

VALUE ENGINEERING TRAINING STUDY REPORT

Buford Highway Sidewalks

Project No. HPP00-0013-01(062)

DeKalb / Fulton Counties

PI No. 731770

October 22, 2009

OWNER:



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

VALUE ENGINEERING
INSTRUCTOR:



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

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STUDY REPORT

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EXECUTIVE SUMMARY

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Buford Highway Sidewalks

Project No. HPP00-0013-01(062)
PI No. 731770

October 22, 2009

Study Background

This report presents the results of a value engineering (VE) study for sidewalk improvements and pedestrian amenities on Buford Highway from Shallowford Terrace to I-285 in DeKalb and Fulton Counties. The study was conducted as part of a VE training session held for GDOT staff on October 5 to 9, 2009.

The primary need for this project is to provide a continuous and safe ADA pathway and pedestrian crossings along the Buford Highway corridor. There are numerous shopping areas, schools parks and businesses in the area generating significant pedestrian activity. This area also has high MARTA bus ridership. This area is susceptible to many mid-block pedestrian crossings. The estimated construction cost of the project is \$6,093,262, the R/W estimate is \$1,000,000 yielding a total project cost of \$7,093,262. On Monday, October 5, 2009, the design team gave an overview of the project to the VE team and on Friday, October 9, 2009, the VE Team presented their recommendations.

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 worksheets developed during the information, creative and evaluation phases of the study. The reader is encouraged to review all sections of the report in order to obtain a complete understanding of the VE process.

VE-11

DEVELOPMENT PHASE - EXECUTIVE SUMMARY

Project: HPP00-0013-01(062)

Location: Dekalb / Fulton County

Team: 5

Date: 10/9/09

This project consists of the construction of streetscape improvements and the addition of sidewalks along both sides of Buford Highway from Shallowford Terrace to I-285. Improvements include lighting, limited landscaping, hardscaping, mid-block pedestrian refuge/crossing islands, pedestrian gathering and crossing pavilions at intersections, and various improvements recommended by DOT-consultant URS in its Buford Highway Corridor Study.

The VE team identified five areas of opportunity for project improvement and cost savings. The first area proposes no widening to the existing right-of-way and utilizing the existing 14' median to incorporate a 10' pedestrian median and 11 ft left turn lanes w/ 3 ft medians, at intersections. The second area involves reducing the proposed sidewalk from 5 ft to 4 ft. The third area involves reducing the overall number of lighting from 236 to 32. All existing signal should be kept in place and the proposed signal does not meet warrants. There was a resurfacing project done in winter 2007/2008, the existing surface from the Fulton County to the end of the project limits has eight years of benefit remaining.

STUDY IDENTIFICATION

VE-1

STUDY IDENTIFICATION

Project: SR 13 / US 23 – Buford Hwy	Date: 10/9/09
Location: Dekalb / Fulton County	

VE Team Members

Name:	Position:	Organization:	Telephone:
Frantz Boileau	DE III	GDOT	x 1636
Derrick Brown	PM (Site Design)	GDOT	x 1571
Clinton Ford	PM (Construction)	GDOT	
Lowell James	DE III	GDOT	x 1994
Kimberly Nesbitt	PM (Traffic Ops)	GDOT	x 1575
Janique Suber	DE II	GDOT	

Project Description

SR 13 / Buford Highway Arterial Enhancement (Streetscape): This project consists of the construction of streetscape improvements and the addition of sidewalks along both sides of Buford Highway from Shallowford Terrace to I-285. Improvements include lighting, limited landscaping, hardscaping, mid-block pedestrian refuge/crossing islands, pedestrian gathering and crossing pavilions at intersections, and various improvements recommended by DOT-consultant URS in its Buford Highway Corridor Study.

VE RECOMMENDATIONS

VE-9

DEVELOPMENT AND RECOMMENDATION PHASE			
Project: SR 13/US 23 Buford Highway			
Idea No.: A-1	Sheet No.: of	CREATIVE IDEA: Use existing signals, Eliminate proposed/new signal	
Comp By: Group 5 Date: 10/8/2009 Checked By: Group 5 Date: 10/8/2009			
Original Concept: The replacement and installation of five existing and one proposed.			
Proposed Change: Currently the five existing signal are in good condition and the proposed signal does not meet warrant.			
Justification: Currently all signals have LED traffic heads and adequate equipment. If the typical section is not widened all traffic signals can stay in their existing location.			
LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
INITIAL COST: Original	\$1,255,260.51		
Proposed	\$819,533.36		
Savings	\$435,727.15		
FUTURE COST: Savings		\$1,700.00	\$1,700.00
TOTAL PRESENT WORTH SAVINGS			\$437,427.15

VE-9

DEVELOPMENT AND RECOMMENDATION PHASE			
Project: SR 13/US 23 Buford Highway			
Idea No.: B-1	Sheet No.: of	CREATIVE IDEA: Staggered Lighting	
Comp By: Group 5 Date:10/8/2009 Checked By: Group 5 Date: 10/8/2009			
<p>Original Concept:</p> <p>Holophane 12 ft. MH Post Top-150 Watts Type II. Total number of lighting posts is 236.</p> <p>Proposed Change:</p> <p>Type IV, Long roadway lighting with spacing of 367 ft. for 2.2 miles. Will results in a reduction of 204 poles.</p> <p>Justification:</p> <p>Currently the plans call for Holophane Luminaries with 360 degrees of spread. We recommend changing the lights to Mongoose Holophane G400HP00HWCXXX Long, Type IV, Non Cutoff. This will allow the total number of poles to be reduced by 204 and will also channel the lighting towards the road. With the Holphane 12 ft MH Post Top-150 Watts 160 degrees of light is directed away from the road. Cost savings based on \$170.00 per year for one luminarie x 204 x 30 years.</p>			
LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
INITIAL COST: Original	\$985,488.00		
Proposed	\$246,372.00		
Savings	\$739,116.00		
FUTURE COST: Savings		\$1,040,400.00	\$1,779,516.00



Results

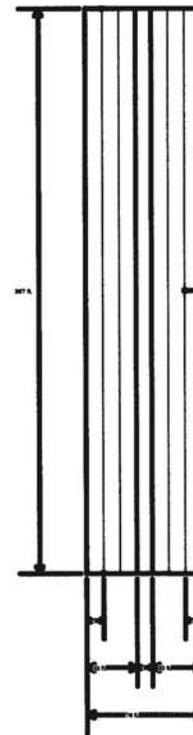
Pole Spacing:	367.00 ft.
Total Luminaires Required:	11
Total Poles Required:	11
Total Cost:	\$0.00
Roadway Lighting Standard:	IESNA RP-8
Horizontal Illuminance	
Average:	1.93 fc
Minimum:	0.48 fc
Maximum:	7.16 fc
Max/Min:	14.82
Ave/Min:	3.99
Roadway Luminance	
Average:	1.13 cd/sq. M
Minimum:	0.39 cd/sq. M
Maximum:	2.50 cd/sq. M
Max/Min:	6.45
Ave/Min:	2.92
Veiling Luminance Ratio:	
Average:	0.09
Minimum:	0.00
Maximum:	0.61
Max/Min:	
Ave/Min:	
Visibility Level	
Average:	5.42
Minimum:	5.18
Maximum:	5.65

Roadway Characteristics

Traffic Flow:	Two-Way
Lane Width:	11.00 ft.
Right Side Lanes:	3
Left Side Lanes:	3
Median Width:	10.00 ft.
Roadway Length:	1835.00 ft.
Pavement Classification:	R3

Pole Characteristics

Pole Properties:	
Mounting Height:	30.00 ft.
Setback:	0.00 ft.
Arm Length:	10.00 ft.
Pole Cost:	\$0.00
Arm Cost:	\$0.00
Lamp Properties	
Lamps Per Luminaire:	1
Lamp Lumens:	50000
Description:	400W CLEAR HPS
Luminaire Properties	
Total Light Loss Factor (w/ tilt):	1.00
Efficiency:	0.822
Wattage:	0.00
Tilt:	0.00°
Cost:	\$0.00
Curve:	
Distribution:	Long, Type IV, Non-Cutoff
Luminaire Description:	Holophane G400HP00HWCXXX



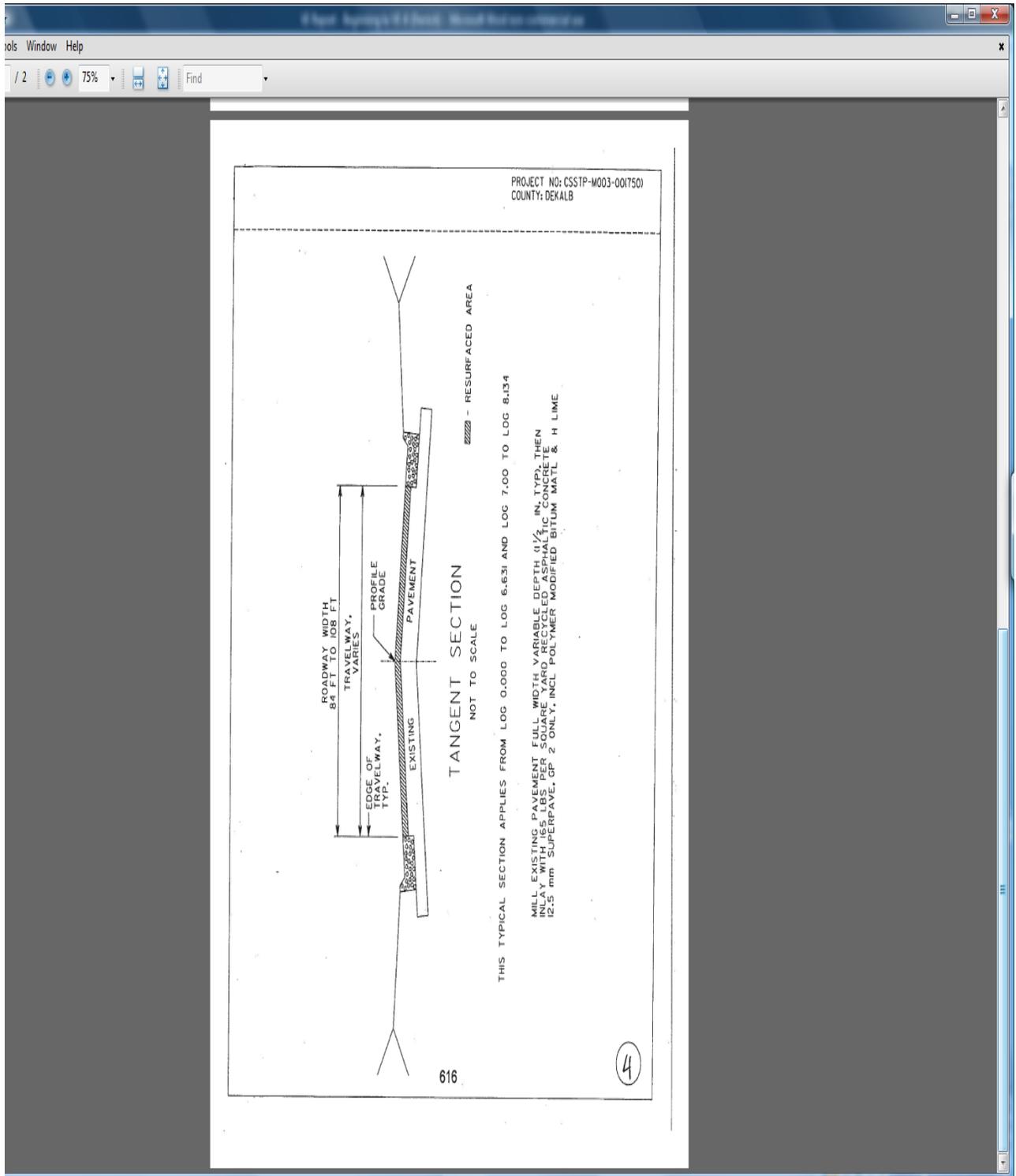
Plan View

Calculated light levels are based on specific information that has been supplied to GE Lighting Systems. Any differences in luminaire installation, lighted area geometry and obstructions in the lighted area may produce different results from the predicted values. Normal tolerances of voltage, lamp output, and ballast and luminaire manufacturer will affect results.

VE-9

DEVELOPMENT AND RECOMMENDATION PHASE			
Project: SR 13/US 23 Buford Highway			
Idea No.: C-1	Sheet No.: of	CREATIVE IDEA: Milling & inlay outside lane and widening a portion of roadway (Hydroblasting necessary)	
Comp By: Group 5 Date:10/8/2009 Checked By: Group 5 Date: 10/8/2009			
Original Concept: This project proposes to Mill & Inlay 1 ½ " of the roadway section. The projects' primary purpose of this application is to "cleanly" remove striping, as to eliminate the presence of "ghost striping". The removed pavement would be replaced with 12.5 mm superpave recycled asphalt. The 12.5 mm asphalt will also be applied over the class B concrete in the proposed widened section.			
Proposed Change: It is recommended that only the outside lanes and the proposed widen section of the corridor be milled and overlaid. It is further recommended that these minor striping conflicts be corrected using hydro blasting.			
Justification: This corridor was recently resurfaced under project PI M003750 which was completed in early 2008. Retaining this recently paved surface will cut overall project cost, while still providing the end user a smooth ride.			
LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
INITIAL COST: Original	\$598,427.80		
Proposed	\$169,861.87		
Savings	\$428,563.73		
FUTURE COST: Savings		0	
TOTAL PRESENT WORTH SAVINGS			\$428,563.73

CALCULATIONS							
Project: <u>BURFORD HWY FM. LENOX to SHALL RD</u>	Idea No.: <u>C-1</u> Client: _____						
<p style="text-align: center;">TOTAL PAVEMENT AREA \Rightarrow <u>32,444 sqd.</u></p> $(165 \text{ lb/sy}) \left(\frac{1}{2,000 \text{ lb}} \right) \times 32,444 \text{ sqd}$ <p style="text-align: center;"><u>NEW QUANTITY</u> 2,676.68 TN @ \$63.46/TN</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;"><u>NEW COST</u></td> <td style="text-align: center;">vs</td> <td style="text-align: center;"><u>(OLD) PROPOSED COST</u></td> </tr> <tr> <td style="text-align: center;">\$ 169,861.87</td> <td></td> <td style="text-align: center;">598,427.8</td> </tr> </table> <p style="text-align: center;">SAVINGS \Rightarrow <u>\$ 428,563.73</u></p>		<u>NEW COST</u>	vs	<u>(OLD) PROPOSED COST</u>	\$ 169,861.87		598,427.8
<u>NEW COST</u>	vs	<u>(OLD) PROPOSED COST</u>					
\$ 169,861.87		598,427.8					



DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 13/US 23 Buford Highway

Idea No.: D-1	Sheet No.: of	CREATIVE IDEA: Reduce Concrete Median Width
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Comp By: Group 5 Date: 10/9/09 Checked By: Group 5 Date: 10/9/09

Original Concept:

The original design required varying width concrete median throughout the project corridor.

Proposed Change:

It is recommended that the concrete median be reduced to stay in the confines of the existing project footprint. This will be accomplished by using the existing paved median to accommodate all ROW needs.

Justification:

By reducing the concrete median width throughout the corridor in effect reduces the required ROW for the entire project corridor.

LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
INITIAL COST: Original	\$480,046.80		
Proposed	\$246,728.58		
Savings	\$233,318.22		
FUTURE COST: Savings			
TOTAL PRESENT WORTH SAVINGS			\$233,318.22

CALCULATIONS

Project: Buford Hwy Fr. Lane to Small Rd.Idea No.: D-1
Client:TS-1

157' x 8' (Median)

$$(157)(8) = \underline{1256 \text{ ft}^2}$$

TS-2

No Median

TS-3

$$5629' \times 8' = \underline{45,032 \text{ ft}^2}$$

TS-4

$$1725.66' \times 5' = 8,628.3 \text{ ft}^2$$

TS-5

$$2890' \times 2' = 5780 \text{ ft}^2$$

SUGGEST

$$4" \text{ Median} = 4" \Rightarrow 6102 \text{ sq} @ 34.76 = \$ 212,105.52$$

$$6" \Rightarrow 642 \text{ sq} @ 53.73 = \underline{34,623.06}$$

\$ 246,728.58

~~Proposed~~ IN CURRENT Proj. Cost = \$480,046.80

$$\begin{array}{r} 480,046.80 \\ - 246,728.58 \\ \hline 233,318.22 \end{array} \Rightarrow 49\%$$

SAVINGS.

VE-9

DEVELOPMENT AND RECOMMENDATION PHASE		
Project: SR 13/US 23 Buford Highway		
Idea No.: E-1	Sheet No.: of	CREATIVE IDEA: Bus Coordination and Community Targeting Campaign. Eliminate Field Office
Comp By: Group 5 Date: 10/09/09 Checked By: Group 5 Date: 10/09/09		
<p>Original Concept:</p> <p><u>Bus Coordination</u>- Per the presentation of both the designer and project manager, there are three companies that provide bus services along this section of Buford Highway: Marta and two private companies. Their presentation conveys to the VE team that no Pedestrian Destination study was performed.</p> <p><u>Community Targeting Campaign</u>- Per the presentation of both the designer and project manager several public outreach programs where effectively carried out prior to design of the project.</p> <p><u>Field Office</u>- The cost estimate total includes the price of a Field Engineers Office.</p> <p>Proposed Change:</p> <p><u>Bus Coordination</u>: A field visit of the corridor revealed 34+ bus stops. To influence pedestrian behavior it is recommended that the Dept. coordination with local bus services by proposing bus stops be placed at intersections and proposed hawks, reducing the number to 24.</p> <p><u>Community Targeting Campaign</u>: It is recommended that in conjunction with proposed infrastructure changes, the project include an “organic” approach to help resolve the conflict between the pedestrians and vehicles. Formulate a post-construction campaign to inform the community of the dangers associated with not using corridor improvements. This is an effort to change the behavior of those using the pedestrian facility.</p> <p><u>Field Engineers Office</u>- It is recommended that this item be removed from the cost of this project. The District 7 office is approx. 3-4 miles away from project location.</p> <p>Justification: Infrastructure improvements alone cannot adequately accomplish the purpose of this project which is to improve pedestrian safety.</p>		

APPENDIX

VE-2

INFORMATION PHASE - SOURCES
Approving/Authorizing Persons

Name:	Position:	Telephone:
Mike Lobdell, P.E.	PM – GDOT	(770) 986-1257
Melvin Waldrop	District 7	(770) 986-1257

Personal Contacts

Name:	Telephone:	Notes:
Taylor Wright, P.E.	(770) 933-0280	PBS&J-PM
Helen Keller, P.E.	(770) 933-0280	PBS&J
Chris Kent	(770) 933-0280	PBS&J

Documents/Abstracts

Reference:	Notes:
TE Studies	Highland North
Lighting Specs	General Electric (GE)
MARTA	34 Bus Stops

VE-3

INFORMATION PHASE - COST MODEL

Project Name

Item	Description	\$ Amount	% of Total Project
A	ROW	\$ 1,000,000.00	12%
B	Traffic Signal Installation	\$ 792,525.63	9%
C	Lighting Std	\$ 702,288.80	8%
D	Grading Complete	\$ 602,239.47	7%
E	Recycled Asphalt 12.5 mm	\$ 598,427.80	7%
F	Traffic Control	\$ 500,000.00	6%
G	Concrete Median, 6 in	\$ 372,117.00	4%
H	Conc. Sidewalk, 4 in	\$ 283,200.00	4%
I	Luminaries, Low Mounting	\$ 283,200.00	3%
J	Steel Strain Pole, TP IV	\$ 261,819.20	3%
K	Conc. Valley Gutter, 8 in	\$ 238,878.00	3%
L	Steel Strain Pole, TP IV, Incl. Luminaries Arm	\$ 188,977.60	2%
M	Concrete Header Curb, 6 in, TP 2	\$ 185,472.00	2%
N	Gr. Aggr. Base CRS, 12 inch, Incl. Matl.	\$ 184,726.80	2%
O	Reconstr. Minor Drainage Str.	\$ 169,223.19	2%
P	Recycled Asph. Conc. 19 mm Superpave	\$ 157,527.00	2%
Q	Mill Asph. Conc. Pvmt., 1 1/2 in Depth	\$ 152,766.00	2%
R	Class B Concrete, Retaining Wall	\$ 136,492.50	2%
S	Cable, TP XHHW, AWG No 6	\$ 133,179.80	2%
T	Field Engineers Office TP 3	\$ 76,009.21	1%
80% Cost Line			
	TOTAL	\$ 7,093,262.40	81%

VE-4

INFORMATION PHASE – FUNCTION ANALYSIS

Project: SR 13 / US 23 – Buford Hwy
Project Function: Provide Pedestrian Safety

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	Worth	Comments
A	ROW	Delineate	Footprint	1,000,000.00	900,000.00	Reduce ROW
B	Traffic Signal Installation	Protect	Pedestrian	792,525.63	292,525.63	Retain existing facility
C	Lighting Std	Make	Visible	702,288.80	352,288.80	Stagger lighting
D	Grading Complete	Provide	Tie-in	602,239.47	542,239.47	Reduce disturbed areas
E	Recycled Asphalt 12.5 mm	Cover	Striping	598,427.80	239,371.12	Reduce surface area
F	Traffic Control	Facilitate	Safety	500,000.00	250,000.00	Reduction of staging
G	Concrete Median, 6 in	Display	Separation	372,117.00	260,481.90	Reduce width
H	Conc. Sidewalk, 4 in	Allow	Refuge	357,392.40	285,913.92	Reduce sidewalk
I	Luminaries, Low Mounting	Make	Visible	283,200.00	141,600.00	Stagger lighting
J	Steel Strain Pole, TP IV	Promote	Support	261,819.20	-	Recycle existing
K	Conc. Valley Gutter, 8 in	Control	Runoff	238,878.00	238,878.00	
L	Steel Strain Pole, TP IV, Incl. Luminaries Arm	Promote	Support	188,977.60	188,977.60	
M	Concrete Header Curb, 6 in, TP 2	Control	Runoff	148,377.60	148,377.60	Reducing quantity
N	Gr. Aggr. Base CRS, 12 inch, Incl. Matl.	Support	Load	184,726.80	184,726.80	

INFORMATION PHASE – FUNCTION ANALYSIS

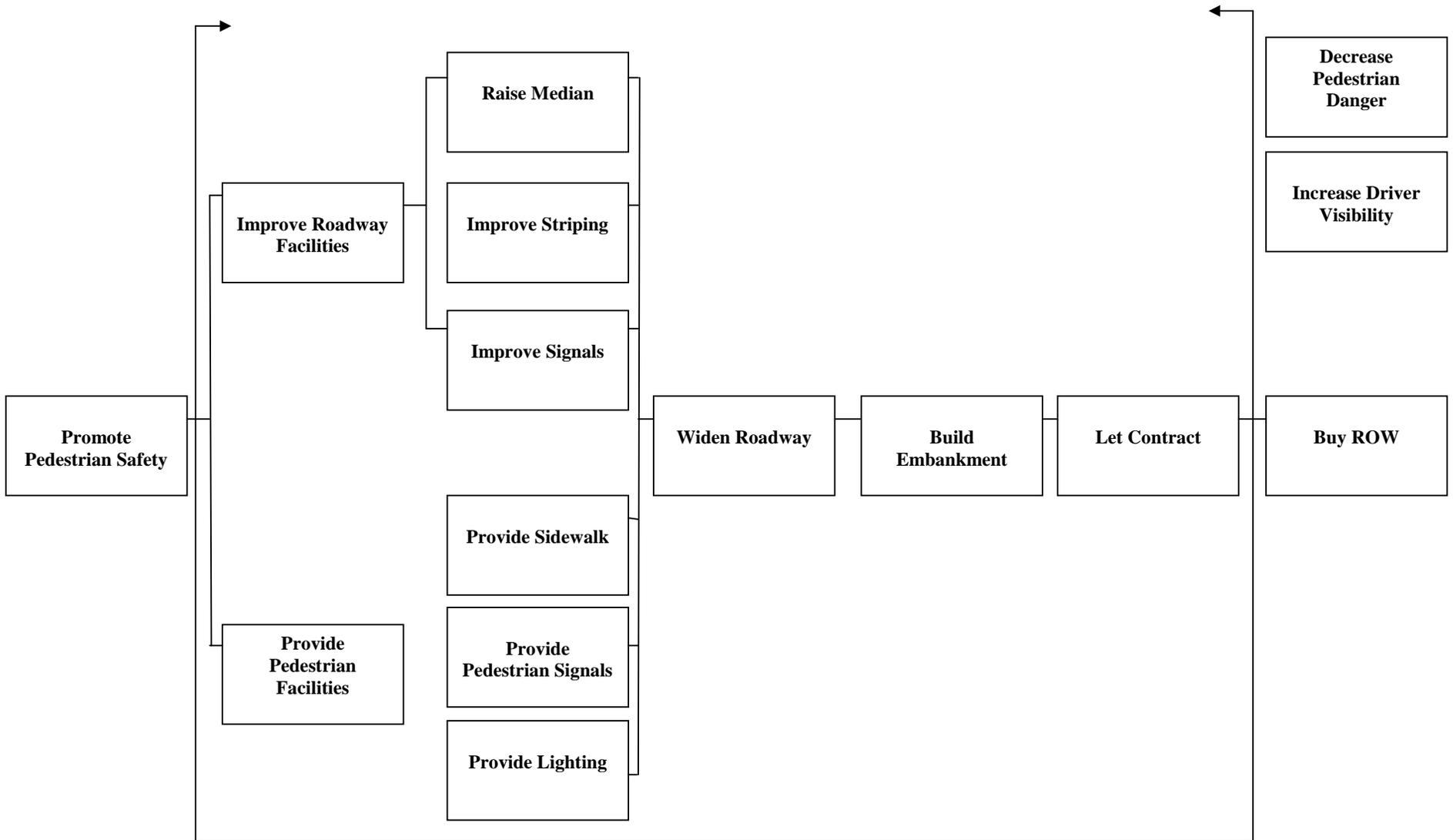
Project: SR 13 / US 23 – Buford Hwy

Project Function: Provide Pedestrian Safety

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	Worth	Comments
O	Reconstr. Minor Drainage Str.	Increase	Capacity	169,233.19	152,300.87	Reduce due to curb quantities
P	Recycled Asph. Conc. 19 mm Superpave	Reduce	Waste	157,527.00	157,527.00	
Q	Mill Asph. Conc. Pvmt., 1 1/2 in Depth	Remove	Material	152,766.00	61,106.40	Reduce disturbed areas
R	Class B Concrete, Retaining Wall	Reduce	ROW	136,492.50	122,843.25	Reduce/remove wall
S	Cable, TP XHHW, AWG No 6	Supply	Support	133,179.80	79,907.88	Reduction of traffic signals
T	Field Engineers Office TP 3	Relay/Store	Information	76,009.21	-	Eliminate

VE-5

INVESTIGATION PHASE - FAST DIAGRAM



VE-6 & 7

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	CREATIVE IDEA	COMMENTS	IDEA RATING
E	Concrete Median		
E-1	Use Double Yellow	No area for pedestrian refuge. Reduce Cost. Save in ROW, Traffic Counts favor Concrete Median	3
E-2	Delineator Tubes	High maintenance cost, inexpensive to install	5
E-3	Barrier Wall with Fence	High Cost, potential Environmental Justice Issues	3
E-4	Reduce median width	Cost reduction, Reduces ROW needed, Reduces driver comfortability	8
E-5	Landscaped median	Cost reduction, maintenance,	7

VE - 8

EVALUATION PHASE – MATRIX ANALYSIS	
Project: SR 13 / US 23 – Buford Hwy	Team No.: 5 Date: 10/9/09

Evaluation Criteria							
A. Cost							
B. User Benefit							
C. Maintenance	A.	B.	C.	D.	E.	F.	
D. Aesthetics							
E. Environmental							
F.							
Criteria Weight: (1-10) >	9	10	6	3	3		
Alternatives:							Total
1. Traffic Signal Installation	4/36	2/20	3/18	1/3	1/3	/	80
2. Lighting	5/45	4/40	4/24	4/12	4/12	/	133
3. Recycled Asphalt (Mill & Inlay)	3/27	2/20	4/24	1/3	3/9	/	83
4. Traffic Control	2/18	2/20	2/12	2/6	2/6	/	62
5. Concrete Median	5/45	2/20	2/12	3/9	2/6	/	92
6. Concrete Sidewalk	4/36	2/20	3/18	2/6	2/6	/	86
7.	/	/	/	/	/	/	
8.	/	/	/	/	/	/	

Rating Note:
5 = Superior
4 = Good
3 = Average
2 = Fair
1 = Poor