VALUE ENGINEERING REPORT

Eagles Landing Parkway
STP-0002-00(638), PI No 0002638
Henry County

September 25, 2007

OWNER AND DESIGN TEAM:

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

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Eagles Landing Parkway

VALUE ENGINEERING STUDY

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VALUE ENGINEERING STUDY

Eagles Landing Parkway
September 4-7, 2007

Introduction

The proposed project will reconstruct a 2.6-mile section of Eagles Landing Parkway from Eagles Point Parkway to approximately 700 feet east of Talon Place in the City of Stockbridge. Eagles Landing Parkway serves as a minor arterial connecting I-75 and SR 42/US 23. The proposed two lane section being reconstructed under this project will connect to a four-lane section to the east and a six-lane section to the west. The proposed widening of Eagles Landing Parkway is a critical piece that will connect I-75 with SR 155 in Henry County.

Significant growth in residential, commercial, and industrial development in the Eagles Landing Parkway corridor has resulted in failing levels of service at many intersections throughout the area. The proposed project will provide for capacity and operational improvements including pedestrian access and improved east-west connectivity. The proposed project will continue the six lane footprint by constructing the proposed four lane roadway on the ultimate six-lane footprint. It will construct all crossroad intersections to the full build out section (including right and left turn lanes). The four-lane facility will include a 44-foot depressed grass median that will allow for the additional two lanes to be constructed in the median once traffic warrants are met for a six lane facility. The proposed project will also replace the existing Pates Creek and the Norfolk Southern Railroad Bridges with new six lane structures and include dual four-foot bike lanes, sidewalks, and curb and gutter. Major contract work items include roadway grading, pavement, bridge construction, the installation of storm drains, and the construction of bike lanes and sidewalks.

Considerations

The project being evaluated under the VE study has an estimated construction cost (including E&C) of $30,440,000. Even though the project has an existing right-of-way (ROW) width of 200 feet, additional ROW and / or easements will be required to construct the project. Right-of-way costs are estimated to be $9,975,000. Additional ROW required for this project will be acquired by Henry County. The project is scheduled for a December 2008 letting. Project construction funding is set for 2009.

Results Obtained

The VE team focused their efforts on the high cost items of the project. The study generated 48 ideas with 29 being identified for additional evaluation as possible recommendations or design suggestions. The VE team developed eight independent recommendations that if implemented

have the potential to reduce the project cost by approximately $2,733,000. The VE team also developed five design suggestions for further consideration by the Design Team. A detailed write-up of each recommendation and design suggestion is contained in the center portion of this report. A summary of the recommendations and design suggestions follows.

Recommendation Highlights

Idea A-10: To reduce the outside shoulder width from 16 feet to 12 feet on Eagles Landing Parkway.

The baseline design concept provides for 16-foot urban shoulders on each side of Eagles Landing Parkway.

It is recommended that the 16-foot outside shoulder be reduced to 12 feet. This will result in reduced grading quantities and will eliminate or reduce the size of the retaining walls. The baseline concept provides for 16-foot shoulders. This allows the sidewalks to be offset 6 feet from the back of the curb. The 16-foot configuration allows the sidewalks to remain in their constructed location and not have to be jogged to cross driveways. Due to the relatively few driveways on this project, constructing a 12-foot shoulder that places the sidewalk only 2 feet from the back of the curb (requiring it to be jogged outward at driveways to avoid crossing the driveway pan) has the potential to reduce the number of ROW easements, the size of roadway retaining walls, the amount of roadway embankment, and the cost of the project.

The total potential savings if this recommendation is accepted is $252,000.

Idea A-9, A-10: To eliminate the dual 4-foot bike lanes from within the roadway section and to construct a 10-foot multi-use bike / pedestrian path in the eastbound outside shoulder.

The baseline design concept provides for the construction (within the roadway section) of 4-foot bicycle lanes on each side of Eagles Landing Parkway.

It is recommended that the dual bicycle lanes be eliminated and that a 10-foot-wide multi-use bike / pedestrian path be constructed in the eastbound outside roadway shoulder. The multi-use bike / pedestrian path would be carried across the Norfolk Southern Railroad and Pates Creek Bridges via a 12-foot wide shoulder on the eastbound side of the bridges. Having bicycle lanes adjacent to traffic lanes that will carry 54,000 vehicles per day in the design year at a posted speed of 45 mph presents safety concerns. Removing the bike lanes from the roadway section will provide improved safety for both bikers and roadway traffic. Acceptance of this recommendation will reduce paving and grading quantities, reduce the size of the bridges, eliminate or reduce the size of the roadway retaining walls, and improve safety. Constructing a separate multi-use bike / pedestrian path could also encourage bicycle and pedestrian use more than the bicycle lanes. This recommendation also includes the concept for reducing the outside westbound16-foot shoulder to 12 feet.

The total potential savings if this recommendation is accepted is $490,000.

Idea B-3: To construction the full six lane roadway section throughout the entire length of Eagles Landing Parkway under this project.

The proposed design upgrades Eagles Landing Parkway to a four-lane roadway on the ultimate six-lane roadway footprint. It proposes to construct the full six-lane section at the intersections leaving only short sections of uncompleted six-lane roadway.

It is recommended that the ultimate six-lane roadway section be constructed for the entire length of the project. This section of Eagles Landing Parkway will require a six-lane roadway section before the end of the project's 20-year design life. The proposed four-lane roadway section will be constructed on the ultimate six-lane roadway footprint and include the six-lane section (with full turning lanes) at all intersections. Due to the close spacing of these intersections and the lengths of the various turn lanes, only a small amount of additional through lanes would have to be constructed at this time to complete the full six-lane section through the project. In addition, the Norfolk Southern Railroad and Pates Creek Bridges are being reconstructed to the full six-lane section. Constructing the four-lane roadway on the six-lane footprint will include constructing essentially all of the drainage required for the ultimate six-lane section. Adding the future center lane roadway sections to this project would improve the constructability of this project by eliminating the many short paving runs required for the various turn lanes throughout the project. This concept would result in a minor cost increase to this project, but eliminate future costs (design, contract advertise / award, construction, traffic control, etc.) associated with letting a future contract to add the additional lanes.

The total potential increase if this recommendation is accepted is $1,149,000.

Idea C-1 (A): To construct two separate 2-lane bridges in lieu of the proposed single 6-lane bridge over the Norfolk Southern Railroad.

The proposed project includes the construction of a single 118' - 5" wide by 192' long bridge over the Norfolk Southern Railroad. This bridge is wide enough to accommodate the ultimate six-lane roadway section, dual bike lanes, and sidewalks on both sides of the bridge.

It is recommended that two separate 40' – 10" wide, two-lane bridges be constructed to accommodate the two-lane roadway section being constructed in this section of the project. The 40' – 10" bridge width would also allow for a bike lane and sidewalk on each bridge. This bridge is located in a section of the project where only four lanes of the ultimate six-lane roadway section will be constructed. The roadway section will have a wide depressed grass median while the bridge section will have a wide raised concrete median. This concept has the potential to reduce the cost of the project and reduce construction time. The dual bridges can be easily widened when the ultimate six-lane section is built.

The total potential savings if this recommendation is accepted is $659,000.

Idea C-1 (B): To construct two separate 2-lane bridges in lieu of the proposed single 6-lane bridge over Pates Creek.

The proposed project includes the construction of a single 118' - 5" wide by 380' long bridge over Pates Creek. The bridge is wide enough to accommodate the ultimate six-lane roadway section, dual bike lanes, and sidewalks on both sides of the bridge.

It is recommended that two separate 40' – 10" wide, two-lane bridges be constructed to accommodate the two-lane roadway section being constructed in this section of the project. The 40' – 10" bridge width would also allow for a bike lane and sidewalk on each bridge. This bridge is located in a section of the project where only four lanes of the ultimate six-lane roadway section will be constructed. The roadway section will have a wide depressed grass median while the bridge section will have a wide raised concrete median. This concept has the potential to reduce the cost of the project and reduce construction time. The dual bridges can be easily widened when the ultimate six-lane section is built.

The total potential savings if this recommendation is accepted is $1,307,000.

Idea C-2: To reduce the elevation of the Pates Creek Bridge and the bridge approach roadways.

The proposed design raises the roadway grade between 2 and 10 feet through the wetland area on the east end of the project. This grade change also raises the Pates Creek Bridge and its approaches approximately 7-8 feet above the elevation of the existing structure.

It is recommended that the proposed Pates Creek Bridge and its approach roadways be lowered approximately 5 feet through the wetland area. Based on preliminary bridge plans, available flood plain information, and discussions with individuals in the hydraulics office, the roadway / bridge elevation is approximately 5 feet higher than needed to provide the required waterway opening. The road profile can be reduced for approximately 1,300 feet on the west side of the bridge and approximately 900 feet on the east side. Reducing the road profile also results in a reduction in the size of the embankment that needs to be constructed within the wetlands. Reducing the embankment lessens the impact on the wetland and may require less mitigation. Lowering the bridge also reduces the amount of piling required for the bridge. Implementing this concept reduces the roadway template and improves constructability.

The total potential savings if this recommendation is accepted is $570,000.

Idea C-4: To construct separate multi-use bike / pedestrian path bridges along side the new roadway bridges crossing the Norfolk Southern Railroad and Pates Creek in lieu of carrying the bike lanes and sidewalk across the roadway bridges.

The proposed project would construct a single 118' – 5" wide by 380-foot long bridge over Pates Creek and a single 118' – 5" wide by 192' long bridge over the Norfolk Southern Railroad. The proposed bridges would accommodate the ultimate six-lane roadway section, dual 4' bike lanes, and sidewalks on both sides of the bridge.

It is recommended that the dual bike lanes and the sidewalk on one side be removed from the highway bridge and placed on a separate "multi-use" bike / pedestrian pathway bridge. Taking the dual bike lanes and one sidewalk off the highway bridges would reduce the width of the roadway bridge from 118' – 5" to 104' – 10." A separate lower cost bike / pedestrian pathway bridge (14' – 10" wide) would be constructed to carry bike and pedestrian traffic safely across the Norfolk Southern Railroad and Pates Creek. A separate "multi-use" bike / pedestrian pathway bridge would provide increased safety and fit well with its surroundings. The bike / pedestrian bridge surface should be constructed with select material to provide for an aesthetically pleasing structure. Construction of a much thinner section "multi-use" bridge has the potential to reduce project cost and contract construction time.

The total potential savings if this recommendation is accepted is $260,000.

Idea F-1: To construct duel, 2-lane single span bridges with vertical abutments and MSE walls in lieu of a 3 span, single 6-lane bridge over the Norfolk Southern Railroad.

The proposed design would construct a three span (57-foot, 84-foot, and 51-foot) bridge across the Norfolk Southern Railroad. The bridge would be 118 feet 5 inches wide.

It is recommended that dual single span (84 feet) bridges with vertical abutments and MSW walls be constructed over the Norfolk Southern Railroad. The dual 40' - 10" wide bridges (with "U" MSE walls instead of two end spans) would accommodate the proposed two-lane roadway section including bike lanes and sidewalks on each bridge. The retaining wall abutments should be continuous through the middle to accommodate future widening when the roadway is widened to its ultimate six-lane section. The cost comparison shows that use of "U" MSE retaining walls will be economical. The use of MSE walls with piles and bents at the abutments would improve constructability, reduce construction time, and result in cost savings to the project. This concept also has the potential to reduce future maintenance cost due to a reduction in the size of the bridge and in the number of bridge joints.

The total potential savings if this recommendation is accepted is $344,000.

Design Suggestions

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

- It is suggested that consideration be given to carrying the roadway Superelevation transition between curves KC5 and KC6 across the Norfolk Southern Railroad Bridge.

- It is suggested that consideration be given to closing the partial intersection and median opening at Business Center Drive and to fully signalize the intersection at Trade Center Parkway. Consideration should also be given to constructing an additional access road between Business Center Drive and Trade Center Parkway (behind the large truck terminal).

- It is suggested that consideration be given to constructing a full intersection with a median opening at either Four M Way or at the major commercial driveways at Station 225+50. This would allow for improved access to the commercial /industrial properties.

- It is suggested that the widening / improvements west of the SR 42 intersection be limited in scope to account for the newly constructed four-lane roadway that has recently been constructed east of the intersection.

- This design suggestion is a variation of Recommendation A-9 that would relocate the "multi-use" bike / pedestrian path from the eastbound shoulder to an area off the roadway from station 194+00 right to station 220+00 right.

Eagles Landing Parkway

SUMMARY OF POTENTIAL COST SAVINGS

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL LIFE CYCLE SAVINGS	SAVINGS POTENTIAL* (%)
	Recommendations						
A-10	To reduce the outside mainline shoulder width from 16 feet to 12 feet	$252,000	$0	$252,000	N/A	$252,000	100%
A-9 & A-10	To eliminate the dual 4-foot bike lanes, to construct a 10-foot multi-use path on south side, & to reduce north side shoulder width	$813,000	$323,000	$490,000	N/A	$490,000	100%
B-3	To construct the full six-lane Eagles Landing Parkway roadway section	$0	($1,149,000)	($1,149,000)	N/A	($1,149,000)	100%
C-1 (A)	To construct dual 2-lane bridges at the Norfolk Southern Railroad	$2,125,000	$1,466,000	$659,000	N/A	$659,000	100%
C-1 (B)	To construct dual 2-lane bridges at Pates Creek	$4,208,000	$2,901,000	$1,307,000	N/A	$1,307,000	100%
C-2	To reduce the elevation of the Pates Creek Bridge and its approaches	$570,000	$0	$570,000	N/A	$570,000	100%
C-4	To construct a separate multi-use Pedestrian / Bike Path Bridge next to the Pates Creek and Norfolk Southern Railroad Bridges	$6,333,000	$6,073,000	$260,000	small	$260,000	100%

Eagles Landing Parkway

SUMMARY OF POTENTIAL COST SAVINGS

ITEM No.	CREATIVE IDEA DESCRIPTION	ORIGINAL INITIAL COST	PROPOSED INITIAL COST	INITIAL COST SAVINGS	FUTURE SAVINGS	TOTAL LIFE CYCLE SAVINGS	SAVINGS POTENTIAL* (%)
F-1	To change the 3-span Norfolk Southern RR Bridge to a single span bridge with vertical abutments and MSE walls	$1,466,000	$1,122,000	$344,000	N/A	$344,000	100%
	Design Suggestions						
A-3	To review / modify the reverse crown on the Norfolk Southern Railroad Bridge	N/A	N/A	N/A	N/A	N/A	N/A
A-5 (1)	To check access at the Trade Center Parkway and Business Center Drive intersections. Add signals @ Trade Center Parkway	N/A	N/A	N/A	N/A	N/A	N/A
A-5 (2)	To check the need for additional access between Four M Way and Station 225+50. No median crossings to access businesses.	N/A	N/A	N/A	N/A	N/A	N/A
B-8	To investigate the need to reconstruct Eagles Landing Parkway east of SR 42 for the 2,200 feet shown on the plans.	N/A	N/A	N/A	N/A	N/A	N/A
K-3	To shift the multi-use bike path proposed in Recommendation A-9 closer to the Country Club Subdivision to serve as a buffer.	N/A	N/A	N/A	N/A	N/A	N/A
	* Note: Savings Potential represents how much of an individual item, exclusive of any overlapping dependent items, can be implemented.						

STUDY IDENTIFICATION

Study Identification

Project: Eagles Landing Parkway	**Date: September 4-7, 2007**
Location: City of Stockbridge, Henry County	

VE Team Members

Name:	Title:	Organization:	Telephone:
Keith Borkenhagen	VE Team Facilitator	MACTEC	623-556-1875
George Obaranec	Roadway Design	MACTEC	770-421-3346
Aruna Sastry	Structures	Sastry & Associates, Inc	678-366-9375
Jim Chambers	Roadway Construction	Street Smarts, Inc.	770-813-0882

Project Description

The proposed project will reconstruct a 2.6-mile section of Eagles Landing Parkway from Eagles Point Parkway to approximately 700 feet east of Talon Place in the City of Stockbridge. Eagles Landing Parkway serves as a minor arterial connecting I-75 and SR 42/US 23. The proposed two lane section being reconstructed under this project will connect to a four-lane section to the east and a six-lane section to the west. The proposed widening of Eagles Landing Parkway is a critical piece that will connect I-75 with SR 155 in Henry County.

Significant growth in residential, commercial, and industrial development in the Eagles Landing Parkway corridor has resulted in failing levels of service at many intersections throughout the area. The proposed project will provide for capacity and operational improvements including pedestrian access and improved east-west connectivity. The proposed project will continue the six lane footprint by constructing the proposed four lane roadway on the ultimate six-lane footprint. It will construct all crossroad intersections to the full build out section (including right and left turn lanes). The four-lane facility will include a 44-foot depressed grass median that will allow for the additional two lanes to be constructed in the median once traffic warrants are met for a six lane facility. The proposed project will also replace the existing Pates Creek and the Norfolk Southern Railroad Bridges with new six lane structures and include dual four-foot bike lanes, sidewalks, and curb and gutter. Major contract work items include roadway grading, pavement, bridge construction, the installation of storm drains, and the construction of bike lanes and sidewalks. The project being evaluated under the VE study has an estimated construction cost (including E&C) of $30,440,000. Even though the project has an existing right-of-way (ROW) width of 200 feet, additional ROW and / or easements will be required to construct the project. Right-of-way costs are estimated to be $9,975,000.

Project Constraints

Several project constraints were discussed during the design presentation. The constraints mentioned include the following:

- The roadway footprint was shifted slightly to the north to minimize impacts on the Country Club subdivision. This subdivision had constructed a combination fence / wall between the existing road and their subdivision. This fence / wall must be removed to construct the new roadway. Negotiations are underway for a suitable replacement. No roadway changes should be made that would cause additional impacts on the subdivision.
- Large water mains are located on the south side of the project and will be near the new Pates Creek Bridge. Roadway construction should not impact these water mains.

Project Briefing

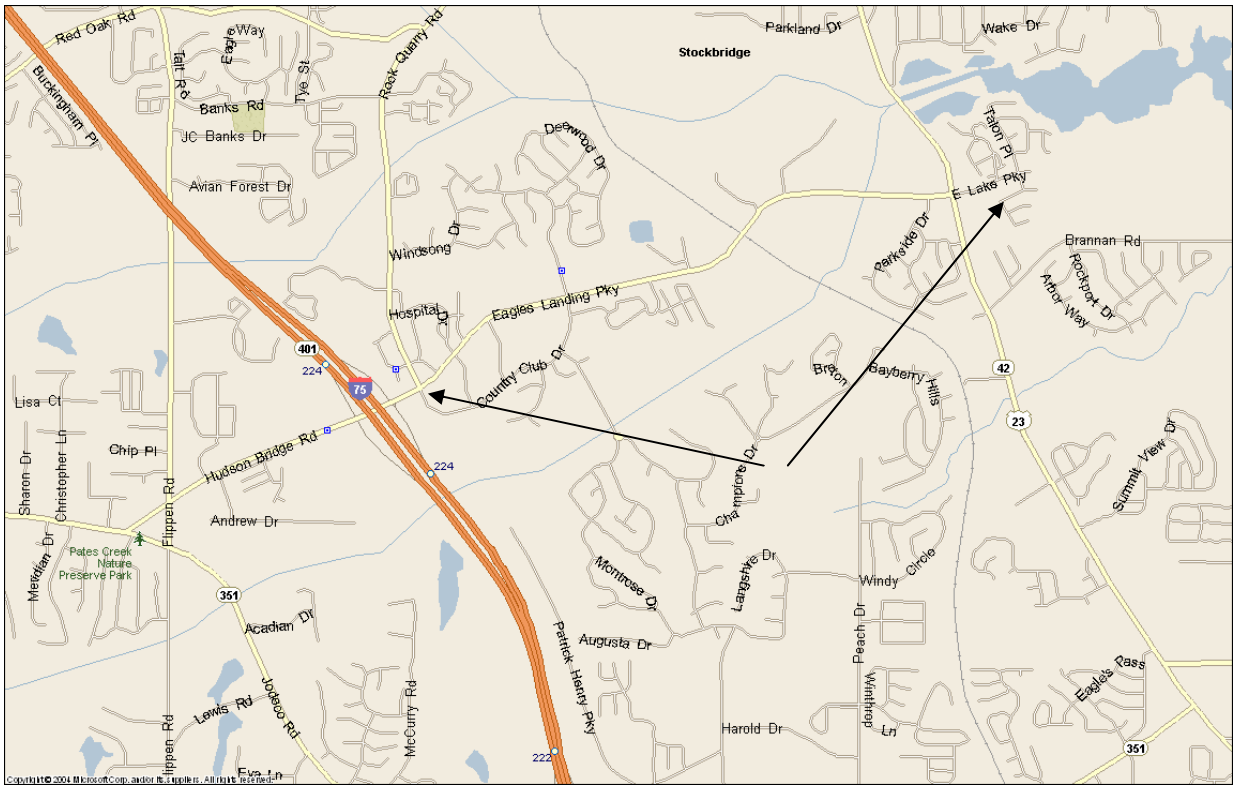
Prior to beginning work, the VE team received a briefing on the current status of the project. Mr. R. Christopher Marsengill, P.E., project manager for McGee Partners, Inc., briefed the team on the project. The following items were discussed:

- This project is scheduled for a December 2008 letting date. Project funding has been ear-marked for the project starting in 2009. Henry County began ROW acquisition in July 2007. Most of the new ROW is required in the SR 42 intersection. Sufficient ROW / easements will also be acquired to construct the full six-lane roadway.
- Reconstruction of the I-75 / Eagles Landing Parkway Interchange to the west of the project is complete. The short section of Eagles Landing Parkway between the I-75 Interchange and the west end of the proposed project has been up-graded to six-lanes. A new four-lane section of Eagles Landing Parkway east of SR 42 is also complete.
- The proposed project will up-grade the existing two-lane roadway to a four-lane roadway built out on the ultimate six-lane footprint. The additional two lanes to make the six-lane section will be constructed in the median.
- The TIP currently includes only a four-lane roadway section for Eagles Landing Parkway through this area.
- The roadway footprint was shifted slightly to the north across from the Country Club subdivision to minimize impact on the community.
- Some public hearings / informational meetings have been held for this project.
- The new railroad bridge crossing is designed wide enough to cross two tracks. The new bridge across Pates Creek will be raised to allow passage of a 100-year flood.
- This project includes dual bike lanes within the roadway typical section. Bike lanes have been constructed on the four-lane section east of this project and the six-lane section west of the project. The community also wants sidewalks to be constructed on both sides of the roadway.
- The proposed intersection at Business Center Drive has truck sight distance problems that prohibit allowing left turns for vehicles exiting Business Center Drive.
- The environmental impacts of this project will be processed through a Categorical Exclusion. A noise study analysis indicates that no noise walls are required on this project.

- The new Pates Creek Bridge will be significantly longer and higher than the existing bridge to clear the 100-year flood plain.
- The project has a design speed of 45 MPH and a projected daily traffic of 54,000 VPD in the design year. The project will require upgrading to the full six-lane section before the design year is reached.
- The new Pates Creek Bridge will be constructed next to two major (16" and 24") water lines.

Project Sketch Map

Eagles Landing Parkway



RECOMMENDATIONS

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA:**
A-10	1 of 4	Reduce the mainline outside shoulder widths from 16 feet to 12 feet.

Comp By: J.R.C. Date: 9-05-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The baseline design concept provides for 16-foot urban shoulders on each side of Eagles Landing Parkway.

Proposed Change:

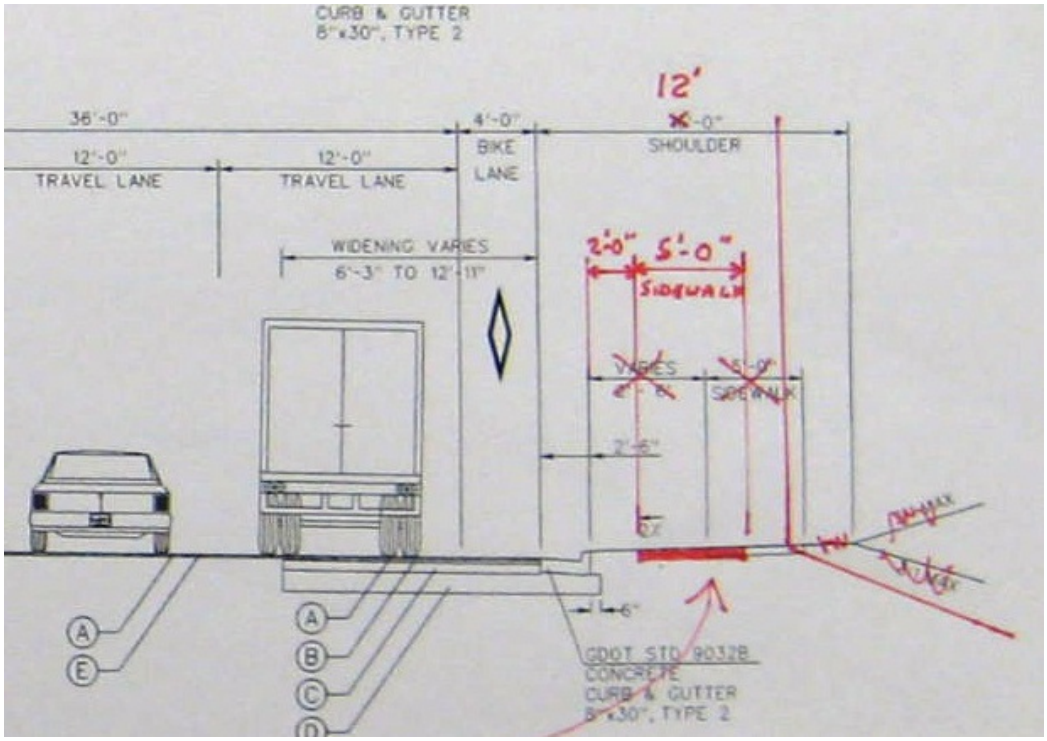
It is recommended that the 16-foot outside shoulder be reduced to 12 feet. This will result in reduced grading quantities and will eliminate or reduce the size of the roadway retaining walls.

Justification:

The baseline concept provides for 16-foot shoulders. This allows the sidewalks to be offset 6 feet from the back of the curb. The 16-foot configuration allows the sidewalks to remain in their constructed location and not have to be jogged to cross driveways. Due to the relatively few driveways on this project, constructing a 12-foot shoulder that places the sidewalk only 2 feet from the back of the curb (requiring it to be jogged outward at driveways to avoid crossing the driveway pan) has the potential to reduce the number of ROW easements, the size of roadway retaining walls, the amount of roadway embankment, and the cost of the project.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**FUTURE COST**	**TOTAL COST**
INITIAL COST - Original	$252,000		
- Proposed	$0		
- Savings	$252,000		$252,000
FUTURE COST – Savings			
TOTAL PRESENT WORTH SAVINGS			**$252,000**

SKETCH	
Project: Eagles Landing Parkway	ITEM N^{o} : A-10 CLIENT: GDOT Sheet 2 of 4



COST WORKSHEET							
Project: Eagles Landing Parkway					IDEA No.: A-10 CLIENT: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Grading	CY	31,276	$6.00	$187,656			$0
Retaining walls (50% reduction)	CY	105	$391.43	$41,100			$0
SUBTOTAL				$228,756			$0
(10% E&C) **MARK-UP (10%)**				$22,876			$0
TOTAL				$251,632			$0
TOTAL ROUNDED				**$252,000**			**$0**

CALCULATIONS	
Project: Eagles Landing Parkway	ITEM N^{o} : A-10 CLIENT: GDOT Sheet 4 of 4

Notes: Total length of bridges = 192’ @ (NS RR) + 380’ @ (Pates Creek) = 572’
Total length of roadway = 13,195’

Grading

For the eastbound side, assume an average earthwork end area approximately 4’ x 8’ = 32 SF less than is currently shown. Total reduction in volume = 13,195 x 32 / 27 = 15,638 CY

For the westbound side, assume an average earthwork end area approximately 4’ x 8’ = 32 SF less than is currently shown. Total reduction in volume = 13,195 x 32 / 27 = 15,638 CY

Total earthwork volume = 15,638 + 15,638 = **31,276 CY**

Retaining walls

Two retaining walls are proposed on the eastbound side of the mainline. If the width of the eastbound shoulder is reduced by 4,’ these walls will be reduced in size or will be eliminated. Assume that the amount of Class B concrete will be reduced by 50%.
50% x 210 CY = **105 CY** Class B Concrete

Right of way

The reduction in shoulder width may result in reduced right of way requirements, but the difference would be minimal, and no attempt to quantify it will be made.

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA:** To Eliminate the dual 4-foot bicycle lanes, to construct a 10-foot multi-use path on the eastbound shoulder, & to reduce the westbound shoulder width.
A-9, A-10	1 of 4	

Comp By: J.R.C. Date: 9-05-07 Checked By: K.B. Date: 9/10/07

Original Concept: The baseline concept provides for the construction (within the roadway section) of 4-foot bicycle lane on each side of the Eagles Landing Parkway.

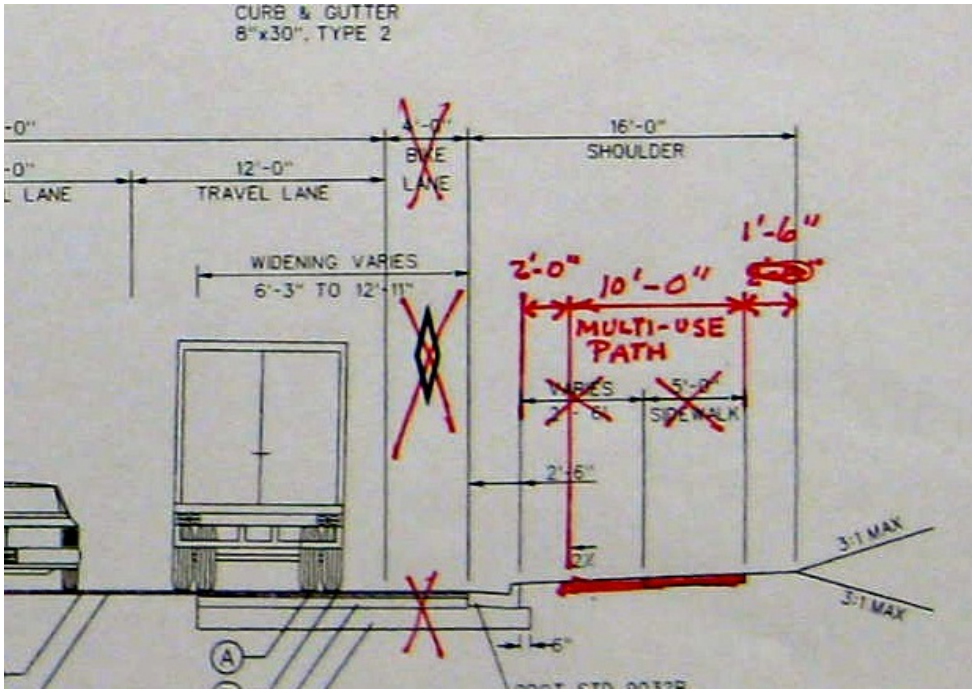
Proposed Change: It is recommended that the dual bicycle lanes be eliminated and replaced with a 10-foot-wide multi-use bike / pedestrian path on the eastbound shoulder. The multi-use path would be carried across the Norfolk Southern and Pates Creek Bridges via a 12-foot wide shoulder on the eastbound side of the bridge. This recommendation also includes the concept for reducing the outside westbound 16-foot shoulder to 12 feet.

Justification: This recommendation will significantly reduce roadway paving and grading quantities, the size of the bridges, and eliminate or reduce the size of roadway retaining walls. A 10-foot multi-use bike / pedestrian path will fit in the proposed 16-foot shoulder if the inside edge of the path is offset 2'-0" from the back of the curb. At driveway locations, the path will have to be offset further to allow smooth crossings at driveways; however, there are relatively few driveways on the project.

The baseline concept provides continuity with the adjacent roadway section. However, having bicycle lanes adjacent to traffic lanes that will carry 54,000 vehicles per day in the design year at a posted speed of 45 mph presents safety concerns. Removing the dual bike lanes from the roadway section and construction of a separate multi-use bike / pedestrian path will be safer and will encourage more bicycle and pedestrian use. The elimination of the full depth dual bike lanes in the pavement section and the construction of a single thin multi-use path on the eastbound shoulder has the potential to reduce the cost of the project while improving overall safety.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**FUTURE COST**	**TOTAL COST**
INITIAL COST - Original	$813,000		
- Proposed	$323,000		
- Savings	$490,000		$490,000
FUTURE COST – Savings			
TOTAL PRESENT WORTH SAVINGS			**$490,000**

SKETCH	
Project: Eagles Landing Parkway	ITEM N^{o} : A-9, A-10 CLIENT: GDOT Sheet 2 of 4



COST WORKSHEET							
Project: Eagles Landing Parkway					IDEA No.: A-9, A-10 CLIENT: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Eliminate dual bike lanes							
Asphalt Concrete paving	Ton	5,484	$75.00	$411,300			$0
Graded aggregate base	Ton	8,016	$18.89	$151,422			$0
Reduction in bridge size							
Bridge	SF	1,144	$80.00	$91,520			$0
Multi-use bike path							
Sidewalk/Multi-Use Path	SY				7,331	$39.88	$292,360
Westbound shoulder reduction							
Grading	CY	15,638	$6.00	$93,828			$0
SUBTOTAL				$748,070			$292,360
(10% E&C) **MARK-UP (10%)**				$74,807			$29,236
TOTAL				$812,877			$322,596
TOTAL ROUNDED				**$813,000**			**$323,000**

CALCULATIONS

Project: Eagles Landing Parkway	ITEM N^{o} : A-9, A-10 CLIENT: GDOT Sheet 4 of 4

Notes: Total length of bridges = 192' @ (NS RR) + 380' @ (Pates Creek) = 572'
Total length of roadway = 13,195'

Asphalt paving
Area of reduced pavement = 13,195 x 2 x 4 = 105,560 SF = 11,730 SY
Asphalt paving = 935 lb/SY x 11,730 / 2,000 = **5,484 tons**

Graded aggregate base
Area of reduced GAB = 13,195 x 2 x 4 = 105,560 SF
Volume = 105,560 x 1 = 105,560 CF / 27 = 3,910 CY
Weight = 3,910 CY x 2.05 Tons/CY = **8,016 Tons**

Grading
For the eastbound side, assume an average earthwork end area approximately 4' x 8' = 32 SF less than is currently shown. Total reduction in volume = 13,195 x 32 / 27 = 15,638 CY

For the westbound side, assume an average earthwork end area approximately 4' x 8' = 32 SF less than is currently shown. Total reduction in volume = 13,195 x 32 / 27 = **15,638 CY**

Bridge
Reduction in bridge area from eliminating bicycle lanes = 572 x 8 = 4,576 SF
Increase in bridge size from adding 6' to sidewalk on eastbound side (total sidewalk/multi-use width will be 12' (10' nominal plus 2' offset from parapet) = 572 x 6 = 3,432 SF
Net decrease in area = 4,576 – 3,432 = **1,144 SF**

Sidewalk/multi-use path
Additional sidewalk area = 13,195' x 5' = 65,975 SF / 9 = **7,331 SY**

Right of way
The reduction in roadway width may result in reduced right of way requirements, but the difference would be minimal, and no attempt to quantify it will be made.

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA:**
B-3	1 of 3	To Construct the Full Six-Lane Roadway Section Now

Comp By: J.R.C. Date: 9-05-07 Checked By: K.B. Date: 9/10/07

Original Concept: The proposed design upgrades Eagles Landing Parkway to a four-lane roadway section on the ultimate six-lane footprint. It proposes to construct the full six-lane section at the intersections leaving only short sections of uncompleted six-lane roadway.

Proposed Change: It is recommended that the ultimate six-lane roadway section be constructed for the entire length of the project.

Justification: This section of Eagles Landing Parkway will require a six-lane roadway section before the end of the 20-year design life for the proposed project. The proposed project will construct the four-lane roadway section on the ultimate six-lane roadway footprint. It already includes the ultimate six-lane roadway section with its full turning lanes at all six of the major intersections. Due to the close spacing of these intersections and the lengths of the various turn lanes, only a small amount of additional through lanes would have to be constructed at this time to complete the full six-lane section through the project.

In addition, the two bridges are being reconstructed to the full six-lane section. Constructing the four-lane roadway on the six-lane roadway footprint will include constructing essentially all of the drainage required for the ultimate six-lane section. Adding the additional center lane roadway sections to this project would improve the constructability of this project by eliminating the many short paving runs required for the various turn lanes throughout the project. This concept would result in a minor cost increase to this project, but eliminate future costs (design, contract advertise / award, construction, traffic control, etc.) associated with letting a future contract to add the additional lanes. This recommendation would also require a programming revision to the TIP which could introduce project delays, however, it would eliminate a major reconstruction project in a relatively short-term duration.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**FUTURE COST**	**TOTAL COST**
INITIAL COST - Original	$0		
- Proposed	$1,149,000		
- Savings	($1,149,000)		($1,149,000)
FUTURE COST – Savings			
TOTAL PRESENT WORTH SAVINGS			**($1,149,000)**

COST WORKSHEET							
Project: Eagles Landing Parkway					IDEA No.: B-3 CLIENT: GDOT Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Complete 6-lane Roadway							
Additional 12-foot lane	SY			$0	17,424	$50.00	$871,200
Additional Median Curb & Gutter	LF			$0	10,576	$14.45	$152,823
Additional Catch Basins	ea			$0	7	$3000.00	$21,000
SUBTOTAL				$0			$1,045,023
(10% E&C) **MARK-UP (10%)**				$0			$104,502
TOTAL				$0			$1,149,025
TOTAL ROUNDED				**$0**			**$1,149,000**

CALCULATIONS

Project: Eagles Landing Parkway	ITEM N^{o} : B-3 CLIENT: GDOT Sheet 3 of 3

Add 3rd Lane

(westbound) Station		(eastbound) Station	
181+00 to 193+00 =	1,200 ft	194+00 to 205+00 =	1,100 ft
198+00 to 210+50 =	1,250 ft	211+80 to 233+14 =	2,134 ft
216+00 to 233+14 =	1,714 ft	Bridge	
Bridge		234+90 to 236+80 =	190 ft
234+90 to 239+80 =	490 ft	240+80 to 243+00 =	280 ft
244+00 to 246+50 =	250 ft	247+60 to 262+20 =	1,460 ft
251+00 to 262+20 =	1,120 ft	Bridge	
Bridge		266+60 to 276+00 =	940 ft
266+00 to 276+00 =	940 ft		
Total Length	**6,964 ft**		**6,104 ft**

6,964 + 6,104 = 13,068

Additional Pavement = (13,068 x 12) / 9 = 17,424 SY

Add Median Curb & Gutter

182+80 to 188+90 = 610 x 2 = 1,220 ft
187+25 to 206+50 = 925 x 2 = 1,850 ft
216+00 to 233+13 = 1,713 x 2 = 3,426 ft
Bridge
250+50 to 262+50 = 1,200 x 2 = 2,400 ft
Bridge
266+30 to 274+70 = 840 x 2 = 1,680 ft
Total Length 10,576 ft

Drop Inlets at 7 Locations

Pavement Cost
Asphalt Paving = 935 lbs/SY = 0.4675 tons / SY
.4675 x $75 / ton = $35 / SY
GAB = 1 SY = 0.33 CY = .33x2.05 = 0.68 ton
0.68 x $18.89 = 12.85 / SY
Total Paving Cost = $35.00
= $12.85
$1.00
Total $48.85 **Use $50.00 / SY**

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA:**
C-1 (A)	1 of 4	To Construct Two Separate Bridge Structures over Norfolk Southern Railroad

Comp By: Aruna Sastry Date: 9-5-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The proposed project includes the construction of a single 118' - 5" wide by 192' long bridge over the Norfolk Southern Railroad. The new bridge would be wide enough to accommodate the ultimate six-lane roadway section, dual bike lanes, and sidewalks on both sides of the bridge.

Proposed Change:

It is recommended that two separate 40' – 10" wide, two-lane bridges be constructed to accommodate the two-lane roadway section being constructed in this section of the project. The 40' – 10" bridge width would allow for a bike lane and sidewalk on each bridge.

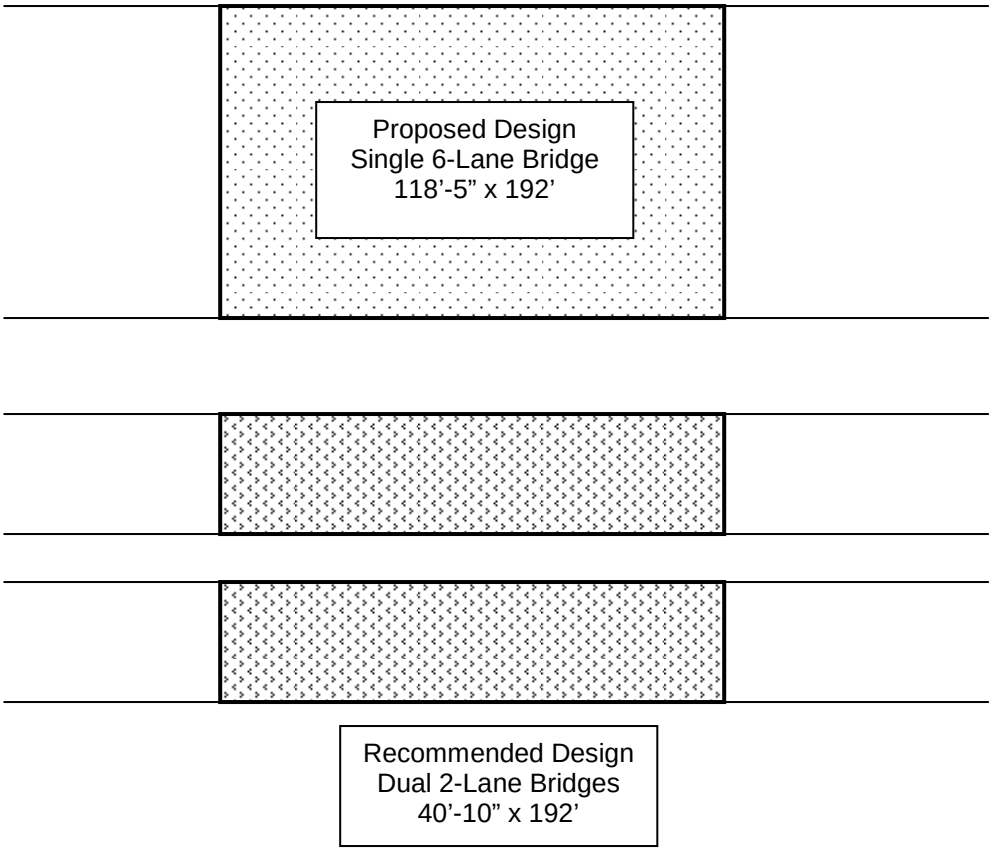
Justification:

This bridge is located in a section of the project where only four lanes of the ultimate six-lane roadway section will be constructed. The roadway section will have a wide depressed grass median while the bridge section will have a wide raised concrete median. The two separate, two-lane bridges would be adequate to accommodate the two roadway lanes, bike lanes and sidewalks. This concept has the potential to reduce the cost of the project and reduce construction time. The dual bridges can be easily widened when the ultimate six-lane section is built.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**FUTURE COST**	**TOTAL COST**
INITIAL COST - Original	$2,125,000		
- Proposed	$1,466,000		
- Savings	$659,000		$659,000
FUTURE COST – Savings			
TOTAL PRESENT WORTH SAVINGS			**$659,000**

SKETCH	
Project: Eagles Landing Parkway	ITEM N^{o} : C-1 (A) CLIENT: GDOT Sheet 2 of 4

Bridge over Norfolk Southern Railroad



COST WORKSHEET							
Project: Eagles Landing Parkway					IDEA No.: C-1 (A) CLIENT: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Single Bridge Over Norfolk Southern Railroad	SF	22,735	$85.00	$1,932,000			
Dual 2-Lane Bridges Over Norfolk Southern RR – Separate Structures	SF				15,680	$85.00	$1,332,800
SUBTOTAL				$1,932,000			$1,332,800
(10% E&C) **MARK-UP (10%)**				$193,200			$133,280
TOTAL				$2,125,200			$1,466,080
TOTAL ROUNDED				**$2,125,000**			**$1,466,000**

CALCULATIONS	
Project: Eagles Landing Parkway	ITEM N^{o} : C-1 (A) CLIENT: GDOT Sheet 4 of 4

Original Bridge Calculations:

118.41 ft. wide x 192 ft. long = **22,735 SF** x $85/SF = $1,932,000

Proposed Two separate Bridges Calculations:

40.83 ft. wide x 192 ft. long = 7,840 SF x 2 bridges = **15,680 SF** x $85/SF = $1,332,800

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA:**
C-1 (B)	1 of 4	To Construct Two Separate Bridge Structures over Pates Creek

Comp By: Aruna Sastry Date: 9-5-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The proposed project includes the construction of a single 118' - 5" wide by 380' long bridge over Pates Creek. The new bridge would be wide enough to accommodate the ultimate six-lane roadway section, dual bike lanes, and sidewalks on both sides of the bridge.

Proposed Change:

It is recommended that two separate 40' – 10" wide, two-lane bridges be constructed to accommodate the two-lane roadway section being constructed in this section of the project. The 40' – 10" bridge width would allow for a bike lane and sidewalk on each bridge.

Justification:

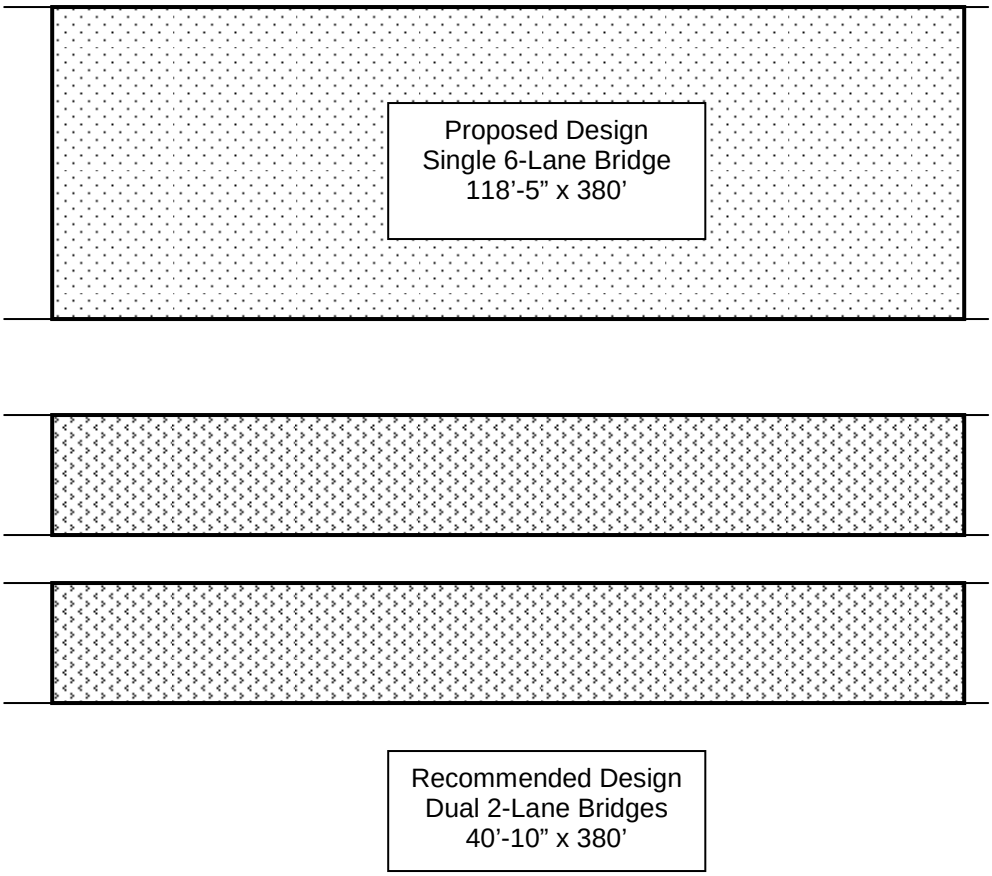
This bridge is located in a section of the project where only four lanes of the ultimate six-lane roadway section will be constructed. The roadway section will have a wide depressed grass median while the bridge section will have a wide raised concrete median. The two separate, two-lane bridges would be adequate to accommodate the two roadway lanes, bike lanes and sidewalks. This concept has the potential to reduce the cost of the project and reduce construction time. The dual bridges can be easily widened when the ultimate six-lane section is built.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**FUTURE COST**	**TOTAL COST**
INITIAL COST - Original	$4,208,000		
- Proposed	$2,901,000		
- Savings	$1,307,000		$1,307,000
FUTURE COST – Savings			
TOTAL PRESENT WORTH SAVINGS			**$1,307,000**

SKETCH

Project: Eagles Landing Parkway	ITEM N^{o} : C-1 (A) CLIENT: GDOT Sheet 2 of 4

Bridge over Pates Creek



COST WORKSHEET							
Project: Eagles Landing Parkway					IDEA No.: C-1 (B) CLIENT: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Single Bridge Over Pates Creek	SF	44,996	$85.00	$3,825,000			
Dual 2-Lane Bridges Over Pates Creek – Separate Structures	SF				31,030	$85.00	$2,637,618
SUBTOTAL				$3,825,000			$2,637,618
(10% E&C) **MARK-UP (10%)**				$382,500			$263,762
TOTAL				$4,207,500			$2,901,380
TOTAL ROUNDED				**$4,208,000**			**$2,901,000**

CALCULATIONS	
Project: Eagles Landing Parkway	ITEM N^{o} : C-1 (B) CLIENT: GDOT Sheet 4 of 4

Original Bridge Calculations:

118.41 ft. wide x 380 ft. long = **44,996 SF** x $85/SF = $3,825,000

Proposed Two separate Bridges Calculations:

40.83 ft. wide x 380 ft. long = 15,515 SF x 2 bridges = **31,030 SF** x $85/SF = $2,637,618

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA:**
C-2	1 of 3	To Review the Need to Raise the Pates Creek Bridge

Comp By: G.O. Date: 9-05-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The proposed design raises the roadway grade between 2 and 10 feet through the wetland area on the east end of the project. This grade change also raises the Pates Creek Bridge and its approaches approximately 7-8 feet above the elevation of the existing structure.

Proposed Change:

It is recommended that the proposed Pates Creek Bridge and its approach roadways be lowered approximately 5 feet through the wetland area.

Justification:

Based on preliminary bridge plans, available flood plain information, and discussions with individuals in the hydraulics office, the roadway / bridge elevation is approximately 5 feet higher than needed to provide the required waterway opening. Lowering the bridge profile 5 feet would also lower the approach grades in both directions. The road profile can be reduced for approximately 1,300 feet on the west side of the bridge and approximately 900 feet on the east side. Reducing the road profile results in a reduction in the size of the embankment that needs to be constructed within the wetlands. This reduction will reduce the embankment's impact on the wetland and should require less mitigation. Lowering the bridge will also reduce the amount of piling required for the bridge. Another added benefit of the reduced roadway template is easier constructability sequencing.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**FUTURE COST**	**TOTAL COST**
INITIAL COST - Original	$570,000		
- Proposed	$0		
- Savings	$570,000		$570,000
FUTURE COST – Savings			
TOTAL PRESENT WORTH SAVINGS			**$570,000**

COST WORKSHEET

Project: Eagles Landing Parkway					IDEA No.: C-2 CLIENT: GDOT Sheet 2 of 3		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Earthwork / Fill	CY	53,000	$9.00	$477,000			$0
Piling	LF	750	$50.00	$37,500			$0
SUBTOTAL				$514,500			$0
(10% E&C) **MARK-UP (10%)**				$51,450			$0
TOTAL				$565,950			$0
TOTAL ROUNDED				**$570,000**			**$0**

CALCULATIONS

Project: Eagles Landing Parkway	ITEM N^{o} : C-2 CLIENT: GDOT Sheet 3 of 3

Earthwork (Station)

	Length	Width
249+00 to 251+00 - Average height 2 ft	x 200 ft	x 170 ft = 68,000
251+00 to 262+00 - Average height 5 ft	x 1,150 ft	x 170 ft = 977,000
Bridge		
266+30 to 268+00 - Average height 5 ft	x 170 ft	x 170 ft = 144,500
268+00 to 275+00 - Average height 2 ft	x 700 ft	x 170 ft = 238,000
	Total	1,427,500 CF

1,417,500 / 27 = 52,870 CY **Use 53,000 CY**

Piling

10 Bents at 15 piles @ 5 ft = **750** feet of piling

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA:**
C-4	1 of 4	To Remove the Bike Lanes from the Roadway Bridges and place them on a separate Multi-Use Bike Path Bridge

Comp By: Aruna Sastry Date: 9-6-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The proposed project would construct a single 118' – 5" wide by 380-foot long bridge over Pates Creek and a single 118' – 5" wide by 192' long bridge over the Norfolk Southern Railroad. The proposed bridges would accommodate the ultimate six-lane roadway section, dual 4' bike lanes, and sidewalks on both sides of the bridge.

Proposed Change:

It is recommended that the dual bike lanes and the sidewalk on one side be removed from the main highway bridge and placed on a separate "multi-use" bike / pedestrian pathway bridge.

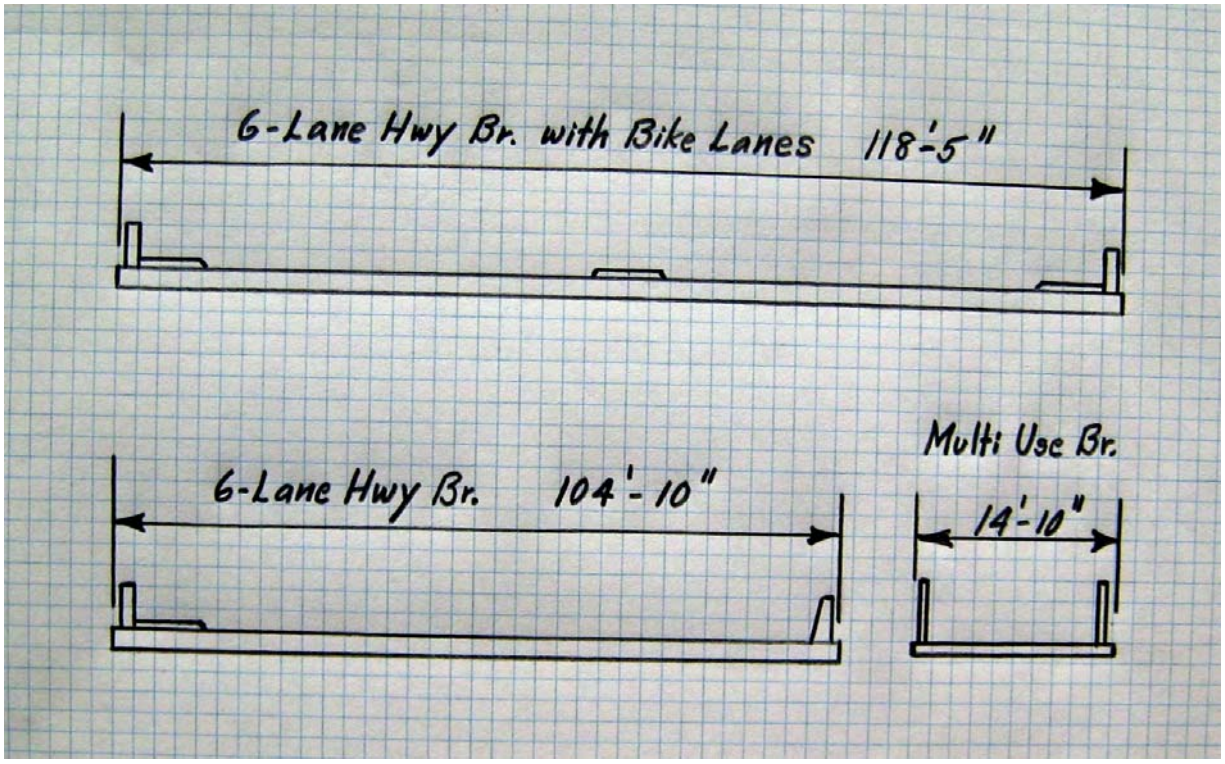
Justification:

Taking the dual bike lanes and one sidewalk off the highway bridges would reduce the width of the roadway bridge from 118' – 5" to 104' – 10." A separate lower cost pedestrian / bike pathway bridge (14' – 10" wide) would be constructed to carry bike and pedestrian traffic safely across the Norfolk Southern Railroad and Pates Creek.

A separate "multi-use" bike / pedestrian pathway bridge would provide increased safety and also fits well with the surroundings. The surface for this bike / pedestrian bridge should be constructed of select material to provide for an aesthetically pleasing structure. Construction of a much thinner section "multi-use" bike / pedestrian bridge has the potential to reduce project cost and contract construction time.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**FUTURE COST**	**TOTAL COST**
INITIAL COST – Original	$6,333,000		
- Proposed	$6,073,000		
- Savings	$260,000		$260,000
FUTURE COST – Savings			
TOTAL PRESENT WORTH SAVINGS			**$260,000**

SKETCH	
Project: Eagles Landing Parkway	ITEM N^{o} : C-4 CLIENT: GDOT Sheet 2 of 4



COST WORKSHEET							
Project: Eagles Landing Parkway					IDEA No.: C-4 CLIENT: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Bridge size / cost							
Bridge Over Norfolk Southern Railroad	SF	22,735	$85.00	$1,932,000			
Bridge Over Pates Creek	SF	44,996	$85.00	$3,825,000			
Size / cost without bike lanes							
Highway Bridge over Norfolk Southern Railroad	SF				20,127	$85.00	$1,710,826
Highway Bridge over Pates Creek	SF				39,835	$85.00	$3,386,009
Size / cost of bike bridge							
"Multi-Use" Pedestrian/Bike Pathway bridge over Norfolk Southern Railroad	SF				2,847	$50.00	$142,368
"Multi-Use" Pedestrian/Bike Pathway bridge over Pates Creek	SF				5,635	$50.00	$281,770
SUBTOTAL				$5,757,000			$5,520,973
(10% E&C) **MARK-UP (10%)**				$575,700			$552,097
TOTAL				$6,332,700			$6,073,070
TOTAL ROUNDED				**$6,333,000**			**$6,073,000**

CALCULATIONS	
Project: Eagles Landing Parkway	ITEM N^{o} : C-4 CLIENT: GDOT Sheet 4 of 4

Original Bridge Calculations:

Norfolk Southern Bridge :
118.41 ft. wide x 192 ft. long = **22,735 SF** x $85/SF = $1,932,451

Bridge over Pates Creek:
118.41 ft. wide x 380 ft. long = **44,996 SF** x $85/SF = $3,825,000

Proposed separate "Multi-Use" Pedestrian/Bike Pathway bridge and Highway bridge calculations:
Highway Bridge over Norfolk Southern Railroad:
192' x 104.83' = **20,127 SF** x $85/SF = $1,710,826

Highway Bridge over Pates Creek:
380' x 104.83' = **39,835 SF** x $85/SF = $3,386,009

"Multi-Use" Pedestrian/Bike Pathway bridge over Norfolk Southern Railroad

192' x 14.83' = **2,847 SF** x $50/SF = $142,368

"Multi-Use" Pedestrian/Bike Pathway bridge over Pates Creek

380' X 14.83' = **5,635 SF** X $50/SF = $281,770

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.: F 1	**Sheet No.:** 1 of 4	**CREATIVE IDEA:** Construction of a single span bridge with "U" MSE walls instead of three span bridge over the railroad (dual two-lane separate Bridge structures)

Comp By: Aruna Sastry Date: 9-05-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The proposed design would construct a three span (57-foot, 84-foot, and 51-foot) bridge across the Norfolk Southern Railroad. The bridge would be 118 feet 5 inches wide.

Proposed Change:

It is recommended that dual single span (84 feet) bridges with vertical abutments and MSW walls be constructed over the Norfolk Southern Railroad. The dual 40' - 10" wide bridges (with "U" MSE walls instead of two end spans) would accommodate the proposed two-lane roadway section including bike lanes and sidewalks on each bridge. The retaining wall abutments should be continuous through the middle section to accommodate future widening when the roadway is widened to its ultimate six-lane section.

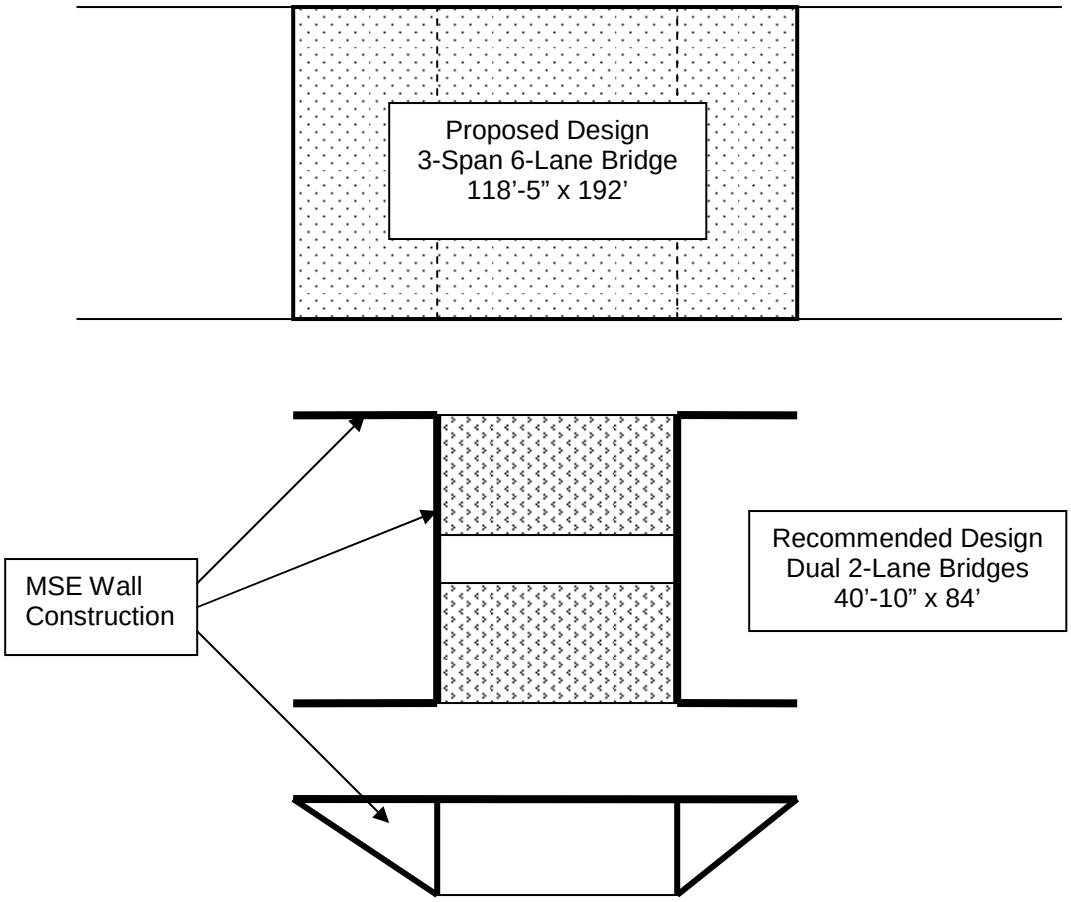
Justification:

The cost comparison shows that use of "U" MSE retaining walls will be economical. The use of MSE walls with piles and bents at the abutments would improve constructability, reduce construction time, and result in cost savings to the project. This concept also has the potential to reduce future maintenance cost due to a reduction in the size of the bridge and in the number of bridge joints.

LIFE CYCLE COST SUMMARY	**CAPITAL COST**	**FUTURE COST**	**TOTAL COST**
INITIAL COST - Original	$1,466,000		
- Proposed	$1,122,000		
- Savings	$344,000		$344,000
FUTURE COST – Savings			
TOTAL PRESENT WORTH SAVINGS			**$344,000**

SKETCH	
Project: Eagles Landing Parkway	ITEM N^{o} : F-1 CLIENT: GDOT Sheet 2 of 4

Bridge over Norfolk Southern Railroad



COST WORKSHEET							
Project: Eagles Landing Parkway					IDEA No.: F-1 CLIENT: GDOT Sheet 3 of 4		
CONSTRUCTION ELEMENT		**ORIGINAL ESTIMATE**			**NEW ESTIMATE**		
Item	**Unit**	**No. Units**	**Cost/Unit**	**Total Cost**	**No. Units**	**Cost/Unit**	**Total Cost**
Proposed 3-Span Structure							
Dual 40'-10" Bridges Over the Norfolk Southern Railroad	SF	15,680	$85.00	$1,332,800			
Recommended 1-Span + MSE							
Dual 40'-10" Bridges spanning the Norfolk Southern Railroad	SF				6,860	$85.00	$583,100
MSE Walls	SF				7,943	$55.00	$436,865
SUBTOTAL				$1,332,800			$1,019,965
(10% E&C) **MARK-UP (10%)**				$133,280			$101,997
TOTAL				$1,466,080			$1,121,962
TOTAL ROUNDED				**$1,466,000**			**$1,122,000**

CALCULATIONS	
Project: Eagles Landing Parkway	ITEM N^{o} : F-1 CLIENT: GDOT Sheet 4 of 4

Proposed Two separate Bridges Calculations:

40.83 ft. wide x 192 ft. long = 7,840 SF x 2 bridges = **15,680 SF** x $85/SF = $1,332,800

40.83 ft wide x 84 ft long = 3,430 SF x 2 bridges = **6,860 SF** x $85/SF = $583,100

Proposed Two separate Bridges with "U" Walls Calculations:

Wall Costs:

23 x 118.67 = 2,729.4 SF x 2 ends = 5,459 SF
½ x 57 x 23 x 2 sides + ½ x 51 x 23 x 2 sides = 1,311 SF + 1,173 SF = 2,484 SF
Total Walls = 5,459 SF + 2,484 SF = **7,943 SF**

7,943 SF x $55/SF = $436,865

Total cost of One span with "U" walls structure (two separate structures)

$436,865 + $583,100 = $1,019,965

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA: Design Suggestion**
A-3	1 of 1	To Check the Roadway Superelevation Transition at the Norfolk Southern Railroad Bridge

Comp By: J.R.C. Date: 9-06-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The original design concept shows a constant reverse crown on the bridge over the Norfolk Southern Railroad.

Proposed Change:

It is suggested that consideration be given to carrying the transition between curves KC5 and KC6 across the bridge.

Justification:

The original design concept appears to be driven by the desire to simplify the bridge design and the constructability of the bridge. However, allowing superelevation transition across the bridge may provide better superelevation transition and be more in accordance with GDOT design practices.

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

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA: Design Suggestion**
A-5(1)	1 of 2	To Review Crossroad Access at Trade Center Parkway

Comp By: G.O. Date: 9-05-07 Checked By: K.B. Date: 9/10/07

Original Concept: The proposed design provides a full intersection at Eagles Landing Parkway and Trade Center Parkway. Trade Center Parkway serves major trucking terminals on both sides of Eagles Landing Parkway. The proposed design does not include signals at this intersection. A second intersection (Business Center Drive) approximately 600 feet to the west also serves the truck facilities on the northwest side of Eagles Landing Parkway. The proposed Business Center Drive intersection will prohibit exiting left turning vehicles due to inadequate sight distance on Eagles Landing Parkway.

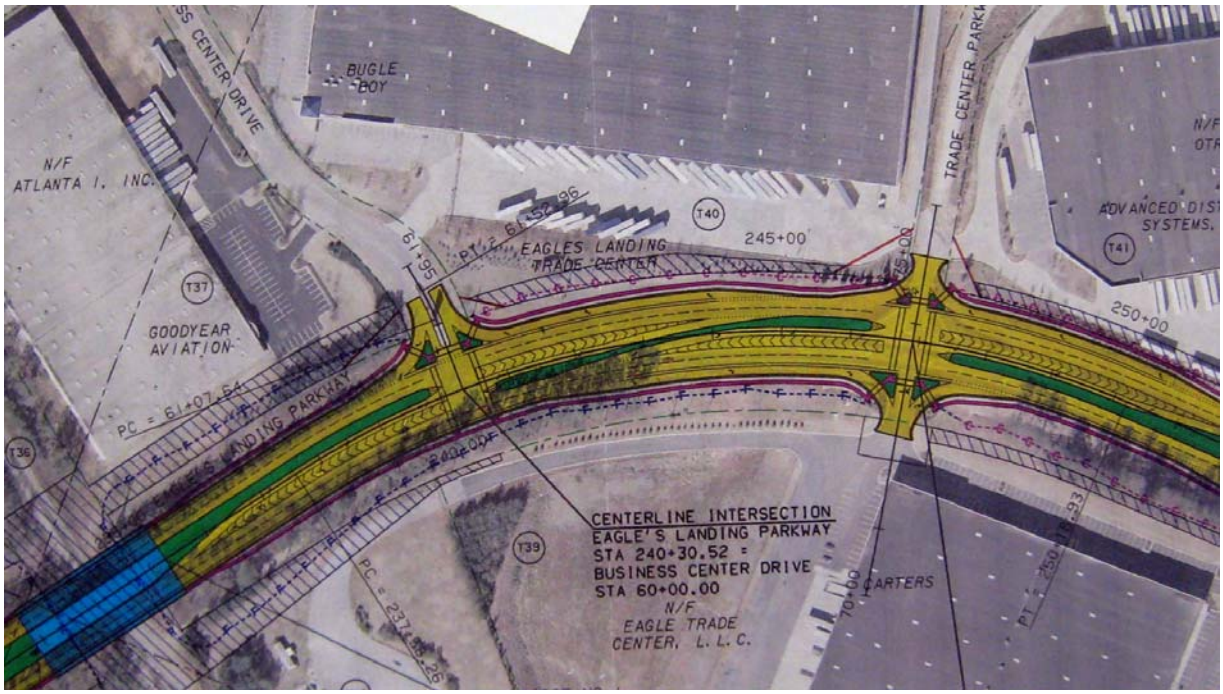
Proposed Change: It is suggested that consideration be given to closing the partial intersection and median opening at Business Center Drive and to fully signalize the intersection at Trade Center Parkway. Consideration should also be given to constructing an additional access road between Business Center Drive and Trade Center Parkway (behind the large truck terminal).

Justification: Maintaining a single signalized intersection at Trade Center Parkway would eliminate the inadequate truck sight distance at Business Center Drive and provide improved safety. Implementing this change will require negotiations with the various property owners and additional costs to construct the new connection, but this concept would satisfy the owner's access concerns and provide fewer median openings resulting in a safer condition. Trade Center Parkway can also be extended to connect with SR 42 for additional access.

The elimination of the partial intersection at Business Center Parkway will eliminate the possibility of wrong turn movements out of Business Center Parkway.

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

SKETCH	
Project: Eagles Landing Parkway	ITEM N^{o} : A-10 CLIENT: GDOT Sheet 2 of 2



DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA: Design Suggestion**
A-5(2)	1 of 2	To Review Crossroad Access at Four M Way

Comp By: G.O. Date: 9-05-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The propose design includes a total of six right-in / right-out driveways and / or street access points on Eagles Landing Parkway between Station 220 and 225+50 with no break in the full width median. This is in a highly developed commercial / industrial area that requires access by both private and commercial vehicles.

Proposed Change:

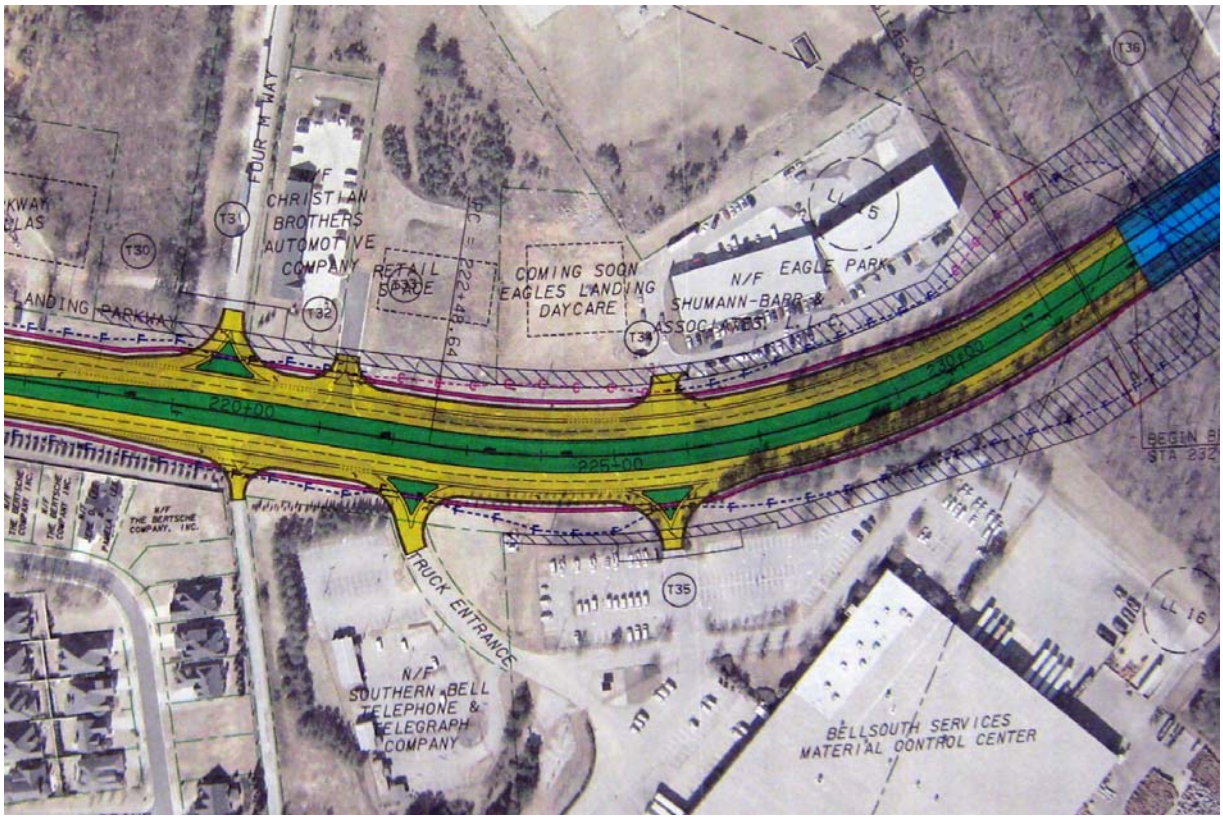
It is suggested that consideration be given to constructing a full intersection, with a median opening at either Four M Way or at the major commercial driveways (Station 225+50) to allow for improved access to the commercial /industrial properties. To the extent possible these six access points should be consolidated into an individual controlled crossing.

Justification:

The lack of a median opening in this area may have a severe impact on the commercial / industrial properties and could result in increased ROW cost. The proposed design does not allow for any median crossing between Killarney Drive (Station 211) and Business Center Drive (Station 240), a distance of 2,900 feet, and inadequate truck sight distance at Business Center Drive will prevent allowing U-turns at that intersection. Some type of median crossing is needed to serve the large commercial / industrial area along this section of Eagle Landing Parkway. Constructing a full intersection at either Four M Way or the driveways at Station 225+50 will provide this access.

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

SKETCH	
Project: Eagles Landing Parkway	ITEM N^{o} : A-10 CLIENT: GDOT Sheet 2 of 2



DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA: Design Suggestion**
K-3	1 of 2	Relocate the Recommended "Multi-Use" Bike / Pedestrian Path from the eastbound shoulder to a location off the roadway for a portion of the project.

Comp By: J.R.C. Date: 9-06-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The baseline concept provides for a 4-foot bicycle lane on each side of the road. VE Recommendation A-9 is to eliminate the bicycle lanes and construct a 10-foot-wide "Multi-Use" path on the eastbound shoulder.

Proposed Change:

This design suggestion is a variation of Recommendation A-9 that would relocate the "Multi-Use" path from the eastbound shoulder to an area off the roadway from station 194+00 right to station 220+00 right (stations are approximate).

Justification:

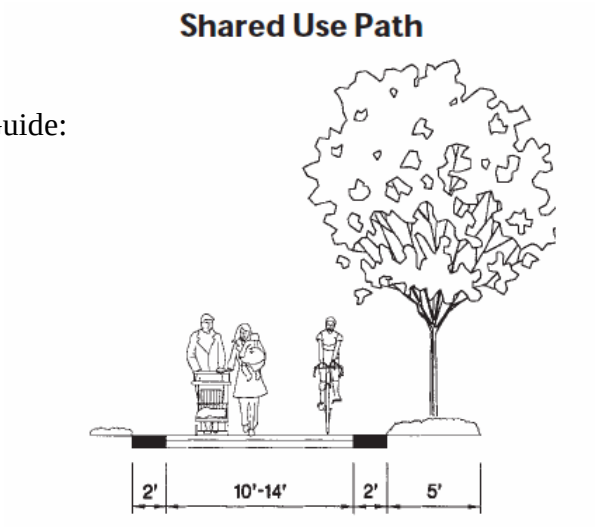
Relocation of the "Multi-Use" path provides for a safer, less expensive facility for bicycles and pedestrians by relocating a portion of the "Multi-Use" path completely off the roadway typical section. In addition, the relocated "Multi-Use" path could function as a buffer between the road and the subdivision houses on the south side of the road.

This suggestion is offered as for design consideration only. No attempt has been made to quantify costs, although it is believed that construction costs would not be significantly different.

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

SKETCH	
Project: Eagles Landing Parkway	ITEM N^{o} : K-3 CLIENT: GDOT Sheet 2 of 2

From the GDOT Pedestrian and Streetscape Guide:



Approximate location of the off-road multi-use path

DEVELOPMENT AND RECOMMENDATION PHASE

Project: Eagles Landing Parkway

IDEA No.:	**Sheet No.:**	**CREATIVE IDEA: Design Suggestion**
B-8	1 of 2	The need to replace the new four-lane roadway section east of SR 42

Comp By: G.O. Date: 9-06-07 Checked By: K.B. Date: 9/10/07

Original Concept:

The proposed design provides for full roadway widening / improvements up to 2,200 feet to the east of the SR 42 intersection.

Proposed Change:

It is suggested that the widening / improvements west of the SR 42 intersection be limited in scope to account for the newly constructed four-lane roadway that has recently been constructed east of the intersection.

Justification:

Eagles Landing Parkway was recently improved to a full four-lane roadway east of SR 42. This recent roadway upgrading should impact the proposed design for the east end of the project and reduce the need to reconstruct the entire 2,200-foot section.

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

SKETCH	
Project: Eagles Landing Parkway	ITEM N^{o} : B-8 CLIENT: GDOT Sheet 2 of 2

APPENDIX

Sources

Approving/Authorizing Persons

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

Personal Contacts

Name:	Telephone:	Notes:
Susan Beck - GDOT	404-656-5285	Bridge / Hydraulic information on wetland to verify bridge widths.
Masood Shabazaz	770-424-1668	Bridge information to verify lengths and widths.
Bill Inglesbae	404-656-5284	Bridge information to verify pedestrian bridge width.
Chris Marsengill	770-938-6400	Verify roadway profile at Pates Creek Bridge.

Documents/Abstracts

Reference:	Reference:
100 Scale Layout Plan	As Built Bridge Plans
60% Plans	Traffic Analysis
Roadway Cross Sections	GDOT Construction Standards
Preliminary Bridge Layout Plans	Soil Survey Report
Traffic Report	Bridge Foundation Exploration Report
Categorical Exclusion Report	Utility Plans
GDOT Design Policies	
AASHTO Design Book	

Eagles Landing Parkway

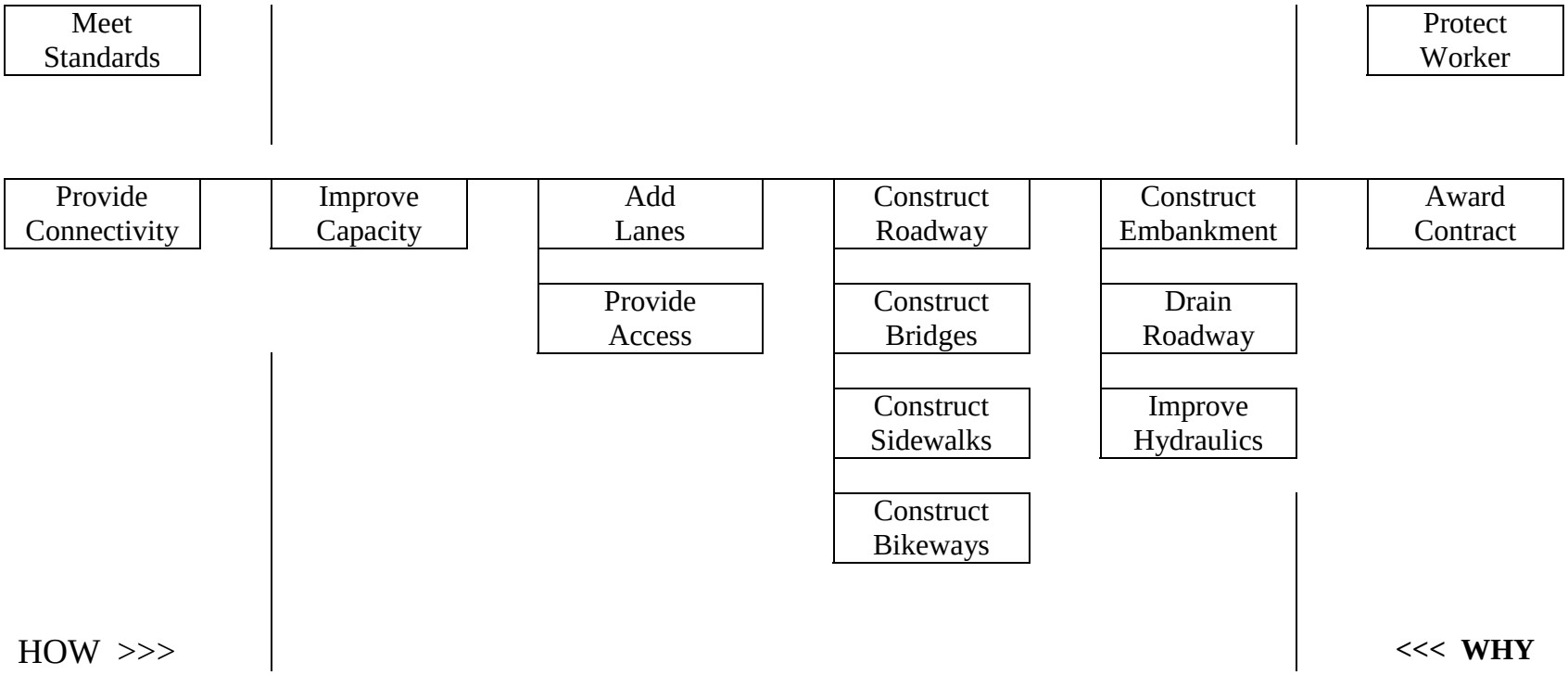
Cost Model / Distribution

Item	Description	$ Amount	% of Total Project
A	Grading	$5,670,000	20.5%
B	Superpave	$5,175,000	18.7%
C	Bridge over Pates Creek	$3,825,000	13.8%
D	Traffic Control	$2,516,000	9.1%
E	Aggregate Base	$1,942,000	7.0%
F	Bridge over RR	$1,932,000	7.0%
G	Storm Drains	$1,368,000	4.9%
H	Miscellaneous	$1,177,000	4.2%
I	Concrete Curb & Gutter	$1,043,000	3.8%
J	Signals	$857,000	3.1%
K	Concrete Sidewalks	$558,000	2.0%
L	Catch Basins	$534,000	1.9%
M	Erosion Control	$405,000	1.5%
N	Concrete Median	$324,000	1.2%
O	Dumped Rip Rap	$215,000	0.8%
P	Foundation Backfill	$132,000	0.5%
	Construction Sub Total	**$27,673,000**	100%
	E & C at 10%	$2,767,000	
	Construction Total	**$30,440,000**	
	Right of Way	$9,975,000	
	Utilities	$468,000	
	Grand Total	**$40,883,000**	

FAST DIAGRAM

Study **Project Name: Eagles Landing Parkway**

Basic Function **Improve Capacity**



INFORMATION PHASE – FUNCTION ANALYSIS

Project: **Eagles Landing Parkway**
Function: **Improve Capacity**

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	% of Total	Worth/Save
A	Grading	Achieve	Grade	$5,670,000	20.5%	Yes
		Construct	Template			
		Construct	Bridge			
		Eliminate	Over Topping			
		Provide	Access			
B	Superpave Asphalt Pavement	Construct	Roadway	$5,175,000	18.7%	Yes
		Construct	Crossroads			
		Construct	Intersections			
		Maintain	Access			
C	Pates Creek Bridge	Cross	Creek	$3,825,000	13.8%	Yes
		Accommodate	Floods			
		Maintain	Wetlands			
		Carry	Bikes / Vehicle			
		Carry	Six Lanes			
		Maintain	Berm / Dike			

INFORMATION PHASE – FUNCTION ANALYSIS

Project: **Eagles Landing Parkway**
Function: **Improve Capacity**

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	% of Total	Worth/Save
D	Traffic Control	Maintain	Traffic	$2,516,000	9.1%	Yes
		Allow	Construction			
		Provide	Safety			
		Stage	Construction			
E	Aggregate Base Course	Construct	Roadway	$1,942,000	7.0%	No
		Support	Pavement			
		Drain	Pavement			
F	Bridge over Railroad	Cross	Railroad	$1,932,000	7.0%	Yes
		Allow	RR Expansion			
		Raise	Grade			
		Improve	Clearance			
		Carry	Traffic			
		Carry	Median			

INFORMATION PHASE – FUNCTION ANALYSIS

Project: **Eagles Landing Parkway**
Function: **Improve Capacity**

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	% of Total	Worth/Save
G	Storm Drains	Remove	Water	$1,368,000	4.9%	No
		Drain	Pavement			
		Drain	Median			
H	Miscellaneous	Build	Project	$1,177,000	4.2%	No
I	Concrete Curb & Gutter	Drain	Pavement	$1,043,000	3.8%	Yes
		Control	Runoff			
		Direct	Traffic			
		Construct	Shoulder			
		Provide	Delineation			
J	Signal	Control	Traffic	$857,000	3.1%	Yes
		Control	Flow			
		Allow	Access			
		Provide	Crossings			

INFORMATION PHASE – FUNCTION ANALYSIS

Project: **Eagles Landing Parkway**
Function: **Improve Capacity**

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	% of Total	Worth/Save
K	Concrete Sidewalks	Allow	Access	$558,000	2.0%	Yes
		Improve	Safety			
		Meet	ADA Reqs.			
		Allow	Ped. Movement			
L	Catch Basins	Collect	Water	$534,000	1.9%	No
		Simplify	Maintenance			
		Remove	Water			
M	Erosion Control	Control	Erosion	$405,000	1.5%	Yes
		Minimize	Wetland Impact			
		Improve	Water Quality			
N	Concrete Median	Separate	Traffic	$320,000	1.2%	Yes
		Widen	Bridges			
		Allow	Turn Lanes			
		Control	Access			
		Allow	U-Turns			

INFORMATION PHASE – FUNCTION ANALYSIS

Project: **Eagles Landing Parkway**
Function: **Improve Capacity**

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	% of Total	Worth/Save
O	Stone Rip Rap	Control	Erosion	$215,000	0.8%	Yes
P	Foundation Backfill	Allow	Construction	$132,000	0.5%	No
Q	Bike Trail / Path	Carry	Bikes			Yes
R	Wetland Berm / Dike	Control	Water			Yes

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
A	**Grading**		
A-1	Check Grade Raise at Pates Creek Bridge	See C-2, Potential to Reduce Cost	X
A-2	Check Grade Rise at RR Bridge	Potential to Reduce Cost, Imp. Sight Distance	✓
A-3	Check Amounts of Superelevation	Reduce Costs	✓
A-4	Check Driveway Access	Improve Grades	✓
A-5	Check Cross Road Access	Improve Grades	✓
A-6	Check Need for Double Left Turn Lanes at SR 42	Reduce Roadway Width, Reduce Cost	✓
A-7	Check Length of Double Left Turn Lane at SR 42	See A-6, Reduce Roadway Width, Reduce Cost	X
A-8	Narrow Roadway Typical Section	Reduce Cost, Reduce Construction Time	✓
A-9	Eliminate / Relocate Bike Lane	Reduce Cost, Improve Safety	✓
A-10	Reduce 16-foot Urban Shoulder Width	Reduce Cost, Reduce Embankment	✓
B	**Superpave Asphalt Pavement**		
B-1	Reduce Pavement Typical Section	See A-8, Reduce Cost	X
B-2	Eliminate / Relocate Bike Lanes	See A-9, Reduce Cost, Improve Safety	X
✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team			

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
B-3	Build Full Six-Lane Section Now	Increase Cost, Complete Project, Single Const	X
B-4	Build to Inside First – Add Sixth Lanes to Outside	Constructability Issues	X
B-5	Investigate / Check Pavement Section	See B-1, Reduce Cost	X
B-6	Reduce Length of Cross Road Reconstruction at SR 42 and Village Center Parkway	Reduce Cost, Needed or Turn Lanes	X
B-7	Check Intersection Widths (6-Lane Build-out)	See B-3, Reduce Cost	X
B-8	Why Replace New Four-lane Section East of SR 42	Reduce Cost, Accelerate Construction	✓
B-9	Construct Median Crossover Near Station 225	Allow Access, Increase Cost	✓
C	**Pates Creek Bridge**		
C-1	Construct at Two Separate Bridges & Reduce Median	Reduce Cost	✓
C-2	Check Need to Raise Grade 7 / 8 Feet	Reduce Cost	✓
C-3	Construct a Main Bridge with Relief Opening	Possible Cost Reduction	✓
C-4	Remove Bike Lane and Move to Separate Bike Trail	See A-9, Reduce Cost, Improve Safety	✓
C-5	Shorten Bridge	See C-3, Reduce Cost	X
C-6	Change Bridge Type (Longer Spans)	Reduce Cost, Speed Construction	✓
✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team			

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
C-7	Check Need to Skew Bridge Parallel to Creek Flow	Reduce Cost	X
C-8	Check Need for Wetland Berm / Dike	Maintain Water in Wetland Area	DS
D	**Traffic Control**		
D-1	Address the 8-foot Grade Difference at Creek Bridge	Improve Constructability	DS
F	**Bridge Over Railroad**		
F-1	Check Use of Vertical Abutments and MSE Walls	Reduce Cost, Speed Construction	✓
F-2	Check Horizontal Opening Requirements (2 vs. 3 Tracks	Possible Reduction to Bridge Length	✓
F-3	Check Superelevation on Bridge	Cost Impacts	✓
F-4	Check Grade Change (Impact on Sight Distance)	Reduce Cost, Improve Sight Distance	X
F-5	Check need for Full Width Median Across Bridge	Reduce Cost	X
F-6	Investigate Bike Lanes and Sidewalks on Bridge	A-9, Reduce Cost	X
F-7	Check Spur Track Location (Impact on Clearance)	Impacts on Bridge Length	DS
✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team			

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
I	**Concrete Curb & Gutter**		
I-1	Reduce Amount of Curb & Gutter	Reduce Cost, Simplify Construction	✓
I-2	Address the 16-foot Urban Shoulder Design	See A-10, Reduce Cost	X
I-3	Install Header Curb in Areas to be Widened Later	Simplify Construction	✓
J	**Signals**		
J-1	Plan for Signals at Intersections once 6-lane Section is Built	Possible Cost Increase,	DS
J-2	Address Truck access / egress at Trade Center Pkwy	Possible Cost Increase	DS
K	**Concrete Sidewalks**		
K-1	Address 16-foot Urban Shoulder Design	See A-10, Reduce Cost	X
K-2	Review sidewalks on SR 42	Possible Cost Reduction	X
K-3	Consider Bike Trail as Buffer to Country Club Homes	Reduce Project Impact on Homes	✓
✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team			

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	**CREATIVE IDEA**	**COMMENTS**	**IDEA RATING**
M	**Erosion Control**		
M-1	Consider the Use of Sediment Basins on Project	Accommodate Construction	DS
M-2	Check Erosion Control Plans for Wetland Area	Reduce Wetland Impacts	X
N	**Concrete Medians**		
N-1	Check Locations of Proposed Concrete Medians	Possible Cost Reductions	DS
N-2	Check Amount of Concrete Medians	Possible Cost Reductions	DS
O	**Stone Rip Rap**		
O-1	Check Need for two sizes of Rip Rap	Possible Cost Reduction, Correct Use of Size	X
✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team			