

VALUE ENGINEERING WORKSHOP

SR 316 FROM I-85 TO SR 20 FOR HOV LANES Gwinnett County, GA

PREPARED FOR:



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VALUE ENGINEERING TEAM STUDY

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VALUE ENGINEERING TEAM STUDY

EXECUTIVE SUMMARY

INTRODUCTION

This Value Engineering Study Report summarizes the events of the VE Workshop facilitated by U. S. Cost, Inc. for the Georgia Department of Transportation (GDOT). The subject of the study is SR 316 from I-85 to SR 20 for HOV Lanes, Gwinnett County, Georgia. The project is being designed by PBS & J Transportation Engineers of Atlanta, Georgia.

The three-day study was conducted 19-21 April 2005 in Georgia Department of Transportation Conference Room #352 and followed an abbreviated job plan established by GDOT. The team was furnished a concept design package, including layout, traffic safety records, traffic count and projections, "HOV Strategic Implementation Plan" of October 2003, cross sections, and bridge layout. *The VE team was advised that it was an un-written GDOT policy that all future constructed HOV lanes will have a separation barrier.*

PROJECT DESCRIPTION

The proposed project would begin approximately 2,200 feet west of Breckinridge Boulevard where it would tie-in with the proposed concurrent High-Occupancy Vehicle (HOV) lanes entering SR 316 from the interchange reconstruction project at SR 316 and I-85 (Project Number HPP-IM-85-2(146), P.I. Number 110530). The proposed project would end approximately 1,500 feet east of Progress Center Avenue. Within the project limits is project MSL-0004-00(86), which includes the conversion of the at-grade, signalized intersections of Collins Hill Road and Buford Drive (SR 20) with SR 316, to grade-separated interchanges. These interchanges are necessary to construct the HOV project through this segment of SR 316. Refer to the project description for proposed project MSL-0004-00(86) below.

The proposed project MSL-003-00(186) would construct barrier separated HOV lanes and allow for HOV only access points throughout the project corridor. The HOV lanes would be constructed within the median of SR 316. No additional Single Occupant Vehicle (SOV) lanes would be added as a result of this project. In order to accommodate the addition of the HOV lanes, other improvements throughout the corridor are necessary. These improvements include the reconstruction of SR 316 to accommodate the barrier separated HOV lanes within the median, and the addition of new bridges to accommodate the HOV lanes. The new bridges would be necessary at Herrington Road, widening the existing bridges at the Yellow River, SR 120, Walther Boulevard, the gas line easement west of Collins Hill Road, and Hi-Hope Road. All new bridges would be designed in such a manner as to not preclude future identified improvements to the corridor.

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EXECUTIVE SUMMARY

Other improvements necessary to accommodate the HOV lanes include grade separation and interchange construction at the existing intersection of Collins Hill Road and SR 316. Connections between the Collins Hill Road and SR 20 interchanges would be created to facilitate operational efficiency. These connections are needed due to the proximity of these interchanges to one another.

HOV interchanges would be constructed at Herrington Road, Walther Boulevard and Hi-Hope Road (west facing ramps only). An additional access point will be provided in the vicinity of Sugarloaf Parkway as a direct merge from the HOV lane westbound to the SOV lanes westbound. This will provide an opportunity for HOV users to exit to Interstate 85 north or to access the proposed Collector Distributor (C-D) Road between Old Peachtree Road and Pleasant Hill Road that is being constructed as part of the Interstate 85/SR 316 interchange construction project.

Modifications of access for businesses that currently have direct, at-grade access with SR 316 would also be provided. All direct access to SR 316 for these businesses will be removed. A new access road will be constructed between Collins Hill Road and SR 20 to provide better access for the existing businesses adjacent to SR 316. A new connection will be provided to the Arrington-Blount Ford dealership on the southwest corner of Collins Hill Road and SR 316.

Major structures (\$23 mil) over SR 316 are proposed as follows:

- New Collins Hill Road bridge [358'X90']
- New SR 20 Bridge (Buford Drive) [368'X115']
- New Hi-Hope Road Bridge [358'X115']
- Replacement SR 120 Bridge (Duluth Highway) [454'X115']
- New Walther Road Bridge [442'X65']
- Replacement Herrington Road Bridge [442'X79']
- Widen Bridge over Columbia Gas Pipeline [131'X90']
- Widen Bridge over Yellow River [115'X90']

EXECUTIVE SUMMARY

NEED AND PURPOSE

The growth in traffic congestion in the Metro Atlanta area over the years has been well documented. Efforts to accommodate this growing congestion have included many major additions and improvements to the area's arterials streets, freeways and transit rail lines.

During 1973, the Atlanta Regional Commission (ARC), in cooperation with the affected local governments, the Metropolitan Atlanta Rapid Transit Authority (MARTA), and the Georgia Department of Transportation (GDOT), began a comprehensive planning process designed to develop a long-range guide for regional growth and development. In 1975, the Commission adopted a guide for growth, known as the Regional Development Plan (RDP). Extensive detailed analysis and evaluation of the transportation element of the RDP resulted in the preparation of the Regional Transportation Plan (RTP), which indicated that a system of good arterial and collector roads would be needed to complement the major transit facilities of the Atlanta region.

Today, this program of major facility construction is reaching the point where additional such projects carry increasing economic, social and environmental costs. This situation has been addressed in two major Legislative acts ~ the Clean Air Act Amendment of 1990, and the Intermodal Surface Transportation and Efficiency Act of 1991. These legislative acts encourage and prescribe more efficient use of the existing transportation system in order to both improve the air quality and to provide an effective transportation system. One of the major strategies promoted by these acts is to increase the vehicle occupancy rate. The creation of high occupancy vehicle (HOV) lanes in major commuter corridors is an effective means to promote and encourage higher occupancy rates in the metro area's vehicles.

Express or HOV lanes are intended to provide choice, mobility and relief from congestion for HOV users, particularly during the peak hours. During this time period, auto occupancy rates tend to be higher overall, and the origins and destinations of work trips are more concentrated, lending themselves to ride sharing and transit usage. There are other objectives of HOV lanes, including reduced energy consumption, improved air quality, reduced total person travel time and improved efficiency of public transit operations and reliability of transit service in order to induce mode shifts.

There currently is no HOV service within the SR 316 corridor. However, traffic studies estimate that 19 percent of the 2029 projected Daily Traffic Volumes and Peak Hour Traffic Volumes will be High Occupancy Vehicles. For SR 316, the 2029 AADT forecasts show 24,400 vehicles in the proposed HOV facility and 135,400 in general lanes. Therefore effective opportunities exist to accommodate the current volumes and encourage greater volumes of HOV traffic along SR 316. Along with projected changes in SOV lanes, the proposed project could maintain a 2029 Level of Service (LOS) C in HOV lanes under these conditions. Currently, LOS F exists during peak hours and would continue to operate at LOS F in 2029 without both SOV and HOV improvements.

VALUE ENGINEERING TEAM STUDY

EXECUTIVE SUMMARY

CONCERNS AND OBJECTIVES:

These projects are part of an overall program to widen SR 316 from I-85 to SR 20 for HOV Lanes, Gwinnett County, Georgia. Over the past ten years upgrades to the corridor have been coming together, spurred by the increased traffic that traverses through Gwinnett County toward Athens. The following are some of the highlighted concerns and objectives noted by the VE team for this project:

CONCERNS/OBSERVATIONS	PROBLEMS/OBJECTIVES
GDOT HOV with Barrier Walls Policy	The un-written GDOT design policy to construct HOV with barriers is a costly solution for this section of SR 316 corridor
Project reflects a cost of \$ 12,400,000 per mile	The high cost is a result of requiring HOV lanes with movable barriers and the complete reconstruction of all existing SR 316 lanes and the requirement for replacement of three bridges, construction of three new bridges and the widening of two
Presentation requested to change to Concrete Pavement ilo Asphalt as shown	The cost of demolition of all existing asphalt pavement and replacing it with new concrete pavement increases the cost by 30%
Demolition of Existing Bridges	It is not necessary to replace Herrington Road Bridge and SR 120 if a variance in HOV shoulder width under bridge is granted.
Material haul distances for demolition material	With the change from asphalt surface pavement to concrete, the cost of the project will increase since the material will not be re-used on this project.
HOV Requirement	It appears the requirement to construct HOV lanes for this 8 mile corridor is not justified and will not serve the local Gwinnett County residents. The interchange locations need to be re-evaluated, and there are no Park and Ride lots currently identified. Bus riders in the corridor will be minimum.

VALUE ENGINEERING TEAM STUDY

EXECUTIVE SUMMARY

Replacement of Existing Bridges	The cost of replacing existing bridges with excellent sufficiency ratings appears counter productive.
Providing for an additional HOV lane	The cost of providing for an additional HOV lane based on traffic projections appears to be costly and un-necessary and should be re-evaluated.

Project Objectives:

Widen SR 316 from I-85 to SR 20 to accommodate new HOV Lanes

Reduce travel time and reduce congestion in Gwinnett County

Benefits the 20 County Georgia Clean Act Policy

The estimated ROW cost and estimated construction cost (ECC) as of 02/08/05 is:

Project	ROW \$	ECC \$	Total \$	Award Date
MSL-0003 (168)	27,000,000	101,000,000	128,000,000	June 2009

See Appendix "B" for details.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Introduction

U.S. Cost Incorporated conducted two concurrent Value Engineering Team Studies on Widen SR 316 from I-85 to SR 20 for HOV Lanes Gwinnett County, Georgia. The dual V.E. study was conducted for three (3) days, 19-21 April 2005, at the Georgia Department of Transportation Conference Room #352 in Atlanta, GA. The study team was furnished with a concept design package. The following individuals were members of the V.E. team:

Name	Firm	Discipline
Lindsey Gardner, P.E., CVS	U.S. Cost, Inc.	VETL
Jerry Brooks, P.E.	MAAI	Roadway Designer
Sam Deeb, P.E.	MAAI	Bridge Designer
Laland Owens	MAAI	Constructability
Lisa Myers	GDOT	Value Engineer
Wade Harris	GDOT	Cost Engineer
Jill Franks	GDOT	Project Manager
Neal O'Brien	GDOT	Project Liaison

Information Phase/Function Analysis

The V.E. team was first briefed on the project designed by PBS & J Transportation engineers in an orientation meeting the morning of the first day of the V.E. Study. The briefing gave insight into the current design, and also into the aspects of Widening SR 316 from I-85 to SR 20 to accommodate new HOV Lanes, which impact the site. The briefing included a review of the design requirements and rationale for the location and arrangement of the major functional areas in addition to information on the bridge structural systems. Discussions regarding project funding, required functions, and project criteria followed the design presentation.

As a basic part of the V.E. process, the team conducted a partial function analysis session on the SR 316 from I-85 to SR 20 for HOV Lanes, project to identify the needs and goals of the project and facilitate the creative idea session, by addressing functions as opposed to the specific design elements.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

The Basic Function of the project is to *Construct HOV*. A strong secondary function is to *Reduce Time* by constructing SR 316 from I-85 to SR 20 for HOV Lanes, in Gwinnett County, Georgia. A detailed project function analysis of the characteristics of the project and their relationships is presented in Appendix A.

Risk Analysis

The group identified the following project risk elements, which may impact the construction/widening of existing SR 316 from I-85 to SR 20 for HOV Lanes, in Gwinnett County, Georgia. This exercise served as a catalyst for the Creative Phase of the study, when several ideas were suggested which would mitigate these project construction risks.

Risk Elements

- Maintaining uninterrupted flow of traffic of existing and detour roads during construction
- Commuters crossing too many lanes to exit SR 316
- Commuter learning curve on entering a barrier restricted HOV lane from an un-barrier, plus signage for commuters approaching from a un-barrier HOV road
- Delays and impact on the traveling/commuting public/interstate commerce
- Contractor Phasing Coordination and traffic management for both contracts
- Poor Progress/Quality By A Low Bid Construction Contractor
- Inflationary (Market Conditions) cost of concrete, asphalt/petroleum and steel
- Failure to meet GDOT advertisement/let date currently scheduled for June 2009
- Accidents and potential lawsuits during construction
- Traffic management and detours during staging/construction
- ROW approval and procurement in a timely manner
- Wetland mitigation

Project Criteria

During the meeting, project goals, criteria and sensitivities were also identified. The following prioritized listing identifies the key items of which the V.E. team should be aware. Criteria with a score of 5 or higher were considered of prime importance, and those criteria therefore must be considered in the review of any design alternative. The ranking below is the V.E. teams' impression of the sensitivity of the criteria from discussions held with Georgia DOT engineers.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Project Criteria Analysis

Life Safety	10
Operational Issues	10
Interruptions	10
FHWA HOV Agreement	10
Clean Air Modeling	10
GRTA Agreement	10
Gwinnett Buy-In Agreement	10
Atlanta Regional Commission	10
GDOT Un-Written Requirement	10
Constructability	8
Functionality	8
Life Cycle Cost (Analysis)	8
AASHTO 2002 Compliance	7
Maintenance and Operations	6
Cost Savings Impact	2

Creative Phase

The Creative Phase of the V.E. study was initiated the morning of the second day of the study. A total of twenty-five (25) creative ideas were generated for further investigation by the team. Many of the creative ideas focused on enhancements to the roadway profile, HOV lanes, safety, excavation techniques, demolition, traffic control, roadway reconstruction, utility locations, bridge replacements, and drainage impact, plus various other design elements of the project. Additional ideas were generated reflecting alternative materials based on an understanding of local construction products and materials and the relative costs of installing them.

A listing of all creative ideas on SR 316 from I-85 to SR 20 for HOV Lanes is included in Appendix "A".

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Evaluation Phase

The ideas generated during the Creative Phase were reviewed and evaluated by the VE team during a meeting held on the morning of the second study day. The intent of the meeting was to allow the V.E. team an opportunity to discuss and evaluate the ideas. A few of the V.E. ideas were dropped at that time as being conceptually unacceptable or in conflict with established Criteria, Right of Way (ROW) conflicts, previous agreements, or local construction methods. The ranking system consisted of VE team representatives assigning a designation to each idea. Those ideas, which the V.E. Team felt had the most promise, were given a designation of 1-5 on acceptability and 1-5 on cost impact, for a maximum rating of 10 points. This is a time management tool to identify those proposals that have the greatest potential.

Approximately twenty (20) out of the original twenty-five (25) creative ideas were deemed promising for further investigation and analysis by the V.E. team.

The time management ranking system used by the VE team is as follows:

FEASIBILITY OF IDEA

- 5 points - Excellent Idea
- 4 points - Good Idea
- 3 points - Fair Idea
- 2 points – Marginal Idea
- 1 point - Poor Idea –do not develop

COST IMPACT

- 5 points - > \$ 500,000
- 4 points - \$400,000 to 499,999
- 3 points - \$300,000 to 399,999
- 2 points - \$200,000 to 299,999
- 1 point – zero to \$199,999
- DS – Design Suggestion – sometimes reflects an increase in cost

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Development Phase

The specific proposals found in the body of this report represent the positive results of investigations by the V.E. team on the project, SR 316 from I-85 to SR 20 for HOV Lanes. Each proposal represents a quality enhancing or cost saving alternative, which is documented by words, drawings and numbers. The proposal format presents the idea, describes the original design element proposed for change and the proposed change, lists the perceived advantages and disadvantages of the proposed change and supports the idea with a detailed cost estimate for the original and proposed design. Where necessary for clarity, the proposal also includes thumbnail design drawings and supporting engineering calculations. Many of the V.E. proposals may require some level of redesign on specific portions of the project to implement the modification. Further, several of the V.E. ideas may involve modifications to the Criteria, or current goals, to Widen SR 316 from I-85 to SR 20 to accommodate HOV Lanes. These ideas are presented to initiate additional discussion and investigation during the next phase of design.

Presentation Phase

A final presentation was not scheduled for the last day of the study.

Resolution Phase

Upon receipt of the Final Value Engineering Report for the project, SR 316 from I-85 to SR 20 to accommodate HOV Lanes, PBS & J and Georgia DOT Program Mangers representatives are requested to prepare written comments on the acceptability of each of the V.E. proposals. Responses should include the rationale for accepting, rejecting, or modifying the V.E. proposal.

Basis of V.E. Cost Savings

The cost information for proposals in this report are based on the cost data prepared by the design A/E /Georgia Department of Transportation designers and bid tabs. Therefore, the savings presented in the proposals is a general order of magnitude (estimate of the potential savings) if the idea were to be accepted. These figures are solely intended to identify the most attractive design solution, and are not prepared to represent a net deduction to the overall project budget. The costs are in 2005 dollars. All life cycle cost analyses are prepared utilizing Present Worth methodology, a 30-year economic period, a 4.0% net discount factor (inclusive of inflation), and 3% escalation in the cost of utilities. With a bid opening of June 2009 with a mark-up of 34%. All cost proposals have been marked up 10% for E & C & 5% per year (4 yrs) for inflation. The cost estimate does not appear to address current market conditions for concrete and steel shortage and or impact of \$55/barrel for the cost of oil.

VALUE ENGINEERING TEAM STUDY

KEY INFORMATION/NOTES

Sustainable/Green Design Proposals

Sustainable design incorporates energy conservation, increased use of renewable energy sources, the reduction or elimination of toxic and harmful substances in facilities, efficiency in resource and material utilization, recycling of building materials, the use of recycled material, the reduction of waste products during both the construction and operation of the facility, and facility maintenance practices that reduce or eliminate harmful effects on people and the natural environment. In keeping with the National Policy objective of building all new facilities with sustainable design features, the VE team proposed sustainable design elements and/or practices. There are no developed sustainable proposals in this report; however, the construction contactor should have the option to employ construction techniques and materials and use re-cycled asphalt and crushed concrete as appropriate.

VALUE ENGINEERING STUDY RECOMMENDATIONS

WIDENING SR 316 FROM I-85 TO SR 20 FOR HOV LANES
GEORGIA DEPARTMENT OF TRANSPORTATION

Proposal	Description	Capital Savings	OPS. & Maint.	Total Savings
	ROADWAY/PROFILE (RW)			
	(with HOV barrier)			
1.0	(Variance Required) Construct HOV without barrier separated and reduce pavement width	27,600,000		27,600,000
1.1	Build barrier separated HOV without provision for future two (2) lane HOV	16,200,000		16,200,000
2.0	(Variance Required) Retain existing dual lanes in current location ilo demolition and resurface with concrete plus construct no separated barrier for HOV lanes	32,000,000		32,000,000
3.0	(Variance Required) Mill or grind and resurface with asphalt existing dual lanes in current location ilo demolition and construct asphalt concrete with no separated barrier for HOV lanes	47,000,000		47,000,000
4.0	Develop and award project as design, build, and operate toll road now ilo in 2010	Design Suggestion		DS
5.0	Re-evaluate the justification for HOV projections through this corridor	Design Suggestion		DS
6.0	Price, identify, and include high mast signage requirements	Design Suggestion		DS
7.0	Identify and purchase locations for Park and Ride lots as part of this project	Design Suggestion		DS
10.0	(Could be a variance) Widen to three lanes using the existing two lanes without HOV designation	47,000,000		47,000,000
10.1	(Variance Required) Widen to three lanes in each direction and construct HOV adjacent to existing pavement without barrier	(10 Million)		(10 Million)
11.0	(Could be a variance) Construct a reversible two (2) lane HOV with barriers and gates	Design Suggestion		DS
12.0	(Variance Required) Consider a No-Build alternate	Design Suggestion		DS
13.0	Retain asphalt surface pavement in lieu of changing to concrete surface pavement	16 million		16 million
14.0	Install fixed concrete barriers in lieu of movable Type 20 concrete barriers	13,300,000		13,300,00

VALUE ENGINEERING STUDY RECOMMENDATIONS

WIDENING SR 316 FROM I-85 TO SR 20 FOR HOV LANES
GEORGIA DEPARTMENT OF TRANSPORTATION

Proposal	Description	Capital Savings	OPS. & Maint.	Total Savings
	STRUCTURAL/BRIDGES (SB)			
1.0	(Variance Required) Construct stripped HOV section ilo barrier: Build Herrington , SR 20, Collins Hill Rd, Hi-Hope Rd and widen Colonial Pileline, and Yellow River Bridges	7,800,000		7,800,000
1.1 **	(Variance Required) Construct stripped HOV section ilo barrier: Build, SR 20, Collins Hill Rd, Hi-Hope Rd and Colonial Pileline Bridges	16,320,000 incl in RW-2.0		16,320,000 incl in RW-2.0
1.2	(Variance Required) Use HPC with two (2) span configuration & MSE walls non barrier separated HOV section	11,300,000		11,300,000
2.0	Eliminate endrolls and utilize MSE walls instead of a barrier separated HOV section	1,700,000		1,700,000
4.0	Use precast Arch culvert over Columbia Gas Pileline ilo bridges	250,000		250,000
5.0	Depress SR 316 under Walther Road and utilize a 53' Arch culvert	3,300,000		3,000,000

**SUMMARY OF PROPOSALS
WIDEN SR 316 WITH SEPARATED HOV BARRIER**

SCHEME # 1

IDEA NO.	IDEA DESCRIPTION	SAVINGS
ROADWAY (RW)		
RW - 1.1	Build barrier separated HOV without provision for future two (2) lane HOV	16,200,000
RW - 6.0	Price, identify, and include high mast signage requirements	Design Suggestion
RW - 7.0	Identify and purchase locations for Park and Ride lots as part of this project	Design Suggestion
RW - 13.0	Retain asphalt surface pavement in lieu of changing to concrete surface pavement (<i>this is not a true savings in the current documents but this could be a dramatic increase in cost if concrete is implemented</i>)	±16,000,000
RW - 14.0	Install fixed concrete barriers in lieu of movable Type 20 concrete barriers	±13,300,000
STRUCTURAL/BRIDGES (SB)		
SB - 4.0	Use precast Arch culvert over Columbia Gas Pile line ilo bridges	250,000
SB - 5.0	Depress SR 316 under Walther Road and utilize a 53' Arch culvert	3,300,000
Potential Optimum Savings		49,050,000
Total 1st and LCC Savings		49,050,000
If concrete surface is not used the true savings is		33,050,000

**SUMMARY OF PROPOSALS
WIDEN SR 316 WITH WITHOUT SEPARATED HOV BARRIER**

SCHEME # 2

IDEA NO.	IDEA DESCRIPTION	SAVINGS
	ROADWAY (RW)	
RW – 1.0	(Variance Required) Construct stripped HOV section ilo barrier: Build Herrington , SR 20, Collins Hill Rd, Hi-Hope Rd and widen Colonial Pipeline, and Yellow River Bridges	27,600,000
RW - 6.0	Price, identify, and include high mast signage requirements	Design Suggestion
RW - 7.0	Identify and purchase locations for Park and Ride lots as part of this project	Design Suggestion
RW – 13,0	Retain asphalt surface pavement in lieu of changing to concrete surface pavement	16,000,000
	STRUCTURAL/BRIDGES (SB)	
SB – 4.0	Use precast Arch culvert over Columbia Gas Pile line ilo bridges	250,000
SB – 5.0	Depress SR 316 under Walther Road and utilize a 53' Arch culvert	3,300,000
	Potential Optimum Savings	47,150,000
	Total 1st and LCC Savings	47,150,000
	If concrete surface is not used the true savings is RW-13,0	31,150,000

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	1 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: CONSTRUCT HOV WITHOUT BARRIER AND REDUCE PAVEMENT WIDTH.

ORIGINAL DESIGN: The proposed project would construct barrier separated HOV lanes and allow for HOV only access points throughout the project corridor. The Office of Materials & Research reported that “reconstruction of SR316 should consist of removal and replacement of the Asphalt Concrete and PCC pavement layers and replacement with PCC pavement.”

PROPOSED CHANGE: The proposed change would construct buffer separated HOV and allow for HOV access at designated points throughout the project corridor. The same pavement section as in the original design is assumed. This proposed change is for roadway only. See proposal SB-01 for bridges.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 66,023,676		\$ 66,023,676
PROPOSED CHANGE:	\$ 38,413,352		\$ 38,413,352
		SAVINGS:	\$ 27,610,324

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	2 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ADVANTAGES:

- Total life cycle cost savings of \$27,610,324
- Shorter construction time.
- Allows HOV users to exit/enter at designated locations rather than HOV only interchanges.
- Less wetland impacts with smaller typical section.
- Less required right of way with smaller typical section.
- Avoids unnecessary bridge replacements.

DISADVANTAGES:

- Does not follow the GDOT current policy requiring barrier separated HOV.

JUSTIFICATION:

At the initial concept team meeting on November 5, 2003, GRTA asked “Has barrier separated verses concurrent HOV lanes been evaluated for this project?” The answer was “No. The project scope:...specifically included barrier separated HOV” which is not a sufficient answer. The HOV Strategic Implementation Plan dated October 2003 in section 9.3, typical sections, states “Barrier separation is desirable and should be used wherever practical.” “Buffer separation should be used to avoid unnecessary bridge replacements, excessive property impacts, or undesirable environmental impacts.”

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	3 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
PCC Pavement 9in*	GDOT	SY	635,500	\$60/sy	\$38,100,000
Conc Barrier TP 20	1	LF	86000	129.09/lf	\$11,171,400
SUBTOTAL:					\$49,271,400
34% MARK UP:					\$16,752,276
TOTAL:					\$66,023,676

*Concept design cost estimate used Asphalt, PCC is required by OMR

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
PCC Pavement 9in	GDOT	SY	477,778	\$60/sy	\$28,666,680
SUBTOTAL:					\$28,666,680
34% MARK UP:					\$9,746,671
TOTAL:					\$38,413,351

SOURCES

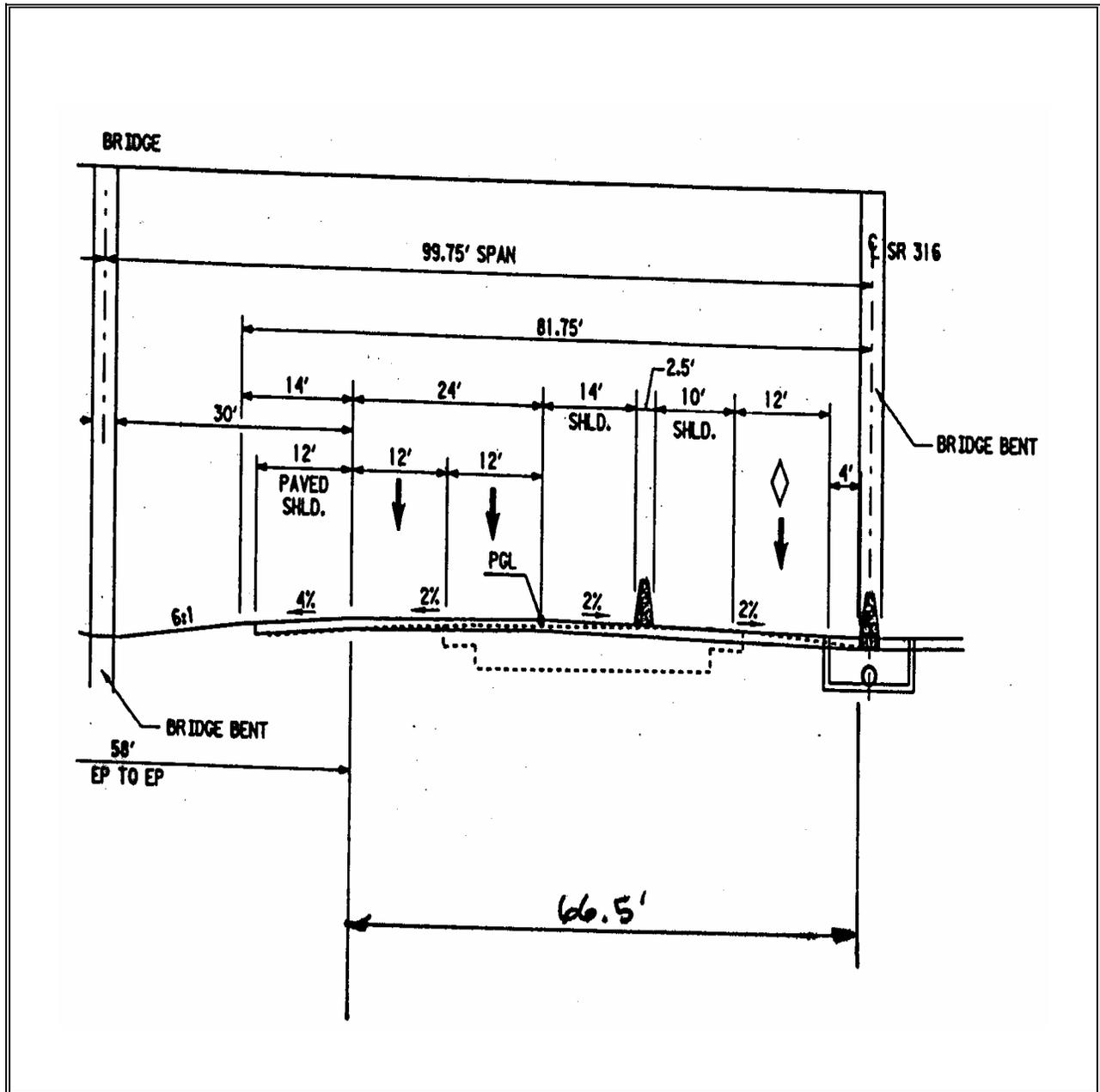
- | | |
|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. CES Data Base | 6. Vendor (Specify) |
| 3. CACES Data Base | 7. Other (Specify) |
| 4. Means Estimating Manual | |

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER:	RW-1.0
PAGE NUMBER:	4 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA



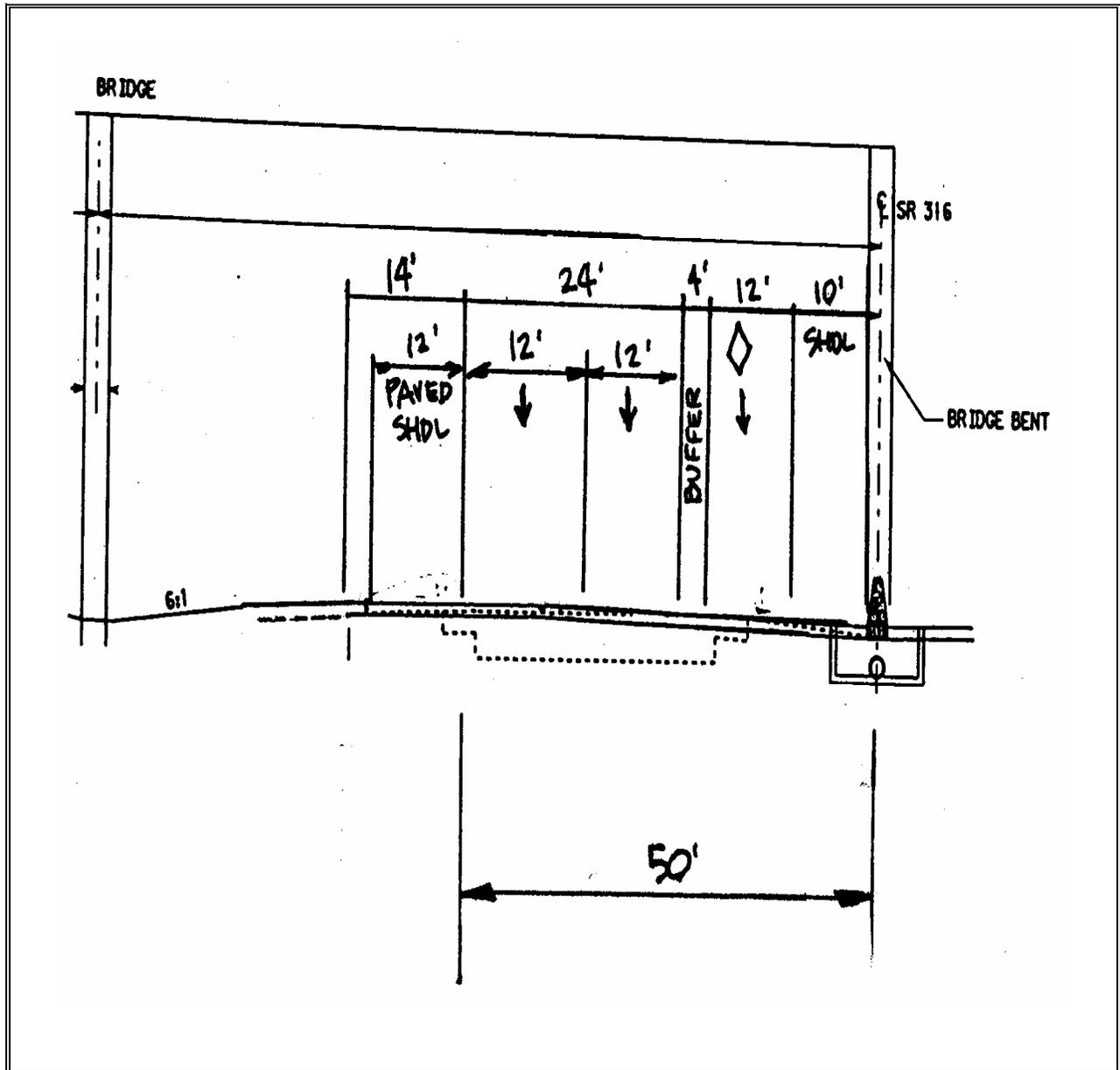
PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER: RW-1.0

PAGE NUMBER: 5 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA



ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	RW-1.0
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PAGE NUMBER:	6 of 7
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PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Project 8.1 miles = approximately 43,000 lf

PCC @ 9" = \$60/sy

Typical section 66.5 ft

43,000 lf x 66.5 ft x 2 ea / 9 = 635,500 sy

635,500 sy @ \$60/sy = **\$38,100,000**

Barrier @ \$129.90/lf

86,000 lf

43,000lf x 2 ea = 86,000 lf

86,000 lf @ \$129.0/lf = **\$11,171,400**

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	RW-1.0
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PAGE NUMBER:	7 of 7
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PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

Project 8.1 miles = approximately 43,000 lf

PCC @ 9" = \$60/sy

Typical section 50 ft

43,000 lf x 50 ft x 2 ea / 9 = 477,778 sy

477,778 sy @ \$60/sy = **\$28,666,680**

Barrier @ \$129.90/lf

Not required

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-1.1
PAGE NUMBER:	1 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: BUILD BARRIER SEPARATED HOV WITHOUT PROVISION FOR FUTURE 2 LANE HOV.

ORIGINAL DESIGN: The original typical has 26.5 feet between edge of pavement of the HOV and the SOV with a movable barrier.

PROPOSED CHANGE: The proposed change would use 16.5 feet between edge of pavement of the HOV and the SOV with a fixed barrier.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 0		\$ 0
PROPOSED CHANGE:	\$(16,194,436)		\$(16,194,436)
		SAVINGS:	\$(16,194,436)

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-1.1
PAGE NUMBER:	2 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ADVANTAGES:
Total life cycle cost savings of \$16,194,436.

DISADVANTAGES:
Does not provide for future capacity.

JUSTIFICATION:
Meets current design standards.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-1.1
PAGE NUMBER:	3 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
SUBTOTAL:					
% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
9" PCC pavement	GDOT	95,500	SY	\$60/sy	(\$5,730,000)
Concrete Median Barrier	Work Sheet	86,000	LF	(\$73.90/lf)	(\$6,355,400)
SUBTOTAL:					(\$12,085,400)
34% MARK UP:					(\$4,109,036)
TOTAL:					(\$16,194,436)

SOURCES

- | | |
|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. CES Data Base | 6. Vendor (Specify) |
| 3. CACES Data Base | 7. Other (Specify) |
| 4. Means Estimating Manual | |

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:

RW-1.1

PAGE NUMBER:

4 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

PCC Pavement:

26.5 feet – 16.5 feet = 10 foot reduction

10 feet x 43,000lf x 2 / 9 = 95,500 SY

95,500 SY @ \$60/SY = \$5,730,000 reduction

Barrier

Moveable barrier concept cost estimate = \$129.90/LF

Conc Median Barrier TP 20 = \$56.00/LF

\$129.90 - \$56 = \$73.90 difference

43,000LF x 2 = 86,000LF

86,000 LF x 73.90 = \$6,355,400 reduction

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-2.0
PAGE NUMBER:	1 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: RETAIN EXISTING DUAL LANES IN CURRENT LOCATION ILO DEMOLITION AND RESURFACE WITH CONCRETE PLUS CONSTRUCT HOV LANES.

ORIGINAL DESIGN: The original design proposes the shifting of lanes away from the centerline at grade separations in order to accommodate the construction of HOV ramps & HOV lanes in the median

PROPOSED CHANGE: The proposed design recommends the retainage of the existing lanes and overlaying them with PCC methods and materials as well as constructing parallel HOV lanes with PCC pavement. In addition, the outside shoulders would be removed and replaced with PCC pavement.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	See Cost Est.		See Cost Est.
PROPOSED CHANGE:	\$ 31,022,119		\$ 31,022,119
SAVINGS:			\$ 31,022,119

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-2.0
PAGE NUMBER:	2 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

- Total life cycle cost savings of \$31,022,119.
- Construction would be more linear thereby affecting production rate.
- Does not require spoil area.
- Traffic maintenance under construction would be facilitated.
- Lowers Right-Of-Way requirement.

DISADVANTAGES:

- Violates GDOT Barrier Separated HOV policies.
- Would require OMR approval for PCC overlay.
- Does allow for HOV interchange.
- Weaving by commuters exiting or entering the HOV lanes to exit or entrance ramps.
- Non authorized use by SOV.

JUSTIFICATION:

The adjacent I-85 corridor conforms to the proposed design and HOV users are accustomed to using it. The proposed design conforms to driver’s expectancy.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-2.0
PAGE NUMBER:	3 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
See Cost Est.					
SUBTOTAL:					
34% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pvmt Stru.	1	LS	1		723,465
Conc Barrier	1	LF	86170	129.90	11,193,483
Bridges	1	LS			11,233,887
SUBTOTAL:					23,150,835
34% MARK UP:					7,871,284
TOTAL:					31,022,119

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|--|--|

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	RW-2.0
PAGE NUMBER:	4 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

Design Pavement Structure \$27,698,592

Proposed Pavement Structure

HOV 2(43,085') x 12' ÷ 9 sf/yd = 114,893 sq x \$39.60 = \$4,549,776

Shoulders:

2(31,085 ft) x 8' ÷ 9 sf/sq = 55,262 sq x 39.60 = 188,375

2(12,000 ft) x 18 ÷ 9 sf/sq = 48,000 sq x 39.60 = 1,900,000

2(43,085 ft) x 12' ÷ 9 sf/sq = 114,893 sq x 39.60 = 4,549,776

Overlay @ PCC

4(43,085 ft) x 12' ÷ 9 sf/sq = 229,787 sq x 60.00 = 13,787,200
\$26,975,127

Pavement Savings \$ 723,465

Bridge Savings 11,233,887

Barrier Savings 11,193,483

Total Savings \$23,150,835

30% E&C & Inflation 7,871,284

Adjusted Total \$31,022,119

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-2.1
PAGE NUMBER:	1 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: MILL OR GRIND AND RESURFACE WITH ASPHALT EXISTING DUAL LANES IN CURRENT LOCATION ILO DEMOLITION AND CONSTRUCT ASPHALTIC CONCRETE HOV LANES.

ORIGINAL DESIGN: The original design is to construct HOV lanes in the SR 316 median shifting the through lanes outward as necessary to accommodate HOV interchanges at three locations.

PROPOSED CHANGE: The proposed design recommendation is to retain the existing lanes, mill the asphalt section, grind the concrete section, construct // HOV lanes symmetrical with the existing alignment, overlay entire project and strip appropriately.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	See Cost Est.		See Cost Est.
PROPOSED CHANGE:	\$(52,723,729)		\$(52,723,729)
SAVINGS:			\$ 52,723,729

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-2.1
PAGE NUMBER:	2 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

Total life cycle cost savings of \$52,723,729.

Lowers Right-Of-Way requirements.

Provides ready access to HOV lanes from all entry points.

Construction operations (paving) would be easier.

Shifting of traffic under construction.

DISADVANTAGES:

Violates GDOT Barrier Separated HOV policies.

Life cycle of flexible pavements are shorter than PCC pavements.

Allows HOV users to leave or enter HOV freely at interchange ramps.

Is not high type design for HOV lanes and does not provide room for upgrade to HOV interchange.

JUSTIFICATION:

The proposal provides for continuity of design with adjoining HOV lanes and would not require as much signing.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-2.1
PAGE NUMBER:	3 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
See CostEst.					
SUBTOTAL:					
34% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Pvmt Stru.	1	LS	1		16,978,398
Conc Barrier	1	LF	86170	129.90	11,193,483
Bridges	1	LS			11,233,887
SUBTOTAL:					39,325,768
34% MARK UP:					13,397,961
TOTAL:					52,723,729

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|--|--|

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:

RW 2.1

PAGE NUMBER:

4 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

Design Pavement Structure

27,698,592

Proposed Pavement Structure

Graded Aggr. base crs (12") $326,414 \text{ sq} \times 12^{28}/_{\text{sq}} = 4,204,212$

Asph Conc 12.5mm (polymer) $9,064 \text{ tons} \times 65^{28}/_{\text{ton}} = 595,414$

Asph Conc 12.5mm (Gp 2) $36,829 \text{ tons} \times 36^{75} = 1,352,729$

Asph Conc 19 mm (Gp 1 or 2) $35,906 \text{ tons} \times 46^{20} = 1,662,448$

Asph Conc 25 mm (Gp 1 or 2) $71,812 \text{ tons} \times 34^{87} = 2,504,084$

Mill Asph Conc permit (var) $120,000 \text{ sq} \times 1^{33} = 159,600$

Grind Conc Permit $109,867 \text{ sq} \times 2^{20} = 241,707$

10,720,194

Pavement savings = # 16,978,398

Bridge savings = 11,233,887

Barrier savings = 11,193,483

39,325,768

30% ETC + inflation 13,397,961

Adjusted Total # 52,723,729

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW 3.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: DEFER ANY COST PROVISION ASSOCIATED WITH CONSTRUCTION OF FUTURE COLLECTOR DISTRIBUTOR SYSTEMS.

ORIGINAL DESIGN:	The original design accommodates a future collector distributor system with increased bridge lengths and moving ramps away from the mainline
PROPOSED DESIGN:	The proposed design recommendation is to evaluate the project concept and defer any design feature that accommodates the future C/D system to future projects

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-3.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

- Probable life cycle cost savings would be in the range of 10-15%.
- Some of the work anticipated with this project could be deferred to the public private partnership saving roadway dollars.
- Would not have to Remove & replace bridges with good sufficiency ratings.
- Ramps would not have to be moved out at this time.
- Could defer purchasing wetland credits to the public private partnership.

DISADVANTAGES:

- Continued development of Right of way needed for C/D system.
- Bridges would have to be rebuilt at future inflated prices.
- Construction under future traffic volumes would result in increased time lost in motorist delay.
- Protection of right of way could include advanced acquisition.

JUSTIFICATION:

Since it is highly probable that the public private partnership will evolve into an upgrade of the corridor it seems appropriate to let tolls pay for the maximum amount for upgrading the corridor.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW 4.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: DEVELOP AND AWARD PROJECT AS A TOLL ROAD FOR IMMEDIATE AWARD AND CONSTRUCTION IN LIEU OF WAITING UNTIL NORMAL FUNDING AND AWARD IN FY 2009. ACCEPT WASHINGTON GROUP PPP PROPOSAL.

ORIGINAL DESIGN: The original design is conventional design, bid, award, and construct by GDOT using government funds.

PROPOSED CHANGE: The Private/Private Partnership (PPP) proposal to design-build the project and operate as a toll facility should be considered and either implemented or ruled out prior to construction of this project with government funds.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW 4.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ADVANTAGES:

Construction of entire corridor in Gwinnett, Barrow and Oconee could be accomplished sooner.
Cost savings of Government funds.

DISADVANTAGES:

May have public opposition to operation as a toll road.

JUSTIFICATION:

Allowed by laws in the State of Georgia.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW 5.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: RE-EVALUATE JUSTIFICATION (18% USAGE) ON HOV PROJECTIONS THROUGH THIS CORRIDOR.

ORIGINAL DESIGN: The original project concept report shows AADT of 135,400 (2029) in General Purpose lanes and 24,400 (2029) in HOV lanes. This represents 18% of the traffic using the HOV lane.

PROPOSED CHANGE: Confirm that traffic projections or estimates used in the concept as justification for building a HOV lane in this corridor are based on sound logic and good engineering judgment.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW 5.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ADVANTAGES:
Identifies if project is justified.

DISADVANTAGES:
Deferring construction until project is needed could increase construction and right of way cost.

JUSTIFICATION:
Accepted engineering practice.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-6.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: PRICE, IDENTIFY AND INCLUDE SIGNAGE REQUIREMENTS.

ORIGINAL DESIGN: The concept does not identify signing requirements for this project and the VE Team cannot determine what advanced signing is in the adjacent I-85/SR-316 interchange reconstruction project.

PROPOSED CHANGE: The proposed change recommendation is to include the estimated cost for signage in the cost model because the type signs require could amount to 2-5% of the project costs.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-6.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ADVANTAGES:

Anticipated life cycle cost savings in the range of 2 to 5 percent.

Provisions for advance signing could be made as part of adjacent projects.

The HOV concept for this project is different than adjoining HDV projects and could violate driver expectancy.

Make project estimate more accurate.

DISADVANTAGES:

None apparent.

JUSTIFICATION:

Signing for the proposed project will be relatively complex and require approach signing outside the project limits.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-7.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: IDENTIFY AND/OR PURCHASE LOCATIONS FOR PARK & RIDE LOTS IN CONJUNCTION WITH, OR AS PART OF, THE RIGHT OF WAY ASSOCIATED COSTS FOR THIS PROJECT.

ORIGINAL DESIGN: The original concept as developed shows locations for HOV only interchanges at Herrington Road, Walther Boulevard, and Hi-Hope Road.

PROPOSED CHANGE: It is recommended that locations for Park & Rides lots be identified and purchased in conjunction with this proposed HOV interchange to insure that the proposed locations for HOV interchanges are correctly located.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-7.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ADVANTAGES:
Ensures locations of HOV interchanges are close of available Park & Ride lots.

DISADVANTAGES:
Adds right of way cost if purchased in conjunction with project.

JUSTIFICATION:
The HOV Strategic Implementation Plan dated October 2003 section 5.1 “As part of the HOV access evaluation, it is recommended that park and ride lots be considered in conjunction with HOV direct access.”

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-10.0
PAGE NUMBER:	1 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: WIDEN TO THREE LANES USING THE EXISTING TWO LANES WITHOUT HOV DESIGNATION.

ORIGINAL DESIGN: The original design is to reconstruct SR 316 adding HOV Lanes in the median with three HOV interchanges

PROPOSED CHANGE: The proposed design recommendation is to add one lane in each direction in the median to increase capacity without HOV designation and no reconstruction of outside shoulder or ramps. This recommended proposal would separate the grade at Collins Hill Road and at SR 20.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	See Cost Est.		See Cost Est.
PROPOSED CHANGE:	\$ 47,118,328		\$ 47,118,328
SAVINGS:			\$ 47,118,328

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-10.0
PAGE NUMBER:	2 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

Total life cycle cost savings of \$47,118,328.

Would provide operational improvements at SR 20 which are desperately needed.

DISADVANTAGES:

Violates modeling for clean air.

Violates design directive for barrier separated HOV lanes.

Probably would not be approved by ARC or GRTA.

Not compatible with corridor upgrade plan.

Would be a temporary fix.

JUSTIFICATION:

The proposal would add much needed capacity to SR 316 by increasing the number of lanes from four to six and grade separate two major choke points.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-10.0
PAGE NUMBER:	3 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
See CostEst.					
SUBTOTAL:					
34% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right Of Way	1	LS			15,000,000
Rdwy	1	LS			40,763,282
Bridges	1	LS			13,407,545
SUBTOTAL:					69,170,827
34% MARK UP:					20,751,248
TOTAL:					89,922,025

SOURCES

- | | |
|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. CES Data Base | 6. Vendor (Specify) |
| 3. CACES Data Base | 7. Other (Specify) |
| 4. Means Estimating Manual | |

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	RW - 10.0
PAGE NUMBER:	4 of 4

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

<u>Design ROW & Construction cost</u>	\$ 127,148,904
<u>Proposal ROW & Construction Cost</u>	89,922,075

<u>estimated savings</u>	\$ 37,226,829
<u>E&C + inflation 30%</u>	11,168,048
<u>Total savings</u>	\$ 48,394,877

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-10.1
PAGE NUMBER:	1 of 3

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: WIDEN TO THREE LANES IN EACH DIRECTION AND CONSTRUCT HOV ADJACENT TO EXISTING PAVEMENT WITHOUT BARRIER.

ORIGINAL DESIGN: The original design is to construct HOV lanes in the SR316 Median shifting the through lanes outward as necessary to accommodate HOV interchanges at three locations and construct grade separations at Collins Hill Road and SR 20.

PROPOSED DESIGN: The proposed design recommendation is to construct an additional thru lane in each direction in addition to constructing HOV lanes in the existing median. This proposed change is for all lanes to be symmetrical about the existing centerline with HOV lanes adjacent to the inside through lanes without barrier separation.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	See Cost Est.		See Cost Est.
PROPOSED CHANGE:	\$(10,413,283)		\$(10,413,283)
		SAVINGS:	\$ (10,413,283)

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-10.1
PAGE NUMBER:	2 of 3

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

Provides needed additional through capacity.

Proves needed HOV lanes.

Would not interfere with C/D concept.

Provides Interchanges at Collins Hill road and SR 20.

DISADVANTAGES:

Violates modeling for clean air.

Violates design directive for barrier separated HOV lanes.

Added capacity is not in project concept.

Could require additional right of way.

JUSTIFICATION:

The proposal provides additional needed capacity, HOV lanes and grade separates with interchanges. Two intersections will be at unacceptable levels of service. The proposal also would correct the accident rate for the roadway segment.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW-10.1
PAGE NUMBER:	3 of 3

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
See CostEst.					
SUBTOTAL:					
34% MARK UP:					
TOTAL:					

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Right Of Way	1	LS			(1,500,000)
Rdwy	1	LS			(5,922,218)
Bridges	1	LS			(588,00)
SUBTOTAL:					(8,010,218)
34% MARK UP:					(2,403,065)
TOTAL:					(10,413,283)

SOURCES

- | | |
|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. CES Data Base | 6. Vendor (Specify) |
| 3. CACES Data Base | 7. Other (Specify) |
| 4. Means Estimating Manual | |

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-11.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: CONSTRUCT A REVERSIBLE TWO LANE
HOW WITH BARRIERS.

ORIGINAL DESIGN: The original design is for each direction HOV lanes operating constantly in one direction.

PROPOSED DESIGN: The recommended change is to operate the HOV lanes as reversible to accommodate am and pm flows.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-11.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:
Maximizes HOV capacity.

DISADVANTAGES:
Would require merge to one HOV lane on I-85.
Would require control mechanisms and clearance interval.
Would require specialty signing.
New concept for HOV lanes in Georgia.

JUSTIFICATION:
With 19% ADT expected to use SR316 HOV lanes reversible HOV lanes would double the HOV capacity for this roadway segment without reconfiguration.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-12.0
PAGE NUMBER:	1 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: CONSIDER NO-BUILD ALTERNATE.

ORIGINAL DESIGN: The original design will construct barrier separated HOV from I-85 to Hi-Hope Road and associated interchange improvements.

PROPOSED CHANGE: The proposed change would defer this project until a later date.

	INITIAL COST	OPERATING COST	TOTAL LIFE- CYCLE COST
ORIGINAL DESIGN:			
PROPOSED CHANGE:			
SAVINGS:			Design Suggestion

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW-12.0
PAGE NUMBER:	2 of 2

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ADVANTAGES:

Allows time for Public/Private Participation proposal to be accepted or rejected.

Allows funds to be used on other projects.

DISADVANTAGES:

Deferring construction could increase construction and right of way cost.

Funding may not be available at a later date for this project.

JUSTIFICATION:

Standard option usually available to any project.

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW - 13.0
PAGE NUMBER:	1 of 3

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: USE ASPHALT CONCRETE ROAD SURFACE
ILO POURED IN PLACE CONCRETE.

ORIGINAL DESIGN: The current schematic design indicates asphalt concrete wearing surface; however it was discussed during the engineers (PBS & J) presentation that GDOT wants the road surface to be change to a concrete surface.

PROPOSED CHANGE: It is recommended to stay with asphalt concrete wearing surface for the new road ilo changing to PCC concrete surface.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 48,000,000		\$ 48,000,000
PROPOSED CHANGE:	\$ 32,000,000		\$ 32,000,000
		SAVINGS:	\$ 16,000,000

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW - 13.0
PAGE NUMBER:	2 of 3

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ADVANTAGES:

Total life cycle savings of \$ 16,000,000.

Can divert traffic on the sub-base asphalt for detours.

Staying with asphalt concrete surface.

Smoother ride for commuters.

Quicker to install.

It is a renewable material to reuse a percentage of old asphalt.

Easier and quicker to repair.

More flexible pavement.

DISADVANTAGES:

GDOT approval is required to install asphalt.

With the current price of oil the savings may be diminished. The award is 2009.

JUSTIFICATION:

The use of asphalt concrete is a renewable (LEED) product. The asphalt being remove (demolish) can be recycle and re-installed on this same SR 316 corridor.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW - 13.0
PAGE NUMBER:	3 of 3

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Asphalt concrete surface	1	SY	±800,000	40.00 avg.	32,000,000
SUBTOTAL:					32,000,000
34 % MARK UP:					incl
TOTAL:					32,000,000

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Concrete wearing surface	7	SY	±800,000	60.00	48,000,000
SUBTOTAL:					48,000,000
34 % MARK UP:					incl
TOTAL:					48,000,000

SOURCES

- | | |
|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. CES Data Base | 6. Vendor (Specify) |
| 3. CACES Data Base | 7. Other (Specify) |
| 4. Means Estimating Manual | |

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	RW-14.0
PAGE NUMBER:	1 of 3

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: INSTALL FIXED CONCRETE BARRIERS IN LIEU OF MOVABLE TYPE 20 MOVABLE BARRIERS.

ORIGINAL DESIGN: The current schematic design specifies a Type 20 movable barrier for all separated barriers on SR 316, which can be moved in later years if and when necessary.

PROPOSED CHANGE: The proposed recommendation is to install a fixed concrete barrier for the separated HOV barriers.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 20,237,040		\$ 20,237,040
PROPOSED CHANGE:	\$ 6,958,620		\$ 6,958,620
		SAVINGS:	\$ 13,278,420

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	RW - 14.0
PAGE NUMBER:	2 of 3

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ADVANTAGES:

Total life cycle cost savings of \$ 13,000,000.

Tremendous cost savings; however engineers cost estimate may be high.

Easier to install.

More durable.

Safer for occupants in HOV lanes if accident happens in adjacent lane.

DISADVANTAGES:

Can not be moved.

Will require addressing drainage design.

Re-design.

JUSTIFICATION:

The installation of installing movable concrete barriers for the remote possibility of moving them in the future is not technically justified.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	RW - 14.0
PAGE NUMBER:	3 of 3

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT - GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Type 20 Concrete barrier	1	LF	115,400	129.90	14,990,460
SUBTOTAL:					14,990,400
34 % MARK UP:					5,246,640
TOTAL:					20,237,040

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Fixed type concrete barrier	7	LF	115,400	45.00	5,193,000
SUBTOTAL:					5,193,000
34 % MARK UP:					1,765,620
TOTAL:					6,958,620

SOURCES

- | | |
|----------------------------|-----------------------------------|
| 1. Project Cost Estimate | 5. Richardson's Estimating Manual |
| 2. CES Data Base | 6. Vendor (Specify) |
| 3. CACES Data Base | 7. Other (Specify) |
| 4. Means Estimating Manual | |

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB - 1.0
PAGE NUMBER:	1 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: BUILD HERRINGTON, SR 120, COLLINS, HI HOPE, SR 20, WIDEN COLONIAL AND YELLOW RIVER BRIDGES ONLY FOR A HOV SECTION.

ORIGINAL DESIGN: The original design is comprised of 4 lanes and dual separated HOV lanes, with 12 & 14' shoulders as well as 2 lanes C/D's with 10' shoulders in both directions with two elevated HOV interchanges.

PROPOSED CHANGE: The proposed design advocates the elimination of the barrier separated HOVs and sanctions the striped HOVs since it drastically reduces the typical section of the project and allows the utilization of the existing bridges as they are with no replacement or rehab. The sufficiency ratings of these bridges, on average, are 80-90 which extend the life span of these bridges by at least 30 years. The modified section will be comprised of an outside 12'-0" shoulder plus 2 lanes @ 12'-0" plus 1 HOV lane @ 16'-0" plus 10'-0" inside shoulder resulting in a section that is less than 62'-0" center-center of existing bents.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 31,373,314		\$ 31,373,314
PROPOSED CHANGE:	\$ 23,554,619		\$ 23,554,619
		SAVINGS:	\$ 7,818,695

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB - 1.0
PAGE NUMBER:	2 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

- Total life cycle cost savings of \$7,818,695.
- Emergency assistance & Access is more favorable.
- Drastically lowers the Construction time.
- Utilized on interstate projects i.e. I-85.
- Meet FHWA/AASHTO.
- Acceptable local technique.
- Reduces span configuration.
- Less New Bridge components & construction materials.
- Easier access by commuters to all interchanges.
- Eliminates Elevated HOV interchanges at Herrington and Walther Roads.

DISADVANTAGES:

- Violates GDOT HOV policies.

JUSTIFICATION:

Major Cost Saving, commuter and emergency access as well as speed of construction are the drivers for the justification.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB - 1.0
PAGE NUMBER:	3 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	23,412,921	1	23,412,921
SUBTOTAL:					23,412,921
34% MARK UP:					7,960,393
TOTAL:					31,373,314

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	8,072,984	1	8,072,984
SUBTOTAL:					17,578,074
34% MARK UP:					5,976,545
TOTAL:					23,554,619

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|--|--|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER:	SB - 1.0
PAGE NUMBER:	4 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Location	Span Width (ft)	Bridge Length (ft)	Bridge Unit Cost (\$KSF)	Bridges (\$K)	Bridge Remove Cost (\$K)	Well Length (ft)	No. of walls	Well Height (ft)	Well Unit Cost (\$SF)	Walls Cost (\$K)	Well Cost (\$K)	Total Cost (\$)	Note			
														12 beams for each side bridge	24 beams total	
Yellow River	90	108.75	52.52, 52	156	10663	32235 **	1,987,586	0	0	0	0	1,987,586	23 ft or remain, steel beams widen.			
	90	182.75	52.70, 52	176	65	28644	2,071,50	#	2,128,010	0	0	2,128,010	0 ft remain, PSC beams replacement			
Colonial Pipeline	70	130.75	90	66	11768		784,888	0	0	0	0	784,888	26 ft or remain each, PSC beams widen.			
	70	182.75	90	66	16448		1,066,088	0	0	0	0	1,066,088	0 ft or bridge remain each side			
Hemphill	85	78.42	46.75, 100.75, 46	442	65	34660	1693,12.5	#	2,422,221	65.27	4	25	65	3330	2,185,436	4,888,887.4%, width in middle of 316, with side for 316
SR 120	50	114.42	89.97, 130.97, 80	574	65	51945	2,946,12.5	#	3,811,046	0	0	0	4,503,469	additional spans	4,998,102. RE Wall	
Walther BLVD	90	54.42	46.75, 100.75, 46	442	65	65975	2,946,12.5	#	4,503,466	0	0	0	4,503,469	additional spans	3,683,098.4%, width in middle of 316, with side for 316	
Collins Hill Rd	75	90.42	77.102, 102.77	358	66	32388	2,103,894	51.76	4	25	65	32610	2,119,877	2,419,164. RE Wall		
	75	90.42	48.77, 102.102, 77.48	454	66	41948	2,866,194	0	0	0	0	2,866,194	2,888,194. additional spans			
SR 20	70	114.42	79.105, 105.79	358	66	42105	2,736,845	53.21	4	25	65	5521	3,694,701. RE Wall			
H-Hope Road	75	90.42	77.102, 102.77	358	66	32388	2,103,894	51.76	4	25	65	4648	2,419,164. RE Wall			
	75	90.42	48.77, 102.102, 77.48	454	66	41948	2,866,194	0	0	0	0	2,888,194	2,888,194. additional spans			

Yellow River: 12 beams for each side bridge 8.8 SF/ft of beam \$ 3.00 / SF beams painting cost 23,412,931

24 beams total 3 times of painting in life time

Note: ex. bridge was built in 1950, its effective life is limited. Additional maintenance cost is not included in the study.

** include painting cost

** include painting cost \$ 2,005F for decamber removal

\$ 3255F for bridge removal

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER:	SB - 1.0
PAGE NUMBER:	5 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Striped HOV(1.0)

Location	Bridge		Bridge Unit		Bridge Removal No.	Walls	Wall Area	Wall Unit		Total Cost	
	Length	Spans	Cost	Area				Cost	Wall Cost		
Herrington	360	80,100,100,80	\$ 65.00	28231	\$ 1,835,128.00	\$ 705,780.00	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,990,908.00
Yellow River	158	52,52,52	\$ 65.00	9048	\$ 588,120.00	.	0	5000	\$ 45.00	.	\$ 588,120.00
SR 120	464	102,130,130,102	\$ 65.00	53091	\$ 3,450,907.20	\$ 1,327,272.00	2	5000	\$ 45.00	\$ 450,000.00	\$ 5,228,179.20
Colonial Pipeline	80	80	\$ 65.00	4140	\$ 269,100.00	.	0	5000	\$ 45.00	.	\$ 269,100.00
Collins Road	368	82,102,102,82	\$ 65.00	33275	\$ 2,162,846.40	.	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,612,846.40
SR 20	380	85,105,105,85	\$ 65.00	43480	\$ 2,828,174.00	.	2	5000	\$ 45.00	\$ 450,000.00	\$ 3,278,174.00
Hi Hope Road	368	82,102,102,82	\$ 65.00	33275	\$ 2,162,846.40	.	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,612,846.40
											\$ 17,578,074.00

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB – 1.1
PAGE NUMBER:	1 of 8

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: (VARIANCE REQUIRED) BUILD COLLINS, HI HOPE, SR 20, WIDEN SR 120 AND YELLOW RIVER BRIDGES ONLY FOR A STRIPPED HOV SECTION.

ORIGINAL DESIGN: The original design is comprised of 4 lanes and dual separated HOV lanes, with 12 & 14' shoulders as well as 2 lanes C/D's with 10' shoulders in both directions with two elevated HOV interchanges.

PROPOSED CHANGE: The proposed design advocates the elimination of the barrier separated HOVs and sanctions the striped HOVs since it drastically reduces the typical section of the project and allows the utilization of the existing bridges as they are with no replacement or rehab. The sufficiency ratings of these bridges, on average, are 80-90 which extend the life span of these bridges by at least 30 years. The modified section will be comprised of an outside 10'0" shoulder plus 2 lanes @ 12'-0" plus 1 HOV lane @ 16'-0" plus 4'-0" inside shoulder resulting in a section that is less than 60'-0" center-center of existing bents. (Requires approval to change criteria)

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 31,373,314		\$ 31,373,314
PROPOSED CHANGE:	\$ 10,817,798		\$ 10,817,798
		SAVINGS:	\$ 20,555,516

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB - 1.1
PAGE NUMBER:	2 of 8

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

Total life cycle cost savings of \$20,500,000.

Emergency assistance & Access is more favorable.

Drastically lowers the Construction time.

Utilized on Interstate projects i.e. I-85.

Meet FHWA/AASHTO.

Acceptable local technique.

Reduces span configuration.

Less New Bridge components & construction materials.

Easier access by commuters to all interchanges.

Eliminates Elevated HOV interchanges at Herrington and Walther Roads.

DISADVANTAGES:

Violates GDOT HOV policies.

Substandard HOV shoulder under all the bridges (4.0' on inside).

JUSTIFICATION:

Commuter and emergency access as well as speed of construction are the drivers for the justification.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB - 1.1
PAGE NUMBER:	3 of 8

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT	\$	23,412,921	1	23,412,921
SUBTOTAL:					23,412,921
34% MARK UP:					7,960,393
TOTAL:					31,373,314

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT	\$	8,072,984	1	8,072,984
SUBTOTAL:					8,072,984
30% MARK UP:					2,744,814
TOTAL:					10,817,798

SOURCES

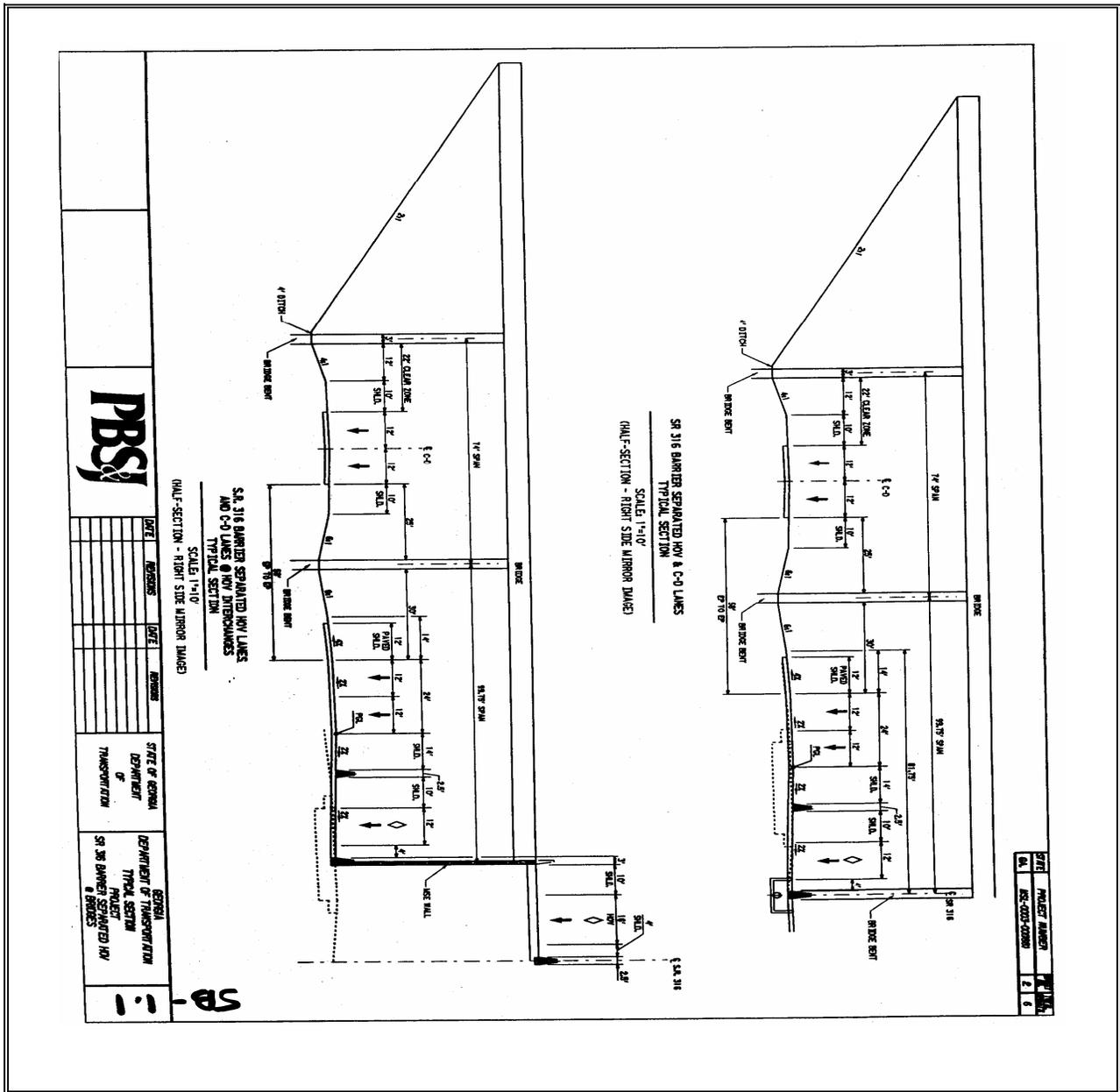
- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER:	SB - 1.1
PAGE NUMBER:	4 of 8

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

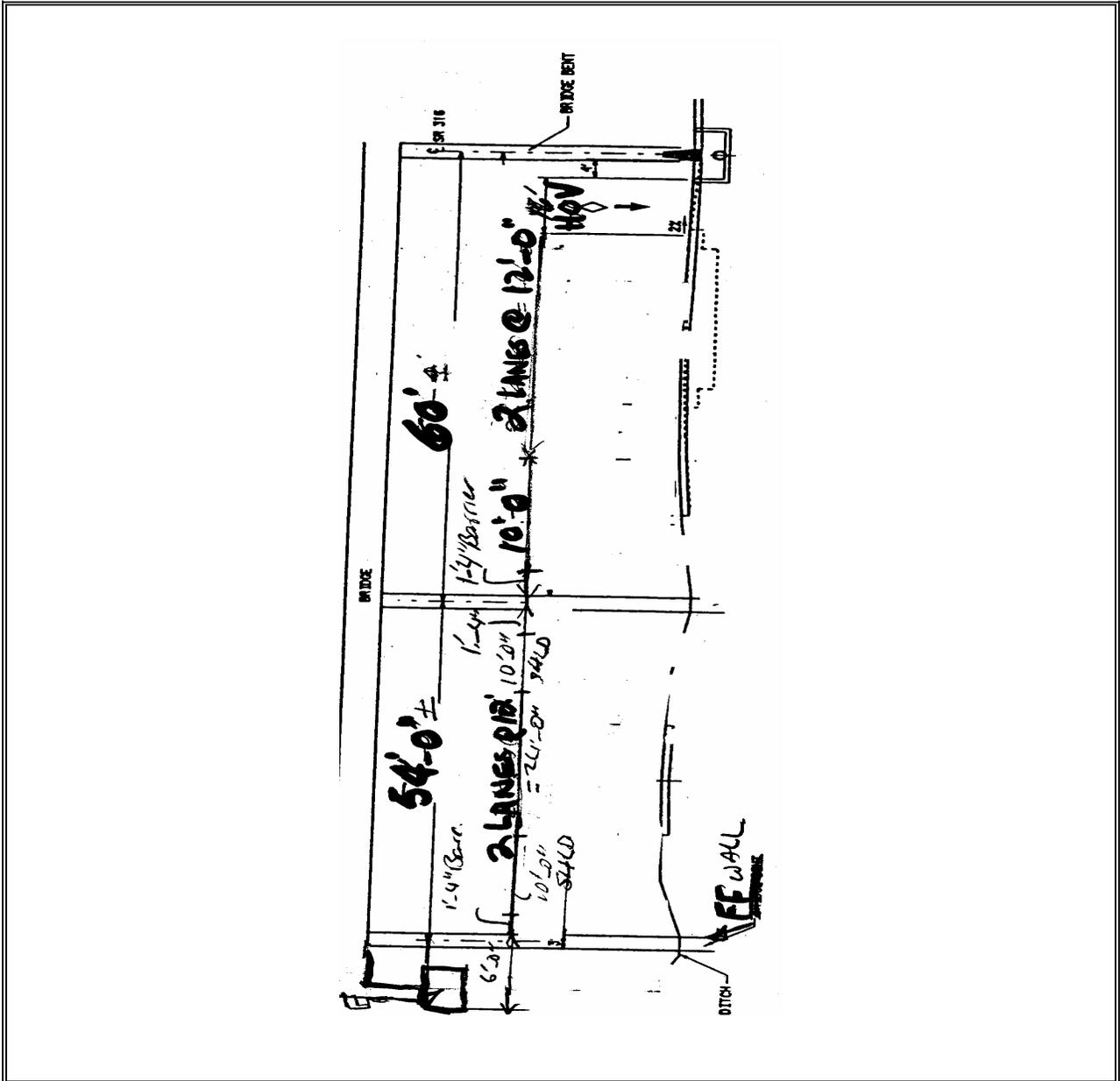


ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER:	SB - 1.1
PAGE NUMBER:	6 of 8

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA



PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB - 1.1
PAGE NUMBER:	7 of 8

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Location	Span	Bridge Width (ft)	spans	Bridge Length (ft)	Bridge Unit Cost (\$/SF)	Bridge Remov Cost (\$SF)	Bridge Cost (\$)	Wall Length (ft)	Wall No. of walls	Wall Height (ft)	Wall Cost (\$/SF)	Wall Cost (\$)	Total Cost (\$)	Note
Yellow River	90	108.75	52.52, 52	156	10653	322265 **	1,987,565	0	0	0	65	0	1,987,565	28 ft ex. remain, steel beams widen.
	90	182.75	52.70, 52	176	65	28544	2,619,010	0	0	0	65	0	2,619,010	0 ft remain, PSC beams replacement
Colonial Pipeline	70	130.75	90	90	65	11789	794,880	0	0	0	65	0	794,880	28 ft ex. remain each, PSC beams widen.
	70	182.75	90	90	65	18448	1,660,080	0	0	0	65	0	1,660,080	0 ft ex. bridge remain each side
Herrington	65	78.42	46.75, 100.75, 46	442	65	34680	1,833,120	627.39	4	25	65	33330	2,166,450	4,888,867 4% walls in middle of 316, no slab for 316
SR 120	50	114.42	97.130, 130.97	454	65	51945	2,346,125	652.7	4	25	65	8124	2,354,249	4,000,102 RE Wall
	50	114.42	60.97, 130.130, 97.80	574	65	66075	3,740,125	0	0	0	65	0	3,740,125	4,533,488 additional spans
Walther BLVD	90	54.42	46.75, 100.75, 46	442	65	24632	1,583,396	625	4	25	65	23610	2,119,877	3,983,288 4% walls in middle of 316, no slab for 316
Collins Hill Rd	75	80.42	77.102, 102.77	358	65	32369	2,103,964	517.6	4	25	65	4849	2,118,813	2,418,164 RE Wall
	75	80.42	48.77, 102.102, 77.48	454	65	41048	2,868,194	0	0	0	65	0	2,868,194	additional spans
SR 20	70	114.42	79.105, 105.79	368	65	42105	2,798,846	532.1	4	25	65	5521	2,804,367	3,006,701 RE Wall
H-Hope Road	75	80.42	77.102, 102.77	358	65	32369	2,103,964	517.6	4	25	65	4849	2,118,813	2,418,164 RE Wall
	75	80.42	48.77, 102.102, 77.48	454	65	41048	2,868,194	0	0	0	65	0	2,868,194	additional spans

23,412,931

\$ 3.00 / SF beams painting cost

8.8 SF ft of beam

12 beams for each side bridge

24 beams total

3 times of painting in life time

Note: ex. bridge was built in 1980, its effective life is limited. Additional maintenance cost is not included in the study.

ex. Bridge H-pile 10x42

*: include painting cost

** : include painting cost & \$20/SF for electric barrier removal

#: \$25/SF for bridge removal

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB - 1.1
PAGE NUMBER:	8 of 8

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Location	Bridge Width	Spans	Bridge Length	Bridge Unit		Area	Bridge Cost	Bridge Removal	No. Walls	Wall Unit		Total Cost
				Cost	Area					Cost	Area	
Yellow River SR 120	58	52,62.52	155	\$ 65.00	9046	\$ 588,120.00	\$ -	0	5000	\$ 45.00	\$ -	\$ 588,120.00
	80	60,777.60	274	\$ 65.00	21820	\$ 1,424,800.00	\$ -	2	5000	\$ 45.00	\$ 450,000.00	\$ 1,874,800.00
Colonial Pipeline Collins Road SR 20 Hi-Hope Road	46	90	90	\$ 65.00	4140	\$ 269,100.00	\$ -	0	5000	\$ 45.00	\$ -	\$ 269,100.00
	90.42	82,102,102.82	388	\$ 65.00	33275	\$ 2,162,846.40	\$ -	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,612,846.40
	114.42	85,105,105.65	380	\$ 65.00	43460	\$ 2,820,714.00	\$ -	2	5000	\$ 45.00	\$ 450,000.00	\$ 3,270,714.00
	90.42	82,102,102.82	388	\$ 65.00	33275	\$ 2,162,846.40	\$ -	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,612,846.40
												\$ 11,233,886.80

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB - 2.0
PAGE NUMBER:	1 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: ELIMINATE ENDROLLS AND UTILIZE MSE WALLS INSTEAD FOR A BARRIER SEPARATED HOV SECTION.

ORIGINAL DESIGN: The original design is comprised of 4 lanes and dual separated HOV lanes, with 12 & 14' shoulders as well as 2 lanes C/D's with 10' shoulders in both directions with two elevated HOV interchanges with 6 spans and endrolls.

PROPOSED CHANGE: The proposed design advocates the elimination of the endrolls and utilizing MSE/Wall end Bents thereby reducing the spans to 4 spans per bridge.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 29,241,670		\$ 29,241,670
PROPOSED CHANGE:	\$ 27,584,975		\$ 27,584,975
		SAVINGS:	\$ 1,656,695

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB - 2.0
PAGE NUMBER:	2 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

- Total life cycle cost savings of \$1,656,695.
- Drastically lowers the Construction time.
- Utilized on interstate projects.
- Meet FHWA/AASHTO/GDOT Standards.
- Acceptable local technique.
- Reduces span configuration.
- Less New Bridge components & construction materials.

DISADVANTAGES:

- No room for further expansion.
- More walls and special backfill than end fills.

JUSTIFICATION:

Major Cost Saving, as well as speed of construction are the drivers for the justification.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB - 2.0
PAGE NUMBER:	3 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	21,822,142	1	21,822,142
SUBTOTAL:					21,822,142
34% MARK UP:					7,419,528
TOTAL:					29,241,670

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	20,585,802	1	20,585,802
SUBTOTAL:					20,585,802
34% MARK UP:					6,999,173
TOTAL:					27,584,975

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
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ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER:	SB - 2.0
PAGE NUMBER:	4 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Estimated Spans

Location	Bridge Width	Spans	Bridge Length	Bridge Unit Cost	Area	Bridge Cost	Bridge Removal	No. Walls	Wall Area	Wall Unit Cost	Wall Cost	Total Cost
Herrington	78.42	48.75, 100, 100, 75, 46	442	\$ 65.00	34682	\$ 2,253,008.60	\$ 866,541.00	0	5000	\$ 45.00	\$ -	\$ 3,119,547.60
Yellow River	108.75	52, 52, 52	158	\$ 65.00	16853	\$ 1,082,445.00	\$ -	0	5000	\$ 45.00	\$ -	\$ 1,082,445.00
SR 120	114.42	80.97, 130, 130, 97, 80	614	\$ 65.00	70254	\$ 4,566,502.20	\$ 1,756,347.00	0	5000	\$ 45.00	\$ -	\$ 6,322,849.20
Waltham Blvd	54.42	48.75, 100, 100, 75, 46	442	\$ 65.00	24054	\$ 1,563,468.60	\$ -	0	5000	\$ 45.00	\$ -	\$ 1,563,468.60
Colonial Pipeline	130.75	90	90	\$ 65.00	11768	\$ 764,887.50	\$ 294,187.50	0	5000	\$ 45.00	\$ -	\$ 1,059,075.00
Collins Road	90.42	48.77, 102, 102, 77, 48	452	\$ 65.00	40870	\$ 2,656,539.60	\$ -	0	5000	\$ 45.00	\$ -	\$ 2,656,539.60
SR 20	114.42	48.77, 102, 102, 77, 48	452	\$ 65.00	51718	\$ 3,361,659.60	\$ -	0	5000	\$ 45.00	\$ -	\$ 3,361,659.60
Hi-Hope Road	80.42	48.77, 102, 102, 77, 48	452	\$ 65.00	40870	\$ 2,656,539.60	\$ -	0	5000	\$ 45.00	\$ -	\$ 2,656,539.60
												\$ 21,622,142.20

25

\$25/SF for bridge Removal

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER:	SB - 2.0
PAGE NUMBER:	5 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

MSE/Well Spans

Location	Bridge Width	Spans	Bridge Length	Bridge Unit Cost	Area	Bridge Cost	Bridge Removal	No. Wells	Well Area	Well Unit Cost	Well Cost	Total Cost
Herrington	78.42	80,100,100,80	360	\$ 65.00	28231	\$ 1,835,028.00	\$ 705,780.00	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,890,808.00
Yellow River	106.75	62,62,62	156	\$ 65.00	16653	\$ 1,082,445.00	\$ -	0	5000	\$ 45.00	\$ -	\$ 1,082,445.00
SR 120	114.42	102,130,130,102	464	\$ 65.00	53081	\$ 3,450,807.20	\$ 1,327,272.00	2	5000	\$ 45.00	\$ 450,000.00	\$ 5,228,179.20
Weather Blvd	54.42	80,100,100,80	360	\$ 65.00	16681	\$ 1,273,428.00	\$ -	2	5000	\$ 45.00	\$ 450,000.00	\$ 1,723,428.00
Colonial Pipeline	130.75	90	90	\$ 65.00	11768	\$ 764,887.50	\$ 294,187.50	0	5000	\$ 45.00	\$ -	\$ 1,059,075.00
Collins Road	90.42	82,102,102,82	368	\$ 65.00	33275	\$ 2,162,846.40	\$ -	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,612,846.40
SR 20	114.42	85,105,105,85	380	\$ 65.00	49480	\$ 3,228,174.00	\$ -	2	5000	\$ 45.00	\$ 450,000.00	\$ 3,278,174.00
Hi Hope Road	90.42	82,102,102,82	368	\$ 65.00	33275	\$ 2,162,846.40	\$ -	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,612,846.40
												\$ 20,686,892.00

\$25/SF for bridge Removal

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB - 3.0
PAGE NUMBER:	1 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: UTILIZE HPC W/2 SPAN CONFIGURATION & MSE WALLS.

ORIGINAL DESIGN: The original design is comprised of 4 lanes and dual separated HOV lanes, with 12 & 14' shoulders as well as 2 lanes C/D's with 10' shoulders in both directions with two elevated HOV interchanges and 4-6 span configuration

PROPOSED CHANGE: The proposed design advocates the elimination of the barrier separated HOVs and sanctions the striped HOVs since it drastically reduces the typical section of the project and allows the utilization HPC for shorter spans. Moreover, with the shorter spans and HPC 2 span configurations can be accomplished.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 31,373,314		\$ 31,373,314
PROPOSED CHANGE:	\$ 20,041,737		\$ 20,041,737
SAVINGS:			\$ 11,331,577

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB - 3.0
PAGE NUMBER:	2 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

Total life cycle cost savings of \$11,331,577.

Drastically lowers the Construction time.

Utilized on interstate projects i.e. SR316 /I-85 Improvement.

Meet FHWA/AASHTO.

Acceptable local technique.

Reduces span configuration.

Less New Bridge components & construction materials.

Easier access by commuters to all interchanges.

Eliminates Elevated HOV interchanges at Herrington and Walther Roads.

Allows for C/D construction in the future.

DISADVANTAGES:

Requires GDOT approval.

No room for future expansion beyond the C/D.

JUSTIFICATION:

Major Cost Saving, as well as speed of construction are the drivers for the justification.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB - 3.0
PAGE NUMBER:	3 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	23,412,921	1	23,412,921
SUBTOTAL:					23,412,921
34% MARK UP:					7,960,393
TOTAL:					31,373,314

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	14,956,520	1	14,956,520
SUBTOTAL:					14,956,520
34% MARK UP:					5,085,217
TOTAL:					20,041,737

SOURCES

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ol style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|--|--|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER:	SB - 3.0
PAGE NUMBER:	4 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Location	Skew	Bridge Width (ft)	Spans	Bridge Length (ft)	Bridge Unit Cost (\$/SF)	Bridge Renov. Cost (\$/SF)	Bridge Cost (\$)	Wall Length (ft)	Wall No. of walls	Wall Height (ft)	Wall Unit Cost (\$/SF)	Walls (LF)	Wall Cost (\$)	Total Cost (\$)	Note
Yellow River	90	108.75	52.52, 52	156	10663	322265 **	1,987,565	0	0	0	65	0	0	1,987,565	25 ft. ex. remain, steel beams widen.
	90	162.75	52.70, 52	176	65	26844	2,671,500 #	2,120,070	0	0	65	0	0	2,120,070	0 ft. remain, PSC beams replacement
Colonel Pipeline	70	130.75	90	90	65	11768	764,880	0	0	0	65	0	0	764,880	25 ft. ex. remain work, PSC beams widen.
	70	182.75	90	90	65	16449	1,099,080	0	0	0	65	0	0	1,099,080	0 ft. ex. bridge remain each side
Herrington	85	78.42	46.75, 100.102, 75.46	442	65	34680	1,693,125 #	2,422,221	627.39	4	25	65	33330	2,169,430	4,888,887 4% walls in middle of 316, see slab for 316
SR 120	50	114.42	97.130, 139.97	454	65	51945	23,4612.5 #	3,671,046	652.7	4	25	65	6124	368,056	4,040,102 RE Wall
	50	114.42	60.97, 130.139, 97.92	574	65	66675	23,4612.5 #	4,503,496	0	0	65	0	0	4,503,496	4,503,496 additional spans
Walker BLVD	80	54.42	46.75, 100.102, 75.46	442	65	24032	1,053,384	0	0	0	65	0	0	1,053,384	4,503,496 additional spans
Collins Hill Rd	75	90.42	77.102, 102.77	358	65	33369	2,103,894	517.6	4	25	65	32610	2,119,877	2,119,877 RE Wall	
	75	90.42	48.77, 102.102, 77.48	454	65	41049	2,698,184	0	0	0	65	0	0	2,698,184	2,698,184 additional spans
SR 20	70	114.42	78.105, 105.79	368	65	42105	2,759,846	53.21	4	25	65	5821	359,850	3,119,700	3,119,700 RE Wall
H-Hope Road	75	90.42	77.102, 102.77	358	65	33369	2,103,894	517.6	4	25	65	4849	315,159	2,419,054	2,419,054 RE Wall
	75	90.42	48.77, 102.102, 77.48	454	65	41049	2,698,184	0	0	0	65	0	0	2,698,184	2,698,184 additional spans

20,412,601

\$ 3.00 /SF beams painting cost

12 beams for each side bridge

24 beams total

8.8 times of painting in life time

3 times of painting in life time

Note: ex. bridge was built in 1980, its effective life is limited. Additional maintenance cost is not included in the study.

ex. Bridge H-pile 10x42

** includes painting cost

** includes painting cost & \$20/SF for deck/beam removal

\$20/SF for bridge removal

PROPOSED CHANGE SKETCH/DETAIL

PROPOSAL NUMBER:	SB - 3.0
PAGE NUMBER:	5 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Location	Bridge Width	Spans	Bridge Length	HPC/S Spans		Bridge Area	Bridge Cost	Bridge Removal	No. Walls	Wall Area	Wall Unit		Total Cost
				Bridge Unit Cost	Bridge Unit Area						Cost	Wall Cost	
Herrington	78.42	115,115	230	\$ 65.00	18037	\$ 1,172,379.00	\$ 450,915.00	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,073,294.00	
Yellow River	108.75	62,62.62	158	\$ 65.00	16653	\$ 1,082,445.00	-	0	5000	\$ 45.00	\$ -	\$ 1,082,445.00	
SR 120	114.42	150,150	300	\$ 65.00	34326	\$ 2,231,180.00	\$ 888,150.00	2	5000	\$ 45.00	\$ 450,000.00	\$ 3,569,340.00	
Walther Blvd	54.42	115,115	230	\$ 65.00	12517	\$ 813,579.00	-	2	5000	\$ 45.00	\$ 450,000.00	\$ 1,263,579.00	
Colonial Pipeline	130.75	90	90	\$ 65.00	11768	\$ 764,887.50	\$ 294,187.50	0	5000	\$ 45.00	\$ -	\$ 1,059,075.00	
Collins Road	90.42	118,118	236	\$ 65.00	21339	\$ 1,387,042.80	-	2	5000	\$ 45.00	\$ 450,000.00	\$ 1,837,042.80	
SR 20	114.42	122,122	244	\$ 65.00	27918	\$ 1,814,701.20	-	2	5000	\$ 45.00	\$ 450,000.00	\$ 2,264,701.20	
Hi Hope Road	90.42	118,118	236	\$ 65.00	21339	\$ 1,387,042.80	-	2	5000	\$ 45.00	\$ 450,000.00	\$ 1,837,042.80	
												\$ 14,956,519.80	

25
\$25/SF for bridge Removal

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB - 4.0
PAGE NUMBER:	1 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: REPLACE PIPELINE BRIDGE WITH PRECAST ARCH CULVERT.

ORIGINAL DESIGN: The original design is comprised of 4 lanes and dual separated HOV lanes, with 12 & 14’ shoulders as well as 2 lanes C/D’s with 10’ shoulders in both directions with two elevated HOV interchanges and 4-6 span configuration.

PROPOSED CHANGE: The proposed design advocates the elimination of the existing bridge and replacing it with a precast arch system.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 1,024,950		\$ 1,024,950
PROPOSED CHANGE:	\$ 778,272		\$ 778,272
SAVINGS:			\$ 246,678

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB - 4.0
PAGE NUMBER:	2 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

Total life cycle cost savings of \$246,678.

Drastically lowers the Construction time.

Meet FHWA/AASHTO.

Less New Bridge components & construction materials.

DISADVANTAGES:

Requires GDOT approval.

More Excavation/Fill requirements.

JUSTIFICATION:

Major Cost Saving as well as speed of construction are the drivers for the justification.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB - 4.0
PAGE NUMBER:	3 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	764,888	1	764,888
SUBTOTAL:					764,888
34% MARK UP:					260,062
TOTAL:					1,024,950

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	580,800	1	580,800
SUBTOTAL:					580,800
34% MARK UP:					197,472
TOTAL:					778,272

SOURCES

- | | |
|--|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|--|--|

ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER:	SB - 4.0
PAGE NUMBER:	4 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Location	Bridge		Bridge Length (ft)	Bridge Unit Cost (\$/SF)	Bridges (SF)	Bridge Remove Cost (\$)	Wall Length (ft)	No. of walls	Wall Height (ft)	Wall Unit Cost (\$/SF)	Wall Cost (\$)	Total Cost (\$)	Note				
	Span Width (ft)	Spans															
Yellow River	90	108.75	52.52	52	158	100	1663	32265	**	197,595	0	197,595	23 ft. e/c. remain, steel beams within.				
	90	182.75	52.70	52	176	65	2884	26750	#	2,129,010	0	2,129,010	0 ft remain, PSC beams replacement				
Colonial Pipeline	70	130.75	90	90	65	11788	764,898	0	0	0	0	0	2000000 -> 70 ft. remain each, PSC beams within.				
	70	182.75	90	90	65	16448	1,060,086	0	0	0	0	0	1,060,086 0 ft. e/c. bridge remain each side				
Herrington	85	78.42	46.75	100.75	46	42	3480	16312.5	#	2,422,221	827.39	4	25	65	33330	2,168,436	4,000,867 4% walls in middle of 316, w/c sub for 316
SR 120	50	114.42	97.130	130.97	65	65	31845	234612.5	#	3,611,046	85.27	4	25	65	6124	390,059	4,000,102 RE Wall
	50	114.42	60.97	130.97	60	65	66375	234612.5	#	4,550,498	0	0	0	65	0	0	4,550,498 additional spars
Walker Blvd	90	54.42	46.75	100.75	46	42	2462	1,593,399	625	4	25	65	32810	2,119,677	3,883,084	4% walls in middle of 316, w/c sub for 316	
Collins Hill Rd	75	90.42	77.102	102.77	568	65	32989	2,103,984	51.76	4	25	65	4648	315,159	2,419,144	RE Wall	
	75	90.42	46.77	102.102	77	46	41048	2,881,194	0	0	0	0	0	0	0	0	2,881,194 additional spars
SR 20	70	114.42	79.105	105.79	368	65	42105	2,756,845	53.21	4	25	65	5921	359,656	3,096,791	RE Wall	
H-Hope Road	75	90.42	77.102	102.77	568	65	32989	2,103,984	51.76	4	25	65	4648	315,159	2,419,144	RE Wall	
	75	90.42	46.77	102.102	77	46	41048	2,881,194	0	0	0	0	0	0	0	0	2,881,194 additional spars

Yellow River: 12 beams for each side bridge 8.8 SF/ft of beam \$ 3.00 / SF beams painting cost 23,412,931
 24 beams total 3 times of painting in life time

Note: w/c bridge was built in 1990, its effective life is limited. Additional maintenance cost is not included in the study.
 ex: Bridge H-Hope 10x42

- *: include painting cost
- ** : include painting cost & 120SF for deckbarrier removal
- # : 125SF for bridge removal

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB - 4.0
PAGE NUMBER:	5 of 5

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Cost Of Bridges

End Spans

BFPR to MSE Wall=6.0'
 Side Barrier= 1.33'
 SHLD =10'-0",
 Lanes= 24'-0"
 SHLD=10'-0'
 Side Barrier= 1.33'
 ½ Pier width= 1.25'
Total = 54.0'

Middle spans

½ Pier width= 1.25'
 Side Barrier= 1.33'
 SHLD =10'-0",
 Lanes= 24'-0"
 HOV =16'-0"
 SHLD=4'-0
 Side Barrier= 1.33'
 ½ Pier width= 1.25'
Total = 60.0'

Total Length of a New Bridge=2(54+60)=228'

Replacement of Colonial Pipeline

Cost of precast units =\$50/SF
 Width= 48 ft
 Length=228*skew 70deg=242
 Total Cost=48ft*242ft*50=\$580,800

*See Cost estimate for additional information

VALUE ENGINEERING PROPOSAL

PROPOSAL NUMBER:	SB - 5.0
PAGE NUMBER:	1 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

PROPOSAL DESCRIPTION: DEPRESS SR 316 UNDER WALTHER RD AND UTILIZE A 53’ ARCH CULVERT.

ORIGINAL DESIGN: The original design is comprised of 4 lanes and dual separated HOV lanes, with 12 & 14’ shoulders as well as 2 lanes C/D’s with 10’ shoulders in both directions with two elevated HOV interchanges and 4-6 span configuration

PROPOSED CHANGE: The proposed design proposes the use of 53’ arch culverts that run along Walther Road and end at a depressed HOV interchange under SR 316. The interchange will be approximately 50 wide in perimeters.

	INITIAL COST	OPERATING COST	TOTAL LIFE-CYCLE COST
ORIGINAL DESIGN:	\$ 4,935,308		\$ 4,935,308
PROPOSED CHANGE:	\$ 1,668,300		\$ 1,668,300
		SAVINGS:	\$ 3,267,008

ADVANTAGES/DISADVANTAGES/JUSTIFICATION

PROPOSAL NUMBER:	SB - 5.0
PAGE NUMBER:	2 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES
PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ADVANTAGES:

Total life cycle cost savings of \$3,267,008.

Drastically lowers the Construction time.

Meet FHWA/AASHTO.

Less New Bridge components & construction materials.

DISADVANTAGES:

Requires GDOT approval.

More Excavation/Fill requirements.

JUSTIFICATION:

Major Cost Saving as well as speed of construction are the drivers for the justification.

COST ESTIMATING WORKSHEET

PROPOSAL NUMBER:	SB - 5.0
PAGE NUMBER:	3 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

ORIGINAL DESIGN

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	3,683,066	1	3,683,066
SUBTOTAL:					3,683,066
34% MARK UP:					1,252,242
TOTAL:					4,935,308

PROPOSED CHANGE

ITEM	SOURCE CODE	U/M	QTY	UNIT COST	TOTAL COST
Bridges	7-GDOT Mean Summary	\$	1,245,000	1	1,245,000
SUBTOTAL:					1,245,000
34% MARK UP:					423,300
TOTAL:					1,668,300

SOURCES

- | | |
|--|--|
| <ul style="list-style-type: none"> 1. Project Cost Estimate 2. CES Data Base 3. CACES Data Base 4. Means Estimating Manual | <ul style="list-style-type: none"> 5. Richardson's Estimating Manual 6. Vendor (Specify) 7. Other (Specify) |
|--|--|

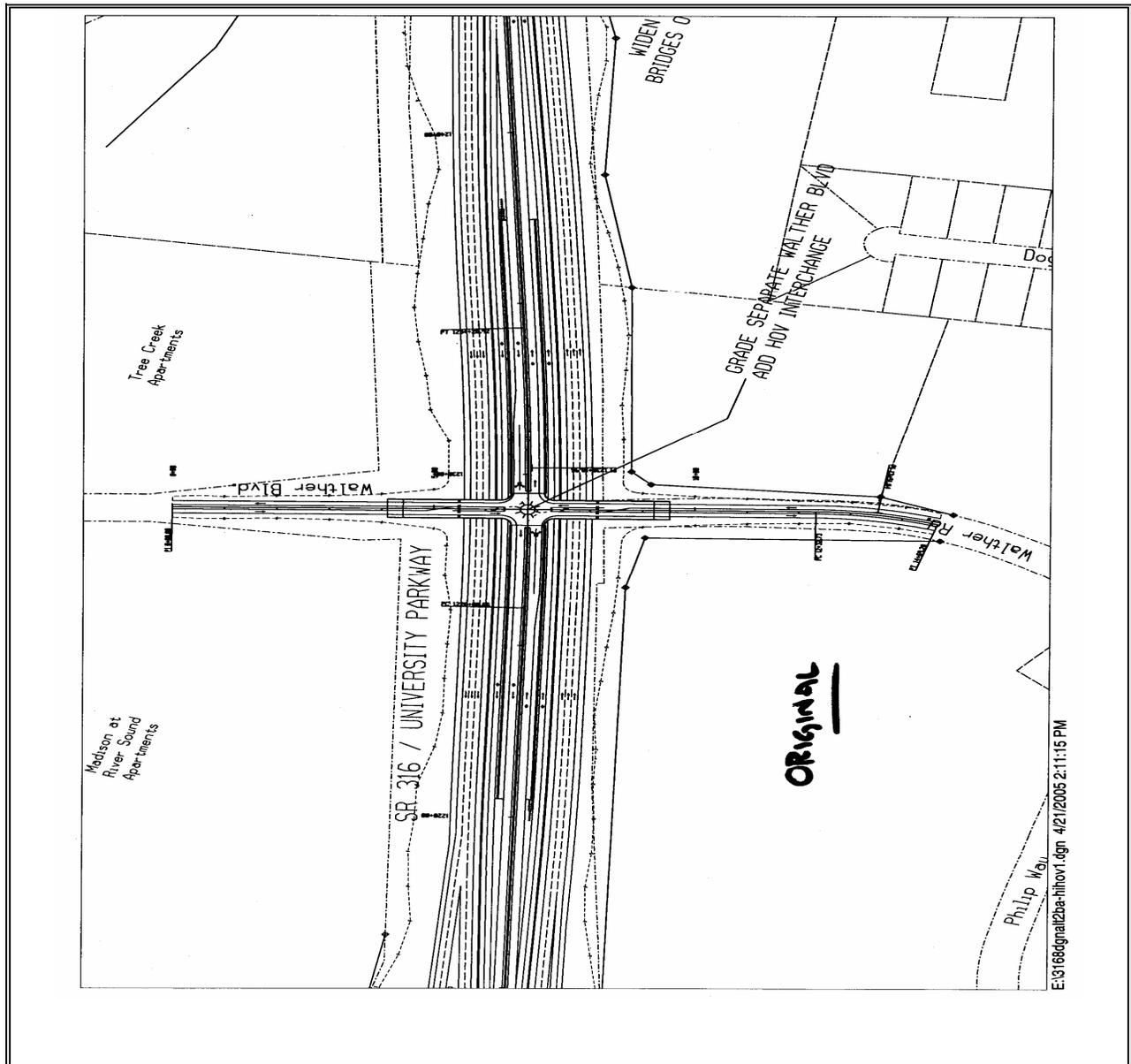
ORIGINAL DESIGN SKETCH/DETAIL

PROPOSAL NUMBER: SB - 5

PAGE NUMBER: 4 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA



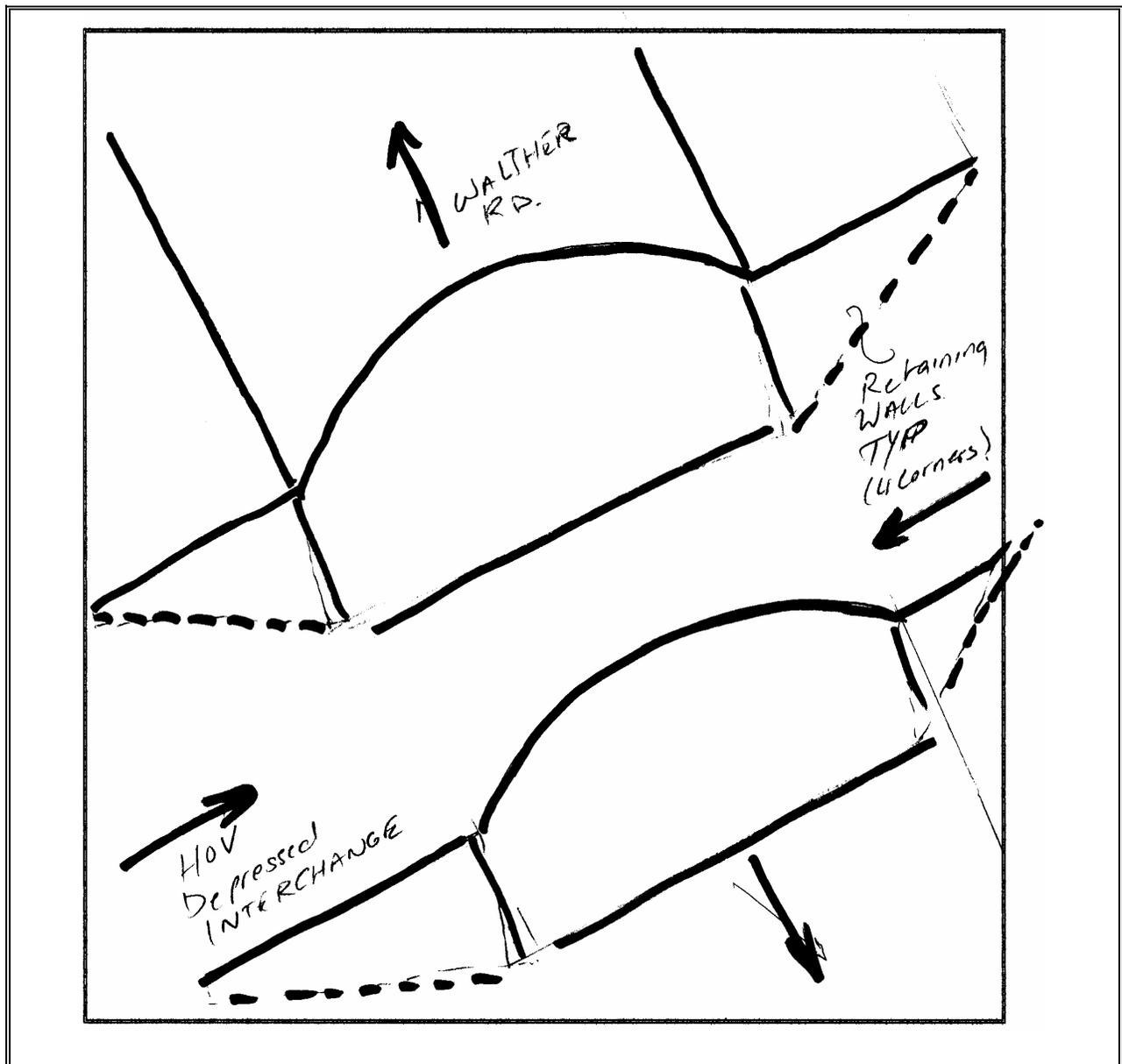
PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER: SB - 4.0

PAGE NUMBER: 5 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA



ORIGINAL DESIGN CALCULATIONS

PROPOSAL NUMBER: SB - 5.0

PAGE NUMBER: 6 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Location	Bew	Width (ft)	Bridge Length (ft)	Bridge Unit Cost (\$/SF)	Bridge Length (ft) x Unit Cost (\$/SF)	Bridge Renewal Cost (\$/SF)	Bridge Renewal Cost (\$)	Wall Length (ft)	Wall Height (ft)	Wall Unit Cost (\$/SF)	Wall Cost (\$)	Total Cost (\$)	Note	
														Cost (\$)
Yellow River	90	100.75	52.52	156	1000	322,335	1,697,995	0	0	65	0	0	1,697,995 28 ft. over, remainder steel beams within.	
	90	162.75	52.70	176	65	28,644	2,120,010	0	0	65	0	0	2,120,010 0 ft. over, remainder steel beams replacement.	
Canaan Pipeline	70	130.75	90	65	11,788	784,890	0	0	0	65	0	0	784,890 28 ft. over, remainder each, PSC beams within.	
	70	162.75	90	65	14,448	1,299,080	0	0	0	65	0	0	1,299,080 0 ft. over, bridge remain within side.	
Henrican	85	79.42	45.75	100.75	46	3,469	1,633,115	4	25	65	3,333	2,186,450	4,889,887 4% walls in middle of 316, with side for 316	
	50	114.42	97.93	30.97	454	65	51,945	2,348,215	4	25	65	6,124	3,864,059	4,008,102 RE Wall
SR 20	50	114.42	97.93	30.97	574	65	68,675	2,348,215	4	25	65	6,124	3,864,059	4,530,468 additional spans
	90	54.42	48.75	100.75	46	65	2,402	1,833,390	4	25	65	3,333	2,118,877	3,888,388 4% walls in middle of 316, with side for 316
Cobb Mill Rd	75	94.42	77.102	102.77	358	65	32,269	2,103,844	51.76	4	25	65	4,948	2,418,154 RE Wall
	75	94.42	48.77	102.77	46	65	41,048	2,888,194	0	0	65	0	2,888,194 additional spans	
SR 20	70	114.42	78.105	105.79	358	65	42,015	2,738,845	53.21	4	25	65	5,621	3,498,791 RE Wall
	75	94.42	77.102	102.77	358	65	32,269	2,103,844	51.76	4	25	65	4,948	2,418,154 RE Wall
H-Hope Road	75	94.42	48.77	102.77	46	65	41,048	2,888,194	0	0	65	0	2,888,194 additional spans	
	75	94.42	48.77	102.77	46	65	41,048	2,888,194	0	0	65	0	2,888,194 additional spans	

Yellow River: 12 beams for each side bridge 8.6 SF/ft of beam \$ 3.00 /SF beams painting cost 23,472,931

24 beams total 3 times of painting in life time

Note: as bridge was built in 1980, its effective life is limited. Additional maintenance cost is not included in the study.

* include painting cost

** include painting cost & \$25/SF for deck-beam removal

‡ \$25/SF for bridge removal

PROPOSED CHANGE CALCULATIONS

PROPOSAL NUMBER:	SB -5.0
PAGE NUMBER:	7 of 7

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GEORGIA DOT – GWINNETT COUNTY, GA

Cost Of Bridges

End Spans

BFPR to MSE Wall=6.0'
 Side Barrier= 1.33'
 SHLD =10'-0",
 Lanes= 24-0"
 SHLD=10'-0"
 Side Barrier= 1.33'
 ½ Pier width= 1.25'
Total = 54.0'

Middle spans

½ Pier width= 1.25'
 Side Barrier= 1.33'
 SHLD =10'-0",
 Lanes= 24-0"
 HOV =16'-0"
 SHLD=4'-0
 Side Barrier= 1.33'
 ½ Pier width= 1.25'
Total = 60.0'

Total Length of a New Bridge=2(54+60)=228'

Replacement of Colonial Pipeline

Cost of Arch units =\$50/SF
 Width= 53ft
 Length=300
 Total Cost=53ft*300ft*50=\$795,000

Cost Of walls

Unit Cost per wall SF=\$45
 No. Of walls=4
 SF per Wall= 2500SF
 Total Cost of walls=450,000

TOTAL COST=1,245,000

VE STUDY SIGN-IN SHEET

Project No.: MSL-0003-00(168) County: Gwinnett PI No.: 0003168 Date: April 19, 20, 21, 2005

NAME	EMPLOYEE ID NO.	DOT OFFICE OR COMPANY	PHONE NUMBER	EMAIL ADDRESS
Lisa L. Myers	00244168	Engineering Services	404-651-7468	lisa.myers@dot.state.ga.us
JERRY BROOKS		MORELAND ALTBELL	770-263-5945	jbrooks@maai.net
Sam Deeb		Moreland Altbell	7/263-5945	sdeeb@maai.net
LINDSEY GARDNER		U S COST	757 496-3055	L.GARDNER@USCOST.COM
LARLAND Owens		Moreland Altbell	706-865-4316	
DANIEL McDUFF		PBS&J	770-933-0280	dmcduff@pbsj.com
RON MORRIS		PBS & J	770-933-0280	rhmorris@pbsj.com
Lynn Clements	00343424	PAVIDGE	404 656-5289	lynn.clements@dot.state.ga.us
Randy Hart		Construction Ga DOT	404 606-5306	Randall.hart@dot.state.ga.us
JERRY MILLIGAN		R/W GA DOT	770 986 1541	jeremy.millingan@dot.state.ga.us
MIKE DAVIS	00270815	GA DOT D-1 GA DOT	7/532-5528	
Neal O'Brien	00256916	GA DOT URBAN	4-656-5842	
N. RAAD	00729514	GA DOT OTS&D	4-635-8126	nahil.raad@dot.ga.us
JILL FRANKS	00809064	GA DOT URBAN	404-656-5442	jill.frank@dot.state.ga.us

COST MODEL/DISTRIBUTION		
WIDEN SR 316 FROM I-85 TO SR 20 FOR HOV LANES		
GWINNEETT COUNTY, GEORGIA		
MSL-0003-00(168)		
	COST	% OF
	\$	TOTAL
RIGHT OF WAY	\$26,074,000	20.49%
RECYCLED ASPHALT CONCRETE	\$25,947,813	20.40%
MAJOR STRUCTURES/BRIDGES	\$22,357,230	17.57%
BARRIER	\$19,966,000	15.69%
AGGREGATE BASE	\$10,866,161	8.54%
MSE WALLS	\$6,692,818	5.26%
TRAFFICE CONTROL	\$4,422,000	3.48%
EROSION CONTROL MATTS, SLOPES	\$3,082,000	2.42%
EARTHWORK EXCAVATION	\$2,906,728	2.28%
BORROW MATERIAL WORK	\$1,308,671	1.03%
TACK COAT, CONCRETE APPROACH SLAB & CONC. MEDIAN	\$1,156,584	0.91%
DRAINAGE	\$874,230	0.69%
CLASS "A" CONCRETE AND REINFORCEMENT STEEL	\$669,162	0.53%
CATCH BASINS & DROP INLETS	\$550,256	0.43%
ENGINEERING FIELD OFFICE	\$251,211	0.20%
RIGHT OF WAY MARKERS	\$24,040	0.02%
TOTALS (E & C = \$ 12,400,000 PER MILE)	\$127,148,904	100.00%

VALUE ENGINEERING TEAM STUDY

FUNCTION ANALYSIS

The following functions for SR 316 from I-85 to SR 20 for HOV Lanes project were identified during discussions with the Georgia DOT design representatives (design team consultants) on the first day of the study. These two word functions consist of an active verb, and a quantifiable (measurable) noun. The functions represent the proposed capital improvement expenditures of Widening SR 142 to Four Lanes project, and assist the V.E. team in becoming familiar with the needs of the project and the long-term goals for these improvements of SR 316 from I-85 to SR 20 for HOV Lanes Interchange. The Basic Function of the project is to “Construct HOV”. The following are considered by the V.E. team to be Secondary and Supporting Functions.

<i>Verb</i>	<i>Noun</i>	<i>Verb</i>	<i>Noun</i>
Construct	Bridge	Reduce	Congestion
Reduce	Cost	Install	Barriers
Add	HOV	Construct	Bridges
Depress	Road	Identify	Centerline
Adjust	Grades	Manage	Traffic
Serve	Communities	Reuse	Materials
Serve	Public	Award	Contract
Protect	Commuters	Develop	Options
Satisfy	Users	Develop	Alternatives
Support	Councils	Define	Performance
Minimize	Lawsuits	Develop	Specification
Improve	Access	Reduce	Liability
Enhance	Image	Re-cycle	Materials
Enhance	Signage	Provide	Drainage
Reduce	Risk	Enhance	Maintainability
Relieve	Traffic	Minimize	Relocations
Enhance	Economy	Expedite	Travel
Reduce	Delays	Improve	Functions
Maintain	Passage	Improve	Drainage
Improve	Constructability	Correct	Drainage
Benefit	Community	Protect	Environment

VALUE ENGINEERING TEAM STUDY

FUNCTION ANALYSIS

<i>Verb</i>	<i>Noun</i>	<i>Verb</i>	<i>Noun</i>
Improve	Flow	Expedite	Intersection
Increase	Capacity	Reduce	Risks
Add	Lanes	Accommodate	Breakdowns
Increase	Speeds	Recycle	Pavement
Reduce	Delays	Import	Fill
Straighten	Alignment	Segregate	Materials
Improve	Line-of-Sight	Store	Materials
Improve	Visibility	Access	Materials
Enhance	Visibility	Access	Storage
Straighten	Road	Remove	Soils
Reduce	Interruptions	Communicate	Changes
Reduce	Delays	Relocate	Soils
Identify	Passing	Demolish	Bridge
Accommodate	Passing	Demolish	Pavement
Delete	Intersections	Contain	Flow
Eliminate	Stopping	Control	Flow
Reduce	Accidents	Stage	Materials
Improve	Safety	Improve	By-Pass
Separate	Lanes	Reduce	Congestion
Provide	Detours	Satisfy	Codes
Eliminate	Medians	Meet	Schedules
Enhance	Definition	Accommodate	Re-alignments
Assure	Safety	Improve	Functions
Accommodate	Hauling	Satisfy	County
Expedite	Hauling	Utilize	Guidelines
Minimize	Hauling	Construct	Bridges
Control	Traffic	Support	County
Control	Erison	Support	Tourism
Phase	Construction	Access	Businesses
Utilize	Resources	Relocate	Utilities
Maximize	Utilization	Improve	Weaving
Widen	Bridge	Help	Commuters
Guide	Traffic	Satisfy	Public
Transmit	Information	Satisfy	Commuters
Manage	Traffic	Support	Weight

VALUE ENGINEERING TEAM STUDY

COST DRIVER ANALYSIS

The V.E. team reviewed the project cost elements and identified the controlling element or cost driver for SR 316 from I-85 to SR 20 for HOV Lanes. The cost drivers are used in the brainstorming process as a focal point of discussion and for idea generation.

<u><i>Element</i></u>	<u><i>Function</i></u>	<u><i>Cost Driver</i></u>
Excavation	Improve Interchange Relieve Congestion Adjust Grade Improve Alignment Improve Drainage	Borrow Distance Demolition/Removal Shoulder Width Road Length & Width
Road Section	Support Weight Maintain Surface Support Vehicles Distribute Load Install Medians Widen Road Detour Traffic Demolish Road	Base Course Materials Source of Materials Wearing Surface Drainage System Road Length & Width Median Width Shoulder Width
Bridge	Bridge Roads Improve Safety Support Weight Support Vehicles Widen Bridge Replace Bridge	Bridge Heights Foundation Protection Materials Used Structural Design Depth of Beams Lengths of Bridge Number of Spans
Traffic Management	Insure Safety Reduce Risk Maintain Passage Avoid Delays Assist Commuters Assist Tourist	Methods of Control Frequency of Control Duration of Control Installation of barriers

BRAINSTORMING OR SPECULATION

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GDOT - GWINNETT COUNTY, GEORGIA

NUMBER	IDEA	RANK
ROADWAY (RW)		
1.0	Construct HOV without barrier and reduce pavement width	1/5
1.1	Construct stripped HOV without barrier and reduce pavement width	1/5
1.2	Relocate HOV to outside lane ilo interior	Drop
2.0	Retain existing dual lanes in current location ilo demolition and resurface with concrete plus construct HOV lane	1/5
2.1	Mill and resurface with asphalt existing dual lanes in current location ilo demolition and resurface with concrete plus construct HOV lane	1/5
3.0	Defer any cost provision associated with construction of future Collector Distributor (CD's)	1/3
4.0	Develop and award project as a toll road for immediate award and construction ilo waiting until normal funding and award in 2009. Accept Washington Group unsolicited proposal	1/5
5.0	Re-evaluate justification (19% usage) on HOV projections through this corridor	2/5
6.0	Price, Identify, and include signage requirements	DS
7.0	Identify and purchase locations for Kiss & Ride parking lots as part of the ROW associated cost – Gwinnett County Approval	DS
8.0	Provide HOV signage information on I-85 prior to ramping on to SR 316	DS
9.0	Make provisions for commuters I-85 heading South to connect to SR 316 heading East	DS
10.0	Widen to three lanes using the existing two lanes without HOV designation	DS
10.1	Widen to three lanes plus HOV lane (see 1.0 above)	See 1.0
11.0	Construct a reversible two lane HOV with barrier for commuters	DS
12.0	Consider a no build option	1/5
13.0	Construct SR 316 as asphalt road section ilo concrete road section.	1/5
14.0	Construct SR 316 with fixed barrier and no extra pavement for expansion of HOV lanes.	2/5

BRAINSTORMING OR SPECULATION

PROJECT TITLE: SR 316 FROM I-85 TO SR 20 FOR HOV LANES

PROJECT LOCATION: GDOT - GWINNETT COUNTY, GEORGIA

NUMBER	IDEA	RANK
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STRUCTURAL/BRIDGES (SB)

1.0	Build/modify only the following bridges: Hi-Hope, Collins Hill Road, SR 20, and SR 120	2/5
2.0	Eliminate end rolls and install MSE walls	2/5
3.0	Widen to inside of Yellow River Bridge ilo replacement	2/5
4.0	Use High Performance Concrete (HPC) span bridge with MSE walls for all bridge work	2/5
5.0	Construct three arches over Columbia Gas Pipe Line ilo constructing bridges	3/5
6.0	Depress SR 316 at Walter Road	1/5
7.0	Raise SR 20 bridge ilo depressing SR 316 twenty feet	Drop

VALUE ENGINEERING WORKSHOP AGENDA

WIDENING SR 316 FROM I-85 TO SR 20 TO ACCOMDATE HOV LANES

GWINNETT COUNTY, GEORGIA

24 HOUR - V.E. STUDY

19-21 April 2005

The value engineering workshop for the subject project will be conducted for three (3) days from 19-21 April 2005, at the Georgia Department of Transportation General Office, Urban Design Conference Room #352, #2 Capitol Square, Atlanta, GA; POC – Lisa Myers @ (404) 651-7468 voice, (404) 463-6161 Fax

TUESDAY	0800 - 0815	Introduction Phase	Lindsey Gardner, P.E., CVS Team Leader, U.S. Cost, Inc. (V.E. Team Only)
		<i>The VETL will review previous events along with activities planned for the week and outline several areas, which may be investigated by the V.E. team.</i>	
	0815 - 1000	Review of Project Plans	V.E. Team Only
		<i>The team members will review the project plans, cost estimates, available calculations, cost models, and cost bar graphs to gain a working knowledge of the project.</i>	
	1000 - 1200	Project Design Briefing	V.E. Team; (A/E), GDOT
		<i>The A/E project design manager will discuss the project requirements and the proposed design solution(s) in some detail. The V.E. team members will ask questions as appropriate to completely understand the project requirements as established by the user and the proposed design solution (both alternatives considered and those recommended by the design team).</i>	
	1200-1300	Lunch	

TUES. (cont.) 1300 - 1700
V.E. Team

Creative Phase

The V.E. team will creatively review, (Brainstorm), and tabulate possible design alternatives for the project. While the designer's solution will serve as the "baseline", the team will identify alternatives not in the recommended solution, but deserving of further investigation. Generally, a brainstorming session will produce between 75 and 100 creative design alternatives. Each system will be carefully analyzed with the basic questions in mind:

What is the system/item?

What does it do (what is its basic function)?

What must it do?

What does it cost?

What is the item worth?

What else will do the same, or a better job?

What does that alternative cost?

During the creative phase, the team will not judge the ideas. The essential requirements for the project, however, must always be considered.

WEDNESDAY 0800 - 1000
V.E. Team

Analysis Phase

During this phase, all of the ideas or alternatives will be ranked according to their potential for life-cycle (25-year) cost reduction and the potential for acceptance by the user, designers, and other appropriate parties.

1000 - 1200

Project Assignments

VETL

Each team member will be assigned a number of ideas for further development. The ideas will be those with the highest rankings. In general, the ideas will be assigned according to technical discipline; road design, structures, and constructability.

1200 – 1300

Lunch

WEDS (cont.) 1300 - 1700 **Development Phase** V.E. Team

During the development phase, each team member will gather information and prepare written proposals for those ideas assigned to him/her. These may require additional discussions with the A/E, outside contractors and suppliers, and other specialists to fully define the alternative. The team members will prepare sketches, perform calculations and develop other data to support each proposal. In addition, costs will be prepared for each alternative as originally designed, and as proposed by the V.E. team. Life-cycle costs for operation, maintenance and related annual costs will also be considered.

THURSDAY 0800 - 1200 **Development Phase (Continued)**

1200 - 1300 Lunch

1300 - 1630 **Development Phase (Continued)**

1630 - 1700 **Summary of Results/Workshop Conclusion VETL**

The study will be concluded. The final report will be delivered within eight working days of the study's conclusion.

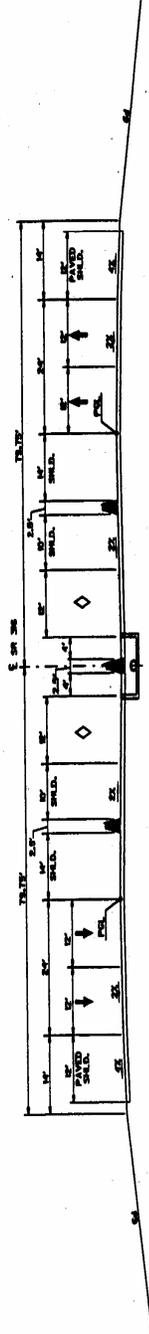
Estimate Report for file "0003168"

Section ROADWAY ITEMS					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1.00	LS	3300000.00	TRAFFIC CONTROL -	3300000.0
153-1300	4.00	EA	48309.78	FIELD ENGINEERS OFFICE TP 3	193239.12
205-0001	680000.00	CY	3.19	UNCLASS EXCAV	2169200.0
206-0002	250000.00	CY	3.95	BORROW EXCAV, INCL MATL	987500.0
207-0203	600.00	CY	31.95	FOUND BK FILL MATL, TP II	19170.0
310-5100	50000.00	SY	13.79	GR AGGR BASE CRS, 10 INCH, INCL MATL	689500.0
310-5120	604200.00	SY	12.28	GR AGGR BASE CRS, 12 INCH, INCL MATL	7419576.0
400-3624	32900.00	TN	65.69	ASPH CONC 12.5 MM PEM, GP 2 ONLY, INCL POLYMER-MODIFIED	2161201.0
402-3112	106100.00	TN	46.30	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM	4912430.0
402-3121	308200.00	TN	34.87	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM	1.07
402-3130	43300.00	TN	36.73	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM	1590408.99
413-1000	196200.00	GL	0.91	BITUM TACK COAT	178542.0
433-1000	5700.00	SY	111.59	REINF CONC APPROACH SLAB	636063.0
441-0740	3300.00	SY	22.75	CONCRETE MEDIAN, 4 IN	75075.0
500-3101	1000.00	CY	410.56	CLASS A CONCRETE	410560.0
500-3800	60.00	CY	681.87	CLASS A CONCRETE, INCL REINF STEEL	40912.2
511-1000	101600.00	LB	0.60	BAR REINF STEEL	60960.0
550-1150	1600.00	LF	29.85	STORM DRAIN PIPE, 15 IN, H 1-10	47760.0
550-1180	12300.00	LF	28.86	STORM DRAIN PIPE, 18 IN, H 1-10	354978.0
550-1240	1000.00	LF	33.84	STORM DRAIN PIPE, 24 IN, H 1-10	33840.0
550-1300	200.00	LF	41.68	STORM DRAIN PIPE, 30 IN, H 1-10	8336.0
550-1360	800.00	LF	51.94	STORM DRAIN PIPE, 36 IN, H 1-10	41552.0
550-1420	400.00	LF	68.25	STORM DRAIN PIPE, 42 IN, H 1-10	27300.0
550-1480	500.00	LF	80.55	STORM DRAIN PIPE, 48 IN, H 1-10	40275.0
550-1540	500.00	LF	196.74	STORM DRAIN PIPE, 54 IN, H 1-10	98370.0
621-3020	115400.00	LF	129.90	CONCRETE BARRIER, TYPE 20	1.49
627-1000	126000.00	SF	39.64	MSE WALL FACE, 0- 10 FT HT, WALL NO -	4994640.0
634-1200	210.00	EA	88.06	RIGHT OF WAY MARKERS	18492.60
668-1100	70.00	EA	1735.86	CATCH BASIN, GP 1	121510.2
668-2100	170.00	EA	1775.08	DROP INLET, GP 1	301763.6
716-2000	1.00	SY	2300000.00	EROSION CONTROL MATS, SLOPES	2300000.0
Section Sub Total:					\$58,970,548.72

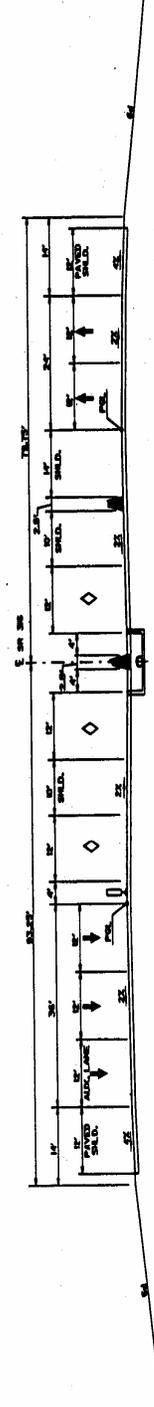
Section BRIDGE ITEMS					
Item Number	Quantity	Units	Unit Price	Item Description	Cost
540-1101	4.00	LS	120000.00	REMOVAL OF EXISTING BRIDGE	480000.0
543-1100	1.00	LS	16204500.00	CONSTR OF BRIDGE - COMPLETE - TO BOTTOM OF CAP	1.62
Section Sub Total:					\$16,684,500.00

Total Estimated Cost: \$75,655,048.72

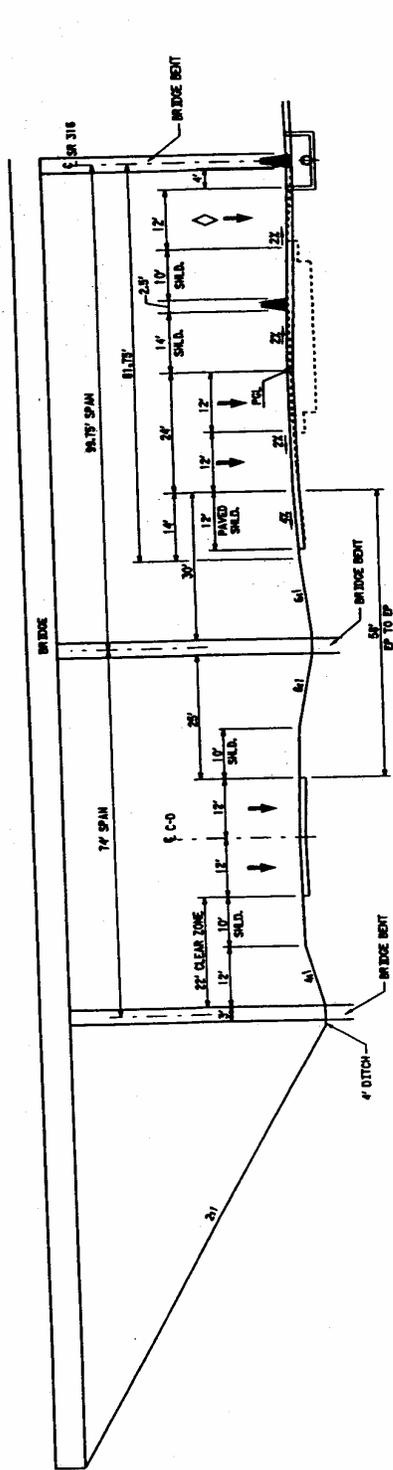
Subtotal Construction Cost	\$75,655,048.72
E&C Rate 10.0 %	\$7,565,504.87
Inflation Rate 5.0 % @ 4.0 Years	\$17,934,549.43
<hr/>	
Total Construction Cost	\$101,155,103.02
Right Of Way	\$26,074,000.00
ReImb. Utilities	Not Yet Available
<hr/>	



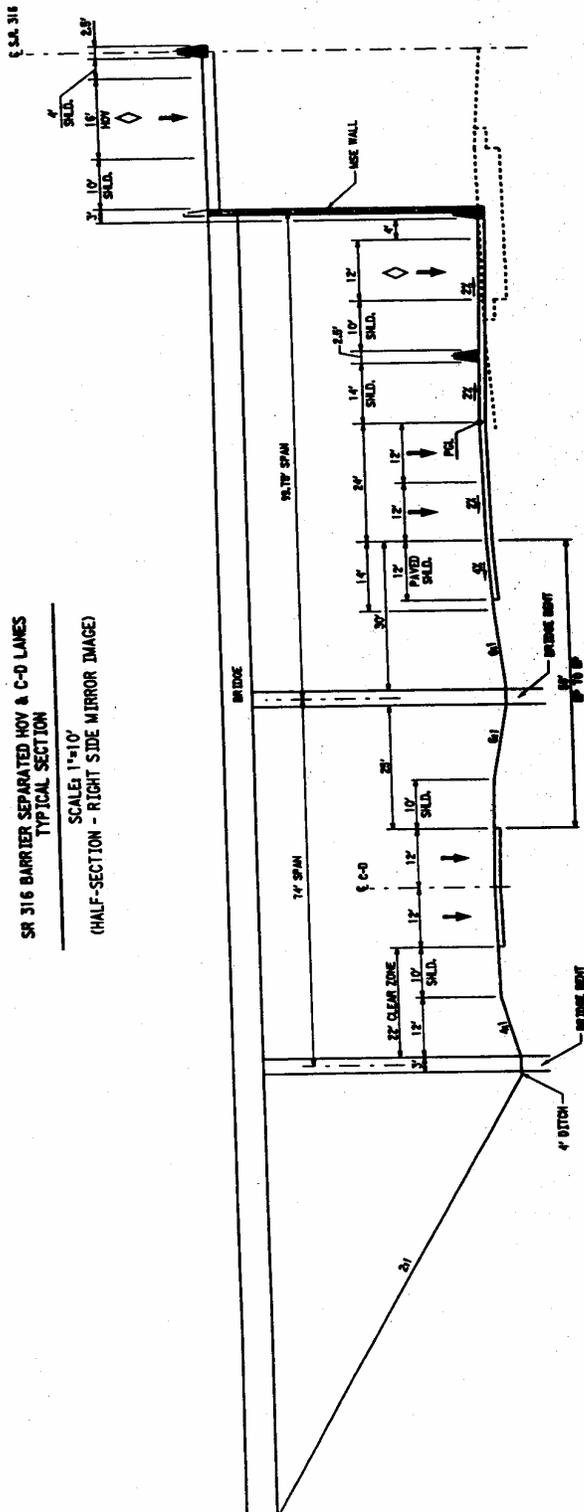
SR 316 BARRIER SEPARATED HOV
LANE TYPICAL SECTION
SCALE: 1"=10'



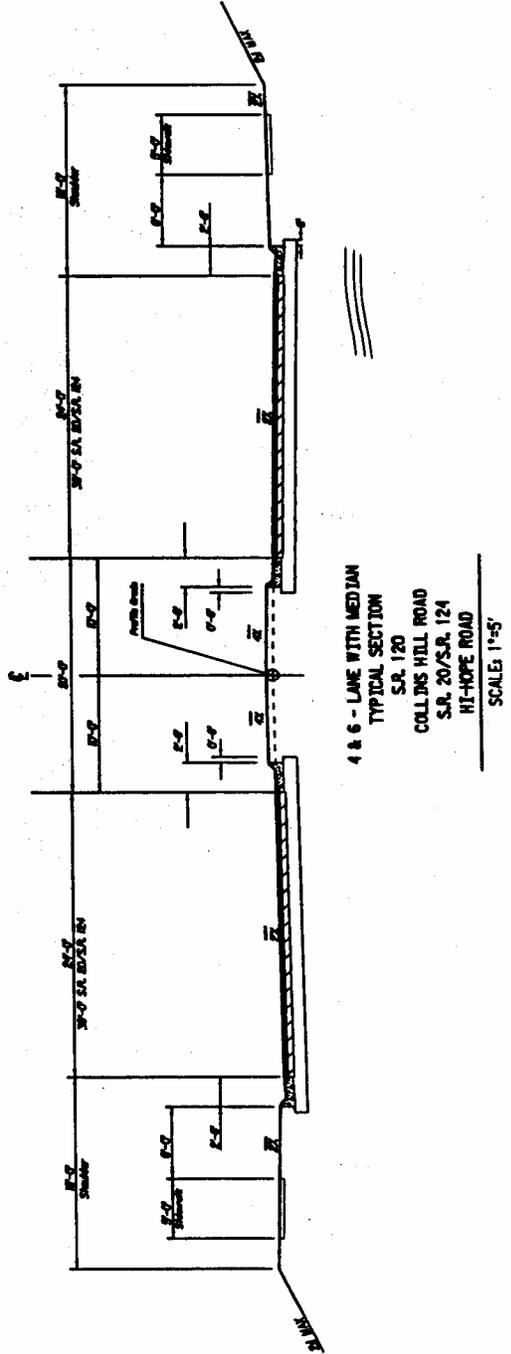
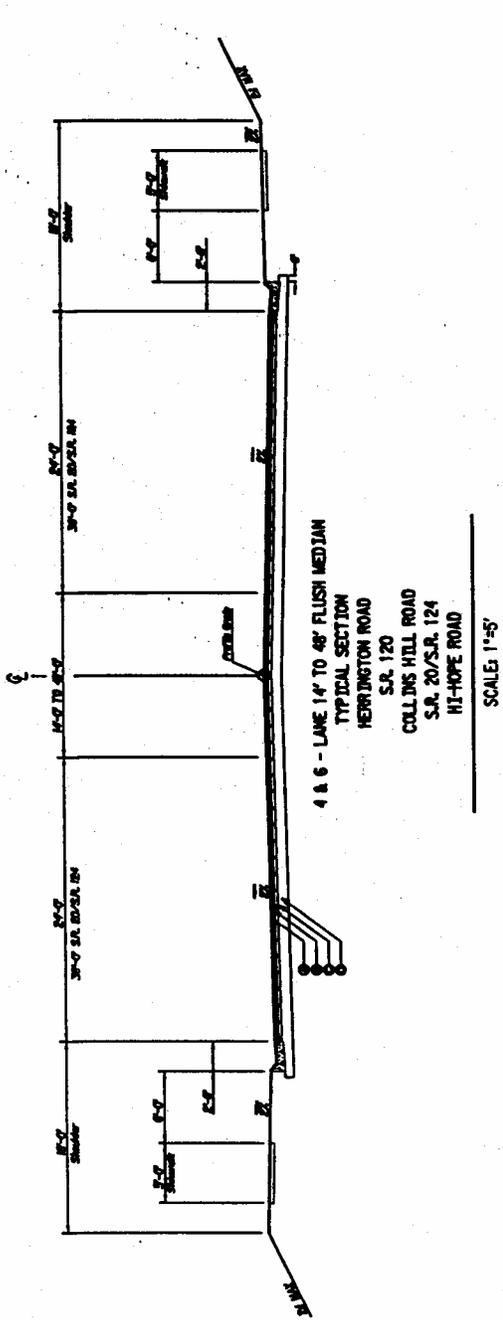
SR 316 BARRIER SEPARATED
HOV W/ CENTER LINE
TYPICAL SECTION
SCALE: 1"=10'

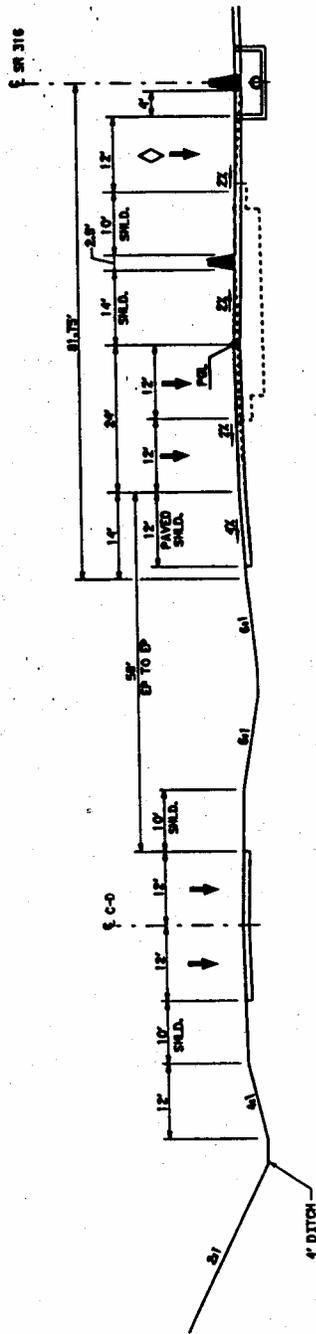


SR 316 BARRIER SEPARATED HOV & C-D LANES
 TYPICAL SECTION
 SCALE: 1"=10'
 (HALF-SECTION - RIGHT SIDE MIRROR IMAGE)



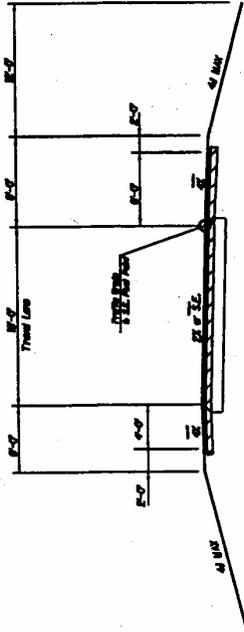
SR 316 BARRIER SEPARATED HOV LANES
 AND C-D LANES @ HOV INTERCHANGES
 TYPICAL SECTION
 SCALE: 1"=10'
 (HALF-SECTION - RIGHT SIDE MIRROR IMAGE)



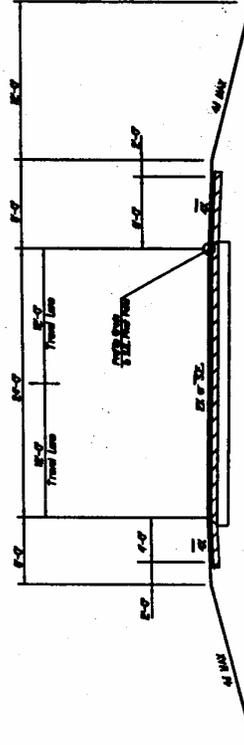


SR 316 BARRIER SEPARATED HOV & C-O LANES
TYPICAL SECTION

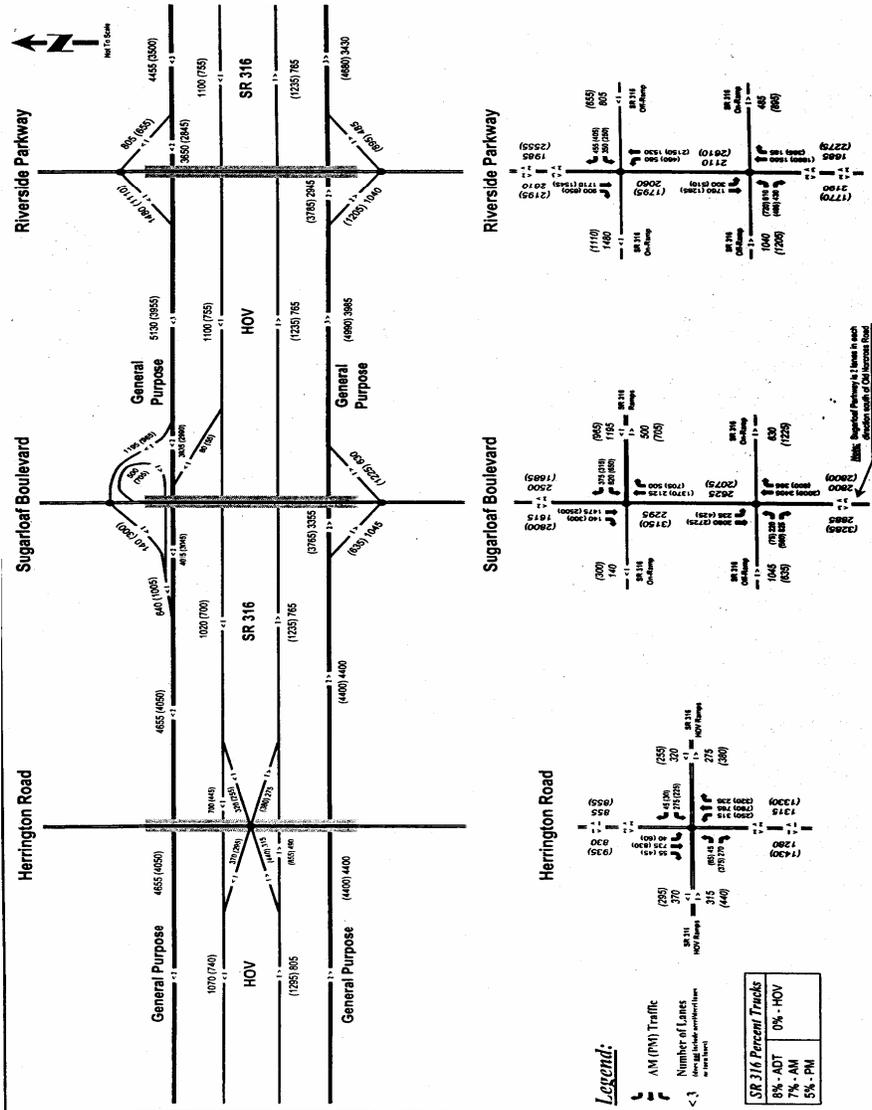
SCALE: 1"=10'
(HALF-SECTION - RIGHT SIDE MIRROR IMAGE)

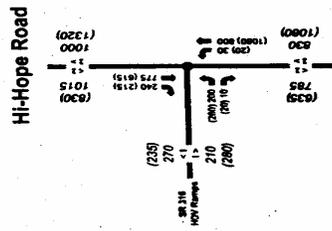
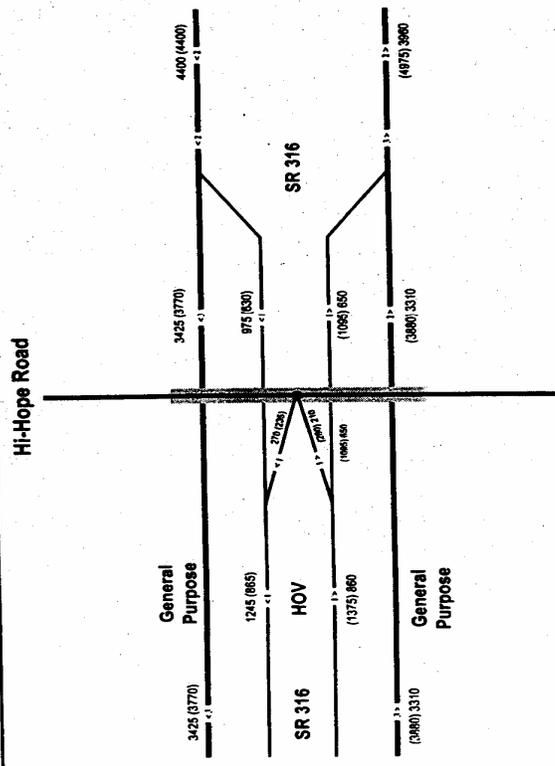


ONE LANE RAMP
TYPICAL SECTION
SCALE: 1"=5'

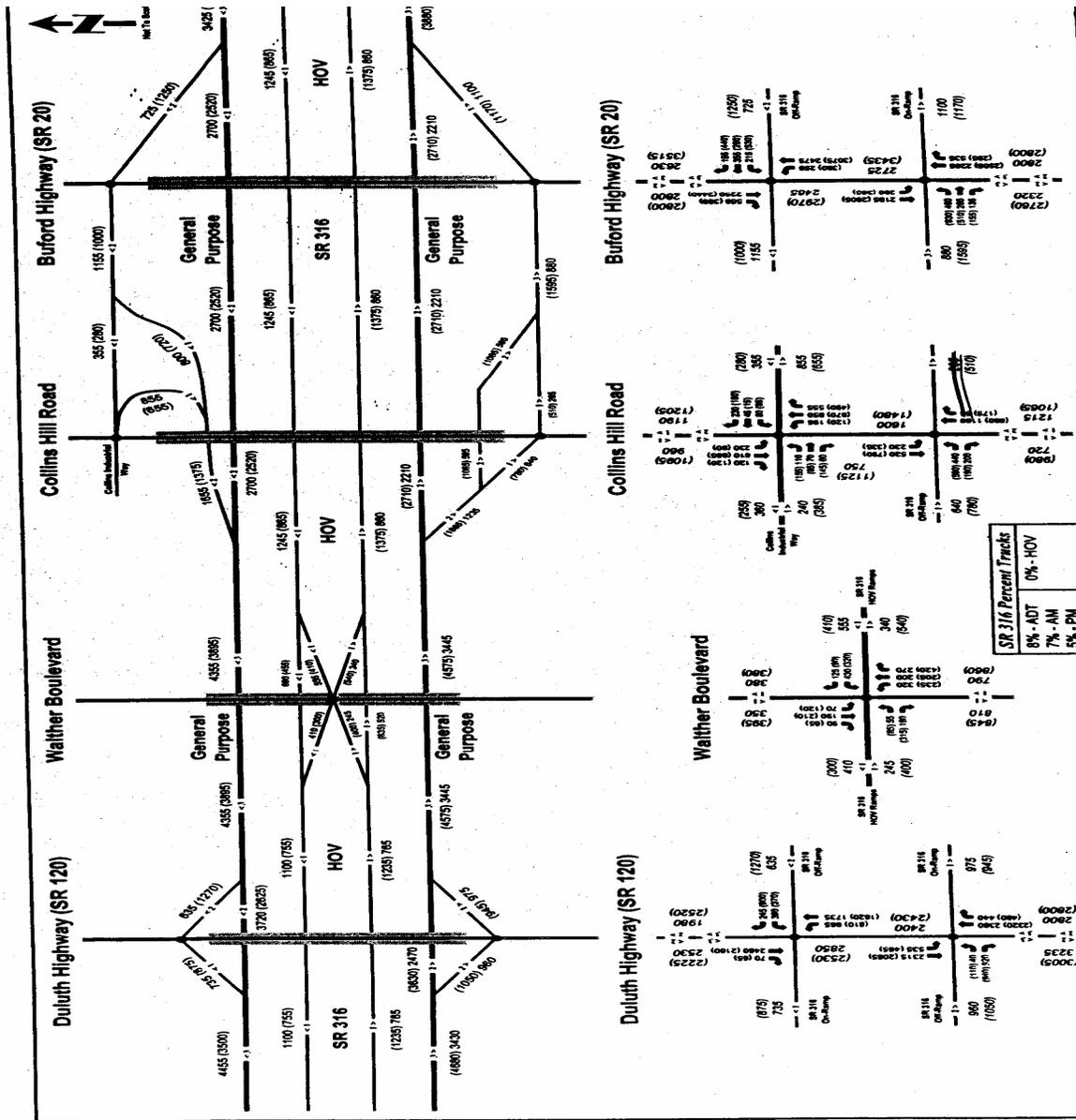


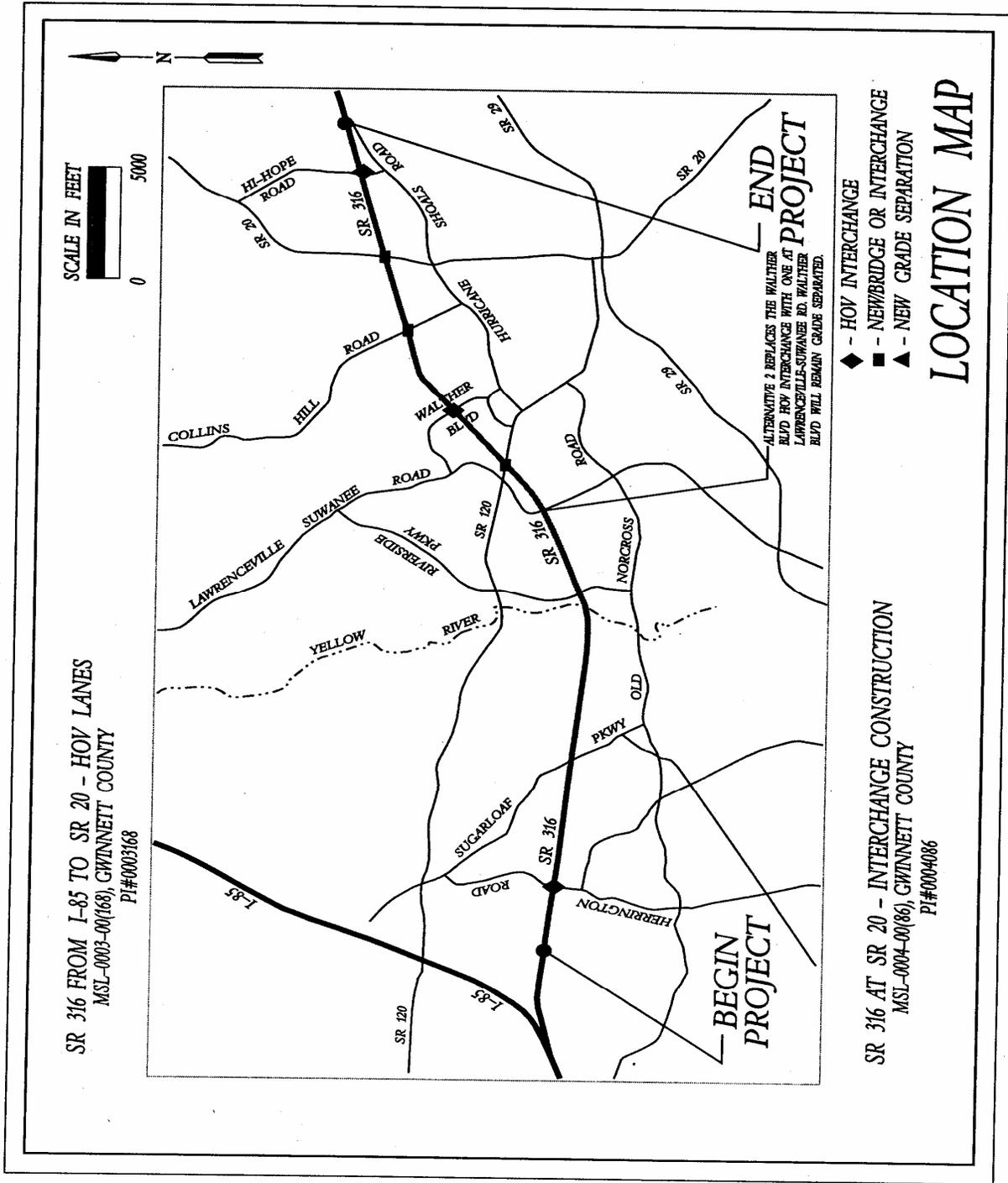
TWO LANE RAMP
TYPICAL SECTION
SCALE: 1"=5'





SR 316 Percent Trucks	
8% - ADT	0% - HOV
7% - AM	
5% - PM	





SR 316 FROM I-85 TO SR 20 - HOV LANES
 MSL-0003-00(168), GWINNETT COUNTY
 PI#0003168

SR 316 AT SR 20 - INTERCHANGE CONSTRUCTION
 MSL-0004-00(86), GWINNETT COUNTY
 PI#0004086

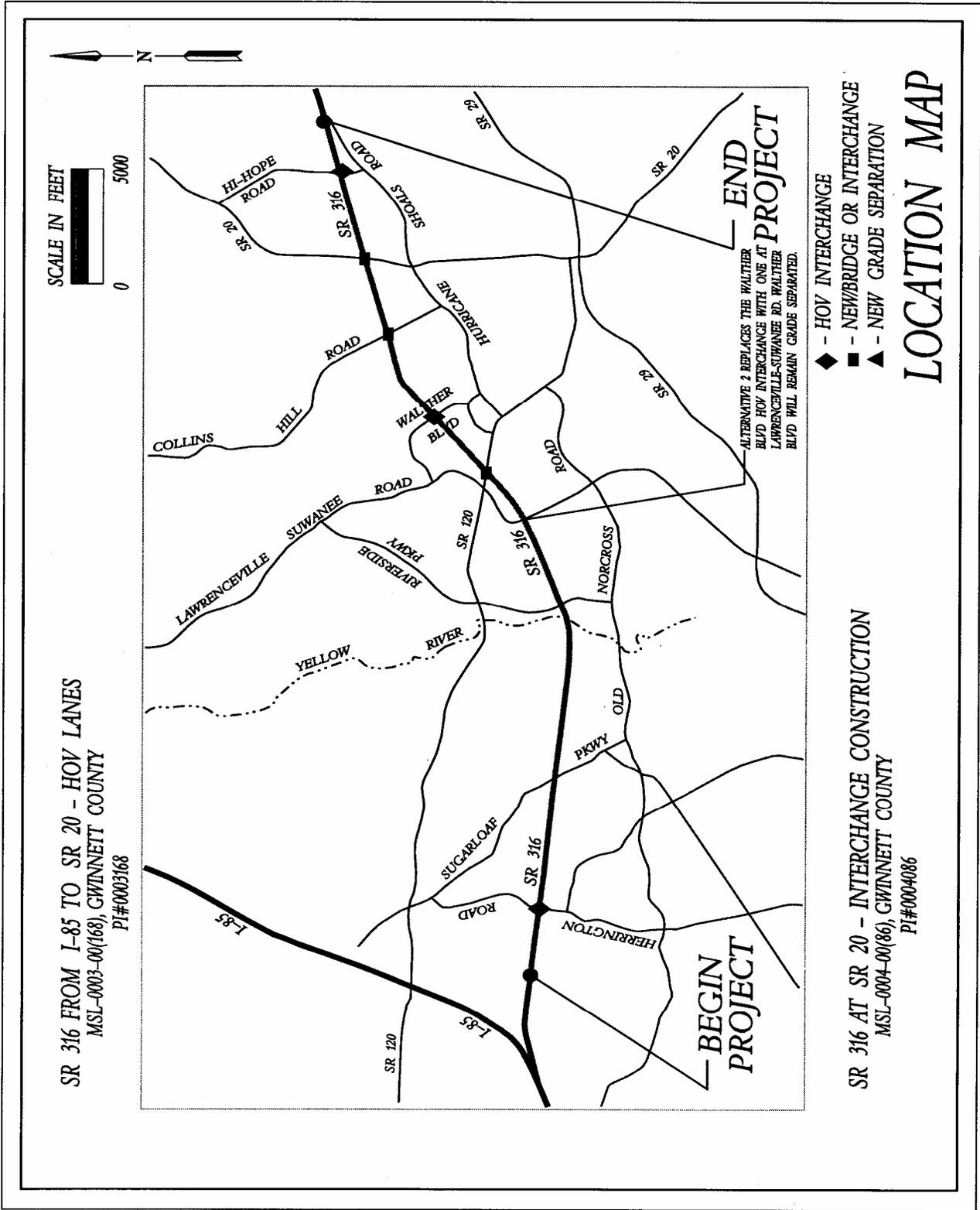
BEGIN PROJECT

END PROJECT

ALTERNATIVE 2 REPLACES THE WALTHER BLVD INTERCHANGE WITH ONE AT LAWRENCEVILLE-SUWANEE RD. WALTHER BLVD WILL REMAIN GRADE SEPARATED.

- ◆ - HOV INTERCHANGE
- - NEW BRIDGE OR INTERCHANGE
- ▲ - NEW GRADE SEPARATION

LOCATION MAP



SCALE IN FEET
0 5000

SR 316 FROM I-85 TO SR 20 - HOV LANES
MSL-0003-00(168), GWINNETT COUNTY
PI#0003168

- ◆ - HOV INTERCHANGE
- - NEW BRIDGE OR INTERCHANGE
- ▲ - NEW GRADE SEPARATION

SR 316 AT SR 20 - INTERCHANGE CONSTRUCTION
MSL-0004-00(86), GWINNETT COUNTY
PI#0004086

LOCATION MAP

BEGIN PROJECT

END PROJECT

ALTERNATIVE 2 REPLACES THE WALTHER BLVD HOV INTERCHANGE WITH ONE AT LAWRENCEVILLE-SUWANEE RD. WALTHER BLVD WILL REMAIN GRADE SEPARATED.