

# VALUE ENGINEERING REPORT

I-75 Auxiliary Lane; and  
I-75 Reversible Managed Lanes from SR 155 to SR 138

Project No.: CSNHS-0009-00(156)(157)

P.I. Nos. 0010126, 0009156; and 0009157

Henry and Clayton Counties

February 15, 2011

OWNER AND DESIGN TEAM:



Georgia Department of Transportation  
600 West Peachtree Street  
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VALUE ENGINEERING CONSULTANT:



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### Henry and Clayton Counties

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## **EXECUTIVE SUMMARY**

# **Executive Summary**

## **Value Engineering Study**

### **I-75 Auxiliary Lane; and I-75 Reversible Managed Lanes from SR 155 to SR 138**

**Project No.: CSNHS-0009-00(156)(157)**

P.I. Nos. 0010126, 0009156; and 0009157

### **Henry and Clayton Counties**

#### **Introduction**

This report presents the results of a value engineering (VE) study conducted on the concept level design for three projects relating to improvements to I-75 just south of Metro Atlanta. Two of the projects include the addition of 12.2 miles of a two lane reversible barrier separated managed lane system to help support the growth in traffic volumes projected, and to improve congestion and traffic movements. The third project includes the widening of northbound I-75 with an auxiliary lane from the Eagles Landing Parkway interchange to the exit lanes at I-675. This project is scheduled to be let at the end of 2011 and is intended to provide some immediate relief to this congested area. The other two projects are part of the 2010 Atlanta Regional Managed Lane System Plan and represent the first tier of the ultimate section for this part of I-75 including two managed lanes in each direction. These projects are scheduled to be let the end of 2012. The total current estimated construction cost for all three projects is \$94 million which does not include markups for E&I or contingencies.

The study took place January 31- February 3, 2011, at the Georgia DOT General Office in Atlanta using a five person VE team. It was conducted at the concept/preliminary design level of these three I-75 improvement projects.

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.

#### **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 32 ideas with 20 being identified for additional evaluation as possible recommendations or design considerations. For all three projects

the VE team developed 13 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 \$22,146,000 in capital cost savings while continuing to provide the required functionality. A positive savings of \$234,000 was realized in the present worth of future costs for a total life cycle potential cost avoidance of \$22,380,000. 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 February 3<sup>rd</sup> at GDOT Headquarters. See Appendix C for a listing of those in attendance. A summary of the recommendations follows.

## **Recommendation Highlights**

### **I-75 Auxiliary Lane Project**

#### **A: Bridges**

**A-2: Close Walt Stephens Road over I-75 and detour traffic during construction.** This recommendation proposes to close the road to reduce the construction time required to build the bridge. The original design calls for a two stage approach while the proposed change will be a single phase with an estimated construction time savings of six months.

*The total potential savings is \$448,000*

#### **B: AC Pavement**

**B-1: Reduce shoulder pavement thickness.** The existing design proposes a full depth pavement be carried under the shoulder area for the entire width of shoulder. This proposal reduces the thickness to 8 inches asphalt and 6 inches GAB instead of the proposed design of 16.5 inches asphalt and 12 inches GAB. The reduced structure should be more than adequate for the limited use the shoulder will receive.

*Potential savings is \$270,000*

**B-3: Reduce shoulder pavement width.** The current design calls for a 12 foot wide paved shoulder with a two foot grass strip. The proposed change is to use an 8 foot paved shoulder and a 6 foot wide grass strip. The proposed system would allow enough room to remove a vehicle completely from the travel lane and be able to keep two wheels on the paved surface while continuing to provide a 14' shoulder.

*Potential savings is \$168,000*

## I-75 Auxiliary Managed Lanes from SR 155 to SR 138

### A: AC Pavement

**A-1: Reduce shoulder pavement thickness.** The existing design proposes a full depth pavement be carried under the shoulder area for the entire width of shoulder. This proposal reduces the thickness to 8 inches asphalt and 6 inches GAB instead of the proposed design of 16.5 inches asphalt and 12 inches GAB. The reduced structure should be more than adequate for the limited use the shoulder will receive.

*Potential savings is \$7,992,000*

**A-2: Reduce shoulder pavement width.** The current design calls for a 12 foot wide paved shoulder with a two foot grass strip. The proposed change is to use an 8 foot paved shoulder and a 6 foot wide grass strip. The proposed system would allow enough room to remove a vehicle completely from the travel lane and be able to keep two wheels on the paved surface while continuing to provide a 14' shoulder.

*Potential savings is \$4,968,000*

**A-4: Construct only one managed lane in each direction.** The existing design calls for construction of a 2 lane reversible managed lane system just north of the SR 155 interchange to the I-675 split. The proposed change includes constructing one managed lane in each direction, eliminating the reversibility operations of the current design. The single lane will accommodate initial projected traffic volumes and does not preclude construction of a second lane when traffic warrants it. The initial costs are higher but future operations savings offsets this amount to a point that both options are comparable in price on a life cycle basis.

*Potential savings is \$43,000*

**A-5: Construct only one reversible lane south of Mt. Carmel Road.** The original concept presented a two lane managed reversible lane system the entire length of the project. This idea suggests using only one lane south of Mt. Carmel Road and starting the two lane system north of that location. The 2035 projections do not seem to warrant a two lane system in this area.

*Savings potential is \$1,820,000*

**A-6: Shorten the project south of Mt. Carmel Road.** This idea proposes to begin the project south of Mt. Carmel Road at +/- Sta. 615+00. Traffic projections from SR 155 to this location do not appear to warrant adding any managed lanes in this area. The relatively low volume of traffic could be handled by the general purpose lanes.

*Potential savings \$9,537,000*

**A-7: Reduce the number of ramp lanes at Mt. Carmel Road access.** The current design proposes to construct two exit and one entry lanes at this location. The proposed VE idea is to construct only one ramp lane and use it as a reversible lane to be consistent with the reversible lane system. Having only one ramp at the intersection should reduce driver confusion regarding accessibility.

*Potential cost avoidance \$1,358,000*

**A-8: Combine the I-675 lane bridges.** The original design calls for the construction of a two lane bridge for the I-675 overpass. The proposed idea is to construct only a one lane ramp and bridge to be used in a reversible manner. This concept is similar to idea above with the intent to retain the reversible roadway operation on the ramps and therefore reduce construction costs.

*Potential avoidance for this item \$1,875,000*

## **E: Bridges**

**E-5: Use a two span concrete bridge at I-675 ramp.** The existing design is for a single span 246 foot long structural steel plate girder bridge with a depth of 10 feet. The proposed system calls for a single pier in the middle using prestressed concrete beams which reduce maintenance (steel painting) and reduce the height which reduces MSE wall height as well as fill requirements.

*Savings potential is \$2,067,000*

**E-7: Eliminate access ramps to I-675.** The current design provides a managed reversible lane system for the I-75 to I-675 connection. The proposed concept is to not provide managed lane connection to I-675. Review of the traffic projections indicate 2015 peak hour use of 910-940 vph. 2035 projections are 1150-1180 vph. These volumes could be accommodated in the existing ramp connection to I-675. There are no plans to provide any managed lanes on I-675 so future system connectivity is not a concern.

*Potential avoidance is \$11,159,000*

**E-8: Use a single span “trellis” bridge using bulb-tee prestressed concrete (PSC) beams at the I-675 ramp.** The current design proposes a 246 foot single span steel bridge structure. The proposed design includes a single span 115 foot long by 225 foot wide “Trellis” PSC beam structure using 63 inch PSC beams. The concrete structure is more economical to construct, reduces maintenance costs and reduces MSE wall height by 5 feet.

*Potential savings \$1,238,000*

**I-75 Auxiliary Lane**

P.I. No. 0010126  
Henry 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
<b>A</b>	<b>Bridges</b>						
A-2	Close Walt Stephens Road over I-75 during bridge construction	1,592,000	1,144,000	448,000	-0-	448,000	448,000
<b>B</b>	<b>AC Pavement</b>						
B-1	Reduce shoulder pavement thickness	526,000	256,000	270,000	-0-	270,000	270,000
B-3	Reduce shoulder pavement width	526,000	358,000	168,000	-0-	168,000	168,000
	<b>Total Potential Cost Avoidance</b>			886,000	-0-		<b>886,000</b>

**I-75 Managed Lanes from SR 155 to SR 138**

P.I. Nos. 0009156 and 0009157

Project Nos: CSNHS-0009-00(156)(157)

**Clayton and Henry Counties**

**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
<b>A</b>	<b>AC Pavement</b>						
A-1	Reduce shoulder pavement thickness	15,552,000	7,560,000	7,992,000	-0-	7,992,000	5,000,000
A-2	Reduce shoulder pavement width	15,552,000	10,584,000	4,968,000	-0-	4,968,000	4,968,000
A-4	Construct only one managed lane in each direction	7,533,000	12,490,000	(4,957,000)	5,000,000	43,000	-0-
A-5	Construct only one reversible lane south of Mt. Carmel Road	1,820,000	-0-	1,820,000	-0-	1,820,000	-0-
A-6	Shorten the project South of Mt. Carmel Road	9,537,000	-0-	9,537,000	-0-	9,537,000	9,537,000
A-9	Reduce the number of ramp lanes at the Mt. Carmel access	1,358,000	-0-	1,358,000	-0-	1,358,000	-0-
A-10	Combine the I-675 ramp bridges	1,875,000	-0-	1,875,000	-0-	1,875,000	1,875,000



## **STUDY IDENTIFICATION**

## Study Identification

<b>Project:</b> I-75 Auxiliary Lane and I-75 Reversible Managed Lanes from SR 155 to SR 138	<b>Date:</b> January 31-February 3, 2011
<b>Location:</b> Henry and Clayton Counties	

## VE Team Members

Name:	Title:	Organization:	Telephone:
George Obaranec	Highway Design	MACTEC	770-421-3346
Steve Bitney	Construction	Santec	770-813-0882
Fleur Hartmann	Toll Analysis	Santec	404-861-9533
Aruna Sastry	Structural	Sastry Associates	404-932-0373
David Wohlscheid	VE Team Facilitator	MACTEC	571-217-0808

### Project Description

The study took place January 31- February 3, 2011, at the Georgia DOT General Office in Atlanta using a five person VE team. The study took place at the concept/preliminary design phase using plans prepared by Parsons of Norcross, GA.

These projects include improvements to I-75 just south of Metro Atlanta. Two of the projects include the addition of 12.2 miles of a two lane reversible barrier separated managed lane system to help support the growth in traffic volumes projected, and to improve congestion and traffic movements. The third project includes the widening of northbound I-75 with an auxiliary lane from the Eagles Landing Parkway interchange to the exit lanes at I-675. This project is scheduled to be let at the end of 2011 and is intended to provide some immediate relief to this congested area. The other two projects are part of the 2010 Atlanta Regional Managed Lane System Plan and represent the first tier of the ultimate section for this part of I-75 including two managed lanes in each direction. These projects are scheduled to be let the end of 2012. The total current estimated construction cost for all three projects is \$94 million with which does not include markups for E&I or contingencies.

### Project Constraints:

The only constraints placed upon the VE team prior to the project kickoff are shown below:

- The existing vertical profile along I-75 must be matched
- Retaining walls were used to reduce right of way
- Walt Stephens Road will have a new alignment as will the connection to I-675
- The auxiliary lane project has impacts to 6 streams due to pipe extensions

- The auxiliary lane project impacts two wetlands south of Hudson Bridge Road

### **Project Briefing:**

The VE team was given a design briefing on the current status of the project by GDOT Project Manager Mike Dover. District 3 staff participated via teleconference. One other constraint was added:

- Do not combine Auxiliary Lane and Managed Lane projects, they must remain separate.

In addition to the above constraints, the following items were discussed:

### **Auxiliary Lane**

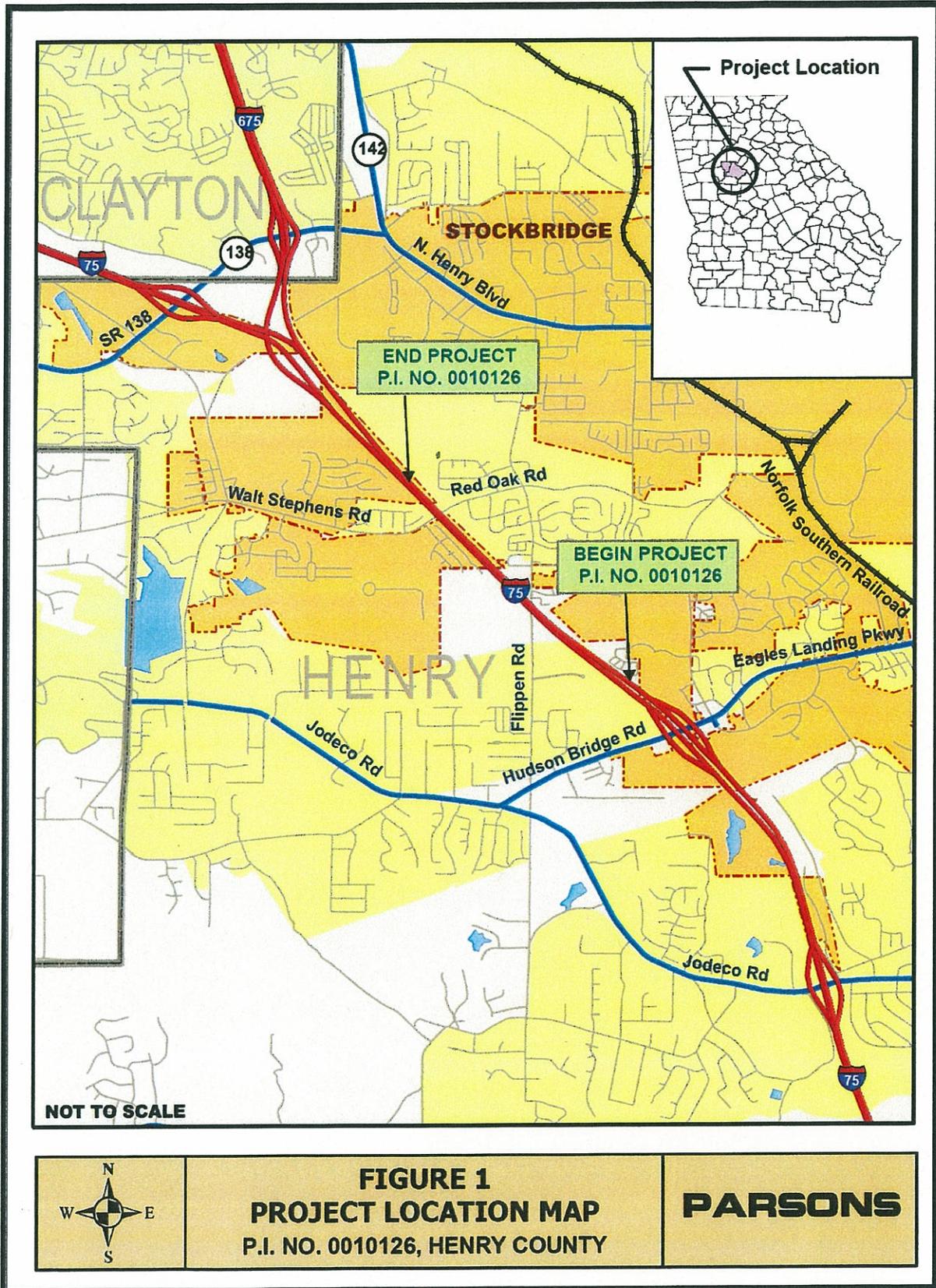
- Flippen Road bridge over I-75 will not be widened.
- Walt Stephens Bridge will be modified and widened in two phases to allow the road to remain open during construction.
- This project is anticipated to be a Design Build contract.
- Letting is scheduled for December 2011.
- This project is mirroring what was earlier constructed southbound in this area.
- Sound study is not completed which may necessitate sound walls being added to the project.
- Typical section included 12 foot lanes and a 12 foot paved shoulder.
- No additional right of way is required for this project.
- No FHWA funds are involved with this project.

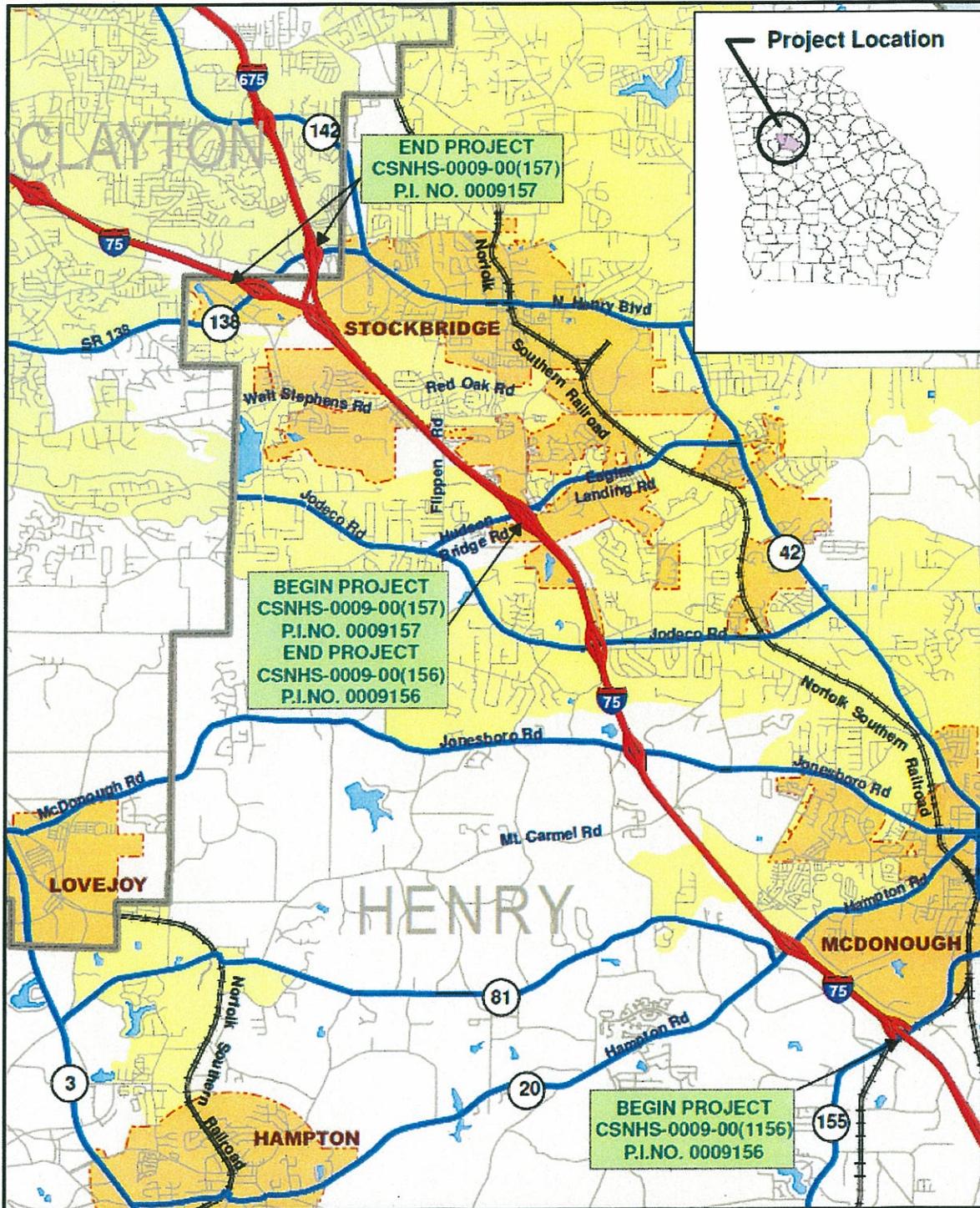
### **Managed Lanes**

- The managed lanes will be added in the median area.
- Access will be as shown on the plans.
- Contract anticipated to be let Nov./Dec 2012 as a Design Build contract.
- FHWA will participate in this contract
- Anticipating toll lanes but type and methods not firmed up at this time
- District is not in favor of HOV
- Mt. Carmel Road bridge will be reconstructed as well as the I-695 flyovers – this is the only bridge work.
- Concrete pavements being considered
- Right of way has been minimized to expedite the project schedule
- Project is following the Atlanta Regional Managed Lanes report dated January 2010

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







Project Location

	<p><b>PROJECT LOCATION MAP</b>                  P.I. NO. 0009156 &amp; P.I. NO. 0009157  <b>REVERSIBLE/CONCURRENT MANAGED LANES</b>                  CLAYTON &amp; HENRY COUNTY</p>	<p>0 0.45 0.9 1.8 2.7                  Miles</p> <p><b>PARSONS</b></p>
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## STATE HIGHWAY AGENCY

## JOB ESTIMATE REPORT

JOB NUMBER : 0010126                      SPEC YEAR: 01  
 DESCRIPTION: I-75 HOV OPERATIONAL IMPROVEMENT

## COST GROUPS FOR JOB 0010126

COST GROUP	DESCRIPTION	QUANTITY	PRICE	AMOUNT	ACTIVE?
WALL	WALLS (SF)				Y
GENR	GENERAL/FIELD OFFICE/ETC (LS)				Y
ACTIVE COST GROUP TOTAL				0.00	
INFLATED COST GROUP TOTAL				0.00	

## ITEMS FOR JOB 0010126

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	310-1101		TN	GR AGGR BASE CRS, INCL MATL	5981.000	18.54	110925.30
0010	400-3604		TN	ASPH CONC 12.5 MM SMA,GP2,INCL P-MBM&HL	1379.000	104.29	143817.96
0015	400-3624		TN	ASPH CONC 12.5 MM PEM,GP2,INCL P-MBM&HL	1128.000	80.30	90588.21
0020	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	11689.000	58.58	684835.37
0025	402-3130		TN	RECYL AC 12.5MM SP,GP2,BM&HL	867.000	72.74	63070.32
0030	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	1799.000	65.37	117607.41
0035	413-1000		GL	BITUM TACK COAT	1717.000	2.38	4095.87
0040	441-0204		SY	PLAIN CONC DITCH PAVING, 4 IN	438.000	27.60	12092.50
0045	456-2012		GLM	INTENT. RUMB. STRIPS - GRND-IN-PL (CONT)	2.000	658.12	1316.25
0050	201-1500		LS	CLEARING & GRUBBING - 0010126	1.000	150000.00	150000.00
0055	210-0100		LS	GRADING COMPLETE - 0010126	1.000	750000.00	750000.00
0060	610-1055		LF	REM GUARDRAIL	878.000	3.11	2733.57
0065	610-1075		EA	REM GUARDRAIL ANCH, ALL TYPES	7.000	143.76	1006.36
0070	641-1200		LF	GUARDRAIL, TP W	3666.000	15.57	57101.32
0075	641-5001		EA	GUARDRAIL ANCHORAGE, TP 1	8.000	615.64	4925.14
0080	641-5012		EA	GUARDRAIL ANCHORAGE, TP 12	8.000	1802.10	14416.80
0085	550-1180		LF	STM DR PIPE 18",H 1-10	8700.000	25.15	218812.40
0090	550-1240		LF	STM DR PIPE 24",H 1-10	2164.000	34.25	74134.83
0095	550-3318		EA	SAFETY END SECTION 18",STD,4:1	8.000	545.17	4361.40
0100	550-3324		EA	SAFETY END SECTION 24",STD,4:1	4.000	927.47	3709.91
0105	163-0232		AC	TEMPORARY GRASSING	5.000	73.70	368.53
0110	163-0240		TN	MULCH	150.000	193.15	28973.86
0115	163-0300		EA	CONSTRUCTION EXIT	2.000	963.90	1927.81
0120	163-0503		EA	CONSTR AND REMOVE SILT CONTROL GATE,TP 3	10.000	345.06	3450.64
0125	163-0521		EA	CONSTR AND REMOVE TEMP DITCH CHECKS	200.000	164.57	32914.00
0130	163-0530		LF	CONSTR AND REMOVE BALED STRW EROSION CHK	75.000	3.34	250.65
0135	163-0550		EA	CONS & REM INLET SEDIMENT TRAP	9.000	159.19	1432.80
0140	165-0010		LF	MAINT OF TEMP SILT FENCE, TP A	3000.000	0.64	1933.74
0145	165-0020		LF	MAINT OF TEMP SILT FENCE, TP B	2000.000	0.63	1271.42

## STATE HIGHWAY AGENCY

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## JOB ESTIMATE REPORT

0150	165-0030	LF	MAINT OF TEMP SILT FENCE, TP C	1250.000	0.72	912.24
0155	165-0040	EA	MAINT OF EROSION CTRL CHKDAMS/DITCH CHKS	200.000	53.74	10748.07
0160	165-0070	LF	MAINT OF BALED STRAW EROSION CHECK	75.000	1.61	120.96
0165	165-0087	EA	MAINT OF SILT CONTROL GATE, TP 3	10.000	102.61	1026.12
0170	165-0101	EA	MAINT OF CONST EXIT	4.000	267.50	1070.00
0175	165-0105	EA	MAINT OF INLET SEDIMENT TRAP	19.000	58.81	1117.41
0180	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	6000.000	1.62	9730.38
0185	171-0020	LF	TEMPORARY SILT FENCE, TYPE B	4000.000	1.05	4236.96
0190	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	2500.000	2.86	7172.45
0195	603-2180	SY	STN DUMPED RIP RAP, TP 3, 12"	116.000	39.79	4616.49
0200	603-7000	SY	PLASTIC FILTER FABRIC	116.000	3.58	415.85
0205	700-6910	AC	PERMANENT GRASSING	10.000	498.18	4981.85
0210	700-7000	TN	AGRICULTURAL LIME	20.000	43.85	877.15
0215	700-7010	GL	LIQUID LIME	45.000	16.09	724.13
0220	700-8100	LB	FERTILIZER NITROGEN CONTENT	650.000	1.90	1238.10
0225	716-2000	SY	EROSION CONTROL MATS, SLOPES	15000.000	0.99	14981.25
0230	150-0009	EA	REM/RST EX SP GD SIGN,OVHD,CIP	2.000	9000.00	18000.00
0235	638-1001	LS	STR SUPPORT OVHD SIGN,TP I,STA 2 LOCATIONS	1.000	240187.67	240187.67
0240	652-5801	LF	SOLID TRAF STRIPE, 8 IN, WHITE	35144.000	0.74	26012.53
0245	652-8351	GLF	SKIP POLYUREA TRAF STRIPE,5 IN,WHITE	15067.000	8.50	128069.50
0250	654-1003	EA	RAISED PVMT MARKERS TP 3	451.000	2.87	1295.53
0255	657-3085	GLF	PRF PL SK PVMT MKG,8",B/W,TPPB	3544.000	3.04	10790.88
0260	657-9111	LF	WET REFL SOL PVMT MKGS,5", YEL	3544.000	10.00	35440.00
0265	657-9515	EA	WET REFL PREF PVMT MKGS WRDS OR SYMB	9.000	500.00	4500.00
0274	543-1100	LS	CONSTR BR-COMP-BOTTOM OF CAP	1.000	585000.00	585000.00
0275	150-1000	LS	TRAFFIC CONTROL - 0010126	1.000	1025000.00	1025000.00
0280	153-1300	EA	FIELD ENGINEERS OFFICE TP 3	1.000	67869.91	67869.92
0300	310-5080	SY	GR AGGR BS CRS 8IN INCL MATL	3533.000	14.17	50093.42
0320	433-1000	SY	REINF CONC APPROACH SLAB	195.000	124.74	24325.16
0329	543-1100	LS	CONSTR BR-COMP-BOTTOM OF CAP	1.000	2668200.00	2668200.00
0330	540-1102	LS	REM OF EX BR, BR NO - WALT STEVENS BRIDGE	1.000	210000.00	210000.00
0355	653-2501	LM	THERMO SOLID TRAF ST, 5 IN, WH	1.000	1211.63	1211.64
0360	653-2502	LM	THERMO SOLID TRAF ST, 5 IN YE	1.000	1236.01	1236.02
0365	654-1001	EA	RAISED PVMT MARKERS TP 1	125.000	3.76	470.79
0370	627-1010	SF	MSE WALL FACE, 10 - 20 FT HT, WALL NO -	10190.000	34.58	352440.92
0375	001-0000	\$	MISC ITEMS ITS ACTIVITIES	1.000	500000.00	500000.00

ITEM TOTAL  
INFLATED ITEM TOTAL

8596187.75  
8596187.75

TOTALS FOR JOB 0010126

ESTIMATED COST:  
CONTINGENCY PERCENT ( 5.0 ):  
ESTIMATED TOTAL:

8596187.76  
429809.39  
9025997.15

STATE HIGHWAY AGENCY

DATE : 01/14/2011  
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JOB ESTIMATE REPORT

JOB NUMBER : 0009156 REV                      SPEC YEAR: 01  
DESCRIPTION: I-75 REVERSIBLE LANES (SR 155 TO EAGLES LANDING)

COST GROUPS FOR JOB 0009156\_REV

COST GROUP	DESCRIPTION	QUANTITY	PRICE	AMOUNT	ACTIVE?
ERTHLS	EARTHWORK (LS)	1.000			N
ASPH	ASPHALT (TN)				N
BASE	BASE/AGGREGATE (TN)				N
CONC	CONCRETE (SY)				N
DRNGEA	DRAINAGE (EA)				N
DRNGLF	DRAINAGE (LF)				N
EROC	EROSION CONTROL (SY)				N
GDRL	GUARDRAIL/BARRIER (LF)				N
GENR	GENERAL/FIELD OFFICE/ETC (LS)				N
MILL	MILLING (SY)				N
MISC	MISCELLANEOUS (LS)				N
NONR	NON-ROADWAY (LS)				N
RPMK	RAISED PAVEMENT MARKING				N
SRET	SURFACE TREATMENT (SY)				N
TRFT	TRAFFIC CONTROL-TEMPORARY (LS)				N
STRO	STRUCTURES, OTHER (SF)				N
WALL	WALLS (SF)				N
RMVL	REMOVALS (LS)				N
SSGN	SMALL ROADSIDE SIGNS				N
PFPM	PREFORMED PLASTIC PAVEMENT MARKING/SYMBOLS				N
PLSY	PLASTIC PAVEMENT MARKING BY SQUARE YARD				N
SIGNPCTO	SIGNS (PERCENT OF JOB)	0.000		0.00	N
THSL	THERMO PLASTIC LINEAR PAVEMENT MARKING				N
THSY	THERMO PLASTIC MARKING SQUARE YARDS				N
SBAR	SOUND BARRIERS (SF)				N
ACTIVE COST GROUP TOTAL				0.00	
INFLATED COST GROUP TOTAL				0.00	

ITEMS FOR JOB 0009156\_REV

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	201-1500		LS	CLEARING & GRUBBING - 0009156	1.000	750000.00	750000.00
0010	210-0100		LS	GRADING COMPLETE - 0009156	1.000	1500000.00	1500000.00
0011	432-0211		SY	MILL ASPH CONC PVMT/ 2.75" DEP	195034.000	1.39	271097.26
0012	456-2012		GLM	INTENT. RUMB. STRIPS - GRND-IN-PL (CONT)	15.800	658.51	10404.61
0015	400-3604		TN	ASPH CONC 12.5 MM SMA,GP2,INCL P-MBM&HL	48693.000	91.87	4473436.62
0020	400-3624		TN	ASPH CONC 12.5 MM PEM,GP2,INCL P-MBM&HL	39840.000	64.55	2571921.40
0025	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	286692.000	47.37	13582882.11
0030	402-3130		TN	RECYL AC 12.5MM SP,GP2,BM&HL	22091.000	59.03	1304147.71
0035	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	44107.000	51.99	2293205.85

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## JOB ESTIMATE REPORT

0040	413-1000	GL	BITUM TACK COAT	42194.000	1.74	73685.91
0045	310-1101	TN	GR AGGR BASE CRS, INCL MATL	307603.000	13.84	4260276.94
0050	441-0204	SY	PLAIN CONC DITCH PAVING, 4 IN	5000.000	24.13	120661.50
0055	610-1055	LF	REM GUARDRAIL	5375.000	2.17	11713.58
0060	610-1075	EA	REM GUARDRAIL ANCH, ALL TYPES	15.000	143.76	2156.49
0065	621-6002	LF	CONC BARRIER, TP S-2	61362.000	70.48	4324793.76
0070	621-6003	LF	CONC BARRIER, TP S-3	7225.000	193.39	1397242.75
0085	641-5001	EA	GUARDRAIL ANCHORAGE, TP 1	14.000	607.34	8502.80
0090	641-5012	EA	GUARDRAIL ANCHORAGE, TP 12	14.000	1802.10	25229.41
0095	641-1100	LF	GUARDRAIL, TP T	750.000	32.75	24567.89
0100	641-1200	LF	GUARDRAIL, TP W	10000.000	14.19	141929.60
0105	649-0018	LF	CONCRETE GLARE SCREEN, 18 INCH	28806.000	14.56	419415.36
0110	550-1180	LF	STM DR PIPE 18",H 1-10	23325.000	24.12	562771.61
0115	550-1240	LF	STM DR PIPE 24",H 1-10	1290.000	35.34	45600.35
0120	550-1300	LF	STM DR PIPE 30",H 1-10	316.000	40.90	12926.44
0125	550-1360	LF	STM DR PIPE 36",H 1-10	189.000	58.71	11097.25
0130	550-1420	LF	STM DR PIPE 42",H 1-10	30.000	81.37	2441.23
0135	550-1480	LF	STM DR PIPE 48",H 1-10	140.000	83.17	11644.99
0140	550-4218	EA	FLARED END SECT 18 IN, ST DR	23.000	398.47	9164.82
0145	550-4224	EA	FLARED END SECT 24 IN, ST DR	12.000	544.16	6529.93
0150	550-4230	EA	FLARED END SECT 30 IN, ST DR	8.000	572.48	4579.91
0155	550-4236	EA	FLARED END SECT 36 IN, ST DR	4.000	1018.08	4072.33
0160	441-0600	CY	CONC HEADWALLS	30.000	989.71	29691.49
0165	500-3101	CY	CLASS A CONCRETE	930.000	337.02	313428.93
0170	511-1000	LB	BAR REINF STEEL	101124.000	0.62	63640.37
0175	615-1000	LF	JACK OR BORE PIPE - 18"	1923.000	411.81	791925.92
0180	615-1000	LF	JACK OR BORE PIPE - 24	1422.000	260.22	370038.51
0185	668-2100	EA	DROP INLET, GP 1	1.000	1886.66	1886.67
0190	668-2105	EA	DROP INLET, GP 1, SPCL DES M1	35.000	1601.38	56048.52
0195	668-2105	EA	DROP INLET, GP 1, SPCL DES M2	114.000	1601.38	182558.02
0200	668-2110	LF	DROP INLET, GP 1, ADDL DEPTH	229.000	151.29	34646.38
0205	668-2231	EA	DROP INLET,GP 1,MOD TP M-1	19.000	1600.00	30400.00
0210	163-0232	AC	TEMPORARY GRASSING	132.000	49.36	6516.41
0215	163-0240	TN	MULCH	4707.000	107.82	507512.41
0220	163-0300	EA	CONSTRUCTION EXIT	15.000	772.95	11594.27
0225	163-0503	EA	CONSTR AND REMOVE SILT CONTROL GATE,TP 3	75.000	307.07	23030.69
0230	163-0520	LF	CONSTR AND REMOVE TEMP PIPE SLOPE DRAIN	2250.000	11.52	25932.80
0235	163-0521	EA	CONSTR AND REMOVE TEMP DITCH CHECKS	1500.000	164.57	246855.00
0240	163-0530	LF	CONSTR AND REMOVE BALED STRW EROSION CHK	7500.000	2.59	19480.88
0245	163-0541	EA	CONSTR & REM ROCK FILTER DAMS	750.000	122.99	92247.54
0250	163-0550	EA	CONS & REM INLET SEDIMENT TRAP	150.000	145.82	21873.11
0255	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	22500.000	0.48	10841.40
0260	165-0020	LF	MAINT OF TEMP SILT FENCE, TP B	18750.000	0.63	11919.56
0265	165-0030	LF	MAINT OF TEMP SILT FENCE, TP C	15000.000	0.51	7749.60
0270	165-0040	EA	MAINT OF EROSION CTRL CHKDAMS/DITCH CHKS	1500.000	51.96	77947.44
0275	165-0070	LF	MAINT OF BALED STRAW EROSION CHECK	7500.000	0.89	6734.93
0280	165-0087	EA	MAINT OF SILT CONTROL GATE, TP 3	75.000	82.17	6163.03
0285	165-0101	EA	MAINT OF CONST EXIT	15.000	249.20	3738.06
0290	165-0110	EA	MAINT OF ROCK FILTER DAM	750.000	152.17	114129.18

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## JOB ESTIMATE REPORT

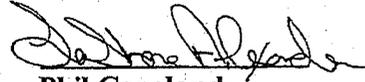
0295	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	12.000	379.39	4552.75
0300	167-1500	MO	WATER QUALITY INSPECTIONS	48.000	451.03	21649.63
0305	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	45000.000	1.25	56322.00
0310	171-0020	LF	TEMPORARY SILT FENCE, TYPE B	37500.000	1.05	39721.50
0315	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	30000.000	2.47	74183.10
0320	603-2180	SY	STN DUMPED RIP RAP, TP 3, 12"	2025.000	31.43	63665.25
0325	603-7000	SY	PLASTIC FILTER FABRIC	2025.000	3.33	6758.92
0330	700-6910	AC	PERMANENT GRASSING	66.000	441.54	29141.66
0335	700-7000	TN	AGRICULTURAL LIME	105.000	40.98	4303.32
0340	700-7010	GL	LIQUID LIME	180.000	15.19	2735.72
0345	700-8100	LB	FERTILIZER NITROGEN CONTENT	2357.000	1.71	4031.74
0350	715-2100	SY	BITUM TRTD ROVING, SLOPES	23625.000	1.80	42599.89
0355	716-2000	SY	EROSION CONTROL MATS, SLOPES	37500.000	0.94	35589.00
0360	654-1003	EA	RAISED PVMT MARKERS TP 3	20020.000	2.22	44523.08
0365	636-1020	SF	HWY SGN,TP1MAT,REFL SH TP3	2500.000	11.77	29425.20
0370	636-1033	SF	HWY SIGNS, TP1MAT,REFL SH TP 9	1140.000	17.95	20472.93
0375	636-2020	LF	GALV STEEL POSTS, TP 2	250.000	23.49	5872.50
0380	636-2070	LF	GALV STEEL POSTS, TP 7	300.000	8.03	2410.08
0385	636-2090	LF	GALV STEEL POSTS, TP 9	350.000	7.80	2731.82
0390	636-5100	EA	MILEPOST SIGNS	20.000	129.90	2598.15
0395	150-0009	EA	REM/RST EX SP GD SIGN,OVHD,CIP	3.000	9000.00	27000.00
0400	638-1001	LS	STR SUPPORT OVHD SIGN,TP I,STA 3 NOS.	1.000	360281.53	360281.53
0405	657-1054	LF	PRF PL SD PVMT MKG,5",WH,TP PB	131050.000	2.44	320522.09
0410	657-3054	GLF	PRF PL SK PVMT MKG,5",WH,TP PB	15138.000	2.37	35931.41
0415	657-3085	GLF	PRF PL SK PVMT MKG,8",B/W,TPPB	15138.000	2.64	39998.53
0420	657-6054	LF	PRF PL SD PVMT MKG,5",YW,TP PB	131050.000	2.05	269783.46
0425	652-5801	LF	SOLID TRAF STRIPE, 8 IN, WHITE	211008.000	0.65	137442.17
0430	652-8351	GLF	SKIP POLYUREA TRAF STRIPE,5 IN,WHITE	48034.000	8.50	408289.00
0435	657-9111	LF	WET REFL SOL PVMT MKGS,5", YEL	15138.000	10.00	151380.00
0440	657-9515	EA	WET REFL PREF PVMT MKGS WRDS OR SYMB	200.000	500.00	100000.00
0445	543-9000	LS	CONSTR OF BRIDGE COMPLETE - 0009156	1.000	1963600.00	1963600.00
0450	627-1010	SF	MSE WALL FACE, 10 - 20 FT HT, WALL NO - 0009156	127925.000	34.58	4423646.50
0455	624-0410	SF	SOUND BARRIER	25000.000	20.00	500000.00
0460	150-1000	LS	TRAFFIC CONTROL - 0009156	1.000	1500000.00	1500000.00
0465	001-0000	\$	MISC ITEMS ITS ACTIVITIES	1.000	1500000.00	1500000.00

ITEM TOTAL						53537794.45
INFLATED ITEM TOTAL						53537794.45

TOTALS FOR JOB 0009156\_REV

ESTIMATED COST:						53537794.46
CONTINGENCY PERCENT ( 0.0 ):						0.00
ESTIMATED TOTAL:						53537794.46

# Preliminary Right of Way Cost Estimate



**Phil Copeland**  
 Right of Way Administrator  
 By: LaShone Alexander

**Date:** December 15, 2010  
**Project:** CSNHS-0009-00(156) **UPDATE** **P.L. Number:** 0009156  
**Existing/Required R/W:** Varies/Varies **No. Parcels:** 5  
**Project Termini :** I-75 Managed Lanes from SR 155 to SR 138 (Stockbridge)  
**Project Description:** I-75 Managed Lanes from SR 155 to SR 138 (Stockbridge)

**Land:**  
 Residential RW Required: 0.75 acres @ \$35,000/acre 26,250  
 Industrial RW Required: 0.25 acres @ \$75,000/acre 18,750

**Improvements :** Landscaping, misc. 15,000

**Relocation:** Commercial (0)  
 Residential (0)

**Damage :** Proximity (0)  
 Cost to Cure (0)  
 Consequential

Net Cost \$ 60,000

Net Cost		\$ 60,000
Scheduling Contingency	55 %	33,000
Adm/Court Cost	60 %	55,800
		<u>\$ 148,000</u>

**Total Cost \$ 148,000**

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

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JOB ESTIMATE REPORT

JOB NUMBER : 0009157\_REV                      SPEC YEAR: 01  
 DESCRIPTION: I-75 REVERSIBLE LANES (EAGLES LANDING TO NORTH OF SR 154)

COST GROUPS FOR JOB 0009157\_REV

COST GROUP	DESCRIPTION	QUANTITY	PRICE	AMOUNT	ACTIVE?
ERTHLS	EARTHWORK (LS)	1.000			N
ASPH	ASPHALT (TN)				N
BASE	BASE/AGGREGATE (TN)				N
CONC	CONCRETE (SY)				N
DRNGEA	DRAINAGE (EA)				N
DRNGLF	DRAINAGE (LF)				N
EROC	EROSION CONTROL (SY)				N
GDRL	GUARDRAIL/BARRIER (LF)				N
GENR	GENERAL/FIELD OFFICE/ETC (LS)				N
MILL	MILLING (SY)				N
MISC	MISCELLANEOUS (LS)				N
NONR	NON-ROADWAY (LS)				N
RPMK	RAISED PAVEMENT MARKING				N
SRFT	SURFACE TREATMENT (SY)				N
TRFT	TRAFFIC CONTROL-TEMPORARY (LS)				N
STRO	STRUCTURES, OTHER (SF)				N
WALL	WALLS (SF)				N
RMVL	REMOVALS (LS)				N
SSGN	SMALL ROADSIDE SIGNS				N
PFPM	PERFORMED PLASTIC PAVEMENT MARKING/SYMBOLS				N
PLSY	PLASTIC PAVEMENT MARKING BY SQUARE YARD				N
SIGNPCTO	SIGNS (PERCENT OF JOB)	0.000		0.00	N
THSL	THERMO PLASTIC LINEAR PAVEMENT MARKING				N
THSY	THERMO PLASTIC MARKING SQUARE YARDS				N
SBAR	SOUND BARRIERS (SF)				N
ACTIVE COST GROUP TOTAL				0.00	
INFLATED COST GROUP TOTAL				0.00	

ITEMS FOR JOB 0009157\_REV

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	201-1500		LS	CLEARING & GRUBBING - 0009157	1.000	500000.00	500000.00
0010	210-0100		LS	GRADING COMPLETE - 0009157	1.000	1500000.00	1500000.00
0011	432-0211		SY	MILL ASPH CONC PVMT/ 2.75" DEP	38874.000	1.39	54034.86
0012	456-2012		GLM	INTENT. RUMB. STRIPS - GRND-IN-PL (CONT)	10.000	1277.48	12774.82
0015	400-3604		TN	ASPH CONC 12.5 MM SMA,GP2,INCL P-MBM&HL	17544.000	91.87	1611771.14
0020	400-3624		TN	ASPH CONC 12.5 MM PEM,GP2,INCL P-MBM&HL	14354.000	76.88	1103573.70
0025	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	121491.000	50.15	6093523.25
0030	402-3130		TN	RECYL AC 12.5MM SP,GP2,BM&HL	4700.000	65.23	306590.31
0035	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	18691.000	55.28	1033382.03

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## JOB ESTIMATE REPORT

0040	413-1000	GL	BITUM TACK COAT	15030.000	1.93	29024.13
0045	310-1101	TN	GR AGGR BASE CRS, INCL MATL	90192.000	15.16	1368043.98
0050	441-0204	SY	PLAIN CONC DITCH PAVING, 4 IN	1500.000	25.79	38688.97
0055	610-1055	LF	REM GUARDRAIL	5375.000	2.17	11713.58
0060	610-1075	EA	REM GUARDRAIL ANCH, ALL TYPES	15.000	143.76	2156.49
0065	621-6002	LF	CONC BARRIER, TP S-2	28890.000	70.48	2036167.20
0070	621-6003	LF	CONC BARRIER, TP S-3	7225.000	193.39	1397242.75
0085	641-5001	EA	GUARDRAIL ANCHORAGE, TP 1	7.000	691.41	4839.92
0090	641-5012	EA	GUARDRAIL ANCHORAGE, TP 12	7.000	1777.28	12441.00
0095	641-1100	LF	GUARDRAIL, TP T	375.000	38.49	14437.03
0100	641-1200	LF	GUARDRAIL, TP W	5000.000	15.13	75672.05
0105	649-0018	LF	CONCRETE GLARE SCREEN; 18 INCH	14403.000	14.56	209707.68
0110	550-1180	LF	STM DR PIPE 18",H 1-10	12560.000	24.76	311046.01
0115	550-1240	LF	STM DR PIPE 24",H 1-10	694.000	36.70	25471.33
0120	550-1300	LF	STM DR PIPE 30",H 1-10	171.000	41.83	7154.20
0125	550-1360	LF	STM DR PIPE 36",H 1-10	102.000	60.53	6174.96
0130	550-1420	LF	STM DR PIPE 42",H 1-10	16.000	84.21	1347.36
0135	550-1480	LF	STM DR PIPE 48",H 1-10	76.000	85.89	6528.23
0140	550-4218	EA	FLARED END SECT 18 IN, ST DR	12.000	398.47	4781.65
0145	550-4224	EA	FLARED END SECT 24 IN, ST DR	6.000	509.36	3056.20
0150	550-4230	EA	FLARED END SECT 30 IN, ST DR	5.000	572.48	2862.44
0155	550-4236	EA	FLARED END SECT 36 IN, ST DR	2.000	1024.80	2049.61
0160	441-0600	CY	CONC HEADWALLS	16.000	989.71	15835.46
0165	500-3101	CY	CLASS A CONCRETE	500.000	350.18	175091.82
0170	511-1000	LB	BAR REINF STEEL	54452.000	0.65	35756.45
0175	615-1000	LF	JACK OR BORE PIPE - 18"	1036.000	274.31	284192.69
0180	615-1000	LF	JACK OR BORE PIPE - 24	766.000	288.46	220963.44
0185	668-2100	EA	DROP INLET, GP 1	1.000	1886.66	1886.67
0190	668-2105	EA	DROP INLET, GP 1, SPCL DES M1	19.000	1668.46	31700.87
0195	668-2105	EA	DROP INLET, GP 1, SPCL DES M2	62.000	1601.38	99285.94
0200	668-2110	LF	DROP INLET, GP 1, ADDL DEPTH	20.000	151.95	3039.18
0205	668-2231	EA	DROP INLET,GP 1,MOD TP M-1	10.000	1600.00	16000.00
0210	163-0232	AC	TEMPORARY GRASSING	88.000	51.87	4565.40
0215	163-0240	TN	MULCH	3138.000	115.47	362366.10
0220	163-0300	EA	CONSTRUCTION EXIT	10.000	808.06	8080.66
0225	163-0503	EA	CONSTR AND REMOVE SILT CONTROL GATE,TP 3	50.000	314.36	15718.43
0230	163-0520	LF	CONSTR AND REMOVE TEMP PIPE SLOPE DRAIN	1500.000	11.87	17818.01
0235	163-0521	EA	CONSTR AND REMOVE TEMP DITCH CHECKS	1000.000	164.57	164570.00
0240	163-0530	LF	CONSTR AND REMOVE BALED STRW EROSION CHK	5000.000	2.65	13278.65
0245	163-0541	EA	CONSTR & REM ROCK FILTER DAMS	500.000	132.50	66254.54
0250	163-0550	EA	CONS & REM INLET SEDIMENT TRAP	100.000	147.67	14767.72
0255	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	15000.000	0.51	7663.50
0260	165-0020	LF	MAINT OF TEMP SILT FENCE, TP B	12500.000	0.63	7946.38
0265	165-0030	LF	MAINT OF TEMP SILT FENCE, TP C	10000.000	0.54	5465.90
0270	165-0040	EA	MAINT OF EROSION CTRL CHKDAMS/DITCH CHKS	1000.000	52.31	52317.45
0275	165-0070	LF	MAINT OF BALED STRAW EROSION CHECK	5000.000	0.94	4727.50
0280	165-0087	EA	MAINT OF SILT CONTROL GATE, TP 3	50.000	85.93	4296.50
0285	165-0101	EA	MAINT OF CONST EXIT	10.000	254.67	2546.79
0290	165-0110	EA	MAINT OF ROCK FILTER DAM	500.000	152.17	76086.12

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## JOB ESTIMATE REPORT

0295	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	6.000	379.39	2276.37
0300	167-1500	MO	WATER QUALITY INSPECTIONS	36.000	466.12	16780.40
0305	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	30000.000	1.31	39557.40
0310	171-0020	LF	TEMPORARY SILT FENCE, TYPE B	25000.000	1.05	26481.00
0315	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	20000.000	2.53	50669.40
0320	603-2180	SY	STN DUMPED RIP RAP, TP 3, 12"	1350.000	32.50	43886.06
0325	603-7000	SY	PLASTIC FILTER FABRIC	1350.000	3.37	4551.81
0330	700-6910	AC	PERMANENT GRASSING	44.000	453.14	19938.21
0335	700-7000	TN	AGRICULTURAL LIME	69.000	41.69	2876.83
0340	700-7010	GL	LIQUID LIME	119.000	15.45	1839.72
0345	700-8100	LB	FERTILIZER NITROGEN CONTENT	1571.000	1.76	2779.84
0350	715-2100	SY	BITUM TRTD ROVING, SLOPES	15750.000	1.80	28399.93
0355	716-2000	SY	EROSION CONTROL MATS, SLOPES	25000.000	0.97	24268.00
0360	654-1003	EA	RAISED PVMT MARKERS TP 3	10500.000	2.32	24390.56
0365	636-1020	SF	HWY SGN, TP1MAT, REFL SH TP3	1250.000	12.22	15276.76
0370	636-1033	SF	HWY SIGNS, TP1MAT, REFL SH TP 9	570.000	18.74	10687.26
0375	636-2020	LF	GALV STEEL POSTS, TP 2	125.000	23.49	2936.25
0380	636-2070	LF	GALV STEEL POSTS, TP 7	150.000	8.48	1273.16
0385	636-2090	LF	GALV STEEL POSTS, TP 9	175.000	7.95	1392.32
0390	636-5100	EA	MILEPOST SIGNS	10.000	142.75	1427.56
0395	150-0009	EA	REM/RST EX SP GD SIGN, OVHD, CIP	9.000	9000.00	81000.00
0400	638-1001	LS	STR SUPPORT OVHD SIGN, TP I, STA 9 NOS.	1.000	1080844.52	1080844.52
0405	657-1054	LF	PRF PL SD PVMT MKG, 5", WH, TP PB	65525.000	2.64	173537.07
0410	657-3054	GLF	PRF PL SK PVMT MKG, 5", WH, TP PB	7569.000	2.44	18468.97
0415	657-3085	GLF	PRF PL SK PVMT MKG, 8", B/W, TPPB	7569.000	2.82	21400.06
0420	657-6054	LF	PRF PL SD PVMT MKG, 5", YW, TP PB	65525.000	2.25	147732.67
0425	652-5801	LF	SOLID TRAF STRIPE, 8 IN, WHITE	105502.000	0.68	72202.40
0430	652-8351	GLF	SKIP POLYUREA TRAF STRIPE, 5 IN, WHITE	24017.000	8.50	204144.50
0435	657-9111	LF	WET REFL SOL PVMT MKGS, 5", YEL	7569.000	10.00	75690.00
0440	657-9515	EA	WET REFL PREF PVMT MKGS WRDS OR SYMB	100.000	500.00	50000.00
0445	543-9000	LS	CONSTR OF BRIDGE COMPLETE - 0009157	1.000	2567400.00	2567400.00
0450	627-1010	SF	MSE WALL FACE, 10 - 20 FT HT, WALL NO - 0009157	151960.000	34.58	5254776.80
0460	150-1000	LS	TRAFFIC CONTROL - 0009157	1.000	1000000.00	1000000.00
0465	001-0000	\$	MISC ITEMS ITS ACTIVITIES	1.000	1000000.00	1000000.00

ITEM TOTAL

31567364.85

INFLATED ITEM TOTAL

31567364.85

TOTALS FOR JOB 0009157\_REV

ESTIMATED COST:

31567364.89

CONTINGENCY PERCENT ( 0.0 ):

0.00

ESTIMATED TOTAL:

31567364.89

## **VE RECOMMENDATIONS**

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Auxiliary Lane

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>	
A-2	1 of 4	Close Walt Stephens Road over I-75 during bridge construction	
Comp By: AS	Date: 2/1/2011	Checked By: DCW	Date: 2/4/11

**Original Concept:**

Replace the Walt Stephens road over I-75 bridge in two stages keeping existing traffic over I-75

**Proposed Change:**

Detour Walt Stephens Road over I-75 and replace the existing bridge with a new 72” Bulb Tee PSC Beam bridge. This avoids stage construction and speeds up the bridge construction. Building the bridge in one stage results in construction cost savings.

**Justification:**

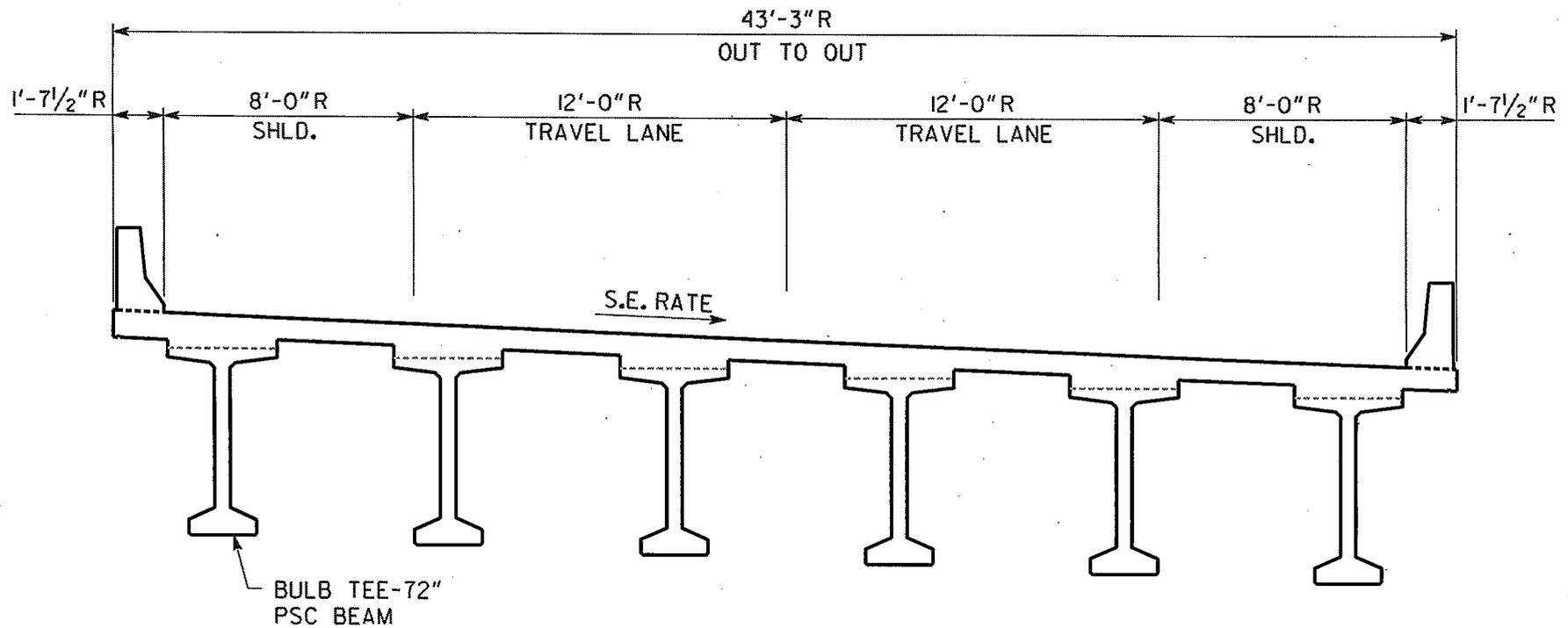
Stage construction adds to the construction time and in turn adds extra construction staging cost. Building the bridge in one stage results in construction cost savings.

A detour will be required to facilitate this recommendation and there could be requirements for a public information meeting as part of the notification process however the overall savings will have to be evaluated against any overall project scheduling impacts. This bridge was recently closed for an extended period with traffic successfully rerouted through the local road network.

The construction of the bridge in one stage will result in potential reduction for the construction time (approx. 6 months). This will result in additional significant savings.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	1,592,000		
<b>- Proposed</b>	1,144,000		
<b>- Savings</b>	448,000		448,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>448,000</b>

CREATIVE IDEA A-2- PROPOSED TYPICAL SECTION USING PSC BEAMS



\* MEASURED NORMAL TO BEAMS

R - DENOTES RADIAL

TYPICAL SECTION

PROPOSED BRIDGE  
LOOKING AHEAD  
NO SCALE



## CALCULATIONS

### I-75 Auxiliary Lane

ITEM N<sup>o</sup>: A-2  
CLIENT: GDOT  
Sheet 4 of 4

Original Walt Stephen Bridge over I-75  
Stage Constructed:

43.25' wide X 294' long = 12715.50 SF X \$ 115/SF = \$1,462,283.00

Proposed Walt Stephen Bridge over I-75  
Constructed in single Stage

43.25' wide X 294' long = 12715.50 SF X \$ 90/SF = \$1,144,395.00

#### Construction Time Savings

6 months estimated time equates to 6 months savings in contractor OH which includes field and office OH plus salaries of field PM and office engineer. Estimate weekly savings 4,000 labor plus 1,000 central office OH = 5,000 per week X 26 weeks = \$130,000. Additional savings from user costs shortening of disruption assumed offset by user use of detour.

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Auxiliary Lane

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
B-1	1 of 5	Reduce Shoulder Pavement Thickness

Comp By: SSB      Date: 2/1/2011      Checked By: DCW      Date: 2/3/11

**Original Concept:**

Provide a 12' wide paved shoulder with a pavement structure comprised of 16.5" of asphalt with 12" of GAB.

**Proposed Change:**

Provide a 12' wide paved shoulder with a pavement structure comprised of 8" asphalt with 6" GAB.

**Justification:**

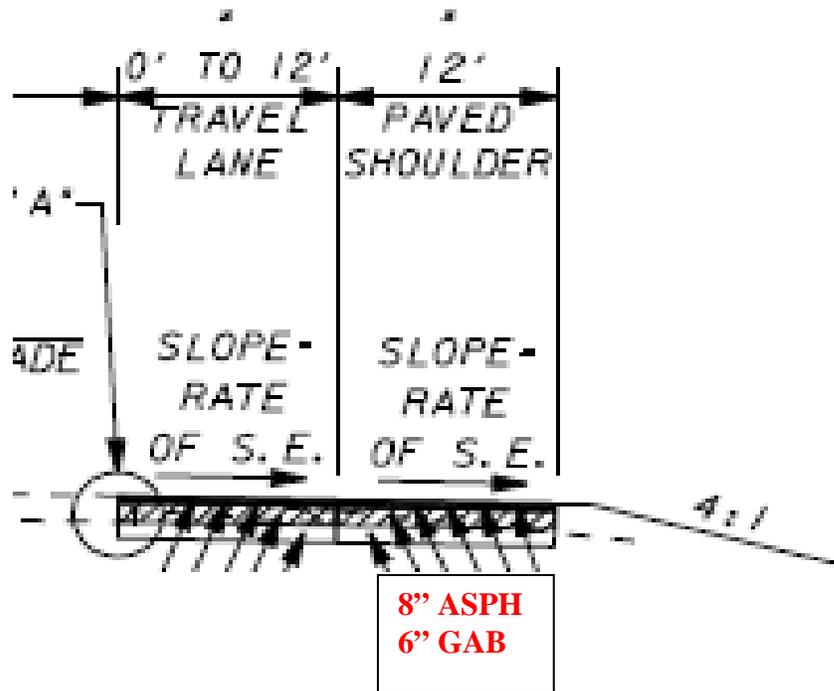
The proposed shoulder thickness would be adequate and provide a significant cost savings. A full depth pavement section is not needed structurally.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	526,000		
<b>- Proposed</b>	256,000		
<b>- Savings</b>	270,000		270,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>270,000</b>

**SKETCH**

**I-75 Auxiliary Lane**

ITEM N<sup>o</sup>: B-1  
CLIENT: GDOT  
Sheet 2 of 5





**CALCULATIONS****I-75 Auxiliary Lane**ITEM N<sup>o</sup>: B-1  
CLIENT: GDOT  
Sheet 4 of 5

## Shoulder Area:

934+84 to 937+37

$$((253(0+12)/2))/9 = 169 \text{ SY}$$

937+37 to 948+75

$$(1,138 \times 12)/9 = 1517 \text{ SY}$$

951+21 to 992+11

$$(4,090 \times 12)/9 = 5,453 \text{ SY}$$

992+11 to 994+65

$$((254(12+0)/2))/9 = 169 \text{ SY}$$

$$\text{Total} = 7,308 \text{ SY}$$

**CALCULATIONS****I-75 Auxiliary Lane**ITEM N<sup>o</sup>: B-1  
CLIENT: GDOT  
Sheet 5 of 5CURRENT DESIGN Asphalt shoulder pavement: 16.5 in asphalt / 12 inch GAB

$$(16.5/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.103 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$$

## Cost per SY

$$(0.103 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$65 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$18.54 / \text{ton}) = \\ \$ 60.33 + 11.26 = \$71.59 / \text{SY} \quad \text{USE: } \$72 \text{ per SY}$$

RECOMMENDED DESIGN Asphalt shoulder pavement: 8 in asphalt / 6 inch GAB

$$(8/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.05 \text{ ton/sf}$$

$$(6/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.03375 \text{ ton/sf}$$

## Cost per SY

$$(0.05 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$65 / \text{ton}) + (0.03375 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$18.54 / \text{ton}) = \\ \$ 29.25 + 5.63 = \$34.88 / \text{SY} \quad \text{USE: } \$35 \text{ per SY}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Auxiliary Lane

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
B-3	1 of 5	Reduce Shoulder Pavement Width

Comp By: SSB      Date: 2/1/2011      Checked By: DCW      Date: 4/3/11

**Original Concept:**

Provide a 12' wide paved shoulder with a 2' grassed strip.

**Proposed Change:**

Provide an 8' wide paved shoulder with a 6' grassed strip.

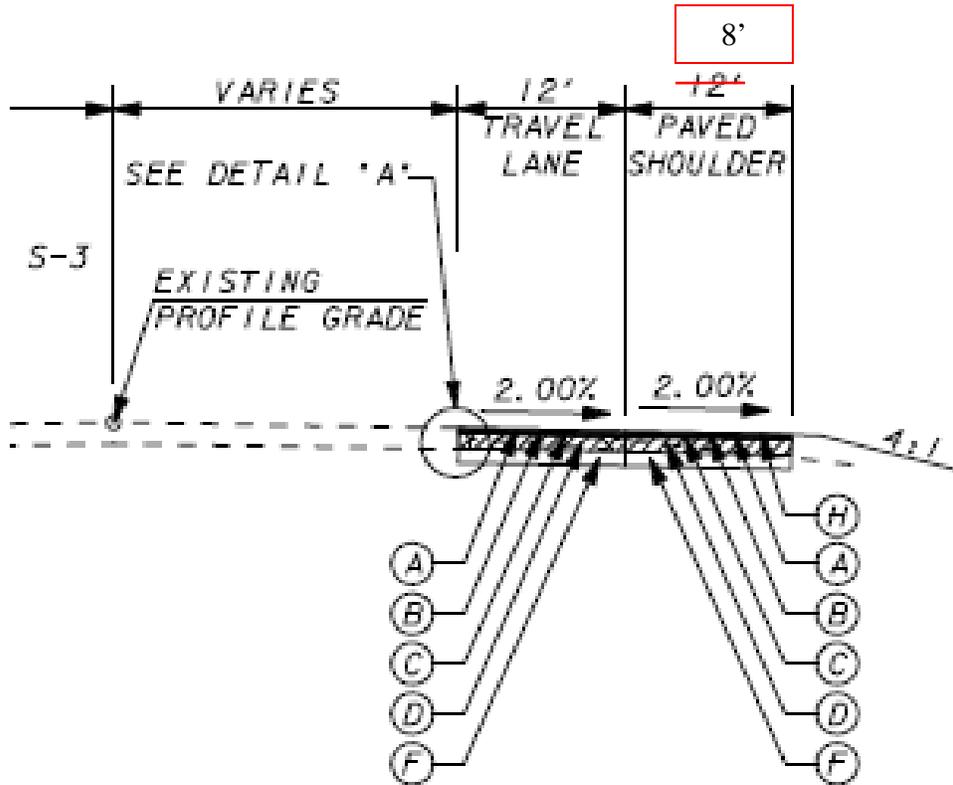
**Justification:**

An 8' wide paved should with a 6' grassed strip is sufficient in width for a vehicle to pull off, and is in compliance with AASHTO guidelines (AASHTO 2004, Chapter 4).

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	526,000		
<b>- Proposed</b>	358,000		
<b>- Savings</b>	168,000		168,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>168,000</b>

I-75 Auxiliary Lane

ITEM N<sup>o</sup>: B-3  
CLIENT: GDOT  
Sheet 2 of 5





**CALCULATIONS****I-75 Auxiliary Lane**ITEM N<sup>o</sup>: B-3  
CLIENT: GDOT  
Sheet 4 of 5**As designed:**934+84 to 937+37  
 $((253(0+12)/2))/9 = 169 \text{ SY}$ 937+37 to 948+75  
 $(1138 \times 12)/9 = 1517 \text{ SY}$ 951+21 to 992+11  
 $(4090 \times 12)/9 = 5453 \text{ SY}$ 992+11 to 994+65  
 $((254(12+0)/2))/9 = 169 \text{ SY}$ 

Total = 7308SY

**As recommended:**934+84 to 937+37  
 $((253(0+8)/2))/9 = 112 \text{ SY}$ 937+37 to 948+75  
 $(1138 \times 8)/9 = 1011 \text{ SY}$ 951+21 to 992+11  
 $(4090 \times 8)/9 = 3635 \text{ SY}$ 992+11 to 994+65  
 $((254(8+0)/2))/9 = 112 \text{ SY}$ 

Total = 4870 SY

Difference:  $7308 - 4870 = 2438 \text{ SY}$

## CALCULATIONS

**I-75 Auxiliary Lane**

ITEM N<sup>o</sup>: B-3  
CLIENT: GDOT  
Sheet 5 of 5

CURRENT DESIGN Asphalt shoulder pavement: 16.5 in asphalt / 12 inch GAB

$$(16.5/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.103 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$$

Cost per SY

$$(0.103 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$65 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$18.54 / \text{ton}) = \\ \$60.33 + 11.26 = \$71.59 / \text{SY} \quad \text{USE: } \$72 \text{ per SY}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
A-1	1 of 5	Reduce Shoulder Pavement Thickness

Comp By: SSB      Date: 2/1/2011      Checked By: DCW      Date: 2/4/11

**Original Concept:**

Provide a 12' wide paved shoulder with a pavement structure comprised of 16.5" of asphalt with 12" of GAB.

**Proposed Change:**

Provide a 12' wide paved shoulder with a pavement structure comprised of 8" asphalt with 6" GAB.

**Justification:**

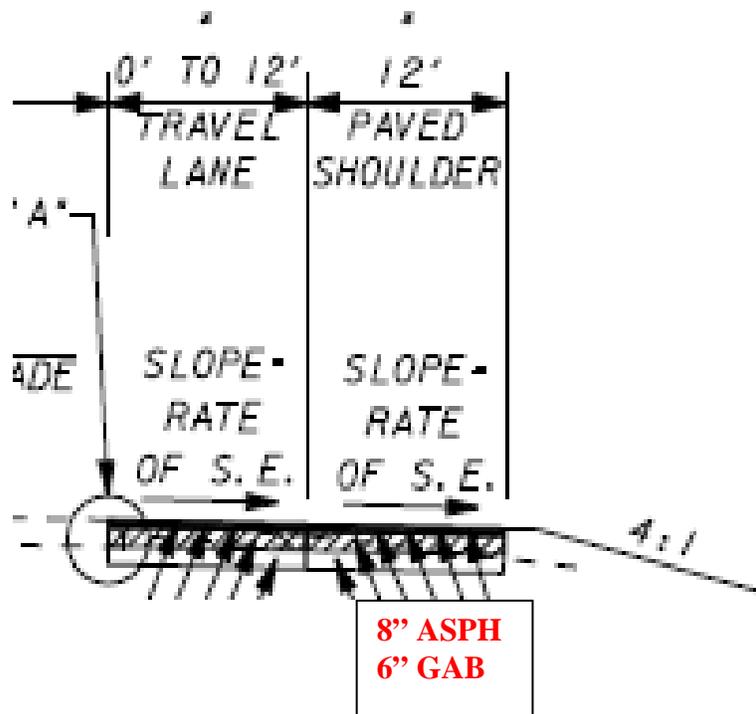
The proposed shoulder thickness would be adequate considering the reduced use. A full depth section is not required for shoulder use and will provide a significant cost savings.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	15,552,000		
<b>- Proposed</b>	7,560,000		
<b>- Savings</b>	7,992,000		7,992,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>7,992,000</b>

**SKETCH**

**I-75 Managed Lanes from SR 155 to SR 138**

ITEM N<sup>o</sup>: A-1  
CLIENT: GDOT  
Sheet 2 of 5





## CALCULATIONS

I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-1  
CLIENT: GDOT  
Sheet 4 of 5

### Outside Shoulder (12') Areas:

N.B.

482+00 to 830+00             $34,800 \times 12/9 = 46,400$  SY

932+00 to 1002+50         $7,050 \times 12/9 = 9,400$  SY

S.B.

488+50 to 511+00         $2,250 \times 12/9 = 3,000$  SY

612+50 to 640+50         $2,800 \times 12/9 = 3,733$  SY

652+50 to 703+00         $5,050 \times 12/9 = 6,733$  SY

### Inside Shoulder (12') Areas:

N.B.

482+00 to 485+50         $350 \times 12/9 = 467$  SY

830+50 to 931+50         $10,100 \times 12/9 = 13,467$  SY

5046+50 to 6017+50       $97,100 \times 12/9 = 129,467$  SY

S.B.

6047+50 to 6072+50       $2,500 \times 12/9 = 3,333$  SY

Total area = 216,000 SY

## CALCULATIONS

I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-1  
CLIENT: GDOT  
Sheet 5 of 5

### CURRENT DESIGN Asphalt shoulder pavement: 16.5 in asphalt / 12 inch GAB

$$(16.5/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.103 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$$

Cost per SY

$$(0.103 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$65 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$18.54 / \text{ton}) = \\ \$ 60.33 + 11.26 = \$71.59 / \text{SY} \quad \text{USE: } \$72 \text{ per SY}$$

### RECOMMENDED DESIGN Asphalt shoulder pavement: 8 in asphalt / 6 inch GAB

$$(8/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.05 \text{ ton/sf}$$

$$(6/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.03375 \text{ ton/sf}$$

Cost per SY

$$(0.05 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$65 / \text{ton}) + (0.03375 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$18.54 / \text{ton}) = \\ \$ 29.25 + 5.63 = \$34.88 / \text{SY} \quad \text{USE: } \$35 \text{ per SY}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
A-2	1 of 5	Reduce Shoulder Pavement Width

Comp By: SSB      Date: 2/1/2011      Checked By: DCW      Date: 2/2/11

**Original Concept:**

Provide a 12' wide paved shoulder with a 2' grassed strip.

**Proposed Change:**

Provide an 8' wide paved shoulder with a 6' grassed strip.

**Justification:**

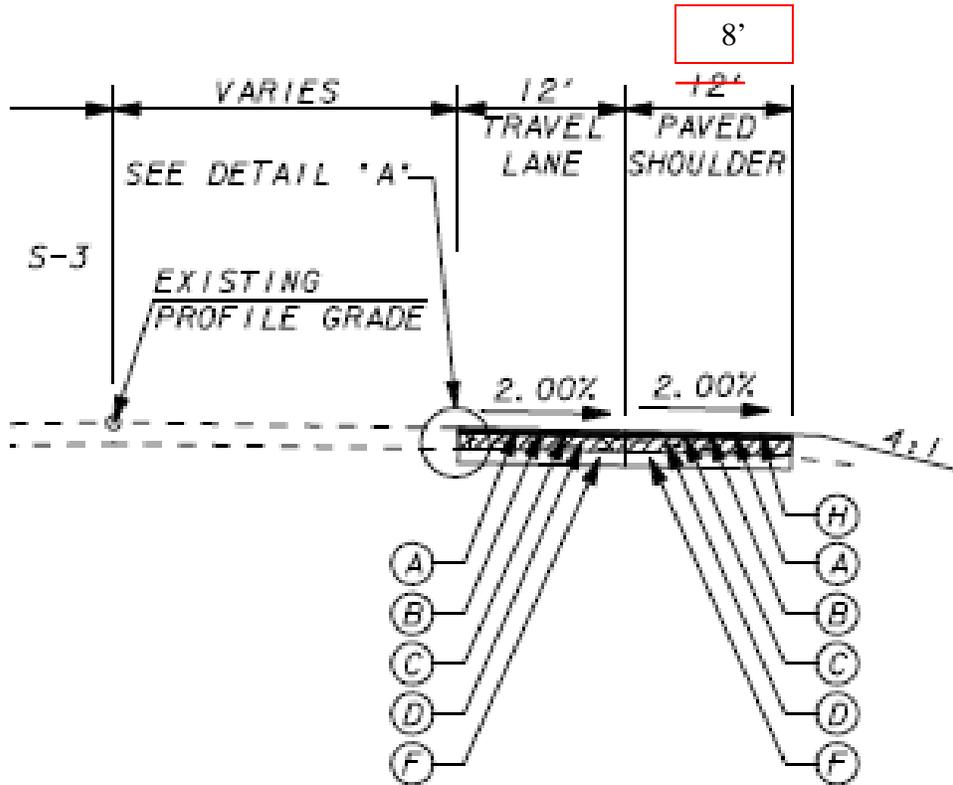
An 8' wide paved should with a 6' grassed strip is sufficient in width for a vehicle to pull off the pavement, and is in conformance with AASHTO 2004, Chapter 4.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	15,552,000		
<b>- Proposed</b>	10,584,000		
<b>- Savings</b>	4,968,000		4,968,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>4,968,000</b>

CONTINUATION

I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-2  
CLIENT: GDOT  
Sheet 2 of 5





## CALCULATIONS

### I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-2  
CLIENT: GDOT  
Sheet 4 of 5

#### Outside Shoulder Areas:

N.B.

482+00 to 830+00                       $34,800 \times 8/9 = 30,933 \text{ SY}$

932+00 to 1002+50                       $7,050 \times 8/9 = 6,267 \text{ SY}$

S.B.

488+50 to 511+00                       $2,250 \times 8/9 = 2,000 \text{ SY}$

612+50 to 640+50                       $2,800 \times 8/9 = 2,488 \text{ SY}$

652+50 to 703+00                       $5,050 \times 8/9 = 4,489 \text{ SY}$

#### Inside Shoulder Areas:

N.B.

482+00 to 485+50                       $350 \times 8/9 = 311 \text{ SY}$

830+50 to 931+50                       $10,100 \times 8/9 = 8,978 \text{ SY}$

5046+50 to 6017+50                       $97,100 \times 8/9 = 86,311 \text{ SY}$

S.B.

6047+50 to 6072+50                       $2,500 \times 8/9 = 2,222 \text{ SY}$

Total area = 143,999 SY

## CALCULATIONS

**I-75 Managed Lanes from SR 155 to SR 138**

ITEM N<sup>o</sup>: A-2  
CLIENT: GDOT  
Sheet 5 of 5

CURRENT DESIGN Asphalt shoulder pavement: 16.5 in asphalt / 12 inch GAB

$$(16.5/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.103 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$$

Cost per SY

$$(0.103 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$65 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$18.54 / \text{ton}) = \\ \$ 60.33 + 11.26 = \$71.59 / \text{SY} \quad \text{USE: } \$72 \text{ per SY}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
A-4	1 of 5	Construct only one managed lane in each direction

Comp By: GAO      Date: 2/1/11      Checked By: DCW      Date: 2/2/11

**Original Concept:**

Construct a 2-lane reversible managed lane system beginning just north of the SR 155 interchange to the I-675 split.

**Proposed Change:**

Construct only one managed lane in each direction, eliminate the reversibility operations of the current design.

**Justification:**

A single managed lane could be sufficient to accommodate the projected traffic volumes expected to use the lane. Traffic in this corridor is less than on the NE section of Atlanta, I-85, where only 1 managed lane is proposed. This alternate would not preclude construction of a second managed lane when the traffic volumes would require it.

A reversible roadway system encompasses and introduces many safety, maintenance, security and operational issues. It is a significant undertaking and a highly specialized operation that when the ultimate build out occurs, will have to be disassembled and removed.

The additional costs associated with the proposed recommendation could be offset by a more realistic estimate of the actual costs for maintenance and operations of a reversible roadway system.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	7,533,000		
<b>- Proposed</b>	12,490,000		
<b>- Savings</b>	(4,957,000)		(4,957,000)
<b>FUTURE COST - Savings</b>		5,000,000	5,000,000
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>43,000</b>





## Life Cycle Cost Analysis – Present Worth Method Future Cost Calculation

### I-75 Managed Lanes from SR 155 to SR 138

Creative Idea No. A-4  
Discount Rate: 3.0%

Sheet 4 of 5  
Economic Life: 20 Years

	A	B	C	D
	<b>Original Design</b>	<b>Alternate Design</b>		
	Cost	PW	Cost	PW
<b>1. Single Expenditures:</b> (i.e., stage Construction, Major Maintenance)				
a. Year 10 PWF 0.7441	50,000	37,205		
b. Year ____ PWF _____				
c. Year ____ PWF _____				
d. Salvage / Unused Service Life Year ____ PWF _____				
<b>1. Total Future Single Costs:</b>		37,025		-0-
<b>2. Annual Costs:</b>				
a. General Maintenance Labor PWF' 14.877	235,000	3,496,095		
b. Other Annual Costs PWF' 14.877	100,000	1,487,700		
<b>2. Total Future Annual Costs</b>		4,983,795		-0-
<b>3. Total Future Costs: (1 + 2)</b>		5,020,820		-0-
<b>4. Total Future Cost Savings on a Present Worth Basis (3B-3D)</b>		5,000,000		
<b>5. Total Future Cost Savings on an Annual Basis (4B X crf_ 0.0672)</b>				

## CALCULATIONS

### I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-4  
CLIENT: GDOT  
Sheet 5 of 5

Project length: sta 485 to 1060; Total distance 57,500 ft = 10.9 miles

Total pavement width construction:

Current design: 62 ft

Proposed design: 88 ft

Difference in pavement area –  $57,500 \times (88 - 62) = 1,495,000$  sq ft = 166,111 sq yd

#### CURRENT DESIGN Asphalt mainline pavement: 17.75 in asphalt / 12 inch GAB

$(17.75/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.11094 \text{ ton/sf}$

$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$

Cost per SY

$(0.11094 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$60 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$15 / \text{ton}) =$   
 $\$59.91 + 9.11 = \$69.02 / \text{SY}$  USE: \$70 per SY

Additional items required for reverse operations.

Changeable message signs; one for each direction, at each access point –  $2 \times 3 = 6$  total

Gate system; including advance warning signs, security measures, gate system

Life Cycle costs;

Twice daily closure and switching operations;

assume 2 staff, 4 hours per closing at \$20 per hour, 365 days per year

$2 \times 2 \times 4 \times \$20 \times 365 = \$233,600$  per year; use 235,000

Additional equipment, maintenance, spare parts; assume 100,000 per year

Assume 1 major incident; response, communication at \$50,000; year 10

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
A-5	1 of 3	Construct only one managed lane south of Mt Carmel Road

Comp By: GAO      Date: 2/1/11      Checked By: DCW      Date: 2/3/11

**Original Concept:**

Construct a 2-lane reversible managed lane system beginning just north of the SR 155 interchange

**Proposed Change:**

Construct only a 1 lane reversible managed lane from the beginning of the project to the Mt Carmel Road interchange. This is a more appropriate point, where traffic conditions demand and benefits will be realized.

**Justification:**

A single managed lane will handle the projected traffic volumes within this area. The traffic conditions within this section need to be reviewed and only the required lanes constructed. Even the 2035 design year traffic projections do not warrant 2 lanes. Eliminating this construction will reduce costs and will not preclude any future managed lane construction.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	1,820,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	1,820,000		1,820,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>1,820,000</b>



## CALCULATIONS

### I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-5  
CLIENT: GDOT  
Sheet 3 of 3

Approximate distance for reducing the number of lanes from 2 to 1: sta 485 to 680;  
Total distance 19,500 ft

Total pavement width reduction – 12 ft  
Pavement area – 19,500 x 12 = 234,000 sq ft = 26,000 sq yds

CURRENT DESIGN Asphalt mainline pavement: 17.75 in asphalt / 12 inch GAB

$$(17.75/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.11094 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$$

Cost per SY

$$(0.11094 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$60 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$15 / \text{ton}) = \\ \$59.91 + 9.11 = \$69.02 / \text{SY} \quad \text{USE: } \$70 \text{ per SY}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b> A-6	<b>PAGE No.:</b> 1 of 4	<b>CREATIVE IDEA:</b> Shorten the project
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Comp By: GAO      Date: 2/1/11      Checked By: DCW      Date: 2/2/11

**Original Concept:**

Construct a 2-lane reversible managed lane system beginning just north of the SR 155 interchange

**Proposed Change:**

Begin construction of the managed lanes at a more appropriate point, where traffic conditions demand and benefits will be realized. This appears to be south of Mt. Carmel Road at Sta. 615+00.

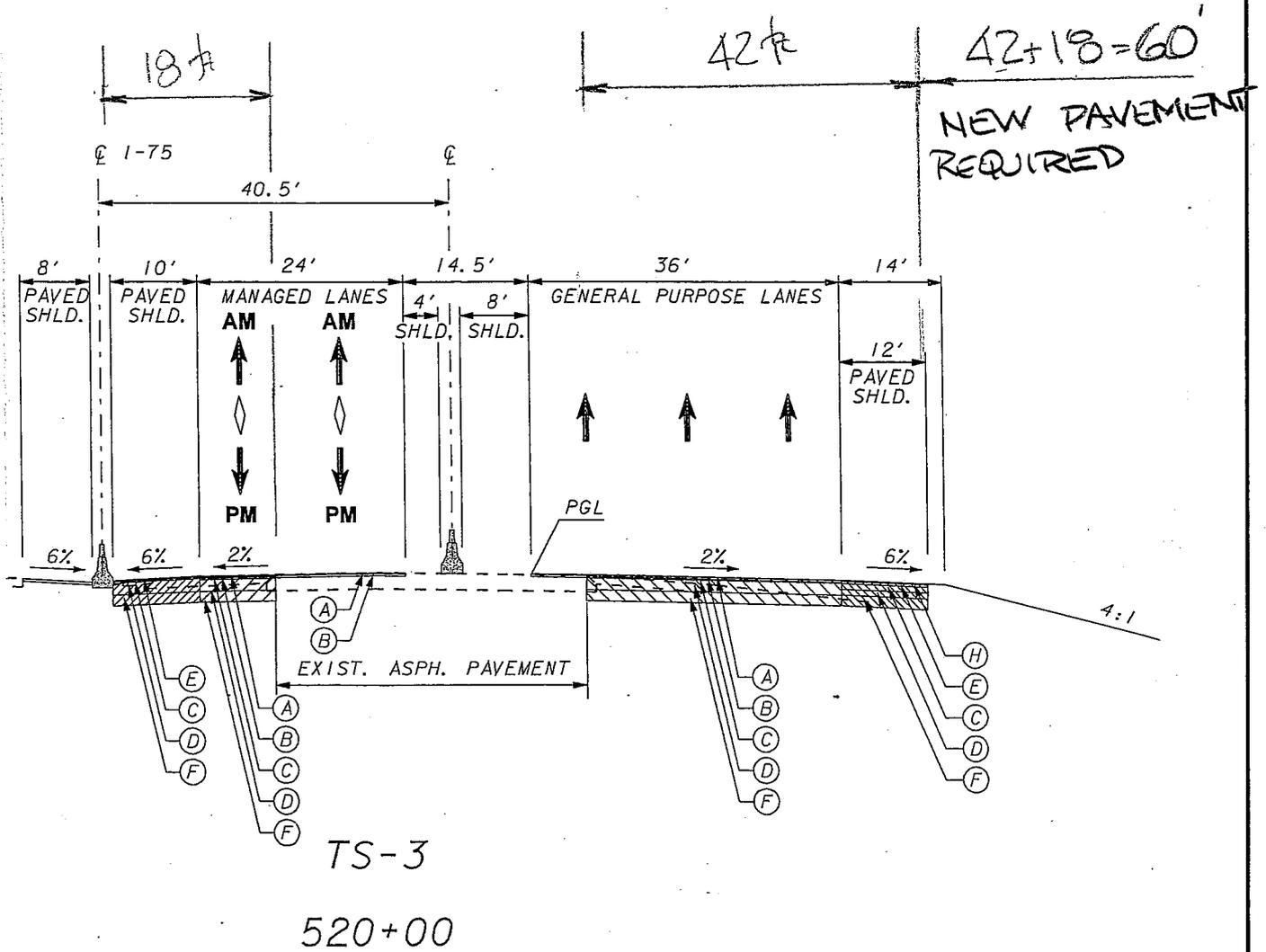
**Justification:**

Traffic conditions do not warrant the managed lanes between SR155 and the current weave area/access point. Eliminating this construction will reduce costs.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	9,537,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	9,537,000		9,537,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>9,537,000</b>

I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-6  
 CLIENT: GDOT  
 Sheet 2 of 4





## CALCULATIONS

### I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-6  
CLIENT: GDOT  
Sheet 4 of 4

Approximate distance for the project to be shortened: sta 485 to 615;  
Total distance 13,000 ft

Total pavement width reduction – 60 ft  
Pavement area – 13,000 x 60 = 780,000 sq ft = 86,667 sq yds

#### CURRENT DESIGN Asphalt mainline pavement: 17.75 in asphalt / 12 inch GAB

$$(17.75/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.11094 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$$

#### Cost per SY

$$(0.11094 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$60 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$15 / \text{ton}) =$$
$$\$ 59.91 + 9.11 = \$69.02 / \text{SY} \quad \text{USE: } \$70 \text{ per SY}$$

Misc items; clearing, grading, drainage, walls; assume 1,000,000

Another method of calculating cost savings to verify estimate above:

Entire project length 57,500 feet; total cost \$85,000,000

Project reduction 13,000 ft

$$13,000 / 57,500 = 0.226 \quad 22\% \text{ reduction}$$

$$85,000,000 \times 0.226 = \$19,210,000$$

Therefore, our estimate appears to be very conservative.

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b> A-7	<b>PAGE No.:</b> 1 of 4	<b>CREATIVE IDEA:</b> Reduce the number of ramp lanes at the Mt. Carmel Road access
-------------------------	----------------------------	--

Comp By: GAO      Date: 2/2/11      Checked By: DCW      Date: 2/3/11

**Original Concept:**

Construct 2 exit and 1 entry lanes for the managed lane ramp access at Mt. Carmel Road, 3 lanes total.

**Proposed Change:**

Construct only 1 ramp lane and use as a reversible lane, consistent with the reversible lane system.

**Justification:**

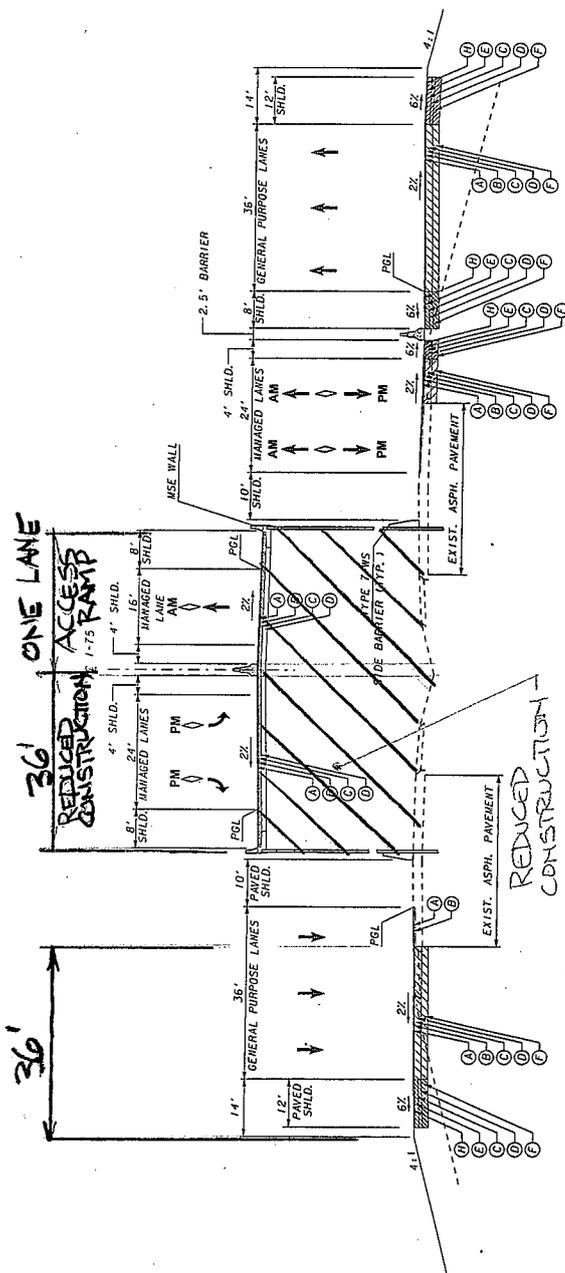
Since the entire system is designed to operate as a reversible roadway, continuing this to the ramps will reduce construction at the bridge and allow the system to continue to operate in a reversible fashion. A final intersection analysis will be required to detail the required lane lengths.

Additionally, having only one ramp at the intersection could reduce confusion as to whether the system is accessible or not and from which direction. Having additional lanes at the access point could actually increase the probability of a wrong way entry.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	1,358,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	1,358,000		1,358,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>1,358,000</b>

I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-7  
CLIENT: GDOT  
Sheet 2 of 4



TS-10  
672+00



## CALCULATIONS

### I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-7  
CLIENT: GDOT  
Sheet 4 of 4

Approximate distance to reduce ramp construction sta 670 to sta 680, 1,000 ft  
Total ramp pavement width reduction – 36 ft

Approximate distance to reduce mainline construction sta 652 to sta 702, 5,000 ft  
Total mainline pavement width reduction;  $\frac{1}{2} (0 + 36) = 18$  ft average

Total pavement area reduction;  $(5,000 \times 18) + (1,000 \times 36) = 126,000$  sq ft = 14,000 sq yds

CURRENT DESIGN Asphalt mainline pavement: 17.75 in asphalt / 12 inch GAB

$$(17.75/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.11094 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$$

Cost per SY

$$(0.11094 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$60 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$15 / \text{ton}) = \\ \$59.91 + 9.11 = \$69.02 / \text{SY} \quad \text{USE: } \$70 \text{ per SY}$$

No reduction in retaining walls;

Reduced bridge area 36 ft x 55 ft wide = 1,980

Approximate earthwork reduction:

$$36 \text{ ft} \times 1,000 \times 15 \text{ ft average height} = 540,000 \text{ cf} = 20,000 \text{ cy}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
A-8	1 of 3	Combine the I-675 ramp bridges

Comp By: GAO      Date: 2/2/11      Checked By: DCW      Date: 2/3/11

**Original Concept:**

Construct a 2 lane bridge for the I-675 overpass.

**Proposed Change:**

Construct only a 1 lane bridge and one lane ramp to be used in a reversible manner.

**Justification:**

Since the entire system is designed to operate as a reversible roadway, combining the ramps and operating them as a reversible system will reduce the bridge area. There are some operational concerns that will need to be addressed such as guard rail overlap however these are relatively minor items.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	1,875,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	1,875,000		1,875,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>1,875,000</b>



## CALCULATIONS

### I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: A-8  
CLIENT: GDOT  
Sheet 3 of 3

Reduced bridge area 246 ft x 34 ft wide = 8,364 sq ft

Reduced pavement area; assume combining about 1,000 feet of the ramps

Width; 12 lane + 14 ft shoulder = 26 ft

Total area 26 x 1,000 = 26,000 sq ft = 2,889 sq yd

#### CURRENT DESIGN Asphalt mainline pavement: 17.75 in asphalt / 12 inch GAB

$$(17.75/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.11094 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$$

#### Cost per SY

$$(0.11094 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$60 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$15 / \text{ton}) = \\ \$59.91 + 9.11 = \$69.02 / \text{SY} \quad \text{USE: } \$70 \text{ per SY}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b> E-5	<b>PAGE No.:</b> 1 of 7	<b>CREATIVE IDEA:</b> Use two span bridge at I-675 Ramp to reduce the cost of construction of the bridge.
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Comp By: AS                      Date: 2/1/11                      Checked By: DCW                      Date: 2/2/11

**Original Concept:**

The proposed bridge is a 246 ft. long with single span structural steel plate girder (120” deep).

**Proposed Change:**

A two span bridge with a pier in the middle will not only cut down the profile but will also reduce the construction cost by utilizing Prestressed Concrete Beams instead of structural steel beams. The spans will be 125 ft. and 121 ft.

**Justification:**

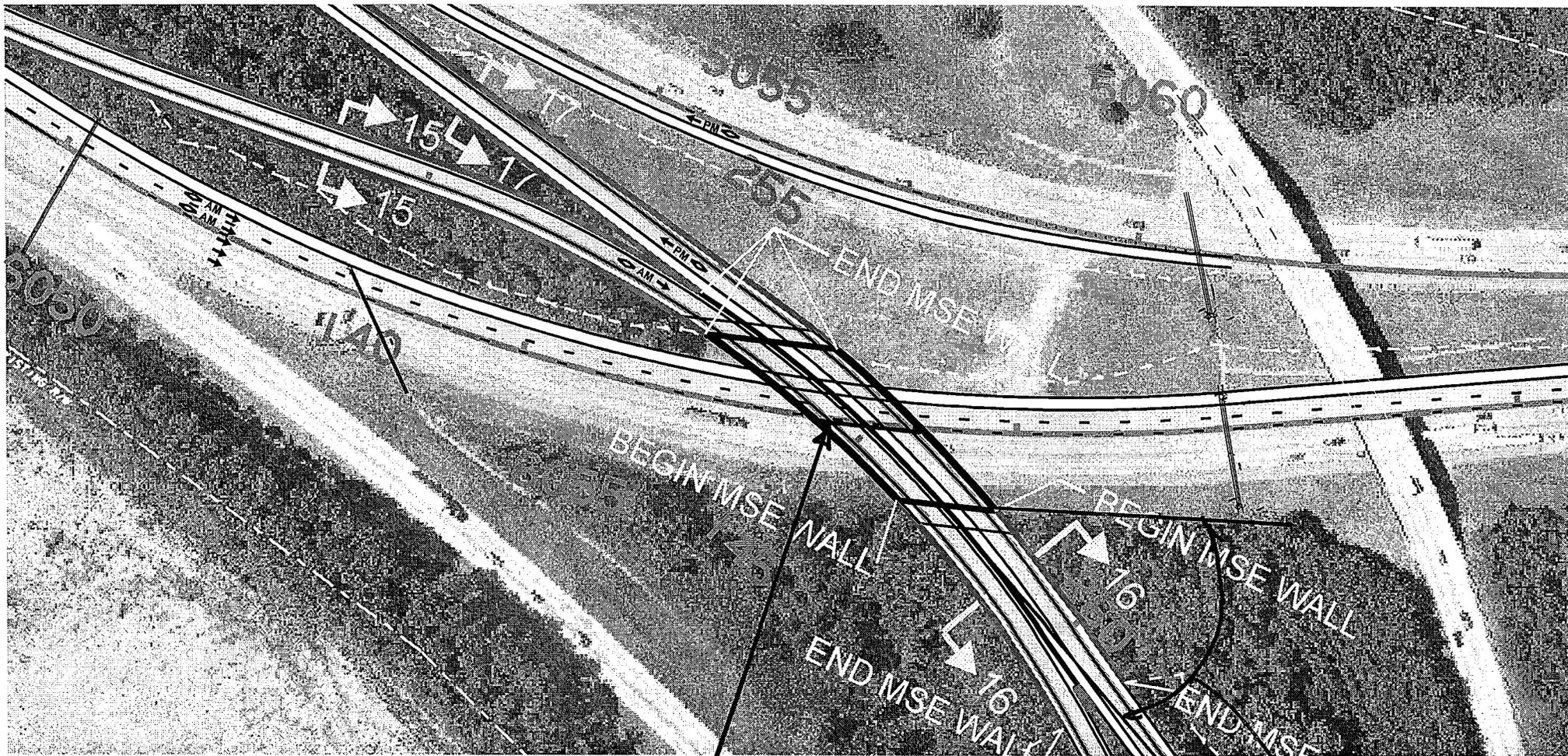
The proposed change will result in significant cost savings. Since the spans will be much shorter to allow using prestressed concrete beams, the overall depth of structure will be reduced from 10 ft. to about 6 ft. The overall savings could be even greater if the final design lowers the profile, retaining walls and earthwork.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	3,333,000		
<b>- Proposed</b>	1,500,000		
<b>- Savings</b>	1,833,000		1,833,000
<b>FUTURE COST - Savings</b>		234,000	234,000
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>2,067,000</b>

I-675 OVER I-75 NB

E-5  
Pg 2 of 7

IDEA E-5 - USE 2-SPAN BRIDGE

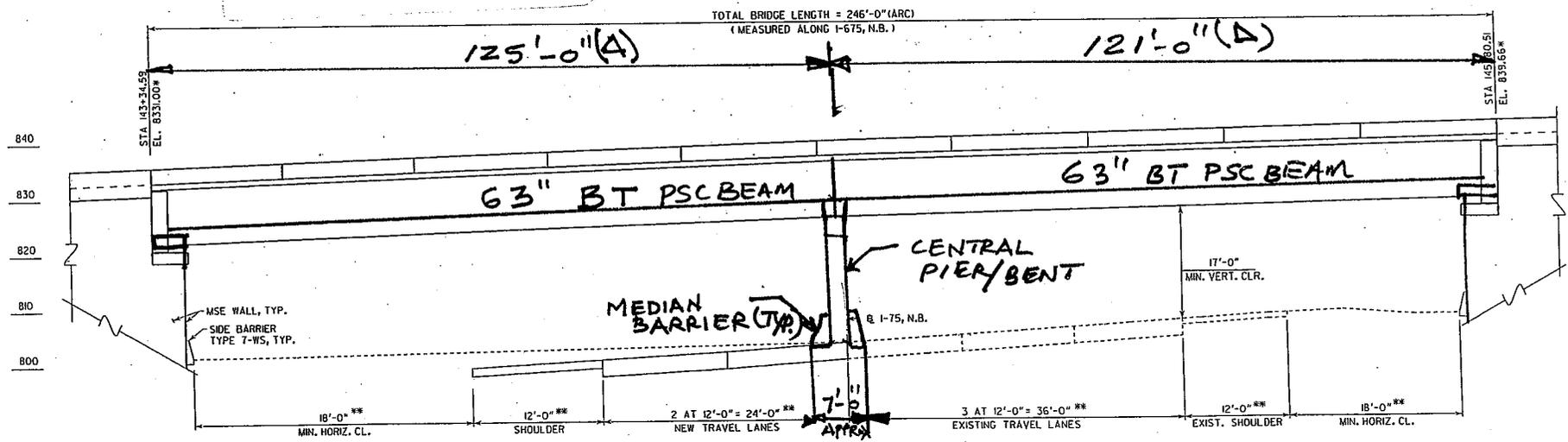


ADDITION  
OF CENTRAL PIER/BENT  
AT END OF EXISTING I-75

450

E-5  
PAGE 3 OF 7

+5.2459%  
500  
PROPOSED  
I-6



ELEVATION  
SCALE: 1" = 10'

\* - PROFILE GRADE ELEVATION ALONG R I-675, N.B.  
\*\* - MEASURED NORMAL TO R I-75, N.B.

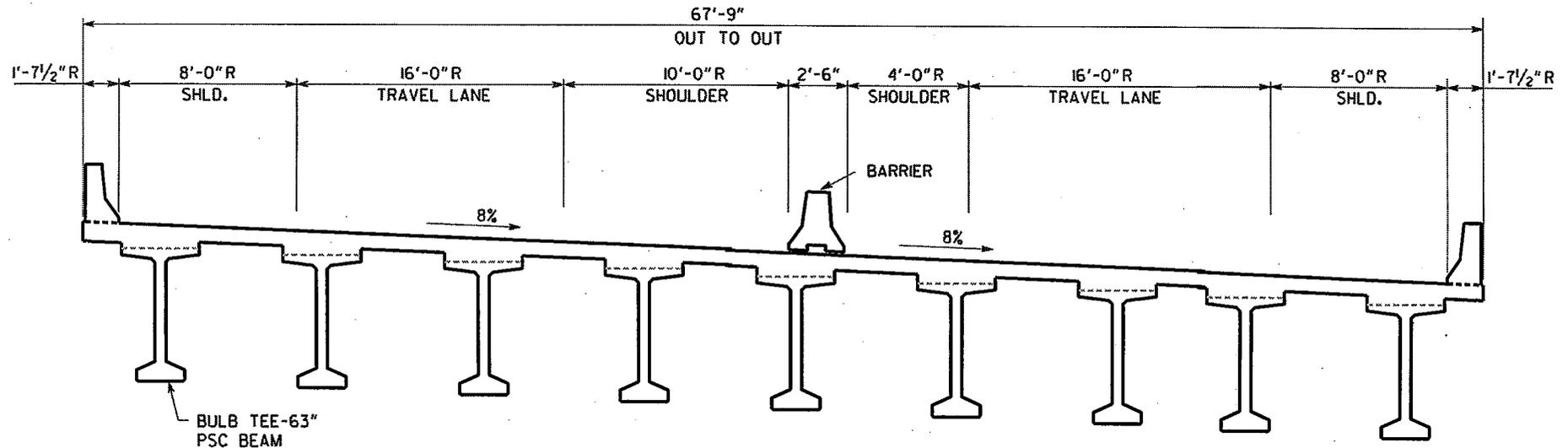
(Δ) (MEASURED ALONG I-675, NB)

3577 P. NORCRO		DEPARTMENT	
		ENGINEERING DIVISION-C	
REVISIONS DATE		OCN	
		I-675 OVE	
		HENRY COUNTY	
DRAWING NO. 35-01 BRIDGE SHEET 1 OF 1		SCALE: AS SHOWN DESIGNED: JCO CHECKED:	

1 INCH WHEN PRINTED FULL SIZE

E-5  
Pg 4 of 7

CREATIVE IDEA - E-5 PROPOSED TYPICAL SECTION USING 63 INCH PSC BEAMS



\* MEASURED NORMAL TO BEAMS  
R - DENOTES RADIAL

TYPICAL SECTION  
PROPOSED BRIDGE  
LOOKING AHEAD  
NO SCALE

**COST WORKSHEET**

PROJECT: **I-75 Managed Lanes from SR 155 to SR 138**

ITEM No: E-5  
 CLIENT: GDOT  
 Sheet 5 of 7

CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
ITEM	Units	No. Units	Cost/ Unit	Total Cost	No. Units	Cost/ Unit	Total Cost
Original I-675 Bridge over I-75: 67.75' wide X 246' long(single span) structural steel beams (120" deep)	SF	16667	200.00	3,333,300			
Proposed I-675 Bridge over I-75: 67.75' wide X 125'-121' = 246' long(two span) PSC Bulb Tee 63" beams					16667	90.00	1,499,985
<b>SUBTOTAL</b>				3,333,300			1,499,985
Markup	0.00%			0			0
<b>TOTAL</b>				3,333,300			1,499,985
<b>TOTAL ROUNDED</b>				3,333,000			1,500,000



## Life Cycle Cost Analysis – Present Worth Method Future Cost Calculation

### I-75 Managed Lanes from SR 155 to SR 138

Creative Idea No. E-5  
Discount Rate: 3.0%

Sheet 6 of 7  
Economic Life: 25 Years

	A	B	C	D
	<b>Original Design</b>		<b>Alternate Design</b>	
	Cost	PW	Cost	PW
<b>1. Single Expenditures:</b> (i.e., stage Construction, Major Maintenance)				
a. Year ___12.5___ PWF 0.6912	200000	138,240		
b. Year ___25___ PWF 0.4776	200000	95,520		
c. Year ___ PWF _____				
d. Salvage / Unused Service Life Year ___ PWF _____				
<b>1. Total Future Single Costs:</b>		233,760		0
<b>2. Annual Costs:</b>				
a. General Maintenance PWF' 17.413	5,000	87,065	5,000	87,065
b. Other Annual Costs PWF' 17.413				
<b>2. Total Future Annual Costs</b>		87,065		87,065
<b>3. Total Future Costs: (1 + 2)</b>		320,828		87,065
<b>4. Total Future Cost Savings on a Present Worth Basis (3B-3D)</b>		233,760		
<b>5. Total Future Cost Savings on an Annual Basis (4B X crf_ 0.0574)</b>		13,500		

## CALCULATIONS

### I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: E-5  
CLIENT: GDOT  
Sheet 7 of 7

Original I-675 Bridge over I-75 :  
67.75' wide X 246' long single span, Structural steel beams (120" deep)

16667 SF X \$200/SF = \$ 3,333,300.00  
(\$200/SF based on Engineer judgment of similar bridges)

Proposed I-675 Bridge over I-75:  
67.75' Wide X 125'-121' = 246' long ( two-span)  
PSC Bulb Tee 63" beams.

16667 SF X \$90/SF = \$1,499,985.00

#### O&M Costs

Steel bridge painting estimated at \$200,000 for each painting. Assumed done at 12.5 years.  
This is in addition to \$5,000 per year for general maintenance.

Concrete maintenance estimated at \$ 5,000 annual for general items.

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b>	<b>PAGE No.:</b>	<b>CREATIVE IDEA:</b>
E-7	1 of 6	Eliminate Access Ramps to I- 675

Comp By: SSB      Date: 2/1/11      Checked By: DCW      Date: 2/2/11

**Original Concept:**

Provide Managed Lanes System to System connection from I-75 to I-675

**Proposed Change:**

Eliminate the entire managed lane connection from I-75 to I-675.

**Justification:**

With the information given, it does not appear that the traffic volumes would warrant the additional cost for the ramp connections. The current 2015 peak hour traffic projections in the managed lanes are 910-940 vph.. The peak hour 2035 traffic is projected to be 1150 to 1180 vph. These volumes could be accommodated in the existing ramp to I-675 and still provide acceptable service. There are no plans to provide any managed lanes on I-675 so future connectivity is not a concern.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	11,159,000		
<b>- Proposed</b>	-0-		
<b>- Savings</b>	11,159,000		11,159,000
<b>FUTURE COST - Savings</b>			-0-
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>11,159,000</b>



**CALCULATIONS**

I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: E-7  
CLIENT: GDOT  
Sheet 3 of 6**Mainline Pavement**

N.B.

100+00 – 106+00  $((0+12)/2)600/9 = 400 \text{ SY}$   
 106+00 – 125+00  $12 \times 600/9 = 800 \text{ SY}$   
 125+00 – 131+00  $((12+16)/2)600/9 = 933 \text{ SY}$   
 131+00 – 173+00  $16 \times 4,200/9 = 7,467 \text{ SY}$   
 173+00 – 176+00  $((16+0)/2)300/9 = 267 \text{ SY}$

S.B.

200+00 – 206+00  $((0+12)/2)600/9 = 400 \text{ SY}$   
 206+00 – 215+00  $((12+16)/2)900/9 = 1,400 \text{ SY}$   
 215+00 – 285+00  $16 \times 7,000/9 = 12,444 \text{ SY}$   
 285+00 – 292+00  $((16+0)/2)700/9 = 622 \text{ SY}$

Total Area = 24,733SY**Shoulder Pavement**

N.B.

133+00 – 143+00 LT  $4 \times 1,000/9 = 444 \text{ SY}$   
 133+00 - 143+00 RT  $10 \times 1,000/9 = 1,111 \text{ SY}$   
 146+00 – 173+00 LT  $4 \times 2,700/9 = 1,200 \text{ SY}$   
 146+00 – 174+00 RT  $4 \times 2,700/9 = 1,200 \text{ SY}$

S.B.

246+00 – 256+00 LT  $4 \times 1,000/9 = 444 \text{ SY}$   
 246+00 – 256+00 RT  $10 \times 1,000/9 = 1,111 \text{ SY}$   
 256+00 – 288+00 LT  $4 \times 3,200 /9 = 1,422 \text{ SY}$   
 256+00 – 288+00 RT  $12 \times 3,200/9 = 4,267 \text{ SY}$

Total Area = 11,199SY**MSE Walls**

N.B.

131+50 – 143+00 LT  $((0+30)/2)1,150 = 17,250 \text{ SF}$   
 134+00 – 143+00 RT  $((0+30)/2)900 = 13,500 \text{ SF}$   
 146+00 – 148+50 RT  $((30+25)/2)250 = 6,875 \text{ SF}$

S.B.

238+00 – 255+00 LT  $((0+30)/2)1,700 = 25,500 \text{ SF}$

**CALCULATIONS**

I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: E-7  
CLIENT: GDOT  
Sheet 4 of 6**MSE Walls (Cont.)**245+00 – 256+00 RT  $((0+30)/2)1,100 = 16,500$  SF258+50 – 261+00 RT  $((30+25)/2)250 = 6,875$  SFTotal Area = 86,500 SF**Earthwork (Emb.)****N.B.**135+00 – 143+00  $((0+30)/2)800/27 = 444$  CY**S.B.**247+00 – 256+00  $((0+30)/2)900/27 = 500$  CY258+50 – 261+00  $((30+25)/2)250/27 = 255$  CY**N.B.**148+00 – 157+00  $((90 \times 26) + (45 \times 5))/2)900/27 = 42,750$  CY157+00 – 161+00  $(35 \times 4)400/27 = 2,015$  CY161+00 – 173+00  $(15 \times 3)1,200/27 = 2,000$  CY**S.B.**261+00 – 268+00  $((110 \times 25) + (45 \times 3))/2)700/27 = 37,398$  CY268+00 – 280+00  $(45 \times 3)1,200/27 = 6,000$  CYTotal Volume = 91,362 CY**Barrier Wall****N.B.**

131+50 – 143+00 LT 1,150 LF

134+00 – 143+00 RT 900 LF

146+00 – 148+00 RT 200 LF

**S.B.**

238+00 – 255+00 LT 1,700 LF

245+00 – 256+00 RT 1,100 LF

258+50 – 261+00 RT 250 LF

Total Length = 5,300 LF

## CALCULATIONS

I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: E-7  
CLIENT: GDOT  
Sheet 5 of 6

### Approach Slabs

South End  $65 \times 30 / 9 = 217 \text{ SY}$   
North End  $65 \times 30 / 9 = 217 \text{ SY}$

Total Area = 434 SY

### Guardrail

#### N.B.

148+00 – 154+00 RT 600 LF  
148+00 – 152+00 LT 400 LF

#### S.B.

261+00 – 262+00 LT 100 LF  
261+00 – 266+00 RT 500 LF

Total Length = 1,600 LF

**CALCULATIONS**

I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: E-7  
CLIENT: GDOT  
Sheet 6 of 6CURRENT DESIGN Asphalt pavement: 16.5 in asphalt / 12 inch GAB

$$(16.5/12 \text{ ft}) (150 \text{ \#/cf}) (1 \text{ ton} / 2000 \text{ \#}) = 0.103 \text{ ton/sf}$$

$$(12/12 \text{ ft}) (135 \text{ \#/cf}) (1 \text{ ton} / 2000\text{\#}) = 0.0675 \text{ ton/sf}$$

## Cost per SY

$$(0.103 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$65 / \text{ton}) + (0.0675 \text{ ton/sf} \times 9 \text{ sf/sy} \times \$18.54 / \text{ton}) = \\ \$ 60.33 + 11.26 = \$71.59 / \text{SY} \quad \text{USE: } \$72 \text{ per SY}$$

## DEVELOPMENT AND RECOMMENDATION PHASE

### I-75 Managed Lanes from SR 155 to SR 138

<b>IDEA No.:</b> E-8	<b>PAGE No.:</b> 1 of 5	<b>CREATIVE IDEA:</b> Use of single span "TRELLIS" bridge using Bulb-Tee PSC beams at I-675 Ramp
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Comp By: AS                      Date: 2/2/11                      Checked By: DCW                      Date: 2/3/11

**Original Concept:**

The proposed bridge is a 246 ft. long with single span structural steel plate girder (120" deep).

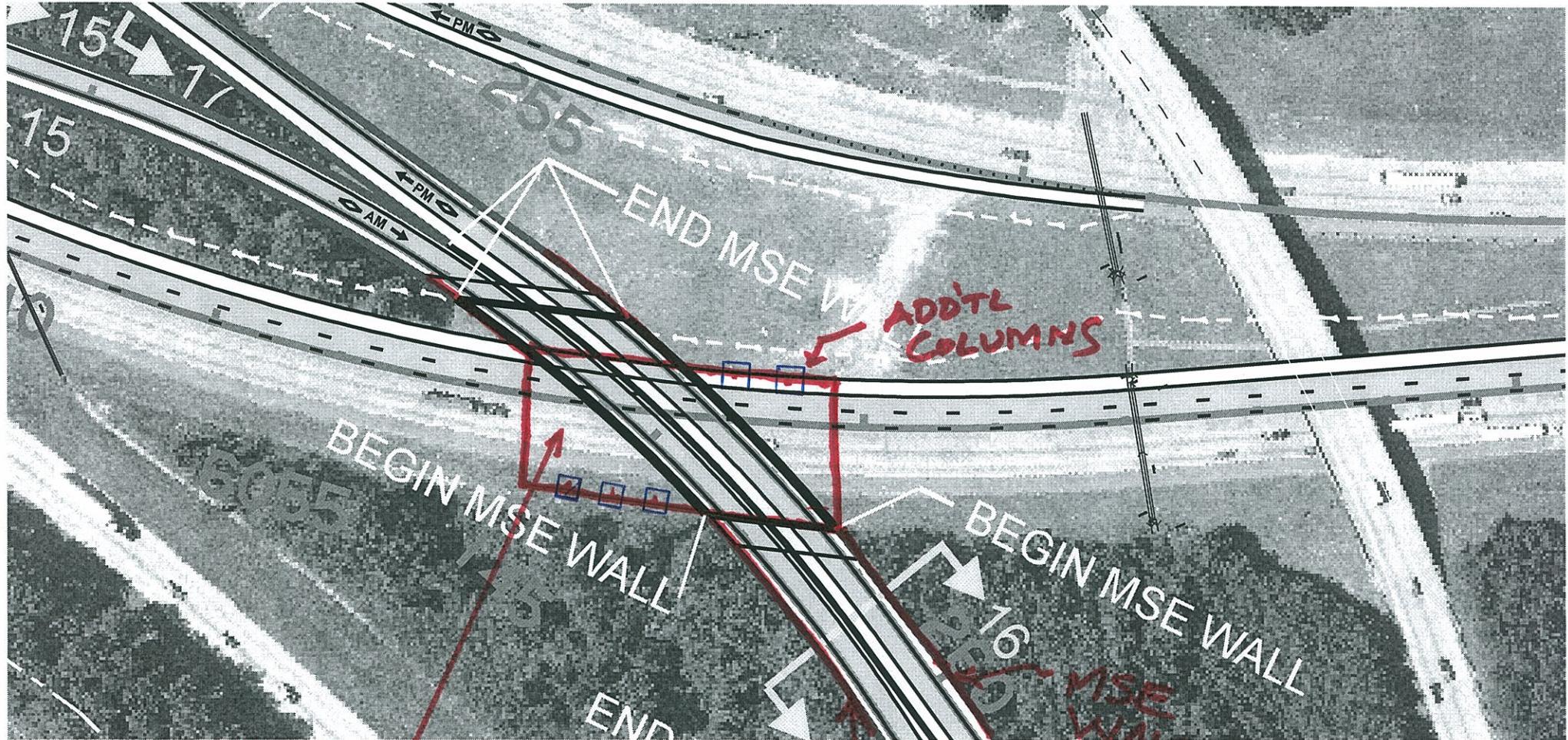
**Proposed Change:**

A single span "TRELLIS" bridge 115 ft. long X 225 ft. wide using 63" PSC Bulb-Tee beams will cut down the profile by approx. 5 ft. resulting in reduction of wall heights and roadway fill construction cost.

**Justification:**

The proposed change will result in significant cost savings. This also simplifies construction utilizing precast elements and requires no "life cycle maintenance" cost for painting the steel structure.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	PRESENT WORTH
<b>INITIAL COST - Original</b>	3,333,000		
<b>- Proposed</b>	2,329,000		
<b>- Savings</b>	1,004,000		1,004,000
<b>FUTURE COST - Savings</b>		234,000	234,000
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>1,238,000</b>



115' LONG (APPROX)  
X 225 FT WIDE  
BT 63" BEAMS PSC BRIDGE  
("TRELLIS" TYPE)

MSE  
WALLS

MSE  
WALLS



## Future Cost Calculation

### I-75 Managed Lanes from SR 155 to SR 138

Creative Idea No.E-8

Sheet 4 of 5

Discount Rate: 3.0%

Economic Life: 20 Years

	A	B	C	D
	<b>Original Design</b>		<b>Alternate Design</b>	
	Cost	PW	Cost	PW
<b>1. Single Expenditures:</b> (i.e., stage Construction, Major Maintenance)				
a. Year ___12.5_PWF 0.6912	200000	138,240		
b. Year _25__PWF 0.4776	200000	95,520		
c. Year ____ PWF _____				
d. Salvage / Unused Service Life Year ____ PWF _____				
<b>1. Total Future Single Costs:</b>		233,760		0
<b>2. Annual Costs:</b>				
a. General Maintenance PWF' 17.413	5,000	87,065	5,000	87,065
b. Other Annual Costs PWF' 17.413				
<b>2. Total Future Annual Costs</b>		87,065		87,065
<b>3. Total Future Costs: (1 + 2)</b>		320,828		87,065
<b>4. Total Future Cost Savings on a Present Worth Basis (3B-3D)</b>		233,760		
<b>5. Total Future Cost Savings on an Annual Basis (4B X crf_ 0.0574)</b>		13,500		

## CALCULATIONS

### I-75 Managed Lanes from SR 155 to SR 138

ITEM N<sup>o</sup>: E-8  
CLIENT: GDOT  
Sheet 5 of 5

Original I-675 Bridge over I-75 :  
67.75' wide X 246' long single span, Structural steel beams (120" deep)

$$16667 \text{ SF} \times \$200/\text{SF} = \$ 3,333,300.00$$

Proposed I-675 "TRELLIS" Bridge over I-75:  
225' Wide X 115' long (single-span)  
PSC Bulb Tee 63" beams.

$$25,875 \text{ SF} \times \$90/\text{SF} = \$2,328,750.00$$

#### O & M Costs

Steel bridge painting estimated at \$200,000 for each painting. Assumed done at 12.5 years.  
This is in addition to \$5,000 per year for general maintenance.

Concrete maintenance estimated at \$5,000 annual for general items.

Use a 25 year economic life.

## Life Cycle Cost Analysis – Present Worth Method



## Sources

### Approving/Authorizing Persons

<b>Name:</b>	<b>Position:</b>	<b>Telephone:</b>
Gerald Ross	Deputy Commissioner & Chief Engineer	404-631-1004
Mike Dover	Project Manager	404-631-1733

### Personal Contacts

<b>Name:</b>	<b>Telephone:</b>	<b>Notes:</b>
Mike Dover	404-631-1733	GDOT, Project design presentation
Xvejun Fan	678-969-2322	Parsons, traffic data
Kevin Mc Keen	678-969-2456	Parsons, project information

### Documents/Abstracts

<b>Reference:</b>	<b>Reference:</b>
Design package and estimate for 3 projects	
AASHTO Roadside Design Guide 2006	
GDOT design Policy Manual	
GDOT Item Mean Summary cost data	
GDOT Standard Detailed Drawings	
Atlanta Regional Managed Lanes Report, January 2010	







## INFORMATION PHASE ----- FUNCTION ANALYSIS

### I-75 Auxiliary Lane

**System:** Improve  
**Function:** Operations

ITEM No.	DESCRIPTION	FUNCTION			INITIAL DOLLARS ( x 1,000 )		
		Verb	Noun	Kind*	Cost	% of Total	Worth
A	Bridge	Separate	Traffic	B	3,538	41	3,000
		Accommodate	Lanes				
B	Asphalt Cement Pavement	Support	Vehicles	S	1,105	13	900
C	Maintenance of Traffic	Facilitate	Construction	S	1,025	12	900
D	Grading	Achieve	Grade	S	750	9	700
		Drain	Project				
		Support	Pavement				
E	Miscellaneous			S	500	6	unknown
<b>TOTAL</b>					<b>6,918</b>	<b>80</b>	<b>5,500</b>

\* B = Basic, S = Secondary

## INFORMATION PHASE ----- FUNCTION ANALYSIS

### I-75 Reversible Managed Lanes SR 155 to SR 138

**System:** Improve  
**Function:** Operations

ITEM No.	DESCRIPTION	FUNCTION			INITIAL DOLLARS ( x 1,000 )		
		Verb	Noun	Kind*	Cost x 10 <sup>6</sup>	% of Total	Worth x 10 <sup>6</sup>
A	AC Pavement	Support	Vehicles		34.8	41	34.0
B	Concrete Barrier	Separate	Traffic		9.8	11	9.0
C	MSE Walls	Reduce	ROW		9.7	11	9.5
D	GAB	Support	Pavement		5.6	7	5
E	Bridge	Allow	Access		4.5	5	3.8
		Cross	Obstacle				
		Provide	Clearance				
F	Sign and Marking	Direct	Traffic		3.9	5	3.9
		Control	Access				
		Inform	Motorist				
G	Storm Drainage	Direct	Water		3.6	4	3.6
		Drain	Pavement				
<b>TOTAL</b>					<b>71.9</b>	<b>84</b>	<b>63.8</b>

\* B = Basic, S = Secondary

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
I-75 Auxiliary Lane			
NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
<b>A</b>	<b>Bridges</b>		
A-1	Do not widen, use new bridge on Flippen	Misunderstood scope	<b>X</b>
A-2	Close Walt Stephens Road and use a detour		√
A-3	Combine projects	Not feasible for acceptance	<b>X</b>
<b>B</b>	<b>Asphalt Cement Pavement</b>		
B-1	Reduce shoulder pavement thickness		√
B-2	Reuse existing shoulder pavement		<b>X</b>
B-3	Use narrower paved shoulder		√
B-4	Add scope to accommodate future construction		<b>X</b>
<b>C</b>	<b>Maintenance of traffic</b>		
C-1	Use barrels in lieu of barriers		<b>DC</b>
C-2	Do bulk of work during off peak hours		<b>DC</b>

\*\* √ = 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	
I-75 Reversible Managed Lanes SR 155 to SR 138			
NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
<b>A</b>	<b>AC Pavement</b>		
A-1	Reduce shoulder thickness		√
A-2	Reduce shoulder width		√
A-3	Increase access points		√
A-3.1	Eliminate access at Mt. Carmel, use Jodeco		√
A-4	Add one managed lane each direction now with the provision for adding one additional lane later		√
A-5	Use one lane south of Mt. Carmel		√
A-6	Shorten the project to south of Mt. Carmel		√
A-7	Reduce the number of ramp lanes at the Mt. Carmel access		√
A-8	Combine the I-675 ramp bridges		√
<b>B</b>	<b>Concrete Barrier</b>		
B-1	Use alternate type barrier for easier emergency access	No alternatives evaluated	<b>X</b>
B-2	Use cable barrier	Requires too much deflection space	<b>X</b>

\*\* √ = 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	
I-75 Reversible Managed Lanes SR 155 to SR 138			
NO.	CREATIVE IDEA	COMMENTS	IDEA RATING **
<b>C</b>	<b>MSE Walls</b>		
C-1	Reduce walls, increase grading	No feasible areas	<b>X</b>
<b>D</b>	<b>Graded Aggregate Base</b>		
	No ideas generated		
<b>E</b>	<b>Bridges</b>		
E-1	Use 54" bulb T at Mt. Carmel	Not cost effective	<b>X</b>
E-2	Eliminate left turn exits, use flyovers	Not cost effective	<b>X</b>
E-3	Realign I675 ramps to be more perpendicular and shorten the bridge	Not a feasible design	<b>X</b>
E-4	Use right hand exit on north bound ramp	Not economically feasible	<b>X</b>
E-5	Use 2 span in lieu of one span I-675 ramp bridges		√
E-6	Shorten I-675 southbound ramp	Insufficient design detail to evaluate	<b>X</b>
E-7	Eliminate I-675 access		√
E-8	Use single span "Trellis" bridge using bulb-tee PSC beams		√

\*\* √ = 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.: CSNHS-009-00(156)(157) County: Henry PI No.: 0009156,0009157,0010126 Date: Jan. 31 - Feb. 3, 2011  
 (No Project # for 0010126)

Days:

FIRST	LAST	NAME	EMPLOYEE ID NO.	DOT OFFICE OR COMPANY	PHONE NUMBER	EMAIL ADDRESS
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Lisa L. Myers		Engineering Services	404-631-1770	lmyers@dot.ga.gov
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Matt Sanders		Engineering Services	404-631-1752	msanders@dot.ga.gov
<input checked="" type="checkbox"/>	<input type="checkbox"/>	James K. Magnus		Construction	404-631-1971	jmagnus@dot.ga.gov
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Bill DuVall		Bridge Design	404-631-1883	bduvall@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"/>	DAVID WOHLSCHEID	—	MACTEC	571-217-0808	dwohlscheid@mactec.com
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Steve Bitney	—	Stantec	770-815-0887	Steve.bitney@stantec.com
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Fleur Hartmann	—	Stantec	404-861-9583	fleur.hartmann@stantec.com
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	GEORGE OBAPANE	—	MACTEC	770-421-3346	GOBAPANE@MACTEC.COM
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ARUNA SASRY	—	SASTRY AND ASSOC	404-932-0313 678-366-9375	sast9375@bellsouth.net
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Kerin McKee	—	PARSONS	678-969-2456	kerin.mckee@parsons.com
<input checked="" type="checkbox"/>	<input type="checkbox"/>	SAM MOKA	—	PARSONS	678-969-2450	samuel.moka@parsons.com
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Shawn Reese	—	PARSONS	678-969-2457	shawn.reese@parsons.com
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	XUETUN FAN	—	PARSONS	678-969-2322	XUETUN.FAN@PARSONS.COM
<input checked="" type="checkbox"/>	<input type="checkbox"/>	JARED OGORER	—	PARSONS	678-969-2357	JARED.OGORER@PARSONS.COM
<input checked="" type="checkbox"/>	<input type="checkbox"/>	MIKE DAVER	?	CDOT	404-631-1753	mdaver@dot.ga.gov
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ASHLEY CHAN	—	HNTB	404-946-5716	aschan@hntb.com
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Kendra Bunker	—	FHWA	404-562-3644	kendra.bunker@dot.ga.gov
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	KELVIN MULLINS	—	CDOT	404-631-1675	Kemullins@dot.ga.gov
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nabil Raad	—	CDOT	404-635-8126	nraad@dot.ga.gov
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Bobby Dollar	—	CDOT	404-819-9858	rdollar@dot.ga.gov

Check all that attend     = Did Not Attend

23 Attended Project Overview (Day 1)

12 Attended Project Presentation (Day 4)

3 VIA VIDEO D#3

NO VIDEO

