Value Engineering Study Report

Widening and Reconstruction of Grange Road

CSNHS-0007-00(885), PI #0007885

July 2011

Prepared by

Value Management Strategies, Inc.

VMS
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Date: July 22, 2011

To: Mr. Matt Sanders, AVS
Georgia Department of Transportation
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One Georgia Center
600 West Peachtree Street, N.W., 5th Floor
Atlanta, Georgia 30308-3603

Subject: Value Engineering Study Report
Widening and Reconstruction of Grange Road
City of Port of Wentworth, Chatham Country, Georgia
CSNHS-0007-00(885), PI #0007885

Dear Mr. Sanders:

Value Management Strategies, Inc. is pleased to transmit this Value Engineering Study Report for the referenced project. This report summarizes the events of the study conducted July 11 to 14, 2011.

It was a pleasure working with you, Georgia Department of Transportation's General Office, and District 5 on this project and we look forward to our continued professional relationship and future taskings.

Should you have any questions or comments concerning this report, please do not hesitate to contact me at 678-488-4287 or email lmvenegas@aol.com.

Sincerely,

VALUE MANAGEMENT STRATEGIES, INC.

Luis M. Venegas, PE, CVS-Life, LEED AP, F.SAVE
Value Engineering Team Leader

Copy: (2 copies/1 CD/PDF) Addressee

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

A value engineering (VE) study, sponsored by the Georgia Department of Transportation (GDOT) and facilitated by Value Management Strategies, Inc., was conducted for the widening and reconstruction of Grange Road in Port Wentworth, Chatham County, Georgia. The study was conducted in July 11 through 14, 2011. This *Executive Summary* provides an overview of the project, key findings, and the alternatives developed by the VE team.

PROJECT SUMMARY

Grange Road is located in the city limits of Port Wentworth in Chatham County, directly to the north of Garden City and both east and north of the City of Savannah. Grange Road connects State Road (SR) 21 (Augusta Road) in a T-intersection configuration at its westernmost limit, intersects SR-25 (South Coastal Highway) and continues east where it ends at the Savannah River and Georgia Port terminal facilities at its easternmost limit. In 2004, Grange Road was designated as an intermodal connector on the National Highway System (NHS) and is described as a port terminal (Facility ID No. GA33P) of the Port of Savannah from SR-21 to the terminal facilities. Intermodal connectors on the NHS are designated to provide access between major interstate facilities and other routes on the NHS.

Total project costs for all elements of the project are currently estimated at $12,874,558.

PROJECT PURPOSE AND NEED

The need of this project is to improve operations and reduce the incidence of accidents along Grange Road (from SR-21 to where Grange Road ends at the port terminal facilities) and where traffic is projected to reach 13,500 Average Annual Daily Traffic (AADT) and level of service (LOS) is anticipated to be "D." There is also a need to reduce the incidence of crashes at the intersections of Grange Road and SR-21 and at Grange Road and SR-25. The purpose of this project is to improve operational conditions along Grange Road from SR-21 to the port terminal facilities.

VE STUDY TIMING

The VE study was conducted early in the pre-concept stage. The project's Let Date is currently scheduled for August 15, 2013.

VE STUDY OBJECTIVES

The objectives of the VE study were to:

- Support the future growth of the Port of Savannah
- Facilitate movement of containers
- Improve traffic operations at the proposed Access Gate No. 8 to the Port of Savannah
- Facilitate access to the interstate system

KEY PROJECT ISSUES

The items listed below are the key drivers, constraints, or issues being addressed by the project and considered during this VE study to identify possible improvements:

- The Jimmy Deloach Connector is to precede this project with access/connection points on Grange Road for the proposed diamond interchange with Grange Road.
- The proposed Access Gate No. 8 will not be completed by the time this project commences/ completes.
- Widening of Grange Road will occur primarily to the north.
- Design speed will be 40 mph, but it is anticipated that the posted speed of 35 mph will be retained upon completion of the new facility.

VE ALTERNATIVES

The VE team developed 10 alternatives for improvement of the project. The following are the alternatives identified, along with their associated potential initial cost and/or life-cycle cost (LCC) savings, potential change in schedule, and a brief discussion of each. Please note that because the cost data depicted below represent *savings*, a number in parentheses represents a cost *increase*.

Alternative No. & Description	Initial Cost Savings	Change in Schedule
2 Eliminate 14-foot two-way center turn lane	$1,243,000	Improved
3 Reduce shoulder width to 12 feet with 10 feet paved	$940,000	Improved
5 Remove unsuitable material to support the new pavement	($1,195,000)	Decrease
7 Reduce typical section to a three-lane section with reduced shoulder width west of the Jimmy Deloach Connector	$527,000	Improved
8 Allow a free right turn lane from westbound Grange Road to Northbound SR-21	($381,000)	Decreased
9/11 Allow westbound Grange Road to Southbound SR-21 movement and signalize the intersection	($14,000)	—
12 Do not signalize the Grange Road/SR-25 Intersection	$107,000	—
18 Eliminate right turn lanes at the SR-25/Grange Road Intersection	$182,000	—
21 Limit project between SR-21 and SR-25	$1,645,000	Improved
26 Reduce center turn lane from 14 feet to 12 feet	$196,000	Improved
30 Only provide center turn lane from railroad crossing to SR-21	$412,000	Improved

Note: Because the data depicted above represent cost and time savings*, a negative number represents an increase.*

VE STUDY RESULTS

Acknowledging the rationale for the need and purpose of widening and reconstructing Grange Road, the VE study was able to maximize the facility's functional requirements to accommodate Port operations by moving goods and facilitating access to the interstate system and local roads while reducing the necessary investment required. This is evidenced by understanding that the proposed Access Gate No. 8 is to alleviate Port ingress/egress truck congestion by balancing this traffic with its existing southern gate serviced by SR-307 (Bourne Avenue). Furthermore, since the Jimmy Deloach Connector, a limited access freeway (anticipated to be completed before the commencement of this project), will have a full interchange at Grange Road and provides direct connection from SR-307 at the south to SR-21 at the north and ultimately to I-95, the need to have the proposed 70-foot-wide facility is redundant. As such, the VE effort concentrated on alternatives that maximized Grange Road's width, center turn lane and shoulders where most needed – west of the Jimmy Deloach Connector to access truck related industries on the north and south sides of Grange Road while minimizing the facility's width where least needed - east of the railroad crossing to SR-25 and the proposed new Access Gate No. 8.

VE TEAM

VE Study Team

Name	Organization	Title
Luis M. Venegas	Value Management Strategies, Inc.	VE Team Leader/Facilitator
Lori G. Kennedy	Kennedy Engineering & Associates Group, LLC	President/ Construction VE Team Member
Dominic F. Saulino	HNTB	Associate Vice President/ Designer VE Team Member

Key Project Contacts

Name	Organization	Title
Matt Sanders	GDOT, Engineering Services, General Office	Value Engineering Specialist
Brad Saxon	GDOT, District 5	Preconstruction Engineer

VE ALTERNATIVES

VALUE ENGINEERING ALTERNATIVES

The results of this study are presented as individual alternatives to the baseline concept. Each alternative consists of a summary of the baseline concept, a description of the suggested change, a listing of its advantages and disadvantages, a cost comparison, change in performance and value, discussion of schedule and risk impacts (if applicable), and a brief narrative comparing the baseline concept with the alternative. (Please refer to the *Project Analysis* section of this report for an explanation of how the performance attributes and value are calculated.) Sketches and calculations are also presented where applicable.

The cost comparisons reflect a comparable level of detail as in the baseline estimate. A life-cycle benefit-cost analysis for major alternatives is included where appropriate.

VE ALTERNATIVE SUMMARY TABLES

Summary of VE Alternatives

Alternative No. & Description	Initial Cost Savings	Change in Schedule
2 Eliminate 14-foot two-way center turn lane	$1,243,000	Improved
3 Reduce shoulder width to 12 feet with 10 feet paved	$940,000	Improved
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7 Reduce typical section to a three-lane section with reduced shoulder width west of the Jimmy Deloach Connector	$527,000	Improved
8 Allow a free right turn lane from westbound Grange Road to Northbound SR-21	($381,000)	Decreased
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18 Eliminate right turn lanes at the SR-25/Grange Road Intersection	$182,000	—
21 Limit project between SR-21 and SR-25	$1,645,000	Improved
26 Reduce center turn lane from 14 feet to 12 feet	$196,000	Improved
30 Only provide center turn lane from railroad crossing to SR-21	$412,000	Improved

Note: Because the data depicted above represent cost and time savings*, a negative number represents an increase.*

OTHER CONSIDERATIONS

The VE team identified the following observations, relatively general in nature, for consideration by the project team.

- The Jimmy Deloach Connector Interchange will precede this project.
- The Jimmy Deloach Connector Project will purchase the required right-of-way for the proposed interchange.

VE ALTERNATIVE 2

ELIMINATE 14-FOOT TWO-WAY CENTER TURN LANE

Cost Savings: $1,243,000
Time Savings: Improved

Description of Baseline Concept:

The current design calls for the use of two 12-foot lanes, a 14-foot two-way turn lane, and 16-foot shoulders of which 14 feet is paved and 2 feet is unpaved.

Description of Alternative Concept:

Eliminate the 14-foot two-way turning lane and use two 12-foot lanes and 16-foot shoulders of which 14 feet is paved and 2 feet is unpaved.

Advantages:

- Initial cost savings.
- Smaller typical section footprint thereby reducing right-of-way takes and displacements as well as utility relocations/coordination.

Disadvantages:

- No refuge for trucks making turning movements into local facilities along Grange Road.
- Through trucks must stop and wait while trucks making a turning movement with no center turn lane turn.

Discussion:

The current condition along Grange Road does not provide for a continuous two-way turning lane with 9-foot travel lanes. Although this is not an ideal situation, truckers using this facility have adjusted to these conditions and have made it a reasonably usable roadway.

With the new facility providing 12-foot travel lanes and 16-foot, full depth shoulders, users of the roadway can handle left-turning traffic more efficiently and will adapt to the proposed solution even without a 14-foot turning lane.

Technical Review Comments:

Actual utility and right-of-way savings will have to be analyzed in greater depth to ascertain actual savings. However, a reduction in overall roadway width from 70 feet to 56 feet stands to reason that time and material savings are achievable.

A narrower roadway section could also lead to an improved alignment of the proposed widening.

VE ALTERNATIVE 2

ELIMINATE 14-FOOT TWO-WAY CENTER TURN LANE

Project Management Considerations:

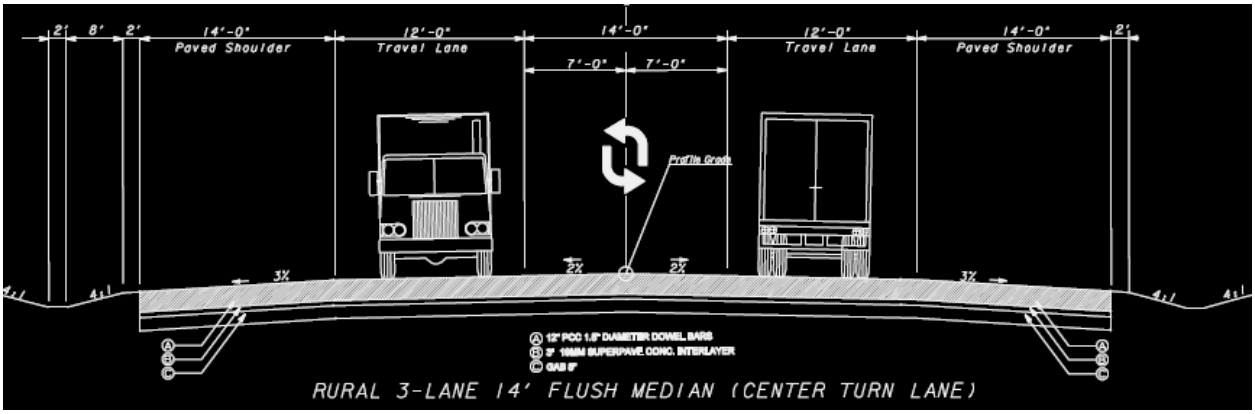
The current use of Grange Road is to access the trucking industry related businesses on both the north and south side of the roadway. Currently, no direct access to the Port of Savannah exists from Grange Road as the proposed Access Gate No. 8 has not been constructed.

Since Grange Road is now designated an intermodal connector and the Jimmy Deloach Connector will be in place prior to the construction of this facility, the need to have a 14-foot two-way turn lane is perhaps unwarranted. This stems from the probability that most trucks to and from the Port at future Access Gate No. 8 will use the Jimmy Deloach Connector first rather than travelling to SR-21 unless there is a backup or accident on the Jimmy Deloach Connector. Furthermore, there are only three "curb cuts" on the north side of Grange Road between the proposed Access Gate No. 8 and the Jimmy Deloach Connector further negating the need for a continuous turning lane.

Discussion of Schedule Impacts:

A reduction in this facility's width will result in some construction time savings, although not to the degree that could really be quantified at this early stage of design.

Baseline Concept Sketch:

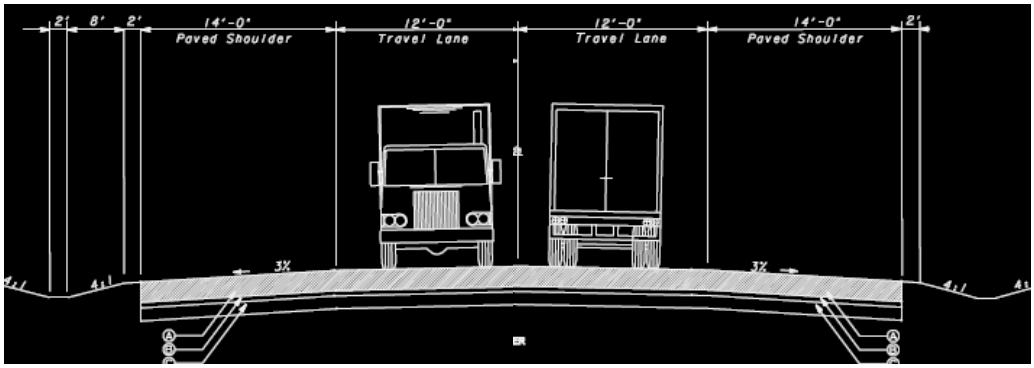


/------16'------/-----12'-----/------14'------/-----12'-----/------16'------/

VE ALTERNATIVE 2

ELIMINATE 14-FOOT TWO-WAY CENTER TURN LANE

VE Alternative Concept Sketch:



/------16'------/-----12'-----//-----12'-----/------16'------/

Assumptions and Calculations:

<u>Clear and Grub</u>

1.79 acres (AC) x $4,000/AC = $7,160

<u>Pavement</u>

14 linear feet (LF) x 5,560 LF = 77,840 square feet (SF) ÷ 9 SF/square yard (SY) = 8,648.89 SY, say 8,649 SY

8,649 SY x $85.30/SY = $737,759.7, say $737,760

<u>Right-of-Way</u>

1.79 AC x $95,000/AC = $170,050

VE ALTERNATIVE 2

ELIMINATE 14-FOOT TWO-WAY CENTER TURN LANE

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Clear/Grub	AC	1.79	$4,000	$7,160			$0
Pavement	SY	8,649	$85.30	$737,760			$0
ROADWAY SUBTOTAL				*$744,920*			*$0*
ROADWAY MARK-UP	*10.31%*			*$76,801*			*$0*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$821,721*			*$0*
RIGHT-OF-WAY ITEMS							
Land	AC	1.79	$95,000	$170,050			$0
RIGHT-OF-WAY SUBTOTAL				*$170,050*			*$0*
RIGHT-OF-WAY MARK-UP	*148%*			*$251,674*			$0
VA ADDED MARK-UP				*$0*			$0
RIGHT-OF-WAY TOTAL				*$421,724*			*$0*
TOTAL				$1,243,445			$0
TOTAL (Rounded)				$1,243,000			$0
						SAVINGS	**$1,243,000**

VE ALTERNATIVE 3

REDUCE SHOULDER WIDTH TO 12 FEET WITH 10 FEET PAVED

Cost Savings: $940,000
Time Savings: Improved

Description of Baseline Concept:

The current concept proposes 16-foot shoulders with 14-foot full depth paved.

Description of Alternative Concept:

Reduce the shoulder width to 12 feet with 10 feet full depth paved.

Advantages:

- Meets American Association of State Highway and Transportation Officials (ASSHTO) Standards Material cost savings.
- Still meets project's need and purpose.
- Initial cost savings.

Disadvantages:

- Trucks may need full 16-foot shoulder if they are broken down.
- If Grange Road is widened to four through lanes in the future, it would be easier with 16-foot shoulders.

Discussion:

The current condition along Grange Road does not provide any shoulders with 9-foot travel lanes. Although this is not an ideal situation, truckers using this facility have adjusted to these conditions and have made it a reasonably usable roadway. With the new facility providing a continuous 14-foot turn lane, 12-foot shoulders could easily accommodate a disabled vehicle. Furthermore, narrower shoulders will reduce the right-of-way impacts and pavement quantities. Reducing shoulder widths from 16 feet to 12 feet would not only provide a considerable cost savings, it would also minimize impacts onto entrances and frontage of local businesses along Grange Road.

Technical Review Comments:

Technically, 12-foot shoulders with 10-foot full depth paved section are consistent with interstate standards where travel speeds exceed 55 mph. The narrower shoulders will suffice when one considers the design speed is only 40 mph and will most likely continue to be signed at 35 mph.

Project Management Considerations:

Management may wish to retain the proposed 16-foot shoulders or even 14-foot shoulders if future expansion of the Port of Savannah would warrant widening Grange Road in the future.

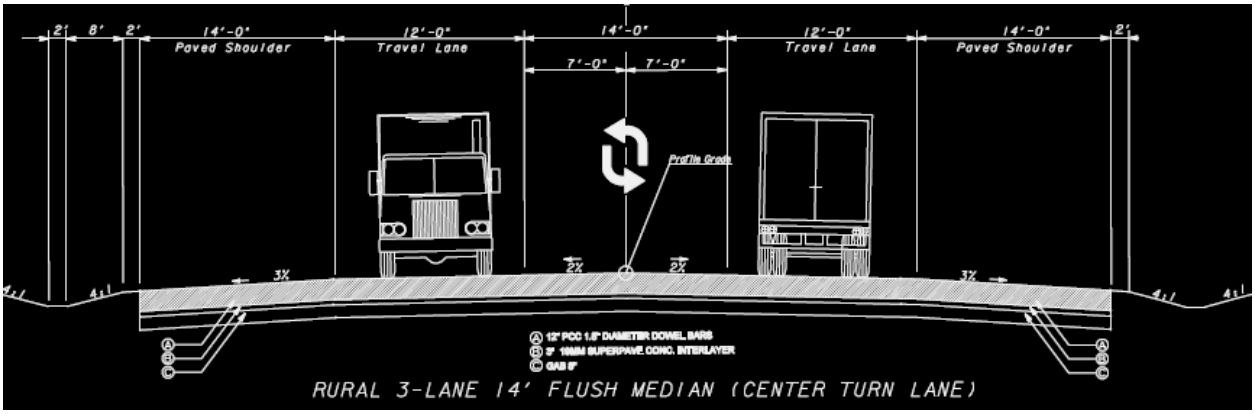
VE ALTERNATIVE 3

REDUCE SHOULDER WIDTH TO 12 FEET WITH 10 FEET PAVED

Discussion of Schedule Impacts:

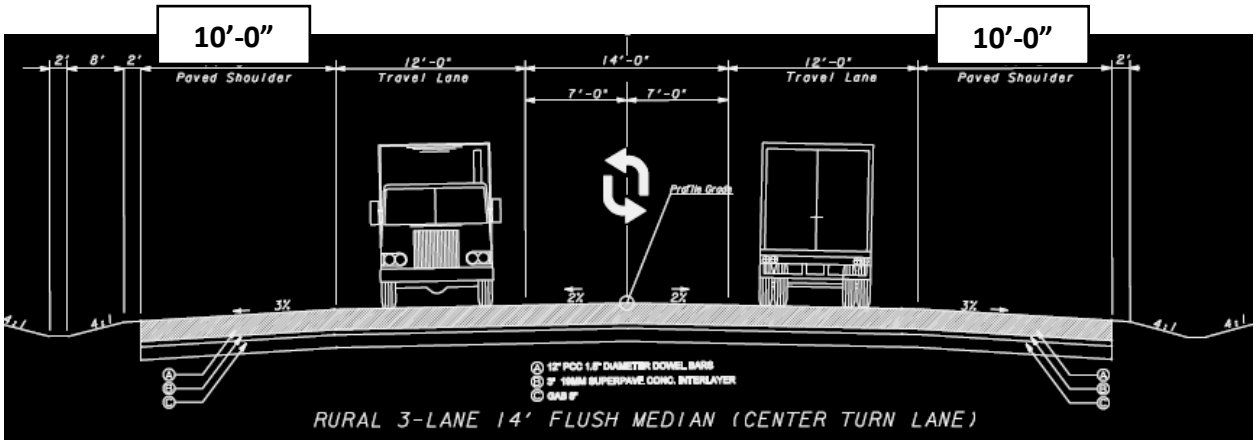
The schedule should not be compromised with reduction of the proposed shoulder widths to 12 feet.

Baseline Concept Sketch:



/------16'------/-----12'-----/------14'------/-----12'-----/------16'------/

VE Alternative Concept Sketch:



/------12'------/-----12'-----/------14'------/-----12'-----/------12'------/

VE ALTERNATIVE 3

REDUCE SHOULDER WIDTH TO 12 FEET WITH 10 FEET PAVED

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Clearing and Grubbing	AC	1.35	$4,000	$5,400			$0
Concrete Pavement	SY	6,542	$85.30	$558,033			$0
ROADWAY SUBTOTAL				*$563,433*			*$0*
ROADWAY MARK-UP	*10.31%*			*$58,090*			*$0*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$621,523*			*$0*
RIGHT-OF-WAY ITEMS							
Land	AC	1.35	$95,000	$128,250			$0
RIGHT-OF-WAY SUBTOTAL				*$128,250*			*$0*
RIGHT-OF-WAY MARK-UP	*148%*			*$189,810*			$0
VA ADDED MARK-UP				*$0*			$0
RIGHT-OF-WAY TOTAL				*$318,060*			*$0*
TOTAL				$939,583			$0
TOTAL (Rounded)				$940,000			$0
						SAVINGS	**$940,000**

VE ALTERNATIVE 5

REMOVE UNSUITABLE MATERIAL TO SUPPORT THE NEW PAVEMENT

Cost Savings: ($1,195,000)
Time Savings: Decrease

Description of Baseline Concept:

It appears the current design only removes the existing pavement to include the base aggregate.

Description of Alternative Concept:

Undercut the proposed widening to remove the known, unsuitable subgrade material in order to appropriately support the new pavement with select backfill.

Advantages:

- Increases life of the new pavement.
- Improves ridability.
- Assures pavement stability.

Disadvantages:

- Increases initial cost.
- Slight increase in construction duration.

Discussion:

Discussions during the initial designer's and stakeholders' presentation indicated the condition of the existing pavement was quite poor due to the high volume of truck traffic and the known, extremely inadequate condition of the subgrade.

Technical Review Comments:

A more detailed analysis of the railroad crossing will have to be undertaken as a result of the undercutting.

Project Management Considerations:

Since Grange Road has been designated an intermodal connector on the NHS as a port terminal (Facility ID No. GA33P of the Port of Savannah from SR-21 to the terminal facilities), the additional costs associated with this alternative can be easily justified for consideration. Furthermore, since intermodal connectors on the NHS are intended to provide access between major interstate facilities and other routes on the NHS, the durability aspects approach those of interstate systems and warrants serious consideration.

VE ALTERNATIVE 5

REMOVE UNSUITABLE MATERIAL TO SUPPORT THE NEW PAVEMENT

Discussion of Schedule Impacts:

A slight increase in construction duration may occur as a result of having to undercut the new roadway.

Discussion of Risk Impacts:

The existing poor condition of Grange Road is directly attributed to the condition of the subgrade. This alternative reduces the potential of a shortened life span for the new facility by replacing the unsuitable material and replacing with select backfill.

Assumptions and Calculations:

Determine volume of excavation and select backfill:

- Length of new roadway = 1.4 miles ∴ 1.4 miles x 5,280 LF)mile = 7,392 LF
- Width of new roadway = 70 LF
- Assume an undercut depth of 4 vertical LF (VLF)

As such:

- 7,392 LF x 70 LF x 4 VLF = 2,069,760 cubic feet (CF) ∴ 2,069,760 CF ÷ 27 CF/cubic yard (CY) = 76,658 CY of excavation and backfill, say **76,700 CY**

In consultation with GDOT, average cost of select backfill for the anticipated quantity is between $10 to $11/CY, therefore use **$10.50/CY**.

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Unclassified Excavation (GDOT's 12/28/10 Item Mean Summary)	CY			$0	76,700	$3.62	$277,654
Select Backfill (GDOT average)	CY			$0	76,700	$10.50	$805,350
ROADWAY SUBTOTAL				*$0*			*$1,083,004*
ROADWAY MARK-UP	*10.31%*			*$0*			*$111,658*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$0*			*$1,194,662*
TOTAL				$0			$1,194,662
TOTAL (Rounded)				$0			$1,195,000
						SAVINGS	**($1,195,000)**

VE ALTERNATIVE 7

REDUCE TYPICAL SECTION TO A THREE-LANE SECTION WITH REDUCED SHOULDER WIDTH WEST OF THE JIMMY DELOACH CONNECTOR

Cost Savings: $527,000
Time Savings: Improved

Description of Baseline Concept:

The current design provides for a three-lane section with 16-foot shoulders along the section between SR-21 and the Jimmy Deloach Connector.

Description of Alternative Concept:

Use the same three-lane section with a reduced shoulder width of 10 feet with 6-foot full depth paved.

Advantages:

- Truck traffic is 60% lower on Grange Road west of the Jimmy Deloach Connector, so 16-foot shoulders are not warranted.
- Slightly easier to construct.
- Reduces land take.
- Initial cost savings.

Disadvantages:

- Reduced width to pass a disabled truck on the narrower shoulder.
- Loss of a design feature.

Discussion:

Since truck traffic is significantly lower west of the Jimmy Deloach Connector, the extra wide shoulders do not appear to be warranted, nor are they as needed as east of the connector. Additionally, the 14-foot two-way turn lane can be encroached upon should a truck breakdown and obstruct part of the travel lane.

Discussion of Schedule Impacts:

A slight reduction in construction duration may occur as a result of having narrower shoulders on the new roadway.

Discussion of Risk Impacts:

Since most of the truck traffic accessing the proposed Access Gate No. 8 will be using the Jimmy Deloach Connector, minimal risk is assumed for a wider road section on the western portion of the project between SR-21 and the Jimmy Deloach Connector.

VE ALTERNATIVE 7

REDUCE TYPICAL SECTION TO A THREE-LANE SECTION WITH REDUCED SHOULDER WIDTH WEST OF THE JIMMY DELOACH CONNECTOR

Assumptions and Calculations:

Shoulder pavement reduced from 14 feet to 6 feet:

Station (STA) 100+40 to STA 121+00 = 2,060 feet

2,060 feet x 8 feet (width) x 2 (two shoulders) / 9 SF/SY = 3,662 SY

Right-of-Way Reduction:

16 feet wide x 2,060 feet / 43,2560 SF/AC = 0.76 AC

Clearing and grubbing area same as right-of-way reduction = 0.76 AC

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Clearing and Grubbing	AC	0.76	$4,000.00	$3,040			$0
Concrete Pavement	SY	3,662	$85.30	$312,369			$0
ROADWAY SUBTOTAL				*$315,409*			*$0*
ROADWAY MARK-UP	*10.31%*			*$32,519*			*$0*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$347,927*			*$0*
RIGHT-OF-WAY ITEMS							
Land	AC	0.76	$95,000	$72,200			$0
RIGHT-OF-WAY SUBTOTAL				*$72,200*			*$0*
RIGHT-OF-WAY MARK-UP	*148%*			*$106,856*			$0
VA ADDED MARK-UP				*$0*			$0
RIGHT-OF-WAY TOTAL				*$179,056*			*$0*
TOTAL				$526,983			$0
TOTAL (Rounded)				$527,000			$0
						SAVINGS	**$527,000**

VE ALTERNATIVE 8

ALLOW A FREE RIGHT TURN LANE FROM WESTBOUND GRANGE ROAD TO NORTHBOUND SR-21

Cost Savings: ($381,000)
Time Savings: Decreased

Description of Baseline Concept:

The current design does not provide a free right turn lane from westbound Grange Road to northbound SR-21. All westbound traffic on Grange Road must come to a stop prior to proceeding northbound on SR-21.

Description of Alternative Concept:

Provide a free right turn lane from westbound Grange Road to northbound SR-21.

Advantages:

- Continuous movement for trucks onto SR-21 without stopping.
- Improved operations on Grange Road.
- No additional right-of-way needed along SR-21.

Disadvantages:

- Additional pavement required.
- Impacts operations on SR-21.

Discussion:

Since the basic function of the project is to accommodate port operations by facilitating access to the interstate system, the concept of a free flow right movement from westbound Grange Road to northbound SR-21 is warranted, as goods movement is not hampered at the intersection. Furthermore, no additional right-of-way takes are anticipated along the intersection's northeast corner and northbound of SR-21.

Technical Review Comments:

A more detailed analysis of the length of the free flow lane from Grange Road to SR-21 must be undertaken to ensure appropriate length and no encroachment on adjacent properties.

Project Management Considerations:

The free flow right movement should be viewed as an improvement to operations on Grange Road to accommodate the Port of Savannah operations by facilitating access to the interstate system.

Discussion of Schedule Impacts:

VE ALTERNATIVE 8

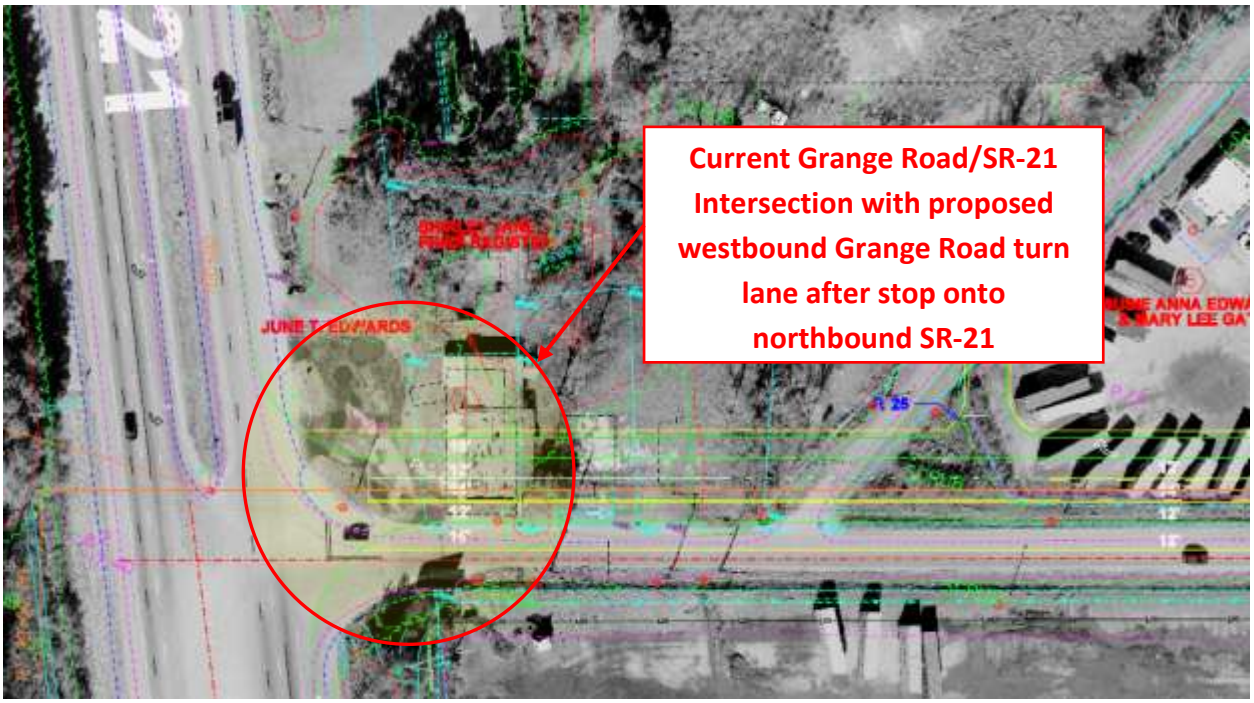
ALLOW A FREE RIGHT TURN LANE FROM WESTBOUND GRANGE ROAD TO NORTHBOUND SR-21

Although minimally, there will be an increase in construction time due to the additional work associated with the free flow right movement lane.

Discussion of Risk Impacts:

A potential risk exists with a land take if it is determined the free right lane must be extended beyond the anticipated 1,400 LF.

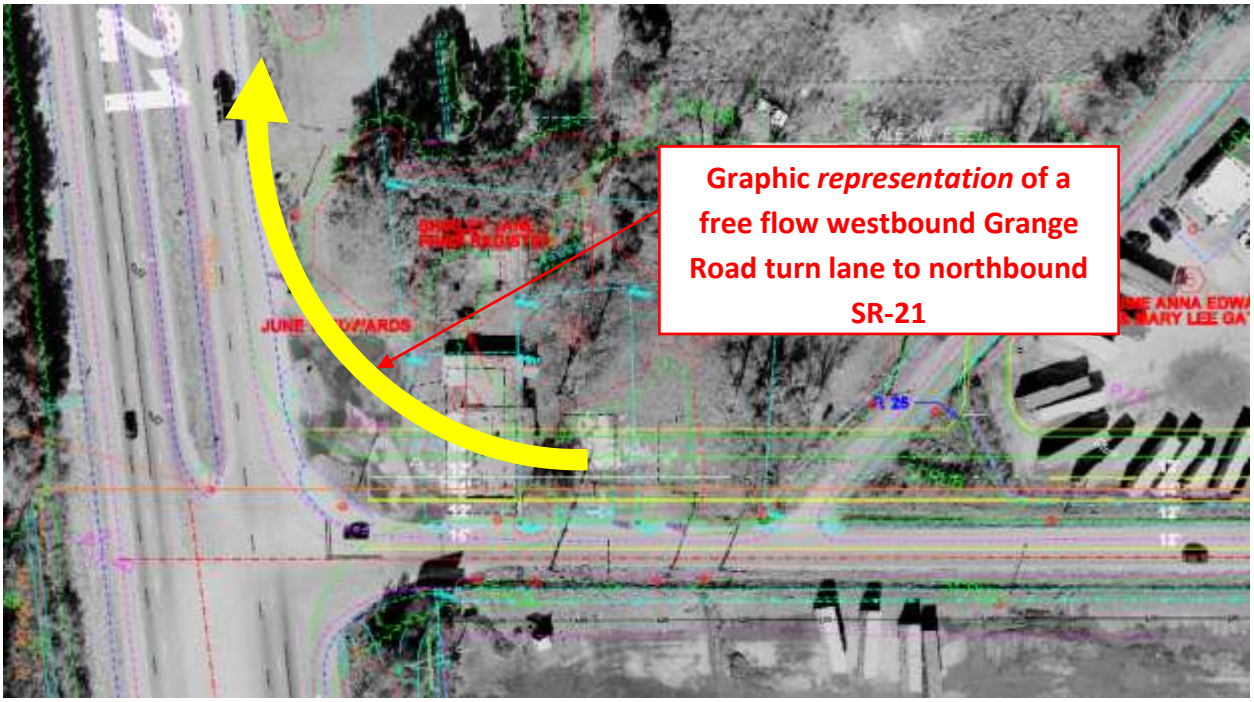
Baseline Concept Sketch:



VE ALTERNATIVE 8

ALLOW A FREE RIGHT TURN LANE FROM WESTBOUND GRANGE ROAD TO NORTHBOUND SR-21

VE Alternative Concept Sketch:



Assumptions and Calculations:

Assume a 1,400 LF acceleration lane needed along SR-21.

Assume 14 LF shoulder adjacent to acceleration lane along SR-21.

<u>Acceleration Lane</u>

1,400 LF x 12 LF = 16,800 SF/9 SF/SY = 1,867 SY

1,867 SY x $85.30/SY = $159,255

<u>Shoulder Adjacent to Acceleration Lane</u>

1,400 LF x 14 LF = 19,600 SF/9 SF/SY = 2,178 SY

2,178 SY x $85.30/SY = $185,783

$159,255 + $185,783 = $345,038

VE ALTERNATIVE 8

ALLOW A FREE RIGHT TURN LANE FROM WESTBOUND GRANGE ROAD TO NORTHBOUND SR-21

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Acceleration Lane	SY	1,867	$85.30	$159,255			$0
Shoulder Adjacent to Acceleration Lane	SY	2,178	$85.30	$185,783			$0
ROADWAY SUBTOTAL				*$345,039*			*$0*
ROADWAY MARK-UP	*10.31%*			*$35,573*			*$0*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$380,612*			*$0*
TOTAL				$380,612			$0
TOTAL (Rounded)				$381,000			$0
						SAVINGS	**$381,000**

VE ALTERNATIVE 9/11

ALLOW WESTBOUND GRANGE ROAD TO SOUTHBOUND SR-21 MOVEMENT AND SIGNALIZE THE INTERSECTION

Cost Savings: ($14,000)

Description of Baseline Concept:

The current concept proposes to reduce movement at the Grange Road/SR-21 Intersection by eliminating the left turn from Grange Road (westbound) to SR-21 (southbound). The concept also modifies the existing medians on SR-21 at this intersection to reduce the possibility of making the left turn. The concept also proposes signalizing this intersection.

Description of Alternative Concept:

Remove the raised median and provide full depth pavement on Grange Road at the intersection with SR-21 to allow a left turn movement (westbound Grange Road to southbound SR-21). The alternative would eliminate the proposed work at the SR-21 medians, but retains the proposed signal.

Advantages:

- Maintains all **existing** movements at the intersection.
- Potential accident reduction due to signalized intersection.
- Maintains drive expectation onto a State Road.

Disadvantages:

- The intersection has a history of accidents mostly associated with the left turn movement; it is noted however, the intersection is not currently signalized, having only a stop sign on Grange Road.
- Minimal increase in initial cost.

Discussion:

The current concept proposes a signal at the Grange Road/SR-21 Intersection primarily to facilitate truck traffic travel southbound on SR-21 to turn eastbound on Grange Road and access the proposed new Access Gate No. 8. This signal can easily accommodate the westbound Grange Road to southbound SR-21 truck traffic, thereby improving the operation of the intersection.

Technical Review Comments:

Elimination of the 12-foot median at the Grange Road/SR-21 Intersection would have been eliminated and a full depth pavement section added to accommodate the turning movement onto SR-21.

VE ALTERNATIVE 9/11

ALLOW WESTBOUND GRANGE ROAD TO SOUTHBOUND SR-21 MOVEMENT AND SIGNALIZE THE INTERSECTION

Project Management Considerations:

It is understood GDOT and the Port of Savannah have been discussing the possibility of eliminating the signal at SR-21, and although this alternative is counter this effort, it is being provided in an effort to retain the same level of turning movements as is currently at the intersection.

Assumptions and Calculations:

Remove:

Raised median: STA 0+75 to STA 2+60 = 185 LF

Curb and gutter at median: (21 LF + 157 LF) x 2 (sides) = 356 LF

Concrete: 261 SY of 4" concrete

Add:

Full depth pavement: 261 SY

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Curb and Gutter	LF	356	$12.22	$4,350			$0
4" Concrete	SY	261	$20.16	$5,262			$0
Concrete Pavement	SY			$0	261	$85.30	$22,263
ROADWAY SUBTOTAL				*$9,612*			*$22,263*
ROADWAY MARK-UP	*10.31%*			*$991*			*$2,295*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$10,603*			*$24,559*
TOTAL				$10,603			$24,559
TOTAL (Rounded)				$11,000			$25,000
						SAVINGS	**($14,000)**

VE ALTERNATIVE 12

DO NOT SIGNALIZE THE GRANGE ROAD/SR-25 INTERSECTION

Cost Savings: $107,000

Description of Baseline Concept:

The current conceptual design indicates the Grange Road/SR-21 (Augusta Road) and Grange Road/SR-25 (South Coastal Highway) Intersections at are to be signalized.

Description of Alternative Concept:

Eliminate the signalization at the Grange Road/SR-25 Intersection.

Advantages:

- Minimizes traffic disruption.
- Allows for continuous traffic flow from the Port of Savannah (future Access Gate No. 8).
- Eliminates O&M costs associated with signalization equipment.

Disadvantages:

- Will require stop signs on SR-25.
- Impedes north-south traffic flow on SR-25.

Discussion:

The intent of the Grange Road widening and reconstruction is to improve truck traffic flow from the proposed Access Gate No. 8 to SR-25, the Jimmy Deloach Connector, and SR-21 to facilitate access to the interstate system.

Providing a signalized intersection immediately upon departing the port facility could create a backup of truck traffic on SR-25 and the port egress. Certainly this would create additional delays and slow the transportation of goods to the interstate system.

Technical Review Comments:

Signal warrants have not yet been prepared for either of the Grange Road intersections and would need to be finalized prior to determination if signals are needed at both intersections. It appears the volume of traffic in the design year 2035 on SR-25 does not necessitate a signal in the north-south direction; however, the east-west through traffic on Grange Road could potentially limit the number of vehicles crossing or turning from SR-25.

Project Management Considerations:

If the question of east-west through traffic is paramount, then strong consideration should be given to this alternative and may require dialogue with the Port, State, and City officials.

VE ALTERNATIVE 12

DO NOT SIGNALIZE THE GRANGE ROAD/SR-25 INTERSECTION

Discussion of Schedule Impacts:

As signalization of intersections is rarely on construction critical paths, a reduction in overall construction would not be expected. However, parallel construction activities could benefit from one less activity.

Discussion of Risk Impacts:

As one of the basic functions of this project is to move goods to the interstate system as soon as possible, this alternative eliminates the risk associated with delays of a signalized intersection along the mainline.

Assumptions and Calculations:

During the designer's initial presentation, it appeared the Port of Savannah was in favor of eliminating the signals at SR-25; however, this must be confirmed from both an engineering and traffic point of view.

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Traffic Signal at SR-25	EA	1	$100,000	$100,000			$0
Stops Signs on SR-25	EA			$0	2	$1,500	$3,000
ROADWAY SUBTOTAL				*$100,000*			*$3,000*
ROADWAY MARK-UP	*10.31%*			*$10,310*			*$309*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$110,310*			*$3,309*
TOTAL				$110,310			$3,309
TOTAL (Rounded)				$110,000			$3,000
						SAVINGS	**$107,000**

VE ALTERNATIVE 18

ELIMINATE RIGHT TURN LANES AT THE SR-25/GRANGE ROAD INTERSECTION

Cost Savings: $182,000

Description of Baseline Concept:

The current concept provides for right turn lanes, southbound SR-25 to westbound Grange Road and northbound SR-25 to eastbound Grange Road. The concept also proposes signalizing this intersection.

Description of Alternative Concept:

Maintain the center turn lanes through the intersection and remove the right turn lanes from SR-25 to Grange Road due to low right turn movements and the proposed signalized intersection.

Advantages:

- Reduces pavement width at intersections.
- Reduces right-of-way take at the intersection.
- Lessens the visual impact to the SR-25 historic resource.

Disadvantages:

- If the Port continues to expand beyond the expected growth due to the proposed Access Gate No. 8, traffic volumes may increase along SR-25 where right turns may be needed in the future.

Discussion:

Right turn movements along northbound and southbound SR-25 are low and can be accommodated without dedicated lanes since the intersection is proposed to be signalized.

Technical Review Comments:

Because of the low turning movements along SR-25, the operation of the SR-25/Grange Road Intersection will not be compromised.

Project Management Considerations:

Management may desire to retain the right turn lanes along SR-25 as it may be more difficult in the future to justify and coordinate with the State Historic Preservation Office (SHPO) to add them at a later date, especially knowing GDOT has currently received a favorable “no adverse effect” from the SHPO for the current design.

VE ALTERNATIVE 18

ELIMINATE RIGHT TURN LANES AT THE SR-25/GRANGE ROAD INTERSECTION

Assumptions and Calculations:

Remove:

Remove right turn lanes along northbound and southbound SR-25:
(475 LF x 12 LF) x 2 / 9 SF/SY = 1,266.6 SY, say 1,267 SY

Right-of-way reduction:

1,267 SY / 4,840 SY/AC = 0.26 AC

Clearing and grubbing is the same as right-of-way = 0.26 AC

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Clearing and Grubbing	AC	0.26	$4,000	$1,040			$0
Concrete Pavement	SY	1,267	$85.30	$108,075			$0
ROADWAY SUBTOTAL				*$109,115*			*$0*
ROADWAY MARK-UP	*10.31%*			*$11,250*			*$0*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$120,365*			*$0*
RIGHT-OF-WAY ITEMS							
Land	AC	0.26	$95,000	$24,700			$0
RIGHT-OF-WAY SUBTOTAL				*$24,700*			*$0*
RIGHT-OF-WAY MARK-UP	*148%*			*$36,556*			$0
VA ADDED MARK-UP				*$0*			$0
RIGHT-OF-WAY TOTAL				*$61,256*			*$0*
TOTAL				$181,621			$0
TOTAL (Rounded)				$182,000			$0
						SAVINGS	**$182,000**

VE ALTERNATIVE 21

LIMIT PROJECT BETWEEN SR-21 AND SR-25

Cost Savings: $1,645,000
Time Savings: Improved

Description of Baseline Concept:

The current conceptual project terminates at the proposed Port of Savannah Access Gate No. 8 entrance, approximately 1,800 feet east of SR-25.

Description of Alternative Concept:

Assuming the design of the proposed Access Gate No. 8 is not finalized and the design requirements (number of through lanes, turn lanes, shoulders, etc.) for Grange Road between SR-25 and the proposed Port entrance are unknown, stopping the project at SR-25 and having the Port of Savannah complete their desired entrance, to include that portion of Grange Road in consultation with GDOT, appears to be prudent.

Advantages:

- Initial cost savings.
- A more customized design of Grange Road east of SR-25 to accommodate the proposed Homeland Security entrance to Access Gate No. 8.
- Reduces construction time.
- Allows for a better coordinated road design with proposed ingress/egress of Access Gate No. 8.

Disadvantages:

- This portion of Grange Road's construction is delayed until the design for the proposed entrance to Access Gate No. 8 is finalized.
- Could result in substantial edge of pavement damages on the east side of SR-25.

Discussion:

The current typical section along Grange Road immediately east of SR-25 allows for two through 12-foot lanes (one lane in each direction), 14-foot shoulders, and a 12-foot westbound right turn lane onto northbound SR-25 for approximately 400 feet; continuing east the current typical section is two through 12-foot lanes (one lane in each direction) and 14-foot shoulders for approximately 1,400 feet.

Without the design of the proposed Access Gate No. 8 being finalized by Homeland Security, it may behoove GDOT to end the project limits at SR-25 to allow additional coordination between the Port and GDOT concerning the typical section in this area. For example, the green space north of Grange Road and east of SR-25 may wish to be used as a holding storage area for trucks entering this Port entrance so that backups do not occur along Grange Road entering the Port.

VE ALTERNATIVE 21

LIMIT PROJECT BETWEEN SR-21 AND SR-25

Technical Review Comments:

By ending the project limits at SR-25, a better customized design of Grange Road between SR-25 and the actual proposed Port entrance at Access Gate No. 8 can be accomplished.

Project Management Considerations:

Without completing this section of Grange Road now, additional costs could be incurred by GDOT to remobilize and construct this section of roadway. However, if procurement of this section of roadway is done through the Port Authority, GDOT would not have to worry about this concern.

Discussion of Schedule Impacts:

Direct access to the proposed Access Gate No. 8 could be delayed for the Port if this section of roadway is built at a later time than the remaining construction of Grange Road.

Discussion of Risk Impacts:

This alternative has the opportunity of mitigating a potential risk impact: Deferring construction of the eastern most portion of Grange Road avoids the possibility of demolishing a portion of the new roadway to accommodate the Port's plans for Access Gate No. 8, thereby avoiding the cost of this "throwaway" work. This alternative transfers this work to the Port, thereby alleviating GDOT of this risk.

Baseline Concept Sketch:

Through Lanes (approximately 1,400 feet):

/-----14'-----/-----12'----//-----12'-----/-----14'-----/

Turn Lanes onto SR 25 (approximately 400 feet):

/-----14'-----/-----12'-----/-----14'-----/-----12'-----/-----12'-----/--4'--/

Shoulder EB Lane Left Turn WB Lane Shoulder…Slope

VE ALTERNATIVE 21

LIMIT PROJECT BETWEEN SR-21 AND SR-25

Assumptions and Calculations:

Through Lanes (approximately 1,400 feet):

Clearing and grubbing: 0.58 AC x $4,000/AC = $2,320

Pavement:

52 LF x 1,400 LF = 72,800 SF

72,800 SF / 9 SF/SY = 8,089 SY

8,089 SY x $85.30/SY = $689,992

Right-of-way: 1.84 AC x $95,000/AC = $174,800

Turn Lanes (approximately 400 feet) onto SR-25:

Clearing and grubbing: 0.17 AC x $4,000/AC = $680

Pavement:

68 LF x 400 LF = 27,200 SF

27,200 SF / 9 SF/SY = 3,022 SY

3,022 SY x $85.30/SY = $257,777

Right-of-way: 0.69 AC x $95,000/AC = $65,550

VE ALTERNATIVE 21

LIMIT PROJECT BETWEEN SR-21 AND SR-25

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Clearing and Grubbing	AC	0.75	$4,000	$3,000			$0
Pavement	SY	11,111	$85.30	$947,768			$0
ROADWAY SUBTOTAL				*$950,768*			*$0*
ROADWAY MARK-UP	*10.31%*			*$98,024*			*$0*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$1,048,793*			*$0*
RIGHT-OF-WAY ITEMS							
Land	AC	2.53	$95,000	$240,350			$0
RIGHT-OF-WAY SUBTOTAL				*$240,350*			*$0*
RIGHT-OF-WAY MARK-UP	*148%*			*$355,718*			$0
VA ADDED MARK-UP				*$0*			$0
RIGHT-OF-WAY TOTAL				*$596,068*			*$0*
TOTAL				$1,644,861			$0
TOTAL (Rounded)				$1,645,000			$0
						SAVINGS	**$1,645,000**

VE ALTERNATIVE 26

REDUCE CENTER TURN LANE FROM 14 FEET TO 12 FEET

Cost Savings: $196,000
Time Savings: Improved

Description of Baseline Concept:

The current concept provides for a continuous 14-foot two-way turn lane for the majority of the entire project.

Description of Alternative Concept:

Reduce the width of the continuous turn lane from 14 feet to 12 feet.

Advantages:

- The proposed increased shoulder width of 16 feet will allow trucks to use shoulders to facilitate a 12-foot turn lane.
- Initial cost savings.
- Simplifies construction – three 12-foot lanes.
- Slight decrease in construction time.

Disadvantages:

- Trucks using center tune lane could encroach into travel lane due to reduced width.

Discussion:

The center turn lane is 14 feet wide throughout the length of the project. This is typical, but can be reduced to 12 feet given the extra wide shoulders at 16 feet. Additionally, although the design speed is 40 mph, the current posted speed limit is 35 mph and will mostly likely remain at that speed upon completion of the new facility.

Technical Review Comments:

Even at the design speed of 40 mph, the use of a 12-foot-wide continuous turn lane is of adequate width. This is especially true knowing the proposed facility is to have 16-foot-wide shoulders and can accommodate any encroachment of the travel lane by a turning vehicle.

Discussion of Schedule Impacts:

A reduction in this facility's width will result in some construction time savings, although not to the degree that could really be quantified at this early stage of design.

VE ALTERNATIVE 26

REDUCE CENTER TURN LANE FROM 14 FEET TO 12 FEET

Assumptions and Calculations:

Reduce center turn lane to 12 feet:

STA 100+40 to STA 162+00 = 6,160 LF x 2 LF = 12,320 SF / 9 SF / SY = 1,369 SY

Right-of-way: 1,369 SY / 4,840 SY/AC = 0.28 AC

Clearing and grubbing the same as right-of-way = 0.28 AC

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Clearing and Grubbing	AC	0.28	$4,000	$1,120			$0
Pavement	SY	1,369	$85.30	$116,776			$0
ROADWAY SUBTOTAL				*$117,896*			*$0*
ROADWAY MARK-UP	*10.31%*			*$12,155*			*$0*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$130,051*			*$0*
RIGHT-OF-WAY ITEMS							
Land	AC	0.28	$95,000	$26,600			$0
RIGHT-OF-WAY SUBTOTAL				*$26,600*			*$0*
RIGHT-OF-WAY MARK-UP	*148%*			*$39,368*			$0
VA ADDED MARK-UP				*$0*			$0
RIGHT-OF-WAY TOTAL				*$65,968*			*$0*
TOTAL				$196,019			$0
TOTAL (Rounded)				$196,000			$0
						SAVINGS	**$196,000**

VE ALTERNATIVE 30

ONLY PROVIDE CENTER TURN LANE FROM RAILROAD CROSSING TO SR-21

Cost Savings: $412,000
Time Savings: Improved

Description of Baseline Concept:

The current concept provides for a continuous 14-foot two-way turn lane for the majority of the entire project.

Description of Alternative Concept:

Remove the continuous turn lane from the railroad crossing east to SR-25. Retain the continuous center turn lane from the railroad west to SR-21.

Advantages:

- Reduces total pavement width.
- Initial cost savings.
- Reduces right-of-way take.

Disadvantages:

- Eastbound trucks must use shoulder to pass trucks turning left into one of the two driveways (although they could wait in a queue).
- Future business development may require a need for the center turn lane between the railroad crossing and SR-25.

Discussion:

As there are currently only two driveways on the north side of Grange Road east of the railroad crossing and the parcel of land on the south side is owned by the Port of Savannah, the necessity of a two-way center turn lane in this area is unwarranted.

Technical Review Comments:

Will require a transitional road section from three lanes to two lanes; however, even this might be a moot point considering the Jimmy Deloach Connector Interchange is just east of the railroad crossing and may already account for lane shifts.

Project Management Considerations:

The preponderance of truck traffic using the center turn lane will be between the railroad crossing and SR-21 regardless if the Port of Savannah delays the completion of Access Gate No. 8. The current use of Grange Road is to access truck related businesses along Grange Road and transitioning to port related functions further south along SR-25 and SR-21.

VE ALTERNATIVE 30

ONLY PROVIDE CENTER TURN LANE FROM RAILROAD CROSSING TO SR-21

Discussion of Schedule Impacts:

A reduction in this facility's length of the center turn lane will result in some construction time savings, although not to the degree that could really be quantified at this early stage of design.

Assumptions and Calculations:

Reduce length of the center turn lane:

STA 136+50 to STA 155+00 = 1,850 LF x 14 LF wide = 25,900 SF / 9 SF / SY = 2,878 SY

Right-of-way: 2,878 SY / 4,840 SY/AC = 0.59 AC

Clearing and grubbing the same as right-of-way = 0.59 AC

Initial Costs:

CONSTRUCTION ELEMENT	Unit	ORIGINAL CONCEPT			ALTERNATIVE CONCEPT		
Description		Quantity	Cost/Unit	Total	Quantity	Cost/Unit	Total
ROADWAY ITEMS							
Clearing and Grubbing	AC	0.59	$4,000	$2,360			$0
Concrete Pavement	SY	2,878	$85.30	$245,493			$0
ROADWAY SUBTOTAL				*$247,853*			*$0*
ROADWAY MARK-UP	*10.31%*			*$25,554*			*$0*
VA ADDED MARK-UP				*$0*			*$0*
ROADWAY TOTAL				*$273,407*			*$0*
RIGHT-OF-WAY ITEMS							
Land	AC	0.59	$95,000	$56,050			$0
RIGHT-OF-WAY SUBTOTAL				*$56,050*			*$0*
RIGHT-OF-WAY MARK-UP	*148%*			*$82,954*			$0
VA ADDED MARK-UP				*$0*			$0
RIGHT-OF-WAY TOTAL				*$139,004*			*$0*
TOTAL				$412,411			$0
TOTAL (Rounded)				$412,000			$0
						SAVINGS	**$412,000**

PROJECT INFORMATION

PROJECT INFORMATION

BACKGROUND

Grange Road is located in the City of Port Wentworth in Chatham County, directly to the north of Garden City and both east and north of the City of Savannah. Grange Road connects SR-21 (Augusta Road) in a T-intersection configuration at its westernmost limit, intersects SR-25 (South Coastal Highway) and continues east where it ends at the Savannah River and Georgia Port terminal facilities at its easternmost limit.

In 2004, Grange Road was designated as an intermodal connector on the NHS and is described as a port terminal (Facility ID No. GA33P) of the Port of Savannah from SR-21 to the terminal facilities. Intermodal connectors on the NHS are designated to provide access between major interstate facilities and other routes on the NHS.

PROJECT DESCRIPTION

The proposed City Street (CS) 650, Grange Road widening and reconstruction project is approximately 1.4 miles, from SR-21 to the Port of Savannah terminal facilities east of SR-25. The baseline concept for this project satisfies the need and purpose by adding operational improvements throughout the corridor that include:

- Widening the existing lanes from 9 feet to 12 feet,
- Adding a 14-foot center turn lane,
- Adding right turn lanes at SR-25 and SR-21,
- Adding 16-foot full depth shoulders with 14 feet being paved, and
- Installation of traffic signals at Grange Road and SR-25 and SR-21.

INFORMATION PROVIDED TO THE VE TEAM

The following project documents were provided to the VE team for their use during the study:

- DRAFT Project Concept Report, Project Number: CSNHS-0007-00(885), P. I. Number: 0007885; undated
- Georgia Port Authority (GPA) Proposed Gate Design [for Access Gate no. 8]; undated
- Grange Road Aerial with Proposed Improvements Overlay; June 21, 2011
- Grange Road Aerial with Proposed Utilities Improvements Overlay; June 21, 2011
- Crossroad Plans for Jimmy Deloach Connector Interchange and Grange Road (CSMSL-0008-00(690)); January 5, 2009
- Jimmy Deloach Connector Aerial with Proposed Interchange with Grange Road Overlay; undated
- Map denoting National Highway System for Savannah, Georgia; August 2004

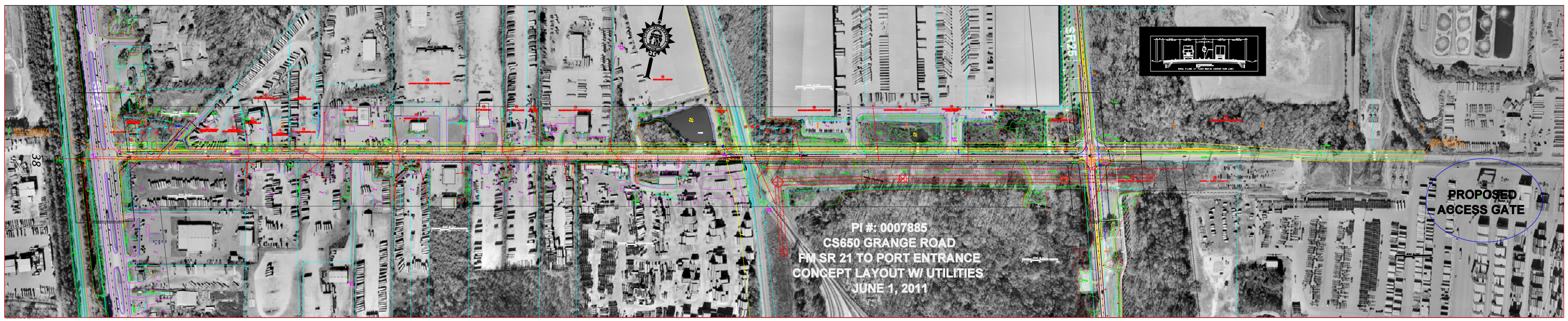
PROJECT DRAWINGS

Selected sheets from the project drawings are included on the following pages.

PROJECT COST ESTIMATE

The project cost estimate that was used as the baseline for the VE study is included at the end of this section.

PI #: 0007885
CS650 GRANGE ROAD
FM SR 21 TO PORT ENTRANCE
CONCEPT LAYOUT
JUNE 1, 2011
PROPOSED
ACCESS GATE
SR25
37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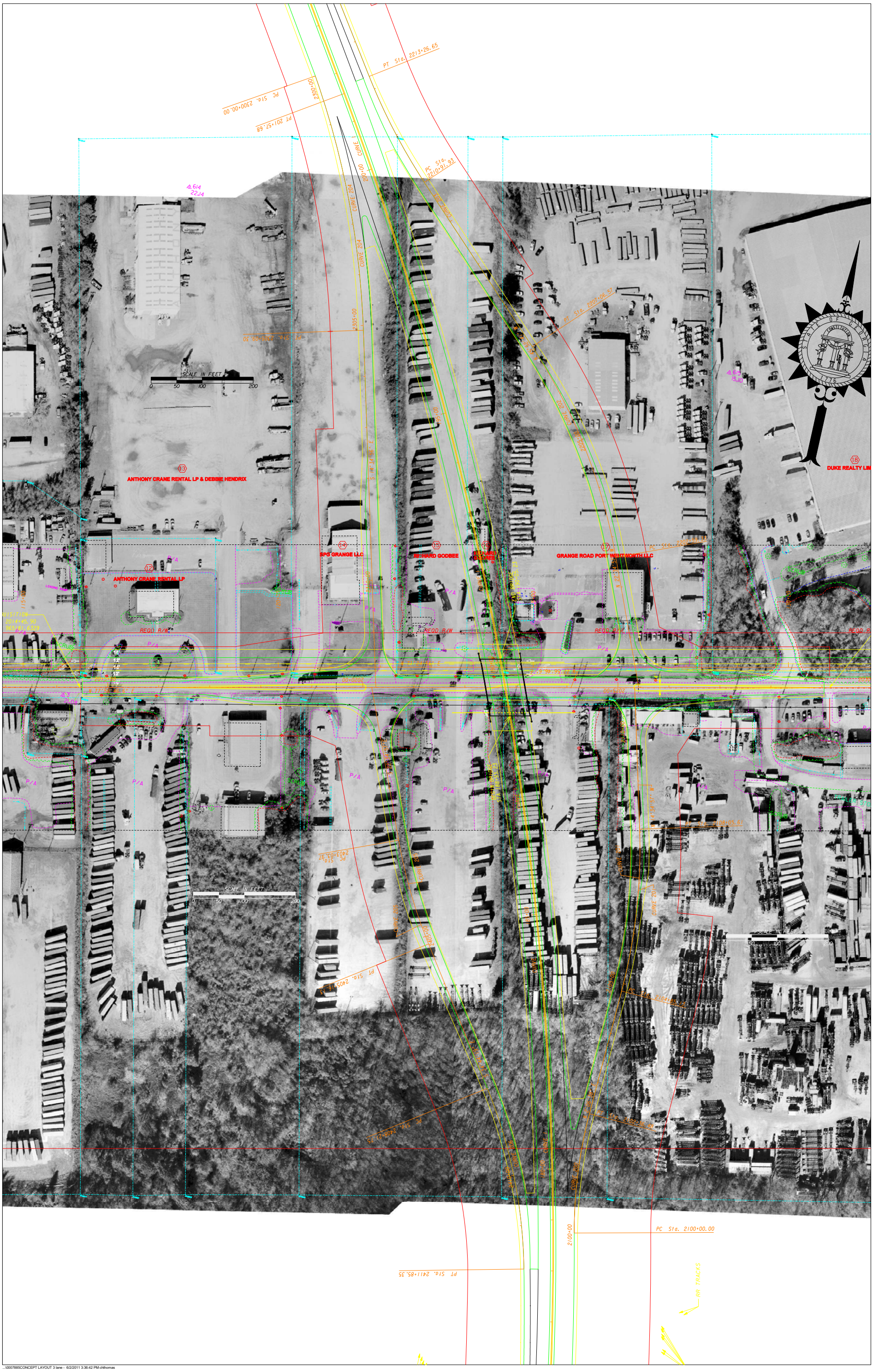
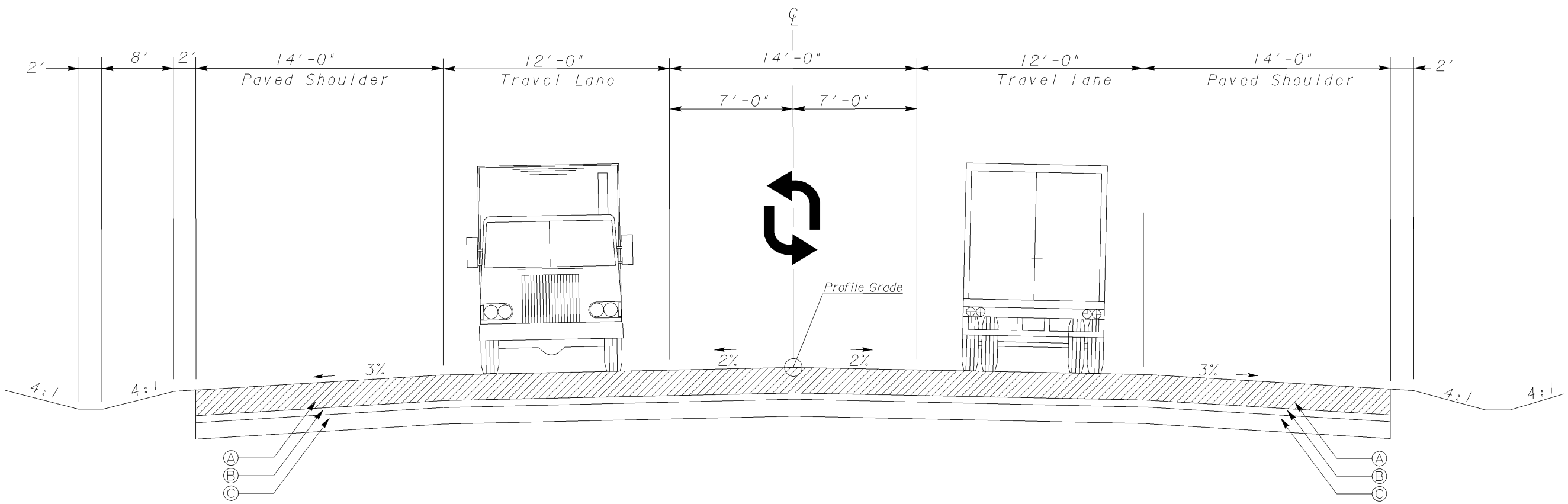
CS650 GRANGE ROAD
FM SR 21 TO PORT ENTRANCE
CONCEPT LAYOUT W/ UTILITIES
JUNE 1, 2011
PROPOSED
ACCESS GATE



..\0007885CONCEPT LAYOUT 3 lane - 6/2/2011 3:36:42 PM chthomas

4/28/2011 chthomas	Thu Apr 28 10:37:36 2011	\\Gdot-dsn1\GOCFG\resources\Gdot2007_Klp.TBL	M:\UD5\0007885 - CS 650GRANGE ROAD FROM SR 21 TO SR 25\DGN\0007885_TYPICAL SECTION.dgn	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
				GA	CSNHS-0007-00(885)		



Ⓐ 12" PCC 1.5" DIAMETER DOWEL BARS
Ⓑ 3" 19MM SUPERPAVE CONC. INTERLAYER
Ⓒ 8" GAB

TS-1

RURAL 3-LANE 14′ FLUSH MEDIAN (CENTER TURN LANE)

STA (100+00.00 - 174+00.00)

DESIGN SPEED 40 MPH

GEORGIA
DEPARTMENT OF TRANSPORTATION

REVISION DATES		

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION

OFFICE: ROADWAY DESIGN

TYPICAL SECTIONS

CS650 - GRANGE ROAD FROM SR21 TO SR25

DRAWING No. 5-01

1/5/2009 GPLN

Attachment #5

April 28, 2011

PRELIMINARY COST ESTIMATE

PROJECT NUMBER: CSNHS-007-00(885) COUNTY: CHATHAM
PI NUMBER: 0007885
DESCRIPTION: CS 650 - GRANGE RD FROM SR 21 TO SR 25

PROJECT COST		
A. CONSTRUCTION:		
1. MAJOR STRUCTURES:		
a. OVERPASSES	$	-
B. OTHER	$	-
SUBTOTAL: A-1	$	-
2. GRADING COMPLETE:		
a. EARTHWORK (15,700 cy @ $4.50/cy)	$	70,650.00
b. CLEARING AND GRUBBING (12 acres @ $4000/ac)	$	48,000.00
SUBTOTAL: A-2	$	118,650.00
SUBTOTAL + CONTINGENCY(110%): A-2	$	250,000.00
3. DRAINAGE:		
a. MISC. DRAINAGE	$	50,000.00
SUBTOTAL: A-3	$	50,000.00
4. BASE AND PAVING:		
a. GRADED AGGREGATE BASE (54,267 sy @ $13.00/cy)	$	705,466.67
b. ASPHALT PAVING:		
c. CONCRETE PAVING:		
19mm SP Conc. Interlayer (8,954 Ton @ $75/Ton)	$	671,550.00
PCC 1.5" Diameter Dowel Bars (54,267 sy @ $69/sy)	$	3,744,400.00
SUBTOTAL: A-4	$	5,121,416.67
SUBTOTAL + CONTINGENCY(10%): A-4	$	5,633,558.33
5. LUMP ITEMS:		
a. TRAFFIC CONTROL	$	400,000.00
b. EROSION CONTROL	$	150,000.00
SUBTOTAL: A-5	$	550,000.00
6. MISCELLANEOUS:		
a. TRAFFIC SIGNALS		
Grange Rd @ SR 21	$	100,000.00
Grange Rd @ SR 25	$	100,000.00
b. SIGNING AND STRIPING	$	200,000.00
SUBTOTAL: A-6	$	400,000.00

TOTAL CONSTRUCTION COST $ 6,883,558

Preliminary Right of Way Cost Estimate

Phil Copeland
Right of Way Administrator
By: LaShone Alexander

Date: April 8, 2011
Project: CSNHS-0007-00(885)Chatham
Existing/Required R/W: Varies/Varies
Project Termini : Grange Road CS650 Fm SR 21 to SR 25
Project Description: Grange Road CS650 Fm SR 21 to SR 25

P.I. Number: 0007885
No. Parcels: 32

Land: Industrial/Commercial R/W: 13.06 acres @ $ 95,000			$ 1,240,700
Improvements : misc. site improvements, landscape, building			750,000
Relocation: Commercial (4)			100,000
Residential (0)			0
Damage : Proximity	175,000		
Consequential			
Cost to Cure	150,000		325,000
		Net Cost	$ 2,415,700

Net Cost		$ 2,415,700
Scheduling Contingency	55 %	1,328,635
Adm/Court Cost	60 %	2,246,601
		$ 5,990,936

Total Cost $5,991,000

Note: The Market Appreciation (40%) is not included in the updated Preliminary Cost Estimate.

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE NHS-0007-00(885), Chatham County
P.I. # 0007685 (Grange Road)

OFFICE Jesup

DATE 3/24/2011

FROM Karon L. Ivery, District Utilities Engineer

TO Robert Murphy, Senior Project Manager - GDOT

SUBJECT UTILITY COST ESTIMATE

As requested by your office, we are furnishing you with an Updated Utility Cost estimate of each utility with facilities potentially located within the above project limits.

Facility Owner	Non-Reimbursable	Reimbursable	Comments
Comcast	$ 28,000.00	$ 0.00	
ATT/Bellsouth	$ 268,000.00	$ 0.00	
City of Port WentWorth	$ 367,000.00	$ 0.00	
Georgia Power Distribution	$ 369,000.00	$ 0.00	
Georgia Power Transmission	$ 0.00	$ 110,000.00	* See note below
Atlanta Gas Light	$ 28,000.00	$ 0.00	
City Of Savannah	$ 0.00	$1,000,000.00	** See note below
Southern Natural Gas		$ 40,000.00	
Totals	$1,060,000.00	$ 1,150,000.00	
Total Reimbursement		$ 1,150,000.00	

This estimate is based on cost for adequate clear zone and no impact to the existing10- 115 KV concrete structures on the south-side of the project roadway which includes only cost of relocation of the guy wires for each structure. *Please note if structures are impacted, additional cost will need to be added. **On the east side of SR-25 the City of Savannah has 48″ ID line on private easement

CC: Angie Robinson, Office of Financial Management;
Terry Brigman, Assistant State Utilities Engineer
District Office File
Utilities Office File

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: **CSNHS-0007-00(885), Chatham County**
P.I. No. 0007885

OFFICE: State Utilities Office

JLF FOR

FROM: **Jeff Baker, State Utilities Engineer**

DATE: June 13, 2011

TO: **Bobby Hilliard, State Program Delivery Engineer**
ATTN: Robert Murphy

SUBJECT: PRELIMINARY RAILROAD COST FOR SURFACE WORK (CONCEPT ESTIMATE)

A review of railroads located within the project limits on the above referenced project has been conducted based on the proposed concept report provided. Listed below is a breakdown of the estimated railroad costs:

FACILITY OWNER	NON-REIMBURSABLE	REIMBURSABLE
Norfolk Southern	**$0.00**	**$211,000.00**
Total Reimbursement Cost:	**$0.00**	**$211,000.00**

Total railroad surface work reimbursable cost for the above project is estimated to be:
$211,000.00.

Please note that this amount does not include other reimbursable utility and railroad warning device costs that may be associated with this project. Please keep the railroad costs separate from other utilities in your designer's cost estimate.

If you have any questions, please contact Richard Crowley, (404)631-1372, rcrowley@dot.ga.gov or Jill Franks, (404) 631-1370, jfranks@dot.ga.gov.

JB:RLC:jlf

cc: Sal Pirzad, State Utilities Preconstruction Engineer
Angela Robinson, State Financial Management Administrator
Karon Ivery, District 5 Utilities Engineer
Key Phillips, Railroad Crossing Program Manager

PROJECT ANALYSIS

PROJECT ANALYSIS

SUMMARY OF ANALYSIS

The following analysis tools were used to study the project:

- Key Project Factors
- Cost Model
- Function Analysis

KEY PROJECT FACTORS

The first day of the VE study included meetings with the project stakeholders and design team. The following summarizes key project issues identified during this session.

Project Issues

The following are some of the issues and concerns associated with the project:

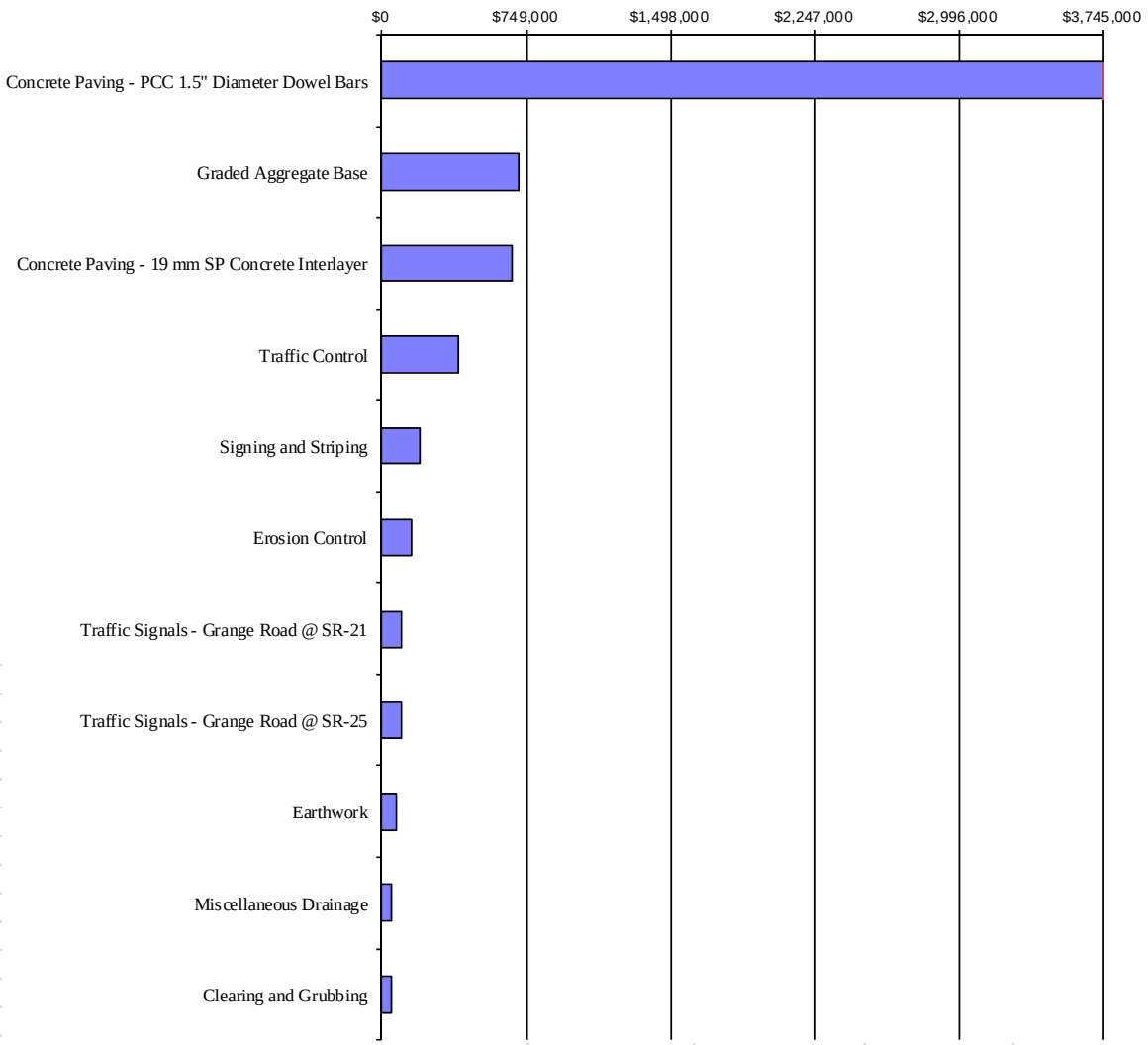
- The Jimmy Deloach Connector is to precede this project with access/connection points on Grange Road for the proposed diamond interchange with Grange Road.
- The proposed Access Gate No. 8 will not be completed by the time this project commences/ completes.
- Widening of Grange Road will occur primarily to the north.
- Design speed will be 40 mph, but it is anticipated that the posted speed of 35 mph will be retained upon completion of the new facility.

COST MODEL

The VE team leader prepared cost models from the cost estimate presented in the *Project Information* section of this report. The models are organized to identify major construction elements or trade categories, the original estimated costs, and the percent of total project cost for the significant cost items.

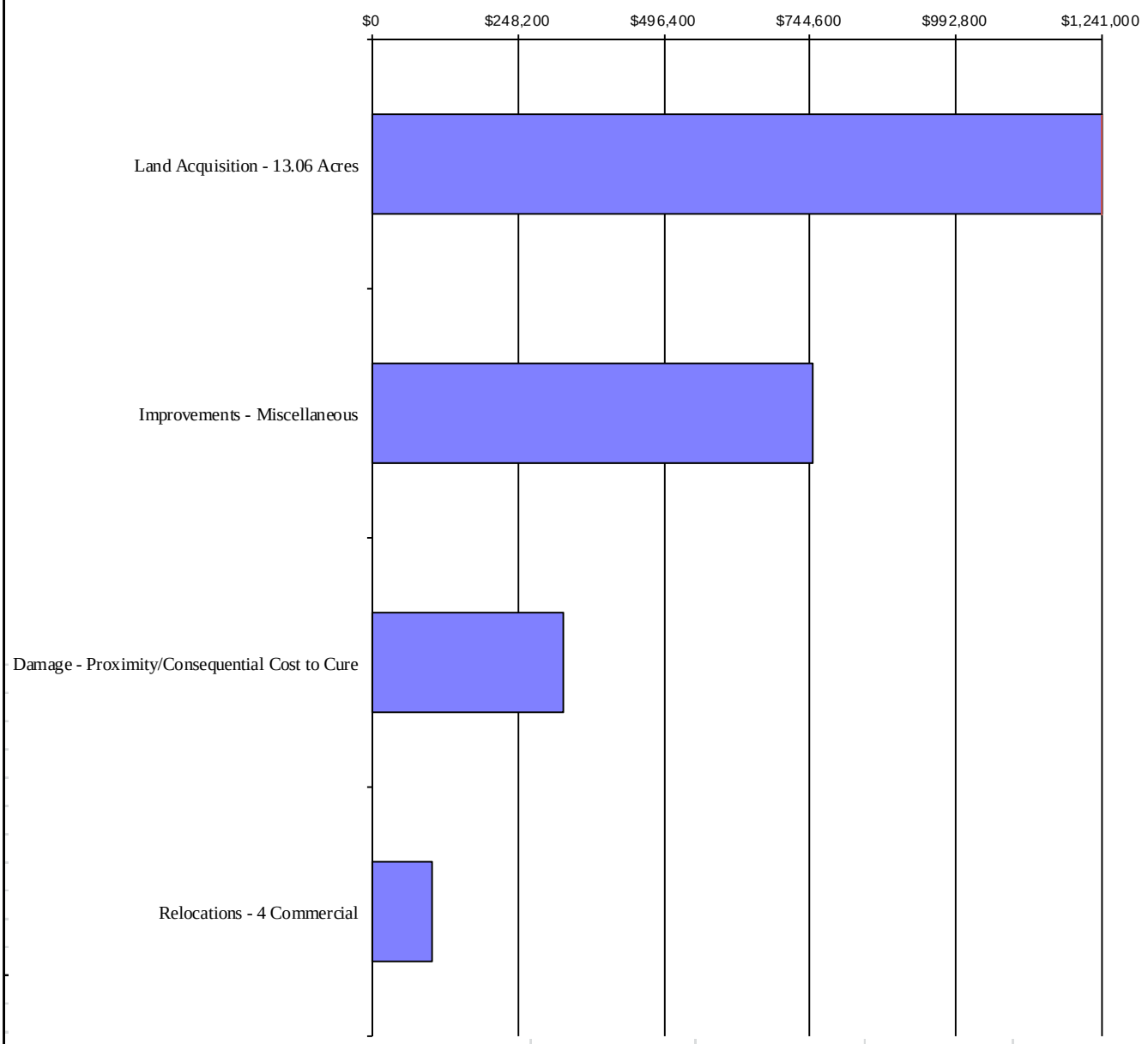
The cost models clearly showed the cost drivers for the project and were used to guide the VE team during the VE study.

PRELIMINARY CONSTRUCTION COST ESTIMATE		COST	PERCENT	CUM. PERCENT
Concrete Paving - PCC 1.5" Diameter Dowel Bars		3,744,400	60.01%	60.01%
Graded Aggregate Base		705,467	11.31%	71.31%
Concrete Paving - 19 mm SP Concrete Interlayer		671,550	10.76%	82.07%
Traffic Control		400,000	6.41%	88.48%
Signing and Striping		200,000	3.21%	91.69%
Erosion Control		150,000	2.40%	94.09%
Traffic Signals - Grange Road @ SR-21		100,000	1.60%	95.69%
Traffic Signals - Grange Road @ SR-25		100,000	1.60%	97.30%
Earthwork		70,650	1.13%	98.43%
Miscellaneous Drainage		50,000	0.80%	99.23%
Clearing and Grubbing		48,000	0.77%	100.00%
Construction Cost		**6,240,067**	100.00%	
Contingency for Base and Paving Only at	10.00%	512,141	Composite	
Contingency for Grading Complete Only at	110.70%	131,350	Construction	
Total Construction Only		6,883,558	Markup	10.31%



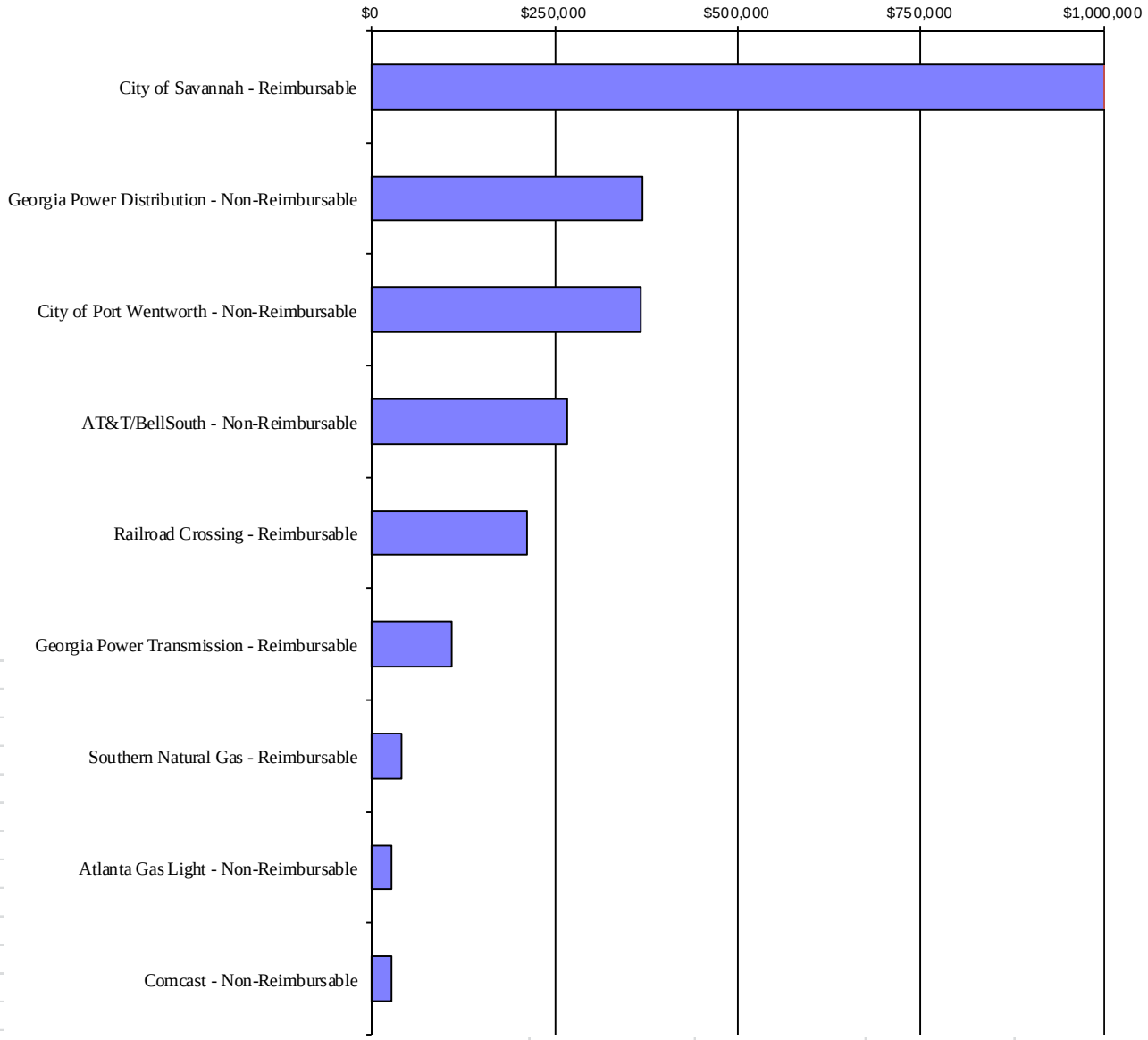
Costs in Graph are not marked up.

PRELIMINARY RIGHT-OF-WAY COST ESTIMATE		COST	PERCENT	CUM. PERCENT
Land Acquisition - 13.06 Acres		1,240,700	51.36%	51.36%
Improvements - Miscellaneous		750,000	31.05%	82.41%
Damage - Proximity/Consequential Cost to Cure		325,000	13.45%	95.86%
Relocations - 4 Commercial		100,000	4.14%	100.00%
Right-of-Way Costs		**2,415,700**	100.00%	
Scheduling Contingency	55.00%	1,328,635	ROW	
Administration/Court Cost	60.00%	2,246,601	Composite	
Total Right-of-Way Costs*		5,990,936	Markup	148.00%



The Market Appreciation (40%) is not included in the updated Preliminary ROW Cost Estimate
Costs in Graph are not marked up.

UTILITY COSTS	COST	PERCENT	CUM. PERCENT
City of Savannah - Reimbursable	1,000,000	41.31%	41.31%
Georgia Power Distribution - Non-Reimbursable	369,000	15.24%	56.55%
City of Port Wentworth - Non-Reimbursable	367,000	15.16%	71.71%
AT&T/BellSouth - Non-Reimbursable	268,000	11.07%	82.78%
Railroad Crossing - Reimbursable	211,000	8.72%	91.49%
Georgia Power Transmission - Reimbursable	110,000	4.54%	96.03%
Southern Natural Gas - Reimbursable	40,000	1.65%	97.69%
Atlanta Gas Light - Non-Reimbursable	28,000	1.16%	98.84%
Comcast - Non-Reimbursable	28,000	1.16%	100.00%
Total Utility Costs	**2,421,000**	100.00%	



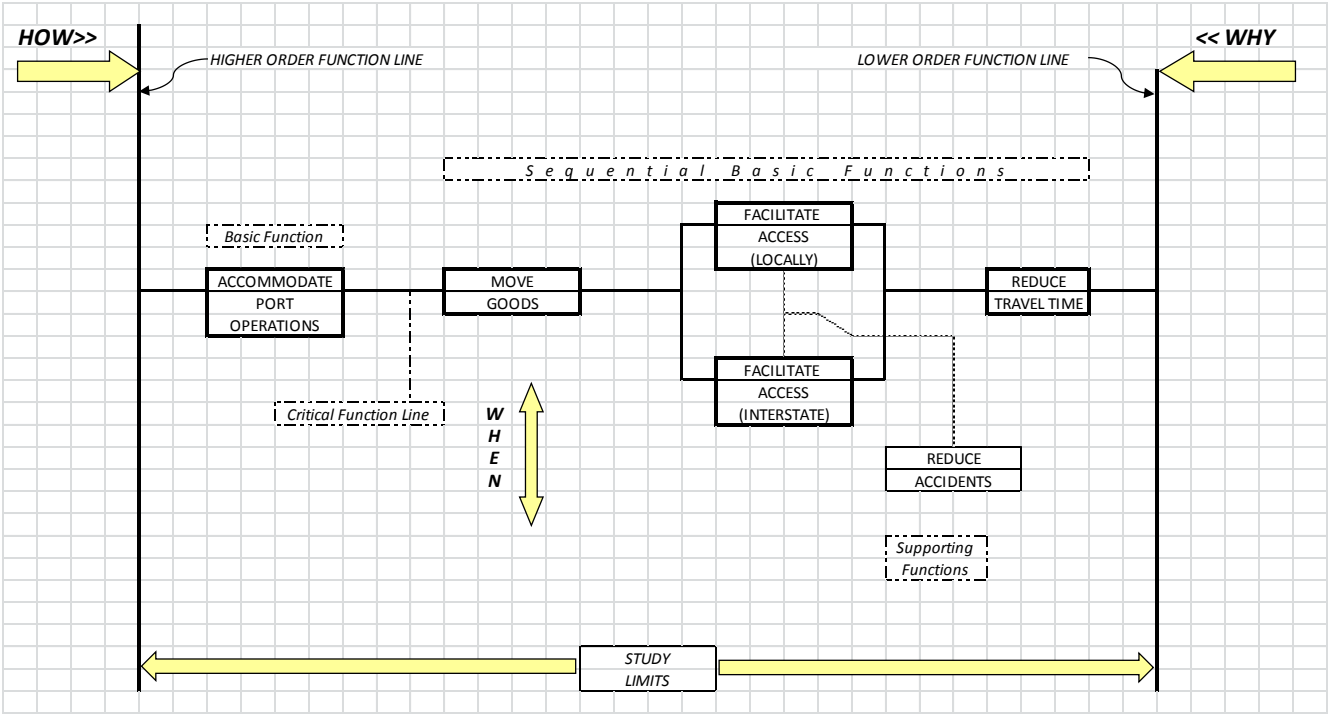
Costs in Graph are not marked up.

FUNCTION ANALYSIS

Function analysis was performed and a Function Analysis System Technique (FAST) Diagram was produced, which revealed the key functional relationships for the project. This analysis provided a greater understanding of the total project and how the project's performance, cost, time, and risk characteristics are related to the various functions identified.

The FAST diagram arranges the functions in logical order so that when read from left to right, the functions answer the question, "How?" If the diagram is read from right to left, the functions answer the question, "Why?" Functions connected with a vertical line are those that happen at the same time as, or are caused by, the function at the top of the column (a "When?" relationship).

FAST Diagram



IDEA EVALUATION

IDEA EVALUATION

EVALUATION PROCESS

The VE team generated and evaluated ideas on how to perform the various project functions using other approaches. The idea list was grouped by function or major project element. Each idea was evaluated with respect to the functional requirements of the project. Performance, cost, time, and risk may also have been considered during this evaluation.

Once each idea was fully evaluated, it was given a rating. This is based on the following:

Y = Idea to be developed
N = Idea not to be developed
ABD = Already being/been done
— = Not applicable

Ideas noted as "Y" were developed further and those that were found to have the greatest potential for value improvement are documented in the *Value Engineering Alternatives* section of this report.

IDEA SUMMARY LIST

Idea Code and Description	Rating
1: Grade separate Grange Road from SR-25	N
2: Use two travel lanes with 16-foot shoulders	Y
3: Reduce shoulder width to 12 feet; 10 feet paved	Y
4: Grade separate Grange Road at railroad crossing	N
5: Undercut the existing road	Y
6: Elevate Grange Road	N
7: Reduce the typical section to a three-lane section westbound from the Jimmy Deloach Connector	Y
8: Provide free right from westbound Grange Road to northbound SR-21	Y
9: Allow westbound Grange Road traffic to southbound SR-21 (combine with Alternative 11)	Y
10: Provide a grass median at the SR-21/Grange Road Intersection	Y
11: Signalize the SR-21/Grange Road Intersection (combine with Alternative 9)	Y
12: Do not signalize the Grange Road/SR-25 Intersection	Y
13: Combine project with the Jimmy Deloach Connector project	N
14: Use design-build contracting methodology	N

Idea Code and Description	Rating
15: Retain existing pavement and place new road on top	N
16: Tunnel beneath railroad tracks	N
17: Minimize number of driveways along Grange Road	Y
18: Reduce the number of lanes at the SR-25/Grange Road Intersection	ABD
19: Use a roundabout at the SR-25/Grange Road Intersection	N
20: Use a roundabout at the SR-21/Grange Road Intersection	N
21: Stop project at SR-25 and have the Port of Savannah complete their desired terminus	Y
22: Eliminate the Jimmy Deloach Connector/Grange Road Interchange	N
23: Use a flyover from westbound Grange Road to southbound SR-21	N
24: Use a two-stage maintenance of traffic (MOT): Continue to use the existing pavement initially and build to the north then shift traffic to new lanes on the north and demolish/reconstruct the south portion of the project	N/A
25: Widen symmetrically with two construction stages and one shift in traffic	N
26: Use a 12-foot center turning lane	Y
27: Use two 12-foot lanes in lieu of 9-foot lanes (same as Alternative 9)	N/A
28: Shift new Grange Road alignment to match existing Grange Road alignment 600 feet west of the Grange Road/SR-25 Intersection	N
29: Eliminate center turning lane and provide a collector-distributor system on Grange Road	N
30: Only provide turning lane from railroad crossing to SR-21	Y

VE PROCESS

VALUE ENGINEERING PROCESS

A systematic approach is used in the VE study. The key procedures followed were organized into two distinct parts: (1) Pre-Study Preparation and (2) VE Study.

PRE-STUDY PREPARATION

In preparation for the VE study, the team leader reviews critical aspects of the project and areas for improvement. In the week prior to the start of the VE study, the VE team reviews the documents provided by the designer to become better prepared for the study. In addition, performance attributes and requirements are initially identified that are relevant to the project.

VE STUDY

The Value Methodology (VM) Job Plan is followed to guide the teams in the consideration of project functionality and performance, potential schedule issues, high cost areas, and risk factors in the design. These considerations are taken into account in developing alternative solutions for the optimization of project value. The Job Plan phases are:

- Information Phase
- Function Phase
- Speculation Phase
- Evaluation Phase
- Development Phase
- Presentation Phase

Information Phase

At the beginning of the VE study, the design team presents a more detailed review of the design and the various systems. This includes an overview of the project and its various requirements, which further enhances the VE team's knowledge and understanding of the project. The project team also responds to questions posed by the VE team.

The project’s performance requirements and attributes are discussed, and the performance of the baseline concept is evaluated.

Function Phase

Key to the VM process is the function analysis techniques used during the Function Phase. Analyzing the functional requirements of a project is essential to assuring an owner that the project has been designed to meet the stated criteria and its need and purpose. The analysis of these functions in terms cost, performance, time and risk is a primary element in a VE study, and is used to develop alternatives. This procedure is beneficial to the VE team, as it forces the participants to think in terms

of functions and their relative value in meeting the project's need and purpose. This facilitates a deeper understanding of the project.

Speculation Phase

The Speculation Phase involves identifying and listing creative ideas. During this phase, the VE team participates in a brainstorming session to identify as many means as possible to provide the necessary project functions. Judgment of the ideas is not permitted in order to generate a broad range of ideas.

The idea list includes all of the ideas suggested during the study. These ideas should be reviewed further by the project team, since they may contain ideas that are worthy of further evaluation and may be used as the design develops. These ideas could also help stimulate additional ideas by others.

Evaluation Phase

The purpose of the Evaluation Phase is to systematically assess the potential impacts of ideas generated during the Speculation Phase relative to their potential for value improvement. Each idea is evaluated in terms of its potential impact to performance, cost, time and risk. Once each idea is fully evaluated, it is given a total rating number. Typically, this is based on a scale of 1 to 7, as indicated by the following rating index.

7 = Major Value Improvement 6 = Moderate Value Improvement 5 = Minor Value Improvement 4 = Possible Value Improvement	These ratings represent the subjective opinion of the VE team regarding the potential benefits of the concepts in order to prioritize them for development.
3 = Minor Value Degradation	Concept results in a minor cost or performance improvement at the expense of the other.
2 = Moderate Value Degradation	Concept reduces cost but creates an unacceptable degradation to performance.
1 = Major Value Degradation	Concept is not technically feasible or does not meet project need and purpose.

Ideas rated 4 to 7 are developed further and those found to have the greatest potential for value improvement are documented in the *Value Engineering Alternatives* section of this report.

However, in this specific case, the VE team opted to use a simpler system due to time constraints and minimal number of ideas. This simplified system consisted of the following notations: ***Y*** *= Idea to be developed;* ***N*** *= Idea not to be developed;* ***ABD*** *= Already being/been done; and* ***—*** *= Not applicable.*

Development Phase

During the Development Phase, the highly rated ideas are expanded and developed into VE alternatives. The development process considers the impact to performance, cost, time, and risk of the alternative concepts relative to the baseline concept. This analysis is prepared as appropriate for

each alternative, and the information may include a performance assessment, initial cost, and life-cycle cost comparisons, schedule analysis, and an assessment of risk. Each alternative describes the baseline concept and proposed changes and includes a technical discussion. Sketches and calculations are also prepared for each alternative as appropriate.

Presentation Phase

The VE study concludes with a preliminary presentation of the VE team's assessment of the project and VE alternatives. The presentation provides an opportunity for the owner, project team, and stakeholders to preview the alternatives and develop an understanding of the rationale behind them.

VE STUDY AGENDA

Monday, 11 July

8:00 AM – 8:45 AM	**Assembly of the GDOT Stakeholders, Interested Parties and VE Team**
8:45 AM – 9:00 AM	**Video Conferencing Setup**
9:00 AM – 11:00 AM	**General Introductions of All Parties, Review of the VE Process Owner's/Designer's Presentation and Information Phase**

The GDOT design team and stakeholders are expected to present information concerning the project, including, but not necessarily limited to: rationale for design, criteria for specific areas of study, project constraints, and the reasons for design decisions.

9:30 AM – 11:00 AM **Commence Function Analysis Phase**

The VE team will continue their familiarization with the cost models and project data for each area of study. The cost model(s) will be refined, as necessary; define the function of each project element or system in the cost model, select the primary or basic functions, and determine the worth, or least cost, to provide the function. In addition, the VE team will continue defining the function of each element/system to gain a thorough understanding of the project's needs and requirements and refine the FAST diagram(s).

11:00 AM – 12:00 Noon **Conclude the Function Analysis Phase and Commence the Creative Phase**

The VE team will conduct a brainstorming session and list as many ideas as possible for consideration. The aim is to obtain a large quantity of ideas through free association by eliminating roadblocks to creativity and deferring judgment.

12:00 Noon – 1:00 PM **Lunch**

1:00 PM – 5:00 PM **Conclude Creative Phase and Complete Evaluation/Analytical Phase**

The VE team will finalize the brainstorming session and analyze the ideas listed in the creative phase and select the best ideas for further development.

Tuesday, 12 July

8:00 AM – 12:00 Noon **Development Phase**

The VE team will develop creative ideas into alternate design solutions. Initial and life-cycle cost estimates comparing original and proposed alternatives will be prepared. Selected alternatives for change will be developed and supported with sketches, calculations, and written substantiation.

12:00 Noon – 1:00 PM **Lunch**

1:00 PM – 5:00 PM **Continue Development Phase**

Wednesday, 13 July

8:00 AM – 12:00 Noon **Continue Development Phase**

12:00 Noon – 1:00 PM **Lunch**

1:00 PM – 5:00 PM **Continue Development Phase**

Thursday, 14 July

8:00 AM – 9:00 AM **Conclude Development Phase and Prepare Summary Worksheets for Informal Oral Presentation**

The VE team prepares a summary of the VE alternatives with descriptions and initial and life-cycle costs for an informal oral presentation to representatives of the owner and design team. Draft copies of the *Summary of Potential Cost Savings* worksheets are prepared for distribution to VE presentation attendees.

9:00 AM – 11:00 AM **Conduct Informal Presentation**

The VE team presents its alternatives to the owner and design team representatives and is available to clarify any points.

11:00 AM **Adjourn**

VE STUDY MEETING ATTENDEES

Widening and Reconstruction of Grange Road, City of Port Wentworth, Chatham County, Georgia
CHNHS-007-00(885), PI #0007885, Georgia Department of Transportation

2011 JULY				NAME	ORGANIZATION	POSITION	PHONE/CELL	EMAIL
11	12	13	14					
x	x	x	x	Lisa L. Myers	GDOT, Engineering Services	VE Coordinator	404-631-1770	lmyers@dot.ga.gov
x	x		x	Matt Sanders	GDOT, Engineering Services	Value Engineering Specialist	404-631-1752	msanders@dot.ga.gov
x				Ken Werho	GDOT, Traffic Operations	Project Design/Concept Review Manager	404-635-8144	kwerho@dot.ga.gov
x			x	Ron Wishon	GDOT, Engineering Services	State Project Review Engineer	404-631-1753	rwishon@dot.ga.gov
x			x	Chester Thomas	GDOT, Roadway Design	Design Engineer II	404-631-1693	chthomas@dot.ga.gov
x			x	Marcela Coll	GDOT, Roadway Design	Lead Design Engineer	404-631-1692	mcoll@dot.ga.gov
x			x	Albert Welch	GDOT, Roadway Design	Design Engineer/Group Manager	404-631-1690	awelch@dot.ga.gov
x				Melissa Harper	GDOT, Construction	Assistant State Construction Engineer	404-631-1971	mharper@dot.ga.gov
x			x	Robert Murphy	GDOT, Project Management	Senior Project Manager	404-631-1586	romurphy@dot.ga.gov
x				Bobby Dollar	GDOT, Office of Environmental Services	Transportation Environmental Planner Associate	404-631-1920	rdollar@dot.ga.gov
x				Brad Saxon	GDOT, District 5	Preconstruction Engineer	912-427-5715	bsaxon@dot.ga.gov
x				G. Slade Cole	GDOT, District 5	Area Assistant Engineer	912-651-2144	gcole@dot.ga.gov

VE STUDY MEETING ATTENDEES

Widening and Reconstruction of Grange Road, City of Port Wentworth, Chatham County, Georgia
CHNHS-007-00(885), PI #0007885, Georgia Department of Transportation

2011 JULY				NAME	ORGANIZATION	POSITION	PHONE/CELL	EMAIL
11	12	13	14					
x				Teresa Scott	GDOT, District 5	Planning and Programming Engineer	912-427-5788	tscott@dot.ga.gov
x	x	x	x	Lori Kennedy	KEA Group	Construction	678-904-8591 x 22	lkennedy@keagroup.com
x	x	x	x	Dom Saulino	HNTB	Design	404-946-5745	dsaulino@hntb.com
x	x	x	x	Luis M. Venegas	VMS, Inc.	VE Facilitator	678-488-4287	lmvenegas@aol.com
			x	Andrew Hoenig	GDOT, Integrated Project Delivery (IPD)	Project Manager	404-631-1365	ahoenig@dot.ga.gov
			x	Darrell Richardson	GDOT, Roadway Design	Design	404-631-1705	drichardson@dot.ga.gov
			x	David Hanson	HNTB	Jimmy Deloach Connector Project Manager	404-275-2829	dhanson@hntb.com

Value Management Strategies, Inc.

Offices in Escondido and Sacramento, California; Grand Junction, Colorado; Sarasota, Florida; Marietta, Georgia; Portland, Oregon; Seattle, Washington; Merriam, Kansas; and Great Falls, Montana

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Value Engineering Study Report
Widening and Reconstruction of Grange Road
Georgia Department of Transportation
July 2011

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Widening and Reconstruction of Grange Road
Georgia Department of Transportation
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