which effectively reduces the overall impact to these protected environmental resources.

## **Jurisdictional Waters**

Through the concept development and EIS process, efforts have been made to avoid and minimize impacts to jurisdictional waters. Because of the linear nature of the project, it is not possible to totally avoid jurisdictional impacts. Impacts have been greatly minimized within the proposed corridor by bridging the majority of the streams. Because many of the wetland systems are associated with these drainages, impacts to wetlands have also been reduced by the bridging. Under the D Avoidance and Minimization Alternative, approximately 4.71 acres of wetlands, and 916<sup>1</sup> linear feet of streams would have been impacted; under the D-VE Alternative (which includes a 44-foot median as compared to a 68-foot median, a 250-foot right-of-way as compared to a 400-foot right-of-way, and more compact interchange configurations at US 41, SR 61, and at I-75), there are less wetland areas and streams that would be impacted. As mentioned previously, the compact interchanges have reduced the limits of transition required to connect to the existing roadway network, which has eliminated impacts to both streams and wetlands that would no longer be crossed or filled. In addition, the narrower mainline roadway section would require a smaller area of fill to cross existing streams and wetlands, which reduces the overall impact to wetlands.

Under the D-VE Alternative, approximately 1.47 acres of wetlands, and 701 linear feet of streams would be impacted. Refer to **Tables 4 and 5** for a summary of the stream and wetland impacts for the D-VE Alternative as compared to the impacts identified for the D Avoidance and Minimization Alternative. There were no new streams or wetlands identified within the limits of the D-VE Alternative. Please refer to the project Ecology Assessment or the FSEIS to review the detailed descriptions of the jurisdictional waters located within the project area.

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<sup>1</sup> The initial ecology assessment incorrectly identified a portion of Stream 25 as a perennial stream. Approximately 300 feet of stream 25 is a concrete roadside drainage ditch that is no longer included as an impact to streams. In addition, it has been determined that the remainder of Stream 25 is an intermittent stream rather than a perennial stream as previously identified.

**Table 4**  
**Detailed Summary of Wetland Impacts (in Acres) for the Alternative D-Avoidance/Minimization Compared to Alternative (D-VE)**

Jurisdictional Area	Acre Impact	
	D-Avoid/Min.	D-VE
W/L 1	0	0
W/L 3	0	0
W/L 4	0	0
W/L 4A	0.07	0
W/L 5	0.33	0
W/L 7	0	0
Pond 10	0.08	0.08
Pond 11	0.3	0.3
Pond 12	0.09	0.08
W/L 13	0	0
W/L 15	0	0
W/L 18	0.01	0
W/L 19	1.33	0.25
Pond 23	0.76	0.76
Pond 24	0.01	0
W/L 26	1.59	0
W/L 27	0.09	0
W/L 30	0.05	0
	<b>4.71 ac</b>	<b>1.47 ac</b>

**Table 5**  
**Detailed Summary of Stream Impacts (in Linear Feet) for the Alternative D-Avoidance/Minimization Compared to Alternative (D-VE)**

Jurisdictional Area Classification	Linear Feet Impact	
	D-Avoid/Min.	D-VE
Stream 2	0	0
Stream 4B	0	0
Stream 6	0	0
Stream 8	0	0
Stream 9	0	0
Stream 14	0	0
Stream 16	0	0
Stream 17	0	0
Stream 20	425	251
Stream 21	0	0
Stream 22	0	0
Stream 25	*466	450
Stream 28	0	0
Stream 28A	0	0
Stream 29	0	0
Stream 31	0	0
<b>TOTAL IMPACTS</b>	<b>*916 lf</b>	<b>701 lf</b>

\*Reflects updated stream evaluation modifying the description of an existing concrete drainage channel that was incorrectly classified as a stream. Higher impact numbers for streams were reported at the latest CAC, PIOH, and agency briefing because field evaluations to verify the modified interchange footprint were not completed until after these meetings.

**Mitigation of Unavoidable Impacts**

Because the potential impacts would require a permit from the USACE, the March 2004 Standard Operating Procedure for Compensatory Mitigation has been reviewed to determine potential required mitigation credits for the proposed project. Impacts to Waters of the U.S. were calculated to comply with all updated regulations including the Etowah Habitat Conservation Plan (HCP). The Etowah HCP is more stringent in regards to acceptable culvert design requirements than the updated Section 404 permit regulations. Mitigation credits were also updated according to the new Compensatory Mitigation Rule. This assessment determined that 8.1 wetland and 3,084.4 stream mitigation credits would be required for the project. Refer to **Tables 6 through 9** for more detailed information.

**Table 6  
Jurisdictional Wetland and Open Water Adverse Impact Factors**

Factor	Options						
	Fill	Dredge	Impound	Drain	Flood	Clear	Shade
Dominant Effect	2.0	1.8	1.6	1.4	1.2	1.0	0.5
Duration of Effects	7+ years 2.0	5-7 years 1.5	3-5 years 1.0	1-3 years 0.5	< 1 year 0.1		
Existing Condition	Class 1 2.0	Class 2 1.5	Class 3 1.0	Class 4 0.5	Class 5 0.1		
Lost Kind	Kind A 2.0	Kind B 1.5	Kind C 1.0	Kind D 0.5	Kind E 0.1		
Preventability	High 2.0	Moderate 1.0	Low 0.5	None 0			
Rarity Ranking	Rare 2.0	Uncommon 0.5	Common 0.1				

**Table 7  
Required Wetland Mitigation Credits Worksheet**

Factor	Area 4	Area 5	Area 6	Area 8	Area 9
	Pond 10	Pond 11	Pond 12	Wetland 19	Pond 23
	POW	POW	POW	PFO1E/PEMIE	POW
Dominant Effect	2.0	2.0	2.0	2.0	2.0
Duration of Effect	2.0	2.0	2.0	2.0	2.0
Existing Condition	0.1	0.1	0.1	0.5	0.1
Lost Kind	0.5	0.5	0.5	2.0	0.5
Preventability	0.5	0.5	0.5	0.5	0.5
Rarity Ranking	0.1	0.1	0.1	0.1	0.1
Sum of r Factors	5.2	5.2	5.2	7.1	5.2
Area of Affects (ac)	0.08	0.3	0.08	0.25	0.76
R x AA	0.4	1.6	0.4	1.7	4.0
<b>Total Required Credits = <math>\sum (R \times AA) = 8.1</math></b>					

**Table 8  
Stream Adverse Impact Factors**

Factors	Options								
	Lost Type	Intermittent 0.1			Perennial Stream > 15' in Width 0.4			Perennial Stream ≤ 15' in Width 0.8	
Priority Area	Tertiary 0.5			Secondary 0.8			Primary 1.5		
Existing Condition	Fully Impaired 0.25			Somewhat Impaired 0.5			Fully Functional 1.0		
Duration	Temporary 0.05			Recurrent 0.1			Permanent 0.2		
Dominant Impact	Shade/ Clear 0.05	Utility Crossing 0.4	Bank Armor 0.7	Detention 1.5	Stream Crossing (≤ 100') 1.7	Impound 2.7	Morphologic Change 2.7	Pipe > 100' 3.0	Fill 3.0
Linear Distance	<100 0	100-200 0.05	201-500 0.1	501-1,000 0.2	> 1,000' Impact 0.4 for each 1,000' of impact (round impacts to the nearest 1,000')				

**Table 9  
Required Stream Mitigation Credits Worksheet**

Factor	Area 1 Stream 20 INT	Area 2 Stream 25 INT
Lost Type	0.1	0.1
Priority Area	0.5	0.5
Existing Condition	0.5	0.5
Duration	0.2	0.2
Dominant Impact	3.0	3.0
Linear Distance	0.1	0.1
Sum of Factors (M)	4.4	4.4
Linear Feet Impact (A)	251	450
M x A	1,104.4	1,980

Unavoidable wetland and stream impacts would be mitigated with compensatory measures that would generate suitable credit according to the SOP for Compensatory Mitigation, Savannah District, USACE. Mitigation would occur as close to the project impacts as is practicable and within the same ecoregion and eight digit USGS Hydrologic Unit Catalogue Unit, according to regulatory agency guidelines for mitigation in Georgia.

It is anticipated that on-site mitigation for stream impacts would include restoration, enhancement and components of preservation of stream reaches that have been degraded, and may include watershed improvements as well. The proposed method of mitigation would be based on a justification for actions required to address the unique symptoms of stream and watershed degradation. Such methods may include revegetation, redirection of runoff to treatment or detention facilities, stream profile grade control, and reconfiguration of a stream's plan, dimensions, and profile. When applied to stream restoration, methodology would follow principles of natural stream channel design. Restoration proposals involving natural channel

design would be based on data gathered from an appropriate reference reach and local USGS gauge station. The reference and gauge data would be validated with dimensions and hydraulic geometry data from a regional curve for bankfull discharge generated in the same hydro-physiographic conditions.

It is anticipated that on-site mitigation for wetland impacts would include either restoration or enhancement of wetland areas that have been degraded or drained as part of a conversion to pasture land or other developed land use. The mitigation plan may also include components of preservation of existing wetland areas. The proposed method of mitigation would be based on a justification for actions required to address the unique symptoms of the wetland degradation. Such methods may include revegetation, removal of existing drainage facilities to restore natural hydrology, and reconfiguration and expansion of a specific wetland area.

Based on the above mitigation goals, GDOT is presently investigating the use of on-site areas to provide mitigation for adverse impacts to streams and wetlands associated with the US 411 Connector project. If it is determined that on-site opportunities are not feasible for mitigating the impacts to streams and wetlands, mitigation credits would either be purchased from a mitigation bank or debited from an existing GDOT-owned mitigation bank.

### **Transportation**

In terms of transportation system impacts and implications, Alternative D-VE differs from Alternative D -Avoidance/Minimization only at the US 411 Connector/I-75 Interchange. The primary difference is that Alternative D-VE does not include the direct freeway-to-freeway ramps (connecting the US 411 Connector to/from the west with I-75 to/from the south) that were part of Alternative D-Avoidance/Minimization. The specific connectivity changes are compiled in **Table 10**.

The traffic volumes and travel times for each Project Alternative, including Alternative D-VE, were determined using the State-of-the-Art traffic forecasting model described in all the project documents. The traffic volumes obtained from the forecasting model served as the basis for all traffic operational and safety analyses prepared for the project.

All traffic volume and travel time methodologies and sources have been identified and thoroughly described throughout the various studies and in the DSEIS and FSEIS. The traffic forecasts used were derived from the officially-sanctioned regional traffic forecasting model that is based on adopted future population and employment forecasts, adopted transportation plans, which considers future regional and local travel patterns and traffic operating conditions (i.e., congestion) on the transportation network in Bartow County. This model is derived from and compatible with the models used to prepare forecasts for projects throughout the Atlanta metropolitan region, and its use is required in order to ensure that analyses and decisions on all projects are based on compatible data, which in turn helps ensure that transportation funds are expended fairly and efficiently.

**Table 10  
Highway Network Connection Differences**

Connection	Alternative D (A/M)	Alternative D-VE
<b>Northbound I-75 to Westbound US 411 Connector</b>	via direct freeway-to-freeway ramp (no signalized intersections)	via off-ramp to existing SR 20, approximately 1 mile on eastbound SR 20, and left turn onto US 411 Connector at signalized intersection (traffic would proceed through four signalized intersections)
<b>Eastbound US 411 Conn to Southbound I-75</b>	via direct freeway-to-freeway ramp (no signalized intersections)	via on-ramp from signalized ramp terminal intersection on US 411 Connector (one signalized intersection)
<b>Southbound I-75 to existing SR 20</b>	via off-ramp to existing SR 20 (one signalized intersection)	via off-ramp at US 411 Connector and frontage road from US 411 Connector to existing SR 20 (two signalized intersections)

The traffic forecasting model separately and explicitly estimates future truck volumes, and incorporates those truck volumes in the traffic forecasts used in all the operational analyses prepared for all project alternatives. In addition, all the operational analyses have explicitly recognized and accounted for the forecasted truck volumes and percentages.

**Figure 2** illustrates the I-75/US 411 Connector interchange configuration. Because the Alternative D-VE route from northbound I-75 to westbound US 411 Connector is longer and has more signalized intersections to traverse than does the Alternative D-Avoidance/Minimization route, travel time from the I-75/SR 20 Interchange to the US 411 Connector/US 41 Interchange will be longer for Alternative D-VE than for Alternative D-Avoidance/Minimization. As shown in **Table 11**, 2030 p.m. peak hour travel time for this primary I-75-to-US 411 West traffic flow will be significantly better with Alternative D-VE than it will be for the No-Build Alternative (8.7 min vs. 15.8 min), but it also will be somewhat slower than for Alternative D-Avoidance/Minimization (8.7 min vs. 7.2 min).

**Table 11**  
**2030 PM Peak Hour Peak Direction Travel Time**  
**SR 20 at the I-75 interchange to US 411 at the US 41 Interchange**

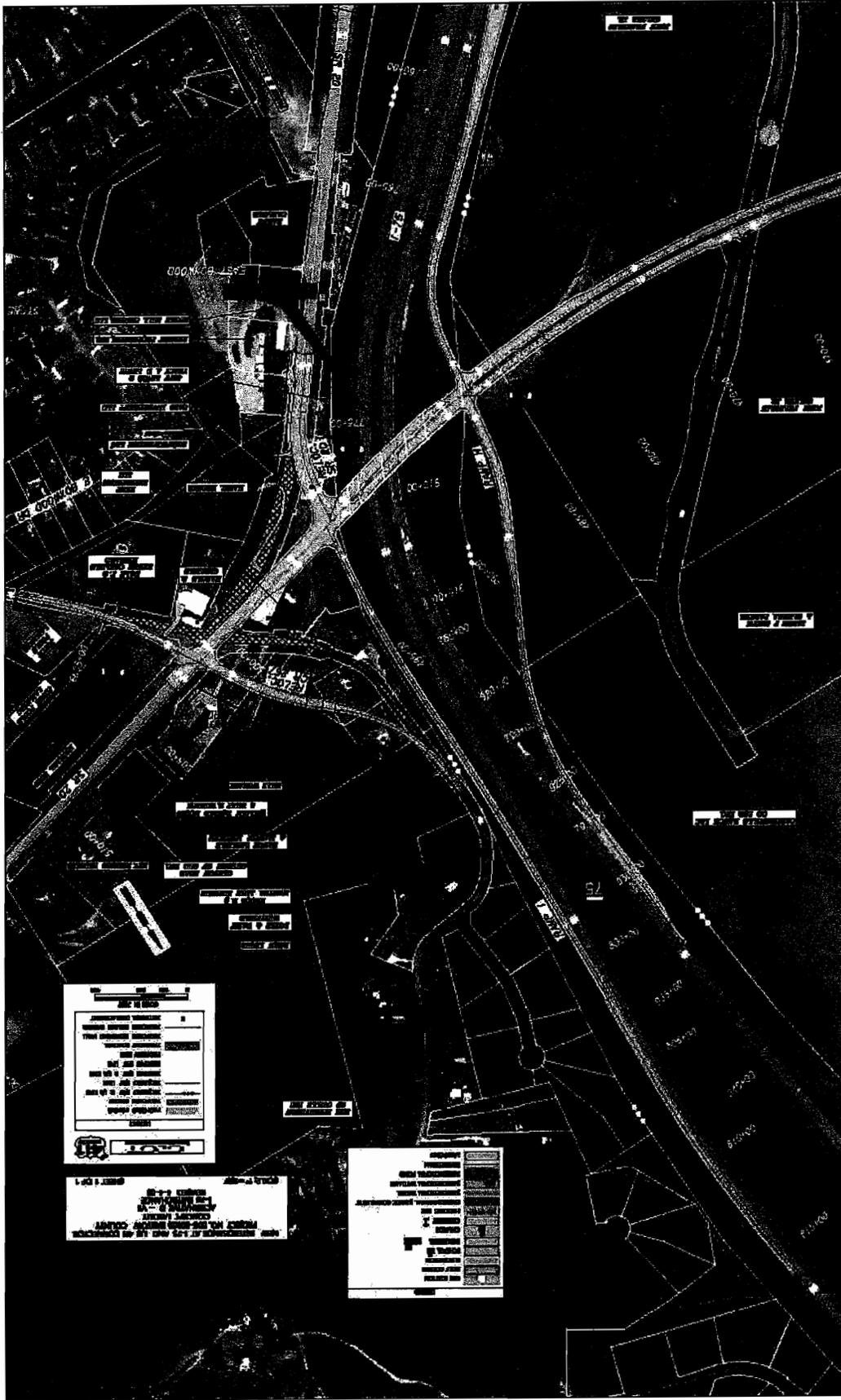
Alternative	Travel Time
No-Build Alternative	15.8 min
Alternative D Avoidance/Minimization	7.2 min
Alternative D-VE	8.7 min

The difference in travel time for Alternative D-VE and Alternative D-Avoidance/Minimization affects forecasted traffic volumes on the US 411 Connector and on the existing route (US 41 and SR 20). As shown in **Table 12**, Alternative D-VE attracts a significant volume of 2030 daily traffic (24,400), but does not attract as much daily traffic as Alternative D-Avoidance/Minimization (32,900). Table 12 also shows that Alternative D-VE provides significant relief to the existing route, reducing 2030 daily volumes on US 41 by 16,400 (35%) and on SR 20 by 7,700 (26%), although that relief is less than that provided by Alternative D-Avoidance/Minimization.

**Table 12**  
**2030 Daily Traffic Volumes**

Roadway Segment	No-Build Alternative	Alternative D Avoidance/Minimization	Alternative D-VE
Existing US 41 (between US 411 and SR 61)	47,000	25,800	30,600
Existing SR 20 (between SR 61 and I-75)	29,400	17,900	21,700
US 411 Connector	—	32,900	24,400

Also, it has been determined that it is not feasible to have the project open to traffic by 2010 as identified in the FSEIS; therefore, the traffic analysis and evaluation of the air quality have been updated assuming an opening year of 2014 and a design year of 2034.



...DISPLAY\_FIDH\_100\_V8(REVISED).dgn 4/6/2008 11:33:21 AM

Figure 2 US 411 / I-75 Interchange (Part 1)



Figure 2 US 411 / I-75 Interchange (Part 2)

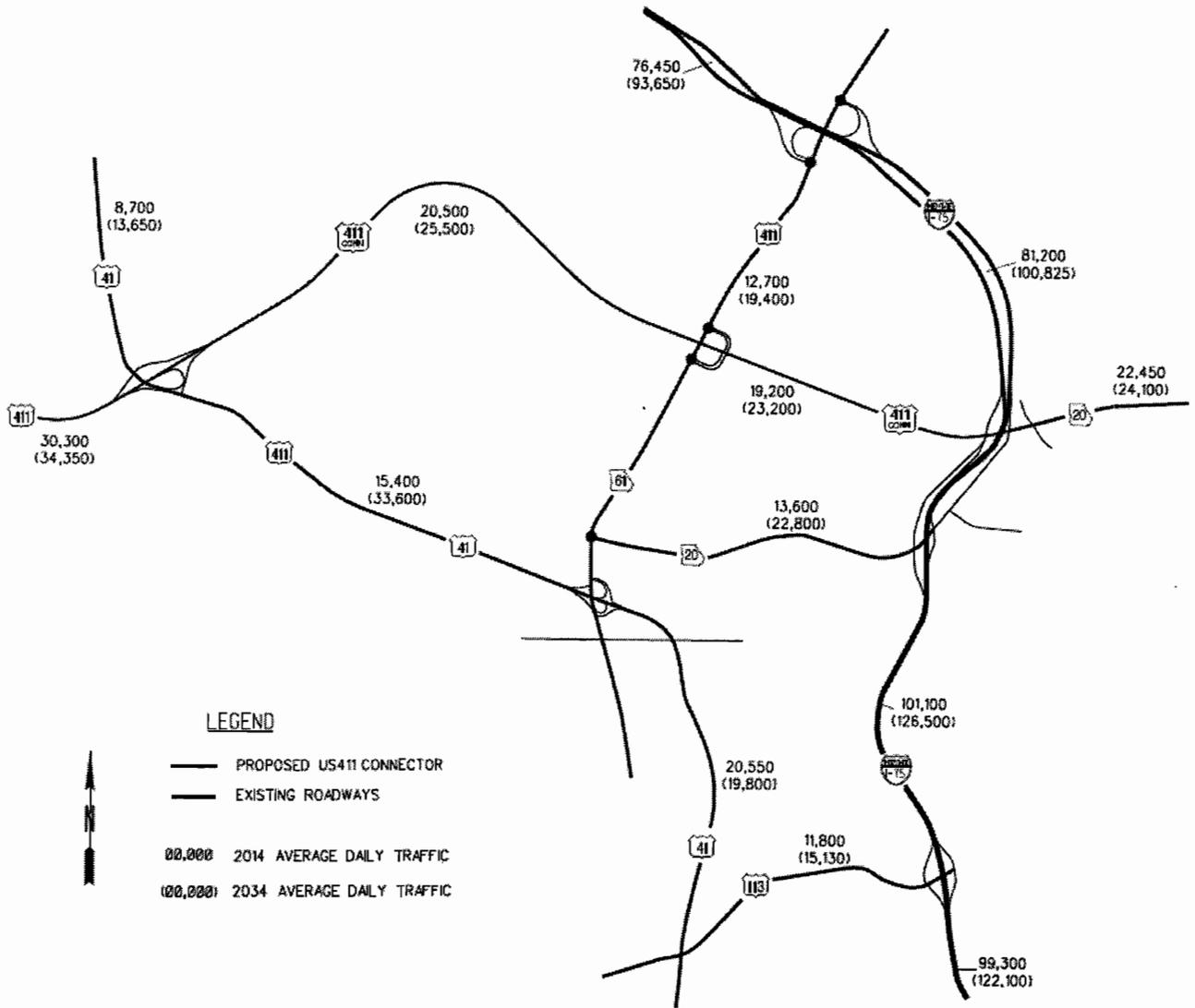
Daily traffic volumes on the study area road system for Alternative D-VE in Opening Year (2014) and the Design Year (2034) are shown in **Figure 3**, and **Appendix C** contains a discussion of the traffic operations analysis of the modified interchange connection between the US 411 Connector and I-75 at SR 20.

As part of the cost saving measures to reduce the overall project cost by approximately \$100M, the design was revised by reducing the design speed from 65 mph to 55 mph, modifying the terrain type from rolling to mountainous (better representation of the terrain within the project corridor), and eliminating the direct connect fly-over ramps. These modifications allowed the following design modifications:

- Reduction of the design speed from 65 mph to 55 mph reduced the clear zone in the median to 22-foot and the clear zone on the outside to 26-foot, thus reducing the overall footprint of the mainline and still meeting 2002 AASHTO Roadside Design Guide requirements for clear zone (Table 4-10).
- Reduction of the design speed to 55 mph along with modifying the terrain type to mountainous allowed the maximum grade to increase to 7 percent (6 percent from exhibit and an additional 1 percent steeper due to mountainous terrain conditions 2004 AASHTO Geometric Design of Highways and Streets, exhibit 8-1).
- The removal of the direct access ramps for the I-75 NB exit and the I-75 SB entrance movements results in an increase of left turn movements for the split diamond interchange. Signals are warranted where US 411 becomes a non-controlled access roadway.

These modifications eliminated the direct freeway-to-freeway connection and slightly increased the overall corridor travel times. The current design (Alternative D-VE) meets AASHTO requirements for the above mentioned design criteria while still maintaining safety for the traveling public.

**Figure 3**  
**Build and Design Year Daily Traffic Volumes**



## Air Quality

The initial preferred alternative (Alternative D-Avoidance/Minimization) was evaluated for its consistency with state and federal air quality goals, including carbon monoxide (CO), ozone, fine particulate matter (PM<sub>2.5</sub>) and mobile source air toxics (MSATs). The US 411 Connector project has been included in the ARC updated conformity modeling for both ozone and PM<sub>2.5</sub> in the 2020 network, the 2030 Plan and the 2008-2013 TIP. The USDOT made a conformity determination on the Envision6 2030 RTP / 2008-2013 TIP made on October 10, 2007. Although the Alternative D-VE (the modified preferred alternative) alignment follows the same alignment as the initial preferred alternative, the traffic patterns are different for the D-VE Alternative. However, the D-VE Alternative is not considered to be a significant change in the project's original design concept and scope; therefore, a new conformity determination is not required per 40 CFR 93.104(d). As mentioned previously, the evaluation of the air quality has been updated assuming an opening year of 2014 and a design year of 2034. The US 411 Connector is included in and consistent with the regional emissions analysis, however the change in open to traffic year (from 2010 to 2014) has not changed the year in which the project was modeled, the 2020 open to traffic network.

Additionally, all intersections along existing SR 20 and US 41 will operate at level-of-service (LOS) D or better in both D alternatives (Alternative D-Avoidance/Minimization and Alternative D-VE) in design year 2034. Under 2034 no-build conditions, the LOS at these intersections along SR 20 will operate at LOS E or F. Therefore, either alternative (Alternative D-VE or Alternative D-Avoidance/Minimization) would provide enough benefit to relieve congestion along the existing SR 20 route as well as meet the proposed project's stated need and purpose.

### Carbon Monoxide (CO)

The State of Georgia and the federal government set the maximum acceptable average CO concentrations at 9 ppm for a continuous eight-hour period and 35 ppm for a maximum one-hour averaging time. One-hour CO concentrations were predicted for the anticipated first year of operation, 2014, and the design year, 2034. If the predicted CO concentration for the one-hour standard exceeded the NAAQS for the eight-hour level for either 2014 or 2034, eight-hour levels were calculated. **Table 13** summarizes the results of the CO analysis and shows that CO concentrations for Alternative D-VE are well below the 1-hour and 8-hour NAAQS. See Appendix A for a sample of the updated air model data.

**Table 13- Air Quality Model Results Alternative D-VE**

Interchange with highest predicted concentration	2014 predicted 1-hour CO concentration	2034 predicted 1-hour CO concentration	Greater than NAAQS for 8-hour level (9 ppm)?	CO concentration for 8-hour analysis
US 411 and I-75 SB off ramp	4.4 ppm	6.3 ppm	No	N/A*
SR 20 and I-75 NB off ramp	5.8 ppm	6.5 ppm	No	N/A*

\* 8-hour analysis not performed if 2014 and 2034 values are below NAAQS for 8-hour level (9ppm)

## Mobile Source Air Toxics (MSATs)

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. MSAT assessments are required statewide for most federal transportation projects. Based on the example projects defined in the FHWA guidance “Interim Guidance on Air Toxic Analysis in NEPA Documents” dated February 3, 2006, the US 411 Connector Project would be classified as a project with *Low Potential MSAT Emissions*, which requires a qualitative assessment of emissions projections.

### *Unavailable Information for Project Specific MSAT Impact Analysis*

The FSEIS included a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in the FSEIS. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

### *Information that is Unavailable or Incomplete*

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project. A more detailed description of the deficiencies with each of these modeling parameters is explained in the FSEIS.

The FSEIS provided a qualitative analysis of MSAT emissions relative to the various alternatives, and acknowledged that the Preferred Alternative (D Avoidance/Minimization) may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

As discussed above and in the FSEIS, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable

methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: [www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm](http://www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm)

As identified in the FSEIS, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. Although the VMT estimated for the No Build Alternative is slightly lower than Alternative D-VE, Alternative D-VE has lower Vehicle Hours Traveled (VHT). Alternative D-VE would result in a reduction of 1,307 VHT over the No Build Alternative, so higher levels of regional MSATs are not expected from the Alternative D-VE compared to the No Build Alternative. See **Table 14**. MSAT emissions will likely be lower than present levels in the design year as a result of EPA’s national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

**Table 14**  
**2030 VMT and VHT for Alternative D Avoidance/Minimization and Alternative D-VE**

	No Build	Alternative D-VE	Alternative D Avoidance/Minimization
<b>VMT</b>	8,262,811	8,287,426	8,282,775
<b>VHT</b>	221,327	220,020	218,761

PM<sub>2.5</sub>

It has been determined that the D-VE Alternative would continue to meet the criteria set forth in 40 CFR 93.123(b)(1) for projects of air quality concern because of the effects it has to I-75. The US 411 Connector is a new highway, with projected diesel vehicle volumes well below those cited as an example under the above regulation. However, the proposed project would increase the number of diesel trucks on I-75 at and south of the proposed new interchange because it would attract truck traffic from other facilities in the project area. See **Appendix D** for the updated PM<sub>2.5</sub> conformity determination.

Ozone

With regard to Ozone, the changes in project design do not significantly change the original design concept or scope (Alternative D-Avoidance/Minimization). Likewise, the change in the open to traffic year (now 2014) is consistent with how the project was modeled in the regional emissions analysis. Therefore, no additional discussion on air quality is necessary.

## **Noise**

As part of the updated evaluation of the D-VE Alternative, the potential noise impacts have also been updated following the methods and procedures defined in the Draft Noise Impact Report for the US 411 Connector, dated February 2005, and the report addendum prepared in March 2005. For this project, sensitive receptors are represented by the residential grouping, which includes residences and schools, and by the commercial grouping, which includes businesses. The commercial and residential sites nearest the alignment were identified as representative receptors for modeling purposes. The area of receptors located in the corridor of the project alignment has not changed; however, the project now includes a portion of SR 20 on the east side of I-75 within the project limits.

### **Updated Model Results**

As a result of slightly lower peak traffic volumes on the section of the project from US 41 to I-75, the modeled existing  $L_{10}$  noise levels along this section of the proposed US 411 Connector indicate decreased noise levels from 1 to 2 dBA, while on the section of SR 20 that would function as a connector road for northbound I-75 traffic to access the US 411 Connector, traffic volumes would increase and noise levels are predicted to increase from 1 dBA to 3 dBA. See **Appendix B** for a sample of the updated noise model data using the 2034 predicted traffic volumes. Although there are some additional receptors along SR 20 that would be impacted by noise, barriers were determined to be ineffective in this area; this is because of the requirement to provide breaks in any barrier to permit access to adjacent properties. Therefore, the locations of proposed noise barriers are unchanged from what was presented in the FSEIS.

## **Farmland**

Alternative D-VE would have an insignificantly smaller impact upon farmland that is considered prime and unique, or of statewide or local importance because the project footprint would be smaller than what was proposed under the D Avoidance/Minimization Alternative presented in the FSEIS.

## **Natural Resources and Energy Supply**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

## **Threatened and Endangered Species**

As part of the Biological Opinion (BO) issued by the U.S. Fish and Wildlife Service (USFWS), there were several measures cited as measures to minimize harm to protected species (these measures can be found in the FSEIS). The BO states that, for the purpose of consultation under Section 7 of the Endangered Species Act, the "action area" is defined at 50 CFR.402 to mean "all areas affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." Under the original BO the USFWS determined the extent of the action area based on a reasonable stream channel length that would have realized: (1) short-term

increases in turbidity that could affect the foraging behavior of the darter; and (2) direct, physical disturbance of the streambed when heavy equipment enters the stream during culvert demolition and removal specifically at streams 4B and 22. However, because of the proposed project footprint reduction, including more compact interchange configurations at US 41, SR 61, and at I-75, a reduced direct impact to environmental resource areas would result. For example, the compact interchanges have reduced the limits of transition required to connect to the existing roadway network, which has eliminated direct impacts to both streams and wetlands that would no longer be crossed or filled. In addition, the narrower roadway section would require a smaller area of fill to cross existing streams and wetlands, which effectively reduces the overall impact to these protected environmental resources. Specifically, the project would no longer cause direct impacts at Streams 4B and 22. Because these direct impacts have been avoided, it is proposed to leave the existing culverts at these streams in place since they are now effectively located outside of the proposed project limits.

Other streams downstream of the project corridor would realize no appreciable, long-term or chronic degradation because GDOT incorporated stormwater infiltration and attenuation measures into the proposed action, eliminating indirect effects from stormwater runoff.

### **Section 7 Consultation and Fish and Wildlife Coordination Act (FWCA)**

As a result of agency coordination with the USFWS regarding project design changes, a letter dated April 29, 2008 was issued by the USFWS which included an amendment to the January 17, 2007 BO for the Cherokee darter. The letter stated that as a result of the design changes, the project is not likely to adversely affect the Cherokee darter and the incidental take statement in the BO is no longer necessary. However, they did agree that the project should continue to include special stormwater control and infiltration measures as previously described in the BO to avoid long-term indirect effects to the Cherokee darter. Therefore, obligations under Section 7(a)(2) of the Endangered Species Act have been satisfied and formal consultation is not required.

USFWS also concurred by letter dated March 23, 2007, that stream impacts occurring along the project were necessary and unavoidable. Concurrence was also received with the determination that all practicable avoidance and minimization measures were investigated and that proposed mitigation of the impacts is adequate. Therefore, no further coordination is required under the FWCA. Please refer to **Appendix E** for a copy of the April 29, 2008 USFWS letter.

### **Neotropical Migratory Birds**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

### **Invasive Species**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

**Floodplains**

Through the concept development and EIS process, efforts have been made to avoid and minimize impacts to floodplains. Because of the linear nature of the project, it is not possible to totally avoid floodplain impacts. Impacts have been greatly minimized within the proposed corridor by bridging the majority of the floodplains. Under the D Avoidance and Minimization Alternative, approximately 36 acres of floodplains would have been impacted. Under the D-VE Alternative (which includes a 44-foot median as compared to a 68-foot median, a 250-foot right-of-way as compared to a 400-foot right-of-way, and more compact interchange configurations at US 41, SR 61, and at I-75), approximately 14 acres of floodplains would be impacted. As mentioned previously, the compact interchanges have reduced the limits of transition required to connect to the existing roadway network, which has reduced impacts to floodplains.

**Table 15** provides information on floodplain crossings in the project area for each of the alternatives considered.

**Table 15  
Floodplain Crossing Impacts (in Acres) for the Alternative D-Avoidance/Minimization  
Compared to Alternative (D-VE)**

Alternative	100-Year Floodplains	Direct Impacts
<b>D Avoidance/Minimization</b>	Nancy Creek	7.0 acres fill
	Pettit Creek	29 acres fill
	Unnamed tributary of Pettit Creek	
	Unnamed tributary of Pettit Creek	None. Construction would occur within existing right-of-way.
<b>D-VE</b>	Nancy Creek	2.0 acres fill
	Pettit Creek	12 acres fill
	Unnamed tributary of Pettit Creek	
	Unnamed tributary of Pettit Creek	None. Construction would occur within existing right-of-way.

**Water Quality**

The proposed US 411 Connector is located within Priority Area Two defined by the Etowah Habitat Conservation Plan (HCP), which set draft guidelines for Runoff Limits and Priority Area Protection for the Etowah watershed. The objective of the HCP is, through better site design and comprehensive water quality management practices, to minimize and mitigate the impact of land development on aquatic species and darter streams in the Etowah watershed.

The US Fish and Wildlife Service (USFWS) has specifically requested that the runoff from 2-year recurrence interval storms be treated to protect the Cherokee darter and minimize impacts to its

habitats. A 2-year storm event corresponds to 3.9 inches of rainfall in a 24-hour period for Bartow County. Upon preliminary evaluation of the project, roadway BMPs including stormwater recharge basins and swales for water quality treatment have been identified for runoff leading to all streams located in the US 411 Connector project corridor.

These stormwater ponds and swales would retain and treat stormwater runoff primarily through settling and a biological uptake mechanism. As part of the continued design for this project GDOT has agreed to meet the HCP storm water run-off standards as described above.

### **Coast Guard/Corps of Engineers Permit Applicability**

No Coast Guard permit would be required for the US 411 Connector because the project corridor is neither located in a coastal area nor contains navigable waters as defined under Section 10 of the Rivers and Harbors Act.

An Individual Section 404 Permit (IP) is required from the USACE for projects having more than minimal cumulative adverse impacts on the Nation's Waters. Projects attaining certain criteria, as outlined in the *Federal Register*, may qualify for one of 44 types of Nationwide Permits (NWP), which have been established previously by the USACE for projects that have minimal cumulative impacts to the Nation's Waters.

Impacts identified for Alternative D-VE have been reduced as compared to the D Avoidance Minimization Alternative as presented in the FSEIS. However, jurisdictional impacts associated with the Alternative D-VE would still exceed the linear foot threshold provided in the NWP Program, so an IP would still be required. Mitigation is also required as a part of the Section 404 IP process.

### **Historic Resources**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

### **Archaeological Resources**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

### **Section 106 Issues**

Because no change in impacts to cultural resources was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS, there is also no change with regard to Section 106 issues.

### **Section 4(f) and 6(f) Applicability**

Similar to the D Avoidance Minimization Alternative, Alternative D-VE would have no impact to Section 4(f) or Section 6(f) resources or properties.

### **Economic Consequences**

**Table 16** summarizes the impacts to employment in the project area for the D-VE Alternative as compared to the D Avoidance/Minimization Alternative.

**Table 16**  
**Impacts to Employment in the Project Area**

	<b>Alternative D Avoidance/Minimization</b>	<b>Alternative D-VE</b>
<b># Businesses Displaced</b>	6	3
<b>Range of Business Values</b>	\$300,000-\$500,000	\$300,000-\$500,000
<b># Employees Impacted</b>	44	12

The proposed project would establish energy-efficient and time-saving links between US 411 and I-75. This would serve to encourage a positive and stable base for future regional economic growth. The amount of right-of-way needed to implement the proposed project would not materially affect the tax bases of either Bartow County or the City of Cartersville.

### **Community Impact**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

### **Environmental Justice**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

### **Land Use**

One minor change in impacts for land use was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS. By utilizing the section of existing SR 20 as a connection from I-75 northbound to the US 411 Connector westbound, additional traffic would be traveling this section of SR 20. Although the majority of this corridor is already developed with commercial uses, and the area was already predicted to develop with additional commercial businesses, it is likely that this corridor would develop sooner than

originally predicted. It is also anticipated that the existing businesses in this area would benefit from the increased traffic in the corridor.

### **Utilities**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

### **Construction**

No change in direct impacts to the traveling public was identified for Alternative D-VE as compared to the D-Avoidance Minimization Alternative presented in the FSEIS. However, temporary inconveniences to the public could occur along SR 20 east of I-75 during construction, due to lane shifts required for staging or temporary changes in access for the construction of driveway tie-ins, side streets, or entrance/exit ramps.

### **Visual Quality**

Alternative D-VE would have an insignificantly smaller impact upon visual quality in the project corridor because the project footprint would be smaller than what was proposed under the D Avoidance/Minimization Alternative presented in the FSEIS.

### **Hazardous Waste sites/Underground Storage Tanks**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

### **Short-Term Use vs. Long-Term Productivity**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

### **Irreversible and Irretrievable Commitments of Resources Involved in the Proposed Action**

No change in impacts was identified for Alternative D-VE as compared to the D Avoidance Minimization Alternative as presented in the FSEIS.

### **Relocations**

The term “relocations” refers to the number of homes, residents, businesses, and employees that would have to move (or relocate) as a result of project construction. It is important to note that GDOT would provide monetary compensation for all relocations at full fair market value, assist in relocation searches, and assist with moving displaced owners and tenants of residents and businesses to new homes or businesses.

**Table 17** outlines the potential total displacements of homes and businesses that would occur with Alternative D-VE. Alternative D-Avoidance/Minimization is also presented to demonstrate that Alternative D-VE would actually have fewer relocations.

**Table 17  
Potential Home and Business Relocations**

Alternative	Type of Displacement	Impact (number of displaced)		
<b>D-VE</b>	Owner Occupied Single Family Homes	12		
	Tenant Occupied Single Family Homes	0		
	Owner Occupied Mobile Homes	2		
	Tenant Occupied Mobile Homes	0		
	Tenant Occupied Multi-Family Homes (# Units)	0 (0)		
	Homes Under Construction	0		
	Businesses (Owner/Tenant)	Employees	3 (3/0)	12
	<b>TOTALS</b>		<b>17</b>	
<b>D Avoidance/ Minimization</b>	Owner Occupied Single Family Homes	10		
	Tenant Occupied Single Family Homes	3		
	Owner Occupied Mobile Homes	0		
	Tenant Occupied Mobile Homes	3		
	Tenant Occupied Multi-Family Homes (# Units)	0 (0)		
	Homes Under Construction	0		
	Businesses (Owner/Tenant)	Employees	6 (6/0)	44
	<b>TOTALS</b>		<b>22</b>	

**Conclusion**

Because of the proposed project footprint reduction, including more compact interchange configurations at US 41, SR 61, and at I-75, a reduced direct impact to environmental resource areas would result. For example, the compact interchanges have reduced the limits of transition required to connect to the existing roadway network, which has eliminated direct impacts to both streams and wetlands that would no longer be crossed or filled. In addition, the narrower roadway section would require a smaller area of fill to cross existing streams and wetlands, which effectively reduces the overall impact to these protected environmental resources. It is anticipated that for those resource areas where direct impacts would be less than previously identified, both indirect and cumulative impacts would also be lower. Although in one particular instance the benefit to the watershed would be less than proposed under the D-Avoidance/Minimization Alternative because two existing culverts that were proposed to be replaced with innovative culverts are no longer proposed to be replaced. Because the direct impacts have been avoided, it is proposed to leave the existing culverts at these streams in place since they are now effectively located outside of the proposed project limits.

## **Appendix A**

### **Benefit Cost Analysis Worksheet**

Benefit Cost Analysis Work Sheet CONGESTION Projects	
PROJECT NUMBER	
PI NUMBER	
COUNTY	
PROJECT DESCRIPTION	
Congestion Benefit = Tb + CMb + Fb	
<b>Person Time Savings Benefit (Tb)</b>	
*Db (hrs)	
ADT	
Tb (\$s)	\$0.00
<b>Commercial or Truck Time Savings Benefit (CMb)</b>	
Db (hrs)	0
% Truck Traffic	
ADT	0.00
CMb	\$0.00
<b>Fuel Savings Benefit (Fb)</b>	
ADT	0.00
Fb (\$s)	\$0.00
<b>Total Congestion Benefit</b>	<b>\$0.00</b>
<b>Total Project Cost</b>	
<b>B/C Ratio</b>	<b>#DIV/0!</b>

Db is the difference in travel time (in hrs) through the corridor with and without the improvement using 20 yr projected tra  
 ADT = The 20 yr Average Daily Traffic for the Project

\*Reduction in delay or **Delay Benefit (D<sub>b</sub>)** can be defined as the difference between the peak hour travel time through the corridor without the proposed improvement and the peak hour travel time through the corridor with the proposed improvement.

## **Appendix B**

### **Sample Model Data**

## **Air Model Output**

**CO Concentrations (ppm)****PM Peak Hour Traffic**

Intersection/ Receptors	2014	First
	Year of	2034
	Operation	Design Year
<b>US-411 &amp; I-75 SB off ramp</b>	<b>411_7514</b>	<b>411_7534</b>
receptor 1	3.9	5.8
receptor 2	4.4	5.1
receptor 3	4.2	6.3
<b>US-411 &amp; I-75 NB on ramp</b>	<b>SR207514</b>	<b>SR207534</b>
receptor 1	4.1	4.6
receptor 2	6.2	4.4
receptor 3	4.6	3.7
receptor 4	3.9	4.5
<b>SR-20 &amp; I-75 SB off ramp</b>	<b>2075SB14</b>	<b>2075SB34</b>
receptor 1	3.8	4.0
receptor 2	3.6	3.8
receptor 3	3.7	4.7
receptor 4	4.7	5.1
<b>SR-20 &amp; I-75 NB off ramp</b>	<b>2075NB14</b>	<b>2075NB34</b>
receptor 1	5.7	6.5
receptor 2	5.8	5.9
receptor 3	5.8	6.2
receptor 4	4.3	5.4



JOB: US 411 Extension

RUN: SR-20 & I-75 NB off ramp 2014 PM

DATE : 4/ 9/ 8  
TIME : 14: 1:41

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S Z0 = 108. CM  
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 1.0 PPM

LINK VARIABLES

LINK DESCRIPTION QUEUE	* X1 (VEH)	Y1	X2	Y2	* (FT)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (FT)	W (FT)	V/C
1. EB Approach	*****	*****	*****	*****	2395.	289. AG	620.	12.5	.0	44.0	.21
2. EB Queue	*****	*****	*****	*****	47.	288. AG	894.	100.0	.0	24.0	.40
3. EB Left Turn	*****	*****	*****	*****	92.	288. AG	447.	100.0	.0	12.0	4.7
4. EB Depart	*****	*****	*****	*****	3443.	305. AG	1650.	12.5	.0	44.0	
5. WB Approach	*****	*****	*****	*****	3457.	125. AG	620.	12.5	.0	44.0	
6. WB Queue	*****	*****	*****	*****	83.	107. AG	894.	100.0	.0	24.0	.36
7. WB Right Turn	*****	*****	*****	*****	21.	107. AG	447.	100.0	.0	12.0	.09
8. WB Depart	*****	*****	*****	*****	2341.	110. AG	1375.	12.5	.0	44.0	
9. NB Approach	*****	*****	*****	*****	391.	177. AG	1785.	12.5	.0	44.0	
10. NB Left Queue	*****	*****	*****	*****	93.	177. AG	731.	100.0	.0	24.0	.42
11. NB Right Queue	*****	*****	*****	*****	127.	177. AG	731.	100.0	.0	24.0	.64

RUN: SR-20 & I-75 NB off ramp 2014 PM

JOB: US 411 Extension

DATE : 4/ 9/ 8  
 TIME : 14: 1:41

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	* CYCLE LENGTH (SEC)	* RED TIME (SEC)	* CLEARANCE LOST TIME (SEC)	* APPROACH VOL (VPH)	* SATURATION FLOW RATE (VPH)	* IDLE EM FAC (gm/hr)	* SIGNAL TYPE	* ARRIVAL RATE
2. EB Queue	100	55	2.0	315	1863	303.00	2	3
3. EB Left Turn	100	55	2.0	305	1863	303.00	2	3
6. WB Queue	100	55	2.0	550	1863	303.00	2	3
7. WB Right Turn	100	55	2.0	70	1863	303.00	2	3
10. NB Left Queue	100	45	2.0	755	1770	303.00	2	3
11. NB Right Queue	100	45	2.0	1030	1583	303.00	2	3

RECEPTOR LOCATIONS

RECEPTOR	* X	* Y	* Z
1. 1088	*****	*****	5.9 *
2. 1089	*****	*****	5.9 *
3. 1090	*****	*****	5.9 *
4. 1091	*****	*****	5.9 *

JOB: US 411 Extension  
MODEL RESULTS  
-----  
RUN: SR-20 & I-75 NB off ramp 2014 PM

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONC1	* CONC2	* CONC3	* CONC4
0.	1.0	3.2	3.6	1.0
10.	1.0	3.0	3.2	1.0
20.	1.0	2.9	3.0	1.0
30.	1.0	2.7	3.1	1.0
40.	1.0	2.3	3.5	1.0
50.	1.0	2.0	4.0	1.0
60.	1.0	1.7	4.4	1.0
70.	1.0	1.6	4.8	1.0
80.	1.0	1.7	5.3	1.0
90.	1.0	1.8	5.5	1.2
100.	1.0	2.0	5.5	1.7
110.	1.1	2.6	5.7	2.4
120.	1.7	3.2	5.8	3.2
130.	2.5	3.2	5.6	3.6
140.	3.1	2.7	5.1	3.5
150.	3.5	2.2	4.5	4.0
160.	4.0	1.9	3.7	4.3
170.	5.0	2.0	2.7	4.2
180.	5.7	2.4	1.7	3.6
190.	5.7	3.2	1.2	3.2
200.	4.6	4.0	1.1	2.8
210.	3.6	4.6	1.0	2.5
220.	3.2	4.9	1.0	2.3
230.	2.5	5.0	1.0	2.1
240.	2.2	5.0	1.0	2.0
250.	1.9	5.0	1.0	1.9

260.	*	1.8	5.2	1.0	1.9
270.	*	1.8	5.5	1.0	2.0
280.	*	1.7	5.8	1.3	2.0
290.	*	1.5	5.7	2.1	1.8
300.	*	1.1	4.9	3.1	1.4
310.	*	1.0	3.8	4.0	1.1
320.	*	1.0	3.6	4.6	1.0
330.	*	1.0	3.2	4.8	1.0
340.	*	1.0	3.2	4.5	1.0
350.	*	1.0	3.3	4.2	1.0
360.	*	1.0	3.2	3.6	1.0
-----*					
MAX	*	5.7	5.8	5.8	4.3
DEGR.	*	180	280	120	160

THE HIGHEST CONCENTRATION OF 5.80 PPM OCCURRED AT RECEPTOR REC3 .

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221

RUN: SR-20 & I-75 NB off ramp 2034 PM

JOB: US 411 Extension

DATE : 4/ 9/ 8  
TIME : 14: 1:31

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S Z0 = 108. CM  
U = 1.0 M/S CLAS = 4 (D) ATIM = 60. MINUTES MIXH = 1000. M AMB = 1.0 PPM

LINK VARIABLES

LINK DESCRIPTION	* X1	Y1	X2	Y2	* LENGTH (FT)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (FT)	W (FT)	V/C
1. EB Approach	*****	*****	*****	*****	2395.	289. AG	755.	9.5	.0	44.0	
2. EB Queue	*****	*****	*****	*****	83.	288. AG	813.	100.0	.0	24.0	.19
3. EB Left Turn	*****	*****	*****	*****	40.	288. AG	406.	100.0	.0	12.0	.09
4. EB Depart	*****	*****	*****	*****	3443.	305. AG	1985.	9.5	.0	44.0	
5. WB Approach	*****	*****	*****	*****	3457.	125. AG	925.	9.5	.0	44.0	
6. WB Queue	*****	*****	*****	*****	120.	107. AG	813.	100.0	.0	24.0	.27
7. WB Right Turn	*****	*****	*****	*****	12.	108. AG	406.	100.0	.0	12.0	.03
8. WB Depart	*****	*****	*****	*****	2341.	110. AG	1755.	9.5	.0	44.0	
9. NB Approach	*****	*****	*****	*****	391.	177. AG	2250.	9.5	.0	44.0	
10. NB Left Queue	*****	*****	*****	*****	119.	177. AG	813.	100.0	.0	24.0	.28
11. NB Right Queue	*****	*****	*****	*****	828.	177. AG	813.	100.0	.0	24.0	1.09

RUN: SR-20 & I-75 NB off ramp 2034 PM

JOB: US 411 Extension

DATE : 4/ 9/ 8  
 TIME : 14: 1:31

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	* CYCLE LENGTH (SEC)	* RED TIME (SEC)	* CLEARANCE LOST TIME (SEC)	* APPROACH VOL (VPH)	* SATURATION FLOW RATE (VPH)	* IDLE EM FAC (gm/hr)	* SIGNAL TYPE	* ARRIVAL RATE
2. EB Queue	100	50	2.0	610	3539	303.00	2	3
3. EB Left Turn	100	50	2.0	145	3539	303.00	2	3
6. WB Queue	100	50	2.0	880	3539	303.00	2	3
7. WB Right Turn	100	50	2.0	45	3539	303.00	2	3
10. NB Left Queue	100	50	2.0	875	3433	303.00	2	3
11. NB Right Queue	100	50	2.0	1375	1375	303.00	2	3

RECEPTOR LOCATIONS

RECEPTOR	* X	* Y	* Z	* COORDINATES (FT)
1. 1088	*****	*****	5.9	*
2. 1089	*****	*****	5.9	*
3. 1090	*****	*****	5.9	*
4. 1091	*****	*****	5.9	*

JOB: US 411 Extension  
 RUN: SR-20 & I-75 NB off ramp 2034 PM

MODEL RESULTS  
 -----

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE * (DEGR) *	CONCENTRATION (PPM)			
	REC1	REC2	REC3	REC4
0.	1.0	3.0	3.4	1.0
10.	1.0	2.9	3.1	1.0
20.	1.0	2.9	3.0	1.0
30.	1.0	2.9	3.1	1.0
40.	1.0	2.9	3.5	1.0
50.	1.0	2.8	4.0	1.0
60.	1.0	2.6	4.6	1.0
70.	1.0	2.3	5.4	1.0
80.	1.0	1.9	5.7	1.0
90.	1.0	1.9	5.8	1.2
100.	1.1	2.1	5.8	1.7
110.	1.3	2.6	6.0	2.5
120.	2.0	3.2	6.2	3.3
130.	2.9	3.2	6.1	3.7
140.	3.4	2.6	6.0	3.6
150.	3.4	2.2	6.0	4.5
160.	4.0	2.1	5.8	5.3
170.	5.2	2.9	4.6	5.4
180.	6.5	4.1	2.8	4.2
190.	6.1	5.0	1.5	3.3
200.	4.7	5.4	1.1	2.8
210.	3.6	5.5	1.0	2.6
220.	3.2	5.5	1.0	2.3
230.	2.5	5.4	1.0	2.1
240.	2.3	5.4	1.0	1.9
250.	2.0	5.2	1.0	1.8

260.	*	1.6	5.5	1.0	1.8
270.	*	1.7	5.7	1.1	2.0
280.	*	1.7	5.9	1.5	2.0
290.	*	1.5	5.7	2.4	1.7
300.	*	1.1	4.7	3.3	1.3
310.	*	1.0	3.8	4.1	1.1
320.	*	1.0	3.1	4.5	1.0
330.	*	1.0	3.1	4.4	1.0
340.	*	1.0	3.0	4.1	1.0
350.	*	1.0	3.0	4.0	1.0
360.	*	1.0	3.0	3.4	1.0
-----*					
MAX	*	6.5	5.9	6.2	5.4
DEGR.	*	180	280	120	170

THE HIGHEST CONCENTRATION OF 6.50 PPM OCCURRED AT RECEPTOR RECL .

## **Noise Model Output**



STAMINA 2.0/BCR  
 FHWA VERSION 3 (MARCH 1983)

THE TECHNOLOGY GROUP  
 LOUISVILLE, KENTUCKY

(INPUT UNITS- ENGLISH , OUTPUT UNITS- ENGLISH )

US411 - PROPOSED HIGH PROFILE EAST - 2034 PM

PROGRAM INITIALIZATION PARAMETERS

HEIGHT	CODE	DESCRIPTION
0.00	1	RECEIVER HEIGHT ADJUSTMENT
1.00	2	A-WEIGHTED SOUND LEVEL ONLY
0.00	3	HEIGHT ADJUSTMENT FOR PASSENGER CARS (CARS)
8.00	4	HEIGHT ADJUSTMENT FOR HEAVY TRUCKS (HT)
2.30	5	HEIGHT ADJUSTMENT FOR MEDIUM TRUCKS (MT)

EMISSION CURVE: Georgia\_1989

ROADWAY 1 D-12 - SR20 & 175 - EASTBOUND

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	1604.	55.
HT	60.	55.
MT	60.	55.

	-----COORDINATES-----			GRADE
	X	Y	Z	
41201	2117361.	1531505.	928.	
41202	2117627.	1531835.	936.	
41203	2117773.	1532013.	938.	
41204	2118061.	1532359.	939.	
41205	2118213.	1532541.	942.	

ROADWAY 2 D-13 - US411C and SR61 Junction - Westbound

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	377.	55.
HT	14.	55.
MT	14.	55.

	-----COORDINATES-----			GRADE
	X	Y	Z	
41301	2118122.	1532486.	938.	
41302	2117853.	1532161.	939.	
41303	2117673.	1531945.	937.	
41304	2117334.	1531527.	929.	

ROADWAY 3 D-14 - I75N - US411C WESTBOUND EXITRAMP

VEHICLE TYPE	VEHICLES/HOUR	SPEED
--------------	---------------	-------

CARS	5236.	55.
HT	197.	55.
MT	197.	55.

	-----COORDINATES-----			GRADE
	X	Y	Z	
41401	2117182.	1531556.	914.	
41402	2117226.	1531734.	921.	
41403	2117299.	1531907.	920.	
41404	2117524.	1532346.	920.	
41405	2117639.	1532570.	932.	

ROADWAY 4 D-15 - US411C TO I75 SOUTHBOUND EXIT RAMP

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	4710.	55.
HT	177.	55.
MT	177.	55.

	-----COORDINATES-----			GRADE
	X	Y	Z	
41501	2117183.	1532633.	954.	
41502	2117135.	1532478.	934.	
41503	2116991.	1532166.	930.	
41504	2116881.	1531932.	930.	
41505	2116752.	1531607.	933.	
41506	2116681.	1531326.	937.	

ROADWAY 5 D-21 - US411C and Grassdale Rd - Westbound

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	921.	55.
HT	35.	55.
MT	35.	55.

	-----COORDINATES-----			GRADE
	X	Y	Z	
40064	2110369.	1537006.	808.	
40063	2111213.	1536679.	803.	
40062	2112123.	1536327.	825.	
40061	2113089.	1535952.	877.	
40060	2114078.	1535569.	930.	
40059	2114941.	1535235.	976.	
40058	2115719.	1534933.	1017.	
40057	2116376.	1534679.	1042.	
40056	2117040.	1534473.	1053.	
40055	2117592.	1534376.	1052.	
40054	2118021.	1534343.	1045.	
40053	2118606.	1534358.	1027.	
40052	2119424.	1534495.	994.	
40051	2120926.	1534878.	1001.	
40050	2122443.	1535257.	1011.	

ROADWAY 6 D-22 - US411C and Grassdale Rd - Westbound

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	1572.	55.
HT	59.	55.
MT	59.	55.

	-----COORDINATES-----			GRADE
	X	Y	Z	
40065	2122503.	1535294.	1010.	
40066	2120868.	1534888.	1001.	
40067	2119418.	1534519.	994.	
40068	2118906.	1534416.	1013.	
40069	2118268.	1534365.	1038.	
40070	2117690.	1534389.	1051.	
40071	2117076.	1534490.	1053.	
40072	2116385.	1534701.	1042.	
40073	2115709.	1534963.	1016.	
40074	2114897.	1535278.	973.	
40075	2114023.	1535616.	926.	
40076	2113051.	1535993.	874.	
40077	2112081.	1536368.	823.	
40078	2111179.	1536718.	803.	
40079	2110342.	1537042.	808.	

ROADWAY 7 D-25 - US411C and Grassdale Rd - Westbound

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	1630.	55.
HT	70.	55.
MT	70.	55.

	-----COORDINATES-----			GRADE
	X	Y	Z	
40031	2102227.	1542181.	836.	
40039	2104513.	1539938.	788.	
40038	2104898.	1539592.	779.	
40037	2105315.	1539263.	769.	
40036	2105800.	1538933.	761.	
40035	2106269.	1538660.	764.	
40034	2106772.	1538412.	770.	
40033	2107389.	1538160.	778.	
40032	2110317.	1537026.	808.	

ROADWAY 8 D-26 - US411C and Grassdale Rd - Westbound

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	1780.	55.
HT	75.	55.
MT	75.	55.

	-----COORDINATES-----			GRADE
	X	Y	Z	
40040	2110297.	1537059.	808.	
40041	2107435.	1538168.	778.	
40042	2106938.	1538365.	772.	
40043	2106499.	1538568.	767.	
40044	2106127.	1538766.	762.	
40045	2105655.	1539055.	763.	

40046	2105363.	1539258.	768.
40047	2104958.	1539573.	778.
40048	2104623.	1539867.	786.
40049	2102253.	1542189.	836.

ROADWAY 9 NB-07 - Branton Road to I75 - Eastbound

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	1000.	55.
HT	38.	55.
MT	38.	55.

## -----COORDINATES-----

	X	Y	Z	GRADE
50701	2112216.	1530850.	828.	
50702	2112511.	1530829.	831.	
50703	2112804.	1530786.	834.	
50704	2113093.	1530719.	837.	
50705	2113377.	1530635.	839.	
50706	2113659.	1530543.	842.	
50707	2113943.	1530457.	845.	
50708	2114226.	1530371.	848.	
50709	2114510.	1530285.	851.	
50710	2114793.	1530199.	856.	
50711	2115081.	1530128.	865.	
50712	2115377.	1530112.	878.	
50713	2115672.	1530135.	892.	
50714	2115959.	1530207.	903.	
50715	2116231.	1530324.	909.	

ROADWAY 10 NB-08 - Branton Road to I75 - Westbound

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	1423.	55.
HT	54.	55.
MT	54.	55.

## -----COORDINATES-----

	X	Y	Z	GRADE
50801	2116202.	1530379.	908.	
50802	2115932.	1530263.	901.	
50803	2115647.	1530194.	890.	
50804	2115354.	1530175.	875.	
50805	2115062.	1530205.	856.	
50806	2114778.	1530281.	852.	
50807	2114496.	1530366.	843.	
50808	2114215.	1530452.	835.	
50809	2113934.	1530537.	847.	
50810	2113652.	1530622.	841.	
50811	2113371.	1530708.	827.	
50812	2113089.	1530791.	834.	
50813	2112802.	1530855.	831.	
50814	2112511.	1530898.	827.	
50815	2112218.	1530918.	824.	

ROADWAY 11 NB-11 - Old Grassdale - total volume

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	220.	45.
HT	5.	55.
MT	5.	55.

	-----COORDINATES-----			GRADE
	X	Y	Z	
51101	2099638.	1538127.	811.	
51102	2100075.	1538443.	786.	
51103	2100296.	1538749.	789.	
51104	2100527.	1539076.	801.	
51105	2100700.	1539525.	799.	
51106	2100856.	1540035.	799.	
51107	2101385.	1540570.	801.	
51108	2101955.	1541114.	794.	
51109	2102574.	1541569.	790.	
51110	2102956.	1541871.	792.	
51111	2103301.	1542087.	797.	

ROADWAY 12 NB-18 - SR20 spur east of SR20-I75 - total volume

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	1386.	45.
HT	52.	45.
MT	52.	45.

	-----COORDINATES-----			GRADE
	X	Y	Z	
51801	2117295.	1531427.	928.	
51802	2117528.	1531230.	944.	
51803	2117781.	1531038.	961.	
51804	2117963.	1530931.	975.	
51805	2118225.	1530821.	993.	

ROADWAY 13 NB-24 - off of SR61 W of Cline Smith - tot vol assumed

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	220.	35.
HT	5.	35.
MT	5.	35.

	-----COORDINATES-----			GRADE
	X	Y	Z	
52401	2106430.	1534469.	806.	
52402	2106565.	1534689.	807.	
52403	2106699.	1534905.	797.	
52404	2106820.	1535102.	785.	
52405	2107165.	1534922.	772.	
52406	2107472.	1534763.	760.	
52407	2107349.	1534536.	773.	
52408	2107211.	1534297.	782.	
52409	2107058.	1534035.	788.	
52410	2106935.	1533825.	790.	

ROADWAY 14 NB-25 - N-S rd NE of I75 at SR20 - total volume assumed

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	623.	35.
HT	23.	35.
MT	23.	35.

	-----COORDINATES-----			GRADE
	X	Y	Z	
52513	2121791.	1533896.	963.	
52514	2122328.	1533932.	962.	
52515	2123430.	1534335.	957.	
52501	2121002.	1533996.	951.	
52502	2120692.	1534295.	960.	
52503	2120384.	1534591.	980.	
52504	2120101.	1534842.	984.	
52505	2119959.	1534943.	973.	
52506	2119779.	1535214.	959.	
52507	2119772.	1535529.	956.	
52508	2119741.	1535884.	956.	
52509	2119843.	1536195.	935.	
52510	2120301.	1536362.	922.	
52511	2120783.	1537054.	927.	
52512	2121165.	1537046.	944.	

ROADWAY 15 NB-26 - E-W rd NE of I75 at SR20 - total volume

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	3270.	45.
HT	81.	45.
MT	81.	45.

	-----COORDINATES-----			GRADE
	X	Y	Z	
52609	2119339.	1533948.	970.	
52610	2118582.	1533012.	964.	
52611	2118080.	1532409.	938.	
52601	2119643.	1534301.	973.	
52602	2119943.	1534548.	983.	
52603	2120263.	1534708.	991.	
52604	2120764.	1534845.	1003.	
52605	2121248.	1534977.	1000.	
52606	2121767.	1535114.	1001.	
52607	2122173.	1535216.	1007.	
52608	2123118.	1535405.	983.	

ROADWAY 16 NB-27 - Wilkins Road - total volume assumed

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	400.	25.
HT	10.	25.
MT	10.	25.

	-----COORDINATES-----			GRADE
	X	Y	Z	
52701	2110533.	1535101.	820.	
52702	2111384.	1535187.	794.	

52703	2111568.	1535254.	800.
52704	2111718.	1535154.	800.
52705	2111716.	1535037.	798.
52706	2111537.	1534363.	794.
52707	2111253.	1533598.	789.

ROADWAY 17 NB-28 - parallel to and S of Wilkins - tot vol assumed

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	30.	25.
HT	1.	25.
MT	1.	25.

## -----COORDINATES-----

	X	Y	Z	GRADE
52801	2111747.	1535028.	800.	
52802	2112015.	1534961.	811.	
52803	2112311.	1535006.	833.	
52804	2112415.	1535039.	840.	
52805	2112521.	1535112.	838.	
52806	2112652.	1535327.	840.	

ROADWAY 18 NB-29 - small rd off of Wilkins - total volume assumed

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	6.	25.
HT	0.	25.
MT	0.	25.

## -----COORDINATES-----

	X	Y	Z	GRADE
52901	2112579.	1535190.	840.	
52902	2112428.	1535299.	846.	
52903	2112415.	1535393.	844.	

ROADWAY 19 NB\_HIST\_27 -

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	1024.	55.
HT	33.	55.
MT	33.	55.

## -----COORDINATES-----

	X	Y	Z	GRADE
62701	2103904.	1536487.	739.	
62702	2103792.	1536638.	739.	
62703	2103747.	1536799.	738.	
62704	2103731.	1537104.	740.	
62705	2103693.	1537447.	757.	
62706	2103661.	1537739.	767.	
62707	2103628.	1538036.	767.	
62708	2103596.	1538323.	759.	
62709	2103590.	1538665.	753.	
62710	2103590.	1538902.	755.	

ROADWAY 20 NB\_HIST\_28 - Tennessee Road/SR61

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	1476.	55.
HT	47.	55.
MT	47.	55.

## -----COORDINATES-----

	X	Y	Z	GRADE
62808	2106209.	1532677.	806.	
62809	2106994.	1533925.	789.	
62801	2107553.	1534916.	760.	
62802	2107777.	1535343.	757.	
62803	2108098.	1535955.	761.	
62804	2108441.	1536611.	770.	
62805	2108765.	1537216.	775.	
62806	2109111.	1537876.	772.	
62807	2109359.	1538355.	760.	

ROADWAY 21 NB\_HIST\_29 - small rd off of SR61 w of Cline Smith

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	220.	35.
HT	5.	35.
MT	5.	35.

## -----COORDINATES-----

	X	Y	Z	GRADE
62901	2107340.	1534832.	766.	
62902	2106996.	1535010.	778.	
62903	2106577.	1535264.	791.	
62904	2106215.	1535548.	765.	

ROADWAY 22 NB\_HIST\_32 - I75 service road

VEHICLE TYPE	VEHICLES/HOUR	SPEED
CARS	256.	55.
HT	10.	55.
MT	10.	55.

## -----COORDINATES-----

	X	Y	Z	GRADE
63201	2115695.	1530406.	886.	
63202	2115632.	1530710.	877.	
63203	2115711.	1531024.	882.	
63204	2115902.	1531357.	899.	
63205	2115949.	1531831.	936.	
63206	2115973.	1532201.	965.	
63207	2116263.	1532840.	987.	
63208	2116639.	1533517.	1007.	
63209	2116824.	1533841.	1017.	

BARRIER 1 TYPE(S) BARRIER C - 20ft

-----COORDINATES-----						
	X	Y	Z	Z0	DELZ	P
1300	2093293.	1538334.	917.	897.	0.	
1301	2094038.	1538780.	894.	874.		
1302	2094774.	1539240.	845.	825.		
1303	2095456.	1539775.	830.	810.		
1304	2096073.	1540385.	818.	798.		
1305	2096678.	1541008.	834.	814.		
1306	2097283.	1541630.	849.	829.		
1307	2097888.	1542253.	872.	852.		
1308	2098575.	1542778.	890.	870.		
1309	2099374.	1543089.	975.	955.		

THE PREVIOUS STRUCTURE APPLIES ONLY TO ROADWAY NUMBERS

1 2

BARRIER 2 TYPE(S) BARRIER D - 10-30ft

-----COORDINATES-----						
	X	Y	Z	Z0	DELZ	P
1400	2102079.	1542147.	930.	900.	0.	
1401	2101692.	1542465.	887.	857.		
1402	2101256.	1542711.	860.	830.		
1403	2100784.	1542877.	863.	833.		
1404	2100290.	1542958.	903.	873.		
1405	2099790.	1542951.	923.	913.		
1406	2099298.	1542858.	1013.	1003.		
1407	2098831.	1542681.	935.	925.		
1408	2098401.	1542424.	914.	904.		
1409	2098024.	1542099.	902.	892.		

THE PREVIOUS STRUCTURE APPLIES ONLY TO ROADWAY NUMBERS

1 2

BARRIER 3 TYPE(S) BARRIER E - 22ft

-----COORDINATES-----						
	X	Y	Z	Z0	DELZ	P
1500	2100102.	1543171.	945.	923.	0.	
1501	2100324.	1543161.	922.	900.		
1502	2100544.	1543135.	889.	867.		
1503	2100762.	1543093.	882.	860.		
1504	2100977.	1543035.	876.	854.		
1505	2101186.	1542962.	868.	846.		
1506	2101390.	1542875.	864.	842.		
1507	2101587.	1542772.	865.	843.		
1508	2101773.	1542658.	874.	852.		
1509	2101950.	1542531.	883.	861.		

THE PREVIOUS STRUCTURE APPLIES ONLY TO ROADWAY NUMBERS

1 2

BARRIER 4 TYPE(A) BARRIER F - 23ft

	-----COORDINATES-----				DELZ	P
	X	Y	Z	Z0		
1600	2111336.	1536574.	842.	819.	0.	
1601	2111616.	1536466.	834.	811.		
1602	2111897.	1536357.	826.	803.		
1603	2112178.	1536248.	839.	816.		
1604	2112458.	1536140.	853.	830.		
1605	2112739.	1536031.	868.	845.		
1606	2113019.	1535922.	883.	860.		
1607	2113300.	1535814.	898.	875.		
1608	2113580.	1535705.	927.	904.		
1609	2113861.	1535596.	956.	933.		

Receivers

	-----COORDINATES-----		
	X	Y	Z
477	2120568.	1534915.	1025.
478	2121274.	1535132.	1003.
479	2121471.	1535172.	1010.
488	2120316.	1534629.	986.
489	2111695.	1535405.	807.
490	2112381.	1535506.	840.
491	2117629.	1532243.	934.
492	2117536.	1531523.	937.
568	2103285.	1537779.	749.
576	2107208.	1535834.	750.
626	2112971.	1535505.	856.

ALPHA FACTORS - RECEIVER ACROSS, ROADWAY DOWN

1 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0										
2 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0										
3 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0										
4 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0										
5 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0										
6 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0										
7 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0										
8 *	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0										

```

9 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
10 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
11 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
12 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
13 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
14 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
15 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
16 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
17 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
18 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
19 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
20 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
21 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
22 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0

```

## SHIELDING FACTORS - RECEIVER ACROSS, ROADWAY DOWN

```

1 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
2 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
3 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
4 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
5 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
6 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
7 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
8 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
9 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
10 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
11 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
12 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
13 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
14 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   0.0
15 * 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

```

0.0  
 16 \* 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 0.0  
 17 \* 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 0.0  
 18 \* 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 0.0  
 19 \* 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 0.0  
 20 \* 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 0.0  
 21 \* 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 0.0  
 22 \* 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0  
 0.0

RECEIVER LEQ(H) L10  
 477 73.4 75.7

ROADWAY SEGMENT SOUND LEVEL CONTRIBUTIONS EXCEEDING 40.0 DBA

ROADWAY SEGMENT

3 3  
 42.0  
 5 11 12 13 14  
 41.5 46.8 65.4 55.6  
 6 1 2 3 4 5 6  
 58.9 68.6 47.8 45.5 42.4 40.7  
 14 3 4 5 6 7 8 9 10 12 13  
 46.7 45.4 50.1 51.1 45.0 45.2 42.7 41.4 40.2 41.0  
 15 1 2 3 4 5 6 7 8 9 10  
 49.3 43.3 53.1 52.2 56.8 68.2 61.2 53.5 48.3 48.4

RECEIVER LEQ(H) L10  
 478 72.3 74.4

ROADWAY SEGMENT SOUND LEVEL CONTRIBUTIONS EXCEEDING 40.0 DBA

ROADWAY SEGMENT

3 3  
 40.3  
 5 12 13 14  
 43.0 54.7 64.2  
 6 1 2 3 4  
 67.4 56.4 43.8 42.4  
 14 1 2 3 4 5 6 13  
 40.8 41.8 48.1 42.6 43.1 41.7 41.0  
 15 1 2 3 4 5 6 7 8 9 10  
 46.4 41.2 49.8 46.6 48.6 54.5 63.6 66.4 55.2 52.8

RECEIVER LEQ(H) L10

479            72.6    74.7

ROADWAY SEGMENT SOUND LEVEL CONTRIBUTIONS EXCEEDING    40.0 DBA

ROADWAY    SEGMENT

5	12	13	14							
	42.2	52.5	64.6							
6	1	2	3	4						
	67.8	54.3	42.9	41.7						
14	1	2	3	4	5	6	13			
	41.2	42.5	48.3	41.5	41.6	40.2	40.7			
15	1	2	3	4	5	6	7	8	9	10
	45.7	40.7	49.1	45.5	47.3	52.4	59.0	67.9	58.6	54.5

RECEIVER    LEQ(H)    L10

488            75.6    78.8

ROADWAY SEGMENT SOUND LEVEL CONTRIBUTIONS EXCEEDING    40.0 DBA

ROADWAY    SEGMENT

3	3	4								
	43.0	41.1								
4	2									
	40.5									
5	11	12	13	14						
	42.9	49.0	67.2	52.1						
6	1	2	3	4	5	6	7			
	55.0	68.3	50.1	47.1	43.6	41.7	40.3			
14	3	4	5	6	7	8	9	10		
	46.5	46.8	57.8	69.6	48.1	46.5	42.8	40.8		
15	1	2	3	4	5	6	7	8	9	10
	51.4	44.7	55.6	56.9	66.7	68.5	55.5	50.7	46.4	47.0

RECEIVER    LEQ(H)    L10

489            59.3    61.0

ROADWAY SEGMENT SOUND LEVEL CONTRIBUTIONS EXCEEDING    40.0 DBA

ROADWAY    SEGMENT

5	1	2	3	5						
	46.6	42.1	40.6	41.7						
6	9	10	12	13	14					
	41.0	44.1	43.4	44.6	48.6					
7	8									
	48.4									
8	1									
	48.6									
16	1	2	3	4	5					
	45.3	46.8	48.6	43.5	45.0					

RECEIVER    LEQ(H)    L10

## ROADWAY SEGMENT

5	1	2	3	4
	54.7	50.7	44.5	40.6
6	7	8	9	10
	43.2	47.1	53.1	56.8
9	1	2		
	40.9	40.2		

RECEIVER	LEQ(H)	L10
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491	73.9	75.9
-----	------	------

ROADWAY SEGMENT SOUND LEVEL CONTRIBUTIONS EXCEEDING 40.0 DBA

## ROADWAY SEGMENT

1	1	2	3	4			
	55.7	57.8	61.4	53.4			
2	1	2	3				
	53.7	55.0	52.0				
3	1	2	3	4			
	54.8	57.4	70.1	67.3			
4	1	2	3	4	5		
	56.0	59.1	55.9	54.9	51.8		
5	6	7	8	9	10		
	41.4	41.6	40.8	41.8	41.9		
6	1	2	3	4	5	6	7
	41.7	43.9	44.2	44.4	43.8	42.0	40.8
9	1	2	3	4			
	56.1	51.9	48.8	46.6			
10	1	2	3				
	45.7	47.7	50.7				
11	1	2	3	4			
	47.5	46.2	43.0	43.2			
13	1	2	3				
	46.5	55.0	60.6				
14	6	7					
	40.5	41.1					

RECEIVER	LEQ(H)	L10
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492	71.5	73.7
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ROADWAY SEGMENT SOUND LEVEL CONTRIBUTIONS EXCEEDING 40.0 DBA

## ROADWAY SEGMENT

1	1	2	3	4	
	66.5	55.6	53.5	47.0	
2	1	2	3		
	45.1	47.5	58.9		
3	1	2	3	4	
	61.1	60.1	60.9	53.9	
4	1	2	3	4	5
	50.0	54.8	54.9	56.6	55.1
6	2	3	4	5	6
	41.3	41.3	41.6	41.4	40.1
7	11				
	40.7				
8	1	2			
	42.3	40.9			

9	1	2	3	4
	52.6	49.4	46.9	44.8
10	1	2	3	
	43.9	45.7	48.2	
11	1	2	3	4
	59.6	55.6	49.6	48.2
13	1	2	3	
	44.4	52.0	55.2	

RECEIVER      LEQ(H)      L10  
 568              41.6      42.4  
 NO ROADWAY SEGMENTS EXCEED      40.0 DBA

RECEIVER      LEQ(H)      L10  
 576              47.3      48.2  
 NO ROADWAY SEGMENTS EXCEED      40.0 DBA

RECEIVER      LEQ(H)      L10  
 626              64.0      65.9  
 ROADWAY SEGMENT SOUND LEVEL CONTRIBUTIONS EXCEEDING      40.0 DBA

ROADWAY      SEGMENT

5	1	2	3	4	
	55.6	56.3	47.8	42.9	
6	6	7	8	9	10
	41.7	45.5	50.5	58.5	57.2
9	1	2	3	4	
	42.0	41.2	40.8	40.6	
10	3				
	40.3				
13	2				
	41.0				



## **Appendix C**

### **US 411/I-75 Interchange Traffic Analysis Summary**

# Memorandum

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US 411 Connector  
Project EDS-500(5)  
Bartow County  
P.I. No. 661950

## US 411 Connector/I-75 Interchange Traffic Analysis Summary

In Fall, 2007, a Georgia DOT Value Engineering team created a revised preferred alternative for the US 411 Connector Project. Although the alignment of the “new” preferred alternative (Alternative D-VE) has not changed and the overall footprint of the project has been minimized, the I-75/US 411 Connector/SR 20 Interchange design and configuration has been modified from the interchange configuration presented in the FSEIS. Jordan, Jones & Goulding has prepared complete traffic operations analyses for the Alternative D-VE interchange design/configuration. Those analyses and their results are described in this memorandum.

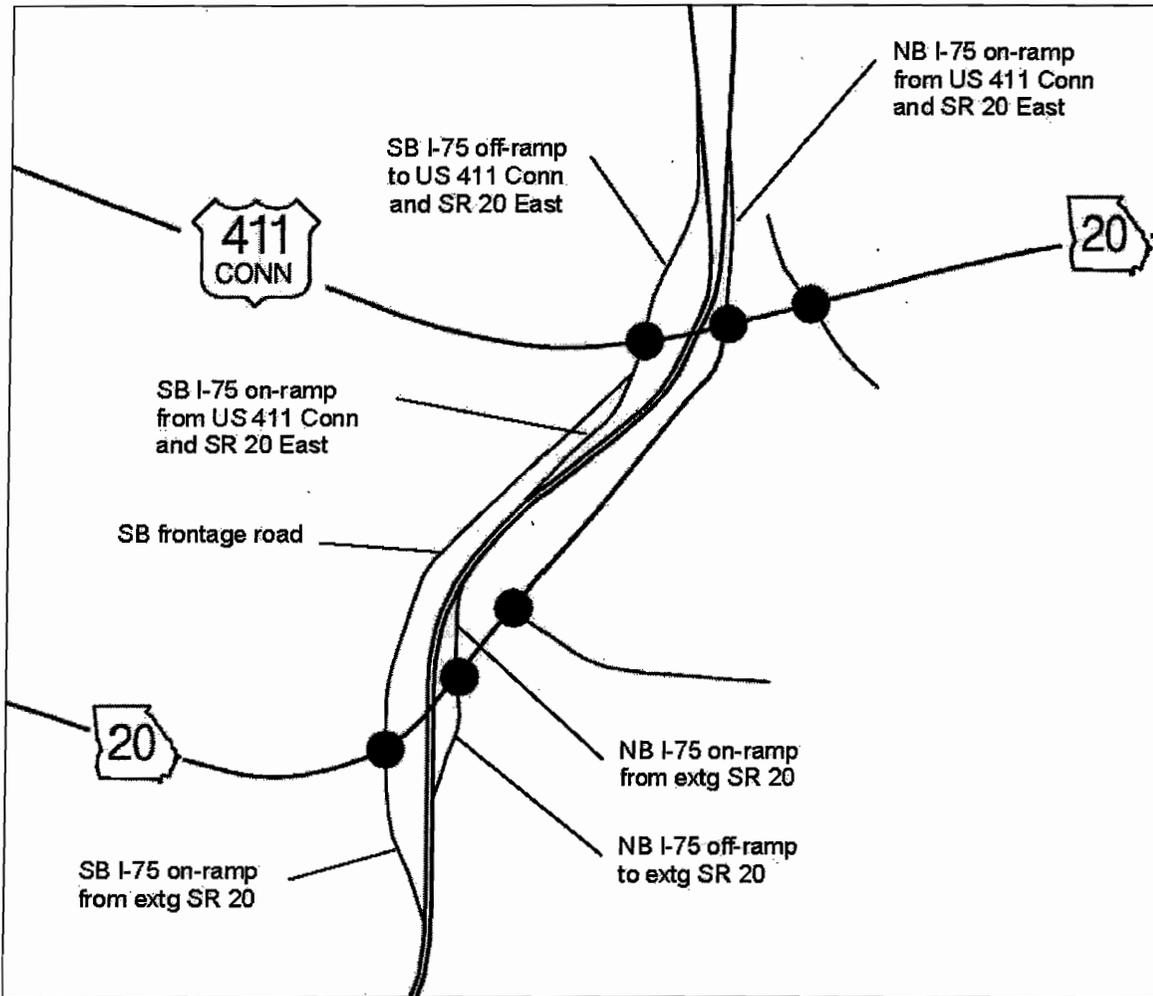
### I-75/US 411 Connector/SR 20 Interchange Configuration

The proposed Alternative D-VE new/modified interstate access is located on I-75 north of the existing SR 20 interchange, as shown in **Figure 1**. The new/modified access comprises the following elements:

- 3/4-diamond at US 411 Connector–SR 20 E. (There is no I-75 NB off-ramp: the connection from NB I-75 to US 411 Conn [WB] is via the existing SR 20 off-ramp, a one-mile EB segment of existing SR 20, and a left turn at the signalized US 411 Conn/NB I-75 ramp terminal intersection.)
- 3/4-diamond at existing SR 20. (There is no SB off-ramp: the connection from SB I-75 to SR 20 W is via the US 411 Conn off-ramp and a one-way SB frontage road to the signalized SR 20 W/SB I-75 ramp terminal intersection.)
- The US411 Connector links directly to the east-west segment of existing SR 20 on the east side of I-75; existing SR 20 to/from the west/south “tees” in at the signalized NB I-75 on-ramp terminal intersection.

An interchange plan showing interchange configuration, ramp/roadway location, lane configuration, and traffic controls is provided in **Attachment 1**.

Figure 1: I-75/US 411 Connector/SR 20 Interchange Configuration



**Traffic Forecasts**

A complete set of daily and peak freeway mainline, freeway ramp, and ramp terminal intersection counts was made in 2005. Daily and p.m. peak hour traffic forecasts for Alternative D-VE for the original project Design Year (2030) were prepared using the US 411 Connector sub-area (Bartow County) traffic forecasting model originally developed and used for the original US 411 Connector traffic analyses. The Alternative D-VE 2030 volumes were extrapolated to the new 2034 Design Year using an average annual traffic growth rate computed using 2010 and 2030 forecasts from the US 411 Connector sub-area model. Traffic volumes for the 2034 a.m. peak hour traffic were estimated using the p.m. peak hour forecasts and the 2005 counts.

## **Alt D-VE Interchange Traffic Analysis**

### **Page 3**

Design Year (2034) p.m. peak hour intersection traffic volumes are compiled in **Figure 2**, and Design Year p.m. peak hour freeway ramp and mainline traffic volumes are compiled in **Figure 3**. Design Year (2034) a.m. peak hour intersection traffic volumes are compiled in **Figure 4**, and Design Year a.m. peak hour freeway ramp and mainline traffic volumes are compiled in **Figure 5**.

### **Design Alternative Development and Analysis Approach**

An iterative approach was used to define the specific ramp, mainline, arterial, and intersection lane configurations and traffic controls to incorporate in the Alternative D-VE interchange design.

The first step of the process was to prepare level of service (LOS) and queuing analyses of the interchange design and configuration as originally developed by the Value Engineering team. LOS for freeway ramps and mainline segments was determined using Highway Capacity Manual procedures and the HCS software, and LOS for signalized intersections was determined using the Synchro intersection analysis software. (LOS definitions are compiled in **Attachment 2**.) Queuing at signalized intersection was evaluated using a CORSIM simulation model.

Based on a review of the LOS and queuing analysis results, several modifications of the original interchange design/configuration were identified:

- The specific intersection lane configurations necessary to support adequate LOS and queuing conditions were identified (these lane configurations are shown in the peak hour intersection volume diagrams (see **Figure 2** and **Figure 4**).
- In order to provide adequate LOS on the US 411 Connector's southbound I-75 on-ramp and in the 3-lane ramp influence area on southbound I-75, the on-ramp was extended south as an additional/auxiliary lane to and through the existing SR 20 Interchange, where it would continue into the existing fourth southbound lane on I-75 south of existing SR 20. (In other words, the fourth southbound lane on I-75 south of existing SR 20 would be extended north to the new US 411 Connector southbound on-ramp.)
- The initial queuing (simulation) analysis indicated that the close proximity of the existing SR 20 intersections at the northbound I-75 ramp terminal and SR 20 Spur could create significant queuing problems. In order to prevent ramp terminal intersection queues from spilling back up the existing SR 20 northbound I-75 off-ramp to the mainline, a third eastbound lane was added to SR 20 from the northbound I-75 off-ramp to and through the SR 20 Spur intersection.

All of the above refinements and modifications have been incorporated in the interchange designs presented and the analyses reported in this memorandum.

## **Alt D-VE Interchange Traffic Analysis**

**Page 4**

### **Traffic Operations Analysis Results**

Design Year (2034) P.M. Peak Hour traffic operations analysis results are compiled in **Figure 6**, and Design Year A.M. Peak Hour traffic operations analysis results are compiled in **Figure 7**.

As shown in the Figures, all SR 20 signalized intersections operate at LOS C or better in the 2034 a.m. and p.m. peak hours, and the two I-75 ramp terminal intersections on the US 411 Connector operate at LOS D or better. Similarly, each of the six SR 20 and US 411 Connector ramp junctions on I-75 (i.e., the points on the freeway where on-ramps and off-ramps connect to I-75; refer to Figures 6 and 7) operate at LOS C or D in the 2034 a.m. and p.m. peak hours, with the exception of the US 411 Connector northbound on-ramp in the p.m. peak hour (LOS F) and southbound off-ramp in the a.m. peak hour (LOS F). On both of these ramps, peak volumes are modest, and in each case the LOS F conditions at the ramp junction area are attributable directly to heavy through volumes and inadequate capacity on the I-75 mainline.

Figure 2: 2034 P.M. Peak Hour Intersection Traffic Volumes

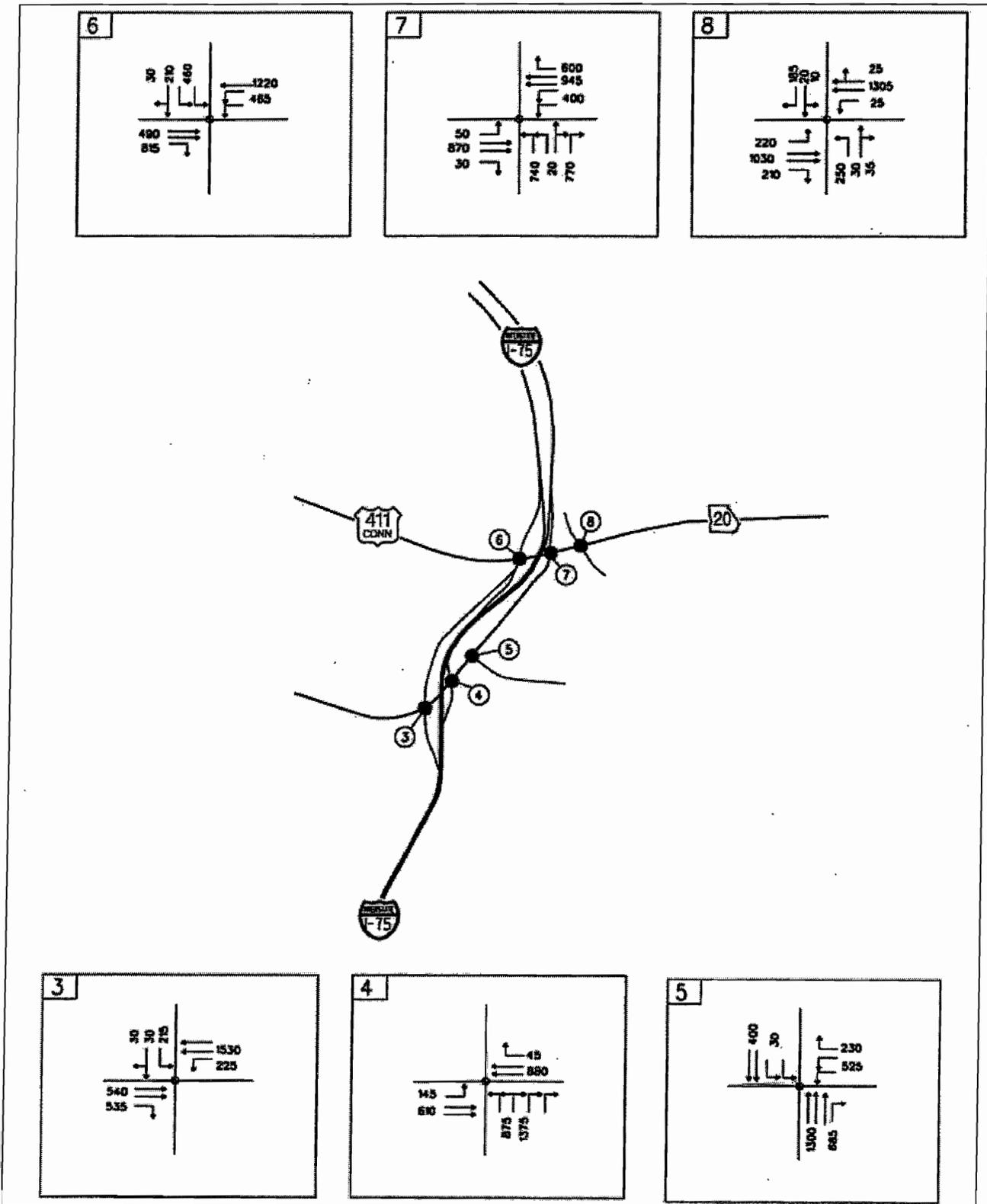


Figure 3: 2034 P.M. Peak Hour Interstate Ramp and Mainline Traffic Volumes

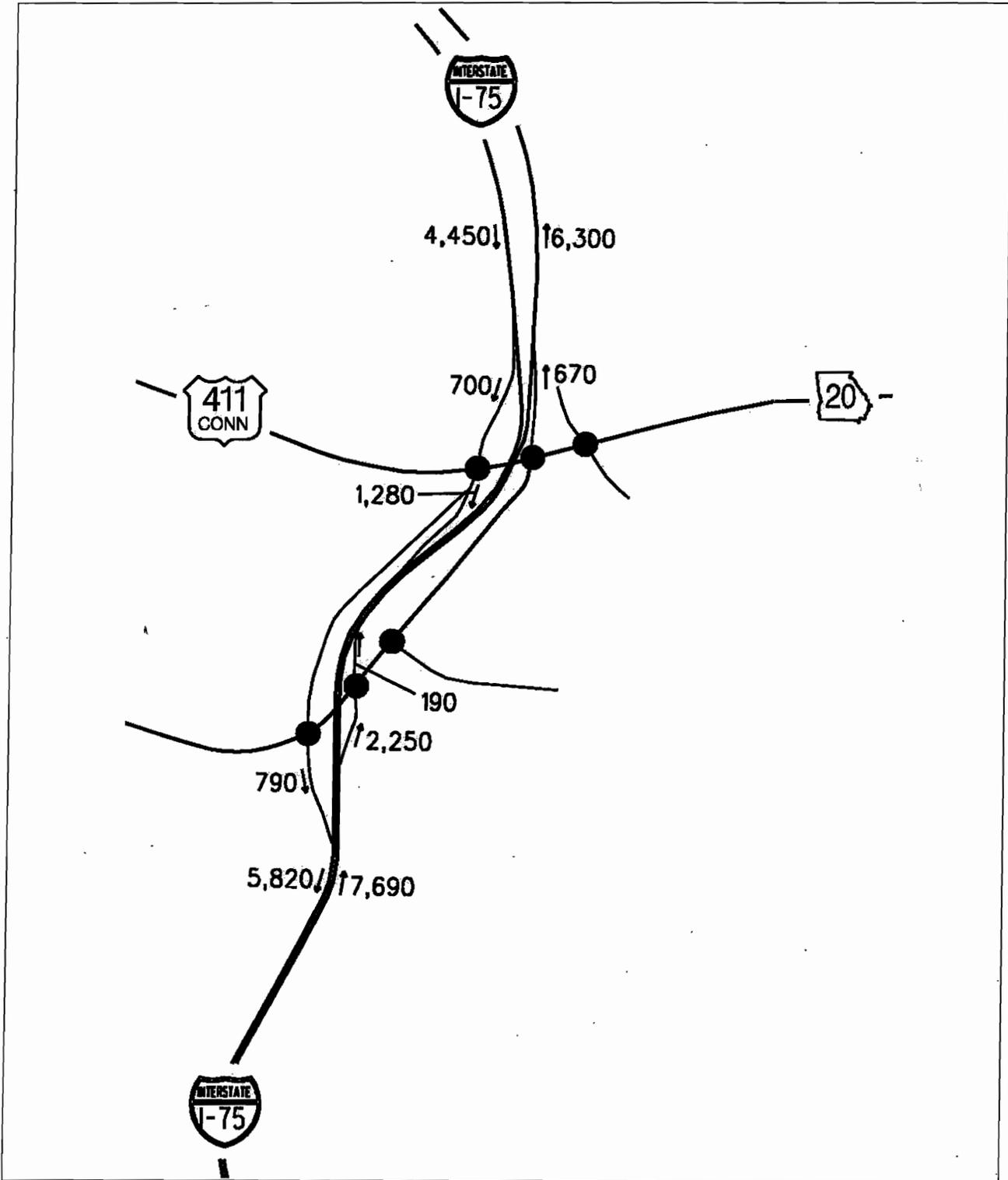


Figure 4: 2034 A.M. Peak Hour Intersection Traffic Volumes

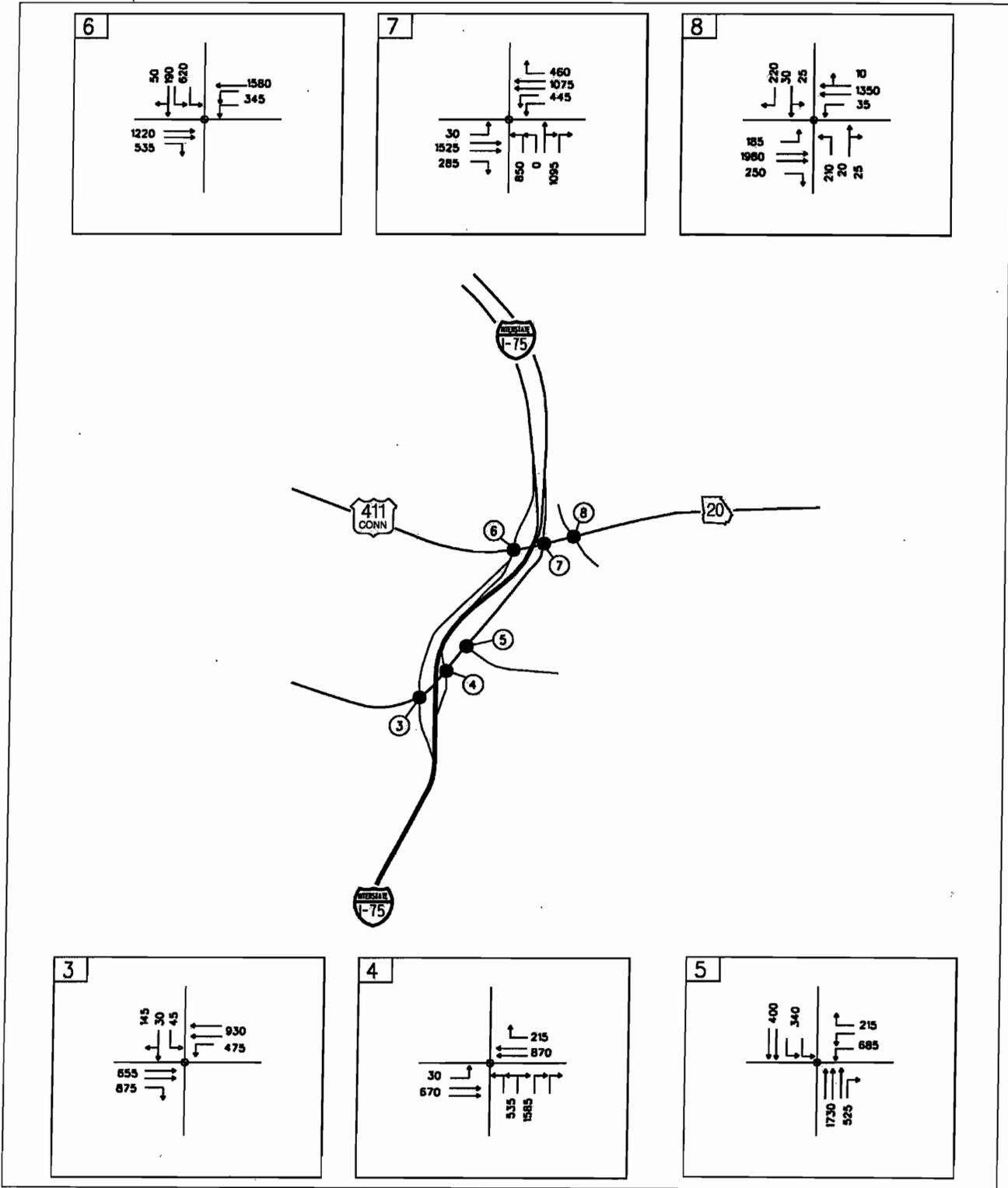


Figure 5: 2034 A.M. Peak Hour Interstate Ramp and Mainline Traffic Volumes

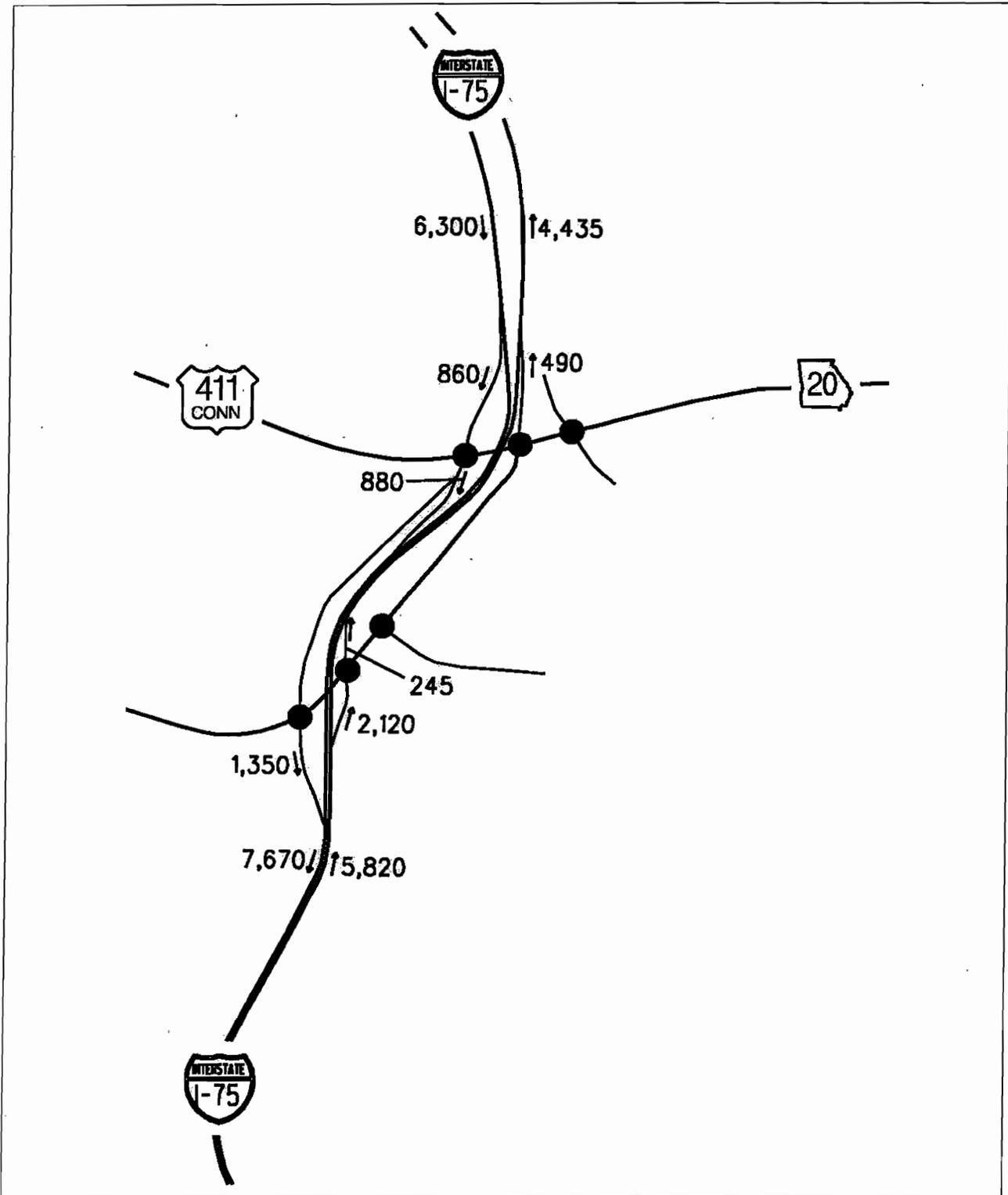


Figure 6: 2034 P.M. Peak Hour Level of Service (LOS)

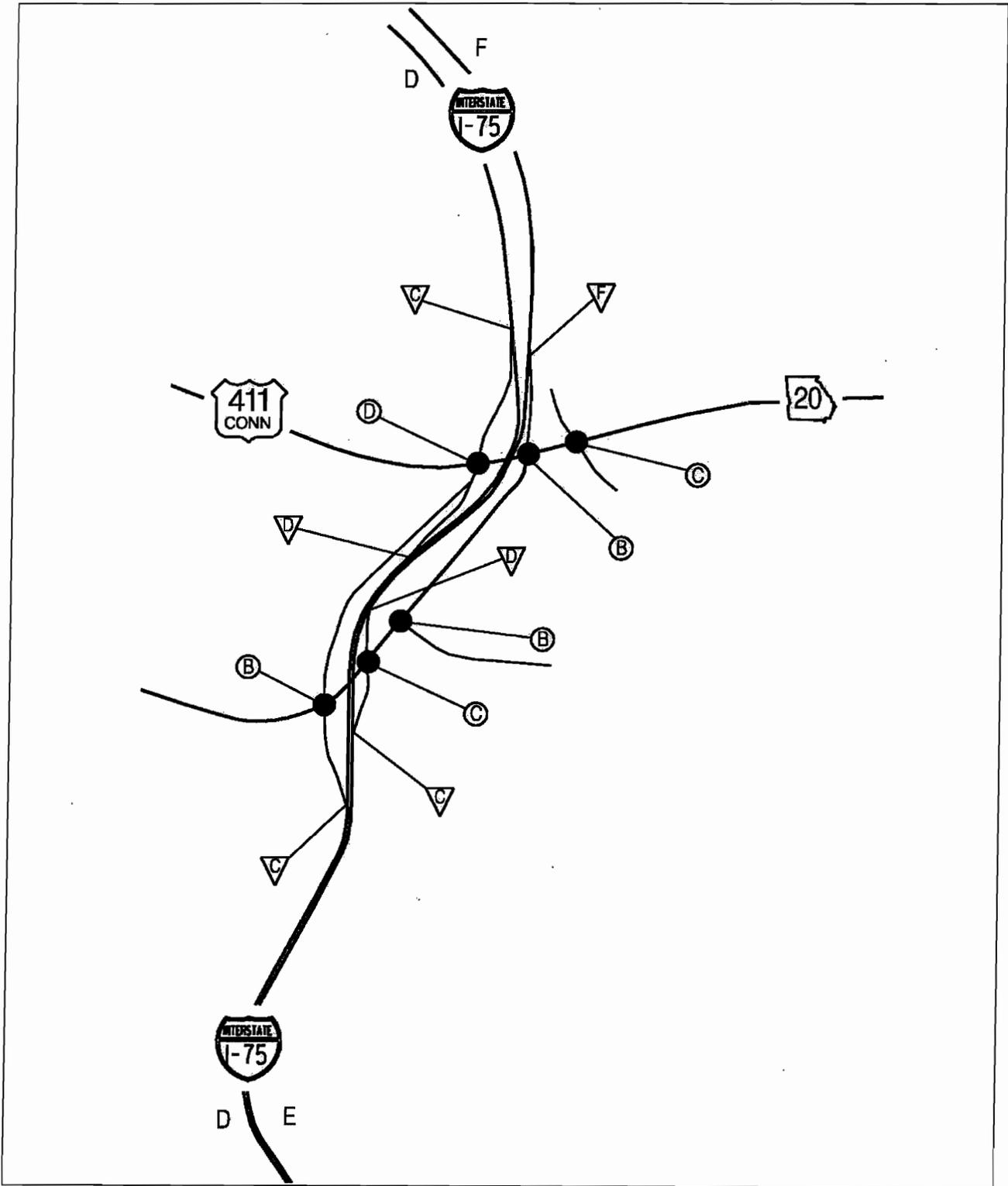
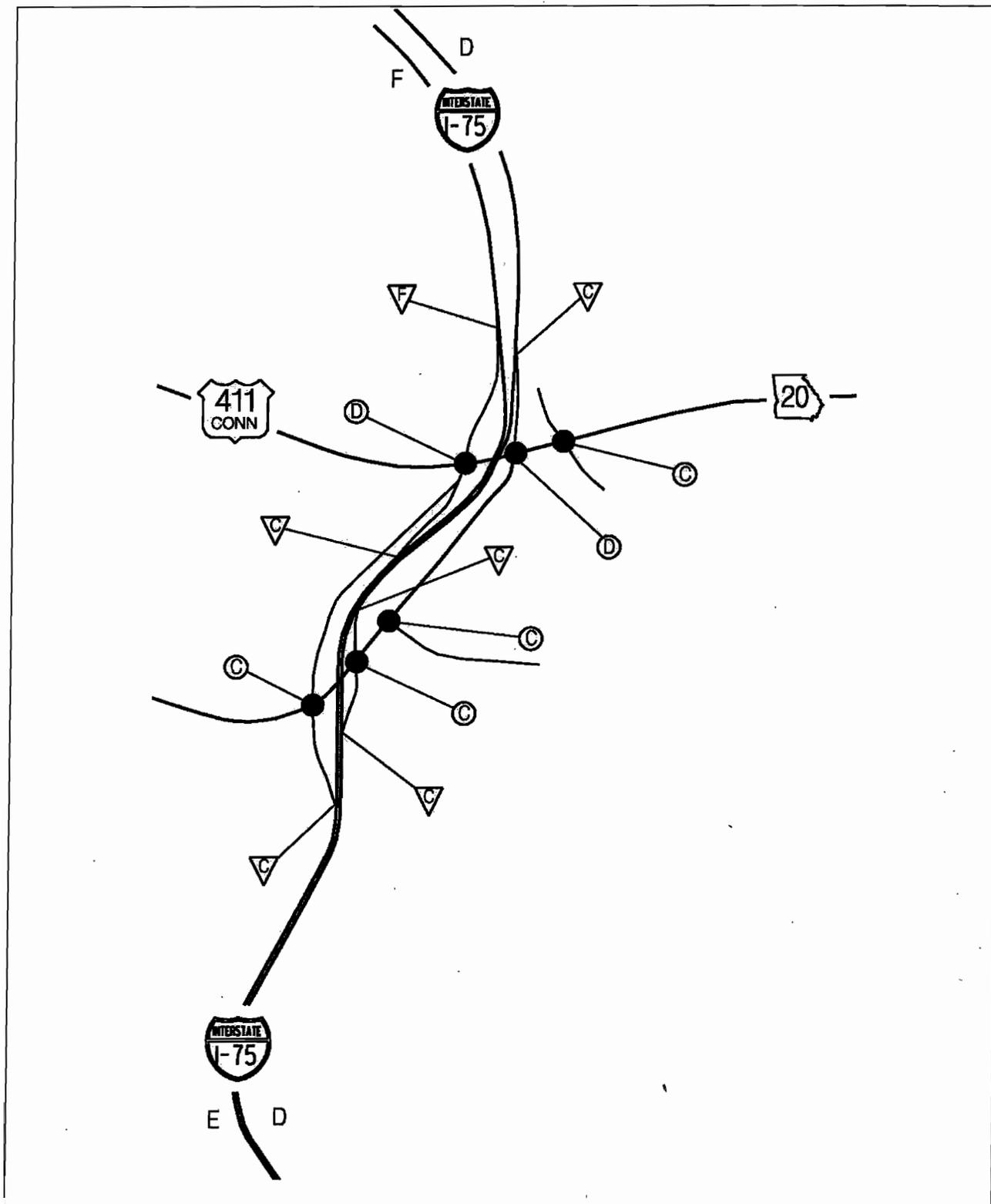
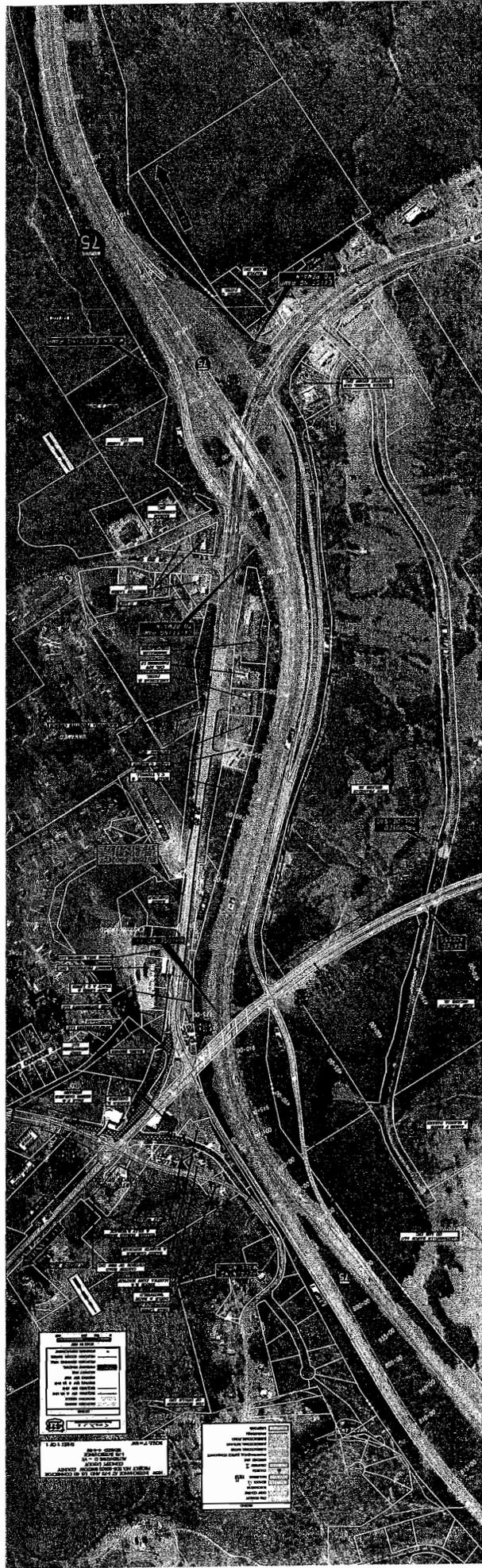


Figure 7: 2034 A.M. Peak Hour Level of Service (LOS)



# Attachment 1



## Attachment 2

### Attachment 2: Traffic Operations Analysis Methodology

The traffic operations analyses prepared for the alternatives analysis were based on the “Level of Service” (LOS) determined for each roadway element (freeway mainline and ramps, signalized and stop-controlled intersections, etc.).

The Highway Capacity Manual, published by the Transportation Research Board and used nationwide, defines LOS as follows:

*“Level of Service” (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.*

*Six LOS are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with A representing the best operating conditions and F the worst. Each level of service represents a range of operating conditions and the driver’s perception of those conditions. Safety is not included in the measures that establish LOS.”<sup>1</sup>*

LOS is used by planners, engineers, and the lay public alike to assess traffic conditions, to identify problems, and to develop improvements and “solutions.” In addition, local governments and other public agencies responsible for transportation use LOS to set standards for traffic conditions. Georgia DOT indicates LOS D is permissible for traffic operations in highly developed urbanized areas.<sup>2</sup>

LOS is determined for the peak 15 minutes of a 1-hour period. In urban areas, the 1-hour period for which LOS is determined is usually the “weekday peak hour” (i.e., the hour when traffic volumes are greatest). The traffic volumes on which LOS analyses are based can be traffic forecasts or actual traffic counts.

In addition to traffic volumes, LOS is based on roadway characteristics (numbers and configuration of lanes, lane width, roadway grade, etc.) and the types of traffic controls. As implied in the definition above and outlined below, LOS is determined differently for different types of roadways and intersections:

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<sup>1</sup> *Highway Capacity Manual (HCM2000)*, Transportation Research Board, National Research Council, 2000, p. 2-2

<sup>2</sup> *GDOT Design Policy Manual*, Table 6.3 GDOT Design Standards for Arterial Roadways, and Table 6.4 GDOT Design Standards for Freeways

## Attachment 2

Signalized intersections: LOS is determined for the intersection as a whole, and is based on average delay for vehicles entering the intersection. LOS D conditions exist when average control delay – i.e., delay attributable to the traffic signal – is less than 55 seconds per vehicle. LOS criteria are as follows:

LOS	control delay
A	$\leq 10$ sec/veh
B	10-20 sec/veh
C	20-35 sec/veh
D	35-55 sec/veh
E	55-80 sec/veh
F	$> 80$ sec/veh

Source: HCM2000, Exh 16-2

Two-lane highways: LOS is based on average travel speed and reflects the extent of motorists' ability to pass slower-moving traffic. LOS D conditions exist when average travel speed exceeds 40 mph. LOS criteria are as follows:

LOS	average travel speed
A	$> 55$ mph
B	50-55 mph
C	45-50 mph
D	40-45 mph
E	$\leq 40$ mph
F	[flow rate $>$ capacity]

Source: HCM2000, Exh 20-2

Freeway mainline: LOS is based on traffic density and reflects the extent of motorists' freedom to maneuver within the traffic stream. LOS D conditions exist when traffic density is less than 35 vehicles per mile per lane. LOS criteria are as follows:

LOS	maximum traffic density
A	$\leq 11$ veh/mi/lane
B	11-18 veh/mi/lane
C	18-26 veh/mi/lane
D	26-35 veh/mi/lane
E	35-45 veh/mi/lane
F	$> 45$ veh/mi/lane

Source: HCM2000, page 23-3

## Attachment 2

Freeway ramp junctions<sup>3</sup>: LOS is based on traffic density in the ramp influence area and reflects the extent of motorists' ability to move freely onto or off of the freeway. For single-lane ramps, LOS D conditions exist when traffic density in the ramp influence area is less than 35 vehicles per mile per lane. LOS criteria are as follows:

LOS	maximum traffic density
A	≤ 10 veh/mi/lane
B	10-20 veh/mi/lane
C	20-28 veh/mi/lane
D	28-35 veh/mi/lane
E	> 35 veh/mi/lane
F	[demand > capacity]

Source: HCM2000, Exh 25-4

Freeway weave sections<sup>4</sup>: LOS is based on traffic density in the weave section, and reflects the level of traffic "turbulence" caused by the weaving. LOS D conditions exist when traffic density in the weave section is less than 35 vehicles per mile per lane. LOS criteria are as follows:

LOS	maximum traffic density	
	freeway mainline	collector-distributor rdwy
A	≤ 10 veh/mi/lane	≤ 12 veh/mi/lane
B	10-20 veh/mi/lane	12-24 veh/mi/lane
C	20-28 veh/mi/lane	24-32 veh/mi/lane
D	28-35 veh/mi/lane	32-36 veh/mi/lane
E	35-43 veh/mi/lane	36-40 veh/mi/lane
F	> 43 veh/mi/lane	> 40 veh/mi/lane

Source: HCM2000, Exh 24-2

<sup>3</sup> "Ramp junctions" are the points on the freeway where on-ramps and off-ramps connect; the "ramp influence area" is the portion of the freeway affected by merging or diverging at the ramps, and comprises the outer two lanes of the freeway within 1,500 ft of the ramp.

<sup>4</sup> "Weaving" is the crossing of two traffic streams traveling in the same general direction; the "weave section" comprises the lanes in which weaving occurs.

## **Appendix D**

### **PM 2.5 Hot-Spot Analysis Addendum**

## Appendix D

### PM<sub>2.5</sub> Hot-Spot Analysis Addendum

The following addendum has been prepared to address the project operational changes associated with the D-VE Alternative for the US 411 Connector project. The initial preferred alternative (Alternative D-Avoidance/Minimization) was evaluated for its consistency with state and federal air quality goals, including carbon monoxide (CO), ozone, fine particulate matter (PM<sub>2.5</sub>) and mobile source air toxics (MSATs). The US 411 Connector project has been included in the ARC updated conformity modeling for both ozone and PM<sub>2.5</sub> in the 2030 Plan and the 2008-2013 TIP. The USDOT made a conformity determination on the Envision6 2030 RTP / 2008-2013 TIP on October 10, 2007. Alternative D-VE (the modified preferred alternative) follows the same alignment as the initial preferred alternative, and provides a still improved and more direct connection to I-75. Alternative D-VE provides the same connectivity on essentially the same alignment and provides similar relief to the existing roadway network. The D-VE Alternative is not considered to represent a significant change in the project's original design concept and scope; therefore, a new conformity determination is not required per 40 CFR 93.104(d). As mentioned previously, the evaluation of the air quality has been updated assuming an opening year of 2014 and a design year of 2034. The US 411 Connector is included in and consistent with the regional emissions analysis, and the change in open to traffic year (from 2010 to 2014) has not changed the initial year in which the project was modeled (2020) in the regional emissions analysis.

Additionally, all intersections along existing SR 20 and US 41 will operate at level-of-service (LOS) D or better in both D alternatives (Alternative D-Avoidance/Minimization and Alternative D-VE) in design year 2034. Under 2034 no-build conditions, the LOS at these intersections along SR 20 will operate at LOS E or F. Therefore, either alternative (Alternative D-VE or Alternative D-Avoidance/Minimization) would provide enough benefit to relieve congestion along the existing SR 20 route as well as meet the proposed project's stated need and purpose.

It has been determined that the D-VE Alternative would continue to meet the criteria set forth in 40 CFR 93.123(b)(1) for projects of air quality concern because of the effects it has to I-75. The US 411 Connector is a new highway, with projected diesel vehicle volumes well below those cited as an example under the above regulation. However, the proposed project would increase the number of diesel trucks on I-75 at and south of the proposed new interchange because it would divert truck traffic from other facilities further south in the project area that would currently enter I-75.

The proposed I-75/SR 20 interchange was originally evaluated for 2010 (initial open to traffic date), with total daily truck traffic for I-75 southbound forecasted to be 22,770, an increase of 1,310 trucks over the no-build condition. The project open to traffic date has since been shifted out to 2014, with total daily truck traffic for I-75 southbound forecasted to be 24,260 in the build condition, an increase of 2,160 trucks over the 2014 no-build condition. This addendum is required to address the revised traffic years and the revised selected alternative, D-VE.

## ***Transportation and Traffic Conditions***

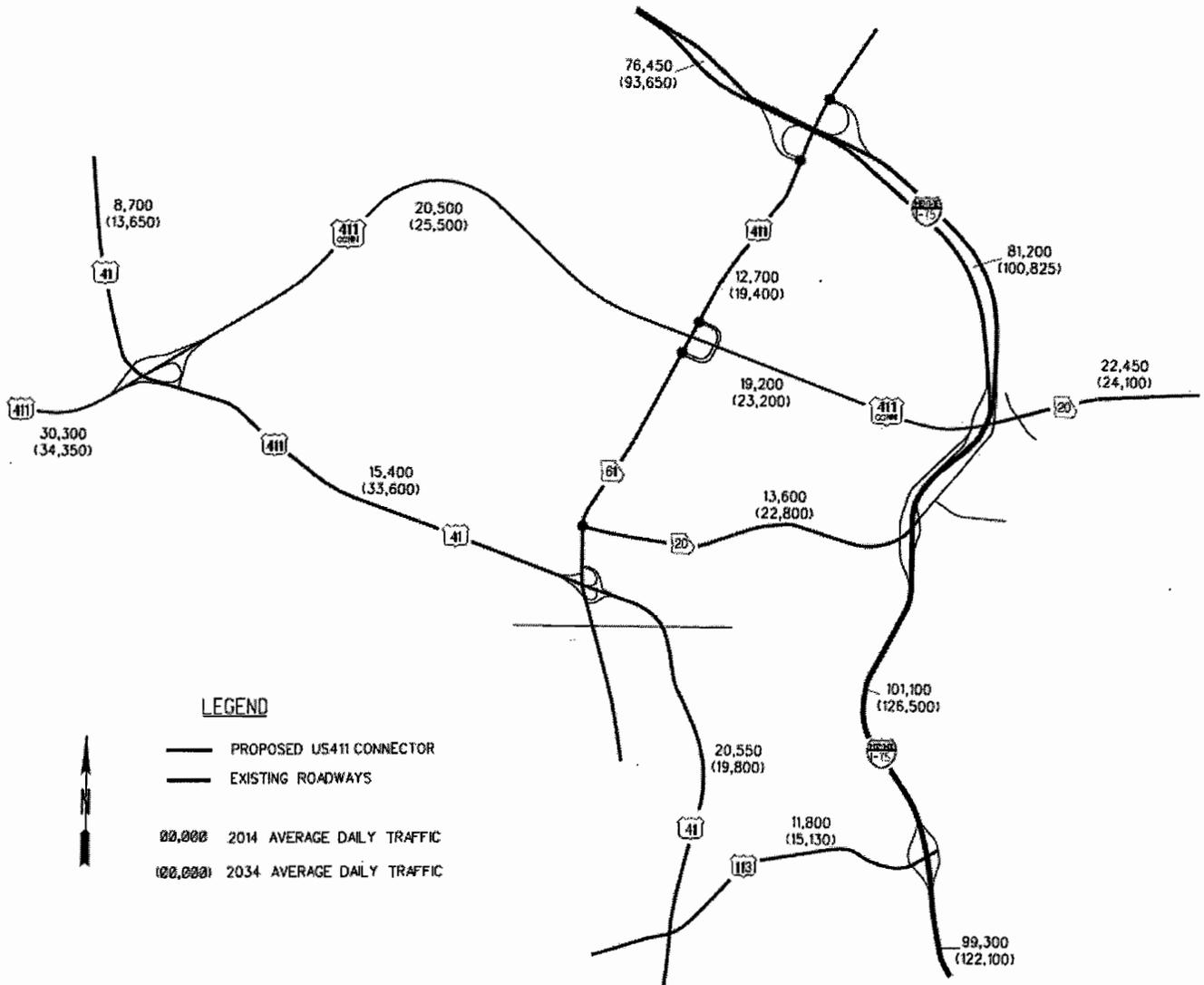
As noted in the original PM<sub>2.5</sub> Project-Level Conformity Determination, between 1984 and 2002, AADT for the US 411 corridor increased 26- to 99-percent, and the SR 3/US 41 interchange is causing noticeable delays in traffic. 2014 traffic data for the build condition is presented in **Figure 1**, as 2014 would be the worst-case scenario (i.e., year of peak emissions) for PM<sub>2.5</sub>. Truck traffic on the proposed US 411 Connector would actually be re-routed onto the new facility from other roadways in the project area, and there is only a net increase of 2,160 trucks (AADT) in the greater project area. Under the 2014 build condition, the number of trucks on the proposed US 411 Connector facility is predicted to be 4,300 (refer to **Table 1** for a summary of truck traffic and AADT under the build and no-build conditions), which is well below the 10,000 trucks per day example that is discussed in the March 10, 2006 transportation conformity rule that establishes requirements for PM<sub>2.5</sub> and PM<sub>10</sub> project-level conformity determinations. While the proposed project would increase the number of trucks on I-75 south of the proposed new interchange under the build condition, it is important to note that the truck percentage would only increase by 1 percent (from 23 percent to 24 percent) under the build and no-build conditions, and the increase in trucks in this location is mainly because trucks would shift to the new US 411 Connector facility. Therefore, the apparent increase in trucks on I-75 south of the proposed new interchange is due to the fact that trucks are entering I-75 sooner, as opposed to being more dispersed among the various existing facilities and entering I-75 further to the south.

While there is a slight increase in truck numbers on I-75 south of the proposed new US 411 Connector interchange under the 2014 build condition, it is also important to note that the proposed project would remove trucks and reduce AADT along the current facilities in the study area. For example, in 2014, the number of trucks would be reduced by 2,300 on SR 20 just west of its interchange with I-75 under the build condition and AADT would drop by 13,500. The number of trucks on US 41/SR 3 would be reduced by 1,940 and AADT would be reduced by 14,450 just west of the SR 61 interchange under the 2014 build condition. The number of trucks on SR 113 would be reduced by 280 and AADT would be reduced by 3,350 under the 2014 build condition.

These major routes would experience reduced truck traffic and AADT under the build condition because the proposed project would provide an improved connection to I-75. Therefore, the US 411 Connector would not induce an increase in the percentage of trucks in the project area, but is diverting truck traffic, consistent with its stated purpose and need. Please refer to Table 1 for a summary of truck traffic and AADT under the build and no-build conditions.

While the Alternative D-VE does not include the direct freeway-to-freeway ramps (connecting the US 411 Connector to/from the west with I-75 to/from the south) that were part of Alternative D-Avoidance/Minimization, it still provides a more direct and free-flowing facility compared to the congested roadways in the existing corridor. Alternative D-VE still benefits air quality in the project area by reducing the number of starts/stops and shifting required by trucks and other traffic, both of which contribute to emissions on existing facilities in the project area.

**Figure 1**  
**Build and Design Year Daily Traffic Volumes**



The US 411 Connector, under either the original concept alternative or the new Alternative D-VE, both meet the purpose and need of this project by providing a more direct link between US 411 to the west and I-75 to the east. The original alternate was expected to attract 32,900 vehicles per day (vpd) and Alternative D-VE would attract 24,400 vpd away from the existing roadway network. Although Alternative D-VE would attract approximately 25 percent less daily vehicles than the original alternative, 24,400 vehicles constitutes a substantial number of daily trips that would no longer need to utilize the overburdened existing roadways. Alternative D-VE would still provide an improved and more direct connection between US 411 to the west and I-75 to the east. Without this additional connection, US 41, SR 61, and SR 20 are expected to experience LOS F conditions in the design year. Under both the original alternative as well as Alternative D-VE, these roadways are expected to experience LOS D or better conditions in the design year. Thus, the I-75 interchange configuration differences associated with the original concept alternative and Alternative D-VE do not affect this project's ability to improve traffic conditions in the corridor. For these reasons, the current proposed design does not represent a significant change from the concept and scope of the project originally presented in the FSEIS.

The US 411 Connector revised open to traffic date of 2014 is considered the worst-case year for emissions because the regional emissions trends are showing improving conditions over time as the various PM<sub>2.5</sub> control programs are being implemented. Under the 2014 build condition, the number of trucks on I-75 south of the proposed US 411 Connector interchange is predicted to be 24,260, versus 22,100 under the no-build, an increase of 2,160 trucks. Under the 2010 build/no-build scenarios, truck traffic in the same area was 22,770 versus 21,460, an increase of 1,310. Therefore the difference between the original 2010 assessment and this updated 2014 assessment is 850 trucks per day. Under the original assessment the 2010 worst-case scenario was compared to three surrogate sites. The 2014 traffic volumes for the D-VE alternative were also compared to these same surrogate sites and were all found to be well below the volumes identified at the surrogate sites. Therefore, even with a later open to traffic date, the conclusions made in the PM<sub>2.5</sub> qualitative hot spot analysis are still applicable for the D-VE alternative. The three surrogate sites are discussed in detail in the PM<sub>2.5</sub> hot spot analysis on pages 13 through 26.

**Table 1**  
**2010 Build (original open to traffic) vs. No-Build ADT Compared to**  
**2014 Build (revised open to traffic) vs. No-Build ADT**  
**and Truck Percentages for Major Roadways in the Study Area**

Volumes	2010 No Build			2010 Build			2014 No Build			2014 Build		
	ADT	Truck Total	Truck %	ADT	Truck Total	Truck %	ADT	Truck Total	Truck %	ADT	Truck Total	Truck %
<b>I-75</b>												
North of SR 61	72,200	17,540	24	73,600	17,680	24	75,700	18,170	24	76,500	19,100	25
Between SR 61 and SR 20	78,300	18,840	24	75,400	18,630	25	82,100	19,700	24	81,250	20,300	25
Between SR 20 and SR 113	91,800	21,460	23	97,000	22,770	23	96,300	22,100	23	101,100	24,260	24
South of SR 113	90,500	22,340	25	93,100	23,120	25	94,900	23,700	25	99,300	24,800	25
US 41/SR3	35,400	5,640	16	18,300	2,120	12	37,100	5,940	16	22,650	4,000	15
SR 20	25,800	4,090	16	11,400	1,080	9	27,100	4,340	16	13,600	2,040	15
SR 113	14,400	2,720	19	10,100	1,940	19	15,100	2,870	19	11,750	2,590	22
US 411/SR 61	6,700	1,000	15	12,800	2,000	16	7,000	1,050	15	11,100	1,560	14
Proposed US 411 Connector	*		*	24,700	4,880	20	*		*	20,450	4,300	21

Note: 2014 volumes were estimated by doing a straightline interpolation between the 2010 and 2030 volumes obtained from the traffic forecasting model. These interpolations were done on a link-specific basis (i.e., for each roadway link individually).

## Emissions Trends

**Table 2**  
**PM<sub>2.5</sub> Mobile Source Emissions Trends Analysis for Atlanta Nonattainment Area**  
**ARC (Mobility 2030 RTP) PM<sub>2.5</sub> Conformity Assessment**

		<b>PM<sub>2.5</sub></b> <b>(average annual tons/day)</b>
<b>Base Year Emissions (2002)</b>		<b>8.49</b>
<b>Analysis Years</b>	<b>2010</b>	<b>4.67</b>
	<b>2020</b>	<b>3.42</b>
	<b>2030</b>	<b>3.71</b>

EPA has a series of national vehicle control programs expected to reduce mobile source emissions substantially over the next several years. These programs include the 2007 Highway Rule for heavy-duty diesel vehicles, and other related programs.

Regional mobile source emissions are a good indicator of emissions trends in the region; therefore, it is expected that the open to traffic date of 2014 would represent the year of peak emissions from the project and other emissions sources that affect the project area, that is, the worst case condition. Many regulatory programs have been put in place to reduce PM<sub>2.5</sub> emissions. These programs require technological improvements to both mobile and stationary sources. Some of the stationary source regulations include CAIR<sup>1</sup>, and BART (a program requiring older power plants to retrofit pollution control equipment with more advanced equipment). National mobile source rules for both on-road and non-road vehicles and equipment and programs such as diesel engine retrofit programs, as well as the more stringent standards for sulfur limits in diesel and gasoline engines will also contribute to lower PM<sub>2.5</sub> emissions regionally.

As identified in the original project assessment, the proposed project would not increase the percentage of trucks in the overall project area, but would divert trucks from other existing facilities. While the Alternative D-VE does not include the direct freeway-to-freeway ramps (connecting the US 411 Connector to/from the west with I-75 to/from the south) that were part of Alternative D-Avoidance/Minimization, it still provides a more direct, limited access connection to I-75. This would provide a more free-flowing facility and help reduce stop and go traffic and extended idling. The new project is therefore not expected to increase PM<sub>2.5</sub> emissions in the overall project area.

---

<sup>1</sup> The D.C. Circuit issued a decision on July 11, 2008, vacating the Clean Air Interstate Rule. *North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir. 2008). However, the court's mandate effectuating the vacatur has not yet been issued. Parties have until September 24, 2008 to file motions for rehearing asking the D.C. Circuit to reconsider its decision in the case. If a motion for rehearing is filed, it is likely that issuance of the mandate would be further postponed, and, if the court grants that motion, the scope of the court's decision may change as a result of the rehearing.

## *Summary*

In summary, it has been determined that there is no substantive difference between Alt. D-Avoidance/Minimization and Alt. D-VE's design, scope & traffic impacts to I-75 and therefore, a new PM 2.5 hotspot analysis is not required for Alternative D-VE. It has also been determined that the shift from 2010 to 2014 open to traffic would not have a negative impact on air quality as the relatively small increase of 850 trucks per day between 2010 and 2014 would be offset to a great degree by turnover to trucks that meet the 2007 emissions standards that occurs between those same years, and by other mobile source rules and programs that result in reductions in emissions between those same years.

A surrogate analysis was used as a comparative approach for the PM<sub>2.5</sub> hot-spot consideration under the original assessment of the D-Avoidance Minimization Alternative. A "surrogate" monitoring site is one near roadways with traffic volumes and truck counts comparable to or greater than those expected in the year(s) being considered in the qualitative hot-spot analysis.

It had been previously determined that the proposed US 411 Connector project would meet all the project-level conformity requirements, and that the proposed project would not cause or contribute to a new violation of the PM 2.5 NAAQS, or increase the frequency or severity of a violation. This conclusion was based on the analysis of three surrogate sites selected as most similar to the US 411 project from nine available sites in the greater project area.

In addition, congestion is not expected to be worsened on either the US 411 Connector, on I-75 or in the new SR 20/US 411 interchange. Because of the national policies and programs in place and other technological improvements that contribute to the generally downward trend in regional emissions, overall emissions in the project area in 2014 are expected to be less than emissions in the previous 2010 analysis (Refer to Table 2). Also, even with the project now opening in 2014 and slightly more truck traffic expected on I-75 in the open to traffic year compared to the no-build, the Alternative D-VE is not likely to create a new violation of the PM 2.5 NAAQS, or worsen an existing violation in the vicinity of I-75 south of the proposed SR 20/US 411 interchange.

**Appendix E**

**USFWS Consultation/Coordination Letter  
April 29, 2008**



United States Department of the Interior

RECEIVED  
MAY 02 2008

Fish and Wildlife Service  
105 West Park Drive, Suite D  
Athens, Georgia 30606

OEZ

West Georgia Sub Office  
P.O. Box 52560  
Ft. Benning, Georgia 31995-2560

APR 29 2008

Coastal Sub Office  
4270 Norwich Street  
Brunswick, Georgia 31520

Mr. Rodney Barry, P.E.  
Division Administrator.  
Federal Highway Administration, Georgia Division  
61 Forsyth Street, SW  
Suite 17T100  
Atlanta, Georgia 30303  
ATTN: Ms. Jennifer Giersch

RE: USFWS Log# 41460-2008-F-0745, GDOT P.I. No. 661950

Dear Mr. Barry:

Thank you for your April 4, 2008, electronic mail regarding Georgia Department of Transportation (GDOT) project EDS-500(5). We submit the following comments under provisions of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*) and the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

The referenced project proposes to construct the US 411 Connector in Bartow County, Georgia. Recent changes in project design, resulting from GDOT's Value Engineering study, necessitated a reconsideration of effects to: (1) the threatened Cherokee darter (*Etheostoma scotti*), under the ESA; and (2) streams along the project, under FWCA.

**Endangered Species Act Consultation**

This letter constitutes an amendment to the January 17, 2007, biological opinion issued for project effects to the Cherokee darter. Since the issuance of the biological opinion, the Federal action changed and eliminated the planned removal and clear-span bridge replacement of two existing box culverts located at Streams # 4B and 22, tributaries to Nancy and Pettit Creeks, respectively.

The removal of these culvert replacements from the Federal action would eliminate direct and indirect effects to the Cherokee darter that would have occurred through potential harm during demolition activities and through increases in turbidity. Thus, the revised action area no longer encompasses the 400-foot, respective channel segments of Streams #4B and 22. Long-term benefits that would have potentially occurred with the removal of the culverts (habitat connectivity) are also eliminated from the Federal action.

As a result of the recent changes to the proposed action, the project is not likely to adversely affect the Cherokee darter and the incidental take statement in the biological opinion is no longer necessary. The Federal action includes special stormwater control and infiltration measures, as described in the biological opinion. These stormwater measures are critical for avoiding long-term, indirect effects to the Cherokee darter.

BOWMAN Williams  
D'AVINO  
KNUDSON Perkins  
THOMPSON \_\_\_\_\_  
WILLIAMS \_\_\_\_\_  
FILE EDS-500(5)  
661950

Obligations of section 7(a)(2) of the Act have been satisfied, and formal consultation is not required. However, obligations under the Act must be reconsidered if: (1) the project is modified in a manner not considered by this assessment; (2) a new species is listed or critical habitat is determined that may be affected by the project; or (3) new information indicates that the project may affect listed species or critical habitat in a manner not previously considered.

**Fish and Wildlife Coordination**

The Service concurred with your agency, by letter dated March 23, 2007, that stream impacts occurring along the project were necessary and unavoidable. As a result of GDOT's Value Engineering study, the constriction of project termini further reduces stream impacts from 1,191 linear feet (reported in GDOT's March 14, 2007 FWCA coordination package) to 916 linear feet. We concur with your determination that all practicable avoidance and minimization measures were investigated and that proposed mitigation of these impacts is adequate. No further compensation is required under FWCA

If you have any questions or require further information, please contact staff biologist Pete Pattavina, at 706-613-9493, ext. 236.

Sincerely,



Sandra S. Tucker  
Field Supervisor

cc: Rich Williams, GDOT  
file

## **Appendix F**

### **Public Involvement Summaries and Responses to Comments**



# DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

## INTERDEPARTMENT CORRESPONDENCE

FILE P. I. No. 661950 OFFICE Environment/Location  
DATE February 26, 2008  
FROM Glenn Bowman, State Environmental/Location Engineer  
TO DISTRIBUTION BELOW  
SUBJECT: Project EDS-500(5), Bartow County, Summary of Comments Received During the Public Comment Period for the PIOH - US 411 Connector

### COMMENT TOTALS:

A total of 316 people attended the public information open house, held on February 12, 2008, from 4:00 to 7:00 p.m. at the Cartersville Civic Center, 435 Main Street, Cartersville, Georgia. From those attending, thirty six (36) comment forms and thirteen (13) oral statements were received. An additional five (5) comments were received during the 10 day comment period following the open house. One person submitted the same comment as an email and as a comment card, so there were a total of fifty three (53) individual comments summarized as follows:

<u>No. Opposed</u>	<u>No. In Support</u>	<u>Uncommitted</u>	<u>Conditional</u>
10 (18.8 %*)	25 (47.1 %*)	8 (15.0 %*)	10 (18.8 %*)

\*% of comments received

### MAJOR CONCERNS:

- The project is taking too long.
- Concerned that GDOT is not listening to the public.
- Concerned about noise impacts.
- Concerned about impacts to the environment.
- Concerned about impacts to personal property.
- Concerned about changes to SR 20 access at I-75.
- Prefer the direct connection between US 411 and I-75 rather than using a portion of existing SR 20.
- Project cost is too high and doesn't provide adequate value to the public.
- Opposition to the proposed cul-de-sacs on Old Grassdale Road.
- Opposition to the proposed cul-de-sac and restricted access on Clifton Way.
- Concerned that the proposed changes creates a project that would no longer meet the need and purpose.

**OFFICIALS IN ATTENDANCE:**

Norris Westbrook - Cartersville Fire Chief  
 Jayce Stepp - Cartersville City Council  
 Kirk Milam - Rome Public Services Manager  
 David Doss - GDOT Board Member  
 Dean Clemmer- Coosa Valley RDC  
 Jamie McCord - Rome Public Works Director  
 Randy Gray - Bartow County Roads Director  
 Buzz Wachsteter - City of Rome Commission  
 John O'Keefe - Representative for Congressman Phil Gingrey  
 Janet Byington - Representative for Congressman Phil Gingrey  
 Wright Bagby - Rome Mayor  
 Matt Santin - Cartersville Mayor  
 Jerry Milam - City of Catersville  
 Marie Gordon – Representative of Senator Isakson's office

**MEDIA:**

Rome News Tribune  
 Cartersville Daily Tribune  
 WBHF - Cartersville  
 WGRA - Rome

**DISPOSITION OF COMMENTS:**

The following represents a break down of comments by the offices to which they pertain:

<b>Total Number of Comments</b>	<b>Office Responsible for review</b>	<b>Comment Number</b>
17	Urban Design	2, 7, 9, 15, 17, 18, 21, 23, 26, 27, 36, 40, 41, 42, 48, 51, 53
6	Location	4, 8, 36, 39, 43, 52
4	Environmental	31, 36, 41, 52
10	Traffic	5, 17, 18, 21, 23, 26, 36, 42, 47, 48
1	Planning	36
4	Right of Way	3, 16, 17, 32

Public Information Open House Summary  
EDS-500(5), Bartow County  
February 26, 2008  
Page 3

Jordan, Jones & Goulding and JB Trimble will respond to all comments on behalf of the Department of Transportation.

Attached is a complete transcript of the comments received during the comment period and a copy of the open house handout for review. Please respond to Ken Anderson, JJG ([ken.anderson@jjg.com](mailto:ken.anderson@jjg.com)) with a copy to Jennifer Mathis, GDOT ([jmathis@dot.ga.gov](mailto:jmathis@dot.ga.gov)) by February 28, 2008.

If you have any questions about the comments, please call or e-mail Jennifer Mathis at (404) 699-4408 or [jmathis@dot.ga.gov](mailto:jmathis@dot.ga.gov).

GB/jm/gth

Attachments

DISTRIBUTION:

Todd Long, P. E.  
Angela Alexander  
Ben Buchan, P.E.  
Vicki Gavalas  
Kent Sager  
DeWayne Comer  
Albert Shelby,  
Gerald Ross, P.E.  
Keith Golden, P.E.  
Howard (Phil) Copeland  
Ken Thompson





Example Response Letter

## Department of Transportation

State of Georgia  
#2 Capitol Square, S.W.  
Atlanta, Georgia 30334-1002

GENA L. ABRAHAM, Ph.D.  
COMMISSIONER  
(404) 656-5206

GERALD M. ROSS, P.E.  
CHIEF ENGINEER  
(404) 656-5277

BUDDY GRATTON, P.E.  
DEPUTY COMMISSIONER  
(404) 656-5206

EARL L. MAHFUZ  
TREASURER  
(404) 656-5224

March 10, 2008

Mr. William Richard Warren  
998 Grassdale Rd.  
Cartersville, Georgia 30120

Dear Mr. Warren:

The Department appreciates your interest in the proposed US 411 Connector project. A total of 316 people attended the public information open house. From those attending, thirty six (36) comment forms and thirteen (13) verbal statements were received. An additional 5 comments were received by mail or through the GDOT website during the ten day comment period. The comments received as a result of the February 12, 2008 Public Information Open House will help the project team to better plan and design a project to serve the transportation needs of your community, its residents and the traveling public.

The comments received at the February Open House are synthesized by topic, where appropriate. They are listed below and followed by the Department's response (*in italics*).

### Planning

#### Comment-

**Feel that the project is a waste of taxpayer dollars.**

#### Response-

*Project cost has become an important factor in the overall project evaluation especially in light of increased construction materials costs and more limited transportation funding budgets. Various cost benefit analyses have been completed beginning at the concept development stage on through determination of a Preferred Alternative. The results of these cost benefit analysis is that the Alternative D-VE, which is now the Preferred Alternative, is a viable project from a cost perspective. The construction of the US 411 Connector would provide a more direct connection to I-75 for through traffic from western Bartow and Floyd counties. Through traffic would no longer be combined with locally generated traffic along these existing facilities, reducing*

*congestion in the corridor. The diversion of through truck traffic away from the existing system would enhance the safety and operation of SR 20 and SR 3/US 41. The continued growth and economic vitality of the City of Rome and Floyd County would be supported by the implementation of the US 411 Connector by providing improved access to the interstate system for commercial traffic, in particular trucks. The Department believes that construction of the US 411 Connector would be a reasonable expenditure of public funds.*

**Comment-**

**Concerned that the decision on the project is being rushed.**

**Response-**

*The US 411 project has been under consideration for over 20 years. In 1985, the Department completed a feasibility study to determine if there was a need to extend US 411 eastward from its junction with US 41 to I-75. The results of the study clearly demonstrated the need for a more direct connection to I-75 as traffic volumes were predicted to worsen congestion on the existing US 41/SR 20 corridor to I-75. Based on recommendations from the feasibility study, development of a project to construct a US 411 connection to I-75 was initiated in 1986. The concept for the US 411 project was later incorporated into a proposed recommendation for an outer perimeter highway around Atlanta, conceived as part of the Economic Development System, (EDS). This facility, later known as the Outer Perimeter, was included in legislation designating it as part of the Governor's Road Improvement Program.*

*The US 411 project continued to be developed as an individual project; an Environmental Impact Statement (EIS) was completed and approved by the Federal Highway Administration (FHWA) in 1989. The concept used for the EIS was based on alternatives conceived as part of the larger Outer Perimeter Highway. The location of the US 411 project's interchange with I-75 was located to accommodate future extension of the Outer Perimeter.*

*A complaint was filed (by the Rollins family) in the United States District Court, Northern District of Georgia on July 5, 1991, seeking a declaratory judgment that the GDOT and FHWA had failed to comply with the National Environmental Policy Act (NEPA) and other requirements in the development of the EIS for the US 411 extension. A hearing was conducted in January 1992; in January 1993, when the court ruled that the EIS had not adequately followed the NEPA requirements, it prevented the GDOT and FHWA from approving or expending any federal funds on the US 411 project until an adequate and proper EIS was prepared. More specifically, it was noted that the EIS did not adequately compare and evaluate project alternatives, and it also failed to provide the information needed by the public and the decision makers to compare environmental, social, and economic impacts of potential alternatives. The court noted that the US 411 project had independent utility since it could be built separately from the Outer Perimeter project. The Court determined that, because the US 411 project was not a mere segment of the Outer Perimeter, it may be considered independently of the Outer Perimeter*

*In order to address the court's ruling, the US 411 project was incorporated into the proposed Northern Arc project, a portion of the former Outer Perimeter project. The Northern Arc was to extend from the US 411/US 41 interchange in Bartow County to SR 316 in Gwinnett County. An*

*EIS was completed and approved for the eastern portion of the Northern Arc from SR 400 to I-85. Beginning in 1997, a series of studies, including a Major Investment Study (MIS), Funding Feasibility Study, and Draft EIS, were begun on the portion of the Northern Arc from the US 411/US 41 interchange to SR 400.*

*The MIS was completed in December 2000. In July 2002, detailed studies and preparation of the Draft EIS for the Northern Arc were underway when then-Governor Barnes announced that the project was cancelled. The Northern Arc project was subsequently removed from the Regional Transportation Plan. The Department initiated development of the US 411 Connector in July 2003, at the request of Governor Sonny Perdue. In November 2003, FHWA issued a Notice of Intent (NOI) to advise the public that a Draft Supplemental Environmental Impact Statement (DSEIS) would be prepared for the proposed extension of US 411 from US 41 to I-75. Because the original EIS failed to adequately study the full range of alternatives, FHWA determined that a SEIS that evaluated the original and potential new alternatives would be the most appropriate method to fully comply with NEPA.*

*In October of 2005, the Department presented the Preferred Alternative and its associated benefits and impacts to the public at a Public Hearing Open House (PHOH). Over the past several months, GDOT has been continuing with preliminary design work and more refined construction cost estimates of the preferred alternative. Currently, GDOT follows a policy that requires all projects with a cost of \$25 million or more to go through a Value Engineering (VE) study process. Therefore, the Department was required to complete a VE study for the US 411 Connector project, which was completed in October of 2007. The Department then met with the project Citizens Advisory Committee in January 2008 and with the public in February of 2008 to present the results of the VE study.*

*In summary, the Department has been working on the US 411 project for over twenty (20) years, a preferred alternative alignment has been defined for over two years and the recent VE study is refining this preferred alternative further. Even after the decision is finalized minor details of the project are likely to change as a result of the ongoing design phase of the project.*

## **Alternatives/Concepts**

### **Comments-**

**Suggested that the connection of US 411 to I-75 should be to the north west of the Anheuser Bush Brewery to save money, and avoid impacts to developed areas.**

**Suggested an alternative that connects to the existing US 411/I-75 interchange with four lanes.**

**Suggested an alternative that follows US 411 between US 41 and I-75 to avoid the substantial grading required to construct the proposed alternative.**

**Suggested that the northern concepts are now more viable than the current preferred alternative.**

Response-

*In the early phases of this project a set of eight concept alignments were developed to completely cover the basic ways that US 411 could be connected to I-75 between the Cassville-White Road and SR 20 interchanges. These concepts (identified as A-H), as well as the no-build alternative, were evaluated to determine which ones best met the project need and purpose and also to what extent they may adversely impact social, economic and environmental resources in the project area. The results and details of this evaluation are discussed in the Concepts Screening Report (CSR), which is on file and available for review at the GDOT Office of Environmental Location. A summary of pertinent data from this report is discussed below.*

*There are two primary needs for this project: one is to provide a more direct connection to I-75; and the second is to reduce the congestion on the arterial roadways that presently connect US 411 to I-75, which in turn would improve safety in the corridor. The findings and conclusions were developed sequentially, as follows: (1) the first basis for the findings and conclusions was the extent to which each Concept is expected to attract traffic to the new US 411 Connector (to satisfy the need for connectivity between the US 411/US 41 interchange and I-75); (2) second was the extent to which each Concept reduces traffic on the existing connection, SR 3/US 41 and SR 20 (to satisfy the need to reduce congestion on the existing corridor); and (3) third was general engineering considerations, including costs and economic viability, as well as generalized environmental impacts (impacts were reviewed to identify significant impacts that might erode or negate the identified advantages).*

*As the CSR reported, the results of the Concept traffic analysis were quite clear: Concepts B (new alignment freeway connecting to I-75 at existing SR 20 Interchange) and D (new alignment freeway connecting to existing SR 20 east of I-75) attract larger volumes of traffic and provide substantial relief to the existing US 411-I-75 connection (i.e., SR 3/US 41 and SR 20), while each of the other Concepts on a new location, including Concepts C (new alignment freeway extending only to existing US 411/SR 61) and G (new alignment freeway connecting to I-75 at existing SR 61 Interchange), attract significantly less traffic and provide no relief for the existing US 411-I-75 connection. Concept A, which utilizes the existing corridor, attracts a significant volume of traffic, but does not provide relief to the existing connection. All eight of the initial concepts evaluated would serve the stated purpose of providing a more direct connection to I-75. However, traffic analysis shows that the northern concepts (E, F, G, and H) attract such a small percentage of vehicles away from the existing US 41 and SR 20 corridor that sufficient congestion relief would not be provided. The concept screening process determined that the northern concepts **do not meet the need and purpose** of the project sufficiently to warrant further development.*

*The concepts that were found to perform the best while causing the least environmental impact were developed into more refined alternatives, and evaluated further as part of the Draft Supplemental Environmental Impact Statement (DSEIS) process. The selection of Concepts A, B, and D for further development – and the decision to forego further development of Concepts C, E, F, G, H, and F “Modified” – was entirely appropriate and strongly supported by thorough and proper traffic analyses, initial environmental review, engineering feasibility assessment, and general cost/benefit evaluation. The traffic forecasts were derived from the officially-sanctioned*

*traffic forecasting model that is based on adopted future population and employment forecasts, adopted transportation plans, and which considers future regional and local travel patterns and traffic operating conditions (i.e., congestion) on the entire transportation network. The traffic model forecasts were checked for reasonableness before they were used for any purpose in the US 411 Connector Project.*

*As a result of the recent Value Engineering study and ongoing design evaluations, there are several modifications that are being proposed in order to reduce the overall cost of the US 411 Connector project. The following list represents the modifications determined to be feasible from an engineering perspective while not causing an adverse environmental impact, and have therefore been recommended for implementation:*

- *Reduce median width from 68-feet to 44-feet*
- *Reduce right-of-way (ROW) width from 400-feet to 250-feet*
- *Use folded diamond interchange rather than full diamond interchange at SR 61*
- *Related reductions in bridges, retaining walls, drainage systems, paving, erosion control, traffic control, signing/ marking/signals, guardrail, and miscellaneous items*
- *Use a split diamond connection of the US 411 Connector to I-75, which retains a diamond ramp to SR 20 from the south*
- *More compact interchange at US 41*
- *Raise design profile, and allow 7% grade to accommodate mountainous terrain*
- *Terminate Clifton Way south of the US 411 Connector, and connect it to the US 411 Connector on the north side with an at-grade intersection for gated access to the cell tower*

*Although some of the project details, including the interchange type and configurations and other construction and engineering details as identified above are being incorporated into the preferred alternative, the alignment of the proposed roadway has not changed from what was presented in the Final Supplemental Environmental Impact Statement (FSEIS). As a result of the proposed cost saving measures, the roadway will not function as efficiently as the original Preferred Alternative (Alternative D-Avoidance/Minimization); although the volume of cars that are predicted to use the Alternative D-VE (new Preferred Alternative) and the volume of cars diverted from the existing US 41/SR 20 corridor are still at levels that the proposed investment is considered a reasonable expenditure of funds. In comparison, the northern alignments still do not divert enough traffic off of the US 41/SR 20 corridor and still do not have predicted traffic volumes that would make them reasonable expenditure of funds.*

## **Environmental/Community Impacts**

### **Comment-**

**Concerned that the cul-de-sacs on Old Grassdale Road would be detrimental to existing residents, businesses and the high school located in this area.**

Response-

*Based upon several objections expressed by members from the CAC, including representatives from the Bartow County School System, and from a large industrial site and residents that would be adversely impacted, the Department has decided to eliminate the proposed cul-de-sac at Old Grassdale Road. Consequently, the proposed design for the US 411 Connector will be revised to include a bridge over Old Grassdale Road to retain the existing Old Grassdale connection (between Grassdale Rd and Peebles Valley Rd). Retaining this connection will eliminate the impacts on truck and employee access to a large industrial facility, and it will avoid routing industrial traffic by a school and through an existing residential area.*

Comment-

**Request for preservation of as many trees as possible.**

**Concerned about impacts to the environment.**

Response-

*There are over 25 different resource types that must be evaluated in the EIS process, including history, noise, ecology, community (homes, businesses, parks, schools, churches, government), and visual, to note a few. Based upon the results of the evaluation of potential impacts to these resources it was determined that the preferred alternative had the least impact on environmental and community resources while still meeting the project need and purpose. The Department makes every attempt to construct projects that cause the least amount of impact to the environment and the community while concurrently attempting to minimize property acquisition and relocations. Where it was determined that project-related impacts could not be avoided or minimized, scenarios to mitigate for such impacts have been investigated and are being included in the construction plans.*

*One of the main results of the VE study is a project that will be more compact with an overall smaller footprint compared to the Preferred Alternative that was last presented to the public. The features that contribute to this smaller footprint include the following:*

- A reduced median width from 68-feet to 44-feet*
- A reduced right-of-way (ROW) width from 400-feet to 250-feet*
- A more compact interchange at US 41*
- A raised design profile, allow 7% grade to accommodate mountainous terrain, which minimizes the amount of clearing and grading in the areas with steeper slopes*

*It is also anticipated that additional landscaping would be provided in some areas of the corridor to help screen the project from adjacent visually sensitive areas provided that drought conditions do not prohibit this potential landscaping.*

Comment-

**Request that the noise barriers be aesthetically pleasing.**

Response-

*GDOT currently uses standard metal noise walls in order to help keep project costs down, which has become more important due to the limited budgets available for transportation projects.*

*GDOT uses a maximum cost of \$50,000 per impacted structure while requiring at least a 5-dBA reduction in noise levels to determine if the construction of a noise barrier is reasonable and feasible. The current material cost used by GDOT is \$15 per square foot of noise wall needed. A noise barrier is considered reasonable according to the following formula:*

*Reasonable Cost = (# of impacted sites having a 5 dBA reduction x \$50,000) +  
(# of additional benefited sites having a 5 dBA reduction x \$25,000) ≥ Estimated Cost of Barrier*

*Noise barriers can only be constructed where they are considered both reasonable and feasible. The Georgia Department of Transportation (GDOT) does not consider it reasonable to construct barriers at locations where site characteristics would require a wall height greater than 30 feet or prevent obtaining at least a 5-dBA reduction at impacted sites.*

*Where the barrier cost is more than the Reasonable Cost calculated above, a noise barrier is not considered cost effective. If GDOT were to use alternate materials the cost of the walls would likely increase, thus resulting in barriers that are not cost effective based on the GDOT formula. Property owners may be offered the option to provide the balance of the cost of abatement where it exceeds the Reasonable Cost through local governments or otherwise.*

Comment-

**Concerned that GDOT is not listening to the affected community.**

Response-

*Public and community involvement have been a major component of the US 411 Connector project including the February 12, 2008 PIOH, which was specifically held to inform the public about proposed project changes and obtain public input regarding the modified project alternative. Listed below are some of the main features of the project Public Involvement Program:*

*Project Hotline Voice mail:*

*A telephone hotline has been established at 678-333-0648. To date the hotline has received over 85 calls to ask a question or make a comment about the project.*

*Project Newsletter:*

*A project newsletter has been developed to help inform the community of the current project status. To date seven separate issues have been mailed, and the mailing list numbers over 700 addresses.*

*Project Website:*

*The Department has a link to the US 411 Connector project on its website: [www.dot.ga.gov](http://www.dot.ga.gov). This site is updated regularly to include a variety of project maps, frequently asked questions, and meeting announcements. To date the website has received more than 6,000 hits.*

*Public Meetings:*

*To date the Department has hosted five Public Information Open House (PIOH) meetings. These meetings gave the community an opportunity to learn about the project and to voice specific comments or concerns. Meetings are advertised as widely as possible, including meeting announcements published in *The Cartersville Daily Tribune*, and project newsletters. In addition, we have sent out meeting announcement postcards to the project mailing list of more than 700 individuals, distributed flyers at key locations throughout the community, placed kiosks containing project information in high pedestrian traffic areas, and posted signs at major intersections prior to each of the planned open house events. The PHOH, held on October 24, 2005, was attended by 363 people, while the other open houses had attendances of 206, 171, and 279. There were 41 written and 27 oral comments received at the PHOH and of these 32 noted that they were in favor of the project, 17 said they were against the project, eight were conditionally in favor of the project, and 10 were 'uncommitted'. The final PIOH held on February 12, 2008 was attended by 316 people. There were a total of 54 comments received as a result of the PIOH and of these 25 noted that they were in favor of the project, 10 said they were against the project, 10 were conditionally in favor of the project, and eight were 'uncommitted'. Response letters addressing those comments received after each PIOH or PHOH were mailed out to each individual who provided a comment. The response letter addressed those questions received and provided additional information regarding the decisions made.*

*Community Involvement:*

*In addition to the public meetings, the project team has been requested to present project updates and hear comments at several community meetings, which will continue to occur as requested. The project also includes a Citizen Advisory Committee (CAC) made up of a group of people with a diverse set of perspectives and opinions. The 27-member group was chosen to represent varying views of the community, including business, landowner, local government, agriculture, minority and environmental stakeholders. The CAC has been actively engaged in dialogue and discussion about the US 411 Connector project throughout the preliminary engineering and environmental analysis process. The CAC met a total of six times with the project team to exchange information and ideas.*

*Specific outreach for the minority and low-income populations has also been completed. Leaders within the local African-American community were contacted and assisted the team in establishing a minority focus group. Flyers have been distributed into the minority community at churches and other public locations along with invitations from the specific minority community*

leaders. To date a total of three focus group meetings with minority stakeholders have been held to discuss the project status and hear concerns or answer questions.

All comments received from the meetings, open houses, hotline, emails and other methods noted above have been considered and evaluated to assess whether modifications to the project are warranted. Several suggestions from the public and local officials have been evaluated, with some being included in the project alternatives and others being excluded because of potentially greater impacts or inadequate performance. Following are three brief examples of comments from citizens and local officials that had a direct impact upon modifications to alignments and selection of a preferred alternative:

- The alignment of Alternative D was shifted based on suggestions from the CAC and community members to minimize impacts to the Lexington Farms subdivision.
- Local officials and citizens voiced concern of the impacts to businesses that would result from impacts created by Alternative B. The project team evaluated three additional alternatives near the B Alternative to compare impacts to businesses and the community. An alternative other than B was eventually determined as the preferred in order to avoid the substantial impacts to businesses by the B Alternative.
- Industry, residents and school officials noted concern over the proposed cul-de-sacs on Old Grassdale Road potentially causing adverse traffic impacts. After additional evaluation, the Department is proposing to modify the project to include a bridge over Old Grassdale rather than constructing cul-de-sacs.

**Comment-**

**Concerned about increased runoff from the roadway onto private property.**

**Response-**

Best Management Practices (BMPs) for storm water management would be incorporated into the construction plans. A specially designed storm water control system is being implemented throughout the entire project corridor, which would include Enhanced Swales (vegetated open channels that are explicitly designed and constructed to capture and treat stormwater runoff within dry or wet cells formed by check dams or other means), and Stormwater Ponds to retain and treat stormwater runoff primarily through settling and a biological uptake mechanism. These measures to recharge stormwater run-off from the project will benefit water quality in the region and also avoid flooding of adjacent properties.

**Traffic/Traffic Model**

**Comments-**

Questions regarding the traffic methodology and results including travel time and how they have been applied throughout the project process.

Response-

*The following is a brief description of the overall traffic analysis process and timeline, which also includes specific references as to where this data was reported and publicly available throughout the project development process. In Section 2 of the DSEIS and the FSEIS, Figure 2.1.1.A-2, the travel time between US 411 at US 41 and I-75 South at SR 20 for the No Build (No Action) scenario is reported as 16.3 minutes; and the source of this information was clearly identified as the Concepts Screening Report (CSR). The methodology used to determine this travel time estimate, which is described in detail in Appendix C of the CSR, used actual travel distances and assumed average travel speeds along the routes of the proposed concepts. At this initial point in the NEPA process, the concept travel times were estimated because the regional travel model was not yet available for the consultant team to use. Subsequently, traffic forecasts were prepared for all concepts using a Bartow County sub-area traffic model, as is very clearly stated in pages 6-8 of the CSR.*

*Please note that the sub-area model forecasts represent a much higher level of sophistication and accuracy than the initial "floating car" analysis performed at the very initiation of the DSEIS. This use of updated information as the study progressed is perfectly consistent with standard NEPA document preparation practice.*

*Also in Section 2 of the DSEIS and the FSEIS, Table 2.4-1, travel times are identified for the alternatives (not to be confused with concepts). In this table, the travel time for the No Action scenario is identified as 15.8 minutes and the methodology used to calculate this (which is different from that used in the CSR), is referenced as a footnote in the table.*

*With development of Alternative D-VE, it was also necessary to update the traffic model so that analysis similar to that completed for the other alternatives considered could also be completed for this alternative. The results of this model update were presented to the CAC in January 2008 and presented to the public in February 2008.*

*All travel time methodologies and sources have been identified correctly throughout the various studies and in the DSEIS and FSEIS. The traffic forecasts used were derived from the officially-sanctioned regional traffic forecasting model that is based on adopted future population and employment forecasts, adopted transportation plans, and which considers future regional and local travel patterns and traffic operating conditions (i.e., congestion) on the entire transportation network in Bartow County. This model is derived from and compatible with the models used to prepare forecasts for projects throughout the Atlanta metropolitan region, and its use is required in order to ensure that analyses and decisions on all projects are based on compatible data, which in turn helps ensure that transportation funds are expended fairly and efficiently. Daily and weekday p.m. peak hour traffic forecasts were prepared for the eight initial corridor concepts (A – H) for Design Year (2030) and Opening Year (2010) conditions, and for Design Year conditions for three concept variations (F-modified, and F-modified with an additional interchange, and D with an additional interchange) suggested by comments from the public. Design Year and Opening Year weekday p.m. peak hour traffic forecasts were prepared for all project alternatives (A, AB, B, D and D Avoidance/Minimization), including the modified Preferred Alternative (Alternative D-VE). Please also note that all traffic model evaluations completed throughout this project have assumed construction of all transportation improvements*

*in the current regional transportation plan, which includes the SR 20 project located to the south of the US 411 Connector.*

*The traffic model forecasts were checked for reasonableness before they were used for any purpose in the US 411 Connector Project. The traffic model was calibrated against actual traffic counts to a "precision" of about +/-10%, and based on review and evaluation of the model and its results/products, we are fully confident in the accuracy of the traffic forecasts used.*

**Comments-**

**Questioned whether the proposed SR 20 improvement project between I-75 and SR 61/US 41 were considered when determining the need and traffic projections for the US 411 project.**

**Response-**

*The US 411 Connector traffic forecasts and analyses, as well as all design activities, assumed that the proposed SR 20 improvement project between I-75 and SR 61/US 41 would be constructed and open to traffic, as planned and programmed. In addition, all State and local projects programmed for completion before the US 411 Connector were similarly incorporated in the analysis and design processes.*

**Comment-**

**Questioned whether the lower traffic volumes on the D-VE Alternative warrant a four lane roadway.**

**Response-**

*As identified in the both the DSEIS and the FSEIS the traffic volume that warrants a four-lane roadway is 18,900 vehicles per day (vpd). It is predicted that the volumes would be greater than 18,900 vpd the very first year that the roadway is open to traffic; therefore, it is clear that a four-lane roadway is the appropriate design for the US 411 Connector.*

**Comment-**

**Questions about congestion on I-75 south of the project limits.**

**Response-**

*Design year (2030) congestion on I-75 south of the project limits is forecasted under all circumstances, whether or not the US 411 Connector project is built (i.e., the congestion will be there for the No-Build Alternative and all Build Alternatives, including Alternatives D-Avoidance/Minimization and D-VE), and the project will not significantly impact, positively or negatively, this future congestion. It has been determined that the need for and benefits of the US 411 Connector project are not impacted by the I-75 congestion to the south, and the US 411 Connector project need not and ought not be tied to and constrained by the I-75 congestion to the south.*

**Comment-**

**Concerned about traffic from the south having to use existing SR 20 and travel through three traffic lights to access the new US 411 Connector.**

**Response-**

*The connection from northbound I-75 to the US 411 Connector westbound will use a 1-mile section of SR 20 and will pass through three signalized intersections. This segment of SR 20 will be widened and the three intersections will be designed to provide adequate capacity for forecasted design year (2030) volumes. With these improvements and design elements, it is estimated that in the 2030 p.m. peak hour, this route will take approximately 90 seconds more to traverse than would the originally-proposed freeway-to-freeway ramp serving the connection.*

**Comment-**

**Concerned about north bound traffic movement from US 41 to US 411 west will be overloaded from heavy truck volume and employees accessing the Shaw plant near this interchange.**

**Response-**

*The signalized intersection and on-ramp serving traffic movements from northbound US 41 to westbound US 411 will be designed to provide adequate capacity for forecasted design year (2030) volumes. Any modifications or refinements required to ensure safe and convenient traffic operations at the nearby Shaw Plant driveway will be determined and considered during the US 411 Connector final design process.*

**Comment-**

**Request for the number of diesel trucks that are predicted to use the US 411 Connector.**

**Response-**

*Based upon the recently updated traffic model completed for the Alternative D-VE it is estimated that approximately 20-22% of the vehicles using the new US 411 Connector would be trucks.*

## **Project Details/Design**

**Comment-**

**Requested that a loop type exit ramp in the north east quadrant from I-75 north to US 411 be considered.**

**Prefer the direct connect ramps from I-75 north bound to the new connector rather than the proposed connection using existing SR 20.**

**Response-**

*A loop ramp providing a direct connection for traffic traveling from northbound I-75 to the US 411 Connector westbound is being analyzed as part of the required Interchange Justification Report (IJR) for the project.*

*Although preferable from a traffic operations and safety perspective, the direct freeway-to-freeway ramps included in the original alternative were found to be financially infeasible.*

**Comment-**

**Concerned about eliminating/shifting the existing I-75 south bound exit to SR 20.**

**Response-**

*A ramp providing a direct connection from southbound I-75 to SR 20 at the existing SR 20 Interchange is being analyzed as part of the required Interchange Justification Report (IJR) for the project. The analysis required for the southbound connection at I-75 which will be included in the IJR is ongoing.*

**Comment-**

**Request that a connection from Clifton Way be provided to US 411 to facilitate a large planned commercial development.**

**Response-**

*Based on the US 411 project Need and Purpose, which is to provide a more direct link between US 411 at its interchange with SR 3/US 41 west of Cartersville, and I-75, the Department will not create an access break at-grade with US 411. The main objective from the beginning of development of the alternatives has been to improve mobility and safety for through travelers (including truck traffic) by providing a freeway alternative between SR 3/US 41 and I-75.*

**Comments-**

**Question the accuracy of previous and more recent cost estimates.**

**Question whether on-going project changes are reflected in latest published cost estimate.**

**Noted calculation errors in the cost benefit analysis.**

**Response-**

*All cost estimates have been prepared following accepted standard methodologies using the unit prices as approved by the Department at the time of the cost estimate preparation. As the project development process has proceeded, there have been several rounds of revisions to the cost estimates completed. For example, during the development of the concepts, estimates based on a more general scale using factors including Cost per freeway mile, Cost per arterial mile, Cost per minor interchange, or Cost per major interchange were used. As the concepts were developed into alternatives, more specific detail for each alternative was developed, thus allowing for a more refined and detailed estimate. During the most recent cost estimates, even greater project details have been determined as the preliminary engineering for the Preferred Alternative has advanced. What is important to note is that at each level of cost estimating the concepts or alternatives were evaluated consistently across the board based upon the detail available and the unit prices at the time of estimation.*

*As a result of a recent Value Engineering study and ongoing design evaluations, there are several modifications that are being proposed in order to reduce the overall cost of the US 411*

*Connector project. These evaluations have reduced potential project cost estimates from approximately \$399 million for the original preferred alternative (later reduced to approx. \$341 million after further design, using more refined quantities and unit prices) to less than \$200 million for the modified preferred alternative, which includes all currently considered project modifications.*

## **Other Improvements**

### **Comment-**

**Concerned that a cul-de-sac proposed on SR 20 (part of a separate project) will cause adverse impacts to a business that will be located in the cul-de-sac.**

**Concerned about access to SR 20 from an adjacent side road (to the east beyond the limits of the proposed improvements associated with the US 411 project).**

### **Response-**

*The impact noted above is not directly associated with the US 411 Connector project. However, these comments are all being considered as the project evaluation continues. There is a separate project presently being advanced to complete improvements to SR 20, which proposes the cul-de-sac that is referenced above.*

*In addition to the SR 20 widening project currently being planned on the west side of I-75, the Department also has a passing lane project on the east side of SR 20 that is planned for construction beginning in 2008. This project proposes to widen limited portions of the existing two-lane section of SR 20 to provide an extra lane to allow slower vehicles (especially trucks) to be passed. This improvement is anticipated to improve localized congestion along this section of SR 20 and should also improve access to the facility from adjoining side roads.*

## **Right-of-Way**

### **Comments-**

**Concerned that elimination of access at Clifton Way will adversely affect Bartow County's ability to develop a business park job base.**

**Concerned about property that would be cut off by the proposed cul-de sacs at Clifton Way.**

### **Response-**

*The proposed modifications at Clifton Way are a result of the VE study and on-going design efforts and are estimated to provide cost savings of approximately \$3.3 million. Because this change would eliminate access to portions of some properties, the Department will assess right of way costs versus construction of a bridge and lowering Clifton Way to get adequate vertical clearance. However, at this point the Department plans to move forward with Alternative D-VE without an access break at-grade with the US 411 Connector or a bridge over Clifton Way. At the time of right of way acquisition, the cost comparison assessment will be completed.*

US 411 Connector  
Page 15 of 15  
March 10, 2007

Thank you for your attendance at the PIOH and comments regarding the proposed US 411 Connector roadway project. Your comments made as a result of the February 12, 2008 public information open house have been entered into the official public record. If you have any additional questions or comments, please contact Jennifer Mathis at (404) 699-4408 or Rich Williams at (404) 699-4438 of my staff.

Sincerely,

*Glenn Bowman, P.E./jem*

Glenn Bowman, P.E.  
State Environment/Location Engineer

GB/jm/gth (JJG)

Cc: Albert Shelby, GDOT Urban Design  
Larry Cook, JB Trimble

**US 411 Connector  
Project EDS-500(5)  
Bartow County  
P.I. No. 661950**

**PIOH #4 Comment Response Distribution List**

<b><u>Name</u></b>	<b><u>Address</u></b>	<b><u>City</u></b>
Earl Ashby	30 Camden Woods Drive	Cartersville, GA 30121
Mayor Wright Bagby	317 E. Third Avenue	Rome, GA 30161
Mike Bearden	30 Bluebird Circle	White, GA 30184
Arnold Bearden	82 Bearden Road	Cartersville, GA 30120
John Bennett	P. O. Box 1433	Rome, GA 30161
Scott Bentel	3 Central Place	Rome, GA 30161
Linda Bease	15 Spruce Street	White, GA 30184
Dana Bonney	14 Appling Way	Cartersville, GA 30121
James Christina	3 Bristol Court	Cartersville, GA 30120
Joseph Davidson	P. O. Box 1433	Rome, GA 30162
Frances Caldwell	50 Churchill Downs	Cartersville, GA 30121
Lydia Davidson	3731 Starboard Court	Acworth, GA 30102
Kristen Burns	135 Tower Ridge Road	Cartersville, GA 30121
Lauren J. Burns	135 Tower Ridge Road	Cartersville, GA 30121
Jack Fleming	23 Magnolia Drive	Cartersville, GA 30120
Frank Gelzer - Equity Mgmt.	2470 Windy Hill Road -Ste. 100	Marietta, GA 30067
Charley Harper	P. O. Box 2405	Cartersville, GA 30120
Richmond Hammond	9 Saddle Trail	Rome, GA 30161
Sue Hiller	P. O. Box 1433	Rome, GA 30167
James Jarrett	Shaw Ind. - P. O. Box 428	Cartersville, GA 30120
Todd Jones	16 Valley Drive	Cartersville, GA 30120
Gary Klimb	21 Russell Ridge	Euharlee, GA 30145
Nita Lawhorn	1949 Floyd Springs Road	Archee, GA 30105
Karen Leak	51 Shinall Gaines Road	Cartersville, GA 30121
Jerry Norman	101 Mimosa Drive	Rome, GA 30161
Sharon Norman	101 Mimosa Drive	Rome, GA 30161
John O'Keefe	38 Freedom Drive	Cartersville, GA 30121
Linda Parns	5355 Highway 20	Cartersville, GA 30120
Greg Patton	909 Road 1 South	Cartersville, GA 30120
Laura Pemberton	16 Pine Oak Centr	Cartersville, GA 30121
George and Frances Roberson	999 Grassdale Road	Cartersville, GA 30121
Laurie Shadle	25 Trotters Walk	Cartersville, GA 30121
Jan Simone	P. O. Box 267	White, GA 30184
Keith Soulis	12 Honey Locust Court	Cartersville, GA 30121
Michael Weiss -King & Spalding	1180 Peachtree Street	Atlanta, GA 30309
Steve White	53 Flat Road Road	Rome, GA 30161
Teresa Wilson	174 Cline Smith Road	Cartersville, GA 30121

Jimmy Wilson	174 Cline Smith Road	Cartersville, GA 30121
Tiffany Morgan	22 Gray Road	Cartersville, GA 30121
Bevan Flavin	39 CJ Drive	Euharlee, GA 30145
John Bobo	25 Wellington Drive	Cartersville, GA 30121
Arnold Bearden	82 Bearden Road	Cartersville, GA 30121
Janet Byington	104 Fieldwood Road	Rome, GA 30161
Kirk Milam	317 E. Third Avenue	Rome, GA 30161
Sam Freeman	105 West Eighth Avenue	Rome, GA 30161
Mike Sakmar	33 Ranger Road	Cartersville, GA 30121
Buzz Wachsteter	P. O. Box 1433	Rome, GA 30162
Curtis Hart	228 Parkview Drive	Cartersville, GA 30120
Bill McMullen	36 Westchester Drive	Cartersville, GA 30120
Douglas Berg	23 Spruce Street	White, GA 30184
Toni Kirk	28 Trotters Walk	Cartersville, GA 30120
Nathan Sanders	312 Mt. Chase Drive	Cartersville, GA 30120
Chris Daniel	11 Hawks Farm Road	White, GA 30184
Donald J. Bell	23 Stonebreak Drive	Rome, GA 30165





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*State of Georgia*  
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*Atlanta, Georgia 30334-1002*

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EARL L. MAHFUZ  
TREASURER  
(404) 656-5224

May 2, 2008

Mr. Dean Bagwell  
1043 Cass White Road  
Cartersville, GA 30121

Subject: US 411 Connector Citizen Advisory Committee

Dear Mr. Bagwell:

Thank you for your participation as a member of the Citizen Advisory Committee for the US 411 Connector project. The CAC has served an important advisory role in the development and outcome of this project, and your efforts are appreciated. Since the start of the project there have been six meetings of the CAC held at various stages of the planning process. We hope these meetings have provided ample opportunity for you to participate in the process. Questions asked and inputs provided in these meetings have been instrumental in shaping the project.

A summary of the sixth CAC meeting is attached for your reference. As requested at the meeting a copy of the cost/benefit calculation form used by GDOT has also been included. There may be additional opportunities for CAC input during the design phase of the project, which is ongoing.

As discussed at the sixth CAC meeting, the next step in the overall process is the issuance of the Record of Decision by FHWA as to whether Alternative D-VE is the Selected Alternative. Assuming that Alternative D-VE is selected, authorization for the purchase of right-of-way will be made, and actual right-of-way purchase can begin, concurrent with the preparation of final construction plans.

We hope that you have enjoyed participating in the planning process of the US 411 Connector project. If you have any questions or require additional information, please feel free to contact Amber Perkins of my staff at (404)699-3473 or [perkins@dot.ga.gov](mailto:perkins@dot.ga.gov) or Rich Williams at (404) 699-4438 or [rwilliams@dot.ga.gov](mailto:rwilliams@dot.ga.gov).

Sincerely,

Glenn Bowman, P.E.  
State Environment/Location Engineer

Benefit Cost Analysis Work Sheet CONGESTION Projects	
PROJECT NUMBER	
PI NUMBER	
COUNTY	
PROJECT DESCRIPTION	
<b>Congestion Benefit = Tb + CMb + Fb</b>	
<b>Person Time Savings Benefit (Tb)</b>	
*Db (hrs)	_____
ADT	_____
Tb (\$s)	\$0.00
<b>Commercial or Truck Time Savings Benefit (CMb)</b>	
Db (hrs)	0
% Truck Traffic	_____
ADT	0.00
CMb	\$0.00
<b>Fuel Savings Benefit (Fb)</b>	
ADT	0.00
Fb (\$s)	\$0.00
<b>Total Congestion Benefit</b>	<b>\$0.00</b>
<b>Total Project Cost</b>	_____
<b>B/C Ratio</b>	<b>#DIV/0!</b>

Db is the difference in travel time (in hrs) through the corridor with and without the improvement using 20 yr projected tra  
 ADT = The 20 yr Average Daily Traffic for the Project

\*Reduction in delay or **Delay Benefit (Db)** can be defined as the difference between the peak hour travel time through the corridor without the proposed improvement and the peak hour travel time through the corridor with the proposed improvement.

First Name	Address	City, State, Zip
Mr. Dean Bagwell	1043 Cass White Road	Cartersville, GA 30121
Ms. Molly Bearden - BCHA	P. O. Box 1024	Cassville, GA 30123
Mr. Steven R. Bradley - Co. Manager	135 W. Cherokee Ave. - Suite 251	Cartersville, GA 30120
The Hon. Clarence Brown, Commissioner	135 W. Cherokee Ave. - Suite 251	Cartersville, GA 30120
Mr. Gary Burkhalter, Bartow Co. Schools	65 Gilreath Road	Cartersville, GA 30121
Mr. Michael Dean - New Frontiers Club	65 White Oak Drive, SE	Cartersville, GA 30121
Mr. Jeff Galloway - Shaw Industries	P. O. Box 429	Cartersville, GA 30120
Ms. Jennifer Giersch - FHA	61 Forsyth Street - Suite 171100	Atlanta, GA 30303
Ms. Molly Grover - Cartersville-Bartow COC	122 West Main Street	Cartersville, GA 30120
Mr. Bryan Hager - Ga. Sierra Club	1401 Peachtree St. - Suite 345	Atlanta, GA 30303
Mr. Thom Holt - Advanced Communications	300 North 5th Avenue	Rome, GA 30165
Ms. Linda Kellogg	92 Kellogg Circle, NE	Cartersville, GA 30121
Ms. Sheila Kokoruda - Anheuser Busch	P. O. Box 200248	Cartersville, GA 30120
Mr. Curtis Lewis - Coosa Valley RDC	1 Jackson Hill Road	Rome, GA 30162
Mr. Ric Mason - Etowah Foundation	15 N. Gilmer Street	Cartersville, GA 30120
Mr. Jerry Milam - City of Cartersville	1 N. Erwin Street	Cartersville, GA 30120
Mr. Victor Morgan	P. O. Box 200007	Cartersville, GA 30120
Mr. William Neel, Jr.	P. O. Box 458	Cartersville, GA 30120
Mr. Guy Parmenter - Etowah Valley His. Soc.	P. O. Box 457	Cartersville, GA 30120
Mr. J. Ted Perry	970 Joe Frank Harris Parkway - Suite 240	Cartersville, GA 30120
Ms. Lisa Ponder	14 Trotters Walk	Cartersville, GA 30121
Mr. Hank Rhodes	109 Maple Drive	Cartersville, GA 30120
Mr. Leamon Scott - Georgia DCA	P. O. Box 268	Rome, GA 30162
Mr. Bryan Shealy	42 Three Rivers Drive	Rome, GA 30161
Ms. Julie Mayfield - Ga. Conservancy	817 W. Peachtree St. - Suite 200	Atlanta, GA 30308
Mr. Tommy Strickland - Raintree Properties	P. O. Box 1312	Cartersville, GA 30120
Mr. Thorne Winter - RFA Mgmt. Co.	2801 Buford Highway, Suite 470	Atlanta, GA 30329