

VALUE ENGINEERING REPORT

SR 124 / US 78 Continuous Flow Intersection
CSSTP-0006-00(439), PI No. 0006439
Gwinnett County

April 29, 2010

OWNER AND DESIGN TEAM:



Georgia Department of Transportation
600 West Peachtree Street
Atlanta, GA 30308

VALUE ENGINEERING CONSULTANT:



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VALUE ENGINEERING STUDY

CSSTP-0006-00(439), Atlanta Georgia
PI No. 0006439

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EXECUTIVE SUMMARY

Executive Summary

VALUE ENGINEERING STUDY

CSSTP-0006-00(439), PI No. 0006439
US 78 / SR 124 Continuous Flow Intersection
April 12-15, 2010

Introduction

This report presents the results of a value engineering (VE) study conducted on the proposed design for a Continuous Flow Intersection (CFI) to be constructed at the current US 78 / SR 124 intersection in Snellville, Georgia. The current intersection includes four through lanes on US 78, dual left turn lanes for eastbound US 78 traffic and a single left turn lane for westbound US 78 traffic. The CFI will provide four through lanes on US 78 and dual left turn lanes for both eastbound and westbound traffic. The purpose of the project is to reduce congestion and improve the safety of the US 78 / SR 124 intersection. The project will be constructed in two phases. Phase 1 consists of the construction of the two legged CFI on US 78. The CFI would improve the LOS and reduce travel delays. Phase 2 would construct an eastbound bypass on Henry Clower Boulevard to remove some of the traffic from the intersection to further improve its LOS and reduce travel delays.

Major contract work items include grading complete, asphalt pavement, traffic signals, concrete curb & gutter, and concrete sidewalk. The total estimated project cost including right-of-way (R/W) is \$15.3 million. The design is currently in the concept stage. The study took place on April 12-15, 2010, at the GDOT General Office in Atlanta, Georgia, using a three person VE team.

This report presents the Team's recommendations and all back-up information, for consideration by the decision-makers. This **Executive Summary** includes a brief description of each recommendation. The **Study Identification** section contains information about the project and the team. The **Recommendations** section presents a more detailed description and support information about each recommendation. The **Appendix** includes a complete record of the Team's activities and findings. The reader is encouraged to review all sections of the report in order to obtain a complete understanding of the VE process.

Considerations

The VE team's evaluation of the proposed project looked to develop options that were not listed in the project team's evaluated CAC input and developed list of four non-viable alternatives and seven viable alternatives. In developing these options, the VE team was given several constraints to consider. The constraints were:

- keep the limited access on the northwest quadrant to protect the free flow right turn lane,
- keep the dual left turn lanes on both sides of the intersection,
- keep the left turn lane lengths and distance from the intersection to maximize signal timing,

- Do not consider any of the four (Full level Bypass, SPUI, Echelon, Diamond Interchange) non-viable alternatives.

A Draft Project Concept Report has been prepared. The Draft Environmental Document is being prepared. Project funding is listed as long range and no R/W has been acquired. No letting date has been established.

Results Obtained

The VE team focused their efforts on the high cost items of the project. Through the use of functional analysis and “brain storming” techniques, the team generated 28 ideas with 22 being identified for additional evaluation as possible recommendations or design suggestions. The VE team developed five independent recommendations and three alternative recommendations. Implementation of the five independent recommendations has the potential to reduce the project cost by approximately \$9.3 - \$13.3 million depending on which alternative is selected. A detailed write-up of each recommendation is contained in the respective portion of this report. A summary of the recommendations follows.

Recommendation Highlights

Idea A-5: Construct a right turn lane / bay for eastbound US 78 traffic entering the Bypass (Henry Clower Boulevard) curve.

The current project does not include any dedicated deceleration lane / bay for the new dual lane eastbound US 78 right turn exit to Henry Clower Boulevard.

It is recommended that a dedicated right turn deceleration lane / bay be constructed to provide a smooth transition into the first exit curve at Henry Clower Boulevard. This modification will improve the operational characteristics of the two lane right turn exit. This dedicated turn lane should be signed well in advance to advise and encourage traffic to use Henry Clower Boulevard as a “Bypass” around the US 78 / SR 124 intersection.

The total potential cost increase if accepted is \$204,000.

Idea A-8: Close the existing Rawlins Street / SR 124 and Bird House / SR 124 access openings and provide new access via Norton Road.

The current design allows two local access openings on the northwest side of SR 124. These access openings tie directly into where the proposed direct flow right turn lane curves to enter US 78.

It is recommended that the two existing SR 124 access openings be closed and new access be provided via Norton Road. Closing these access openings would eliminate potential conflict points at the entrance to the new southbound SR 124 to westbound US 78 direct flow ramp. New access can be provided / constructed through the Buisson property west of the historic Bird

House to serve the affected properties. This concept will require additional R/W and the construction of a new access road to Norton Road.

The total potential cost increase if accepted is \$421,000.

Idea A-12: Reduce the width of the shoulders from 16 feet to 12 feet.

The current roadway typical section includes a 16-foot wide outside shoulder. The current design requires significant R/W and closes access to several local businesses.

It is recommended that the shoulder width be reduced from 16 feet to 12 feet on the north side of the CFI and at the new right turn lanes on Henry Clower Boulevard. Reducing the width of the grass area between the sidewalk and the curb by 4 feet will reduce the width of the shoulder. This will reduce R/W impacts and save cost.

The total potential savings if accepted is \$412,000.

Idea B-1: Reduce the width of the through and left turn lanes on US 78 from 12 feet to 11 feet.

The current pavement typical section uses 12-foot lane widths, for both through and turn lanes, on US 78.

It is recommended that the lane widths through the CFI be reduced from 12 feet to 11 feet. Constructing 11-foot lane widths through the intersection would be more in line with existing 10-foot lane widths on US 78 west of the proposed project. This concept reduces cost and saves R/W.

The total potential savings if accepted is \$488,000.

Idea A-1: Construct only Phase 2 (Bypass), improve the US 78 Bypass Signing to maximize its use, and leave the existing SR 124 / US 78 intersection “as is”.

The current project would construct a CFI at the SR 124 / US 78 Intersection (Phase 1) and improve Henry Clower Boulevard and its associated intersections (Phase 2). This design requires extensive roadway reconstruction, additional R/W and local access closures.

This recommendation would eliminate all Phase 1 improvements and construct only Phase 2 improvements. It would add additional overhead signing on US 78 to encourage traffic to use Henry Clower Boulevard to Bypass the US 78 / SR 124 intersection. This concept would reduce congestion (reduction of delay) and improve safety by redistributing a portion of conflicting through traffic at the intersection. This concept provides substantial improvements at a fraction of the cost. Project funding is currently designated as long range and the implementation of the project may be delayed many years. This concept could more readily be funded through a

combination of Federal, State and local funds. The Phase 1 CFI improvements could be constructed at a later date when funding becomes available.

The total potential savings if accepted is \$12,750,000.

Idea A-1.1: ALTERNATIVE TO A-1. Construct only Phase 2 (Bypass), improve the US 78 Bypass Signing to maximize its use, and eliminate the Left Turns from SR 124 in the existing SR 124 / US 78 intersection.

The current project would construct a CFI at the SR 124 / US 78 Intersection (Phase 1) and improve Henry Clower Boulevard and its associated intersections (Phase 2). This design requires extensive roadway reconstruction, additional R/W, and local access closures.

This recommendation would eliminate all Phase 1 improvements and construct only Phase 2 improvements. This concept would add additional overhead signing on US 78 to encourage traffic to use Henry Clower Boulevard to Bypass the US 78 / SR 124 intersection. It would also eliminate the existing SR 124 left turn lanes at the intersection. The northbound SR 124 left turn traffic would utilize the SR 124 / Henry Clower Boulevard Intersection. The southbound SR 124 left turn traffic would utilize the Oak Road, Wisteria Drive or Henry Clower Boulevard Intersections. Eliminating this signal phase reduced the 2012 intersection delay from 128 seconds (No-Build) to 63 seconds and the 2032 intersection delay from 256 seconds (No-Build) to 128 seconds. Eliminating the southbound left turn lane will also improve access to the shopping center by preventing backed-up left turn traffic from blocking the entrance.

This concept addresses the need and purpose of reducing congestion (reduction of delay) and improving safety (removal of SR 124 left turn phase) at the intersection. This concept provides substantial improvement at a fraction of the cost. Project funding is currently designated as long range and the implementation of the project may be delayed many years. This revised concept could more readily be funded through a combination of Federal, State and local funds. The Phase 1 CFI improvements could be constructed at a later date when funding becomes available.

The total potential savings if accepted is \$12,050,000.

Idea A-2: Modify the existing SR 124 / US 78 intersection by adding another through lane to US 78 and the south side of SR 124.

The current project would construct a CFI at the SR 124 / US 78 Intersection (Phase 1) and improve Henry Clower Boulevard and its associated intersections (Phase 2). This design requires extensive roadway reconstruction, additional R/W, and local access closures.

This recommendation would revise the current US 78 / SR 124 intersection. This concept adds additional through lanes to improve capacity and LOS. One through lane would be added in each direction on US 78 and one southbound through lane would be added to SR 124. The current double eastbound US 78 to northbound SR 124 left turn lane would be maintained. Making conventional modifications to the intersection can be accomplished with less R/W impacts. Adding lanes to US 78 will match the current roadway section to the west and allow for

continuation of the 3 lanes for future widening to the east. This concept results in an overall intersection LOS of E with a delay of 78 seconds. The US 78 / SR 124 intersection is poorly oriented for a CFI. It has a sharp 30 (+/-) degree skew angle requiring the west side of the intersection to be constructed with a large curve complicating its operation. The CFI contains only four US 78 through lanes that may require future modifications as US 78 is widened to six lanes east of this intersection. This concept reduces costs and R/W requirements.

The total potential savings if accepted is \$9,133,000.

Idea B-3: Eliminate the left turn lanes from US 78 at the SR 124 / US 78 intersection, add a lane to US 78, require (sign) the left turns to be made via the Bypass (jug handle concept), and close Lenora Church Road south of the fire station.

The current project would construct a CFI at the SR 124 / US 78 Intersection (Phase 1) and improve Henry Clower Boulevard and its associated intersections (Phase 2). This design requires extensive roadway reconstruction, additional R/W, and local access closures.

This recommendation eliminates the US 78 left turns at the intersection and relocates them to Henry Clower Boulevard. Westbound left turns would use the US 78 and Oak Road/Henry Clower Boulevard intersection and eastbound left turns would use the Henry Clower Boulevard / SR 124 intersection (jug handle concept). This concept reconfigures eastbound Henry Clower Boulevard providing for dual left turns at SR 124. US 78 would also be reconfigured to provide for three through lanes in each direction west of SR 124 and three eastbound through lanes and two westbound through lanes east of SR 124. In addition, a cul-de-sac would be constructed on Lenora Church Road to eliminate through traffic from entering SR 124. The cul-de-sac would be constructed in a way that would allow full north / south access for fire / rescue vehicles stationed at the fire station to the north. This concept requires advance signing to direct motorists to the proper lanes to complete the left turning movements. This concept would construct the Phase 2 improvements in the vicinity of US 78 and Knollwood Drive, but eliminate the proposed improvements at US 78 and Oak Road/Henry Clower Boulevard.

The “jug handle” design moves the heavy left turn movement away from the conflicting heavy through movements on US 78. The minimal opposing through movements on Henry Clower Boulevard will allow this intersection to facilitate the heavy left turn volumes in a more efficient manner. Removing the US 78 left turn movement phase and adding additional through lanes to US 78 will allow the US 78 / SR 124 intersection to operate more efficiently. This concept reduces R/W and construction costs. It minimizes the need for control of access thereby eliminating the need to close several local businesses.

The total potential savings if accepted is \$13,184,000.

Idea A-11: Eliminate the need for the new CFI by constructing a one-way pair through the city (EB use Henry Clower Boulevard, WB use US 78).

The current project would construct a CFI at the SR 124 / US 78 Intersection (Phase 1) and improve Henry Clower Boulevard and its associated intersections (Phase 2). This design requires extensive roadway reconstruction, additional R/W, and local access closures.

It is recommended that only Phase 2 (Henry Clower Boulevard By-pass) be constructed at this time and the roadway network be converted into a one-way pair alignment thereby eliminating the need to construct Phase 1 (CFI). Converting to a one-way pair alignment will eliminate the Phase 1 CFI portion of the project resulting in significant cost savings. One-way pair alignments are used in many downtown areas and can be applied here. A one-way traffic pair would improve signal / intersection operation, save R/W, eliminate the need for access control, simplify pedestrian crossings and help develop more of a “downtown feel” for Snellville. This concept reduces R/W and construction costs. This revised concept could more readily be funded through a combination of Federal, State and local funds. Implementing this concept would not preclude the construction of the Phase 1 CFI improvements at a later date when funding becomes available.

The total potential savings if accepted is \$11,720,000.

SR 124 / US 78 Continuous Flow Intersection
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-5	Construct a right turn lane / bay for eastbound US 78 traffic entering the Bypass (Henry Clower Boulevard) curve.	\$0	(\$204,000)	(\$204,000)	N/A	(\$204,000)	(100%)
A-8	Close the existing Rawlins Street / SR 124 and Bird House / SR 124 access openings and provide new access via Norton Road.	\$0	(\$421,000)	(\$421,000)	N/A	(\$421,000)	(100%)
A-12	Reduce the width of the shoulders from 16 feet to 12 feet.	\$412,000	\$0	\$412,000	N/A	\$412,000	100%
B-1	Reduce the width of the through and left turn lanes on US 78 from 12 feet to 11 feet.	\$488,000	\$0	\$488,000	N/A	\$488,000	100%
A-1	Construct only Phase 2 (Bypass), improve the US 78 Bypass Signing to maximize its use, and leave the existing SR 124 / US 78 intersection "as is".	\$15,283,000	\$2,533,000	\$12,750,000	N/A	\$12,750,000	100%
A-1.1	ALTERNATIVE TO A-1 Construct only Phase 2 (Bypass), improve the US 78 Bypass Signing to maximize its use, and eliminate the Left Turns from SR 124 in the existing SR 124 / US 78 intersection.	\$15,283,000	\$3,233,000	\$12,050,000	N/A	\$12,050,000	100%

SR 124 / US 78 Continuous Flow Intersection
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 * (%)
A-2	Modify the existing SR 124 / US 78 intersection by adding another through lane to US 78 and the south side of SR 124.	\$15,283,000	\$6,150,000	\$9,133,000	N/A	\$9,133,000	100%
B-3	Eliminate the left turn lanes from US 78 at the SR 124 / US 78 intersection, add lane to US 78, require (sign) the left turns to be made via the Bypass (jug handle concept), and close Lenora Church Road south of the fire station.	\$15,283,000	\$2,099,000	\$13,184,000	N/A	\$13,184,000	100%
A-11	Eliminate the need for the new CFI by constructing a one-way pair through the city (EB use Henry Clower Boulevard, WB use US 78).	\$15,283,000	\$3,563,000	\$11,720,000	N/A	\$11,720,000	100%
	* Note: Savings Potential represents how much of an individual item, exclusive of any overlapping dependent items, can be implemented.						

STUDY IDENTIFICATION

Study Identification

Project: SR 124 / US 78 Continuous Flow Intersection	Date: April 12 – 15, 2010
Location: Gwinnett County	

VE Team Members

Name:	Title:	Organization:	Telephone:
George Obaranec	Design	MACTEC	770-421-3346
Steven Gaines	Construction	Wolverton & Associates	770-447-8999
Keith Borkenhagen	VE Team Facilitator	MACTEC	623-556-1875

Project Description:

This project would construct a Continuous Flow Intersection (CFI) at the US 78 / SR 124 intersection in Snellville, Georgia. The current intersection includes four through lanes on US 78, dual left turn lanes for eastbound US 78 to northbound SR 124 traffic, and a single left turn lane for westbound US 78 traffic. The CFI will provide four through lanes on US 78 and dual left turn lanes for both eastbound and westbound traffic. The purpose of the project is to reduce congestion and improve the safety of the US 78 / SR 124 intersection.

The project will be constructed in two phases. Phase 1 consists of the construction of the two legged CFI on US 78. The CFI would improve the LOS and reduce travel delays. Phase 2 would construct an eastbound bypass on Henry Clower Boulevard to shift some of the traffic from the intersection to further improve its LOS and reduce travel delays. Major contract work items include grading complete, asphalt pavement, traffic signals, concrete curb & gutter, and concrete sidewalk. The total estimated project cost including right-of-way (R/W) is \$15.3 million.

Project Constraints:

The VE team was given several constraints to follow while developing their recommendations. These constraints were:

- keep limited access on the northwest quadrant to protect the free flow right turn lane,
- keep the dual left turn lanes on both sides of the intersection,
- keep the left turn lane lengths and distance from the intersection to maximize signal timing,

- Do not consider any of the four (Full level Bypass, SPUI, Echelon, Diamond Interchange) non-viable alternatives.

Project Briefing:

An overview of the current project status was presented by Mr. Scott Shelton, PE and Mr. Kent Black, PE from Gresham Smith and Partners. The following items were discussed:

- This project has been studied for several years. Its development has been thoroughly monitored by a Citizen Action Committee (CAC) established by the City of Snellville.
- During the various CAC meetings, the group eliminated four options (Full Bypass, SPUI, Echelon, and Diamond Interchange) from future consideration.
- During the various meetings they agreed with seven (Turn Lanes at US 78 & SR 124, Left Turn Flyover, Eastbound Bypass, 2-legged CFI on US 78, 2-legged CFI on US 78 with Eastbound Bypass, 3-legged CFI, and 3-legged CFI with Eastbound Bypass) alternatives for additional consideration.
- The CAC agreed to have GDOT and their consultant develop the 2-legged CFI with the Eastbound Bypass as the preferred alternative.
- The project was split into two phases. Phase 1 consisted of constructing the CFI at the US 78 / SR 124 intersection. Phase 2 consisted of constructing the Clower Bypass.
- Significant areas of additional R/W are required for this project. This project will also limit access in the northwest quadrant of the intersection. R/W costs are estimated at \$8,856,000.
- The construction cost estimate is \$6,423,000. Funding is not available for this project. No letting date has been established.
- There are several historic properties throughout the project. The current design does not impact any of these properties although access patterns could be modified based on the final design.
- The 2-legged CFI design includes dual left turn lanes. These dual left turn lanes must be maintained. The length of the storage areas for these turn lanes must be maintained to assure proper operation.
- The current CFI design would eliminate the northbound right and left turns from SR 124 to US 78.
- Local funding is involved in this project. The county is funding project design. The construction / R/W phases of the project will likely use Federal and / or State funds once they become available.

Figure 1
Project Sketch Map

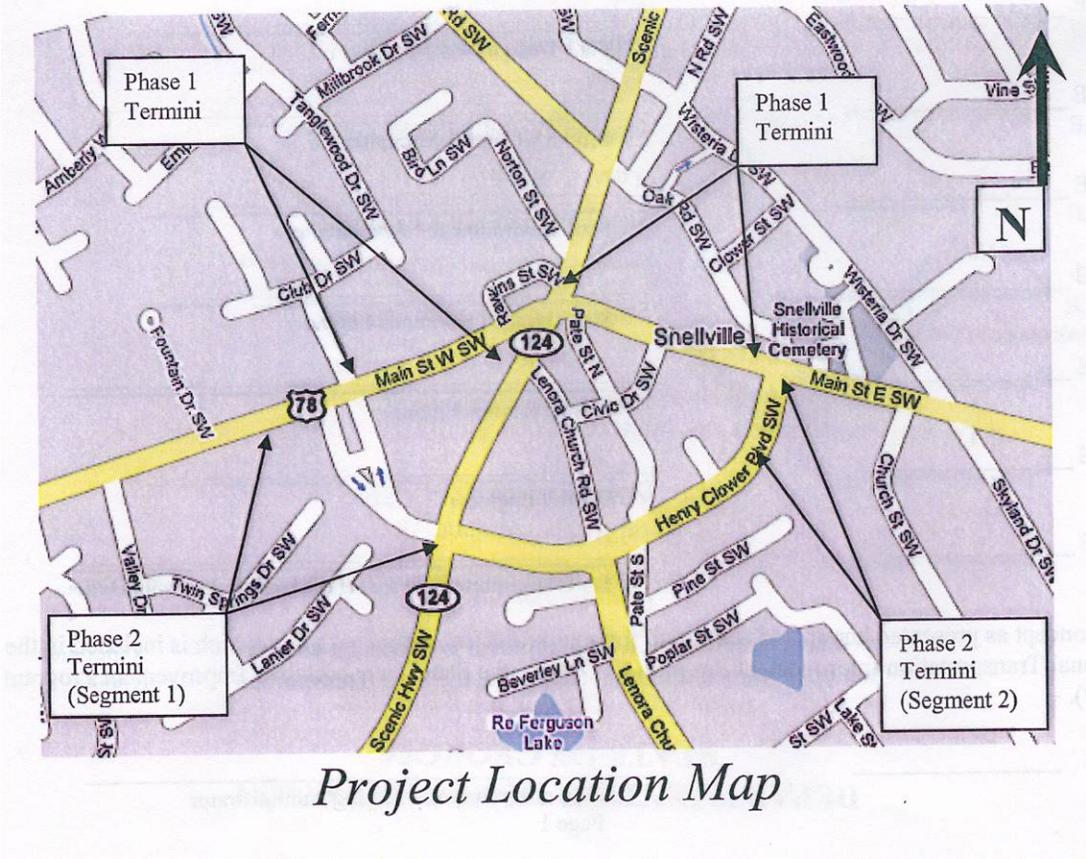
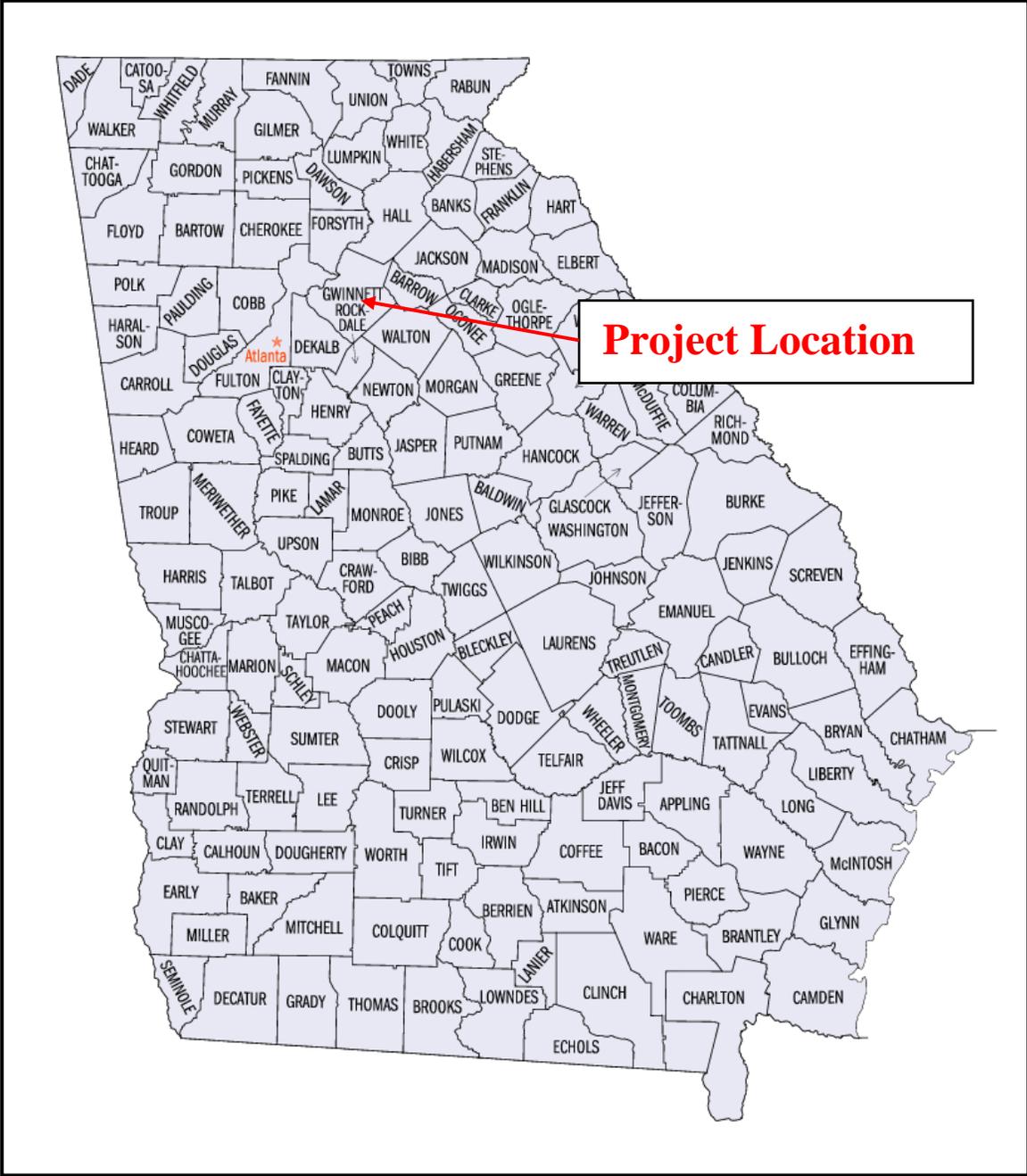


Figure 2
Project Vicinity Map



County Map of Georgia

VE RECOMMENDATIONS

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 124 / US 78 Continuous Flow Intersection

IDEA No.: A-5	Sheet No.: 1 of 4	CREATIVE IDEA: Construct a right turn lane / bay for eastbound US 78 traffic entering the Henry Clower Boulevard (Bypass) curve.
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Comp By: GAO Date: 4-14-2010 Checked By: KEB Date: 04/19/2010

Original Concept:

The current project includes a new eastbound US 78 dual right turn exit to Henry Clower Boulevard. The current design does not include any dedicated deceleration lane / bay to accommodate the first right turn at the dual exit curves.

Proposed Change:

It is recommended that a dedicated right turn deceleration lane / bay be constructed to provide a smooth transition into the first exit curve at Henry Clower Boulevard. The deceleration lane should be approximately 500 feet long and appropriately signed.

Justification:

This modification will improve the operational characteristics of the two lane right turn exit. Having a dedicated right turn deceleration lane will assure that all of the vehicles in that lane will use the first turn right exit curve and leave the second exit curve for vehicles in the next lane. This dedicated turn lane should be signed well in advance to advise and encourage EB traffic to use Henry Clower Boulevard as a “Bypass” around the US 78 / SR 124 intersection. This recommendation will increase the cost of the project.

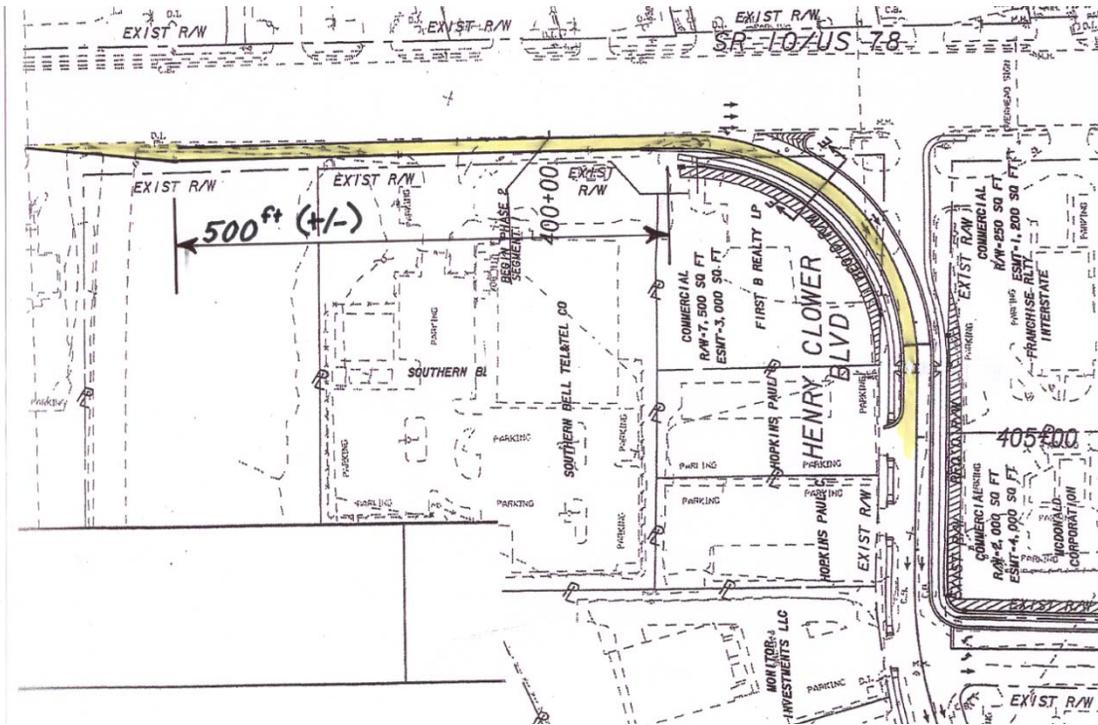
The VE team considered installing dual right turn lanes / bays installed but concluded that the additional R/W would likely result in the purchase of access control through this area and close three additional businesses.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST: - Original	\$0		
- Proposed	(\$204,000)		
- Savings	(\$204,000)		(\$204,000)
FUTURE COST: – Savings		N/A	N/A
TOTAL PRESENT WORTH SAVINGS			(\$204,000)

SKETCH

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-5
Client: GDOT
Sheet 2 of 4



CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-5
Client: GDOT
Sheet 4 of 4

Cost of Asphalt Pavement; US 78 / SR 124: 9 ¼ inches asphalt on 12 inches GAB

$$(9.25/12 \text{ ft}) (150 \text{ \#/CF}) (1 \text{ TON} / 2000 \text{ \#}) = 0.0578 \text{ TON/SF}$$

$$(12/12 \text{ ft}) (135 \text{ \#/CF}) (1 \text{ TON} / 2000\text{\#}) = 0.0675 \text{ TON/SF}$$

Cost per SY

$$(0.0578 \text{ TON/SF} \times 9 \text{ SF/SY} \times \$75 / \text{TON}) + (0.0675 \text{ TON/SF} \times 9 \text{ SF/SY} \times \$25 / \text{TON}) = \\ \$39.02 + \$15.12 = \$54.14 / \text{SY} \quad \text{USE: } \mathbf{\$55 \text{ per SY}}$$

Construct a separate right turn lane on eastbound US 78 approaching Knollwood Drive
500-foot long with a 100-foot taper.

$$(500 \text{ ft} \times 12 \text{ ft}) + (0.5 \times 12 \times 100) = 6,000 + 600 = 6,600 \text{ SF} = 733 \text{ SY}$$

Additional Pavement Area and R/W Area

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 124 / US 78 Continuous Flow Intersection

IDEA No.: A-8	Sheet No.: 1 of 4	CREATIVE IDEA: Close the existing Rawlins Street / SR 124 and Bird House / SR 124 access openings and provide access via Norton Road.
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Comp By: KEB Date: 04/14/2010 Checked By: GAO Date: 04/19/2010

Original Concept:

The current design allows two access openings on the northwest side of SR 124 in the north leg of the CFI. The first opening is for Rawlins Street which serves the Shell Richard, B Wise Investment Corporation, (2) Buisson, and the Bird House properties. The second opening is for the Bird House. These access openings tie directly into where the proposed direct flow right turn lane curves toward westbound US 78.

Proposed Change:

It is recommended that the SR 124 / Rawlins Street and SR 124 Bird House access openings be closed and new access be provided via Norton Road.

Justification:

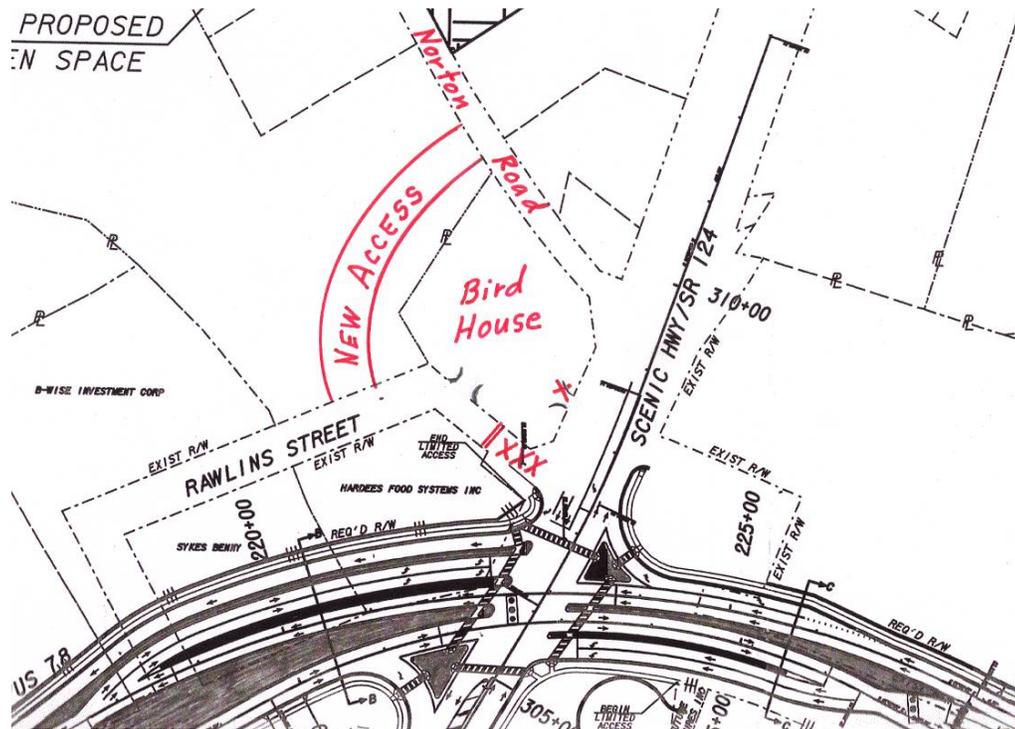
Closing the existing Rawlins Street / SR 124 and Bird House / SR 124 access openings would eliminate potential conflict points at the entrance to the new southbound SR 124 to westbound US 78 direct flow lane. Eliminating these right side openings will prevent vehicles from entering the continuous flow right turn lane immediately next to the area where they have to veer right to enter the US 78 direct flow lane. New access can be provided / constructed through the Buisson property northwest of the historic Bird House to serve all the affected properties. This concept will require additional R/W and construction cost for the new access connection to Norton Road but it will eliminate a poor access point immediately at the intersection.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST: - Original	\$0		
- Proposed	\$563,000		
- Savings	(\$563,000)		(\$563,000)
FUTURE COST: - Savings		N/A	N/A
TOTAL PRESENT WORTH SAVINGS			(\$563,000)

SKETCH

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-8
Client: GDOT
Sheet 2 of 4



CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-8
Client: GDOT
Sheet 4 of 4

Additional R/W:

$$50 \text{ ft} \times 320 \text{ ft} = 16,000 \text{ SF}$$

$$16,000 \text{ SF} \times \$10 / \text{SF} \times 2.48 \text{ (factor)} = \$396,800$$

New Pavement:

Assume asphalt pavement @ 4 inches on 6 inches of GAB

$$(4/12 \text{ ft}) (150 \text{ \#/CF}) (1 \text{ ton} / 2000 \text{ \#}) = 0.025 \text{ ton/SF}$$

$$(6/12 \text{ ft}) (135 \text{ \#/CF}) (1 \text{ ton} / 2000\text{\#}) = 0.03375 \text{ ton/SF}$$

Cost per SY

$$(0.025 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$75 / \text{ton}) + (0.03375 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$25 / \text{ton}) = \\ \$16.88 + \$7.59 = \$24.47 / \text{SY} \quad \text{USE: } \mathbf{\$25 \text{ per SY}}$$

$$24 \text{ ft} \times 320 \text{ ft} = 7,680 \text{ SF} / 9 = 854 \text{ SY}$$

$$854 \text{ SY} @ \$25 / \text{SY} = \$21,350$$

Barricade @ \$1,000

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 124 / US 78 Continuous Flow Intersection

IDEA No.: A-12	Sheet No.: 1 of 4	CREATIVE IDEA: Reduce the width of the roadway shoulder from 16 feet to 12 feet.
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Comp By: KEB Date: 04/14/2010 Checked By: GAO Date: 04/14/2010

Original Concept:

The current roadway typical section includes a 16-foot wide outside shoulder. The shoulder width includes a 30-inch curb & gutter, a 6-foot grass area between the sidewalk and the back of curb, a 5-foot sidewalk, and an 18-inch outside grass area. The current CFI design requires significant R/W and closes access to several local businesses.

Proposed Change:

It is recommended that the shoulder width be reduced from 16 feet to 12 feet on the north side of the CFI and at the new right turn lanes on Henry Clower Boulevard.

Justification:

The width of the shoulder can be reduced without impacting the purpose of the project. The six-foot width of the grass area between the sidewalk and the curb can be reduced by four feet without impacting the roadway typical section. This will reduce R/W impacts and save cost.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST: - Original	\$412,000		
- Proposed	\$0		
- Savings	\$412,000		\$412,000
FUTURE COST: - Savings		N/A	N/A
TOTAL PRESENT WORTH SAVINGS			\$412,000

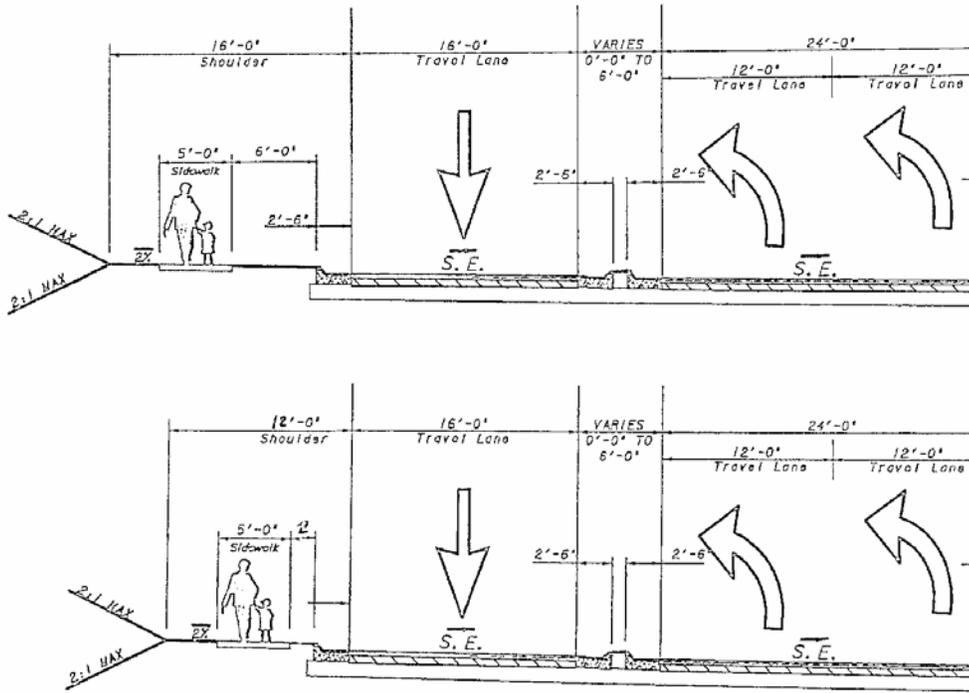
SKETCH

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-12

Client: GDOT

Sheet 2 of 4



CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-12

Client: GDOT

Sheet 4 of 4

Area of R/W Impacted:

US 78 (North Side)

Station 110+00 to Station 122+50 + Station 123+50 to Station 137+00

$(1,150 \text{ ft} + 1,350 \text{ ft}) \times 4 \text{ ft} = 10,000 \text{ SF}$

Henry Clower Boulevard

Right Turn Lane at SR 124 $350 \text{ ft} \times 4 \text{ ft} = 1,400 \text{ SF}$

Right Turn lane at US 78 $900 \text{ ft} \times 4 \text{ ft} = 3,600 \text{ SF}$

Around McDonalds $400 \text{ ft} \times 4 \text{ ft} = 1,600 \text{ SF}$

$(1,400 + 3,600 + 1,600) = 6,600 \text{ SF}$

Total Area = $10,000 \text{ SF} + 6,600 \text{ SF} = 16,600 \text{ SF}$

R/W Cost:

$16,600 \text{ SF} @ \$10.00 / \text{SF} \times 2.48 \text{ (factor)} = \$411,680$

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 124 / US 78 Continuous Flow Intersection

IDEA No.: B-1	Sheet No.: 1 of 3	CREATIVE IDEA: Reduce the US 78 lane widths through the CFI from 12 feet to 11 feet.
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Comp By: KEB Date: 04/14/2010 Checked By: GAO Date: 04/19/2010

Original Concept:

The current roadway typical section design for the CFI includes lane width of 12 feet.

Proposed Change:

It is recommended that the lane widths through the CFI be reduced from 12 feet to 11 feet.

Justification:

Constructing 11-foot lane widths through the CFI would be more in line with existing 10-foot lane widths on US 78 west of the proposed project. This concept would reduce the cost of the project and save R/W.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST: - Original	\$1,570,000		
- Proposed	\$1,082,000		
- Savings	\$488,000		\$488,000
FUTURE COST: - Savings		N/A	N/A
TOTAL PRESENT WORTH SAVINGS			\$488,000

CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: B-1
Client: GDOT
Sheet 3 of 3

Pavement sections:

EB US 78 2 @ 24 x 3,000 ft = 72,000 SF
WB US 78 2 @ 24 x 3,000 ft = 72,000 SF
EB US 78 Left Turn Lane 2 @ 24 x 1,100 ft = 26,400 SF
WB US 78 Left Turn Lane 2 @ 24 x 950 ft = 22,800 SF
(72,000 + 72,000 + 26,400 + 22,800) = 193,200 SF / 9 = 21,467 SY

EB US 78 2 @ 22 x 3,000 ft = 66,000 SF
WB US 78 2 @ 22 x 3,000 ft = 66,000 SF
EB US 78 Left Turn Lane 2 @ 22 x 1,100 ft = 24,200 SF
WB US 78 Left Turn Lane 2 @ 22 x 950 ft = 20,900 SF
(66,000 + 66,000 + 24,200 + 20,900) = 177,100 SF / 9 = 19,678 SY

Asphalt pavement: 9 1/4 in asphalt / 12 inch GAB

(9.25/12 ft) (150 #/CF) (1 TON / 2000 #) = 0.0578 TON/SF
(12/12 ft) (135 #/CF) (1 TON/ 2000#) = 0.0675 TON/SF

Cost per SY

(0.0578 TON/SF x 9 SF/SY x \$75 / TON) + (0.0675 TON/SF x 9 SF/SY x \$25 / TON) =
\$39.02 + \$15.19 = \$54.21 / SY USE: **\$55 per SY**

R/W Reduction on the north side:

Assume 4 feet from Sta 107+00 to Sta 112+00 4 ft x 500 ft = 2,000 SF
Assume 6 feet from Sta 112+00 to Sts 122+00 6 ft x 1,000 ft = 6,000 SF
Assume 6 feet from Sta 122+50 to Sta 132+00 6 ft x 950 ft = 5,700 SF
Assume 4 feet from Sta 132+00 to Sta 137+00 4 ft x 500 ft = 2,000 SF
(2,000 + 6,000 + 5,700 + 2,000) = 15,700 SF
15,700 SF x \$10.00 / SF x 2.48 factor = \$389,360

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 124 / US 78 Continuous Flow Intersection

IDEA No.: A-1	Sheet No.: 1 of 3	CREATIVE IDEA: Construct only Phase 2 (Bypass), improve the US 78 Bypass Signing to maximize its use, and leave the existing SR 124 / US 78 intersection “as is”.
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Comp By: SWG Date: 4-15-2010 Checked By: KEB Date: 04/19/2010

Original Concept: The current design proposes to construct a CFI at the SR 124 / US 78 intersection (Phase 1) and construct additional improvements to Henry Clower Boulevard and its associated intersections (Phase 2). ITS measures will also be implemented to redirect portions of US 78 through traffic onto Henry Clower Boulevard to create a “Bypass” around the intersection. The proposed design requires extensive roadway reconstruction, additional R/W, and local access closures.

Proposed Change: This recommendation would eliminate all Phase 1 improvements and construct only the Phase 2 improvements. It would also add additional overhead signing on US 78 to encourage traffic to bypass the US 78 / SR 124 intersection.

Justification: This concept addresses the need and purpose of reducing congestion (reduction of delay) and improving safety (redistributing a portion of conflicting through traffic) at the intersection. By modifying Henry Clower Boulevard (Phase 2) and signing it as a “Bypass,” a percentage of the US 78 through traffic will be removed from the intersection improving its operation. Eliminating Phase 1 improvements would significantly reduce construction cost and R/W impacts and cost. While this concept does not provide the reduction in delay of the original concept, it provides some improvement at a fraction of the cost. Project funding is currently designated as long range and the implementation of the project may be delayed many years. This revised concept could more readily be funded through a combination of Federal, State and local funds. The Phase 1 CFI improvements could be constructed at a later date when funding becomes available.

NOTE: This concept assumes that recommendation A-5 (construct the right turn bay for eastbound US-78 traffic) is also implemented to improve the entrance to Henry Clower Boulevard.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST: - Original	\$15,283,000		
- Proposed	\$2,533,000		
- Savings	\$12,750,000		\$12,750,000
FUTURE COST: – Savings		N/A	N/A
TOTAL PRESENT WORTH SAVINGS			\$12,750,000

CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-1
Client: GDOT
Sheet 3 of 3

Assumptions:

1. Eliminate all right-of-way and construction costs for phase 1.
2. All phase 2 Improvements will be constructed as proposed.
3. Add overhead signing on US 78 to encourage traffic to use Henry Clower Boulevard to bypass the US 78 / SR 124 intersection.

Original Concept:

Phase 1 (US 78 / SR 124 CFI)

Construction Cost = \$5,000,000

R/W Cost = \$7,850,000

Phase 2 (Improvements to Henry Clower Boulevard)

Construction Costs = \$1,427,000

R/W Costs = \$1,006,000

VE Revised Concept:

Phase 1 (SR 124/US 78 Intersection)

Construction Cost = \$0

Right-of-Way Cost = \$0

Phase 2 (Improvements to Henry Clower Boulevard)

Construction Costs = \$1,427,000

R/W Costs = \$1,006,000

Additional Overhead Signs:

2 advance overhead signs for eastbound traffic 2 @ \$25,000 = \$50,000.

2 advance overhead signs for westbound traffic 2 @ \$25,000 = \$50,000

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 124 / US 78 Continuous Flow Intersection

IDEA No.: A-1.1	Sheet No.: 1 of 6	CREATIVE IDEA: <u>ALTERNATIVE TO A-1</u> Construct only Phase 2 (Bypass), improve the US 78 Bypass Signing to maximize its use, and eliminate the left turns from SR 124 in the existing SR 124 / US 78 intersection.
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Comp By: SWG Date: 4-15-2010 Checked By: KEB Date: 04/19/2010

Original Concept: The current design proposes to construct a CFI at the SR 124 / US 78 intersection (Phase 1) and construct additional improvements to Henry Clower Boulevard and its associated intersections (Phase 2). ITS measures will also be implemented to redirect portions of US 78 through traffic onto Henry Clower Boulevard to create a “Bypass” around the intersection. The proposed design requires extensive roadway reconstruction, additional R/W and local access closures.

Proposed Change: This recommendation would eliminate all Phase 1 improvements and construct only Phase 2 improvements. It would also eliminate the existing SR 124 left turn lanes. Some minor intersection improvements to accommodate the additional left turn movements may be needed at SR 124 and Oak Road and Wisteria Drive.

Justification: Constructing only Phase 2 would significantly reduce construction costs and R/W impacts and cost. The SR 124 northbound left turn traffic can utilize the SR 124 / Henry Clower Boulevard Intersection. The SR 124 southbound left turn traffic can utilize the Oak Road, Wisteria Drive or Henry Clower Boulevard Intersections.

A Synchro analysis was performed assuming no left turns from SR 124 in the US 78 / SR 124 intersection and using the same assumptions for rerouted traffic onto Henry Clower Boulevard as the original concept. Eliminating this signal phase reduced the 2012 intersection delay from 128 seconds (No-Build) to 63 seconds and the 2032 intersection delay from 256 seconds (No-Build) to 128 seconds. A more in-depth traffic analysis should be performed to verify these results.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
<u>INITIAL COST:</u> - Original	\$15,283,000		
- Proposed	\$3,233,000		
- Savings	\$12,050,000		\$12,050,000
<u>FUTURE COST:</u> - Savings		N/A	N/A
TOTAL PRESENT WORTH SAVINGS			\$12,050,000

CONTINUATION

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-1.1
Client: GDOT
Sheet 2 of 6

Eliminating the SR 124 southbound left turn lane will also improve access to the shopping center by preventing backed-up left turn traffic from blocking the entrance. This concept addresses the need and purpose of reducing congestion (reduction of delay) and improving safety (removal of SR 124 left turn phase) at the intersection. Although this concept does not provide the total reduction in delay of the original concept, it provides significant improvement at a fraction of the cost.

Project funding is currently designated as long range and the implementation of the project may be delayed many years. This revised concept could more readily be funded through a combination of Federal, State and local funds. Implementing this concept would not preclude the construction of the Phase 1 CFI improvements at a later date when funding becomes available.

NOTE: This concept assumes that recommendation A-5 (construct the right turn bay for eastbound US-78 traffic) is also implemented to improve the entrance to Henry Clower Boulevard.

SKETCH

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-1.1

Client: GDOT

Sheet 4 of 6

PM Peak 2032

US 78 at SR 124
Scenario A-1.1

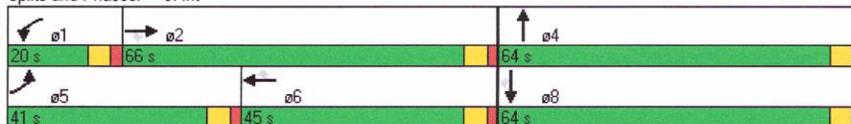
PM Peak
2032

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕	↖	↖	↕	↖		↕			↕	↖
Volume (vph)	1010	1275	25	145	1050	60	0	1135	85	0	1675	600
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	0	3504	0	0	3539	1583
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	0	3504	0	0	3539	1583
Satd. Flow (RTOR)			4			10		6				453
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1098	1386	27	158	1141	65	0	1326	0	0	1821	652
Turn Type	Prot		Perm	Prot		Perm						Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6						8
Total Split (s)	41.0	66.0	66.0	20.0	45.0	45.0	0.0	64.0	0.0	0.0	64.0	64.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	4.0	6.0	6.0
Act Effct Green (s)	35.0	60.0	60.0	14.0	39.0	39.0		58.0			58.0	58.0
Actuated g/C Ratio	0.23	0.40	0.40	0.09	0.26	0.26		0.39			0.39	0.39
v/c Ratio	1.37	0.98	0.04	0.96	1.24	0.16		0.98			1.33	0.73
Control Delay	217.2	63.5	24.7	126.0	162.8	37.3		64.2			191.3	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	217.2	63.5	24.7	126.0	162.8	37.3		64.2			191.3	16.6
LOS	F	E	C	F	F	D		E			F	B
Approach Delay		130.3			152.6			64.2			145.2	
Approach LOS		F			F			E			F	

Intersection Summary

Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.37
 Intersection Signal Delay: 127.6 Intersection LOS: F
 Intersection Capacity Utilization 119.1% ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 3: Int



CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-1.1

Client: GDOT

Sheet 6 of 6

Assumptions:

1. Eliminate all right-of-way and construction costs for Phase 1.
2. All phase 2 Improvements will be constructed as proposed.
3. Improvements to the SR 124 / US 78 intersection include minor restriping and signal modifications.
4. Add intersection minor improvements at US 78 and Oak Road and Wisteria Drive to accommodate additional left turn movements.
5. Add overhead signing on US 78 to encourage traffic to use Henry Clower Boulevard to bypass the US 78 / SR 124 intersection.

Original Concept:

Phase 1 (US 78 / SR 124 CFI)

Construction Cost = \$5,000,000

R/W Cost = \$7,850,000

Phase 2 (Improvements to Henry Clower Boulevard)

Construction Costs = \$1,427,000

R/W Costs = \$1,006,000

VE Revised Concept:

Phase 1 (SR 124/US 78 Intersection)

Construction Cost = \$0

Right-of-Way Cost = \$0

Phase 2 (Improvements to Henry Clower Boulevard)

Construction Costs = \$1,427,000

R/W Costs = \$1,006,000

Left Turn Intersection Modifications:

SR124/US 78 Improvements (Restriping & Signal Modifications)

Lump Sum Cost = \$200,000

Intersection Improvements @ US 78 / Oak Road

Lump Sum Cost = \$250,000

Intersection Improvements @ US 78 / Wisteria Drive)

Lump Sum Cost = \$250,000

Additional Overhead Signs:

2 advance overhead signs for eastbound traffic 2 @ \$25,000 = \$50,000.

2 advance overhead signs for westbound traffic 2 @ \$25,000 = \$50,000

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 124 / US 78 Continuous Flow Intersection

IDEA No.: A-2	Sheet No.: 1 of 7	CREATIVE IDEA: Modify the existing SR 124 / US 78 intersection by adding through lanes to US 78 and southbound SR 124.
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Comp By: GAO Date: 4-13-10 Checked By: KEB Date: 04/20/2010

Original Concept: The current design proposes to construct a CFI at the SR 124 / US 78 intersection (Phase 1) and construct additional improvements to Henry Clower Boulevard and its associated intersections (Phase 2). ITS measures will also be implemented to redirect portions of US 78 through traffic onto Henry Clower Boulevard to create a “Bypass” around the intersection. The proposed design requires extensive roadway reconstruction, additional R/W, and local access closures.

Proposed Change: This recommendation would make more conventional changes to the US 78 / SR 124 intersection. The changes would add additional through lanes to both routes to improve capacity and LOS. One through lane would be added in each direction on US 78 and one southbound through lane would be added to SR 124. The current double eastbound US 78 to northbound SR 124 left turn lane would be maintained. The recommended widening will have to avoid the project constraints however a more detailed alignment study should be developed to completely analyze the impacts.

Justification: Making conventional modifications to the intersection can be accomplished for less cost and with less R/W impacts than the proposed CFI design. Reducing the R/W impacts would allow several local businesses to remain and keep current local access points open. The CFI alignment imposes severe restrictions and limitations on local access. Adding lanes to US 78 will match the current roadway section to the west and allow for continuation of the three lanes for future widening to the east. This concept results in an overall intersection LOS of E with a delay of 78 seconds. Pedestrian crossing options are improved in this concept.

The US 78 / SR 124 intersection is poorly oriented for a CFI. It has a sharp 30 (+/-) degree skew angle requiring the west side of the intersection to be constructed with a large curve, complicating its operation. The CFI contains only four US 78 through lanes that may require future modifications as US 78 is widened to six lanes east of this intersection. The VE team is

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST: - Original	\$15,283,000		
- Proposed	\$6,150,000		
- Savings	\$9,133,000		\$9,133,000
FUTURE COST: - Savings		N/A	N/A
TOTAL PRESENT WORTH SAVINGS			\$9,133,000

CONTINUATION

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-2
Client: GDOT
Sheet 2 of 7

also concerned about the operational characteristics of the north leg of the proposed CFI. This leg contains several local access points which could impact the major left turn movement should vehicles stop / slow to enter or leave the shopping areas. It appears that this dual left turn movement would require two dedicated lanes on SR 124 to clear all of its stored vehicles in the allotted time which is unlikely to occur due to the local access openings. Unless access to the shopping area is closed, it appears that the CFI may require three northbound lanes on SR 124 to properly operate.

This concept reduces construction costs and the amount of R/W required to construct the project. It also minimizes changes to the control of access thereby eliminating the need to close several local businesses. Project funding is currently designated as long range and the implementation of the project may be delayed many years. This revised concept could more readily be funded through a combination of Federal, State and local funds. Implementing this concept would not preclude the construction of the Phase 1 CFI improvements at a later date when funding becomes available.

NOTE: The Phase 2 project would also be constructed under this option.

SKETCH

Project: SR 124 / US 78 Continuous Flow Intersection

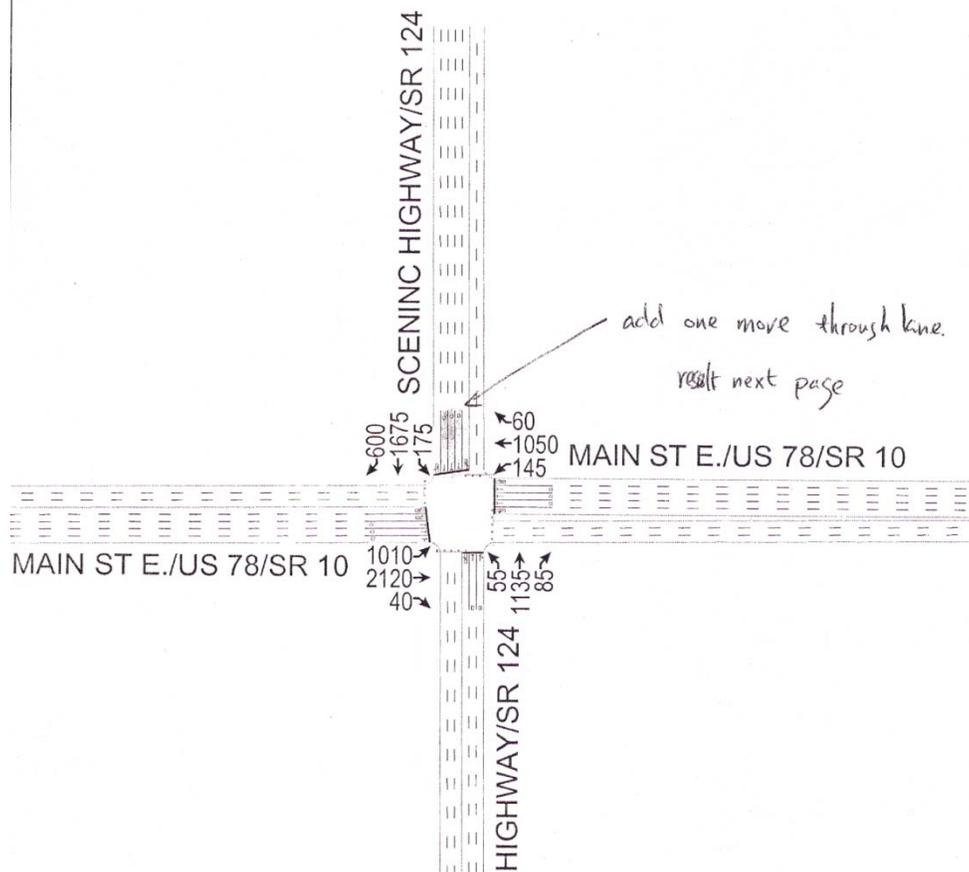
Idea No.: A-2
Client: GDOT
Sheet 3 of 7



SKETCH

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-2
Client: GDOT
Sheet 4 of 7



SKETCH

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-2
Client: GDOT
Sheet 5 of 7

Capacity Analysis

A-2

HCM Signalized Intersection Capacity Analysis

3: MAIN ST E./US 78/SR 10 & SCENINC HIGHWAY/SR 124

4/13/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗		↖	↖↗	↗	↖	↖↗		↖	↖↗	↗
Volume (vph)	1010	2120	40	145	1050	60	55	1135	85	175	1675	600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	0.95	1.00	0.95	1.00	0.91	1.00
Fr _t	1.00	1.00		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5071		1770	5085	1583	1770	3502		1770	5085	1583
Flt Permitted	0.12	1.00		0.17	1.00	1.00	0.10	1.00		0.09	1.00	1.00
Satd. Flow (perm)	438	5071		310	5085	1583	187	3502		171	5085	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1098	2304	43	158	1141	65	60	1234	92	190	1821	652
RTOR Reduction (vph)	0	2	0	0	0	49	0	5	0	0	0	17
Lane Group Flow (vph)	1098	2345	0	158	1141	16	60	1321	0	190	1821	635
Turn Type	pm+pt			custom		custom	pm+pt			pm+pt		pm+ov
Protected Phases	5	2		1		6	3		8	7	4	5
Permitted Phases	2			5			8			4		4
Actuated Green, G (s)	62.0	53.0		29.0	29.0	29.0	43.0	39.8		50.6	43.6	72.6
Effective Green, g (s)	62.0	53.0		29.0	29.0	29.0	43.0	39.8		50.6	43.6	72.6
Actuated g/C Ratio	0.51	0.44		0.24	0.24	0.24	0.36	0.33		0.42	0.36	0.60
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	944	2225		135	1221	380	108	1154		164	1835	1004
v/s Ratio Prot	c0.28	0.46		0.05	0.22		0.01	0.38		c0.07	0.36	0.15
v/s Ratio Perm	c0.32			0.23		0.01	0.18			c0.42		0.25
v/c Ratio	1.16	1.05		1.17	0.93	0.04	0.56	1.14		1.16	0.99	0.63
Uniform Delay, d1	36.3	33.9		45.1	45.0	35.2	31.4	40.5		30.2	38.4	15.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	85.1	35.2		130.5	13.0	0.0	6.1	75.8		119.3	19.3	1.3
Delay (s)	121.4	69.1		175.6	57.9	35.3	37.5	116.3		149.5	57.7	16.8
Level of Service	F	E		F	E	D	D	F		F	E	B
Approach Delay (s)		85.8			70.5			112.9			54.3	
Approach LOS		F			E			F			D	

Intersection Summary

HCM Average Control Delay	78.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	120.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-2
Client: GDOT
Sheet 7 of 7

Assume asphalt pavement @ 9 ¼ inches on 12 inches of GAB

Additional Pavement on US 78 / SR 124:

$$(9.25/12 \text{ ft}) (150 \text{ \#/CF}) (1 \text{ TON} / 2000 \text{ \#}) = 0.0578 \text{ TON/SF}$$

$$(12/12 \text{ ft}) (135 \text{ \#/CF}) (1 \text{ TON} / 2000\text{\#}) = 0.0675 \text{ TON/SF}$$

Cost per SY

$$(0.0578 \text{ TON/SF} \times 9 \text{ SF/SY} \times \$75 / \text{TON}) + (0.0675 \text{ TON/SF} \times 9 \text{ SF/SY} \times \$25 / \text{TON}) = \\ \$39.02 + \$15.19 = \$54.21 / \text{SY} \quad \text{USE: } \mathbf{\$55 \text{ per SY}}$$

US 78

Between Knollwood Drive and Oak Road, Sta 106+00 to Sta 136+00 = 3,000 ft

$$(3,000 \text{ ft} \times 24 \text{ ft}) = 72,000 \text{ SF} / 9 = 8,000 \text{ SY} \quad (\text{also represents required R/W})$$

SR 124

From Henry Clower Boulevard to Oak Road, a distance of 3,000 ft.

$$(3,000 \text{ ft} \times 12 \text{ ft}) = 36,000 \text{ SF} / 9 = 4,000 \text{ SY} \quad (\text{also represents required R/W})$$

Pavement costs under current CFI design (includes GAB, asphalt and tack coat)

$$\$400,000 + \$37,500 + \$600,000 + \$300,000 + \$187,500 + \$4,500 = \$1,529,500$$

Total R/W costs under current CFI design Phase 1 = \$7,850,700

Additional R/W:

$$(8,000 \text{ SY} + 4,000 \text{ SY}) \times 9 = 108,000 \text{ SF}$$

$$108,000 \text{ SF} \times \$10 / \text{SF} \times 2.48 \text{ (factor)} = \$2,678,400$$

Additional Signal Improvements for added lanes:

Assume \$100,000

Milling – US 78 - Assume Same Area as Idea B-1 Pavement Area = 21,467 SY

$$\text{SR 124} - 3,000 \text{ ft} \times 24 \text{ ft} = 72,000 \text{ SF} / 9 = 8,000 \text{ SY}$$

1 ½ inch milling of US 78

$$29,467 \text{ SY} @ \$1.25 = \$36,834$$

Overlay – Assume Same Area as B-1 for US 78 Pavement Area = 21,467 SY

1 ½ inch Asphalt Overlay:

$$(1.5/12 \text{ ft}) (150 \text{ \#/CF}) (1 \text{ ton} / 2000 \text{ \#}) = 0.009375 \text{ ton/SF}$$

Cost per SY

$$(0.009375 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$75 / \text{ton}) = \$6.33 \quad \text{USE: } \mathbf{\$6.50 \text{ per SY}}$$

$$29,467 \text{ SY} @ \$6.50 = \$191,536$$

Add Phase 2 Costs: \$1,427,000 construction + \$1,006,000 R/W

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 124 / US 78 Continuous Flow Intersection

IDEA No.:
B-3

Sheet No.:
1 of 6

CREATIVE IDEA: Eliminate the US 78 left turn lanes at the SR 124 / US 78 intersection and provide for them via Henry Clower Boulevard (Bypass jug handle concept).

Comp By: SWG Date: 04-15-2010 Checked By: KEB Date: 04/19/2010

Original Concept: The current design proposes to construct a CFI at the SR 124 / US 78 intersection (Phase 1) and construct additional improvements to Henry Clower Boulevard and its associated intersections (Phase 2). ITS measures will also be implemented to redirect portions of US 78 through traffic onto Henry Clower Boulevard to create a "Bypass" around the intersection. The proposed design requires extensive roadway reconstruction, additional R/W, and local access closures.

Proposed Change: This recommendation would eliminate the US 78 left turn movements at its intersection with SR 124. Westbound left turn movements would be relocated to the US 78 / Oak Road / Henry Clower Boulevard intersection. Eastbound left turn movements would be relocated to the Henry Clower Boulevard / SR 124 intersection (providing a jug handle concept). Eastbound Henry Clower Boulevard would be reconfigured to provide for dual left turns at SR 124.

West of SR 124, US 78 would be reconfigured to provide for three through lanes with a narrow raised median in each direction. East of SR 124, US 78 would be reconfigured to provide for three eastbound through lanes and two westbound through lanes with a narrow raised median. One eastbound through lane will drop into the existing left turn lane at Oak Road. In addition, a cul-de-sac would be constructed on Lenora Church Road to eliminate through traffic entering SR 124 and impacting traffic. The cul-de-sac would be constructed in a way that would allow full north / south access for fire / rescue vehicles stationed at the fire station to the north.

This concept will require advance signing to direct motorists to the proper lanes to complete the left turning movements. This concept would construct the Phase 2 improvements in the

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST: - Original	\$15,283,000		
- Proposed	\$2,099,000		
- Savings	\$13,184,000		\$13,184,000
FUTURE COST: - Savings		N/A	N/A
TOTAL PRESENT WORTH SAVINGS			13,184,000

CONTINUATION

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: B-3
Client: GDOT
Sheet 2 of 6

vicinity of US 78 and Knollwood Drive, but eliminate the proposed improvements at US 78 and Oak Road/Henry Clower Boulevard.

Justification:

The original concept requires extensive reconstruction and R/W impacts to construct the CFI at the SR 124/US 78 intersection. The VE concept implements a “jug handle” design to move the heavy left turn movement away from the conflicting heavy through movements on US 78. The minimal opposing through movements on Henry Clower Boulevard and the reduced southbound SR 124 through volumes will allow this intersection to facilitate the heavy left turn volumes in a more efficient manner. The removal of the US 78 left turn movement phase and increased US 78 capacity will allow the SR 124/US 78 intersection to operate more efficiently.

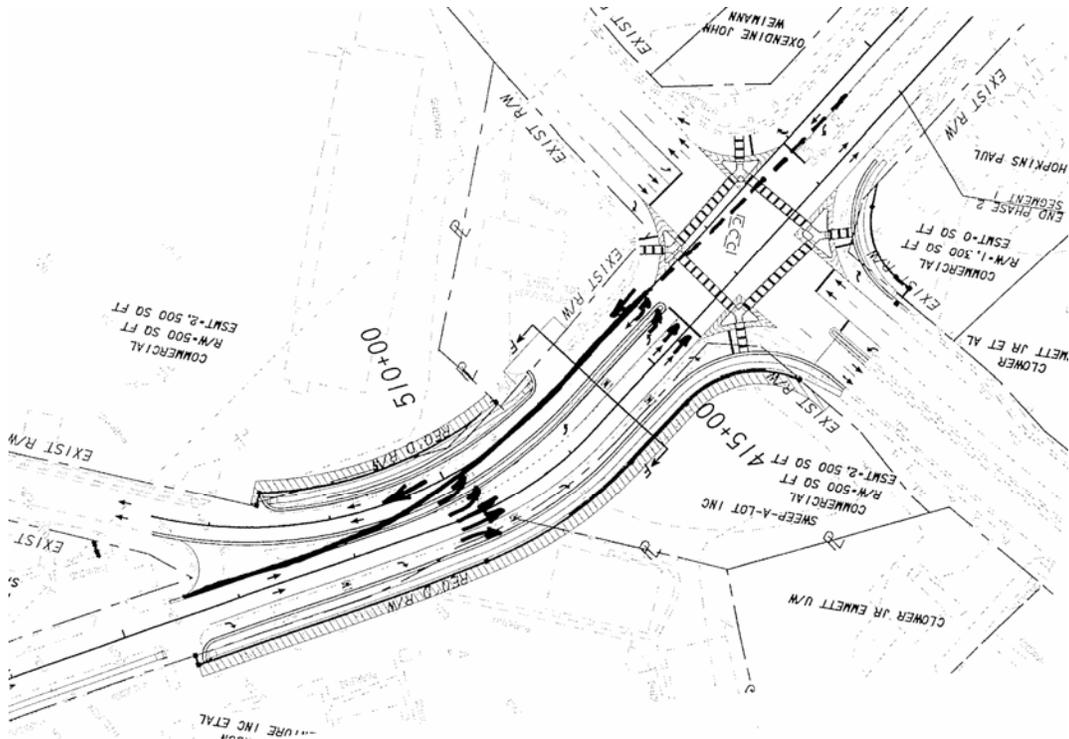
The exclusive left turn “jug handle” concept would change the Henry Clower Boulevard / SR 124 intersection configuration. This concept would provide dual left turn lanes for eastbound US 78 to northbound SR 124 traffic. The dual turning movement would operate effectively since there is little opposing traffic, in fact, the opposing traffic can be accommodated in a single westbound lane. This lane configuration can be accommodated within the proposed R/W (Phase 2 concept).

This concept reduces R/W and construction costs. It also minimizes changes to the control of access thereby eliminating the need to close several local businesses. Project funding is currently designated as long range and the implementation of the project may be delayed many years. This revised concept could more readily be funded through a combination of Federal, State and local funds. Implementing this concept would not preclude the construction of the Phase 1 CFI improvements at a later date when funding becomes available.

SKETCH

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: B-3
Client: GDOT
Sheet 3 of 6



CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: B-3
Client: GDOT
Sheet 5 of 6

Assumptions:

1. Remove all right-of-way and construction costs for phase 1.
2. Required improvements to Henry Clower/Knollwood will be equivalent to 2/3 total construction and right-of-way costs for Phase 2.
3. Add Mill, Resurface & Striping for US 78
4. Add Narrow Median on US 78 from SR 124 to Oak Road
5. Add Cul-de-sac on Lenora Church Road to prevent through traffic to SR 124 NB

Original Concept

Phase 1 (SR 124/US 78 Intersection)
Construction Cost = \$5,000,000
Right-of-Way Cost = \$7,850,000

Phase 2 (SR 124/US 78 Intersection)
Construction Cost = \$1,420,000
Right-of-Way Cost = \$1,006,000

Revised Concept

Phase 1 (SR 124/US 78 Intersection)
Construction Cost = \$0
Right-of-Way Cost = \$0

Phase 2 (SR 124/US 78 Intersection)-2/3 Cost
Construction Cost = \$951,400
Right-of-Way Cost = \$670,000

Milling – Assume Same Area as B-1 for US78
Pavement Area = 21,467 SY

1 ½ inch milling of US 78

21,467 SY @ \$1.25 = \$26,834

Overlay – Assume Same Area as B-1 for US 78
Pavement Area = 21,467 SY

1 ½ inch Asphalt Overlay:

$(1.5/12 \text{ ft}) (150 \text{ \#/CF}) (1 \text{ ton} / 2000 \text{ \#}) = 0.009375 \text{ ton/SF}$

Cost per SY

$(0.009375 \text{ ton/SF} \times 9 \text{ SF/SY} \times \$75 / \text{ton}) = \$6.33$

USE: **\$6.50 per SY**

21,467 SY @ \$6.50 = \$139,536

CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: B-3
Client: GDOT
Sheet 6 of 6

Narrow Median (SR 124 to Oak Road- Sta 223+50 to 236+50)-Assume 4-foot width
Median Area = $(1,300 \text{ ft})(4 \text{ ft}) = 5,200 \text{ SF} = 578 \text{ SY}$

Cul-de-sac Lenora Church – Approximate Pavement Area & C&G Length
Pavement Area = 5,000 SF = 556 SY

C&G Length = 500 LF

Striping (US 78)
Lump Sum Cost = \$50,000

Signal modifications
Lump Sum = \$100,000

Additional Overhead Signs:

2 advance overhead signs for eastbound traffic 2 @ \$25,000 = \$50,000.
2 advance overhead signs for westbound traffic 2 @ \$25,000 = \$50,000

DEVELOPMENT AND RECOMMENDATION PHASE

Project: SR 124 / US 78 Continuous Flow Intersection

IDEA No.: A-11	Sheet No.: 1 of 6	CREATIVE IDEA: Eliminate the need for the new CFI by constructing a one-way pair through the city (EB use Henry Clower Boulevard, WB use US 78).
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Comp By: GAO Date: 4-14-2010 Checked By: KEB Date: 04/19/2010

Original Concept: The current design proposes to construct a CFI at the SR 124 / US 78 intersection (Phase 1) and construct additional improvements to Henry Clower Boulevard and its associated intersections (Phase 2). ITS measures will also be implemented to redirect portions of US 78 through traffic onto Henry Clower Boulevard to create a “Bypass” around the intersection. The proposed design requires extensive roadway reconstruction, additional R/W, and local access closures.

Proposed Change: It is recommended that only Phase 2 (Henry Clower Boulevard By-pass) be constructed at this time and the roadway network be converted into a one-way pair alignment thereby eliminating the need to construct Phase 1 (CFI).

Justification: Converting to a one-way pair alignment would eliminate the Phase 1 CFI portion of the project resulting in significant cost savings. One-way pair alignments are used in many downtown areas and can be applied here. While this concept would result in a major change in traffic and access patterns, it would improve all signal and intersection operations. A one-way traffic pair would simplify pedestrian crossings and help develop more of a “downtown feel” for Snellville. This concept will require advance signing to inform motorists of the change to a one way pair.

This concept would provide three through lanes in each direction with auxiliary lanes for accessing local businesses. To accommodate the three lanes, a third lane would have to be added to the current two curves at the east approach. These three curved lanes would need to be shifted north to line-up with the existing three traffic lanes on US 78. The curved right-turn lanes exiting and entering US 78 should be analyzed and designed to accommodate a reasonable design speed potentially using larger radii.

LIFE CYCLE COST SUMMARY	CAPITAL COST	FUTURE COST	TOTAL COST
INITIAL COST: - Original	\$15,283,000		
- Proposed	\$3,563,000		
- Savings	\$11,720,000		\$11,720,000
FUTURE COST: – Savings		N/A	N/A
TOTAL PRESENT WORTH SAVINGS			11,720,000

CONTINUATION

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-11
Client: GDOT
Sheet 2 of 6

The existing Henry Clower Boulevard R/W width (west of McDonald's) appears to be about 70 (+/-) feet wide (scaled). This width should be sufficient to construct a three-lane roadway (two 12-foot shoulders, three 11/12-foot lanes, and two 24-inch curb & gutters) without taking any additional R/W. Nevertheless, some R/W in this area is scheduled to be acquired under the Phase 2 portion of this project. This concept would also eliminate the need to acquire R/W from the south and southeast portion of McDonald's property.

The one way pair concept would still keep the short section of Knollwood Drive between the shopping center and McDonald's as a two-way roadway to improve access to the properties. The raised median on Henry Clower Boulevard would be removed and replaced with new pavement to provide a flush roadway. The one way pair concept includes milling, resurfacing and restriping both US 78 and Henry Clower Blvd. within the project limits.

This concept reduces R/W and construction costs. It also minimizes changes to the control of access thereby eliminating the need to close several local businesses. Project funding is currently designated as long range and the implementation of the project may be delayed many years. This revised concept could more readily be funded through a combination of Federal, State and local funds. Implementing this concept would not preclude the construction of the Phase 1 CFI improvements at a later date when funding becomes available.

SKETCH

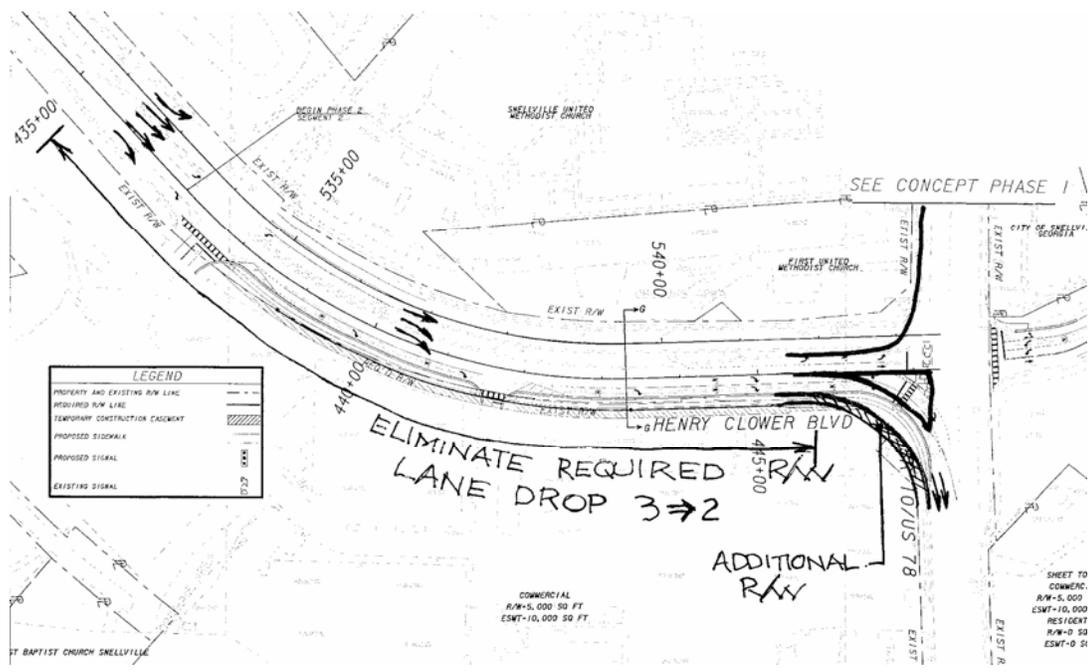
Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-11

Client: GDOT

Sheet 4 of 6

This concept would require a dual right turn lane from Henry Clower Boulevard to eastbound US 78.



CALCULATIONS

Project: SR 124 / US 78 Continuous Flow Intersection

Idea No.: A-11

Client: GDOT

Sheet 6 of 6

New Asphalt Pavement; US 78 / SR 124: 9 1/4 inches asphalt on 12 inches GAB

(9.25/12 ft) (150 #/CF) (1 TON / 2000 #) = 0.0578 TON/SF

(12/12 ft) (135 #/CF) (1 TON/ 2000#) = 0.0675 TON/SF

Cost per SY

(0.0578 TON/SF x 9 SF/SY x \$75 / ton) + (0.0675 TON/SF x 9 SF/SY x \$25 / ton) =

\$39.02 + \$15.19 = \$54.21 / SY USE: \$55 per SY

Henry Clower Blvd.; From SR 124 to US 78, remove existing raised median and replace with full-depth pavement.

(1,500 ft x 16 ft) + (1,200 x 8) = 24,000 + 9,600 = 33,600 sq ft / 9 = 3,733 sq yd;

Additional right turn lane; US 78 by-pass ramp;

2,000 ft x 12 ft = 24,000 sq ft = 2,667 sq yd

1 1/2 inch Asphalt Overlay:

(1.5/12 ft) (150 #/CF) (1 ton / 2000 #) = 0.009375 ton/SF

Cost per SY

(0.009375 ton/SF x 9 SF/SY x \$75 / ton) = \$6.33

USE: **\$6.50 per SY**

Overlay US 78 – Assume Same Area as B-1 Pavement Area = 21,467 SY

Overlay Henry Clower Blvd. Sta 405 to Sta 457 = (5,200 ft x 48 ft) / 9 = 27,733 SY

Right & Left turn Bays [(3 LT @ 12 ft x 250 ft) + (3 RT @ 12 ft x 250 ft)] / 9 = 2,000 SY

21,467 SY + 27,733 SY + 2,000 SY = 51,200 SY

Mill 1 1/2 inches from Us 78 & Henry Clower Boulevard:

51,200 SY @ \$1,25 = \$64,000

Additional R/W to improved Clower Blvd. to US 78 EB right turn:

additional R/W 400 x 50 = 20,000 sq ft 20,000 @ \$10.00 x 2.48 factor = \$496,000

Restriping Costs: Assume \$100,000

Additional Overhead Signs:

2 advance overhead signs for eastbound traffic 2 @ \$25,000 = \$50,000.

2 advance overhead signs for westbound traffic 2 @ \$25,000 = \$50,000

APPENDIX

Sources

Approving/Authorizing Persons

Name:	Position:	Telephone:
Ron Wishon	Engineering Services	404-631-1753
Neal O'Brian	Roadway Design - PM	404-631-1725

Personal Contacts

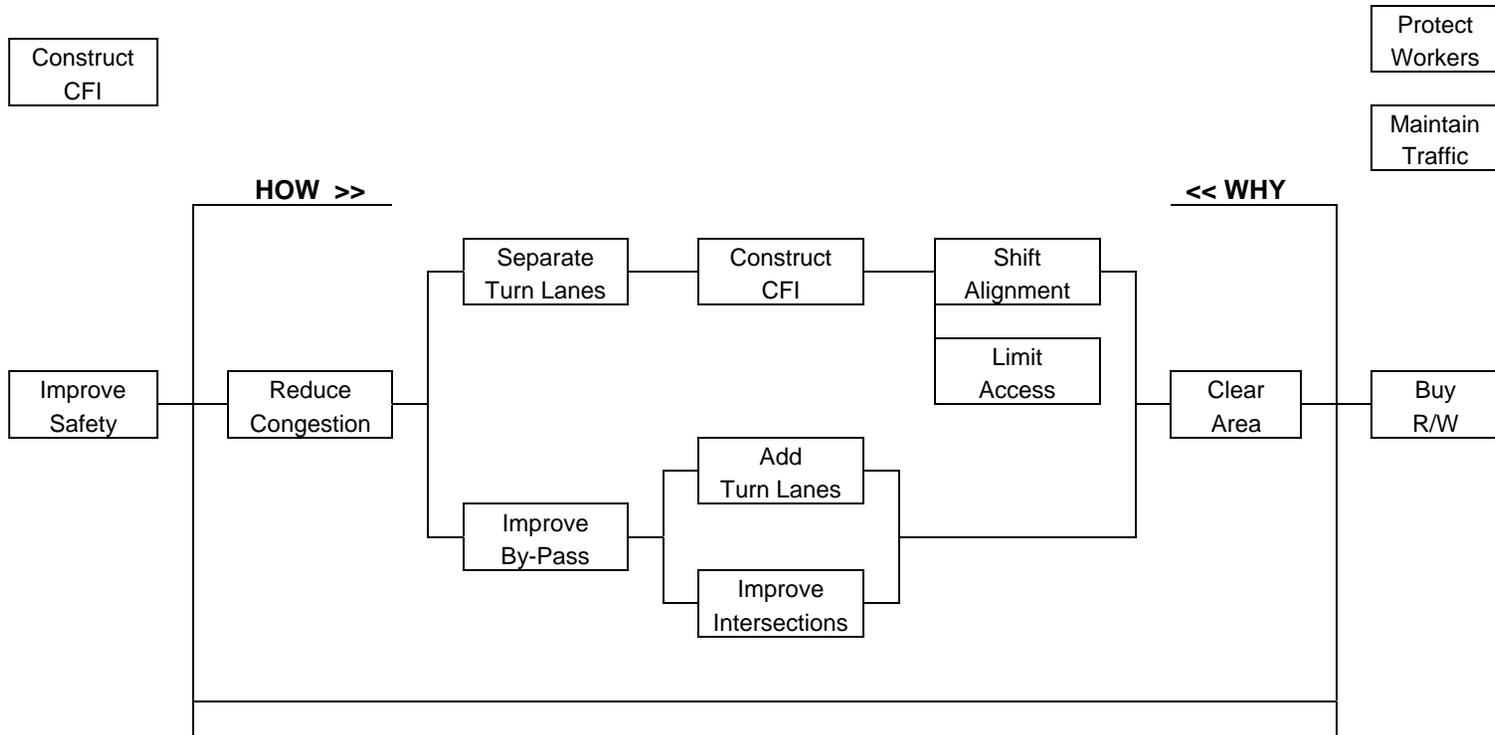
Name:	Telephone:	Notes:
Scott Shelton	770-754-0755	Project Briefing
Kent Black	770-754-0755	Project briefing
Todd DeVos	770-447-8999	Traffic capacity / signalization

Documents/Abstracts

Reference:	Reference:
100 Scale Layouts on Arial Photos	Project Concept Report
Typical Sections	Accident Summaries
Phase 1 & Phase 2 Cost Estimate	Matrix Comparison of Alternatives

FAST DIAGRAM

SR 124 / US 78 Continuous Flow Intersection



INFORMATION PHASE – FUNCTION ANALYSIS

Project: SR 124 / US 78 Continuous Flow Intersection

Function: Reduce Congestion

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	% of Total	Worth/Save
A	Right of Way	Store	Project	\$8,857,000	62.6%	Yes
		Add	Turn Lanes			
		Control	Access			
		Shift	Alignment			
		Eliminate	Historic Impact			
		Accommodate	Landscaping			
B	Asphalt Pavement	Add	Turn Lanes	\$1,356,000	9.6%	Yes
		Construct	CFI			
		Construct	Dual Turn Lane			
		Store	Traffic			
		Widen	Roadway			
		Control	Access			
C	Grading Complete	Support	Roadways	\$550,000	3.9%	Yes
		Remove	Pavement			
		Prepare	Site			

INFORMATION PHASE – FUNCTION ANALYSIS

Project: SR 124 / US 78 Continuous Flow Intersection

Function: Reduce Congestion

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	% of Total	Worth/Save
D	Traffic Signals	Control	Traffic Flow	\$510,000	3.6%	Yes
		Signalize	CFI			
		Establish	Q			
		Improve	Existing			
		Provide	Ped Access			
		Optimize	Network			
E	Aggregate Base Course	Support	Pavement	\$475,000	3.4%	Yes
		Add	Lanes			
F	Concrete Curb & Gutter	Delineate	Lanes	\$410,000	2.9%	Yes
		Convey	Storm Water			
		Separate	Traffic			
		Control	Access			
G	Traffic Control	Stage	Construction	\$350,000	2.5%	Yes
H	Miscellaneous	Construct	Project	\$310,000	2.2%	No

INFORMATION PHASE – FUNCTION ANALYSIS

Project: SR 124 / US 78 Continuous Flow Intersection

Function: Reduce Congestion

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	% of Total	Worth/Save
I	18" / 24" Storm Drain Pipe	Convey	Water	\$282,000	2.0%	No
		Extend	Existing			
J	Concrete Sidewalk	Accommodate	Pedestrians	\$210,000	1.5%	Yes
		Tie to	Existing			
K	Erosion Control	Control	Sediment	\$190,000	1.3%	No
L	Concrete Side Barrier	Improve	Safety	\$188,000	1.3%	Yes
		Protect	Pond			
M	Catch Basins	Drain	Pavement	\$138,000	1.0%	No
		Collect	Water			
N	Signing / Pavement Marking	Direct	Traffic	\$137,000	1.0%	Yes
		Identify	Lanes			
		Identify	Stop Points			
		Distribute	Traffic			

INFORMATION PHASE – FUNCTION ANALYSIS

Project: SR 124 / US 78 Continuous Flow Intersection

Function: Reduce Congestion

ITEM No.	DESCRIPTION	FUNCTION		INITIAL DOLLARS		
		Verb	Noun	Cost	% of Total	Worth/Save
O	Concrete Median	Separate	Traffic	\$103,000	0.7%	Yes
		Provide	Pedestrian Refuge			
		Minimize	Maintenance			
		Control	Access			
P	Concrete Driveways	Provide	Access	\$80,000	0.6%	No
		Replace	“In Kind”			
		Continue	Existing Access			

CREATIVE PHASE Creative Idea Listing		JUDGMENT PHASE Idea Evaluation	
No.	CREATIVE IDEA	COMMENTS	IDEA RATING
A	Right-of Way		
A-1	Construct Phase 2 (Bypass) only and improve US 78 signing for the Bypass thereby leaving the existing SR 124 / US 78 intersection as is.	Funds are unavailable to construct the entire project. Eliminates much of the new R/W. Interim solution with minimal funding needs.	✓
A-1.1	Construct Phase 2 (Bypass) and eliminate the left turns off SR 124 at the existing SR 124 / US 78 intersection.	Eliminates one traffic signal phase.	✓
A-2	Modify the existing SR 124 / US 78 intersection by adding lanes to US 78 and SR 124.	US 78 is already a 6-lane section west of the proposed project.	✓
A-2.1	Modify the existing SR 124 / US 78 intersection by adding additional lanes and eliminating the left turns from SR 124 at the intersection.	Eliminates one traffic signal phase.	✓
A-3	Eliminate left turns from the SR 124 at the existing SR 124 / US 78 intersection.	Eliminates on traffic signal phase.	✓
A-4	Reduce the width of the various raised / grassed medians on the west side to realign the roadway and reduce the amount of R/W needed to construct the project.	Reduce R/W cost. May impact CFI west side spacing.	X
A-5	Construct a right turn lane / bay for EB US 78 traffic entering the bypass (Henry Clower Blvd.).	Improve safety, Improve right-turn movement.	✓
✓ = 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
A-6	Reduce the US 78 lane widths from 12 feet to 11 feet.	See B-1	X
A-7	Add a second lane to the SB SR 124 to WB US 78 ramp to provide for local access to parcels in NW quadrant.	Reduce R/W cost.	✓
A-8	Close the existing Rawlins Street / SR 124 access point and provide access via Norton Road north of the historic property.	Eliminate conflicts to the north leg of the proposed new CFI.	✓
A-9	Construct a frontage road alongside the SB to WB ramp in the northwest quadrant area.	Reduce R/W impacts and cost.	✓
A-10	Relocate shopping center entrance / exit off SR 124 on the north side of the intersection.	Improve safety.	✓
A-11	Eliminate the need for the CFI by constructing a one-way pair through the city (EB use US 78, WB use Bypass).	Save R/W and cost.	✓
A-12	Reduce the width of the shoulders from 16 feet to 12 feet.	Save R/W and cost.	✓
B	Asphalt Pavement		
B-1	Reduce the lane width from 12 feet to 11 feet.	Existing lanes on US 78 west of the project are 11 feet. Reduce cost. Save R/W.	✓
B-2	Construct a one-way pair through the city.	See Idea A-11	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	Eliminate the left turn lanes from US 78 at the SR 124 / US 78 intersection and provide for them via the bypass (jug handle concept) and close Lenora Church Road south of the fire station.	Eliminates the need for the CFI. Saves R/W and cost.	✓
B-4	Add a right turn lane / bay to US 78 west of the bypass.	See Idea A-5	X
B-5	Add an additional through lane to US 78 in both directions.	See Idea A-2	X
B-6	Construct a frontage road in the northwest quadrant.	See Idea A-9	X
D	Signals		
D-1	Optimize the signals through the area	Improve capacity	DS
F	Concrete Curb & Gutter		
F-1	Reduce the width of the curb & gutter from 30 inches to 24 inches.	Reduce cost. Save roadway width and R/W	✓
F-2	Use header curb in-lieu-of 30-inch curb and gutter.	Reduce cost. Save roadway width and R/W	✓
✓ = 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
L	Concrete Side Barrier		
L-1	Reduce the width of the shoulder and use guardrail (put sidewalk alongside curb and reduce right turn lane to 11 feet.	Reduce needed R/W, Reduce / eliminate wall and side barrier.	✓
N	Signing and Pavement Markings		
N-1	Place large arrows in the traffic lanes to guide motorists through the CFI weave sections.	Improve safety, assist motorists traveling through CFI	DS
O	Concrete Median		
O-1	Replace concrete medians with decorative stone filled medians.	Reduce costs	DS
O-2	Replace grass medians with artificial turf.	Reduce maintenance costs	DS
O-3	Replace grass medians with decorative stone /concrete medians	Reduce maintenance	DS
✓ = Will be considered further; X = will be dropped; DS = Design suggestion –written for consideration by design team			

VE STUDY SIGN-IN SHEET

Project No.: CSSTP-0006-00(439)

County: Gwinnett

PI No.: 0006439

Date: April 12-15, 2010

Days

1	4	NAME	EMPLOYEE ID NO.	DOT OFFICE OR COMPANY	PHONE NUMBER	EMAIL ADDRESS
✓		Lisa L. Myers		Engineering Services	404-631-1770	lmyers@dot.ga.gov
✓	✓	Matt Sanders		Engineering Services	404-631-1752	msanders@dot.ga.gov
✓		James K. Magnus		Construction	404-631-1971	jmagnus@dot.ga.gov
✓		Ken Werho		Traffic Operations	404-635-8144	kwerho@dot.ga.gov
		XXXXXXXXXX		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
✓	✓	GEOFF O'BRIEN		MACTEC	770-421-3346	GADBARANER@MACTEC.COM
✓	✓	Steven Gaines		Wolverton + Assoc	770-447-8999	steven.gaines@wolverton-assoc.com
✓	✓	Keith Borkenhagen		MACTEC	678-556-1875	kborkenhagen@msn.com
✓	✓	Scott Shelton		GS&P	678-518-3684	Scott.Shelton@gspnet.com
✓		Kurt Black		GS&P	770-754-0755	Kurt_black@gspnet.com
✓	✓	Laura Rish		Env. Services	404-631-1415	lrish@dot.ga.gov
✓	✓	Jeff Church		GS&P	678-578-3983	Jeff.Church@gspnet.com
✓	✓	Jill FRANKS		Roadway Design	404-631-1726	jfranks@dot.ga.gov
✓	✓	Neal O'Brien		Roadway Design	404-631-1725	no_brian@dot.ga.gov
✓	✓	Russell McMurphy		Roadway Design	404-631-1777	rmcmurphy@dot.ga.gov
✓		Jay Bockisch		GS&P	678-518-3660	jay_bockisch@gspnet.com
✓		Chuck Hasty		Roadway Design	(404) 631-1704	chasty@dot.ga.gov

✓ Check all that apply

14 Attended Project Overview (Day 1)

12 Attended Project Presentation (Day 4)