

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
TIA PROJECT CONCEPT REPORT
Minor Project (Local Roads Only)**



Project Type: <u>Improvement</u>	P.I. Number: <u>0011385</u>
GDOT District: <u>2</u>	County: <u>Richmond</u>
Federal Route Number: <u>N/A</u>	MPO ID Number: <u>RC07-000112</u>
State Route Number: <u>N/A</u>	

The project is located in Hephzibah, Georgia (Richmond County) at the intersection of Brothersville Road and GA 88. The proposed improvements include the realignment of Brothersville Road to a perpendicular approach to GA 88, the widening of Brothersville Road at the intersection approach to accommodate the addition of a left turn lane that stores multiple vehicles, and the addition of a channeling island between the Brothersville Road left and right turn lanes.

Submitted for Review/Approval:

<u></u> , URS CORPORATION	<u>06-24-2014</u>
Consultant Designer & Firm	DATE
<u></u>	<u>6-23-2014</u>
Local Government Representative	DATE
<u></u>	<u>6-26-2014</u>
TIA Project Manager	DATE
<u></u>	<u>27 Jun 2014</u>
TIA Program Manager	DATE
<u></u>	<u>6/27/2014</u>
GDOT TIA Regional Coordinator	DATE
<u></u>	<u>6/28/2014</u>
GDOT State TIA Administrator	DATE

Approval:

Concur: <u></u>	<u>9/5/14</u>
GDOT Director of Engineering	DATE
Approve: <u></u>	<u>9-9-14</u>
GDOT Chief Engineer	DATE

County: Richmond

PROJECT LOCATION



PLANNING & BACKGROUND DATA

Description of the proposed project:

GA 88 at Brothersville Road in Augusta, GA (Richmond County) is an intersection improvement project. Both GA 88 and Brothersville Road are urban local roads. At the intersection, GA 88 is a three-lane paved section with the middle lane serving as a two-way left turn lane, 35 mph posted speed and a continuous through movement. Brothersville Road is a two lane undivided roadway that tees into GA 88 from the south and has a posted speed of 35 mph. Vehicular traffic on Brothersville Road approaching the intersection encounters a stop condition by the standard placement of post mounted “Stop” signs. The project limits extend approximately 250 feet from the center of the intersection for all approaches.

Accident data provided by the City of Augusta show that eight (8) collisions occurred at this intersection during years 2009 through 2013. The most common type was rear-ending collisions at the northbound Brothersville Road approach to GA 88.

Proposed improvements include the realignment of Brothersville Road to a perpendicular approach to GA 88, the widening of Brothersville Road at the intersection approach to accommodate the addition of a left turn lane that stores multiple vehicles, and the addition of a channeling island and pedestrian refuge.

Federal Oversight: Exempt State Funded TIA Other

Regional Commission: Central Savannah River RC RC Project ID RC07-000112

Congressional District(s): 12

Projected Traffic: No traffic counts or projected traffic is available for this project.

Functional Classification (Mainline): Urban Local Road

Major Structures: N/A

Utility Involvements:

- Water –City of Hephzibah
- Telecommunications – AT&T
- Cable TV – Comcast Cablevision of Georgia
- Electric – Georgia Power
- Gas - AGL

SUE Required: No Yes

Railroad Involvement: None

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

County: Richmond

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:	1
Displacements Anticipated:	0
Businesses:	0
Residences:	0
Other:	0

Design Exceptions to FHWA/AASHTO controlling criteria anticipated: No Yes

Design Variances to GDOT Standard Criteria anticipated: No Yes

ENVIRONMENTAL DATA

Anticipated Environmental Document:

GEPA: Type A Letter Type B Letter
NEPA: CE EA/FONSI

Project 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
MS4 not required for this project due to less than 1 acre of disturbed area.

Environmental Permits/Variations/Commitments/Coordination anticipated:

A Type A GEPA letter is anticipated for this project. No other permits or coordination are anticipated.

NEPA/GEPA Comments & Information:

This project does not fall under the NEPA. Only GEPA applies to this project

- Ecology – No significant impact
- History – Resources not present; no adverse effect anticipated
- Archeology – No effect
- Air – No effect
- Noise – Not Applicable under GEPA
- Public Involvement – No public meetings have been held for this project.

County: Richmond

Other projects in the area:

Other GDOT Projects

009916 – SR 88 at CR 58/Bath Edie Road roundabout project

M002589 – Burke/Richmond SR 88 Mill/Level/Resurface maintenance project

M002681 – Richmond/Burke Co SR 88 Safety Edge Design FHWA Pilot maintenance project

Other coordination to date:

The team has coordinated with Roger James, City of Hephzibah Public Works, regarding utilities impacts, impacts to landscaping, and impacts to the City Hall parking lot at the southwest corner of the intersection. (5/14/2014)

The team obtained accident data for the intersection for years 2009 through 2013 from the City of Augusta. This data was compiled and displayed on an accident exhibit attached to this document.

Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	Breakdown of ROW	Breakdown of Reimbursable Utilities	CST*	Environmental Mitigation	Total Cost
By Whom	TIA	TIA	TIA	TIA	TIA	
Date of Estimate	5/19/2014	5/19/2014	5/19/2014	5/19/2014	5/19/2014	
TIA Current Programmed Budget \$	\$50,000	\$15,000	\$0	\$350,000	\$0	\$415,000
Estimated Amount \$	\$47,721.72	\$10,000	\$9886.92	\$116,983.44	\$0	
Budget Contingency \$	\$3,000	\$900	\$0	\$31,500	\$0	
Total Estimated Cost	\$50,721.72	\$10,900	\$9,886.92	\$148,483.44	\$0	\$219,992.08

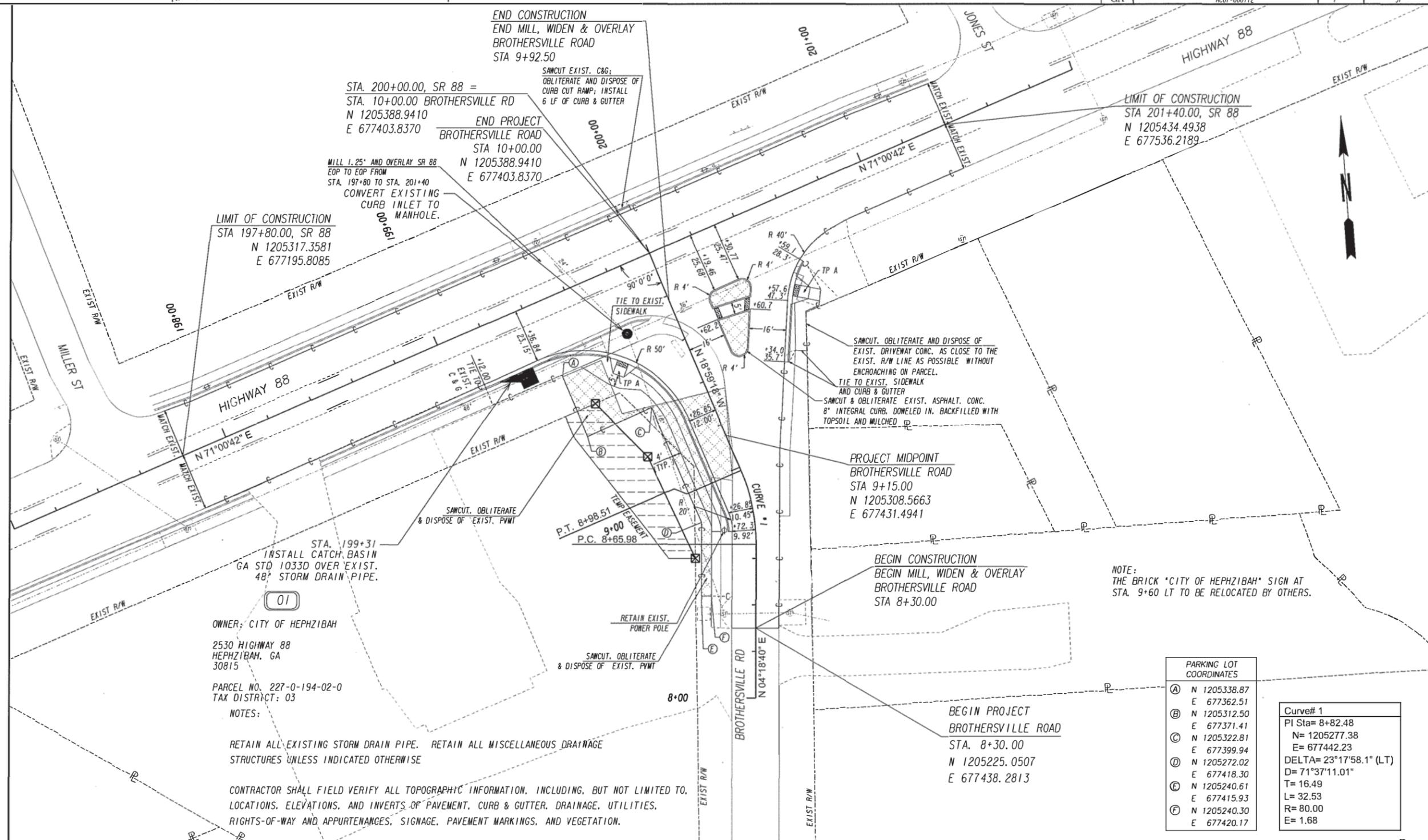
Notes:

1. All phases contain 1% Department Management costs and calculated project risk contingency in the Budget Contingency line item.
2. The CST Budget Contingency includes 3% CEI in addition to other contingencies.

Attachments:

1. Concept Layout
2. Cost Estimates
3. Accident Report Exhibit
4. Meeting Minutes
5. Fact Sheet
6. Design Exception

ATTACHMENT 1
CONCEPT LAYOUT



PARKING LOT COORDINATES	
(A)	N 1205338.87 E 677362.51
(B)	N 1205312.50 E 677371.41
(C)	N 1205322.81 E 677399.94
(D)	N 1205272.02 E 677418.30
(E)	N 1205240.61 E 677415.93
(F)	N 1205240.30 E 677420.17

Curve# 1	
PI Sta=	8+82.48
N=	1205277.38
E=	677442.23
DELTA=	23°17'58.1" (LT)
D=	71°37'11.01"
T=	16.49
L=	32.53
R=	80.00
E=	1.68

PROPERTY AND EXISTING R/W LINE	---
REQUIRED R/W LINE	---
CONSTRUCTION LIMITS	---
EASEMENT FOR CONSTR	---
& MAINTENANCE OF SLOPES	---
EASEMENT FOR CONSTR OF SLOPES	---
EASEMENT FOR CONSTR OF DRIVES	---

BEGIN LIMIT OF ACCESS.....BLA	---
END LIMIT OF ACCESS.....ELA	---
LIMIT OF ACCESS	---
REQ'D R/W & LIMIT OF ACCESS	---

GEORGIA
DEPARTMENT
OF
TRANSPORTATION

URS
400 NORTHPARK TOWN CENTER
1000 ABERNATHY ROAD, N.E., SUITE 900
ATLANTA, GEORGIA 30328
TEL: (678) 908-8800 FAX: (678) 808-8400

SCALE IN FEET
0 20 40 80

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: TRANSPORTATION INVESTMENT ACT
MAINLINE PLAN
SR 88 @ CR 1504/BROTHERSVILLE ROAD
INTERSECTION IMPROVEMENTS
AUGUSTA, GA (RICHMOND COUNTY)

DRAWING NO.
13-001

Project Concept Report
County: Richmond

P.I. Number: 0011385

ATTACHMENT 2
COST ESTIMATE

♀
 DATE : 05/19/2014
 PAGE : 2

STATE HIGHWAY AGENCY

JOB DETAIL ESTIMATE

0159	700-6001	LS	GRASSING - COMPLETE	1.000	2000.00	2000.00
0160	610-2365	LF	REM WATER MAIN, 6 IN	68.000	10.00	680.00
0165	670-1060	LF	WATER MAIN, 6 IN	67.000	26.23	1758.03
0170	670-2060	EA	GATE VALVE, 6 IN	1.000	869.33	869.34
0175	670-3126	EA	TAP SLEEVE/VAL ASSY,12" X 6"	1.000	2000.00	2000.00
0180	670-4000	EA	FIRE HYDRANT	1.000	2955.33	2955.34
0185	670-4520	EA	CONC THRUST COLLAR, 12" PIPE	1.000	500.00	500.00
0190	670-5020	LF	WATER SERVICE LINE, 2 IN	29.000	15.00	435.00
0194	670-9910	EA	REM X WATER VALVE, INCL BOX	1.000	277.32	277.33
0195	670-9920	EA	REMOVE EXIST FIRE HYDRANT	1.000	411.65	411.66
0200	702-9025	SY	LANDSCAPE MULCH	235.000	7.34	1726.20

 ITEM TOTAL 123724.97
 INFLATED ITEM TOTAL 123724.97

TOTALS FOR JOB 0011385

 ESTIMATED COST: 123725.00
 CONTINGENCY PERCENT (0.0): 0.00
 ESTIMATED TOTAL: 123725.00

Project Concept Report
County: Richmond

P.I. Number: 0011385

ATTACHMENT 3
ACCIDENT REPORT EXHIBIT

SEASON	ACC	TYPE ACC	ACC
WINTER (Dec-Feb)	0	SIDESWIPE	0
SPRING (Mar-May)	1	REAR END	3
		RT. ANGLE	1
SUMMER (June-Aug)	2	LEFT TURN	2
		LOST CONTROL	0
FALL (Sept-Nov)	4	HEAD ON	1
		OTHER	0
TOTAL	7	TOTAL	7

TIME	ACC	WEATHER	ACC
0600-1000	2	CLEAR	3
1000-1600	2	CLOUDY	3
1600-1900	2	RAIN	1
1900-2400	1	FOG	0
2400-0600	0	SNOW	0
TOTAL	7	TOTAL	7

ROAD	ACC	INJURY/FATAL	ACC
DRY	5	INJURY	4
WET	2	FATAL	0
SNOWY/ICY	0		
TOTAL	7		



LEGEND

LEFT TURN 	RIGHT ANGLE 	SIDESWIPE 	IMPROPER BACKING 	XX-XXXXXX = DMV CRASH NUMBER
FIXED OBJECT 	HEAD ON 	REAR END 	INJURY 	FATAL

URS

URS CORPORATION
400 NORTHPARK TOWN CENTER
ATLANTA, GA 30328
TEL: (678) 808-8800 FAX: (678) 808-8400

NORTH

GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE: TRANSPORTATION INVESTMENT ACT

ACCIDENT DATA EXHIBIT
BROTHERSVILLE RD @ SR 88
RICHMOND COUNTY, GEORGIA
FROM 2009 TO 2013

GDOT PROJECT NO.: RC07-000112
GDOT PI NO.: 0011385
URS PROJECT NO.: 15281605

Project Concept Report
County: Richmond

P.I. Number: 0011385

ATTACHMENT 4
MEETING MINUTES



Meeting Minutes – TIA Intersection Improvements Concept Design Coordination Meeting

MEETING DATE: February 11, 2014, 11:00 am
GDOT Headquarters

Bath Edie Rd at GA 88 Intersection Improvements, GDOT PI 0011380
Gordon Hwy at Deans Bridge Rd Intersection Improvements, GDOT PI 0011388
City of Augusta, GA (Richmond County)
Brothersville Rd at GA 88 Intersection Improvements, GDOT PI 0011385
City of Hephzibah, GA (Richmond County)

I. Attendees

Steve Tiedemann	GDOT TIA	stiedemann@dot.ga.gov
Tim Mathews	GDOT TIA	tmathews@dot.ga.gov
Erick Fry	URS	erick.fry@urs.com
Jeff Henry	URS	jeff.henry@urs.com

These meeting minutes are a summary of topics and comments discussed during the meeting. They were compiled from short hand notes and from memory and do not represent direct quotes from attendees.

CONVERSATION TOPICS AND ACTION ITEMS

Steve Tiedemann introduced the projects and opened the floor for discussion.

Bath Edie Rd at GA 88:

The purpose of the project is to reduce accidents. **URS** will study the intersection and provide concept ideas for evaluation at a future meeting.

Brothersville Rd at GA 88:

The purpose of the project is to improve intersection efficiency. **Steve Tiedemann** stated that he and Tim Mathews met with the City of Hephzibah to discuss the project. **Steve** is developing a concept plan in concert with the City of Hephzibah and will provide the concept to URS when it is completed. The city desires that a landscaped island be between proposed left and right turn lanes. **URS** indicated that they would call Kedrick Collins (D2 Traffic Engineer) and discuss potential options.

Gordon Hwy at Deans Bridge Rd:

The purpose of the project is to reduce accidents and provide pedestrian access. **Jeff Henry** will develop initial concept options based upon GIS data provided by the City of Augusta. Concept options will be evaluated at a future meeting.

Jeff Henry will contact the City of Augusta to request the last five (5) years of accident data for all intersections. URS has already acquired GIS shape files, including edge of pavements, parcel lines, stream buffers, stream centerlines, pond locations, special flood hazard areas, wetlands, and available utilities alignments for all three intersections.



Meeting Minutes

Subject: TIA Intersection Improvement Project Scoping Meeting
Brothersville Road at SR 88, PI 0011385

Date: 3:15 PM, February 26, 2014

Location: Hephzibah City Hall

Attendees: Tim Matthews GDOT TIA Regional Coordinator
Steve Tiedemann GDOT TIA Project Manager
Roger James Hephzibah City Public Works Director
Dwayne Flowers Hephzibah Police Department

Discussion:

Tim and Steve explained the project as they understood it and stated that they wanted to find out what ideas or thoughts the City might have for the intersection. Brothersville Road currently ends at the intersection of SR 88 as a two lane road with no additional turn lanes. SR 88 has two travel lanes with a center two-way left turn lane.

The City Chairman was scheduled to attend but was not able to make the meeting.

Dwayne stated that accidents have occurred but there is nothing substandard about the intersection that would account for the accidents. The problems that he observed were primarily related to vehicle turning movements from Brothersville Road onto SR 88, particularly when school is beginning or ending. There is currently only one lane for northbound Brothersville Road traffic. The majority of vehicles traveling north tend to turn right onto SR 88. It only takes one vehicle turning left to block right turning traffic and cause delays.

Dwayne also stated that a left turn lane with a short storage bay would be enough to help to alleviate this problems.

In the field, there are buildings and overhead utilities close to the existing right of way that would prohibit widening to the east. However, there appears to be adequate room to widen to the west onto city property on the southwest corner of the intersection. There is an existing city sign monument and some landscaping that would be impacted but Roger stated that these could be relocated. The landscaping is in the process of being replaced but would be delayed until the project could be completed.

Tim asked Roger if he thought the city would endorse the scope of the project as discussed. Roger is in agreement with the scope but will confirm with the Chairman before committing to it. Steve will send Roger the meeting minutes prior to the meeting so that the Chairman could be briefed in time for the meeting. Roger will then inform Tim and Steve of his findings.



Meeting Minutes – TIA Intersection Improvements Concept Design Coordination Meeting

MEETING DATE: April 21, 2014, 11:00 am
GDOT Headquarters

Bath Edie Rd at GA 88 Intersection Improvements, GDOT PI 0011380
Gordon Hwy at Deans Bridge Rd Intersection Improvements, GDOT PI 0011388
City of Augusta, GA (Richmond County)
Brothersville Rd at GA 88 Intersection Improvements, GDOT PI 0011385
City of Hephzibah, GA (Richmond County)

I. Attendees

Steve Tiedemann	GDOT TIA	stiedemann@dot.ga.gov
Tim Mathews	GDOT TIA	tmathews@dot.ga.gov
Erick Fry	URS	erick.fry@urs.com
Jeff Henry	URS	jeff.henry@urs.com

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CONVERSATION TOPICS AND ACTION ITEMS

Bath Edie Rd at GA 88:

URS presented several potential options for signing and marking the road to reduce accidents. The positives and negatives were discussed amongst the group of attendees. **Tim Mathews** indicated that if an energy agreement with the City is needed, the process for acquiring the agreement should be started as soon as possible. The current preferred plan calls for a double yellow stripe through the intersection to eliminate the passing zone, a vehicle activated flashing yellow assembly on GA 88 in both directions to warn drivers of presence of a vehicle on the Bath Edie Rd approaches, and dual stop signs at the Bath Edie approaches with “Crossing Traffic Does Not Stop” plaques. **Tim Mathews** indicated that flashing light assemblies should preferably be placed overhead at the intersection. **Erick Fry** indicated that URS would contact Kedrick Collins (GDOT District 2) for input.

Brothersville Rd at GA 88:

URS presented a layout developed from a hand drawn sketch provided by Steve Tiedemann. Both Steve Tiedemann and Tim Mathews like the layout, but stated they would like additional queuing length in the left turn lane (enough for at least 2 cars). URS agreed to modify the layout and provide to Steve Tiedemann via email for additional comment.

Gordon Hwy at Deans Bridge Rd:

Jeff Henry presented the accident exhibits and discussed locations where accidents occur most frequently. In summary, the plan proposes to eliminate the “Keep Moving” right turns. **Erick Fry** suggested the next course of action should be to seek feedback from Kedrick Collins (GDOT District 2) and the City of Augusta.



Meeting Minutes – TIA Intersection Improvements Concept Design Coordination Meeting

MEETING DATE: May 01, 2014, 9:00 am
GDOT Headquarters

Bath Edie Rd at GA 88 Intersection Improvements, GDOT PI 0011380
City of Augusta, GA (Richmond County)

Brothersville Rd at GA 88 Intersection Improvements, GDOT PI 0011385
City of Hephzibah, GA (Richmond County)

I. Attendees

Steve Tiedemann	GDOT TIA	stiedemann@dot.ga.gov
Mike Dover	GDOT TIA	mdover@dot.ga.gov
Tony Sanger	GDOT TIA	asanger@dot.ga.gov
Tim Mathews	GDOT TIA	tmathews@dot.ga.gov
Erick Fry	URS	erick.fry@urs.com

These meeting minutes are a summary of topics and comments discussed during the meeting. They were compiled from short hand notes and from memory and do not represent direct quotes from attendees.

CONVERSATION TOPICS AND ACTION ITEMS

Bath Edie Rd at GA 88:

URS presented a plan where a loop activated flashing yellow warning system would be installed at intersection warning signs on GA 88.

Mike Dover recommended using solar powered flashing yellow assemblies to preclude the need for an energy agreement between the GDOT and the City. He also recommended using the white marking spec for utilities.

Erick Fry stated that URS would investigate whether or not a solar power units can support a loop activated system.

Steve Tiedemann indicated he would contact Kelvin Mullins and obtain the white marking spec for use on both the Bath Edie Rd and Brotherseville Rd projects.

Mike Dover requested that resurfacing be added to the project, 500' in both directions on GA 88 and 250' in both directions on Bath Edie Road.

Erick Fry stated that URS would prepare the required GDPA Type A letter and submit it ASAP.

Brothersville Rd at GA 88:

Erick Fry brought up the concern that it might not be possible to have right-of-way negotiations and utility coordination certified in time for a July letting.

Mike Dover suggested a deferred let date.

URS will prepare R/W plan and provide to Steve Tiedemen so he can kickoff the R/W acquisition process.

URS will use the white marking spec for the Brothersville Rd project.

Erick Fry committed to deliver final plans and concept reports on the following dates:

Bath Edie on 5/13/14

Brothersville on 5/19/14



Meeting Minutes – TIA Brothersville Rd Water Utility Coordination Meeting

MEETING DATE: May 09, 2014, 3:00 pm
Conference Call

**Brothersville Rd at GA 88 Intersection Improvements, GDOT PI 0011385
City of Hephzibah, GA (Richmond County)**

I. Attendees

Roger James	City of Hephzibah	cityofhephzibah@bellsouth.net
Jeff Henry	URS	jeff.henry@urs.com
BJ Martin	URS	bj.martin@urs.com

These meeting minutes are a summary of topics and comments discussed during the meeting. They were compiled from short hand notes and from memory and do not represent direct quotes from attendees.

CONVERSATION TOPICS AND ACTION ITEMS

Brothersville Rd at GA 88:

Jeff Henry introduced the meeting topic as the fire hydrant relocation at Brothersville Rd. and stated that BJ Martin would be coordinating the water line relocation with Roger James.

Roger James indicated he would discuss with appropriate city representatives whether or not the memorial planting area will need to be relocated/replanted at the SW corner of the proposed intersection. He stated he would contact URS with an answer by Monday 5/12/14.

Roger James indicated that his preferred location for the hydrant is off the back of the sidewalk along GA 88.

BJ Martin indicated he would draw a proposed relocation plan in cad and provide to Roger James for his feedback.

Project Concept Report
County: Richmond

P.I. Number: 0011385

ATTACHMENT 5

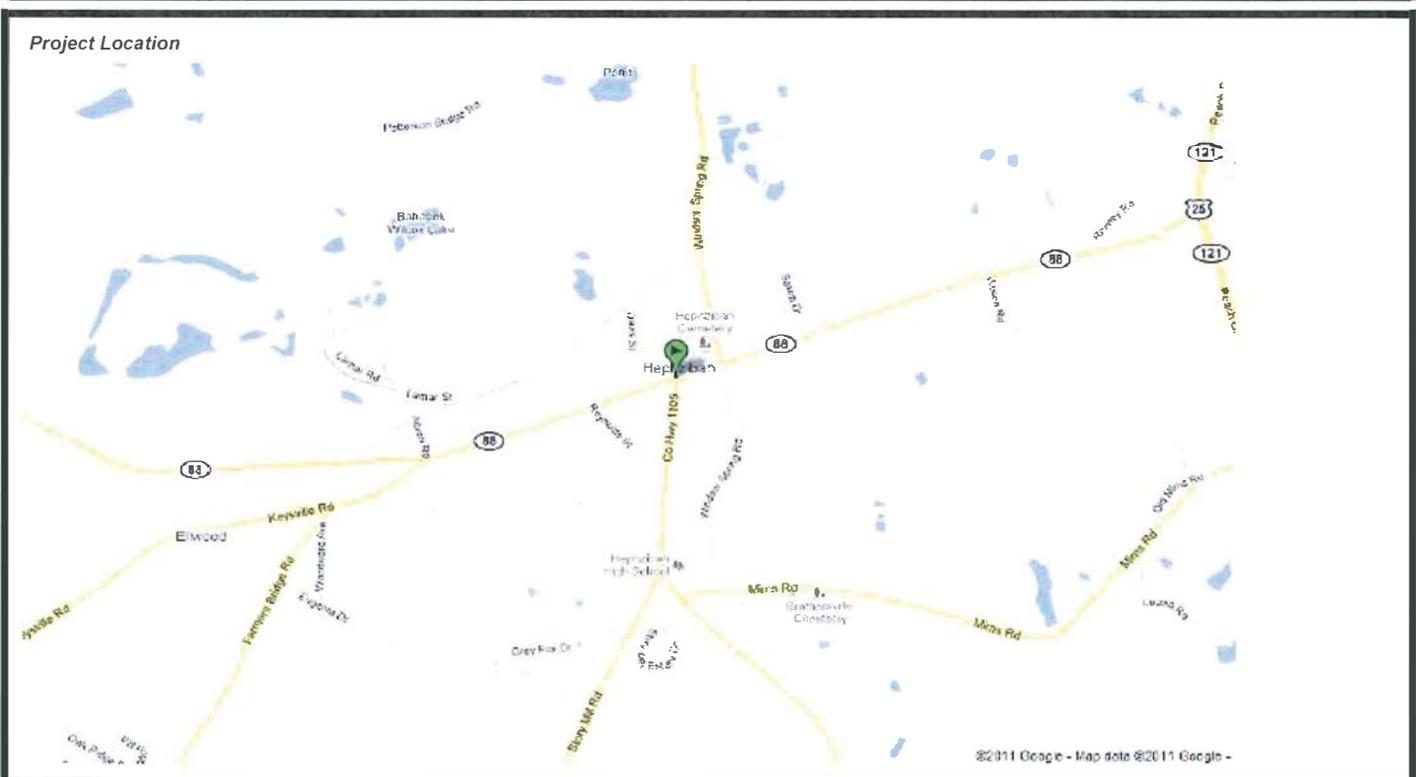
FACT SHEET

Project Sheet

Project Number:	RC07-000112	Project Name:	Brothersville Road and Highway 88 Intersection Improvements
GDOT ID:	0011385		
Project Description:	Brothersville Road at Highway 88 intersection improvements		
Regional Commission:	Central Savannah River Area		
County:	Richmond County		

Phase	Total Project Cost	Total TIA Amount	Comments (Please note all cost estimates are in 2011 dollars and actual costs for all phases at year of expenditure will be higher):
PE	\$50,000	\$50,000	
ROW	\$15,000	\$15,000	
CST	\$350,000	\$350,000	
Total	\$415,000	\$415,000	

Public Benefit	Notes
Ensuring Safety and Security	This project would benefit the public by potentially reducing the incidence of crashes along this roadway segment, corridor, and/or intersection.
Additional Benefits	This project would benefit the public by enhancing safety by resolving the high incidence of right angle accidents at this intersection. The project would also analyze, design, and construct appropriate treatments to improve the safety of the intersection.



ATTACHMENT 6
DESIGN EXCEPTION

vehicles on SR 88 and one (1) vehicle struck the curb after turning left from west bound SR 88 onto southbound Brothersville Road. Injuries occurred in four (4) of the seven (7) accidents.

Additional Costs Associated With Increasing the Curve Radius to 154 Feet

Cost Category	Cost \$
Construction	\$1,750
Reimbursable Utility (utility pole relocation)	\$18,962 (estimated by Southern Company)
Right-of-Way (land + consultant fee)	\$2,000
Additional PE to revise the design	\$15,000
TOTAL ADDITIONAL COST ----->	\$37,712

The \$37,712 total additional cost noted in the above table is a 17% increase over the original estimated project cost.

An additional unquantified cost consideration is the loss of two (2) parking spaces on the City Hall parcel if the radius were to be increased to 154 feet whereas, only one space would be lost in the proposed 80-foot radius curve design.

Furthermore, increasing the curve radius would cause schedule delays associated with design revision and approval, utility coordination, right-of-way acquisition and relocation of the utility pole.

It is requested that the proposed curve radius of 80 feet be permitted in order to minimize project cost and schedule delays.

Mitigating Factors

The following are mitigating factors of the proposed design:

- The proximity of the curve to the intersection means that northbound left-turning drivers will naturally be slowing down to make the movement into the left-turn lane as they prepare to stop while southbound drivers will be moving relatively slowly as they turn onto Brothersville Rd. and approach the curve.
- The flat terrain in the area provides drivers with ample sight distance to view the intersection and associated signage and striping. Drivers should have ample time to plan for navigating the intersection.
- The channelizing island between the left- and right-turn lanes will serve as a traffic calming device, and will encourage northbound drivers to slow down on the approach.

RECOMMENDED: Jeff Henry DATE 08/21/2014
 Jeff Henry, P.E., Consultant Engineer

CONCUR: Glenn Bowman DATE 9/5/14
 Glenn Bowman, P.E., Director of Engineering

APPROVED: Russell McMurry DATE 9.9.14
 Russell McMurry, P.E., Chief Engineer