

VALUE ENGINEERING REPORT

US 278 / SR 12 Widening and Reconstructing

PI Nos. 231630 & 231635

Newton County

Project Nos: STP00-0046-01(029) & BHF00-0046-01(030)

April 6, 2009

OWNER:



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

VALUE ENGINEERING CONSULTANT:



MACTEC Engineering and Consulting, Inc.
3200 Town Point Drive NW, Suite 100
Kennesaw, GA 30144

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EXECUTIVE SUMMARY

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Newton County

Project Nos. STP00-0046-01(029) & BHF00-0046-01(030)

April 6, 2009

Introduction

This report summarizes the results of a value engineering (VE) study conducted on the upgrade and widening of US 278 / SR 12 including a roadway project and a bridge project. The total



estimated project cost for both projects includes an estimated 11% factor for E&C for the road project and 10% for the bridge project, and a fuel adjustment cost of \$2.5 million for the road project and \$0.34 million for the bridges. This results in a markup factor over the cost estimate base costs of 1.4378 for the road project and 1.1311 for the bridge project. Also included in the estimate is 0% for additional inflation and all right of way and utility costs. Right of way and utilities have no markup applied to the base costs. The total cost for both projects is

\$29.068 million. The project is functionally classified as an urban minor arterial west of the Alcovy River and a rural minor arterial east of the Alcovy River. Projected AADT (2026) is 55,000 from the current (2006) AADT of 39,600.

The project is located east of the City of Covington in Newton County approximately 35 miles east of Atlanta. These combined projects include the widening and reconstruction of US 278 / SR 12 from the Covington Bypass (CR 653) to SR 142 for a total of 2.50 miles. Currently, US 278 / SR 12 is a two lane rural roadway with a posted speed limit of 45 mph from the Covington Bypass to the Covington City limit and 55 mph from this point to SR 142. The 1997 accident rates for the urban section were below statewide averages, but the rural section rates were more than triple the statewide averages.

This effort included a four day study with a four person VE team on the 60% level design for the roadway portions of this project. The study was conducted on March 17-20, 2009 at the GDOT offices in Atlanta. The design team included GDOT District 2 personnel.

This report presents the VE 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. Lastly, the **Appendix** includes a complete record of the VE Team's activities and findings as well as the meeting attendees sign in sheet. The reader is encouraged to review all sections of the report in order to obtain a complete understanding of the VE process.



Considerations

During the presentation by the design team on the project overview, the VE Team was alerted to the stakeholder's constraints on this project which include:

- ◆ The Environmental document has been submitted and approved.
- ◆ There is one historic property located in the vicinity of the project that will be avoided.
- ◆ There are numerous churches located along the route with property that should be avoided if possible.
- ◆ Revised traffic patterns have resulted in the main flow along US 278 and not SR 142 as originally designed for.

Results Obtained

The VE Team generated 13 ideas and presented 11 recommendations for consideration by GDOT. The recommendations involve: Convert portions of the ROW to permanent easements; reduce lane and median widths; reduce bridge width and length; reconfigure the intersection of US 278 and SR142 due to traffic changes; and reduce paved shoulder widths.

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 \$5.952 million capital cost savings while continuing to provide the required functionality. This is shown in the last column of the Summary Table that follows the summary description below.

A brief presentation of these recommendations was conducted on March 20th , with the following in attendance: Douglas Fadool from GDOT Engineering Services, District 2 personnel via video teleconference including Foster Grimes, Larry Morris, and Alan Smith, and the VE Team: Dave Wohlscheid, Stephen Gaines, Greg Grant and Dan Cogan.

Recommendation Highlights

A-1 Convert portions of the ROW to permanent easements

This concept includes new ROW acquisition from the shoulder break to the property line. The cost of permanent easement is about 60% of the acquisition cost and would allow access for slope mowing and maintenance.

Potential savings if implemented is \$1,123,000

A-2 Reduce median width from 44 feet to 32 feet retaining the depressed median

This idea tightens up the median width at a significant savings in earthwork and right of way.

Potential savings is \$608,200

A-3 Reduce median width from 44 to 24 feet with a raised median

This is similar to A-2 only increased costs result from curb and gutter and earthwork, which is partially offset by additional savings in right of way.

Potential savings amounts to \$392,000

B-1 Reduce bridge #1 width from 38 feet to 36 feet

The proposed change complies with the current GDOT policy for multilane rural divided roadways reducing the outside shoulder width by two feet.

Savings is estimated at \$243,000

B-2 Reduce bridge #1 length by 80 feet

This concept eliminates two 40 foot spans from the west side of the bridge. It appears from review of the hydraulic report this will still meet the design criteria creating a backwater equal to 1.00 feet.

Estimated potential savings is \$568,000

B-3 Reduce bridge #1 width and length as described above

Combining B-1 and B-2 results in the potential savings shown here. The original ideas have some overlapping items and therefore cannot be directly added.

Estimated savings for the two items \$783,000

C-1 Maintain US 278 / SR 12 @ SR 142 configuration and tie US 278 / SR 12 in sooner
Referring to the proposed layout, it appears the revised location may be feasible and would substantially reduce required pavement.

Potential savings is \$2,190,000

C-2 Reconfigure intersection of US 278 @ SR 142

Based on revised traffic projections it appears the current major traffic flow is along the US 278 / SR 12 route in lieu of the SR 142 route. This concept revises this intersection based on this information and is an alternate to that proposed in C-1.

Savings is estimated at \$2,758,000

C-3 Reduce lane widths from 12 to 11 feet

Considering the urban development that is influencing this project, this idea may prove feasible, especially in the 45 mph portion of the project. It has been accepted in many other urban projects with low truck use projections and saves right of way, drainage, pavement and other associated items.

Potential savings for the entire project length is \$1,000,000

C-4 Reduce the paved portion of the outside shoulder width from 6.5 to 2.0 feet

This concept evaluates the shoulder use in this almost urban type setting. It is proposed to reduce the paved width to allow pavement edge protection as well as the minimum wandering recommendation by AASHTO and allow the grassed portion to serve as the pull off area in an emergency.

Potential savings is \$354,900

D-1 Reduce the bridge width for bridge #2 over the Alcovy River

This proposal is similar to item B-1 where the width is reduced 2 feet to conform to current GDOT standards.

Estimated savings is \$131,000

US 278 / SR 12 Widening and Reconstruction
Project Nos. STP00-0046-01(029) & BHF00-0046-01(030)
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
A	Right of Way						
A-1	Convert portions of ROW takes to permanent easements	2,807,000	1,684,000	1,123,000	-0-	1,123,000	700,000
A-2	Reduce median width from 44 feet to 32 feet retaining the depressed median	608,200	-0-	608,200	-0-	608,200	500,000
A-3	Reduce median width from 44 feet to 24 feet using a raised grassed median	855,000	463,000	392,000	-0-	392,000	-0-
B	Bridge # 1 – Alcovy River Overflow						
B-1	Reduce the bridge width from 38 to 36 feet	5,463,000	5,220,000	243,000	-0-	243,000	-0-
B-2	Reduce the bridge length from 680 to 600 feet	5,463,000	4,895,000	568,000	-0-	568,000	-0-
B-3	Reduce the bridge length and width as described in B-1 and B-2	5,463,000	4,680,000	783,000	-0-	783,000	783,000

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C	AC Pavement						
C-1	Maintain US 278 / SR 12@SR 142 configuration and tie US 278/SR 12 in sooner	3,173,000	983,000	2,190,000	-0-	2,190,000	-0-
C-2	Reconfigure intersection at US 278 @ SR 142	3,452,000	694,000	2,758,000	-0-	2,758,000	2,758,000
C-3	Reduce lane widths from 12 to 11 feet	1,000,000	-0-	1,000,000	-0-	1,000,000	800,000
C-4	Reduce paved portion of outside shoulder width from 6.5 to 2.0 feet	354,900	-0-	354,900	-0-	354,900	280,000
D	Bridge #2 – Alcovy River						
D-1	Reduce bridge width from 38 to 36 feet	2,908,000	2,777,000	131,000	-0-	131,000	131,000
	TOTAL POTENTIAL SAVINGS						\$5,952,000

STUDY IDENTIFICATION

STUDY IDENTIFICATION

US 278 / SR 12 Widening	Dates: March 17-20, 2009
Location: GDOT HQ - Atlanta	

VE Team Members

Name:	Discipline:	Organization:	Telephone:
David Wohlscheid	VE Team Leader	MACTEC	703-471-8383
Stephen Gaines	Highway Design	Wolverton & Associates	770-447-8999
Greg Grant	Structural	Wolverton & Associates	770-447-8999
Dan Cogan	Highway Construction	KEA Group	404-290-6424

Project Description

This value engineering effort included a four day study on the concept level design for this widening and reconstruction project which includes the roadway and two bridges.

The total estimated project cost for both projects includes an estimated 11% factor for E&C for the road project and 10% for the bridge project, and a fuel adjustment cost of \$2.5 million for the road project and \$0.34 million for the bridges. This results in a markup factor over the cost estimate base costs of 1.4378 for the road project and 1.1311 for the bridge project. Also included in the estimate is 0% for additional inflation and all right of way and utility costs. Right of way and utilities have no markup applied to the base costs. The total cost for both projects is \$29.068 million. The project is functionally classified as an urban minor arterial west of the Alcovy River and a rural minor arterial east of the Alcovy River. Projected AADT (2026) is 55,000 from the current (2006) AADT of 39,600.



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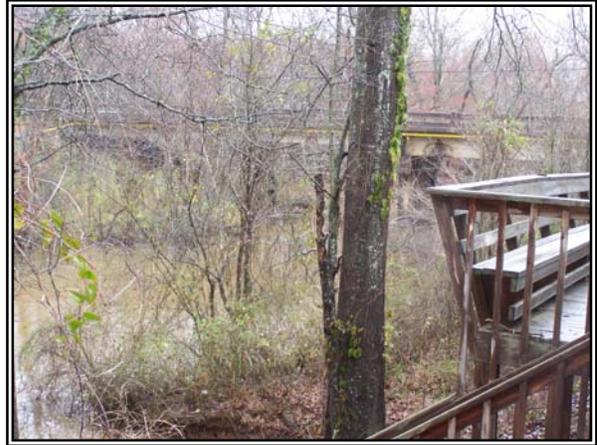
from this point to SR 142. The 1997 accident rates for the urban section were below statewide averages, but the rural section rates were more than triple the statewide averages.

The proposed construction will widen US 278 / SR 12 to furnish four 12 foot lanes separated by a 44 foot depressed median with 12 foot outside shoulders (6.5 feet paved), 4 foot inside shoulders (2 feet paved) and turn lanes as required. The design speed will vary from 45 to 55 mph as in the existing project conditions. Two new bridges will be constructed over the Alcovy River and Alcovy River Overflow to accommodate the new lanes. The existing bridges over the Alcovy River and Alcovy River Overflow have sufficiency ratings in the 50s and will also be replaced. Traffic will be maintained via staging during construction.

A COE 404 permit will be required for this project and a Categorical Exclusion will be prepared.

Please refer to the Cost Distribution Models contained in the Appendix for a breakdown of the estimate for this project.

The VE study was conducted on March 17-20, 2009 at the GDOT offices in Atlanta using a four person VE team. The design team included GDOT District 2 personnel.



Kick off Meeting/Design Presentation

In addition to the VE Team, the following personnel attended this meeting which was held at the outset of the VE study:

Lisa Myers	GDOT Engineering Services
Doug Fadool	GDOT Engineering Services
James Magnus	GDOT Construction
Ken Werho	GDOT Traffic Operations
Jack Muirhead	GDOT Bridge Design
Via Teleconferencing:	
Foster Grimes	District 2 Project Manager
Larry Morris	District 2 Design Engineer 1
Alan Smith	District 2 Design Engineer
George Brewer	District 2 Preconstruction Engineer

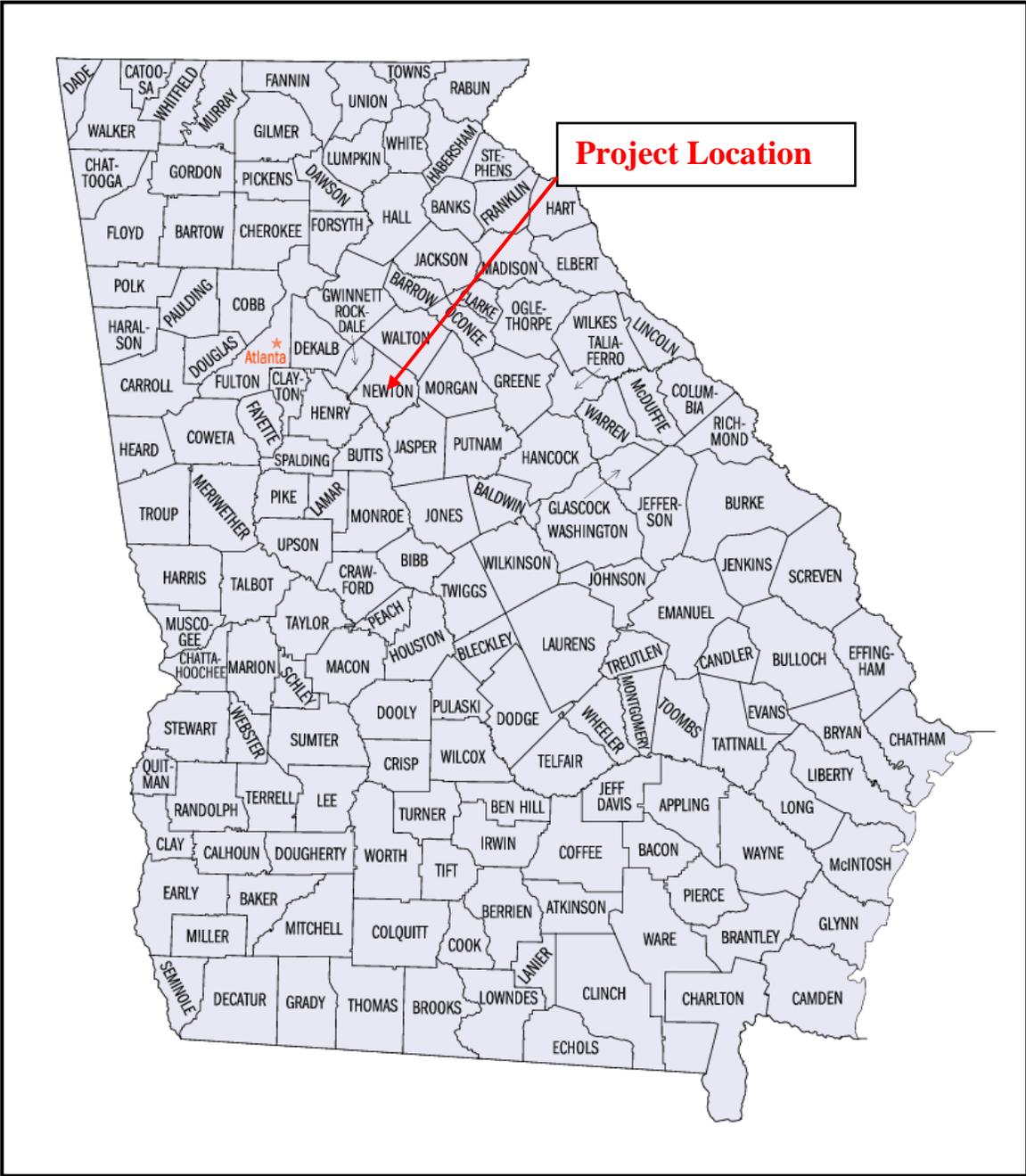
The VE Team appreciated the project overview given by Foster Grimes. Highlights included:

- There are two (2) existing traffic signals that will be upgraded for this project. A 44 foot depressed median will be used.
- 12 foot lanes are provided throughout as well as 14 foot shoulders.
- Mason Drive at River Bend Road will be relocated to improve the intersection.
- All four bridges (two new and two replacements) are 38 feet wide.

- East of the Alcovy River bridge an existing traffic signal will be relocated to the relocated intersection with Elks Club Road.
- The environmental document has been approved for this project.
- There is one historic property in the project vicinity; however, it is not impacted by the current project design.
- There are wetlands within the project limits at sta. 105+00.

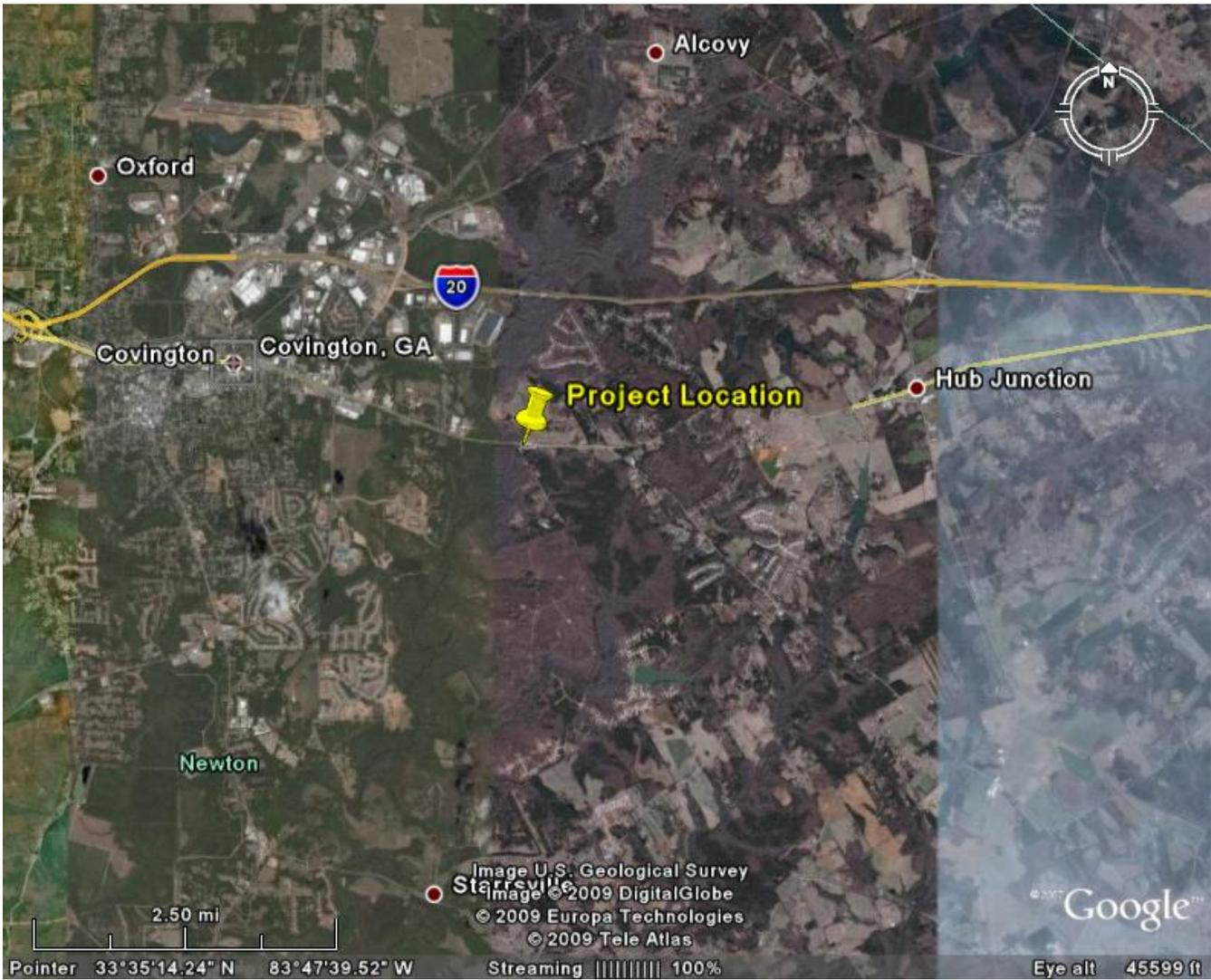
The following displays represent the project vicinity and location maps, plan views and project cost information used in this VE effort to present a more complete project overview.

Figure 1
Project Vicinity Map



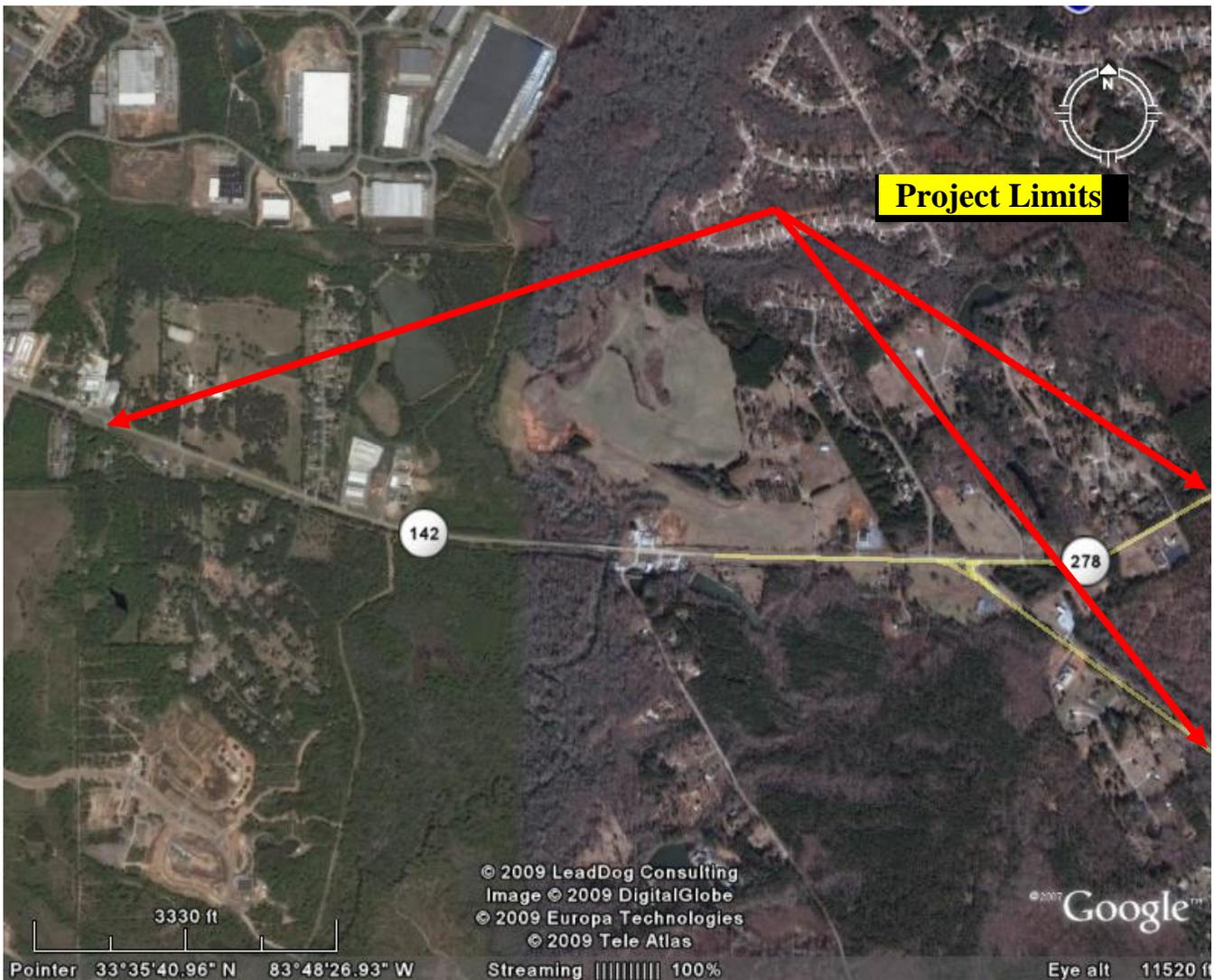
County Map of Georgia

Figure 2
Project Location Map

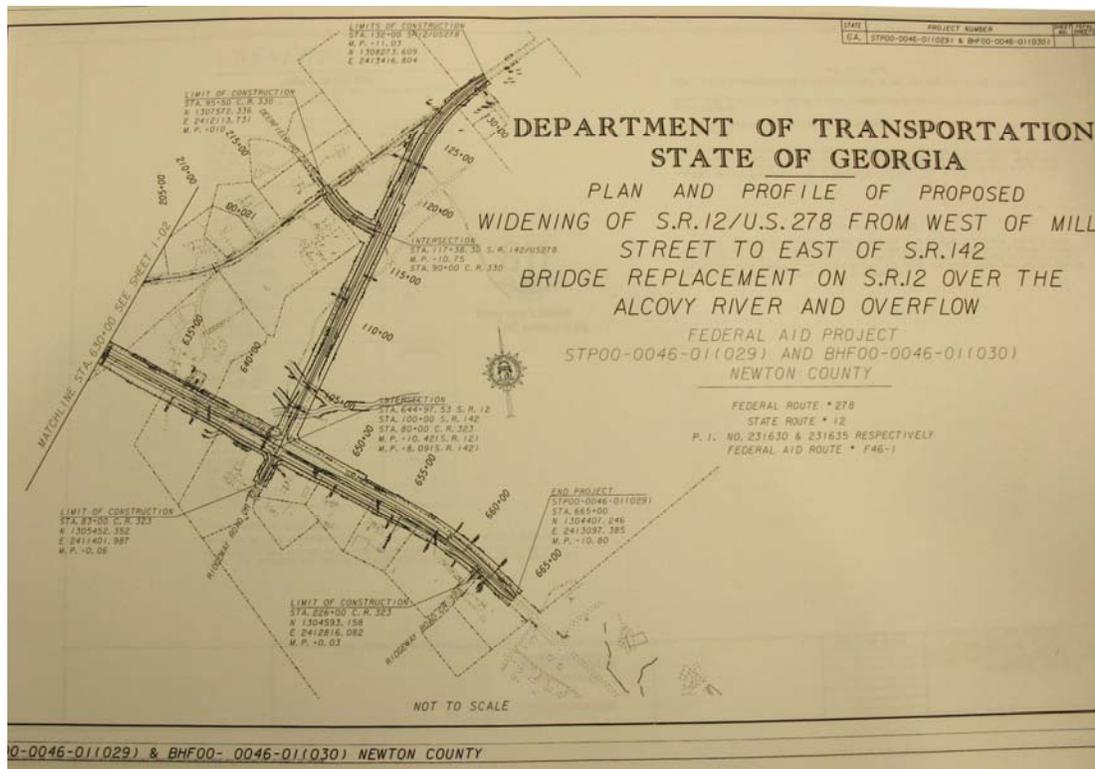
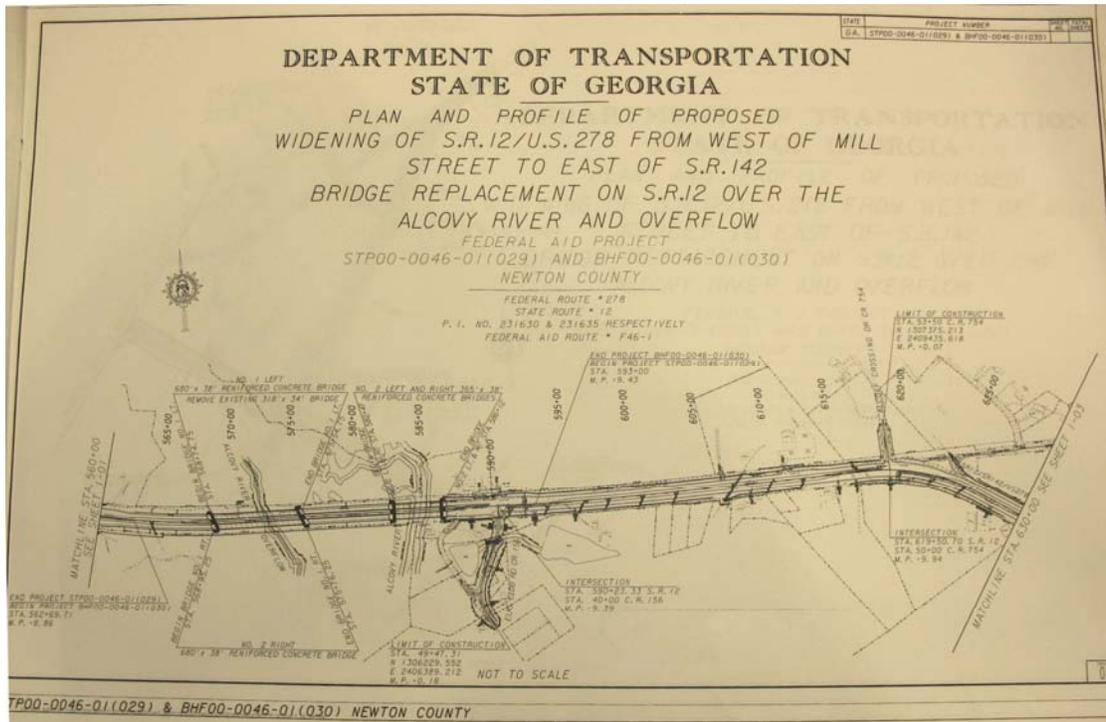


**Figure 3
Project Limits**

US 278 / SR 12



**Figure 4
Project Plan**



Estimate Report for file "STP00-0046-01(029)NEWTON_2009-02-18"

Section ROADWAY					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LUMP	81500.00	TRAFFIC CONTROL - STP-046-1(29)	81500.00
153-1300	1	EA	70578.50	FIELD ENGINEERS OFFICE TP 3	70578.50
201-1500	1	LUMP	343000.00	CLEARING AND GRUBBING - STP-046-1(29)	343000.00
205-0001	143000	CY	2.91	UNCLASS EXCAV	416130.00
206-0002	80300	CY	5.43	BORROW EXCAV, INCL MATL	436029.00
310-1201	63651	TN	23.00	GR AGGR SUBBASE CRS, INCL MATL	1463973.00
318-3000	5000	TN	21.01	AGGR SURF CRS	105050.00
402-1812	3000	TN	69.41	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	208230.00
402-3112	14079	TN	75.00	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	1055925.00
402-3121	21043	TN	59.90	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	1260475.70
402-4510	10768	TN	66.98	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL POLYMER-MODIFIED BITUM MATL & H LIME	721240.64
413-1000	13801	GL	2.13	BITUM TACK COAT	29396.13
500-3800	500	CY	630.66	CLASS A CONCRETE, INCL REINF STEEL	315330.00
550-1180	2271	LF	39.05	STORM DRAIN PIPE, 18 IN, H 1-10	88682.55
550-1240	574	LF	46.58	STORM DRAIN PIPE, 24 IN, H 1-10	26736.92
550-1360	253	LF	68.77	STORM DRAIN PIPE, 36 IN, H 1-10	17398.81
550-1480	186	LF	106.56	STORM DRAIN PIPE, 48 IN, H 1-10	19820.16
550-2180	1151	LF	32.35	SIDE DRAIN PIPE, 18 IN, H 1-10	37234.85
550-2240	399	LF	35.29	SIDE DRAIN PIPE, 24 IN, H 1-10	14080.71
550-3618	56	EA	544.70	SAFETY END SECTION 18 IN, SIDE DRAIN, 6:1 SLOPE	30503.20
550-3624	18	EA	813.88	SAFETY END SECTION 24 IN, SIDE DRAIN, 6:1 SLOPE	14649.84
550-3636	8	EA	2999.00	SAFETY END SECTION 36 IN, SIDE DRAIN, 6:1 SLOPE	23992.00
550-4118	27	EA	413.69	FLARED END SECTION 18 IN, SIDE DRAIN	11169.63
550-4124	6	EA	530.00	FLARED END SECTION 24 IN, SIDE DRAIN	3180.00
550-4218	10	EA	616.11	FLARED END SECTION 18 IN, STORM DRAIN	6161.10
550-4224	4	EA	744.82	FLARED END SECTION 24 IN, STORM DRAIN	2979.28
550-4236	2	EA	1094.13	FLARED END SECTION 36 IN, STORM DRAIN	2188.26
550-4236	4	EA	1094.13	FLARED END SECTION 36 IN, STORM DRAIN	4376.52
550-4242	2	EA	1362.13	FLARED END SECTION 42 IN, STORM DRAIN	2724.26
573-2006	5000	LF	15.97	UNDDR PIPE INCL DRAINAGE AGGR, 6 IN	79850.00
634-1200	107	EA	99.08	RIGHT OF WAY MARKERS	10601.56
641-1200	370	LF	17.60	GUARDRAIL, TP W	6512.00
641-5001	1	EA	665.08	GUARDRAIL ANCHORAGE, TP 1	665.08
654-1001	85	EA	3.06	RAISED PVMT MARKERS TP 1	260.10
654-1003	500	EA	3.26	RAISED PVMT MARKERS TP 3	1630.00
668-2100	40	EA	2425.77	DROP INLET, GP 1	97030.80
668-2110	20	LF	253.80	DROP INLET, GP 1, ADDL DEPTH	5076.00
668-5000	8	EA	1901.62	JUNCTION BOX	15212.96
Section Sub Total:					\$7,029,574.56

Section EROSION CONTROL					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0240	1260	TN	172.38	MULCH	217198.80
603-2018	950	SY	40.42	STN DUMPED RIP RAP, TP 1, 18 IN	38399.00
603-7000	950	SY	4.43	PLASTIC FILTER FABRIC	4208.50
700-6910	70	AC	825.66	PERMANENT GRASSING	57796.20
700-7000	140	TN	63.09	AGRICULTURAL LIME	8832.60
700-7010	175	GL	21.49	LIQUID LIME	3760.75
700-8000	115	TN	384.56	FERTILIZER MIXED GRADE	44224.40
700-8100	4050	LB	2.30	FERTILIZER NITROGEN CONTENT	9315.00
715-2100	3000	SY	2.03	BITUMINOUS TREATED ROVING, SLOPES	6090.00
716-2000	33182	SY	0.96	EROSION CONTROL MATS, SLOPES	31854.72
Section Sub Total:					\$421,679.97

Section Temporary Erosion Control					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	210	AC	385.22	TEMPORARY GRASSING	80896.20
163-0300	22	EA	1234.88	CONSTRUCTION EXIT	27167.36
163-0503	43	EA	451.42	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 3	19411.06
163-0520	1000	LF	14.72	CONSTRUCT AND REMOVE TEMPORARY PIPE SLOPE DRAIN	14720.00
163-0522	775	EA	94.19	CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS - TYPE A SILT FENCE	72997.25
163-0530	1000	LF	2.69	CONSTRUCT AND REMOVE BALED STRAW EROSION CHECK	2690.00
163-0550	28	EA	206.02	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	5768.56
165-0030	7000	LF	0.78	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	5460.00
165-0040	775	EA	57.20	MAINTENANCE OF EROSION CONTROL CHECKDAMS/DITCH CHECKS	44330.00
165-0070	9000	LF	2.22	MAINTENANCE OF BALED STRAW EROSION CHECK	19980.00
165-0071	500	LF	0.73	MAINTENANCE OF SEDIMENT BARRIER - BALED STRAW	365.00
165-0101	22	EA	511.06	MAINTENANCE OF CONSTRUCTION EXIT	11243.32
167-1000	2	EA	597.96	WATER QUALITY MONITORING AND SAMPLING	1195.92
167-1500	18	MO	655.95	WATER QUALITY INSPECTIONS	11807.10
171-0030	14000	LF	3.46	TEMPORARY SILT FENCE, TYPE C	48440.00
Section Sub Total:					\$366,471.77

Section TRAFFIC SIGNS AND MARKINGS					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
636-1029	280	SF	14.67	HIGHWAY SIGNS, TP 2 MATL, REFL SHEETING, TP 3	4107.60
636-1033	620	SF	20.20	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	12524.00
636-2070	1270	LF	9.14	GALV STEEL POSTS, TP 7	11607.80
652-2501	3	LM	333.70	SOLID TRAFFIC STRIPE, 5 IN, WHITE	1001.10
652-2502	3	LM	324.59	SOLID TRAFFIC STRIPE, 5 IN, YELLOW	973.77
652-6501	440	GLF	0.10	SKIP TRAFFIC STRIPE, 5 IN, WHITE	44.00
653-0120	52	EA	73.08	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	3800.16
653-0170	3	EA	87.22	THERMOPLASTIC PVMT MARKING, ARROW, TP 7	261.66
653-1704	320	LF	3.48	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	1113.60
653-1804	687	LF	1.70	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	1167.90
653-2501	5	LM	1268.08	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	6340.40
653-2502	4	LM	1260.45	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	5041.80
653-4501	5	GLM	748.56	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	3742.80
653-6004	5943	SY	2.77	THERMOPLASTIC TRAF STRIPING, WHITE	16462.11
653-6006	1845	SY	2.69	THERMOPLASTIC TRAF STRIPING, YELLOW	4963.05
654-1001	85	EA	3.06	RAISED PVMT MARKERS TP 1	260.10
654-1003	500	EA	3.26	RAISED PVMT MARKERS TP 3	1630.00
Section Sub Total:					\$75,041.85

Total Estimated Cost: \$7,892,768.15

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE STP-046-1 (29) - Newton County
PI No. - 231630

OFFICE: Tennille Utilities

DATE: February 13, 2002

FROM ^{JFH/DAS} James F. Hobby, Jr., District Utilities Engineer

TO David Griffith, District Preconstruction Engineer
Attention: George Brewer

SUBJECT UTILITY COST ESTIMATE

Attached is a Utility Cost Estimate that has been completed on the above referenced project. The estimate was done by Alan Smith of this office and is based on concept drawings provided by your office, dated February 12, 2002 and an on-site inspection performed on February 12, 2002. Unit costs are based on the "mean item summary" and former "force account agreements".

All of the above information is an estimate and may be revised when project plans are developed and prior rights research has been performed. If you should have questions, please contact Alan Smith in the Utilities Section of this office at 478-552-4637.

JFH:DAS

cc: Jeff Baker / Scott Greene via e-mail

Herman Griffin

Debbie Pennington

UTILITY COST ESTIMATE				
PROJECT #	COUNTY	PROJECT DESCRIPTION	P.I. NUMBER	LAYOUT DATE
STP-046-1 (29)	NEWTON	US 278 FM SR 142 SOUTH TO SR 142 NORTH	231630	12-Feb-02
QUANTITY	UNITS	ITEM DESCRIPTION	UNIT PRICE	TOTAL
		POWER		
		CITY OF COVINGTON		
50	EACH	RELOCATE 3 PHASE POWER LINE & POLES	\$2,500.00	\$125,000.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
		WATER		\$125,000.00
		CITY OF COVINGTON		
13200	LIN FT	RELOCATE 6" TRANSITE WATER MAIN (USE DUCTILE IRON)	\$19.00	\$250,800.00
1200	LIN FT	RELOCATE EXISTING 12" D.I. WATER MAIN	\$26.00	\$31,200.00
10	EACH	RELOCATE FIRE HYDRANT	\$1,550.00	\$15,500.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
		SEWER		\$297,500.00
		CITY OF COVINGTON		
2110	LIN FT	RELOCATE 8" PVC SANITARY SEWER MAIN	\$19.00	\$40,090.00
10	EACH	SANITARY SEWER MANHOLES	\$1,600.00	\$16,000.00
120	LIN FT	EXTEND CASING FOR 15" SANITARY SEWER CROSSING	\$138.00	\$16,560.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
		TELEPHONE		\$72,650.00
		AT&T		
80	EACH	EXTEND CASING FOR AT&T TELEPHONE CROSSING	\$138.00	\$11,040.00
		See Note # 1		\$0.00
		See Note # 2		\$0.00
				\$0.00
				\$11,040.00

		GAS			
		CITY OF COVINGTON			
13200	LIN FT	RELOCATE 4" HPS GAS MAIN	\$19.00		\$250,800.00
3	EACH	HOT TAPS	\$5,000.00		\$15,000.00
4	EACH	GAS REGULATOR STATIONS	\$3,000.00		\$12,000.00
					\$0.00
					\$0.00
		RAILROAD			\$277,800.00
		NONE			
					\$0.00
					\$0.00
					\$0.00
					\$0.00
		CATV			\$0.00
		CITY OF COVINGTON			
50	EACH	RELOCATE AERIAL CATV TO NEW POWER POLES	\$450.00		\$22,500.00
					\$0.00
					\$0.00
					\$0.00
					\$0.00
					\$22,500.00
TOTAL ESTIMATED UTILITY COSTS					\$806,490.00
Estimate Prepared By: Alan Smith - Assistant District Utilities Engineer			Date: 13-Feb-02		

Note # 1: At&T has a building located on S.R. 142 South that is currently being shown as impacted by the required Right of Way. Gene Guerran with AT&T has provided a preliminary estimate of \$1,000,000.00 to relocate these facilities. This office recommends that this building be avoided due to the extensive costs involved.

Note # 2: BellSouth has facilities located on the existing Right of Way within the project limits that should not be considered eligible for reimbursement.

The Information above is an estimate and may change as project plans develop and prior rights research has been performed.

Unit Costs are based on former "Force Account Agreements" and the Department of Transportation's "Mean Item Summary".

Newton County Land Sales

<u>Highest & Best Use</u>	<u>Size (Acres)</u>	<u>Value/Acre</u>	<u>Sales Price</u>
Commercial	1.15	\$ 28,261	\$ 32,500
	0.63	\$ 55,079	\$ 34,700
	2.50	\$ 18,000	\$ 45,000
	0.97	\$ 26,289	\$ 25,500
Residential	1.041	\$ 132,084	\$ 137,500
	1.065	\$ 197,183	\$ 210,000
	1.098	\$ 194,899	\$ 214,000
	2.001	\$ 200,000	\$ 400,200

Estimate Report for file "BHF00-0046-01(030) NEWTON COUNTY 2008-11-24"

Section 1. ROADWAY					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LUMP	18500.00	TRAFFIC CONTROL - BHF-046-1(30)	18500.00
201-1500	1	LUMP	57000.00	CLEARING AND GRUBBING - BHF-046-1(30)	57000.00
310-1101	9100	TN	18.55	GR AGGR BASE CRS, INCL MATL	168805.00
318-3000	500	TN	22.59	AGGR SURF CRS	11295.00
402-1812	350	TN	70.77	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	24769.50
402-3121	2660	TN	61.97	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	164840.20
402-3130	1600	TN	66.31	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME	106096.00
402-3190	2150	TN	65.71	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	141276.50
413-1000	1100	GL	2.21	BITUM TACK COAT	2431.00
433-1200	1050	SY	169.43	REINF CONC APPROACH SLAB, INCL SLOPED EDGE	177901.50
441-0301	8	EA	2007.02	CONC SPILLWAY, TP 1	16056.16
500-3800	500	CY	744.34	CLASS A CONCRETE, INCL REINF STEEL	372170.00
550-1180	1000	LF	35.19	STORM DRAIN PIPE, 18 IN, H 1-10	35190.00
550-4218	10	EA	626.69	FLARED END SECTION 18 IN, STORM DRAIN	6266.90
573-2006	1000	LF	12.81	UNDDR PIPE INCL DRAINAGE AGGR, 6 IN	12810.00
634-1200	33	EA	102.33	RIGHT OF WAY MARKERS	3376.89
641-1100	344	LF	48.72	GUARDRAIL, TP T	16759.68
641-1200	4550	LF	16.80	GUARDRAIL, TP W	76440.00
641-5001	1	EA	647.99	GUARDRAIL ANCHORAGE, TP 1	647.99
641-5012	6	EA	1814.87	GUARDRAIL ANCHORAGE, TP 12	10889.22
654-1001	100	EA	3.23	RAISED PVMT MARKERS TP 1	323.00
654-1003	40	EA	3.64	RAISED PVMT MARKERS TP 3	145.60
668-2100	4	EA	2385.97	DROP INLET, GP 1	9543.88
Section Sub Total:					\$1,433,534.02

Section 2. EROSION CONTROL					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0240	216	TN	187.05	MULCH	40402.80
603-2181	1875	SY	32.01	STN DUMPED RIP RAP, TP 3, 18 IN	60018.75
603-7000	1875	SY	5.30	PLASTIC FILTER FABRIC	9937.50
700-6910	12	AC	894.09	PERMANENT GRASSING	10729.08
700-7000	24	TN	67.32	AGRICULTURAL LIME	1615.68
700-7010	30	GL	20.46	LIQUID LIME	613.80
700-8000	20	TN	387.15	FERTILIZER MIXED GRADE	7743.00
700-8100	600	LB	2.46	FERTILIZER NITROGEN CONTENT	1476.00

716-2000	8500	SY	0.89	EROSION CONTROL MATS, SLOPES	7565.00
Section Sub Total:					\$140,101.61

Section 3. TEMPORARY EROSION CONTROL

Item Number	Quantity	Units	Unit Price	Item Description	Cost
163-0232	36	AC	483.29	TEMPORARY GRASSING	17398.44
163-0300	6	EA	1499.05	CONSTRUCTION EXIT	8994.30
163-0530	2500	LF	3.60	CONSTRUCT AND REMOVE BALED STRAW EROSION CHECK	9000.00
165-0010	1500	LF	0.86	MAINTENANCE OF TEMPORARY SILT FENCE, TP A	1290.00
165-0030	1250	LF	0.97	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	1212.50
165-0070	1250	LF	1.76	MAINTENANCE OF BALED STRAW EROSION CHECK	2200.00
165-0101	6	EA	493.20	MAINTENANCE OF CONSTRUCTION EXIT	2959.20
167-1000	2	EA	752.60	WATER QUALITY MONITORING AND SAMPLING	1505.20
167-1500	18	MO	871.69	WATER QUALITY INSPECTIONS	15690.42
171-0010	3000	LF	2.66	TEMPORARY SILT FENCE, TYPE A	7980.00
171-0030	2500	LF	3.78	TEMPORARY SILT FENCE, TYPE C	9450.00
715-2100	7000	SY	1.61	BITUMINOUS TREATED ROVING, SLOPES	11270.00
Section Sub Total:					\$88,950.06

Section 4. TRAFFIC SIGNS AND MARKINGS

Item Number	Quantity	Units	Unit Price	Item Description	Cost
647-1000	1	LS	48257.06	TRAFFIC SIGNAL INSTALLATION NO -	48257.06
653-1501	7000	LF	0.45	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	3150.00
653-1502	7000	LF	0.45	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	3150.00
653-1704	50	LF	3.53	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	176.50
653-3501	4000	GLF	0.31	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	1240.00
653-6004	957	SY	2.79	THERMOPLASTIC TRAF STRIPING, WHITE	2670.03
657-1054	1045	LF	4.23	PREFORMED PLASTIC SOLID PVMT MKG, 5 IN, WHITE, TP PB	4420.35
657-3054	1045	GLF	2.39	PREFORMED PLASTIC SKIP PVMT MKG, 5 IN, WHITE, TP PB	2497.55
657-6054	1045	LF	4.24	PREFORMED PLASTIC SOLID PVMT MKG, 5 IN, YELLOW, TP PB	4430.80
Section Sub Total:					\$69,992.29

Section 5. BRIDGE NO. 1 LT & RT(ALCOVY RIVER OVERFLOW)

Item Number	Quantity	Units	Unit Price	Item Description	Cost
540-1101	1	LS	398250.00	REMOVAL OF EXISTING BR, STA NO	398250.00

				568+85.00 (8850 SF X \$45/SF)-	
543-9000	2	LUMP	2283100.00	CONSTR OF BRIDGE COMPLETE (28900 SF X \$79/SF)	4566200.00
Section Sub Total:					\$4,964,450.00

Section 6. BRIDGE NO. 2 LT & RT(ALCOVY RIVER)					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
540-1101	1	LS	1911700.00	REMOVAL OF EXISTING BR, STA NO 583+73.00 (4260 SF X \$45/SF)-	191,700 1911700.00
543-9000	2	LUMP	1264000.00	CONSTR OF BRIDGE COMPLETE (16000 SF X \$79/SF)	2528000.00
Section Sub Total:					\$4,439,700.00

\$2,719,700
Total Estimated Cost: \$11,136,727.98
 9,416,729.98

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE STP-046-1 (30) - Newton County
PI No. - 231365

OFFICE: Tennille Utilities

DATE: February 13, 2002

FROM ^{JFH/DAS} James F. Hobby, Jr., District Utilities Engineer

TO David Griffith, District Preconstruction Engineer
Attention: George Brewer

SUBJECT UTILITY COST ESTIMATE

Attached is a Utility Cost Estimate that has been completed on the above referenced project. The estimate was done by Alan Smith of this office and is based on concept drawings provided by your office, dated February 12, 2002 and an on-site inspection performed on February 12, 2002. Unit costs are based on the "mean item summary" and former "force account agreements".

All of the above information is an estimate and may be revised when project plans are developed and prior rights research has been performed. If you should have questions, please contact Alan Smith in the Utilities Section of this office at 478-552-4637.

JFH:DAS

cc: Jeff Baker / Scott Greene via e-mail

Herman Griffin

Debbie Pennington

		GAS		
		CITY OF COVINGTON		
1320	LIN FT	RELOCATE 4" HPS GAS MAIN	\$19.00	\$25,080.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
		RAILROAD		
		NONE		
				\$0.00
				\$0.00
				\$0.00
				\$0.00
		CATV		
		CITY OF COVINGTON		
16	EACH	RELOCATE CATV TO NEW POWER POLES	\$450.00	\$7,200.00
				\$0.00
				\$0.00
				\$0.00
				\$0.00
TOTAL ESTIMATED UTILITY COSTS				\$7,200.00
				\$131,200.00
Estimate Prepared By: Alan Smith - Assistant District Utilities Engineer			Date: 13-Feb-02	

Unit Costs are based on former "Force Account Agreements" and the Department of Transportation's "Mean Item Index"

The information above is an estimate and is subject to change as project plans are developed and prior rights research has been performed.

BellSouth has facilities located on the existing Right of Way within the project limits that should not be considered eligible for reimbursement. They are attached to the bridges and have submitted a request to attach to the new bridges on this project.

The City of Covington has a 4" HPS steel gas main attached to the existing bridges.

VE RECOMMENDATIONS

DEVELOPMENT AND RECOMMENDATION PHASE

SR 12 / US 278 Widening and Reconstruction

IDEA No.: A-1	PAGE No.: 1 of 3	CREATIVE IDEA: Convert portions of Right-of-Way to Permanent Easement
Comp By: DPC	Date: 3/17/09	Checked By: DCW Date: 3/18/09

Original Concept:

Acquire all needed land through the permanent right-of-way (ROW) acquisition process.

Proposed Change:

It is recommended that all land required beyond the shoulder break point to the adjoining property line be acquired through permanent easement methods.

Justification:

Acquiring land via permanent easement method versus permanent ROW method can reduce present project land acquisition cost by approximately 40%. This land acquisition alternative can significantly reduce project costs without jeopardizing future maintenance access.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	2,807,000		
- Proposed	1,684,000		
- Savings	1,123,000		1,123,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			1,123,000

SR 12 / US 278 Widening and Reconstruction

ITEM N^o: A-1
 CLIENT: GDOT
 Sheet 2 of 3

Right-of-Way (ROW) Cost:

Using only commercial and residential land costs per acre and eliminating improvement, relocation, and damage costs is how the average ROW costs will be calculated on a SF basis. 24 total acres required to widen corridor at a total raw cost of \$ 2,184,000. Adding GDOT scheduling contingency, court, administrative and market adjustments, this ROW cost increases to \$ 5,416,320.

24 acres (one acre = 43,560 SF) = 1,045,440 SF.

Therefore, the approximate cost per square foot = \$ 5.18.

LOCATIONS:

Use shoulder break point to stop ROW purchase and begin Temporary Easement from break point over to adjoining property owner instead. The following areas were scaled and taken from Construction Plan Drawings.

600' x 40' rt = 24,000 sf

250' x 20' = 5,000 sf

500' x 20' = 10,000 sf

1,850' x 10' = 18,500 sf

327' x 10' = 3,270 sf

2,500' x 40' = 100,000 sf

1,546' x 40' = 61,840 sf

292' x 10' = 2,920 sf

1,228' x 5' = 6,140 sf

540' x 10' = 5,400 sf

550' x 20' = 11,000 sf

1,120' x 20' = 22,400 sf

230' x 20' = 4,600 sf

1,900' x 45' = 85,500 sf

1,100' x 25' = 27,500 sf

1,600' x 40' = 64,000 sf

800' x 40' = 32,000 sf

500' x 26' = 13,000 sf

689' x 40' = 27,560 sf

689' x 25' = 17,225 sf

TOTAL = 541,855 SF = area converted from ROW takes to permanent easement takes

From ROW personnel, permanent easements are 60% of "takes" cost.

∴ Permanent easement cost = 0.60 X \$5.18 = \$3.11 / SF

DEVELOPMENT AND RECOMMENDATION PHASE

US 278 / SR 12 Widening and Reconstruction

IDEA No.: A-2	PAGE No.: 1 of 4	CREATIVE IDEA: Reduce Median Width from 44' to 32'
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Comp By: SWG Date: 3-20-09 Checked By: DW Date: 3-20-09

Original Concept:

The original concept proposes a typical section with 4 travel lanes and a 44' depressed median.

Proposed Change:

The revised concept proposes a typical section with 4 travel lanes and a 32' depressed median.

Justification:

The need and purpose of the project is to increase capacity and improve safety. These functions can be maintained with a reduction in the width of the median. The reduction will provide significant savings in right-of-way and earthwork.

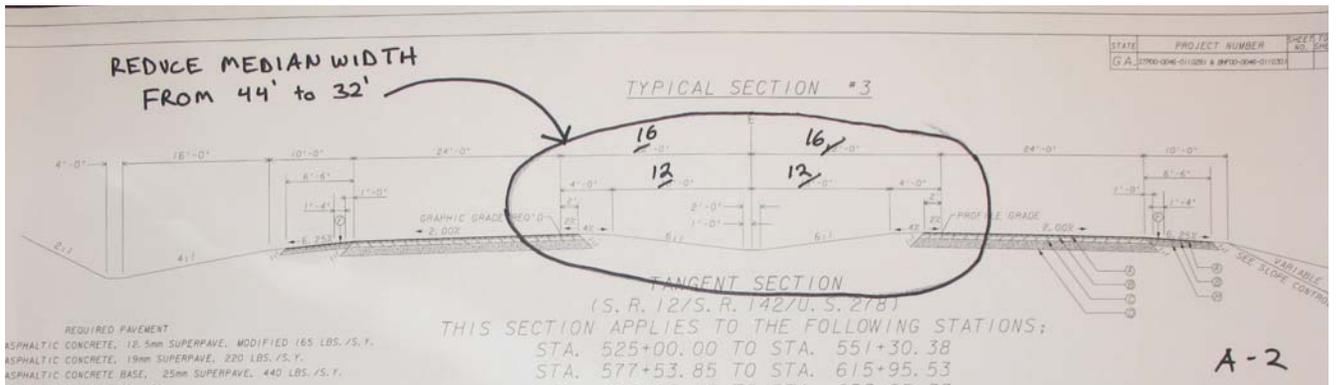
LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	608,200		
- Proposed	0		
- Savings	608,200		608,200
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			608,200

SKETCH

US 278 / SR 12 Widening and Reconstruction

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

PROPOSED CONCEPT



CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

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

Earthwork

Assumption: 50 sf earthwork reduction per cross section

Mainline Roadway Length = (654+00 - 522+00) - (680 +365) = 12,155 lf

Volume = (12,155 lf)(50 sf)/27 = 22,509 cy

R/W (12' width)

Applicable Station Ranges:

535+37 to 538+77 (L = 340)

548+42 to 550+35 (L = 193)

556+50 to 583+50 (L = 2700)

604+07 to 607+35 (L = 328)

617+80 to 654+00 (L = 3620)

Total Length = 7,181 lf

Total Area = (7,181)(12) = 86,172 sf

Assume composite RW unit cost of \$5.18/sf as calculated in A-1

DEVELOPMENT AND RECOMMENDATION PHASE

US 278 / SR 12 Widening and Reconstruction

IDEA No.: A-3	PAGE No.: 1 of 4	CREATIVE IDEA: Reduce Median Width from 44' to 24'
Comp By: SWG Date: 3/20/09 Checked By: DW Date: 3/20/09		

Original Concept:

The original concept proposes a typical section with 4 travel lanes and a 44' depressed median.

Proposed Change:

The revised concept proposes a typical section with 4 travel lanes and a 24' raised median.

Justification:

The need and purpose of the project is to increase capacity and improve safety. These functions can be maintained with a change to the median type. The reduction will provide significant savings in right-of-way and earthwork. It is assumed that the additional cost of closed drainage (curves only) will be offset by removal of current median drainage.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	855,000		
- Proposed	463,000		
- Savings	392,000		392,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			392,000

CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

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

Original Concept

Earthwork

Assumption: 80 sf earthwork reduction per cross section

Mainline Roadway Length = (654+00 - 522+00) - (680 +365) = 12,155 lf

Volume = (12,155 lf)(80 sf)/27 = 36,015 cy

R/W

12' Width Savings

Applicable Station Ranges:

535+37 to 538+77 (L = 340)

548+42 to 550+35 (L = 193)

556+50 to 583+50 (L = 2700)

604+07 to 607+35 (L = 328)

Total Length = 3,561 lf

20' Width Savings

617+80 to 654+00 (L = 3620)

Total Length = 3,620 lf

Total Area = (3,561)(12) + (3,620)(20) = 115,132 sf

Assume composite RW unit cost of \$5.18/sf as calculated in A-1

Revised Concept

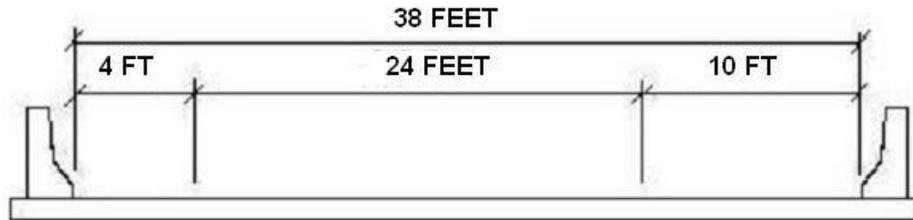
Curb & Gutter (Assume raised median & rural shoulder)

Length = 2 * Mainline Roadway Length = 2 * 12,155 = 24,310 lf

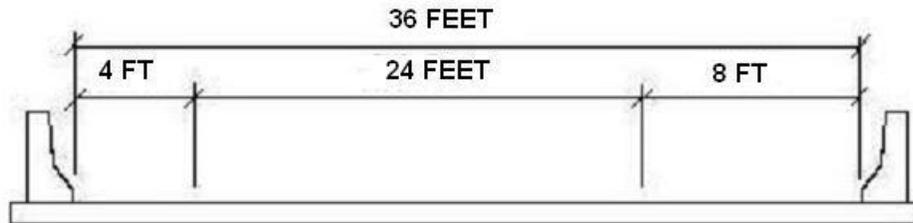
SKETCH

US 278 / SR 12 Widening and Reconstruction

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



ORIGINAL CONCEPT



PROPOSED CONCEPT

CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

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

Cost of Original Concept:

$$\text{Width} = 38 \text{ ft} + 2 \times 1.625 \text{ ft (side barriers)} = 41.25 \text{ ft}$$

$$\text{Length} = 680 \text{ feet}$$

$$\text{Number of Bridges} = 2$$

$$\text{Total Square footage} = 2 \times 41.25 \times 680 = 56,100 \text{ sq. ft.}$$

This number was used in the cost estimate 28,900 sq ft @ 680 ft long = 42.5 wide

⇒ **Use the correct numbers. (56,100 sq. ft.)**

Cost of Proposed Concept:

$$\text{Width} = 36 \text{ ft} + 2 \times 1.625 \text{ ft (side barriers)} = 39.25 \text{ ft}$$

$$\text{Length} = 680 \text{ feet}$$

$$\text{Number of Bridges} = 2$$

$$\text{Total Square} = 2 \times 39.25 \times 680 = 53,380 \text{ sq. ft.}$$

Cost Savings:

$$56,100 - 53,380 = 2,720 \text{ sq ft}$$

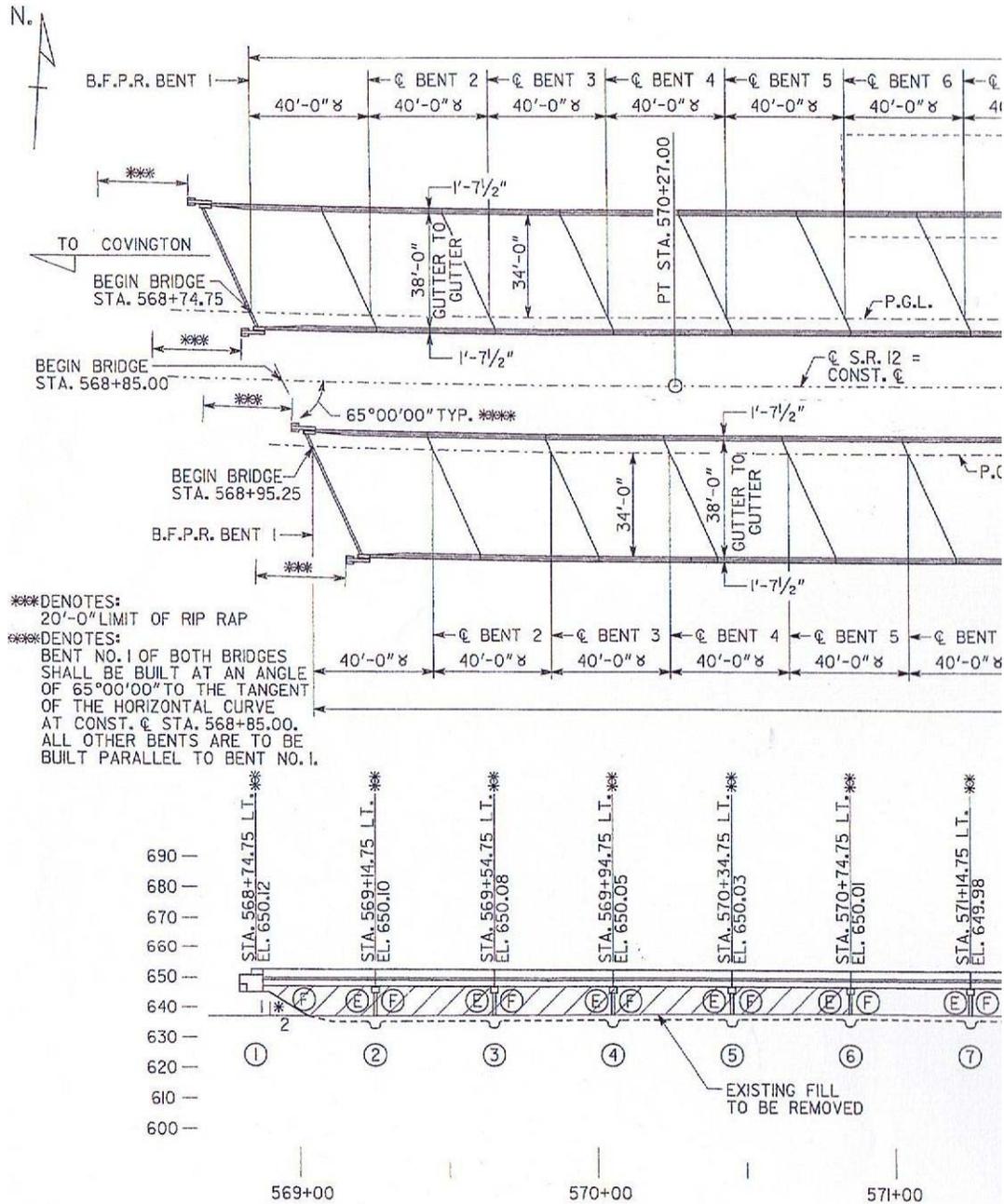
$$2,720 \text{ sq ft} \times \$79/\text{sq ft} = \$214,880$$

$$\$214,880 \times 1.1311 \text{ (markup)} = \$243,050$$

Savings equals \$243,000

US 278 / SR 12 Widening and Reconstruction

ITEM N^O: B-2
 CLIENT: GDOT
 Sheet 2 of 8

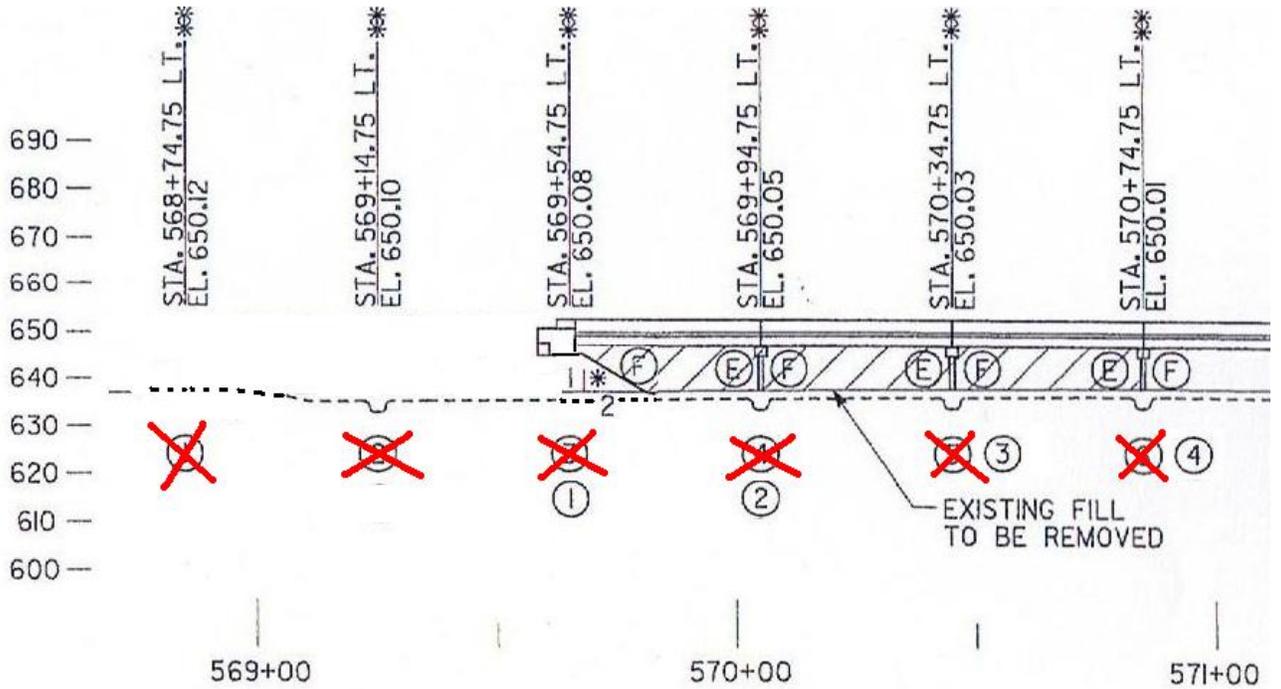


ORIGINAL CONCEPT

SKETCH

US 278 / SR 12 Widening and Reconstruction

ITEM N^o: B-2
CLIENT: GDOT
Sheet 3 of 8



PROPOSED CHANGE

Table 4: Hydraulic Table

SR 12 over Alcovy River

B-2
Pg 4/8

50-Year Storm	Existing Bridge	Proposed Bridge	Natural Channel
	L = 154 feet	L = 365 feet	without Bridge
Floodstage (ft)	641.81	641.76	N/A
Total Discharge (cfs)	15353.00	15353.00	15353.00
Discharge Thru Bridge (cfs)	8342.00	7570.00	N/A
Discharge Over Road (cfs)	0.00	0.00	N/A
Area of Bridge Opening Under Floodstage (sf)	1102.28	2054.39	N/A
Velocity Thru Bridge (ft/s)	7.57	3.68	N/A
Channel Velocity Thru Bridge (ft/s)	8.17	5.66	4.26
Approach Floodstage (ft)	643.76	642.89	642.06
Backwater (ft)	1.70	0.83	N/A

100-Year Storm	Existing Bridge	Proposed Bridge	Natural Channel
	L = 154 feet	L = 365 feet	without Bridge
Floodstage (ft)	642.40	642.36	N/A
Total Discharge (cfs)	18040.00	18040.00	18040.00
Discharge Thru Bridge (cfs)	9470.00	8645.00	N/A
Discharge Over Road (cfs)	0.00	0.00	N/A
Area of Bridge Opening Under Floodstage (sf)	1178.45	2255.31	N/A
Velocity Thru Bridge (ft/s)	8.04	3.83	N/A
Channel Velocity Thru Bridge (ft/s)	8.71	5.98	4.35
Approach Floodstage (ft)	644.52	643.54	642.65
Backwater (ft)	1.87	0.89	N/A

500-Year Storm	Existing Bridge	Proposed Bridge	Natural Channel
	L = 154 feet	L = 365 feet	without Bridge
Floodstage (ft)	643.82	643.81	N/A
Total Discharge (cfs)	25371.00	25371.00	25371.00
Discharge Thru Bridge (cfs)	12453.00	11651.00	N/A
Discharge Over Road (cfs)	0.00	0.00	N/A
Area of Bridge Opening Under Floodstage (sf)	1368.77	2739.48	N/A
Velocity Thru Bridge (ft/s)	9.10	4.25	N/A
Channel Velocity Thru Bridge (ft/s)	9.97	6.80	4.54
Approach Floodstage (ft)	646.35	645.18	644.1
Backwater (ft)	2.25	1.08	N/A

2-Year Storm	Existing Bridge	Proposed Bridge	Natural Channel
	L = 154 feet	L = 365 feet	without Bridge
Floodstage (ft)	638.50	638.46	N/A

Notes:

Backwater depth was calculated at the approach river station, RS 35+00.

CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

ITEM N^o: B-2
 CLIENT: GDOT
 Sheet 5 of 8

Proposed Change:

HEC-RAS proposed conditions model was revised to eliminate (2) -40 foot spans from west side of model. Effective flow areas were adjusted to account for reduction in opening.

Original Sq. Ft. for 2 bridges = 56,100 sq. ft. (See B-1)

Less 2 spans @ 40 ft = 2 x 40 x 41.25 x 2 bridges = 6,600 sq. ft.

 Total = 49,500 sq. ft.

Bridge Savings for Proposed Change:

(1) Bridge Cost: 2 bridges x 2 spans x 40 ft / span x 41.25 ft wide x \$79/sq ft = \$521,400

Total Savings = (1) = \$521,400

Add 13.11 % markup = \$521,400 +68,356 = \$589,755 (Rounded to \$589,000, see spreadsheet)

Embankment Removal Savings:

With the 80 foot reduction in the bridge length, on the existing portion (Westbound SR 12) 80 foot less of the embankment will need to be removed, on Eastbound 80 feet more fill will need to be placed.

Assume the result is a wash in cost

Additional pavement and subgrade cost:

Item	TONS	\$/ton	\$
12.5 mm (0.6 tons/LFT x 80 ft =48 tons)	48	66.31	3,183
19 mm (0.8 tons/LFTx 80 ft = 64 tons)	64	65.71	4,205
25 mm (1.2 tons/LFT x 80 ft = 96 tons)	96	61.97	5,949
GAB (3.55 tons/LFT x 80 ft = 284 tons)	284	18.55	5,268
Total			18,605
Markup @ 13.11%			2439
Total with Markup			21,044

Savings equals \$568,000

CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

ITEM N^o: B-2
 CLIENT: GDOT
 Sheet 6 of 8

ORIGINAL CONCEPT

Profile Output Table - WS Table

HEC-RAS Plan: Plan 07 River: Alcovy River Reach: Reach 1

Rivers = 1
 # Hydraulic Reaches = 1
 # River Stations = 7
 # Plans = 1
 # Profiles = 4

Reach	River Sta	Profile	W.S. Elev (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)	
Reach 1	-1600	Q2	633.57	12.67	2285.91	1833.42	1246.29	
Reach 1	-1600	Q50	637.85	104.17	4646.49	10602.34	1890.67	
Reach 1	-1600	Q100	638.53	141.08	5082.54	12816.38	1989.83	
Reach 1	-1600	Q500	640.17	331.37	6194.81	18844.82	2231.59	
Reach 1	1875	Q2	637.19	8.74	2965.44	1157.83	1963.05	
Reach 1	1875	Q50	640.75	95.79	4395.98	10861.23	2356.95	
Reach 1	1875	Q100	641.37	124.23	4712.88	13202.89	2393.26	
Reach 1	1875	Q500	642.89	211.80	5527.15	19632.05	2457.98	
Reach 1	2785	Q2	638.46	13.86	3153.14	965.00	2152.27	
Reach 1	2785	Q50	641.76	158.26	6778.33	8416.41	2370.82	
Reach 1	2785	Q100	642.36	207.45	7474.13	10358.42	2401.11	
Reach 1	2785	Q500	643.81	362.80	9244.16	15764.04	2462.79	
Reach 1	2892		Mult Open					
Reach 1	3000	Q2	638.89	11.40	2009.20	2111.40	2196.38	
Reach 1	3000	Q50	642.42	120.15	5029.05	10203.80	2285.34	
Reach 1	3000	Q100	643.04	154.73	5672.46	12212.81	2303.45	
Reach 1	3000	Q500	644.57	260.75	7351.18	17759.07	2344.68	
Reach 1	3500	Q2	639.21	7.68	1428.92	2695.39	2193.22	
Reach 1	3500	Q50	642.89	73.32	3017.95	12261.73	2287.49	
Reach 1	3500	Q100	643.54	93.57	3363.28	14583.15	2306.38	
Reach 1	3500	Q500	645.13	154.65	4258.35	20958.01	2348.39	
Reach 1	3700	Q2	639.29	7.38	1463.04	2661.58	2189.64	
Reach 1	3700	Q50	642.97	72.45	3040.87	12239.67	2285.00	
Reach 1	3700	Q100	643.62	92.63	3385.13	14562.24	2303.92	
Reach 1	3700	Q500	645.22	153.53	4278.62	20938.85	2346.49	

CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

ITEM N^o: B-2
 CLIENT: GDOT
 Sheet 7 of 8

VE STUDY

Profile Output Table - WS Table

HEC-RAS Plan: Plan 07 River: Alcovy River Reach: Reach 1

Rivers = 1
 # Hydraulic Reaches = 1
 # River Stations = 7
 # Plans = 1
 # Profiles = 4

Reach	River Sta	Profile	W.S. Elev (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)	
Reach 1	-1600	Q2	633.57	12.67	2285.91	1833.42	1246.29	
Reach 1	-1600	Q50	637.85	104.17	4646.49	10602.34	1890.67	
Reach 1	-1600	Q100	638.53	141.08	5082.54	12816.38	1989.83	
Reach 1	-1600	Q500	640.17	331.37	6194.81	18844.82	2231.59	
Reach 1	1875	Q2	637.19	8.74	2965.44	1157.83	1963.05	
Reach 1	1875	Q50	640.75	95.79	4395.98	10861.23	2356.95	
Reach 1	1875	Q100	641.37	124.23	4712.88	13202.89	2393.26	
Reach 1	1875	Q500	642.89	211.80	5527.15	19632.05	2457.98	
Reach 1	2785	Q2	638.48	14.23	3204.98	912.79	2153.14	
Reach 1	2785	Q50	641.78	165.85	7068.08	8119.07	2371.85	
Reach 1	2785	Q100	642.37	217.67	7811.35	10010.98	2401.72	
Reach 1	2785	Q500	643.82	381.56	9701.37	15288.07	2463.23	
Reach 1	2892		Mult Open					
Reach 1	3000	Q2	638.92	12.08	2087.41	2032.52	2197.52	
Reach 1	3000	Q50	642.49	128.55	5286.41	9938.04	2287.61	
Reach 1	3000	Q100	643.12	165.55	5970.19	11904.26	2305.88	
Reach 1	3000	Q500	644.66	278.99	7756.11	17335.90	2346.87	
Reach 1	3500	Q2	639.25	7.82	1414.16	2710.02	2194.84	
Reach 1	3500	Q50	642.99	74.36	2991.06	12287.58	2290.50	
Reach 1	3500	Q100	643.65	94.81	3334.92	14610.27	2309.66	
Reach 1	3500	Q500	645.26	156.44	4226.35	20988.21	2351.47	
Reach 1	3700	Q2	639.33	7.51	1448.60	2675.89	2191.13	
Reach 1	3700	Q50	643.07	73.46	3014.33	12265.21	2287.89	
Reach 1	3700	Q100	643.73	93.84	3357.14	14589.03	2307.08	
Reach 1	3700	Q500	645.35	155.28	4247.02	20968.71	2349.47	

VE Study modification to HEC-RAS analysis adds (643.65-643.54)=0.11 ft to backwater increase

Total Backwater = 0.89 +0.11 = 1.00 ft OK

DEVELOPMENT AND RECOMMENDATION PHASE

US 278 / SR 12 Widening and Reconstruction

IDEA No.: B-3	PAGE No.: 1 of 4	CREATIVE IDEA: Reduce the bridge length and width of the S.R. 12 bridge over the Alcovy River Overflow. (Combination of Ideas B-1 & B-2)
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Comp By: GCG Date: 3/17/09 Checked By: DCW Date: 3/19/09

Original Concept:

The original concept calls for two parallel 680 foot bridges comprised of seventeen - 40 foot T-Beam spans. The bridges are 41.25 feet wide.

Proposed Change:

Reduce the Bridge width to 39.25 ft wide per design policy.

Reduce Bridge length to 600 feet by removing 2 spans of 40 foot T beams from the west side

Justification:

See Idea B-1 for justification of reduction in bridge width

See Idea B-2 for justification of reduction in spans

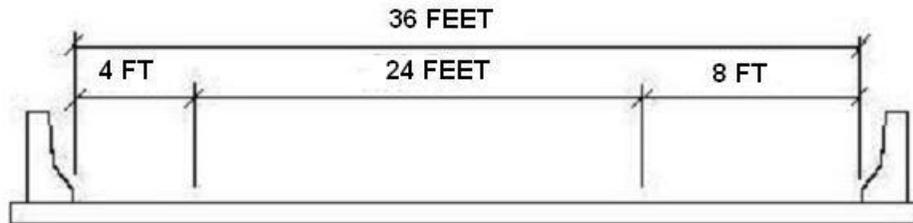
LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	5,463,000		
- Proposed	4,680,000		
- Savings	783,000		783,000
FUTURE COST - Savings		0	0
TOTAL PRESENT WORTH SAVINGS			783,000

US 278 / SR 12 Widening and Reconstruction

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



ORIGINAL CONCEPT



PROPOSED CONCEPT

COST WORKSHEET							
PROJECT: US 278 / SR 12 Widening BRIDGE PROJECT ITEMS					ITEM No: B-3		
					CLIENT: GDOT		
					Sheet 3 of 4		
CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
Bridge 1 Cost	SF	57,800	79	4,566,200			
Area adjustment for incorrect barrier width	SF	-1700	79	-134,300			
Bridge Removal	LS	1.00	398250	398,250	1.00	398250	398,250
Bridge 1 Cost minus (2) 40 ft spans	SF				49500	79	3,910,500
Reduce the width of the smaller bridge by 2 feet	SF				-2400	79	-189,600
Additional Earthwork as a result of reduction in bridge length					0	0	
Additional pavement section to add							
80 feet of Pavement to add:							
12.5 mm (0.6 tons/LFT x 80 ft =48 tons)	TONS				48	66.31	3,183
19 mm (0.8 tons/LFTx 80 ft = 64 tons)	TONS				64	65.71	4,205
25 mm (1.2 tons/LFT x 80 ft = 96 tons)	TONS				96	61.97	5,949
GAB (3.55 tons/LFT x 80 ft = 284 tons)	TONS				284	18.55	5,268
SUBTOTAL				4,830,150			4,137,756
Markup @ 13.11%				633,233			542,460
TOTAL				5,463,383			4,680,215
TOTAL ROUNDED				5,463,000			4,680,000

CALCULATIONS**US 278 / SR 12 Widening and Reconstruction**ITEM N^o: B-3
CLIENT: GDOT
Sheet 4 of 4**Proposed Change:****Bridge Savings:**

(1) Bridge Cost: 2 bridges x 2 spans x 40 ft / span x 41.25 ft wide x \$79/sq ft = 521,400

(2) Bridge width: 2 bridges x 600 ft long x 2 ft reduction x \$79/sq ft = 189,600

Total Savings = (1) + (2) = \$711,000

Add 13.11 % markup = \$711,000 + 93,212 = \$804,212 (Round to \$804,000)

Embankment Removal Savings:

With the 80 foot reduction in the bridge length, on the existing portion (Westbound SR 12) 80 foot less of the embankment will need to be removed, on Eastbound 80 feet more fill will need to be placed.

Assume the result is a wash

Additional pavement and subgrade cost:

Item	TONS	\$/ton	\$
12.5 mm (0.6 tons/LFT x 80 ft = 48 tons)	48	66.31	3,183
19 mm (0.8 tons/LFT x 80 ft = 64 tons)	64	65.71	4,205
25 mm (1.2 tons/LFT x 80 ft = 96 tons)	96	61.97	5,949
GAB (3.55 tons/LFT x 80 ft = 284 tons)	284	18.55	5,268
Total			18,605
Markup @ 13.11%			2,439
Total with Markup			21,044

\$804,212 (bridge savings) - \$ 0 (embankment) - \$21,044 (Pavement add) = \$783,168

(Say 783,000)

Savings equals \$783,000

DEVELOPMENT AND RECOMMENDATION PHASE

US 278 / SR 12 Widening and Reconstruction

IDEA No.:	PAGE No.:	CREATIVE IDEA:	
C-1	1 of 5	Maintain SR 12/US 278 @ SR 142 configuration and tie SR 12/US 278 (east side) in sooner	
Comp By: SWG	Date: 3-20-09	Checked By: DW	Date: 3-20-09

Original Concept:

The original concept proposes to reconfigure the existing intersection of SR 142 and SR 12/US 278 to provide a continuous movement from SR 12/US 278 (East Side of Intersection) onto SR 142. A new intersection is proposed for SR 142 and SR 12/US 278 at SR 12/US 278 Sta. 645+00. Approximately 3200 lf of new location roadway is proposed for SR 12/US 278 to tie into the existing roadway on the east side of the intersection. Approximately 500' of new location roadway is proposed for Deerfield Road to tie into relocated SR 12/US 278.

Proposed Change:

The revised concept maintains the intersection reconfiguration to provide a continuous movement from SR 12/US 278 onto SR 142. A new intersection is proposed for SR 142 and SR 12/US 278 at SR 12/US 278 Sta. 631+00. Approximately 1300 lf of new location roadway is proposed for SR 12/US 278 to tie into the existing roadway on the east side of the intersection. Approximately 400 lf of new location roadway is proposed for Meadow Lane to tie into relocated SR 12/US 278.

Justification:

The need and purpose of the project is to increase capacity and improve safety. The reconfiguration of the existing intersection of SR 142 and SR 12/US 278 can be achieved with a significant reduction in new location roadway for SR 12/US 278 on the west side of the intersection. In addition, approximately 1600 lf of 4-lane widening on SR 142/SR 12/US 278 can be eliminated.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	3,173,000		
- Proposed	983,000		
- Savings	2,190,000		2,190,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			2,190,000

US 278 / SR 12 Widening and Reconstruction

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

PROPOSED CONCEPT



CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

ITEM N^o: C-1
CLIENT: GDOT
Sheet 3 of 5

General Assumptions – 2 Lane New Location

ROW – Average 140' Width
Pavement Width (Travel Lane) - 24'
Pavement Width (Shoulder) – 13' (2 x 6.5')
Earthwork – Average 300 sf / Cross Section

General Assumptions – 4 Lane Widening

ROW – Average 80' Width
Pavement Width (Travel Lane) - 48'
Pavement Width (Shoulder) – 17' (2 x 6.5' + 2 x 2')
Earthwork – Average 500 sf / Cross Section

Original Concept

SR 12/US 278 – 3200' New Location / Deerfield Road – 500' 2-Lane New Location (Total 3700')
SR 12/SR 142/US 278 – 1600' 4-Lane Widening (Sta. 649+00 to 665+00)

2 Lane New Location

RW area = (140 lf)(3700 lf) = 518,000 sf
Earthwork = (300 sf)(3700 lf)/27 = 41,111 cy
12.5 mm Wt = (0.0825 tons/sy)(3700 lf)(37 lf)(1sy/9sf) = 1,255 tons
19 mm Wt = (0.11 tons/sy)(3700 lf)(37 lf)(1sy/9sf) = 1,673 tons
25 mm Wt = (0.22 tons/sy)(3700 lf)(24 lf)(1sy/9sf) = 2,171 tons
GAB Wt = (0.55 tons/sy)(3700 lf)(24 lf)(1sy/9sf) + (0.33 tons/sy)(3700 lf)(13 lf)(1sy/9sf) = 7,190 tons

4 Lane Widening

RW area = (80 lf)(1600 lf) = 128,000 sf
Earthwork = (500 sf)(1600 lf)/27 = 29,630 cy
12.5 mm Wt = (0.0825 tons/sy)(1600 lf)(65 lf)(1sy/9sf) = 954 tons
19 mm Wt = (0.11 tons/sy)(1600 lf)(65 lf)(1sy/9sf) = 1,271 tons
25 mm Wt = (0.22 tons/sy)(1600 lf)(48 lf)(1sy/9sf) = 1,877 tons
GAB Wt = (0.55 tons/sy)(1600 lf)(48 lf)(1sy/9sf) + (0.33 tons/sy)(1600 lf)(17 lf)(1sy/9sf) = 5,651 tons

Totals

RW area = 518,000 + 128,000 = 646,000 sf
Earthwork = 41,111 + 29,630 = 70,741 cy
12.5 mm Wt = 1,255 + 954 = 2,209 tons
19 mm Wt = 1,673 + 1,271 = 2,944 tons
25 mm Wt = 2,171 + 1,877 = 4,048 tons
GAB Wt = 7,190 + 5,651 = 12,841 tons

CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

ITEM N^o: C-1

CLIENT: GDOT

Sheet 4 of 5

CALCULATIONS (Cont)

Revised Concept

SR 12/US 278 – 1300' New Location / Meadow Lane – 400' New Location

(Total 2-Lane Widening 1700')

SR 12/SR 142/US 278 – 0' Additional 4-Lane Widening (Sta. 649+00 to 665+00)

2 Lane New Location

RW area = (140 lf)(1700 lf) = 238,000 sf

Earthwork = (300 sf)(1700 lf)/27 = 18,889 cy

12.5 mm Wt = (0.0825 tons/sy)(1700 lf)(37 lf)(1y/9sf) = 576 tons

19 mm Wt = (0.11 tons/sy)(1700 lf)(37 lf)(1y/9sf) = 769 tons

25 mm Wt = (0.22 tons/sy)(1700 lf)(24 lf)(1y/9sf) = 997 tons

GAB Wt = (0.55 tons/sy)(1700 lf)(24 lf)(1y/9sf) + (0.33 tons/sy)(1700 lf)(13 lf)(1y/9sf) = 3304 tons

4-Lane Additional Widening (STA 649+00 to 665+00)

All quantities are equal to zero because no additional widening is required for these stations

DEVELOPMENT AND RECOMMENDATION PHASE

US 278 / SR 12 Widening and Reconstruction

IDEA No.:	PAGE No.:	CREATIVE IDEA:
C-2	1 of 5	Reconfigure intersection of US 278 @ SR 142

Comp By: SWG Date: 3/20/09 Checked By: DW Date: 3/20/09

Original Concept:

The original concept proposes to reconfigure the existing intersection of SR 142 and SR 12/US 278 to provide a continuous movement from SR 12/US 278 (West Side of Intersection) onto SR 142. A new intersection is proposed for SR 142 and SR 12/US 278 at SR 12/US 278 Sta. 645+00. Approximately 3200' of new location roadway is proposed for SR 12/US 278 to tie into the existing roadway on the east side of the intersection. Approximately 500' of new location roadway is proposed for Deerfield Road to tie into relocated SR 12/US 278.

Proposed Change:

The revised concept proposes to maintain the existing intersection configuration and relocate the tie-in for SR 142 to align with the intersection of Meadow Lane and SR 12/US 278. Approximately 1200 lf of new location roadway will be required to provide the tie-in.

Justification:

Traffic patterns along SR 12/US 278 have changed significantly since the initial traffic study was performed. The volume of traffic moving continuously along SR 12/US 278 is now greater than the volume of traffic moving from SR 12/US 278 to SR 142. The revised concept significantly reduces the length of proposed new location roadway and reduces the amount of 4 lane widening on SR 142/SR 12/US 278 by approximately 2000 lf.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	3,452,000		
- Proposed	694,000		
- Savings	2,758,000		2,758,000
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			2,758,000

CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

ITEM N^o: C-2

CLIENT: GDOT

Sheet 3 of 5

General Assumptions – 2 Lane New Location

ROW – Average 140' Width

Pavement Width (Travel Lane) - 24'

Pavement Width (Shoulder) – 13' (2 x 6.5')

Earthwork – Average 300 sf / Cross Section

General Assumptions – 4 Lane Widening

ROW – Average 80' Width

Pavement Width (Travel Lane) - 48'

Pavement Width (Shoulder) – 17' (2 x 6.5' + 2 x 2')

Earthwork – Average 500 sf / Cross Section

Original Concept

SR 12/US 278 – 3200' New Location / Deerfield Road – 500' New Location (*Total 3700'*)

SR 12/SR 142/US 278 – 2000' Additional 4-Lane Widening

2 Lane New Location

RW area = (140 lf)(3700 lf) = 518,000 sf

Earthwork = (300 sf)(3700 lf)/27 = 41,111 cy

12.5 mm Wt = (0.0825 tons/sy)(3700 lf)(37 lf)(1sy/9sf) = 1,255 tons

19 mm Wt = (0.11 tons/sy)(3700 lf)(37 lf)(1sy/9sf) = 1,673 tons

25 mm Wt = (0.22 tons/sy)(3700 lf)(24 lf)(1sy/9sf) = 2,171 tons

GAB Wt = (0.55 tons/sy)(3700 lf)(24 lf)(1sy/9sf) + (0.33 tons/sy)(3700 lf)(13 lf)(1sy/9sf) = 7,190 tons

4 Lane Widening

RW area = (80 lf)(2000 lf) = 160,000 sf

Earthwork = (500 sf)(2000 lf)/27 = 37,037 cy

12.5 mm Wt = (0.0825 tons/sy)(2000 lf)(65 lf)(1sy/9sf) = 1,192 tons

19 mm Wt = (0.11 tons/sy)(2000 lf)(65 lf)(1sy/9sf) = 1,589 tons

25 mm Wt = (0.22 tons/sy)(2000 lf)(48 lf)(1sy/9sf) = 2,347 tons

GAB Wt = (0.55 tons/sy)(2000 lf)(48 lf)(1sy/9sf) + (0.33 tons/sy)(2000 lf)(17 lf)(1sy/9sf) = 7,113 tons

Totals

RW area = 518,000 + 160,000 = 678,000 sf

Earthwork = 41,111 + 37,037 = 78,148 cy

12.5 mm Wt = 1,255 + 1,192 = 2,447 tons

19 mm Wt = 1,673 + 1,589 = 3,262 tons

25 mm Wt = 2,171 + 2,347 = 4,518 tons

GAB Wt = 7,910 + 7,113 = 15,023 tons

CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

ITEM N^o: C-2

CLIENT: GDOT

Sheet 4 of 5

CALCULATIONS (Cont.)

Revised Concept

SR 12/US 278 – 1200' New Location 2-Lane

SR 12/SR 142/US 278 – 0' Additional 4-Lane Widening

2 Lane New Location

RW area = (140 lf)(1200 lf) = 168,000 sf

Earthwork = (300 sf)(1200 lf)/27 = 13,333 cy

12.5 mm Wt = (0.0825 tons/sy)(1200 lf)(37 lf)(1sy/9sf) = 407 tons

19 mm Wt = (0.11 tons/sy)(1200 lf)(37 lf)(1sy/9sf) = 543 tons

25 mm Wt = (0.22 tons/sy)(1200 lf)(24 lf)(1sy/9sf) = 704 tons

GAB Wt = (0.55 tons/sy)(1200 lf)(24 lf)(1sy/9sf) + (0.33 tons/sy)(1200 lf)(13 lf)(1sy/9sf) = 2,332 tons

CALCULATIONS

SR 12 / US 278 Widening

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

SR 12 / US 278 Section:

Project limits: STA 518+00 to STA 665+00 = 14,700 feet.

- a. Mainline (4) 12-foot lanes from begin project to end project = 58,800 feet.
- b. Left turn lane and off-set lane total lengths = 5,100 feet.
- c. Right turn lane total lengths = 2,860 feet.
- d. Total = 66,760 feet x 1.0 foot = 66,760 SF

New US 278 Section:

Project limits: STA 101+00 to STA 132+00 = 3,100 feet.

- a. (4) 12' lanes from begin project to end project = 12,400 feet
- b. Right turn lane total lengths = 600 feet.
- c. Total = 13,000 feet x 1.0 foot = 13,000 SF

Grand total pavement section reduction = 79,760 SF / 9 SY = 8,863 SY

GAB and Asphalt SY to Ton calculations:

1. GAB – 128 # x 8,863 SY / 2,000 # = 570 Tons
2. 12.5 mm mix – 165 # x 8,863 SY / 2,000 # = 732 Tons
3. 19 mm mix – 220 # x 8,863 SY / 2,000 # = 975 Tons
4. 25 mm mix – 440 # x 8,863 SY / 2,000 # = 1,950 Tons

Right-of-Way (ROW) Cost:

Using only commercial and residential land costs per acre and eliminating improvement, relocation, and damage costs is how the average ROW costs will be calculated on a SF basis.

24 acres required to widen corridor at a total raw cost of \$ 2,184,000. Adding GDOT contingency, court, administrative and market adjustments, this ROW cost increases to \$ 5,416,320.

24 acres (one acre = 43,560 SF) = 1,045,440 SF.

Cost per square foot = \$ 5.18.

79,760 SF total pavement section reduction x \$ 5.18 SF = \$ 413,157

Embankment Estimates:

Current estimate provides both a Borrow and Excavation line items totaling \$ 852,159. Conditions on SR 12 / US 278 appear more balanced and grading operations will be minimized due to this typical section reduction.

For recommendation estimating purposes the VE team will assume a 1% reduction regarding borrow and excavation for each linear foot eliminated in roadway section width, therefore a 4-foot reduction would produce an approximate \$ 34,086 cost savings. (4% x \$852,159)

Storm Drain Cross-Drain Pipes:

Quantities taken directly from plan sheets.

DEVELOPMENT AND RECOMMENDATION PHASE

SR 12 / US 278 Widening and Reconstruction

IDEA No.:	PAGE No.:	CREATIVE IDEA:	
C-4	1 of 3	Reduce Outside Shoulder Width.	
Comp By:	DPC	Date:	3/18/09
Checked By:	DCW	Date:	3/18/09

Original Concept:

All project typical sections (except for side roads) call for a 6' - 6" wide outside paved shoulder. Corresponding inside paved shoulder currently set at 2-foot.

Proposed Change:

It is recommended to reduce the existing 6' - 6" wide outside paved shoulder to 2' - 0", leaving the 1.0' wide inclusive rumble strip in place as well as retaining the remaining 4' 6" grass shoulder. The 10' wide EOP to grade break would not be altered, thus there is no ROW saving.

Justification:

Since part of the project is currently classified as "urban minor arterial" and projected 2026 AADT is near 40,000, an urban curb and gutter section (no paved shoulder) could have been considered for this project. The 6' - 6" wide shoulder is too narrow for comfortable emergency access and not wide enough to allow but a very small vehicle a safe breakdown area. It is suggested to design the shoulder to a minimum 2' paved width.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	354,900		
- Proposed	0		
- Savings	354,900		354,900
FUTURE COST - Savings			-0-
TOTAL PRESENT WORTH SAVINGS			354,900

CALCULATIONS

SR 12 / US 278 Widening and Reconstruction

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

Total length of shoulder calculation:

Mainline SR 12/US 278 right side 518+00 to 665+00: 13,655' - 590' side road = 13,065'

Mainline SR 12/US 278 left side 518+00 to 665+00: 13,655' - 620' side road = 13,035'

New US 278 both sides 101+00 to 132+00: 6,200' - 120' side road = 6,080'

Total length of shoulder effected = 32,180'

Existing outside paved shoulder width is 6' - 6". Reducing width of paved shoulder to match inside 2 foot paved section constitutes a 4' - 6" reduction.

Total SY of shoulder reduced = 32,180' x 4.5' = 144,810 SF/ 9 SY = 16,090 SY

Right-of-Way (ROW) Cost:

Using only commercial and residential land costs per acre and eliminating improvement, relocation, and damage costs is how the average ROW costs will be calculated on a SF basis. 24 total acres required to widen corridor at a total raw cost of \$ 2,184,000. Adding GDOT scheduling contingency, court, administrative and market adjustments, this ROW cost increases to \$ 5,416,320.

24 total acres (1 acre = 43,560 SF) = 1,045,440 SF.

Cost per square foot = \$ 5.18 cost basis.

GAB Conversion: SY to Ton:

Use typical 128 pounds per SY conversation factor.

16,090 SY x 128 LBS/SY x (1/2,000 LBS/Ton) = 1,039 x 1.10 = **1,145 Tons**

12.5 MM Asphalt Conc. Conversion: SY to Ton:

Use typical 165 pounds per SY conversation factor.

16,090 SY x 165 LBS/SY x (1/2,000 LBS/Ton) = 1,330 x 1.10 = **1,470 Tons**

19 MM Asphalt Conc. Conversion: SY to Ton:

Use typical 220 pounds per SY conversation factor.

16,090 SY x 220 LBS/SY x (1/2,000 LBS/Ton) = 1,770 x 1.10 = **1,950 Tons**

DEVELOPMENT AND RECOMMENDATION PHASE

US 278 / SR 12 Widening and Reconstruction

IDEA No.:	PAGE No.:	CREATIVE IDEA:
D-1	1 of 4	Reduce the bridge width of the S.R. 12 bridge over the Alcovy River

Comp By: GCG Date: 3/17/09 Checked By: DCW Date: 3/20/09

Original Concept:

The original concept calls for a 38 foot wide bridge (measured from face of “jersey style” barrier to face of “jersey style” barrier). The original concept bridge width is comprised of 2-12 foot lanes, 1- 4 foot shoulder and 1 - 10 foot shoulder = 38 feet.

Proposed Change:

The Proposed change calls for a 36 foot wide bridge (measured from face of “jersey style” barrier to face of “jersey style” barrier). The proposed change bridge width is comprised of 2-12 foot lanes, 1- 4 foot shoulder and 1 - 8 foot shoulder = 36 feet.

Justification:

This change is consistent with current GDOT Policy and Procedure Subject No. 4265-10 “Geometric Design Guide on Highways having State Route Numbers, Other than Interstates. (Similar to B-1)

For multilane rural (divided)

Travel Width = 2 x 12 foot lanes = 24 feet

Bridge Width = Travel Width + 12 feet

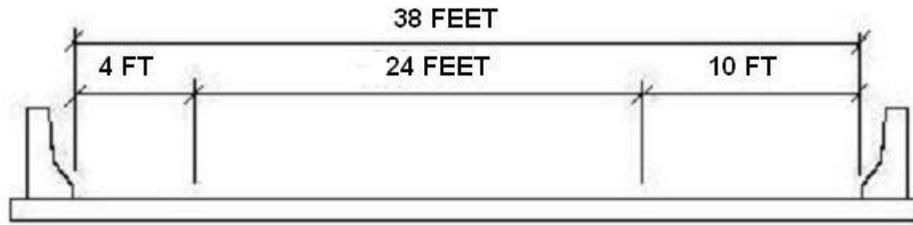
Bridge Width = Travel Width + 4 feet inside shoulders + 8 feet outside shoulders

Bridge Width = 24 feet + 12 feet = 36 feet

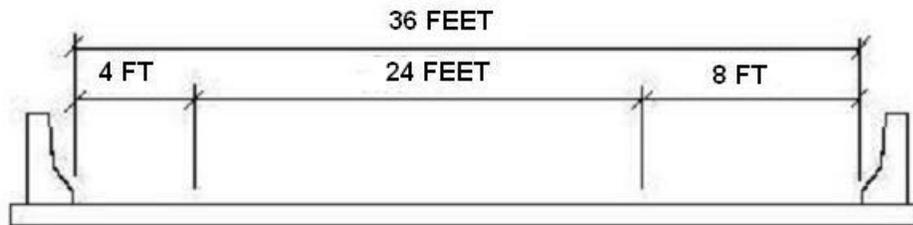
LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
INITIAL COST - Original	2,908,000		
- Proposed	2,777,000		
- Savings	131,000		131,000
FUTURE COST - Savings		0	-0-
TOTAL PRESENT WORTH SAVINGS			131,000

US 278 / SR 12 Widening and Reconstruction

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



ORIGINAL CONCEPT



PROPOSED CONCEPT

CALCULATIONS

US 278 / SR 12 Widening and Reconstruction

ITEM N^o: D-1
CLIENT: GDOT
Sheet 3 of 4

Original Concept

Width = 38 ft + 2x1.625 ft (side barriers) = 41.25 ft

Length = 365 feet

Number of Bridges = 2

Total Square footage = 2 x 41.25 x 365 = 30,113 sq. ft.

Project cost estimate uses 16000 x 2 = 32,000 → Use the correct numbers

Proposed Concept

Width = 36 ft + 2x1.625 ft (side barriers) = 39.25 ft

Length = 365 feet

Number of Bridges = 2

Total Square = 2 x 39.25 x 365 = 28,653 sq. ft.

Cost Savings :

30,113 - 28,653 = 1460 sq ft

1460 sq ft x \$79/sq ft = \$115,340

\$115,340 *1.1311 (markup) = \$130,461

Savings equals \$131,000

APPENDIX



INFORMATION PHASE

FUNCTION ANALYSIS

US 278 / SR 12 Widening and Reconstruction

System: Widen Roadway
Function: Increase Capacity

ITEM No.	DESCRIPTION	FUNCTION			INITIAL DOLLARS (x 1,000)		
		Verb	Noun	Kind*	Cost	% of Total	Worth
A	Right of Way	Store	Project	S	6,133	21	5,000
B	Bridge #1 – overflow	Span	Area	B	5,615	20	5,000
C	AC Pavement	Support	Traffic	B	5,206	18	4,000
		Comfort	Traveler				
D	Bridge #2 – river	Span	River	B	3,076	11	4,700
E	Aggregate Base and Surface	Support	Pavement	S	2,460	8	1,900
F	Erosion Control	Trap	Soil	S	1,392	5	1,100
G	Excavation	Achieve	Grade	S	1,225	4	900
TOTALS					25,107	86	22,600

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
US 278 / SR 12 Widening and Reconstruction			
NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
A	Right of Way		
A-1	Convert portions of ROW to easements		√
A-2	Reduce median width to 32 feet		√
A-3	Reduce median width to 24 feet		√
B	Bridge #1 Alcony River Overflow		
B-1	Reduce bridge width		√
B-2	Reduce bridge length		√
B-3	Reduce bridge width and bridge length		√
C	AC Pavement		
C-1	Maintain relocated SR 278 configuration, tie in sooner		√
C-2	Reconfigure tie in with SR 142		√
C-3	Use 11 foot lanes in select areas		√
C-4	Reduce shoulder width		√

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

NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
D	Bridge #2		
D-1	Reduce bridge width		√
D-2	Reduce bridge length	Does not work out	X
E	Aggregate Base		
	No ideas generated as a stand alone item		
F	Excavation		
	No ideas generated as a stand alone item		
G	Erosion Control		
	No ideas generated as a stand alone item		
H	Other		
H-1	Use a box culvert for three 54 inch storm drains at Elks Club Road.	Not cost effective	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.: STP00-0046-01(029) BHF00-0046-01(030) County: Newton PI No.: 231630/231635 Date: March 17-20, 2009

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