VALUE ENGINEERING REPORT

I-75 Resurfacing Project
PI No. M003587
Project No. CSNHS-M003-00(587)
Fulton and Cobb Counties

November 12, 2008

OWNER AND DESIGN TEAM:

State of Georgia
Department of Transportation
Engineering Services
600 W. 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

Executive Summary

VALUE ENGINEERING STUDY

I-75 Resurfacing Project
Project No. CSNHS-M003-00(587)
November 12, 2008

Introduction

This report summarizes the results of a value engineering (VE) study conducted on the I-75 Resurfacing Project, located between the Brookwood Interchange and the I-285 Interchange in Fulton and Cobb Counties. The project consists of milling and inlaying AC pavement on the mainline of the 8-mile section of I-75, and also includes ramp, shoulder, and guardrail improvements. The estimated construction cost is $25M. The design is currently at the preliminary stage and the estimated let date is scheduled for early 2009. The project is being designed by Georgia DOT and their subconsultant LCW Engineering. The study was conducted on October 20-23, 2008, at the GDOT headquarters and was conducted by a three-person VE team.

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. Lastly, 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 study.

Considerations

Only a partial cost estimate, including milling and AC costs, was available at the time of the study. Key elements of the work include asphalt concrete pavement, milling, and maintenance of traffic. The VE Team concentrated its efforts on these elements. No formal constraints to the value analysis were established, but the team understood that micro-milling has been eliminated from consideration by the Design Team due to concerns about its durability.

Results Obtained

The VE Team developed 5 recommendations for consideration by the decision-makers. These recommendations have the potential to save or defer several million dollars in construction costs while continuing to provide the functional requirements of the I-75 corridor. The VE recommendations are briefly described in this section of the report and are presented in more detail later in the report.

Recommendation Highlights

1.1 Defer Project for 3-5 Years
Based on the VE Team's visual inspection of the pavement condition, and on the contents of the Pavement Evaluation Summaries, it appears that this project could be deferred for at least three years, which would result in a significant life-cycle savings as well as a deferred cost which could be used for another project.

The total potential life- cost savings, if accepted, is $2,775,000, roughly estimated based on an assumed project cost of $25M per the Design Team, and a three-year deferral.

1.2 Construct Northbound Now and Defer Southbound for 3-5 Years
If Recommendation 1.1 cannot be implemented, the VE Team recommends that only the northbound roadway be resurfaced in 2009, with the southbound roadway being deferred. The Pavement Evaluation Summary indicates that the northbound roadway pavement is in somewhat worse condition than the southbound. This change would also spread out the impact on the traveling public over several years.

The total potential life-cycle cost savings if accepted is $1,387,500, roughly estimated assuming a total project cost of $25M, and a three-year deferral.

2.1 Mill Distressed Areas Only and Overlay Entire Mainline Roadway
As mentioned above, a review of the Pavement Evaluation Summary and a visual survey by the VE Team indicated that the pavement is in good condition in most areas. This recommendation would involve identifying more specifically the distressed areas, milling in those areas to the depth required, replacing the milled material with SMA material, and then overlaying the entire mainline with 1.25" of PEM material.

The total potential savings if accepted is $9,790,000.

2.2 Reduce Mill Depth to 2" and Inlay with SMA Material.
If Recommendation 2.1 cannot be implemented, the VE Team recommends a reduction of milling depth from 3.25" as planned for most of the mainline, to 2". A review of the results from the coring done on the mainline indicated that a reduced depth would likely result in an acceptably rehabilitated pavement, at significantly lower cost. The exact depth of milling would need to be determined by the Design Team.

The total potential savings if accepted is $7,320,000.

3 Night Work Only – Seven Nights Per Week
The baseline concept involves reducing the roadway to two lanes in each direction from Friday evening until early Monday morning. In addition, night work would be permitted on other nights as well. The VE recommendation is to permit the reduction to two lanes each direction only at night. This would result in more available work hours per month, but would likely add to MOT costs. Impact to the traveling public would be reduced.
The total potential cost increase if accepted is roughly estimated at $1,000,000.

I-75 Resurfacing

SUMMARY OF VALUE ENGINEERING RECOMMENDATIONS

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL LIFE CYCLE SAVINGS	NOTES
1.1	Defer this project 3-5 years **OR:**	$25,000,000	$0	$25,000,000 (Deferral)	$2,775,000	$2,775,000	O&M constant
1.2	Do the NB now; defer SB 3-5 years	$25,000,000	$12,500,000	$12,500,000 (Deferral)	$1,387,500	$1,387,500	O&M constant
2.1	Mill distressed areas only; Overlay with 1.25" PEM **OR:**	$12,310,000	$2,520,000	$9,790,000	$0	$9,790,000	Assume 20% Distress
2.2	Mill 2" in lieu of 3.25"; inlay with 1.5" recycled superpave.	$15,260,000	$7,940,000	$7,320,000	$0	$7,320,000	
3	Permit night work only; 7 days per week	$500,000	$1,500,000	(1,000,000)	$0	(1,000,000)	Benefit to Public
DS	Rubberized Asphalt/Ground Shingles						

STUDY IDENTIFICATION

Study Identification

Project: I-75 Resurfacing	**Dates: October 20-23, 2008**
Location: GDOT Headquarters, Atlanta	

VE Team Members

Name:	Discipline:	Organization:	Telephone:
George Obaranec, PE	Highway Design	MACTEC	770-421-3346
Dan Cogan, PE	Constructability	KEA Group	678-904-8591
Rod Curtis, PE CVS	Value Engineering	MACTEC	602-770-1062

Project Description

This is a resurfacing and maintenance project involving milling of the existing pavement to various depths, primarily 3.25", and resurfacing with SMA and PEM materials. The project also includes bridge joint maintenance and guardrail upgrades. The limits of the work are from the I-75/I-85 split at MP 250 to the I-285 interchange, a distance of approximately 8 miles. All ramps will be milled and resurfaced to the gores. In addition, some ramps will be resurfaced beyond the gore point. Two ramps will be reconstructed. Shoulders will be improved only in areas of guardrail upgrade. No changes in horizontal or vertical alignment are planned.

A full cost estimate was not available at the time of the value engineering study. The mill and repaving estimate was $17.0M. Total project cost was estimated by the Design Team at $25M including maintenance of traffic costs, joint reconstruction and guardrail items.

A kick-off meeting was held on the first morning of the VE study, with the following personnel in attendance:

Lisa Myers	GDOT Engineering Services
Ron Wishon	GDOT Engineering Services
Amber Phillips	GDOT OEL
Mickey McGee	GDOT District 7
Ken Werho	GDOT Traffic
Albert Shelby	GDOT Urban Design – Project Manager
Travis McDonald	GDOT Urban Design
Darrell Williams	GDOT
Doug Starr	GDOT District 7 Area 4
James Magnus	GDOT Construction
Mindy Roberson	FHWA

Loretta Washington	LCW Engineering
Raices Goodwin	LCW Engineering

Project Manager Albert Shelby gave an informative overview of the project. The following items were noted:

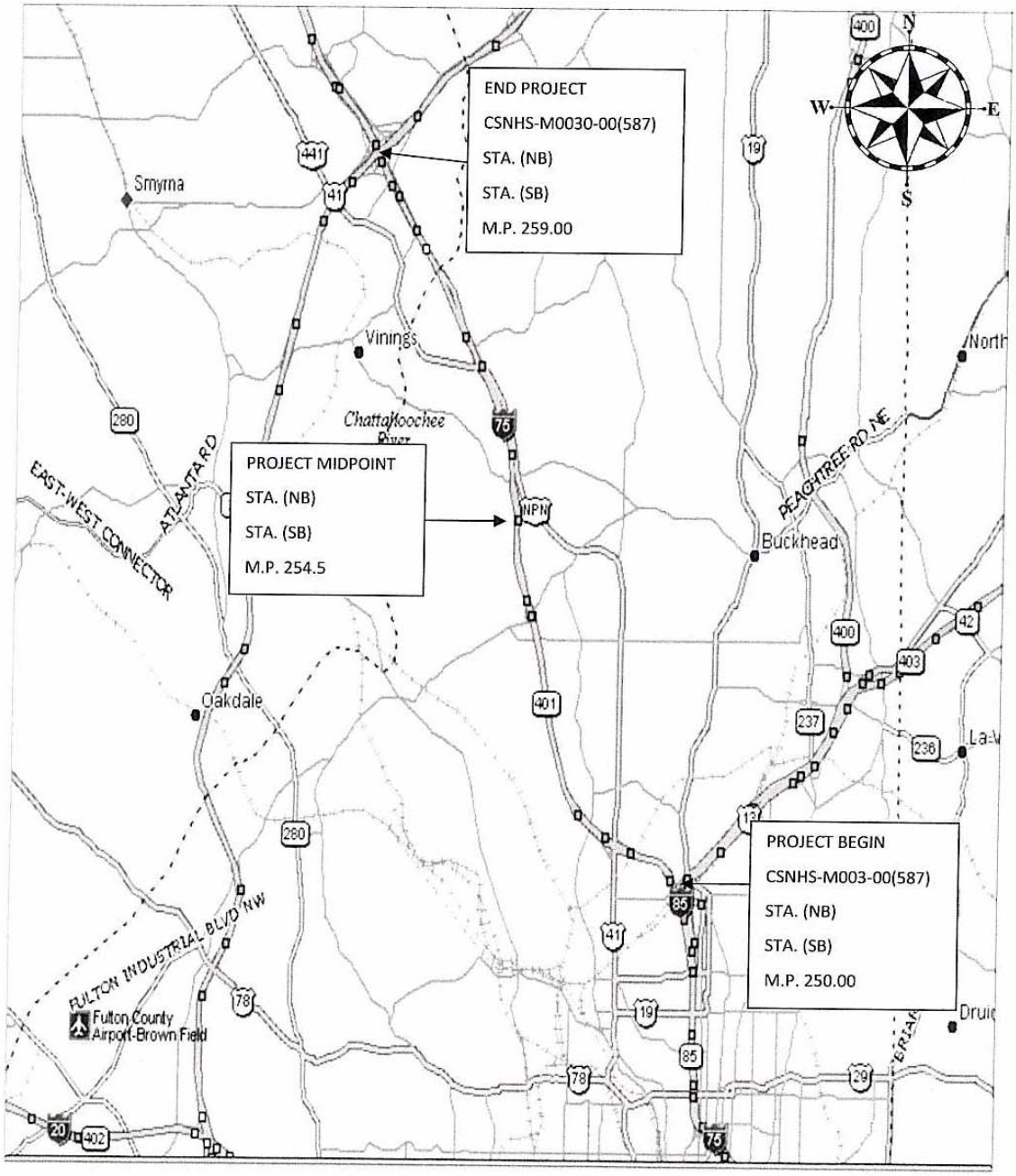
- The existing mainline ADT for this section of I-75 is approximately 110,000.
- The Design Team is considering the use of concrete barrier in lieu of guardrail in some areas.
- The budget for the project is $35M.
- The project will be constructed in 2009, in one season.
- 10 of 27 ramps will be upgraded; two of the 10 will be full-depth reconstruction, with only mill and inlay for the remainder.
- Mickey McGee recommended upgrading all ramps and shoulders under this project and avoid differing life-cycles between the ramps and the mainline.
- There is a separate sign upgrade project which will overlap this one.
- The existing pavement in this section is approximately 12 years old.
- Micro-milling was considered but has been excluded for this project because that concept would not restore enough of the distressed pavement.
- Two bridges on the mainline have been overlaid with AC and will need joint work
- The tentative MOT concept is to maintain a minimum of two lanes open (three lanes closed) in each direction on weekends from Friday evening until early Monday morning. This method has recently been used successfully on a similar adjacent project. Ramp closures will be permitted.
- Most of the milling will be 3.25" deep but 2 miles of the project – with PCCP pavement – will have only 2" milled.
- Milled material will be recycled but probably not directly to this project.
- The HOV stripe spacing will be adjusted under this contract.
- **No formal constraints to the VE were established but micro-milling is not a favored option by the design team.**

V.E. Team Presentation

Following the study, the VE Team gave a brief overview of its recommendations. The following personnel were in attendance:

Lisa Myers	GDOT Engineering Services
Ron Wishon	GDOT Engineering Services
Travis McDonald	GDOT Urban
Mindy Roberson	FHWA
Carolyn Penry	FHWA
Loretta Washington	LCW Engineering
Raices Goodwin	LCW Engineering

PROJECT LOCATION MAP
Project No. CSNHS-M003-00(587)
P.I. NO. M003587
MILL & INLAY I-75
FULTON & COBB COUNTIES, GEORGIA



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V.E. RECOMMENDATIONS

DEVELOPMENT AND RECOMMENDATION PHASE		
I-75 Resurfacing		
IDEA No.: 1.1	**Sheet No.:** 1 of 2	**CREATIVE IDEA:** **Defer Project For 3-5 Years**

Prepared By: GAO **Date: 10-21-08** **Checked By: RHC** **Date: 10/28/08**

Original Concept: The baseline plan is to construct the entire project in 2009.

Proposed Change: The VE Team recommends that GDOT defer the project for several seasons (years). The existing pavement is generally in good to fair condition with few areas rated as poor. Rather than resurfacing pavement in fair conditions, we recommend a deferral until more of the pavement exhibits a poor condition, perhaps 3-5 years. Our rough estimate of cost impact is based on a three-year deferral period.

Justification: This recommendation would defer construction costs until the condition of the pavement warrants the maintenance resurfacing. The existing pavement is rated in the Pavement Evaluation Summary as good to poor for the NB and good to fair for the SB. The COPACES designation is 87 of 105. There were several cores that showed cracking, in some cases up to 3 inches. Of the 37 cores listed, however, only 8 showed load or block cracking. The remainder of the cores showed no cracking.

During the VE Team's site tour, the rideability seemed reasonable, both in the right and left lanes. There did not appear to be significant potholes or patches that significantly alter driving patterns. There are some areas of longitudinal gouging that could be annoying to drivers, but they did not seem very problematic and could be tolerated for several more years. Additionally, this section of I-75 is inside the perimeter where truck volumes are low which should further reduce the wear and tear of the existing pavement.

The intent of this recommendation would be to try to get more use out of the existing pavement while it is still in good to fair condition. There may be areas that are more distressed, but overall the pavement does not appear to exhibit signs or severe stress or break up. If this project could be deferred for 3 – 5 years, the life cycle costs would be significantly improved. This would also allow more flexibility for the maintenance cycles for the ramps and shoulders to be matched to the mainline, a concern expressed during the VE study kick-off meeting.

Additionally, if this extension could be applied to the entire Metro area interstate system, significant maintenance resurfacing costs could be deferred, thereby freeing up construction funds for more applicable and relevant projects and congestion relief.

LIFE CYCLE COST SUMMARY	CAPITAL COST	PRESENT WORTH OF FUTURE COST	TOTAL COST SAVINGS
INITIAL COST – Original	$25,000,000		
– Proposed	$0		
– Deferral	$25,000,000		
FUTURE COST – Savings		$22,225,000	$2,775,000
TOTAL PRESENT WORTH SAVINGS			**$2,775,000**

ASSUMPTIONS/CALCULATIONS/CONTACTS MADE	
Project Name: I-75 Resurfacing	ITEM No: 1.1
	Sheet 2 of 2

The project construction cost is approximately $25,000,000 including maintenance of traffic. This figure was discussed at the project kick-off meeting and will be used for evaluation purposes, because no formal construction cost estimate for the entire project was available at the time of the VE study.

The baseline maintenance resurfacing duration is 12 years. Extending this duration by 3 years to 15 provides a 25 % savings, allowing more funds to be available for other work. A 5 year extension to 17 years would yield a 42 % savings.

Thus, extending the baseline resurfacing period by 3 years to 15 years average would yield a savings of about $6,250,000.

0.25 x $25,000,000 = $6,250,000

The figure calculated represents an overall savings, if implemented on a continuing basis as a system-wide savings measure. Since the pavement is in fair condition, it can last several additional years before maintenance resurfacing is absolutely required.

We assumed that for the extended period, there would not be significant additional maintenance costs incurred, based on visual inspection and the Pavement Evaluation.

From a life-cycle cost perspective, the Present Worth of the $25M construction cost given a three-year deferral, would be: $25M x 0.8890 (pwf 4%, 3 years) = $22,225,000. Thus the life-cycle savings can be expressed as $25,000,000 – $22,225,000 = $2,775,000.

DEVELOPMENT AND RECOMMENDATION PHASE

I-75 Resurfacing

IDEA No.: 1.2	**Sheet No.:** 1 of 2	**CREATIVE IDEA:** **Defer a Portion of Project For 3-5 Years**

Prepared By: GAO **Date: 10-21-08** **Checked By: RHC** **Date: 10/28/08**

Original Concept: The baseline concept is to construct the entire project in 2009. .

Proposed Change: If Recommendation 1.1 cannot be implemented, the VE Team recommends that a portion of the project be deferred for several seasons (years). The existing SB pavement is rated in the Pavement Evaluation Summary as "good to fair condition" while the NB is rated as "good to poor condition". Rather than resurfacing both roadways, we recommend deferring the SB resurfacing until more of the pavement exhibits poor condition, perhaps 3- 5 years.

Justification: This recommendation would defer about half of the construction costs until the condition of the SB pavement warrants the maintenance resurfacing. The existing pavement is rated as good to poor for the NB and good to fair for the SB. The COPACES designation is 87 of 105, but this measure was not broken out by roadway. There were several cores that showed cracking, in some cases up to 3 inches. Of the 37 cores listed, however, only 8 showed some amount of load or block cracking. Only 4 of the 15 cores listed for the SB roadway had any level of cracking. The rideability seemed reasonable during the several times the team drove the project, both in the right and left lanes. There did not appear to be significant potholes or patches that significantly alter driving patterns.
The intent of this recommendation would be to try to get more use out of the existing pavement while it is still in good to fair condition, even for only half the project. There may be areas that are more distressed, but the pavement does not appear to exhibit signs or severe stress or break up. If half this project could be deferred for up to 3 – 5 years, the life cycle costs could be significantly improved. This would also allow more flexibility for the maintenance cycles for the ramps and shoulders to be matched to the mainline.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**PRESENT WORTH OF FUTURE COST**	**TOTAL COST SAVINGS**
INITIAL COST – Original	$25,000,000		
– Proposed	$12,500,000		
– Deferral	$12,500,000		
FUTURE COST – Savings		$11,112,500	$1,387,500
TOTAL PRESENT WORTH SAVINGS			**$1,387,500**

ASSUMPTIONS/CALCULATIONS/CONTACTS MADE	
Project Name: I-75 Resurfacing	ITEM No: 1.2
	Sheet 2 of 2

The project construction cost is $25,000,000 including maintenance of traffic. This estimate was approximated and discussed at the project kick-off meeting. Assume that resurfacing only one direction of roadway would cut this figure in half; 12,500,000.

The baseline maintenance resurfacing duration is 12 years. Extending this duration by 3 years to 15 provides a 25 % savings extension for the life cycle analysis.

3/12 = 0.25

Extending the baseline resurfacing period by 3 years to 15 years average would yield a savings of about $3,125,000.

0.25 x $12,500,000 = $3,125,000

The figure calculated represents an overall savings, if implemented on a continuing basis as a system-wide savings measure. Since the pavement is in fair condition, it can last several additional years before maintenance resurfacing is absolutely required and not just desired.

We assume that for the extended period, there will not be significant additional maintenance costs incurred.

From a life-cycle cost perspective, the Present Worth of the $12.5M deferral is:

$12,500,000 X .8890 = $11,112,500 ($12.5M X 0.8890 (pwf 4%, 3 years)

Thus life-cycle savings can be expressed as $12,500,000 – $11,112,500 = $1,387,500

DEVELOPMENT AND RECOMMENDATION PHASE		
I-75 Resurfacing		
IDEA No.: 2.1	**Sheet No.:** 1 of 3	**CREATIVE IDEA:** **Mill Distressed Areas Only and Overlay Entire Mainline**

Prepared By: dpc **Date:** 10.22.08 **Checked By:** RHC **Date:** 10/28/08

Original Concept: The baseline project proposes to mill to various depths, primarily 3-1/4", and replace with 2" of SMA and 1-1/4" of PEM materials.

Proposed Change: The value engineering recommendation is to eliminate the "milling complete" approach and only mill distressed areas to a depth of 2", replacing with SMA. The VE Team assumed for purposes of illustration that 20% of the mainline surface area may require milling and inlay. After the milling, the entire mainline would be cleaned, type M crack filler applied, and the 1-1/4" overlay with PEM material would be applied as per the baseline concept.

Justification: Based upon the August 29, 2008 Pavement Evaluation Summary, this section of I-75 SB was rated as "good to fair condition" (with only 2 load level type cracks discovered) and the I-75 NB section was rated "good to poor condition" (with 3 load level type cracks discovered). 70% of the cores were found to be in good condition with a COPACES visual rating of 87 out of 105. The roadway visually appears solid and currently provides a smooth ride except at isolated bridge joint areas and certain on/off-ramp locations. The VE Team believes that this recommendation would continue to provide the required functionality of this pavement maintenance project while reducing cost significantly.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST – Original	12,310,000		
– Proposed	2,520,000		
– Savings	9,790,000		9,790,000
FUTURE COST – Savings		$0	$0
TOTAL PRESENT WORTH SAVINGS			**9,790,000**

COST WORKSHEET							
Project Name: I-75 Resurfacing					IDEA No: 2.1		
					Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	UNITS	Nº UNITS	COST/ UNIT	TOTAL COST	Nº UNITS	COST/ UNIT	TOTAL COST
Milling Complete (100%)	LS	1	4,020,543	4,020,543			
Distressed Milling (20%)	LS				0.2	4,020,543	804,109
Asphalt Concrete 12.5 MM SMA Surface Mix	LS	1	8,148,012	8,148,012	0.2	8,148,012	1,629,602
Bitum. Tack Coat	GL	68,364	$2.07	141,513	41,018	$2.07	84,907
TOTAL				12,310,068			2,518,618
TOTAL ROUNDED				12,310,000			2,520,000

ASSUMPTIONS/CALCULATIONS/CONTACTS MADE	
Project Name: I-75 Resurfacing	ITEM No: 2.1
	Sheet 3 of 3

The VE Team discussed this project with Steve Pahno of the Department's Materials and Research Lab, Pavement Management Branch. Mr. Pahno described how the recommended mill depths of 2" and 3-1/4" came about and explained details of the Pavement Evaluation Summary Report dated August 29, 2008.

An in-depth assessment of the mainline to estimate the requiring milling was not developed as part of this VE study due to the lack of detailed pavement information. The VE Team assumed that 20% of the surface area may require milling, which we believe is a conservative estimate, based on the information in the Pavement Evaluation Summary and on our visual survey of the roadway condition.

DEVELOPMENT AND RECOMMENDATION PHASE		
I-75 Resurfacing		
IDEA No.: 2.2	**Sheet No.:** 1 of 3	**CREATIVE IDEA:** **Reduce Mill Depth to 2" and Overlay With SMA**
Prepared By: dpc Date: 10.22.08 Checked By: RHC Date:10/28/08		

Original Concept: The baseline concept is to mill the entire mainline area to various depths, primarily 2" or 3-1/4", and replace with 2" of SMA and 1-1/4" of PEM material in the 3-1/4" depth sections.

Proposed Change: If Recommendation 2.1 cannot be implemented, the VE Team recommends that the Design Team change the required milling depths of 2" and 3-1/4" to a consistent depth of 2" for the entire project limits. Clean the pavement surface, apply type M crack filler, cover cracks with high strength pavement reinforcement fabric, and apply 1-1/2" of recycled asphalt concrete 12.5 MM superpave surface mix.

Justification: The pavement structure appears to be in acceptable condition. Superpave mix does not provide the drainage characteristics of the PEM surface mix, but provides the functional purpose of the project intent. PEM mix cannot be placed in a recycled format, but a Superpave mix can. Using recycled material could provide the required function at less cost if the PEM material is not an absolute requirement on this roadway at this time. The proposed 1-1/2" depth of inlay is based on the assumption that this would bring the mainline grade even with that of the shoulders. A thicker inlay might be required to achieve this function and if so, the potential cost reduction of this recommendation would be reduced somewhat.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST – Original	15,260,000		
– Proposed	7,940,000		
– Savings	7,320,000		7,320,000
FUTURE COST – Savings		$0	$0
TOTAL PRESENT WORTH SAVINGS			**7,320,000**

COST WORKSHEET							
Project Name: I-75 Resurfacing					IDEA No: 2.2		
					Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	UNITS	Nº UNITS	COST/ UNIT	TOTAL COST	Nº UNITS	COST/ UNIT	TOTAL COST
Asphalt Conc. 12.5 MM PEM Surface Mix	TN	43,354	$89.72	3,889,720			
Asphalt Conc. 12.5 MM SMA mix	TN	80,506	$101.21	8,148,012			
Mill Asphalt Conc. Pave. 3-1/2” depth	SY	492,800	$6.25	3,080,000			
Mill Asphalt Conc. Pave. 2” depth	SY				492,800	$4.84	2,385,152
Asphalt Conc. 12.5 MM Recycled Superpave Gp.2	TN				80,506	$68.14	5,485,679
Bitum. Tack Coat	GL	68,364	$2.07	141,513	34,182	$2.07	70,756
TOTAL				15,259,245			7,941587
TOTAL ROUNDED				15,260,000			7,940,000

ASSUMPTIONS/CALCULATIONS/CONTACTS MADE	
Project Name: I-75 Resurfacing	ITEM No: 2.2
	Sheet 3 of 3

The VE Team discussed this project with Steve Pahno at the Department's Materials and Research Lab, Pavement Management Branch. We discussed how the recommended mill depths of 2" and 3-1/4" came about and 12.5 MM PEM versus 12.5 MM recycled asphalt surface course material policy. Recycled material typically costs less than virgin material, and Mr. Pahno was not sure if the industry had developed a cost effective process to manufacture and use recycled PEM type mix.

The Team made the assumption that asphalt concrete 12.5 MM SMA mix and recycled asphalt concrete 12.5 MM mix share similar unit weights.

The cost of the fabric is assumed to be included in the costs for the milling and inlay operation.

DEVELOPMENT AND RECOMMENDATION PHASE

I-75 Resurfacing

IDEA No.: 3	**Sheet No.:** 1 of 3	**CREATIVE IDEA: Night work only, 7-days a week.**

Prepared By: dpc Date: 10.22.08 Checked By: RHC Date: 10/28/08

Original Concept: The baseline concept will use the current GDOT Special Provision 150 which restricts the Contractor's working hours as follows: Weekend work beginning 9:00 pm Friday evening and ending Monday morning at 5:00 am (56 hours) and week nights (Monday through Thursday) between the hours of 9:00 pm until 6:00 am (36 hours).

Proposed Change: The VE recommendation is to offer the alternative working parameters as follows: Monday through Friday 8:00 pm to 6:00 am (10 hour windows) and Saturday and Sunday 7:00 pm to 7:00 am (12 hour windows).

Justification: Historically, contractors have exclusively chosen the sole solution to work the Friday night through Monday morning schedule largely due to mobilization and demobilization time constraints. Since the mainline milling depth on this project is set primarily for 3-1/4" this project will allow for a higher production rate versus the deeper milling operation required on some recent work, which constrains production rates. Comparing the available working hours per month:

1. Current allowable working hours per week are approximately 92 hours, but Contractor only utilizes the 56 hour segment, choosing not to work nights during Monday through Thursday due to personnel limitation. This translates into the Contractor working approximately 224 hours per every 30 calendar day period.
2. The VE alternative would increase working hours per week to approximately 74 hours. This translates into 318 working hours per every 30 calendar day period.

A typical 6-month "weekend only approach" project could be reduced by approximately 4 months if Contractor works a daily schedule versus a weekend only schedule. This condensed schedule would allow GDOT the opportunity to let two major projects in a single paving season as well as allow the awarded Contractor the opportunity to bid and perform a second similar major project in one paving season.

This alternative is directly related to milling depth. Depths greater than 3.5 inches would force Contractor to select the weekend only project approach due to production rates.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST – Original	500,000		
– Proposed	1,500,000		
– Savings	(-1,000,000)		(-1,000,000)
FUTURE COST – Savings			
TOTAL PRESENT WORTH SAVINGS			**(-1,000,000)**

COST WORKSHEET							
Project Name: I-75 Resurfacing					IDEA No: 3		
					Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
ITEM	UNITS	Nº UNITS	COST/ UNIT	TOTAL COST	Nº UNITS	COST/ UNIT	TOTAL COST
Traffic Control (3% cost)	LS	1	500,000	500,000			
Traffic Control (9% cost)	LS				1	1,500,000	1,500,000
TOTAL				500,000			1,500,000
TOTAL ROUNDED				500,000			1,500,000

ASSUMPTIONS/CALCULATIONS/CONTACTS MADE	
Project Name: I-75 Resurfacing	ITEM No: 3
	Sheet 3 of 3

The VE Team spoke with Tim Knight of E.R. Snell Contracting to get a Contractor's perspective on historical similar operations and he indicated that there is a milling depth in which they would consider working a week night schedule versus weekend schedule.

We also spoke with Doug Starr of GDOT District 7, Area 4 to discuss historical, similar past projects to determine positive and negative experiences from a client project management perspective.

No traffic control cost was available in engineer's estimate. Therefore, the VE Team assumed 3% of total construction cost would be required for MOT under the baseline concept of weekend work. To implement the daily approach to traffic control it was assumed that the cost would triple (to 9%) because of the everyday basis and a shorter duration each day.

SAY $18M total construction cost X 3% = $540,000 Assume $500K and $1.5M

APPENDIX

Sources

Key Positions

Name:	Position:	Telephone:
Lisa Myers	Value Engineering Coordinator	404-631-1770
Albert Shelby	Project Manager – Urban Design	404-631-1675

Personal Contacts

Name:	Telephone:	Notes:
Tim Knight	E.R. Snell Contracting	Snell constructed recent similar project
Doug Starr	District 7	Discussed recent projects
Steve Pahno	Materials and Research Lab	Discussed milling depths determination

Documents Used During Study

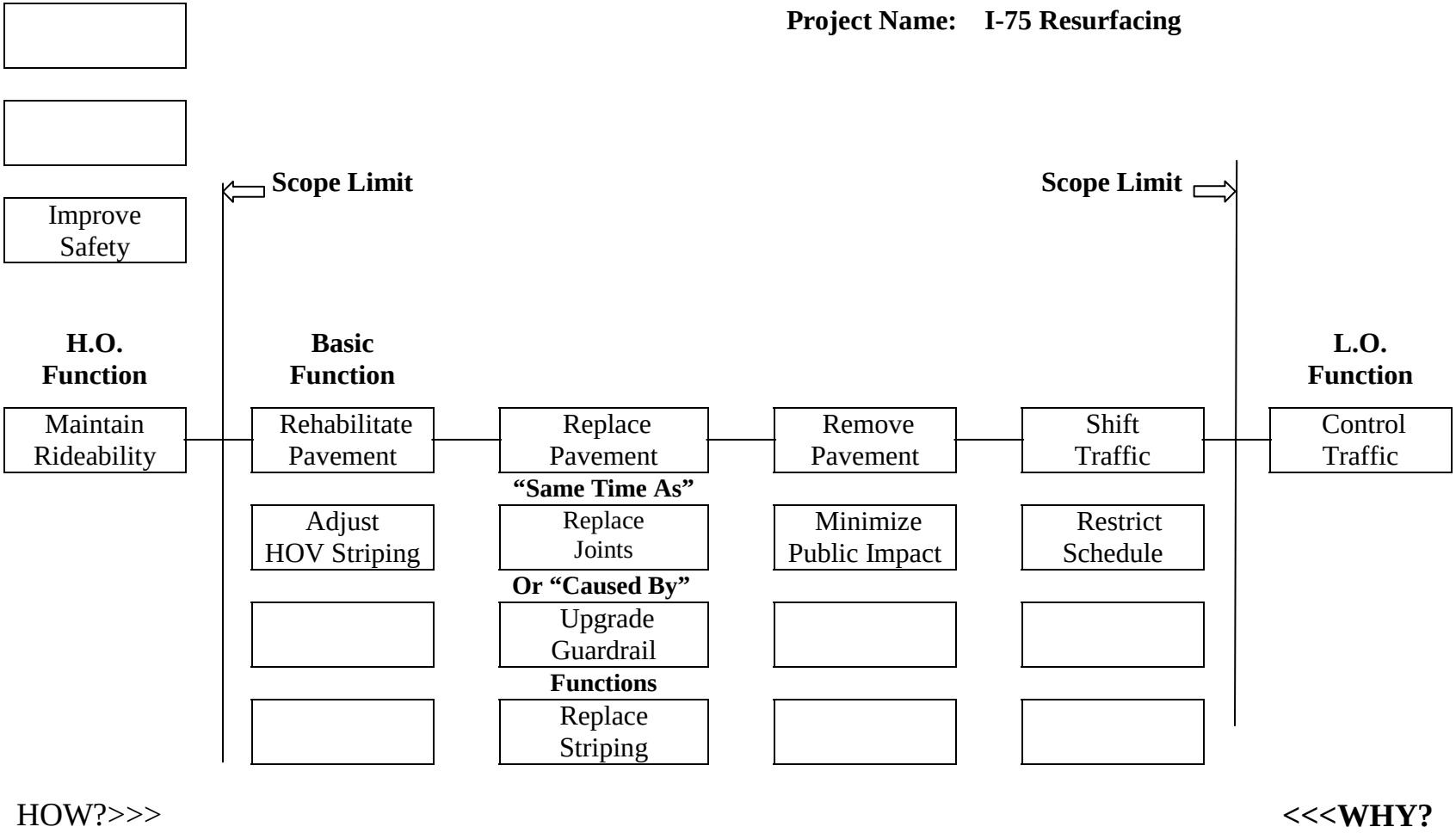
Document:	Source:
Preliminary Plans	LCW Engineering 10/08
Pavement Evaluation Summaries – Mainline and Ramps	GDOT 8.2008
Partial Cost Estimate (AC and Milling only)	LCW Engineering 10/08
Task Order Summary	Office of Urban Design

Cost Model/Distribution

Item	Description	$ Amount	% of Total Project
	PARTIAL – A/C and Milling only		
	AC – 12.5mm SMA	8,148,012	48%
	Milling – 2” – 4.5”	4,020,543	24%
	AC – 12.5mm PEM	3,889,721	23%
	Recycled AC	758,866	4%
	Tack Coat	`141,513	1%
	Aggregate Base	49,335	0%
	TOTAL	**$17,007,990**	**100**

F.A.S.T. DIAGRAM

Project Name: I-75 Resurfacing



CREATIVE PHASE Creative Idea Listing		EVALUATION PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**ADVANTAGES/DISADVANTAGES**	**IDEA RATING**
1	Pavement re-design	Combine with No. 2	X
2	2” milling depth	A- Significant cost reduction; continues to provide the rehab function; faster construction	✓ **Rec 2.2**
		D – May not eliminate all cracked areas	
3	Micro milling	Dropped in first cut	X
4	Defer this project until later	A – Defers/saves significant cost that can be used elsewhere	✓ **Rec 1.1**
		A – Pavement appears to be in good condition	
		D – Pavement could deteriorate over next few years	
5	Close one direction completely	Dropped in first cut	X
6	Maintain 3 lanes open at all times	D – only effective for one phase of work	X
		D – affects contractor production	
		D- only marginal improvement in traffic capacity due to merge problem.	
7	Maintain four lanes open at all times	Dropped in first cut	X
8	Permanently reduce lane width	Dropped in first cut	X
✓ = Recommendation; X = will be dropped; DS = Design suggestion A = Advantage D = Disadvantage			

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No.	**CREATIVE IDEA**	**ADVANTAGES/DISADVANTAGES**	**IDEA RATING**
9	Narrow lanes during construction	Dropped in first cut	X
10	Recycle in situ	Dropped in first cut	X
11	Recycle off site and use of this project	Combine with No. 2	X
12`	Night work only – seven days a week	A- less impact to traveling public; A – safer construction; A – more work hours per month – faster completion of work.	✓ **Rec 3**
		D – would cost more for MOT	
13	Mill and inlay on the most distressed lanes	D – information not available to distinguish	X
		D – this is a maintenance project, in which work is normally done for entire section of corridor	
14	No milling at this time, overlay only	A – reduces cost significantly A – pavement appears in good shape	✓ **Rec 2.1**
		A- conserves resources	
		A – continues to provide rehab function	
		D – may not eliminate all cracked sections	
✓ = Recommendation; X = will be dropped; DS = Design suggestion A = Advantage D = Disadvantage			

CREATIVE PHASE Creative Idea Listing		EVALUATION PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**ADVANTAGES/DISADVANTAGES**	**IDEA RATING**
15	Do all the ramps under this project	D- not justified per the pavement evaluation report	X
		D – adds cost without adding needed function	
16	Do all the shoulders under this project	D – not justified per visual inspection of project	X
		D – adds significant cost without needed function	
17	Defer mainline and do all mainline, ramps, shoulders later	Combine this concept with No. 4	X
18	No shoulder work now	This is considered to be the baseline for the project	X
19	Rubberized AC	Possible Design Suggestion	DS
✓ = Recommendation; X = will be dropped; DS = Design suggestion A = Advantage D = Disadvantage			

CREATIVE PHASE Creative Idea Listing		EVALUATION PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**ADVANTAGES/DISADVANTAGES**	**IDEA RATING**
20	Ground up shingles (Virginia has done this)	Possible design suggestion	DS
21	Less AC, more Agg Base on ramps	D – Requires additional GAB and excavation	X
		D – May incur drainage problems	
		D- Saves only +/- $20,000	
22	Do NB now, SB later	A – defers/saves significant cost A – rehabs portion of pavement most in need now; defer pavement in better condition	✓ **Rec 1.2**
✓ = Recommendation; X = will be dropped; DS = Design suggestion A = Advantage D = Disadvantage			