

VALUE ENGINEERING REPORT

US 1 / SR 4 Corridor Improvements

Project # EDS00-0545-00(023), PI No. 522220
Project # EDS00-0545-00(024), PI No. 522180
Project # EDS00-0545-00(025), PI No. 522190
Project # EDS00-0545-00(026), PI No. 522200
Project # BHN00-0038-01(036), PI No. 522185
Project # BHN00-0038-01(037), PI No. 522225

Toombs County

April 19, 2011

OWNER AND DESIGN TEAM:



Georgia Department of Transportation
600 West Peachtree Street
Atlanta, GA 30308

VALUE ENGINEERING CONSULTANT:



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Toombs County

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EXECUTIVE SUMMARY

Executive Summary

Value Engineering Study

US 1 / SR 4 Corridor Improvements

Project # EDS00-0545-00(023), PI No. 522220

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Project # EDS00-0545-00(025), PI No. 522190

Project # EDS00-0545-00(026), PI No. 522200

Project # BHN00-0038-01(036), PI No. 522185

Project # BHN00-0038-01(037), PI No. 522225

Toombs County

Introduction

This report presents the results of a value engineering (VE) study conducted on the concept level design for improvements to US 1 / SR 4 in Toombs County located approximately 180 miles southeast of Atlanta. It was conducted April 4-7, 2011, at the Georgia DOT General Office in Atlanta using a five person VE team.

Included are six projects that will be studied in four packages for a total of 23.7 miles of roadway improvements. The project starts just south of the border with Appling County south of the crossing of the Altamaha River and proceeds north to just north of Lyons, GA at the junction with SR 130. The improvements are part of the Governor's Road Improvement Program (GRIP) initiated in the 1980's. The project includes expanding the two lane facility to a four lane divided facility.

The total current estimated construction cost for all project is \$128,170,000 million with no markups included for inflation, E&C or contingencies.

This report presents the Team's recommendations and all back-up information for consideration by the decision-makers. This Executive Summary includes a brief description of each recommendation. The Study Identification section contains information about the project and the team. The Recommendations section presents a more detailed description and support information about each recommendation. The Appendix includes a complete record of the Team's activities and findings. The reader is encouraged to review all sections of the report in order to obtain a complete understanding of the VE process.

Each recommendation was developed using unit costs from the respective project updated estimates received on April 4, 2011. The unit costs used in the individual recommendations do not include any markups including inflation, contingencies, or E&C.

Results Obtained

The VE team focused their efforts on the high cost items of the project. Through the use of function analysis and “brain storming” techniques, the team generated 18 ideas with 16 being identified for additional evaluation as possible recommendations or design suggestions. Many of the ideas affected more than one of the projects and each was developed as a separate idea under each project they impacted. The VE team developed 28 recommendations for consideration by the design team. Neglecting the overlapping nature of the recommendations as much as possible, the net total of all the recommendations have the potential to reduce project costs by as much as \$16,196,000 in capital cost savings while continuing to provide the required functionality. This is shown in the last column of the Summary Tables that follows the summary description below.

A brief presentation of these recommendations was conducted on April 7th at GDOT General Office. See Appendix C for a listing of those in attendance. A summary of the recommendations follows.

Summary of Recommendations **US 1 / SR 4 Corridor Improvements** **Toombs County**

Project No EDS00-545-00(23); PI Nos. 522220 and 522225

A: Right of Way

A-1: Reduce median width from 44 to 32 feet edge of pavement to edge of pavement. This recommendation reduces the median width which complies with recent GDOT Standards as well as with AASHTO Guidelines. Reducing width would also result in reduced impacts to environmentally sensitive areas within the corridor. Savings results in R/W, earthwork, clearing and grubbing, grassing and pavement for the crossovers.

The total potential savings is \$378,000

A-3: Use right of way to shoulder break and easements beyond. Savings in the costs of right of way using this practice could be substantial. The easement section would include the slopes and ditches outside the shoulder break.

The total potential savings is \$190,000

B: Structures

B-1: Reduce the bridge width from 38 feet (gutter to gutter) to 36 feet for each of the five (5) structures included in this project. This is based on the accepted bridge widths in GDOT bridge and structures policy manual for rural section (multi-divided) including a 4 ft. (inside shoulder) +TW+ 8 ft. (outside shoulder).

The total potential savings is \$1,057,000

C: AC Pavement

C-2: Reduce paved shoulder width from 6.5 feet to 4 feet. The purpose of the project is to increase capacity by providing additional through lanes. This can be accomplished with 4' paved shoulders. AASHTO guidelines do not mandate a required paved shoulder width. Savings shown reflects savings in pavement only.

The total potential savings is \$228,000

C-3: Reduce the amount of side street work. This idea involves reducing the length of some of the side street connections. The idea evaluated 3 intersections, CR 49, CR 51 and CR 52.

The total potential savings is \$102,000

C-5: Use reduced depth pavement for medians and left turn lanes. Because of the lighter traffic loadings for these areas, a thinner pavement section than the mainline, full-depth section will reduce asphalt, grading and GAB costs.

The total potential savings is \$324,000

Project No EDS00-545-00(24); PI No. 522180

A: Right of Way

A-1: Reduce median width from 44 to 32 feet edge of pavement to edge of pavement. This recommendation reduces the median width which complies with recent GDOT Standards as well as with AASHTO Guidelines. Reducing the width would also result in reduced impacts to environmentally sensitive areas within the corridor. Savings results in R/W, earthwork, clearing and grubbing, grassing and pavement for the crossovers.

The total potential savings is \$357,000

A-3: Use right of way to shoulder break and easements beyond. Savings in the costs of right of way using this practice could be substantial. The easement section would include the slopes and ditches outside the shoulder break.

The total potential savings is \$93,000

C: AC Pavement

C-2: Reduce paved shoulder width from 6.5 feet to 4 feet. The purpose of the project is to increase capacity by providing additional through lanes. This can be accomplished with 4' paved shoulders. AASHTO guidelines do not mandate a required paved shoulder width. Savings shown reflects savings in pavement only.

The total potential savings is \$118,000

C-3: Reduce the amount of side street work. This idea involves reducing the length of some of the side street connections. The idea evaluated 4 intersections, CR 106, CR 103, CR 101 and CR 98/102.

The total potential savings is \$345,000

C-5: Use reduced depth pavement for medians and left turn lanes. Because of the lighter traffic loadings for these areas, a thinner pavement section than the mainline, full-depth section will reduce asphalt, grading and GAB costs.

The total potential savings is \$277,000

Project No EDS00-545-00(25); PI Nos. 522190 & 522185

A: Right of Way

A-1: Reduce median width from 44 to 32 feet edge of pavement to edge of pavement. This recommendation reduces the median width which complies with recent GDOT Standards as well as with AASHTO Guidelines. Reducing the width would also result in reduced impacts to environmentally sensitive areas within the corridor. Savings results in R/W, earthwork, clearing and grubbing, grassing and pavement for the crossovers.

The total potential savings is \$278,000

A-3: Use right of way to shoulder break and easements beyond. Savings in the costs of right of way using this practice could be substantial. The easement section would include the slopes and ditches outside the shoulder break.

The total potential savings is \$70,000

B: Structures

B-1: Reduce the bridge width from 38 feet (gutter to gutter) to 36 feet for each of the two (2) structures included in this project. This is based on the accepted bridge widths in GDOT bridge and structures policy manual for rural section (multi-divided) including a 4 ft. (inside shoulder) +TW+ 8 ft. (outside shoulder).

The total potential savings is \$114,000

C: AC Pavement

C-2: Reduce paved shoulder width from 6.5 feet to 4 feet. The purpose of the project is to increase capacity by providing additional through lanes. This can be accomplished with 4' paved shoulders. AASHTO guidelines do not mandate a required paved shoulder width. Savings shown reflects savings in pavement only.

The total potential savings is \$92,000

C-3: Reduce the amount of side street work. This idea involves reducing the length of some of the side street connections. The idea evaluated 1 intersection, CR 115.

The total potential savings is \$122,000

C-5: Use reduced depth pavement for medians and left turn lanes. Because of the lighter traffic loadings for these areas, a thinner pavement section than the mainline, full-depth section will reduce asphalt, grading and GAB costs.

The total potential savings is \$185,000

Project No EDS00-545-00(26); PI No. 522200

A: Right of Way

A-1: Reduce median width from 44 to 32 feet edge of pavement to edge of pavement. This recommendation reduces the median width which complies with recent GDOT Standards as well as with AASHTO Guidelines. Reducing the width would also result in reduced impacts to environmentally sensitive areas within the corridor. Savings results in R/W, earthwork, clearing and grubbing, grassing and pavement for the crossovers.

The total potential savings is \$1,065,000

A-1.1: Reduce median width from 44 to 20 feet and use a cable barrier. The same benefits as A-1. A 20 foot median can be used with a cable barrier installed two feet off the center of the median to account for cable deflection and still prevent vehicle crossovers. This recommendation is more suitable for this project due to increased R/W costs.

The total potential savings is \$1,455,000

A-3: Use right of way to shoulder break and easements beyond. Savings in the costs of right of way using this practice could be substantial. The easement section would include the slopes and ditches outside the shoulder break.

The total potential savings is \$1,798,000

B: Structures

B-1: Reduce the bridge width from 38 feet (gutter to gutter) to 36 feet for each of the four (4) structures included in this project. This is based on the accepted bridge widths in GDOT bridge and structures policy manual for rural section (multi-divided) including a 4 ft. (inside shoulder) +TW+ 8 ft. (outside shoulder).

The total potential savings is \$338,000

B-3: Use MSE wall on railroad end of bridge to shorten the bridge over railroad / US 280 crossing. Using a MSE wall would allow the bridge structure to be shortened by 72 feet. This savings offsets the cost for the wall.

The total potential savings is \$283,000

B-4: Eliminate bridges at SR 30 and SR 292 and provide an at grade railroad crossing. Based on information received during the study, there are only 2-4 trains per day along this corridor which represents a relatively low volume use. Eliminating the bridges and constructing an at-grade crossing would significantly reduce construction costs and long term bridge maintenance. Conditions and signalization at an at-grade RR crossing can be improved by enhanced crossings with double gates and warning signals.

The total potential savings is \$7,278,000

B-4.1 Eliminate bridges at SR 292. As an alternate to B-4 above, the new bridges at SR 292 are proposed due to the proximity of SR 292 to the new RR crossing, a distance of about 800 feet. Eliminating these bridges and reconstructing new pavement and earthwork on SR 292 will significantly reduce costs while providing the same function and eliminate costly bridges. It

would provide an at-grade crossing which is more direct connectivity between the 2 state routes. This would eliminate the side loop ramp also.

The total potential savings is \$2,785,000

C: AC Pavement

C-2: Reduce paved shoulder width from 6.5 feet to 4 feet. The purpose of the project is to increase capacity by providing additional through lanes. This can be accomplished with 4' paved shoulders. AASHTO guidelines do not mandate a required paved shoulder width. Savings shown reflects savings in pavement only.

The total potential savings is \$175,000

C-3: Reduce the amount of side street work. This idea involves reducing the length of some of the side street connections. The idea evaluated 1 intersection, CR 295.

The total potential savings is \$175,000

C-5: Use reduced depth pavement for medians and left turn lanes. Because of the lighter traffic loadings for these areas, a thinner pavement section than the mainline, full-depth section will reduce asphalt, grading and GAB costs.

The total potential savings is \$324,000

C-6: Realign the bypass to utilize more of the existing pavement south of Lyons.

Realigning the by-pass alignment will reduce construction costs and maintain the current design approach of existing pavement re-use, where feasible. The estimated distance is about 2,000 feet. Detailed topographic and environmental constraints will have to be identified prior to final layout, however there do not appear to be any critical issues at this phase.

The total potential savings is \$203,000

D: Unclassified Excavation

D-1: Reduce design speed to 55 mph. Reducing the design speed to 55 mph will allow the designers more flexibility to develop an economical and appropriate design. The most critical area is at the new bridges over SR 30, the RR and SR 292. Increasing the grades from 3% to 4 % will yield significant cost savings in earthwork. The project to the north, PI 522130 has already implemented 55 mph for the design speed and this would represent a continuation of that through the by-pass alignment.

The total potential savings is \$508,000

**US 1 / SR 4 Corridor Improvements
Toombs County**

SUMMARY OF POTENTIAL COST SAVINGS

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
	PI Nos. 522220 & 522225						
A	Right of way (R/W)						
A-1	Reduce median width from 44 feet to 32 feet	378,000	-0-	378,000	-0-	378,000	378,000
A-3	Use R/W to shoulder break, easements beyond	380,000	190,000	190,000	-0-	190,000	190,000
B	Structures						
B-1	Reduce bridge width from 38 feet to 36 feet gutter to gutter	21,838,000	20,781,000	1,057,000	-0-	1,057,000	1,057,000
C	AC Pavement						
C-2	Reduce paved shoulder width from 6.5 feet to 4.0 feet	228,000	-0-	228,000	-0-	228,000	228,000
C-3	Reduce amount of side street work	102,000	-0-	102,000	-0-	102,000	102,000
C-5	Use reduced full depth pavement for medians and left turn lanes	324,000	-0-	324,000	-0-	324,000	324,000
	Total Potential Cost Avoidance PI Nos. 522220 & 522225						\$2,279,000

**US 1 / SR 4 Corridor Improvements
Toombs County**

SUMMARY OF POTENTIAL COST SAVINGS

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
	PI No. 522180						
A	Right of Way						
A-1	Reduce median width from 44 feet to 32 feet	357,000	-0-	357,000	-0-	357,000	357,000
A-3	Use right of way to shoulder breakpoint and easements beyond	186,000	93,000	93,000	-0-	93,000	93,000
C	AC Pavement						
C-2	Reduce paved shoulder width from 6.5 feet to 4.0 feet	118,000	-0-	118,000	-0-	118,000	118,000
C-3	Reduce amount of side street work	345,000	-0-	345,000	-0-	345,000	345,000
C-5	Use reduced full depth pavement for medians and left turn lanes	277,000	-0-	277,000	-0-	277,000	277,000
	Total Potential Cost Avoidance PI No. 522180						\$1,190,000

**US 1 / SR 4 Corridor Improvements
Toombs County**

SUMMARY OF POTENTIAL COST SAVINGS

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
	PI Nos. 522190 & 522185						
A	Right of way						
A-1	Reduce median width from 44 feet to 32 feet	278,000	-0-	278,000	-0-	278,000	278,000
A-3	Use right of way to shoulder break and easements beyond	139,000	69,000	70,000	-0-	70,000	70,000
B	Structures						
B-1	Reduce bridge width from 38 feet to 36 feet gutter to gutter	2,354,000	2,240,000	114,000	-0-	114,000	114,000
C	AC Pavement						
C-2	Reduce paved shoulder width from 6.5 feet to 4.0 feet	92,000	-0-	92,000	-0-	92,000	92,000
C-3	Reduce amount of side street work	122,000	-0-	122,000	-0-	122,000	122,000
C-5	Use reduced full depth pavement for medians and left turn lanes	185,000	-0-	185,000	-0-	185,000	185,000
	Total Potential Cost Avoidance PI Nos. 522190 & 522185						\$861,000

**US 1 / SR 4 Corridor Improvements
Toombs County**

SUMMARY OF POTENTIAL COST SAVINGS

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
	PI No. 522200						
A	Right of way						
A-1	Reduce median width from 44 feet to 32 feet	1,065,000	-0-	1,065,000	-0-	1,065,000	-0-
A-1.1	Reduce median width from 44 feet to 20 feet and use a cable barrier	2,127,000	672,000	1,455,000	-0-	1,455,000	1,455,000
A-3	Use right of way to shoulder break and easements beyond	3,597,000	1,799,000	1,798,000	-0-	1,798,000	1,798,000
B	Structures						
B-1	Reduce bridge width from 38 feet to 36 feet gutter to gutter	6,984,000	6,646,000	338,000	-0-	338,000	75,000
B-3	Use MSE wall on railroad end of bridge to shorten bridge over railroad / SR 280 crossing	2,511,000	2,228,000	283,000	-0-	283,000	283,000
B-4	Eliminate bridges at SR 30 and SR 292 and provide an at-grade crossing	8,236,000	958,000	7,278,000	-0-	7,278,000	7,278,000
B-4.1	Eliminate bridges at SR 292	5,480,000	2,695,000	2,785,000	-0-	2,785,000	-0-

**US 1 / SR 4 Corridor Improvements
Toombs County**

SUMMARY OF POTENTIAL COST SAVINGS

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL PRESENT WORTH SAVINGS	Maximum Savings in Combination with other VE proposals
C	AC Pavement						
C-2	Reduce paved shoulder width from 6.5 feet to 4.0 feet	175,000	-0-	175,000	-0-	175,000	175,000
C-3	Reduce amount of side street work	175,000	-0-	175,000	-0-	175,000	175,000
C-5	Use reduced full depth pavement for medians and left turn lanes	324,000	-0-	324,000	-0-	324,000	324,000
C-6	Realign the bypass to utilize more of the existing pavement south of Lyons	203,000	-0-	203,000	-0-	203,000	203,000
D	Unclassified Excavation						
D-1	Reduce design speed to 55 mph	508,000	-0-	508,000	-0-	508,000	-0-
	Total Potential Cost Avoidance PI No. 522200						\$11,766,000
	Total Potential Cost Avoidance for All Projects						\$16,196,000

STUDY IDENTIFICATION

Study Identification

Project:	Date: April 4-7, 2011
Location: Toombs County	

VE Team Members

Name:	Title:	Organization:	Telephone:
Stephen Gaines	Highway Design	Wolverton	770-447-8999
Steve Bitney	Highway Design	Stantec	770-813-0882
Aruna Sastry	Structural	Sastry Associates	404-932-0373
George Obaranec	Construction	MACTEC	770-421-3346
David Wohlscheid	VE Team Facilitator	MACTEC	571-217-0808

Project Description

The VE study was conducted on April 4-7, 2011 at the Georgia DOT General Office in Atlanta using a five person VE team. The study took place at the concept design phase on six separate projects. These projects were grouped into four packages that run concurrently along the corridor for 23.7 miles.

The project starts just south of the border with Appling County south of the crossing with the Altamaha River and proceeds north to just north of Lyons, GA at the junction with SR 130. The improvements are part of the Governor's Road Improvement Program (GRIP) initiated in the 1980's. The project includes expanding the two lane facility to a four lane divided facility.

The improvements include adding two lanes and reconstructing the existing two lanes where feasible. Improvements will be made to horizontal and vertical alignments and the general proposed design speed is 65 mph. A typical section will include four 12 foot travel lanes with a 44 foot grassed median and an open drainage ditch. Outside shoulders are proposed to be 10 feet with 6.5 feet paved while the inside is 6 feet with 2 feet paved.

The project is currently not programmed for construction. The Draft Environmental Assessment has been approved but will need updating based on the revisions to the concept report. One of the project concerns will be with the historic properties in the area.

Project Constraints

There were no constraints placed upon the VE team prior to the project kickoff.

Project Briefing:

The VE team was given a design briefing on the current status and overview of the project by Michelle Wright, GDOT Program Delivery. This was followed by the more detailed project discussion by David Acree and Brad McManus, GDOT Roadway Design. David Acree is Design Manager for the southern sections (PI Nos. 522220 and 522225; and PI No. 522180) while Brad McManus is Design Manager for the northern sections (PI Nos. 522190 and 522185; and PI No. 522200). No constraints were identified.

The following items were discussed:

- Updated cost estimates were provided for all projects
- The unit costs in the revised estimates would be used wherever possible in the development of suggested recommendations.
- The cost models were developed during the pre-study phase using information provided by the design team. These are used for background information only by the VE Team and were not upgraded with the new estimate numbers.
- The project is part of the GRIP program and is a major north-south corridor for this part of Georgia.
- All projects are at the concept phase of design. Some are more advanced than others as some have preliminary designs to review. Revised concept design reports have been developed for the projects.
- A Draft Environmental Assessment has been approved for all projects but will need to be resubmitted because of the time lapse.
- The typical section for this project includes four 12 foot travel lanes with a 44 foot grassed median and open drainage ditches. Outside shoulders are proposed to be 10 feet with 6.5 feet paved while the inside is 6 feet with 2 feet paved.
- The project will add two new lanes and reuse the existing two lanes to the greatest extent feasible.
- The major environmental concern along the corridor is wetland impacts.
- The main concern of the EA document is for impacts on historic resources in the area.
- The current scheduling for the project is to begin right of way acquisition in 2016.
- The project immediately to the north of these projects is going to begin construction this year. That project has a 32 foot median.

The remainder of this section shows the project location as well as the updated cost estimate sheets furnished by GDOT for the project to give the reader a better understanding of the scope of work.

**Figure 1
Project Location Map**

County Map of Georgia

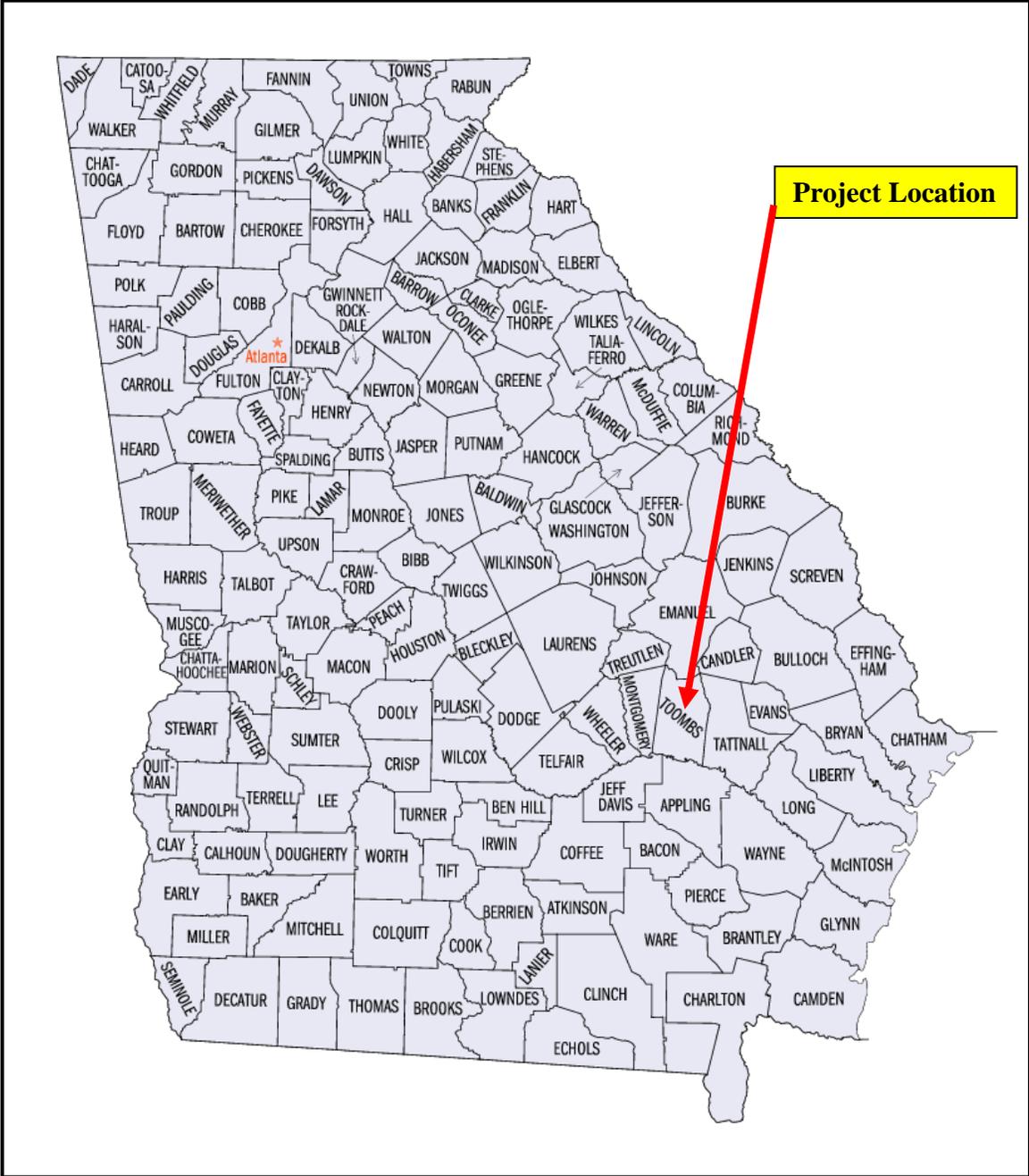


Figure 2
Project Vicinity

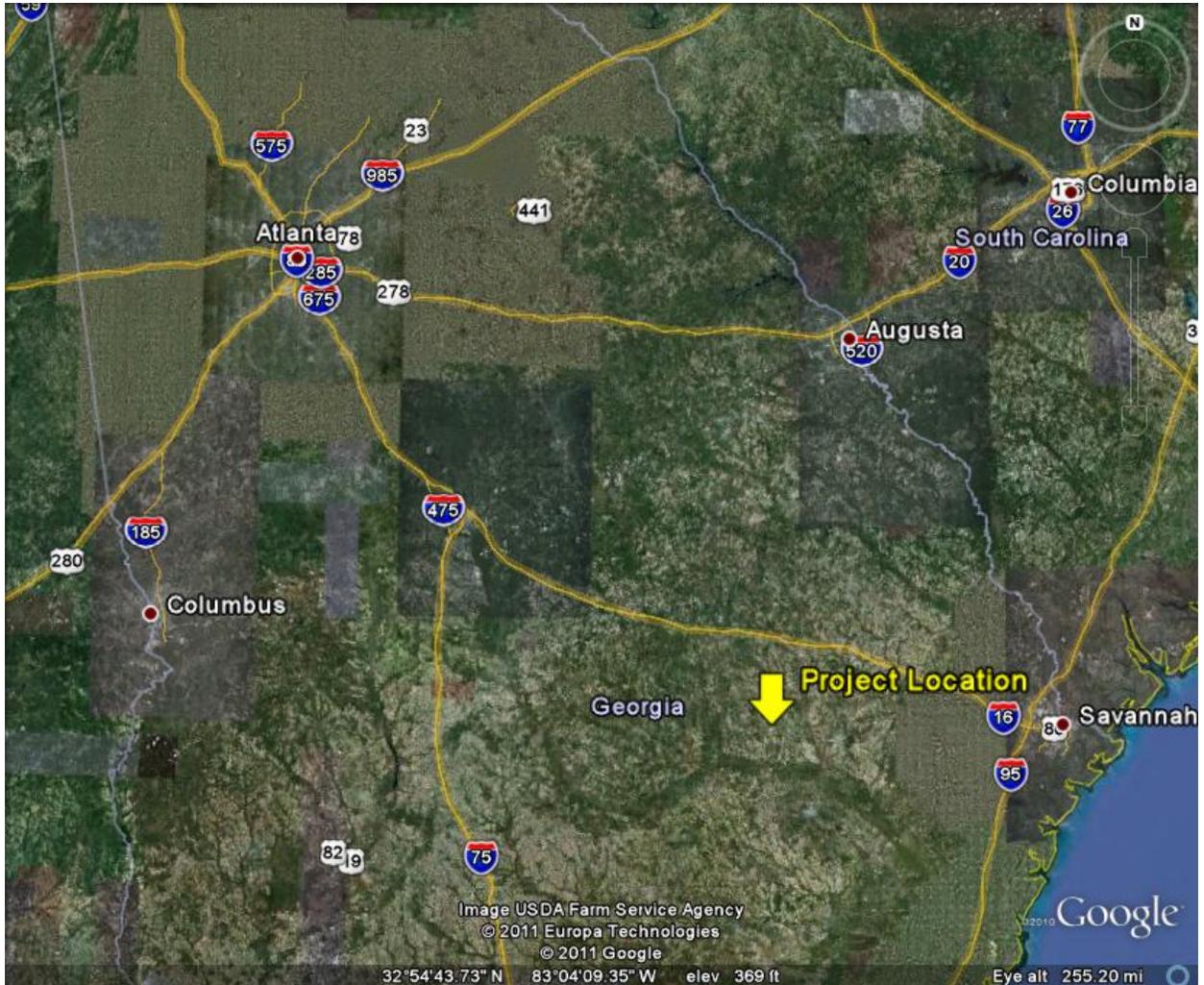
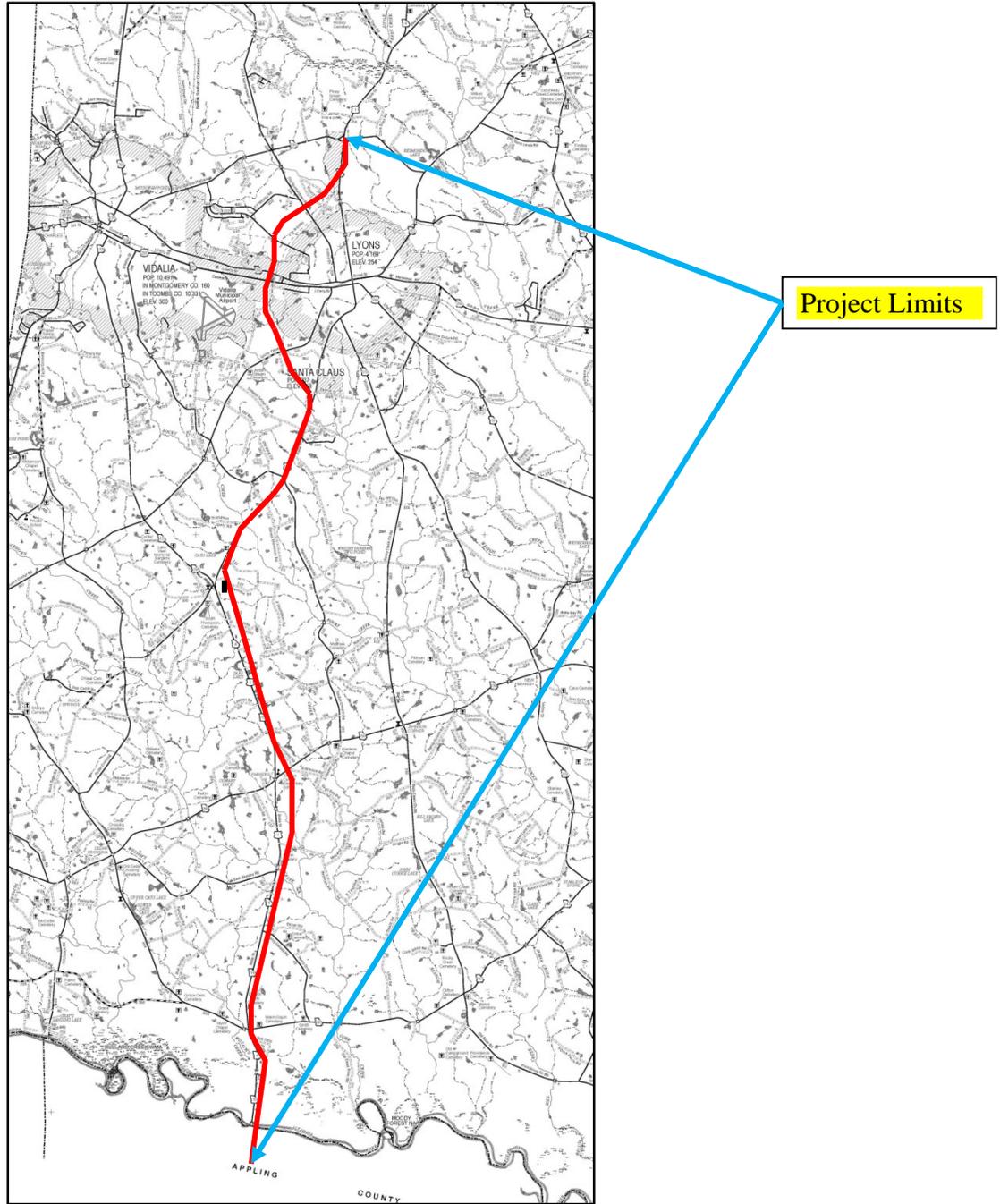


Figure 3
Project Limits



Project Cost Estimate Summary Sheets

DATE : 04/04/2011

PAGE : 1

JOB ESTIMATE REPORT

JOB NUMBER : 522220 SPEC YEAR: 01
 DESCRIPTION: SR4/US1 FM PLANT HATCH TO SR56 IN TOOMBS CO.

ITEMS FOR JOB 522220

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	150-1000		LS	TRAFFIC CONTROL - EDS00-0545-00(023)	1.000	950000.00	950000.00
0010	153-1300		EA	FIELD ENGINEERS OFFICE TP 3	1.000	55869.29	55869.29
0015	150-5010		EA	TRAF CTRL,PORTABLE IMPACT ATTN	120.000	8717.71	1046126.38
0020	201-1500		LS	CLEARING & GRUBBING - EDS00-00545-00(23)	1.000	1200000.00	1200000.00
0025	205-0001		CY	UNCLASS EXCAV	516042.000	3.30	1706344.48
0030	207-0203		CY	FOUND BKFILL MATL, TP II	10000.000	35.45	354582.00
0035	310-1101		TN	GR AGGR BASE CRS, INCL MATL	10000.000	16.90	169001.80
0040	310-5040		SY	GR AGGR BS CRS 4IN INCL MATL	13039.000	8.00	104312.00
0045	310-5060		SY	GR AGGR BS CRS 6IN INCL MATL	54817.000	9.34	512286.79
0050	310-5080		SY	GR AGGR BS CRS 8IN INCL MATL	227706.000	8.74	1991537.17
0055	318-3000		TN	AGGR SURF CRS	9500.000	23.87	226792.27
0060	402-1812		TN	RECYL AC LEVELING,INC BM&HL	26205.000	68.81	1803395.34
0065	402-3103		TN	REC AC 9.5 MM SP,TPII,GP2, INCL BM & H L	29554.000	69.55	2055587.09
0070	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	37571.000	57.93	2176698.43
0075	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	32199.000	65.79	2118582.47
0080	413-1000		GL	BITUM TACK COAT	10086.000	2.66	26858.31
0085	432-5010		SY	MILL ASPH CONC PVMT,VARB DEPTH	10000.000	2.21	22151.10
0090	433-1000		SY	REINF CONC APPROACH SLAB	1053.000	146.12	153870.04
0095	436-1000		LF	ASPH CONC CURB - TBD	1000.000	9.65	9659.44
0100	441-0016		SY	DRIVEWAY CONCRETE, 6 IN TK	1000.000	35.00	35000.66
0105	441-0740		SY	CONC MEDIAN, 4 IN	500.000	28.88	14444.61
0110	441-4020		SY	CONC VALLEY GUTTER, 6 IN	700.000	31.55	22088.93
0115	446-1100		LF	PVMT REF FAB STRIPS, TP2,18 INCH WIDTH	51624.000	1.61	83148.20
0120	456-2015		GLM	INDENT. RUMB. STRIPS - GRND-IN-PL (SKIP)	16.000	748.55	11976.89
0125	500-2100		LF	CONCRETE BARRIER	4400.000	37.98	167136.73
0130	500-3101		CY	CLASS A CONCRETE	100.000	498.82	49882.55
0135	500-3200		CY	CL B CONC	100.000	259.07	25907.84
0140	500-3800		CY	CL A CONC, INCL REINF STEEL	10.000	764.55	7645.60
0145	500-3900		CY	CL B CONC, INCL REINF STEEL	10.000	561.82	5618.27
0150	511-1000		LB	BAR REINF STEEL	10000.000	0.70	7041.50
0155	634-1200		EA	RIGHT OF WAY MARKERS	474.000	79.74	37801.37
0160	641-1100		LF	GUARDRAIL, TP T	413.000	38.79	16021.41
0165	641-1200		LF	GUARDRAIL, TP W	15328.000	13.17	201876.66
0170	641-5001		EA	GUARDRAIL ANCHORAGE, TP 1	18.000	614.38	11058.86
0175	641-5012		EA	GUARDRAIL ANCHORAGE, TP 12	21.000	1881.08	39502.79
0200	550-1180		LF	STM DR PIPE 18",H 1-10	7402.000	24.55	181778.91
0205	550-1240		LF	STM DR PIPE 24",H 1-10	1320.000	34.97	46160.53
0210	550-1241		LF	STM DR PIPE 24",H 10-15	300.000	29.05	8716.69
0215	550-1300		LF	STM DR PIPE 30",H 1-10	788.000	45.04	35498.21
0220	550-1360		LF	STM DR PIPE 36",H 1-10	702.000	60.98	42813.03
0225	550-1361		LF	STM DR PIPE 36",H 10-15	130.000	66.51	8646.56

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0230	550-2180	LF	SIDE DR PIPE 18",H 1-10	3262.000	21.56	70342.16
0235	550-2240	LF	SIDE DR PIPE 24",H 1-10	701.000	28.52	19997.24
0240	550-3318	EA	SAFETY END SECTION 18",STD,4:1	11.000	775.80	8533.82
0245	550-3324	EA	SAFETY END SECTION 24",STD,4:1	12.000	927.47	11129.74
0250	550-3330	EA	SAFETY END SECTION 30",STD,4:1	4.000	1375.15	5500.62
0255	550-3336	EA	SAFETY END SECTION 36",STD,4:1	3.000	2216.50	6649.52
0260	550-3418	EA	SAFETY END SECTION 18",SD,4:1	56.000	581.71	32576.09
0265	550-3424	EA	SAFETY END SECTION 24",SD,4:1	11.000	560.02	6160.29
0270	550-4118	EA	FLARED END SECT 18 IN, SIDE DR	64.000	521.90	33402.23
0275	550-4424	EA	FLARED END SECT 24 IN, SLP DR	17.000	434.06	7379.02
0280	550-4218	EA	FLARED END SECT 18 IN, ST DR	68.000	500.57	34039.40
0285	550-4224	EA	FLARED END SECT 24 IN, ST DR	6.000	557.28	3343.69
0290	550-4230	EA	FLARED END SECT 30 IN, ST DR	6.000	843.37	5060.22
0295	550-4236	EA	FLARED END SECT 36 IN, ST DR	9.000	989.84	8908.60
0300	573-2006	LF	UNDDR PIPE INCL DRAIN AGGR 6"	3000.000	12.46	37404.87
0305	611-9000	EA	CAPPING MINOR STRUCTURE	30.000	499.72	14991.90
0310	668-1100	EA	CATCH BASIN, GP 1	100.000	2048.47	204847.85
0315	668-2100	EA	DROP INLET, GP 1	89.000	1660.93	147822.80
0320	668-4300	EA	STORM SEW MANHOLE, TP 1	10.000	2439.31	24393.12
0325	668-5000	EA	JUNCTION BOX	10.000	1760.52	17605.30
0400	500-3101	CY	CLASS A CONCRETE	373.000	452.59	168816.92
0405	511-1000	LB	BAR REINF STEEL	38690.000	0.64	25101.30
0410	543-9000	LS	CONSTR OF BRIDGE COMPLETE - ATLTAHAHA RIVER	1.000	16015800.00	16015800.00
0415	543-9000	LS	CONSTR OF BRIDGE COMPLETE - ALTAMAHA RIVER OVERFLOW	1.000	1137900.00	1137900.00
0420	543-9000	LS	CONSTR OF BRIDGE COMPLETE - WILLIAMS CREEK	1.000	1389000.00	1389000.00
0425	543-9000	LS	CONSTR OF BRIDGE COMPLETE - COBB CREEK	1.000	1647900.00	1647900.00
0500	636-1020	SF	HWY SGN,TP1MAT,REFL SH TP3	290.000	13.52	3922.82
0505	636-1031	SF	HWY SIGNS,TP1MTL,RFL SHTG,TP6	900.000	17.12	15408.00
0510	636-2070	LF	GALV STEEL POSTS, TP 7	2600.000	6.92	18002.01
0515	636-2080	LF	GALV STEEL POSTS, TP 8	30.000	9.16	274.94
0520	636-2090	LF	GALV STEEL POSTS, TP 9	222.000	8.02	1780.69
0525	652-0110	EA	PAVEMENT MARKING, ARROW, TP 1	55.000	41.09	2260.44
0530	652-0120	EA	PAVEMENT MARKING, ARROW, TP 2	15.000	40.21	603.22
0535	652-5451	LF	SOLID TRAF STRIPE, 5 IN, WHITE	15997.000	0.12	1949.71
0540	652-5452	LF	SOLID TRAF STRIPE, 5 IN, YELLO	14930.000	0.08	1283.98
0545	653-1501	LF	THERMO SOLID TRAF ST 5 IN, WHI	89948.000	0.24	21789.00
0550	653-1502	LF	THERMO SOLID TRAF ST, 5 IN YEL	88450.000	0.23	20475.29
0555	653-1704	LF	THERM SOLID TRAF STRIPE,24",WH	294.000	3.35	986.22
0560	653-3501	GLF	THERMO SKIP TRAF ST, 5 IN, WHI	91903.000	0.10	9770.21
0565	653-6004	SY	THERM TRAF STRIPING, WHITE	6861.000	2.56	17631.88
0570	653-6006	SY	THERM TRAF STRIPING, YELLOW	1528.000	2.71	4145.78
0575	654-1001	EA	RAISED PVMT MARKERS TP 1	222.000	3.66	814.74
0580	654-1003	EA	RAISED PVMT MARKERS TP 3	1239.000	2.99	3711.94
0585	654-1010	EA	RAISED PVMT MARKERS TP 10	40.000	37.00	1480.38
0600	163-0232	AC	TEMPORARY GRASSING	92.000	458.28	42162.40
0605	163-0240	TN	MULCH	2651.000	133.25	353269.05
0610	163-0300	EA	CONSTRUCTION EXIT	32.000	992.13	31748.42
0615	163-0503	EA	CONSTR AND REMOVE SILT CONTROL GATE,TP 3	36.000	386.71	13921.80
0620	163-0520	LF	CONSTR AND REMOVE TEMP PIPE SLOPE DRAIN	458.000	14.99	6869.06

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0625	163-0521	EA	CONSTR AND REMOVE TEMP DITCH CHECKS	21.000	146.93	3085.53
0630	163-0530	LF	CONSTR AND REMOVE BALED STRW EROSION CHK	12860.000	3.49	44990.20
0635	163-0531	EA	CONSTR & REM SEDIMENT BASIN, TP 1, STA NO- EDS00-0545-00(023)	1.000	8459.81	8459.82
0640	163-0550	EA	CONS & REM INLET SEDIMENT TRAP	66.000	156.21	10310.48
0645	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	30030.000	0.53	16104.19
0650	165-0030	LF	MAINT OF TEMP SILT FENCE, TP C	15900.000	0.46	7318.61
0655	165-0040	EA	MAINT OF EROSION CTRL CHKDAMS/DITCH CHKS	21.000	38.90	817.00
0660	165-0050	LF	MAINT OF SILT RETENTION BARRIER	905.000	1.78	1617.36
0665	165-0060	EA	MAINT OF TEMP SEDIMENT BASIN, STA NO - EDS00-0545-00(023)	1.000	1336.72	1336.73
0670	165-0070	LF	MAINT OF BALED STRAW EROSION CHECK	6430.000	1.05	6804.48
0675	165-0087	EA	MAINT OF SILT CONTROL GATE, TP 3	36.000	101.33	3648.16
0680	165-0101	EA	MAINT OF CONST EXIT	32.000	368.44	11790.15
0685	165-0105	EA	MAINT OF INLET SEDIMENT TRAP	33.000	56.29	1857.74
0690	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	2.000	628.44	1256.89
0695	167-1500	MO	WATER QUALITY INSPECTIONS	36.000	720.38	25933.96
0700	170-1000	LF	FLOAT SILT RETENTION BARRIER	905.000	12.44	11261.08
0705	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	31640.000	1.72	54484.40
0710	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	31800.000	3.28	104612.78
0715	441-0204	SY	PLAIN CONC DITCH PAVING, 4 IN	1000.000	39.13	39137.57
0720	603-2024	SY	STN DUMPED RIP RAP, TP 1, 24"	100.000	57.94	5794.55
0725	603-2180	SY	STN DUMPED RIP RAP, TP 3, 12"	665.000	46.91	31195.30
0730	603-2182	SY	STN DUMPED RIP RAP, TP 3, 24"	100.000	70.05	7005.80
0735	603-7000	SY	PLASTIC FILTER FABRIC	665.000	4.08	2719.50
0740	700-6910	AC	PERMANENT GRASSING	183.000	1113.15	203706.94
0745	700-7000	TN	AGRICULTURAL LIME	600.000	44.42	26653.94
0750	700-7010	GL	LIQUID LIME	457.000	15.27	6979.20
0755	700-8000	TN	FERTILIZER MIXED GRADE	183.000	430.26	78738.64
0760	700-8100	LB	FERTILIZER NITROGEN CONTENT	5000.000	2.39	11975.15
0765	710-9000	SY	PERM SOIL REINFORCING MAT	1000.000	3.95	3956.47
0770	715-2200	SY	BITUM TRTD ROVING, WATERWAYS	57054.000	1.31	74761.28
0775	716-2000	SY	EROSION CONTROL MATS, SLOPES	45230.000	1.37	62092.20
ITEM TOTAL						40272695.94
INFLATED ITEM TOTAL						46620679.64
TOTALS FOR JOB 522220						
ESTIMATED COST:						46620679.68
CONTINGENCY PERCENT (4.0):						1864827.19
ESTIMATED TOTAL:						48485506.87

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JOB NUMBER : 522180 SPEC YEAR: 01
DESCRIPTION: SR4/US1 FM SR56 TO SR29

ITEMS FOR JOB 522180

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	150-1000		LS	TRAFFIC CONTROL - EDS00-0545-00(024)	1.000	420000.00	420000.00
0010	150-5010		EA	TRAF CTRL,PORTABLE IMPACT ATTN	75.000	8717.71	653828.99
0015	153-1300		EA	FIELD ENGINEERS OFFICE TP 3	1.000	60146.65	60146.65
0020	201-1500		LS	CLEARING & GRUBBING - EDS00-0545-00(024)	1.000	850000.00	850000.00
0025	205-0001		CY	UNCLASS EXCAV	275800.000	3.97	1097093.79
0030	207-0203		CY	FOUND BKFILL MATL, TP II	7000.000	37.96	265725.81
0035	310-1101		TN	GR AGGR BASE CRS, INCL MATL	68657.000	14.54	998873.53
0040	318-3000		TN	AGGR SURF CRS	5700.000	24.27	138344.30
0045	402-1812		TN	RECYL AC LEVELING,INC BM&HL	15800.000	69.16	1092855.98
0050	402-3103		TN	REC AC 9.5 MM SP,TPII,GP2, INCL BM & H L	14985.000	69.58	1042784.57
0055	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	19325.000	59.44	1148722.25
0060	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	20488.000	62.72	1285100.17
0065	413-1000		GL	BITUM TACK COAT	12298.000	2.66	32796.31
0070	432-5010		SY	MILL ASPH CONC PVMT,VARB DEPTH	6000.000	2.85	17110.62
0075	436-1000		LF	ASPH CONC CURB - TBD	600.000	11.69	7016.54
0080	441-0016		SY	DRIVEWAY CONCRETE, 6 IN TK	600.000	42.57	25543.21
0085	441-0740		SY	CONC MEDIAN, 4 IN	100.000	38.16	3816.27
0090	441-4020		SY	CONC VALLEY GUTTER, 6 IN	150.000	33.70	5055.67
0095	446-1100		LF	PVMT REF FAB STRIPS, TP2,18 INCH WIDTH	45800.000	1.76	80751.35
0100	456-2015		GLM	INDENT. RUMB. STRIPS - GRND-IN-PL (SKIP)	9.000	633.83	5704.49
0105	500-2100		LF	CONCRETE BARRIER	3000.000	38.57	115737.81
0110	500-3101		CY	CLASS A CONCRETE	100.000	498.82	49882.55
0115	500-3200		CY	CL B CONC	100.000	542.26	54226.83
0120	500-3800		CY	CL A CONC, INCL REINF STEEL	10.000	717.00	7170.04
0125	500-3900		CY	CL B CONC, INCL REINF STEEL	10.000	561.82	5618.27
0130	511-1000		LB	BAR REINF STEEL	10000.000	0.70	7041.50
0135	634-1200		EA	RIGHT OF WAY MARKERS	300.000	90.08	27024.85
0140	641-1100		LF	GUARDRAIL, TP T	100.000	61.54	6154.09
0145	641-1200		LF	GUARDRAIL, TP W	8000.000	13.92	111432.72
0150	641-5001		EA	GUARDRAIL ANCHORAGE, TP 1	10.000	623.20	6232.02
0155	641-5012		EA	GUARDRAIL ANCHORAGE, TP 12	12.000	1828.09	21937.15
0200	550-1180		LF	STM DR PIPE 18",H 1-10	4420.000	27.49	121528.21
0205	550-1240		LF	STM DR PIPE 24",H 1-10	1200.000	35.17	42207.17
0210	550-1241		LF	STM DR PIPE 24",H 10-15	200.000	29.27	5854.15
0215	550-1300		LF	STM DR PIPE 30",H 1-10	200.000	55.23	11046.69
0220	550-1360		LF	STM DR PIPE 36",H 1-10	540.000	61.61	33273.15
0225	550-2180		LF	SIDE DR PIPE 18",H 1-10	1960.000	23.23	45547.83
0230	550-2240		LF	SIDE DR PIPE 24",H 1-10	420.000	28.29	11883.16
0235	550-3318		EA	SAFETY END SECTION 18",STD,4:1	8.000	543.14	4345.19
0240	550-3324		EA	SAFETY END SECTION 24",STD,4:1	8.000	927.47	7419.82
0245	550-3330		EA	SAFETY END SECTION 30",STD,4:1	2.000	1375.15	2750.31

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0250	550-3336	EA	SAFETY END SECTION 36",STD,4:1	2.000	1888.42	3776.84
0255	550-3418	EA	SAFETY END SECTION 18",SD,4:1	34.000	494.17	16801.90
0260	550-3424	EA	SAFETY END SECTION 24",SD,4:1	8.000	560.02	4480.21
0265	550-4118	EA	FLARED END SECT 18 IN, SIDE DR	38.000	372.79	14166.35
0270	550-4218	EA	FLARED END SECT 18 IN, ST DR	42.000	472.17	19831.29
0275	550-4224	EA	FLARED END SECT 24 IN, ST DR	18.000	534.05	9613.07
0280	550-4230	EA	FLARED END SECT 30 IN, ST DR	4.000	802.10	3208.43
0285	550-4236	EA	FLARED END SECT 36 IN, ST DR	6.000	991.74	5950.47
0290	550-4424	EA	FLARED END SECT 24 IN, SLP DR	10.000	434.06	4340.60
0295	573-2006	LF	UNDDR PIPE INCL DRAIN AGGR 6"	2000.000	13.02	26049.40
0300	611-9000	EA	CAPPING MINOR STRUCTURE	20.000	530.09	10601.95
0305	668-1100	EA	CATCH BASIN, GP 1	60.000	2060.65	123639.07
0310	668-2100	EA	DROP INLET, GP 1	50.000	2008.03	100401.79
0315	668-4300	EA	STORM SEW MANHOLE, TP 1	6.000	2138.33	12830.00
0320	668-5000	EA	JUNCTION BOX	6.000	1739.42	10436.57
0400	500-3101	CY	CLASS A CONCRETE	298.000	460.16	137128.20
0405	511-1000	LB	BAR REINF STEEL	30952.000	0.65	20354.04
0500	636-1020	SF	HWY SGN,TP1MAT,REFL SH,TP3	174.000	13.97	2431.58
0505	636-1031	SF	HWY SIGNS,TP1MTL,RFL SHTG,TP6	540.000	17.12	9244.80
0510	636-2070	LF	GALV STEEL POSTS, TP 7	1560.000	7.18	11206.35
0515	636-2080	LF	GALV STEEL POSTS, TP 8	18.000	9.18	165.33
0520	636-2090	LF	GALV STEEL POSTS, TP 9	133.000	8.11	1079.95
0525	652-0110	EA	PAVEMENT MARKING, ARROW, TP 1	33.000	42.26	1394.78
0530	652-0120	EA	PAVEMENT MARKING, ARROW, TP 2	9.000	40.89	368.07
0535	652-5451	LF	SOLID TRAF STRIPE, 5 IN, WHITE	9598.000	0.13	1285.08
0540	652-5452	LF	SOLID TRAF STRIPE, 5 IN, YELLO	8958.000	0.09	890.69
0545	653-1501	LF	THERMO SOLID TRAF ST 5 IN, WHI	53969.000	0.26	14310.96
0550	653-1502	LF	THERMO SOLID TRAF ST, 5 IN YEL	53070.000	0.25	13436.26
0555	653-1704	LF	THERM SOLID TRAF STRIPE,24",WH	176.000	3.47	611.08
0560	653-3501	GLF	THERMO SKIP TRAF ST, 5 IN, WHI	55142.000	0.11	6341.88
0565	653-6004	SY	THERM TRAF STRIPING, WHITE	4117.000	2.62	10824.17
0570	653-6006	SY	THERM TRAF STRIPING, YELLOW	917.000	2.79	2562.79
0575	654-1001	EA	RAISED PVMT MARKERS TP 1	133.000	3.92	521.87
0580	654-1003	EA	RAISED PVMT MARKERS TP 3	743.000	3.10	2305.15
0585	654-1010	EA	RAISED PVMT MARKERS TP 10	24.000	38.26	918.33
0600	163-0232	AC	TEMPORARY GRASSING	55.000	458.28	25205.78
0605	163-0240	TN	MULCH	1591.000	141.37	224929.96
0610	163-0300	EA	CONSTRUCTION EXIT	19.000	1050.72	19963.79
0615	163-0501	EA	CONSTR AND REMOVE SILT CONTROL GATE,TP 1	5.000	672.48	3362.44
0620	163-0502	EA	CONSTR AND REMOVE SILT CONTROL GATE,TP 2	5.000	517.30	2586.51
0625	163-0503	EA	CONSTR AND REMOVE SILT CONTROL GATE,TP 3	22.000	347.59	7647.02
0630	163-0520	LF	CONSTR AND REMOVE TEMP PIPE SLOPE DRAIN	275.000	15.57	4283.97
0635	163-0521	EA	CONSTR AND REMOVE TEMP DITCH CHECKS	13.000	146.93	1910.09
0640	163-0530	LF	CONSTR AND REMOVE BALED STRW EROSION CHK	7716.000	3.59	27759.47
0645	163-0531	EA	CONSTR & REM SEDIMENT BASIN,TP 1,STA NO- EDS-0545-00(024)	1.000	8459.81	8459.82
0650	163-0550	EA	CONS & REM INLET SEDIMENT TRAP	40.000	156.90	6276.26
0655	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	18018.000	0.57	10402.33
0660	165-0030	LF	MAINT OF TEMP SILT FENCE, TP C	9540.000	0.49	4714.38

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0665	165-0040	EA	MAINT OF EROSION CTRL CHKDAMS/DITCH CHKS	13.000	39.63	515.25
0670	165-0050	LF	MAINT OF SILT RETENTION BARRIER	543.000	1.78	970.42
0675	165-0060	EA	MAINT OF TEMP SEDIMENT BASIN, STA NO - EDS-0545-00(024)	1.000	1336.72	1336.73
0680	165-0070	LF	MAINT OF BALED STRAW EROSION CHECK	3858.000	1.12	4356.69
0685	165-0085	EA	MAINT OF SILT CONTROL GATE, TP 1	5.000	198.58	992.90
0690	165-0086	EA	MAINT OF SILT CONTROL GATE, TP 2	5.000	198.34	991.72
0695	165-0087	EA	MAINT OF SILT CONTROL GATE, TP 3	22.000	108.24	2381.45
0700	165-0101	EA	MAINT OF CONST EXIT	19.000	377.54	7173.42
0705	165-0105	EA	MAINT OF INLET SEDIMENT TRAP	20.000	56.29	1125.90
0710	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	2.000	628.44	1256.89
0715	167-1500	MO	WATER QUALITY INSPECTIONS	24.000	752.62	18063.06
0720	170-1000	LF	FLOAT SILT RETENTION BARRIER	543.000	12.44	6756.65
0725	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	18984.000	1.82	34649.41
0730	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	19080.000	3.36	64286.24
0735	441-0204	SY	PLAIN CONC DITCH PAVING, 4 IN	700.000	39.81	27873.49
0740	603-2024	SY	STN DUMPED RIP RAP, TP 1, 24"	70.000	58.49	4095.00
0745	603-2180	SY	STN DUMPED RIP RAP, TP 3, 12"	399.000	49.20	19631.66
0750	603-2182	SY	STN DUMPED RIP RAP, TP 3, 24"	70.000	71.86	5030.30
0755	603-7000	SY	PLASTIC FILTER FABRIC	399.000	4.12	1646.98
0760	700-6910	AC	PERMANENT GRASSING	110.000	1113.15	122446.80
0765	700-7000	TN	AGRICULTURAL LIME	360.000	45.58	16411.12
0770	700-7010	GL	LIQUID LIME	274.000	15.72	4308.10
0775	700-8000	TN	FERTILIZER MIXED GRADE	110.000	442.89	48718.46
0780	700-8100	LB	FERTILIZER NITROGEN CONTENT	3000.000	2.49	7471.83
0785	710-9000	SY	PERM SOIL REINFORCING MAT	700.000	4.04	2830.88
0790	715-2200	SY	BITUM TRTD ROVING, WATERWAYS	34232.000	1.31	45171.52
0795	716-2000	SY	EROSION CONTROL MATS, SLOPES	27138.000	1.41	38330.80
ITEM TOTAL						11369418.80
INFLATED ITEM TOTAL						13161523.44
TOTALS FOR JOB 522180						
ESTIMATED COST:						13161523.44
CONTINGENCY PERCENT (4.0):						526460.94
ESTIMATED TOTAL:						13687984.38

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JOB ESTIMATE REPORT

JOB NUMBER : 522190 SPEC YEAR: 01
 DESCRIPTION: SR 4/US 1 FM SR 56 TO SR 29
 EDS00-0545-00(025) PI # 522190 TOOMBS COUNTY

ITEMS FOR JOB 522190

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	150-1000		LS	TRAFFIC CONTROL - EDS00-0545-00(025)	1.000	317000.00	317000.00
0010	153-1300		EA	FIELD ENGINEERS OFFICE TP 3	1.000	63389.65	63389.65
0015	201-1500		LS	CLEARING & GRUBBING - EDS00-0545-00(025)	1.000	912000.00	912000.00
0020	207-0203		CY	FOUND BKFILL MATL, TP II	5300.000	36.35	192662.42
0025	210-0100		LS	GRADING COMPLETE - EDS00-0545-00(025)	1.000	2121300.00	2121300.00
0030	310-1101		TN	GR AGGR BASE CRS, INCL MATL	53700.000	17.47	938326.95
0035	318-3000		TN	AGGR SURF CRS	1000.000	20.93	20935.60
0040	402-1812		TN	RECYL AC LEVELING, INC BM&HL	1000.000	75.42	75425.46
0045	402-3103		TN	REC AC 9.5 MM SP, TP II, GP2, INCL BM & H L	13030.000	58.35	760308.19
0050	402-3121		TN	RECYL AC 25MM SP, GP1/2, BM&HL	19300.000	61.23	1181887.03
0055	402-3190		TN	RECYL AC 19 MM SP, GP 1 OR 2, INC BM&HL	16560.000	62.85	1040902.15
0060	413-1000		GL	BITUM TACK COAT	13000.000	2.28	29672.37
0065	432-5010		SY	MILL ASPH CONC PVMT, VARB DEPTH	17010.000	1.87	31881.67
0070	433-1100		SY	REF CONC APPR SL/INCL CURB	400.000	179.31	71726.21
0075	436-1000		LF	ASPH CONC CURB - EDS00-0545-00(025)	5000.000	6.73	33695.50
0080	441-0016		SY	DRIVEWAY CONCRETE, 6 IN TK	7500.000	28.00	210055.65
0085	441-0104		SY	CONC SIDEWALK, 4 IN	32400.000	19.76	640311.80
0090	441-0740		SY	CONC MEDIAN, 4 IN	340.000	29.79	10128.90
0095	441-4020		SY	CONC VALLEY GUTTER, 6 IN	8690.000	25.54	222004.82
0100	455-1000		SY	FILTER FAB/EMBANKMENT STAB	2600.000	2.94	7662.15
0105	500-0100		SY	GROOVED CONCRETE	400.000	7.63	3052.64
0110	500-3101		CY	CLASS A CONCRETE	800.000	332.46	265969.93
0115	500-3200		CY	CL B CONC	18.000	426.82	7682.89
0120	500-3800		CY	CL A CONC, INCL REINF STEEL	10.000	745.50	7455.04
0125	500-3900		CY	CL B CONC, INCL REINF STEEL	10.000	559.84	5598.40
0130	511-1000		LB	BAR REINF STEEL	7550.000	0.78	5956.95
0135	634-1200		EA	RIGHT OF WAY MARKERS	250.000	72.44	18111.94
0140	641-1100		LF	GUARDRAIL, TP T	1000.000	39.34	39344.26
0145	641-1200		LF	GUARDRAIL, TP W	8420.000	14.51	122191.46
0150	641-5001		EA	GUARDRAIL ANCHORAGE, TP 1	10.000	636.01	6360.19
0155	641-5012		EA	GUARDRAIL ANCHORAGE, TP 12	50.000	1745.58	87279.49
0160	550-1180		LF	STM DR PIPE 18", H 1-10	1580.000	27.78	43906.34
0165	550-1240		LF	STM DR PIPE 24", H 1-10	1050.000	35.16	36925.29
0170	550-1300		LF	STM DR PIPE 30", H 1-10	230.000	43.12	9919.48
0175	550-1360		LF	STM DR PIPE 36", H 1-10	210.000	59.06	12402.95
0180	550-1480		LF	STM DR PIPE 48", H 1-10	220.000	70.97	15614.85
0185	550-2180		LF	SIDE DR PIPE 18", H 1-10	160.000	27.00	4320.49
0190	550-2240		LF	SIDE DR PIPE 24", H 1-10	120.000	29.95	3594.16
0195	550-3318		EA	SAFETY END SECTION 18", STD, 4:1	25.000	704.34	17608.54
0200	550-3324		EA	SAFETY END SECTION 24", STD, 4:1	15.000	1028.86	15433.03
0205	550-3518		EA	SAFETY END SECTION 18", STD, 6:1	6.000	675.72	4054.34
0210	550-3524		EA	SAFETY END SECTION 24", STD, 6:1	8.000	863.62	6908.98
0215	550-4118		EA	FLARED END SECT 18 IN, SIDE DR	12.000	518.28	6219.36

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JOB ESTIMATE REPORT

0220	550-4224	EA	FLARED END SECT 24 IN, ST DR	18.000	527.36	9492.53
0225	550-4130	EA	FLARED END SECT 30 IN, SIDE DR	8.000	608.10	4864.85
0230	573-2006	LF	UNDDR PIPE INCL DRAIN AGGR 6"	2280.000	12.33	28131.94
0235	611-9000	EA	CAPPING MINOR STRUCTURE	35.000	433.63	15177.26
0240	668-1100	EA	CATCH BASIN, GP 1	30.000	2146.33	64390.05
0245	668-1110	LF	CATCH BASIN, GP 1, ADDL DEPTH	40.000	142.67	5707.14
0250	668-2100	EA	DROP INLET, GP 1	20.000	1701.03	34020.75
0255	668-2110	LF	DROP INLET, GP 1, ADDL DEPTH	10.000	147.95	1479.52
0260	668-4300	EA	STORM SEW MANHOLE, TP 1	6.000	1670.85	10025.11
0265	668-5000	EA	JUNCTION BOX	4.000	1606.21	6424.86
0270	543-9000	LS	CONSTR OF BRIDGE COMPLETE - ROCKY CREEK BRIDGE	1.000	2354100.00	2354100.00
0280	500-3101	CY	CLASS A CONCRETE	350.000	332.46	116361.84
0285	511-1000	LB	BAR REINF STEEL	40230.000	0.70	28224.56
0290	636-1020	SF	HWY SGN, TP1MAT, REFL SH TP3	80.000	13.92	1114.35
0295	636-1033	SF	HWY SIGNS, TP1MAT, REFL SH TP 9	430.000	18.47	7942.95
0300	636-2070	LF	GALV STEEL POSTS, TP 7	9050.000	5.68	51469.43
0305	636-2080	LF	GALV STEEL POSTS, TP 8	40.000	6.56	262.73
0310	636-2090	LF	GALV STEEL POSTS, TP 9	150.000	8.56	1285.29
0315	636-5030	EA	DELINEATOR, TP 3	14.000	35.68	499.52
0320	652-0091	EA	PVMT MARKING, SYMBOL, TP 1	4.000	41.75	167.03
0325	652-0094	EA	PVMT MARKING, SYMBOL, TP 4	4.000	52.52	210.10
0330	652-0110	EA	PAVEMENT MARKING, ARROW, TP 1	40.000	41.98	1679.31
0335	652-0120	EA	PAVEMENT MARKING, ARROW, TP 2	20.000	51.28	1025.74
0340	652-5451	LF	SOLID TRAF STRIPE, 5 IN, WHITE	17050.000	0.05	996.23
0345	652-5452	LF	SOLID TRAF STRIPE, 5 IN, YELLO	17050.000	0.11	1889.14
0350	653-1501	LF	THERMO SOLID TRAF ST 5 IN, WHI	57030.000	0.30	17302.90
0355	653-1502	LF	THERMO SOLID TRAF ST, 5 IN YEL	57030.000	0.29	16870.04
0360	653-1704	LF	THERM SOLID TRAF STRIPE, 24", WH	260.000	3.37	877.49
0365	653-1804	LF	THERM SOLID TRAF STRIPE, 8", WH	2200.000	1.69	3738.72
0370	653-3501	GLF	THERMO SKIP TRAF ST, 5 IN, WHI	65300.000	0.17	11464.07
0375	653-6004	SY	THERM TRAF STRIPING, WHITE	5275.000	2.65	14017.84
0380	653-6006	SY	THERM TRAF STRIPING, YELLOW	485.000	3.01	1462.45
0385	654-1001	EA	RAISED PVMT MARKERS TP 1	150.000	3.61	542.43
0390	654-1003	EA	RAISED PVMT MARKERS TP 3	780.000	3.47	2709.83
0395	654-1010	EA	RAISED PVMT MARKERS TP 10	35.000	36.86	1290.35
0400	657-1054	LF	PRF PL SD PVMT MKG, 5", WH, TP PB	1225.000	3.97	4874.15
0405	657-3085	GLF	PRF PL SK PVMT MKG, 8", B/W, TPPB	875.000	3.63	3183.75
0410	657-5002	SY	PREFORMED PLASTIC PVMT MKG, YE, TP PB	185.000	18.80	3478.67
0415	163-0232	AC	TEMPORARY GRASSING	35.000	178.37	6243.01
0420	163-0240	TN	MULCH	680.000	185.39	126070.42
0425	163-0300	EA	CONSTRUCTION EXIT	8.000	1171.11	9368.95
0430	163-0501	EA	CONSTR AND REMOVE SILT CONTROL GATE, TP 1	8.000	681.13	5449.09
0435	163-0503	EA	CONSTR AND REMOVE SILT CONTROL GATE, TP 3	10.000	371.86	3718.65
0440	163-0520	LF	CONSTR AND REMOVE TEMP PIPE SLOPE DRAIN	1020.000	11.64	11874.71
0445	163-0521	EA	CONSTR AND REMOVE TEMP DITCH CHECKS	25.000	146.93	3673.25
0450	163-0530	LF	CONSTR AND REMOVE BALED STRW EROSION CHK	6810.000	4.66	31734.60
0455	163-0531	EA	CONSTR & REM SEDIMENT BASIN, TP 1, STA NO- EDS00-0545-00 (025)	1.000	7314.20	7314.21

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0460	163-0531	EA	CONSTR & REM SEDIMENT BASIN, TP 1, STA NO- EDS00-0545-00(025)	1.000	7314.20	7314.21
0465	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	8350.000	0.74	6222.34
0470	165-0030	LF	MAINT OF TEMP SILT FENCE, TP C	6615.000	0.58	3848.41
0475	165-0040	EA	MAINT OF EROSION CTRL CHKDAMS/DITCH CHKS	15.000	64.24	963.60
0480	165-0050	LF	MAINT OF SILT RETENTION BARRIER	2200.000	3.11	6857.66
0485	165-0060	EA	MAINT OF TEMP SEDIMENT BASIN, STA NO -	1.000	1054.38	1054.39
0490	165-0060	EA	MAINT OF TEMP SEDIMENT BASIN, STA NO -	1.000	1054.38	1054.39
0495	165-0070	LF	MAINT OF BALED STRAW EROSION CHECK	2100.000	1.05	2205.00
0500	165-0085	EA	MAINT OF SILT CONTROL GATE, TP 1	8.000	191.48	1531.84
0505	165-0087	EA	MAINT OF SILT CONTROL GATE, TP 3	10.000	117.31	1173.12
0510	165-0101	EA	MAINT OF CONST EXIT	16.000	662.13	10594.08
0515	165-0105	EA	MAINT OF INLET SEDIMENT TRAP	80.000	62.35	4988.58
0520	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	2.000	448.81	897.63
0525	167-1500	MO	WATER QUALITY INSPECTIONS	24.000	749.02	17976.61
0530	170-1000	LF	FLOAT SILT RETENTION BARRIER	750.000	11.02	8272.49
0535	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	16700.000	2.05	34399.50
0540	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	13230.000	3.22	42671.51
0545	441-0204	SY	PLAIN CONC DITCH PAVING, 4 IN	20130.000	22.61	455321.28
0550	603-2024	SY	STN DUMPED RIP RAP, TP 1, 24"	1435.000	48.45	69526.24
0555	603-2182	SY	STN DUMPED RIP RAP, TP 3, 24"	850.000	41.19	35014.38
0560	603-7000	SY	PLASTIC FILTER FABRIC	565.000	3.84	2170.89
0565	700-6910	AC	PERMANENT GRASSING	46.000	823.82	37895.79
0570	700-7000	TN	AGRICULTURAL LIME	120.000	58.52	7023.38
0575	700-7010	GL	LIQUID LIME	115.000	18.59	2138.14
0580	700-8000	TN	FERTILIZER MIXED GRADE	45.000	433.18	19493.23
0585	700-8100	LB	FERTILIZER NITROGEN CONTENT	2300.000	2.30	5312.17
0590	710-9000	SY	PERM SOIL REINFORCING MAT	530.000	4.17	2213.83
0595	715-2200	SY	BITUM TRTD ROVING, WATERWAYS	15025.000	1.65	24899.43
0600	716-2000	SY	EROSION CONTROL MATS, SLOPES	25000.000	1.25	31394.25

ITEM TOTAL						13505817.70
INFLATED ITEM TOTAL						15634672.21

TOTALS FOR JOB 522190						

ESTIMATED COST:						15634672.21
CONTINGENCY PERCENT (4.0):						625386.89
ESTIMATED TOTAL:						16260059.10

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JOB ESTIMATE REPORT

0215	550-4130	EA	FLARED END SECT 30 IN, SIDE DR	6.000	588.12	3528.76
0220	573-2006	LF	UNDDR PIPE INCL DRAIN AGGR 6"	3300.000	12.34	40725.23
0225	611-9000	EA	CAPPING MINOR STRUCTURE	12.000	570.99	6851.97
0230	668-1100	EA	CATCH BASIN, GP 1	120.000	2060.65	247278.14
0234	668-1110	LF	CATCH BASIN, GP 1, ADDL DEPTH	60.000	161.71	9702.99
0235	668-2100	EA	DROP INLET, GP 1	65.000	2008.03	130522.32
0239	668-2110	LF	DROP INLET, GP 1, ADDL DEPTH	40.000	228.44	9137.88
0240	668-4300	EA	STORM SEW MANHOLE, TP 1	4.000	2138.33	8553.33
0245	668-5000	EA	JUNCTION BOX	6.000	1739.42	10436.57
0250	543-9000	LS	CONSTR OF BRIDGE COMPLETE - LITTLE ROCKY CREEK BRIDGE	1.000	706230.00	706230.00
0255	543-9000	LS	CONSTR OF BRIDGE COMPLETE - GA CENTRAL RR/US 280 KING BRIDGE	1.000	2511040.00	2511040.00
0260	543-9000	LS	CONSTR OF BRIDGE COMPLETE - SR 292 CROSSING BRIDGE	1.000	1412460.00	1412460.00
0265	543-9000	LS	CONSTR OF BRIDGE COMPLETE - SWIFT CREEK BRIDGE	1.000	2354100.00	2354100.00
0270	500-3101	CY	CLASS A CONCRETE	600.000	553.87	332322.79
0275	511-1000	LB	BAR REINF STEEL	61240.000	0.63	38641.83
0280	636-1020	SF	HWY SGN, TP1MAT, REFL SH TP3	310.000	13.46	4175.57
0285	636-1031	SF	HWY SIGNS, TP1MTL, RFL SHTG, TP6	900.000	17.12	15408.00
0290	636-2070	LF	GALV STEEL POSTS, TP 7	3200.000	6.82	21827.17
0295	636-2080	LF	GALV STEEL POSTS, TP 8	60.000	9.13	548.20
0300	636-2090	LF	GALV STEEL POSTS, TP 9	300.000	7.96	2389.09
0305	636-5030	EA	DELINEATOR, TP 3	24.000	53.94	1294.71
0310	652-0091	EA	PVMT MARKING, SYMBOL, TP 1	4.000	42.82	171.28
0315	652-0094	EA	PVMT MARKING, SYMBOL, TP 4	4.000	47.32	189.30
0320	652-0110	EA	PAVEMENT MARKING, ARROW, TP 1	60.000	40.90	2454.21
0325	652-0120	EA	PAVEMENT MARKING, ARROW, TP 2	30.000	39.30	1179.20
0330	653-1704	LF	THERM SOLID TRAF STRIPE, 24", WH	640.000	3.18	2037.64
0335	653-1804	LF	THERM SOLID TRAF STRIPE, 8", WH	6000.000	1.59	9574.14
0340	652-5451	LF	SOLID TRAF STRIPE, 5 IN, WHITE	22000.000	0.11	2528.68
0345	652-5452	LF	SOLID TRAF STRIPE, 5 IN, YELLO	22000.000	0.07	1694.88
0350	653-1501	LF	THERMO SOLID TRAF ST 5 IN, WHI	40130.000	0.27	11214.73
0355	653-1502	LF	THERMO SOLID TRAF ST, 5 IN YEL	40130.000	0.26	10670.57
0360	653-3501	GLF	THERMO SKIP TRAF ST, 5 IN, WHI	80300.000	0.10	8715.76
0365	653-6004	SY	THERM TRAF STRIPING, WHITE	7860.000	2.55	20076.96
0370	653-6006	SY	THERM TRAF STRIPING, YELLOW	3960.000	2.56	10167.06
0375	654-1001	EA	RAISED PVMT MARKERS TP 1	330.000	3.48	1150.03
0380	654-1003	EA	RAISED PVMT MARKERS TP 3	1570.000	2.94	4628.08
0385	654-1010	EA	RAISED PVMT MARKERS TP 10	50.000	36.47	1823.72
0390	657-1054	LF	PRF PL SD PVMT MKG, 5", WH, TP PB	2350.000	3.63	8546.15
0395	657-3085	GLF	PRF PL SK PVMT MKG, 8", B/W, TPPB	1590.000	4.37	6959.84
0400	657-5002	SY	PREFORMED PLASTIC PVMT MKG, YE, TP PB	215.000	20.03	4306.73
0405	163-0232	AC	TEMPORARY GRASSING	50.000	458.28	22914.35
0410	163-0240	TN	MULCH	1800.000	139.36	250865.86
0415	163-0300	EA	CONSTRUCTION EXIT	20.000	1044.81	20896.21
0420	163-0501	EA	CONSTR AND REMOVE SILT CONTROL GATE, TP 1	6.000	672.48	4034.93
0425	163-0503	EA	CONSTR AND REMOVE SILT CONTROL GATE, TP 3	10.000	509.36	5093.60
0430	163-0520	LF	CONSTR AND REMOVE TEMP PIPE SLOPE DRAIN	1800.000	13.54	24382.62

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0435	163-0521	EA	CONSTR AND REMOVE TEMP DITCH CHECKS	35.000	146.93	5142.55
0440	163-0530	LF	CONSTR AND REMOVE BALED STRW EROSION CHK	16290.000	4.66	75911.40
0445	163-0531	EA	CONSTR & REM SEDIMENT BASIN, TP 1, STA NO- EDS-545(26)	1.000	8459.81	8459.82
0450	163-0531	EA	CONSTR & REM SEDIMENT BASIN, TP 1, STA NO- EDS-545(26)	1.000	8459.81	8459.82
0455	163-0550	EA	CONS & REM INLET SEDIMENT TRAP	110.000	155.52	17107.36
0460	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	20130.000	0.56	11437.06
0465	165-0030	LF	MAINT OF TEMP SILT FENCE, TP C	16500.000	0.45	7555.85
0470	165-0040	EA	MAINT OF EROSION CTRL CHKDAMS/DITCH CHKS	25.000	64.24	1606.00
0475	165-0050	LF	MAINT OF SILT RETENTION BARRIER	5400.000	1.78	9650.56
0480	165-0060	EA	MAINT OF TEMP SEDIMENT BASIN, STA NO -	1.000	1336.72	1336.73
0485	165-0060	EA	MAINT OF TEMP SEDIMENT BASIN, STA NO -	1.000	1336.72	1336.73
0490	165-0070	LF	MAINT OF BALED STRAW EROSION CHECK	8145.000	1.20	9774.00
0495	165-0085	EA	MAINT OF SILT CONTROL GATE, TP 1	6.000	198.58	1191.48
0500	165-0087	EA	MAINT OF SILT CONTROL GATE, TP 3	10.000	120.30	1203.06
0505	165-0101	EA	MAINT OF CONST EXIT	20.000	376.64	7532.85
0510	165-0105	EA	MAINT OF INLET SEDIMENT TRAP	110.000	58.52	6437.43
0515	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	2.000	628.44	1256.89
0520	167-1500	MO	WATER QUALITY INSPECTIONS	24.000	752.62	18063.06
0525	170-1000	LF	FLOAT SILT RETENTION BARRIER	1300.000	12.44	16176.13
0530	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	40260.000	1.67	67451.20
0535	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	33000.000	3.28	108372.33
0540	441-0204	SY	PLAIN CONC DITCH PAVING, 4 IN	4850.000	36.25	175847.66
0545	603-2024	SY	STN DUMPED RIP RAP, TP 1, 24"	2400.000	53.23	127756.34
0550	603-2182	SY	STN DUMPED RIP RAP, TP 3, 24"	960.000	59.62	57243.98
0555	603-7000	SY	PLASTIC FILTER FABRIC	870.000	4.06	3540.45
0560	700-6910	AC	PERMANENT GRASSING	85.000	1113.15	94617.98
0565	700-7000	TN	AGRICULTURAL LIME	250.000	46.43	11608.85
0570	700-7010	GL	LIQUID LIME	200.000	16.00	3201.46
0575	700-8000	TN	FERTILIZER MIXED GRADE	100.000	445.30	44530.07
0580	700-8100	LB	FERTILIZER NITROGEN CONTENT	8300.000	2.30	19121.71
0585	710-9000	SY	PERM SOIL REINFORCING MAT	930.000	3.97	3695.96
0590	715-2200	SY	BITUM TRTD ROVING, WATERWAYS	57070.000	1.31	74781.67
0595	716-2000	SY	EROSION CONTROL MATS, SLOPES	45280.000	1.37	62156.76

ITEM TOTAL

34252241.09

INFLATED ITEM TOTAL

39651250.59

TOTALS FOR JOB 522200

ESTIMATED COST:

39651250.64

CONTINGENCY PERCENT (4.0):

1586050.03

ESTIMATED TOTAL:

41237300.67

VE RECOMMENDATIONS

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI Nos: 522220 and 522225

IDEA No.:	PAGE No.:	CREATIVE IDEA:
A-1	1 of 5	Reduce median width from 44 feet to 32 feet

Comp By: SSB Date: 4/4/11 Checked By: DCW Date: 4/5/11

Original Concept:

Provide a 44 foot wide grassed median.

Proposed Change:

Reduce median width from 44 feet to 32 feet.

Justification:

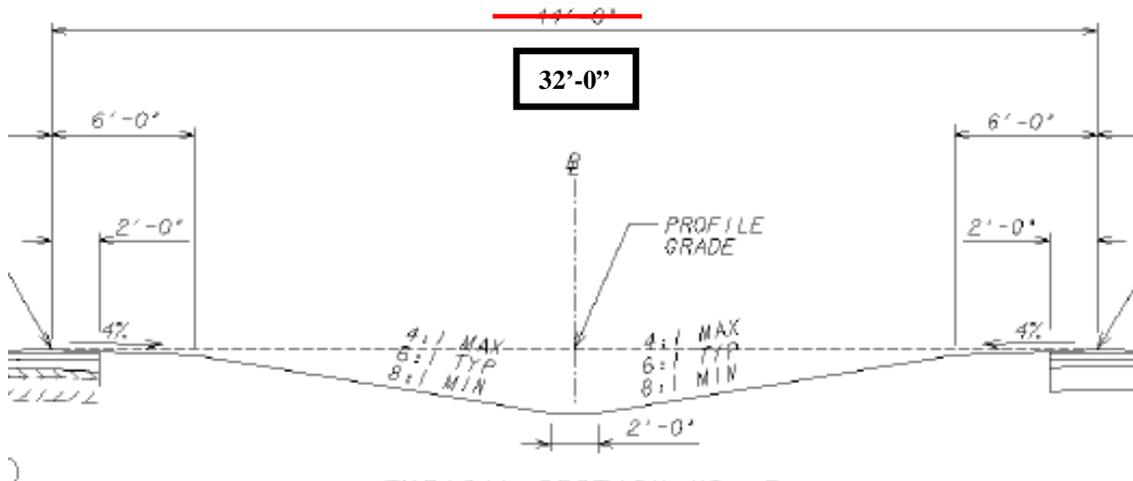
32 foot medians have been accepted and used in the past for these type of GRIP projects. A 32' median on this type of facility is acceptable per GDOT's Standards and is also in compliance with AASHTO Guidelines. The reduced median will require 12 feet less right-of-way, will reduce the amount of grassing, earthwork, clearing and grubbing, and pavement at the crossover locations, and will reduce the required length for all cross drains.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	378,000		
- Proposed	-0-		
- Savings	378,000		378,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			378,000

SKETCH

US 1 / SR 4 Corridor Improvements
PI Nos: 522220 & 522225

ITEM N^o: A-1
CLIENT: GDOT
Sheet 2 of 5



CALCULATIONS

US 1 / SR 4 Corridor Improvements
PI Nos: 522220 & 522225

ITEM N^o: A-1
CLIENT: GDOT
Sheet 4 of 5

Right-of-Way –

Right-of-Way Unit Costs (522220)

Use composite unit price for combination of residential, agricultural, and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way =

$$1.55 \times 1.60 \times (1 \div 191) \times [(3,500 \times 46) + (1,000 \times 145)] = \$3,973/\text{acre}$$

Residential/Agricultural/Commercial Easement (50% Right-of-Way) = \$1,987/acre

Median Taper from 32' to 44' (per plan) = 600'

7 median opening locations at 100' each

1 bridge location at 350'

Total Length = (29,850 + 600) - (350 + 700) = 29,400' total length

$$29,400 \times 12 \div 43560 = 8.1 \text{ acre}$$

Earthwork –

Total Length = 29,400'

Assume 14,700' is in 5' fill and 14,700' is in 6' cut

Excavation – (6 x 12 x 14,700) ÷ 27 = 39,200 CY

Embankment – (5 x 12 x 14,700) ÷ 27 = 32,667 CY

Total = 71,867 CY

Clearing and Grubbing –

Total Length = 29,400'

$$29,400 \times 12 \div 43,560 = 8.1 \text{ ac}$$

Drainage Structures –

Assume 36" RCP at 40 locations. 40 x 12 = 480 LF

Permanent Grassing –

Total Length = 29,400'

$$29,400 \times 12 \div 43,560 = 8.1 \text{ ac}$$

CALCULATIONS

US 1 / SR 4 Corridor Improvements
PI Nos: 522220 & 522225

ITEM N^o: A-1
CLIENT: GDOT
Sheet 5 of 5

Pavement –

Crossover Locations – 7 locations, 100' length, $(12 \times 100 \times 7) \div 9 = 933$ SY

9.5mm, 165 lb/SY	$933 \times 165 \div 2,000 = 77$ TN
19.0mm, 220 lb/SY	$933 \times 330 \div 2,000 = 154$ TN
25.0mm, 440 lb/SY	$933 \times 440 \div 2,000 = 205$ TN
Tack Coat	$933 \times 0.05 \times 3 = 140$ GA
GAB	$933 \times 100 \div 2,000 = 47$ TN

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI Nos: 522220 and 522225

IDEA No.:	PAGE No.:	CREATIVE IDEA:
A-3	1 of 4	Use right-of-way to shoulder breakpoint and easements beyond

Comp By: SWG Date: 4/7/11 Checked By: DCW Date: 4/7/11

Original Concept:

The original concept shows required right-of-way for all shoulders and slopes.

Proposed Change:

The revised concept shows required right-of-way to the shoulder breakpoint and easements for slopes and ditches.

Justification:

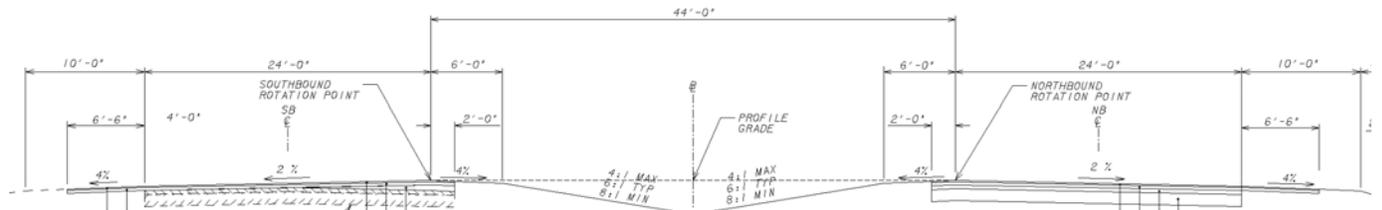
The purpose of the project is to increase capacity by providing additional through lanes. This can be accomplished with slopes and ditches included in easements instead of required right-of-way.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	380,000		
- Proposed	190,000		
- Savings	190,000		190,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			190,000

SR 4 / US 1 Corridor Improvements
PI Nos: 522220 and 522225

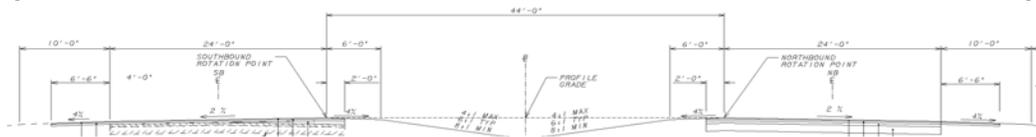
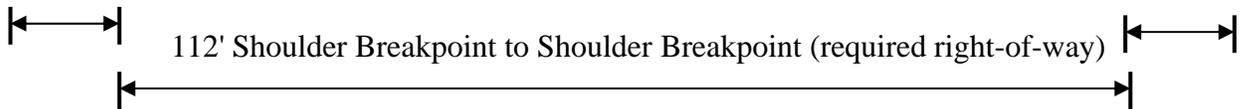
ITEM N^o: A-3
CLIENT: GDOT
Sheet 2 of 4

Original Concept

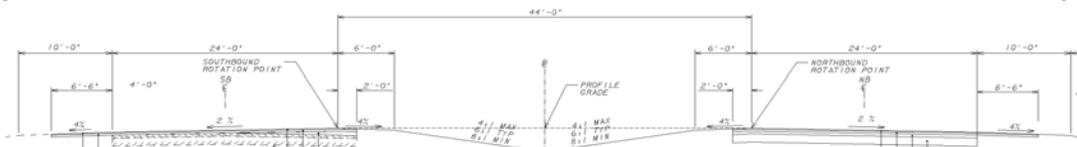
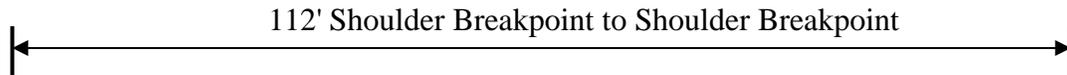
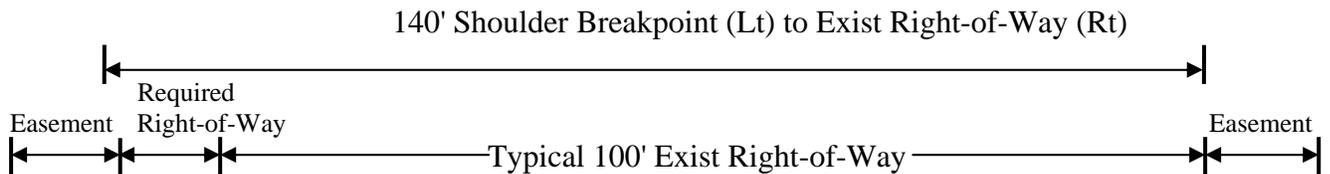


Revised Concept (250' Required Right-of-Way Sections on New Location)

69' Easement 69' Easement



Revised Concept (Typical 250' Required Right-of-Way on Exist Right-of-Way)



**SR 4 / US 1 Corridor Improvements
PI Nos: 522220 and 522225**

ITEM N^o: A-3
CLIENT: GDOT
Sheet 4 of 4

Right-of-Way Unit Costs (522220 & 522225)

Use composite unit price for combination of residential and agricultural right-of-way.

Residential/Agricultural Right-of-Way =

$$1.55 \times 1.60 \times 1 \div 191 \times [(3,500 \times 46) + (1,000 \times 145)] = \$3,973/\text{acre}$$

Residential/Agricultural/Commercial Easement (50% Right-of-Way) = \$1,987/acre

Area of Right-of-Way to be converted to Easement

112' width required from shoulder breakpoint to shoulder breakpoint (10+24+44+24+10)

Assume higher width required for right-of-way savings calculations to account for shifting alignment in sections that are on existing right-of-way. The proposed centerline is typically not in same location as existing centerline and the 112' width is not centered on existing right-of-way. Assume additional 28' required to account for offset → 140' required width on sections with existing right-of-way to determine right-of-way savings.

A required 112' width will be assumed for new location sections.

Exist Right-of-Way Sections

13,000 LF (270' required right-of-way ÷ 200' exist right-of-way), 17,000 LF of required right-of-way (250' required right-of-way)

$$\text{Area} = 13,000 \times (270 - 200) + (17,000) \times (250 - 140) = 2,780,00 \text{ SF} \rightarrow 63.8 \text{ acres}$$

New Location Sections

10,000 LF (250' required right-of-way)

$$\text{Area} = 10,000 \times (250 - 112) = 1,380,000 \text{ sf} \rightarrow 31.8 \text{ acres}$$

$$\text{Total Area} = 63.8 + 31.8 = 95.6 \text{ acres}$$

Original Concept

Area (right-of-way) = 95.6 acres

Area (easement) = 0 acres

Revised Concept

Area (easement) = 95.6 acres; Area (right-of-way) = 0 acres

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI Nos: 522220 and 522225

IDEA No.:	PAGE No.:	CREATIVE IDEA:
B-1	1 of 3	Reduce bridge width from 38 feet to 36 feet gutter to gutter

Comp By: AS Date: 4/5/11 Checked By: DCW Date: 4/5/11

Original Concept:

The proposed bridge widths are 38 feet (gutter to gutter) for the three new parallel bridges (over Altamaha River, over Overflow, and over Williams Creek) southbound and for the bridge over Cobb Creek both northbound and southbound.

Proposed Change:

The bridge widths can be reduced to 36 feet (gutter to gutter) for the three new parallel bridges (over Altamaha River, over Overflow, and over Williams Creek) southbound and for the bridge over Cobb Creek both northbound and southbound. This is based on the accepted bridge widths in the GDOT bridge and structures policy manual for rural section (multi-divided) 4 ft. (inside shoulder) + Traveled Way (TW) + 8 ft. (outside shoulder).

Justification:

This results in significant construction cost savings.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	21,838,000		
- Proposed	20,781,000		
- Savings	1,057,000		1,057,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			1,057,000

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI Nos: 522220 and 522225

ITEM N^o: B-1
CLIENT: GDOT
Sheet 3 of 3

Original Bridge Cost Estimate:

Bridge over Altamaha River (Southbound)
4,082 ft x 41.3 ft wide = 168,587 SF

Bridge over Overflow (Southbound)
290 ft x 41.3 ft wide = 11,977 SF

Bridge over Williams Creek (Southbound)
354 ft x 41.3 ft wide = 14,620 SF

Bridge over Cobb Creek (Both Northbound and Southbound)
2 bridges x 420 ft x 41.3 ft wide = 34,692 SF

VE proposed Bridge Cost Estimate:

Bridge over Altamaha River (Southbound)
4,082 ft x 39.3 ft wide = 16,0422.6 SF

Bridge over Overflow (Southbound)
290 ft x 39.3 ft wide = 11,397 SF

Bridge over Williams Creek (Southbound)
354 ft x 39.3 ft wide = 13,912.2 SF

Bridge over Cobb Creek (Both Northbound and Southbound)
2 bridges x 420 ft x 39.3 ft wide = 33,012 SF

DEVELOPMENT AND RECOMMENDATION PHASE

CALCULATIONS

**US 1 / SR 4 Corridor Improvements
PI Nos: 522220 and 522225**

IDEA No.: C-2	PAGE No.: 1 of 3	CREATIVE IDEA: Reduce paved shoulder width from 6.5 feet to 4 feet
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Comp By: SWG Date: 4/7/11 Checked By: DCW Date: 4/7/11

Original Concept:

The original concept proposes 6.5' width paved shoulders.

Proposed Change:

The revised concept proposes 4' width paved shoulders.

Justification:

The purpose of the project is to increase capacity by providing additional through lanes. This can be accomplished with 4' paved shoulders. AASHTO guidelines do not mandate a required paved shoulder width. The unpaved shoulder width remains the same at 10 feet.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	228,000		
- Proposed	-0-		
- Savings	228,000		228,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			228,000

**SR 4 / US 1 Corridor Improvements
PI Nos: 522220 and 522225**

ITEM N^o: C-2
CLIENT: GDOT
Sheet 3 of 3

Assumed Pavement Section for Paved Shoulder – 1.5" 9.5mm, 2" 19mm, 6" GAB

Pavement Cost/ SY

$$9.5\text{mm} - 165 \text{ lb/SY} \times 1 \text{ ton}/2000 \text{ lb} \times \$69.55/\text{ton} = \$5.74$$

$$19\text{mm} - 220\text{lb/SY} \times 1 \text{ ton}/2000\text{lb} \times \$69.55/\text{ton} = \$7.65$$

$$6" \text{ GAB} - 660 \text{ lb/SY} \times 1 \text{ ton}/2000 \text{ lb} \times \$16.90/\text{ton} = \$5.60$$

$$\text{Total Cost} = \$18.99/\text{SY}$$

$$\text{Area (Additional 2.5' Paved Shoulder)} = 8.2 \times 5,280 \times 2.5 \div 9 = 12,027 \text{ SY}$$

Original Concept

$$\text{Area (Additional 2.5' Paved Shoulder Width)} = 12,027 \text{ SY}$$

Revised Concept

$$\text{Area (Additional 2.5' Paved Shoulder Width)} = 0 \text{ SY}$$

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI Nos: 522220 & 522225

IDEA No.:	PAGE No.:	CREATIVE IDEA:
C-3	1 of 5	Reduce amount of side street work

Comp By: SSB Date: 4/5/11 Checked By: DCW Date: 4/5/11

Original Concept:

Side road lengths per concept layout.

Proposed Change:

Reduce side road lengths by tying into existing sooner.

Justification:

Minimize cost by reducing side road lengths.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	102,000		
- Proposed	-0-		
- Savings	102,000		102,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			102,000

SR 4 / US 1 Corridor Improvements
PI Nos: 522220 & 522225

ITEM N^o: C-3
CLIENT: GDOT
Sheet 2 of 5



Proposed Location

CR 49



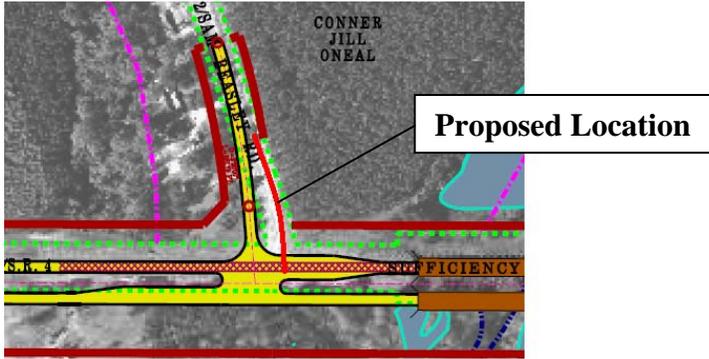
Proposed Location

CR 51

SKETCH

**SR 4 / US 1 Corridor Improvements
PI Nos: 522220**

ITEM N^o: C-3
CLIENT: GDOT
Sheet 3 of 5



CR 52

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI Nos: 522220

ITEM N^o: C-3
 CLIENT: GDOT
 Sheet 5 of 5

CR 49

Shorten by 300'

Pavement – $(300 \times 24) \div 9 = 800 \text{ SY}$

Right-of-way – $(300 \times 100) \div 43,560 = 0.7 \text{ Ac}$

Embankment – $(240 \times 300) \div 27 = 2,667 \text{ CY}$

CR 51

Shorten by 350'

Pavement – $(350 \times 24) \div 9 = 933 \text{ SY}$

Right-of-way – $(350 \times 100) \div 43,560 = 0.8 \text{ Ac}$

Embankment – $(240 \times 350) \div 27 = 3,111 \text{ CY}$

CR 52

Shorten by 200'

Pavement – $(200 \times 24) \div 9 = 533 \text{ SY}$

Right-of-way – $(200 \times 100) \div 43,560 = 0.5 \text{ Ac}$

Embankment – $(240 \times 200) \div 27 = 1,778 \text{ CY}$

Right-of-Way Unit Costs (522220 & 522225)

Use composite unit price for combination of residential, agricultural, and commercial right-of-way

Residential/Agricultural/Commercial Right-of-way =
 $1.55 \times 1.60 \times (1 \div 191) \times [(3,500 \times 46) + (1,000 \times 145)] = \$3,973/\text{acre}$

Pavement totals –

9.5mm – $((800 + 933 + 533) \times 165) \div 2,000 = 187 \text{ TN}$

19mm – $((800 + 933 + 533) \times 330) \div 2,000 = 374 \text{ TN}$

25mm – $((800 + 933 + 533) \times 440) \div 2,000 = 499 \text{ TN}$

Tack Coat – $((800 + 933 + 533) \times 0.050) \times 3 = 340 \text{ Gal}$

GAB – $((800 + 933 + 533) \times 100) \div 2,000 = 113 \text{ TN}$

Right-of-way total – $0.7 + 0.8 + 0.5 = 2.0 \text{ Ac}$

Embankment total – $2,667 + 3,111 + 1,778 = 7,556 \text{ CY}$

DEVELOPMENT AND RECOMMENDATION PHASE

**US 1 / SR 4 Corridor Improvements
PI Nos: 522220 and 522225**

IDEA No.: C-5	PAGE No.: 1 of 4	CREATIVE IDEA: Use reduced depth pavement for the medians and turn lanes
Comp By: GAO	Date: 4/5/11	Checked By: DCW
		Date: 4/5/11

Original Concept:

Construct full depth pavement for the median openings and turn lanes.

Proposed Change:

Using practical design guidelines, construct reduced pavement thickness for the turn lanes and median areas.

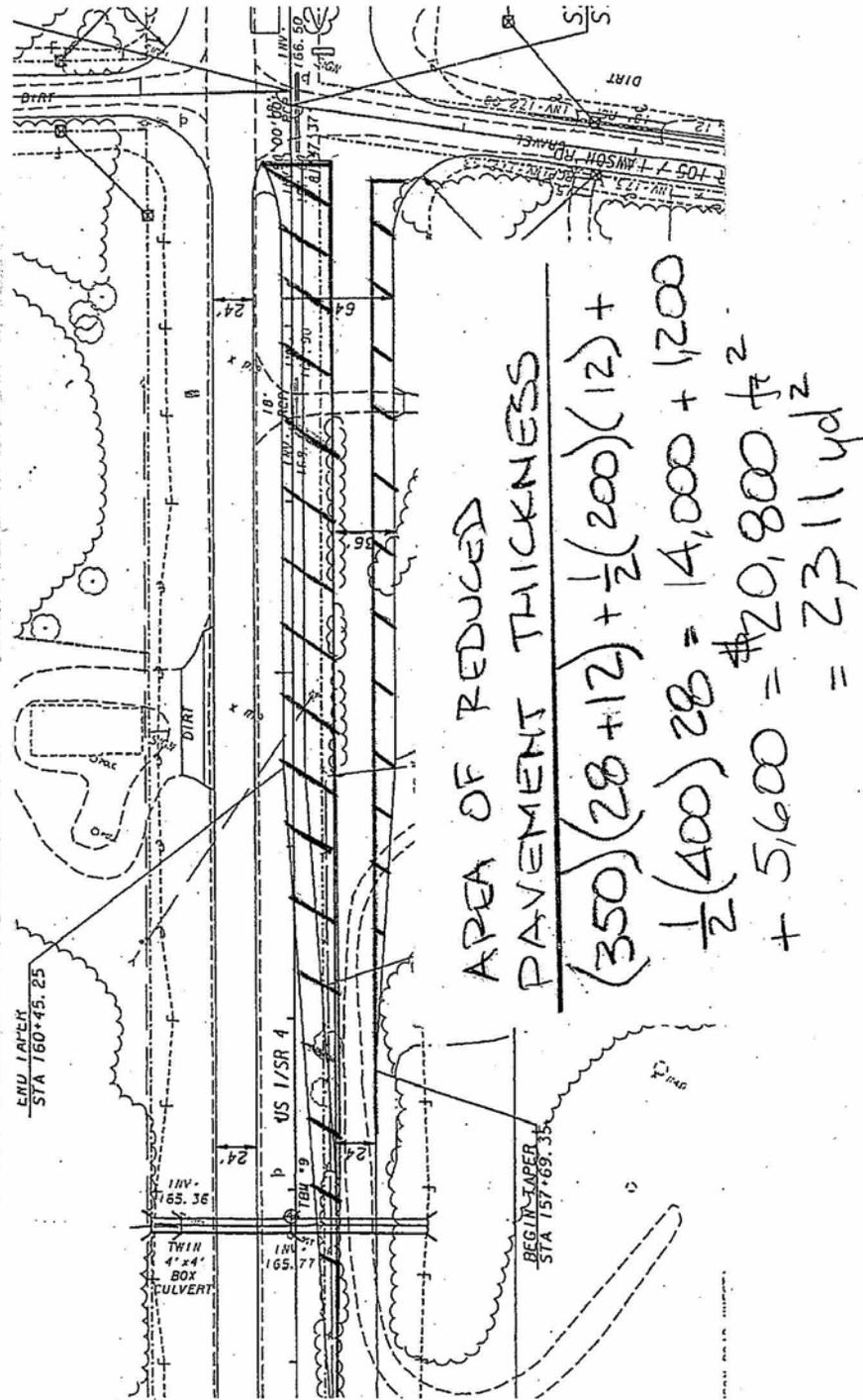
Justification:

Pavement design is usually dictated by traffic volumes on the mainline. This developed pavement section typically extends to the median area and turn lanes. However, there are significantly lower traffic volumes in the median and turn lanes, thereby allowing a reduced thickness pavement section. For the purposes of this recommendation, we assume a 33% reduction. Final traffic volumes and pavement design will dictate the actual numbers.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	324,000		
- Proposed	-0-		
- Savings	324,000		324,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			324,000

SR 4 / US 1 Corridor Improvements
 PI Nos: 522220 and 522225

ITEM N^o: C-5
 CLIENT: GDOT
 Sheet 2 of 4



Typical Median Opening

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI Nos: 522220 and 522225

ITEM N^o: C-5
CLIENT: GDOT
Sheet 4 of 4

CURRENT DESIGN: Cost of asphalt mainline pavement: 6.25 in asphalt / 8 inch GAB

$$(6.25/12 \text{ ft}) \times (150 \text{ lb/CF}) \times (1 \text{ ton} / 2,000 \text{ lb}) = 0.03906 \text{ ton/SF}$$

$$(8/12 \text{ ft}) \times (135 \text{ lb/CF}) \times (1 \text{ ton} / 2,000 \text{ lb}) = 0.045 \text{ ton/SF}$$

Cost per SY

$$(0.03906 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$60/\text{ton}) + (0.045 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$17/\text{ton}) = \\ \$21.09 + 6.89 = \$27.98/\text{SY} \quad \text{USE: } \$30 \text{ per SY}$$

Assume 33% reduction: use \$20 per SY

Area of reduced pavement thickness; from sketch = 2,311 SY

For each median opening:

$$2 \text{ approaches} \times 2,311 \text{ SY} \times \$(30 - 20) \text{ per SY} = \$46,220 \text{ per median opening}$$

Median Opening Locations

Plant Hatch Access Road
Bob Cato Cir.
Cedar Crossing Road
Henry O'Neal Road
H. Powell Road
Sam Beasley Road
Alexander Road

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522180

IDEA No.:	PAGE No.:	CREATIVE IDEA:
A-1	1 of 5	Reduce median width from 44 feet to 32 feet

Comp By: SSB Date: 4/4/2011 Checked By: DCW Date: 4/5/2011

Original Concept:

Provide a 44 foot wide grassed median.

Proposed Change:

Reduce median width from 44 feet to 32 feet.

Justification:

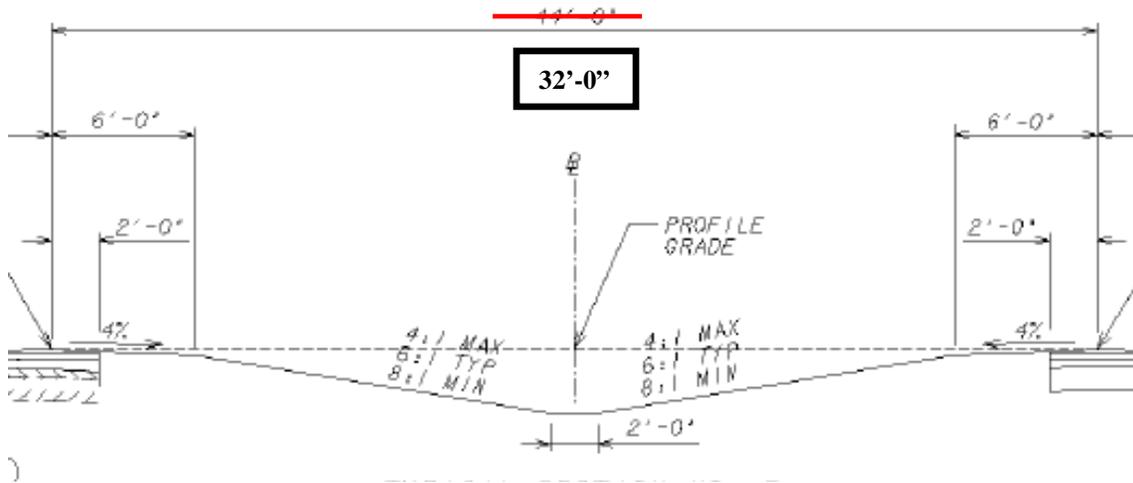
32 foot medians have been accepted and used in the past for these type of GRIP projects. A 32' median on this type of facility is acceptable per GDOT's Standards and is also in compliance with AASHTO Guidelines. The reduced median will require 12 feet less right-of-way, will reduce the amount of grassing, earthwork, clearing and grubbing, and pavement at the crossover locations, and will reduce the required length for all cross drains.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	357,000		
- Proposed	-0-		
- Savings	357,000		357,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			357,000

SKETCH

SR 4 / US 1 Corridor Improvements
PI No: 522180

ITEM N^o: A-1
CLIENT: GDOT
Sheet 2 of 5



CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522180

ITEM N^o: A-1
CLIENT: GDOT
Sheet 4 of 5

Right of Way –

Right-of-Way Unit Costs (522180)

Use composite unit price for combination of residential, agricultural and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way =

$$1.55 \times 1.60 \times [(1 \div 103.4) \times [(3,500 \times 10.34) + (1,000 \times 93.06)]] = \$3,100/\text{acre}$$

Residential/Agricultural/Commercial Easement (50% Right-of-Way) = \$1,550/acre

5 median opening locations at 100' each

Total Length = 23,600 - 500 = 23,100' total length

$$23,100 \times 12 \div 43,560 = 6.4 \text{ Ac}$$

Earthwork –

Total Length = 23,600'

Assume 11,800' is in 5' fill and 11,800' is in 6' cut

Excavation – $(6 \times 12 \times 11,800) \div 27 = 31,467 \text{ CY}$

Embankment – $(5 \times 12 \times 11,800) \div 27 = 26,222 \text{ CY}$

Total = 57,689 CY

Clearing and Grubbing –

Total Length = 23,600'

$$(23,600 \times 12) \div 43,560 = 6.5 \text{ Ac,}$$

Drainage Structures –

Assume 36" RCP at 40 locations. $40 \times 12 = 480 \text{ LF}$

Permanent Grassing –

Total Length = 23,600'

$$(23,600 \times 12) \div 43,560 = 6.5 \text{ Ac}$$

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522180

ITEM N^o: A-1
CLIENT: GDOT
Sheet 5 of 5

Pavement –

Crossover Locations – 5 locations, 100' length, $(12 \times 100 \times 5) \div 9 = 667$ SY

9.5mm, 165 lb/SY	$(667 \times 165) \div 2,000 = 55$ TN
19.0mm, 330 lb/SY	$(667 \times 330) \div 2,000 = 110$ TN
25.0mm, 440 lb/SY	$(667 \times 440) \div 2,000 = 147$ TN
Tack Coat	$(667 \times 0.05) \times 3 = 100$ GA
GAB	$(667 \times 100) \div 2,000 = 33$ TN

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522180

IDEA No.:	PAGE No.:	CREATIVE IDEA:	
A-3	1 of 4	Use right-of-way to shoulder breakpoint and easements beyond	
Comp By: SG	Date: 4/7/11	Checked By: DCW	Date: 4/7/11

Original Concept:

The original concept shows required right-of-way for all shoulders and slopes.

Proposed Change:

The revised concept shows required right-of-way to the shoulder breakpoint and easements for slopes and ditches.

Justification:

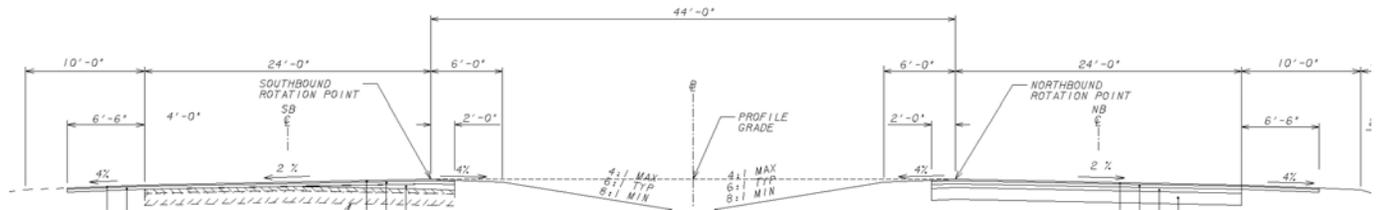
The purpose of the project is to increase capacity by providing addition through lanes. This can be accomplished with slopes and ditches included in easements instead of required right-of-way.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	186,000		
- Proposed	93,000		
- Savings	93,000		93,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			93,000

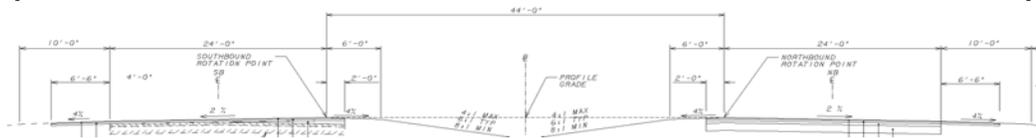
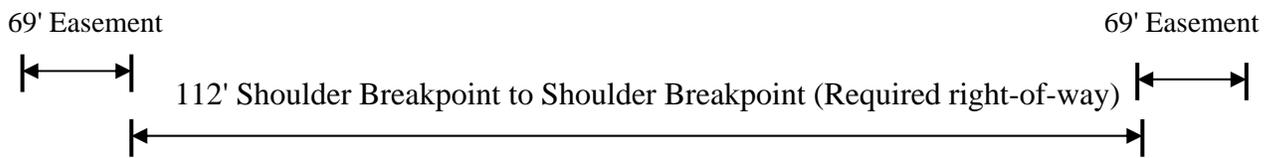
**SR 4 / US 1 Corridor Improvements
PI No: 522180**

ITEM N^o: A-3
CLIENT: GDOT
Sheet 2 of 4

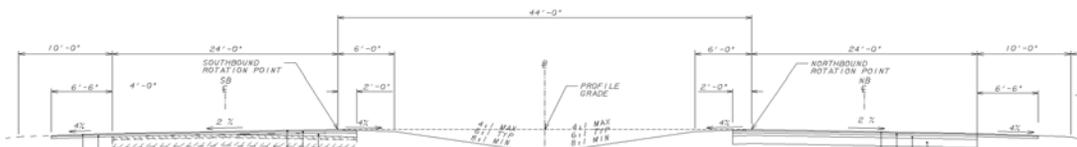
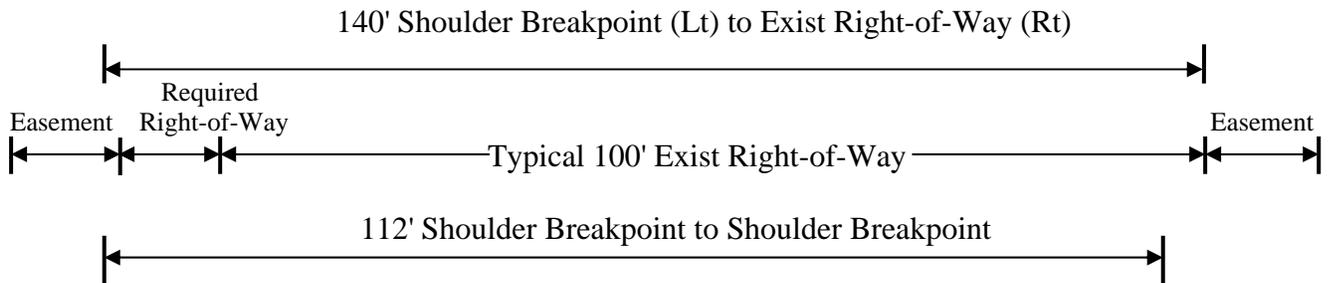
Original Concept



Revised Concept (250' Required Right-of-Way Sections on New Location)



Revised Concept (Typical 250' Required Right-of-Way on Exist Right-of-Way)



CALCULATIONS

SR 4 / US 1 Corridor Improvements PI No: 522180

ITEM N^o: A-3
CLIENT: GDOT
Sheet 4 of 4

Right-of-Way Unit Costs (522180)

Use composite unit price for combination of residential and agricultural right-of-way

Residential and Agricultural right-of-way =

$$1.55 \times 1.60 \times (1 \div 103.4) \times [(3,500 \times 10.34) + (1,000 \times 93.06)] = \$3,100/\text{acre}$$

Residential/Agricultural/Commercial Easement (50% right-of-way) = \$1,550/acre

Area of Right-of-Way to be converted to Easement

112' width required from shoulder breakpoint to shoulder breakpoint (10+24+44+24+10)

Assume higher width required for right-of-way savings calculations to account for shifting alignment in sections that are on existing right-of-way. The proposed centerline is typically not in same location as existing centerline and the 112' width is not centered on existing right-of-way. Assume additional 28' required to account for offset → 140' required width on sections with existing right-of-way to determine right-of-way savings.

A required 112' width will be assumed for new location sections.

Exist Right-of-Way Sections

20,000 LF of Required right-of-way (250' Required right-of-way)

$$\text{Area} = 20,000 \times (250 - 140) = 2,200,000 \text{ SF} \rightarrow 50.5 \text{ acres}$$

New Location Sections

3,000 LF of (250' Required right-of-way)

$$\text{Area} = 3,000 \times (250 - 112) = 414,000 \text{ sf} \rightarrow 9.5 \text{ acres}$$

$$\text{Total Area} = 50.5 + 9.5 = 60 \text{ acres}$$

Original Concept

Area (right-of-way) = 60 acres

Area (easement) = 0 acres

Revised Concept

Area (right-of-way) = 0 acres

Area (easement) = 60 acres

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522180

IDEA No.:	PAGE No.:	CREATIVE IDEA:
C-2	1 of 3	Reduce paved shoulder width from 6.5 feet to 4 feet

Comp By: SG Date: 4/7/11 Checked By: DCW Date: 4/7/11

Original Concept:

The original concept proposes 6.5' width paved shoulders.

Proposed Change:

The revised concept proposes 4' width paved shoulders.

Justification:

The purpose of the project is to increase capacity by providing additional through lanes. This can be accomplished with 4' paved shoulders. AASHTO guidelines do not mandate a required paved shoulder width. The unpaved shoulder width remains the same at 10 feet.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	118,000		
- Proposed	-0-		
- Savings	118,000		118,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			118,000

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522180

ITEM N^o: C-2
CLIENT: GDOT
Sheet 3 of 3

Assumed Pavement Section for Paved Shoulder – 1.5" 9.5mm, 2" 19mm, 6" GAB

Pavement Cost/ SY

9.5mm – (165 lb/SY) x (1 ton/2,000 lb) x (\$69.58/ton) = \$5.74

19mm – (220 lb/SY) x (1 ton/2,000 lb) x (\$62.72/ton) = \$6.90

6" GAB – (660 lb/SY) x (1 ton/2,000 lb) x (\$14.54/ton) = \$4.80

Total Cost = \$17.44/SY

Area (Additional 2.5' Paved Shoulder) = $4.6 \times 5,280 \times 2.5 \div 9 = 6,747$ sy

Original Concept

Area (Additional 2.5' Paved Shoulder Width) = 6,747 sy

Revised Concept

Area (Additional 2.5' Paved Shoulder Width) = 0 sy

DEVELOPMENT AND RECOMMENDATION PHASE

**US 1 / SR 4 Corridor Improvements
PI No: 522180**

IDEA No.: C-3	PAGE No.: 1 of 5	CREATIVE IDEA: Reduce amount of side street work
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Comp By: SSB Date: 4/6/11 Checked By: DCW Date: 4/6/11

Original Concept:

Side road lengths per concept layout.

Proposed Change:

Reduce side road lengths by tying in to existing sooner.

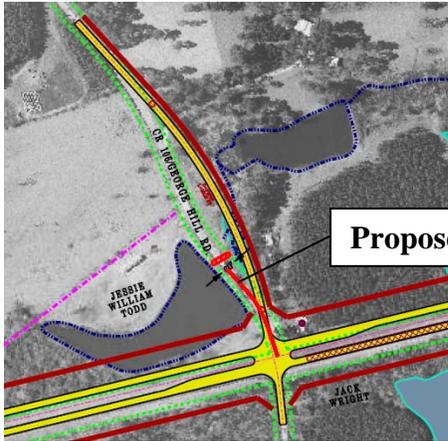
Justification:

Minimize cost by reducing side road lengths.

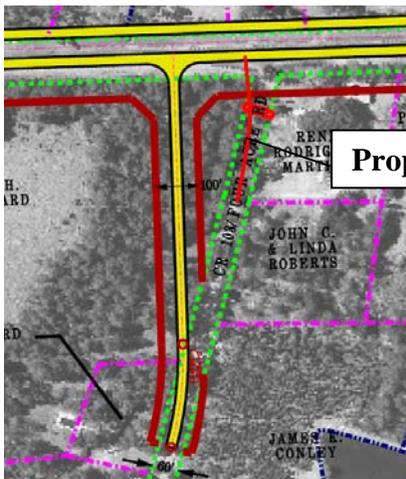
LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	345,000		
- Proposed	-0-		
- Savings	345,000		345,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			345,000

**SR 4 / US 1 Corridor Improvements
PI No: 522180**

ITEM N^o: C-3
CLIENT: GDOT
Sheet 2 of 5



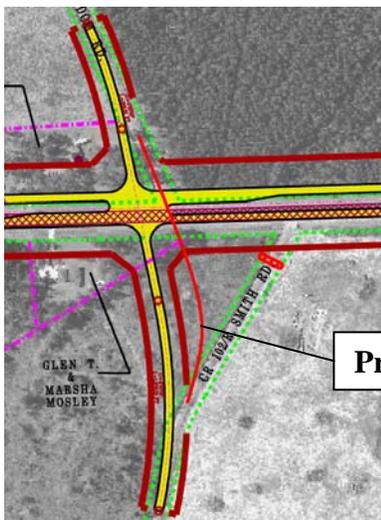
CR 106



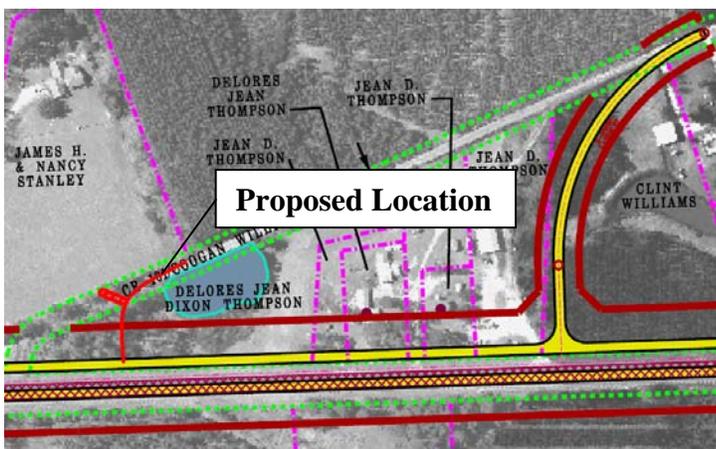
CR 103

SR 4 / US 1 Corridor Improvements
PI No: 522180

ITEM N^o: C-3
CLIENT: GDOT
Sheet 3 of 5



CR 98/102



CR 101

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522180

ITEM N^o: C-3
 CLIENT: GDOT
 Sheet 5 of 5

CR 106

Shorten by 1,000'

Pavement – $(1,000 \times 24) \div 9 = 2,667$ SY

R/W – $(1,000 \times 100) \div 43,560 = 2.3$ Ac

Embankment – $(240 \times 1,000) \div 27 = 8,889$ CY

CR 103

Shorten by 600'

Pavement – $(600 \times 24) \div 9 = 1,600$ SY

R/W – $(600 \times 100) \div 43,560 = 1.4$ Ac

Embankment – $(240 \times 600) \div 27 = 5,333$ CY

CR 98/102

Shorten by 600'

Pavement – $(600 \times 24) \div 9 = 1,600$ SY

R/W – $(600 \times 100) \div 43,560 = 1.4$ Ac

Embankment – $(240 \times 600) \div 27 = 5,333$ CY

CR 101

Shorten by 600'

Pavement – $(600 \times 24) \div 9 = 1,600$ SY

R/W – $(600 \times 100) \div 43,560 = 1.4$ Ac

Embankment – $(240 \times 600) \div 27 = 5,333$ CY

Right-of-Way Unit Costs (522180)

Use composite unit price for combination of residential, agricultural and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way =

$$1.55 \times 1.60 \times [(1 \div 103.4) \times [(3,500 \times 10.34) + (1,000 \times 93.06)]] = \$3,100/\text{acre}$$

Pavement totals –

$$9.5\text{mm} - ((2,667 + 1,600 + 1,600 + 1,600) \times 165) \div 2000 = 616 \text{ TN}$$

$$19\text{mm} - ((2,667 + 1,600 + 1,600 + 1,600) \times 330) \div 2000 = 1,232 \text{ TN}$$

$$25\text{mm} - ((2,667 + 1,600 + 1,600 + 1,600) \times 440) \div 2000 = 1,643 \text{ TN}$$

$$\text{Tack Coat} - ((2,667 + 1,600 + 1,600 + 1,600) \times 0.05) \times 3 = 1,120 \text{ Gal}$$

$$\text{GAB} - ((2,667 + 1,600 + 1,600 + 1,600) \times 100) \div 2000 = 373 \text{ TN}$$

Right-of-Way total – $2.3 + 1.4 + 1.4 + 1.4 = 6.5$ Ac

Embankment total – $8,889 + 5,333 + 5,333 + 5,333 = 24,888$ CY

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522180

IDEA No.:	PAGE No.:	CREATIVE IDEA:
C-5	1 of 4	Use reduced depth pavement for the medians and turn lanes

Comp By: GAO Date: 4/5/11 Checked By: DCW Date: 4/5/11

Original Concept:

Construct full depth pavement for the median openings and turn lanes.

Proposed Change:

Using practical design guidelines, construct reduced pavement thickness for the turn lanes and median areas.

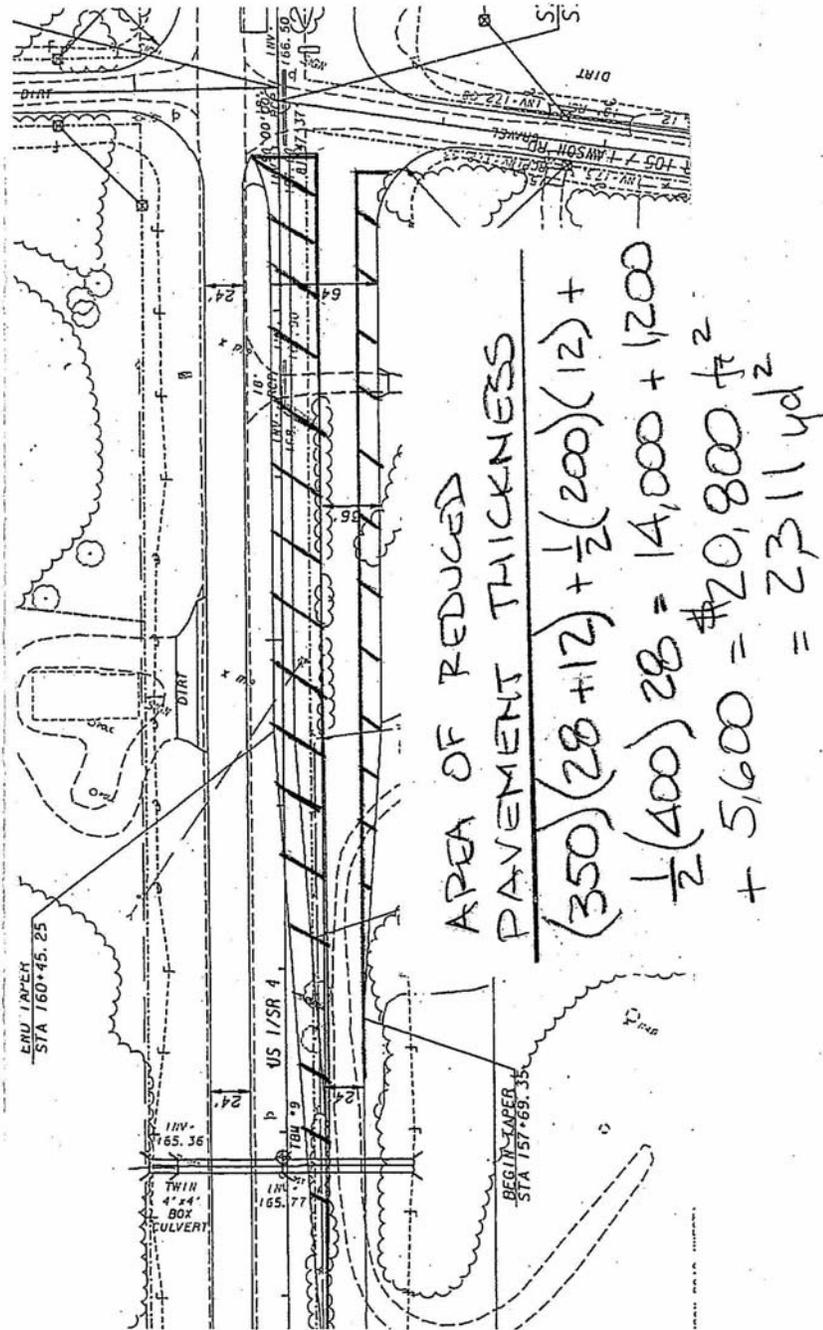
Justification:

Pavement design is usually dictated by traffic volumes on the mainline. This developed pavement section typically extends to the median area and turn lanes. However, there are significantly lower traffic volumes in the median and turn lanes, thereby allowing a reduced thickness pavement section. For the purposes of this recommendation, we assume a 33% reduction. Final traffic volumes and pavement design will dictate the actual numbers.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	277,000		
- Proposed	-0-		
- Savings	277,000		277,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			277,000

SR 4 / US 1 Corridor Improvements
 PI No: 522180

ITEM N^o: C-5
 CLIENT: GDOT
 Sheet 2 of 4



Typical Median Opening

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522180

ITEM N^o: C-5
CLIENT: GDOT
Sheet 4 of 4

CURRENT DESIGN: Cost of asphalt mainline pavement: 6.25 in asphalt / 8 inch GAB

$$(6.25/12 \text{ ft}) \times (150 \text{ lb/CF}) \times (1 \text{ ton}/2,000 \text{ lb}) = 0.03906 \text{ ton/SF}$$

$$(8/12 \text{ ft}) \times (135 \text{ lb/CF}) \times (1 \text{ ton}/2,000 \text{ lb}) = 0.045 \text{ ton/SF}$$

Cost per SY

$$(0.03906 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$60/\text{ton}) + (0.045 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$17/\text{ton}) = \\ \$21.09 + 6.89 = \$27.98/\text{SY} \quad \text{USE: } \$30 \text{ per SY}$$

Assume 33% reduction: use \$20 per SY

Area of reduced pavement thickness; from sketch = 2,311 SY

For each median opening;

$$2 \text{ approaches} \times 2,311 \text{ SY} \times (\$30 - 20) \text{ per SY} = \$46,220 \text{ per median opening}$$

Median Opening Locations

CR 106 / George Hill Road
CR 105 / Lawson Road
CR 102 / R. Smith Road
CR 101
CR 97
SR 15 / SR 29

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI Nos: 522190 and 522185

IDEA No.:	PAGE No.:	CREATIVE IDEA:
A-1	1 of 5	Reduce median width from 44 feet to 32 feet

Comp By: SSB Date: 4/5/11 Checked By: DCW Date: 4/5/11

Original Concept:

Provide a 44 foot wide grassed median.

Proposed Change:

Reduce median width from 44 feet to 32 feet.

Justification:

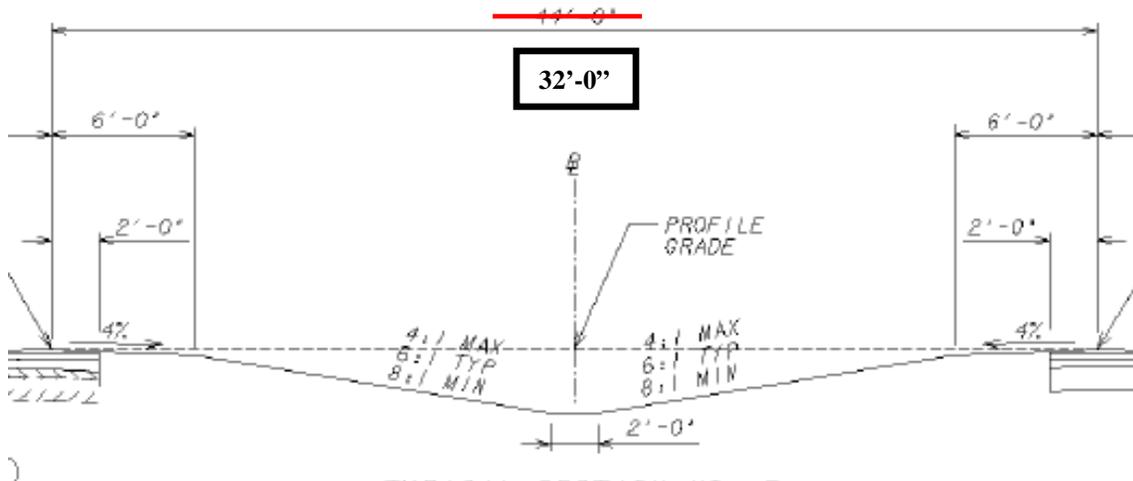
32 foot medians have been accepted and used in the past for these type of GRIP projects. A 32' median on this type of facility is acceptable per GDOT's Standards and is also in compliance with AASHTO Guidelines. The reduced median will require 12 feet less right-of-way, will reduce the amount of grassing, earthwork, clearing and grubbing, and pavement at the crossover locations, and will reduce the required length for all cross drains.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	278,000		
- Proposed	-0-		
- Savings	278,000		278,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			278,000

SKETCH

SR 4 / US 1 Corridor Improvements
PI Nos: 522190 and 522185

ITEM N^o: A-1
CLIENT: GDOT
Sheet 2 of 5



CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI Nos: 522190 and 522185

ITEM N^o: A-1
CLIENT: GDOT
Sheet 4 of 5

Right of Way –

Right-of-Way Unit Costs (522190)

Use composite unit price for combination of residential, agricultural, and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way =

$$1.55 \times 1.60 \times (1 \div 99.66) \times [(3,500 \times 6.6) + (1,000 \times 93.06)] = \$2,891/\text{acre}$$

Residential/Agricultural/Commercial Easement (50% Right-of-Way) = \$1,446/acre

4 median opening locations at 100' each

1 Bridge location at 300'

Total Length = 19,080 - 400 - 300 = 18,380' total length

$$18,380 \times 12 \div 43,560 = 5.1 \text{ Ac}$$

Earthwork –

Total Length = 19,080 - 300 = 18,780'

Assume 9,390' is in 5' fill and 9,390' is in 6' cut

Excavation – $(6 \times 12 \times 9,390) \div 27 = 25,040 \text{ CY}$

Embankment – $(5 \times 12 \times 9,390) \div 27 = 20,867 \text{ CY}$

Total = 45,907 CY

Clearing and Grubbing –

Total Length = 19,080 - 300 = 18,780'

$$(18,780 \times 12) \div 43,560 = 5.2 \text{ Ac,}$$

Drainage Structures –

Assume 36" RCP at 40 locations. $40 \times 12 = 480 \text{ LF}$

Permanent Grassing –

Total Length = 19,080 - 400 - 300 = 18,380'

$$(18,380 \times 12) \div 43,560 = 5.1 \text{ Ac}$$

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI Nos: 522190 and 522185

ITEM N^o: A-1
CLIENT: GDOT
Sheet 5 of 5

Pavement –

Crossover Locations – 4 locations, 100' length, $(12 \times 100 \times 4) \div 9 = 533$ SY

9.5mm, 165 lb/SY	$(533 \times 165) \div 2,000 = 44$ TN
19.0mm, 330 lb /SY	$(533 \times 330) \div 2,000 = 88$ TN
25.0mm, 440 lb /SY	$(533 \times 440) \div 2,000 = 117$ TN
Tack coat	$(533 \times 0.05) \times 3 = 80$ GA
GAB	$(533 \times 100) \div 2,000 = 27$ TN

DEVELOPMENT AND RECOMMENDATION PHASE

**US 1 / SR 4 Corridor Improvements
PI Nos. 522190 and 522185**

IDEA No.: A-3	PAGE No.: 1 of 4	CREATIVE IDEA: Use right-of-way to shoulder breakpoint and easements beyond
Comp By: SG	Date: 4/7/11	Checked By: DCW Date: 4/7/11

Original Concept:

The original concept shows required right-of-way for all shoulders and slopes.

Proposed Change:

The revised concept shows required right-of-way to the shoulder breakpoint and easements for slopes and ditches.

Justification:

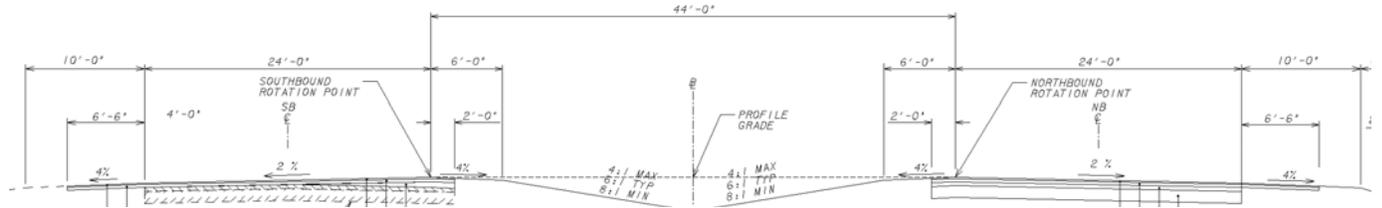
The purpose of the project is to increase capacity by providing addition through lanes. This can be accomplished with slopes and ditches included in easements instead of required right-of-way.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	139,000		
- Proposed	69,000		
- Savings	70,000		70,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			70,000

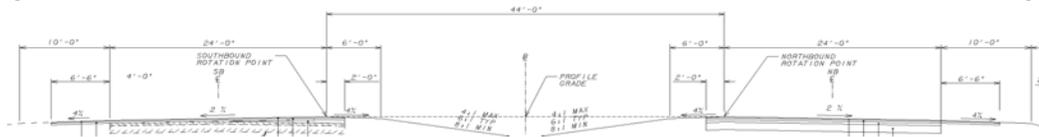
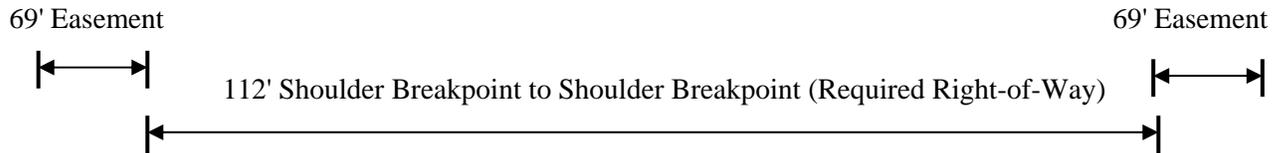
**SR 4 / US 1 Corridor Improvements
PI Nos. 522190 and 522185**

ITEM N^o: A-3
CLIENT: GDOT
Sheet 2 of 4

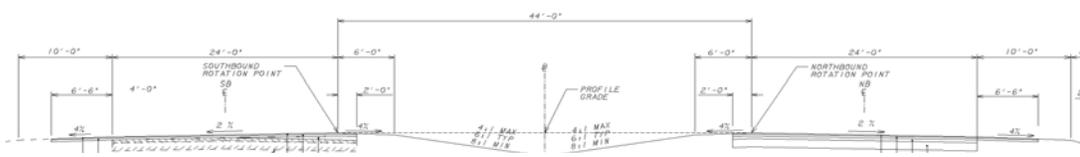
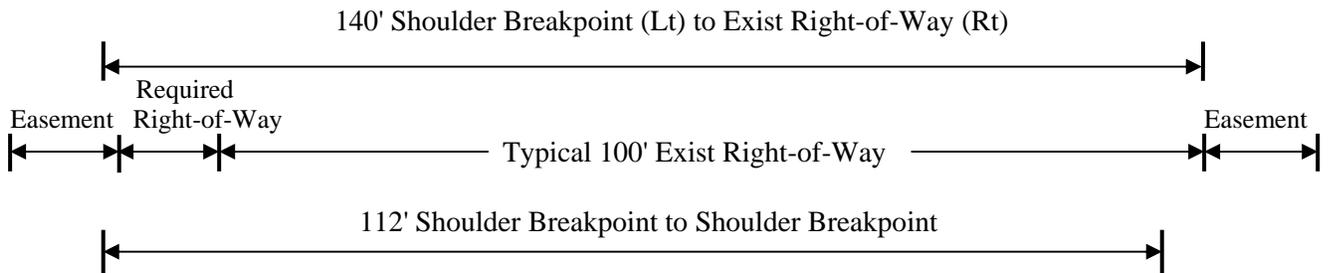
Original Concept



Revised Concept (250' Required Right-of-Way Sections on New Location)



Revised Concept (Typical 250' Required Right-of-Way on Exist Right-of-Way)



CALCULATIONS

SR 4 / US 1 Corridor Improvements PI Nos. 522190 and 522185

ITEM N^o: A-3
CLIENT: GDOT
Sheet 4 of 4

Right-of-Way Unit Costs (522185 & 522190)

Use composite unit price for combination of residential and agricultural right-of-way

Residential/Agricultural Right-of-Way =

$$1.55 \times 1.60 \times (1 \div 99.66) \times [(3,500 \times 6.6) + (1,000 \times 93.06)] = \$2,891/\text{acre}$$

Residential/Agricultural/Commercial Easement (50% Right-of-Way) = \$1,446/acre

Area of Right-of-Way to be converted to Easement

112' width required from shoulder breakpoint to shoulder breakpoint (10+24+44+24+10)

Assume higher width required for right-of-way savings calculations to account for shifting alignment in sections that are on existing right-of-way. The proposed centerline is typically not in same location as existing centerline and the 112' width is not centered on existing right-of-way. Assume additional 28' required to account for offset → 140' required width on sections with existing right-of-way to determine right-of-way savings.

A required 112' width will be assumed for new location sections.

Exist Right-of-Way Sections

19,000 LF (250' Required Right-of-Way)

$$\text{Area} = 19,000 \times (250 - 140) = 2,090,000 \text{ SF} \rightarrow 48.0 \text{ acres}$$

Original Concept

Area (Right-of-Way) = 48.0 acres

Area (Easement) = 0 acres

Revised Concept

Area (Right-of-Way) = 0 acres

Area (Easement) = 48.0 acres

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI Nos. 522190 and 522185

IDEA No.:	PAGE No.:	CREATIVE IDEA:	
B-1	1 of 3	Reduce bridge width from 38 feet to 36 feet gutter to gutter	
Comp By: AS	Date: 4/5/11	Checked By: DCW	Date: 4/5/11

Original Concept:

The proposed bridge widths are 38 feet (gutter to gutter) for one new double parallel bridge (Bridge over Rocky Creek) northbound and southbound.

Proposed Change:

The bridge widths can be reduced to 36 feet (gutter to gutter) for one new double parallel bridge (Bridge over Rocky Creek) northbound and southbound.

This is based on the accepted bridge widths in GDOT bridge and structures policy manual for rural section (multi-divided) 4 ft. (inside shoulder) +TW+ 8 ft. (outside shoulder).

Justification:

This results in significant construction cost savings.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	2,354,000		
- Proposed	2,240,000		
- Savings	114,000		114,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			114,000

CALCULATIONS

**SR 4 / US 1 Corridor Improvements
PI Nos. 522190 and 522185**

ITEM N^o: B-1
CLIENT: GDOT
Sheet 3 of 3

Original Bridge Cost Estimate:

New double parallel bridge over Rocky Creek (Northbound/Southbound)

$$2 \text{ bridges} \times 300 \text{ ft} \times 41.3 \text{ ft wide} = 2 \times 12,390 \text{ SF} = 24,780 \text{ SF}$$

VE proposed Bridge Cost Estimate:

New double parallel bridge over Rocky Creek (Northbound/Southbound)

$$2 \text{ bridges} \times 300 \text{ ft} \times 39.3 \text{ ft wide} = 2 \times 11,790 \text{ SF} = 23,580 \text{ SF}$$

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI Nos. 522190 and 522185

IDEA No.:	PAGE No.:	CREATIVE IDEA:
C-2	1 of 3	Reduce paved shoulder width from 6.5 feet to 4 feet

Comp By: SG Date: 4/7/11 Checked By: DCW Date: 4/7/11

Original Concept:

The original concept proposes 6.5' width paved shoulders.

Proposed Change:

The revised concept proposes 4' width paved shoulders.

Justification:

The purpose of the project is to increase capacity by providing additional through lanes. This can be accomplished with 4' paved shoulders. AASHTO guidelines do not mandate a required paved shoulder width. The unpaved shoulder width remains the same at 10 feet.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	92,000		
- Proposed	-0-		
- Savings	92,000		92,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			92,000

CALCULATIONS

**SR 4 / US 1 Corridor Improvements
PI Nos. 522190 and 522185**

ITEM N^o: C-2
CLIENT: GDOT
Sheet 3 of 3

Assumed Pavement Section for Paved Shoulder – 1.5" 9.5mm, 2" 19mm, 6" GAB

Pavement Cost/ SY

$$9.5\text{mm} - (165 \text{ lb/SY}) \times (1 \text{ ton}/2,000 \text{ lb}) \times (\$58.35/\text{ton}) = \$4.81$$

$$19\text{mm} - (220 \text{ lb/SY}) \times (1 \text{ ton}/2,000 \text{ lb}) \times (\$62.85/\text{ton}) = \$6.91$$

$$6" \text{ GAB} - (660 \text{ lb/SY}) \times (1 \text{ ton}/2,000 \text{ lb}) \times (\$17.47/\text{ton}) = \$5.77$$

$$\text{Total Cost} = \$17.49/ \text{SY}$$

$$\text{Area (Additional 2.5' Paved Shoulder)} = 3.6 \times 5,280 \times 2.5 \div 9 = 5,280 \text{ SY}$$

Original Concept

$$\text{Area (Additional 2.5' Paved Shoulder Width)} = 5,280 \text{ SY}$$

Revised Concept

$$\text{Area (Additional 2.5' Paved Shoulder Width)} = 0 \text{ SY}$$

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI Nos: 522190 and 522185

IDEA No.:	PAGE No.:	CREATIVE IDEA:
C-3	1 of 4	Reduce amount of side street work

Comp By: SSB Date: 4/6/11 Checked By: DCW Date: 4/6/11

Original Concept:

Side road lengths per concept layout.

Proposed Change:

Reduce side road lengths by tying in to existing sooner.

Justification:

Minimize cost by reducing side road lengths.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	122,000		
- Proposed	-0-		
- Savings	122,000		122,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			122,000

SKETCH

**SR 4 / US 1 Corridor Improvements
PI Nos: 522190**

ITEM N^o: C-3
CLIENT: GDOT
Sheet 2 of 4



Proposed Location

CR 115

CALCULATIONS

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI Nos: 522190

ITEM N^o: C-3
CLIENT: GDOT
Sheet 4 of 4

CR 115

Shorten by 1,000'

Pavement – $(1,000 \times 24) \div 9 = 2,667$ SY

Right-of-way – $(1,000 \times 100) \div 43,560 = 2.3$ Ac

Embankment – $(240 \times 1,000) \div 27 = 8,889$ CY

Right-of-Way Unit Costs (522185 & 522190)

Use composite unit price for combination of residential, agricultural and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way =

$1.55 \times 1.60 \times (1 \div 99.66) \times [(3,500 \times 6.6) + (1,000 \times 93.06)] = \$2,891/\text{acre}$

Pavement totals –

9.5mm – $(2,667 \times 165) \div 2,000 = 220$ TN

19mm – $(2,667 \times 330) \div 2,000 = 440$ TN

25mm – $(2,667 \times 440) \div 2,000 = 587$ TN

Tack coat – $(2,667 \times 0.05) \times 3 = 400$ Gal

GAB – $(2,667 \times 100) \div 2,000 = 133$ TN

DEVELOPMENT AND RECOMMENDATION PHASE

**US 1 / SR 4 Corridor Improvements
PI Nos. 522190 and 522185**

IDEA No.: C-5	PAGE No.: 1 of 4	CREATIVE IDEA: Use reduced depth pavement for medians and turn lanes
Comp By: GAO	Date: 4/5/11	Checked By: DCW
		Date: 4/5/11

Original Concept:

Construct full depth pavement for the median openings and turn lanes.

Proposed Change:

Using practical design guidelines, construct reduced pavement thickness for the turn lanes and median areas.

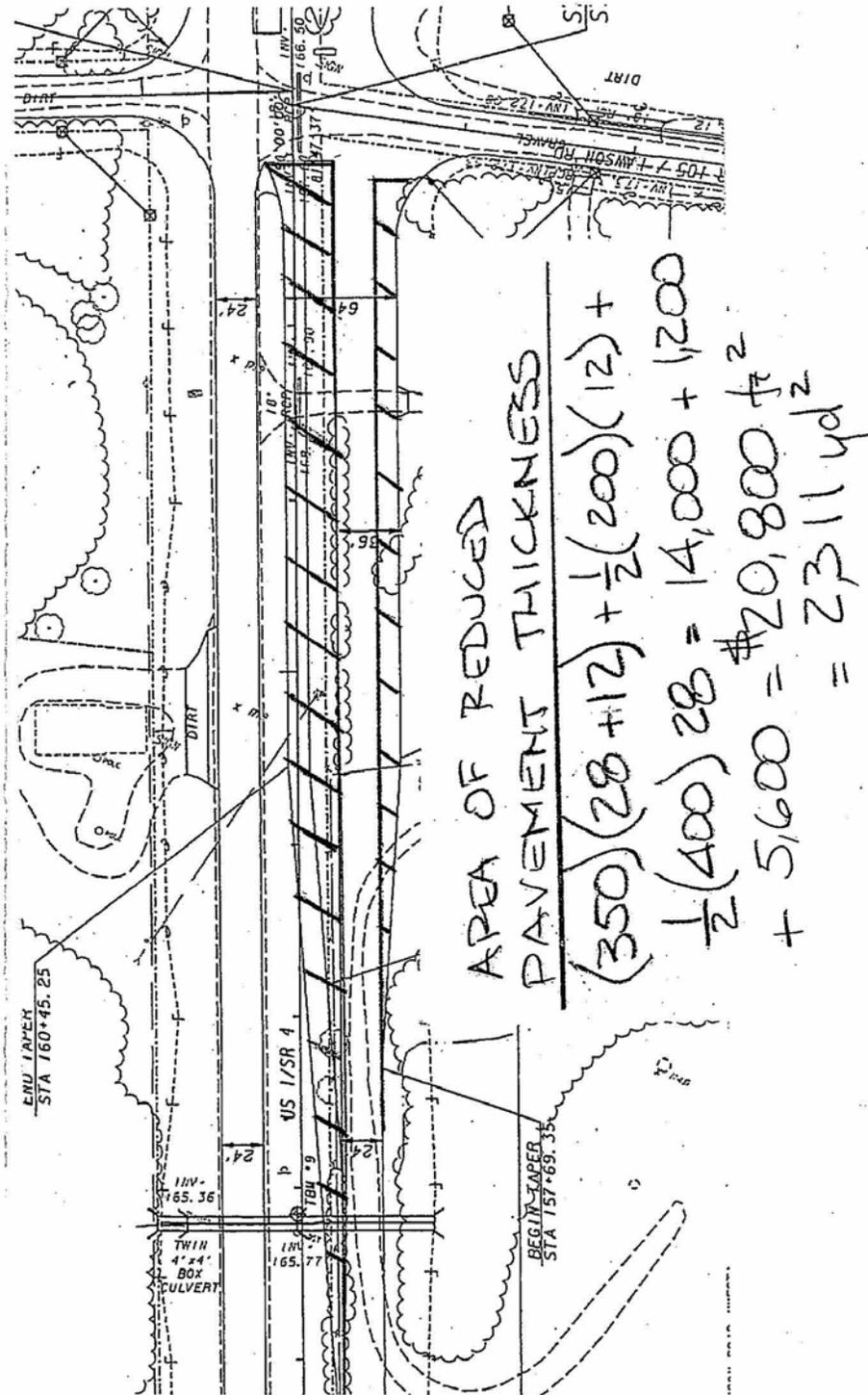
Justification:

Pavement design is usually dictated by traffic volumes on the mainline. This developed pavement section typically extends to the median area and turn lanes. However, there are significantly lower traffic volumes in the median and turn lanes, thereby allowing a reduced thickness pavement section. For the purposes of this recommendation, we assume a 33% reduction. Final traffic volumes and pavement design will dictate the actual numbers.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	185,000		
- Proposed	-0-		
- Savings	185,000		185,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			185,000

SR 4 / US 1 Corridor Improvements
 PI Nos. 522190 and 522185

ITEM N^o: C-5
 CLIENT: GDOT
 Sheet 2 of 4



Typical Median Opening

CALCULATIONS

**SR 4 / US 1 Corridor Improvements
PI Nos. 522190 and 522185**

ITEM N^o: C-5
CLIENT: GDOT
Sheet 4 of 4

CURRENT DESIGN: Cost of asphalt mainline pavement: 6.25 in asphalt / 8 inch GAB

$$(6.25/12 \text{ ft}) \times (150 \text{ lb/cf}) \times (1 \text{ ton}/2,000 \text{ lb}) = 0.03906 \text{ ton/SF}$$

$$(8/12 \text{ ft}) \times (135 \text{ lb/cf}) \times (1 \text{ ton}/2,000 \text{ lb}) = 0.045 \text{ ton/SF}$$

Cost per SY

$$(0.03906 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$60/\text{ton}) + (0.045 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$17/\text{ton}) = \\ \$ 21.09 + 6.89 = \$27.98/\text{SY} \quad \text{USE: } \$30 \text{ per SY}$$

Assume 33% reduction: use \$20 per SY

Area of reduced pavement thickness; from sketch = 2,311 SY

For each median opening;

$$2 \text{ approaches} \times 2,311 \text{ SY} \times (\$30 - 20) \text{ per SY} = \$46,220 \text{ per median opening}$$

Median Opening Locations

JL Thompson Road
Bobby Williamson Road / Darrell Thompson Road
Harden Chapel Road
Glenn James Road

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522200

IDEA No.:	PAGE No.:	CREATIVE IDEA:
A-1	1 of 5	Reduce median width from 44 feet to 32 feet

Comp By: SSB Date: 4/5/2011 Checked By: DCW Date: 4/6/2011

Original Concept:

Provide a 44 foot wide grassed median.

Proposed Change:

Reduce median width from 44 feet to 32 feet.

Justification:

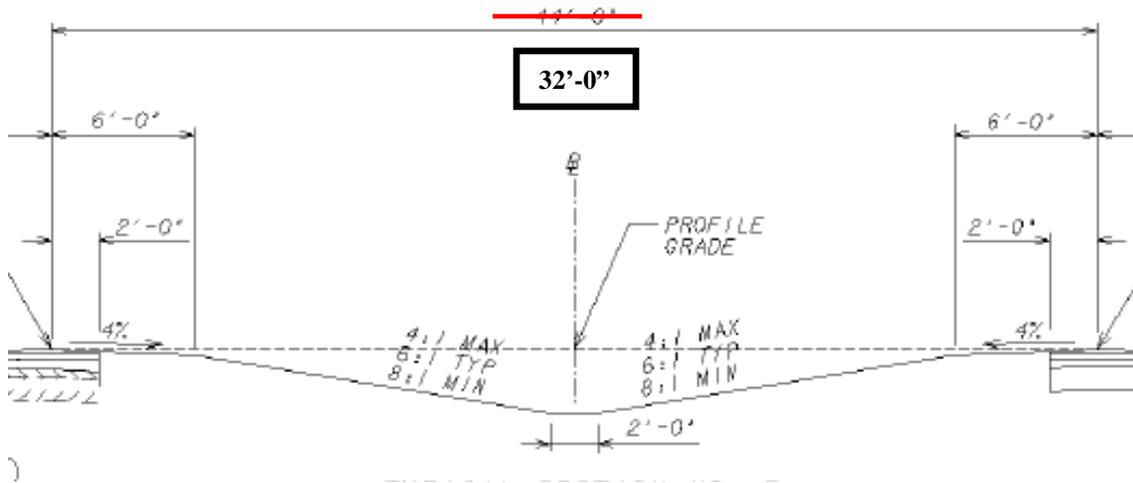
32 foot medians have been accepted and used in the past for these type of GRIP projects. A 32 foot median on this type of facility is acceptable per GDOT's Standards and is also in compliance with AASHTO Guidelines. The reduced median will require 12 feet less right-of-way, will reduce the amount of grassing, earthwork, clearing and grubbing, and pavement at the crossover locations, and will reduce the required length for all cross drains.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	1,065,000		
- Proposed	-0-		
- Savings	1,065,000		1,065,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			1,065,000

SKETCH

SR 4 / US 1 Corridor Improvements
PI No: 522200

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CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

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CLIENT: GDOT
Sheet 4 of 5

Right-of-Way –

Use composite unit price for combination of residential, agricultural and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way =

$$1.55 \times 1.60 \times (1 \div 214.27) \times [(3,500 \times 47.7) + (1,000 \times 145.8) + (110,000 \times 21.0)] = \\ \$30,356/\text{acre}$$

Residential/Agricultural/Commercial Easement (50% Right-of-Way) = \$15,178/acre

8 median openings locations at 100' each

3 Bridge locations at 1,150'

Total Length = 36,344 – 800 - 1,150 = 34,394' total length

$$34,394 \times 12 \div 43,560 = 9.5 \text{ Ac}$$

Earthwork –

Total Length = 36,344 - 1,150 = 35,194'

Assume 17,597' is in 5' fill and 17,597' is in 6' cut

Excavation – $(6 \times 12 \times 17,597) \div 27 = 46,925 \text{ CY}$

Embankment – $(5 \times 12 \times 17,597) \div 27 = 39,104 \text{ CY}$

Total = 86,029 CY

Clearing and Grubbing –

Total Length = 36,344 - 1,150 = 35,194'

$$(35,194 \times 12) \div 43,560 = 9.7 \text{ Ac}$$

Drainage Structures –

Assume 36" RCP at 48 locations. $48 \times 12 = 576 \text{ LF}$

Permanent Grassing –

Total Length = 36,344 – 800 - 1,150 = 34,394'

$$(34,394 \times 12) \div 43,560 = 9.5 \text{ Ac}$$

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

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CLIENT: GDOT
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Pavement –

Crossover Locations – 8 locations, 100' length, $(12 \times 100 \times 8) \div 9 = 1,067$ SY

9.5mm, 165 lb/SY	$(1,067 \times 165) \div 2,000 = 88$ TN
19.0mm, 330 lb/SY	$(1,067 \times 330) \div 2,000 = 176$ TN
25.0mm, 440 lb/SY	$(1,067 \times 440) \div 2,000 = 235$ TN
Tack Coat	$(1,067 \times 0.05) \times 3 = 160$ Gal
GAB	$(1,067 \times 100) \div 2,000 = 53$ TN

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522200

IDEA No.:	PAGE No.:	CREATIVE IDEA:
A-1.1	1 of 5	Reduce median width from 44 feet to 20 feet with a cable barrier

Comp By: SSB Date: 4/6/11 Checked By: DCW Date: 4/6/11

Original Concept:

Provide a 44 foot wide grassed median.

Proposed Change:

Reduce median width from 44 feet to 20 feet and install a cable barrier.

Justification:

A 20 foot median can be used with a cable barrier installed two feet off the center of the median.

The reduced median will require 24 feet less right-of-way, will reduce the amount of grassing, earthwork, clearing and grubbing, and pavement at the crossover locations, and will reduce the required length for all cross drains.

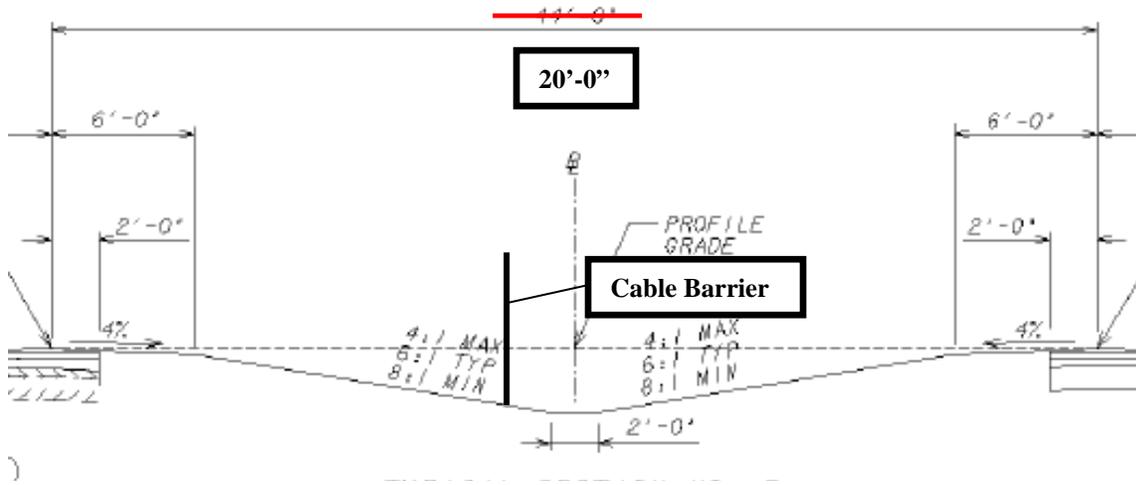
Earthwork costs were obtained from the CY cost in the concept report. Right-of-way costs are based on an average of the different land types.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	2,127,000		
- Proposed	672,000		
- Savings	1,455,000		1,455,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			1,455,000

SKETCH

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: A-1.1
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CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: A-1.1
CLIENT: GDOT
Sheet 4 of 5

Right of Way –

Use composite unit price for combination of residential, agricultural and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way =

$$1.55 \times 1.60 \times (1 \div 214.27) \times [(3,500 \times 47.7) + (1,000 \times 145.8) + (110,000 \times 21.0)] = \\ \$30,356/\text{acre}$$

8 median openings locations at 100' each

3 Bridge locations at 1,150'

Total Length = 36,344 - 800 - 1,150 = 34,394' total length

$$34,394 \times 24 \div 43,560 = 19.0 \text{ Ac}$$

Earthwork –

Total Length = 36,344 - 1,150 = 35,194'

Assume 17,597' is in 5' fill and 17,597' is in 6' cut

Excavation – $(6 \times 24 \times 17,597) \div 27 = 93,851 \text{ CY}$

Embankment – $(5 \times 24 \times 17,597) \div 27 = 78,209 \text{ CY}$

Total = 172,060 CY

Clearing and Grubbing –

Total Length = 36,344 - 1,150 = 35,194'

$$(35,194 \times 24) \div 43,560 = 19.3 \text{ Ac}$$

Drainage Structures –

Assume 36" RCP at 48 locations. $48 \times 24 = 1,152 \text{ LF}$

Permanent Grassing –

Total Length = 36,344 - 800 - 1,150 = 34,394'

$$(34,394 \times 24) \div 43,560 = 18.9 \text{ Ac}$$

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: A-1.1
CLIENT: GDOT
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Pavement –

Crossover Locations – 8 locations, 100' length, $(24 \times 100 \times 8) \div 9 = 2,133$ SY

9.5mm, 165 lb/SY	$(2,133 \times 165) \div 2,000 = 176$ TN
19.0mm, 330 lb/SY	$(2,133 \times 330) \div 2,000 = 352$ TN
25.0mm, 440 lb/SY	$(2,133 \times 440) \div 2,000 = 469$ TN
Tack Coat	$(2,133 \times 0.05) \times 3 = 320$ GA
GAB	$(2,133 \times 100) \div 2,000 = 106$ TN

Cable Barrier –

$35,194 - (8 \times 200) = 33,594$ LF

DEVELOPMENT AND RECOMMENDATION PHASE

**US 1 / SR 4 Corridor Improvements
PI No: 522200**

IDEA No.: A-3	PAGE No.: 1 of 4	CREATIVE IDEA: Use right-of-way to shoulder breakpoint and easements beyond
Comp By: SG	Date: 4/7/11	Checked By: DCW Date: 4/7/11

Original Concept:

The original concept shows required right-of-way for all shoulders and slopes.

Proposed Change:

The revised concept shows required right-of-way to the shoulder breakpoint and easements for slopes and ditches.

Justification:

The purpose of the project is to increase capacity by providing addition through lanes. This can be accomplished with slopes and ditches included in easements instead of required right-of-way.

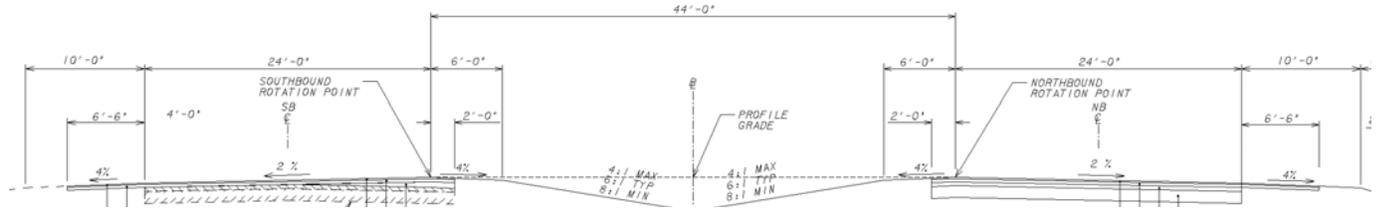
LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	3,597,000		
- Proposed	1,799,000		
- Savings	1,798,000		1,798,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			1,798,000

SKETCH

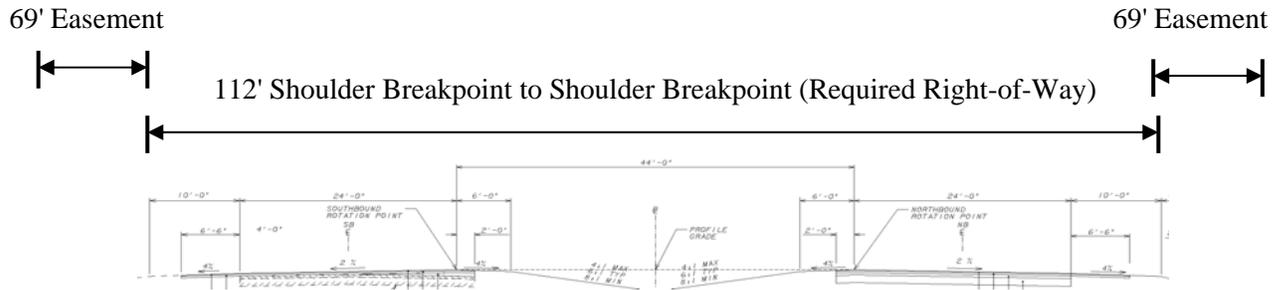
**SR 4 / US 1 Corridor Improvements
PI No: 522200**

ITEM N^o: A-3
CLIENT: GDOT
Sheet 2 of 4

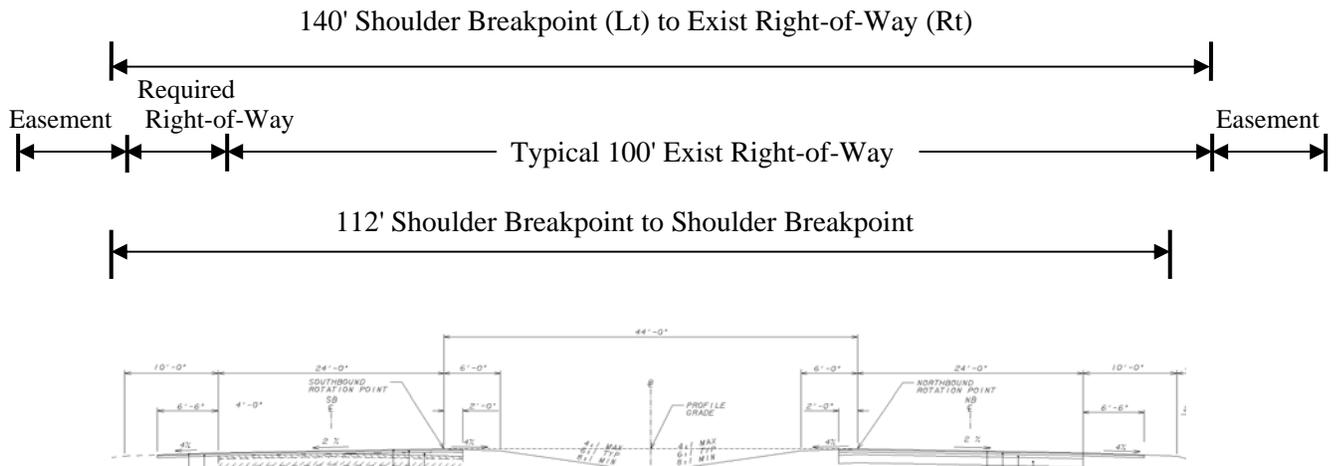
Original Concept



Revised Concept (250' Required Right-of-Way Sections on New Location)



Revised Concept (Typical 250' Required Right-of-Way on Exist R/W)



CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: A-3
CLIENT: GDOT
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Right-of-Way Unit Costs (522200)

Use composite unit price for combination of residential, agricultural and commercial right-of-way

$$\text{Residential/Agricultural/Commercial Right-of-Way} = 1.55 \times 1.60 \times (1 \div 214.27) \times [(3,500 \times 47.7) + (1,000 \times 145.8) + (110,000 \times 21.0)] = \$30,356/\text{acre}$$

$$\text{Residential/Agricultural/Commercial Easement (50\% Right-of-Way)} = \$15,178/\text{acre}$$

Area of Right-of-Way to be converted to Easement

112' width required from shoulder breakpoint to shoulder breakpoint (10+24+44+24+10)

Assume higher width required for right-of-way savings calculations to account for shifting alignment in sections that are on existing right-of-way. The proposed centerline is typically not in same location as existing centerline and the 112' width is not centered on existing right-of-way. Assume additional 28' required to account for offset → 140' required width on sections with existing right-of-way to determine right-of-way savings.

A required 112' width will be assumed for new location sections.

Exist Right-of-Way Sections

3,000 LF of Required Right-of-Way (250' Required Right-of-Way)

$$\text{Area} = 3,000 \times (250 - 140) = 330,000 \text{ SF} \rightarrow 7.6 \text{ acres}$$

New Location Sections

35,000 LF (250' Required Right-of-Way)

$$\text{Area} = 35,000 \times (250 - 112) = 4,830,000 \text{ SF} \rightarrow 110.9 \text{ acres}$$

$$\text{Total Area} = 7.6 + 110.9 = 118.5 \text{ acres}$$

Original Concept

Area (Right-of-Way) = 118.5 acres

Area (Easement) = 0 acres

Revised Concept

Area (Right-of-Way) = 0 acres

Area (Easement) = 118.5 acres

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522200

IDEA No.:	PAGE No.:	CREATIVE IDEA:
B-1	1 of 3	Reduce bridge width from 38 feet to 36 feet gutter to gutter

Comp By: AS Date: 4/5/11 Checked By: DCW Date: 4/5/11

Original Concept:

The proposed bridge widths are 38 feet (gutter to gutter) for the four new double parallel bridges (bridge over Little Rocky Creek, bridge over Georgia Central RR/US 280 Crossing, bridge over SR 292 Crossing, bridge over Swift Creek) northbound and southbound.

Proposed Change:

The bridge widths can be reduced to 36 feet (gutter to gutter) for the four new double parallel bridges (bridge over Little Rocky Creek, bridge over Georgia Central RR/US 280 Crossing, bridge over SR 292 Crossing, bridge over Swift Creek) northbound and southbound. This is based on the accepted bridge widths in GDOT bridge and structures policy manual for rural section (multi-divided) 4 ft. (inside shoulder) +TW+ 8 ft. (outside shoulder).

Justification:

This results in significant construction cost savings.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	6,984,000		
- Proposed	6,646,000		
- Savings	338,000		338,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			338,000

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

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Original Bridge Cost Estimate:

New double parallel bridge over Little Rocky Creek (Northbound/Southbound)
2 bridges x (90 ft x 41.3 ft wide) = 2 x 3,717 SF

New double parallel bridge over Georgia Central RR/US 280 Crossing (Northbound/
Southbound)
2 bridges x (320 ft x 41.3 ft wide) = 2 x 13,216 SF

New double parallel bridge over SR 292 Crossing (Northbound/Southbound)
2 bridges x (180 ft x 41.3 ft wide) = 2 x 7,434 SF

New double parallel bridge over Swift Creek (Northbound/Southbound)
2 bridges x (300 ft x 41.3 ft wide) = 2 x 12,390 SF

VE proposed Bridge Cost Estimate:

New double parallel bridge over Little Rocky Creek (Northbound/Southbound)
2 bridges x (90 ft x 39.3 ft wide) = 2 x 3,537 SF

New double parallel bridge over Georgia Central RR/US 280 Crossing (Northbound/
Southbound)
2 bridges x (320 ft x 39.3 ft wide) = 2 x 12,576 SF

New double parallel bridge over SR 292 Crossing (Northbound/Southbound)
2 bridges x (180 ft x 39.3 ft wide) = 2 x 7,074 SF

New double parallel bridge over Swift Creek (Northbound/Southbound)
2 bridges x (300 ft x 39.3 ft wide) = 2 x 11,790 SF

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522200

IDEA No.: B-3	PAGE No.: 1 of 4	CREATIVE IDEA: Use MSE wall on railroad end of bridge to shorten bridge over railroad/US 280 crossing
-------------------------	----------------------------	---

Comp By: AS Date: 4/5/11 Checked By: DCW Date: 4/5/11

Original Concept:

The proposed bridge widths are 38 feet (gutter to gutter) for the four new double parallel bridges over the Georgia Central RR/US 280 crossing with sloped end spans.

Proposed Change:

The end span for the railroad side of the bridge over the Georgia Central RR/US 280 crossing will be built with an MSE wall. This eliminates the one end span reducing the bridge length by 72 feet.

Justification:

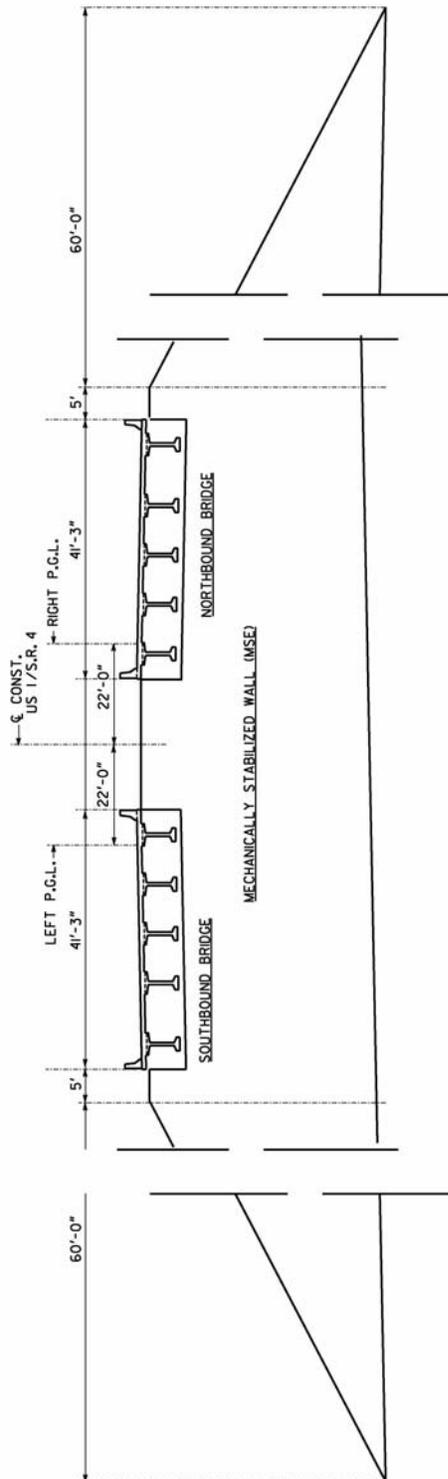
This results in significant construction cost savings.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	2,511,000		
- Proposed	2,228,000		
- Savings	283,000		283,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			283,000

SKETCH

SR 4 / US 1 Corridor Improvements
PI No: 522200

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B3- CREATIVE IDEA - USE OF MSE WALL AT RAILROAD END SPAN

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: B-3
CLIENT: GDOT
Sheet 4 of 4

Original Bridge Cost Estimate:

New double parallel bridge over Georgia Central RR/US 280 Crossing (Northbound/
Southbound)

$$2 \text{ bridges} \times 320 \text{ ft} \times 41.3 \text{ ft wide} = 2 \times 13,216 \text{ SF} = 26,432 \text{ SF}$$

VE proposed Bridge Cost Estimate:

New double parallel bridge over Georgia Central RR/US 280 Crossing (Northbound/
Southbound) with MSE wall at railroad end

$$2 \text{ bridges} \times 248 \text{ ft} \times 41.3 \text{ ft wide} = 20,484.8 \text{ SF}$$

Additional MSE wall at railroad end

$$115.25 \text{ ft} + 60 \text{ ft} + 60 \text{ ft} = 235.25 \times 30 \text{ ft. high} = 7,057.5 \text{ SF}$$

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522200

IDEA No.: B-4	PAGE No.: 1 of 5	CREATIVE IDEA: Eliminate bridges at SR 30 and SR 292 and provide an at-grade crossing
-------------------------	----------------------------	---

Comp By: GAO Date: 4/5/11 Checked By: DCW Date: 4/5/11

Original Concept:

Construct bridges to cross SR 30, the railroad, and SR 292.

Proposed Change:

Eliminate the bridges and construct an at-grade crossing.

Justification:

Based on information received during the study, there are only 2-4 trains per day along this corridor, which represents a relatively low volume use. The railroad tracks parallel SR 30 and would not significantly affect SR 30 traffic, other than turning movements.

Eliminating the bridges and constructing an at-grade crossing would significantly reduce construction costs and long term bridge maintenance. Conditions and signalization at an at-grade RR crossing can be improved by enhanced crossings with double gates and warning signals.

An at-grade intersection between SR 30 and US 1/SR 4 would provide a more direct connection and eliminate some ramp construction. Most likely, a new traffic signal will be warranted at this intersection and is included in the cost analysis.

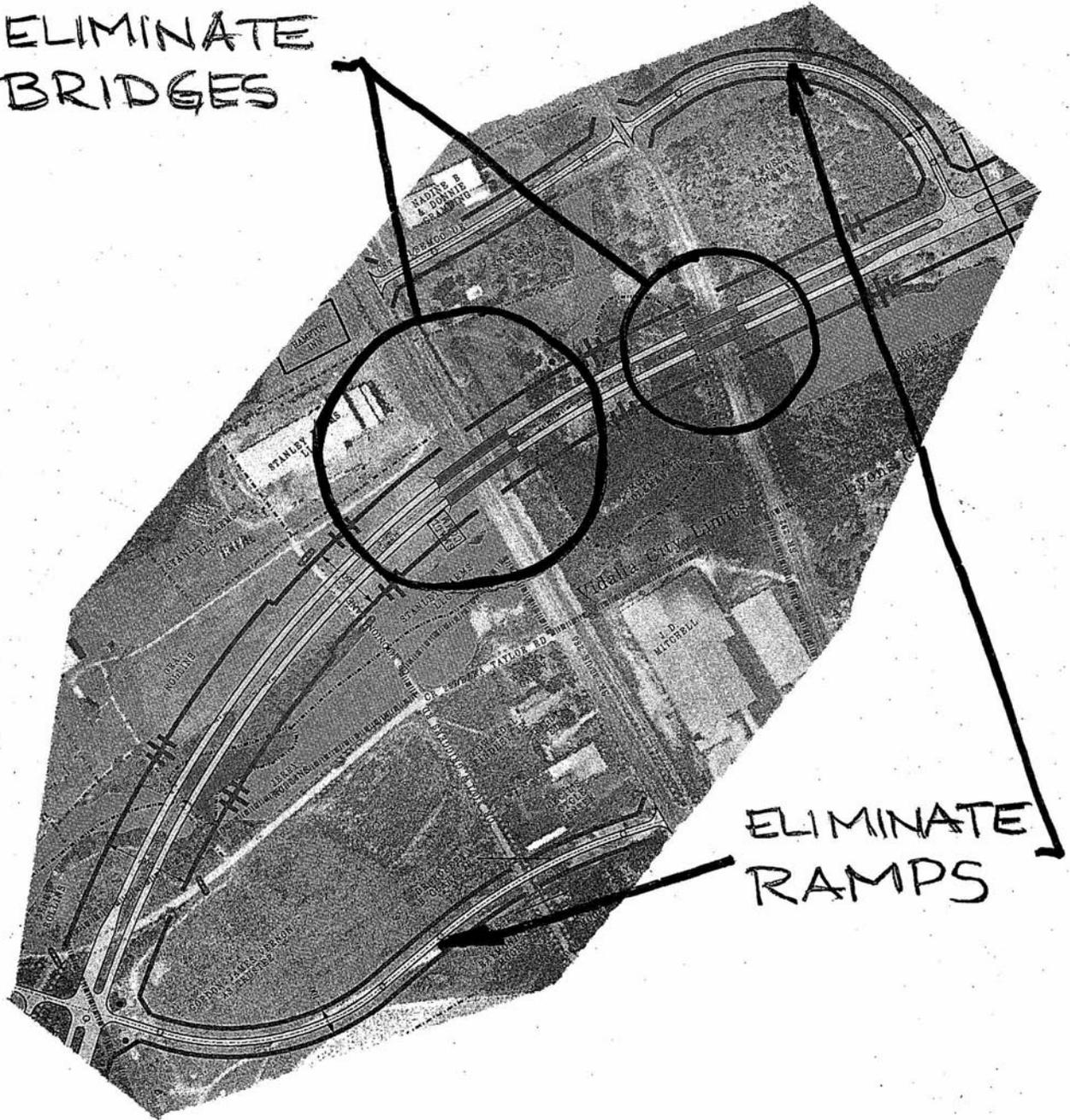
Additionally, there is an airport immediately north of the area of the proposed bridges that could have impacts on the approach path template. Removing the bridges would improve or minimize any potential conflicts with the airport operations and permitting.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	8,236,000		
- Proposed	958,000		
- Savings	7,278,000		7,278,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			7,278,000

SR 4 / US 1 Corridor Improvements
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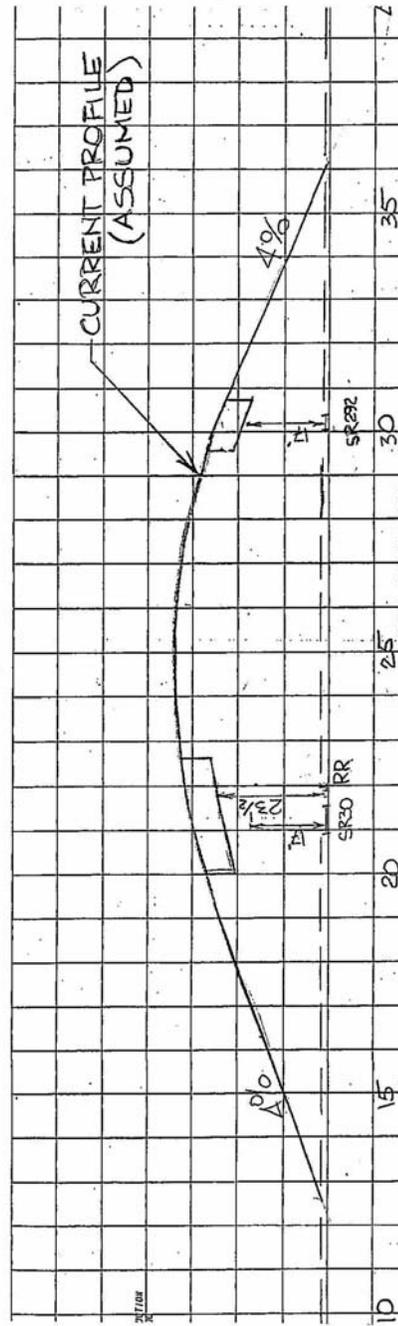
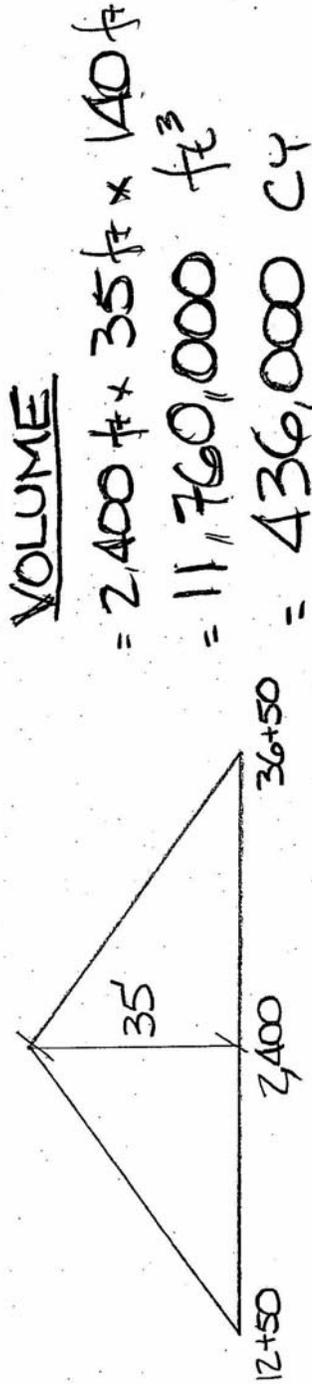
ELIMINATE
BRIDGES



ELIMINATE
RAMPS

SR 4 / US 1 Corridor Improvements
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CALCULATIONS

SR 4 / US 1 Corridor Improvements
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Earthwork reduction (see sketch): 436,000 CY

Bridge reduction: SR 30 = 300 ft long x 41.3 ft wide x 2 bridges = 24,780 SF

SR 292 = 200 ft long x 41.3 ft wide x 2 bridges = 16,520 SF

Total bridge area = 24,780 + 16,520 = 41,300 SF

Additional pavement construction / intersection improvements:

(300 + 200) x 64 ft wide = 32,000 SF = 3,600 SY

CURRENT DESIGN: Cost of asphalt mainline pavement: 6.25 in asphalt / 8 inch GAB

(6.25/12 ft) x (150 lb/CF) x (1 ton/2,000 lb) = 0.03906 ton/SF

(8/12 ft) x (135 lb/CF) x (1 ton/2,000 lb) = 0.045 ton/SF

Cost per SY:

(0.03906 ton/SF x 9 SF/SY x \$60/ton) + (0.045 ton/SF x 9 SF/SY x \$17/ton) =
 \$21.09 + 6.89 = \$27.98/ SY USE: \$30 per SY

Assume this intersection will require a new signal at \$100,000

Assume this intersection will require a new, enhanced RR signal system at \$750,000

Reduction in roadway construction:

Loop ramp to tie into SR 30: 2,200 + 2,400 ft = 4,600 ft

4,600 ft x 32 ft = 147,200 SF = 16,350 SY

Reduced right-of-way: 4,600 x 100 ft wide = 460,000 sq ft = 10.56 acres

Right-of-Way Unit Costs (522200)

Use composite unit price for combination of residential, agricultural and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way = 1.55 x 1.60 x (1÷214.27) x
 [(3,500 x 47.7) + (1,000 x 145.8) + (110,000 x 21.0)] = \$30,356/acre

Residential/Agricultural/Commercial Easement (50% Right-of-Way) = \$15,178/acre

DEVELOPMENT AND RECOMMENDATION PHASE

**US 1 / SR 4 Corridor Improvements
PI No: 522200**

IDEA No.: B-4.1	PAGE No.: 1 of 5	CREATIVE IDEA: Eliminate bridges at SR 292
---------------------------	----------------------------	--

Comp By: GAO Date: 4/4/11 Checked By: DCW Date: 4/4/11

Original Concept:

Construct bridges to cross SR 292 due to proximity of new railroad bridges, about 800 feet.

Proposed Change:

Maximize the gradient on the northern approach to match the existing grade at SR 292 as quickly as feasible. This could require some construction on SR 292.

Justification:

The new bridges at SR 292 are proposed due to the proximity of SR 292 to the new railroad crossing, a distance of about 800 feet. Eliminating these bridges and reconstructing new pavement and earthwork on SR 292 will significantly reduce costs while providing the same function and eliminating costly bridges. It would provide an at-grade crossing, which is more direct connectivity between the 2 state routes. This would also eliminate the side loop ramp. Even if this intersection warrants a signal, the cost benefits are worthwhile.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	5,480,000		
- Proposed	2,695,000		
- Savings	2,785,000		2,785,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			2,785,000

SR 4 / US 1 Corridor Improvements
 PI No: 522200

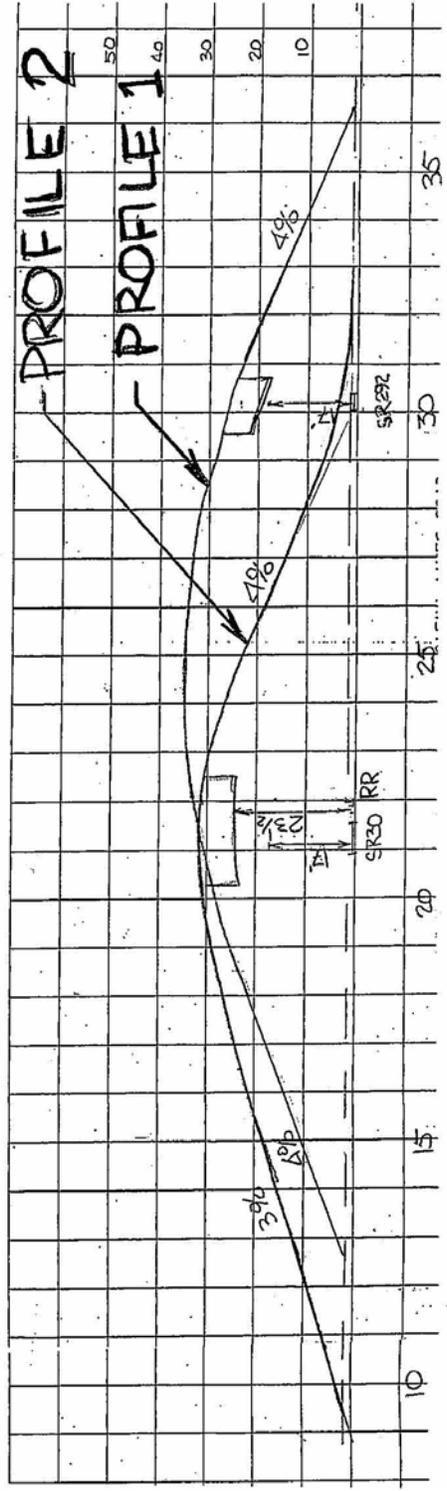
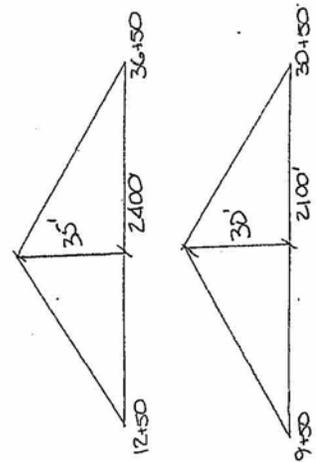
ITEM N^o: 4.1
 CLIENT: GDOT
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AREA 1 - CURRENT DESIGN (ASSUMED) - PROFILE 1

VOLUME = $2,400\text{ft} \times 35\text{ft} \times 140\text{ft WIDE}$
 $= 11,760,000\text{ft}^3 = 436,000\text{ CY}$

AREA 2 - RECOMMENDED DESIGN - PROFILE 2

VOLUME = $2,100\text{ft} \times 30\text{ft} \times 140\text{ft WIDE}$
 $= 8,820,000\text{ft}^3 = 327,000\text{ CY}$



CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: B-4.1
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Earthwork: see sketch

Bridge reduction: no bridges over SR 292
200 ft long x 41.3 ft wide x 2 bridges = 16,520 SF

Additional work required on SR 292; raise grade 5 feet to match new profile on mainline.
Earthwork; assume 400 ft long
400 ft x 5 ft x 60 ft wide = 120,000 CF = 4,500 CY

Roadway pavement construction:
400 ft x 32 ft = 12,800 SF = 1,422 SY

CURRENT DESIGN: Cost of asphalt mainline pavement: 6.25 in asphalt / 8 inch GAB

$$(6.25/12 \text{ ft}) \times (150 \text{ lb/CF}) \times (1 \text{ ton}/2,000 \text{ lb}) = 0.03906 \text{ ton/SF}$$

$$(8/12 \text{ ft}) \times (135 \text{ lb/CF}) \times (1 \text{ ton}/2,000 \text{ lb}) = 0.045 \text{ ton/SF}$$

Cost per SY:

$$(0.03906 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$60/\text{ton}) + (0.045 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$17/\text{ton}) = \\ \$21.09 + 6.89 = \$27.98/\text{SY} \quad \text{USE: } \$30 \text{ per SY}$$

Reduction in roadway construction:

Loop ramp pavement to tie into SR 30; 2,400 ft in length
2,400 ft x 32 ft = 76,800 SF = 8,533 SY

Reduce right-of-way 2,400 x 100 ft wide = 240,000 SF = 5.51 acres

Right-of-Way Unit Costs (522200)

Use composite unit price for combination of residential, agricultural and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way = $1.55 \times 1.60 \times (1 \div 214.27) \times$
 $[(3,500 \times 47.7) + (1,000 \times 145.8) + (110,000 \times 21.0)] = \$30,356/\text{acre}$

Residential/Agricultural/Commercial Easement (50% Right-of-Way) = \$15,178/acre

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522200

IDEA No.:	PAGE No.:	CREATIVE IDEA:
C-2	1 of 3	Reduce paved shoulder width from 6.5 feet to 4 feet

Comp By: SG Date: 4/7/11 Checked By: DCW Date: 4/7/11

Original Concept:

The original concept proposes 6.5' width paved shoulders.

Proposed Change:

The revised concept proposes 4' width paved shoulders.

Justification:

The purpose of the project is to increase capacity by providing additional through lanes. This can be accomplished with 4' paved shoulders. AASHTO guidelines do not mandate a required paved shoulder width. The unpaved shoulder width remains the same at 10 feet.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	175,000		
- Proposed	-0-		
- Savings	175,000		175,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			175,000

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: C-2
CLIENT: GDOT
Sheet 3 of 3

Assumed Pavement Section for Paved Shoulder – 1.5" 9.5mm, 2" 19mm, 6" GAB

Pavement Cost/ SY

9.5mm – (165 lb/SY) x (1 ton/2,000 lb) x (\$67.21/ton) = \$5.54

19mm – (220 lb/SY) x (1 ton/2,000 lb) x (\$57.90/ton) = \$6.37

6" GAB – (660 lb/SY) x (1 ton/2,000 lb) x (\$13.46/ton) = \$4.44

Total Cost = \$16.35/ SY

Area (Additional 2.5' Paved Shoulder) = $7.3 \times 5,280 \times 2.5 \div 9 = 10,707$ SY

Original Concept

Area (Additional 2.5' Paved Shoulder Width) = 10,707 SY

Revised Concept

Area (Additional 2.5' Paved Shoulder Width) = 0 SY

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522200

IDEA No.:	PAGE No.:	CREATIVE IDEA:
C-3	1 of 4	Reduce scope of work on side streets

Comp By: SSB Date: 4/6/11 Checked By: DCW Date: 4/6/11

Original Concept:

Side road lengths per concept layout.

Proposed Change:

Reduce side road lengths by tying in to existing sooner.

Justification:

Minimize cost by reducing side road lengths.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	175,000		
- Proposed	-0-		
- Savings	175,000		175,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			175,000

SKETCH

**SR 4 / US 1 Corridor Improvements
PI No: 522200**

ITEM N^o: C-3
CLIENT: GDOT
Sheet 2 of 4



CR 295

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: C-3
CLIENT: GDOT
Sheet 4 of 4

CR 295

Shorten by 1,000'

Pavement – $(1,000 \times 24) \div 9 = 2,667$ SY

Right-of-Way – $(1,000 \times 100) \div 43,560 = 2.3$ Ac

Embankment – $(240 \times 1,000) \div 27 = 8,889$ CY

Right-of-Way Unit Costs (522200)

Use composite unit price for combination of residential, agricultural and commercial right-of-way

Residential/Agricultural/Commercial Right-of-Way =

$1.55 \times 1.60 \times (1 \div 214.27) \times [(3,500 \times 47.7) + (1,000 \times 145.8) + (110,000 \times 21.0)] =$
\$30,356/acre

Pavement totals –

9.5mm – $(2,667 \times 165) \div 2,000 = 220$ TN

19mm – $(2,667 \times 330) \div 2,000 = 440$ TN

25mm – $(2,667 \times 440) \div 2,000 = 587$ TN

Tack Coat – $(2,667 \times 0.05) \times 3 = 400$ Gal

GAB - $(2,667 \times 100) \div 2,000 = 133$ TN

DEVELOPMENT AND RECOMMENDATION PHASE

**US 1 / SR 4 Corridor Improvements
PI No: 522200**

IDEA No.: C-5	PAGE No.: 1 of 4	CREATIVE IDEA: Use reduced depth pavement for the medians and turn lanes
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Comp By: GAO Date: 4/5/11 Checked By: DCW Date: 4/5/11

Original Concept:

Construct full depth pavement for the median openings and turn lanes.

Proposed Change:

Using practical design guidelines, construct reduced pavement thickness for the turn lanes and median areas.

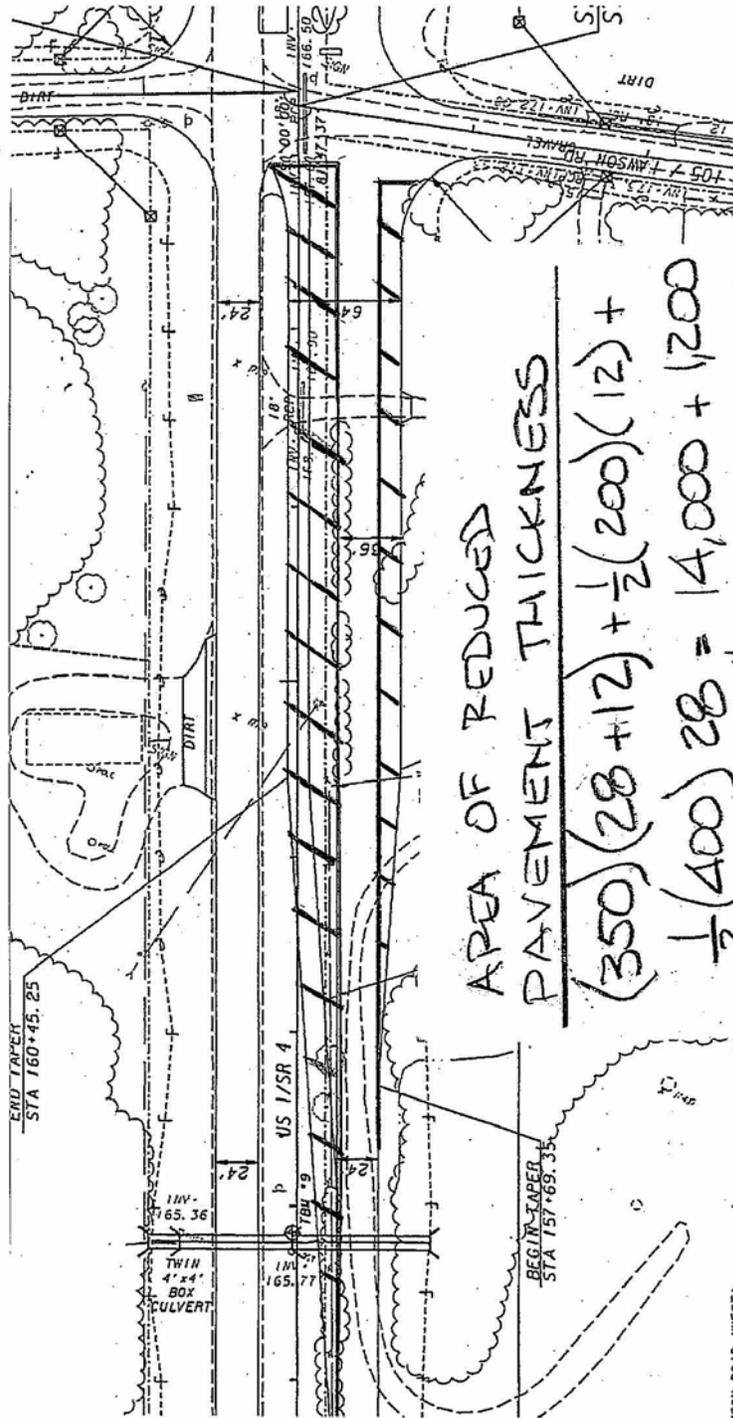
Justification:

Pavement design is usually dictated by traffic volumes on the mainline. This developed pavement section typically extends to the median area and turn lanes. However, there are significantly lower traffic volumes in the median and turn lanes, thereby allowing a reduced thickness pavement section. For the purposes of this recommendation, we assume a 33% reduction. Final traffic volumes and pavement design will dictate the actual numbers.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	324,000		
- Proposed	-0-		
- Savings	324,000		324,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			324,000

SR 4 / US 1 Corridor Improvements
 PI No: 522200

ITEM N^o: C-5
 CLIENT: GDOT
 Sheet 2 of 4



AREA OF REDUCED
 PAVEMENT THICKNESS

$$(350)(28+12) + \frac{1}{2}(200)(12) +$$

$$\frac{1}{2}(400)28 = 14,000 + 1,200$$

$$+ 5,600 = 20,800 \text{ ft}^2$$

$$= 2311 \text{ yd}^2$$

Typical Median Opening

CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: C-5
CLIENT: GDOT
Sheet 4 of 4

Current Design: Cost of asphalt mainline pavement: 6.25 in asphalt / 8 inch GAB

$$(6.25/12 \text{ ft}) \times (150 \text{ lb/CF}) \times (1 \text{ ton/ } 2,000 \text{ lb}) = 0.03906 \text{ ton/SF}$$

$$(8/12 \text{ ft}) \times (135 \text{ lb/CF}) \times (1 \text{ ton/ } 2,000 \text{ lb}) = 0.045 \text{ ton/ SF}$$

Cost per SY:

$$(0.03906 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$60/\text{ton}) + (0.045 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$17/\text{ton}) = \\ \$21.09 + 6.89 = \$27.98/\text{SY} \quad \text{USE: } \$30 \text{ per SY}$$

Assume 33% reduction: use \$20 per SY

Area of reduced pavement thickness; from sketch = 2,311 SY

For each median opening;

$$2 \text{ approaches} \times 2,311 \text{ SY} \times \$ (30 - 20) \text{ per SY} = \$46,220 \text{ per median opening}$$

Median Opening Locations

Old SR 4 / US 1 Tie-in
Lyons Center Road
Ezra Taylor Road / SR 30 Connector
Semco Drive / SR 292 Connector
McDilda Road
Old Normantown Road
Victory Cir.

DEVELOPMENT AND RECOMMENDATION PHASE

US 1 / SR 4 Corridor Improvements PI No: 522200

IDEA No.: C-6	PAGE No.: 1 of 4	CREATIVE IDEA: C-6 Realign the by-pass to utilize more of the existing pavement – south of Lyons
-------------------------	----------------------------	--

Comp By: GAO Date: 4/6/11 Checked By: DCW Date: 4/6/11

Original Concept:

Maintain the current by-pass alignment. In the area south of Lyons, the new alignment breaks away from the existing alignment in the vicinity of the beginning of the project.

Proposed Change:

Realign the by-pass alignment on the south of Lyons to follow the existing alignment longer, before breaking away; about 2,000 feet longer.

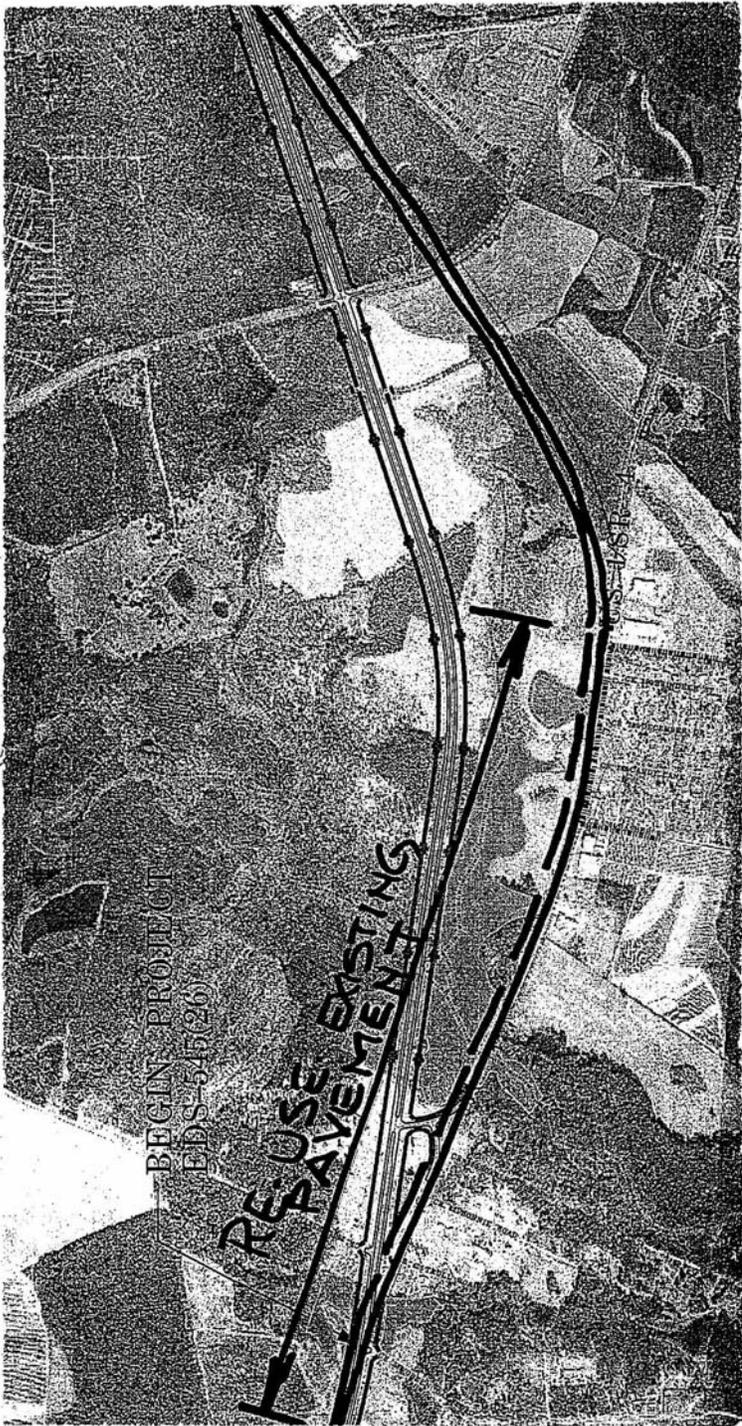
Justification:

Realigning the by-pass alignment will reduce construction costs and maintain the current design approach of existing pavement re-use, where feasible. The estimated distance is about 2,000 feet. Detailed topographic and environmental constraints will have to be identified prior to final layout, however there do not appear to be any critical issues at this phase. The realignment is relatively minor and any re-evaluation of the environmental document should not be affected.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	203,000		
- Proposed	-0-		
- Savings	203,000		203,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			203,000

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: C-6
CLIENT: GDOT
Sheet 2 of 4



CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: C-6
CLIENT: GDOT
Sheet 4 of 4

The basic difference between new roadway construction and re-using one of the roadways is full depth pavement vs. leveling and resurfacing for 24 ft width and the reduced right of way required.

Per LF calculation:

New pavement; 24 ft x 1 ft wide = 24 SF = 2.67 sq yds

CURRENT DESIGN: Cost of asphalt mainline pavement: 6.25 in asphalt / 8 inch GAB

$(6.25/12 \text{ ft}) (150 \text{ lb/CF}) (1 \text{ ton} / 2000 \text{ lb}) = 0.03906 \text{ ton/SF}$

$(8/12 \text{ ft}) (135 \text{ lb/CF}) (1 \text{ ton} / 2000 \text{ lb}) = 0.045 \text{ ton/SF}$

Cost per SY

$(0.03906 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$60 / \text{ton}) + (0.045 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$17 / \text{ton}) =$
 $\$ 21.09 + 6.89 = \$27.98 / \text{SY} \quad \text{USE: } \30 per SY

Per LF:

$2.67 \text{ SY/LF} \times \$30 = \$80 \text{ per LF}$

Leveling (assume 3 inches);

$(24 \text{ ft} \times 3/12 \times 1 \text{ ft}) \times 0.5 \times (150 \text{ lb/CF}) \times (1 \text{ Ton} / 2,000 \text{ lb}) = 0.225 \text{ Tons} / \text{LF}$
 $0.225 \times \$60 \text{ per Ton} = \13.5 per LF

Reduced Right of Way:

$2,000 \text{ ft} \times 100 \text{ ft wide} = 200,000 \text{ SF} = 4.6 \text{ acres}$

R/W Unit Costs (522200)

Use composite unit price for combination of residential, agricultural and commercial R/W

Residential/Agricultural/Commercial R/W =

$(1.55)(1.60)(1/214.27)[(3,500)(47.7)+(1,000)(145.8)+ (110,000)(21.0)] = \$30,356/\text{acre}$

Residential/Agricultural/Commercial Easement (50% R/W) = \$15,178/acre

DEVELOPMENT AND RECOMMENDATION PHASE

**US 1 / SR 4 Corridor Improvements
PI No: 522200**

IDEA No.: D-1	PAGE No. 1 of 4	CREATIVE IDEA: Reduce design speed to 55 mph
-------------------------	---------------------------	--

Comp By: GAO Date: 4/6/11 Checked By: DCW Date: 4/6/11

Original Concept:

Maintain the design speed at 65 mph; typical for a GRIP corridor.

Proposed Change:

Reduce the design speed to 55 mph.

Justification:

Reducing the design speed to 55 mph will allow the designers more flexibility to develop an economical and appropriate design. The most critical area is at the new bridges over SR 30, the railroad, and SR 292. Increasing the grades from 3% to 4 % will yield significant cost savings. The project to the north, PI 522130, has already implemented 55 mph for the design speed and this would represent a continuation of that through the bypass alignment. Additionally, savings and efficiencies can be realized in a narrower median, reduced right-of-way, and other design elements. Although these savings are not included in this analysis, they are addressed in other specific recommendations.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	508,000		
- Proposed	-0-		
- Savings	508,000		508,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			508,000

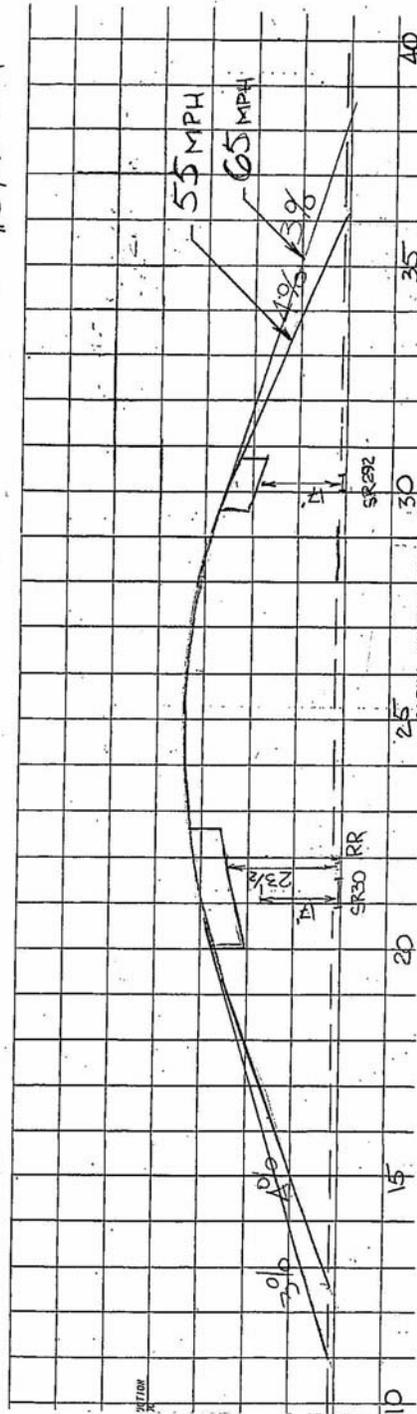
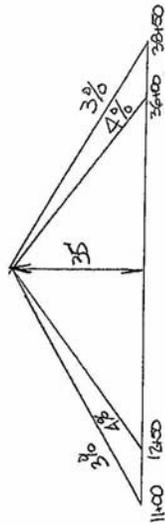
SR 4 / US 1 Corridor Improvements
 PI No: 522200

ITEM N^o: D-1
 CLIENT: GDOT
 Sheet 2 of 4

VOLUMES

$$\frac{3\% - (38+50) - (11+00) = 2750 \text{ ft}}{4\% - (36+00) - (12+50) = 2350 \text{ ft}}$$

$$\Delta = (2750 - 2350) 35 \text{ ft} \times 140 \text{ ft wide} = 400 \text{ ft}(35) 140 \text{ ft} = 1,960,000 \text{ ft}^3 = 72,600 \text{ cy}$$



CALCULATIONS

SR 4 / US 1 Corridor Improvements
PI No: 522200

ITEM N^o: D-1
CLIENT: GDOT
Sheet 4 of 4

Reduced earthwork:

From sketch – 72,600 CY

Approving/Authorizing Persons

Name:	Position:	Telephone:
Gerald Ross	Deputy Commissioner & Chief Engineer	404-631-1004
Michelle Wright	Program Delivery	912-271-7562
Brad Saxon	Preconstruction Engineer District 5	912-427-5715

Personal Contacts

Name:	Telephone:	Notes:
Brian Czech	912-654-2940	GDOT, District 5 Area Engineer
David Acree	404-631-1627	GDOT PM Roadway Design
Brad McManus	404-631-1630	GDOT, PM Roadway Design

Documents/Abstracts

Reference:	Reference:
Concept Reports and cost estimates	
AASHTO Roadside Design Guide 2006	
GDOT Design Policy Manual	
GDOT Item Mean Summary cost data	
GDOT Standard Detailed Drawings	

INFORMATION PHASE ----- FUNCTION ANALYSIS

US 1 / SR 4 Corridor Improvements

System: Improve Corridor
Function: Promote Economy

ITEM No.	DESCRIPTION	FUNCTION			INITIAL DOLLARS (x 1,000)		
		Verb	Noun	Kind*	Cost	% of Total	Worth
A	Right of Way	Store	Project	S	24,727	24	19,000
B	Structures	Cross	Obstacles	B	19,959	19	18,000
C	AC Pavement	Support	Vehicles	S	19,686	19	17,000
D	Unclassified Excavation	Achieve	Grade	B	10,027	10	9,000
		Provide	Drainage	S			
E	GAB	Support	Pavement	B	7,271	7	6,500
F	Clearing and Grubbing	Prepare	Site	S	4,447	4	4,000
TOTAL					86,117	83	73,500

* B = Basic, S = Secondary

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
US 1 / SR 4 Corridor Improvements			
NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
A	Right of Way (R/W)		
A-1	Reduce median width to 32 feet		√
A-1.1	Use 20 foot median with a median barrier	May not be economical for all projects	√
A-2	Reduce shoulder width	Not practical for the design speed	X
A-3	Use R/W to shoulder breakpoint and use easements beyond		√
A-4	Revise side slopes to reduce R/W	R/W not expensive; guardrail needed	X
A-5	Use alternate section for urban areas	Not sufficient urban area	X
B	Major Structures		
B-1	Reduce bridge width to 36 feet		√
B-2	Use culverts where possible	Not feasible, too much flow	X
B-3	Use MSE walls at RR crossing to shorten bridge		√
B-4	Eliminate bridges at SR 30 / RR and SR 292 and use an at-grade crossing		√
B-4.1	Eliminate bridges at SR 292		√
C	AC Pavement		
C-1	Reduce lane width	Design speed is too high	X

** √ = Idea will be evaluated; X = idea will be dropped; DC = Design Consideration – presented for consideration by the design team

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
US 1 / SR 4 Corridor Improvements			
NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
C-2	Reduce outside shoulder to 4 feet paved width		√
C-3	Reduce extent of side street work		√
C-4	Shorten left turn lanes	Not feasible	X
C-5	Reduce depth of pavement for medians and left turn lanes		√
C-6	Realign the bypass to utilize more existing pavement		√
D	Unclassified Excavation		
D-1	Reduce design speed to 55 mph		√
E	GAB		
E-1	Use alternate to GAB	Not economical	X

** √ = Idea will be evaluated; X = idea will be dropped; DC = Design Consideration – presented for consideration by the design team

VE STUDY SIGN-IN SHEET

Project No.: EDS00-0545-00(023)(024) County: Toombs PI No.: 522180, 522185, 522190 Date: April 4-7, 2011
 EDS00-0545-00(025)(026) & BHN00-0038-01(036)(037) 522200, 522220, 522225

Days		NAME	EMPLOYEE ID NO.	DOT OFFICE OR COMPANY	PHONE NUMBER	EMAIL ADDRESS
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<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Matt Sanders		Engineering Services	404-631-1752	msanders@dot.ga.gov
<input type="checkbox"/>	<input type="checkbox"/>					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ken Werho		Traffic Operations	404-635-8144	kwerho@dot.ga.gov
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ron Wishon		Engineering Services	404-631-1753	rwishon@dot.ga.gov
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Bill DuVall		Bridge Design	404-631-1883	bduvall@dot.ga.gov
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DAVID WOLFSCHIED		MACTEC	571-217-0808	d.wolfschied@mactec.com
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Steven Gaines		Wolverton + Assoc	678-405-3137	steven.gaines@wolverton-assoc.com
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<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	DAVID ACREE		Roadway Design	631-1627	ducree "
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ANGELI YOKARIS		ROADWAY DESIGN	631-1631	AYOKARIS "
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	JASON McCOOK		ROADWAY DESIGN	404-631-1606	JMcCook@dot.ga.gov
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	STANLEY HILL		Program Delivery	404-631-1560	sthill@dot.ga.gov
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Michael Hester		ENV. GDOT	404-631-1255	MHESTER@DOT.GA.GOV

Check all that attend

17 Attended Project Overview (Day 1)
3 VIA VIDEO Dist #5
20 TOTAL ATTENDEES

13 Attended Project Presentation (Day 4)
1 VIA VIDEO Dist #5
14 TOTAL ATTENDEES

