

# VALUE ENGINEERING MOD 1 TRAINING REPORT

SR 101/North 2<sup>nd</sup> Avenue Widening  
Roadway Improvements – Downtown Rome

Project No. STP-3711(9)

Floyd County

PI No. 650540

March 11, 2009

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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  
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**March 11, 2009**

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## **EXECUTIVE SUMMARY**

**EXECUTIVE SUMMARY**

**VALUE ENGINEERING**  
**MOD 1 TRAINING REPORT**

SR 101/North 2<sup>nd</sup> Avenue  
Downtown Rome

Project No. STP-3711(9)  
PI No. 650540

**March 5, 2009**

**Introduction**

This report summarizes the results of a value engineering (VE) study for roadway improvements of North 2<sup>nd</sup> Avenue/SR 101 beginning at the Oostanaula River Bridge just south of West 3<sup>rd</sup> Street continuing for about 650 ft along Martha Berry Blvd to just north of the intersection of Turner McCall Blvd. in Rome, GA, Floyd County. The study was conducted as part of the Mod 1 training session held for select GDOT staff on February 23 to 27, 2009.

This project proposes to widen North 2<sup>nd</sup> Avenue/SR 101 to provide 4-11 ft lanes, a 19 ft median, 12 ft shoulders with curb and gutter and 5 ft sidewalks on both sides. Turn lanes will be added at the intersections where warranted. The “Y” intersection will be removed and all traffic will be re-routed to a four-leg intersection at North 2<sup>nd</sup> Avenue/SR 101 and Turner McCall Blvd. Traffic will be maintained during construction. The estimated construction cost of the project is \$5,708,919, the R/W estimate is \$17,187,500, yielding a total project cost of \$23,896,419. 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

<b>Project:</b> PI 650540 <b>Location:</b> SR 101/Martha Berry Blvd at Turner McCall Rome Georgia	<b>Team:</b> Group 6 <b>Date:</b> 2-27-2009
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This purpose of this project is to improve traffic safety, pedestrian safety and operational efficiency along North 2<sup>nd</sup> Avenue S.W. (SR101), by separating the through movements from the turning movements. The project begins at the Oostanaula River and ends at Martha Berry Boulevard. The proposed length of project is 0.6 miles. The “Y” intersection at N. 2<sup>nd</sup> Avenue S.W. (SR 101) and N. 2<sup>nd</sup> Avenue N.W. will be removed and all traffic will be routed to a 4 leg intersection at N. 2<sup>nd</sup> Avenue and Turner McCall Boulevard. The typical section consists of 11’ lanes (2 in each direction) separated by a raised median. There is a 6’ shoulder on the west side and a 10’ shoulder on the east side with a 5’ wide sidewalk, left and right turn lanes where traffic warrants. The total estimated cost of the project is \$17,726,000.

### Recommendations:

<u>Recommendations:</u>	<u>Approx Savings</u>
➤ A2 Shift the alignment to the west side of SR 101	\$209,906
➤ A3 Reduce shoulder width on east side from station 13+40 to 39+70	\$493,811
➤ A5 Reduce improvements to W. 5 <sup>th</sup> Street and reduce radii	\$162,905
➤ C1 Reduce pavement thickness on side streets	\$49,000
➤ E3 Retain existing pavement along 2nd Ave. (SR101)	\$271,020
➤ E4 Retain existing pavement along Turner McCall Blvd	\$248,268
➤ Q1 Use Area office as Engineers field office	\$ 65,859

### Design Suggestions:

- C3 & G1 Set Profile Grade to East Side Referencing EOP
  
- Implementations of these 7 recommendations offer the potential to save up to \$1,500,769
  
- Implementation of these recommendations would reduce ROW impacts/costs, traffic staging and construction time.
  
- Sufficient time exists to implement these changes because this project is not scheduled for ROW funding until 2011. Funding for CST is not funded yet.

## DEVELOPMENT PHASE - SUMMARY OF COST SAVINGS

Project: Location:					Team No.: Date:	
Idea No.	Creative Idea Description	Original Initial Cost	Proposed Initial Cost	Initial Cost Savings	Future Savings	Total Life Cycle Savings
A2	Shift Alignment to the west side (1-2 ft.)	\$448,276	\$238,370	\$209,906		
A3	Reduce Shoulder Width on east side of North 2 <sup>nd</sup> Ave. Station 13+40 to 39+70 and Turner McCall Blvd. on both sides of the roadway between station 50+00 and 63+59.	\$493,811	\$0	\$493,811		
A5	Eliminate 192 ft of improvements on 5 <sup>th</sup> St. including changing 50 ft radii to 35 ft radii.	\$162,905	\$0	\$162,905		
C1	Reduce pavement thickness on Sideroads	\$112,014	\$63,011	\$49,000		
E3	Mill old asphalt to existing PCC Base on North 2 <sup>nd</sup> Ave, retain old PCC base and overlay	\$726,244	\$455,244	\$271,020		
E4	Retain existing pavement on Turner McCall Blvd	\$281,310	\$33,042	\$248,268		
Q1	Use Area Engineer's Office instead of proposed Field Engineer's Office	\$65,859	\$0	\$65,859		
<b>Total</b>				\$1,500,769		

## STUDY IDENTIFICATION

## STUDY IDENTIFICATION

<b>Project: SR 101/North 2<sup>nd</sup> Avenue Roadway Improvements</b>	<b>Dates: February 23 – 27, 2009</b>
<b>Location: GDOT HQ – Atlanta, 4<sup>th</sup> Floor; Conducted as part of Module 1 Training</b>	

### VE Team Members

Name:	Position:	Organization:	Telephone:
Steve Adewale	Project Manager	Office of Program Delivery	404 631 1578
Brad McManus	Design Group Manager	Road Design	404-631-1630
Brent Story	Administrator	Road Design	404-631-1600
Ron Grimes	Group Leader	Bridge Design	404-631-1901
Susan Beck	Group Leader	Bridge Design	404-631-1862
Margaret Reitz	Design Engineer III	Urban Design	404-631-1674

### Project Description

This purpose of this project is to improve traffic safety, pedestrian safety and operational efficiency along N. 2<sup>nd</sup> Avenue S.W. (SR101), by separating the through movements from the turning movements. The project begins at the Oostanula River and ends at Martha Berry Boulevard. The proposed length of project is 0.6 miles. The “Y” intersection at N. 2<sup>nd</sup> Avenue S.W. (SR 101) and N. 2<sup>nd</sup> Avenue N.W. will be removed and all traffic will be routed through a 4 leg intersection at N. 2<sup>nd</sup> Avenue and Turner McCall Boulevard. The typical section consists of 11’ lanes (2 in each direction) separated by a raised median. There is a 6’ shoulder on the west side and a 10’ shoulder on the east side with a 5’ wide sidewalk, left and right turn lanes where traffic warrants. The total estimated cost of the project is \$17,726,000.

### Project Constraints

Project constraints include Right-Of-Way, Utilities, H. H. Kill Levee, historical resources and environmental resources.

**Figure 1  
Project Vicinity Map**



**County Map of Georgia**

## **VE RECOMMENDATIONS**

## DEVELOPMENT AND RECOMMENDATION PHASE

**Project: 640540 SR101/North 2<sup>nd</sup> Ave in Rome**

**Idea No.:**  
A2

**Sheet No.:**  
of

**CREATIVE IDEA:**  
**Shift Alignment to the west side (1-2 ft.)**

Comp By: Gp. 6

Date:

**2-27-09**

Checked By:

Date:

**Original Concept:**

Current proposed alignment is established with approx. 1-2 feet of widening on the right side (east side) along North 2<sup>nd</sup> Ave in Rome (between stations 14+70 and 26+48) with curb and gutter and 10-12 ft. shoulders with 5-ft sidewalk.

**Proposed Change:**

Propose shifting the alignment 1-2 feet to the west side to maintain the existing edge of pavement on the east side of North 2<sup>nd</sup> Ave; between stations 14+70 and 26+48. This will require shifting the proposed wall #2, 1-2 feet towards the levee and increase the wall height approximately 1-ft vertical.

**Justification:**

Maintaining the existing edge of pavement on the east side of North 2<sup>nd</sup> Ave will reduce ROW impacts/costs along the east side between stations 14+70 and 26+48. This will reduce construction duration and traffic staging along the east side. This will require additional ROW from the City of Rome who owns the property and slope between the roadway and the levee.

#LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
<b>INITIAL COST: Original</b>	\$448,276		
<b>Proposed</b>	\$238,370		
<b>Savings</b>	\$209,906		
<b>FUTURE COST: Savings</b>			
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>\$209,906</b>



## CALCULATIONS

Project: **640540 SR101/North 2<sup>nd</sup> Ave in Rome**

Idea No. : A2

Client::

Sheet of

Currently proposed in plans – sta 14+70 to 26+48 on N. 2<sup>nd</sup> Ave:

Required R/W = 7169 ft<sup>2</sup>

Required easement = 13576 ft<sup>2</sup>

Total = 20745 ft<sup>2</sup> x \$6.86/ft<sup>2</sup> = \$142310

X 3.15 (contingency)

Total                      \$ 448278

VE recommendation A2:

Total required easement = 11031 ft<sup>2</sup> x \$6.86/ft<sup>2</sup> = \$75673

X 3.15

Total                      \$238369

Conclusion – saves \$209909

## DEVELOPMENT AND RECOMMENDATION PHASE

**Project: 640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome**

**Idea No.:**  
A3

**Sheet No.:**  
of

**CREATIVE IDEA:**  
**Reduce Shoulder Width on east side of North 2<sup>nd</sup> Ave. Station 13+40 to 39+70 and Turner McCall Blvd. on both sides of the roadway between station 50+00 and 63+59.**

Comp By: Gp. 6

Date:

**2-27-09**

Checked By:

Date:

**Original Concept:**

The current plans establish a 12-ft. wide urban shoulder with 5-ft. sidewalk.

**Proposed Change:**

It is recommended that the urban shoulder width on the east side of North 2<sup>nd</sup> Ave. be reduced in width from 12-ft to 10-ft. between stations 13+40 and 39+70. Also, it is recommended to reduce the shoulder width on both sides of Turner McCall Blvd between station 50+00 and 63+59.

**Justification:**

The use of a 10-ft. urban shoulder will reduce ROW impacts/costs to the adjacent commercial properties along the east side of North 2<sup>nd</sup> Ave between stations 13+40 and 39+70 and on Turner McCall Blvd. between station 50+00 and 63+59.

#LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
<b>INITIAL COST: Original</b>	\$493811		
<b>Proposed</b>	0		
<b>Savings</b>	\$493811		
<b>FUTURE COST: Savings</b>			
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>\$493,811</b>



## CALCULATIONS

Project: **640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome**

Idea No. :  
Client::  
Sheet of

Reducing Shoulder width from 12ft to 10 ft provides an estimated R/W & easement savings of \$89/ft.

N 2<sup>nd</sup> Ave. : 13+40 to 39+70 = 2630 ft

-83 ft (intersection paving)

Total = 2547 ft

2547 ft x \$89/ft = \$266,683

Turner McCall Blvd.: 50+00 to 63+59 = 1359 ft

-83 ft(intersection paving)

Total 1276 ft

Both sides X 2

Total 2552

2552 ft x \$89/ft = \$227,128

Total R/W savings = \$493,811

## DEVELOPMENT AND RECOMMENDATION PHASE

**Project: 640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome**

**Idea No.:**  
A5

**Sheet No.:**  
of

**CREATIVE IDEA:**

Eliminate 192 ft of improvements on 5<sup>th</sup> St. including changing 50 ft radii to 35 ft radii.

Comp By:      Date:      **2-27-09**

Checked By:      Date:

**Original Concept:**

The original design calls for 300 ft of improvements along 5<sup>th</sup> street and uses 50 ft radii at the intersection of 5<sup>th</sup> Street and N. 2<sup>nd</sup> Avenue.

**Proposed Change:** It is recommended to end the 5<sup>th</sup> street improvements 108 ft from the SR 101 mainline edge of pavement (EOP), thereby eliminating 192 ft of improvements. It is also recommended to change the radii from 50 ft to 35 ft.

**Justification:**

The proposed changes will reduce ROW and material costs of the project.

#LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
<b>INITIAL COST: Original</b>	\$162,905		
<b>Proposed</b>	\$0		
<b>Savings</b>	\$162,905		
<b>FUTURE COST: Savings</b>			
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>\$162,905</b>



## CALCULATIONS

Project: 640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome

Idea No. :  
Client::  
Sheet of

**Eliminate 192 ft of improvements on 5<sup>th</sup> St. including changing 50 ft radii to 35 ft radii.**

**Price of pavement as originally designed \$46.57/yd<sup>2</sup>**

**Price of asphalt saved = 647 x 46.57 = \$30,130**

**R/W costs savings**

**R/W area saved = 2418 ft<sup>2</sup>**

**Cost R/W = 2418 ft<sup>2</sup> x \$6.86/ft<sup>2</sup> = \$16,587**

**Easement area saved = 6225 ft<sup>2</sup>**

**Cost of easement = 6225 x (6.86/2) = \$21,351**

**Total Land Value = \$37,938**

**Add cost of scheduling contingency = 55%**

**Administration cost = 60%**

**Total Factors = 55% & 60% = 3.15**

**Total R/W Savings = \$119,504**

**Curb and gutter savings for 192 LF on both sides**

**Cost of c & g = \$16.26/ft**

**Cost = 384 LF x \$16.26/ft = \$62.44**

**Sidewalk savings 384 LF sidewalk**

**Area = 384 LF x 5 ft width = 1920 ft<sup>2</sup>**

**= 213 yd<sup>2</sup>**

**Cost = \$33.09/yd<sup>2</sup> \$33.09 x 213 yd<sup>2</sup> = \$7,059**

**Total savings = cost of asphalt \$30,130**

**= R/W savings \$119,504**

**= c & g savings \$6,244**

**= sidewalk savings \$7,059**

**Total savings \$162,937**



## CALCULATIONS

Project: **640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome**

Idea No. :  
Client::  
Sheet of

### Reduce pavement thickness on Sideroads

Original Design                    12 in GAB  
(Side Roads)                    6 in 25mm superpave  
   2 in 19mm superpave  
   1.5 in 12.5 mm superpave

Proposal C1  
8 in GAB  
3 in 19mm superpave  
1.5 in 12.5mm superpave

#### Original Design:

$$1 \text{ ft GAB} \times 9 \text{ ft}^2/\text{yd}^2 = 9 \text{ ft}^3 \text{ GAB}$$

$$\text{GAB} = 150\#/\text{ft}^3 \quad \text{GAB} = (150\#/\text{ft}^3)(9\text{ft}^3) = 1350\#/\text{yd}^2 \text{ or } 0.675 \text{ ton}/\text{yd}^2$$

$$\text{GAB} = \$18.2/\text{ton} \quad \text{GAB} = (\$18.2/\text{ton})(0.675\text{ton}/\text{yd}^2) = \$12.285/\text{yd}^2$$

$$25\text{mm} = (660\#/\text{yd}^2) = (0.33 \text{ ton}/\text{yd}^2) @ \$62.0/\text{ton} = \$20.46/\text{yd}^2$$

$$19\text{mm} = (220\#/\text{yd}^2) = (0.11 \text{ ton}/\text{yd}^2) @ \$76/\text{ton} = \$8.36/\text{yd}^2$$

$$12.5\text{mm} = (165\#/\text{yd}^2) = (0.825 \text{ ton}/\text{yd}^2) @ \$66.31/\text{ton} = \$5.47/\text{yd}^2$$

$$\text{Total cost}/\text{yd}^2 = \$46.57/\text{yd}^2$$

$$\text{Total yds} = 2405 \text{ yd}^2 = \text{total area side roads}$$

$$\text{Total cost original design} = 2405\text{yd}^2 \times \$46.57/\text{yd}^2 = \$112,014.25$$

#### Proposed Design:

$$8 \text{ in GAB} = (900\#/\text{yd}^2) = (0.45 \text{ ton}/\text{yd}^2) @ \$18.20/\text{ton} = \$8.20/\text{yd}^2$$

25 mm = not needed

$$19\text{mm} = (330\#/\text{yd}^2) @ \$76/\text{ton} = \$12.54/\text{yd}^2$$

$$12.5\text{mm} = (165\#/\text{yd}^2) = (0.825 \text{ ton}/\text{yd}^2) @ \$66.31/\text{ton} = \$5.47/\text{yd}^2$$

$$\text{Total cost of proposed} = (26.2)(2405) = \$63,011$$

$$\text{Savings} = \$112,014.25 - \$63,011$$

$$= \$49,000$$



## DEVELOPMENT AND RECOMMENDATION PHASE

**Project: 640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome**

**Idea No.:**  
E3

**Sheet No.:**  
of

**CREATIVE IDEA:**  
Mill old asphalt to existing PCC Base on North 2<sup>nd</sup> Ave, retain old PCC base and overlay

Comp By:      Date:      **2-27-09**

Checked By:      Date:

**Original Concept:**

The original concept calls for the total replacement of existing pavement structure with full depth asphalt pavement.

**Proposed Change:**

It is recommended that this project mill the old asphalt layer down to the existing PCC base and overlay.

**Justification:**

The Pavement Evaluation Summary dated 11/17/08 recommends milling the old asphalt pavement structure down to the PCC base, retaining the PCC base, and then overlay. This will reduce the overall pavement cost, and reduce traffic staging and construction time.

#LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
<b>INITIAL COST: Original</b>	\$726,244		
<b>Proposed</b>	\$455,224		
<b>Savings</b>	\$271,020		
<b>FUTURE COST: Savings</b>			
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>\$271,020</b>





## DEVELOPMENT AND RECOMMENDATION PHASE

**Project: 640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome**

**Idea No.:**  
E4

**Sheet No.:**  
of

**CREATIVE IDEA:**  
Retain existing pavement on Turner McCall Blvd

Comp By: Gp.6

Date:

**2-27-09**

Checked By:

Date:

**Original Concept:**

The original concept calls for the total replacement of existing pavement structure with full depth asphalt pavement.

**Proposed Change:**

It is recommended that the existing pavement be retained, leveled, and overlay.

**Justification:**

The Pavement Evaluation Summary dated 11/17/08 recommends retaining the existing pavement structure and overlay. This will reduce traffic staging and construction time.

#LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
<b>INITIAL COST: Original</b>	\$281,310		
<b>Proposed</b>	\$33,042		
<b>Savings</b>	\$248,268		
<b>FUTURE COST: Savings</b>			
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>\$248,268</b>



## CALCULATIONS

Project: : **640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome**

Idea No. :  
Client::  
Sheet of

Turner McCall Blvd.

Original Design (Side Roads)	12 in GAB 6 in 25mm superpave 2 in 19mm superpave 1.5 in 12.5 mm superpave
Proposal E4	1.5 in 12.5mm superpave

Original Design:

$$1 \text{ ft GAB} \times 9 \text{ ft}^2/\text{yd}^2 = 9 \text{ ft}^3 \text{ GAB}$$

$$\text{GAB} = 150\#/\text{ft}^3 \quad \text{GAB} = (150\#/\text{ft}^3)(9\text{ft}^3) = 1350\#/\text{yd}^2 \text{ or } 0.675 \text{ ton}/\text{yd}^2$$

$$\text{GAB} = \$18.2/\text{ton} \quad \text{GAB} = (\$18.2/\text{ton})(0.675\text{ton}/\text{yd}^2) = \$12.285/\text{yd}^2$$

$$25\text{mm} = (660\#/\text{yd}^2) = (0.33 \text{ ton}/\text{yd}^2) @ \$62.0/\text{ton} = \$20.46/\text{yd}^2$$

$$19\text{mm} = (220\#/\text{yd}^2) = (0.11 \text{ ton}/\text{yd}^2) @ \$76/\text{ton} = \$8.36/\text{yd}^2$$

$$12.5\text{mm} = (165\#/\text{yd}^2) = (0.825 \text{ ton}/\text{yd}^2) @ \$66.31/\text{ton} = \$5.47/\text{yd}^2$$

$$\text{Total cost}/\text{yd}^2 = \$46.57/\text{yd}^2$$

$$\text{Total yds} = 6040.6 \text{ yd}^2 = \text{total area Turner McCall Blvd.}$$

$$\text{Total cost original design} = 6040.6 \text{ yd}^2 \times \$46.57/\text{yd}^2 = \$281,310$$

Proposed Design:

$$12.5\text{mm} = (165\#/\text{yd}^2) = (0.825 \text{ ton}/\text{yd}^2) @ \$66.31/\text{ton} = \$5.47/\text{yd}^2$$

$$\text{Total cost of proposed} = (5.47)(6040.6) = \$33,042$$

$$\text{Savings} = \$281,310 - \$33,042$$

$$= \$248,268$$

## DEVELOPMENT AND RECOMMENDATION PHASE

**Project: 640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome**

**Idea No.:**  
Q1

**Sheet No.:**  
of

**CREATIVE IDEA:**  
Use Area Engineer's Office instead of proposed Field Engineer's Office

Comp By: Gp. 6

Date:

**2-27-09**

Checked By:

Date:

**Original Concept:**

The current plans call for a Field Engineer's Office, Type 3.

**Proposed Change:**

It is recommended that the Field Engineer's Office be eliminated and make use of the Area Engineer's Office.

**Justification:**

The Area Engineer's Office is within 2 miles of the proposed project. Use of the current Area Office will save the estimated cost for Field Engineer's Office (\$65,859).

#LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
<b>INITIAL COST: Original</b>	\$65,859		
<b>Proposed</b>	\$0.00		
<b>Savings</b>	\$65,859		
<b>FUTURE COST: Savings</b>			
<b>TOTAL PRESENT WORTH SAVINGS</b>			<b>\$65,859</b>



## DEVELOPMENT AND RECOMMENDATION PHASE

**Project: 640540 Floyd - SR101/North 2<sup>nd</sup> Ave in Rome**

**Idea No.:**  
C3 & G1

**Sheet No.:**  
of

**CREATIVE IDEA/DESIGN SUGGESTIONS:**  
Establish profile grade along North 2<sup>nd</sup> Ave with reference to the eastside edge of pavement and recommended pavement design.

Comp By: Gp. 6

Date:

**2-27-09**

Checked By:

Date:

**Original Concept:**

It appears that the original profile grade was established for full depth pavement replacement and without reference to maintaining the eastside edge of pavement.

**Proposed Change:**

It is recommended that the design profile grade be established with reference to maintaining the eastside edge of pavement by shifting the alignment 2-ft west, and retaining the existing PCC base under the existing pavement.

**Justification:**

This establishes a design that represents the recommended pavement structure and reduces impacts to the eastside of North 2<sup>nd</sup> Ave and adjacent commercial properties.

#LIFE CYCLE COST SUMMARY	INITIAL Project Cost	FUTURE Project Cost	TOTAL Present Worth Cost
<b>INITIAL COST: Original</b>			
<b>Proposed</b>			
<b>Savings</b>			
<b>FUTURE COST: Savings</b>			
<b>TOTAL PRESENT WORTH SAVINGS</b>			

**APPENDIX**

**INFORMATION PHASE - SOURCES**  
**Approving/Authorizing Persons**

Name:	Position:	Telephone:
Gerald Ross	Chief Engineer	
Ron Wishon	Acting State Project Review Engr.	

**Personal Contacts**

Name:	Telephone:	Notes:
Jan Hilliard		Proj Manager-discuss reason why
Wes Brock		R/W-need more detail on estimate
Teresa Lannon		Pictures of project

**Documents/Abstracts**

Reference:	Notes:
Soil survey	
Existing pavement evaluation	
PFPR report	
Approved L&D	
Plans/layouts	
Concept	
Design Variance	

## INFORMATION PHASE - COST MODEL

Project Name

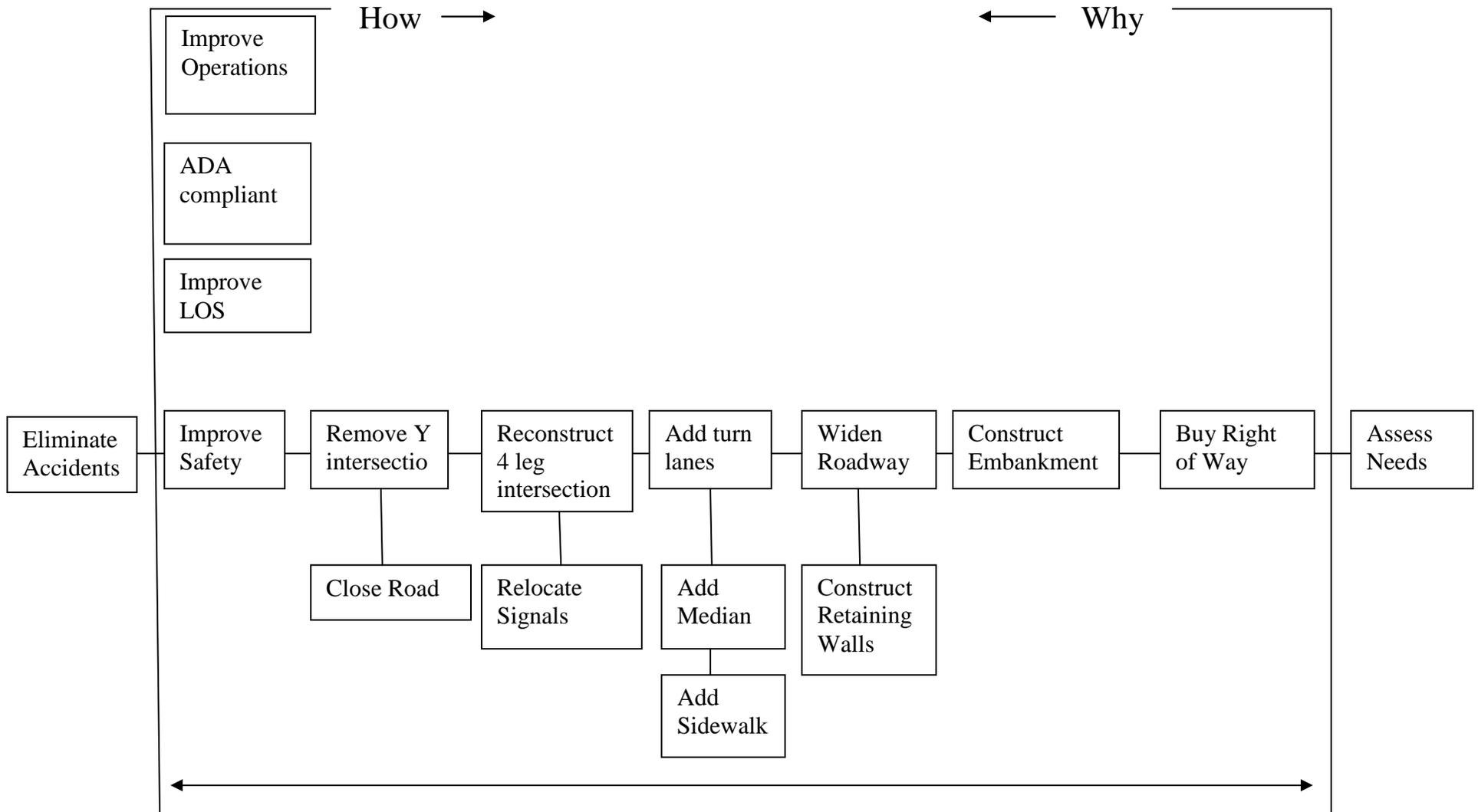
Item	Description	\$ Amount	% of Total Project
A	right of way	\$ 17,187,500.00	71.93%
B	utilities	\$ 1,665,000.00	6.97%
<b>80% Cost Line</b>			
C	paving	\$ 1,364,757.00	5.71%
D	major structures (walls)	\$ 1,361,559.00	5.70%
E	base	\$ 511,420.00	2.14%
F	storm drain pipe	\$ 279,625.00	1.17%
G	earthwork	\$ 250,000.00	1.05%
H	curb gutter	\$ 202,448.00	0.85%
I	signals	\$ 158,509.00	0.66%
J	catch basins	\$ 157,415.00	0.66%
K	erosion control	\$ 140,309.00	0.59%
L	sidewalk	\$ 124,088.00	0.52%
M	drainage drop inlet sewer mh	\$ 124,087.00	0.52%
N	concrete median	\$ 105,979.00	0.44%
O	traffic control	\$ 100,000.00	0.42%
P	signing and marking	\$ 88,897.00	0.37%
Q	field engineers office	\$ 65,859.00	0.28%
R	right of way markers	\$ 8,967.00	0.04%
	<b>TOTAL</b>	<b>\$ 23,896,419.00</b>	<b>100%</b>

## INFORMATION PHASE – FUNCTION ANALYSIS

**Project:**  
**Project Function:**

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	Worth	Comments
A	right of way	contain	project limits	\$ 17,187,500.00	\$ 15,468,750.00	reduce 10%
B	Utilities	provide	service	\$ 1,665,000.00	\$ 1,498,500.00	reduce 10%
C	Paving	supports	traffic	\$ 1,364,757.00	\$ 1,228,281.30	reduce side str
D	major structures (walls)	limit	right of way	\$ 1,361,559.00	\$ 1,388,790.18	increase if poss
E	Base	supports	pavement	\$ 511,420.00	\$ 460,278.00	reduce 10%
F	storm drain pipe	convey	water	\$ 279,625.00	\$ 265,643.75	reduce 5%
G	earthwork	form	typical section	\$ 250,000.00	\$ 255,000.00	increase if poss
H	curb gutter	convey - channels	water - traffic	\$ 202,448.00	\$ 202,448.00	no change
I	Signals	improve	operation	\$ 158,509.00	\$ 158,509.00	no change
J	catch basins	collects	water	\$ 157,415.00	\$ 154,266.70	reduce 2%
K	erosion control	prevent	sedimentation	\$ 140,309.00	\$ 140,309.00	no change
L	sidewalk	accommodate	pedestrian	\$ 124,088.00	\$ 124,088.00	no change
M	drainage drop inlet sewer mh	collect	water	\$ 124,087.00	\$ 124,087.00	no change
N	concrete median	separate	traffic	\$ 105,979.00	\$ 100,680.05	reduce 5%
O	traffic control	maintain	traffic	\$ 100,000.00	\$ 95,000.00	reduce 5%
P	signing and marking	defines	direction	\$ 88,897.00	\$ 88,897.00	no change
Q	field engineers office	provide	office space	\$ 65,859.00	0	remove

## INVESTIGATION PHASE - FAST DIAGRAM



CREATIVE PHASE Creative Idea Listing Item: R/W		JUDGMENT PHASE Idea Evaluation	
No.	CREATIVE IDEA	COMMENTS	IDEA RATING
A1	Reduce project limits to begin project at W. 6 <sup>th</sup> Street	Reduces the construction cost and r/w impacts. Negative-does not improve side road intersections	5
A2	Shift alignment to west side	Reduce R/W costs. Negative- increase wall cost and possible historic/4f impacts	8
A3	Reduce shoulder width on east side 13+40 to 39+70	Reduce R/W costs. Negative-reduction in safety	8
A4	Header curb/gravity wall at shoulder point	Reduce R/W impacts. Negative-drop off and increase costs	9
A5	Reduce improvements to West 5 <sup>th</sup> Sreet and reduce radii	Reduce R/W impacts, reduce pavement. Negative trucks run over shoulder and reduce turn capacity.	9
B1	Eliminate impacts	Less utility costs Negative-no road improvements	2
B2	Combine utilities on poles	Reduce right of way costs and makes room for other improvements. Negative-increases utility cost.	3
C1	Reduce pavement thickness	Advantage reduces initial pavement costs. Negative increases maintenance costs	7
C2	Retain existing pavement and use overlay	Reduces initial pavement costs, construction time, reduces traffic maintenance. Negatives increases maintenance cost versus full depth.	10
C3	Set profile grade to east side referencing EOP	Advantage this saves existing pavement , Negative incurs design costs (this is inherent in all design changes).	10

<b>CREATIVE PHASE</b> Creative Idea Listing Item: R/W		<b>JUDGMENT PHASE</b> Idea Evaluation	
<b>No.</b>	<b>CREATIVE IDEA</b>	<b>COMMENTS</b>	<b>IDEA RATING</b>
E1	Reduce base thickness on mainline and sideroads	Advantage this saves material costs. Negative this will increase maintenance costs	6
E2	Soil Cement	Advantage easily placement Negative needs time to cure	2
<b>E3</b>	<b>Retain existing base</b>	<b>Reduces material costs. Negative increases maintenance costs.</b>	<b>10</b>
F1	Retain existing structures	Reduces construction costs. Negative reduces flexibility, lower service life	5
<b>G1</b>	<b>Modify profile</b>	<b>Reduces earthwork. Negative increases design costs</b>	<b>10</b>
H1	Eliminate C&G at Singular Dwy	Advantage is this saves material costs. Disadvantage is the aesthetics.	6
<b>I1</b>	<b>Eliminate signal at 5<sup>th</sup> Street</b>	<b>Advantage is the material costs of a signal, improves the mainline capacity. Negative, this goes against driver expectancy, and may increase accidents.</b>	<b>7</b>
I2	Eliminate signal at Desoto Avenue	Advantage is the material costs of a signal, improves the Shorter Avenue capacity. Negative, this goes against driver expectancy, and may increase accidents.	5
I3	Use salvaged signals	Advantage saves material costs. Negative, increases maintenance costs, increase energy costs as opposed to LED lights.	2

<b>CREATIVE PHASE</b> Creative Idea Listing Item: R/W		<b>JUDGMENT PHASE</b> Idea Evaluation	
<b>No.</b>	<b>CREATIVE IDEA</b>	<b>COMMENTS</b>	<b>IDEA RATING</b>
L1	Move sidewalk to back of curb	Advantage increases room for utilities. Negative places people closer to traffic (reduces safety)	9
L2	Eliminate sidewalks on side street	Advantage reduces material costs. Negative this may violate ADA guidelines	2
Q1	Use Area office as Engineers Office 2.5 miles away	Advantage this saves costs of engineering field office. Negative this may reduce customer service and response, also room may not be available, quality control	8
Q2	Use vacant space as Field Engineers Office	Advantage saves trailer costs, closer to project improving customer service response and quality control. Negative, availability, rent expenses	2