TIA

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
TIA PROJECT CONCEPT REPORT

Project Type: Roadway Improvement
P.I. Number: 0011396
GDOT District: 2
County: Richmond
Federal Route Number: N/A
MPO ID Number:
State Route Number: N/A

North Leg Road Corridor is to be modified to improve operations and safety at the intersections of Wrightsboro Road and Sibley Road.

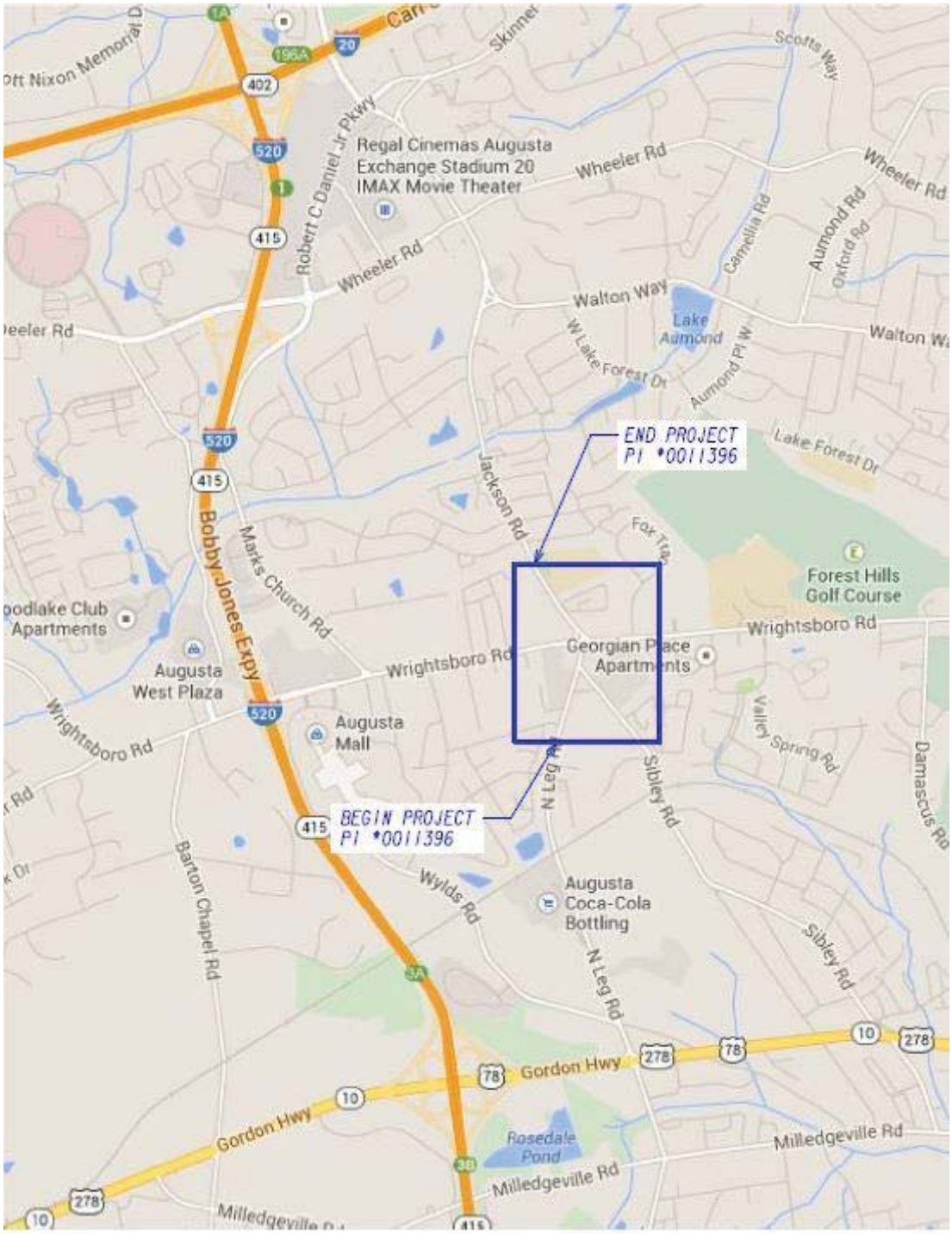
Submitted for approval:

Local Government Representative	DATE 9/2/14
District Engineer/Consultant & Firm Wolverton & Associates, Inc.	DATE 9.2.14
TIA Project Manager	DATE 9/10/14
GDOT TIA Regional Coordinator	DATE 9/10/14
TIA Program Manager	DATE 10 SEP 2014
GDOT State TIA Administrator	DATE 9/15/2014

Approval:

Concur: GDOT Director of Engineering	DATE 9/19/14
Approve: GDOT Chief Engineer	DATE 9-23-14

PROJECT LOCATION



PLANNING & BACKGROUND DATA

Project Intended Benefit:
This project would benefit the public by potentially reducing the incidence of crashes along this roadway, segment, corridor, and intersection.

This project could potentially maximize the full utility of an existing transportation facility(s). In some cases, bypasses will be necessary. Example benefits could be: mitigating congestion (e.g. operational improvements) and optimizing capital asset management (e.g. resurfacing, rehabilitation). The impacts would apply to this roadway segment, corridor, and or/intersection.

This project would benefit the public through enhancing safety at the intersection by analyzing, designing, and reconstructing the intersection appropriately in order to reduce the high volume of crash incidents that occur at this location. The project will provide congestion relief by correcting poor intersection geometrics that are currently causing poor sigh distance.

Description of the proposed project:
The project proposes to improve the North Leg Road corridor. The proposed project would begin at a point approximately 0.20 miles south of the intersection of Wrightsboro Road and North Leg Road and ends approximately 0.17 miles north of the intersection. The total project length is approximately 0.79 miles. The geographic midpoint of the project is located at 33°28’ 09.6” N and 82°04’ 01.1” W.

The intersection of Wrightsboro Road with North Leg Road/Jackson Road will be realigned to improve the existing substandard skew angle in order to address the significant crash history at the intersection. Dual left turn lanes will be installed northbound and southbound in order to improve the operations of the intersection.

The intersection of Sibley Road and North Leg Road will be realigned to intersect at a 90° angle to improve operations and safety by creating more distance between it and the adjacent signalized intersection of North Leg Road and Wrightsboro Road. Another improvement at the intersection would be the addition of turn lanes on both North Leg Road and Sibley Road.

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

MPO: Augusta – Richmond County Planning Commission MPO Project ID N/A

Regional Commission: Central Savannah River Area (CSRA) RC Project ID 07-000129

Congressional District(s): 12

Projected Traffic: N/A

Functional Classification:
Wrightsboro: *Urban Principal Arterial*
North Leg Road/Jackson Road: *Urban Minor Arterial*
Sibley Road: *Urban Major Collector*

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: *North Leg Road*

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**Varies 2-6**	**N/A**	**Varies 2-7**
- **Lane Width(s)**	**Varies 11'-12'**	**11'-12'**	**11'**
- **Median Width & Type**	**None**	**None**	**None**
- **Outside Shoulder or Border Area Width**	**Varies**	**10'**	**10'**
- **Outside Shoulder Slope**	**Varies**	**2%**	**2%**
- **Inside Shoulder Width**	**N/A**	**N/A**	**N/A**
- **Sidewalks**	**None**	**5'**	**5'**
- **Auxiliary Lanes**	**Varies 11'-12'**	**11'-12'**	**11'**
- **Bike Lanes**	**None**	**None**	**None**
Posted Speed	**45 mph**		**45 mph**
Design Speed	**30 mph***	**N/A**	**45 mph**
Min Horizontal Curve Radius	**280'**	**711'**	**715'**
Superelevation Rate	**2%**	**4%**	**4%**
Max Grade	**3%**	**6%**	**3%**
Access Control	**None**	**None**	**None**
Right-of-Way Width	**Varies 120'-190'**	**N/A**	**Varies 120'-190'**
Maximum Grade – Crossroad	**N/A**	**N/A**	**N/A**
Design Vehicle	**N/A**	**WB-40**	**WB-62**

*Existing roadway design elements meet a design speed that is lower than the posted speed.

Mainline Design Features: *Jackson Road*

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**3-5**	**N/A**	**3-6**
- **Lane Width(s)**	**12'**	**11'-12'**	**11'**
- **Median Width & Type**	**None**	**None**	**None**
- **Outside Shoulder or Border Area Width**	**Varies**	**10'**	**10'**
- **Outside Shoulder Slope**	**Varies**	**2%**	**2%**
- **Inside Shoulder Width**	**N/A**	**N/A**	**N/A**
- **Sidewalks**	**5'**	**5'**	**5'**
- **Auxiliary Lanes**	**12'**	**11'-12'**	**11'**
- **Bike Lanes**	**None**	**None**	**None**
Posted Speed	**45/35 mph**		**45/35 mph**
Design Speed	**30 mph***	**N/A**	**45 mph**
Min Horizontal Curve Radius	**280'**	**711'**	**5930'**
Superelevation Rate	**2%**	**4%**	**NC**
Max Grade	**3%**	**6%**	**3%**
Access Control	**None**	**None**	**None**
Right-of-Way Width	**Varies 80'-170'**	**N/A**	**Varies 80'-170'**
Maximum Grade – Crossroad	**N/A**	**N/A**	**N/A**
Design Vehicle	**N/A**	**WB-40**	**WB-62**

Mainline Design Features: *Sibley Road*

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	**2**	**2**	**2**
- **Lane Width(s)**	**10'**	**11'-12'**	**11'**
- **Median Width & Type**	**None**	**None**	**None**
- **Outside Shoulder or Border Area Width**	**10' paved**	**10'**	**10'**
- **Outside Shoulder Slope**	**Varies**	**2%**	**2%**
- **Inside Shoulder Width**	**N/A**	**N/A**	**N/A**
- **Sidewalks**	**None**	**5'**	**5'**
- **Auxiliary Lanes**	**None**	**11'-12'**	**11'**
- **Bike Lanes**	**None**	**None**	**None**
Posted Speed	**35 mph**		**30 mph**
Design Speed	**35 mph**	**35 mph**	**30 mph****
Min Horizontal Curve Radius	**None**	**371'**	**250'**
Superelevation Rate	**4%**	**4%**	**4%**
Max Grade	**4%**	**9%**	**4%**
Access Control	**None**	**None**	**None**
Right-of-Way Width	**60'**	**N/A**	**60'**
Maximum Grade – Crossroad	**N/A**	**N/A**	**N/A**
Design Vehicle	**N/A**	**BUS-40**	**BUS-40**

*Existing roadway design elements meet a design speed that is lower than the posted speed.
**The City of Augusta has agreed to post a lower speed on Sibley Road as drivers would be approaching a stop condition.

Major Structures: None

Major Interchanges/Intersections: Wrightsboro Road at North Leg Road and Jackson Road is a signalized intersection within the project limits. The intersection will remain signalized but will be upgraded to accommodate the additional turn lanes.

Utility Involvements:
AGL – Gas
AT&T – Telephone
Augusta Richmond Water – Water
Georgia Power – Electric
Comcast – Cable
Wide Open West - Cable

Public Interest Determination Policy and Procedure recommended (Utilities)? ☒ No ☐ Yes

SUE Required: ☒ No ☐ Yes
Quality Level D provided

Railroad Involvement: No railroads are within the project limits.

Complete Streets - Bicycle, Pedestrian, and/or Transit Warrants:
Warrants met: ☒ None ☐ Bicycle ☐ Pedestrian ☐ Transit

Right-of-Way:
Required Right-of-Way anticipated: ☐ No ☒ Yes ☐ Undetermined
Easements anticipated: ☐ None ☒ Temporary ☒ Permanent ☐ Utility ☐ Other

Anticipated number of impacted parcels:	16
Displacements Anticipated:	0
Businesses:	13
Residences:	0
Other:	3

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

Design Exceptions to FHWA/AASHTO controlling criteria anticipated: N/A

Design Variances to GDOT Standard Criteria anticipated: N/A

ENVIRONMENTAL DATA

Anticipated Environmental Document: None Anticipated
GEPA: ☐ Type A Letter ☐ Type B Letter
NEPA: ☐ CE ☐ EA/FONSI

Project Air Quality: *(On-system projects only)*

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 anticipated

NEPA/GEPA Comments & Information:
A NEPA/GEPA document would not be required for this project. No State or Federal Funds involved. Augusta, GA will certify that compliance with applicable local, state, federal environmental requirements has been completed.

PROJECT RESPONSIBILITIES

Project Activities:

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

Lighting required: ☒ No ☐ Yes

Other projects in the area:
PI# 0011393 Jackson Road Resurfacing: The proposed project consists of milling, resurfacing, and striping Jackson Road from Walton Way to Wrightsboro Road.

Other coordination to date: None

Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	Breakdown of ROW	Breakdown of Reimbursable Utilities	Breakdown of CST	GDOT Project Management	Total Cost
By Whom	TIA	TIA	TIA	TIA	TIA	
Date of Estimate					$0	
TIA Current Programmed Budget $	$500,000	$500,000	$0	$2,794,429.43	$38,327.57	$3,832,757
Estimated $ Amount	$689,310	$602,536	$89,837	$2,296,612	$0	
Budget Contingency $	$10,000	$0	$0	$106,133	$0	
Total Estimated Cost	$699,310	$602,536	$89,837	$2,402,745	$38,327.57	$3,832,756

Note: 1. Construction phase contains 3% CE&I in addition to other contingencies.
2. All phases contain Augusta Project Management costs.

ALTERNATIVES

Preferred Alternative: Operational and Safety Improvements			
Estimated Property Impacts:	**18**	**Estimated Total Cost:**	**$3,832,756**
Estimated ROW Cost:	**$602,536**	**Estimated CST Time:**	**8 months**
Rationale:			

Comments/additional information:
N/A

Attachments:

1. Concept Layout
2. Opinions of Probable Cost
    a. Summary of Costs
    ~~b. Construction Costs~~
    ~~c. Landscape Costs~~
    d. Utility Costs
    e. Right of Way Costs
    ~~f. Other Costs not included in Total~~
3. Crash summaries
4. Capacity analysis summary – (Improvement Alternative 2 is the preferred alternative)
5. Summary of TE Study – (Improvement Alternative 2 is the preferred alternative)

Attachment 1: Concept Layout

North Leg Road Corridor Improvements

P.I. Number 0011396

NORTH LEG ROAD
CORRIDOR IMPROVEMENTS
P.I. #: 0011396

Wolverton & Associates
Consulting Engineers • Land Surveyors
6745 Sugarloaf Parkway • Suite 101 • Duluth, Georgia 30097
Phone: (770) 447-8999 • Fax: (770) 447-9070
www.wolvertonassoc.com

SCALE IN FEET
0 50 100 200

LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED GRAVITY WALL
- EXISTING PROPERTY LINE OR RIGHT OF WAY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED PERMANENT EASEMENT
- PROPOSED DRIVEWAY EASEMENT
- PROPOSED CUT/FILL LIMITS
- PROPOSED LANDSCAPED AREA

N

N/F
LULUS HOLDINGS JACKSON ROAD, LLC.
PARCEL 042-1-025-02-0
DB 1309, PG 1670
PB 9, PG 120

N/F
HIGGINS H SCOTT
PARCEL 042-1-025-05-0
DB A1, PG 2378
DB 312, PG 1302

N/F
U S GOVERNMENT
PARCEL 041-2-146-00-0
TRACT1
NO REFERENCE

N/F
HIGGINS H SCOTT
PARCEL 042-1-026-01-0
DB A1, PG 6565
DB 208, PG 2412

N/F
HIGGINS H SCOTT
PARCEL 042-1-026-03-0
DB A1, PG 6578
DB 208, PG 2412

N/F
I-20 INVESTORS LLC
PARCEL 042-3-001-01-0
DB 1401, PG 611
PB 66, PG 370

N/F
WALTRUST PROPERTIES INC
PARCEL 042-3-003-07-0
DB 1167, PG 538
PB 35Q 240

N/F
JOHN GIBSON ET
PARCEL 042-3-024
DB 1134, PG 11
PB 380 948

N/F
WILLIAM H. BAER
PARCEL 041-4-103-02
DB 1336, PG 840
PB 672, PG 771

N/F
GROWMR, INC
PARCEL 041-4-202-00
DB 660, PG 775
PB 37-Y, PG 328

N/F
AUTOZONE, INC #882
PARCEL 042-3-001-02
DB 532, PG 1177

N/F
WOLTZ EDWARD K.
PARCEL 042-3-101-00-0
DB 5856, PG 45

N/F
G&H AUGUSTA, LLC
PARCEL 042-3-098-00-0
DB 1221, PG 1227

N/F
I-20 INVESTORS, LLC
PARCEL 042-3-001-00-0
DB 816, PG 398
PB24, PG 1752

N/F
CUNNINGHAM CHRISTOPHER A
PARCEL 042-3-004-00
DB 1413, PG 1081
PB 33S, PG 943

N/F
ODYSSEY (II) DP XII LLC
PARCEL 042-3-105-00
DB 1077, PG 713
DB 832, PG 1668

N/F
GRACE FELLOWSHIP OF AUGUSTA INC
PARCEL 042-3-005-03
DB 1105, PG 2352
DB 883, PG 1445
DB 69, PG 416

N/F
SCMOLLINS LLC
PARCEL 042-3-005-02
DB 879/688
PB 34-T, PG 625

N/F
WILLIAMS ELLIS
PARCEL 042-4-125-00
DB 38P, PG 548
PB 27Y, PG 224

Attachment 2: Opinion of Probable Cost

North Leg Road Corridor Improvements

P.I. Number 0011396

Construction Costs

North Leg Road Improvements

8/27/2014

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	EXTENSION	
	ROADWAY					
150-1000	TRAFFIC CONTROL	LS	LUMP	$ 246,000.00	$ 246,000.00	12%
205-0001	UNCLASS EXCAV	CY	4200	$ 6.99	$ 29,358.00	
201-1500	CLEARING & GRUBBING	LS	LUMP	$ 227,500.00	$ 227,500.00	13%
210-0100	GRADING COMPLETE	LS	LUMP	$ 35,000.00	$ 35,000.00	2%
310-1101	GR AGGR BASE CRS, INCL MATL	TN	7300	$ 26.08	$ 190,384.00	
318-3000	AGGR SURF CRS	TN	1900	$ 21.55	$ 40,945.00	
402-3121	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	TN	2500	$ 69.33	$ 173,325.00	
402-3130	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIM	TN	2100	$ 87.14	$ 182,994.00	
402-3190	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2,INCL BITUM MATL & H LIME	TN	2800	$ 81.50	$ 228,200.00	
413-1000	BITUM TACK COAT	GL	2200	$ 3.17	$ 6,974.00	
432-0206	MILL ASPH CONC PVMT, 1 1/2 IN DEPTH	SY	3275	$ 3.74	$ 12,250.16	
432-0208	MILL ASPH CONC PVMT, 2 IN DEPTH	SY	4115	$ 2.24	$ 9,218.10	
441-0018	DRIVEWAY CONCRETE, 8 IN TK	SY	490	$ 44.09	$ 21,604.10	
441-0104	CONC SIDEWALK, 4 IN	SY	3150	$ 39.48	$ 124,362.00	
441-0748	CONCRETE MEDIAN, 6 IN	SY	122	$ 48.32	$ 5,895.04	
441-6222	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	LF	6500	$ 18.12	$ 117,780.00	
500-3200	CLASS B CONCRETE	CY	21	$ 531.29	$ 11,157.09	
550-1180	STORM DRAIN PIPE, 18 IN, H 1-10	LF	470	$ 37.31	$ 17,535.70	
550-1240	STORM DRAIN PIPE, 24 IN, H 1-10	LF	810	$ 42.96	$ 34,797.60	
550-1300	STORM DRAIN PIPE, 30 IN, H 1-10	LF	520	$ 53.49	$ 27,814.80	
550-1360	STORM DRAIN PIPE, 36 IN, H 1-10	LF	160	$ 65.96	$ 10,553.60	
550-1420	STORM DRAIN PIPE, 42 IN, H 1-10	LF	240	$ 78.04	$ 18,729.60	
611-3030	RECONSTR STORM SEW MANHOLE, TYPE 1	EA	13	$ 1,450.61	$ 18,857.93	
668-1100	CATCH BASIN, GP 1	EA	27	$ 2,185.84	$ 59,017.68	
668-2100	DROP INLET, GP 1	EA	10	$ 1,919.67	$ 19,196.70	
	EROSION CONTROL					
163-0232	EROSION CONTROL	LS	LUMP	$ 41,000.00	$ 41,000.00	2%
	SIGNING AND MARKING					
636-1020	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3	SF	130	$ 14.05	$ 1,826.50	
636-1033	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	SF	210	$ 17.92	$ 3,763.20	
636-2070	GALV STEEL POSTS, TP 7	LF	460	$ 7.20	$ 3,312.00	
653-0120	THERMOPLASTIC PVMT MARKING, ARROW, TP 2	EA	52	$ 76.10	$ 3,957.20	
653-0210	THERMOPLASTIC PVMT MARKING, WORD, TP 1	EA	4	$ 112.64	$ 450.56	
653-1501	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, WHITE	LF	2900	$ 0.77	$ 2,233.00	
653-1502	THERMOPLASTIC SOLID TRAF STRIPE, 5 IN, YELLOW	LF	5000	$ 0.77	$ 3,850.00	
653-1704	THERMOPLASTIC SOLID TRAF STRIPE, 24 IN, WHITE	LF	280	$ 6.27	$ 1,755.60	
653-1804	THERMOPLASTIC SOLID TRAF STRIPE, 8 IN, WHITE	LF	1900	$ 2.14	$ 4,066.00	
653-3501	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, WHITE	GLF	5800	$ 0.54	$ 3,132.00	
653-3502	THERMOPLASTIC SKIP TRAF STRIPE, 5 IN, YELLOW	GLF	1800	$ 0.31	$ 558.00	
653-6004	THERMOPLASTIC TRAF STRIPING, WHITE	SY	190	$ 3.80	$ 722.00	
653-6006	THERMOPLASTIC TRAF STRIPING, YELLOW	SY	510	$ 3.44	$ 1,754.40	
654-1001	RAISED PVMT MARKERS TP 1	EA	150	$ 3.74	$ 561.00	
654-1003	RAISED PVMT MARKERS TP 3	EA	150	$ 3.96	$ 594.00	
656-0005	REMOVE EXIST SOLID TRAF STRIPE, 5 IN, PAINT	LF	900	$ 0.52	$ 468.00	
656-1005	REMOVE EXIST SKIP TRAF STRIPE, 5 IN, PAINT	GLF	1100	$ 0.92	$ 1,012.00	
	SIGNALS					
	SIGNAL MAST ARMS	LS	LUMP	$ 100,000.00	$ 100,000.00	
				SUB-TOTAL ROADWAY:	$ 2,044,465.56	
				10% Contingencies	$ 204,446.56	
	LANDSCAPE AND LIGHTING					
	LANDSCAPING - ALL	LS	LUMP	$ 45,000.00	$ 45,000.00	
				SUB-TOTAL LANDSCAPE/LIGHTING:	$ 45,000.00	
				6% Contingencies For Landscaping	$ 2,700.00	
				TOTAL:	**$ 2,296,612.12**	

TRANSPORTATION INVESTMENT ACT
TIA PROGRAM MANAGEMENT

Preliminary ROW Costs

Project No. RC07-000129
PI No. 0011396
Project Name: N. Leg Intersection
Date: 07/31/2014

Land and Improvements	Agriculture	Residential	Commercial	Industrial	Notes
Estimate ($/ac)	$0	$0	$250,000	$0	Enter Cost / Acre
Fee Simple Area (ac)	0.00	0.00	0.64	0.00	Enter Acreage
Fee Simple Estimate	$0	$0	$159,772	$0	CALCULATED FIELD
Perm Easement Area (ac)	0.00	0.00	0.87	0.00	Enter Acreage
Perm Easement Factor	0%	50%	50%	0%	Adjust Percentage as Appropriate
Perm Easement Estimate	$0	$0	$108,491	$0	CALCULATED FIELD
Temp Easement Area (ac)	0.00	0.00	0.39	0.00	Enter Acreage
Temp Easement Factor	0%	25%	25%	0%	Adjust Percentage as Appropriate
Temp Easement Estimate	$0	$0	$24,551	$0	CALCULATED FIELD
City Land Available for Swap (ac)	0.00	0.00	0.00	0.00	Enter Acreage (If required)
City Land Available for Swap Estimate	$0	$0	$0	$0	Enter Estimated Value (If required)
Proximity Damages	$0	$0	$0	$0	Enter Fees and Provide Notes as Appropriate
Consequential Damages	$0	$0	$0	$0	Enter Fees and Provide Notes as Appropriate
Cost to Cures	$0	$0	$0	$0	Enter Fees and Provide Notes as Appropriate
Improvements	$0	$0	$30,000	$0	asphalt, curbing, irrigation system
Trade Fixtures	$0	$0	$50,000	$0	Signs, Security Fence&Gates
PROPERTY TYPE TOTALS	**$0**	**$0**	**$372,813**	**$0**	CALCULATED FIELD
	Land and Improvements Sub Total		**$372,813**		CALCULATED FIELD

Valuation Services	Agriculture	Residential	Commercial	Industrial	
Appraisals (# of Parcels)	0	0	18	0	Adjust Parcels as required
Estimated Fee (per Parcel)	$0	$0	$2,000	$0	Enter Estimated Fee per Parcel
Total Appraisals	$0	$0	$36,000	$0	CALCULATED FIELD
Specialty Reports	$0	$0	$6,000	$0	Signs & Light Standards, Fencing Cost to Cure
Estimated Fees	$0	$0	$0	$0	Enter Estimated Fees and Provide Notes
PROPERTY TYPE TOTALS	**$0**	**$0**	**$42,000**	**$0**	CALCULATED FIELD
	Valuation Services Sub Total		**$42,000**		CALCULATED FIELD

Legal Services	Parcels	Estimated Fees		Totals	
Meeting with Attorney	18	$125		$2,250	Adjust Parcels / Fees as required (using best judgement)
Preliminary Titles	18	$300		$5,400	Adjust Parcels / Fees as required
Closing and Final Title	18	$500		$9,000	Adjust Parcels / Fees as required
Recording Fees	18	$50		$900	Adjust Parcels / Fees as required
	Legal Services Sub Total		**$17,550**		CALCULATED FIELD

Administrative	Parcels	Man Hours/Parcel		Totals	
Pre-Acquisition	18	20		$18,000	Adjust Parcels / Fees as required
Acquisition	18	50		$45,000	Adjust Parcels / Fees as required
Administrative Appeals	18	50		$6,750	Calculates as 15% of Acq Parcel Count (Adjust if Necessary)
	Administrative Sub Total		**$69,750**		CALCULATED FIELD

Contingency					
Overall Contingency	20%	$100,423			Enter Percentage for Contingency (Default = 20%)

Total Estimated Costs **$602,536** CALCULATED FIELD

UTILITY COSTS					
670-9710	RELOCATE EXIST FIRE HYDRANT	EA	1	$ 2,946.65	$ 2,946.65
670-9720	RELOCATE EXIST WATER VALVE, INCL BOX	EA	10	$ 596.99	$ 5,969.90
670-9730	RELOCATE EXIST WATER METER, INCL BOX	EA	6	$ 469.85	$ 2,819.10
	RELOCATE EXIST ELECTIC POLE	EA	13	$ 5,000.00	$ 65,000.00
611-8050	AD□UST MANHOLE TO GRADE	EA	7	$ 704.94	$ 4,934.58
				SUB-TOTAL UTILITIES□	$ 81,670.23
				10% CONTINGENCY	$ 8,167.02
				TOTAL UTILITIES	**$ 89,837.25**

Attachment 3: Crash Summaries

North Leg Road Corridor Improvements

P.I. Number 0011396

CRASH ANALYSIS

North Leg Road Traffic Engineering Report

The crash data obtained from GDOT for the study area for the years 2005 through 2013 are summarized in Tables 6 through 11.

Table 6 – North Leg Road / Jackson Road and Wrightsboro Road Intersection Crashes

YEAR	REAR END	SIDE SWIPE	ANGLE	HEAD ON	OTHER	TOTAL	INJURY	FATALITY
2005	51	4	13	0	2	70	8	0
2006	36	5	11	0	0	52	9	0
2007	31	5	8	0	0	44	4	0
2008	55	4	13	3	1	76	15	0
2009	40	9	10	0	0	59	9	0
2010	11	4	3	0	3	21	1	0
2011	22	4	1	0	1	28	4	0
2012	12	4	1	0	1	18	7	0
2013	11	1	3	0	0	15	7	0
Total	269	40	63	3	8	383	64	0
Avg	30	4	7	0	1	43	7	0

Table 7 – North Leg Road and Sibley Road Intersection Crashes

YEAR	REAR END	SIDE SWIPE	ANGLE	HEAD ON	OTHER	TOTAL	INJURY	FATALITY
2005	7	0	9	0	1	17	7	0
2006	9	0	6	0	0	15	4	0
2007	9	1	9	0	0	19	8	0
2008	5	0	10	0	0	15	3	0
2009	8	1	9	2	0	20	15	0
2010	6	2	8	0	0	16	0	0
2011	3	0	8	1	1	13	3	0
2012	8	0	7	1	0	16	6	0
2013	2	2	4	0	2	10	4	0
Total	57	6	70	4	4	86	50	0
Avg	6	1	8	0	0	10	6	0

Table 8 – North Leg Road Midblock Crashes between Wrightsboro Road and Sibley Road

YEAR	REAR END	SIDE SWIPE	ANGLE	HEAD ON	OTHER	TOTAL	INJURY	FATALITY
2005	1	0	1	0	0	2	0	0
2006	1	0	1	0	0	2	0	0
2007	0	0	0	0	1	1	1	0
2008	0	0	2	0	1	3	0	0
2009	0	1	1	0	0	2	0	0
2010	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0
2012	1	0	0	0	0	1	2	0
2013	1	0	1	0	0	2	2	0
Total	4	1	6	0	2	13	5	0
Avg	0	0	1	0	0	1	1	0

*Table 9 – Wrightsboro Road Midblock Crashes near North Leg Road**

YEAR	REAR END	SIDE SWIPE	ANGLE	HEAD ON	OTHER	TOTAL	INJURY	FATALITY
2010	1	0	0	0	0	1	0	0
2011	1	1	2	0	0	4	2	0
2012	3	1	0	0	1	5	0	0
2013	1	0	1	0	0	2	1	0
Total	6	2	3	0	1	12	3	0
Avg	2	1	1	0	0	3	1	0

*No crash data were available for 2005-2009

*Table 10 – Sibley Road Midblock Crashes near North Leg Road**

YEAR	REAR END	SIDE SWIPE	ANGLE	HEAD ON	OTHER	TOTAL	INJURY	FATALITY
2010	0	0	0	0	0	0	0	0
2011	1	0	0	0	0	1	1	0
2012	1	0	0	0	1	2	0	0
2013	0	0	0	0	0	0	0	0
Total	2	0	0	0	1	3	1	0
Avg	1	0	0	0	0	1	0	0

*No crash data were available for 2005-2009

*Table 11 – North Leg Road Crash Totals**

YEAR	REAR END	SIDE SWIPE	ANGLE	HEAD ON	OTHER	TOTAL	INJURY	FATALITY
2005	59	4	23	0	3	89	15	0
2006	46	5	18	0	0	69	13	0
2007	40	6	17	0	1	64	13	0
2008	60	4	25	3	2	94	18	0
2009	48	11	20	2	0	81	24	0
2010	17	6	11	0	3	37	1	0
2011	25	4	9	1	2	41	7	0
2012	21	4	8	1	1	35	15	0
2013	14	3	8	0	2	27	13	0
Total	330	47	139	7	14	537	119	0
Avg	37	5	15	1	2	60	13	0

*These North Leg Road crash totals were obtained by adding together the North Leg Road/Jackson Road and Wrightsboro Road intersection accidents, North Leg Road and Sibley Road intersection accidents, and North Leg Road midblock accidents.

The crash rates along North Leg Road were compared to the statewide averages of similar facilities. The statewide averages are calculated using crash data that is collected annually by GDOT. Crash rates are based on the number of crashes, injuries, and fatalities per 100 million vehicle miles traveled. Crash data on the North Leg Road corridor was collected for the years of 2005 through 2013. Table 12 illustrates the crash rates on North Leg Road and the statewide averages. As can be seen in the table, the crash rates on North Leg Road exceeded the statewide averages for number of crashes and number of injuries for each of the years for which statewide averages were available. It should be noted that the short distance of the segment and the inclusion of two intersections contributed to the high crash rates.

Table 12 – Crash Rates for North Leg Road

LOCATION	TYPE	2005		2006		2007		2008		2009		2010		2011		2012		2013*	
		STATEWIDE	N. LEG RD	STATEWIDE	N. LEG RD	STATEWIDE	N. LEG RD	STATEWIDE	N. LEG RD	STATEWIDE	N. LEG RD	STATEWIDE	N. LEG RD	STATEWIDE	N. LEG RD	STATEWIDE	N. LEG RD	STATEWIDE	N. LEG RD
N. Leg Rd from	Collision	554	37255	548	32616	513	28368	469	42730	463	35822	464	16512	482	18445	476	16022	--	12237
Wrightsboro Rd	Injuries	213	6279	208	6145	190	5762	176	8182	173	10614	172	446	166	3149	178	6866	--	5892
to Sibley Rd	Fatalities	1.63	0	1.55	0	1.48	0	1.47	0	1.10	0	1.19	0	1.20	0	1.13	0	--	0

*The statewide averages for 2013 were not available at the time this report was prepared.

Attachment 4: Capacity Analysis Summary

North Leg Road Corridor Improvements

P.I. Number 0011396

Intersection Capacity Analysis Methodology

Intersection capacity analysis was used to evaluate the projected volumes at the study intersections along the corridor. This process was used to determine the geometry and traffic control needed at each intersection to result in adequate levels of service (LOS) for the Opening Year 2016 and Design Year 2036 conditions.

Synchro (1) was used to conduct capacity analysis. *Synchro* implements the capacity methods of the *Highway Capacity Manual* (HCM) (2) for performing the industry standard evaluation of intersection performance.

The HCM defines LOS in terms of the amount of control delay, including initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

The LOS definitions for both stop controlled and signal controlled intersections are provided in Table 1.

Table 1 – Level of Service Criteria

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)	
	WITH STOP-SIGN CONTROL	WITH SIGNAL CONTROL
A	$\leq$ 10	$\leq$ 10
B	> 10 and $\leq$ 15	> 10 and $\leq$ 20
C	> 15 and $\leq$ 25	> 20 and $\leq$ 35
D	> 25 and $\leq$ 35	> 35 and $\leq$ 55
E	> 35 and $\leq$ 50	> 55 and $\leq$ 80
F	> 50	> 80

Source: *Highway Capacity Manual*

GDOT has ranges of adequate LOS based on the area classification. Rural, sparsely developed areas have a minimum LOS requirement of C. This is due to the expectancy of rural residents for relatively uncongested conditions and to design flexibility related to lower right of way costs. The minimum LOS for urban areas is D. This reflects the greater acceptance of delay and congestion by urban residents. Additionally, the increased density of developments makes right of way costs much higher in urban areas. The North Leg Road project corridor is in the Augusta metro area and, therefore, has a minimum LOS requirement of D.

Intersection Capacity Analysis Results

Existing and No-Build

The study intersections were initially evaluated with the existing geometry, using the Existing Year 2014, Opening Year 2016, and Design Year 2036 volumes. This establishes a baseline for comparing improvements.

Table 2 contains the results of the capacity analysis with the existing roadway geometry and operational conditions for the Existing Year 2014, Opening Year 2016, and Design Year 2036. The values shown in parenthesis indicate the estimated delay in seconds per vehicle. Intersection capacity analysis printouts for the Existing Year 2014 and No-Build Alternative are provided in Appendix B.

Table 2 – Existing and No-Build Alternative Intersection Capacity Analysis

INT #	INTERSECTION	MOVEMENT	EXISTING YEAR 2014		OPENING YEAR 2016		DESIGN YEAR 2036	
			AM PEAK HOUR	PM PEAK HOUR	AM PEAK HOUR	PM PEAK HOUR	AM PEAK HOUR	PM PEAK HOUR
1	N. Leg Rd/Jackson Rd & Wrightsboro Rd	Overall	D (37.4)	E (56.3)	D (38.5)	E (58.2)	D (54.8)	F (85.4)
2	N. Leg Rd & Sibley Rd	SBL	A (8.7)	B (10.2)	A (8.8)	B (10.4)	A (9.3)	B (12.3)
		WB	B (11.4)	D (32.4)	B (11.6)	E (36.0)	B (13.5)	F (254.8)
3	N. Leg Rd & Shopping Center Dwy	NBL+T	A (8.1)	A (8.5)	A (8.1)	A (8.5)	A (8.4)	A (8.9)
		EBL	B (12.9)	C (18.5)	B (13.1)	C (18.9)	B (14.8)	D (26.6)
		EBR	B (10.6)	B (11.6)	B (10.6)	B (11.8)	B (11.3)	B (13.1)
4	N. Leg Rd & Walmart Dwy	NB	A (8.3)	A (8.8)	A (8.3)	A (8.8)	A (8.6)	A (9.3)
		EB	B (11.9)	C (18.3)	B (12.0)	C (18.7)	B (13.2)	D (25.0)
5	N. Leg Rd & Service Dr	SBL	A (8.1)	A (8.5)	A (8.1)	A (8.6)	A (8.3)	A (9.0)
		WB	C (15.3)	C (23.6)	C (15.5)	C (24.5)	C (18.9)	E (40.1)

As shown in Table 2, four of the five study intersections are currently operating adequately. The intersection of North Leg Road/Jackson Road and Wrightsboro Road is currently operating inadequately in the PM peak hour.

In Opening Year 2016, three of the five study intersections are expected to operate adequately. In addition to the intersection of North Leg Road/Jackson Road and Wrightsboro Road, the westbound movement at the intersection of North Leg Road and Sibley Road is expected to be operating inadequately in the PM peak hour.

By the Year 2036, Table 2 shows two of the five study intersections are expected to operate adequately. As could be expected, the intersection of North Leg Road/Jackson Road and Wrightsboro Road is not expected to operate adequately in the PM Peak Hour. Also, the westbound movement for the intersections of North Leg Road and Sibley Road, and North Leg Road and Service Drive are projected to be inadequate during the PM peak hour.

Both Improvement Alternatives include the following:

- Shift the intersection of North Leg Road/Jackson Road and Wrightsboro Road to the west approximately 75 feet
- Modify the existing southbound left turn lane to be 255 feet long and construct a second southbound left turn lane on Jackson Road at Wrightsboro Road
- Modify the existing northbound left turn lane to be 300 feet long, construct a second northbound left turn lane, and reconstruct the northbound right turn lane to be 210 feet long on North Leg Road at Wrightsboro Road

- Restripe the eastbound left turn lane to 375 feet long and the eastbound right turn lane to 200 feet long on Wrightsboro Road at North Leg Road/Jackson Road
- Restripe the westbound left turn lane to 355 feet long and the westbound right turn lane to 270 feet long on Wrightsboro Road at North Leg Road/Jackson Road
- Restripe the existing southbound left turn lane on North Leg Road at Sibley Road to be a through lane
- Construct an additional southbound through lane on North Leg Road from existing Sibley Road to the Walmart Driveway, where the outside lane will be a drop-right turn lane for the Walmart Driveway
- Construct an additional northbound through lane from the Walmart Driveway to Service Drive/Relocated Sibley Road

Improvement Alternative 2

Improvement Alternative 2 consists of relocating the southbound left, northbound right, and westbound left turns for the intersection of North Leg Road and Sibley Road approximately 430 feet south to the current location of the intersection of North Leg Road and Service Drive, while allowing the existing westbound right turn to remain at its existing location. Improvement Alternative 2 will also consist of the construction of a TWLTL that will run north, from the intersection of North Leg Road and Relocated Sibley Road, to just south of the intersection of North Leg Road and Existing Sibley Road. The westbound approach of Relocated Sibley Road at North Leg Road will consist of a 135 foot long westbound right turn lane and a westbound left turn lane that aligns with the through lane on Sibley Road.

Table 4 shows the LOS of the improved study intersections for the Opening Year 2016 and Design Year 2036 for Improvement Alternative 2. Intersection capacity analysis printouts for Improvement Alternative 2 are located in Appendix D of this report.

Table 3 – Improvement Alternative 2 Intersection Capacity Analysis

INT #	INTERSECTION	MOVEMENT	OPENING YEAR 2016		DESIGN YEAR 2036	
			AM PEAK HOUR	PM PEAK HOUR	AM PEAK HOUR	PM PEAK HOUR
1	N. Leg Rd/Jackson Rd & Wrightsboro Rd	Overall	C (30.8)	D (43.4)	D (38.7)	D (54.9)
2	N. Leg Rd & Existing Sibley Rd	WB	B (10.9)	B (13.7)	B (12.0)	C (17.5)
3	N. Leg Rd & Shopping Center Dwy	NBL	A (8.8)	A (9.9)	A (9.3)	B (10.9)
		EBL	B (13.9)	C (20.1)	C (15.7)	D (27.5)
		EBR	B (10.3)	B (11.9)	B (10.9)	B (13.3)
4	N. Leg Rd & Walmart Dwy	NBL	A (8.3)	A (8.7)	A (8.6)	A (9.2)
		EB	B (11.9)	C (18.4)	B (13.2)	C (24.5)
5	N. Leg Rd & Relocated Sibley Rd	SBL	A (8.8)	B (10.5)	A (9.3)	B (12.7)
		WBL	D (26.6)	F (221.3)	E (42.8)	F (987.4)
		WBR	A (9.4)	A (9.9)	A (9.7)	B (10.4)

The results in Table 4 reveal the study intersections are expected to operate adequately for Improvement Alternative 2 except for the intersection of North Leg Road and Relocated Sibley Road.

At the intersection of North Leg Road and Relocated Sibley Road, the LOS for the westbound left turn lane is expected to be inadequate in the PM peak hour for the Opening Year 2016 condition as well as both AM and PM peak hours for the Design Year 2036 conditions.

The concept layout for Improvement Alternative 2 is included in Appendix D.

Storage Summary

Table 5 shows the 95th percentile queue lengths from *Synchro* for the No-Build Alternative and Improvement Alternatives 1 and 2 for the Design Year 2036.

Table 5 – Storage Summary

INT #	INTERSECTION	MOVEMENT	EXISTING & [FUTURE] STORAGE LENGTH	NO-BUILD		ALT. 1		ALT. 2	
				AM PEAK HOUR	PM PEAK HOUR	AM PEAK HOUR	PM PEAK HOUR	AM PEAK HOUR	PM PEAK HOUR
1	N. Leg Rd/ Jackson Rd & Wrightsboro Rd	NBL	200 ft [300 ft]	244 ft	464 ft	94 ft	158 ft	94 ft	158 ft
		NBT	325 ft [490 ft]	220 ft	294 ft	220 ft	236 ft	220 ft	236 ft
		NBR	325 ft [210 ft]	122 ft	142 ft	122 ft	104 ft	122 ft	104 ft
		SBL	240 ft [255 ft]	602 ft	771 ft	213 ft	255 ft	213 ft	255 ft
		SBT+R	N/A [N/A]	328 ft	453 ft	328 ft	354 ft	328 ft	354 ft
		EBL	150 ft [375 ft]	191 ft	451 ft	191 ft	374 ft	191 ft	374 ft
		EBT	N/A [N/A]	536 ft	572 ft	536 ft	482 ft	536 ft	482 ft
		EBR	150 ft [200 ft]	108 ft	142 ft	108 ft	130 ft	108 ft	130 ft
		WBL	275 ft [355 ft]	234 ft	458 ft	234 ft	355 ft	234 ft	355 ft
		WBT	N/A [N/A]	296 ft	783 ft	296 ft	658 ft	296 ft	658 ft
		WBR	170 ft [270 ft]	66 ft	312 ft	55 ft	208 ft	55 ft	208 ft
2	N. Leg Rd & Existing Sibley Rd	SBL	325 ft [N/A]	25 ft	75 ft	N/A	N/A	N/A	N/A
		WB	N/A [N/A]	50 ft	625 ft	N/A	N/A	50 ft	125 ft
3	N. Leg Rd & Shopping Center Dwy	NBL+T	200 ft [N/A]	25 ft	25 ft	N/A	N/A	N/A	N/A
		NBL	N/A [ALT #1: 135 ft/ ALT #2: TWLTL]	N/A	N/A	25 ft	25 ft	25 ft	25 ft
		EBL	50 ft [50 ft]	25 ft	50 ft	25 ft	125 ft	25 ft	50 ft
		EBR	50 ft [50 ft]	25 ft	25 ft	25 ft	25 ft	25 ft	25 ft
4	N. Leg Rd & Walmart Dwy	NB	N/A [N/A]	25 ft	25 ft	25 ft	25 ft	25 ft	25 ft
		SBR	N/A [205 ft]	N/A	N/A	25 ft	25 ft	25 ft	25 ft
		EB	N/A [N/A]	25 ft	50 ft	25 ft	50 ft	25 ft	50 ft
5	N. Leg Rd & Service Dr/Relocated Sibley Rd	SBL	N/A [ALT #1: 325 ft/ ALT #2: TWLTL]	25 ft	25 ft	25 ft	75 ft	25 ft	75 ft
		WB	N/A [N/A]	25 ft	75 ft	N/A	N/A	N/A	N/A
		WBL	N/A [N/A]	N/A	N/A	25 ft	275 ft	25 ft	275 ft
		WBR	N/A [ALT #1: N/A/ ALT #2: 135 ft]	N/A	N/A	50 ft	125 ft	25 ft	25 ft

As can be seen from Table 5, the proposed turn bay lengths for Improvement Alternative 1 are expected to accommodate the expected queues except at the intersection of North Leg Road and Shopping Center Driveway.

At the intersection of North Leg Road and Shopping Center Driveway, the eastbound left turn queue is expected to extend beyond its left turn bay by three vehicle lengths during the PM peak hour for Improvement Alternative 1. It is expected that motorists will relocate to other driveways on the shopping center property if the eastbound left turn lane has too long of a queue.

For Improvement Alternative 2, the proposed turn bay lengths are expected to accommodate the expected queues at all intersections for both Opening Year 2016 and Design Year 2036.

Attachment 5: Summary of TE Study

North Leg Road Corridor Improvements

P.I. Number 0011396

CONCLUSIONS

North Leg Road Traffic Engineering Report

Based on the analysis documented in this report, Wolverton and Associates, Inc. make the following conclusions.

Existing Year 2014:

- All of the study intersections are currently operating adequately, except for the following. The intersection of North Leg Road/Jackson Road and Wrightsboro Road is operating as a LOS E during the PM peak hour.

No-Build Alternative, Opening Year 2016:

- All of the study intersections are expected to operate adequately, except for the following. The intersection of North Leg Road/Jackson Road and Wrightsboro Road is expected to operate at a LOS E during the PM peak hour. The westbound approach of Sibley Road at North Leg Road is expected to operate at a LOS E during the PM peak hour.

No-Build Alternative, Design Year 2036:

- All of the study intersections are expected to operate adequately, except for the following. The intersection of North Leg Road/Jackson Road and Wrightsboro Road is expected to operate at a LOS F during the PM peak hour. The westbound approach of Sibley Road at North Leg Road is expected to operate at a LOS F during the PM peak hour. The westbound approach of Service Drive at North Leg Road is expected to operate at a LOS E during the PM peak hour.

Crash Analysis:

- The crash rates on North Leg Road exceeded the statewide averages for number of crashes and number of injuries for each of the years for which statewide averages were available. The short distance of the segment and the inclusion of two intersections contributed to the high crash rates.

Both Improvement Alternatives include the following:

- Shift the intersection of North Leg Road/Jackson Road and Wrightsboro Road to the west approximately 75 feet
- Modify the existing southbound left turn lane to be 255 feet long and construct a second southbound left turn lane on Jackson Road at Wrightsboro Road
- Modify the existing northbound left turn lane to be 300 feet long, construct a second northbound left turn lane, and reconstruct the northbound right turn lane to be 210 feet long on North Leg Road at Wrightsboro Road
- Restripe the eastbound left turn lane to 375 feet long and the eastbound right turn lane to 200 feet long on Wrightsboro Road at North Leg Road/Jackson Road

- Restripe the westbound left turn lane to 355 feet long and the westbound right turn lane to 270 feet long on Wrightsboro Road at North Leg Road/Jackson Road
- Restripe the existing southbound left turn lane on North Leg Road at Sibley Road to be a through lane
- Construct an additional southbound through lane on North Leg Road from existing Sibley Road to the Walmart Driveway, where the outside lane will be a drop-right turn lane for the Walmart Driveway
- Construct an additional northbound through lane from the Walmart Driveway to Service Drive/Relocated Sibley Road

Improvement Alternative 2:

- Relocate the southbound left, northbound right, and westbound left turns for the intersection of North Leg Road and Sibley Road approximately 430 feet south to the current location of the intersection of North Leg Road and Service Drive, while allowing the existing westbound right turn to remain at the existing location. The westbound approach of Relocated Sibley Road at North Leg Road will consist of a 135 foot long westbound right turn lane and a westbound left turn lane that aligns with the through lane on Sibley Road.
- Construct a TWLTL that will run north, from the intersection of North Leg Road and Relocated Sibley Road, to just south of the intersection of North Leg Road and Existing Sibley Road.

For Improvement Alternative 2, the study intersections are expected to operate adequately for all conditions except for the intersection of North Leg Road and Relocated Sibley Road.

At the intersection of North Leg Road and Relocated Sibley Road, the LOS for the westbound left turn lane is expected to be inadequate in the PM peak hour for the Opening Year 2016 condition as well as both AM and PM peak hours for the Design Year 2036 conditions.

For Improvement Alternative 2, the proposed turn bay lengths are expected to accommodate the expected queues at all intersections for both Opening Year 2016 and Design Year 2036.

At the intersection of North Leg Road and the Shopping Center Driveway, Improvement Alternative 2 is expected to provide better LOS for the traffic exiting the Shopping Center than Improvement Alternative 1 because Improvement Alternative 2 will reroute fewer trips past the Shopping Center Driveway than Improvement Alternative 1. Therefore, Improvement Alternative 2 is considered to be the preferred alternative.