# VALUE ENGINEERING REPORT

SR 10 Loop / Atlanta Highway Interchange
NH-003-3(53), PI No 122890
Clarke County

August 10, 2007

**OWNER AND DESIGN TEAM:**

Georgia Department of Transportation
No.2 Capitol Square
Atlanta, GA 30334

**VALUE ENGINEERING CONSULTANT:**

MACTEC Engineering and Consulting, Inc.
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Kennesaw, GA 30144

# TABLE OF CONTENTS

SR 10 Loop / Atlanta Highway Interchange

# EXECUTIVE SUMMARY

# Executive Summary

## VALUE ENGINEERING STUDY

### SR 10 Loop / Atlanta Highway Interchange
### July 24-27, 2007

## Introduction

The SR 10 Loop / Atlanta Highway Interchange is regionally significant in that it provides access to SR 10 Loop from the Atlanta Highway which servers a major regional shopping complex and associated commercial interests. This project consists of making improvements to the SR 10 Loop / Atlanta Highway Interchange in Athens, Georgia. It includes the construction of a new loop ramp from Atlanta Highway westbound to SR 10 Loop southbound and a long deceleration lane on the existing SR 10 Loop southbound ramp to Atlanta Highway. The project also includes widening Atlanta Highway by four lanes, replacing the dual bridges over SR 10 Loop, adding or lengthening turn lanes, lengthening acceleration / deceleration lanes on SR 10 Loop, and improvements to the Huntington Road and Jennings Mill Road intersections with Atlanta Highway.

Accident frequency on Atlanta Highway indicates a significant problem within the limits of the proposed project. Major contract items include bridge construction, ramp construction, roadway embankment, pavement, concrete barrier, signals, and drainage facilities.

## Considerations

The project being evaluated under this VE study has an estimate cost (including ROW, utilities, E&C, and inflation) of $36.8 million. Right-of-way is the highest cost project item and acquisition is scheduled to start in 2007 with construction following in 2010. The State is preparing a categorical exclusion document for the project.

## Results Obtained

The VE team focused their efforts on the high cost items of the project. The study generated 42 ideas with 25 being identified for additional evaluation as possible recommendations or design suggestions. The VE team developed ten independent recommendations and three alternative recommendations that if implemented have the potential to reduce the project cost by approximately $3,125,000. The VE team also developed five design suggestions for further consideration by the State. A detailed write-up of each recommendation and design suggestion is contained in the center portion of this report. A summary of the recommendations follows.

# Recommendation Highlights

**Idea A-2, To investigate a Developer proposal to connect the southbound SR 10 off ramp to Huntington Court in-lieu-of the current Huntington Road slip ramp connector.**

The current design provides for direct access from the SR 10 southbound off ramp to Huntington Road North via a separate slip ramp off the SR 10 southbound exit ramp. The access ramp extends west to Huntington Road as a separate road on the north side of Atlanta Highway.

It is recommended that consideration be given to a developer's proposal to construct the proposed Huntington Road slip ramp through his property and connect directly to Huntington Court. If the developer's proposed direct connection to Huntington Court is feasible, it would significantly reduce the length of the currently design slip ramp. This concept would reduce the cost for the Huntington Road slip ramp because of its shorter length and the probability the developer would pay for much of his recommended connection. This concept would also reduce ROW needs on the north side of Atlanta Highway.

**The total potential cost savings if accepted is $115,000.**

**Idea A-7, To change the project's 16-foot urban shoulder to a 10-foot urban shoulder.**

The current design provides for the construction of a 16-foot wide urban shoulder. The 16-foot shoulder width includes a 2.5-foot curb and gutter, a 6-foot grass buffer area between the curb and the sidewalk, a 5-foot sidewalk, and a 2.5-foot grass area outside the sidewalk.

It is recommended that the 16-foot urban shoulder width be reduced to 10 feet by reducing the width of the 6-foot grass buffer area to 2 feet and the 2.5-foot grass area outside the sidewalk to 6 inches. ROW is the highest cost item on this project. Reducing the urban shoulder width 6 feet would reduce the amount of new ROW required to construct the project. This change would reduce the cost of the project and reduce its impact on the community.

**The total potential cost savings if accepted is $204,000.**

**A-7A, To eliminate the 2.5-foot grass area between the outside edge of the sidewalk and the inside edge of the retaining walls.**

The current design provides for a 2.5-foot grass buffer area between the outside edge of the sidewalk and the inside edge of the retaining walls along Atlanta Highway and Huntington Road.

It is recommended that the 2.5-foot grass buffer area between the edge of the sidewalk and the inside edge of the retaining wall be eliminated. ROW is the highest cost item on this project. This 2.5-foot reduction would result in less ROW being required along the businesses adjacent to the mall. It would result in a potential cost savings to the project and reduce the project's impact on local businesses.

**The total potential cost savings if accepted is $21,000.**

**Idea B-7, To reduce the radius of the curve for the eastbound right-turn movement from Atlanta Highway to the SR 10 northbound on ramp.**

The current design uses a 134-foot radius curve for the eastbound right turn movement from Atlanta Highway to the SR 10 northbound on ramp.

It is recommended that the on-ramp location be shifted slightly to the west and use a 100-foot radius curve. Shifting the ramp location to the west and changing to a 100-foot radius curve will provide greater separation between the ramp gore and the right-in / right-out driveway on the Logans parcel. This change would improve safety. It will also reduce the amount of ROW required from the Logans parcel. This change would reduce the project's impact on this parcel and result in a potential cost savings.

**The total potential cost savings if accepted is $33,000.**

**Idea B-7A, To close the existing access driveway at the Logans Roadhouse parcel.**

The current design proposes to convert the existing full access driveway into a right-in / right-out driveway located just east of the beginning of the SR 10 northbound 10 on ramp.

It is recommended that Logans driveway be closed and that new access be provided through a wider "common driveway" that would serve both the Logans' property and the adjacent property. Maintaining an access driveway anywhere along the Logans' property line will have a negative impact on the right turn movement for the SR 10 northbound on ramp. In addition, maintaining any Logans' driveway could lead to exiting vehicles attempting to cross Atlanta Highway (four lanes) to make a U-turn at the median opening in order to travel eastbound, or for vehicles to drive the wrong way on Atlanta Highway and cross at the Jennings Mill Road opening. Constructing a "common driveway" directly opposite the relocated Jennings Mill Road entrance will allow for both right and left turns since the intersection will be signalized. This concept would require ROW access adjustments and increased project cost, but its vastly improved safety implications warrant making the change.

**The total potential cost increase if accepted is $54,000.**

**Idea B-10, To eliminate the proposed 4-foot bike lane on both sides of Atlanta Highway.**

The current design includes the construction of a 4-foot bike lane along the outside lane on both sides of US 78 (Atlanta Highway).

It is recommended that the 4-foot bike lane be eliminated for safety reasons. Including a 4-foot bike lane on both sides of the 8-lane Atlanta Highway presents a safety hazard due to the high number of travel lanes, the high volume right-turn lanes. and the existing and proposed heavy traffic volumes. Constructing bike lanes on the outside of both sides or the 8-lane facility places them in conflict with heavily traveled right turn lanes for the on and off ramps of the SR 10 / Atlantic Highway Interchange and numerous commercial driveways as well as intersecting streets. Eliminating the bike lanes would reduce the overall pavement section width resulting in a

significant cost savings and also the reduction in the amount of new ROW required to construct the project.

**The total potential cost savings if accepted is $473,000.**

**Idea B-11, To reduce the width of the 12-foot travel lanes on Atlanta Highway.**

The current design proposes to use 12-foot travel lanes on Atlanta Highway.

It is recommended that consideration be given to reducing the 12-foot travel lanes to 11 feet. ROW is the highest cost item on this project. Reducing the overall pavement section width would result in a potential pavement cost savings and also reduce the amount of new ROW required to construct the project. Using 11-foot lane widths would help keep the speeds down on Atlanta Highway and should not impact the level of service for the project.

**The total potential cost savings if accepted is $497,000.**

**Idea B-12, To close the Atlanta Highway median opening at Station 68+75 and provide Type B median crossovers at Timothy Road and Jennings Mill Road.**

The current design maintains the existing median opening at station 68+75. It also uses Type 'A' median crossovers west of Timothy Road (to match the existing Type 'A' east crossover) and at Jennings Mill Road.

It is recommended that the median opening at station 68+75 be closed and the impacted access driveways be converted to right-in / right-out access only. In addition, the opposing left turn lanes at the Timothy Road Intersection and the Jennings Mill Road median crossover should be converted to Type 'B' median crossovers. Retaining the median opening at Sta. 68+75 presents a safety hazard because of its close proximity to the Timothy Road intersection. Closing the median opening would allowed for the construction of a longer, more adequate left turn lane for Timothy Road. The wide median at the Timothy Road and Jennings Mill Road intersections would allow for opposing left turn lanes on Atlanta Highway to be aligned across from each other (Type 'B' crossover) for better sight distance for turning vehicles. This change would add cost to the project and may require additional ROW negations due to the need to change local access, but would significantly improve safety.

**The total potential cost increase if accepted is $186,000.**

**Idea F-1, To minimize the amount of urban curb and gutter shoulder on Jennings Mill Road.**

The current design proposes to construct concrete curb and gutter along the entire relocated Jennings Mill Road section.

It is recommended that the concrete curb and gutter be eliminated from the southern portion of Jennings Mill Road. The existing Jennings Mill Road has a rural typical section. Maintaining

the rural section on the southern portion of the relocated Jennings Mill Road would result in a cost savings to the project and reduce construction time. It would also maintain a rural roadway section through the undeveloped part of the cemetery.

**The total potential cost savings if accepted is $177,000**

**Idea C-2, To shorten the new bridge spans and construct "U" shaped MSE walls at the abutment ends.**

The current bridge layout consists of a two-span (2 @ 150'-0") structure with Bulb-Tee 74" PSC beams. The structure included a median pier and side slopes with end bents. The construction of the median pier will involve significant traffic control and shifting of lanes on SR 10.

It is recommended the bridge layout be changed to a two-span (2 @ 93'-0") structure with Type III AASHTO PSC beams and two "U" shaped MSE walls at the abutment ends. In addition, the bridge width should be reduced 8 feet by eliminating the Bike Lanes on both sides. This concept would improve constructability through the use of MSE wall construction at the abutments, the use of smaller Type III beams, a reduction in the amount of embankment needed for the structure, and the reduction in bridge width. Removing the bike lanes from the dual 5-lane structures will improve safety. The current design places the bike lanes in direct conflict with merging traffic trying to enter the right turn lanes for the SR 10 loop ramps. This concept would result in a reduction in construction time and result in significant cost savings to the project.

**The total potential cost savings if accepted is $1,845,000.**

**Idea C-2A, Alternative to Idea C-2. To construct a longer single span bridge with "U" shaped MSE walls at the abutment ends.**

The current bridge layout consists of a two-span (2 @ 150'-0") structure with Bulb-Tee 74" PSC beams. The structure included a median pier and side slopes with end bents. The construction of the median pier will involve significant traffic control and shifting of lanes on SR 10.

This alternative recommendation would change the bridge layout to a one-span (165'-0") structure with 74" Bulb-Tee PSC beams and two "U" shaped MSE walls. In addition, the bridge width would be reduced 8 feet by eliminating the Bike Lanes on both sides. This concept would not require the construction of a median pier because the 74" Bulb-Tee beams can span 165'-0" thereby eliminating the need for a median pier. This arrangement results in savings in traffic control and signage since there is no need for a median pier. Removing the bike lanes from the dual 5-lane structures will improve safety. The current design places the bike lanes in direct conflict with merging traffic trying to enter the right turn lanes for the SR 10 loop ramps. This concept would result in cost savings to the project, however, working with the larger beam lengths may present constructability issues. This concept would also place the abutments closer to the edge of shoulder than alternate C-2.

**The total potential cost savings if accepted is $1,376,000.**

**Idea C-2B, Alternative to Idea C-2. To construct a four span bridge across SR 10.**

The current bridge layout consists of a two-span (2 @ 150'-0") structure with Bulb-Tee 74" PSC beams. The structure included a median pier and side slopes with end bents. The construction of the median pier will involve significant traffic control and shifting of lanes on SR 10.

This alternative recommendation would change the bridge layout to a four-span (2 @ 57 feet and 2 @ 93 feet) structure with Type III and Type II AASHTO PSC beams. In addition, the bridge width would be reduced 8 feet by eliminating the Bike Lanes on both sides. This bridge concept would improve constructability through the use of smaller Type III and Type II beams, a reduction in the amount of embankment needed for the structure, and the reduction in bridge width. Removing the bike lanes from the dual 5-lane structures will improve safety. The current design places the bike lanes in direct conflict with merging traffic trying to enter the right turn lanes for the SR 10 loop ramps. This concept would replace the MSE wall abutment configuration suggested in Alternative 2-C above with simple spans and result in two additional bridge joints. It would result in a cost savings to the project.

**The total potential cost savings if accepted is $1,231,000.**

**Idea C-2C, Alternative to Idea C-2. To construct a three span bridge across SR 10.**

The current bridge layout consists of a two-span (2 @ 150'-0") structure with Bulb-Tee 74" PSC beams. The structure included a median pier and side slopes with end bents. The construction of the median pier will involve significant traffic control and shifting of lanes on SR 10.

This alternative recommendation would change the bridge layout to a three-span (2 @ 67'-6" and 1 @ 165 feet) structure with 74" Bulb-Tee beams and Type II AASHTO PSC beams. In addition, the bridge width would be reduced 8 feet by eliminating the Bike Lanes on both sides. This concept would not require the construction of a median pier because the 74" Bulb-Tee beams can span 165'-0" thereby eliminating the need for a median pier. This arrangement results in savings in traffic control and signage since there is no need for median pier. Removing the bike lanes from the dual 5-lane structures will improve safety. The current design places the bike lanes in direct conflict with merging traffic trying to enter the right turn lanes for the SR 10 loop ramps. This concept would result in cost savings to the project, however, working with the larger length beams may present constructability issues. This concept would place the abutments closer to the edge of shoulder than Alternate C-2.

**The total potential cost savings if accepted is $675,000.**

# Design Suggestions

The VE team also developed various Design Suggestions for consideration during the final design of the project. The suggestions are:

- To eliminate the short in-and-out steps in the proposed ROW lines and instead use straight lines.
- The verify the design to insure the superelevation on Atlanta Highway meets the standard road crown being carried across the dual bridges.
- To review the location of all drainage structures to insure they are all within the proposed project ROW.
- To modify the concrete barrier wall end treatments in the two loop ramp to make them parallel to the outside ramps (not the loop ramp) thereby eliminating the need for the beam guard rail ties at the end.
- To eliminate the parapet and pipe handrail placed over the retaining walls.

## SR 10 Loop / Atlanta Highway Interchange
## SUMMARY OF POTENTIAL COST SAVINGS

| ITEM No. | CREATIVE IDEA DESCRIPTION | ORIGINAL INITIAL COST | PROPOSED INITIAL COST | INITIAL COST SAVINGS | FUTURE SAVINGS | TOTAL LIFE CYCLE SAVINGS | SAVINGS POTENTIAL |
|---|---|---|---|---|---|---|---|
| | **Recommendations** | | | | | | |
| A-2 | To Investigate a Developer Proposal to connect the Southbound off ramp to Huntington Court | $110,000 | $0 | $115,000 | N/A | $115,000 | 50% |
| A-7 | To change to Urban Shoulder Width from 16 Feet to 10 Feet | $204,000 | $0 | $204,000 | N/A | $204,000 | 100% |
| A-7A | To Modify the 2 ½ -Foot Grass Area between the Sidewalk & Retaining Wall | $21,000 | $0 | $21,000 | N/A | $21,000 | 100% |
| B-7 | To Reduce the Turn Radius for the NB On Ramp to SR 10 Loop | $72,000 | $39,000 | $33,000 | N/A | $33,000 | 100% |
| B-7A | To Close Existing Driveway at Logans Parcel | $0 | $54,000 | ($54,000) | N/A | ($54,000) | 100% |
| B-10 | To Eliminate the 4-foot Bike Lane | $473,000 | $0 | $473,000 | N/A | $473,000 | 100% |
| B-11 | To Reduce the Atlanta Highway traffic lanes to 11 Feet | $4,498,000 | $4,001,000 | $497,000 | N/A | $497,000 | 100% |
| B-12 | To Close Median Opening @ Station 68+75 and Provide Type B Median Crossovers at Timothy Road and Jennings Mill Road | $0 | ($186,000) | ($186,000) | N/A | ($186,000) | 100% |

## SR 10 Loop / Atlanta Highway Interchange
## SUMMARY OF POTENTIAL COST SAVINGS

| ITEM No. | CREATIVE IDEA DESCRIPTION | ORIGINAL INITIAL COST | PROPOSED INITIAL COST | INITIAL COST SAVINGS | FUTURE SAVINGS | TOTAL LIFE CYCLE SAVINGS | SAVINGS POTENTIAL |
|---|---|---|---|---|---|---|---|
| F-1 | To Minimize Curb & Gutter Section on Jennings Mill Road | $177,000 | $0 | $177,000 | Small | $177,000 | 100% |
| C-2 | To Use MSE Walls at the Abutments and Shorten the Bridge Spans | $4,262,000 | $2,417,000 | $1,845,000 | N/A | $1,845,000 | 100% |
| | | **Net Total Potential Savings** | | | | **$3,125,000** | 100% |
| | **Alternative Bridge Concepts to C-2** | | | | | | |
| C-2A | **Alternative to C-2** To Use Single Span and MSE Walls | $4,262,000 | $2,886,000 | $1,376,000 | N/A | $1,376,000 | 100% |
| C-2B | **Alternative to C-2** To Use 4 Spans in-lieu-of MSE walls | $4,262,000 | $3,031,000 | $1,231,000 | N/A | $1,231,000 | 100% |
| C-2C | **Alternative to C-2** To Use 3-Spans in-lieu-of MSE Walls | $4,262,000 | $3,587,000 | $675,000 | N/A | $675,000 | 100% |
| | | | | | | | |
| | **Design Suggestions** | | | | | | |
| A-1 | To Eliminate short in-and-out Steps in the Proposed ROW Lines | N/A | N/A | N/A | N/A | N/A | N/A |
| B-2 | To Verify Superelevation match at Bridge | N/A | N/A | N/A | N/A | N/A | N/A |

## SR 10 Loop / Atlanta Highway Interchange
## SUMMARY OF POTENTIAL COST SAVINGS

| ITEM No. | CREATIVE IDEA DESCRIPTION | ORIGINAL INITIAL COST | PROPOSED INITIAL COST | INITIAL COST SAVINGS | FUTURE SAVINGS | TOTAL LIFE CYCLE SAVINGS | SAVINGS POTENTIAL |
|---|---|---|---|---|---|---|---|
| D-1 | To Review Drainage Structures locations and make sure they are within ROW | N/A | N/A | N/A | N/A | N/A | N/A |
| E-1 | To Modify the Concrete Barrier End Treatments on the two Loop Ramps | N/A | N/A | N/A | N/A | N/A | N/A |
| L-1, 2 | To Eliminate Parapet & Pipe Handrail over Retaining Walls | N/A | N/A | N/A | N/A | N/A | N/A |
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| | **Note:** Savings Potential represents how much of an individual item (exclusive of any overlapping dependent item) can be implemented. | | | | | | |
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# STUDY IDENTIFICATION

# Study Identification

| | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | **Date: July 24-27, 2007** |
| **Project Location: Athens, Georgia** | |

## VE Team Members

| Name: | Discipline: | Organization: | Telephone: |
|---|---|---|---|
| Keith Borkenhagen | VE Team Facilitator | MACTEC | 623-556-1875 |
| Alex Wiley | Roadway Design | MACTEC | 770-421-3481 |
| Lori Kennedy | Construction | Kennedy Engineering and Associates Group, LLC | 678-904-8591 |
| Aruna Sastry | Structural | Sastry and Associates | 678-366-9375 |

**Project Description**

The SR 10 Loop / Atlanta Highway Interchange is regionally significant in that it provides access to SR 10 Loop from the Atlanta Highway which serves a major regional shopping complex and associated commercial interests. This project consists of making improvements to the SR 10 Loop / Atlanta Highway Interchange in Athens, Georgia. It includes the construction of a new loop ramp from Atlanta Highway westbound to SR 10 Loop southbound and a longer deceleration lane on the existing ramp from SR 10 Loop southbound to Atlanta Highway. The project also includes widening Atlanta Highway by four lanes, replacing the dual bridges over SR 10 Loop, adding or lengthening turn lanes, lengthening acceleration / deceleration lanes on SR 10 Loop, and improvements to the Huntington Road and Jennings Mill Road intersections with Atlanta Highway.

Accident frequency on Atlanta Highway indicates a significant problem within the limits of the proposed project. The project's estimated cost, including ROW, utilities, E&C, and inflation is $36.8 million. The project is scheduled for construction in 2010. Major contract items include bridge construction, ramp construction, roadway embankment, pavement, concrete barrier, signals, and drainage facilities.

**Project Constraints**

The following constraints were identified and discussed:

- The location of the Jennings Mill Road relocation is fixed in the area where it passes through the cemetery. Agreements have been reached with the property owner on the proposed location.

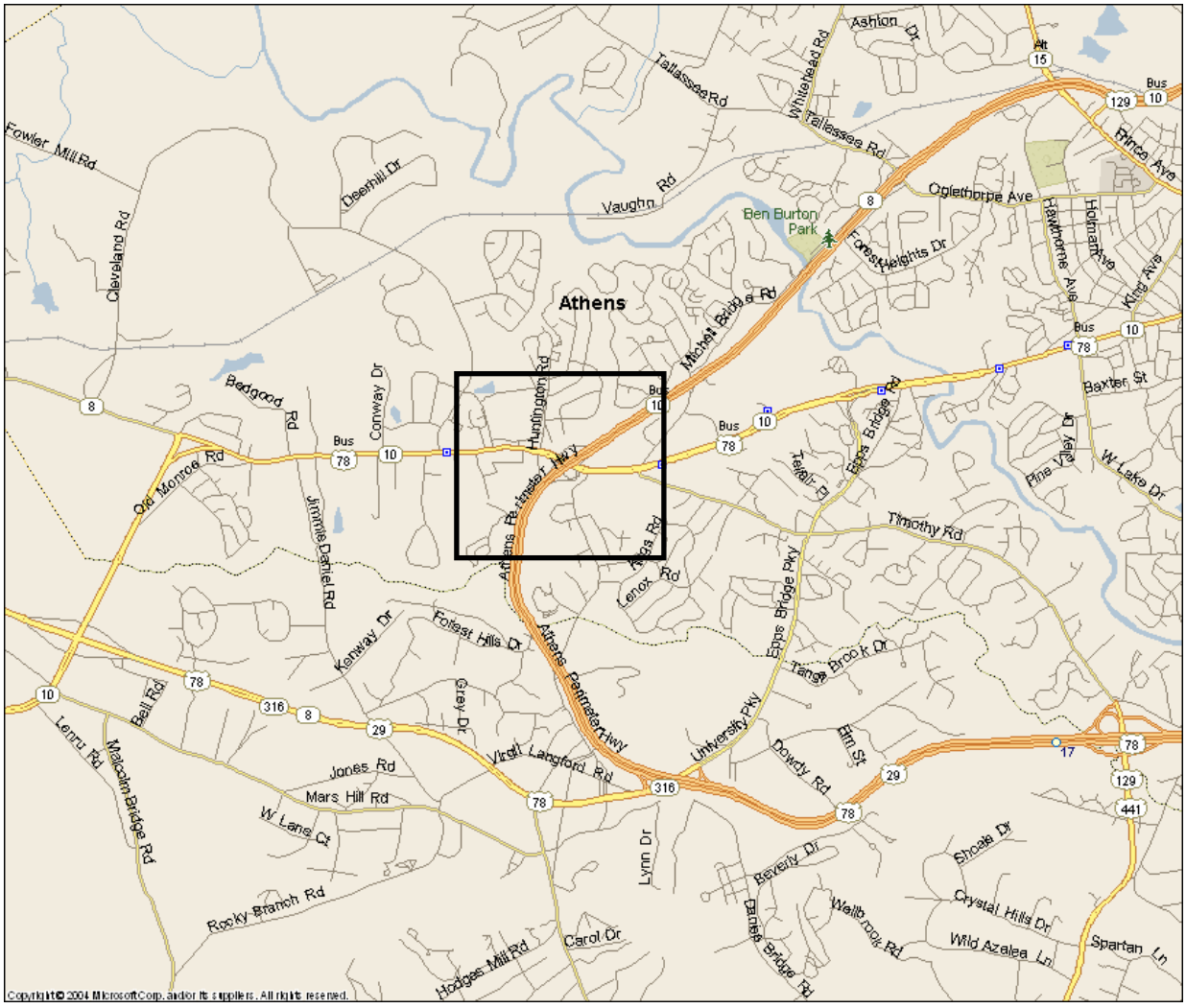
- The vertical clearance for the new Atlanta Highway bridges is set at 17 feet.
- ROW is considered to be fixed. No changes should be made that require additional ROW. ROW is extremely tight on the west end of the project (south of the mall).
- No changes should be made to the project that impact the creek north of the SR 10 southbound off ramp.

## Project Briefing

Prior to beginning work, the VE team was briefed on the status of the project by Shawn Fleet, P.E. and Allen Krivsky, P.E. of Heath & Lineback Engineers, Inc. The following items were discussed:

- The project received concept approval in 2002. The project was moved to the preliminary design phase in 2006. ROW is scheduled to be purchased starting in 2007 and the project is scheduled for letting in early 2010.
- The project impacts 34 parcels and ROW is estimated to cost $11.5 million.
- The project will up-grade Atlanta Highway to an eight-lane arterial street and also add a loop ramp for southbound SR 10 traffic from Atlanta Highway.
- The existing Atlanta Highway bridges crossing SR 10 will be replaced with new dual 150' x 68' structures. There are clearance problems with the existing bridges. The new bridges will be raised 3 feet to provide adequate clearance.
- Maintenance reports on the existing bridges indicate they must be replaced. The bridges were originally constructed in 1964 and widened in 1978.
- The project will add a new loop ramp for westbound traffic to go south on SR 10. Additional acceleration / deceleration lanes will be added to SR 10.
- The County has requested that bike lanes be added to Atlanta Highway. There are no existing bike lanes through the area.
- The project requires the relocation of Jennings Mill Road through a cemetery prior to its tie-in with Atlanta Highway.
- There are no sidewalks on the existing project, however, sidewalks will be provided in the new project.
- The project is being process under a Category Exclusion.
- There are no design exceptions on the proposed project.
- Signals at all existing intersections will be up-dated and new signals will be added at the intersection of relocated Jennings Mill Road.

# Project Sketch Map



# RECOMMENDATIONS

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** **A-2** | **Sheet No.:** 1 of 4 | **CREATIVE IDEA:** Investigate Developer Proposal for Ramp 4 (SR 10 SB Exit) to Huntington Court |
| Comp By: LGK Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

The current design provides for direct access from the SR 10 southbound off ramp to Huntington Road North via a separate slip ramp off the SR 10 southbound exit ramp. The access ramp extends west to Huntington Road as a separate road on the north side of Atlanta Highway.

**Proposed Change:**

It is recommended that consideration be given to a developer's proposal to construct the Huntington Road slip ramp through his property and connect it directly to Huntington Court.

**Justification:**

If the developer's proposed direct connection to Huntington Court is feasible, it significantly reduces the length of the currently design slip ramp. This concept would reduce the cost for the proposed Huntington Road / Slip Ramp due to its shorter length and the probability that the developer would probably be willing to pay for much of his recommended connection. This concept would also reduce ROW needs on the north side of Atlanta Highway.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $115,000 | | |
| **- Proposed** | $0 | | |
| **- Savings** | $115,000 | | $115,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$115,000** |

| SKETCH | |
|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | ITEM N$^{o}$ : A-2<br>CLIENT: GDOT<br>Sheet 2 of 4 |

| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | | | | | IDEA No.: A-2<br>CLIENT: GDOT<br>Sheet 3 of 4 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| | | | | | | | |
| Huntington Road Slip Ramp - | | | | | | | |
| AC Pavement/Base | SY | 1,333.33 | $75.00 | $100,000 | | | $0 |
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| **SUBTOTAL** | | | | $100,000 | | | $0 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $15,000 | | | $0 |
| **TOTAL** | | | | $115,000 | | | $0 |
| **TOTAL ROUNDED** | | | | **$115,000** | | | **$0** |

| CALCULATIONS | |
|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | ITEM N$^{o}$ : A-2<br>CLIENT: GDOT<br>Sheet 4 of 4 |

Huntington Road Slip Ramp –

Sta. 251+00 – 252+00 = 150 feet
Sta. 45+00 – 41+00 = 400 feet
Sta. 134+00 – 129+50 = 450 feet

Total length of ramp that would be eliminated = 1,000 feet

1,000 feet x 12 foot lane = 12,000 sq. ft. = 1,333.33 sq. yd.

Asphalt/Base Savings = $75.00 / SY

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** A-7 | **Sheet No.:** 1 of 4 | **CREATIVE IDEA:** To Change the 16-foot Urban Shoulder Width to 10 feet |
| Comp By: A.W. Date: 07/25/07 Checked By: K.B. Date: 07/25/07 | | |

**Original Concept:**

The current design provides for the construction of a 16-foot wide urban shoulder along Atlanta Highway and Huntington Road. The 16-foot shoulder width (from edge of pavement to the shoulder break) includes a 2.5-foot curb and gutter, a 6-foot grass buffer area between the back of curb and the sidewalk, a 5-foot sidewalk, and a 2.5-foot grass area outside the sidewalk.

**Proposed Change:**

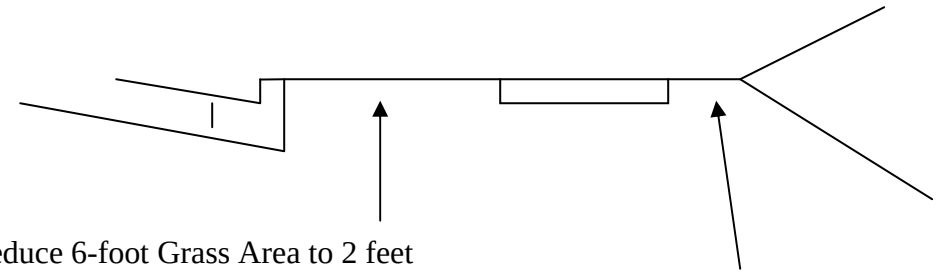
It is recommended that the 16-foot urban shoulder width be reduced to 10 feet by reducing the width of the 6-foot grass buffer area to 2 feet and the 2.5-foot grass area outside the sidewalk to 6 inches.

**Justification:**

ROW is the highest cost item on this project. Narrowing the shoulder width 6 feet on Atlanta Highway would reduce the amount of new ROW required to construct the project. Accepting this change would reduce the cost of the project and reduce its impact on the community. There will also be additional savings realized by the reduced earthwork, topsoiling and grassing of the narrower shoulder.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $204,000 | | |
| **- Proposed** | $0 | | |
| **- Savings** | $204,000 | | $204,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$204,000** |

| SKETCH | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : A-7<br>CLIENT: GDOT<br>Sheet 2 of 3 |



Reduce 6-foot Grass Area to 2 feet

Reduce 2.5-foot area to 6 inches

| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | | | | IDEA No.: A-7<br>CLIENT: GDOT<br>Sheet 3 of 4 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| | | | | | | | |
| Atlanta Highway – 6 ft reduction | | | | | | | |
| Left of Sta. 28+00 to 33+30 | SF | 3,180 | $6.50 | $20,670 | | | $0 |
| Right of Sta. 25+00 to 34+40 | SF | 5,640 | $6.50 | $36,660 | | | $0 |
| Left of Sta. 41+40 to 44+00 | SF | 1,560 | $6.50 | $10,140 | | | $0 |
| Left of Sta. 55+50 to 60+50 | SF | 3,000 | $6.50 | $19,500 | | | $0 |
| | | | | | | | |
| Hunting Road – 6-ft reduction | | | | | | | |
| Left Sta. 200+70 to 208+20 | SF | 4,500 | $6.50 | $29,250 | | | $0 |
| Right Sta. 202+40 to 207+65 | SF | 3,150 | $6.50 | $20,475 | | | $0 |
| Left Sta. 251+40 to 255+25 | SF | 2,310 | $6.50 | $15,015 | | | $0 |
| Right Sta. 253+75 to 255+60 | SF | 1,110 | $6.50 | $7,215 | | | $0 |
| Left Sta. 257+00 to 259+80 | SF | 1,680 | $6.50 | $10,920 | | | $0 |
| Right Sta. 256+20 to 258+00 | SF | 1,080 | $6.50 | $7,020 | | | $0 |
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| **SUBTOTAL** | | | | $176,865 | | | $0 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $26,530 | | | $0 |
| **TOTAL** | | | | $203,395 | | | $0 |
| **TOTAL ROUNDED** | | | | **$204,000** | | | **$0** |

| CALCULATIONS | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : A-7<br>CLIENT: GDOT<br>Sheet 4 of 4 |

Atlanta Highway

| | |
|---|---|
| Left of Sta. 28+00 to 33+30 | 530 ft x 6 ft = 3,180 |
| Right of Sta. 25+00 to 34+40 | 940 ft x 6 ft = 5,640 |
| Left of Sta. 41+40 to 44+00 | 260 ft x 6 ft = 1,560 |
| Left of Sta. 55+50 to 60+50 | 500 ft x 6 ft = 3,000 |
| Sub total | 2,230 ft |

Huntington Road

| | |
|---|---|
| Left Sta. 200+70 to 208+20 | 750 ft x 6 ft = 4,500 |
| Right Sta. 202+40 to 207+65 | 525 ft x 6 ft = 3,150 |
| Left Sta. 251+40 to 255+25 | 385 ft x 6 ft = 2,310 |
| Right Sta. 253+75 to 255+60 | 185 ft x 6 ft = 1,110 |
| Left Sta. 257+00 to 259+80 | 280 ft x 6 ft = 1,680 |
| Right Sta. 256+20 to 258+00 | 180 ft x 6 ft = 1,080 |
| Sub total | 2,305 ft |

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** A-7A | **Sheet No.:** 1 of 3 | **CREATIVE IDEA:** To Modify the area between the Retaining Walls and the Sidewalks |
| Comp By: A.W. Date: 07/25/07 Checked By: K.B. Date: 07/25/07 | | |

**Original Concept:**

The current design provides for a 2.5-foot grass buffer area between the outside edge of the sidewalk and the inside edge of the retaining walls along Atlanta Highway and Huntington Road.

**Proposed Change:**

It is recommended that the 2.5-foot grass buffer area between the edge of the sidewalk and the inside edge of the retaining wall be eliminated.

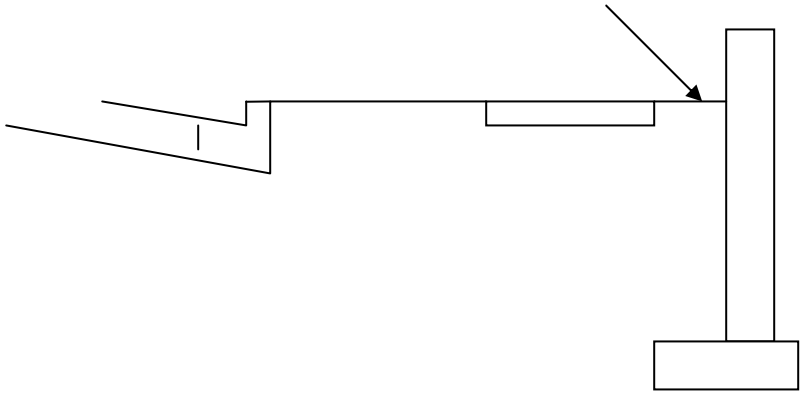
**Justification:**

ROW is the highest cost item on this project. This 2.5-foot reduction would result in less ROW being required to construct the project along the businesses adjacent to the mall. It would result in a potential cost savings to the project and reduce the project's impact on local businesses.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $21,000 | | |
| **- Proposed** | $0 | | |
| **- Savings** | $21,000 | | $21,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$21,000** |

| SKETCH | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : A-7A<br>CLIENT: GDOT<br>Sheet 2 of 3 |

Eliminate Grass Area Between Sidewalk & Wall



| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | | | | IDEA No.: A-7A<br>CLIENT: GDOT<br>Sheet 3 of 3 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| | | | | | | | |
| Atlanta Highway | | | | | | | |
| Left of Sta. 28+50 to 33+30 | SF | 1,200 | $6.50 | $7,440 | | | $0 |
| | | | | | | | |
| Huntington Road | | | | | | | |
| Left of Sta. 203+10 to 205+50 | SF | 600 | $6.50 | $3,900 | | | $0 |
| Left of Sta. 206+70 to 208+10 | SF | 350 | $6.50 | $2,275 | | | $0 |
| Left of Sta. 251+40 to 254+20 | SF | 700 | $6.50 | $4,550 | | | $0 |
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| **SUBTOTAL** | | | | $18,525 | | | $0 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $2,789 | | | $0 |
| **TOTAL** | | | | $21,314 | | | $0 |
| **TOTAL ROUNDED** | | | | **$21,000** | | | **$0** |

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** B-7 | **Sheet No.:** 1 of 3 | **CREATIVE IDEA:** To reduce the turn radius on Ramp 6 at Atlanta Highway |
| Comp By: A.W. Date: 07/26/07 Checked By: K.B. Date: 07/26/07 | | |

**Original Concept:**

The current concept proposes to use a 134-foot radius curve for the eastbound right turn movement from Atlanta Highway into the SR 10 northbound on ramp.

**Proposed Change:**

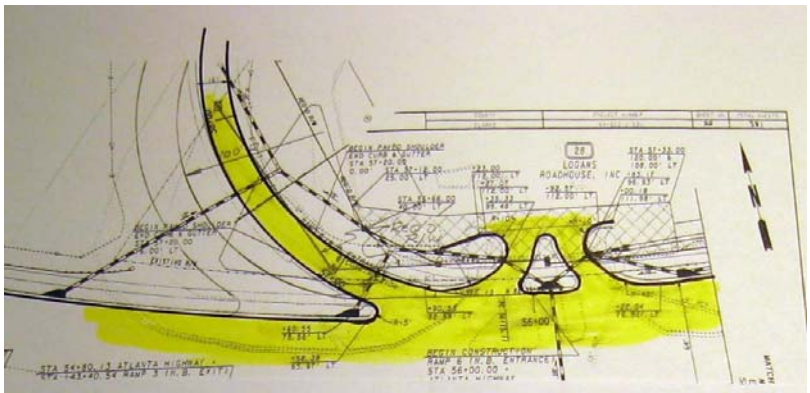
It is recommended that the on ramp location be shifted slightly to the west and use a 100-foot radius curve.

**Justification:**

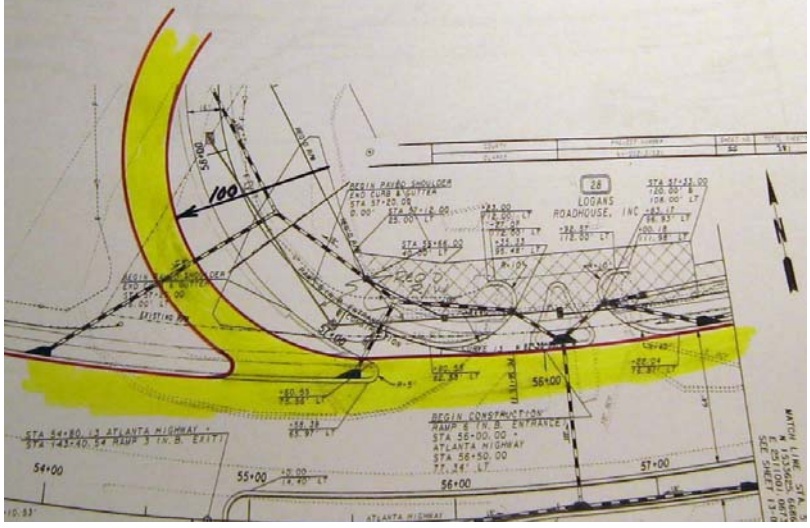
Shifting the ramp location to the west and changing to a 100-foot radius curve will provide greater separation between the ramp gore and the right-in / right-out driveway on the Logans' parcel and improve safety. It will also reduce the amount of ROW required from the parcel. This concept will reduce the project's impact on the Logans parcel and result in a potential cost savings.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $72,000 | | |
| **- Proposed** | $39,000 | | |
| **- Savings** | $33,000 | | $33,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$33,000** |

| SKETCH | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : B-12<br>CLIENT: GDOT<br>Sheet 2 of 3 |



**CURRENT**



**RECOMMENDED**

| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | | | | IDEA No.: B-7<br>CLIENT: GDOT<br>Sheet 3 of 3 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| | | | | | | | |
| ROW Reduction | | | | | | | |
| 125 ft x 30 ft | SF | 3,750 | $6.50 | $24,375 | | | $0 |
| | | | | | | | |
| Pavement Reduction | | | | | | | |
| Current Ramp = 290 ft x 16 ft | SY | 515 | $75.00 | $38,625 | | | |
| Proposed Ramp = 200 ft x 16 ft | SY | | | | 356 | $75.00 | $26,700 |
| Rt Turn Lane Extension = 75 ft | SY | | | | 100 | $75.00 | $7,500 |
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| **SUBTOTAL** | | | | $63,000 | | | $34,200 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $9,450 | | | $5,130 |
| **TOTAL** | | | | $72,450 | | | $39,330 |
| **TOTAL ROUNDED** | | | | **$72,000** | | | **$39,000** |

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** B-7A | **Sheet No.:** 1 of 3 | **CREATIVE IDEA:** To Close the Logans Roadhouse driveway and Utilize a Common Access Entrance with the Adjoining Property |
| Comp By: A.W. Date: 07/26/07 Checked By: K.B. Date: 07/26/07 | | |

**Original Concept:** The current design proposes to convert the existing full access driveway into a right-in / right-out driveway at the beginning of the northbound SR 10 on ramp.

**Proposed Change:** It is recommended that the Logans driveway be closed and that new access be provided through a wider "common driveway" that would serve both the Logans' property and the adjacent property.

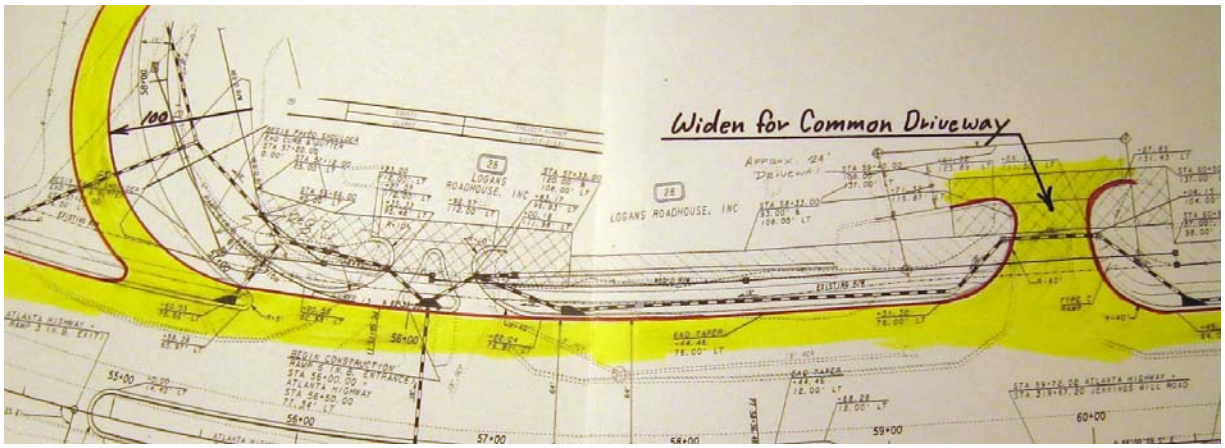
**Justification:** Maintaining an access driveway anywhere along the Logans' property line will negatively impact the right turn movement for vehicles entering the northbound SR 10 on ramp and pose a safety hazard. The construction of any driveway along Logan's property line would be very close to the proposed new Atlanta Highway median openings for Ramp 3 and for relocated Jennings Mill Road. This situation could lead to vehicles exiting Logans to attempt to cross the four lanes of Atlanta Highway to make a U-turn at the Ramp 3 median opening in order to travel eastbound, or for vehicles to attempt to drive the wrong way on Atlanta Highway and cross at the Jennings Mill Road opening.

Maintaining any driveway on the Logan property will result in potential serious safety issues. Providing access to the Logan property through a wider "common driveway" from the adjacent property would greatly improve safety. The "common driveway" would be located directly opposite the relocated Jennings Mill Road entrance, be at a signalized intersection, and allow for both left and right turns.

While this concept requires ROW adjustments, common access dealings with the impacted property owners, and increased project cost, it vastly improves safety and warrants making the change.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $0 | | |
| **- Proposed** | $54,000 | | |
| **- Savings** | ($54,000) | | ($54,000) |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **($54,000)** |

| SKETCH | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : B-7A<br>CLIENT: GDOT<br>Sheet 2 of 3 |



| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | | | | IDEA No.: B-7A<br>CLIENT: GDOT<br>Sheet 3 of 3 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| | | | | | | | |
| Additional New ROW (estimate) | SF | | | $0 | 7,200 | $6.50 | $46,800 |
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| **SUBTOTAL** | | | | $0 | | | $46,800 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $0 | | | $7,020 |
| **TOTAL** | | | | $0 | | | $53,820 |
| **TOTAL ROUNDED** | | | | **$0** | | | **$54,000** |

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** B-10 | **Sheet No.:** 1 of 3 | **CREATIVE IDEA:** To Eliminate the 4-foot Bike Lane on Atlanta Highway |
| Comp By: L.G.K. Date: 07/25/07 Checked By: K.B. Date: 07/25/07 | | |

**Original Concept:**

The current project proposes to construct a 4-foot bike lane along both sides of US 78 (Atlanta Highway).

**Proposed Change:**

It is recommended that the 4-foot bike lane be eliminated from the project due to safety concerns. It would be much safer to construct a bike path / trail around this congested area.

**Justification:**

The inclusion of 4-foot bike lanes on both side of the proposed 8-lane Atlanta Highway would present a possible safety hazard due to the high number of travel lanes, right-turn lanes, and heavy traffic volumes. Constructing the bike lane on the outside of the 8-lane facility places them in conflict with several heavily traveled right turn lanes for the on and off ramps of the SR 10 / Atlanta Highway Interchange.

ROW is the highest cost item on this project. Eliminating the bike lanes would reduce the overall pavement section width resulting in a potential significant cost savings and reduction in the amount of new ROW required to construct the project. This concept may also reduce construction time.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $473,000 | | |
| **- Proposed** | $0 | | |
| **- Savings** | $473,000 | | $473,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$473,000** |

| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | | | | IDEA No.: B-10<br>CLIENT: GDOT<br>Sheet 2 of 3 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| | | | | | | | |
| AC Pavement & Base | | | | | | | |
| 4-foot bike lane | SY | 3,933 | $75.00 | $294,975 | | | $0 |
| | | | | | | | |
| ROW Reduction | | | | | | | |
| 2,230 ft x 4 ft x 2 | SF | 17,840 | $6.50 | $115,960 | | | $0 |
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| **SUBTOTAL** | | | | $410,935 | | | $0 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $61,640 | | | $0 |
| **TOTAL** | | | | $472,675 | | | $0 |
| **TOTAL ROUNDED** | | | | **$473,000** | | | **$0** |

CALCULATIONS

| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : B-10<br>CLIENT: GDOT<br>Sheet 3 of 3 |
|---|---|

Atlanta Highway Pavement Length
Start Sta. 25+05 to Sta. 72+30 = 4,725 feet
Bridge Length = 300 feet  Net Length = 4,425 feet
Bike Lane = 4,425 ft x 8 ft = 35,400 SF  35,400 SF / 9 = 3,933 SY

Estimated Ramp & Cross Road Surface Area
Huntington South
7@12  Sta. 209+51 to 200+00 = 951 x 84 = 79,884 SF
Huntington North
6@12  Sta. 261+51 to 250+00 = 1,151 x 72 = 82,872 SF
Jennings Mill Road
2@12  Sta. 319+67 to 303+50 = 1,617 x 24 = 38,808 SF
Ramp 3
1@12  Sta. 136+71 to 119+00 = 1,771 x 12 = 21,252 SF
2@12  Sta. 143+40 to 136+71 = 669 X 24 = 16,056 SF
Ramp 2
1@12  Sta. 65+00 to 57+00 = 800 x 12 = 9,600 SF
Ramp 5
1@12  Sta. 63+25 to 55+50 = 775 x 12 = 9,300 SF
Ramp 4
1@12  Sta. 181+94 to 145+00 = 3,694 x 12 = 44,328 SF
2@12  Sta. 145+00 to 141+00 = 400 x 24 = 9,600 SF
3@12  Sta. 141+00 to 137+00 = 400 x 36 = 14,400 SF
5@12  Sta. 137+00 to129+00 = 800 x 60 = 48,000 SF
Ramp 6
1@12  Sta. 62+00 to 58+00 = 400 x 12 = 4,800 SF
Ramp 1
1@12  Sta. 129+25 to 126+00 = 325 x 12 = 3,900 SF
Slip Ramp
1@12  Sta. 44+00 to 41+00 = 300 x 12 = 3,600 SF

Total Ramp & Cross Road Surface Area = 386,400 SF = 286,400 / 9 = 42,933 SY
Atlanta Highway Driving Lanes Surface Area = 50,600 SY
Atlanta Highway Bike Lane Surface Area = 4,400 ft x 4 x 2 = 35,200 / 9 = 3,911 SY
Total Surface Area = 97,444 SY

Pavement Cost Per SY = $7,070,000 / 97,444 = $72.55 **Round and Use $75.00 / SY**

ROW 2,230 ft x 4 lanes x 2 = 17,840 SF

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** B-11 | **Sheet No.:** 1 of 3 | **CREATIVE IDEA:** To Reduce Lane Widths on Atlanta Highway |
| Comp By: L.G.K. Date: 07/25/07 Checked By: K.B. Date: 07/25/07 | | |

**Original Concept:**

The current design proposes to use 12-foot travel lanes on Atlanta Highway.

**Proposed Change:**

It is recommended that consideration be given to reducing the 12-foot travel lanes on Atlanta Highway to 11 feet.

**Justification:**

ROW is the highest cost item on this project. Reducing the overall pavement section width would result in a significant cost savings (pavement and ROW) and also reduce / minimize the amount of new ROW required to construct the project.

Using 11-foot lane widths will help keep the speeds down on Atlanta Highway and should not impact the level of service for the project.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $4,498,000 | | |
| **- Proposed** | $4,001,000 | | |
| **- Savings** | $497,000 | | $497,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$497,000** |

| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | | | | IDEA No.: B-11<br>CLIENT: GDOT<br>Sheet 2 of 3 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| | | | | | | | |
| Atlanta Highway | | | | | | | |
| | | | | | | | |
| Using 12-foot lanes | SY | 50,600 | $75.00 | $3,795,000 | | | |
| | | | | | | | |
| Using 11-foot lanes | SY | | | | 46,383 | $75.00 | $3,478,725 |
| | | | | | | | |
| ROW Reduction | | | | | | | |
| 2,230 ft x 4 lanes x 2 | SF | 17,840 | $6.50 | $115,960 | | | $0 |
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| **SUBTOTAL** | | | | $3,910,960 | | | $3,478,725 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $586,644 | | | $521,809 |
| **TOTAL** | | | | $4,497,604 | | | $4,000,534 |
| **TOTAL ROUNDED** | | | | **$4,498,000** | | | **$4,001,000** |

CALCULATIONS

**Project: SR 10 Loop / Atlanta Highway Interchange**

ITEM N$^{o}$ : B-11
CLIENT: GDOT
Sheet 3 of 3

Lineal Feet of Lanes on Atlanta Highway

| Westbound | | Length | x # Lanes | | |
|---|---|---|---|---|---|
| 2@12 | Sta. 25+00 to 27+00 | 200 | 2 | = | 400 |
| 3@12 | Sta. 27+00 to 34+00 | 700 | 3 | = | 2,100 |
| 4@12 | Sta. 34+00 to 40+00 | 600 | 4 | = | 2,400 |
| 6@12 | Sta. 40+00 to 48+50 | 850 | 6 | = | 5,100 |
| 5@12 | Sta. 51+50 to 64+00 | 1,250 | 5 | = | 6,250 |
| 4@12 | Sta. 64+00 to 70+00 | 600 | 4 | = | 2,400 |
| 3@12 | Sta. 70+00 to 72+00 | 200 | 3 | = | 600 |
| | | | | | |
| Eastbound | | | | | |
| 3@12 | Sta. 25+00 to 30+00 | 500 | 3 | = | 1,500 |
| 4@12 | Sta. 30+00 to 33+00 | 300 | 4 | = | 1,200 |
| 5@12 | Sta. 33+00 to 35+00 | 200 | 5 | = | 1,000 |
| 6@12 | Sta. 35+00 to 41+00 | 600 | 6 | = | 3,600 |
| 5@12 | Sta. 41+00 to 48+50 | 750 | 5 | = | 3,750 |
| 4@12 | Sta. 51+50 to 56+00 | 450 | 4 | = | 1,800 |
| 5@12 | Sta. 56+00 to 60+50 | 450 | 5 | = | 2,250 |
| 3@12 | Sta. 60+50 to 67+50 | 700 | 3 | = | 2,100 |
| 4@12 | Sta. 67+50 to 69+00 | 150 | 4 | = | 600 |
| 3@12 | Sta. 69+00 to 72+00 | 300 | 3 | = | 900 |

Total Lane Length = 37,950 ft

1-Foot Area = 37,950 / 9 = 4,217 SY / foot

Atlanta Highway Surface Area

Area = 37,950 x 12 = 455,400 SF / 9 = 50,600 SY

Area = 37,950 x 11 = 417,450 SF / 9 = 46,383 SY

ROW 2,230 ft x 4 lanes x 2 = 17,840 SF

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| Project: SR 10 Loop / Atlanta Highway Interchange | | |
| **IDEA No.:** B-12 | **Sheet No.:** 1 of 2 | **CREATIVE IDEA:** Close median opening at Sta. 68+75 and Provide Type 'B' median crossovers at Timothy Road & Jennings Mill Road |
| Comp By: A.W. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:** The current design maintains the existing median opening at station 68+75. The original design uses a Type 'A' median crossover west of Timothy Road to match the existing Type 'A' crossover on the east side. The project does not involve any construction east of the Timothy Road intersection.

**Proposed Change:** It is recommended that the median opening at sta. 68+75 be closed and the access driveways be converted to right-in / right-out access only. In addition, the opposing left turn lanes at the Timothy Road Intersection and the Jennings Mill Road median crossover should be converted to Type 'B' median crossovers.

**Justification:** Retaining the median opening at Sta. 68+75 presents a safety hazard because of its close proximity to the Timothy Road intersection. The currently designed median left turn bay lane would confuse motorists wanting to turn left at Timothy Road. The proposed extremely short left turn lane at Timothy Road is inadequate. Closing the median opening would allow for an adequate left turn lane to be constructed for Timothy Road. Closing this median will require changing the driveway access to right-in / right-out movements.

The wide medians at the Timothy Road and the relocated Jennings Mill Road intersections would allow for opposing left turn lanes on Atlanta Highway to be aligned across from each other using a Type 'B' crossover for improved safety and sight distance for turning vehicles.

This concept would add cost to the project and may require additional ROW negations due to the need to change local access.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $ 0 | | |
| **- Proposed** | $ 186,000 | | |
| **- Savings** | ($186,000) | | ($186,000) |
| **FUTURE COST – Savings** | | | ($186,000) |
| **TOTAL PRESENT WORTH SAVINGS** | | | ($186,000) |

| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | | | | IDEA No.: B-12<br>CLIENT: GDOT<br>Sheet 3 of 3 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| Additional Paving Cost | | | | | | | |
| Type 'B' cross over at Timothy Road | SY | | | $0 | 1,460 | $75.00 | $109,500 |
| | | | | | | | |
| Additional Paving Cost | | | | | | | |
| Type 'B' crossover at Jennings Mill Road | SY | | | $0 | 700 | $75.00 | $52,500 |
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| **SUBTOTAL** | | | | $0 | | | $162,000 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $0 | | | $24,300 |
| **TOTAL** | | | | $0 | | | $186,000 |
| **TOTAL ROUNDED** | | | | **$0** | | | **$186,000** |

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| Project: SR 10 Loop/Atlanta Highway Interchange | | |
| **IDEA No.:** C-2 | **Sheet No.:** 1 of 4 | **CREATIVE IDEA:** To revise the bridge layout and utilize a smaller two-span bridge with "U" MSE walls |
| Comp By: A.S. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

The original bridge layout consists of a two-span (2 @ 150'-0") structure with Bulb-Tee 74" PSC beams. The structure includes a median pier and side slopes with end bents. The construction of the median pier would involve significant traffic control and shifting of lanes on SR 10 Loop Highway.

**Proposed Change:**

It is recommended the bridge layout be changed to a two-span (2 @ 93'-0") structure with Type III AASHTO PSC beams and two "U" shaped MSE walls. In addition, the bridge width should be reduced 8 feet by eliminating the bike lanes on both sides.

**Justification:**

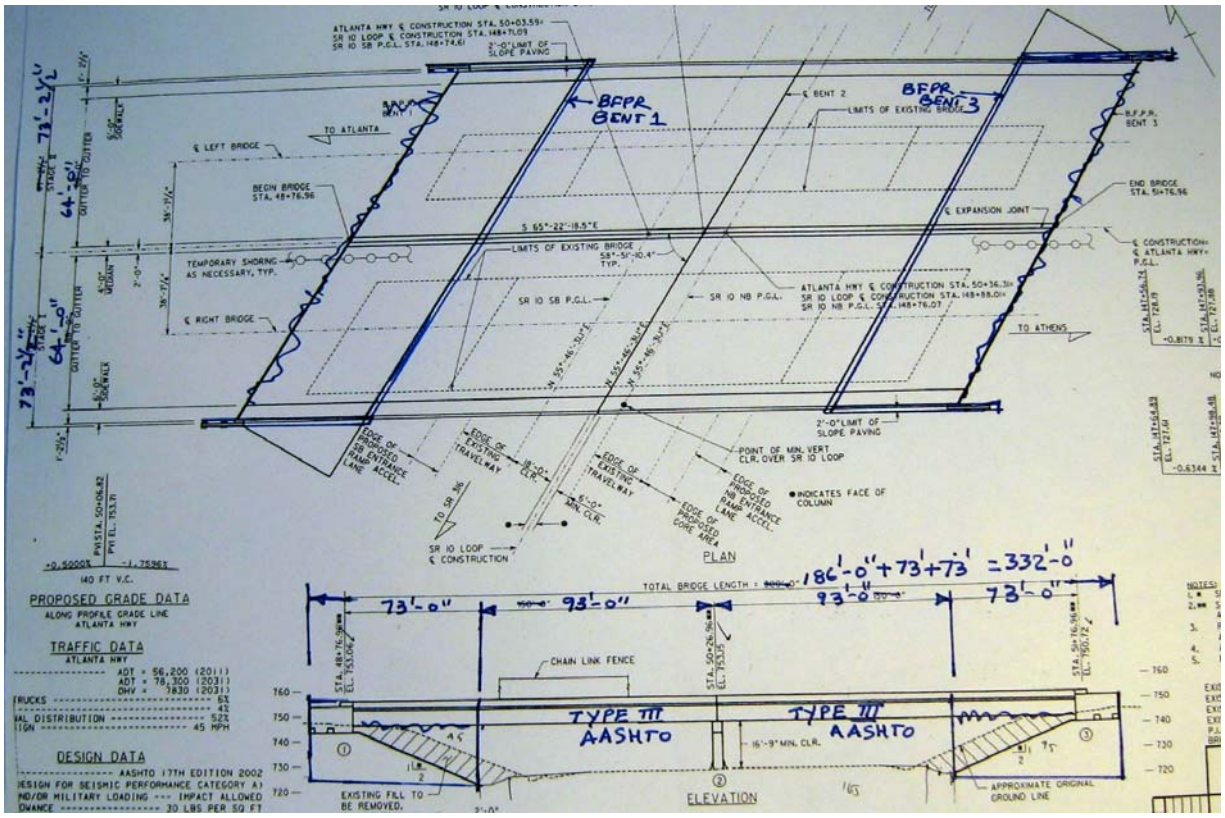
This bridge concept would improve constructability through the use of MSE wall construction at the abutments, the use of smaller Type III beams, a reduction in the amount of embankment needed for the structure (Type III beams are 3'9" vs. 74" Bulb-Tee beams), and the reduction in bridge width. Removing the bike lanes from the dual 5-lane structures will improve safety. The current design places the bike lanes in direct conflict with merging traffic trying to enter the right turn lanes for the SR 10 loop ramps.

This concept would result in a reduction in construction time and result in significant cost savings to the project.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $4,262,000 | | |
| **- Proposed** | $2,417,000 | | |
| **- Savings** | $1,845,000 | | $1,845,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$1,845,000** |

| SKETCH | |
|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | ITEM N$^{o}$ : C-2<br>CLIENT: GDOT<br>Sheet 2 of 4 |

## C-2 Option 2-Span (2 @ 93 feet) with "U" MSE Wall Option



| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | | | | | IDEA No.: C-2<br>CLIENT: GDOT<br>Sheet 3 of 4 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| | | | | | | | |
| Two Span Bridge 150'– 150' | SF | 46,366 | $80/SF | $3,706,080 | | | |
| | | | | | | | |
| Two span Bridge 93'-93' | SF | | | | 27,234 | $60/SF | $1,634,047 |
| "U" Shaped MSE walls | SF | | | | 46,366 | $40/SF | $467,872 |
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| **SUBTOTAL** | | | | $3,706,080 | | | $2,101,919 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $555,912 | | | $315,288 |
| **TOTAL** | | | | $4,261,992 | | | $2,417,207 |
| **TOTAL ROUNDED** | | | | **$4,262,000** | | | **$2,417,000** |

| CALCULATIONS | |
|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | ITEM N$^{o}$ : C-2<br>CLIENT: GDOT<br>Sheet 4 of 4 |

C-2 To revise the Bridge layout utilizing a two-span arrangement with "U" MSE walls.

Bridge Area: 186' x 146.42' = 27,234 SF x $ 60/SF = $1,634,047

"U" MSE Walls:

2 X [ 2x(73'x20') + 20' x 146.42'] SF x $ 40/SF = $467, 872

Sub Total = $2,101,919
Mark-Up (15%) = $315,288
Total = $2,417,207

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| Project: SR 10 Loop/Atlanta Highway Interchange | | |
| **IDEA No.:** C-2A | **Sheet No.:** 1 of 4 | **CREATIVE IDEA: Alternative to C-2** To revise the bridge layout and utilize a one-span bridge spanning the median with "U" MSE walls |
| Comp By: A.S. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

The original bridge layout consists of a two-span (2 @ 150'-0") structure with Bulb-Tee 74" PSC beams. The structure included a median pier and side slopes with end bents. The construction of the median pier would involve significant traffic control and shifting of lanes on SR 10 Loop Highway.

**Proposed Change:**

**This is an alternative to Idea 2-C** It is recommended the bridge layout be changed to a one-span (165'-0") structure with 74" Bulb-Tee PSC beams and two "U" shaped MSE walls. In addition, the bridge width should be reduced 8 feet by eliminating the Bike Lanes on both sides.

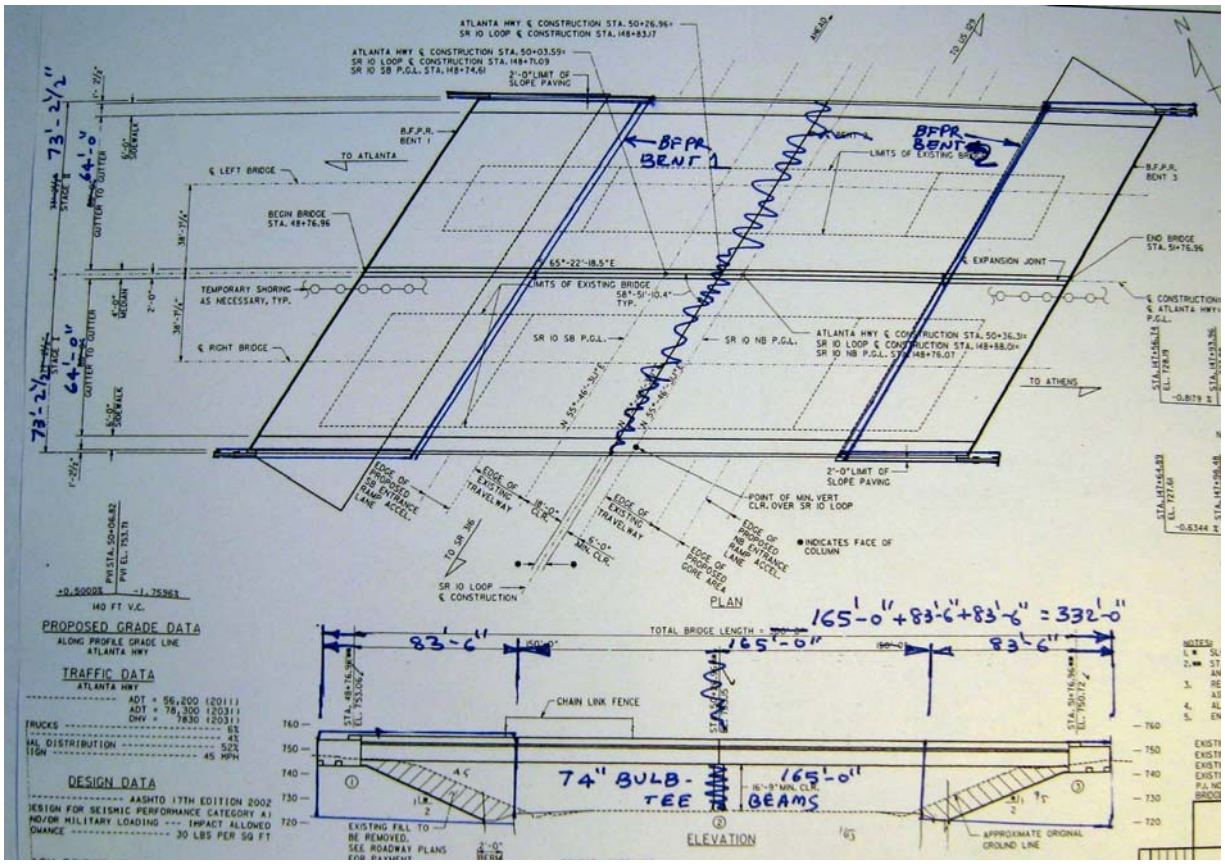
**Justification:** This concept would not require the construction of a median pier because the 74" Bulb-Tee beams can span 165'-0" thereby eliminating the need for a median pier. This arrangement results in savings in traffic control and signage since there is no need for a median pier. Removing the bike lanes from the dual 5-lane structures will improve safety. The current design places the bike lanes in direct conflict with merging traffic trying to enter the right turn lanes for the SR 10 loop ramps.

This concept would result in significant cost savings to the project, however, working with the larger length beams may present constructability issues. This concept would place the abutments closer to the edge of shoulder than alternate C-2.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $4,262,000 | | |
| **- Proposed** | $2,886,000 | | |
| **- Savings** | $1,376,000 | | $1,376,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$1,376,000** |

| SKETCH | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : C-2A<br>CLIENT: GDOT<br>Sheet 2 of 4 |

## C-2A Option 1-Span (165 feet) with "U" MSE Wall Option



| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | | | | | IDEA No.: C-2A<br>CLIENT: GDOT<br>Sheet 3 of 4 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| | | | | | | | |
| Two Span Bridge 150'– 150' | SF | 46,366 | $80/SF | $3,706,080 | | | |
| | | | | | | | |
| One span Bridge 165'-0" | SF | | | | 24,159 | $80/SF | $1,932,744 |
| "U" Shaped MSE walls | SF | | | | 14,417 | $40/SF | $576,693 |
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| **SUBTOTAL** | | | | $3,706,080 | | | $2,509,437 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $555,912 | | | $376,416 |
| **TOTAL** | | | | $4,261,992 | | | $2,885,853 |
| **TOTAL ROUNDED** | | | | **$4,262,000** | | | **$2,886,000** |

| CALCULATIONS | |
|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | ITEM N$^{o}$ : C-2A<br>CLIENT: GDOT<br>Sheet 4 of 4 |

C-2A To revise the Bridge layout utilizing a one-span arrangement with "U" MSE walls.

Bridge Area: 165' x 146.42' = 24,159 SF x $ 80/SF = $1,932,744

"U" MSE Walls:

2 X [ 2x(83.5'x23') + 23' x 146.42'] SF x $ 40/SF = $ 576,693

Sub Total = $2,509,437
Mark-Up (15%) = $ 376,416
Total = $2,885,853

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| Project: SR 10 Loop / Atlanta Highway Interchange | | |
| **IDEA No.:** C-2B | **Sheet No.:** 1 of 4 | **CREATIVE IDEA: Alternative to C-2** To revise the bridge layout and utilize a four-span bridge |
| Comp By: A.S. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

The original bridge layout consists of a two-span (2 @ 150'-0") structure with Bulb-Tee 74" PSC beams. The structure included a median pier and side slopes with end bents. The construction of the median pier would involve significant traffic control and shifting of lanes on SR 10 Loop Highway.

**Proposed Change:**

**This is an alternative to Idea 2-C** It is recommended the bridge layout be changed to a four-span (2 @ 57 feet and 2 @ 93 feet) structure with type III and type II PSC beams. In addition, the bridge width should be reduced 8 feet by eliminating the Bike Lanes on both sides.

**Justification:**

This bridge concept would improve constructability through the use of smaller Type III and Type II AASHTO beams, a reduction in the amount of embankment needed for the structure (Type III beams are 3'9" vs. 74" Bulb-Tee beams), and the reduction in bridge width. Removing the bike lanes from the dual 5-lane structures will improve safety. The current design places the bike lanes in direct conflict with merging traffic trying to enter the right turn lanes for the SR 10 loop ramps.

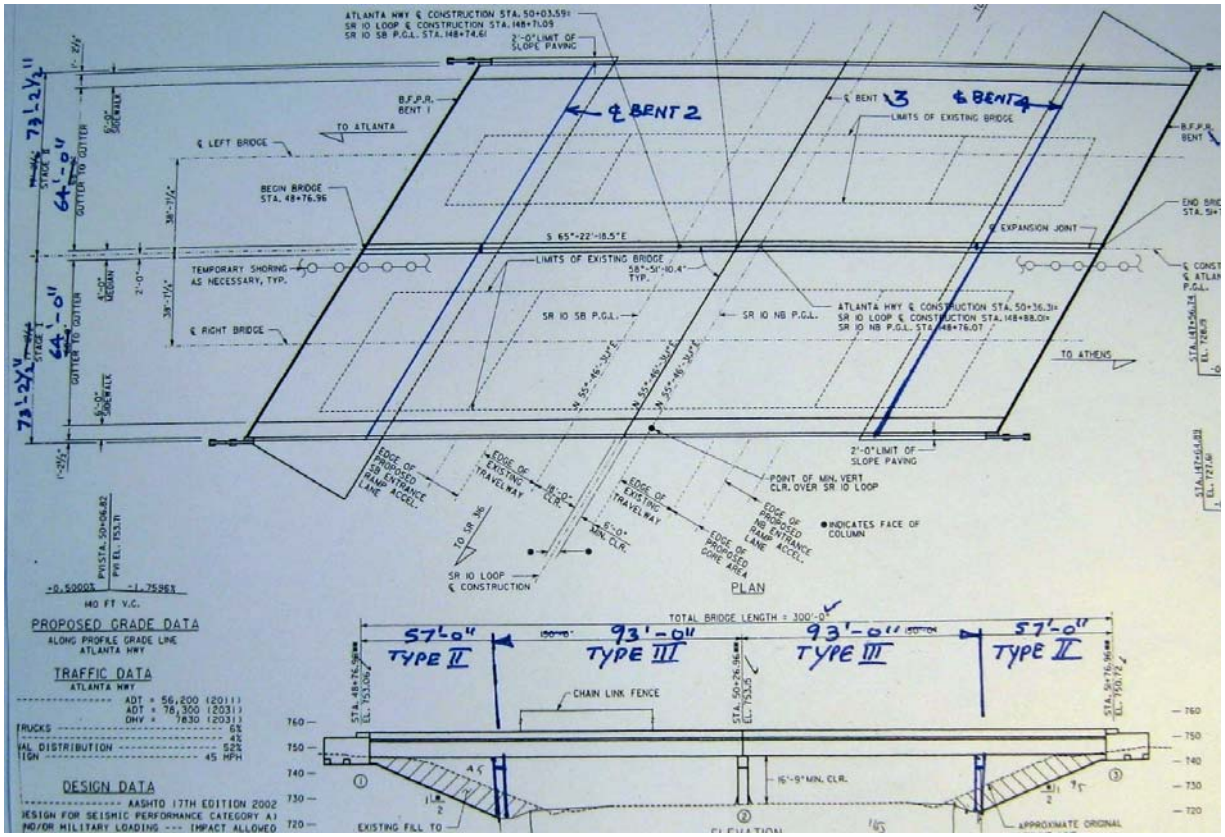
This concept would replace the MSE wall abutment configuration suggested in alternative 2-C above with simple spans. This concept would result is two additional bridge joints. It would result in a cost savings to the project.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $4,262,000 | | |
| **- Proposed** | $3,031,000 | | |
| **- Savings** | $1,231,000 | | $1,231,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$1,231,000** |

| SKETCH | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : C-2B<br>CLIENT: GDOT<br>Sheet 2 of 4 |

## C-2B Option 4-Span (2 @ 57 feet & 2 @ 93 feet)

type 2 type 3



| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | | | | IDEA No.: C-2B<br>CLIENT: GDOT<br>Sheet 3 of 4 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| Two Span Bridge 150'-150' | SF | 46,366 | $80/SF | $3,706,080 | | | |
| | | | | | | | |
| Four Span Bridge 57'– 93'-93'-57' | SF | | | | 43,926 | $60/SF | $2,635,560 |
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| **SUBTOTAL** | | | | $3,706,080 | | | $2,635,560 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $555,912 | | | $$ 395,334 |
| **TOTAL** | | | | $4,261,992 | | | $3,030,894 |
| **TOTAL ROUNDED** | | | | **$4,262,000** | | | **$3,031,000** |

| CALCULATIONS | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : C-2B<br>CLIENT: GDOT<br>Sheet 4 of 4 |

C-2B To revise the Bridge layout utilizing a four-span arrangement .

Bridge Area: 300’ x 146.42’ = 43,926 SF x $60/SF = $2,635,560

Sub Total = $2,635,560
Mark-Up (15%) = $393,334
Total = $3,030,894

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| Project: SR 10 Loop / Atlanta Highway Interchange | | |
| **IDEA No.:** C-2C | **Sheet No.:** 1 of 4 | **CREATIVE IDEA: Alternative to C-2** To revise the bridge layout and utilize a three-span bridge |
| Comp By: A.S. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

The original bridge layout consists of a two-span (2 @ 150'-0") structure with Bulb-Tee 74" PSC beams. The structure included a median pier and side slopes with end bents. The construction of the median pier would involve significant traffic control and shifting of lanes on SR 10 Loop Highway.

**Proposed Change:**

**This is an alternative to Idea 2-C** It is recommended the bridge layout be changed to a three-span (2 @ 67'-6" and 1 @ 165 feet) structure with 74" Bulb-Tee beams and Type II AASHTO PSC beams. In addition, the bridge width should be reduced 8 feet by eliminating the Bike Lanes on both sides.

**Justification:** This concept would not require the construction of a median pier because the 74" Bulb-Tee beams can span 165'-0" thereby eliminating the need for a median pier. This arrangement results in savings in traffic control and signage since there is no need for median pier. Removing the bike lanes from the dual 5-lane structures will improve safety. The current design places the bike lanes in direct conflict with merging traffic trying to enter the right turn lanes for the loop ramps.

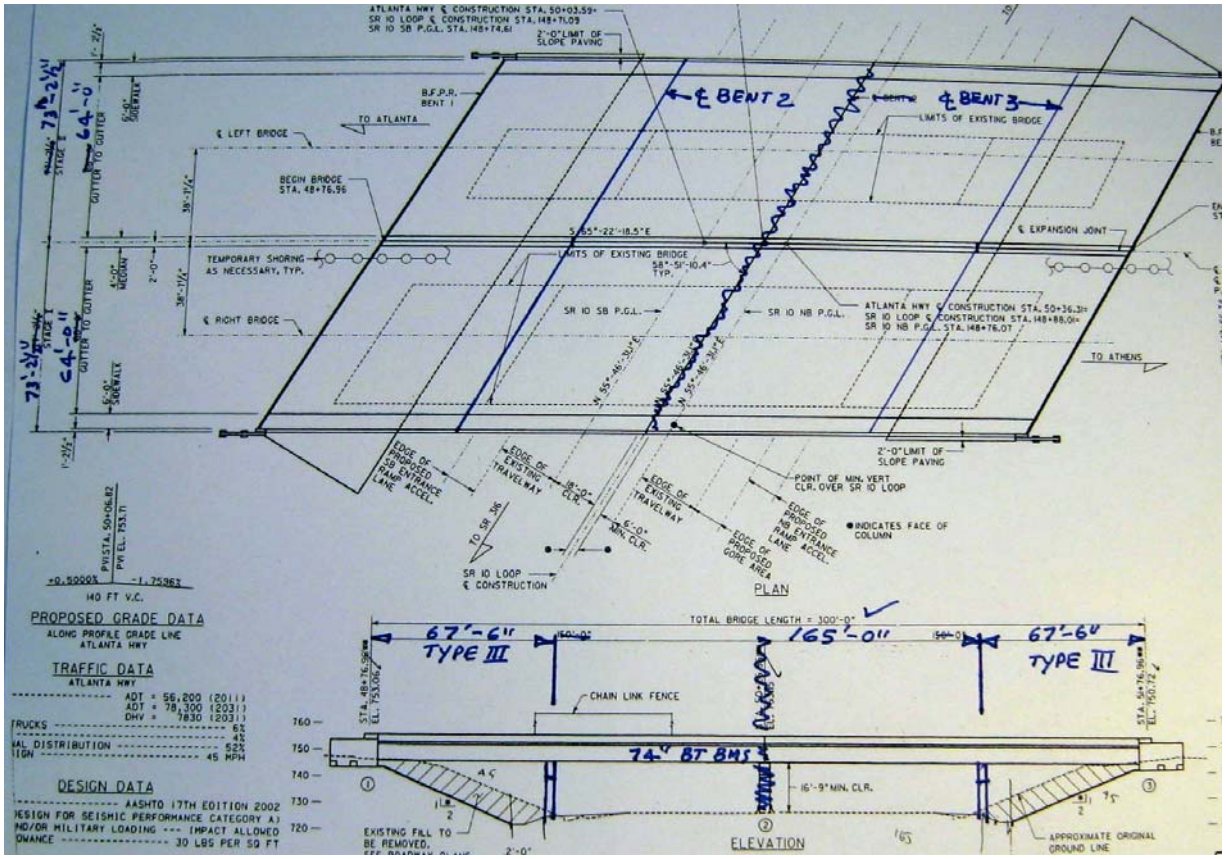
This concept would result in significant cost savings to the project, however, working with the larger length beams may present constructability issues. This concept would place the abutments closer to the edge of shoulder than alternate C-2.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $4,262,000 | | |
| **- Proposed** | $3,587,000 | | |
| **- Savings** | $675,000 | | $675,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | $675,000 |

| SKETCH | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : C-2C<br>CLIENT: GDOT<br>Sheet 2 of 4 |

## C-2C Option 3-Span (2 @ 67'-6" & 1 @ 165 feet)

Type 3 BT 74



| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | | | | IDEA No.: C-2C<br>CLIENT: GDOT<br>Sheet 3 of 4 | | |
| **CONSTRUCTION ELEMENT** | | **ORIGINAL ESTIMATE** | | | **NEW ESTIMATE** | | |
| **Item** | **Unit** | **No. Units** | **Cost/Unit** | **Total Cost** | **No. Units** | **Cost/Unit** | **Total Cost** |
| Two Span Bridge 150'-150' | SF | 46,366 | $80/SF | $3,706,080 | | | |
| | | | | | | | |
| Three Span Bridge 67.5'-165'-67.5' - For 165' span | SF | | | | 24,159 | $80/SF | $1,932,744 |
| Three Span Bridge 67.5'-165'-67.5' - For 67.5' end spans | SF | | | | 19,767 | $60/SF | $1,186,020 |
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| **SUBTOTAL** | | | | $3,706,080 | | | $3,118,764 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $555,912 | | | $467,815 |
| **TOTAL** | | | | $4,261,992 | | | $3,586,579 |
| **TOTAL ROUNDED** | | | | **$4,262,000** | | | **$3,587,000** |

| CALCULATIONS | |
|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | ITEM N$^{o}$ : C-2C<br>CLIENT: GDOT<br>Sheet 4 of 4 |

C-2C To revise the Bridge layout utilizing a four-span arrangement.

Bridge Area: 165’ x 146.42’ = 24,159 SF x $ 80/SF = $1,932,744
Bridge Area: 2x 67.5’ x 146.42’ = 19,767 SF x $ 60/SF = $1,186,020

Sub Total = $3,118,764
Mark-Up (15%) = $467,815
Total = $3,586,579

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| Project: SR 10 Loop/Atlanta Highway Interchange | | |
| **IDEA No.:** **F-1** | **Sheet No.:** 1 of 3 | **CREATIVE IDEA:** To Minimize / Reduce the Curb &Gutter on Jennings Mill Road |
| Comp By: LGK Date: 7-25-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

The current design proposes to construct concrete curb and gutter along the entire relocated Jennings Mill Road section.

**Proposed Change:**

It is recommended that the concrete curb and gutter be eliminated from a section on Jennings Mill Road.

**Justification:**

The existing Jennings Mill Road section has a rural typical section. Maintaining the rural section on the southern portion of the relocated Jennings Mill Road would result in a cost savings to the project and reduce construction time. It would also maintain the rural roadway section through the undeveloped part of the cemetery.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST - Original** | $177,000 | | |
| **- Proposed** | $0 | | |
| **- Savings** | $177,000 | | $177,000 |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **$177,000** |

| COST WORKSHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | | | | | IDEA No.: F-1<br>CLIENT: GDOT<br>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 Curb & Gutter | | | | | | | |
| 8 in. x 30 in., Type 2 | LF | 2,400 | $29.84 | $71,616 | | | $0 |
| Storm Drain Pipe | | | | | | | |
| RCP, H1-10, 18 in. | LF | 1,290 | $53.59 | $69,131 | | | $0 |
| RCP, H1-10, 36 in. | LF | 120 | $90.23 | $10,827 | | | $0 |
| Flared End Section Storm Drain | EA | 2 | $1,236.00 | $2,472 | | | $0 |
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| | | | | | | | |
| **SUBTOTAL** | | | | $154,046 | | | $0 |
| (10% E&C + 5% Inflation)<br>**MARK-UP (15%)** | | | | $23,107 | | | $0 |
| **TOTAL** | | | | $177,153 | | | $0 |
| **TOTAL ROUNDED** | | | | **$177,000** | | | **$0** |

| CALCULATIONS | |
|---|---|
| **Project: SR 10 Loop/Atlanta Highway Interchange** | ITEM N$^{o}$ : F-1<br>CLIENT: GDOT<br>Sheet 3 of 3 |

Jennings Mill Road –

Sta. 318+00 – 306+00 – 1,200 feet of concrete curb and gutter
1,200 feet x 2 = 2,400 linear feet
2,400 linear feet x $29.84/ft. = $71,616

18” storm drain pipe –
1,290 linear feet x $53.59/ft. = $69,131

36” storm drain pipe –
120 linear feet x $90.23/ft. = $10,827

2 Flared End Sections (36”)
2 x $1236 each = $2,472

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** **E-1** | **Sheet No.:** 1 of 1 | **CREATIVE IDEA: Design Suggestion** Modify Barrier End Treatment – Ramps 2 and 5 |
| Comp By: A.W. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

Ramp 2 (NB entrance ramp) and Ramp 5 (SB entrance ramp) original concepts show guardrail attached to the end of the barrier walls where ramps 2 and 3 begin to split and where ramps 5 and 4 begin to split to protect on ramp traffic from the end of the barrier walls.

**Proposed Change:**

It is suggested that the barrier wall end be extended parallel to the adjacent off-ramps versus parallel to the loop on-ramps thereby eliminating the barrier end walls as hazards

**Justification:**

This may allow the guardrail sections to be removed. Guardrail in and of itself is a hazard and should be used only when needed and necessary.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST – Original** | **Design Suggestion** | | |
| **- Proposed** | | | |
| **- Savings** | | | |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **Design Suggestion** |

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** D-1 | **Sheet No.:** 1 of 1 | **CREATIVE IDEA: Design Suggestion** Make sure all drainage structures are within right of way |
| Comp By: A.W. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

There are several locations where the proposed drainage pipes and structures are located outside of the right of way.

**Proposed Change:**

It is suggested that the drainage plans be reviewed and revised to keep all drainage facilities within the proposed ROW where possible. If this is not possible then additional ROW should be acquired.

**Justification:**

Permanent drainage facilities have to be located within project ROW or a permanent drainage easement.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST – Original** | **Design Suggestion** | | |
| **- Proposed** | | | |
| **- Savings** | | | |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **Design Suggestion** |

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** A-1 | **Sheet No.:** 1 of 1 | **CREATIVE IDEA: Design Suggestion** Eliminate short steps in the proposed right of way |
| Comp By: A.W. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

At several locations on the current plans, the proposed ROW line steps in-or-out several times over a short distance (examples: Sta. 32+40 to 33+50 right of Atlanta Highway, drawing no. 13-02; Sta. 135+98 to 137+15 left of ramp 4, drawing no. 14-25).

**Proposed Change:**

It is suggested that the many short in-or-out steps in the ROW be eliminated by using a straight diagonal line.

**Justification:**

Eliminating the short in-or-out steps in the ROW could save ROW costs, make it easier to acquire, and better suit both the project and parcel owner.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST – Original** | **Design Suggestion** | | |
| **- Proposed** | | | |
| **- Savings** | | | |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **Design Suggestion** |

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** L1/L2 | **Sheet No.:** 1 of 1 | **CREATIVE IDEA: Design Suggestion** Elimination of Parapet and One Pipe Handrail over Retaining Walls |
| Comp By: A.S. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

The original design for wall layout shows a parapet and one pipe handrail at several locations.

**Proposed Change:**

It is suggested that the parapet and one-pipe handrail be eliminated and be replaced by raising the wall and using a two-pipe handrail (GA STD 9031R – Pipe Handrail for Retaining Walls).

**Justification:**

This concept has the potential to save cost.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST – Original** | **Design Suggestion** | | |
| **- Proposed** | | | |
| **- Savings** | | | |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **Design Suggestion** |

| DEVELOPMENT AND RECOMMENDATION PHASE | | |
|---|---|---|
| **Project: SR 10 Loop / Atlanta Highway Interchange** | | |
| **IDEA No.:** B 2 | **Sheet No.:** 1 of 1 | **CREATIVE IDEA: Design Suggestion** Verification of Superelevation near bridge area |
| Comp By: A.S. Date: 7-26-07 Checked By: K.B. Date: 07/30/07 | | |

**Original Concept:**

The current design shows the bridge typical section with a normal crown with 2% cross slopes while the Atlanta Highway approach section is on a curve with superelevation.

**Proposed Change:**

It is suggest that the superelevation rate to be verified and corrected to reflect curve #10 and also match up with the typical section crossing the bridge.

It is also suggested that the designer use a 4% superelevation versus a 6%.

**Justification:**

Superelevation transitions are to be avoided within bridge limits. The urban nature of Atlanta Highway and the lower speeds should allow for less superelevation on the gentle curves approaching the bridge.

| LIFE CYCLE COST SUMMARY | CAPITAL COST | FUTURE COST | TOTAL COST |
|---|---|---|---|
| **INITIAL COST – Original** | **Design Suggestion** | | |
| **- Proposed** | | | |
| **- Savings** | | | |
| **FUTURE COST – Savings** | | | |
| **TOTAL PRESENT WORTH SAVINGS** | | | **Design Suggestion** |

# APPENDIX

# Sources

## Approving/Authorizing Persons

| Name: | Position: | Telephone: |
|---|---|---|
| Ron Wishon | Transportation Engineering Assistant Administrator | 404-651-7470 |
| Brian Summers | Transportation Engineering Administrator | 404-656-6846 |
| | | |

## Personal Contacts

| Name: | Telephone: | Notes: |
|---|---|---|
| Peng Zhang - MACTEC | 770-421-7053 | To discuss Single Point Interchange Concept – Run Traffic Analysis |
| Jerry Milligan – GDOT | 770-986-1541 | ROW details on Atlanta Highway |
| | | |
| | | |
| | | |

## Documents/Abstracts

| Reference: | Reference: |
|---|---|
| 30% Plans | |
| Roadway Cross Sections | |
| Preliminary Bridge Layout | |
| Project Cost Estimate | |
| Revised Project Concept Report | |
| Project Concept Report | |
| 100 Scale Layout Map | |
| | |

# SR 10 Loop / Atlanta Highway (SR 10/US 78) Interchange

## Cost Model / Distribution

| Item | Description | $ Amount | % of Total Project |
|---|---|---|---|
| | | | |
| **A** | ROW | $11,533,000 | 41.4 |
| **B** | Pavement & Base | $7,070,000 | 25.4 |
| **C** | Bridge | $3,706,000 | 13.3 |
| **D** | Drainage | $800,000 | 2.9 |
| **E** | Concrete Barrier | $556,000 | 2.0 |
| **F** | Curb & Gutter | $528,000 | 1.9 |
| **G** | Signals | $520,000 | 1.9 |
| **H** | Erosion Control | $400,000 | 1.4 |
| **I** | Signing & Markings | $400,000 | 1.4 |
| **J** | Sidewalks | $319,000 | 1.1 |
| **K** | Clear & Grubbing | $300,000 | 1.1 |
| **L** | Concrete Parapet | $262,000 | 0.9 |
| **M** | Mortar Rubble Wall | $251,000 | 0.9 |
| **N** | Traffic Control | $250,000 | 0.9 |
| **O** | Temporary Barrier | $204,000 | 0.7 |
| **P** | Embankment | $202,000 | 0.7 |
| **Q** | Miscellaneous | $575,000 | 2.1 |
| | | | |
| | | | |
| | **Sub-Total** | $27,876,000 | |
| | | | |
| | 10% E & C of Construction Items | $1,634,000 | |
| | 5% Inflation @ 2 Years | $1,843,000 | |
| | | | |
| | **TOTAL** | $31,353,000 | |
| | | | |
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| | **Note:** The 10% E&C Cost and the 5% Inflation Cost are used as Mark-up on the Recommendation Cost Sheets | | |
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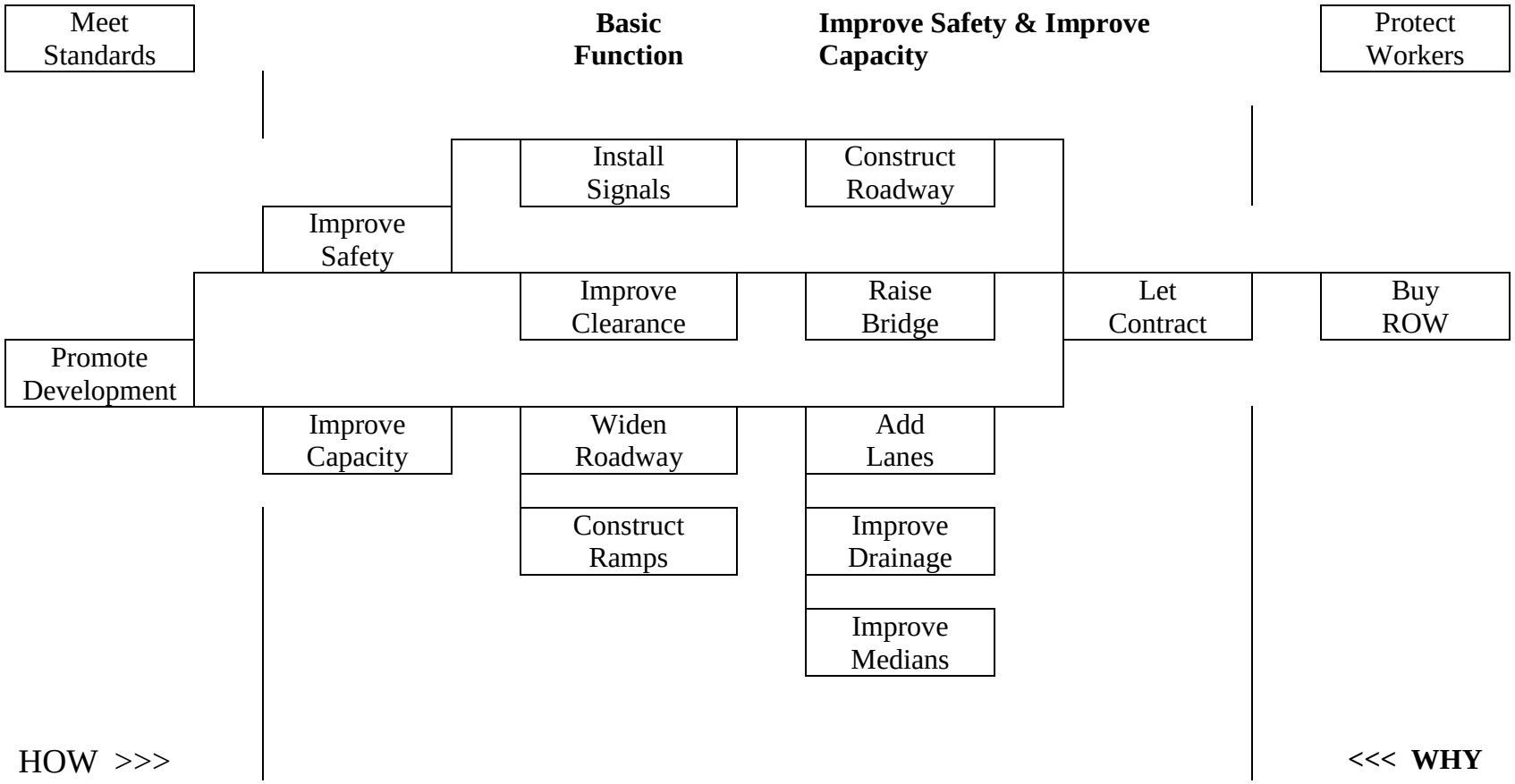
# FAST DIAGRAM

**Study** **Project Name**: **SR 10 Loop / Atlanta Highway (SR 10/US 78) Interchange**



# INFORMATION PHASE – FUNCTION ANALYSIS

**Project:** **SR 10 Loop / Atlanta Highway (SR 10/US 78) Interchange**
**Function:** **Improve Safety & Improve Capacity**

| ITEM No. | DESCRIPTION | FUNCTION | | INITIAL DOLLARS | | |
|---|---|---|---|---|---|---|
| | | Verb | Noun | Cost | % of Total | Worth/Save |
| **A** | Right of Way | Store | Project | $11,533,000 | 41.4% | Yes |
| **B** | Pavement & Base | Provide | Surface | $7,070,000 | 25.4% | Yes |
| | | Provide | Drainage | | | |
| | | Provide | Safety | | | |
| | | Provide | Access | | | |
| | | Provide | Turn Movements | | | |
| | | Provide | Access | | | |
| | | Add | Lanes / Ramps | | | |
| | | Widen | Median | | | |
| | | Provide | Staging | | | |
| **C** | Bridge | Connect | Roadway | $3,706,000 | 13.3% | Yes |
| | | Accommodate | Ramps | | | |
| | | Improve | Interchange | | | |
| | | Improve | V/H Clearance | | | |
| | | Accommodate | Sidewalks | | | |
| | | Accommodate | Bikeway | | | |
| | | Accommodate | Accel/Decel Lanes | | | |
| | | Accommodate | Additional Lanes | | | |

# INFORMATION PHASE – FUNCTION ANALYSIS

**Project:** **SR 10 Loop / Atlanta Highway (SR 10/US 78) Interchange**
**Function:** **Improve Safety & Improve Capacity**

| ITEM No. | DESCRIPTION | FUNCTION | | INITIAL DOLLARS | | |
|---|---|---|---|---|---|---|
| | | Verb | Noun | Cost | % of Total | Worth/Save |
| **D** | Drainage | Drain | Roadway | $800,000 | 2.9% | Yes |
| | | Convey | Storm Water | | | |
| | | Retain | Storm Water | | | |
| **E** | Concrete Barrier | Separate | Traffic | $556,000 | 2.0% | Yes |
| | | Prevent | Crossover | | | |
| **F** | Curb & Gutter | Drain | Roadway | $528,000 | 1.9% | Yes |
| | | Direct | Traffic | | | |
| | | Protect | Pedestrians | | | |
| | | Provide | ADA Access | | | |
| **G** | Signals | Control | Traffic | $520,000 | 1.9% | Yes |
| | | Improve | Safety | | | |
| | | Improve | Access | | | |
| | | Improve | Operation | | | |
| **H** | Erosion Control | Prevent | Erosion | $400,000 | 1.4% | No |
| **I** | Signing & Markings | Control | Traffic | $400,000 | 1.4% | No |
| | | Advise | Motorists | | | |
| | | Improve | Operation | | | |
| | | Improve | Safety | | | |

# INFORMATION PHASE – FUNCTION ANALYSIS

**Project:** **SR 10 Loop / Atlanta Highway (SR 10/US 78) Interchange**
**Function:** **Improve Safety & Improve Capacity**

| ITEM No. | DESCRIPTION | FUNCTION | | INITIAL DOLLARS | | |
|---|---|---|---|---|---|---|
| | | Verb | Noun | Cost | % of Total | Worth/Save |
| **J** | Sidewalks | Provide | Safety | $319,000 | 1.1% | Yes |
| | | Provide | Access | | | |
| | | Meet | ADA Reqm't | | | |
| **K** | Clear & Grubbing | Allow | Construction | $300,000 | 1.1% | No |
| | | Generate | Mulch | | | |
| **L** | Concrete Parapet | Support | Sidewalk | $262,000 | 0.9% | Yes |
| | | Support | Fence | | | |
| **M** | Mortar Rubble Wall | Retain | Material | $251,000 | 0.9% | Yes |
| **N** | Traffic Control | Allow | Construction | $250,000 | 0.9% | Yes |
| | | Maintain | Traffic | | | |
| | | Allows | Staging | | | |
| **O** | Temporary Barrier | Direct | Traffic | $204,000 | 0.7% | Yes |
| | | Facilitate | Construction | | | |
| | | Improve | Safety | | | |
| **P** | Embankment | Achieve | Grade | $202,000 | 0.7 | Yes |
| | | Support | Roadway | | | |
| | | Construct | Ramps | | | |
| | | Support | Bridge | | | |

| CREATIVE PHASE<br>Creative Idea Listing | | JUDGMENT PHASE<br>Idea Evaluation | |
|---|---|---|---|
| **No.** | **CREATIVE IDEA** | **COMMENTS** | **IDEA RATING** |
| **A** | **Right of Way** | | |
| A-1 | Minimize ROW | None site specific | X |
| A-2 | Investigate Developer Proposal for Mall Connector | Could reduce ROW costs, Simplify Access | ✓ |
| A-3 | Investigate Southbound Ramp Width | Save ROW, Change Decision Point, Median | ✓ |
| A-4 | Modify Huntington Road Connector | Improve Traffic Flow | ✓ |
| A-5 | Investigate Jennings Mill Road Relocation | See A-8 | X |
| A-6 | Investigate Northbound On-ramp Connection | Impact on ROW, Business Entrance, Turn Lane | ✓ |
| A-7 | Review / Modify 16-foot Urban Shoulder Design | Reduce ROW Needs | ✓ |
| A-8 | Consider a Single Point Interchange | Improve LOS and reduce ROW Needs | ✓ |
| | | | |
| **B** | **Pavement & Base** | | |
| B-1 | Use Existing Pavement | Standard Procedure | X |
| B-2 | Check Super Elevations at Bridge Approaches | Correct Pavement Alignment | DS |
| B-3 | Check Number of Lanes on SB Off-ramp | See A-3 | X |
| B-4 | Check Number of Lanes on Atlanta Highway | Improve Capacity | X |
| ✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team | | | |

| CREATIVE PHASE<br>Creative Idea Listing | | JUDGMENT PHASE<br>Idea Evaluation | |
|---|---|---|---|
| **No.** | **CREATIVE IDEA** | **COMMENTS** | **IDEA RATING** |
| B-5 | Check Pavement Type for Ramps | Not Enough Information Available | X |
| B-6 | Check Needs for Double Left Turn Lanes into Mall | East End of the Project | DS |
| B-7 | Investigate Rt-in / Rt-out at Northbound on-ramp | Reduce Impact on Ramp | ✓ |
| B-8 | Add Length to Southbound 2-Lane Deceleration Lane | Extend Ramp Decision Point | DS |
| B-9 | To Check Item for Temporary Pavement for Detours | Not Enough Information Available | X |
| B10 | To Remove the Proposed Bike Lane | Reduce Cost, Save ROW, Accelerate Const. | ✓ |
| B-11 | To Narrow Atlanta Highway Lane Widths | Reduce Cost, Save ROW, Accelerate Const. | ✓ |
| B-12 | Review Timothy Road Intersection (Type B Median) | Comply With Standards | ✓ |
| | | | |
| **C** | **Atlanta Highway Bridge** | | |
| C-1 | Review Number of Spans (3 Span vs. 2 Span) | Reduce Cost, Accelerate Construction | ✓ |
| C-2 | Use MSE Wall / Abutments & Reduced Spans | Reduce Cost, Accelerate Construction | ✓ |
| C-3 | Investigate Types of Beams | See C-1, C-2 | X |
| C-4 | Narrow the Bridge Width – Eliminate Bikeway | Reduce Cost | ✓ |
| C-5 | Shorten Bridge | See C-1, C-2 | ✓ |
| ✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team | | | |

| CREATIVE PHASE<br>Creative Idea Listing | | JUDGMENT PHASE<br>Idea Evaluation | |
|---|---|---|---|
| **No.** | **CREATIVE IDEA** | **COMMENTS** | **IDEA RATING** |
| C-6 | Investigate Single Point Interchange | See A-8 | X |
| C-7 | Review Staging for Bridge | Limited Information Available | X |
| | | | |
| **D** | **Drainage** | | |
| D-1 | Review Catch Basin Locations Off ROW | Correct Plans to meet Standards | DS |
| | | | |
| **E** | **Concrete Barrier** | | |
| E-1 | Check Locations, Modify Approach End Treatments | Upgrade Safety, Meet Standards | ✓ |
| | | | |
| **F** | **Curb & Gutter** | | |
| F-1 | Reduce / Minimize Amount of Jennings Mill Road | Reduce Cots | DS |
| F-2 | Review 16-foot Urban Shoulder Concept | See A-7 | X |
| F-3 | Review Widths of Concrete Medians | See B-12 | X |
| F-4 | Review Median in SB Off-ramp | See A-3 | X |
| F-5 | Median / Turn Bays on East End of Project | Meet Standards | ✓ |
| ✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team | | | |

| CREATIVE PHASE<br>Creative Idea Listing | | JUDGMENT PHASE<br>Idea Evaluation | |
|---|---|---|---|
| **No.** | **CREATIVE IDEA** | **COMMENTS** | **IDEA RATING** |
| **G** | **Signals** | | |
| G-1 | Eliminate by Using Single Point Interchange | See A-8 | X |
| G-2 | Include U-Turns on Atlanta Highway | Allow / Improve Access | DS |
| | | | |
| **J** | **Sidewalks** | | |
| J-1 | Modify 16-foot Urban Shoulder Design | See A-7 | X |
| | | | |
| **L** | **Concrete Parapet** | | |
| L-1 | To Eliminate the Handrail | | ✓ |
| L-2 | To Eliminate Parapet and Use 2-Pipe Railing | | ✓ |
| | | | |
| **N** | **Traffic Control** | | |
| N-1 | Dollar Value for the Item is Low | | DS |
| N-2 | Are Temporary Traffic Signals Included in Item | | DS |
| | | | |
| ✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team | | | |

| CREATIVE PHASE<br>Creative Idea Listing | | JUDGMENT PHASE<br>Idea Evaluation | |
|---|---|---|---|
| **No.** | **CREATIVE IDEA** | **COMMENTS** | **IDEA RATING** |
| **P** | **Embankment** | | |
| P-1 | Reduce Amount – Use Single Point Interchange | See A-8 | X |
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| ✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team | | | |