VALUE ENGINEERING
MOD 1 TRAINING REPORT

SR 234 / Gillionville Road
From Eight Mile Road to Lockett Station

Project No. STP00-0133-00(005)
Dougherty County
PI No. 450490
February 18, 2009

OWNER:

Georgia Department of Transportation
600 West Peachtree Street
Atlanta, GA 30308
(404.631.1770)

VALUE ENGINEERING
MOD 1 INSTRUCTOR:

MACTEC Engineering and Consulting, Inc.
3200 Town Point Drive NW, Suite 100
Kennesaw, GA 30144
(770.421.3400)

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EXECUTIVE SUMMARY

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Overview

This report summarizes the results of a value engineering (VE) study for roadway widening and improvements on SR 234 / Gillionville Road from Eight Mile Road to Lockett Station in Dougherty County. The study was conducted as part of the Mod 1 training session held for select GDOT staff on January 26 to 30, 2009. On Monday, January 26, 2009, the design team gave an overview of the project to the VE team and on Friday, January 30, 2009, the VE Team presented their recommendations.

This project consists of widening and reconstructing Gillionville Road to 2 – 12 foot lanes and a 4 foot bike lane in each direction separated by a 14 foot flush median / turn lane. Due to the R/W impacts and utility conflicts, an urban section will be provided. The posted speed will be reduced from55 mph to 45 mph. Access will be controlled by driveway permits. The total estimated construction cost of the project is $8,588,000.

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

DEVELOPMENT PHASE - EXECUTIVE SUMMARY

Project: STP00-0133-00(005) Dougherty County P.I. No. 450490- **Location: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road**	**Team:** **Date:** January 30, 2009

This project extends easterly along SR234/Gillionville Road from 1312 feet west of Eight Mile Road to Lockett Station Road for a total of 2.3 miles. The typical section will widen Gillionville Road to two, 12 ft. lanes and a 4 ft. bike lane in each direction separated by 14 ft. flush median. Urban shoulders are proposed to minimize right-of-way impacts and costly reimbursable utility relocations. The basic function of the project is to improve SR 234 by reducing travel time. The project has an estimated cost of $8,588,000.

The VE Team identified 5 areas of opportunity for project improvement and cost savings. The first area reduces the typical section from a five lane urban section with bike lanes and sidewalks to a 3 lane rural section. The second area reduces the project pavement design thickness. The third area is to extend the existing arch pipe culvert instead of replacing at a new location. The fourth area is to eliminate bike lanes. The fifth area is to eliminate the sidewalk or have sidewalk on only one side of the roadway.

The first and most important area of improvement is justified by low traffic volumes and a low truck percentage. The project, located along a residential area, has a crash history below the statewide average. Recent traffic counts indicate that the 1999 traffic diagram AADT counts were overestimated. Cost savings would save 33% of the original cost, if implemented. Even though ROW has been acquired by the local government, reduction of the project typical section would allow for additional future travel lanes (one in each direction) with an urban section, if the traffic counts are warranted. Only construction plan changes are required for an additional estimated schedule increase of 6 to 9 months, since the project is to be placed on the "SHELF".

The second key function of the project was the examination of the subsurface base pavement. After much discussion and debate, the VE Team decided to use a Matrix evaluation to make the final recommendation. The weighted matrix reviewed four areas: cost, durability, maintenance, and user benefit. The two highest ranking pavement designs were so close in the evaluation that the VE Team decided to choose the alternative with the lower cost.

The third function was whether or not to replace the existing arch culvert. There was little doubt that keeping the existing structure in place would be the least expensive and easiest option. The VE Team consulted GDOT structural engineers and they recommended rehabbing the existing culvert and extending the arch pipe on both sides. This will result not only in significant cost savings, but also enable the contractor to stage the project without disrupting traffic.

The last two functions were eliminating the bike lanes and sidewalk. These two suggestions seem easy for the team to justify. The road is not on the Statewide Bicycle System and sidewalks on a rural shoulder would be a safety problem.

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DEVELOPMENT PHASE - SUMMARY OF COST SAVINGS

Project: **STP00-0133-00(005) Dougherty County P.I. No. 450490-**
Location: **SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road**

Team No.:
Date: Jan 29, 2009

Idea No.	Creative Idea Description	Original Initial Cost	Proposed Initial Cost	Initial Cost Savings	Future Savings	Total Life Cycle Savings
A-1	Modify typical section from 5-lanes Urban, Bike lanes, and 5-ft sidewalks to 3-lanes Rural section.	$5,071,000	$1,689,000	$3,382,000		$3,382,000
A-6	Reduce Pavement Design (3-Lane Section)	$1,508,000	$521,000	$987,000		$987,000
A-6.1	Reduce Pavement Design (5-Lane Section)	$1,508,000	$1,353,000	$155,000		$155,000
H-3	Maintain & Extend Existing Pipe Culvert	$1,126,000	$720,000	$406,000		$406,000
A-3	Eliminate Bike Lanes from Current typical	$404,000	0	$404,000		$404,000
F-2	Eliminate sidewalks	$590,000	0	$590,000		$590,000
F-2.1	Have sidewalk on only one side of the roadway	$590,000	$295,000	$295,000		$295,000

STUDY IDENTIFICATION

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STUDY IDENTIFICATION

Project: SR 234/Gillionville Road Roadway Widening	Date: January 26-30, 2009
Location: GDOT HQ – Atlanta,, 4th Floor; Conducted as part of Module 1 Training	

VE Team Members

Name:	Position:	Organization:	Telephone:
Derrick Cameron	Traffic Design Manager	GDOT – TS&D	404-635-8153
Marcela Coll	Assist. Design Group Mgr	GDOT – Urban	404-631-1692
Mike Haithcock *	Transp. Engr. Asst. Adm.	GDOT – OCD/PD	404-631-1562
Fletcher Miller	Design Group Manager	GDOT – Road	404-631-1652
David Powell	Assist. Design Group Mgr	GDOT - Road	404-631-1620
* Team Leader			

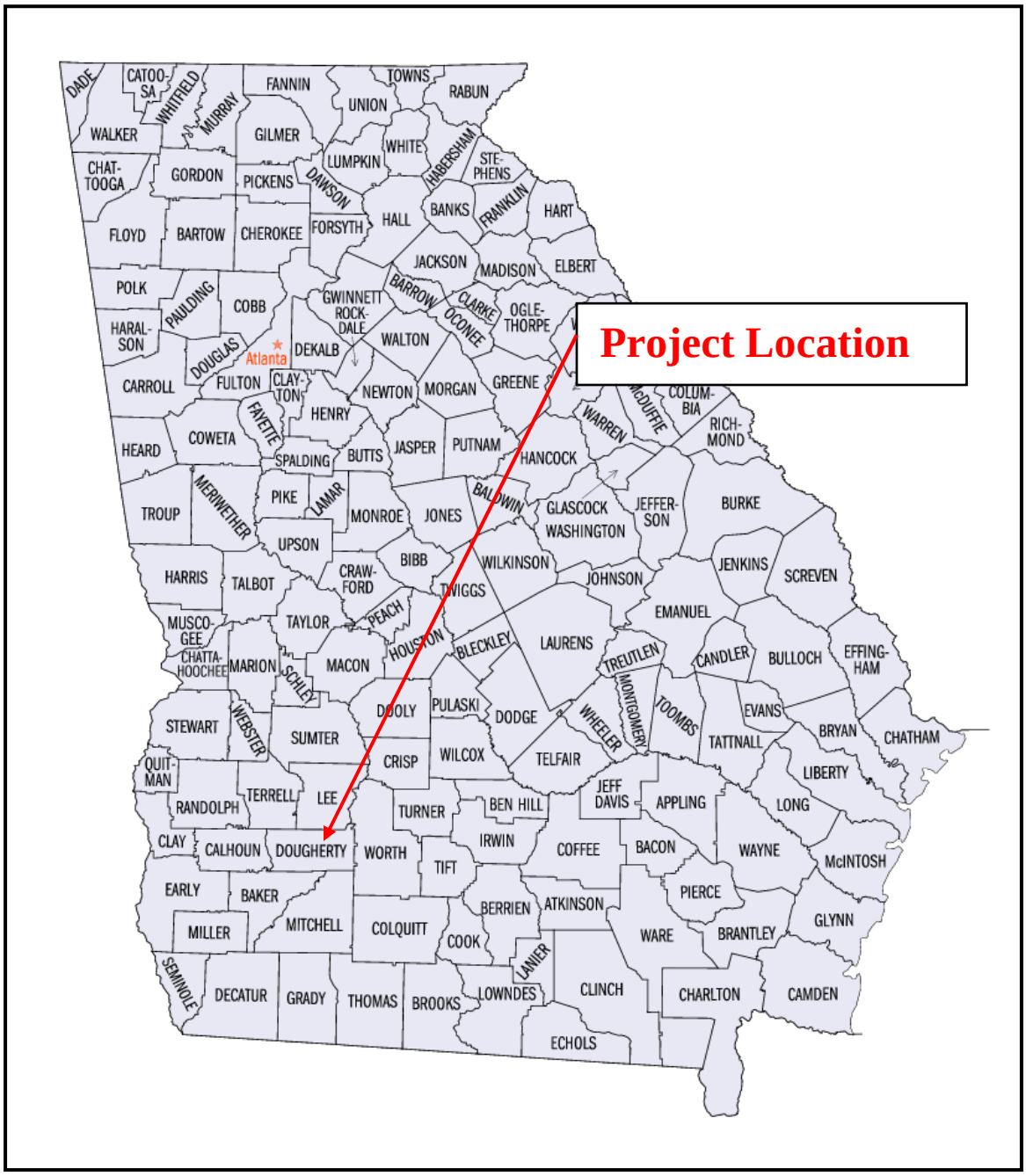
Project Description

The project extends easterly along Gillionville Road from 1312 feet west of Eight Mile Road to Lockett Station Road for a total of 2.3 miles. The typical section will widen Gillionville Road to two, 12 ft. lanes and a 4 ft. bike lane in each direction separated by 14 ft. flush median. Urban shoulders are proposed to minimize right-of-way impacts and costly reimbursable utility relocations.

Project Constraints

ROW is purchased. Historical arch bridge culvert stone to be re-used in replacement structure.

Figure 1
Project Vicinity Map



County Map of Georgia

VE RECOMMENDATIONS

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DEVELOPMENT AND RECOMMENDATION PHASE

Project: **SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road**

Idea No.:A-1	**Sheet No.:1** of	**CREATIVE IDEA:** Modify typical section from 5-lanes Urban, Bike lanes, and 5-ft sidewalks to 3-lanes Rural section.

Comp By: Date: Checked By: Date:

Original Concept: The original typical section has 5-lanes Urban; four 12-ft and one 14-ft lane. In addition, there are 4-ft bike lane and 5-ft sidewalk on each side of the roadway.

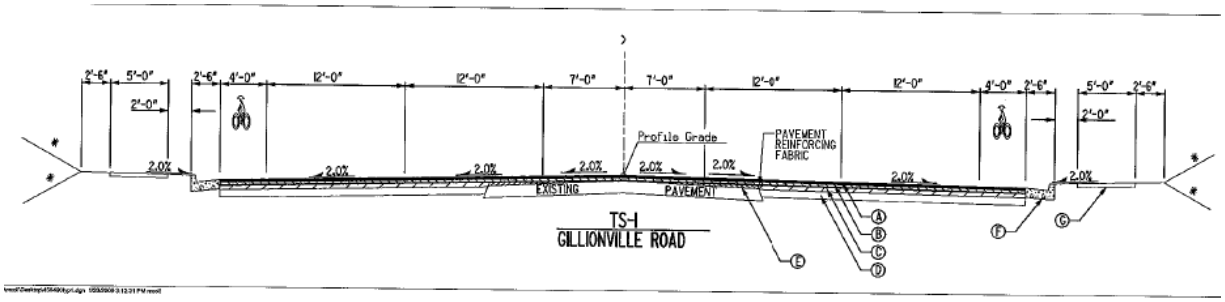
Proposed Change: The proposed change is to modify the typical section to a 3-lane Rural section. This typical section will consist of two 12-ft through lanes and a 14-ft TWTL and 4-ft shoulders.

Justification: The provided ADT of 8,300 for 2010 year and14, 200 for 2030 year are low enough to suggest the proposed change. Also, the 3% truck traffic, and the fact that the project is along a residential area with no high history of accidents suggests that the proposed change of the facility would serve the need of the area at a 33% of the original cost.

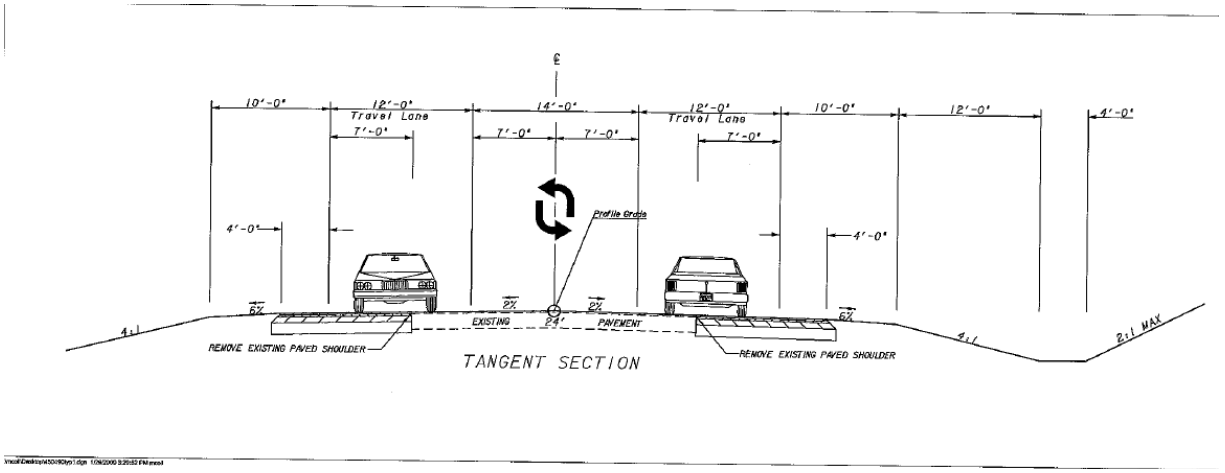
LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: Original	$5,071,000		
Proposed	$1,689,000		
Savings	$3,382,000		
FUTURE COST: Savings			
TOTAL PRESENT WORTH SAVINGS			**$3,382,000**

SKETCH

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road	Idea No.: A-1 Client:: Sheet 2 of



CURRENT



PROPOSED

COST WORKSHEET

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road

Idea No.: A-1
Client::
Sheet of

CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
10" GAB	SY	56,393	$21.88	$1,234,000	21,726	$21.88	$475,000
12.5 mm Superpave	TN	7391	$63.00	$466,000	4531	$63.00	$286,000
19 mm Superpave	TN	9855	$63.00	$621,000	6041	$63.00	$381,000
25 mm Superpave	TN	9305	$63.00	$586,000	3585	$63.00	$226,000
Concrete Sidewalk	SY	13,118	$45.00	$590,310	0	$45.00	0
Curb and Gutter	LF	24,182	$14.59	$352,815	0	$14.59	0
Drainage (Longitudinal Items)				$1,221,000			$321,000
Subtotal:							
Mark-up (to %)							
Total				$5,071,125			$1,689,000
Total Rounded				**$5,071,000**			**$1,689,000**

CALCULATIONS

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road	Idea No.: Client:: Sheet of

See attached

Pavement Quantities - STP 133 (5) Dougherty County

The VE Team closely examined Pavement Cost for since it is the largest project expense.

The roadway items in the Summary of Quantities (and subsequent costs) are as follows:

12.5 mm Super Pave = 9454 Tons x $63 / Ton =	$595,602
19.0 mm Super Pave = 12,606 Tons x $63 / Ton =	$794,178
25.0 mm Super Pave = 12,180 Tons x $63 / Ton =	$767,340
Graded Aggregate Base = 71,478 Sq Yd x $21.88 / Sq Yd =	$1,563,940
Total	$3,721,060

The VE Team calculated the same items and arrived at different quantities and costs

70' Typical Section

Surface Course

TS-1	Stat 126+50 to Stat 29+00 = 9750 Feet Length X 70 Feet Wide / 9 =	75,833 Sq Yd
TS-2	Stat 12+83 to Stat 10+00 = 283 Feet Length X 24 Feet / 9 =	755 Sq Yd
TS-3	Seven Sidestreets = 450 Feet Length X 24 Feet / 9 =	1,200 Sq Yd
TS-4	Four Sidestreets = 1475 Feet Length X 24 Feet / 9 =	3,933 Sq Yd
TS-5	Stat 135+00 to 126+50 = 850 Feet Length X 70 Feet Wide / 9 =	6,611 Sq Yd
		88,332 Sq Yd

Full Depth Pavement

TS-1	Stat 126+50 to Stat 29+00 = 9750 Feet Length X 46 Feet Wide / 9 =	49,833 Sq Yd
TS-4	Four Sidestreets = 1475 Feet Length X 24 Feet / 9 =	3,933 Sq Yd
TS-6	Stat 107+50 to 102+00 = 550 Feet Length X 70 Feet Wide / 9 =	4,278 Sq Yd
		58,044 Sq Yd

12.5 mm Super Pave = (88,332 Sq Yd) (165 # / 2000) = 7287 Tons x $63 / Ton =	$459,081
19.0 mm Super Pave = (58,044 Sq Yd) (220 # / 2000) = 6385 Tons x $63 / Ton =	$402,255
25.0 mm Super Pave = (58,044 Sq Yd) (330 # / 2000) = 9577 Tons x $63 / Ton =	$603,351
Graded Aggregate Base = 58,044 Sq Yd x $21.88 Sq Yd =	$1,270,000
Total	$2,734,687

Although these quantities and costs are preliminary, it seems that the plans provided to the VE Team had roadway items which were over calculated and construction costs were overstated.

38' Typical Section – RECOMMENDED BY VE TEAM

Surface Course		
TS-1	Stat 126+50 to Stat 29+00 = 9750 Feet Length X 38 Feet Wide / 9 =	41,167 Sq Yd
TS-2	Stat 12+83 to Stat 10+00 = 283 Feet Length X 24 Feet / 9 =	755 Sq Yd
TS-3	Seven Sidestreets = 450 Feet Length X 24 Feet / 9 =	1,200 Sq Yd
TS-4	Four Sidestreets = 1475 Feet Length X 24 Feet / 9 =	3,933 Sq Yd
TS-5	Stat 135+00 to 126+50 = 850 Feet Length X 38 Feet Wide / 9 =	4,344 Sq Yd
		51,399 Sq Yd
Full Depth Pavement		
TS-1	Stat 126+50 to Stat 29+00 = 9750 Feet Length X 14 Feet Wide / 9 =	15,167 Sq Yd
TS-4	Four Sidestreets = 1475 Feet Length X 24 Feet / 9 =	3,933 Sq Yd
		19,100 Sq Yd

12.5 mm Super Pave = (51,399 Sq Yd) (165 # / 2000) = 4240 Tons x $63 / Ton =	$267,146
19.0 mm Super Pave = (19,100 Sq Yd) (220 # / 2000) = 2101 Tons x $63 / Ton =	$132,363
25.0 mm Super Pave = (19,100 Sq Yd) (330 # / 2000) = 3152 Tons x $63 / Ton =	$198,576
Graded Aggregate Base = 51,399 Sq Yd x $21.88 Sq Yd =	$1,124,610
Total	$1,722,695

Original Cost Estimate for 70' Roadway =	$3,721,060
Corrected Cost Estimate for 70' Roadway =	$2,734,687
Proposed Cost Estimate for 38' Roadway =	$1,722,695

The VE Team got Road Design to do a second set of pavement quantities as Quality Assurance, and the two estimates were within 6% of each other. Neither estimate accounted for right turn lanes or various minor typical section changes and are intended to be highly preliminary and only for use in evaluation. We also recommend revising the Sidestreet Profiles to use overlay instead of full depth pavement sections wherever possible.

38' Typical Section:

Typical Section	Sta. Beg.	Sta. End	Length	Overlay Width	Full Depth Width	Overlay Area	Full Depth Area
TS-1	29+00.00	102+00.00	7300.00 ft.	24.00 ft.	14.00 ft.	19467 sq. yd.	11356 sq. yd.
TS-6	102+00.00	107+50.00	550.00 ft.	0.00 ft.	38.00 ft.	0 sq. yd.	2322 sq. yd.
TS-1	107+50.00	126+50.00	1900.00 ft.	24.00 ft.	14.00 ft.	5067 sq. yd.	2956 sq. yd.
TS-5	126+50.00	135+00.00	850.00 ft.	70.00 ft.	0.00 ft.	6611 sq. yd.	0 sq. yd.
						31144 sq. yd.	***16633 sq. yd.***

70' Typical Section:

Typical Section	Sta. Beg.	Sta. End	Length	Overlay Width	Full Depth Width	Overlay Area	Full Depth Area
TS-1	29+00.00	102+00.00	7300.00 ft.	24.00 ft.	46.00 ft.	19467 sq. yd.	37311 sq. yd.
TS-6	102+00.00	107+50.00	550.00 ft.	0.00 ft.	70.00 ft.	0 sq. yd.	4278 sq. yd.
TS-1	107+50.00	126+50.00	1900.00 ft.	24.00 ft.	46.00 ft.	5067 sq. yd.	9711 sq. yd.
TS-5	126+50.00	135+00.00	850.00 ft.	70.00 ft.	0.00 ft.	6611 sq. yd.	0 sq. yd.
						31144 sq. yd.	***51300 sq. yd.***

Side Roads	Sta. Beg.	Sta. End	Length	Overlay Area	Full Depth Area
Eight Mile Rd.	10+00.00	11+20.00	120.00 ft.	333 sq. yd.	0 sq. yd.
Byron Plantation Rd.	10+00.00	13+85.00	385.00 ft.	1195 sq. yd.	491 sq. yd.
White Oak Dr.	10+00.00	13+00.00	300.00 ft.	133 sq. yd.	729 sq. yd.
Wildwood Dr.	10+00.00	14+00.00	400.00 ft.	133 sq. yd.	997 sq. yd.
Divine Dr.	10+00.00	12+50.00	250.00 ft.	67 sq. yd.	663 sq. yd.
Springfield Dr.	6+50.00	14+00.00	750.00 ft.	200 sq. yd.	2213 sq. yd.
				2061 sq. yd.	***5093 sq. yd.***

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 234/Gillionville Road

Idea No.:	**Sheet No.:**	**CREATIVE IDEA:**
A-6	of	Reduce Pavement Design (3-Lane Section)

Comp By: Date: 1/29/09 Checked By: Date:

Original Concept:
The current pavement design is for a 5-lane roadway section, that includes two 12 ft. travel lanes with 4 ft. bike lanes in each direction with a 14'TWLT. The project proposes the same typical section and pavement design as for the adjacent constructed project. (See / /00 attached approved Pavement Design) % Overdesign

Proposed Change:
In addition to reducing the typical section from a 5-lane section to a 3-lane section, this recommendation proposes to reduce the mainline pavement design from 3-in. to 2.5-in. of 25 mm SuperPave and 10-in. to 8-in. of GAB. Also, it is recommended to use 12.5 mm SuperPave in lieu of 9.5 mm SuperPave. It is also recommended that updated traffic be requested before revising the pavement design since the current traffic diagrams are dated ____/99. (See 01/29/09 attached Pavement Design) 9.7% Underdesign

Justification:
Since the traffic volumes are reduced in the project's section of the corridor and construction of the adjacent projects are not concurrent, the pavement design/typical section may be reduced for a significant savings without compromising structural value.

LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: Original	$1,508,000		
Proposed	$521,000		
Savings	$987,000		
FUTURE COST: Savings			
TOTAL PRESENT WORTH SAVINGS			**$987,000**

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COST WORKSHEET

Project: SR 234/Gillionville Road

Idea No.: A-6
Client::
Sheet of

CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Asphalt Concrete 25 mm	TN	9305	$63.00	$586,000	2988	$63.00	$188,000
10” GAB	SY	56,393	$16.35	$922,000			
8” GAB	SY				21,726	$15.32	$333,000
Subtotal:							
Mark-up (%)							
Total				$1,508,000			$521,000
Total Rounded				$1,508,000			$521,000

CALCULATIONS

Project: SR 234/Gillionville Road	Idea No.: Client:: Sheet of

See Attached

FLEXIBLE PAVEMENT DESIGN ANALYSIS

Project: STP-0133(5) **County:** Dougherty
P.I. no.: 450490
Description: Widen SR 234/Gillionville Rd fm Eight Mile Rd to Lockett Station

Traffic Data (NOTE: AADTs are one-way)
24-hour Truck Percentage: 3.00%
AADT initial year of design period: 4,150 vpd (2004)
AADT final year of design period: 7,100 vpd (2024)
Mean AADT (one-way): 5,625 vpd

Design Loading

Mean AADT		LDF		Trucks		18-K ESAL		Total Daily Loads
5,625	*	1.00	*	0.030	*	1.13	=	192

Total predicted design period loading = 192 * 20 * 365 = 1,401,600

Design Data
Terminal Serviceability Index: 2.50
Soil Support: 3.50
Regional Factor: 1.40

PROPOSED FLEXIBLE PAVEMENT STRUCTURE

Material	Thickness Inches	Thickness (mm)	Structural Coefficient	Structural Value
12.5 mm Superpave	1.50	(38)	0.44	0.66
19 mm Superpave	2.00	(51)	0.44	0.88
25 mm Superpave	1.00	(25)	0.44	0.44
	1.50	(38)	0.30	0.45
Graded Aggregate Base	8.00	(203)	0.16	1.28

Required SN = 4.11 Proposed SN = 3.71

>>> Proposed pavement is 9.7% Underdesign <<<

Remarks: Revised Pavement Design for the 3-Lane Section.

Prepared by VE Study Team January 29, 2009
Date

Recommended _____
State Urban Design Engineer **Date**

Approved _____
State Pavement Engineer **Date**

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DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 234/Gillionville Road

Idea No.: A-6.1	**Sheet No.:** of	**CREATIVE IDEA:** Reduce Pavement Design (5-Lane Section)

Comp By: Date: Checked By: Date:

Original Concept:
The current pavement design is for a 5-lane roadway section, that includes two 12 ft. travel lanes with 4 ft. bike lanes in each direction with a 14'TWLT. The project proposes the same typical section and pavement design as for the adjacent constructed project. (See / /00 attached approved Pavement Design) % Overdesign

Proposed Change:
If the typical section is not reduced from a 5-lane section to a 3-lane section, this recommendation proposes to reduce the mainline pavement design from 3-in. to 2.5-in. of 25 mm SuperPave and 10-in. to 8-in. of GAB. Also, it is recommended to use 12.5 mm SuperPave in lieu of 9.5 mm SuperPave. It is also recommended that updated traffic be requested before revising the pavement design since the current traffic diagrams are dated ____/99. (See 01/29/09 attached Pavement Design) 4.4% Underdesign

Justification:
Since the traffic volumes are reduced in the project's section of the corridor and construction of the adjacent projects are not concurrent, the pavement design/typical section may be reduced for a significant savings without compromising structural value.

LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: Original	$1,508,000		
Proposed	$1,353,000		
Savings	$155,000		
FUTURE COST: Savings			
TOTAL PRESENT WORTH SAVINGS			**$155,000**

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COST WORKSHEET

Project: SR 234/Gillionville Road

Idea No.: A-6.1
Client::
Sheet of

CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Asphalt Concrete 25 mm	TN	9305	$63.00	$586,000	7754	$63.00	$489,000
10” GAB	SY	56,393	$16.35	$922,000			
8” GAB	SY				56,393	$15.32	$864,000
Subtotal:							
Mark-up (%)							
Total				$1,508,000			$1,353,000
Total Rounded				$1,508,000			$1,353,000

CALCULATIONS

Project: SR 234/Gillionville Road	Idea No.: Client:: Sheet of

See Attached

FLEXIBLE PAVEMENT DESIGN ANALYSIS

Project: STP-0133(5) **County:** Dougherty
P.I. no.: 450490
Description: Widen SR 234/Gillionville Rd fm Eight Mile Rd to Lockett Station

Traffic Data (NOTE: AADTs are one-way)
24-hour Truck Percentage: 3.00%
AADT initial year of design period: 4,150 vpd (2004)
AADT final year of design period: 7,100 vpd (2024)
Mean AADT (one-way): 5,625 vpd

Design Loading

Mean AADT		LDF		Trucks		18-K ESAL		Total Daily Loads
5,625	*	0.70	*	0.030	*	1.13	=	134

Total predicted design period loading = 134 * 20 * 365 = 978,200

Design Data
Terminal Serviceability Index: 2.50
Soil Support: 3.50
Regional Factor: 1.40

PROPOSED FLEXIBLE PAVEMENT STRUCTURE

Material	Thickness Inches	Thickness (mm)	Structural Coefficient	Structural Value
12.5 mm Superpave	1.50	(38)	0.44	0.66
19 mm Superpave	2.00	(51)	0.44	0.88
25 mm Superpave	1.00	(25)	0.44	0.44
	1.50	(38)	0.30	0.45
Graded Aggregate Base	8.00	(203)	0.16	1.28

Required SN = 3.88 Proposed SN = 3.71

>>> Proposed pavement is 4.4% Underdesign <<<

Remarks: Revised Pavement Design for the 5-Lane Section.

Prepared by VE Study Team January 29, 2009
Date

Recommended _____
State Urban Design Engineer **Date**

Approved _____
State Pavement Engineer **Date**

DEVELOPMENT AND RECOMMENDATION PHASE

Project: STP-0133(5), P.I. No. 450490

Idea No.: H-3	**Sheet No.:** of	**CREATIVE IDEA:** Maintain & Extend Existing Pipe Culvert

Comp By: DSP Date: 01/29/2009 Checked By: MH Date: 01/29/2009

Original Concept:

The widening of SR 234/Gillionville Rd from Eight Mile Rd to Lockett Station Rad consists of upgrading the roadway from an existing two lane highway to a proposed five lane section with a 14-ft flush median. The concept proposes to replace the existing 21' X 8'-10" arch culvert with the same structure but in a different location so that the proposed structure will allow the Cooleewahee Creek to flow through the culvert. The proposed grade above the existing culvert has a grade difference of approximately five feet. The aesthetics of the culvert headwall shall be retained due to historic preservation requirements, although the structure has experienced severe scouring.

Proposed Change:

The VE Team recommends retaining the existing 21' X 9' pipe arch culvert and extending it on both sides of SR 234 to match the Cooleewahee Creek stream centerline. The existing profile is approximately three feet above the existing culvert. The VE Team recommends that the proposed grade of the SR 234 to reflect the 0.29-ft overlay grade change above the existing culvert. The stones in the existing headwalls will be used to construct the proposed headwalls.

Justification:

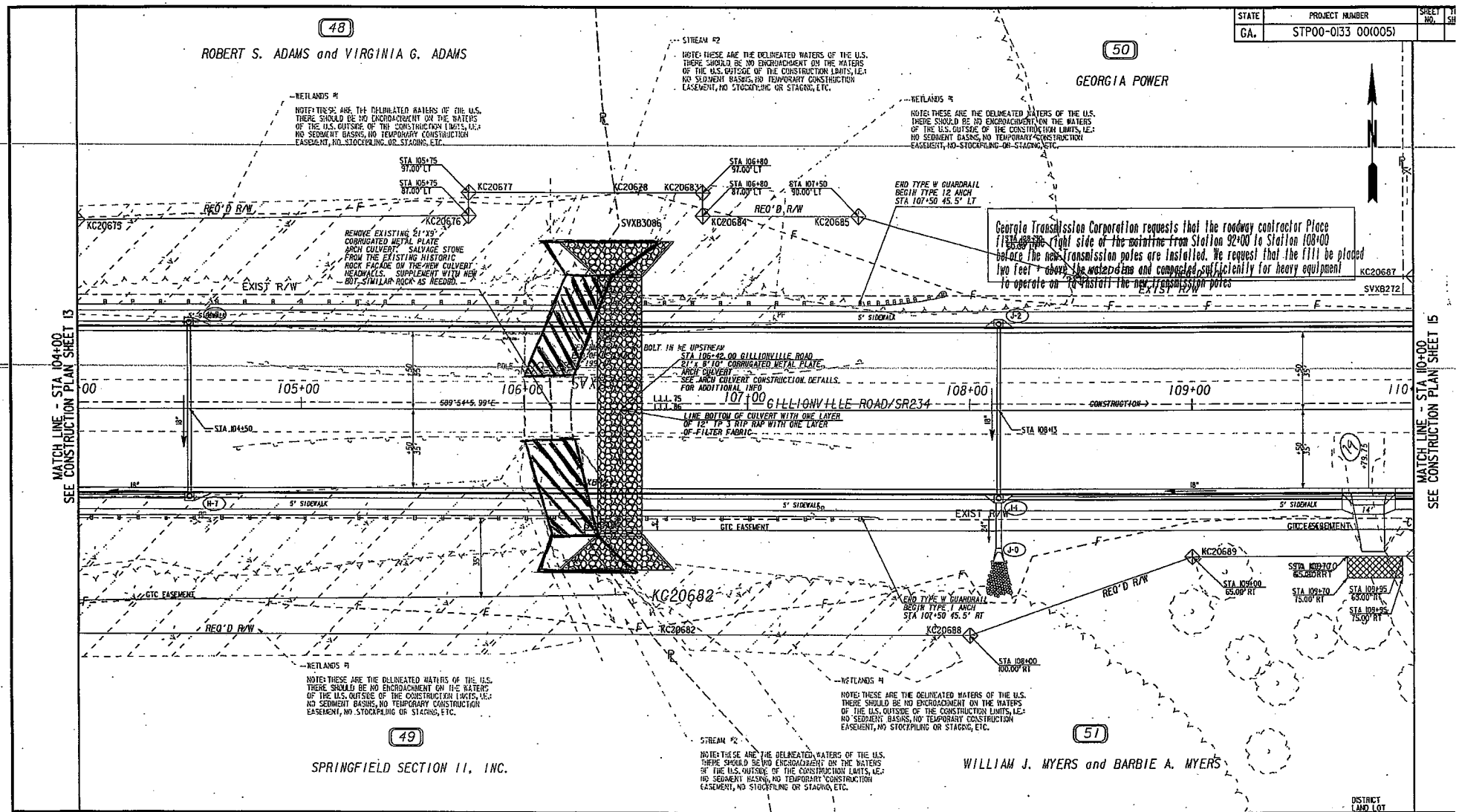
Maintaining and extending the existing culvert permits better traffic control, reduces the amount of required earthwork, and reduces drainage cost. Extending the existing culvert will alleviate the scouring and will improve hydraulic performance. Extending the culvert to accommodate the proposed five lane section will be cost effective than waiting until SR 234 will need five lanes because of future traffic growth.

LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
INITIAL COST: Original	$1,126,420.00		
Proposed	$719,640.00		
Savings	$406,780.00		$406,780.00
FUTURE COST: Savings			
TOTAL PRESENT WORTH SAVINGS			

SKETCH

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road	Idea No.: H-3 Client:: Sheet 2 of

See Attached Construction Plan Sheet and Profile Sheets



STATE	PROJECT NUMBER	SHEET NO.
GA.	STP00-0133 00(005)	

PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS

4180 LAVISTA ROAD, TUCKER, GA 30084
PHONE: (770) 414-0404
FAX: (770) 414-0637

20 0 20 40 60
SCALE: 1" = 20'

DATE	REVISIONS	DATE	REVISIONS

Wilbur Smith Associates
ENGINEERS PLANNERS ECONOMISTS
2920 BRANDYWINE ROAD
SUITE 220
ATLANTA, GEORGIA 30341
(770) 936-8650

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATIO
CONSTRUCTION PLAN
PROJECT - STP00-0133 00(005)
COUNTY - DOUGHERTY
14 OF

DISTRICT
LAND LOT

1/6/2009 11:10:46 AM \\GDOT-DSNI\GOPLOT\GCF\GO_Kip8000.gcf tmcdonald Y:\450490-Gillionville Road Unit 5\DGN\450490C14.prf GO-UD6

MATCH LINE - STA 70+50
SEE PREVIOUS SHEET
MATCH LINE - STA 86+00
SEE ABOVE
MATCH LINE - STA 86+00
MATCH LINE - STA 101+50
STATE
GA.
PROJECT NUMBER
STP00-0133 00(005)
SHEET NO.
BEGIN ANALYSIS STA. 99+00.00
PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES
BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
4270 LAVISTA ROAD, TUCKER, GA 30084
PHONE (770) 414-0404
FAX (770) 414-0637
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SCALE: 1" = 20'
DATE
REVISIONS
DATE
REVISIONS
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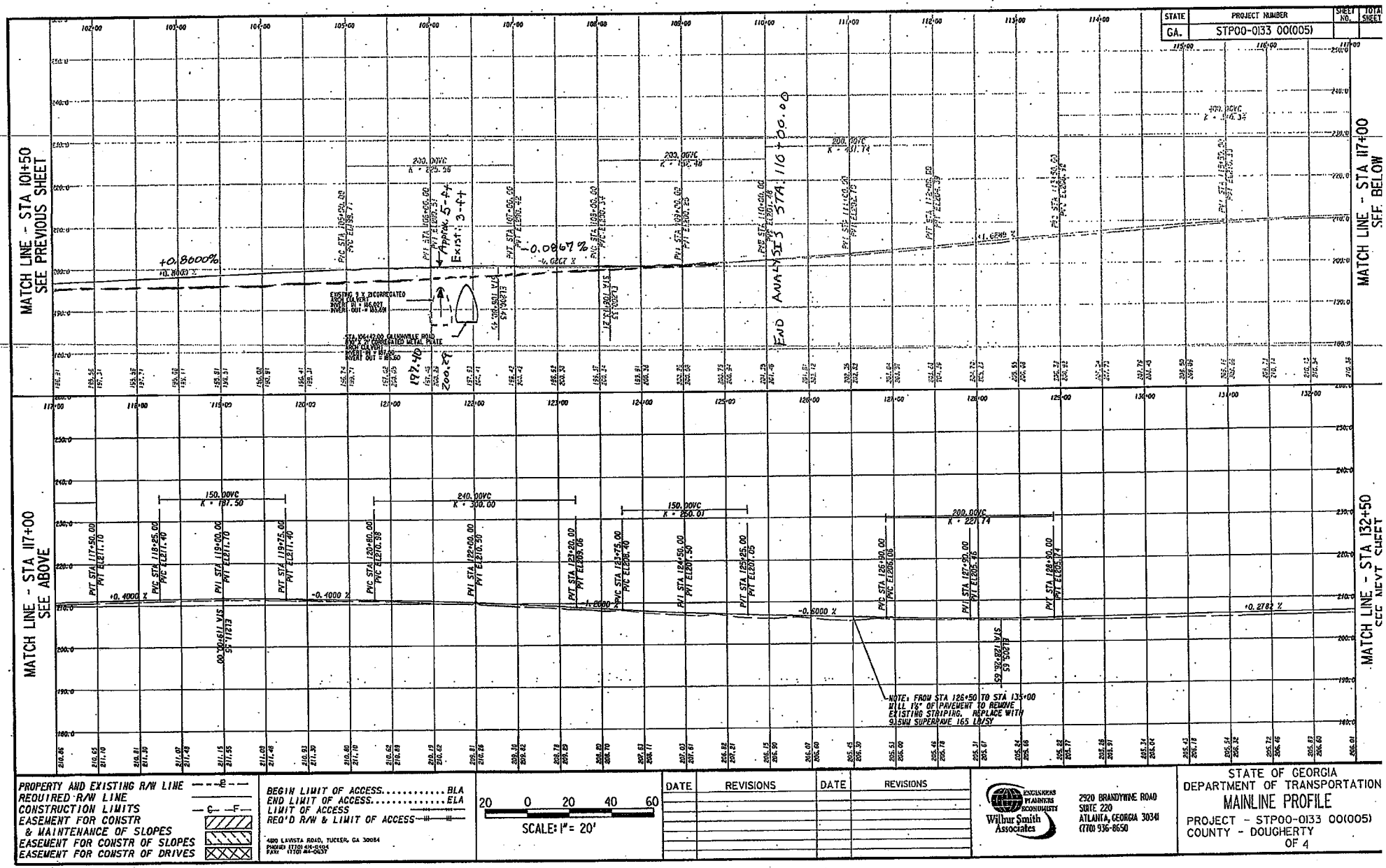
2920 BRANDYWINE ROAD
SUITE 220
ATLANTA, GEORGIA 30341
(770) 936-8650
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
MAINLINE PROFILE
PROJECT - STP00-0133 00(005)
COUNTY - DOUGHERTY
OF 3


MATCH LINE - STA 101+50
SEE PREVIOUS SHEET
MATCH LINE - STA 117+00
SEE ABOVE
MATCH LINE - STA 117+00
SEE BELOW
MATCH LINE - STA 132+50
SEE NEXT SHEET
STATE
GA.
PROJECT NUMBER
STP00-0133 00(005)
SHEET NO.
TOTAL SHEET
+0.8000%
-1.0867 %
+0.4000 %
-0.4000 %
-1.6000 %
-0.6000 %
+0.2782 %
200.00VC
K = 225.56
150.00VC
K = 187.50
240.00VC
K = 300.00
150.00VC
K = 250.01
200.00VC
K = 184.38
200.00VC
K = 201.74
200.00VC
K = 227.14
400.00VC
K = 571.43
STA 110+00.00
END ANALYSIS
Appr. 5-ft
Exist. 3-ft
197.40
200.83
NOTE: FROM STA 126+50 TO STA 135+00
MILL 1½" OF PAVEMENT TO REMOVE
EXISTING STRIPING. REPLACE WITH
9.5MM SUPERPAVE 165 LB/SY
PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES
BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
SCALE: 1" = 20'
DATE
REVISIONS
DATE
REVISIONS
Wilbur Smith Associates
2920 BRANDYWINE ROAD
SUITE 220
ATLANTA, GEORGIA 30341
(770) 936-8650
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
MAINLINE PROFILE
PROJECT - STP00-0133 00(005)
COUNTY - DOUGHERTY
OF 4

VE-9B Page of

COST WORKSHEET

Project:	Idea No.: Client:: Sheet of

CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
SP DS PIPE ARCH CULVERT	SQ FT	2,415	$200.00	$483,000	1,800	$200	$396,000
SHORING	LS	LS	LS	$120,370	LS	LS	$120,370
12” TP 3, RIP RAP	SQYD	258	$41.75	$10,775	267	$41.75	$11,150
24” TP 3, RIP RAP	SQYD	121	$44.65	$5,405	121	$44.65	$5,405
PLASTIC FILTER FABRIC	SQYD	379	$4.26	$1,615	388	$4.26	$1,655
CUT	CUYD	408	$2.84	$1,200	285	$2.84	$810
FILL	CUYD	23,397	$5.29	$124,000	16,378	$5.29	$86,640
12.5 mm SUPERPAVE	TN	706	$63.00	$44,500	182	$63.00	$11,500
19.0 mm SUPERPAVE	TN	942	$63.00	$59,350	242	$63.00	$15,250
25.0 mm SUPERPAVE	TN	1,412	$63.00	$89,000	363	$63.00	$22,900
GRADED AGGR BASE	SQYD	8,556	$21.88	$187,205	2,200	$21.88	$47,960
Subtotal:				$1,126,420			$719,640
Mark-up (%)							
Total				$1,126,420			$719,640
Total Rounded				$1,126,420			$719,640

CALCULATIONS

Project: STP-0133(5), P.I. No. 450490	Idea No.: H-3 Client:: GADOT Sheet of

SPECIAL DESIGN PIPE CULVERT

ORIGINAL COST: 2,415-ft^2 X \$200/ft^2 = \$483,000.00

H-3 COST: 1,800- ft^2 X \$200/ft^2 = \$360,000 plus %10 for skew = \$396,000.00

SHORING

ORIGINAL AND H-3 COST (LS) = \$120,370.00

RIPP RAP

12" TP 3, RIP RAP:

ORIGINAL COST: 258-ft^2 X \$41.75/ft^2 = \$10,775.00

H-3 COST: 267-ft^2 X \$41.75/ft^2 = \$11,150.00

24" TP 3, RIP RAP

ORIGINAL COST AND H-3 COST: 121-ft^2 X \$44.65/ft^2 = \$5,405.00

PLASTIC FILTER FABRIC

ORIGINAL COST: 379-ft^2 X \$4.26/ft^2 = \$1,615.00

H-3 COST: 388- ft^2 X \$4.46/ft^2 = \$1,655.00

EARTHWORK

CUT

ORIGINAL COST: 408-yd^3 X \$2.84/yd^3 = \$1,200.00

H-3 COST: 285-yd^3 X \$2.84/yd^3 = \$810.00

FILL

ORIGINAL COST: 23,397-yd^3 X \$5.29/yd^3 = \$124,000.00

H-3 COST: 16,378-yd^3 X \$5.29/yd^3 = \$86,640.00

PAVEMENT *ORIGINAL AREA* = (24+24+14+8)-ft X 1100 X (1/9) = 8,665 yd^2

H-3 AREA = (24+14+8) X 1100 X (1/9) = 2,200 yd^2

12.5 mm SUPERPAVE Sq. ft. x (1/9) x (165) x 1/2000 = tons

ORIGINAL COST: 706-TN X \$63.00/TN = \$44,500.00

H-3 COST: 182-TN X \$63.00/TN = \$11,500.00

19.0 mm *SUPERPAVE* *Sq. ft. x (1/9) x (220) x 1/2000 = tons*

ORIGINAL COST: 942-TN X \$63.00/TN = \$59,350.00

H-3 COST: 242-TN X \$63.00/TN = \$15,250.00

25.0 mm SUPERPAVE Sq. ft. x (1/9) x (330) x 1/2000 = tons

ORIGINAL COST: 1412-TN X \$63.00/TN = \$89,000.00

H-3 COST: 363-TN X \$63.00/TN = \$22,900.00

GAB Sq. ft. x (1/9) = square yards

ORIGINAL COST: 8,556- yd^2 X \$63.00/TN = \$187,205.00

H-3 COST: 2,200- yd^2 X \$63.00/TN = \$47,960.00

DEVELOPMENT AND RECOMMENDATION PHASE

Project: **SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road**

Idea No.:A-3	**Sheet No.:1** of	**CREATIVE IDEA:** Eliminate Bike Lanes from current typical

Comp By: Date: Checked By: Date:

Original Concept: The original typical section has 5-lanes Urban; four 12-ft and one 14-ft lane. In addition, there are 4-ft bike lane and 5-ft sidewalk on each side of the roadway.

Proposed Change: The proposed change is to modify the typical section to eliminate 8-ft of full-depth pavement by not designating a bike lane and encourage share use of lane.

Justification: The provided ADT of 8,300 for 2010 year and14, 200 for 2030 year are low enough to suggest the proposed change. Also, the 2% truck traffic, and the fact that the project is along a residential area with no high history of accidents suggests that the proposed change of the facility would serve the need of the area at a 33% of the original cost.

LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: Original	$403,558		
Proposed	$0		
Savings	$403,558		
FUTURE COST: Savings			$404,000
TOTAL PRESENT WORTH SAVINGS			

SKETCH

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road

Idea No.: A-3
Client::
Sheet 2 of

COST WORKSHEET

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road

Idea No.: A-3
Client::
Sheet of

CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
10" GAB	SY	71,478	21.88	1,563,938	62,811	21.88	$1,374,304
12.5 mm Superpave	TN	9,454	63.00	595,602	9,289	63.00	$585,207
25 mm Superpave	TN	12,180	63.00	767,340	10,750	63.00	$677,250
19 mm Superpave	TN	12,606	63.00	794,178	11,653	63.00	$734,139
Earthwork	LS	LS	750000	750000	LS	LS	$731,250
Subtotal:				4,471,058			$4102,150
Mark-up (to %)							
Total							
Total Rounded							

CALCULATIONS

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road	Idea No.: A-3 Client:: Sheet of

Reduce the Typical Section by deleting the East and Westbound bike lanes.

Project Length = 2.02 miles

Typical Section TS-1 Length = 9750' (1.85 miles)

Quantity Reduction =

10" GAB
9750' x 8' (4' for each side) = 8667 SY @ $21.88 = $189,634

12.5 mm Superpave
8667 SY @ 165#/SY spread rate = 715 Tons
715 Tons @ $63.00 = $45,045

25 mm Superpave
8667 SY @ 330#/SY spread rate = 1430 Tons
1430 Tons @ $63.00 = $90,090

19 mm Superpave
8667 SY @ 220#/SY spread rate = 953 Tons
953 Tons @ $63.00 = $60,039

Asphalt Cost Savings = $384,808

Estimated Earthwork Cost Savings is 2.5% of the existing.
$750,000 Earthwork Cost @ 2.5% = $18,750

Total Savings of $403,558

DEVELOPMENT AND RECOMMENDATION PHASE

Project: **SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road**

Idea No.:F-2	**Sheet No.:1** of	**CREATIVE IDEA:** Eliminate sidewalks or have sidewalk on only one side of the roadway

Comp By: Date: Checked By: Date:

Original Concept: The original typical section has 5-lanes Urban; four 12-ft and one 14-ft lane. Also, there are 4-ft bike lane and 5-ft sidewalk on each side of the roadway.

Proposed Change: The proposed change is to modify the typical section to eliminate the side walk or to have sidewalk on only one side of the roadway.

Justification: The current area along the project is residential and there is not a pedestrian traffic study that warrants it at this time.

LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: Original	$590,000		
Proposed	$295,155 or $0		
Savings	$295,155 or $590,310		
FUTURE COST: Savings			
TOTAL PRESENT WORTH SAVINGS			

SKETCH

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road	Idea No.: F-2 Client:: Sheet 2 of

COST WORKSHEET

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road

Idea No.: F-2
Client::
Sheet of

CONSTRUCTION ELEMENT		ORIGINAL ESTIMATE			NEW ESTIMATE		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
One Side							
Concrete Sidewalk	SY	13,118	45.00	590,310	6559	45.00	$295,155
Both Sides							
Concrete Sidewalk	SY	13,118	45.00	590,310	0	45.00	$0
Subtotal:							
Mark-up (to %)							
Total							
Total Rounded							

CALCULATIONS

Project: SR 234/Gillionville Road from Eight Mile Road to Lockett Station Road	Idea No.: F-2 Client:: Sheet of

Eliminate Sidewalk from one or both sides of the mainline typical section.

Proposed = 13118 SY of 4" Concrete Sidewalk

13118SY / 2 = 6559 SY of sidewalk per each side.

6559 SY @ $45.00per SY = $295,155 cost savings of Concrete Sidewalk per side

$295,155 x 2 = $590,310 Potential Total Cost Savings

APPENDIX

INFORMATION PHASE - SOURCES

Approving/Authorizing Persons

Name:	Position:	Telephone:
Albert Shelby	Design Group Manager	404-631-1675
Ron Wishon	Assist. State Review Engineer	404-631-xxxx
Gerald Ross	Chief Engineer	404-631-xxxx

Personal Contacts

Name:	Telephone:	Notes:
Travis McDonald	404-631-1673	Hydraulic Report, Capacity Analysis
Rishee Shah	440-631-xxxx	

Documents/Abstracts

Reference:	Notes:
FFPR Construction Plans	FFPR; last one held 4/24/08
Revised Concept Report	Approved 3/19/99
Detailed Cost Estimate	
100 Scale Layout	
Hydraulic Report	Exist./Proposed Arch Culvert
Capacity Analysis	

INFORMATION PHASE - COST MODEL
SR 234/Gillionville Road

Item	Description	$ Amount	% of Total Project
A	Base Course	$ 1,884,474	22%
B	Graded Aggregate Base	$ 1,692,558	20%
C	Traffic Control	$ 760,000	9%
D	Grading Complete	$ 750,000	9%
E	Surface Course	$ 595,602	7%
F	Sidewalk	$ 590,310	7%
G	Circular Pipe	$ 463,214	5%
H	Drainage (other)	$ 355,755	4%
	80% Cost Line		
I	Curb & Gutter	$ 352,815	4%
J	Inlets	$ 263,877	3%
K	Concrete (other)	$ 202,919	2%
L	Miscellaneous	$ 154,366	2%
M	Eliptical Pipe	$ 138,157	2%
N	Silt Fence	$ 107,490	1%
O	Driveways	$ 94,564	1%
P	Stabilization	$ 83,394	1%
Q	Signing & Marking	$ 63,719	1%
R	Median Barrier	$ 17,010	0%
S	Erosion Control (other)	$ 14,234	0%
T	Valley Gutter	$ 3,899	0%
	TOTAL	$8,588,357	100%

INFORMATION PHASE – FUNCTION ANALYSIS

Project: SR 234/Gillionville Road
Function: Increase Capacity

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	Worth	Comments
A	Base Course	Supports	Traffic	$1,884,474	$470,000	Reduce Lanes
B	Graded Aggregate Base	Supports	Pavement	$1,692,558	$425,000	Reduce Lanes
C	Traffic Control	Provides	Safety	$760,000	$500,000	Reduce Cost
D	Grading Complete	Grade	Earthwork	$750,000		
E	Surface Course	Improves	Ride	$595,602	$360,000	Reduce Lanes
F	Sidewalk	Carries	Pedestrians	$590,310	0	Remove
G	Circular Pipe	Drains	Pavement	$463,214	$75,000	Use Ditches
H	Drainage (other)	Channelizes	Stream	$355,755	$728,755	Revise Cost
I	Curb & Gutter	Drains	Pavement	$352,815	0	Use Ditches
J	Inlets	Drains	Pavement	$263,877	$20,000	Use Ditches
K	Concrete (other)	Completes	Construction	$202,919		
L	Miscellaneous	Completes	Construction	$154,366		
M	Eliptical Pipe	Drains	Pavement	$138,157		Change Material
N	Silt Fence	Retains	Sediment	$107,490	$107,490	No Change
O	Driveways	Provides	Access	$94,564	$60,000	Change Material
P	Stabilization	Retains	Sediment	$83,394	$83,394	No Change
Q	Signing & Marking	Provides	Guidance	$63,719	$50,000	Reduce Lanes
R	Median Barrier	Deflects	Vehicles	$17,010	0	Double-counted
S	Erosion Control (other)	Retains	Sediment	$14,234	$14,234	No Change
T	Valley Gutter	Drains	Pavement	$3,899	0	Use Rural Shldr.

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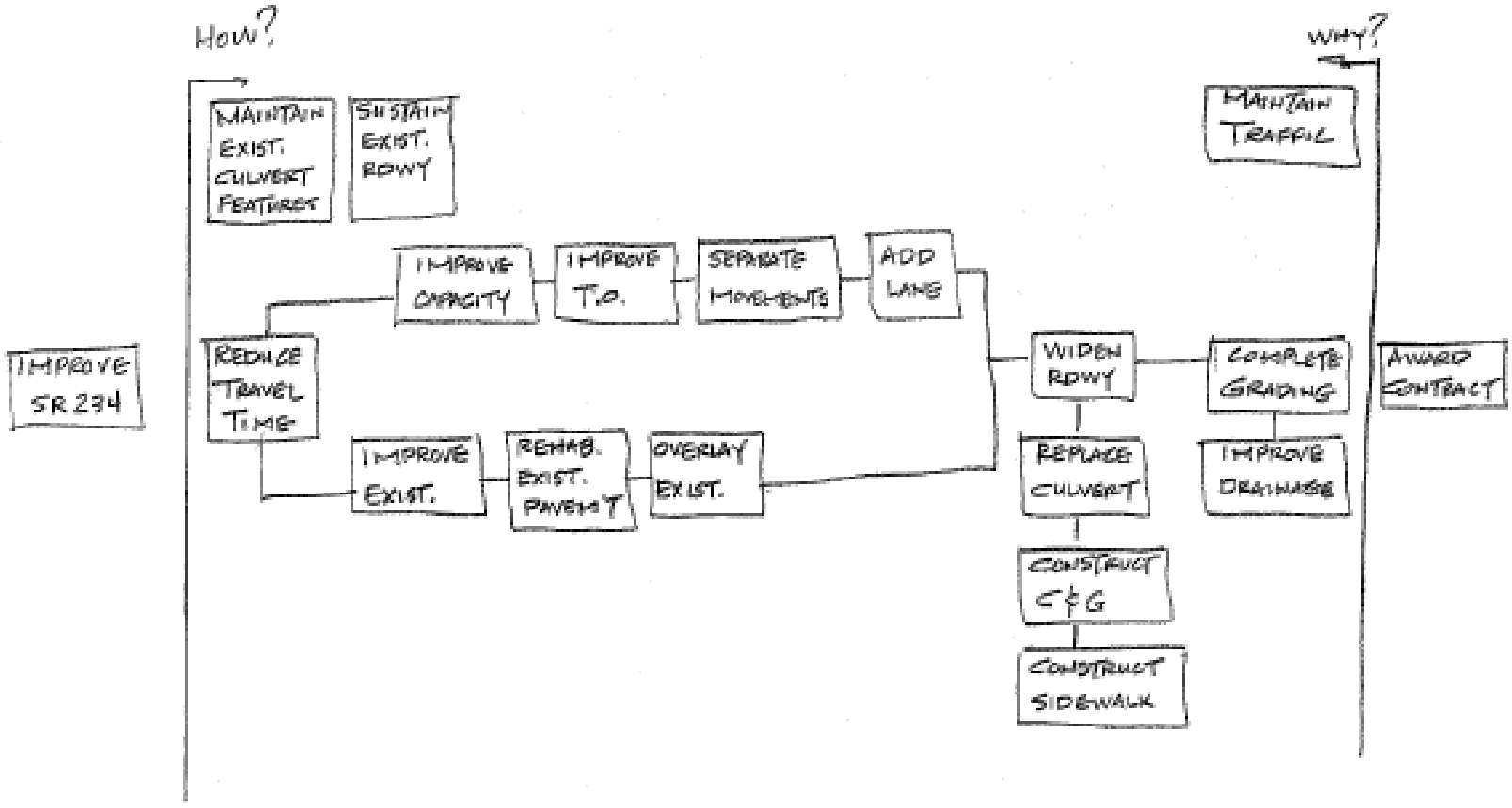
INVESTIGATION PHASE - FAST DIAGRAM



VE-6 & 7 Page of

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
A	Base Course		
A-1	Eliminate Lanes		10
A-2	Maintain Existing Pavement		10
A-3	Eliminate Bike Lanes		9
A-4	Reduce Lane Width		9
A-5	Use Soil Cement		8
A-6	Use Thinner Section		7
A-7	Use Full-Depth Rural Shoulder		5

VE-6 & 7 Page of

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
B	Graded Aggregate Base		
B-1	Eliminate Lanes		10
B-2	Maintain Existing Pavement		10
B-3	Eliminate Bike Lanes		9
B -4	Reduce Lane Width		9
B -5	Use Soil Cement		8
B -6	Use Thinner Section		7

VE-6 & 7 Page of

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
C	Traffic Control		
C-1	Maintain Existing Pavement		10
C -2	Use Cones/Barrels		10
C -3	Reduce Speed		10
C -4	Use Flaggers		9
C -5	Use Temporary Message Boards		8
C -6	Use On-site Detour		5

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
D	Grading Complete		
D-1	Use Rural Shoulder		10
D -2	Eliminate Lanes		10
D -3	Maintain Existing Pavement		10
D -4	Use Existing Profile Grade		10
D -5	Reduce Construction Limits/Clearing & Grubbing		10
D -6	Reduce Lane Width		9
D -7	Minimize Staging		8
D -8	Reduce Profile		8

VE-6 & 7 Page of

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
E	Surface Course		
E-1	Eliminate Lanes		10
E -2	Reduce Lane Width		9

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
F	Sidewalk		
F-1	Use Paved Shoulders		10
F -2	Eliminate Sidewalk		9
F -3	Sidewalk on One Side Only		7
F -4	Multi-use Trail		7
F -5	Use Asphalt Sidewalk		5

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
G	Circular Pipe		
G-1	Use Rural Shoulder		10
G -2	Use Ditches		10
G -3	Use Wider Ditches		8
G -4	Use Plastic Pipe		8
G -5	Use perforated Under-Drain Pipe		8
G -6	Use Smaller pipe Sizes		6

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
H	Drainage (other)		
H-1	Use Pre-Fabricated Structure		9
H -2	Use Multiple Pipes for Structure		7
H -3	Extend Existing Structure		7

VE-6 & 7 Page of

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
A			
A-1	Reduce Typical Section from 5 to 3 Lane Section		10
A-2	Overlay Existing Pavement at Culvert/Side Street Locations		10
A-3	Use Bike-able Rural Shoulders Instead of Lanes		9
A-4	Reduce Lane Width from 12’ to 11’, if 3 Lane Section is Rejected		9
A-6	Reduce Pavement Design (1.5, 2, 2, 9) 3 Lane Section		7
A-6.1	Reduce Pavement Design (1.5, 2, 2, 8) 5 Lane Section		7
C -2	Eliminate Concrete Barrier, if Culvert Extended		10
C -5	Add Temporary Message Boards		8
D-1	Use Rural Shoulder Instead of Urban Shoulder		10
D -5	Reduce Construction Limits/Clearing & Grubbing		10
D -7	Minimize Staging		8
D -8	Reduce Profile at Culvert Area		8
F-1	Use Paved Shoulders in Lieu of Sidewalk		10
F -2	Eliminate Sidewalk from Urban Shoulder		9
F -3	Sidewalk on One Side Only, if Urban Shoulder Used		7

F -4	Use Multi-use Trail		7
G-1	Use Rural Shoulder/Ditches instead of Longitudinal Drainage System		10
G -4	Use Plastic Pipe under Driveways Instead of 18” RCP		8
G -5	Use Perforated Under-Drain Pipe		8
G -6	Use Smaller Pipe Sizes and Wider Ditches		6
H-1	Use Alternate Culvert		9
H -2	Use Multiple Pipes for Structure		7
H -3	Extend Existing Structure		7