VALUE ENGINEERING
MOD 1 TRAINING REPORT

Lithonia Industrial Blvd Extension – Phase I
Stone Mountain Lithonia Road to Rogers Lake Road

Project No. HPP-9347(1)
DeKalb County
PI No. 753230
March 11, 2009

OWNER:

Georgia Department of Transportation
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EXECUTIVE SUMMARY

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Introduction

This report summarizes the results of a value engineering (VE) study for roadway improvements to Lithonia Industrial Blvd. Extension, Phase I, from Stone Mountain Lithonia Road to Rogers Lake Road in DeKalb County. The study was conducted as part of the Mod 1 training session held for select GDOT staff on February 23 to 27, 2009.

The purpose of the Lithonia Industrial Blvd Extension is to provide an industrial by-pass around the west side of Lithonia for commercial truck traffic travelling to and from Gwinnett and east Dekalb Counties to I-20. The extension will also provide local access and circulation to and from properties in the western side of the Lithonia Industrial District. The project will extend Lithonia Industrial Blvd. The proposed typical section will consist of a four lane facility with a 20 ft median, curb and gutter and 5 ft sidewalks. Left and right turn lanes will be provided at all intersections. Also included in this project is a proposed CSX railroad bridge with the roadway going under the railroad tracks. The estimated construction cost of the project is $18,668,755; the R/W cost is $3,744,739 for a total estimated project cost of $22,413,494. On Monday, February 23, 2009, the design team gave an overview of the project to the VE team and on Friday, February 27, 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. 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: Lithonia Industrial Boulevard; Phase I **Location:** DeKalb County, GA	**Team:** 5 **Date:** February 23-27, 2009

This project consists of an extension of the existing Lithonia Industrial Boulevard in eastern DeKalb County. The project, as presented, is an urban roadway with a raised median. Side roads would be upgraded with curb and gutter and sidewalks. The basic function of the roadway project is to provide an alternate route in this industrial area. The project has an estimated cost of $22.4 million

The VE Team identified 2 areas of potential improvement and cost savings. The first area that was reviewed is the typical sections. In this industrial area, pedestrian facilities do not appear to be needed. By eliminating the sidewalk on Lithonia Industrial Blvd, $262,600 cost savings could be realized. Eliminating sidewalk on the entire project except at the radius returns of the two signalized intersections will have a $391,700 cost savings. By using a rural shoulder with ditch in place of curb and gutter and sidewalk on Lithonia Industrial Blvd, Chapman Rd, and Rogers Lake Rd, $890,400 could be saved. Utilizing an 8' raised concrete median instead of the 20' raised median along Lithonia Industrial Blvd could save $11,100. Finally, by constructing all of the front and back slopes at 2:1 instead of varying from 6:1 to 2:1 could realize a savings of $36,120.

The second area of potential savings was at the bridge. By realigning the new roadway the curved portion of the lead track would be removed from the bridge. All tracks running tangent on the structure would reduce the width of the bridge. This alternative would provide a cost savings of approximately $110,000. The second recommendation would eliminate one temporary wall and redesign the second. This could potentially save approximately $207,500.

The implementation of these design alternatives has the potential to save $1,255,120, or 6% of the total project cost. Coordination with CSXT is nearly complete, and changes to the bridge alignment would reopen this coordination effort and may significantly delay the project. However, this project has $8 million of funding proposed for 2012, which would provide ample time to implement each of the other recommendations.

DEVELOPMENT PHASE - SUMMARY OF COST SAVINGS

Project: Lithonia Industrial Boulevard; Phase 1
Location: DeKalb County, GA

Team No.: 5
Date: 2/26/2009

Idea No.	Creative Idea Description	Original Initial Cost	Proposed Initial Cost	Initial Cost Savings	Future Savings	Total Life Cycle Savings
B-1	Change Alignment @ Bridge	$9,837,000	$9,727,000	$110,000		
B-4.1	Eliminate Temporary Wall	$107,000	$8,000	$99,000		
B-4.2	Change Temporary Wall Type	$256,000	$147,500	$108,500		
R-7	Rural Typical Section	$1,094,600	$204,200	$890,400		
R-10	8’ Raised Median	$2,903,500	$2,892,400	$11,100		
R-12	Eliminate Sidewalk on LIB	$400,000	$137,400	$262,600		
R-14	Eliminate Sidewalk except at radius returns	$400,000	$8,300	$391,700		
R-17	Construct All Front & Back Slopes @ 2:1	$938,150	$902,030	$36,120		
DS-1	Bid Earthwork Using Grading Complete					
DS-2	Increase Eyebrow Size for Trucks					
DS-3	Use Concrete Pavement on LIB					

STUDY IDENTIFICATION

STUDY IDENTIFICATION

Project: Lithonia Industrial Blvd Extension – Phase 1	Dates: February 23 - 27, 2009
Location: GDOT HQ – Atlanta, 4th Floor; Conducted as part of Module 1 Training	

VE Team Members

Name:	Position:	Organization:	Telephone:
Charity Belford	Traffic Safety & Design	GDOT	404-635-8154
Bill DuVall	Bridge Design	GDOT	404-631-1883
Jack Grant	Road Design	GDOT	404-631-1669
Stanley Kim	Bridge Design	GDOT	404-631-1895
Karyn Matthews	Program Delivery	GDOT	404-631-1584
Jeff Simmons	Urban Design	GDOT	404-631-1724

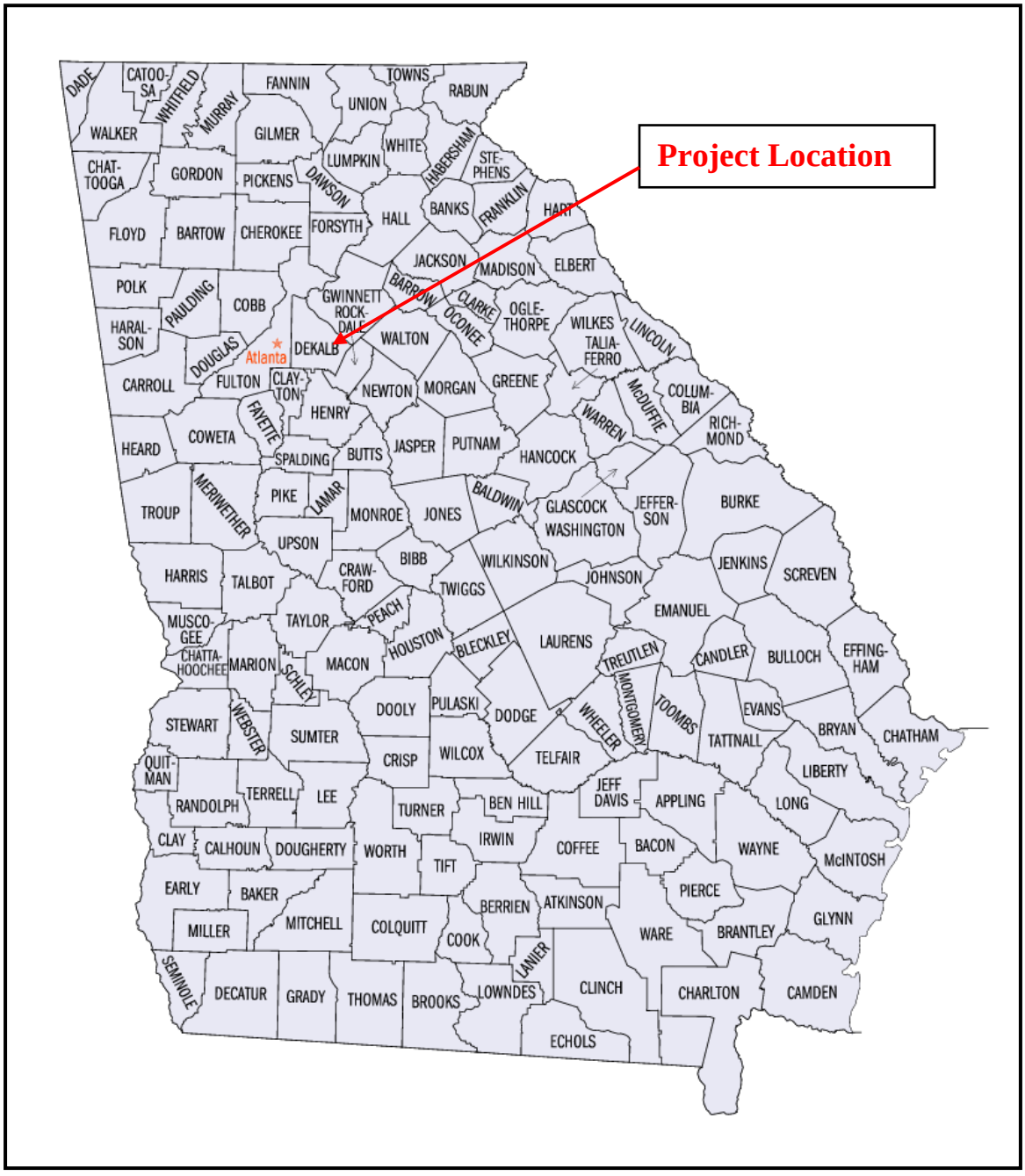
Project Description

This project consists of an extension of the existing Lithonia Industrial Boulevard (LIB) in eastern DeKalb County. The first phase of this project begins at the intersection of LIB and South Stone Mountain Lithonia Road and terminates at a proposed intersection with Rogers Lake Road in Lithonia. The proposed LIB will be a 4-lane facility with a 20-foot raised median, curb and gutter, and 5-foot sidewalks. The alignment of LIB will follow an existing dirt and asphalt, 2-lane, private roadway. CSXT Railroad will be relocated approximately 70' and bridged over the new LIB. Rogers Lane Road and Chapman Road will be 2-lane roads with curb and gutter and sidewalk while South Stone Mountain Lithonia Road will be a 2-lane road with curb and gutter, sidewalk, and 4-foot bike lanes. Left and right turns lanes will be provided at all intersections. The project length is 1.33 miles.

Project Constraints

- The area is industrial and the roadway is designed for truck traffic.
- The right-of-way acquisition is 90% complete.
- The railroad coordination has taken several years and is nearly complete.
- The existing grade of the railroad constrains the grades separation possibilities.

Figure 1
Project Vicinity Map



County Map of Georgia

VE RECOMMENDATIONS

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Lithonia Industrial Boulevard; Phase I

Idea No.: B-1	**Sheet No.:** 1 of 4	**CREATIVE IDEA:** Change LIB alignment and bridge

Comp By: SK Date: 2/26/09 Checked By: BD Date: 2/26/09

Original Concept:
Following the existing ROW for Lithonia Industrial Boulevard (LIB) results in a varying width railroad bridge to accommodate main line and branched-curved lead line of the railroads.

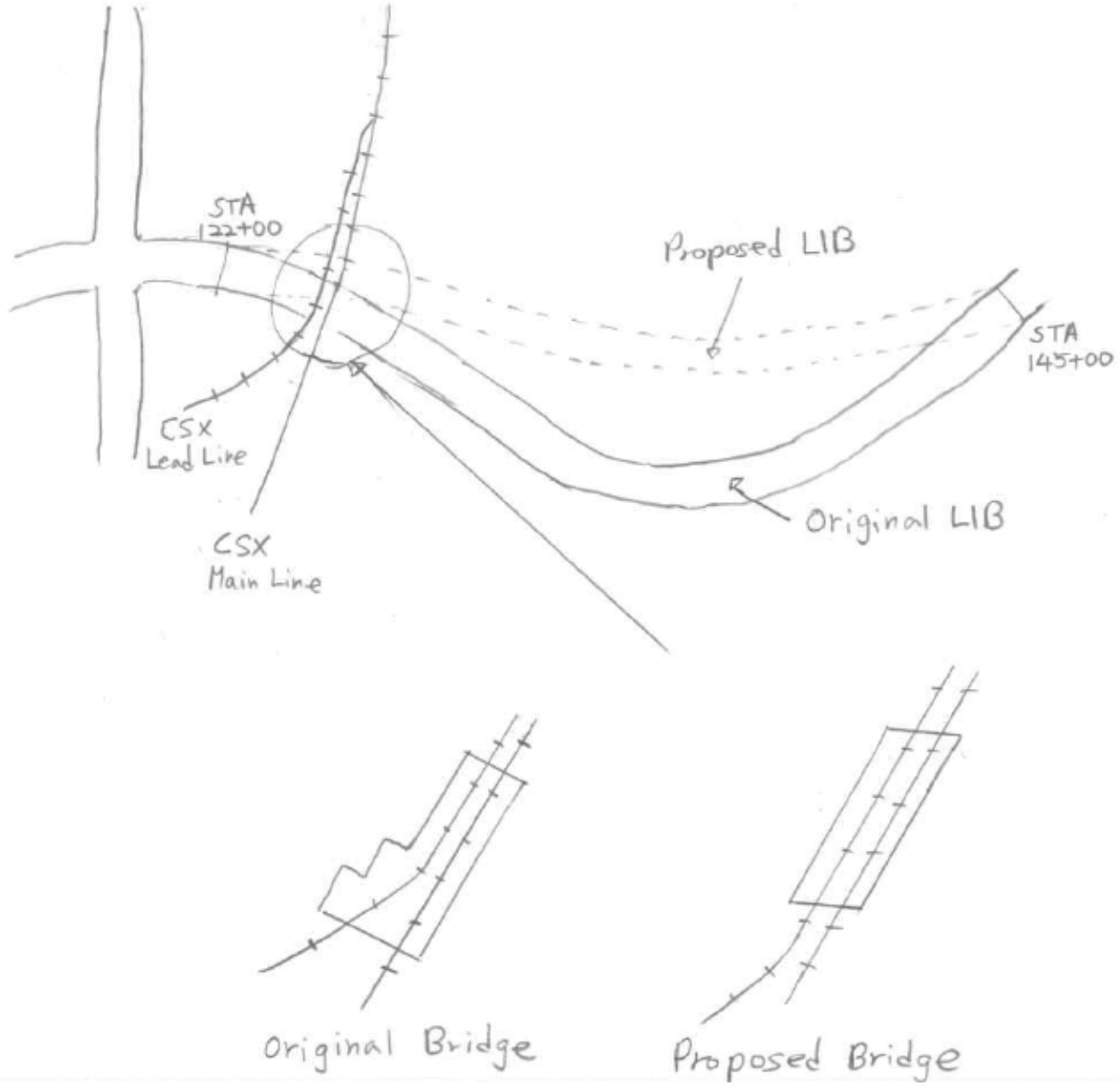
Proposed Change:
Shift the alignment of LIB toward north with flatter curve between original STA 122+00 and 145+00. New LIB will go under the railroads where main line and lead line are parallel.

Justification:

- Save the construction cost by removing step-out part of the original varying width bridge in span 1 & span 2.
- Save the construction cost by making LIB straighter and shorter.
- Achieve better sight distance in LIB.

LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: **Original**	$9,837,000		
Proposed	$9,727,000		
Savings	$110,000		
FUTURE COST: **Savings**			
TOTAL PRESENT WORTH SAVINGS			$110,000

SKETCH	
Project: **Lithonia Industrial Boulevard; Phase I**	Idea No. : B-1 Client: GDOT Sheet 2 of 4



COST WORKSHEET

Project: Lithonia Industrial Boulevard; Phase I					Idea No.: B-1 Client: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
ROW Purchase Increase	AC				3.90	$53,000	$206,700
Bridge	LS			$5,379,505			$5,140,594
Pavement/Drainiage							
12.5mm Superpave	ton	7100	$69	$489,900	7012	$69	$483,828
19mm Superpave	ton	12500	$63	$787,500	12324	$63	$776,412
25mm Superpave	ton	22800	$55	$1,254,000	22448	$55	$1,234,640
GAB	ton	61000	$16	$976,000	60296	$16	$964,736
TP2 Concrete Curb & Gutter	LF	21000	$13	$273,000	20600	$13	$267,800
TP7 Concrete Curb & Gutter	LF	12700	$14	$177,800	12300	$14	$172,200
4” Concrete Sidewalk	SY	16000	$25	$400,000	15689	$25	$392,225
30” Storm Drain Pipe	LF	1800	$55	$99,000	1600	$55	$88,000
Subtotal:							
Mark-up (%)							
Total				$9,836,705			$9,727,135
Total Rounded				$9,837,000			$9,727,000

CALCULATIONS

Project: **Lithonia Industrial Boulevard; Phase I**	Idea No. : B-1 Client: GDOT Sheet 4 of 4

Length of original LIB mainline = 2300 ft (from STA 122+00 to STA 145+00)
Length of proposed LIB mainline = app. 2100 ft (**200 ft reduced**)

ROW Cost Increase

ROW purchase will be made between STA 126+00 and 145+00
Estimated ROW area = (1900'-200') x 100' = 170000 ft^2 = 3.90 ac
Cost increase = $53,000/ac x 3.90 ac = $206,700

Bridge Cost Savings

Total deck surface area

Original bridge = (39'x76') + (60'x66') + (116'x56') = 13420 ft^2
Proposed bridge = (229'x56') = 12824 ft^2 (note: total length increased by skew angle of 70 deg)

Cost saving

New bridge cost = (original bridge cost) x (proposed brige area)/(original bridge area)
= $5,379,504.92 x 12824 / 13420 = $5,140,593.97
Cost saving = $5,379,504.92 - $5,140,593.97 = $238,911

Pavement/Drainage Cost Savings

Roadway area reduced = 200' x 48' = 9600 ft^2 = 1067 yd^2

Pay Items	**Quantity**	**Savings**
402-3130 (12.5mmSP)	165 lb/yd^2 x 1067 yd^2 = 88 tn	$69/ton x 88 tn = $6,072
402-3190 (19mmSP)	330 lb/yd^2 x 1067 yd^2 = 176 tn	$63/ton x 176 tn = $11,088
402-3121 (25mmSP)	660 lb/yd^2 x 1067 yd^2 = 352 tn	$55/ton x 352 tn = $19,360
310-1101 (GAB)	110 lb/in/yd^2 x 12" x1067 yd^2 = 704 tn	$16/ton x 704 tn = $11,264
441-6222 (TP2 Curve&Gutter)	2 x 200' = 400 LF	$13/LF x 400 LF = $5,200
441-6740 (TP7 Curve&Gutter)	2 x 200' = 400 LF	$14/LF x 400 LF = $5,600
441-0104 (4" Conc. SW)	2 x 7' x 200' = 311 yd^2 (note: colored conc. between SW and curb is included)	$25/SY x 311 SY = $7,775
550-1300 (30" Storm Drain)	200'	$55/LF x 200 LF = $11,000

Total roadway saving = $77,359

Total Cost Savings

$238,911 + $77,359 - $206,700 = $109,570, say $110,000

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Lithonia Industrial Boulevard; Phase 1

Idea No.: B-4.1	**Sheet No.:** 1 of 4	**CREATIVE IDEA:** Eliminate Type 6 retaining wall in detour

Comp By: BD Date: 2/26/09 Checked By: SK Date: 2/26/09

Original Concept: Utilizes Type 6 Side Barrier wall between stations 31+60 and 33+40 to construct detour for South Stone Mountain Lithonia Road.

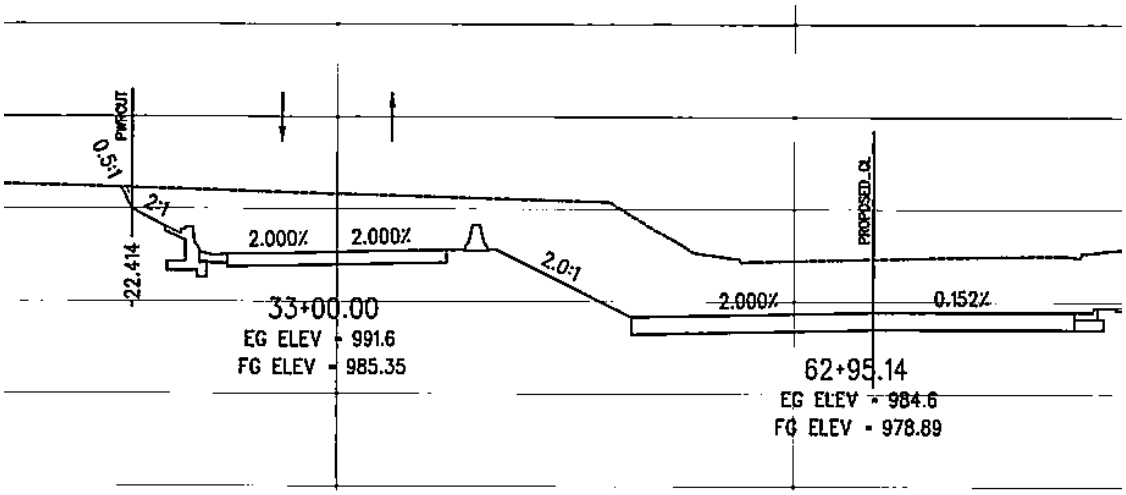
Proposed Change: Eliminate Type 6 Side Barrier and concrete V gutter and utilize 1:1 slope, Temporary Barrier and extended temporary pavement.

Justification: This cut is relatively short with partially weathered rock. Additional excavation would be necessary to construct footing. Using 1:1 back-slope will fit behind temporary barrier.

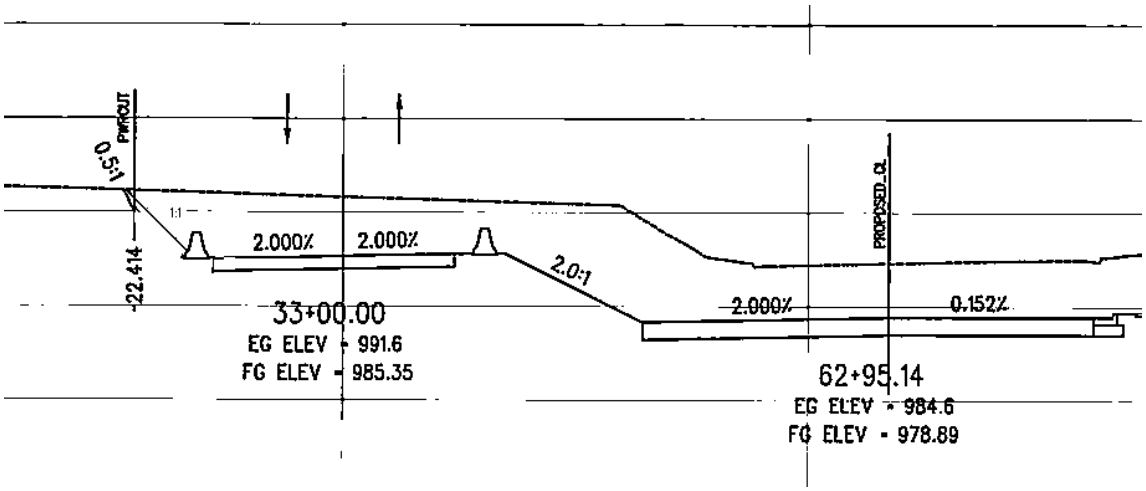
LIFE CYCLE COST SUMMARY		**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST:	**Original**	107000.00		
	Proposed	8000.00		
	Savings	99000.00		99000.00
FUTURE COST:	**Savings**		0.00	0.00
TOTAL PRESENT WORTH SAVINGS				**99000.00**

SKETCH

Project: **Lithonia Industrial Boulevard; Phase 1**	Idea No.: B-4.1 Client:: GDOT Sheet 2 of 4



Concrete Side Barrier, Type 6 - Plans 1



1:1 Slope and Temp. Barrier - Proposed

COST WORKSHEET

Project: Lithonia Industrial Boulevard; Phase 1					Idea No.: B-4.1 Client:: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Conc. Side Barrier, Type 6A	LF	200	515.00	103000.00			
Concrete V Gutter	LF	200	19.81	3962.00			
Temporary Barrier	LF				200	33.01	6602.00
12.5 mm Superpave	TN				3.67	67.01	245.93
19 mm Superpave	TN				4.89	63.00	308.07
25 mm Superpave	TN				7.33	55.01	403.15
GAB	TN				24.4	16.00	390.40
Subtotal:							
Mark-up (%)							
Total				106962.00			7949.55
Total Rounded				107000.00			**8000.00**

CALCULATIONS

Project: **Lithonia Industrial Boulevard; Phase 1**	Idea No.: B-4.1 Client:: GDOT Sheet 4 of 4

Additional Temporary Pavement Section to replace Concrete V Gutter:

12.5 mm Superpave: (2')(200')(1/9 sy/sf)((165 #/sy)(1/2000 #/tn) = 3.67 TN
19 mm Superpave: (2')(200')(1/9 sy/sf)((220 #/sy)(1/2000 #/tn) = 4.89 TN
25 mm Superpave: (2')(200')(1/9 sy/sf)((330 #/sy)(1/2000 #/tn) = 7.33 TN

GAB: Use (110 #/sy*in)(12 in/ft)(1/9 sy/sf) = 146.67 #/cy
(2')(200')(10/12 in/ft)(146.67 #/cy)(1/2000 #/tn) = 24.4 TN

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Lithonia Industrial Boulevard; Phase 1

Idea No.: B-4.2	**Sheet No.:** 1 of 4	**CREATIVE IDEA:** Change type of retaining wall from Type 2A and 2B to a contractor designed temporary wall.

Comp By: BD Date: 2/26/09 Checked By: SK Date: 2/26/09

Original Concept: Construct Concrete Side Barrier, Types 2A and 2B for detour of South Stone Mountain Lithonia Road between Stations 33+90 and 37+57.

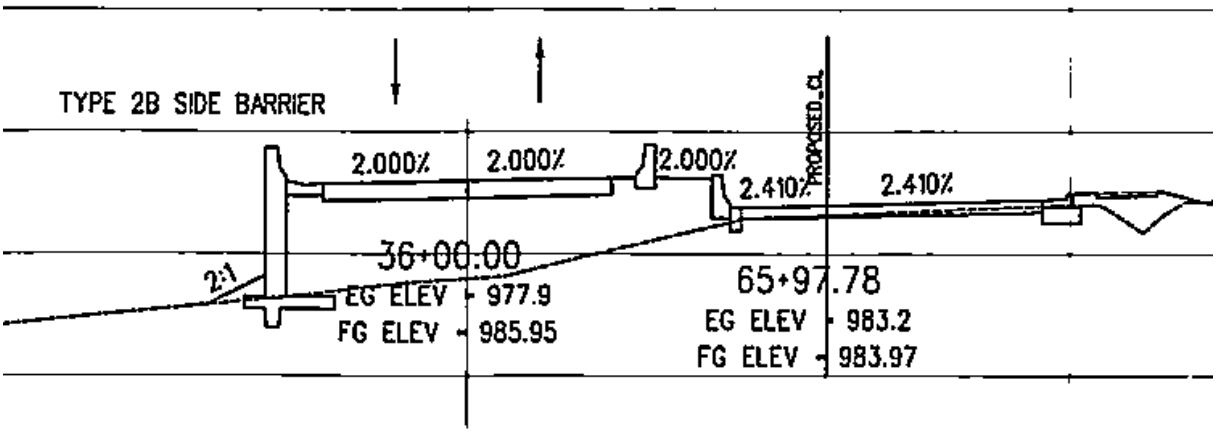
Proposed Change: Show a temporary retaining wall required as a contractor design such as temporary MSE wall and provide Temporary Barrier.

Justification: Utilizing a contractor design will reduce cost, reduce construction time and reduce cost for removal of the concrete retaining wall.

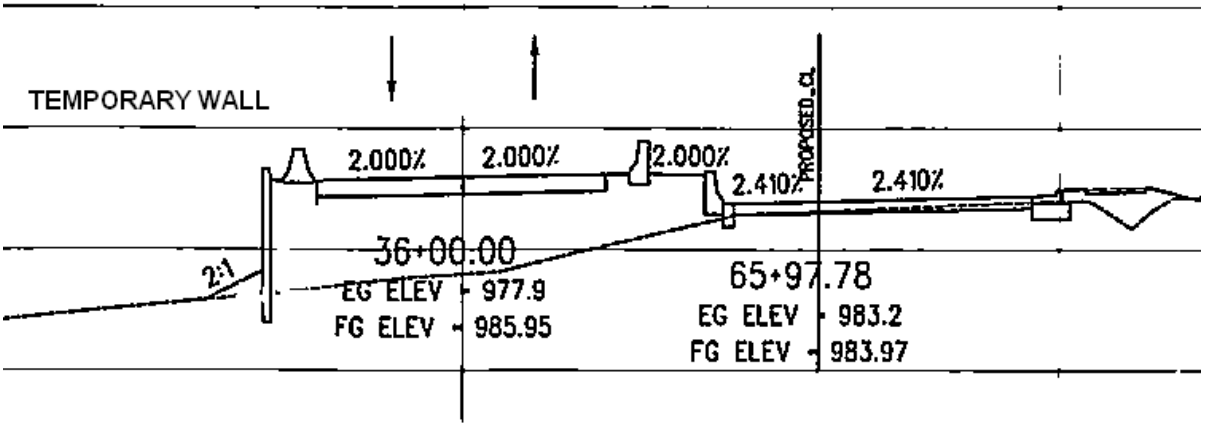
LIFE CYCLE COST SUMMARY		**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST:	**Original**	256000.00		
	Proposed	147500.00		
	Savings	108500.00		108500.00
FUTURE COST:	**Savings**		0.00	0.00
TOTAL PRESENT WORTH SAVINGS				**108500.00**

SKETCH

Project: **Lithonia Industrial Boulevard; Phase 1**	Idea No.: B-4.2 Client:: GDOT Sheet 2 of 4



PLANS



PROPOSED

COST WORKSHEET

Project: Lithonia Industrial Boulevard; Phase 1					Idea No.: B-4.2 Client:: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Concrete Side Barrier, Type 2A	LF	90	444.19	39977.10			
Concrete Side Barrier, Type 2B	LF	280	530.57	148559.60			
Concrete V Gutter	LF	370	19.81	7329.70			
Removal	LS	1	60000.00	60000.00			
Temporary Retaining Wall	SF				3000	40.00	120000.00
Temporary Barrier	LF				370	33.01	12213.70
Removal	LS				1	15000.00	15000.00
Subtotal:				255866.40			147213.70
Mark-up (%)							
Total							
Total Rounded				**256000.00**			**147500.00**

CALCULATIONS

Project: **Lithonia Industrial Boulevard; Phase 1**	Idea No.: B-4.2 Client:: GDOT Sheet 4 of 4

TYPE 2A – (Average height – 5')

STATIONS 33+90 TO 34+34	40 LF
STATIONS 37+10 TO 37+57	50 LF

TYPE 2B – (Average height – 9')

STATIONS 34+34 TO 37+10	280 LF

USE: Temporary MSE Wall at (40 $/SF) and Temporary Barrier

Area:

(40+50)(5) + (280)(9) = 2970 SF => Say 3000 SF

Total Length = 370 LF

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Lithonia Industrial Boulevard; Phase I

Idea No.:	**Sheet No.:**	**CREATIVE IDEA:**
R-7	1 of 4	Rural Typical

Comp By: KMM Date: 2/26/2009 Checked By: JLS Date: 2/26/2009

Original Concept:

The original typical sections on Lithonia Industrial Blvd, Chapman Rd, and Rogers Lake Rd call for curb and gutter and sidewalks.

Proposed Change:

Modify typical sections to provide a 6-ft paved shoulder instead of curb and gutter and sidewalks.

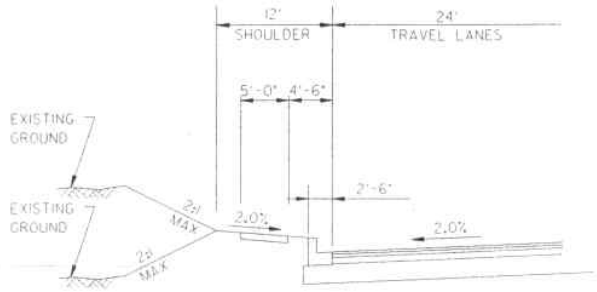
Justification:

It does not appear that pedestrian access is necessary in this area. Additionally, there would be no connectivity for pedestrian access for Chapman Rd. or Rogers Lake Rd. beyond the project limits. The proposed rural typical section will provide cost savings and reduce the risk of water on the roadway.

LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: **Original**	$1,094,600		
Proposed	$204,200		
Savings	$890,400		
FUTURE COST: **Savings**			**$1,094,600**
TOTAL PRESENT WORTH SAVINGS			

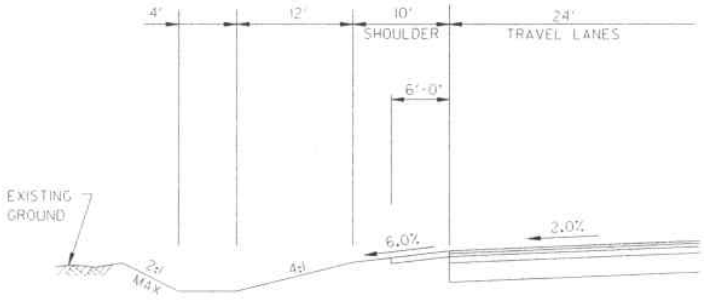
SKETCH

Project: Lithonia Industrial Blvd; Phase I	Idea No. : R-7 Client:: GDOT Sheet 2 of 4



TYPICAL SECTION

URBAN SHOULDER - CURRENT DESIGN



TYPICAL SECTION

RURAL SHOULDER - ALTERNATE R-7

COST WORKSHEET

Project: Lithonia Industrial Blvd; Phase I					Idea No.: R-7 Client:: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Conc. Sidewalk	SY	16000	$25	$400,000	2554	$25	$63,850
Conc. Curb & Gutter, TP 2	LF	21000	$13	$273,000	5530	$13	$71,890
Catch Basin, GP 1	EA	44	$2500	$110,000	0		
Catch Basin, GP 2	EA	5	$3400	$17,000	0		
18” storm drain	LF	1550	$32	$49,600	0		
24” storm drain	LF	6100	$40	$244,000	0		
6’ asphalt shoulder	TN	0			992	$69	$68,448
Subtotal:							
Mark-up (%)							
Total				$1,093,600			$204,188
Total Rounded				**$1,094,600**			**$204,200**

CALCULATIONS

Project: **Lithonia Industrial Blvd; Phase I**	Idea No. : R-7 Client:: GDOT Sheet 4 of 4

Sidewalk – keep at
South Stone Mountain Lithonia Road –
Sta. 47+81 to 70+80 =2299'
Total length: 2299 x 2 sides =
4598' x 5' = 22990 sq yd = 2554 SY

Curb & gutter – keep at
South Stone Mountain Lithonia Road –
Sta. 47+81 to 70+80 =2299'
Lithonia Industrial Boulevard –
Sta. 114+34 to Sta. 119+00 = 466'
Total length: 2765' x 2 sides = 5530 LF

Longitudinal drain – eliminate
L-D1 to L-D15, L-E, L-F, L-G, R-A, R-B, R-C, C-A, C-B
Assume 5900 LF along Lithonia Industrial Blvd, average 24"
Assume 1550 LF along Rogers Lake Rd, average 18"
Assume 200 LF along Chapman Rd, average 24"

Catch Basins (1033) – eliminate at
Lithonia Industrial Boulevard – 31
Chapman Road – 3
Rogers Lake Road - 10

Catch Basins (1034) – eliminate at
Lithonia Industrial Boulevard - 4
Rogers Lake Road - 1

6' asphalt shoulder:
Lithonia Industrial Boulevard – Sta. 121+00 to Sta. 183+00 = 6200 LF
Chapman Road – Sta. 70+50 to Sta. 76+90 = 640 LF
Rogers Lake Road – Sta. 36+72 to Sta. 58+50 = 2178 LF
Total length = 9018 LF x 2 = 18036 LF x 6' = 12024 SY
x 165 LBS/SY = 992 TN

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Lithonia Industrial Boulevard; Phase I

Idea No.:	**Sheet No.:**	**CREATIVE IDEA:** 8' median
R-10	1 of 4	

Comp By: JRG Date: 2/26/09 Checked By: JLS Date:2/26/09

Original Concept: Median Width varies (typical 20')

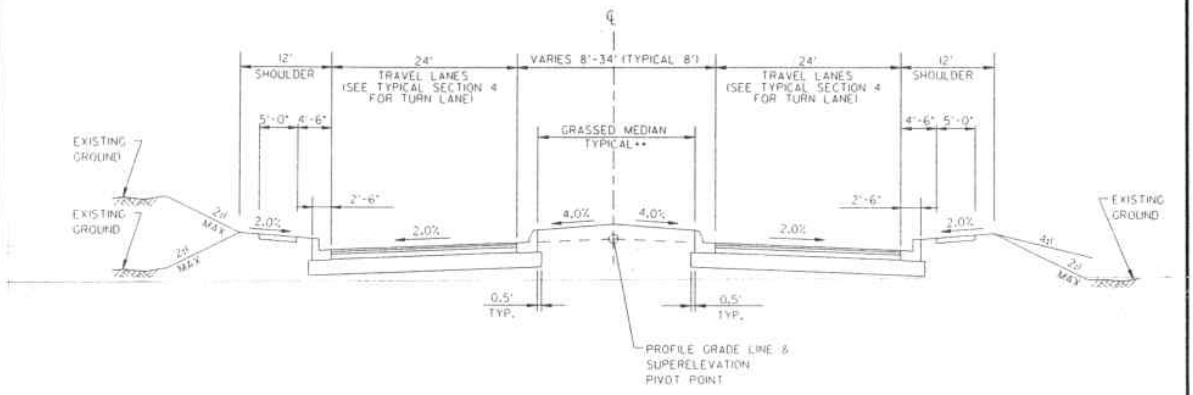
Proposed Change: Median Width varies (typical 8')

Justification: Reduces overall footprint of roadway resulting in savings to R/W cost and earthwork cost. Additionally requires less maintenance. Section has only one median opening. Pavement would flare out at that location to accommodate turn lanes and then again at the intersections on each end.

LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: Original	$2,903,500		
Proposed	$2,892,400		
Savings	$11,100		
FUTURE COST: Savings			**$11,000**
TOTAL PRESENT WORTH SAVINGS			

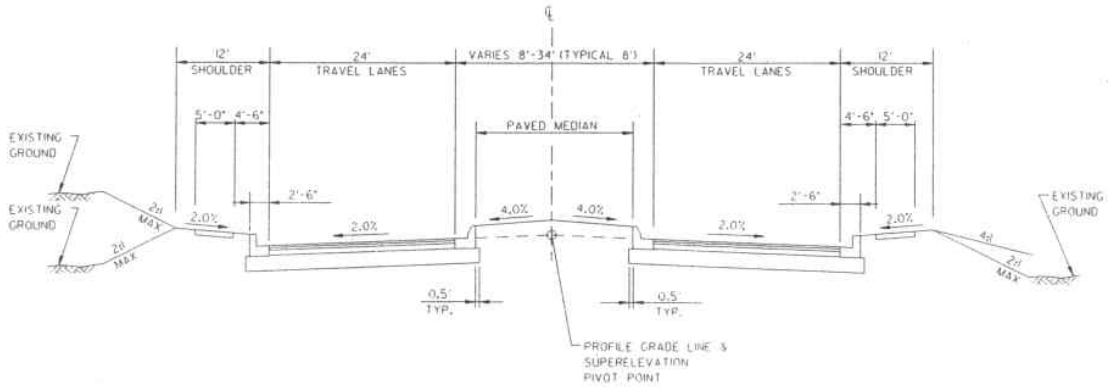
SKETCH

Project: Lithonia Industrial Boulevard; Phase I	Idea No. : R-10 Client:: GDOT Sheet 2 of 4



TYPICAL SECTION I

RAISED MEDIAN



TYPICAL SECTION I

8' RAISED MEDIAN

ALTERNATE R-10

COST WORKSHEET

Project: Lithonia Industrial Boulevard; Phase I					Idea No.: R-10 Client:: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Concrete Median Paving	SY	730	34.32	$25,054	1730	34.32	$59,374
Reduced R/W cost	ACRE		53000	$1,940,279	.83	53000	$1,896,289
Reduced Earthwork cost	CY	323500	2.90	$938,150	323000	2.90	$936,700
Subtotal:				$2,903,482			$2,892,363
Mark-up (%)							
Total							
Total Rounded				$2,903,500			$2,892,400

CALCULATIONS

Project: HP00-9347-00(001), PI 753230

Idea No.: R-10
Client:: GDOT
Sheet 4 of 4

Sta. 130+90 to 141+28 ⇒ 1038'

Sta. 153+90 to 173+52 ⇒ 1962'
(station range reduced to 8')

3000'

8' raised median
2 x 2.5' C&G ⇒ no change from 20' raised med.

4" conc. median thickness
3000' x 3' = 9000 ft² = 1000 yd²

Reduced R/W

12' reduction in median width
∴ 6' reduction in R/W left & right

3000' x 2 x 6' = 36000 ft² = .83 acres

assume 53000 $/acre

.83 acres (53000 $/acre) = $43,990

additional savings → maintenance of reduced earthwork
assume 500 yd³ reduction

mowing grass in median - trivial

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Lithonia Industrial Boulevard; Phase I

Idea No.:	**Sheet No.:**	**CREATIVE IDEA:** REMOVE THE PROPOSED 5-FT SIDEWALKS FROM THE MAINLINE
R-12	1 of 3	

Comp By: CLB Date: 2/26/09 Checked By: JS Date: 2/26/09

Original Concept: THE ORIGINAL DESIGN CALLS FOR THE USE OF 5-FT SIDEWALKS ALONG THE PROPOSED MAINLINE (LITHONIA INDUSTRIAL BLVD).

Proposed Change: IT IS RECOMMENDED THAT THE 5-FT SIDEWALK BE REMOVED FROM THE MAINLINE.

Justification: REMOVING THE SIDEWALKS FROM THE PROPOSED MAINLINE WILL REDUCE THE OVERALL COST OF THE PROJECT. IN ADDITION, WITH THIS AREA BECOMING HIGHLY INDUSTRIAL IN THE NEAR FUTURE, THERE WILL BE MUCH TRUCK TRAFFIC AND THE REMOVAL OF THE SIDEWALK WILL DISCOURAGE PEDESTRIAN TRAFFIC AS WELL AS MIDBLOCK CROSSING.

LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: Original	$400,000		
Proposed	$137,425		
Savings	$262575		
FUTURE COST: Savings			**$262,600**
TOTAL PRESENT WORTH SAVINGS			

COST WORKSHEET

Project: Lithonia Industrial Blvd; Phase I					Idea No.: R-12 Client:: Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
CONCRETE SIDEWALK, 4 IN	SY	16000	25.00	$400,000	5497	25.00	$137425
Subtotal:		16000		$400,000	5497		$137425
Mark-up (%)							
Total		16000		$400,000	5497		$137425
Total Rounded		**16000**		$400,000	**5497**		**$137425**

CALCULATIONS

Project: Lithonia Industrial Blvd; Phase I	Idea No.: R-12 Client:: Sheet 3 of 3:

AFTER REVIEWING THE PLAN QUANTITY FOR SIDEWALK, IT WAS DETERMINED THAT THERE WAS ONLY ABOUT 13000 SY AS OPPOSED TO 16000 SY.

LITHONIA INDUTRIAL BOULEVARD (LIB)

BEGIN S/W AT I82+47 TO 113+50 = 68+97 OR 6897 FT. SINCE THERE IS S/W 0N BOTH SIDES OF THE ROAD, MULTIPLY 6897 BY 2

6897 X 2 =13794 - 288 (DEDUCTIONS FOR DRIVEWAYS, CROSSROADS) =13506 FT X 5 FT(SIDEWALKS) = 67530 / 9 (TO CONVERT TO SY) = 7503 SY (S/W ON LIB)

13000 SY (TOTAL QTY OF S/W THOUGHOUT PROJECT) -7503 SY = 5497 SY

5497 SY X 25.00 (COST PER SY OF CONCRETE, 4 IN) = $137425

$400,000- $137425=262575

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Lithonia Industrial Boulevard; Phase I

Idea No.:	**Sheet No.:**	**CREATIVE IDEA:** REMOVE THE PROPOSED 5-FT SIDEWALKS THROUOUT PROJECT EXCEPT AT RADIUS RETURNS OF INTERSECTIONS
R-14	1 of 3	

Comp By: CLB Date: 2/26/09 Checked By: JS Date: 2/26/09

Original Concept: THE ORIGINAL DESIGN CALLS FOR THE USE OF 5-FT SIDEWALKS ALONG THE PROPOSED MAINLINE AND THE SIDEROADS.

Proposed Change: IT IS RECOMMENDED THAT ALL SIDEWALKS BE REMOVED THROUGHOUT THE PROJECT EXCEPT AT THE RADIUS RETURNS AT THE SIGNALIZED INTERSECTIONS.

Justification: REMOVING THE SIDEWALKS FROM THE PROPOSED MAINLINE AND SIDEROADS WILL REDUCE THE OVERALL COST OF THE PROJECT. IN ADDITION, WITH MAJORITY OF THE PROJECT AREA BECOMING HIGHLY INDUSTRIAL IN THE NEAR FUTURE, THERE WILL BE MUCH TRUCK TRAFFIC AND THE REMOVAL OF THE SIDEWALK WILL DISCOURAGE PEDESTRIAN TRAFFIC AS WELL AS MIDBLOCK CROSSING.

LIFE CYCLE COST SUMMARY	**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST: Original	$400,000		
Proposed	$8333		
Savings	$391667		
FUTURE COST: Savings			**$391,700**
TOTAL PRESENT WORTH SAVINGS			

COST WORKSHEET

Project: Lithonia Industrial Blvd; Phase I					Idea No.: R-14 Client:: Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
CONCRETE SIDEWALK, 4 IN	SY	16000	25.00	$400,000	333	25.00	$8333
Subtotal:		16000		$400,000	333		$8333
Mark-up (%)							
Total		16000		$400,000	333		$8333
Total Rounded		**16000**		$400,000	**333**		**$8333**

CALCULATIONS

Project: Lithonia Industrial Blvd; Phase I	Idea No.: R-14 Client:: Sheet 3 of 3:

AFTER REVIEWING THE PLAN QUANTITY FOR SIDEWALK, IT WAS DETERMINED THAT THERE WAS ONLY ABOUT 13000 SY AS OPPOSED TO 16000 SY.

CONCRETE AT RADIUS RETURNS AT THE TWO SIGNALIZED INTERSECTIONS =75 FT X 8 (NO. OF RADIUS RETURNS) =600 FT X 5 FT = 3000 SF

3000 SF/9 =333 SY

333 SY X $25 = $8333

$400,000- 8333 = $391667

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Lithonia Industrial Boulevard; Phase I

Idea No.:	**Sheet No.:**	**CREATIVE IDEA:** CONSTRUCT ALL FRONT & BACK SLOPES @ 2:1
R-17	1 of 4	

Comp By: JLS Date: 2/26/09 Checked By: JRG Date: 2/26/09

Original Concept: THE PROPOSED TYPICAL SECTIONS DESIGN CALLS FOR CONSTRUCTION OF FRONT AND BACK SLOPES VARIES FROM 2:1, 3:1, 4:1 & 6:.1

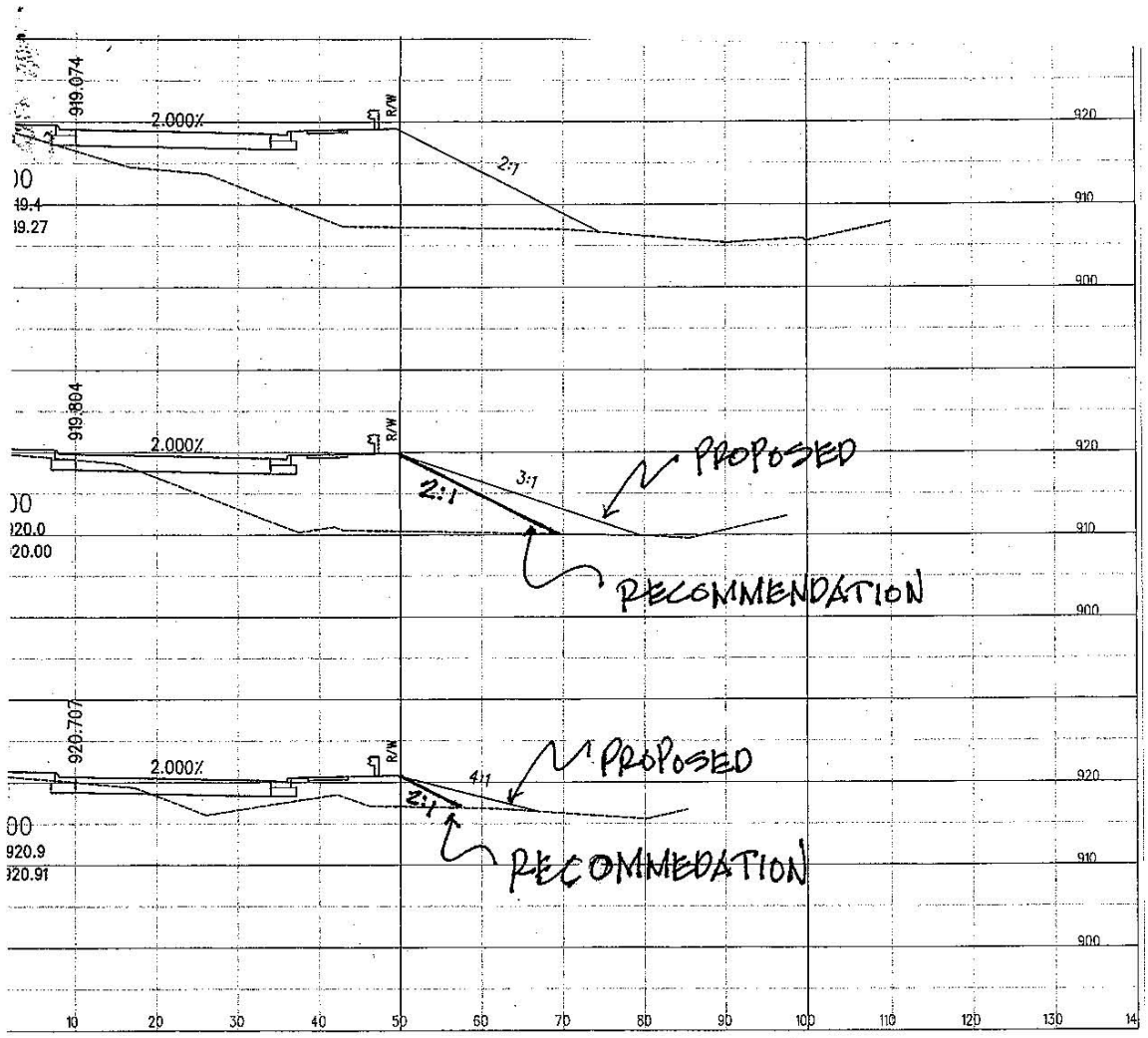
Proposed Change: IT IS RECOMMMENDED THAT ALL FRONT & BACK SLOPES BE CONSTRUCTED AT 2:1

Justification: CONSTRUCTING THE SLOPES AT 2:1 WILL REDUCE THE AMOUNT OF EARTHWORK (MAJORITY CUT) THROUGHOUT PROJECT. CONSTRUCTING THESE SLOPES AT 2:1 WILL NOT NEGATIVELY AFFECT THE PROJECT.

LIFE CYCLE COST SUMMARY		**INITIAL Project Cost**	**FUTURE Project Cost**	**TOTAL Present Worth Cost**
INITIAL COST:	**Original**	$938,150.00		
	Proposed	$902,030.50		
	Savings	$36,120.00		
FUTURE COST:	**Savings**			**$36,120**
TOTAL PRESENT WORTH SAVINGS				

SKETCH

Project: Lithonia Industrial Boulevard; Phase I	Idea No.: Client:: Sheet 2 of 4



SCALE: 1"=10' HORIZONTAL
1"=10' VERTICAL

COST WORKSHEET

Project: Lithonia Industrial Blvd; Phase I					Idea No.: R-17 Client:: Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
UNCLASSIFIEDEXCAVATION	CY	323500	$2.90/CY	$938,150.00	311045	$2.90/CY	$902,030.50
Subtotal:		323500		$938,150.00			$902,030.50
Mark-up (%)							
Total		323500		$938,150.00			$902,030.50
Total Rounded		**323500**		$938,150.00			**$902,031.00**

CALCULATIONS

Project: Lithonia Industrial Blvd; Phase I	Idea No.: R-17 Client:: Sheet 4 of 4:

THE AVERAGE END AREA METHOD WAS UTILIZED TO DETERMINE THE VOLUME OF EARTHWORK

FORMULA:

$$\frac{\frac{A1 + A2}{2} \times D}{27} = \text{CU. YDS.}$$

WHERE A_1 = AREA OF CROSS SECTION 1

A_2 = AREA OF CROSS SECTION 2

D = DISTANCE BETWEEN CROSS SECTIONS

APPENDIX

INFORMATION PHASE - SOURCES

Approving/Authorizing Persons

Name:	Position:	Telephone:
Albert Welch	GDOT Project Manager	404-631-1690
Marcella Coll	Assistant Design Group Leader	404-631-1692
Aisha Rowland	Transportation Engineer Associate	404-631-1695

Personal Contacts

Name:	Telephone:	Notes:
Tonia Brown	678-333-0491	JJ&G – Design Firm
Taylor Wright	770-933-0280	PBS&J – representing DeKalb Co.

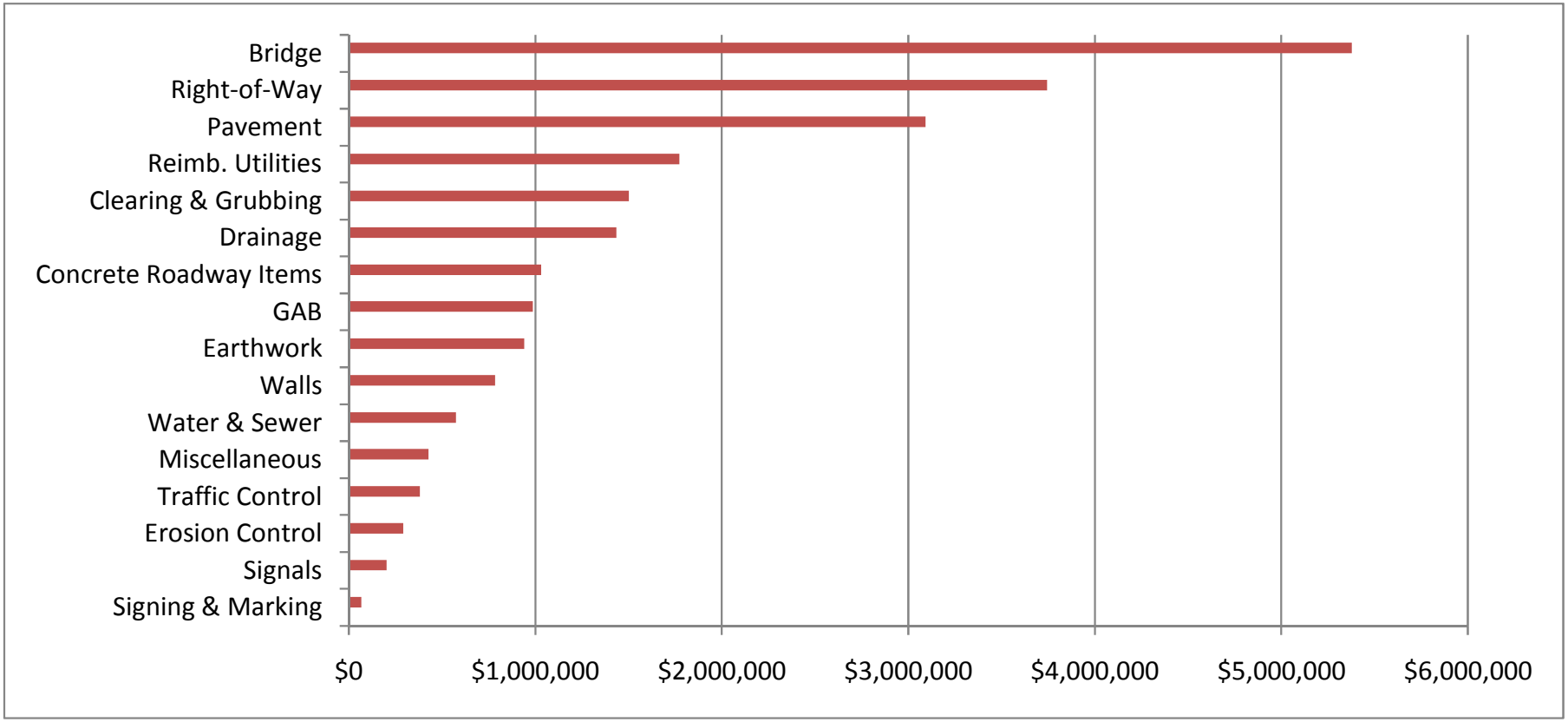
Documents/Abstracts

Reference:	Notes:
Plans	
Geometric Layout	
Approved Concept Report	Approved June 4, 2002
Draft Concept Revision	Written August 12, 2005
Location & Design Report	Approved December 5, 2005
Cost Estimate	Printed February 12, 2009
Preliminary Right-of-Way Cost Est.	Submitted January 13, 2009
Pavement Design	Approved June 8, 2006
Earthwork Summary	
Soil Survey	Approved
Preconstruction Status Report	Printed

INFORMATION PHASE - COST MODEL
Lithonia Industrial Boulevard – Phase I

Item	Description	$ Amount	% of Total Project
1	Bridge	$5,379,504.92	24.00%
2	Right-of-Way	$3,744,739.00	16.71%
3	Pavement	$2,925,915.40	13.05%
4	Reimbursable Utilities	$1,774,260.00	7.92%
5	Clearing & Grubbing	$1,500,000.00	6.69%
6	Drainage	$1,432,243.70	6.39%
7	Concrete Roadway Items	$1,032,775.98	4.61%
80% Cost Line			
8	GAB	$976,000.00	4.35%
9	Earthwork	$938,150.00	4.19%
10	Walls	$789,479.90	3.52%
11	Sewer/Water	$541,126.01	2.41%
12	Erosion Control	$392,100.98	1.75%
13	Traffic Control	$385,380.00	1.72%
14	Miscellaneous	$318,789.44	1.42%
15	Signals	$205,891.20	0.92%
16	Signing & Marking	$77,137.32	0.34%
	TOTAL	$22,413,493.85	100.00

INFORMATION PHASE - COST MODEL
Lithonia Industrial Boulevard – Phase I

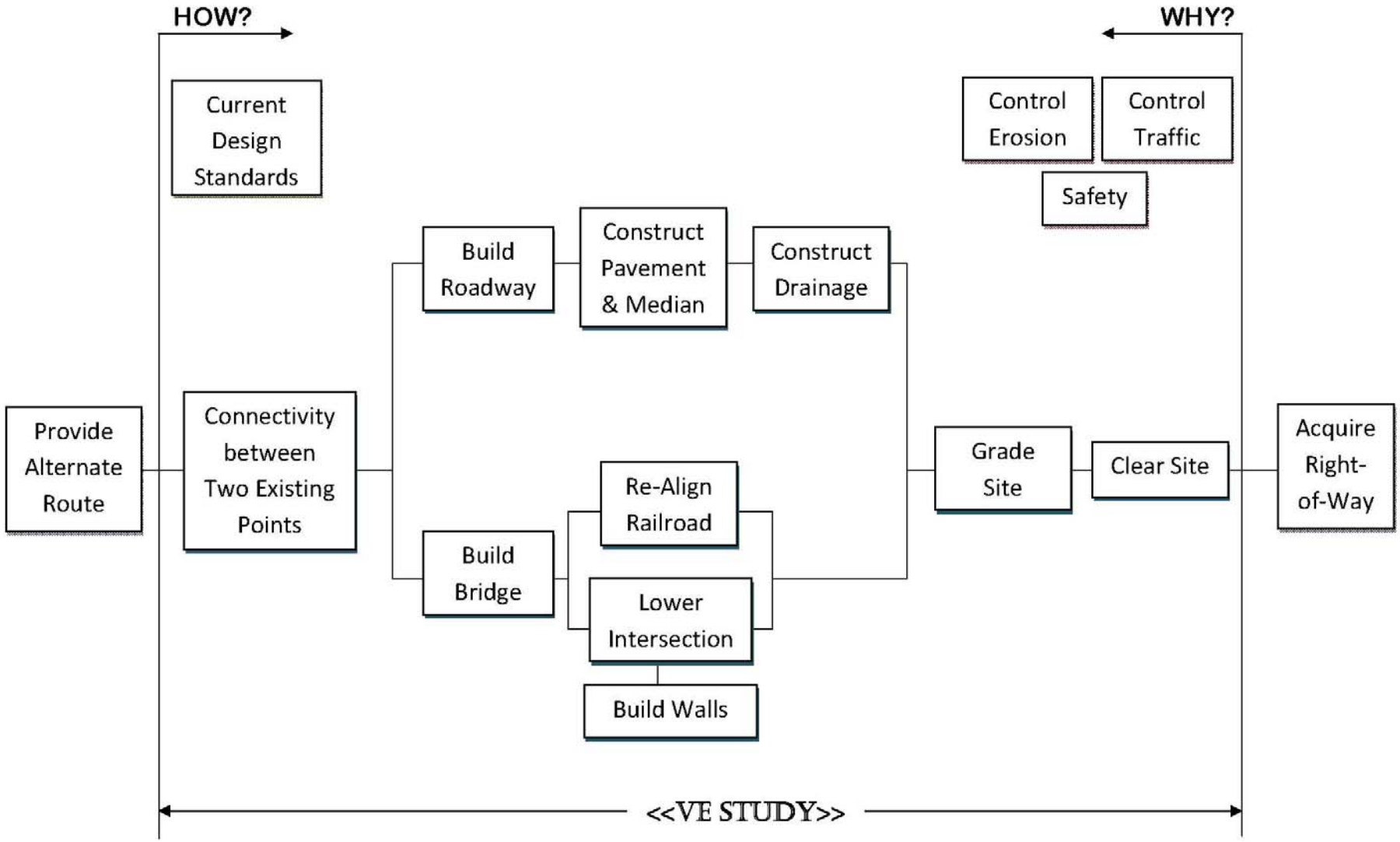


INFORMATION PHASE – FUNCTION ANALYSIS

Project: Lithonia Industrial Boulevard; Phase I
Project Function: Provide Alternate Route

ITEM	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
No.		Verb	Noun	Cost	Worth	Comments
1	Bridge	Separate	Grade	$5,379,504.92	$100,000	At-Grade Crossing
2	Right-of-Way	Acquire	Land	$3,744,739.00	$3,744,739	ROW 90% complete
3	Pavement	Support	Traffic	$2,925,915.40	$2,500,000	Reduce Structure
4	Reimbursable Utilities	Fund	Relocation	$1,774,260.00	$250,000	At-grade Crossing
5	Clearing & Grubbing	Remove	Obstructions	$1,500,000.00	$1,500,000	
6	Drainage	Channel	Water	$1,432,243.70	$1,000,000	Ditches, At-grade X-ing
7	Concrete Roadway Items	Channelizes	Traffic	$1,032,775.98	$100,000	Median, Curb, Sidewalk
8	GAB	Support	Pavement	$976,000.00	$800,000	Reduce Structure
9	Earthwork	Achieve	Grade	$938,150.00	$700,000	At-grade Crossing
10	Walls	Support	Slopes	$789,479.90	$0	At-grade Crossing
11	Sewer/Water	Conveys	Fluids	$541,126.01	$541,126.01	
12	Erosion Control	Protects	Environment	$392,100.98	$250,000	At-grade, slope mats
13	Traffic Control	Safeguards	Work-zone	$385,380.00	$250,000	At-grade, no detours
14	Miscellaneous			$318,789.44		
15	Signals	Control	Traffic	$205,891.20	$0	No signals
16	Signing & Marking	Directs	Traffic	$77,137.32	$70,000	No signals

INVESTIGATION PHASE - FAST DIAGRAM



CREATIVE PHASE		JUDGMENT PHASE		
No.	**CREATIVE IDEA**	**ADVANTAGE**	**DISADVANTAGE**	**IDEA RATING**
B-1	Change alignment @ bridge	Narrower bridge, cost savings, flattens horizontal curve	Changes ROW (increases)	7
B-2	Shorter bridge	Cost savings	Limits future widening of roadway	6
B-3	Reduce bridge clearance	Cost savings	Limits future asphalt overlays	3
B-4	Eliminate temporary wall	Cost savings	May have impact to 4(f)	7
B-5	Change wall type	Potential cost savings		3
R-2	Reduce pavement depth	Initial cost savings	Higher maintenance costs, reduce structural stability	2
R-3	Reduce lane width	Cost savings	Safety for trucks on curves	5
R-4	Pavement material/type	Potential cost savings	Wear, drainage, friction	3
R-5	Retain existing pavement – side roads	Cost savings	No pavement evaluation	2
R-6	Lower profile	Shorten culvert lengths, reduce earthwork	Overall cut job- waste dirt	5
R-7	Rural typical section	Reduce drainage structures, reduces concrete costs	Doesn't provide pedestrian access	10
R-8	Hybrid typical section	Reduce drainage structures, reduces concrete costs	Pedestrians may cross mid-block to access sidewalk	5
R-9	Eliminate median	Cost savings (drainage, concrete, earthwork)	No pedestrian refuge, no separation of traffic, eliminate future inside widening	3

CREATIVE PHASE		JUDGMENT PHASE		
No.	**CREATIVE IDEA**	**ADVANTAGE**	**DISADVANTAGE**	**IDEA RATING**
R-10	8’ raised median	Cost savings (concrete, earthwork)	Eliminate future inside widening	8
R-11	4’ flush median	Cost savings (drainage, concrete, earthwork)	No ped. refuge, no positive separation of traffic, eliminate future inside widening	6
R-12	Eliminate sidewalk	Cost savings	No pedestrian facility, eliminates connectivity	9
R-13	Sidewalk on only one side	Cost savings	Pedestrians may cross mid-block to access sidewalk, reduces connectivity	5
R-14	Eliminate sidewalk on side roads	Cost savings	No pedestrian facility	7
R-16	Reduce GAB thickness	Cost savings	Structural strength, higher maintenance costs	2
R-17	Increase 2:1 slopes	Earthwork savings	May require guardrail	7
T-1	Eliminate raised islands @ intersections	Cost savings	No pedestrian refuge	2
T-2	Eliminate detours	Potential cost savings	Staging problems	3
T-3	Eliminate signals	Cost savings	Traffic delay	2
U-1	Restage utilities	Cost savings (move once), reduce construction time	Inhibit railroad staging	2
U-2	Avoid utilities	Cost savings, reduce construction time	Utilities may be in clear zone	2
DS-1	Grading complete (design suggestion)			
DS-2	Increase eyebrow size for trucks			
DS-3	Concrete pavement			