ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. # 0010871

OFFICE Design Policy & Support

DeKalb County
GDOT District 7 - Metro Atlanta
Quick Project - CR 2989/Lithonia Ind.
Blvd. @ US 278/SR 12

DATE 9/6/2013

FROM for Brent Story, State Design Policy Engineer

TO SEE DISTRIBUTION

SUBJECT **APPROVED CONCEPT REPORT**

Attached is the approved Concept Report for the above subject project.

Attachment

DISTRIBUTION:

Bobby Hilliard, Program Control Administrator
Genetha Rice-Singleton, State Program Delivery Engineer
Glenn Bowman, State Environmental Administrator
Cindy VanDyke, State Transportation Planning Administrator
Kathy Zahul, State Traffic Engineer
Angela Robinson, Financial Management Administrator
Lisa Myers, State Project Review Engineer
Charles "Chuck" Hasty, State Materials Engineer
Mike Bolden, State Utilities Engineer
Jeff Fletcher, Statewide Location Bureau Chief
Andy Casey, State Roadway Design Engineer
Attn: Mac Cranford, District Design Engineer
Rachel Brown, District Engineer
Scott Lee, District Preconstruction Engineer
Patrick Allen, District Utilities Engineer
Peter Emmanuel, Project Manager
BOARD MEMBER - 4th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
LIMITED SCOPE PROJECT CONCEPT REPORT

Project Type:	Operational Improvement	P.I. Number:	0010871
GDOT District:	Seven	County:	DeKalb
Federal Route Number:	N/A	State Route Number:	N/A

The quick traffic operation improvement project CR2989/Lithonia Industrial Blvd at SR 12/US278/Covington Hwy consists of converting the existing 24' grass median on Lithonia Industrial Blvd to a 12' raised median and 12' lanes that will be utilized as left turn lanes onto SR 12, as well as the upgrade of the existing traffic signal to accommodate the new configuration.

Submitted for approval:

Mac Crawford — 7-29-13
District Seven Design Engineer — DATE

7-29-13
GDOT Project Manager — DATE

7/31/2013
State Program Delivery Engineer — DATE

Recommendation for approval:

GLENN BOWMAN*/EKP — 8/7/2013
State Environmental Administrator — DATE

KATHY ZAHUL*/EKP — 8/14/2013
State Traffic Engineer — DATE

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

CINDY VANDYKE*/EKP — 8/13/2013
State Transportation Planning Administrator — DATE

* - RECOMMENDATION ON FILE

Approval:

Concur: — 8/27/2013
GDOT Director of Engineering — DATE

Approve: — 9-2-13
GDOT Chief Engineer — DATE

PROJECT LOCATION

CR2989/Lithonia Industrial Blvd at SR 12/US278/Covington Hwy

Intersection Improvement

PI#0010871

DeKalb County

PLANNING & BACKGROUND DATA

Project Justification Statement: SR 12/US 278 at Lithonia Industrial Blvd in DeKalb County was identified for minor intersection improvements. The proposed project is to be included in the GDOT Operational Improvement Lump Sum Program from the Office of Traffic Operations. This proposed project was approved by the Operational Improvement Committee as a QUICK project.

SR 12/US 278 in the project area is an urban minor arterial that runs parallel to I-20 serving many of the industrial and commercial developments in southeast DeKalb County. Lithonia Industrial Blvd is an urban collector that connects I-20 to many of the industrial parks in the City of Lithonia. SR 12/US 278 is a five lane section undivided roadway with a two general purpose lanes in each direction and a two way left turn lane/left turn auxiliary lane. The intersection is currently signalized with permitted left turn phase on all approaches. Lithonia Industrial Blvd is a four lane divided highway with a 24' grass median and one northbound right turn lane. The left lane in the northbound and southbound direction of Lithonia Industrial Blvd is used for both left and thru movements. This lane configuration is causing long queues and long delays during peak hours. Adding separate left turn lanes will reduce delay times.

Due to the minor project scope, the right-of-way constraints, existing corridor features (existing striped median and shoulder) and the scope approved by the Operational Improvement Committee, a roundabout was not recommended for this location.

The project lies within the boundaries of the Atlanta Regional Commission (ARC), Atlanta's Metropolitan Planning Organization (MPO). As an operational improvement project, this project is categorized under the "operational improvement lump sum category" in the MPO's RTP or TIP.

Description of the proposed project: This project is on Lithonia Industrial Blvd from milepost 0.72 to 0.95. The existing 24' grass median on the both legs of Lithonia Industrial Blvd will be graded and paved to create 12' raised median and 12' lanes that will be utilized as left turn lanes onto SR 12. The turn bays will be 250' long with 100' entry tapers. The existing traffic signal will be upgraded to accommodate the new configuration.

Federal Oversight: ☐ Full Oversight ☒ Exempt ☐ State Funded ☐ Other

MPO: Atlanta Regional Commission (ARC) MPO Project ID: N/A

Regional Commission: Atlanta Regional Commission (ARC) RC Project ID: N/A

Congressional District(s): 4

Projected Traffic ADT:
CS 2989/Lithonia Ind. Blvd
Current Year (2013): 13,622 Open Year (2016): 13,828 Design Year (2036): 15,279

SR 12/Covington Hwy
Current Year (2013): 20,976 Open Year (2016): 21,293 Design Year (2036): 23,527
Traffic Projections Performed by: District Seven

Functional Classification: CS 2989/Lithonia Ind. Blvd – Urban Collector
SR 12/Covington Hwy – Urban Minor Arterial

Is this a 3R (Resurfacing, Restoration, & Rehabilitation) Project? ☒ No ☐ Yes

Will Context Sensitive Solutions procedures be utilized? ☒ No ☐ Yes

DESIGN AND STRUCTURAL DATA

Mainline Design Features: CR2989/Lithonia Industrial Blvd

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**4**	**N/A**	**4**
- **Lane Width(s)**	**12'**	**10'-12'**	**12'**
- **Median Width & Type**	**24' Grassed w/Hdr. Curb**	**24' Grassed w/Hdr. Curb**	**8' Raised w/ Header Curb**
- **Outside Shoulder Width & Type**	**8' – C&G**	**8-10'**	**8' – C&G**
- **Outside Shoulder Slope**	**2%**	**2%**	**2%**
- **Auxiliary Lanes**	**N/A**	**N/A**	**Yes**
Posted Speed	**45**		**45**
Design Speed	**45**	**45**	**45**
Superelevation Rate	**4%**	**4%**	**4%**
Grade	**4%**	**8%**	**4%**
Access Control	**Permit**	**Permit**	**Permit**
Right-of-Way Width	**100'**	**N/A**	**100'**
Maximum Grade – Crossroad	**N/A**	**N/A**	**N/A**
Design Vehicle	**SU**	**SU**	**SU**

*According to current GDOT design policy if applicable

Side Street Design Features: SR 12/US278/Covington Hwy

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**4**	**N/A**	**4**
- **Lane Width(s)**	**12'**	**10'-12'**	**12'**
- **Median Width & Type**	**14' Flush**	**14' Flush**	**14' Flush**
- **Outside Shoulder Width & Type**	**8' – C&G**	**8-10'**	**8' – C&G**
- **Outside Shoulder Slope**	**2%**	**2%**	**2%**
Posted Speed	**45**		**45**
Design Speed	**45**	**45**	**45**
Min Horizontal Curve Radius	**N/A**	**371'**	**371'**
Superelevation Rate	**4%**	**4%**	**4%**
Grade	**2%**	**8%**	**2%**
Access Control	**Permit**	**Permit**	**Permit**
Right-of-Way Width	**100'**	**100'**	**100'**
Maximum Grade – Crossroad	**N/A**	**N/A**	**N/A**
Design Vehicle	**WB40**	**WB40**	**WB40**

*According to current GDOT design policy if applicable

Major Interchanges/Intersections: CR2989/Lithonia Industrial Blvd at SR 12/US278/Covington Hwy.

Utility Involvements: The project as currently planned should not change or affect the utilities.

POWER - To Be Determined
TELEPHONE - To Be Determined
GAS - To Be Determined
WATER - To Be Determined
CABLE - To Be Determined
RAILROAD – N/A

Public Interest Determination Policy and Procedure recommended (Utilities)? ☐ YES ☒ NO

SUE Required: ☐ Yes ☒ No

Railroad Involvement: N/A

Complete Streets - Bicycle, Pedestrian, and/or Transit Warrants:

Warrants met: ☒ None ☐ Bicycle ☐ Pedestrian ☐ Transit

Right-of-Way:
Required Right-of-Way anticipated: ☐ YES ☒ NO ☐ Undetermined
Easements anticipated: ☐ Temporary ☐ Permanent ☐ Utility ☐ Other

Anticipated number of impacted parcels: 0
Anticipated number of displacements (Total): 0
Businesses: 0
Residences: 0

Transportation Management Plan [TMP] Required: ☐ No ☒ Yes
If Yes: Project classified as: ☒ Non-Significant ☐ Significant
TMP Components Anticipated: ☒ TTC/SP 150 ☐ TO ☐ PI

Design Exceptions to FHWA/AASHTO controlling criteria anticipated: Design exception of lateral offset, power pole in northwest corner 18” behind face of curb.

Design Variances to GDOT standard criteria anticipated: None

ENVIRONMENTAL DATA

Anticipated Environmental Document:
GEPA: ☐ **NEPA:** ☒ Programmatic CE ☐ EA/FONSI ☐ EIS

Air Quality:
Is the project located in a PM 2.5 Non-attainment area? ☐ No ☒ Yes

Is the project located in an Ozone Non-attainment area? ☐ No ☒ Yes

Is a Carbon Monoxide hotspot analysis required? ☒ No ☐ Yes

MS4 Compliance – Is the project located in an MS4 area? ☐ No ☒ Yes

Environmental Permits/Variances/Commitments/Coordination anticipated: None

Is a PAR required? ☒ No ☐ Yes

NEPA/GEPA: To Be Determined - No adverse impacts anticipated

Ecology: To Be Determined - No adverse impacts anticipated

History: To Be Determined - No adverse impacts anticipated

Archeology: To Be Determined - No adverse impacts anticipated

Air & Noise: To Be Determined - No adverse impacts anticipated

Public Involvement: To Be Determined

Major stakeholders: GDOT, DeKalb County, City of Lithonia

PROJECT RESPONSIBILITIES

Project Activities:

Project Activity	Party Responsible for Performing Task(s)
Concept Development	GDOT
Design	GDOT
Right-of-Way Acquisition	N/A
Utility Relocation	Utility Company
Letting to Contract	GDOT
Construction Supervision	GDOT
Providing Material Pits	Contractor
Providing Detours	N/A
Environmental Studies, Documents, and Permits	GDOT
Environmental Mitigation	GDOT
Construction Inspection & Materials Testing	GDOT

Lighting required: ☒ No ☐ Yes

Concept Meeting: N/A

Other projects in the area: None

Other coordination to date: N/A

Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	ROW	Utility	CST	Environmental Mitigation	Total Cost
By Whom	GDOT	N/A	GDOT	GDOT	N/A	
$ Amount	189,834.79	0	0	393,158.06	0	582,992.85
Date of Estimate	6/5/2012		6/14/2013	7/22/2013		

CST Cost includes: Construction, Engineering & Inspection

ALTERNATIVES DISCUSSION

Alternative selection:

Preferred Alternative:			
Estimated Property Impacts:	**0 (No properties)**	**Estimated Total Cost:**	**$582,992.85**
Estimated ROW Cost:	**$0.00**	**Estimated CST Time:**	**6**
Rationale: The project can be completed with minimal property impact and low construction cost resulting in improved operations of the intersection and reduction of left turn movements queue spillover on the through lane of Lithonia Industrial Blvd on to SR 12.			

No-Build Alternative: No proposed enhancements.			
Estimated Property Impacts:	**0**	**Estimated Total Cost:**	**$0.00**
Estimated ROW Cost:	**$0.00**	**Estimated CST Time:**	**0**
Rationale: This alternative was not chosen because it does not fulfill the need and purpose of the project as set forth by Office of Planning.			

Comments: N/A

Attachments:

1. Concept Layout
2. Typical Sections
3. Detailed Cost Estimate
    a. Construction incl. E. & I.
    b. Liquid AC Cost Adjustment
    c. Utility
4. Accident Data Summary
5. Traffic Analysis
6. Traffic Engineering Study

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USER:mcoleman gplotborder-V8I-PD-color.tbl

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			

GEORGIA
DEPARTMENT OF TRANSPORTATION

NOT TO SCALE

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: DISTRICT 7

MAINLINE PLAN

LITHONIA IND. BLVD AT SR 12
INTERSECTION IMPROVEMENT

DRAWING No. 13-01

12/14/202 GPLN

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USER:mcotrenco

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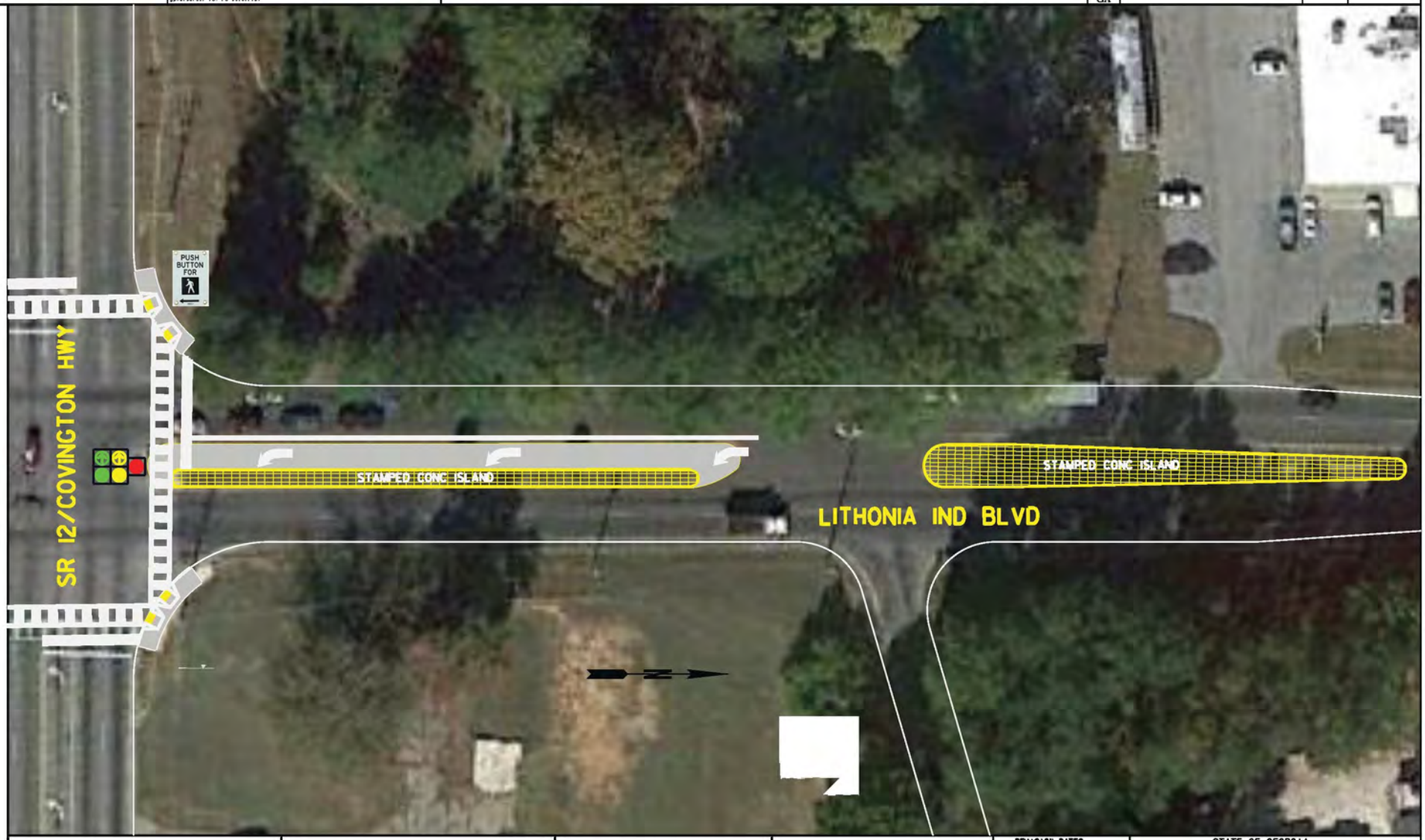
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



GEORGIA
DEPARTMENT
OF
TRANSPORTATION

NOT TO SCALE

REVISION DATES		

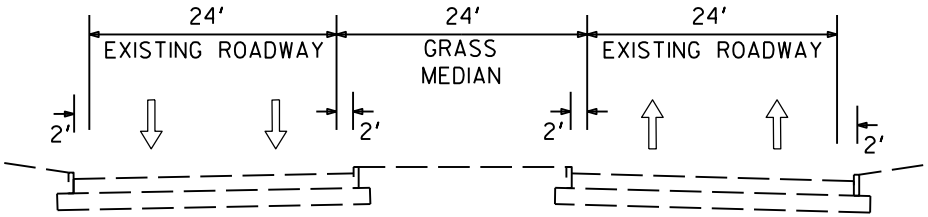
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: DISTRICT 7
MAINLINE PLAN

LITHONIA IND. BLVD AT SR 12

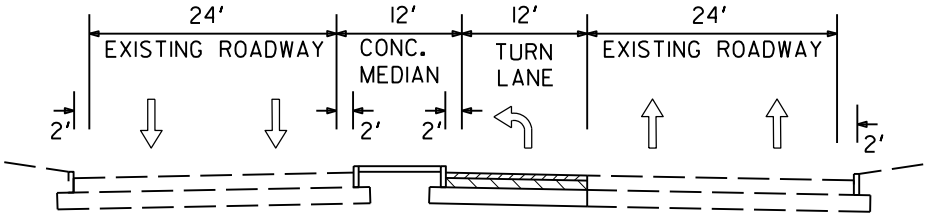
DRAWING No.
13-02

TYPICAL SECTIONS

EXISTING LITHONIA IND. BLVD

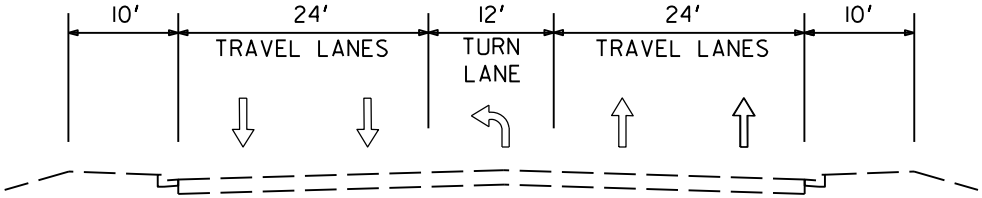


PROPOSED LITHONIA IND. BLVD



EXISTING S.R. 12

NO PROPOSED IMPROVEMENTS



				REVISION DATES	
		GEORGIA DEPARTMENT OF TRANSPORTATION	NOT TO SCALE		STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OFFICE: **TYPICAL SECTIONS** SR 12 AT LITHONIA IND. BLVD INTERSECT IMPROVEMENT DRAWING No. 05-01

PROJ. NO.		CALL NO.
P.I. NO.	0010871	
DATE	3/13/2013	

INDEX (TYPE)	**DATE**	**INDEX**
REG. UNLEADED	Mar-13	$ 3.683
DIESEL		$ 4.092
LIQUID AC		$ 567.00

Link to Fuel and AC Index:
http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx

LIQUID AC ADJUSTMENTS

PA=[((APM-APL)/APL)]xTMTxAPL

Asphalt

Price Adjustment (PA)				**4983.93**	**$**	**4,983.93**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	907.20		
Monthly Asphalt Cement Price month project let (APL)			$	567.00		
Total Monthly Tonnage of asphalt cement (TMT)				14.65		

ASPHALT	**Tons**	**%AC**	**AC ton**
Leveling		5.0%	0
12.5 OGFC		5.0%	0
12.5 mm	68	5.0%	3.4
9.5 mm SP		5.0%	0
25 mm SP	135	5.0%	6.75
19 mm SP	90	5.0%	4.5
	293		**14.65**

BITUMINOUS TACK COAT

Price Adjustment (PA)			**$**	**146.12**	**$**	**146.12**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	907.20		
Monthly Asphalt Cement Price month project let (APL)			$	567.00		
Total Monthly Tonnage of asphalt cement (TMT)				0.429510092		

Bitum Tack Gals	gals/ton	tons
100	232.8234	0.42951009

PROJ. NO.		CALL NO.	
P.I. NO.	0010871		
DATE	3/13/2013		

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)				**0**	**$ -**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	907.20	
Monthly Asphalt Cement Price month project let (APL)			$	567.00	
Total Monthly Tonnage of asphalt cement (TMT)				0	

Bitum Tack	SY	Gals/SY	Gals	gals/ton	tons
Single Surf. Trmt.		0.20	0	232.8234	0
Double Surf.Trmt.		0.44	0	232.8234	0
Triple Surf. Trmt		0.71	0	232.8234	0
					0

TOTAL LIQUID AC ADJUSTMENT	**$**	**5,130.05**

Department of Transportation
State of Georgia

Interdepartmental Correspondence

FILE	Utility Cost Estimate	**OFFICE**	District #7
		DATE	June 14, 2013

FROM Prick Allen, District 7 Utilities Engineer
Wade Woodard, Metro Utilities Engineer, Utility Cost Estimator

TO Mac Cranford, D-7 Assistance Preconstruction Engineer

SUBJECT **Preliminary Utilities Cost Estimate**
Project: Dekalb County
P.I. No.: 0010871
Description: SR 12/US278 @ CR/Lithonia Industrial Blvd
Quick Project

As per your request, Utilities Cost Estimates on the above referenced projects. **There are no Utilities reimbursements at this time.** When plans are develop, this may change.

If you have any questions, please contact Wade Woodard at
The **GEORGIA DEPARTMENT OF TRANSPORTATION**
5025 New Peachtree Road Chamblee, Georgia 30341
Office of Utilities-District-7, at (770) 986-1117

Sincerely,

Rachel S. Brown
District Engineer

By: Patrick Allen
District Utilities Engineer

PA: WW
Attachments
c: file

ACCIDENT DATA SUMMARY

For Year(s): 2010,2011,2012

		SR 12 AT CS2989					
	Angle	Head On	Rear End	Sideswipe	Non Collision	Injuries	Fatalities
2010	9	1	11	2	1	1	0
2011	14	0	11	2	2	7	0
2012	10	2	12	5	2	22	0
Total	**33**	**3**	**34**	**9**	**5**	**30**	**0**

TOTAL CRASHES - 84

Covington Highway/US 278/SR 12 at Lithonia Industrial Boulevard Intersection Operations and Safety Improvement Project
DeKalb County

Prepared for:

DeKalb County
Department of Transportation
REVISED May 2010

Prepared by:

GRICE
& ASSOCIATES

Two Midtown Plaza
1349 West Peachtree Street, NE
Suite 1290
Atlanta, Georgia 30309
Phone (404) 577-6300
Fax (404) 577-6310

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EXECUTIVE SUMMARY

The intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard in DeKalb County has been examined for intersection operations and safety improvements. The study intersection is controlled by a two-phase traffic signal. The eastbound and westbound approaches of Covington Highway/US 278/SR 12 each have a left-turn lane, a through lane, and a shared through/right-turn lane. The northbound approach of Lithonia Industrial Boulevard has a shared left-turn/through lane, a through lane, and a right-turn lane. The southbound approach of Lithonia Industrial Boulevard has a shared left-turn/through lane and a shared through/right-turn lane. The design year for the proposed improvements is 2032.

The following is a summary of the recommended improvements:

- Install a left-turn lane on the northbound approach of Lithonia Industrial Boulevard at Covington Highway/US 278/SR 12.

- Close or convert to right-in/right-out the existing driveway to the auto parts store on Lithonia Industrial Boulevard that is approximately 130 feet south of the study intersection.

- Install a left-turn lane southbound on Lithonia Industrial Boulevard at the auto parts store driveway that is approximately 430 feet south of the study intersection.

- Close or convert to right-in/right-out the existing driveway to the fire station on Lithonia Industrial Boulevard that is approximately 130 feet south of the study intersection.

- Close the median opening on Lithonia Industrial Boulevard that is approximately 130 feet south of the study intersection. If the fire station driveway remains open, install a median with a mountable curb on Lithonia Industrial Boulevard so that the fire trucks can drive across it but other vehicles will be discouraged from doing so.

- Restripe or reconstruct the eastbound receiving lane on Covington Highway/US 278/SR 12 for the northbound right-turn lane on Lithonia Industrial Boulevard so that it is no longer a receiving lane for the northbound right-turning vehicles.

- Install a left-turn lane on the southbound approach of Lithonia Industrial Boulevard at Covington Highway/US 278/SR 12.

- Install a right-turn lane on the eastbound approach of Covington Highway/US 278/SR 12 at Lithonia Industrial Boulevard.

- Install a right-turn lane on the westbound approach of Covington Highway/US 278/SR 12 at Lithonia Industrial Boulevard.

- Upgrade the existing traffic signal at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard to include protected+permitted left-turn phases on all approaches and signal backplates on all signal faces.

- Stripe crosswalks to meet current standards on all approaches of the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard.

- Reconstruct the existing ADA ramps to meet current standards on all approaches of the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard.

- Upgrade the existing traffic signal at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard to include pedestrian signal heads and pedestrian detectors that meet current standards on all approaches.

- Retime the existing traffic signal at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard to include protected+permitted left-turn phases on all approaches, yellow change intervals, red clearance intervals, and pedestrian intervals that meet current standards.

1. STUDY LOCATION

The intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard in DeKalb County has been examined for intersection operations and safety improvements.

The study intersection is located approximately 0.85 miles north of Interstate 20. At the study intersection, Covington Highway/US 278/SR 12 runs in the northwest-southeast direction, and Lithonia Industrial Boulevard runs in the northeast-southwest direction. For the purpose of this study, Covington Highway/US 278/SR 12 is considered as running in the east-west direction, and Lithonia Industrial Boulevard is considered as running in the north-south direction. Figure 1 – Location Map in Appendix A illustrates the study intersection.

2. TOPOGRAPHY

At the study intersection, the eastbound approach of Covington Highway/US 278/SR 12 is comprised of one 14-foot left-turn lane, one 11-foot through lane, and one 11-foot shared through/right-turn lane. The westbound approach is comprised of one 12-foot left-turn lane, one 12-foot through lane, and one 12-foot shared through/right-turn lane.

The northbound approach of Lithonia Industrial Boulevard consists of one 11-foot shared left-turn/through lane, one 13-foot through lane, and one 11-foot right-turn lane. The southbound approach of Lithonia Industrial Boulevard consists of one 12-foot shared left-turn/through lane and one 12-foot shared through/right-turn lane.

A single-family home is located in the northwest quadrant of the study intersection. A fire station is located in the southwest quadrant. An auto parts store is located in the southeast quadrant. An apparently vacant single-family home is located in the northeast quadrant.

Please see photos of the study intersection in Appendix B and Figure 2 – Existing Conditions Diagram in Appendix C for topographical information about the study intersection.

3. EXISTING TRAFFIC CONTROL

The study intersection is controlled by a two-phase traffic signal. Please see Figure 2 – Existing Conditions Diagram in Appendix C and Appendix F – Signalized Intersection Capacity Analysis Results (SYNCHRO reports) for phasing and timing of the traffic signal. There are a striped crosswalk, pedestrian signal heads, and pedestrian pushbuttons on the east leg of the study intersection.

4. VEHICLULAR VOLUMES

Turning movement counts (TMC) and twenty-four hour approach tube counts were collected at the intersection for the purpose of conducting intersection capacity analysis. Table 1 shows the approach volumes recorded in December 2009.

Table 1
Existing 2009 Daily Intersection Approach Volumes by Direction

Approach Direction	Daily Approach Volumes (vehicles / day)
Northbound on Lithonia Industrial Blvd	5,472
Southbound on Lithonia Industrial Blvd	5,748
Eastbound on Covington Hwy	8,465
Westbound on Covington Hwy	8,813

Please refer to Figure 3 in Appendix D for existing 2009 peak hour turning movement counts and traffic count data in Appendix H for detailed traffic volume information about the study intersection.

5. VEHICULAR SPEEDS

The posted speed limit on Covington Highway/US 278/SR 12 in the vicinity of the study intersection is 45 mph. The posted speed limit on Lithonia Industrial Boulevard is 45 mph.

6. PEDESTRIAN MOVEMENTS

There are handicap ramps on all corners of the study intersection. There are sidewalks across the grass medians on Lithonia Industrial Boulevard at the study intersection. There are a striped crosswalk, pedestrian signal heads, and pedestrian pushbuttons on the east leg of the study intersection. There are MARTA bus stops on the east and west legs of the study intersection. There are no sidewalks along Covington Highway/US 278/SR 12 or Lithonia Industrial Boulevard in the vicinity of the study intersection. Three pedestrians were observed at the study intersection between 7 a.m. and 9 a.m.; fourteen pedestrians were observed between 11 a.m. and 1 p.m.; and nineteen pedestrians were observed between 4 p.m. and 6 p.m.

7. PARKING

There is no on-street parking permitted in the vicinity of the study intersection along Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard. Off-street parking is provided at the auto parts store.

8. CRASH HISTORY

Crash data were collected from Georgia Department of Transportation (GDOT) for a four-year period from January 2005 to December 2008. The crash data are summarized in Table 2. Please refer to Figures 6 through 9 in Appendix E for detailed information including type of crash, location, date, time, surface condition, day/night, number of injuries, and number of fatalities. Crash rates for each year, expressed as the number of crashes per million entering vehicles (MEV), are also included in Table 2. The crash rates were calculated as shown in the formula below.

$$\text{Intersection Crash Rate} = \frac{[(\text{no. of crashes}) \times (10^6)]}{[\text{AADT} \times 365]}$$

AADT = annual average daily traffic

Table 2
Crash Data

Year	Rear End	Right Angle	Left-Turn with Through	Side Swipe Same Direction	Off Road	Over-taking/ Cut-Off	Total Number of Crashes	Crash Rate per MEV	Injury Crashes / Number of Persons Injured	Fatal Crashes / Number of Fatalities
2005	10	4	2	1	1	0	18	1.45	3 / 5	0 / 0
2006	10	5	5	2	1	0	23	1.86	8 / 10	0 / 0
2007	7	4	3	8	1	1	24	2.21	2 / 4	0 / 0
2008	11	2	8	1	0	0	22	2.17	6 / 7	0 / 0
Total	38	15	18	12	3	1	87	1.90	19 / 26	0 / 0

As can be seen from Table 2, there were 87 crashes reported during the four-year period. The number of crashes reported each year was relatively consistent. Six types of crash were reported: rear end, right angle, left-turn with through, side swipe same direction, off road, and overtaking/cut-off. No head on, side swipe opposite direction, pedestrian, or bicycle crashes were reported.

The most common type of crash was rear end. This is expected at a signalized intersection. The number of rear end crashes each year was relatively consistent. Almost half of the rear end crashes occurred on the westbound approach. Consideration should be given to installing signal backplates on the signal heads to increase signal target value. The yellow change intervals at the intersection are currently 3.5 seconds on all approaches, and the red clearance intervals are 2.0 seconds on all approaches. Consideration should be given to retiming the traffic signal with longer yellow change intervals. The number of rear end crashes might decrease if the yellow change intervals are longer.

The second most common type of crash was between a left-turning vehicle and the opposing through vehicle. There are currently no protected left-turn phases on any of the approaches. If protected left-turn phases are installed, fewer crashes of this type are expected to occur.

Right angle crashes between through vehicles on conflicting approaches were the third most common type of crash. The number of right angle crashes each year was relatively consistent. Consideration should be given to installing signal backplates on the signal heads to increase signal target value. The yellow change intervals at the intersection are currently 3.5 seconds on all approaches, and the red clearance intervals are 2.0 seconds on all approaches. Consideration should be given to retiming the traffic signal with longer yellow change intervals. The number of right angle crashes might decrease if the yellow change intervals are longer.

Side swipe same direction crashes were the fourth most common type of crash. The number of side swipe same direction crashes in 2007 was considerably higher than in the other years.

There was one off road crash each year, except in 2008, when there was zero.

There was one overtaking/cut-off crash between a right-turning vehicle and a through vehicle on the same approach in 2007.

There were nineteen injury crashes resulting in 26 persons injured during the four-year period. There were no fatalities during the four-year period.

9. ADJACENT SIGNALIZED INTERSECTIONS

The following signalized intersections, along with their measured distances to the study intersection, were identified within one mile of the study intersection along Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard:

- Covington Highway/US 278/SR 12 at Phillips Road, 0.37 miles west
- Covington Highway/US 278/SR 12 at Evans Mill Road, 0.81 miles east
- Lithonia Industrial Boulevard at Marbut Road, 1.0 mile north
- Lithonia Industrial Boulevard at The Crossing Way/Chupp Road, 0.62 miles south
- Lithonia Industrial Boulevard at I-20 Westbound On-ramp/Old Hillandale Drive, 0.82 miles south
- Lithonia Industrial Boulevard at I-20 Eastbound Off-ramp, 0.95 miles south

10. TRAFFIC FORECAST

The following two years are considered for intersection capacity analysis:

1. 2012 as the opening year conditions, and
2. 2032 as the design year conditions.

Accordingly, traffic volumes are projected to the two years based on the following data:

- Historic traffic volumes from GDOT
- Existing 2009 traffic volumes
- Traffic growth rate per year

The traffic growth rate per year is derived from historic traffic volumes, collected from GDOT Traffic Count (TC) Stations, along Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard in the vicinity of the study intersection. The growth rate is calculated, using a linear regression analysis of the historic traffic volumes, to be 6.5% per year between 2009 and 2012. The growth rate per year between 2012 and 2032 is 0.5%. The higher growth rate between 2009 and 2012 reflects the recovery from the current economic downturn. More modest growth is expected over the long term.

The traffic forecast procedure is illustrated by the following equations:

$$V_{2012} = V_{2009} \times (1 + R_{2009\text{-}2012})^{3}$$

$$V_{2032} = V_{2012} \times (1 + R_{2012\text{-}2032})^{20}$$

Where:

V_{2009} = existing 2009 traffic volume
V_{2012} = projected 2012 opening year traffic volume
V_{2032} = projected 2032 design year traffic volume
$R_{2009\text{-}2012}$ = traffic growth rate per year from 2009 to 2012
$R_{2012\text{-}2032}$ = traffic growth rate per year from 2012 to 2032

Please refer to Figure 4 in Appendix D for 2012 opening year peak hour turning movement counts and Figure 5 in Appendix D for 2032 design year peak hour turning movement counts.

11. SIGNALIZED INTERSECTION CAPACITY ANALYSIS

Capacity and Level of Service (LOS) analysis for the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard was conducted based on analysis procedures provided in the *Highway Capacity Manual, Special Report 209*, published by the Transportation Research Board (2000). Capacity was examined for signalized conditions.

The results of the intersection capacity analysis for 2012 opening year, under conditions that no improvement measures are implemented, are summarized in Table 3. The signalized intersection capacity analysis reports are included in Appendix F.

Table 3
LOS — 2012 Opening Year, No Improvements
for Covington Hwy at Lithonia Industrial Blvd
Signalized Intersection

Approach	LOS (control delay per vehicle in seconds)	
	AM Peak	PM Peak
Covington Hwy Eastbound	C (24.0)	F (158.0)
Covington Hwy Westbound	F (92.7)	C (25.1)
Lithonia Industrial Blvd Northbound	B (11.0)	B (10.1)
Lithonia Industrial Blvd Southbound	B (11.2)	B (14.4)
Intersection	D (47.1)	E (73.2)

As the capacity analysis results in Table 3 show, the eastbound, northbound, and southbound approaches, as well as the overall intersection, operate at adequate LOS (letter grade "D" and better) during the AM peak period in the 2012 opening year with no improvements; the westbound approach of Covington Highway/US 278/SR 12 operates at an inadequate LOS. The westbound, northbound, and southbound approaches operate at adequate LOS during the PM peak period in the 2012 opening year with no improvements; the eastbound approach of Covington Highway/US 278/SR 12 and the overall intersection operate at inadequate LOS.

Capacity analysis was also conducted for the scenario where the proposed improvements if the intersection remains signalized as described in Section 15. Recommendations will be implemented in the 2012 opening year. The results of the intersection capacity analysis for this scenario are summarized in Table 4.

Table 4
LOS — 2012 Opening Year, Proposed Signalized Improvements
for Covington Hwy at Lithonia Industrial Blvd
Signalized Intersection

Approach	LOS (control delay per vehicle in seconds)	
	AM Peak	PM Peak
Covington Hwy Eastbound	C (26.2)	D (37.0)
Covington Hwy Westbound	D (36.1)	C (27.6)
Lithonia Industrial Blvd Northbound	C (23.5)	C (26.7)
Lithonia Industrial Blvd Southbound	C (26.8)	C (30.8)
Intersection	C (29.9)	C (31.9)

As the capacity analysis results in Table 4 show, all the approaches, as well as the overall intersection, operate at adequate LOS during the AM and PM peak periods, assuming that the proposed improvements if the intersection remains signalized are fully implemented in the 2012 opening year.

Capacity analysis was conducted for the 2032 design year for two scenarios: without improvements and with the proposed improvements if the intersection remains signalized. The analysis results are summarized in Table 5 (no improvements) and Table 6 (proposed improvements if the intersection remains signalized).

Table 5
LOS — 2032 Design Year, No Improvements
for Covington Hwy at Lithonia Industrial Blvd
Signalized Intersection

Approach	LOS (control delay per vehicle in seconds)	
	AM Peak	PM Peak
Covington Hwy Eastbound	C (27.5)	F (213.3)
Covington Hwy Westbound	F (140.8)	C (31.4)
Lithonia Industrial Blvd Northbound	B (12.0)	B (10.9)
Lithonia Industrial Blvd Southbound	B (12.2)	B (17.2)
Intersection	E (67.6)	F (97.3)

Table 6
LOS — 2032 Design Year, Proposed Signalized Improvements
for Covington Hwy at Lithonia Industrial Blvd
Signalized Intersection

Approach	LOS (control delay per vehicle in seconds)	
	AM Peak	PM Peak
Covington Hwy Eastbound	C (23.6)	E (56.7)
Covington Hwy Westbound	D (42.1)	C (31.9)
Lithonia Industrial Blvd Northbound	D (35.9)	C (29.9)
Lithonia Industrial Blvd Southbound	D (36.8)	C (34.6)
Intersection	D (35.4)	D (42.0)

As shown in Table 5, under the conditions that no improvement will be implemented in the 2032 design year, the eastbound, northbound, and southbound approaches operate at adequate LOS during the AM peak period; the westbound approach of Covington Highway/US 278/SR 12 and the overall intersection operate at inadequate LOS. The westbound, northbound, and southbound approaches operate at adequate LOS during the PM peak period in the 2032 design year with no improvements; the eastbound approach of Covington Highway/US 278/SR 12 and the overall intersection operate at inadequate LOS.

As shown in Table 6, under conditions that the proposed improvements if the intersection remains signalized will be implemented in the 2032 design year, all of the approaches, as well as the overall intersection, operate at adequate LOS during the AM and PM peak periods, except for the eastbound approach of Covington Highway/US 278/SR 12 during the PM peak period, which operates at LOS E; however, the proposed improvements if the intersection remains signalized significantly reduce delay for this approach from 213.3 seconds per vehicle to 56.7 seconds per vehicle.

12. ROUNDABOUT ANALYSIS

A multi-lane roundabout at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard was also analyzed. GDOT's *Roundabout Analysis Tool* was used to perform the analysis for the AM and PM peak periods for the 2012 opening year and the 2032 design year. Each approach to the roundabout was assumed to have a shared left-turn/through lane, a through lane, and a right-turn bypass lane. The results, including LOS, control delay per vehicle in seconds, and 95th percentile queue length (the length that the queue is not expected to exceed 95% of the time) for the critical lane (the approach lane with the highest volume) on each approach, are shown in Tables 7 and 8. The results for the right-turn bypass lanes are shown in Table 9. The roundabout analysis reports are included in Appendix G.

It should be noted that GDOT's *Roundabout Analysis Tool* provides two LOS for the critical lane: one for roadway users who are unfamiliar with the roundabout, as could be expected when the roundabout first opens; and one for roadway users who are familiar with the roundabout, as could be expected in the design year. Therefore, it is not unusual for the LOS in the design year to be better than the LOS in the opening year, even though traffic volumes are higher in the design year. It should also be noted that no LOS is provided for the overall roundabout.

Table 7
LOS — 2012 Opening Year, Multi-Lane Roundabout
for Covington Hwy at Lithonia Industrial Blvd

Approach	Roadway User Type	LOS (control delay per vehicle in seconds) [95th percentile queue in feet]	
		AM Peak	PM Peak
Covington Hwy Eastbound	**Unfamiliar**	**B (10.7) [78]**	**F (84.7) [522]**
	Familiar	A (3.0) [46]	A (8.0) [214]
Covington Hwy Westbound	**Unfamiliar**	**D (34.3) [304]**	**B (14.4) [131]**
	Familiar	A (5.4) [139]	A (3.6) [72]
Lithonia Industrial Blvd Northbound	**Unfamiliar**	**B (10.6) [65]**	**D (31.0) [140]**
	Familiar	A (2.9) [37]	A (4.8) [54]
Lithonia Industrial Blvd Southbound	**Unfamiliar**	**D (28.4) [146]**	**C (22.5) [153]**
	Familiar	A (4.5) [57]	A (4.0) [65]

Table 8 LOS — 2032 Design Year, Multi-Lane Roundabout for Covington Hwy at Lithonia Industrial Blvd			
Approach	**Roadway User Type**	**LOS (control delay per vehicle in seconds) [95th percentile queue in feet]**	
		AM Peak	**PM Peak**
Covington Hwy Eastbound	Unfamiliar	B (13.4) [105]	F (157.9) [786]
	Familiar	**A (3.3) [56]**	**B (13.7) [353]**
Covington Hwy Westbound	Unfamiliar	F (68.7) [474]	C (20.5) [187]
	Familiar	**A (7.3) [200]**	**A (4.2) [92]**
Lithonia Industrial Blvd Northbound	Unfamiliar	B (13.2) [86]	F (56.7) [220]
	Familiar	**A (3.2) [45]**	**A (6.3) [77]**
Lithonia Industrial Blvd Southbound	Unfamiliar	F (51.2) [228]	E (38.1) [235]
	Familiar	**A (5.7) [79]**	**A (4.9) [87]**

Table 9 LOS — Right-Turn Bypass Lanes for Covington Hwy at Lithonia Industrial Blvd			
Approach	**Year**	**LOS (control delay per vehicle in seconds) [95th percentile queue in feet]**	
		AM Peak	**PM Peak**
Covington Hwy Eastbound	2012	A (6.6) [32]	A (6.8) [33]
	2032	A (7.3) [39]	A (7.6) [40]
Covington Hwy Westbound	2012	A (5.8) [24]	A (5.2) [9]
	2032	A (6.8) [31]	A (5.3) [10]
Lithonia Industrial Blvd Northbound	2012	A (5.6) [4]	B (11.9) [29]
	2032	A (5.9) [5]	B (14.5) [39]
Lithonia Industrial Blvd Southbound	2012	B (11.3) [34]	A (9.3) [35]
	2032	B (13.6) [45]	B (11.0) [45]

As can be seen in Table 7, for the 2012 opening year when the roadway users are unfamiliar with the roundabout, all approaches to the roundabout operate at adequate LOS during the AM peak period. During the PM peak period, all approaches operate at adequate LOS, except for the eastbound approach of Covington Highway/US 278/SR 12, which operates at LOS F; however, the multi-lane roundabout significantly reduces delay for this approach from 158.0 seconds per vehicle to 84.7 seconds per vehicle. The right-turn bypass lanes on all approaches operate at adequate LOS.

A comparison of Tables 4 and 7 shows that during the AM peak period, a multi-lane roundabout provides lower delays than the improvements proposed if the intersection remains signalized on all approaches except the southbound approach, where the delay would be less than two seconds per vehicle higher. During the PM peak period, a multi-lane roundabout provides lower delays

than the improvements proposed if the intersection remains signalized on the westbound and southbound approaches; delay would be higher on the eastbound and northbound approaches.

As can be seen in Table 8, for the 2032 design year when the roadway users are familiar with the roundabout, all approaches to the roundabout operate at adequate LOS during the AM and PM peak periods. The right-turn bypass lanes on all approaches operate at adequate LOS.

A comparison of Tables 6 and 8 shows that a multi-lane roundabout provides better LOS on all approaches during both peak periods than the improvements proposed if the intersection remains signalized.

A roundabout should eliminate right-angle and left-turn with through crashes. According to GDOT, at intersections where roundabouts have been installed to replace existing intersections, crashes of all types have been reduced by over 35%, and injury crashes have been reduced by over 60%.

13. LITHONIA INDUSTRIAL BOULEVARD EXTENSION

Lithonia Industrial Boulevard is currently being extended from South Stone Mountain-Lithonia Road to Rock Chapel Road/SR 124.

Grice & Associates prepared a Traffic Forecast and Analysis study for the Lithonia Industrial Boulevard Extension in February 2001 for the DeKalb County Public Works Department. At the time the 2001 study was performed, the Lithonia Industrial Boulevard Extension was expected to be open in 2002. Ten percent of the traffic on Rock Chapel Road/SR 124 in the vicinity of the Lithonia Industrial Boulevard Extension was expected to divert to the Extension. Two major developments that were expected to generate considerable traffic volumes were also expected to open along the Lithonia Industrial Boulevard Extension in 2002 – a 3,021,751 square foot industrial development between South Stone Mountain-Lithonia Road and Rogers Lake Road, and a 403,000 square foot office development at the intersection of the Extension and Rock Chapel Road/SR 124. The 2001 study forecasted traffic at the intersection of the Lithonia Industrial Boulevard Extension and South Stone Mountain-Lithonia Road from the traffic diverted from Rock Chapel Road/SR 124, the three million square foot industrial development, and the 403,000 square foot office development.

At this time, the Lithonia Industrial Boulevard Extension is still under construction, and the three million square foot industrial development and the 403,000 square foot office development have not been developed. The traffic volumes expected at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard from the traffic diverted from Rock Chapel Road/SR 124 to the Lithonia Industrial Boulevard Extension, the three million square foot industrial development, and the 403,000 square foot office development were estimated for 2012 and 2032.

GDOT's 2008 count on Rock Chapel Road/SR 124 in the vicinity of the Lithonia Industrial Boulevard Extension was grown by the 1% per year average growth rate used in the 2001 study to 2012 and 2032, and 10% of the traffic was assumed to divert to the Extension. The eastbound and westbound through volumes on Lithonia Industrial Boulevard-Lithonia Industrial Boulevard Extension at South Stone Mountain-Lithonia Road were based on the directional distribution in the 2001 study. These volumes were assumed to reach the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard.

The eastbound and westbound through volumes on Lithonia Industrial Boulevard-Lithonia Industrial Boulevard Extension at South Stone Mountain-Lithonia Road from the three million square foot industrial development and the 403,000 square foot office development were taken from the 2001 study. These volumes were assumed to reach the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard.

The traffic diverted from Rock Chapel Road/SR 124, the three million square foot industrial development, and the 403,000 square foot office development were then assigned to the turning movement volumes at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard based on the existing 2009 turning movement counts.

The additional traffic that could be expected at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard from the Lithonia Industrial Boulevard Extension if the Extension, the three million square foot industrial development, and the 403,000 square foot office development are completed is shown in Table 10.

Table 10
Volumes from Lithonia Industrial Blvd Ext, 3 Million s.f. Industrial Development, and 403,000 s.f. Office Development

	Northbound – Lithonia Industrial Blvd			**Southbound – Lithonia Industrial Blvd**			**Eastbound – Covington Hwy**			**Westbound – Covington Hwy**		
	Left	**Thru**	**Right**	**Left**	**Thru**	**Right**	**Left**	**Thru**	**Right**	**Left**	**Thru**	**Right**
2012 AM	0	63	0	32	120	36	14	0	0	0	0	33
2012 PM	0	72	0	184	498	160	22	0	0	0	0	15
2032 AM	0	66	0	35	133	40	15	0	0	0	0	35
2032 PM	0	77	0	189	509	163	23	0	0	0	0	16

Capacity analysis was conducted for the 2032 design year with the additional volumes expected from the Lithonia Industrial Boulevard Extension, the three million square foot industrial development, and the 403,000 square foot office development and the proposed improvements if

the intersection remains signalized as described in Section 15. Recommendations. The analysis results are summarized in Table 11.

Table 11
LOS — 2032 Design Year with Volumes from Lithonia Industrial Blvd Ext, 3 Million s.f. Industrial Development, and 403,000 s.f. Office Development, Proposed Signalized Improvements for Covington Hwy at Lithonia Industrial Blvd Signalized Intersection

Approach	LOS (control delay per vehicle in seconds)	
	AM Peak	PM Peak
Covington Hwy Eastbound	C (24.9)	F (90.2)
Covington Hwy Westbound	D (50.9)	D (54.4)
Lithonia Industrial Blvd Northbound	D (42.6)	E (64.1)
Lithonia Industrial Blvd Southbound	D (42.4)	F (84.8)
Intersection	D (41.5)	E (77.7)

As shown in Table 11, under conditions that the proposed improvements if the intersection remains signalized will be implemented in the 2032 design year with the additional volumes expected from the Lithonia Industrial Boulevard Extension, the three million square foot industrial development, and the 403,000 square foot office development, all of the approaches, as well as the overall intersection, operate at adequate LOS during the AM peak period. During the PM peak period, the overall intersection operates at LOS E. The southbound left-turn lane on Lithonia Industrial Boulevard would need 340 feet of storage, which would require closing the median opening on Lithonia Industrial Boulevard at Parkway Drive, and restricting Parkway Drive to right-in/right-out at Lithonia Industrial Boulevard. The northbound left-turn lane on Lithonia Industrial Boulevard would need 250 feet of storage. The eastbound left-turn lane on Covington Highway would need to be restriped to include 195 feet of storage.

It is unlikely that additional improvements over those described in Section 15. Recommendations if the intersection remains signalized can be made without right-of-way acquisition. It is also uncertain if the three million square foot industrial development and the 403,000 square foot office development will be built; however, it is expected that development will occur even if those two specific developments do not.

A roundabout is not expected to operate at adequate LOS with the additional volumes expected from the Lithonia Industrial Boulevard Extension, the three million square foot industrial development, and the 403,000 square foot office development.

14. CONCLUSIONS

The following conclusions are based on the collected data, intersection capacity analyses, and field observations:

- The signalized intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard operates at an adequate LOS during the AM peak period in the 2012 opening year without improvement measures, and at LOS E during the PM peak period.

- In the 2012 opening year with the proposed improvements if the intersection remains signalized, the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard operates at adequate LOS during the AM and PM peak periods.

- The signalized intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard operates at inadequate LOS during the AM and PM peak periods in the 2032 design year without improvement measures.

- In the 2032 design year with the proposed improvements if the intersection remains signalized, the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard operates at adequate LOS during the AM and PM peak periods.

- In the 2012 opening year with a multi-lane roundabout, the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard operates at adequate LOS on all approaches during the AM peak period. During the PM peak period, all approaches operate at adequate LOS, except for the eastbound approach of Covington Highway/US 278/SR 12.

- In the 2032 design year with a multi-lane roundabout, the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard operates at adequate LOS on all approaches during both peak periods.

- In the 2012 opening year, a multi-lane roundabout provides approximately the same or lower delays than the improvements proposed if the intersection remains signalized on all approaches during the AM peak period. During the PM peak hour, a multi-lane roundabout provides lower delays on the westbound and southbound approaches; the improvements proposed if the intersection remains signalized provide lower delays on the eastbound and northbound approaches.

- In the 2032 design year, a multi-lane roundabout provides lower delays than the improvements proposed if the intersection remains signalized on all approaches during both peak periods.

- Rear end, right angle, and left-turn with through crashes were the most common types of crashes reported between 2005 and 2008. The improvement measures proposed in this

study as detailed in Section 15. Recommendations are expected to enhance safety at the intersection.

- According to GDOT, at intersections where roundabouts have been installed to replace existing intersections, crashes of all types have been reduced by over 35 percent, and injury crashes have been reduced by over 60 percent.

15. RECOMMENDATIONS

Based on analysis of traffic data, collision experience, and intersection operations, the following recommendations and/or improvement measures are proposed for the study intersection:

If the intersection remains signalized:

- Install a 12-foot left-turn lane on the northbound approach of Lithonia Industrial Boulevard at Covington Highway/US 278/SR 12 to include a 205-foot storage length. This will require closing the median opening on Lithonia Industrial Boulevard that is approximately 130 feet south of the study intersection.

- Reconstruct the existing shared left-turn/through lane on the northbound approach of Lithonia Industrial Boulevard at Covington Highway/US 278/SR 12 into a through lane.

- Close the existing driveway to the auto parts store on Lithonia Industrial Boulevard that is approximately 130 feet south of the study intersection. The auto parts store has another driveway on Lithonia Industrial Boulevard approximately 430 feet south of the study intersection, and a driveway on Covington Highway/US 278/SR 12 approximately 170 feet east of the study intersection. If the auto parts store driveway cannot be closed, consider converting it to right-in/right-out.

- Consider installing a left-turn lane southbound on Lithonia Industrial Boulevard at the auto parts store driveway that is approximately 430 feet south of the study intersection.

- Consider closing the existing driveway to the fire station on Lithonia Industrial Boulevard that is approximately 130 feet south of the study intersection. This driveway aligns with the existing driveway to the auto parts store. It appears that the fire trucks use the driveway on Covington Highway/US 278/SR 12 approximately 95 feet west of the study intersection. If the fire station driveway on Lithonia Industrial Boulevard cannot be closed, consider converting it to right-in/right-out.

- If the fire station driveway and the auto parts store driveway are closed or converted to right-in/right-out, the median opening on Lithonia Industrial Boulevard that is approximately 130 feet south of the study intersection can be closed. If the fire station

driveway remains open, consider installing a median with a mountable curb on Lithonia Industrial Boulevard so that the fire trucks can drive across it but other vehicles will be discouraged from doing so.

- The eastbound receiving lane on Covington Highway/US 278/SR 12 for the northbound right-turn lane on Lithonia Industrial Boulevard currently becomes a right-turn lane for the auto parts store driveway on Covington Highway/US 278/SR 12 that is approximately 170 feet east of the study intersection. Consider restriping or reconstructing the receiving lane so that it is no longer a receiving lane for the northbound right-turning vehicles.

- Install a 12-foot left-turn lane on the southbound approach of Lithonia Industrial Boulevard at Covington Highway/US 278/SR 12 to include a 290-foot storage length. This will prevent queued through vehicles from blocking the entrance to the left-turn lane. If a 290-foot storage length is infeasible due to the proximity of the median opening at Parkway Drive approximately 270 feet north of the study intersection, install as long a left-turn lane as is practical; a 145-foot storage length is required to prevent queued left-turning vehicles from spilling out into the adjacent through lane.

- Reconstruct the existing shared left-turn/through lane on the southbound approach of Lithonia Industrial Boulevard at Covington Highway/US 278/SR 12 into a through lane.

- Install a 12-foot right-turn lane on the eastbound approach of Covington Highway/US 278/SR 12 at Lithonia Industrial Boulevard to include a 760-foot storage length. This will prevent queued through vehicles from blocking the entrance to the right-turn lane. If a 760-foot storage length is infeasible due to the proximity of the fire station driveway approximately 95 feet west of the study intersection, install as long a right-turn lane as is practical. A 95-foot storage length is required to prevent queued right-turning vehicles from spilling out into the adjacent through lane. The minimum storage length from GDOT's *Regulations for Driveway and Encroachment Control*, October 10, 2009, is 175 feet.

- Reconstruct the existing shared through/right-turn lane on the eastbound approach of Covington Highway/US 278/SR 12 into a through lane.

- Install a 12-foot right-turn lane on the westbound approach of Covington Highway/US 278/SR 12 at Lithonia Industrial Boulevard to include a 685-foot storage length. This will prevent queued through vehicles from blocking the entrance to the right-turn lane. If a 685-foot storage length is infeasible, install as long a right-turn lane as is practical. A 90-foot storage length is required to prevent queued right-turning vehicles from spilling out into the adjacent through lane. The minimum storage length from GDOT's *Regulations for Driveway and Encroachment Control*, October 10, 2009, is 175 feet.

- Reconstruct the existing shared through/right-turn lane on the westbound approach of Covington Highway/US 278/SR 12 into a through lane.

- Upgrade the existing traffic signal at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard to include protected+permitted left-turn phases on all approaches and signal backplates on all signal faces. Based on the minimum cross-product values for recommending left-turn protection in the Transportation Research Board's *Highway Capacity Manual, Special Report 209*, 2000, the northbound left-turn on Lithonia Industrial Boulevard and the eastbound left-turn on Covington Highway/US 278/SR 12 are expected to need left-turn protection.

- Stripe crosswalks to meet current standards on all approaches of the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard.

- Reconstruct the existing ADA ramps to meet current standards on all approaches of the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard.

- Upgrade the existing traffic signal at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard to include pedestrian signal heads and pedestrian detectors that meet current standards on all approaches.

- Retime the existing traffic signal at the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard to include protected+permitted left-turn phases on all approaches, yellow change intervals, red clearance intervals, and pedestrian intervals that meet current standards.

If a multi-lane roundabout is installed:

- Install a shared left-turn/through lane, a through lane, and a right-turn bypass lane on all approaches of the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard.

- Install pedestrian and bicycle accommodations that meet current standards on all approaches of the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard.

- Reconstruct the existing approaches of the intersection of Covington Highway/US 278/SR 12 and Lithonia Industrial Boulevard as necessary.

- Consider closing the fire station driveway, the auto parts store driveway, and the median opening on Lithonia Industrial Boulevard that are approximately 130 feet south of the study intersection if appropriate.

Traffic Forecast per TE Study

					Current Year	Opening Year	Design Year
		2009		2012	2014	2016	2036
Lithonia Industrial Blvd	NB	5472	11220	13554	13690	13828	15279
	SB	5748					
SR 12/US 278/Covington Hwy	EB	8465	17278	20871	21081	21293	23527
	WB	8813					
Traffic Growth Rate				6.5%	0.5%	0.5%	0.5%

Attachment: 1
P.I. Number: 0010871
County: Dekalb

State of Georgia
Department of Transportation

HIGHWAY SAFETY MANUAL (HSM) ANALYSIS for CONCEPT REPORTS

This Concept Report includes an HSM predicted average crash frequency analysis for the design year ADT using the Manual's Predictive Method. The HSM uses AADT with the Predictive Method while this analysis uses ADT since AADT is typically not available for GDOT projects. The Predictive Method analysis is based on Safety Performance Functions (SPF) for individual roadway segments and intersections that provide the crash frequency. The HSM often provides information on crash frequency distribution by collision type and severity. Crash severities include Fatality, Incapacitating Injury, Non-Incapacitating Injury, Possible Injury and Property Damage Only. Some SPFs include HSM Crash Modification Factors (CMF) that adjust the SPF crash frequency to account for difference between HSM base conditions that the function is based on and project specific conditions such as geometric design features. The HSM includes local calibration factors to further refine predicted average crash frequency. These local calibration factors have not yet been developed for GDOT.

Two Predictive Method analyses of the proposed Concept design are provided below. One analysis provides the Total predicted average crash frequency which includes all crash severities. The second analysis is for Fatal & Injury severities which includes all crash severities except Property Damage Only.

Project Roadway Segment and Intersection Types analyzed

Roadway Segment				Intersection	
ID #	Type	Sta. Begin	Sta. End	ID #	Type
				SR12/Covington Hwy & CR2989/Lithonia Ind. Blvd	4 Leg Signalized-Urban/Suburban Arterial

The project is on S. R. 12/Covington Hwy at the intersection of C.R. 2989/Lithonia Ind. Blvd in Dekalb County, Georgia. S.R. 12 is a 5-lane urban roadway with 2 – 12' travel lanes in both directions and a 14' flush median serving as a turn lane. C.R. 2989 is a 4-lane divided urban roadway with a 20' raised median. The existing grass median on C.R. 2989 from milepost 0.756 to 0.983 will be graded and paved creating a 12' left turn bay and an 8' raised median. The total predicted crashes per the HSM proposed condition is 4.2 per year at the intersection of S.R. 12 and C.R. 2989 for the 2036 design year. Out of this total of 4.2 crashes per year, 1.5 are injury and fatal crashes.

HSM Predictive Method for Urban/Suburban Arterial Roadway Intersections – Total Crashes

		Urban Intersection Base Crash Frequency – Excluding Vehicle and Pedestrian/Bicycle (total crashes/year)	Left Turn Lanes	Unsignalized – CMF_{2i} = 1.00 Signalized Permissive Left Turn	Right Turn Lanes	Unsignalized – CMF_{4i} = 1.00 Signalized Right Turn On Red	Lighting	Red Light Cameras	Urban Intersection Adjusted Crash frequency – Excluding Vehicle and Pedestrian/Bicycle (total crashes/year)	Vehicle-Pedestrian (total crashes/year)	Vehicle-Bike (total crashes/year)	Total Predicted Average Crash Frequency for Roadway Intersections (total crashes/year)
Intersection ID #	Analysis Condition	$N_{spf\ int}$	CMF_{1i}	CMF_{2i}	CMF_{3i}	CMF_{4i}	CMF_{5i}	CMF_{6i}	N_{bi}	N_{pedi}	N_{bikei}	$N_{predicted\ int}$
SR12/Covington Hwy & CR2989/Lithonia Ind. Blvd	Proposed	7.160	0.66	0.99	0.96	1.00	0.91	1.00	4.090	0.085	0.061	4.237
Total	Proposed	7.160							4.090	0.085	0.061	4.237

HSM Predictive Method for Urban/Suburban Arterial Roadway Intersections – Fatal & Injury Crashes

		Urban Intersection Base Crash Frequency – Excluding Vehicle and Pedestrian/Bicycle (fatal & injury crashes/year)	Left Turn Lanes	Unsignalized – CMF_{2i} = 1.00 Signalized Permissive Left Turn	Right Turn Lanes	Unsignalized – CMF_{4i} = 1.00 Signalized Right Turn On Red	Lighting	Red Light Cameras	Urban Intersection Adjusted Crash frequency – Excluding Vehicle and Pedestrian/Bicycle (fatal & injury crashes/year)	Vehicle-Pedestrian (fatal & injury crashes/year)	Vehicle-Bike (fatal & injury crashes/year)	Total Predicted Average Crash Frequency for Roadway Intersections (fatal & injury crashes/year)
Intersection ID #	Analysis Condition	$N_{spf\ int}$	CMF_{1i}	CMF_{2i}	CMF_{3i}	CMF_{4i}	CMF_{5i}	CMF_{6i}	N_{bi}	N_{pedi}	N_{bikei}	$N_{predicted\ int}$
SR12/Covington Hwy & CR2989/Lithonia Ind. Blvd	Proposed	2.250	0.66	0.99	0.96	1.00	0.91	1.00	1.330	0.085	0.061	1.477
Total	Proposed	2.250							1.330	0.085	0.061	1.477