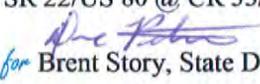


ORIGINAL TO GENERAL FILES

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

**OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE**

FILE P.I. #0009576 **OFFICE** Design Policy & Support
GDOT District 3 - Thomaston
Bibb County **DATE** October 25, 2011
SR 22/US 80 @ CR 33/Holley Road

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:

Genetha Rice-Singleton, Program Control Administrator
Bobby Hilliard, State Program Delivery Engineer
Cindy VanDyke, State Transportation Planning Administrator
Angela Robinson, Financial Management Administrator
Glenn Bowman, State Environmental Administrator
Kathy Zahul, State Traffic Engineer
Georgene Geary, State Materials & Research Engineer
Ron Wishon, State Project Review Engineer
Jeff Baker, State Utilities Engineer
Ken Thompson, Statewide Location Bureau Chief
Michael Henry, Systems & Classification Branch Chief
David Millen, District Engineer
Bill Rountree, District Preconstruction Engineer
Kerry Gore, District Utilities Engineer
Perry Black, Project Manager
BOARD MEMBER - 8th Congressional District

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PROJECT CONCEPT REPORT

Project Number: 0009576
County: Bibb
P. I. Number: 0009576
Federal Route Number: U.S. 80
State Route Number: S.R. 22

S.R. 22/U.S. 80 at C.R. 33/Holley Road

Submitted for approval:

DATE 8/26/2011
DATE 8/29/2011
DATE 8/26/2011

Arl Atkins ATKINS
Design Consultant Name and Firm Name
Emily Black
Office Head (Program Delivery)
Emily Black
Project Manager

Recommendation for approval:

DATE _____
DATE 9/15/2011
DATE 9/2/2011
DATE 9/2/2011
DATE _____
DATE _____
DATE 9/15/2011

Program Control Administrator
Glenn Bowman * / KLP
State Environmental Administrator
Ron Wishon * / KLP
Project Review Engineer
for Sal Pirzad * / KLP
State Utilities Engineer
District Engineer / District Utilities Engineer
State Transportation Financial Management Administrator
Kathy Zahul * / KLP
State Traffic Engineer

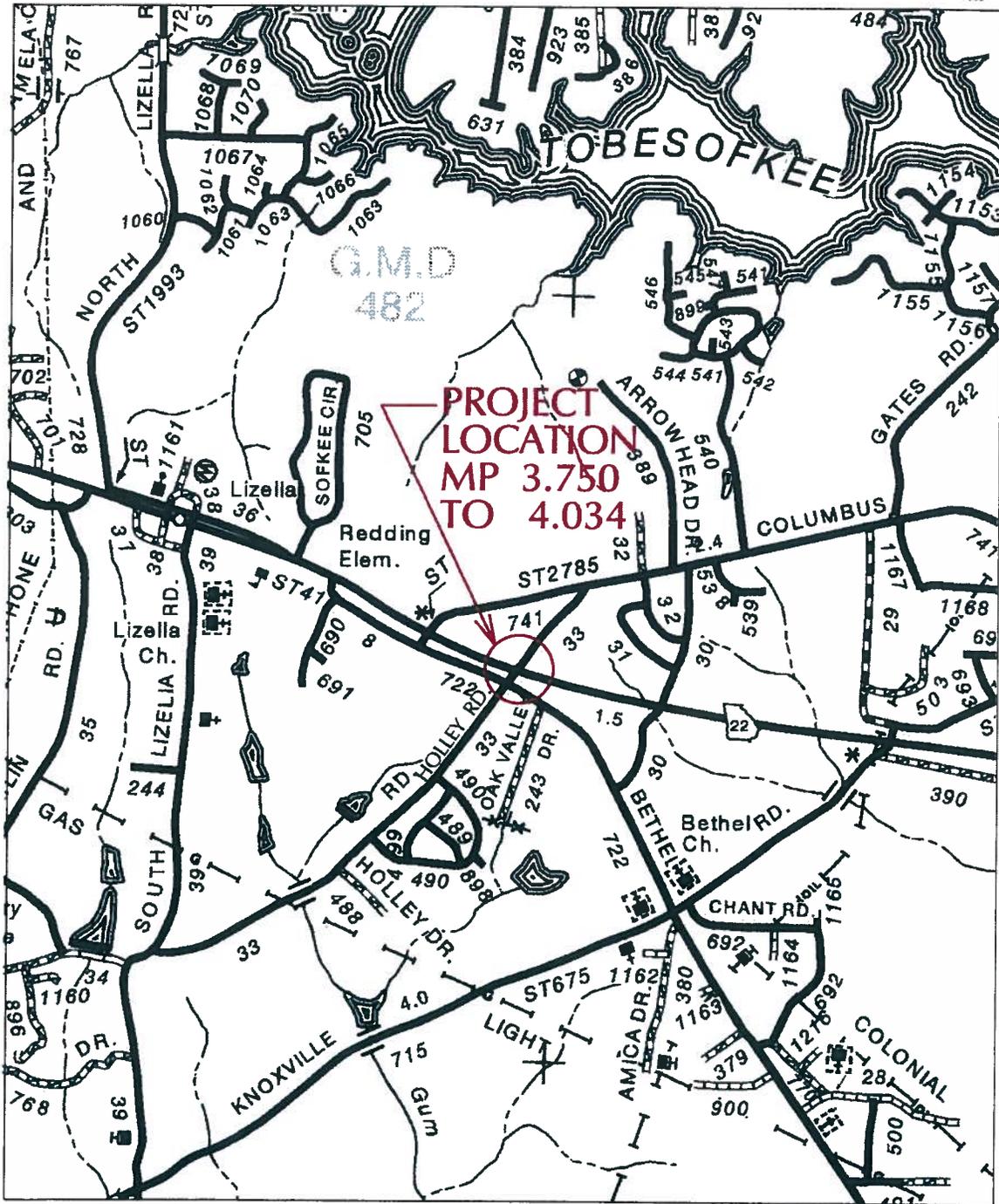
The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Program (RTP) and/or the State Transportation Improvement Program (STIP).

DATE 9-12-11
Cynthia L. Vaughe
State Transportation Planning Administrator

* Recommendation on file

PROJECT LOCATION MAP

S.R. 22 at Holley Road
P.I. # 0009576



NEED AND PURPOSE

The intersection of S.R. 22/U.S. 80 in Bibb County is located in a rural area outside of Lizella, Georgia. S.R. 22/U.S. 80 is a direct route to and from I-75/I-475 and Macon. The existing configuration of this intersection and the high speed on S.R. 22/U.S. 80 (55 mph) have resulted in higher than the state average injury rates since 2008. Since 2004 there have been 3 fatalities due to angle collisions.

The purpose of the proposed project is to reduce crash frequency and severity at the intersection of S.R. 22/U.S. 80 with Holley Road. Based on the crash history and type of collisions a single lane roundabout is proposed. The installation of a single lane roundabout would provide an acceptable level of service for the intersection while reducing crash severity. Based on the National Cooperative Highway Research Program (NCHRP) Report 572 in May 2006 the installation of roundabouts have reduced all crashes by 44% and reduced injury crashes 82% at intersections that were two-way stop controlled.

Description of Existing Roadways

S.R. 22/U.S. 80 is a two-lane east/west roadway with 12 foot travel lanes, paved shoulders and open drainage ditches that runs from U.S. 19/S.R. 3 to Macon and I-75. The facility is functionally classified as a rural minor arterial within the project limits. The posted speed limit along S.R. 22/U.S. 80 is 55 miles per hour (mph). Holley Road is a two-lane north/south roadway with 12 foot travel lanes, paved shoulders and open drainage ditches. This facility is functionally classified as a rural local road. Holley Road intersects Bethel Church Road 300 ft to the south of S.R. 22/U.S. 80 at a four-way stop. The posted speed limit along Holley Road is 35 mph. S.R. 22 and Holley Road are not part of the Statewide Bicycle Plan.

The eastbound and westbound approaches of S.R. 22/U.S. 80 to Holley Road have right turn lanes but no left turn lanes. Holley Road has right turn lanes on the northbound and southbound approaches to the stop sign controlled intersection with S.R. 22/U.S. 80.

A Traffic Signal Warrant Evaluation was completed in December 2005 and no warrants were met. See the attached Traffic Engineering Study dated December 15, 2005 for Warrant Evaluation.

Land Use

S.R. 22/US 280 in the project vicinity is predominantly rural residential. On the northwest corner of S.R. 22/US 280 intersection with Holley Road is a neighborhood retail center. The northeast corner of the intersection is the Lizella Community Club, which consists of a swimming pool and baseball field.

Existing Conditions

Trucks represent approximately 7% of the traffic along S.R. 22. The Average Daily Traffic (ADT) along this section of highway for year 2009 was 5,340. Currently no roadway improvements are in the Construction Work Program for S.R. 22 in this vicinity.

Crash Analysis

A review of the crash data along S.R. 22 shows a total of 15 crashes occurred within the project limits from 2007 through 2009. Eleven of the crashes were the result of angle collisions within the intersection of S.R. 22 and Holley Road. One of the eleven crashes resulted in a fatality. Two of the crashes were rear end collisions and two crashes did not involve a motor vehicle. The crash rates on S.R. 22 were slightly lower than the statewide average for rural minor arterials in 2007 and 2008. The injury rate was lower than the statewide average in 2007 yet significantly higher in 2008. No statewide information was available for the year 2009. Since 2004 there have been 3 fatalities due to angle collisions. See the attached Traffic Engineering Study dated December 15, 2005 for discussion of accident history prior to 2007.

Table 1. Crash Data – S.R. 22 at Holley Road

	2007		2008		2009	
	S.R. 22	Statewide	S.R. 22	Statewide	S.R. 22	Statewide
Crashes	5		4		6	
Crash Rate*	141	149	117	152	204	N/A
Injuries	1		6		5	
Injury Rate*	28	67	176	75	170	N/A

* Rate per 100 million vehicle miles.

DESCRIPTION OF THE PROPOSED PROJECT

The crash frequency and severity described in the previous sections illustrate a need within this corridor for the improvements as proposed by this project. More specifically, this proposed project would include replacing the un-signalized at-grade intersection at S.R. 22 and Holley Road with a roundabout configuration. The proposed alignment would utilize existing pavement along all four approaches where feasible to reduce impacts and project cost. The logical termini were established based on horizontal constraints of the approach roadway to the proposed roundabout.

The proposed project would begin at MP 3.75 and end at MP 4.03 in Bibb County for a project length of 0.28 mile. Located approximately one mile east of Lizella, Ga and approximately twelve miles west of Macon, Ga, the roundabout configuration would consist of a 160-ft inscribed circle diameter with a 20-ft single lane circulatory roadway width. This results in a 120-ft diameter central island including a 20-ft wide traversable truck apron that would accommodate turning movements. Curb and gutter is provided along the outside of the roundabout and along the inside of the truck apron. The roadway approaches would consist of 12-ft travel lanes and 12-ft wide outside shoulders, of which 8 feet is paved, with open ditch drainage. As the roadway approaches the roundabout, the typical section would transition to a divided roadway with variable width travel lanes and curb and gutter on the outside. A splitter island would be utilized to separate entering and exiting traffic streams and assist in channelizing the vehicles through the roundabout.

The intersection of Holley Road and Bethel Church Road, located 200 ft south of the Holley Road/S.R. 22 intersection, does not currently exhibit any operational problems associated with the proximity of these intersections. No queuing problems have been observed at this intersection. Confirmation of these

findings has been substantiated by the District Traffic Engineer. The District Traffic Engineer has analyzed the traffic volumes and traffic patterns as well as knowledge of the location and side street movements to substantiate these findings. The estimate for vehicles waiting on the Holley Road approaches is 5 to 6 vehicles during a peak minute. Therefore queing should not be a problem for vehicles entering from Holley Road north or south approaches versus the SR 22 vehicles east and west of Holley Road.

The construction of the proposed roundabout at S.R. 22 and Holley Road will improve the operational efficiency of this intersection by removing the northbound stop condition on Holley Road and replacing it with a yield condition.

Is the project located in a PM 2.5 Non-attainment area? Yes No

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

The proposed project is in a Maintenance Area and is therefore treated as a Non-attainment area. The proposed roundabout is in conformance with the Macon Area Transportation Study conforming plan's model. The project begins at milepost 3.75 on S.R. 22 and ends at milepost 4.03, which includes the Holley Road intersection. The one lane roundabout is proposed to be open to traffic in 2014.

PDP Classification: Major , Minor

Federal Oversight: Full Oversight , Exempt , State Funded , or Others

Functional Classification: Rural Minor Arterial (S.R. 22); Rural Local Road (Holley Road)

U. S. Route Number(s): U.S. 80 State Route Number(s): S.R. 22

Traffic (AADT):

	Open Year: (2014)	Design Year: (2034)
S.R. 22	6,550 (8% trucks)	8,750 (5% trucks)
Holley Road	2,050 (4% trucks)	2,550 (4% trucks)

Existing Design Features:

- Typical Section:
 - S.R. 22: Two-lane undivided facility with 12 foot wide travel lanes and 12 foot wide outside shoulders, of which 8 feet is paved, with open ditch drainage.
 - Holley Road: Two-lane undivided facility with 12 foot wide travel lanes and 6 foot wide outside shoulders with open ditch drainage.
- Posted Speed: S.R. 22 – 55 mph Holley Road – 35 mph
- Minimum radius for curve: S.R. 22 – Spiral Curve
- Maximum super-elevation rate for curve: S.R. 22 – 0.02
- Maximum Grade: S.R. 22 – 2.6396% Holley Road – 3.0272%
- Width of right of way: S.R. 22 – Varies (Approx. 213 ft – 250 ft) Holley Road – 80 ft
- Major structures: None

- Shift traffic to newly constructed portions of SR 22 and construct remaining portions of roundabout and proposed improvements to Holley Road north of SR 22.
- Open roundabout to traffic and finish truck apron and remaining curb and gutter/sidewalk not constructed in previous stages.
- Design Exceptions to controlling criteria anticipated:

	<u>UNDETERMINED</u>	<u>YES</u>	<u>NO</u>
HORIZONTAL ALIGNMENT:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
LANE WIDTH:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SHOULDER WIDTH:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VERTICAL GRADES:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CROSS SLOPES:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
STOPPING SIGHT DISTANCE:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SUPERELEVATION RATES:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VERTICAL ALIGNMENT:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SPEED DESIGN:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VERTICAL CLEARANCE:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BRIDGE WIDTH:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
BRIDGE STRUCTURAL CAPACITY:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
LATERAL OFFSET TO OBSTRUCTION:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- Design Variances: None anticipated
- Environmental concerns: Historic Resources
- Anticipated Level of environmental analysis:
 - Are Time Saving Procedures appropriate? Yes , No
 - Categorical Exclusion: Yes , No
 - Environmental Assessment/Finding of No Significant Impact (FONSI): Yes , No
 - Environmental Impact Statement (EIS): Yes , No
- Utility involvement: Relocation of facilities in conflict with construction
- VE Study Anticipated? Yes , No
- Benefit/Cost Ratio: 10.66, see Attachments

Project Cost Estimate and Funding Responsibilities:

	PE*	ROW	UTILITY	CST**	MITIGATION
By Whom	GDOT	GDOT	GDOT	GDOT	N/A
\$ Amount	\$327,300	N/A	\$0	\$943,053	\$0

*PE Cost is for Concept through Final Plans

**CST Cost includes: Construction, Engineering & Inspection, Fuel Cost Adjustment and Asphalt Cement Cost Adjustment

Project Activities Responsibilities:

- Design: GDOT/ATKINS
- Right-of-Way Acquisition: GDOT
- Right-of-Way funding (real property): GDOT
- Relocation of Utilities: GDOT (within R/W)
- Letting to contract: GDOT
- Supervision of construction: GDOT
- Providing material pits: Contractor

- Providing detours: Contractor
- Environmental Studies/Documents/Permits: GDOT/ATKINS
- Environmental Mitigation: N/A

Coordination:

- Initial Concept Meeting Date 8/10/2011
- Concept Meeting Date 8/10/2011
- PAR Meeting Date N/A
- FEMA, USCG, and/or TVA: N/A
- Public Involvement: TBD
- Local government comments:
- Other projects in area:
 1. *CSSTP-M003-00(218), Bibb County, P.I. No. M003218, SR 22 FM Tobesofkee Creek Bridge to U.S. 41 BUS/Broadway Street*
 2. *CSSTP-M003-00(470), Bibb County, P.I. No. M003470, SR 74 FM East of CS 751/Summerhill Drive to West of CS 581/Stadium Dr.*
 3. *NH000-0475-01(206), Bibb County, P.I. No. 311992, I-475 Noise Barrier Walls in Bibb County*
 4. *CSSTP-M003-00(066), Bibb County, P.I. No. M003066, S.R. 247 from 58 FT North of S.R. 11 to S.R. 87*
 5. *STP00-3207-00(004), Bibb County, P.I. No. 350960, S.R. 74 FM West of I-475 Turn Lanes to East of Log Cabin Drive/S.R. 74 SP*
 6. *P.I. No. 0009959, Bibb County, SR 22 at CR 740/Fulton Mill Road Roundabout*
 7. *P.I. No. 0009960, Bibb County, SR 22 at CR 715/Knoxville Road Roundabout*
- Railroads: None
- Other coordination to date: None

Scheduling – Responsible Parties' Estimate

- Time to complete environmental process: Begin: 6/3/2011 End: 12/15/2011
- Time to complete preliminary construction plans: Begin: 9/5/2011 End: 12/23/2011
- Time to complete right of way plans: N/A
- Time to complete the Section 404 Permit: N/A
- Time to complete final construction plans: Begin: 2/28/2012 End: 6/25/2012
- Time to complete the purchase of right of way: N/A
- List other major items that will affect the project schedule: Utility Relocations.

Other alternatives considered:

- 1) **No Build** – Eliminated due to higher than average crash history.
- 2) **Signalized Intersection** – Based on Traffic Signal Warrant Evaluation a signal does not meet any of the warrants.
- 3) **Add Left Turn Lanes** – The Traffic Engineering Report dated December 15, 2005 recommended installing left turn lanes by removing the existing right turn lanes on S.R. 280/U.S. 80. While this recommendation's construction costs are less expensive than the single lane roundabout it does not reduce the crash frequency or severity of the intersection. The removal of the right turn lanes would be a design exception and could increase the number of rear end crashes. Also, the operating speeds through the intersection with a roundabout will be lower. The lower operating speeds of the roundabout will allow drivers more time to react to potential conflicts which results in fewer crashes and also the reduced severity of the crashes.

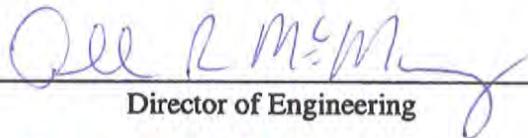
Project Concept Report Page: 2
Project Number: 0009576
P. I. Number: 0009576
County: Bibb

Comments: None

Attachments:

1. Detailed Cost Estimates:
 - a) Construction, including Engineering and Inspection
 - b) Completed Fuel & Asphalt Price Adjustment forms
 - c) Right-of-Way (N/A)
 - d) Preliminary Utility Cost Estimate
2. Typical Sections
3. Conceptual Layout of Project
4. Benefit Cost Analysis Worksheet
5. Accident Summaries
6. Design Traffic, July 20, 2011
7. Traffic Engineering Study, December 15, 2005
8. Roundabout Analysis, September 12, 2011
9. Concept Team Meeting Minutes, August 10, 2011
10. Lighting Agreement, August 16, 2011
11. Fastest Path and Design Vehicle Swept Path Study

Concur: _____


Director of Engineering

Approve: _____


Chief Engineer

Date: 10-21-11

Attachment 1a

Construction Cost Estimate

S.R. 22 at HOLLEY RD
P.I. No. 0009576
Bibb County

Roadway

Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	\$50,000.00	Grading Complete	\$50,000.00
153-1300	1	EA	\$57,385.59	FIELD ENGINEERS OFFICE	\$57,385.59
310-5120	6860	SY	\$18.30	GR AGGR BASE CRS, 12 INCH, INCL MATL	\$125,538.00
402-1812	110	TN	\$63.63	RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME	\$6,999.30
402-3121	1330	TN	\$56.63	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM	\$75,317.90
402-3130	530	TN	\$61.16	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM	\$32,414.80
402-3190	720	TN	\$63.71	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM	\$45,871.20
413-1000	480	GL	\$1.99	BITUM TACK COAT	\$955.20
430-0200	3460	SY	\$41.62	PLAIN PC CONC PVMT, CL 1 CONC, 10 INCH THK	\$144,005.20
441-0104	530	SY	\$28.55	CONC SIDEWALK, 4 IN	\$15,131.50
441-0740	560	SY	\$27.00	CONCRETE MEDIAN, 4 IN	\$15,120.00
441-0754	360	SY	\$43.00	CONCRETE MEDIAN, 7 1/2 IN	\$15,480.00
441-5008	260	LF	\$14.00	CONCRETE HEADER CURB, 6 IN, TP 7	\$3,640.00
441-5010	380	LF	\$10.00	CONCRETE HEADER CURB, 6 IN, TP 9	\$3,800.00
441-6022	1,000.00	LF	\$18.46	CONC CURB & GUTTER, 6 IN X 30 IN, TP 2	\$18,460.00
446-1100	3,500.00	LF	\$4.00	PVMT REINF FABRIC STRIPS, TP 2, 18 INCH WIDTH	\$14,000.00
500-9999	100	CY	\$137.27	CLASS B CONC, BASE OR PVMT WIDENING	\$13,727.00

Subtotal: \$637,845.69

Miscellaneous Items

Item Number	Quantity	Units	Unit Price	Item Description	Cost
150-1000	1	LS	\$95,700.00	Traffic Control (15%)	\$95,700.00
	1	LS	\$31,900.00	Temporary Erosion Control (5%)	\$31,900.00
	1	LS	\$31,900.00	Permanent Erosion Control (5%)	\$31,900.00
	1	LS	\$44,700.00	Signing and Marking (7%)	\$44,700.00
	1	LS	\$31,900.00	Lighting (5%)	\$31,900.00
	1	LS	\$19,200.00	Drainage (3%)	\$19,200.00
	1	LS	\$5,000.00	Landscaping	\$5,000.00

Subtotal: \$260,300.00

Construction Cost	\$898,145.69
Engineering and Inspection (5%)	\$44,907.28
Contingency (0%)	
Total AC and Fuel Adjustment	\$46,704.08
Total Construction Cost	\$943,052.97

Right Of Way	\$0.00
ReImb. Utilities	\$0.00
Total Project Cost	\$943,052.97

Attachment 1b

Fuel/Asphalt Price Adjustment Form

PROJ. NO.

SR 22 at Holley Road

CALL NO.

P.I. NO.

0009576

DATE

9/22/2011

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)

0

Monthly Asphalt Cement Price month placed (APM)

0

Max. Cap

60%

\$

912.00

\$ -

Monthly Asphalt Cement Price month project let (APL)

0

Max. Cap

60%

\$

570.00

\$ -

Total Monthly Tonnage of asphalt cement (TMT)

0

Bitum Tack

SY

Gals/SY

Gals

gals/ton

tons

Single Surf. Trmt.

0.20

0

0

232.8234

0

Double Surf. Trmt.

0.44

0

0

232.8234

0

Triple Surf. Trmt

0.71

0

0

232.8234

0

TOTAL LIQUID AC ADJUSTMENT

\$

46,704.08

Attachment 1d

Preliminary Utility Cost Estimate

**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

INTERDEPARTMENT CORRESPONDENCE

FILE **No Project #, Bibb County, P.I. # 0009576** OFFICE Thomaston
Roundabout SR 22/US 80 @ CR 33/Holley Road

FROM Kerry Gore, District Utilities Engineer DATE August 16, 2011

TO Perry Black, Project Manager

SUBJECT **PRELIMINARY UTILITY COST (ESTIMATE)**

As requested by your office, we are furnishing you with a Preliminary Utility Cost estimate for each utility with facilities potentially located within the project limits.

<u>FACILITY OWNER</u>	<u>NON-REIMBURSABLE</u>	<u>REIMBURSABLE</u>
Atlanta Gas Light	30,250	0
Georgia Power (Distribution)	2,609	0
Macon Water Authority	12,000	0
Public Service Telephone	43,500	0
Southern Rivers Energy	946	0
TOTALS	\$89,305	\$ 0

Total Preliminary Utility Cost Estimate **\$89,305**.

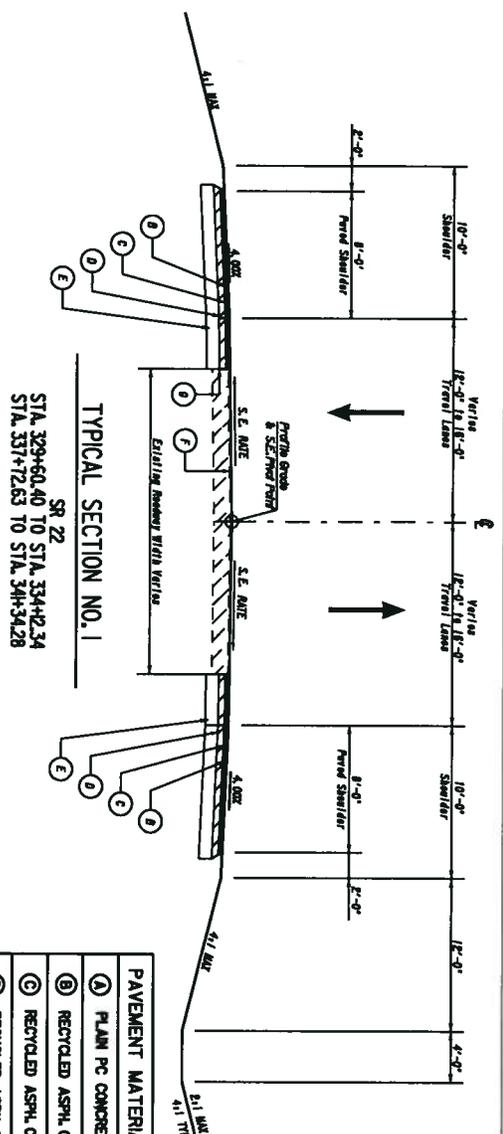
If you have any questions, please contact Kerry Gore at 706-646-6692.

KG/pls

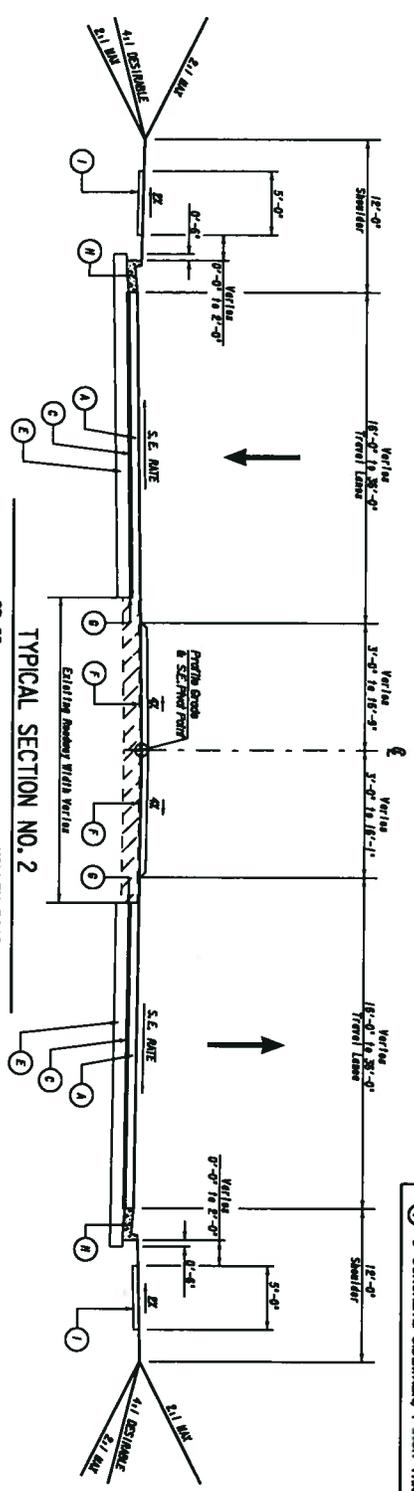
cc: Jeff Baker, P.E., State Utilities Engineer *(via: e-mail)*
Angela Robinson, Office of Financial Management *(via: e-mail)*
Sheldon Minor, Area Engineer *(via: e-mail)*

Attachment 2

Typical Sections

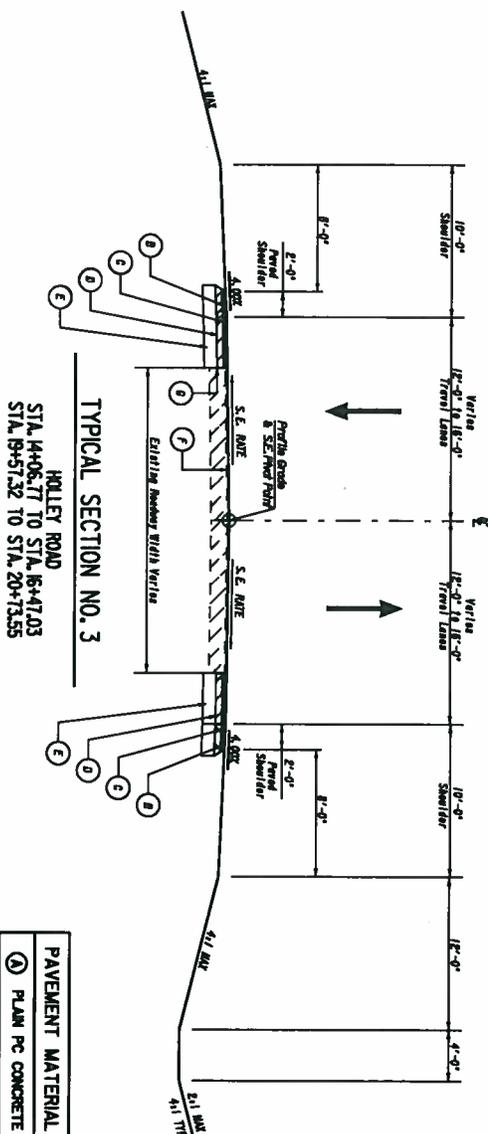


TYPICAL SECTION NO. 1
SR 22
STA. 329+60.40 TO STA. 334+2.34
STA. 337+72.63 TO STA. 344+34.28



TYPICAL SECTION NO. 2
SR 22
STA. 334+2.34 TO STA. 335+2.31
STA. 336+72.31 TO STA. 337+72.63
HOLLEY ROAD
STA. 16+47.03 TO STA. 17+47.32
STA. 19+07.32 TO STA. 19+57.32

PAVEMENT MATERIAL SCHEDULE	
A	PLAIN PC CONCRETE PAVEMENT, 4" CONC, 10"
B	RECYCLED ASPH. CONC. 12.5 MM SUPERPAVE, 165 LBS./SY
C	RECYCLED ASPH. CONC. 19 MM SUPERPAVE, 220 LBS./SY
D	RECYCLED ASPH. CONC. 25 MM SUPERPAVE, 890 LBS./SY
E	GRADED AGGREGATE BASE COURSE, 12"
F	ASPHALTIC CONCRETE LEVELING, AS REQUIRED
G	PAVEMENT REINFORCING FABRIC STRIP
H	CONCRETE CURB & GUTTER, 6" X 30", TYPE 2, GA. STD. 9032 B
I	5" CONCRETE SIDEWALK, 4 INCH THICK



HOLLEY ROAD
 STA. 14+06.77 TO STA. 16+47.03
 STA. 19+57.32 TO STA. 20+73.55
 TYPICAL SECTION NO. 3

PAVEMENT MATERIAL SCHEDULE	
Ⓐ	PLAIN PC CONCRETE PAVEMENT, 12" CONC. 10"
Ⓑ	RECYCLED ASPH. CONC. 12.5 mm SUPERPAVE, 165 LBS./SY
Ⓒ	RECYCLED ASPH. CONC. 19 mm SUPERPAVE, 220 LBS./SY
Ⓓ	RECYCLED ASPH. CONC. 25 mm SUPERPAVE, 860 LBS./SY
Ⓔ	GRADED AGGREGATE BASE COURSE, 12"
Ⓕ	ASPHALTIC CONCRETE LEVELING, AS REQUIRED
Ⓖ	PAVEMENT REINFORCING FABRIC STRIP
Ⓗ	CONCRETE CURB & GUTTER, 8" X 30", TYPE 2, GA STD. 9032 B
Ⓡ	5" CONCRETE SIDEWALK, 4 INCH THICK

Attachment 3

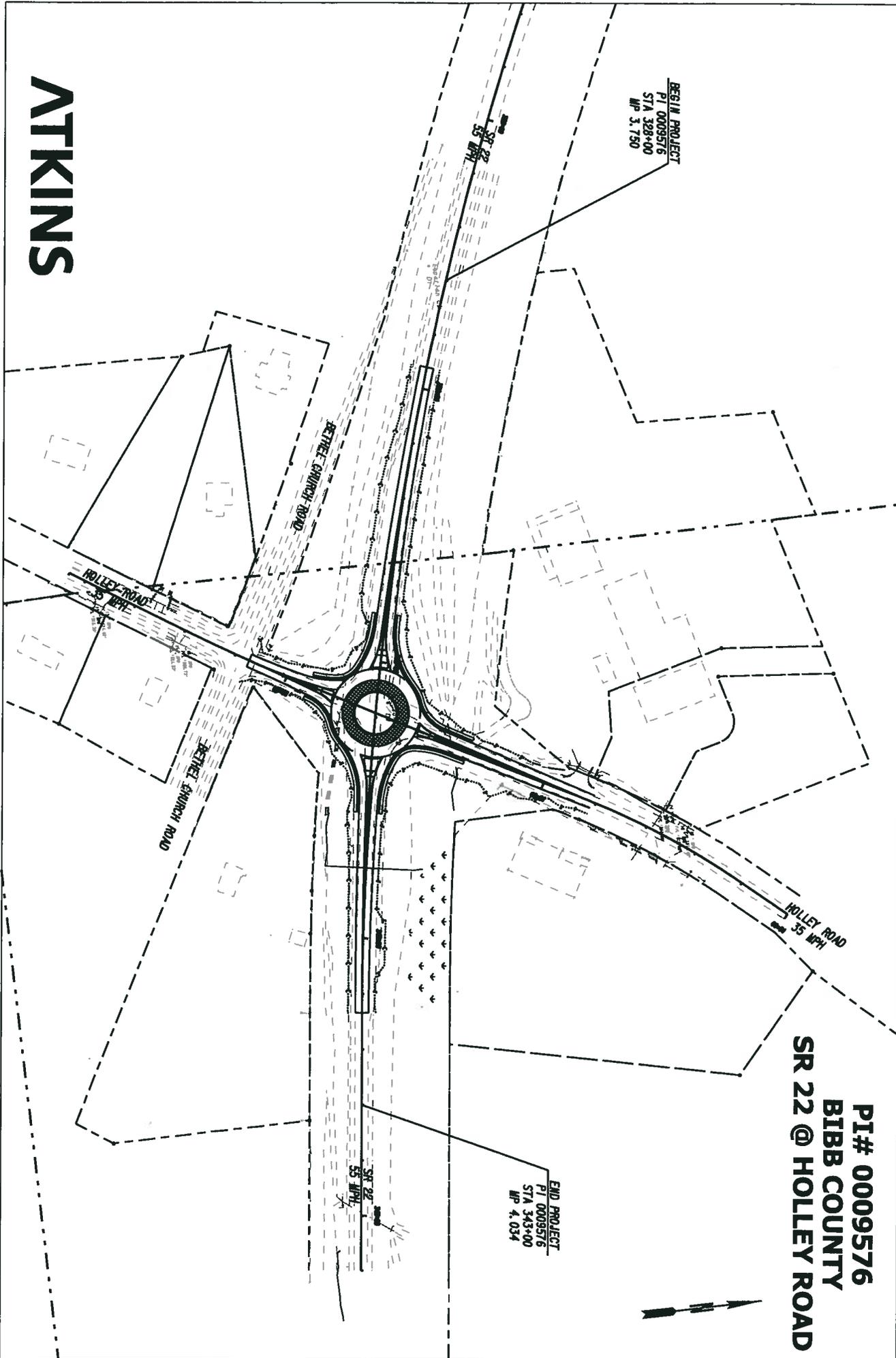
Conceptual Layout of Project

ATKINS

BEGIN PROJECT
PI 0009576
STA 328+00
MP 3.750

END PROJECT
PI 0009576
STA 343+00
MP 4.034

PI# 0009576
BIBB COUNTY
SR 22 @ HOLLEY ROAD



Attachment 4

Benefit Cost Analysis Worksheet

BENEFIT COST ANALYSIS WORKSHEET

SR 22 @ Holley Rd

Bibb County

Intersection Improvement

ACCIDENT DATA

Description	Symbol	Value
Property Damage Accidents (no fatality or injury)	P	1.8
Fatalities	F	0.2
Injuries	I	1.4

FIXED VALUES

Description	Symbol	Value
Fatality Cost	Fc	\$5,800,000
Injury Cost	Ic	\$333,500
Property Damage Cost	Pc	\$4,800
Maintenance/Operating Cost	Cm	\$20,000

TABLE VALUES

Description	Symbol	Value
Reduction Factor (fatalities and injuries) (Appendix E)	R	0.8
Reduction Factor (property damage) (Appendix E)	Rp	0.42
Capital Recovery Factor (Appendix E)	Ek	0.087
Initial Improvement Cost (Itemized Cost Estimate)	Ci	\$1,177,132.00

Q = Weighted cost of fatal and injury collisions

$$Q = \frac{(Fc \times F) + (Ic \times I)}{F + I}$$

$$Q = 1016812.5$$

B = Benefit

$$B = Q (F + I) (R) + Pc (P) (Rp)$$

$$B = 1305148.8$$

C = Cost

$$C = Ek (Ci) + Cm$$

$$C = 122410.484$$

B/C = Benefit/Cost Ratio

$$B/C = 10.66206715$$

BENEFIT/COST RATIO: 10.66

BENEFIT COST ANALYSIS FACTOR DEFINITIONS

- F: annual number of collisions involving fatalities during study period
- I: average annual number of collisions involving injured people for the period of the study
- P: average annual number of collisions involving only property damage for the period of the study
- R: reduction of fatal and injury collisions by type (from Table A - Appendix E)
- Rp: reduction of property damage only collisions by type (from Table A - Appendix E)
- Pc: average cost, in thousands of \$, per property damage only collision
- Q: weighted cost, in thousands of \$, of fatal and injury collisions
- Ic: average cost per injury in thousands of \$
- Fc: average cost per fatality in thousands of \$
- Ek: capital recovery factor based on countermeasure life (from Table B - Appendix E)
- Ci: estimated initial cost of the countermeasure (cost of the improvement including r/w) in thousands of \$
- Cm: estimated annual maintenance and operating cost of the countermeasure in thousands of \$

Attachment 5

Accident Summaries

QUERY SUMMARY

For Year(s): 2007,2008,2009

Year	County	Route Type	Route Number	Beginning Milelog	Ending Milelog	No. Accidents	No. Injuries	No. Fatalities
2007	Bibb	State Route	002200	3.54	5.05	5	1	0
						0	0	0
2007 SubTotal						5	1	0
2008	Bibb	State Route	002200	3.54	5.05	4	6	1
						0	0	0
2008 SubTotal						4	6	1
2009	Bibb	State Route	002200	3.54	5.05	6	5	0
						0	0	0
2009 SubTotal						6	5	0
All Year(s)Total						15	12	1

ACCIDENT RATE CALCULATION for year(s)2007,2008,2009

Accident Data Information System

ACCIDENT RATE CALCULATION 2007

Year	County	Rt Type	Route Num	Low Milelog	High Milelog	ADT	Distance	Vehicle Miles
2007	Bibb	1	002200	3.54	5.05	6,440	1.51	9,724
Total Vehicle Miles: 9724				Total Accidents: 5		Accident Rate: 141		Statewide Accident Rate: 149
Average AADT: 6440				Total Injuries: 1		Injury Rate: 28		Statewide Injury Rate: 67
Length In Miles: 1.51				Total Fatalities: 0		Fatality Rate: 0.00		Statewide Fatality Rate: 1.60

NOTE: Rates are per 100 Million Vehicle Miles.

ACCIDENT RATE CALCULATION 2008

Year	County	Rt Type	Route Num	Low Milelog	High Milelog	ADT	Distance	Vehicle Miles
2008	Bibb	1	002200	3.54	5.05	6,200	1.51	9,362
Total Vehicle Miles: 9362				Total Accidents: 4		Accident Rate: 117		Statewide Accident Rate: 152
Average AADT: 6200				Total Injuries: 6		Injury Rate: 176		Statewide Injury Rate: 75
Length In Miles: 1.51				Total Fatalities: 1		Fatality Rate: 29.26		Statewide Fatality Rate: 1.85

NOTE: Rates are per 100 Million Vehicle Miles.

ACCIDENT RATE CALCULATION 2009

Year	County	Rt Type	Route Num	Low Milelog	High Milelog	ADT	Distance	Vehicle Miles
2009	Bibb	1	002200	3.54	5.05	5,340	1.51	8,063
Total Vehicle Miles: 8063				Total Accidents: 6		Accident Rate: 204		Statewide Accident Rate: N/A*
Average AADT: 5340				Total Injuries: 5		Injury Rate: 170		Statewide Injury Rate: N/A*
Length In Miles: 1.51				Total Fatalities: 0		Fatality Rate: 0.00		Statewide Fatality Rate: N/A*

* 2009 Statewide data not available.

NOTE: Rates are per 100 Million Vehicle Miles.

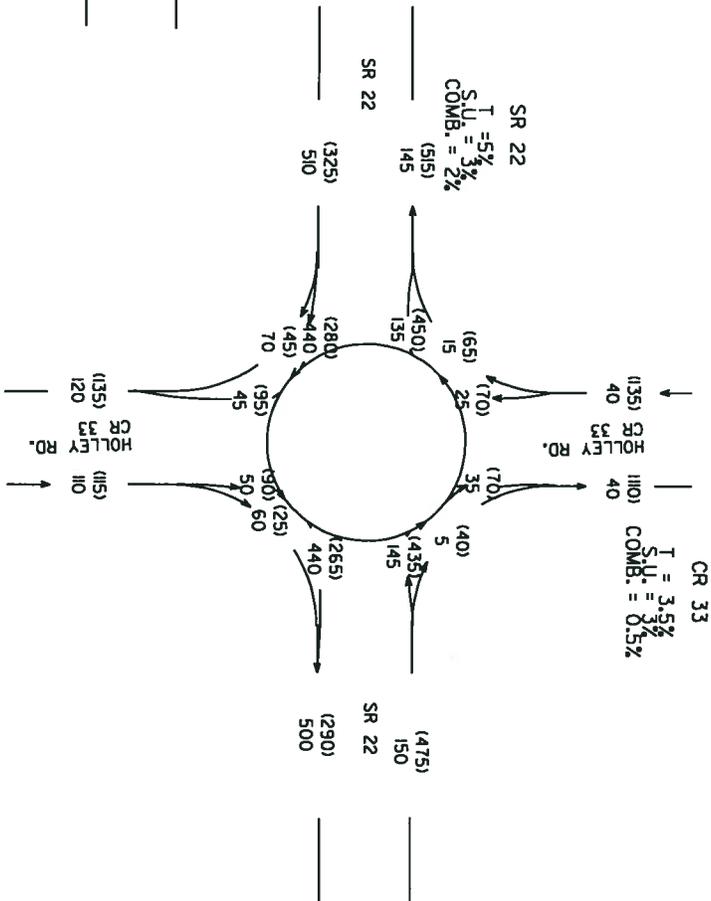
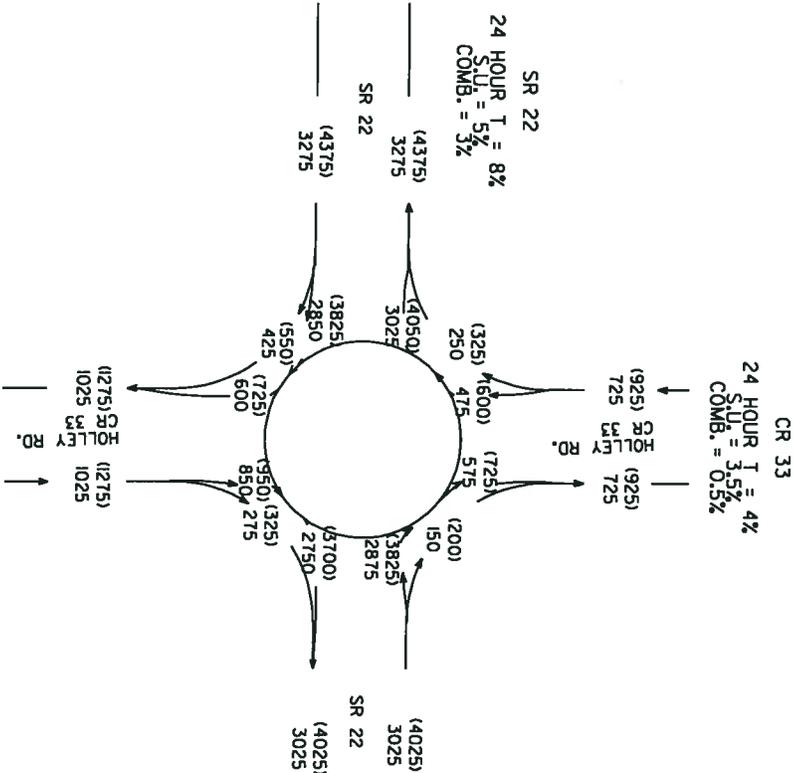
Attachment 6

Design Traffic

July 20, 2011

BUILD = (0000)
2034 ADDT = 0000

BUILD = (0000)
2034 PM DHV = 0000
2034 AM DHV = 0000

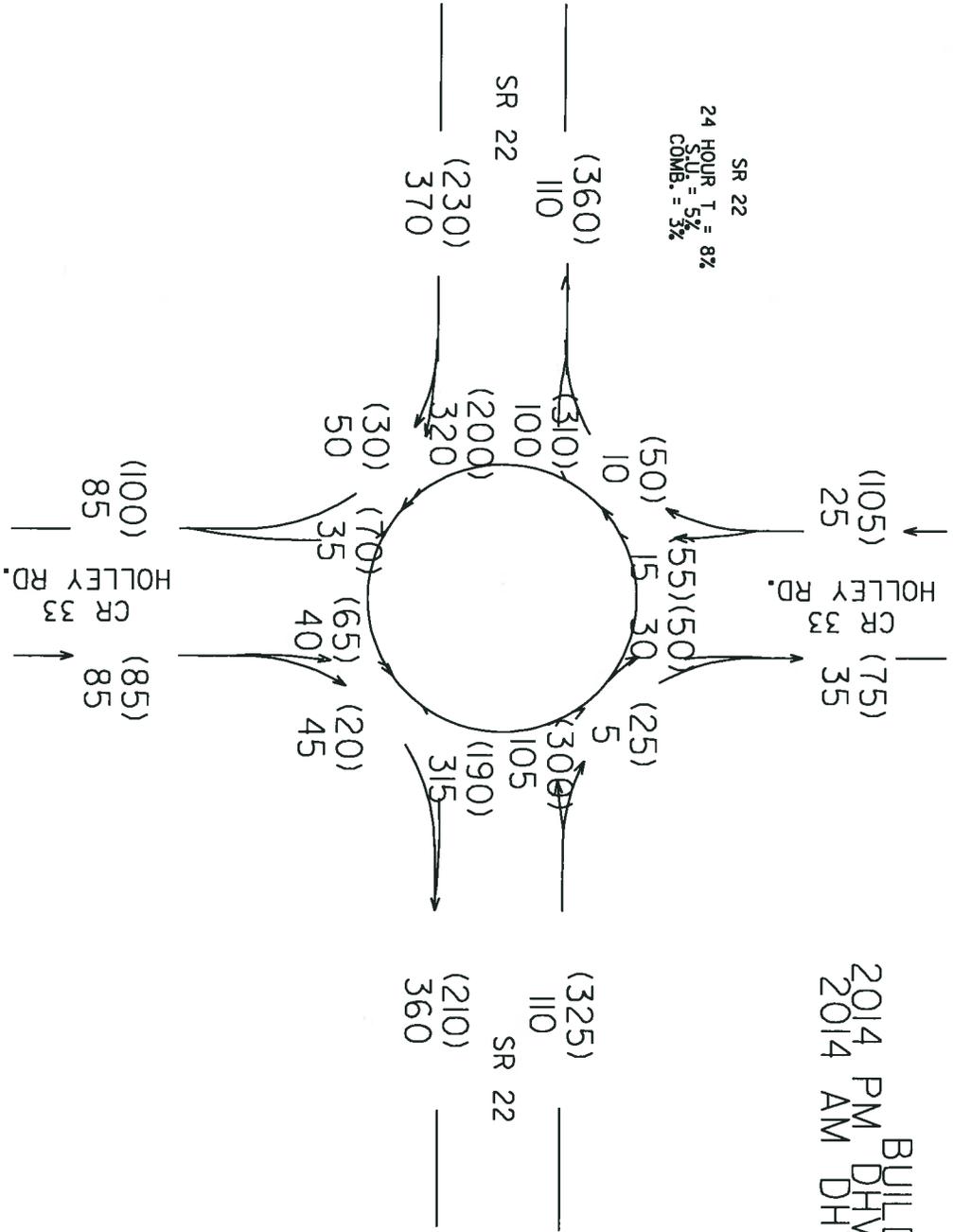


P.I.#. 0009376
BIBB COUNTY
SR 22/US 80 @ CR 33/
HOLLEY RD.

CR 33
 $T = 3.5\%$
 $S_{II} = 3\%$
 COMB. = 0.5%

BUILD
 2014 PM DHV = (0000)
 2014 AM DHV = 0000

SR 22
 24 HOUR $T = 8\%$
 $S_{II} = 5\%$
 COMB. = 3%



P.L.# 0009576
 BIBB COUNTY
 SR 22/US 80 @ CR 33/
 HOLLEY RD.

NO BUILD
2034 ADT = (000)
2014 ADT = 000

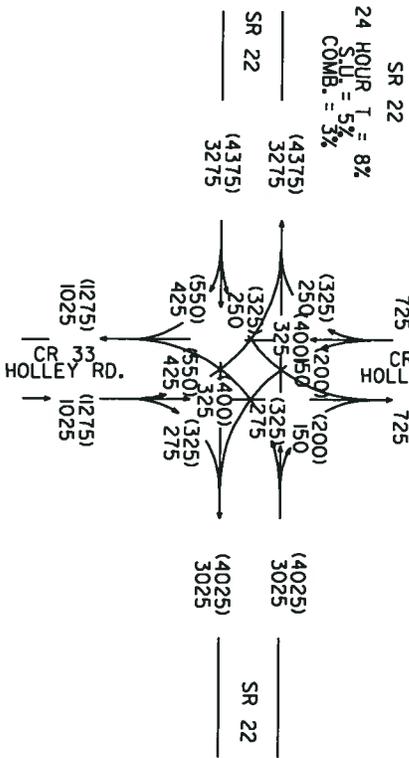
GEORGIA DEPARTMENT OF TRANSPORTATION
OFFICE OF PLANNING

CR 33
24 HOUR T = 4%
S.U. = 3.5%
COMB. = 0.5%

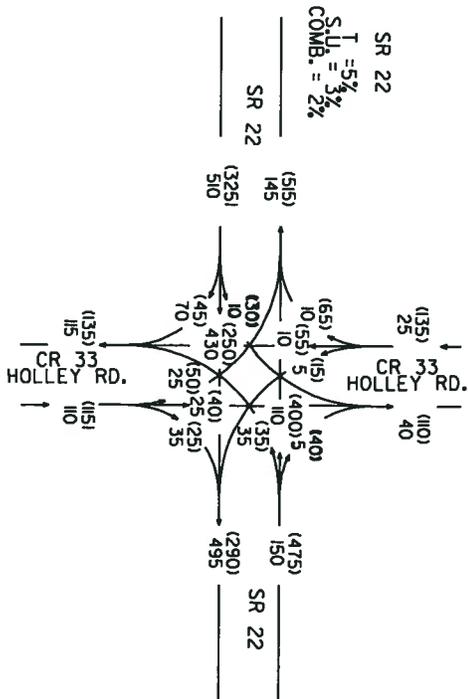
BIBB COUNTY

NO BUILD
2034 PM DHV = (000)
2034 AM DHV = 000

CR 33
T = 3.5%
S.U. = 3.5%
COMB. = 0.5%



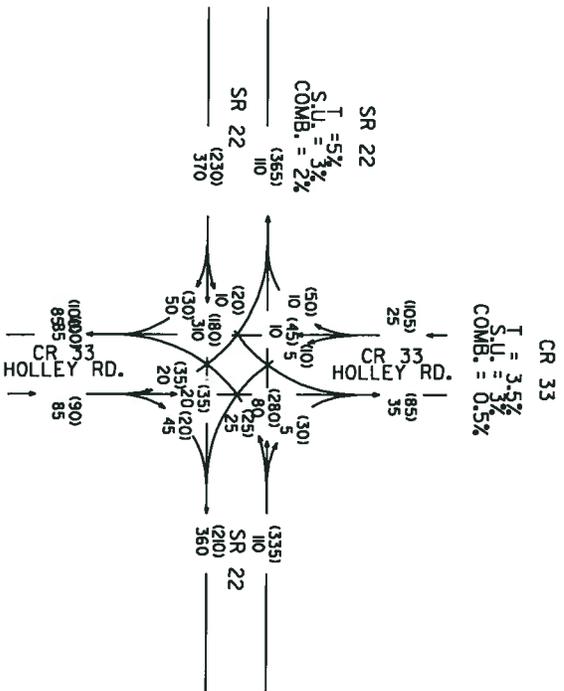
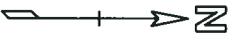
SR 22
T = 5%
S.U. = 3%
COMB. = 2%



P.I. #. 0009576
BIBB COUNTY
SR 22/US 80 @ CR 33/
HOLLEY RD.

BIBB COUNTY

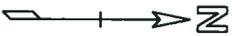
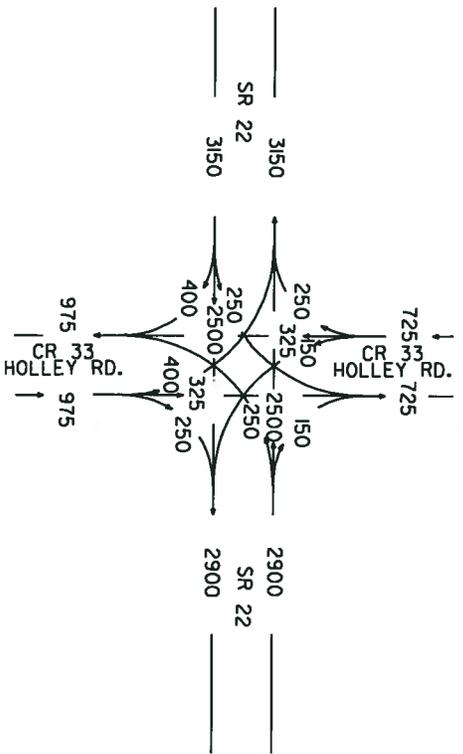
NO BUILD (0000)
2014 PM DHV = 000
2014 AM DHV = 000



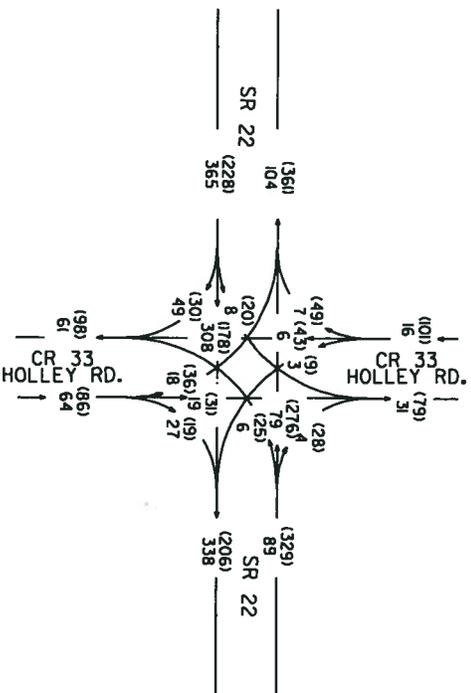
P.L.#: 0009576
BIBB COUNTY
SR 22/US 80 @ CR 33/
HOLLEY RD.

EXISTING 2011 ADT

BIBB COUNTY



EXISTING
2011 PM DHV = (0000)
2011 AM DHV = 000



P.L.# 0009576
BIBB COUNTY
SR 22/US 80 @ CR 33/
HOLLEY RD.

Attachment 7

Traffic Engineering Study

December 15, 2005

12/15/2005

S.R. 22 (U.S. 80) @ Holley Road

Bibb County

GEORGIA DEPARTMENT OF TRANSPORTATION
Traffic Operations Division
Thomaston



TRAFFIC ENGINEERING STUDY
December 15, 2005

LOCATION: SR 22 @ Holley Road, M.P. 3.90

COUNTY: Bibb

REQUESTED BY: Bibb County Commisioners

REASON FOR STUDY: To determine if any road improvements are warranted for this location.

FINDINGS

TOPOGRAPHY: S.R. 22(U.S.80) is a two lane east/west roadway that goes from U.S. 19/S.R. 3 to Macon and Interstate 75. Holley Road is a two lane roadway that intersects Bethel Church Road 300' to the south at a four-way stop, and goes north to. S.R. 22(U.S. 80) has right turn lanes in both directions, with an additional 8-10' of striped out pavement beside the turn lanes in both directions. Both the northeast and southwest quadrants of the intersection have white striped islands with type 10 R.P.M.s channelizing the right turn movements off of S.R. 22. The island in the northeast quadrant also has plastic delineators around the inner radius. The island in the southwest quadrant is missing four (4) white Type 10 R.P.M.'s. S.R. 22 drains to the west at a grade of 2%, while Holley Road crests at the intersection, with both approaches sloped at an approximate 2% slope. All quadrants are undeveloped fields with well defined grassed ditches.

EXISTING TRAFFIC CONTROL: Holley Road is stop sign controlled. There are intersection ahead signs preceding the intersection on both directions on S.R. 22.

VEHICLE VOLUMES: S.R. 22 (U.S. 80) WB - 3118 V.P.D. S.R. 22 (U.S.80) EB - 3190 V.P.D.
Holley Road NB - 980 V.P.D. Holley Road SB - 832 V.P.D.
See attached count sheets.

12/15/2005

S.R. 22 (U.S. 80) @ Holley Road

Bibb County

VEHICULAR SPEEDS: *Posted speed on S.R. 22(U.S. 80) is 55 mph.
Posted speed on Holley Road is 35 mph.*

PEDESTRIAN MOVEMENTS: *No pedestrians were observed at the time of this study. However, considering the surrounding residential area and the convenience store/shopping center located to the north, pedestrians are to be expected.*

PARKING: *There was no parking observed at the time of the study.*

COLLISION HISTORY: *There were five (5) collisions reported from Jan. 2003 to Dec.2003. Of these , there was (1) rear-end collision and (4) right-angle collisions. There were four (4) collisions from Jan. 2004 to Jun. 2004. Of these, there was (1) rear-end collision and (3) right-angle collisions, one of which resulted in two fatalities.*

WARRANT ANALYSIS: *No Warrants were met for signalization. See the attached Traffic signal Warrant Evaluation.*

OTHER INFORMATION:

This intersection is located in a rural section of Bibb County, with no existing signals in the vicinity. S.R. 22 (U.S. 80) is a direct route to Interstate 75 and the city of Macon. After several visits, one potentially hazardous and illegal traffic movement has been observed several times. Traffic traveling eastbound on S.R. 22 (U.S. 80) will stop to take a left turn onto Holley Road and vehicles located behind this stopped vehicle will turn into the right turn lane to drive around the stopped vehicle. The fatality collision recorded on details this same scenario, with a vehicle swerving into the right turn lane to bypass the stopped vehicle, and then converging on a crossing vehicle from Holley Road resulting in a right angle collision and fatality. Delineators and type 10 R.P.M.s have been placed at this quadrant on several occasions, but are removed quickly by illegally passing vehicles.

CONCLUSION:

It can be concluded from the information found in this study that a stop and go signal is not warranted at this time. Instead, our recommendations would be to program and construct a safety project to install left turn lanes and remove existing right turn lanes on SR 22(US 80).

RECOMMENDATIONS:

Short Term: It is recommended that a maintenance bucksip be issued to place delineators and Type 10 R.P.M.s around the inner radius of the southwest quadrant.

Long Term: It is recommended that a permit to install a Stop and Go Signal not be issued to Bibb County. It is further recommended that a safety project to install left turn lanes and remove existing right turn lanes on S.R. 22(U.S. 80) be programmed and constructed.



District Traffic Operations Co-op

12/15/05
Date



District Traffic Engineer

12/15/05
Date



District Engineer

12/15/05
Date

State Traffic Safety and Design Engineer

Date

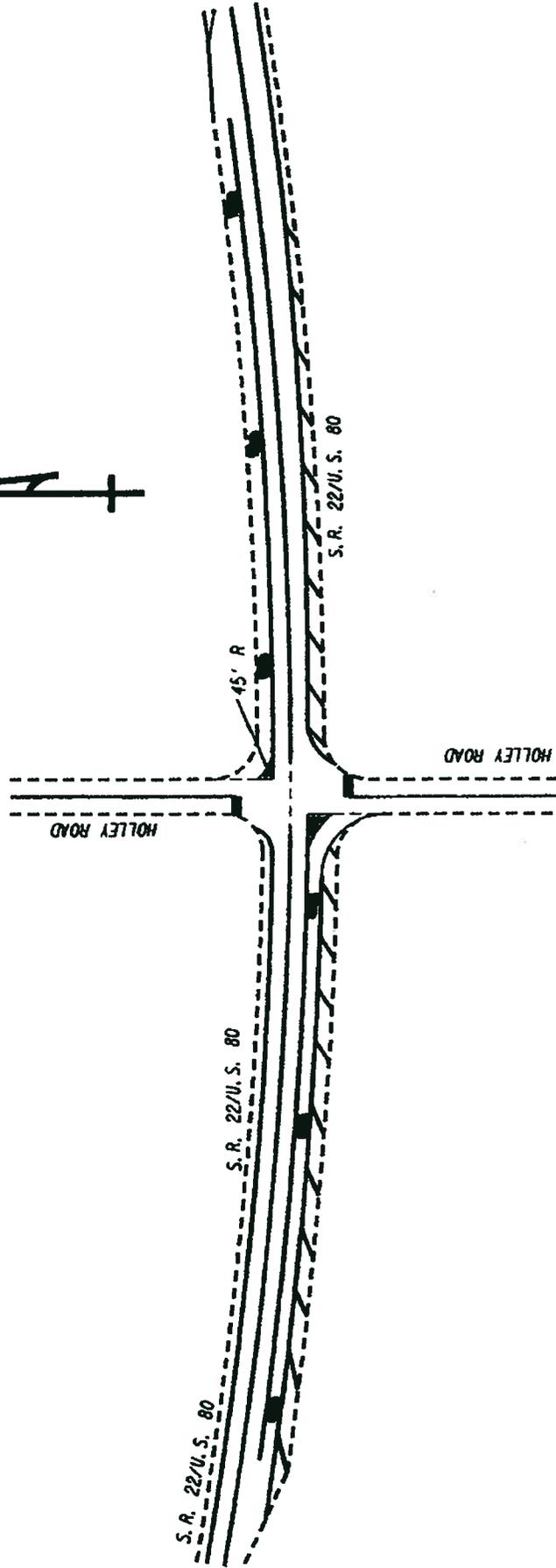
Division Director

Date

INPUT SHEET

Main Street	SR 22	Approach 1 Direction	East	Number of Lanes	1
		Approach 2 Direction	West		
Side Street	Holley Road	Approach 1 Direction	North	Number of Lanes	1
		Approach 2 Direction	South		
Main Street Speed	55	Is intersection within 1,000 FT of adjacent signalized intersections in a system? NO			
Isolated Community	No				
Number of accidents	6	Delay Study Results: Vehicle Hours			
Preventable accidents	5				
Warrant 2 & 3 Figures to use: 4C-2 & 4C-4					
Date Counts Taken		July 2, 2004			
Hour	Main Street Approach 1	Main Street Approach 2	Side Street Approach 1	Side Street Approach 2	Pedestrian Volume Measured
1:00	11	21	2	4	0
2:00	14	14	3	0	0
3:00	10	16	6	1	0
4:00	27	12	2	0	0
5:00	40	13	9	2	0
6:00	173	43	24	3	0
7:00	301	90	58	26	0
8:00	250	129	66	44	0
9:00	276	126	60	43	0
10:00	228	162	50	45	0
11:00	23	16	53	63	0
12:00	206	197	58	63	0
13:00	230	199	57	63	0
14:00	179	200	49	42	0
15:00	175	234	60	67	0
16:00	208	271	69	67	0
17:00	194	328	87	74	0
18:00	181	267	70	60	0
19:00	143	246	54	61	0
20:00	110	199	53	50	0
21:00	86	155	40	41	0
22:00	64	99	27	5	0
23:00	40	53	18	5	0
0:00	21	28	7	3	0
24 Hr. Totals	3190	3118	980	832	0
	6308		1812		

EXISTING CONDITIONS



S.R. 22/U.S. 80 @ HOLLEY ROAD
BBB COUNTY MAP 3.9

COLLISION DIAGRAM JAN 2003 TO DEC 2003

#	DATE	TIME	ACCIDENT RPT.#	INJURIES	FATALITIES	CORRECTABLE?
1	02-23-03	1220	803-06266	6	0	NO
2	05-02-03	1303	803-14957	1	0	YES
3	06-03-03	0735	803-19361	1	0	YES
4	08-14-03	1629	803-29480	0	0	YES
5	09-01-03	1255	803-31923	1	0	YES

S. R. 22/U.S. 80

S. R. 22/U.S. 80

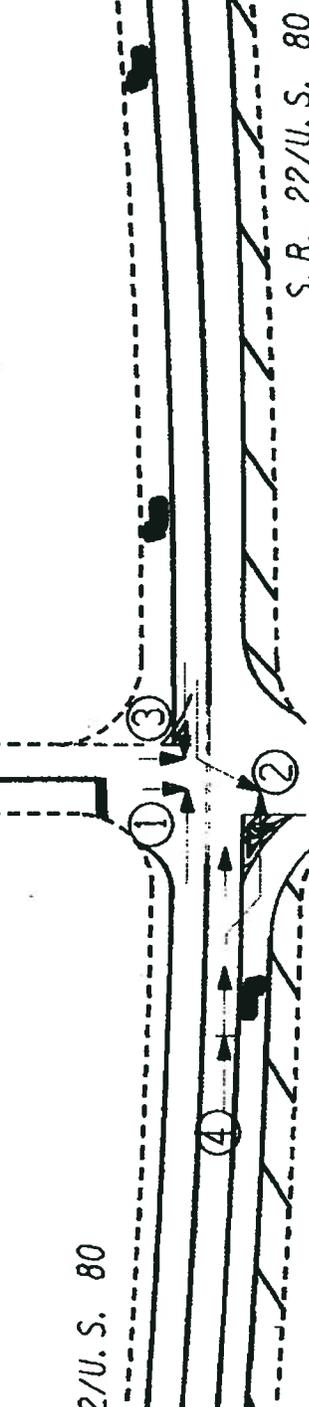
HOLLEY ROAD

S.R. 22/U.S. 80 @ HOLLEY ROAD
BIBB COUNTY M.P. 3.9

LEGEND	
RIGHT ANGLE COLL.	LEFT TURN COLL.
HEAD ON COLL.	REAR END COLL.
PARKING VEH.	PARKED VEH.
MOVING VEH.	SIDE SWIPE
FATAL ACC.	PERSONAL INJURY
	TRAILING M.E.
	FIRE OBJECT
	PEDESTRIAN
	LOG OUT OF CONTR.
	PROP. DAMAGE

COLLISION DIAGRAM JAN 2004 TO JUNE 2004

•	DATE	TIME	ACCIDENT RPT. #	INJURIES	FATALITIES	CORRECTABLE?
1	02-23-03	1220	803-06266	6	0	YES
2	02-27-04	2019	804-06293	4	2	NO
3	05-10-04	2154	804-15985	0	0	YES
4	06-07-04	1805	804-21121	4	0	NO

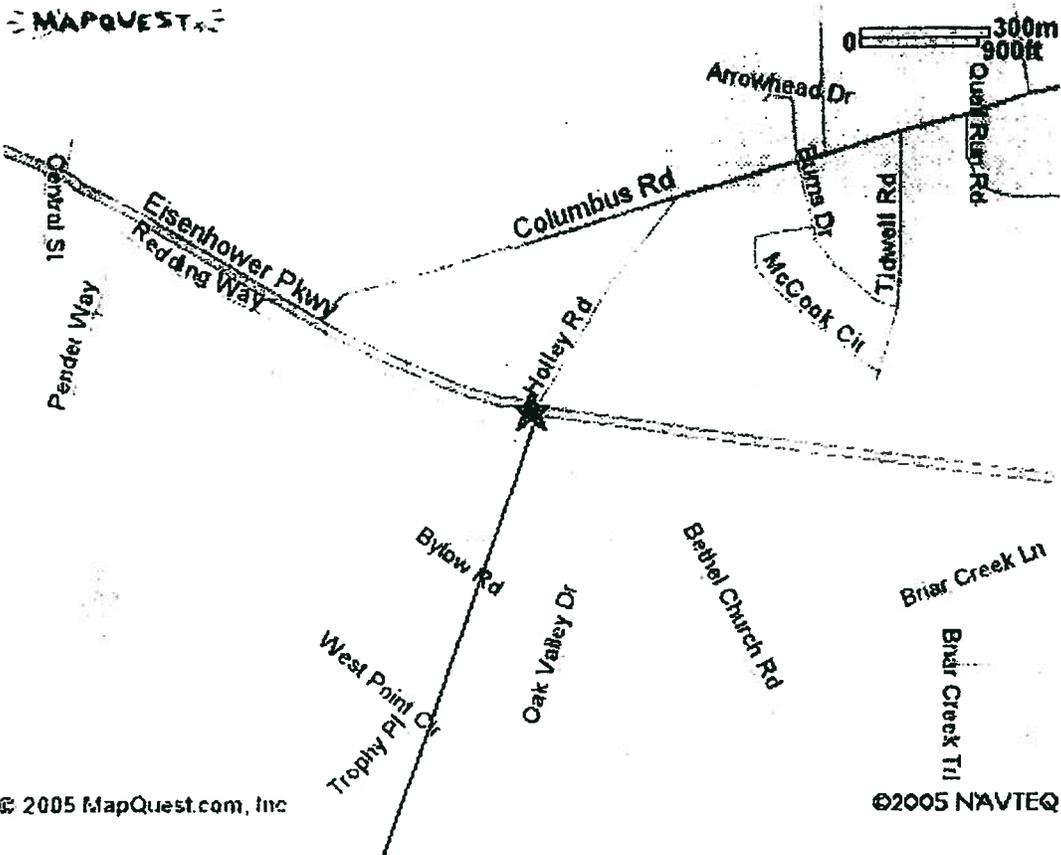


LEGEND

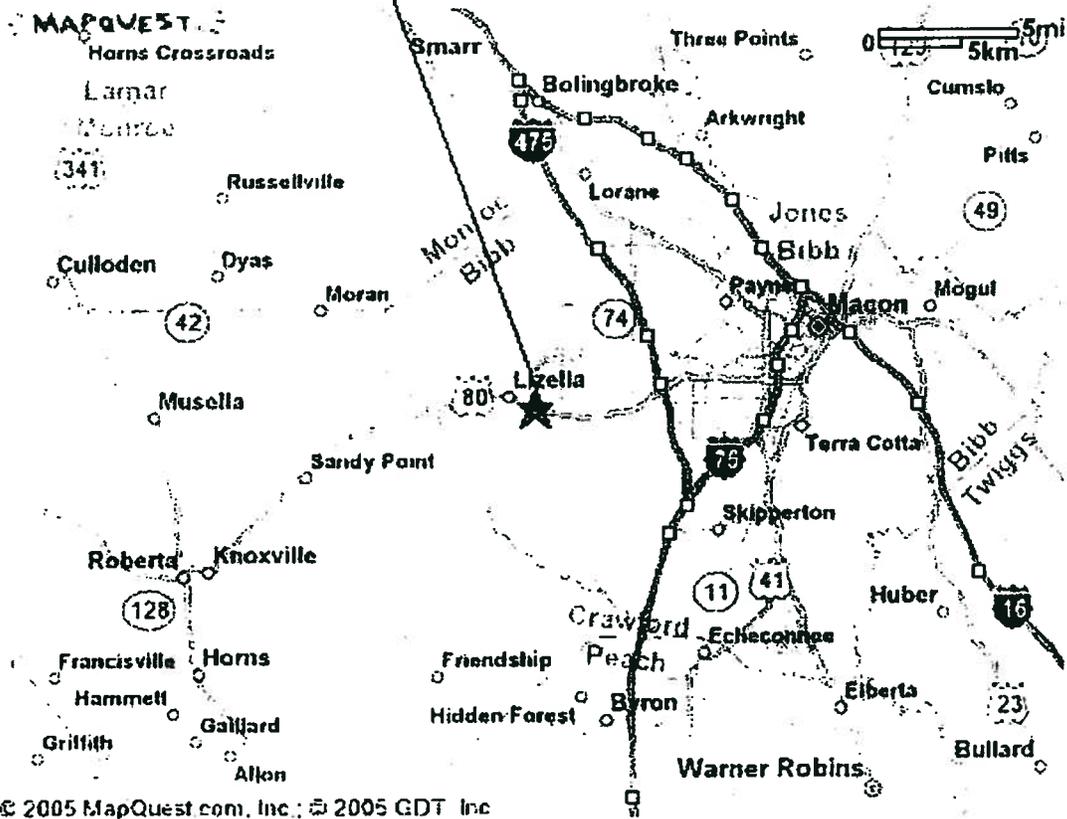
High Angle Coll.	Left Turn Coll.	Backing R.E.
Head On Coll.	Rear End Coll.	Fixed Object
Parking Veh.	Parked Veh.	Pedestrian
Moving Veh.	Side Swipe	Out of Contr.
Fatal Acc.	Personal Injury	Prct. Damage

S.R. 22/U.S. 80 @ HOLLEY ROAD
BIBB COUNTY M.P. 3.9

State Route 22 @ Holley Road (MP 03.90)
Lizella, GA - Bibb County



State Route 22 @ Holley Road (MP 03.90)
There are no signals within a mile of this intersection.



Traffic Signal Warrant Evaluation

Location: SR 22	At: Holley Road
Date: July 6, 2005	

INTRODUCTION:
 This review is based on the methodology presented in the Manual on Uniform Traffic Control Devices Millennium edition as amended by the federal Highway Administration. Please refer to section 4C.02 of that manual.

The 85th percentile speed on the main street is M.P.H.
 Existing traffic control is
 Daily traffic volume of Vehicles.
 Estimated annual traffic volume is Vehicles/Year
 This study is based on counts taken on

1. Eight-Hour Vehicular Volume

Condition A: The Minimum Vehicular Volume, is intended for application where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. Minimum volumes must be present for at least 8 hours of an average weekday. The minimum volumes vary according to the number of lanes on the intersecting streets, the speed of traffic on the main street, and the community size.

Number of hours required traffic present =

Condition A Not Met

Condition B: Interruption of Continuous Traffic, is intended for application where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. Application of this warrant is identical to that of warrant 1, above.

Number of hours required traffic present =

Condition B Not Met

Warrant 1 is not met

2. FOUR-HOUR VEHICULAR VOLUME WARRANT

This warrant is similar to warrant 1, except that the required traffic volumes must be present for at least four hours of an average weekday. The traffic volumes required are based on curves (Figure 4-3 & 4-4) shown in the MUTCD.

Number of Hours Volume Criteria Met:

Warrant 2 is NOT MET

3. PEAK HOUR

This signal warrant shall be applied only in unusual cases. The need for a traffic device shall be considered when a traffic engineering study finds that the criteria in either of the following two categories are met:

- A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:
 - 1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and
 - 2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
 - 3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.
- B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes

Condition A1 is : NOT MET

Condition A2 is : NOT MET

Condition A3 is : NOT MET

Condition A is : NOT MET

Condition B is : NOT MET

Warrant 3 is : NOT MET

4. PEDESTRIAN VOLUME

The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

The need for a traffic control signal at an intersection or midblock crossing shall be considered if an engineering study finds that both of the following criteria are met:

- A. The pedestrian volume crossing the major street at an intersection or midblock location during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour; and
- B. There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic.

The Pedestrian Volume signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 90 m (300 ft), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Number of hours required traffic present = **0**

Warrant 4, Pedestrian Vol. Not Met

5. SCHOOL CROSSING

The School Crossing signal warrant is intended for application where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal.

The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at an established school crossing across the major street shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period (see Section 7A.03) and there are a minimum of 20 students during the highest crossing hour.

Before a decision is made to install a traffic control signal, consideration shall be given to the implementation of other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing.

The School Crossing signal warrant shall not be applied at locations where the distance to the distance to the nearest traffic control signal along the major street is less than 90 m (300 ft), unless the proposed traffic control signal will not restrict the progressive movement of traffic.

Warrant 5 is Not Met

6. SIGNAL PROGRESSION

Progressive movement in a coordinated signal system sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles.

The need for a traffic control signal shall be considered if an engineering study finds that one of the following criteria is met:

- A. On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.
- B. On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.

Warrant 6 Not Met

7. CRASH EXPERIENCE

The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal. The need for a traffic control signal shall be considered if an engineering study finds that all of the following criteria are met:

- A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; and
- B. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and
- C. For each of any 8 hours of an average day, the vehicles per hour (vph) given in both of the 80 percent columns of Condition A in Table 4C-1 (see Section 4C.02), or the vph in both of the 80 percent columns of Condition B in Table 4C-1 exists on the major-street and the higher-volume minor-street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80 percent of the requirements specified in the Pedestrian Volume warrant. These major-street and minor-street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.

Total number of accidents = 6
 Number of preventable accidents = 5
 Number of warrant 1 volume req.s met @ 80% = 1 (eight required)
 Accident Rate for the Intersection = 2.024428 Accidents per million entering vehicles

Warrant Not Met

8. ROADWAY NETWORK

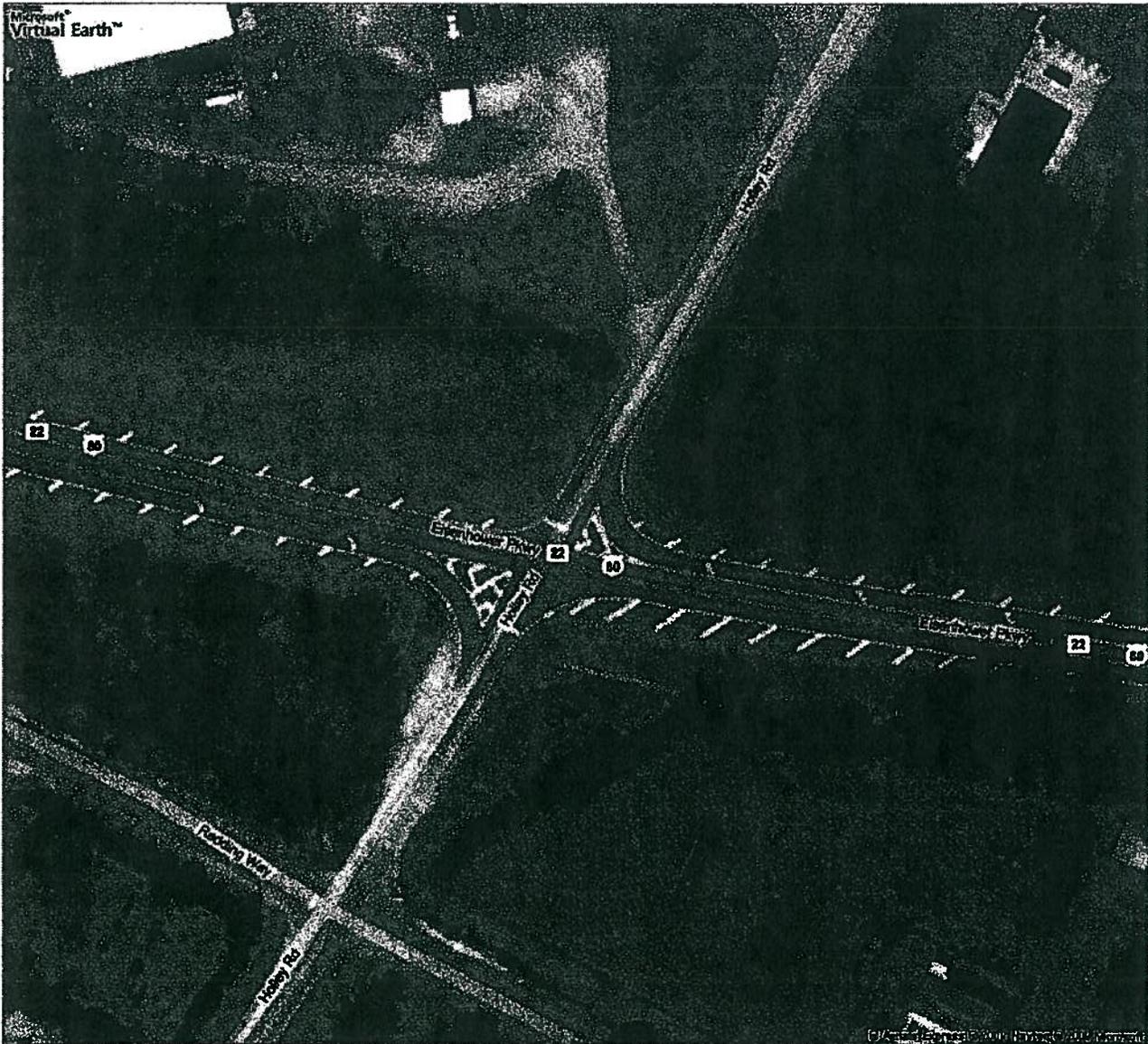
Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network.

The need for a traffic control signal shall be considered if an engineering study finds that the common intersection of two or more major routes meets one or both of the following criteria:

- A. The intersection has a total existing, or immediately projected, entering volume of at least 1,000 vehicles per hour during the peak hour of a typical weekday and has 5-year projected traffic volumes, based on an engineering study, that meet one or more of Warrants 1, 2, and 3 during an average weekday; or
- B. The intersection has a total existing or immediately projected entering volume of at least 1,000 vehicles per hour for each of any 5 hours of a nonnormal business day (Saturday or Sunday).

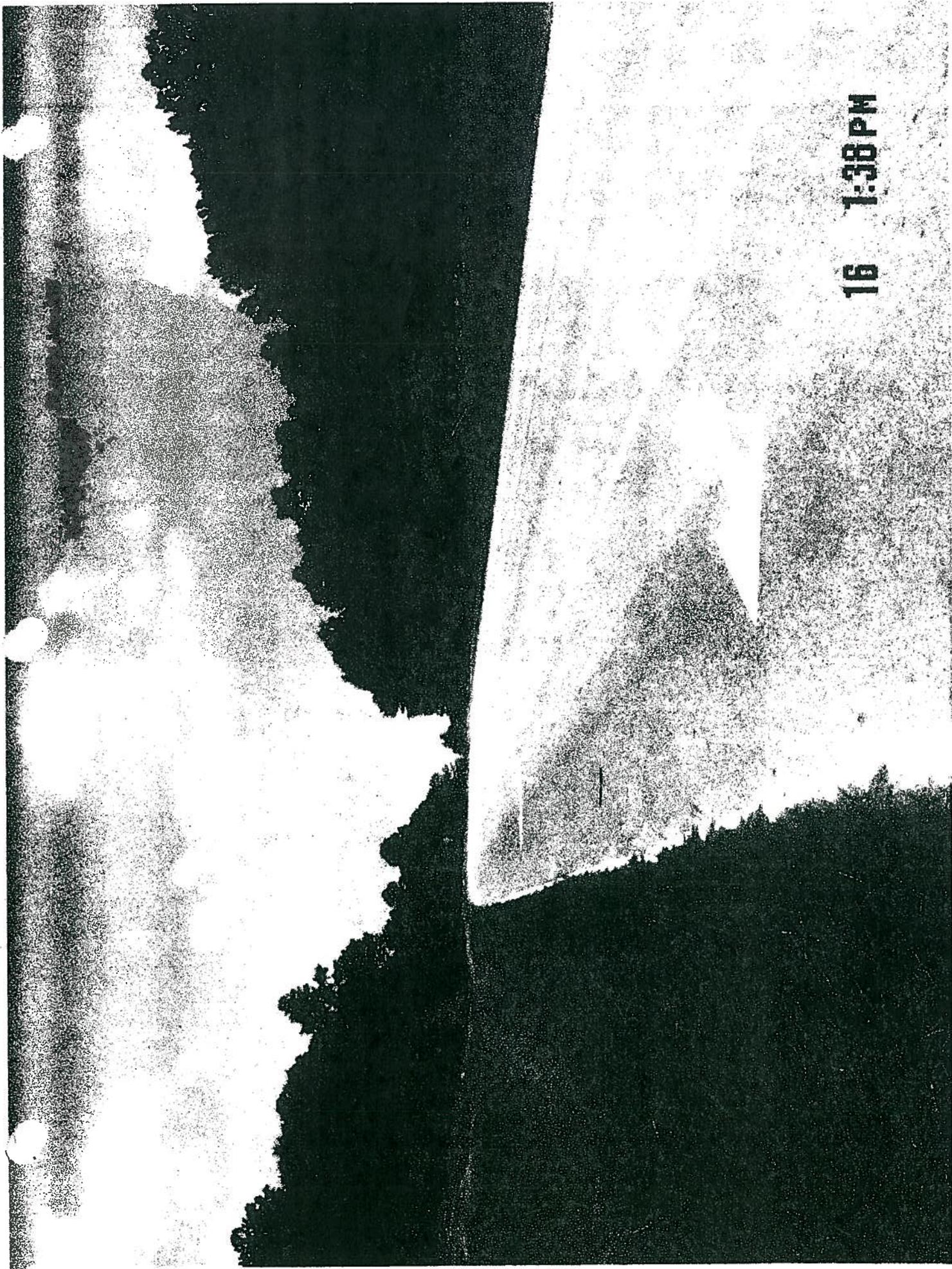
A major route as used in this signal warrant shall have one or more of the following characteristics:

- A. It is part of the street or highway system that serves as the principal roadway network for through traffic flow; or
- B. It includes rural or suburban highways outside, entering, or traversing a city; or
- C. It appears as a major route on an official plan, such as a major street plan in an urban area traffic and transportation study.



 Bird's eye view maps can't be printed, so another map view has been substituted.

16 1:38 PM





Bird's eye view maps can't be printed, so another map view has been substituted.

Attachment 8

Roundabout Analysis

September 12, 2011



Atkins North America, Inc.
1600 RiverEdge Parkway, NW, Suite 600
Atlanta, Georgia 30328

Telephone: +1.770.933.0280

www.atkinsglobal.com/northamerica

MEMORANDUM TO: Perry Black, Project Manager
Georgia Department of Transportation

FROM: Jimmy Adams, AICP
Atkins
Transportation Planning

DATE: September 12, 2011

SUBJECT: Roundabout Analysis
Bibb County, GA
GDOT P.I. #0009576, SR 22/US 80 and CR 33/Holley Road

Introduction:

Atkins has completed an operational analysis for a roundabout intersection design located in Bibb County, Georgia. The subject intersection is located along State Route 22 (SR 22)/US 80 at County Road 33 (CR 33)/Holley Road. Currently this intersection operates as a two-way stop sign controlled intersection, with the minor street approaches occurring along Holley Road. Utilizing safety funds, this intersection has been proposed to be upgraded to a roundabout facility, opening to traffic for the year 2014. The design year for the proposed project is for the year 2034. The location of the subject intersection has been illustrated on Figure 1. This operational analysis has been based upon approved traffic for GDOT P.I. #0009576.

Description of the intersection(s):

A description of each intersecting approach leg is provided below.

- SR 22 is currently classified as a rural minor arterial that is constructed as a two-lane roadway facility. Traveling eastbound on SR 22 the approach currently has one shared left/thru-lane and one right-turn bay that is approximately 400 feet in length. The opposing westbound direction also consists of a shared left/thru-lane with a right-turn bay that is approximately 500 feet in length.
- Holley Road is an undivided two-lane local roadway facility that travels in a north/south direction traversing SR 22, just south of Columbus Road. Both the northbound and southbound approaches, at the subject intersection, consist of a single travel lane.

SR 22/US 80 at CR 33/Holley Rd
P.I. #0009576

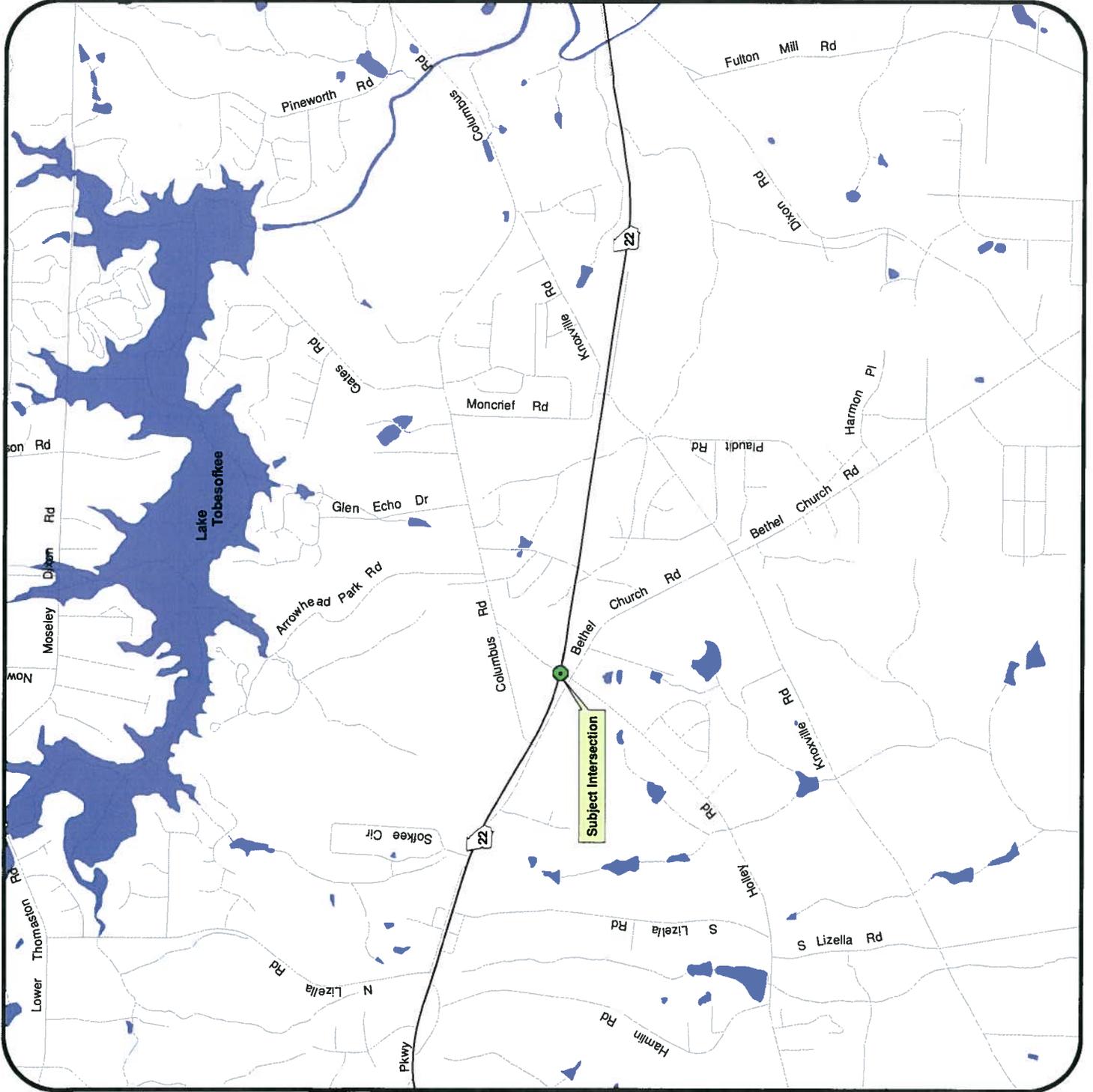
Project Location

Legend

- Subject Intersection
- Stream
- Public Roadway
- State Route
- Railroad
- Lake/Pond



Figure 1



Existing Traffic Control:

- SR 22 is currently uncontrolled at the subject intersection.
- Holley Road is currently stop-sign controlled at SR 22.

Traffic volumes in vehicles per day (vpd):

SR 22

Latest year 24-hour percent trucks: 8.0%

Single-Unit Percentage: 5.0%

Combination Percentage: 3.0%

Holley Rd

Latest year 24-hour percent trucks: 4.0%

Single-Unit Percentage: 3.5%

Combination Percentage: 0.5%

**Table 1
Projected Average Daily Traffic Volumes**

Location	Vehicles per Day		
	2011	2014	2034
SR 22, west of Holley Rd	6,300	6,550	8,750
SR 22, east of Holley Rd	5,800	6,050	8,050
Holley Rd, south of SR 22	1,950	2,050	2,550
Holley Rd, north of SR 22	1,450	1,450	1,850

Vehicular speeds:

The posted speed limit on each of the roadways contained in these analyses is listed below:

- SR 22 is currently posted as 55 mph.
- Holley Road is currently posted as 35 mph.

Delay:

The analysis for the subject intersection has assumed that a level of service (LOS) B or better will be considered adequate (or acceptable) based upon desirable guidelines that have been established in the “GDOT Design Policy Manual.”¹ As discussed previously, SR 22 is classified as a rural minor arterial and desirable levels of service have been specified for these types of facilities that serve more than 2,000 vehicles per day. Levels of service worse than LOS B would indicate that an intersection or approach is approaching unacceptable levels of operation and cannot accommodate substantial increases in traffic without significant increases in congestion and delay. The subject intersection was analyzed, both as an un-signalized intersection and as a roundabout facility.

Un-Signalized Intersection:

Atkins conducted the capacity analysis for the subject intersection, as an un-signalized intersection, utilizing the traffic simulation software CORSIM, version 5.1 and the **2010 Highway Capacity Manual**. CORSIM is a computer model developed by the Federal Highway Administration (FHWA) that simulates traffic and monitors the status of each vehicle as it travels through the network. CORSIM tabulates the average delay per vehicle at each intersection within the study area that is used to provide a level of service (LOS) for each approach and intersection. The CORSIM model provided the most accurate tool for assessing traffic operations at the subject intersection.

The AM and PM peak hour traffic volumes that were utilized for this analysis were based upon approved traffic for GDOT P.I. #0009576. The existing (2011) and future no-build traffic volumes for the years 2014 and 2034 are illustrated on Figures 2 through 4. The results of the CORSIM analysis, which incorporated these current and anticipated future traffic volumes for the years 2014 and 2034, indicates that the intersection of SR 22 and Holley Road currently operates at an acceptable LOS as an un-signalized intersection. Furthermore, the un-signalized intersection is expected to continue to operate at an acceptable LOS for the years 2014 and 2034 for each of the peak periods analyzed. The results of the analysis are provided in Table 2 and more detailed results are provided as an attachment to this memorandum.

¹ Georgia, Georgia Department of Transportation, GDOT Design Policy Manual (A Georgia Department of Transportation Publication, Revised 07/22/2011) Table 6.6, p. 6-17.

SR 22/US 80 at CR 33/Holley Rd
P.I. #0009576

Existing 2011 Peak Hour Turning Movement Volumes

Legend

- ← Turning Movement
- 100 AM Peak Hour Turning Movement Volume
- (100) PM Peak Hour Turning Movement Volume



Not to Scale

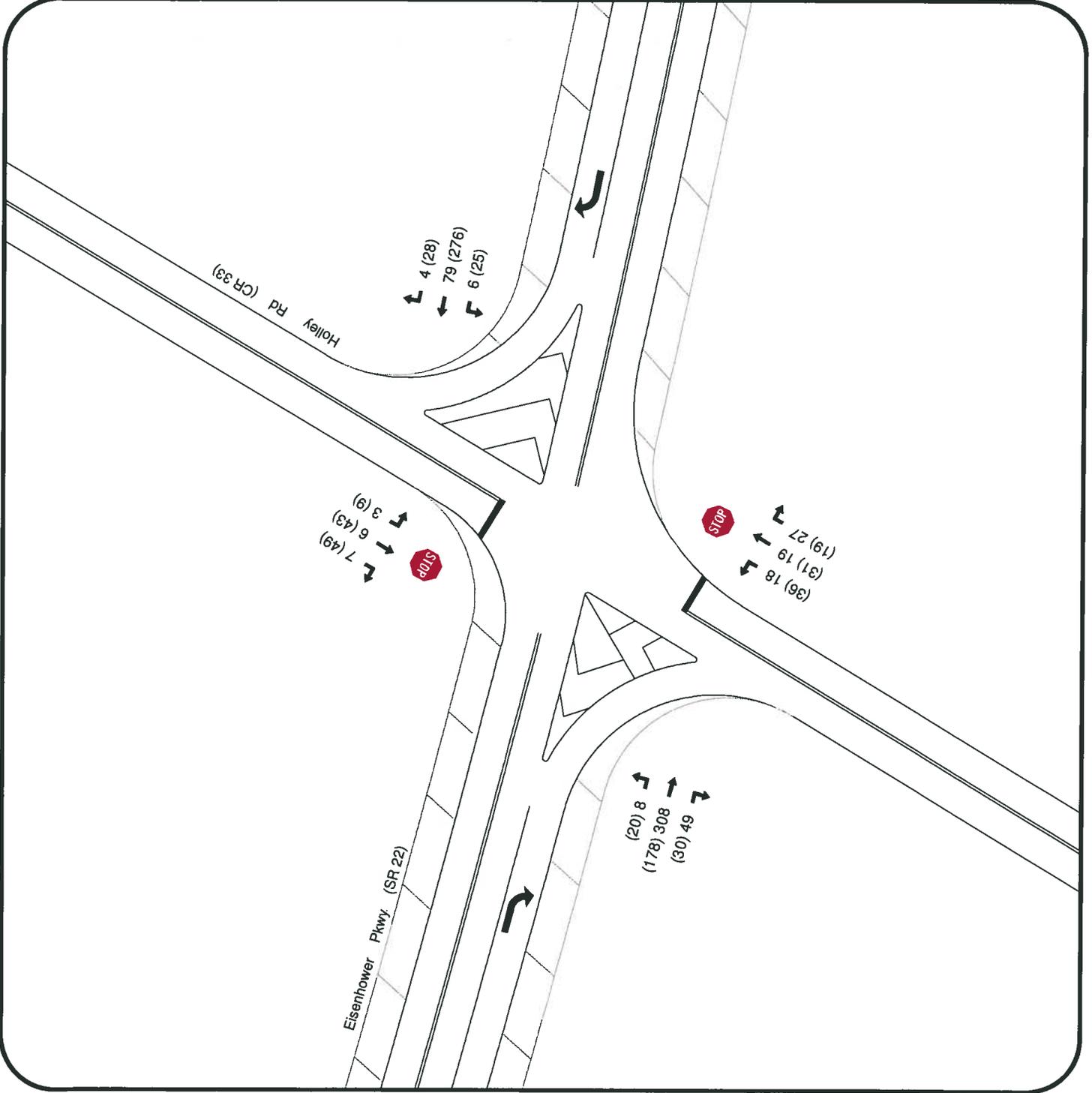


Figure 2

SR 22/US 80 at CR 33/Holley Rd
P.I. #0009576

Future 2014 No-Build Peak Hour Turning Movement Volumes

Legend

- ← Turning Movement
- 100 AM Peak Hour Turning Movement Volume
- (100) PM Peak Hour Turning Movement Volume



Not to Scale

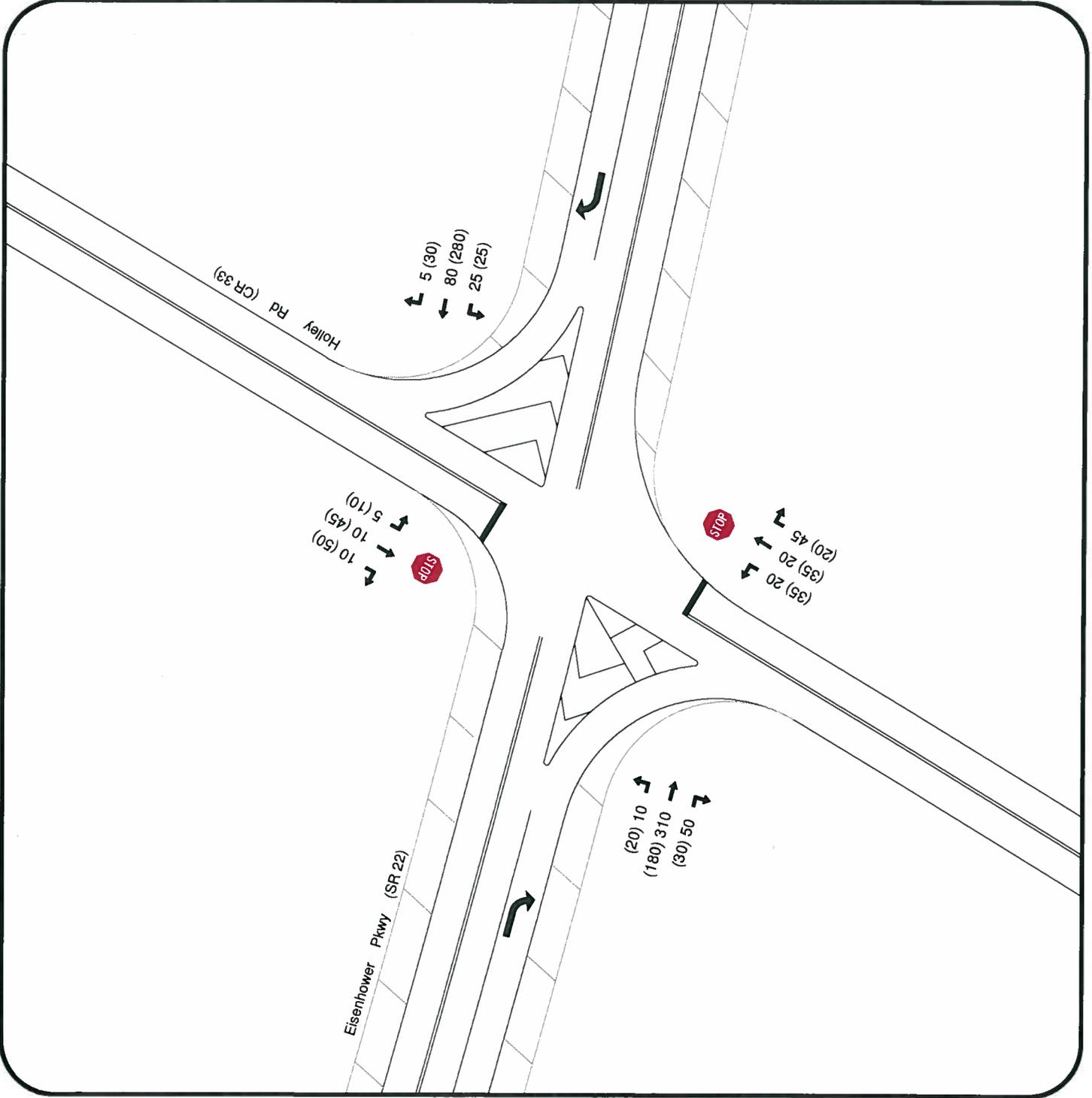


Figure 3

SR 22/US 80 at CR 33/Holley Rd
P.I. #0009576

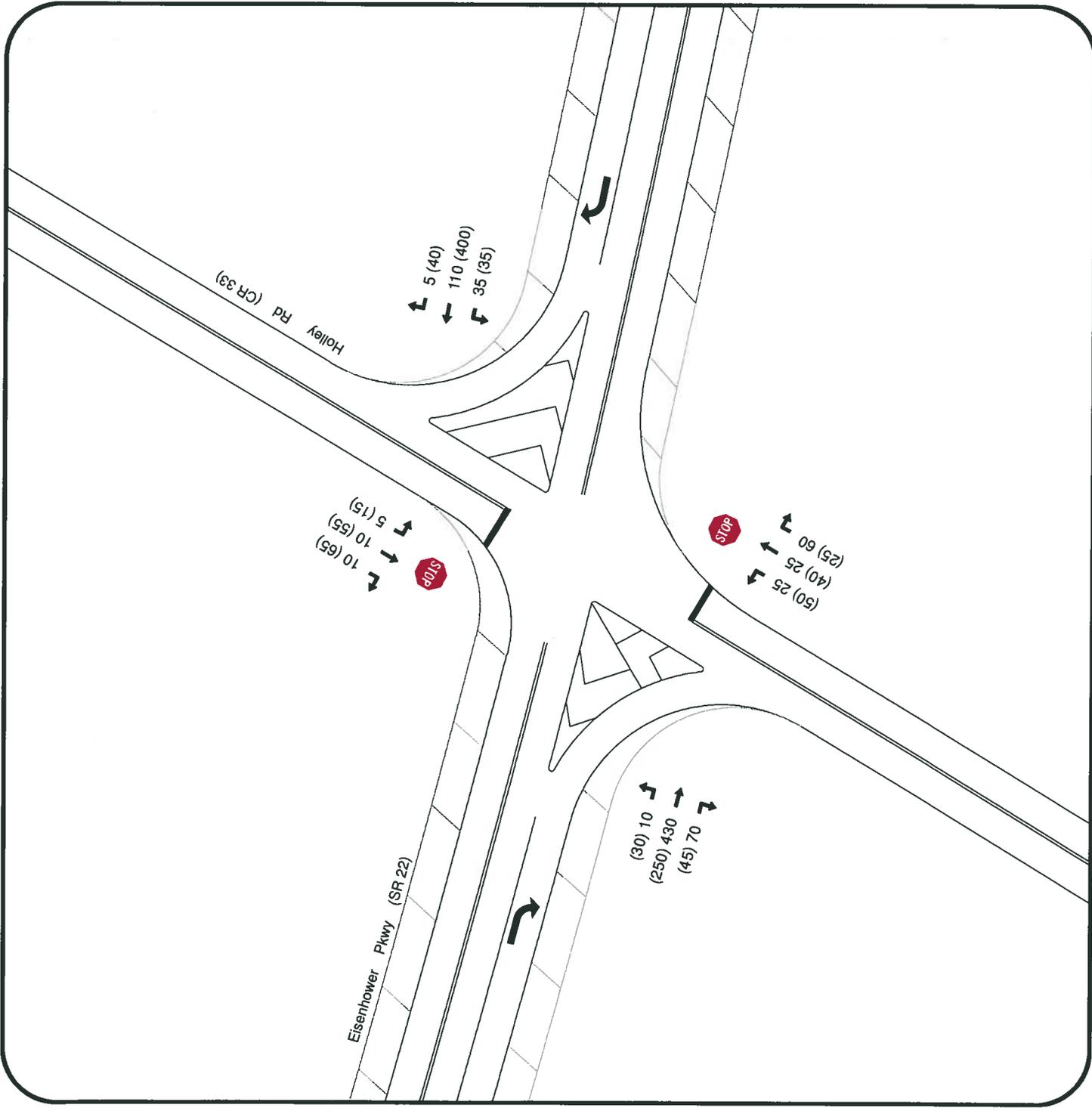
Future 2034 No-Build Peak Hour Turning Movement Volumes

Legend

- ← Turning Movement
- 100 AM Peak Hour Turning Movement Volume
- (100) PM Peak Hour Turning Movement Volume



Figure 4



As demonstrated in Table 2, the subject intersection is expected to operate at LOS A to the year 2014 as an un-signalized intersection. As traffic volumes increase by the year 2034, the minor street approaches are expected to experience additional delay; however, it is anticipated that the intersection will continue to operate at an acceptable LOS. During the AM peak hour, the northbound and southbound approaches are expected to operate at LOS B and each of the same approaches is expected to operate at LOS C during the PM peak hour. The intersection, as a whole by the year 2034, is expected to operate at LOS A during the AM peak hour and at LOS C during the PM peak hour.

Roundabout:

Based upon the current average daily traffic volumes at the subject intersection, there are 7,750 entering vehicles at this location for the year 2011. There are 6,050 vehicles per day entering the intersection along the major street (SR 22) and 1,700 vehicles per day entering the intersection from the minor street (Holley Road). Additionally, approximately 78 percent of the existing traffic occurs along the major roadway, which falls below the 90 percent threshold established by the GDOT. The number of entering vehicles falls below 25,000 vehicles per day, which indicates that a single-lane roundabout design may be appropriate.

In order to conduct an operational analysis for a single-lane roundabout design, Atkins utilized the future peak hour traffic volumes that were incorporated into the operational analysis portion of this evaluation for the un-signalized no-build design. However, the typical peak-hour turning movements were re-distributed at the subject intersection as “circular movements” within a roundabout intersection. The re-distribution of traffic for the years 2014 and 2034 are illustrated on Figures 5 and 6. Capacity analysis procedures for this type of intersection incorporated methods of analysis that have been identified in a publication from the Federal Highway Administration, titled “NCHRP Report 672: Roundabouts: An Informational Guide”.² This publication suggests that three performance measures be considered to estimate the operation of a given roundabout design. These performance measures include:

- Degree of Saturation
- Delay
- Queue Length

² United States, Federal Highway Administration, NCHRP Report 672 Roundabouts: An Informational Guide (Washington, DC: Transportation Research Board, 2010) Chapter 4.

SR 22/US 80 at CR 33/Holley Rd
P.I. #0009576

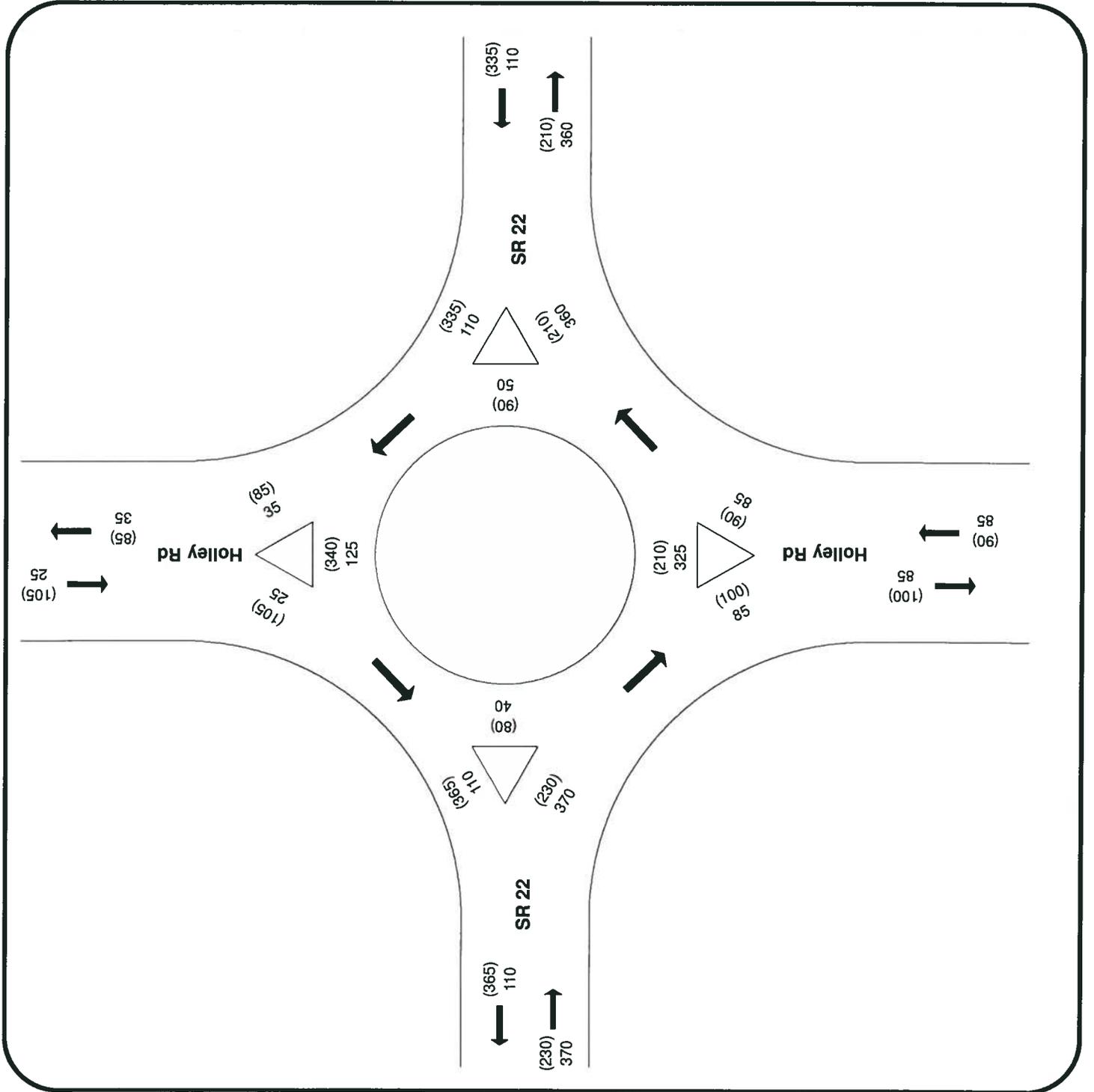
**2014 Build Condition
Peak Hour
Turning Movement Volumes**

Legend

- ← Circular Movement
- 100 AM Peak Hour Turning Movement Volume
- (100) PM Peak Hour Turning Movement Volume



Figure 5



SR 22/US 80 at CR 33/Holley Rd
 P.I. #0009576

**2034 Build Condition
 Peak Hour
 Turning Movement Volumes**

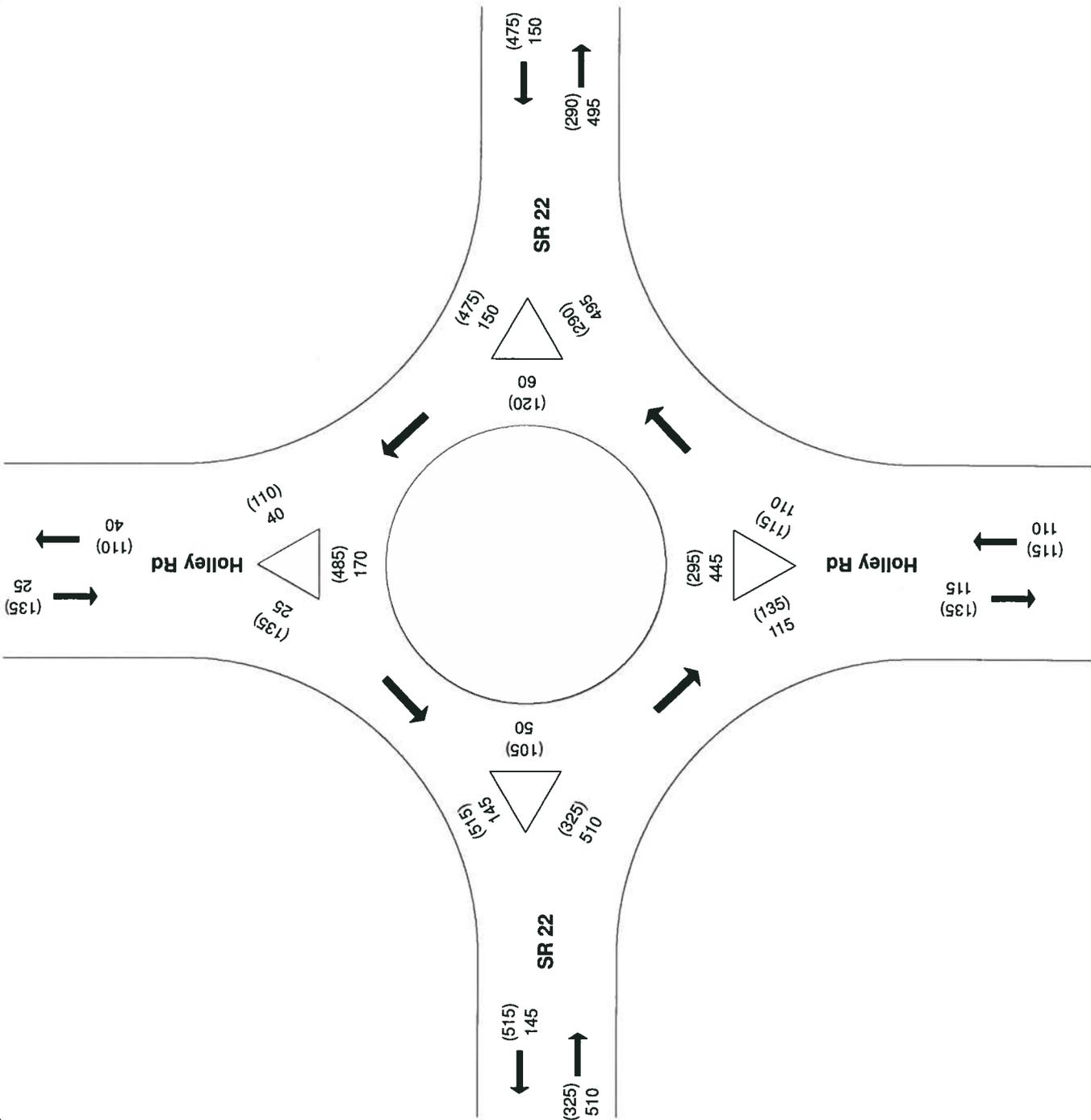
Legend

- ← Circular Movement
- 100 AM Peak Hour Turning Movement Volume
- (100) PM Peak Hour Turning Movement Volume



Not to Scale

Figure 6



The degree of saturation is a ratio based upon the demand present at a roundabout's entrance to the capacity of this same entrance. The suggested degree of saturation should be between 0.85 and 0.90, in order to assume a satisfactory operation of any roundabout facility. Delay is a standard measure of effectiveness used to estimate the performance of an intersection and currently, the "Highway Capacity Manual" only accounts for controlled delay. This is the delay that drivers can be expected to experience, which is attributable to a control device. The delay for a roundabout intersection varies with entering capacity and the volume of circulation flow. Finally, the queue length for a roundabout intersection design is essential to make an assessment on the adequacy of the geometric design for a roundabout's approaches. For the purposes of this analysis, queue lengths are provided as average queue lengths.

The results of the analysis for the roundabout design have been summarized in Table 3 and more detailed results are provided as an attachment to this report. A roundabout intersection at this location was assumed to be constructed as a single-lane facility without any provisions for channelized right-turn movements or flared approaches, each which add capacity. Based upon the roundabout analysis results, this type of intersection design is anticipated to operate at acceptable levels of service for both the AM and PM peak hours for the years 2014 and 2034.

Findings and Conclusions:

The results indicate that the subject intersection along SR 22 at Holley Road currently operates at an acceptable level of service. Additionally, this intersection location is anticipated to continue to operate at an acceptable level of service through the year 2034. However, by the year 2034, the northbound and southbound approaches along Holley Road are expected to experience additional delay as traffic volumes increase. By the year 2034, during the PM peak hour, the subject intersection is anticipated to experience a decline in operational efficiency and operate at LOS C.

The build condition results have indicated that as a roundabout facility the subject intersection continues to operate at acceptable levels of service for the years 2014 and 2034. These results have also revealed that there is not any decline in operational efficiency expected to occur by the year 2034, as a result of constructing the proposed project.

Table 3
Roundabout Intersection Level of Service Summary

Intersection	Approach	Measure of Effectiveness*	2014 Build Condition				2034 Build Condition	
			Period Analyzed		Period Analyzed		Period Analyzed	
			AM	PM	AM	PM	AM	PM
SR 22/US 80 @ CR 33/Holly Rd (roundabout)	Northbound	V/C Ratio	0.13	0.12	0.15	0.17		
		Approach Delay (sec/veh)	5	5	6	5		
		95 th Percentile Queue Length (ln-ft)	11	10	13	15		
			LOS	A	A	A	A	A
	Southbound	V/C Ratio	0.03	0.16	0.03	0.25		
		Approach Delay (sec/veh)	4	6	4	8		
		95 th Percentile Queue Length (ln-ft)	2	15	2	25		
			LOS	A	A	A	A	A
	Eastbound	V/C Ratio	0.41	0.27	0.57	0.39		
		Approach Delay (sec/veh)	6	5	8	6		
95 th Percentile Queue Length (ln-ft)		54	29	100	49			
		LOS	A	A	A	A	A	
Westbound	V/C Ratio	0.12	0.39	0.17	0.58			
	Approach Delay (sec/veh)	4	6	4	9			
	95 th Percentile Queue Length (ln-ft)	11	50	16	102			
		LOS	A	A	A	A	A	

*NCHRP-572 Model Approach Measures of Effectiveness

Traffic Engineering Report Attachments

- Existing Condition Level of Service Worksheets
- Future No-Build Condition Level of Service Worksheets
- Future Build Condition Roundabout Analysis

**SR 22/US 80 @ CR 33/Holley Rd
Existing AM Peak Hour Intersection Level of Service**

Intersection	Approach	CORSIM Nodes		Movement	Existing Volumes		Delay (Sec/Veh)	LOS	Percent CORSIM of Count		GEH Statistic	GEH Criteria	
		A	B		AM PK	CORSIM			Percent	Criteria (Within 15%)		Link	Intersection
SR 22/US 80 @ CR 33/Holley Rd (unsignalized)	Northbound	5	1	Left	18	30	4.6	A	167%	NO			
		5	1	Thru	19	15	3.6	A	79%	NO			
		5	1	Right	27	18	4.7	A	67%	NO			
		OVERALL		64	63	4.4	A		98%	YES	0.102329	YES	
	Southbound	4	1	Left	3	2	9.0	A	67%	NO			
		4	1	Thru	6	6	7.0	A	100%	YES			
		4	1	Right	7	7	4.3	A	100%	YES			
		OVERALL		16	15	6.0	A		94%	YES	0.206284	YES	
	Eastbound	2	1	Left	8	4	4.5	A	50%	NO			
			OVERALL		8	4	4.5	A		50%		1.264911	YES
	Westbound	3	1	Left	6	3	6.0	A	50%	NO			
			OVERALL		6	3	6.0	A		50%		1.095445	YES
Intersection Total					94	85	4.7	A	90%	YES	2.668969		YES

**SR 22/US 80 @ CR 33/Holley Rd
Existing PM Peak Hour Intersection Level of Service**

Intersection	Approach	CORSIM Nodes		Movement	Existing Volumes		Delay (Sec/Veh)	LOS	Percent CORSIM of Count		GEH Statistic	GEH Criteria	
		A	B		PM PK	CORSIM			Percent	Criteria (Within 15%)		Link	Intersection
SR 22/US 80 @ CR 33/Holley Rd (unsignalized)	Northbound	5	1	Left	36	43	6.8	A	119%	NO			
		5	1	Thru	31	24	6.8	A	77%	NO			
		5	1	Right	19	19	4.4	A	100%	YES			
		OVERALL		86	86	6.3	A		100%	YES	0	YES	
	Southbound	4	1	Left	9	11	7.1	A	122%	NO			
		4	1	Thru	43	44	9.8	A	102%	YES			
		4	1	Right	49	47	6.1	A	96%	YES			
		OVERALL		101	102	7.8	A		101%	YES	0.081111	YES	
	Eastbound	2	1	Left	20	29	4.8	A	145%	NO			
			OVERALL		20	29	4.8	A		145%		1.532262	YES
	Westbound	3	1	Left	25	24	3.5	A	96%	YES			
			OVERALL		25	24	3.5	A		96%		0.164399	YES
Intersection Total					232	241	6.5	A	104%	YES	1.777771		YES

**SR 22/US 80 @ CR 33/Holley Rd
2014 No-Build AM Peak Hour Intersection Level of Service**

Intersection	Approach	CORSIM Nodes		Movement	2014 Volumes			Delay (Sec/Veh)	LOS	Percent CORSIM of Count		GEH Criteria		
		A	B		AM PK	CORSIM	LOS			Percent	Criteria (Within 15%)	GEH Statistic	Link	Intersection
		Intersection Total										0	YES	
SR 22/US 80 @ CR 33/Holley Rd (unsignalized)	Northbound	5	1	Left	20	25	4.6	A	125%	NO				
		5	1	Thru	20	21	4.6	A	105%	YES				
		5	1	Right	45	38	6.2	A	84%	NO				
		OVERALL	85	84	5.3	A	99%	YES	0.088736	YES				
	Southbound	4	1	Left	5	5	7.2	A	100%	YES				
		4	1	Thru	10	12	9.0	A	120%	NO				
		4	1	Right	10	8	4.5	A	80%	NO				
		OVERALL	25	25	7.2	A	100%	YES	0	YES				
	Eastbound	2	1	Left	10	14	4.3	A	140%	NO				
		OVERALL	10	14	4.3	A	140%	NO	0.970143	YES				
	Westbound	3	1	Left	25	28	5.8	A	112%	YES				
		OVERALL	25	28	5.8	A	112%	YES	0.480384	YES				
Intersection Total					145	151	5.6	A	104%	YES		1.539263	YES	

**SR 22/US 80 @ CR 33/Holley Rd
2014 No-Build PM Peak Hour Intersection Level of Service**

Intersection	Approach	CORSIM Nodes		Movement	2014 Volumes			Delay (Sec/Veh)	LOS	Percent CORSIM of Count		GEH Criteria		
		A	B		PM PK	CORSIM	LOS			Percent	Criteria (Within 15%)	GEH Statistic	Link	Intersection
		Intersection Total										0.086226 <th>YES </th>	YES	
SR 22/US 80 @ CR 33/Holley Rd (unsignalized)	Northbound	5	1	Left	35	42	9.9	A	120%	NO				
		5	1	Thru	35	28	9.2	A	80%	NO				
		5	1	Right	20	19	5.1	A	95%	YES				
		OVERALL	90	89	8.6	A	99%	YES	0.086226	YES				
	Southbound	4	1	Left	10	11	7.6	A	110%	YES				
		4	1	Thru	45	48	8.4	A	107%	YES				
		4	1	Right	50	47	5.5	A	94%	YES				
		OVERALL	105	106	7.0	A	101%	YES	0.079556	YES				
	Eastbound	2	1	Left	20	29	5.0	A	145%	NO				
		OVERALL	20	29	5.0	A	145%	NO	1.532262	YES				
	Westbound	3	1	Left	25	21	3.7	A	84%	NO				
		OVERALL	25	21	3.7	A	84%	NO	0.671345	YES				
Intersection Total					240	245	7.1	A	102%	YES		2.369369	YES	

**SR 22/US 80 @ CR 33/Holley Rd
2034 No-Build AM Peak Hour Intersection Level of Service**

Intersection	Approach	CORSIM Nodes		Movement	2034 Volumes		Delay (Sec/Veh)	LOS	Percent CORSIM of Count		GEH Criteria	
		A	B		AM PK	CORSIM			Percent	Criteria (Within 15%)	GEH Statistic	Link
SR 22/US 80 @ CR 33/Holley Rd (unsignalized)	Northbound	5	1	Left	25	26	6.2	A	104%	YES		
		5	1	Thru	25	29	9.7	A	116%	NO		
		5	1	Right	60	55	13.2	B	92%	YES		
		OVERALL		110	110	10.6	B		100%	YES	0	YES
	Southbound	4	1	Left	5	5	16.8	C	100%	YES		
		4	1	Thru	10	12	15.5	C	120%	NO		
		4	1	Right	10	8	3.8	A	80%	NO		
		OVERALL		25	25	12.0	B		100%	YES	0	YES
	Eastbound	2	1	Left	10	5	3.6	A	50%	NO		
		OVERALL		10	5	3.6	A		50%	NO	1.414214	YES
	Westbound	3	1	Left	35	40	6.5	A	114%	YES		
		OVERALL		35	40	6.5	A		114%	YES	0.6742	YES
	Intersection Total		180	180	9.7	A		100%	YES	2.088413	YES	

**SR 22/US 80 @ CR 33/Holley Rd
2034 No-Build PM Peak Hour Intersection Level of Service**

Intersection	Approach	CORSIM Nodes		Movement	2034 Volumes		Delay (Sec/Veh)	LOS	Percent CORSIM of Count		GEH Criteria	
		A	B		PM PK	CORSIM			Percent	Criteria (Within 15%)	GEH Statistic	Link
SR 22/US 80 @ CR 33/Holley Rd (unsignalized)	Northbound	5	1	Left	50	54	26.4	D	108%	YES		
		5	1	Thru	40	34	24.7	C	85%	YES		
		5	1	Right	25	27	21.1	C	108%	YES		
		OVERALL		115	115	24.7	C		100%	YES	0	YES
	Southbound	4	1	Left	15	17	27.2	D	113%	YES		
		4	1	Thru	55	56	28.9	D	102%	YES		
		4	1	Right	65	62	20.3	C	95%	YES		
		OVERALL		135	135	24.8	C		100%	YES	0	YES
	Eastbound	2	1	Left	30	38	5.2	A	127%	NO		
		OVERALL		30	38	5.2	A		127%	NO	1.142857	YES
	Westbound	3	1	Left	35	34	4.2	A	97%	YES		
		OVERALL		35	34	4.2	A		97%	YES	0.138675	YES
	Intersection Total		315	322	20.3	C		102%	YES	1.281532	YES	

Welcome to GDOT's Roundabout Analysis Tool. This tool is designed for the user to determine the functionality of a proposed roundabout. The analysis is based on NCHRP Report 572 and the FHWA's Roundabout Design Guide (2000) standards. Please read the notes in the [Instructions](#) tab before using the spreadsheet.

Analyst:	JRA
Agency/Company:	Atkins
Date:	9/1/2011
Project Name or PI#:	0009576
Year, Peak Period:	2014, 7:00 to 8:00 am
County/District:	Bibb
Intersection:	SR 22/US 80 @ CR 33/Holley Rd

Insert Project Information Here in the BLUE SPACE. This information is linked to the Single Lane and Multi Lane Worksheets.

Roundabout Considerations Worksheet

Roundabouts may not operate well if there is too much traffic entering the intersection or if the percentage of traffic on the major road is too high. Candidate intersections shall be analyzed to determine whether a roundabout will perform acceptably. Shown below are thresholds to determine if a roundabout capacity analysis is required:

# of circulatory lanes	ADTs (current/ build year)	% traffic on Major Road
Single Lane	less than 25,000	less than 90%
Multi Lane	less than 45,000	less than 90%

Other things to consider when evaluating roundabouts as an alternative are Right of Way, sight distance, environmental impacts, and access to adjacent properties.

Volume Information (for Analysis Time Period)

1 Enter the Major/Minor Street ADT Volumes in the Chart below:

	Volumes	Split
Major Street	6,550	76%
Minor Street	2,050	24%
Total volumes	8,600	

Proximity to Other Intersections

2 How close is the nearest signal (miles or feet)?

3 Is the proposed intersection located within a coordinated signal network?

Go up to next section...



Proposed Design Configuration Chart

Directions for this Section only: (see Instructions Tab for other sections)

1. **Select** the type of roundabout you are analyzing.
2. **Key in** the number of approaches and the street names at the proposed intersections.
3. Complete the Approach Characteristics Chart:
 - a. **Select** the Street Name from the pull-down menu for each approach leg
 - b. **Select** the Lane Type for each entry approach lane
 *The first box is the inner lane, the second box is the outer lane
 - c. **Select** Yes or No if a right turn bypass will be added to each approach leg

Roundabout Characteristics

Roundabout Type:

of Approaches:

Name of Streets:

Chart Key:

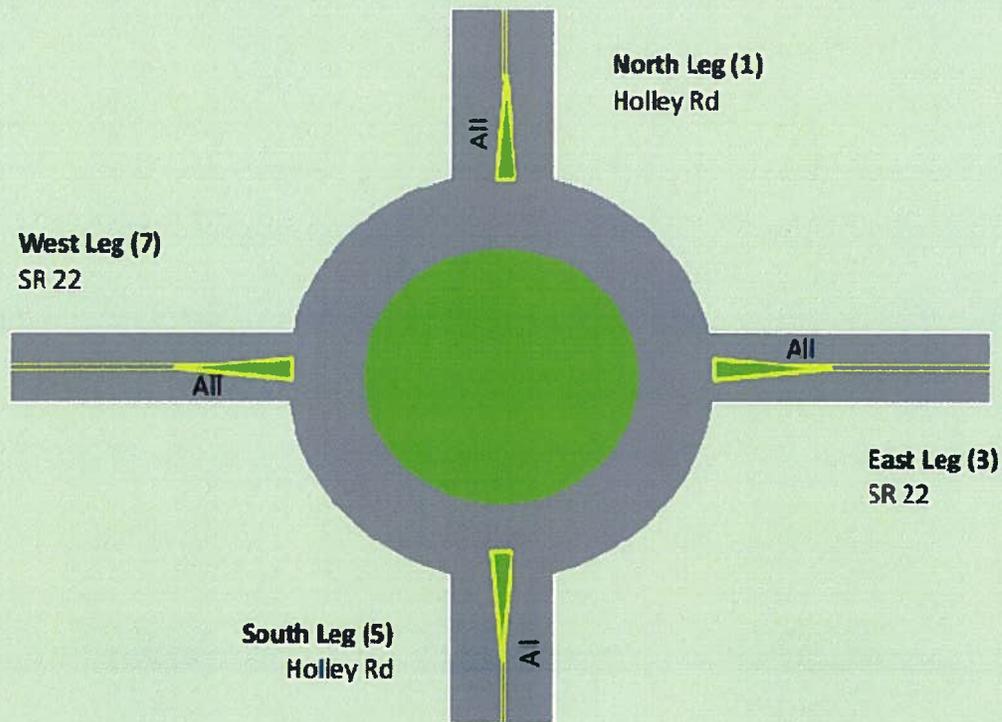
Single Lane	Street Name	
	All	
	Bypass?	
Multi-lane	Street Name	
	Inner Ln	Outer Ln
	Bypass?	

Approach Leg Characteristics:

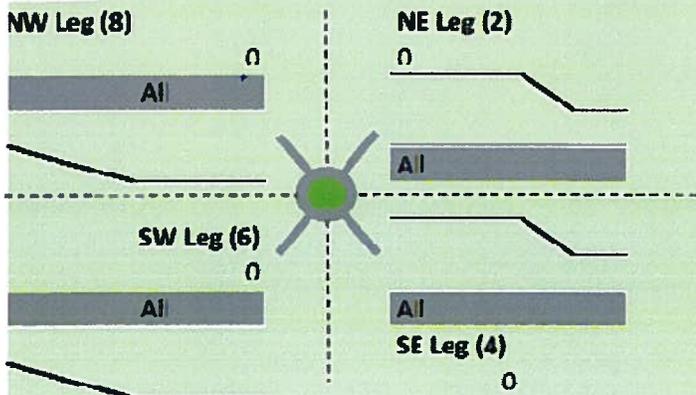
	North Leg (1)	NE Leg (2)	East Leg (3)	SE Leg (4)
Street Name:	Holley Rd		SR 22	
Entry Lane Config	All	All	All	All
Bypass to Adj Leg?	No		No	
	South Leg (5)	SW Leg (6)	West Leg (7)	NW Leg (8)
Street Name:	Holley Rd		SR 22	
Entry Lane Config	All	All	All	All
Bypass to Adj Leg?	No		No	

Additional

Preliminary Roundabout Rendering**



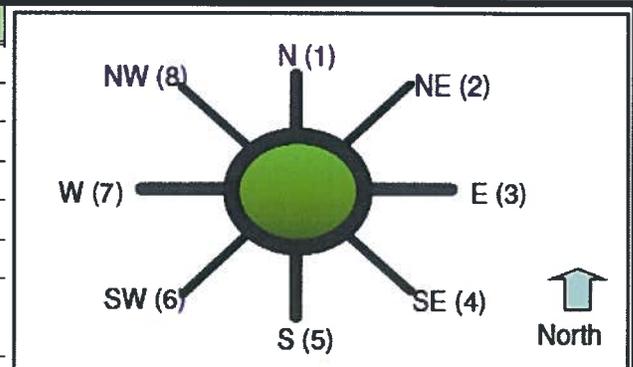
Partial Legs



****Note**

This roundabout sketch does not include the secondary cardinal direction legs due to restrictions in the Excel software. For complex roundabouts, a separate sketch is recommended by the designer.

General & Site Information	
Analyst:	JRA
Agency/Company:	Atkins
Date:	9/1/2011
Project Name or PI#:	0009576
Year, Peak Hour:	2014, 7:00 to 8:00 am
County/District:	Bibb
Intersection:	SR 22/US 80 @ CR 33/Holley Rd



Volumes		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph			5		20		10	
	NE (2), vph								
	E (3), vph	5				45		310	
	SE (4), vph								
	S (5), vph	10		25				50	
	SW (6), vph								
	W (7), vph	10		80		20			
	NW (8), vph								
Output	Total Vehicles	25	0	110	0	85	0	370	0

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	97%	100%	92%	100%	97%	100%	92%	100%
% SU/ Bus	3%	0%	5%	0%	3%	0%	5%	0%
% Trucks/ Combin.	1%	0%	3%	0%	1%	0%	3%	0%
% Bicycle	0%	0%	0%	0%	0%	0%	0%	0%
PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
F _{HV}	0.980	1.000	0.948	1.000	0.980	1.000	0.948	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	6	0	23	0	12	0
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	6	0	0	0	52	0	372	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	12	0	30	0	0	0	60	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	12	0	96	0	23	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	29	0	132	0	99	0	444	0
Conflicting flow, pcu/h	149	0	58	0	389	0	47	0

Roundabout Type	Standard Single Lane or Urban Compact
Enter type here...	Standard Single Lane

Results: Approach Measures of Effectiveness								
NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Entry Capacity, pcu/h	974	NA	1066	NA	766	NA	1078	NA
V/C ratio	0.03		0.12		0.13		0.41	
Control Delay, sec/pcu	4		4		5		6	
LOS	A		A		A		A	
95th % Queue (ft)	2		11		11		54	
UK Model**	N	NE	E	SE	S	SW	W	NW
Entry Capacity, pcu/h	1131	NA	1180	NA	1000	NA	1186	NA
V/C ratio	0.03		0.11		0.10		0.37	
Control Delay, sec/pcu	3		3		4		5	
LOS	A		A		A		A	
95th % Queue (ft)	2		10		8		46	

Notes:

Unit Legend:

vph = vehicles per hour

PHF = peak hour factor

F_{HV} = heavy vehicle factor

pcu = passenger car unit

Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)	N (1)	E (3)	S (5)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	N (1)	E (3)	S (5)		
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF	0.88	0.88	0.88	0.88		
F _{HV}	0.98	0.95	0.98	0.95		
<i>NOTE: Volume Characteristics for Exit Leg are already taken into account</i>						
Entry/Conflicting Flows						
Entry Flow	0	0	0	0		
Conflicting Flow	131	41	430	102		
Bypass Lane Results (NCHRP-572 Model)						
Entry Capacity at bypass mergepoint, pcu/hr	992	1084	735	1021		
V/C ratio	0.00	0.00	0.00	0.00		
Control Delay, sec/pcu	3.6	3.3	4.9	3.5		
LOS	A	A	A	A		
95th % Queue (ft)	0	0	0	0		

Welcome to GDOT's Roundabout Analysis Tool. This tool is designed for the user to determine the functionality of a proposed roundabout. The analysis is based on NCHRP Report 572 and the FHWA's Roundabout Design Guide (2000) standards. Please read the notes in the **Instructions** tab before using the spreadsheet.

Analyst:	JRA
Agency/Company:	Atkins
Date:	9/1/2011
Project Name or PI#:	0009576
Year, Peak Period:	2014, 5:00 to 6:00 pm
County/District:	Bibb
Intersection:	SR 22/US 80 @ CR 33/Holley Rd

Insert Project Information Here in the BLUE SPACE. This information is linked to the Single Lane and Multi Lane Worksheets.

Roundabout Considerations Worksheet

Roundabouts may not operate well if there is too much traffic entering the intersection or if the percentage of traffic on the major road is too high. Candidate intersections shall be analyzed to determine whether a roundabout will perform acceptably. Shown below are thresholds to determine if a roundabout capacity analysis is required:

# of circulatory lanes	ADTs (current/ build year)	% traffic on Major Road
Single Lane	less than 25,000	less than 90%
Multi-Lane	less than 45,000	less than 90%

Other things to consider when evaluating roundabouts as an alternative are Right of Way, sight distance, environmental impacts, and access to adjacent properties.

Volume Information (for Analysis Time Period)

1 Enter the Major/Minor Street ADT Volumes in the Chart below:

	Volumes	Split
Major Street	6,550	76%
Minor Street	2,050	24%
Total volumes	8,600	

Proximity to Other Intersections

2 How close is the nearest signal (miles or feet)?

3 Is the proposed intersection located within a coordinated signal network?

Go up to next section...

Proposed Design Configuration Chart

Directions for this Section only: (see Instructions Tab for other sections)

1. **Select** the type of roundabout you are analyzing.
2. **Key in** the number of approaches and the street names at the proposed intersections.
3. Complete the Approach Characteristics Chart:
 - a. **Select** the Street Name from the pulldown menu for each approach leg
 - b. **Select** the Lane Type for each entry approach lane
**The first box is the inner lane, the second box is the outer lane*
 - c. **Select** Yes or No if a right turn bypass will be added to each approach leg

Roundabout Characteristics

Roundabout Type:

of Approaches:

Name of Streets:

Chart Key:

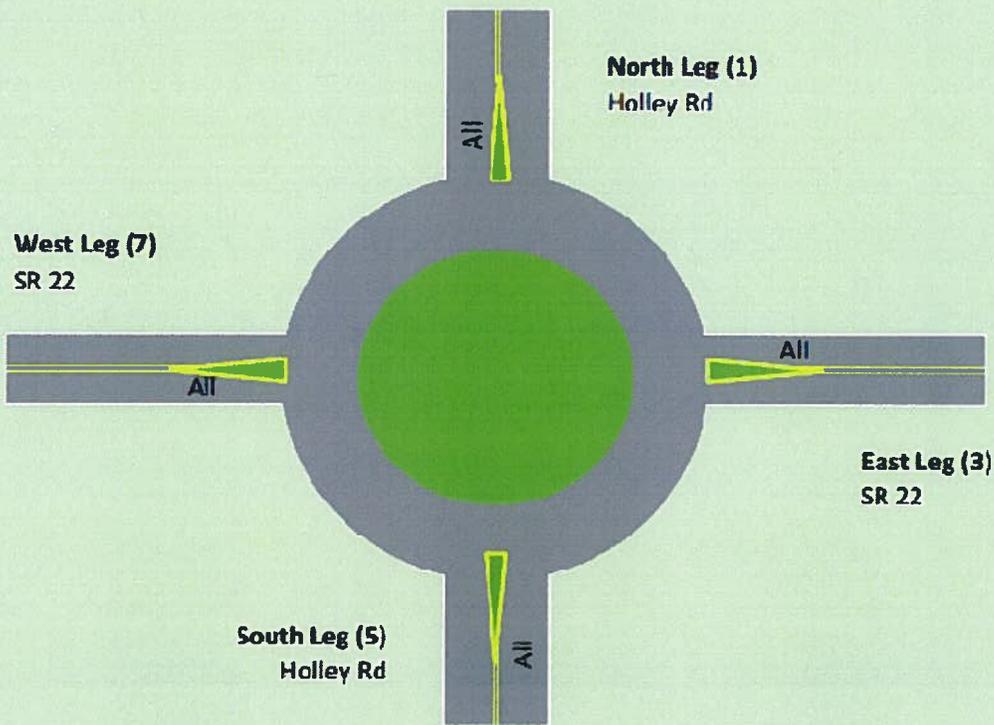
Single Lane	Street Name	
	All	
	Bypass?	
Multi-lane	Street Name	
	Inner Ln	Outer Ln
	Bypass?	

Approach Leg Characteristics:

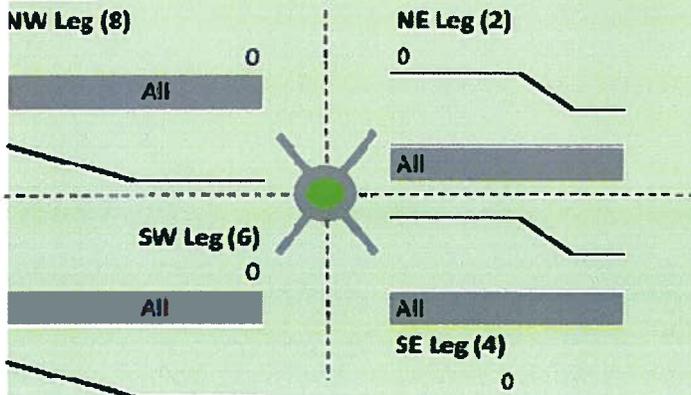
	North Leg (1)	NE Leg (2)	East Leg (3)	SE Leg (4)
Street Name:	Holley Rd		SR 22	
Entry Lane Config	All	All	All	All
Bypass to Adj Leg?	No		No	
	South Leg (5)	SW Leg (6)	West Leg (7)	NW Leg (8)
Street Name:	Holley Rd		SR 22	
Entry Lane Config	All	All	All	All
Bypass to Adj Leg?	No		No	

Additior

Preliminary Roundabout Rendering**



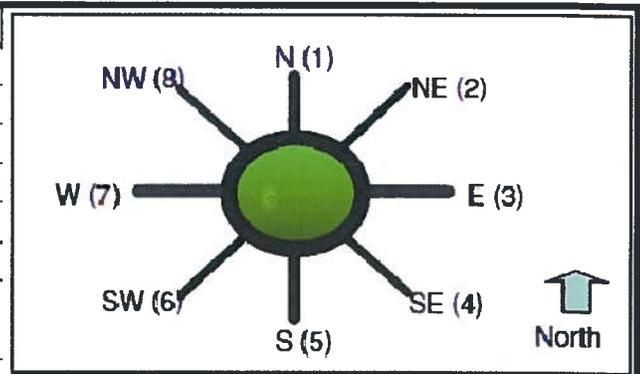
Cardinal Legs



****Note**

This roundabout sketch does not include the secondary cardinal direction legs due to restrictions in the Excel software. For complex roundabouts, a separate sketch is recommended by the designer.

General & Site Information	
Analyst:	JRA
Agency/Company:	Atkins
Date:	9/1/2011
Project Name or PI#:	0009576
Year, Peak Hour:	2014, 5:00 to 6:00 pm
County/District:	Bibb
Intersection:	SR 22/US 80 @ CR 33/Holley Rd



Volumes		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph			30		35		20	
	NE (2), vph								
	E (3), vph	10				20		180	
	SE (4), vph								
	S (5), vph	45		25				30	
	SW (6), vph								
	W (7), vph	50		280		35			
	NW (8), vph								
Output	Total Vehicles	105	0	335	0	90	0	230	0

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	97%	100%	92%	100%	97%	100%	92%	100%
% SU/ Bus	3%	0%	5%	0%	3%	0%	5%	0%
% Trucks/ Combin.	1%	0%	3%	0%	1%	0%	3%	0%
% Bicycle	0%	0%	0%	0%	0%	0%	0%	0%
PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
F _{HV}	0.980	1.000	0.948	1.000	0.980	1.000	0.948	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	36	0	41	0	24	0
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	12	0	0	0	23	0	216	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	52	0	30	0	0	0	36	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	58	0	336	0	41	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	122	0	402	0	104	0	276	0
Conflicting flow, pcu/h	406	0	105	0	251	0	94	0

Roundabout Type	Standard Single Lane or Urban Compact
Enter type here...	Standard Single Lane

Results: Approach Measures of Effectiveness								
NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Entry Capacity, pcu/h	753	NA	1017	NA	879	NA	1029	NA
V/C ratio	0.16		0.39		0.12		0.27	
Control Delay, sec/pcu	6		6		5		5	
LOS	A		A		A		A	
95th % Queue (ft)	15		50		10		29	
UK Model**	N	NE	E	SE	S	SW	W	NW
Entry Capacity, pcu/h	991	NA	1155	NA	1075	NA	1161	NA
V/C ratio	0.12		0.35		0.10		0.24	
Control Delay, sec/pcu	4		5		4		4	
LOS	A		A		A		A	
95th % Queue (ft)	11		42		8		24	

Notes:

Unit Legend:

vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)	N (1)	E (3)	S (5)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	N (1)	E (3)	S (5)		
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF	0.88	0.88	0.88	0.88		
F _{HV}	0.98	0.95	0.98	0.95		
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow	0	0	0	0		
Conflicting Flow	434	101	251	118		
Bypass Lane Results (NCHRP-572 Model)						
Entry Capacity at bypass mergepoint, pcu/hr	732	1022	880	1004		
V/C ratio	0.00	0.00	0.00	0.00		
Control Delay, sec/pcu	4.9	3.5	4.1	3.6		
LOS	A	A	A	A		
95th % Queue (ft)	0	0	0	0		

Welcome to GDOT's Roundabout Analysis Tool. This tool is designed for the user to determine the functionality of a proposed roundabout. The analysis is based on NCHRP Report 572 and the FHWA's Roundabout Design Guide (2000) standards. Please read the notes in the **Instructions** tab before using the spreadsheet.

Analyst:	JRA
Agency/Company:	Atkins
Date:	9/1/2011
Project Name or PI#:	0009576
Year, Peak Period:	2034, 7:00 to 8:00 am
County/District:	Bibb
Intersection:	SR 22/US 80 @ CR 33/Holley Rd

Insert Project Information Here in the BLUE SPACE. This information is linked to the Single Lane and Multi Lane Worksheets.

Roundabout Considerations Worksheet

Roundabouts may not operate well if there is too much traffic entering the intersection or if the percentage of traffic on the major road is too high. Candidate intersections shall be analyzed to determine whether a roundabout will perform acceptably. Shown below are thresholds to determine if a roundabout capacity analysis is required:

# of circulatory lanes	ADTs (current/ build year)	% traffic on Major Road
Single Lane	less than 25,000	less than 90%
Multi-Lane	less than 45,000	less than 90%

Other things to consider when evaluating roundabouts as an alternative are Right of Way, sight distance, environmental impacts, and access to adjacent properties.

Volume Information (for Analysis Time Period)

1 Enter the Major/Minor Street ADT Volumes in the Chart below:

	Volumes	Split
Major Street	8,750	77%
Minor Street	2,550	23%
Total volumes	11,300	

Proximity to Other Intersections

2 How close is the nearest signal (miles or feet)?

3 Is the proposed intersection located within a coordinated signal network?

Go up to next section..

Proposed Design Configuration Chart

Directions for this Section only: (see Instructions Tab for other sections)

1. **Select** the type of roundabout you are analyzing.
2. **Key in** the number of approaches and the street names at the proposed intersections.
3. Complete the Approach Characteristics Chart:
 - a. **Select** the Street Name from the pull-down menu for each approach leg
 - b. **Select** the Lane Type for each entry approach lane
 *The first box is the inner lane, the second box is the outer lane
 - c. **Select** Yes or No if a right turn bypass will be added to each approach leg

Roundabout Characteristics

Roundabout Type:

of Approaches:

Name of Streets:

Chart Key:

Single Lane

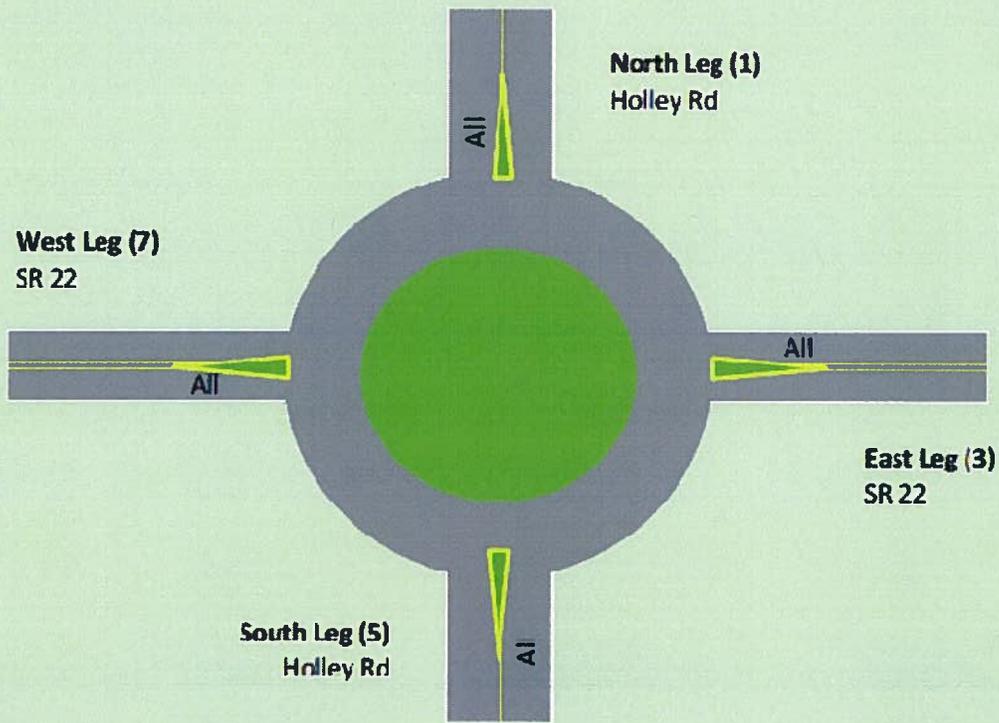
Multi-lane

Approach Leg Characteristics:

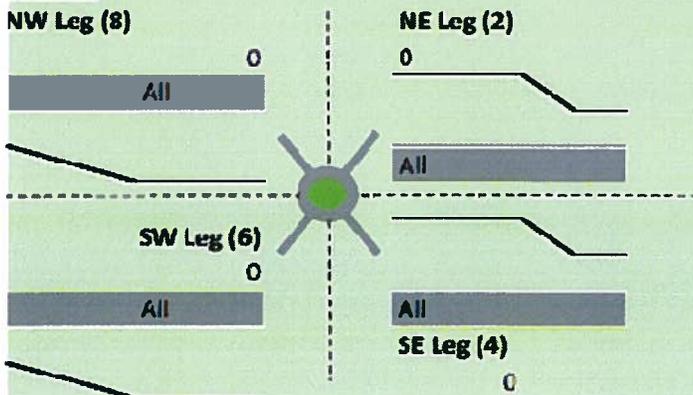
	North Leg (1)	NE Leg (2)	East Leg (3)	SE Leg (4)
Street Name:	<input type="text" value="Holley Rd"/>	<input type="text"/>	<input type="text" value="SR 22"/>	<input type="text"/>
Entry Lane Config	<input type="text" value="All"/>	<input type="text" value="All"/>	<input type="text" value="All"/>	<input type="text" value="All"/>
Bypass to Adj Leg?	<input type="text" value="No"/>	<input type="text"/>	<input type="text" value="No"/>	<input type="text"/>
	South Leg (5)	SW Leg (6)	West Leg (7)	NW Leg (8)
Street Name:	<input type="text" value="Holley Rd"/>	<input type="text"/>	<input type="text" value="SR 22"/>	<input type="text"/>
Entry Lane Config	<input type="text" value="All"/>	<input type="text" value="All"/>	<input type="text" value="All"/>	<input type="text" value="All"/>
Bypass to Adj Leg?	<input type="text" value="No"/>	<input type="text"/>	<input type="text" value="No"/>	<input type="text"/>

Addition

Preliminary Roundabout Rendering**



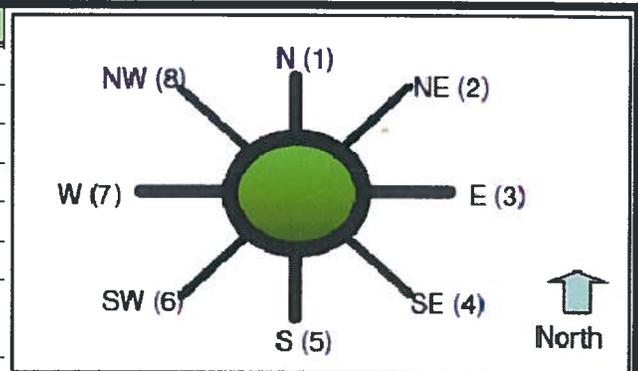
Legs



****Note**

This roundabout sketch does not include the secondary cardinal direction legs due to restrictions in the Excel software. For complex roundabouts, a separate sketch is recommended by the designer.

General & Site Information	
Analyst:	JRA
Agency/Company:	Atkins
Date:	9/1/2011
Project Name or PI#:	0009576
Year, Peak Hour:	2034, 7:00 to 8:00 am
County/District:	Bibb
Intersection:	SR 22/US 80 @ CR 33/Holley Rd



Volumes		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph			5		25		10	
	NE (2), vph								
	E (3), vph	5				35		430	
	SE (4), vph								
	S (5), vph	10		35				70	
	SW (6), vph								
	W (7), vph	10		110		25			
	NW (8), vph								
Output	Total Vehicles	25	0	150	0	85	0	510	0

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	97%	100%	92%	100%	97%	100%	92%	100%
% SU/ Bus	3%	0%	5%	0%	3%	0%	5%	0%
% Trucks/ Combin.	1%	0%	3%	0%	1%	0%	3%	0%
% Bicycle	0%	0%	0%	0%	0%	0%	0%	0%
PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
F _{HV}	0.980	1.000	0.948	1.000	0.980	1.000	0.948	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	6	0	29	0	12	0
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	6	0	0	0	41	0	516	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	12	0	42	0	0	0	84	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	12	0	132	0	29	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	29	0	180	0	99	0	611	0
Conflicting flow, pcu/h	203	0	70	0	533	0	59	0

Roundabout Type	Standard Single Lane or Urban Compact
Enter type here...	Standard Single Lane

Results: Approach Measures of Effectiveness								
NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Entry Capacity, pcu/h	923	NA	1054	NA	663	NA	1065	NA
V/C ratio	0.03		0.17		0.15		0.57	
Control Delay, sec/pcu	4		4		6		8	
LOS	A		A		A		A	
95th % Queue (ft)	2		16		13		100	
UK Model**	N	NE	E	SE	S	SW	W	NW
Entry Capacity, pcu/h	1102	NA	1174	NA	922	NA	1180	NA
V/C ratio	0.03		0.15		0.11		0.52	
Control Delay, sec/pcu	3		4		4		6	
LOS	A		A		A		A	
95th % Queue (ft)	2		14		9		82	

Notes:

Unit Legend:

vph = vehicles per hour

PHF = peak hour factor

F_{HV} = heavy vehicle factor

pcu = passenger car unit

Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)	N (1)	E (3)	S (5)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	N (1)	E (3)	S (5)		
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF	0.88	0.88	0.88	0.88		
F _{HV}	0.98	0.95	0.98	0.95		
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow	0	0	0	0		
Conflicting Flow	172	47	562	137		
Bypass Lane Results (NCHRP-572 Model)						
Entry Capacity at bypass mergepoint, pcu/hr	951	1078	644	985		
V/C ratio	0.00	0.00	0.00	0.00		
Control Delay, sec/pcu	3.8	3.3	5.6	3.7		
LOS	A	A	A	A		
95th % Queue (ft)	0	0	0	0		

Welcome to GDOT's Roundabout Analysis Tool. This tool is designed for the user to determine the functionality of a proposed roundabout. The analysis is based on NCHRP Report 572 and the FHWA's Roundabout Design Guide (2000) standards. Please read the notes in the **Instructions** tab before using the spreadsheet.

Analysis:	JRA
Agency/Company:	Atkins
Date:	9/1/2011
Project Name or PI#:	0009576
Year, Peak Period:	2034, 5:00 to 6:00 pm
County/District:	Bibb
Intersection:	SR 22/US 80 @ CR 33/Holley Rd

Insert Project Information Here in the BLUE SPACE. This information is linked to the Single Lane and Multi Lane Worksheets.

Roundabout Considerations Worksheet

Roundabouts may not operate well if there is too much traffic entering the intersection or if the percentage of traffic on the major road is too high. Candidate intersections shall be analyzed to determine whether a roundabout will perform acceptably. Shown below are thresholds to determine if a roundabout capacity analysis is required:

# of circulatory lanes	ADTs (current/ build year)	% traffic on Major Road
Single Lane	less than 25,000	less than 90%
Multi-Lane	less than 45,000	less than 90%

Other things to consider when evaluating roundabouts as an alternative are Right of Way, sight distance, environmental impacts, and access to adjacent properties.

Volume Information (for Analysis Time Period)

1 Enter the Major/Minor Street ADT Volumes in the Chart below:

	Volumes	Split
Major Street	8,750	77%
Minor Street	2,550	23%
Total volumes	11,300	

Proximity to Other Intersections

2 How close is the nearest signal (miles or feet)?

3 Is the proposed intersection located within a coordinated signal network?

Go up to next section...

Proposed Design Configuration Chart

Directions for this Section only: (see Instructions Tab for other sections)

1. **Select** the type of roundabout you are analyzing.
2. **Key in** the number of approaches and the street names at the proposed intersections.
3. Complete the Approach Characteristics Chart:
 - a. **Select** the Street Name from the pull-down menu for each approach leg
 - b. **Select** the Lane Type for each entry approach lane
 *The first box is the inner lane, the second box is the outer lane
 - c. **Select** Yes or No if a right turn bypass will be added to each approach leg

Roundabout Characteristics

Roundabout Type:

of Approaches:

Name of Streets:

Chart Key:

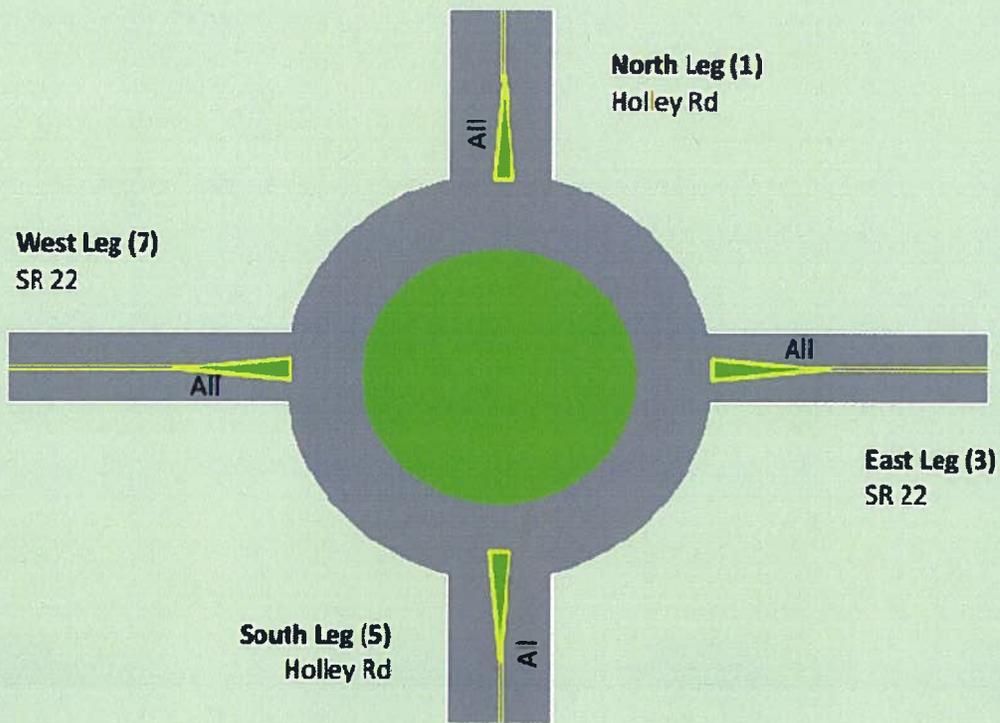
Single Lane	Street Name	
	All	
	Bypass?	
Multi-lane	Street Name	
	Inner Ln	Outer Ln
	Bypass?	

Approach Leg Characteristics:

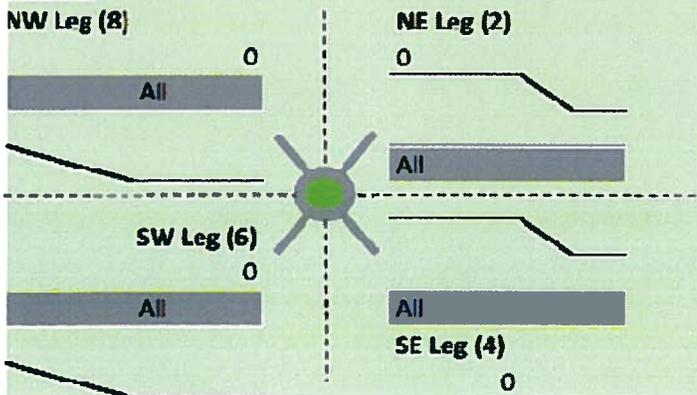
	North Leg (1)	NE Leg (2)	East Leg (3)	SE Leg (4)
Street Name:	Holley Rd		SR 22	
Entry Lane Config	All	All	All	All
Bypass to Adj Leg?	No		No	
	South Leg (5)	SW Leg (6)	West Leg (7)	NW Leg (8)
Street Name:	Holley Rd		SR 22	
Entry Lane Config	All	All	All	All
Bypass to Adj Leg?	No		No	

Additior

Preliminary Roundabout Rendering**



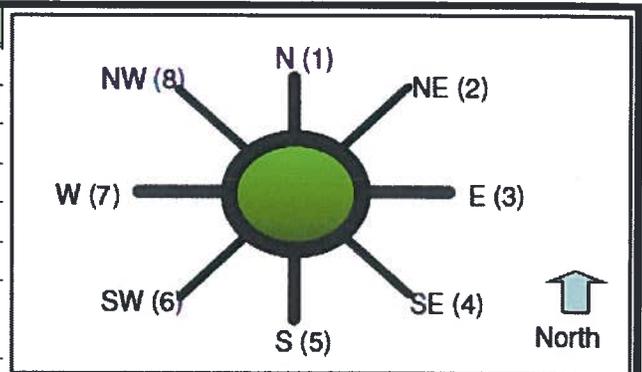
8 Total Legs



****Note**

This roundabout sketch does not include the secondary cardinal direction legs due to restrictions in the Excel software. For complex roundabouts, a separate sketch is recommended by the designer.

General & Site Information	
Analyst:	JRA
Agency/Company:	Atkins
Date:	9/1/2011
Project Name or PI#:	0009576
Year, Peak Hour:	2034, 5:00 to 6:00 pm
County/District:	Bibb
Intersection:	SR 22/US 80 @ CR 33/Holley Rd



Volumes		Entry Legs (FROM)							
		N (1)	NE (2)	E (3)	SE (4)	S (5)	SW (6)	W (7)	NW (8)
Exit Legs (TO)	N (1), vph			40		40		30	
	NE (2), vph								
	E (3), vph	15				25		250	
	SE (4), vph								
	S (5), vph	55		35				45	
	SW (6), vph								
	W (7), vph	65		400		50			
	NW (8), vph								
Output	Total Vehicles	135	0	475	0	115	0	325	0

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	97%	100%	92%	100%	97%	100%	92%	100%
% SU/ Bus	3%	0%	5%	0%	3%	0%	5%	0%
% Trucks/ Combin.	1%	0%	3%	0%	1%	0%	3%	0%
% Bicycle	0%	0%	0%	0%	0%	0%	0%	0%
PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
F _{HV}	0.980	1.000	0.948	1.000	0.980	1.000	0.948	1.000

Entry/Conflicting Flows	N	NE	E	SE	S	SW	W	NW
Flow to Leg # N (1), pcu/h	0	0	48	0	46	0	36	0
NE (2), pcu/h	0	0	0	0	0	0	0	0
E (3), pcu/h	17	0	0	0	29	0	300	0
SE (4), pcu/h	0	0	0	0	0	0	0	0
S (5), pcu/h	64	0	42	0	0	0	54	0
SW (6), pcu/h	0	0	0	0	0	0	0	0
W (7), pcu/h	75	0	480	0	58	0	0	0
NW (8), pcu/h	0	0	0	0	0	0	0	0
Entry flow, pcu/h	156	0	569	0	133	0	390	0
Conflicting flow, pcu/h	579	0	140	0	353	0	123	0

Roundabout Type	Standard Single Lane or Urban Compact
Enter type here...	Standard Single Lane

Results: Approach Measures of Effectiveness								
NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Entry Capacity, pcu/h	633	NA	982	NA	794	NA	999	NA
V/C ratio	0.25		0.58		0.17		0.39	
Control Delay, sec/pcu	8		9		5		6	
LOS	A		A		A		A	
95th % Queue (ft)	25		102		15		49	
UK Model**	N	NE	E	SE	S	SW	W	NW
Entry Capacity, pcu/h	896	NA	1136	NA	1020	NA	1145	NA
V/C ratio	0.17		0.50		0.13		0.34	
Control Delay, sec/pcu	5		6		4		5	
LOS	A		A		A		A	
95th % Queue (ft)	16		76		11		40	

Notes:

Unit Legend:

vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	Bypass #1	Bypass #2	Bypass #3	Bypass #4	Bypass #5	Bypass #6
Select Entry Leg from Bypass (FROM)	N (1)	E (3)	S (5)	W (7)		
Select Exit Leg for Bypass (TO)	W (7)	N (1)	E (3)	S (5)		
Volumes						
Right Turn Volume removed from Entry Leg						
Volume Characteristics (for entry leg)						
PHF	0.88	0.88	0.88	0.88		
F _{HV}	0.98	0.95	0.98	0.95		
NOTE: Volume Characteristics for Exit Leg are already taken into account						
Entry/Conflicting Flows						
Entry Flow	0	0	0	0		
Conflicting Flow	613	130	346	160		
Bypass Lane Results (NCHRP-572 Model)						
Entry Capacity at bypass mergepoint, pcu/hr	612	992	799	963		
V/C ratio	0.00	0.00	0.00	0.00		
Control Delay, sec/pcu	5.9	3.6	4.5	3.7		
LOS	A	A	A	A		
95th % Queue (ft)	0	0	0	0		

Attachment 9

Concept Team Meeting Minutes

August 10, 2011



Meeting Minutes

**S.R. 22/U.S. 80 at C.R. 33/Holley Road
Bibb County
P.I. NO. 0009576**

Date: August 10, 2011

Location/Time: Macon Area Office / 10:00 a.m. – 11:30 a.m.

Attendees:

Perry Black	GDOT – Program Delivery/PM
Derrick Cameron	GDOT – Program Delivery
Kim Phillips	GDOT – Design Policy and Support
Bill Rountree	GDOT – District 3 Preconstruction Engineer
Chance Baxley	GDOT – District 3
Bob O'Rourke	GDOT – District 3
Zoe Chamberlain	GDOT – OES
Kimberly Larson	GDOT – District 3 Construction
Ken Robinson	GDOT – District 3 Construction Engineer
Mike England	GDOT – District 3 Traffic
Harland Smith	GDOT – District 3 Utilities
Ken Sheets	Bibb County Engineering
Mike Moseley	Atkins
Sharon Downs	Atkins

Minutes By: Mike Moseley

The following items were discussed at the meeting:

1. The meeting opened with introductions and following background information:
 - Project initiated due to high accident rate and fatalities
 - Due to existing R/W, topography, intersection configuration and traffic signal did not meet warrants a roundabout was proposed
2. Perry Black then turned the meeting over to Mike Moseley with Atkins, the consultant project manager.

3. To begin the meeting, Mike Moseley handed out two roll plots of the proposed roundabout configuration. There were no specific comments regarding the design at this point.
4. The meeting then moved onto the agenda items per the PDP:
 - a. Need and Purpose – There were no comments on the Need and Purpose as provided in the draft concept report.
 - b. Logical Termini – No comments.
 - c. Planning Concept/STIP project definition – This project is under Safety Lump Sum TIP# MCN-79 in the 2012-2015 TIP approved by the Macon Area Transportation Study Policy Committee on May 18, 2011.
 - d. Project Background – Higher than average accident rate with three (3) fatalities since 2004.
 - e. Benefit to Cost Analysis – Benefit/Cost ratio of 10.66 which is included in the draft concept report.
 - f. Environmental Resources
 - Wetlands, open waters, stream and buffers – There are six (6) delineated state waters that are non-buffered and one (1) wetland
 - Park lands – There is a park located in the northeast quadrant of the intersection that is privately owned by the Lizella Community Club. No impacts are anticipated.
 - Historic properties, potential archaeological sites – There are four (4) historic resources that are proposed as not eligible for the National Register of Historic Places, which will not be impacted by the proposed project. There are no archaeological sites.
 - Cemeteries – There are no cemeteries within the project limits.
 - Location of potential hazardous waste sites – The park has a swimming pool, which can be hazardous materials sites. There is a gas station, dry cleaners and hardware store in the retail development in the northwest quadrant of the intersection. Neither locations will be impacted.
 - Underground storage tank sites – There are three (3) active USTs in the retail development. They will not be impacted.
 - Threatened and Endangered Species – None were present within the limits of the project.
 - g. Public Involvement – PIOH will be required. Atkins will start the process of requesting the PIOH.

- h. Environmental Document anticipated – Categorical Exclusion.
- i. Environmental Permits required – NPDES permit is anticipated. It would be preferable to reduce impacts to under one (1) acre so a NPDES permit would not be required. Due to use of concrete paving in the proposed roundabout temporary pavement will be required to stage construct which could impact wetlands. If wetlands are impacted a 404 Permit will be required.
- j. Alternatives considered – Discussed the alternatives covered in the concept report:
 - No-build – does not address improve safety
 - Signalized Intersection – does not meet signal warrants
 - Add left turn lanes – does not reduce crash frequency or severity
- k. Design Criteria proposed – FHWA Roundabouts: An Informational Guide
- l. Horizontal and Vertical criteria – Comment was made to look at increasing the exit radii for the roundabout and decreasing the truck apron radius. GDOT expressed that trucks had been reluctant to use the truck apron and were running on the outside curbs while making turns. Both options will be reviewed to see if they will not create conflicts between entering and circulating speeds as well as increasing the fastest path too much.
- m. Typical Section – The decision was made to match the existing shoulder on SR 22 and to use a 2 ft paved shoulder on Holley Road. Concrete pavement was proposed in the curb and gutter approaches to the roundabout as well as the roundabout itself.
- n. VE Study – Not applicable.
- o. Interchange Modification Report/Interchange Justification Report – Not applicable.
- p. Access Control – By permit.
- q. Practical Alternative Report – Not applicable.
- r. Project Framework Agreement – Not applicable.
- s. Right of Way – Currently no R/W is required.
- t. Preliminary bridge assessment – Not applicable.
- u. Accident history – Above statewide average.
- v. Potential soil conditions – Nothing abnormal observed during sight visits and there were no maintenance problems reported.
- w. Construction limits – Shown on roll plot for preferred alternate.
- x. Maintenance of Traffic – GDOT suggested the use of concrete pavement for the roundabout and in the curb and gutter approaches due to the truck percentage and rutting/pushing of the

asphalt in other roundabouts. This will require more complicated staging that originally expected. It was suggested to use temporary pavement to shift SR 22 to the north outside of the proposed limits of the roundabout. This will require closing Holley Road. Since a viable detour appears available this will be shown at the PIOH.

- y. Maintenance problems existing along project – None.
- z. Preliminary capacity analysis for the “Build Alternative” and “No-Build Alternatives” – Roundabout analysis included in the draft concept report.
- aa. Potential improvements recommended for intersections along project – None proposed.
- bb. Constructability of proposed project – To be determined based on using concrete pavement in the roundabout.
- cc. Work zone safety and mobility requirements – Standard safety procedures will be utilized.
- dd. Preliminary construction cost estimate – New cost estimate will be prepared for concrete paving and Traffic Control as required with concrete paving.
- ee. Project assignments – Concept report is accurate.
- ff. Project schedule – CE approved by early 2012, PFPR in spring 2012, FFPR in Fall and let in January 2013.
- gg. ITS Concept of Operations – Not applicable.
- hh. Maintenance issues with the ITS system – Not applicable.
- ii. Utility – Utilities located within the project limits include: Atlanta Gas Light, Georgia Power Distribution, Southern Rivers Energy and Public Service Telephone.
- jj. Proximity and probable impacts to railroad and railroad R/W – Not applicable.
- kk. Proximity and probable impacts to airports and/or flight paths – Not applicable.
- ll. Additional items discussed:
 - Add lighting agreement to concept report
 - Minimize lighting to decrease monthly cost for Bibb County

Action Items:

1. Update cost estimate for use of concrete pavement (Atkins)
2. Need utility cost estimate for inclusion into concept report (GDOT)
3. Need Lighting Agreement for inclusion in concept report (GDOT)

Attachments: Concept Team Meeting Agenda , Sign-in sheet

S.R. 22/U.S. 80 at C.R. 33/Holley Road

P.I. Number: 0009576

Bibb County

Initial Concept Team Meeting Agenda based on PDP:

- Introductions
- Need and Purpose
- Logical Termini
- Planning Concept/Conforming plan's project description and network schematic showing through lanes/STIP project definition.
- Project Background
- Benefit to Cost analysis
- Environmental Resources
 - Wetlands, open waters, streams and their buffers
 - Park lands
 - Historic properties, potential archaeological sites
 - Streams and their buffers
 - Cemeteries
 - Location of potential hazardous waste sites
 - Underground storage tank sites
 - Threatened and Endangered Species
- Public Involvement
- Environmental Document anticipated
- Environmental Permits required
- Alternatives considered and rejected to date sufficient for inclusion into the environmental document
- Design Criteria proposed
- Horizontal and Vertical criteria
- Typical Section
- VE Study results or recommendations.
- Interchange Modification Report or Interchange Justification Report requirements.
- Access control
- Practical Alternative Report (PAR)
- Project Framework Agreement
- Right of Way
 - Potential Number of parcels
 - Relocations
 - R/W cost
 - Who is responsible for purchase of R/W?
- Preliminary bridge assessment and structural needs including retaining and noise walls

- Accident history
- Potential soil conditions
- Construction limits
- Maintenance of Traffic (detour, closed or constructed under traffic)
- Maintenance problems existing along project .
- Preliminary capacity analysis for the “Build Alternative” and “No-Build Alternatives”.
- Potential improvements recommended for intersections along project
- Constructability of proposed project.
- Workzone safety and mobility requirements.
- Preliminary construction cost estimate.
- Project assignments.
- Project schedule.
- ITS Concept of Operations
- Maintenance issues with the ITS system.
- Utility
 - Name/size/location
 - Utility cost estimate
- Proximity and probably impacts to railroad and railroad R/W.
- Proximity and probable impacts to airports and/or flight paths.

**GEORGIA DEPARTMENT OF TRANSPORTATION
MEETING / CONFERENCE RECORD OF ATTENDEES**

PURPOSE: P.I.# 0009576 SR 22/US 80 at C.R. 33/Holley Road
Concept Team Meeting-Proposed Roundabout

LOCATION: District 3 Macon Area Office 4499 Riverside Dr. Macon Ga. 31210

DATE: 7/10/2011

TIME: 10:00 A.M.

MODERATOR: Perry Black

GDOT suffix: @dot.ga.gov

	NAME	ORGANIZATION	PHONE NO.	E-MAIL ADDRESS
1	PERRY BLACK	OPD	(4)631-122A	PBLACK
2	Kim Phillips	Design Policy & Support	404-631-1775	Kiphillips@dot.ga.gov
3	Bill Brounree	D3 Precen.	706-646-6987	brounree@dot.ga.gov
4	Sharon Downs	ATKINS	770-933-0280	sharon.downs@atkinglobal.com
5	CHANCE BAXLEY	GDOT D3	706 741 3453	CBAXLEY
6	Bob O'Rourke	GDOT	706 646 6968	borourke@dot.ga.gov
7	Joé Chamberlain	GDOT OES	4-631-1174	zchamberlain...
8	Kimberly Larson	GDOT-DCO	706-646-6938	klarson@dot.ga.gov
9	Ken Robinson	GDOT DCE	706-646-6911	krobinson@dot.ga.gov
10	KEN SHEETS	BIBB COUNTY ENGINEERING	478-621-6660	ksheets@co.bibb.ga.us
11	MIKE ENGLAND	GDOT TRAFFIC	706-646-6676	mengl@dot.ga.gov
12	Harland B. Smith	GDOT Utilities	706-741-3613	hasmith@dot.ga.gov
13	MIKE MOSELEY	ATKINS	770 933-0280	michael.moseley@atkinglobal.com
14				
15				
16				
17				
18				
19				
20				

Attachment 10

Lighting Agreement

August 16, 2011

AGREEMENT
BETWEEN
DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
AND
BIBB COUNTY, GEORGIA

This Agreement is made and entered into this 16th day of August, 2011, by and between the DEPARTMENT OF TRANSPORTATION, an agency of the State of Georgia, hereinafter called the **DEPARTMENT**, and BIBB COUNTY, GEORGIA, acting by and through its Board of Commissioners, hereinafter called the **COUNTY**.

WHEREAS, the COUNTY has represented to the DEPARTMENT a desire to obtain Roadway Lighting at the U.S. 80/SR 22 @ CR 33/Holley Rd roundabout in Bibb County, Georgia, said Lighting to be installed under GDOT P.I. No. 0009576 Bibb County; and

WHEREAS, the COUNTY has represented to the DEPARTMENT a desire to participate in:

- 1) Providing the Energy and 2) the Operation and Maintenance of said lighting systems at the aforesaid location, and the DEPARTMENT has relied upon such representation; and

WHEREAS, the DEPARTMENT has indicated a willingness to fund the materials and installation for the said lighting system at the aforesaid location, with funds of the DEPARTMENT, funds apportioned to the DEPARTMENT by the Federal Highway Administration under Title 23, United States Code, Section 104, or a combination of funds from any of the above sources.

NOW, THEREFORE, in consideration of the mutual promises made and of the benefits to flow from one to the other, the DEPARTMENT and the COUNTY hereby agree each with the other as follows:

1. The DEPARTMENT or its assigns shall cause the installation of all materials and equipment necessary for the Roadway Lighting system at the U.S. 80/SR 22 @ CR 33/Holley Rd roundabout in Bibb County, Georgia, said Lighting to be installed under GDOT P.I. No. 0009576, as shown on Attachment "A" attached hereto and made a part hereof.

2. Upon completion of installation of said lighting system, and acceptance by the DEPARTMENT, the COUNTY shall assume full responsibility for the operation, the repair and the maintenance of the entire lighting system, including but not limited to repairs of any damages, replacement of lamps, ballasts, luminaires, lighting structures, associated equipment, conduit, wiring and service equipment, and the requirements of the Georgia Utility Facility Protection Act. The COUNTY further agrees to provide and pay for all the energy required for the operation of said lighting system.

3. The DEPARTMENT shall retain ownership of all materials and various components of the entire lighting system. The COUNTY, in its operation and maintenance of the lighting system, shall not in any way alter the type or location, or the design of any of the various components which make up the entire lighting system without prior written approval from the DEPARTMENT.

4. This Agreement is considered as continuing for a period of fifty (50) years from the date of execution of this Agreement. The DEPARTMENT reserves the right to terminate this Agreement, at any time for just cause, upon thirty (30) days written notice to the COUNTY.

5. It is understood by the COUNTY that the DEPARTMENT has relied upon the COUNTY'S representation of providing for the energy, maintenance and operation and repair of the lighting represented by this Agreement; therefore, if the COUNTY elects to de-energize or fails to properly maintain or to repair the lighting system during the term of this Agreement, the COUNTY shall reimburse the DEPARTMENT the materials cost for the lighting system. If the COUNTY elects to de-energize or fails to properly operate, to repair, or to maintain any individual unit within the lighting system, the COUNTY shall reimburse the DEPARTMENT for the material cost for the individual unit which will include all costs for the pole, luminaires, foundations, and associated wiring. The DEPARTMENT will provide the COUNTY with a statement of material costs upon completion of the installation.

The covenants herein contained shall, except as otherwise provided accrue to the benefit of and be binding upon the successors and assigns of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have made and executed this Agreement the day and year first above written.

RECOMMENDED:

BIBB COUNTY, GEORGIA

BY: Samuel J. Hart, Sr.
Commission Chairman

(SEAL)

DEPARTMENT OF TRANSPORTATION

Karen Barnes
WITNESS

BY Vann C. Smith
Commissioner

Janice J. Boyd
Notary Public

(SEAL)



My Commission Expires December 10, 2013.

This Agreement approved by the
BOARD OF COMMISSIONERS at a
meeting held at

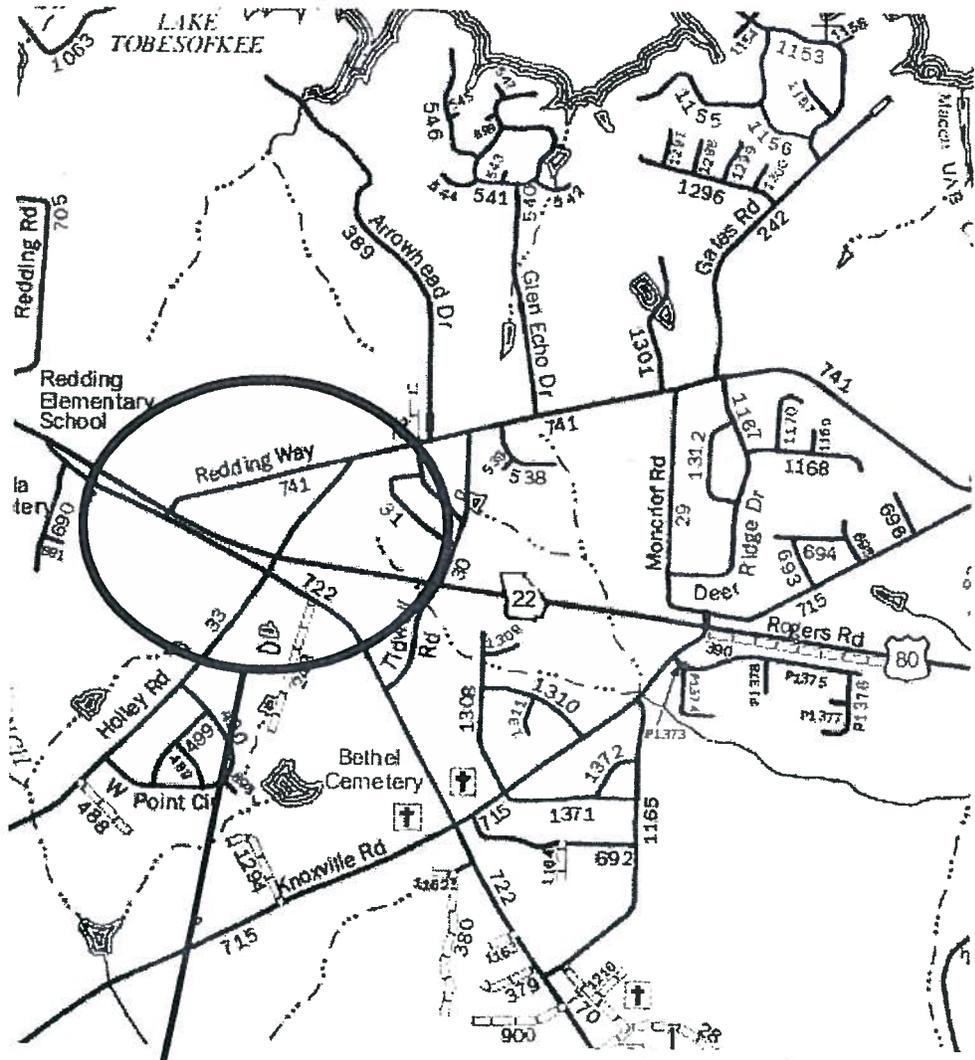
Bibb County Courthouse
this 19th day of July
2011.

ATTEST:

Angela D. Whitworth
Treasurer

Shelia Thurmond
Commission Clerk

Attachment "A"



Project Location Map
P.I. No. 0009576
Bibb County
SR 22/US 80 @ CR 33/Holley Road

**A RESOLUTION OF THE BOARD OF COMMISSIONERS OF BIBB COUNTY,
GEORGIA, RESPECTING THE EXECUTION OF AN AGREEMENT WITH THE
GEORGIA DEPARTMENT OF TRANSPORTATION.**

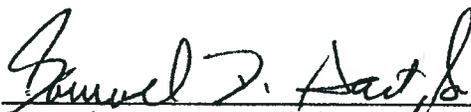
BE IT RESOLVED by the Board of Commissioners of Bibb County, Georgia, and it is hereby resolved by authority of the same that this Board does hereby approve the execution and delivery by Bibb County to the Georgia Department of Transportation an agreement respecting lighting assistance at the U.S.80/SR 22 @ CR 33/Holley Road Roundabout in Bibb County, Georgia.

BE IT FURTHER RESOLVED that the Chairman of this body, the Honorable Samuel F. Hart, Sr., is hereby authorized and empowered to execute and deliver to the Georgia Department of Transportation an agreement in substantially the same form as that attached hereto as Exhibit A and Ms. Shelia Thurmond, the Clerk of this body, is authorized to attest his signature and to affix thereto the County Seal.

BE IT FURTHER RESOLVED that when so executed and delivered, the agreement described shall, upon execution of the same by the Georgia Department of Transportation be fully binding upon Bibb County and shall constitute the obligation of the County.

All Resolutions or parts thereof in conflict herewith are hereby repealed.

Approved by the Board of Commissioners of Bibb County, Georgia, this
19th day of July, 2011.



Samuel F. Hart, Sr., Chairman
Bibb County Board of Commissioners

ATTEST:



Shelia Thurmond, Clerk to the Board

Attachment 11

Fastest Path and Design Vehicle Swept Path Study

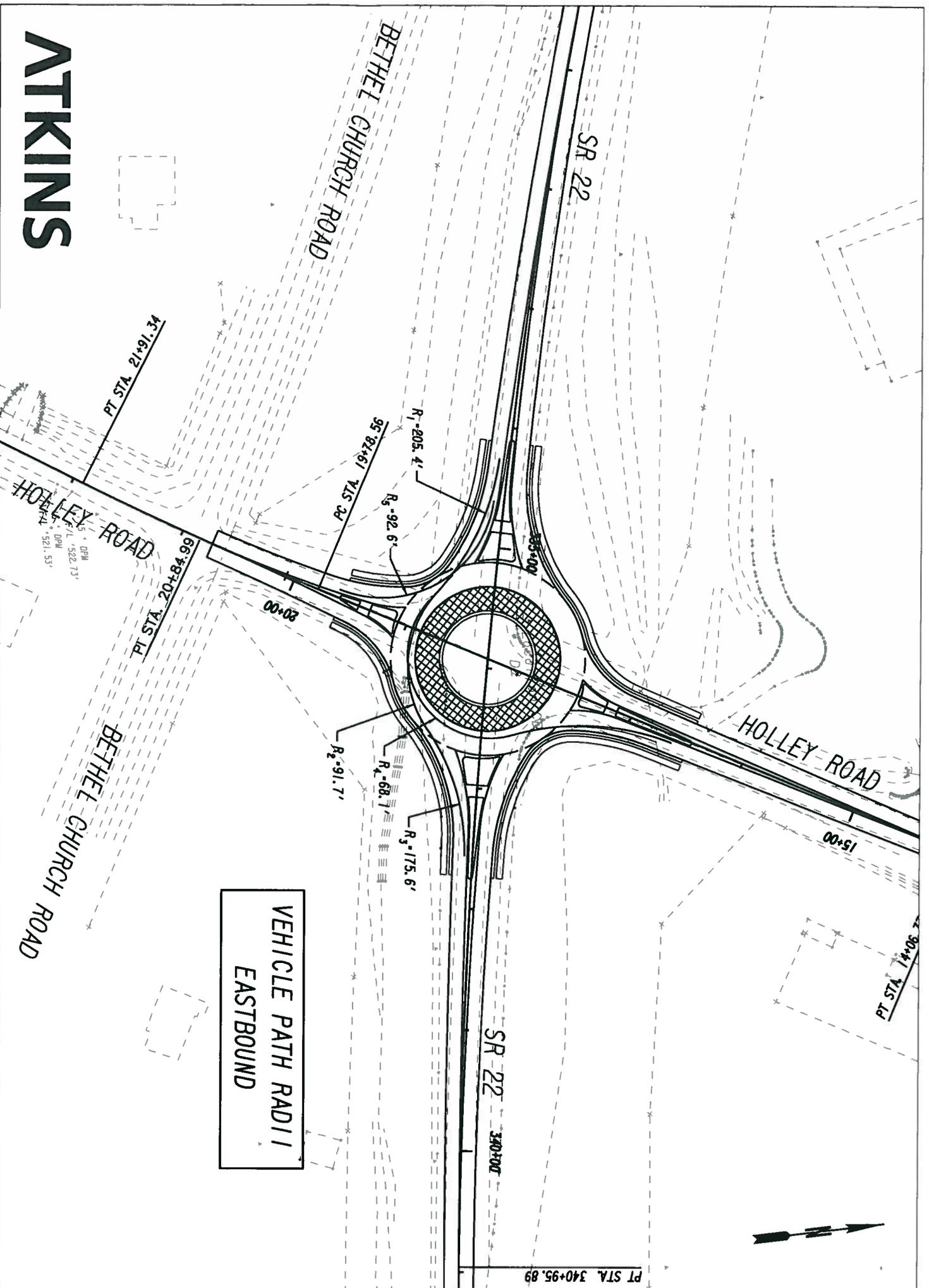
Design Speed Summary Table 160' Diameter

SR 22 at Holley Road, PI 0009576, Bibb County

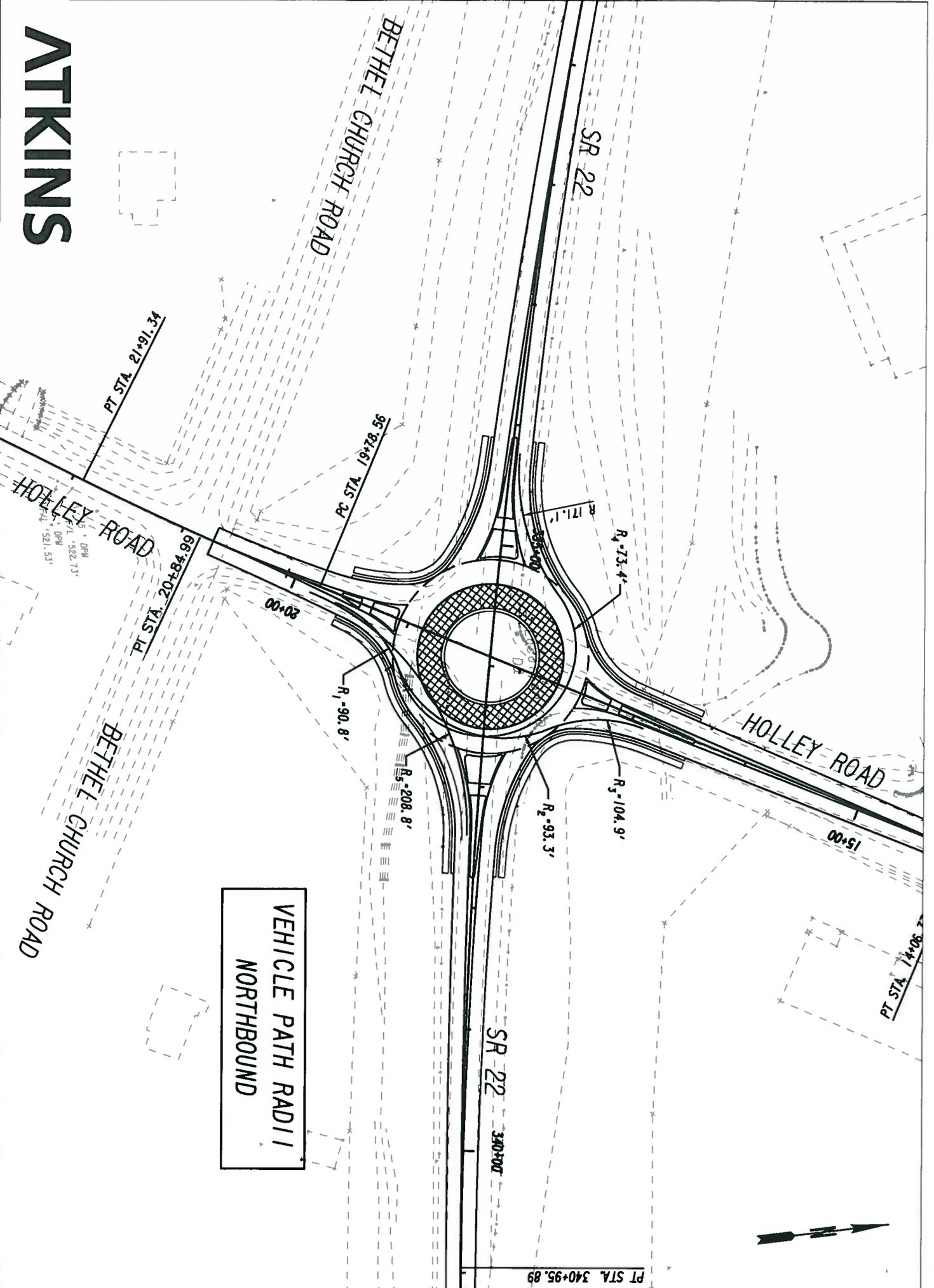
Design Vehicle - WB-67

Approach	Curve	Radius (Feet)	Speed (mph)	Relative Speed Differential (mph)
Eastbound	R1	205.4	27	10
	R2	91.7	18	1
	R3	175.6	25	8
	R4	68.1	17	0
	R5	92.6	20	3
Northbound	R1	90.8	20	3
	R2	93.3	19	2
	R3	104.9	21	4
	R4	73.4	17	0
	R5	208.8	27	10
Westbound	R1	205.1	27	11
	R2	86.4	18	2
	R3	173	25	9
	R4	67.1	16	0
	R5	88.2	20	4
Southbound	R1	91.2	20	3
	R2	93.6	19	2
	R3	107.8	21	4
	R4	73.3	17	0
	R5	203.9	27	10

ATKINS



ATKINS



VEHICLE PATH RADI I
NORTHBOUND

PT STA. 340+95.89

PT STA. 14+06.7

15+00

SR 22

HOLLEY ROAD

BETHEL CHURCH ROAD

HOLLEY ROAD

BETHEL CHURCH ROAD

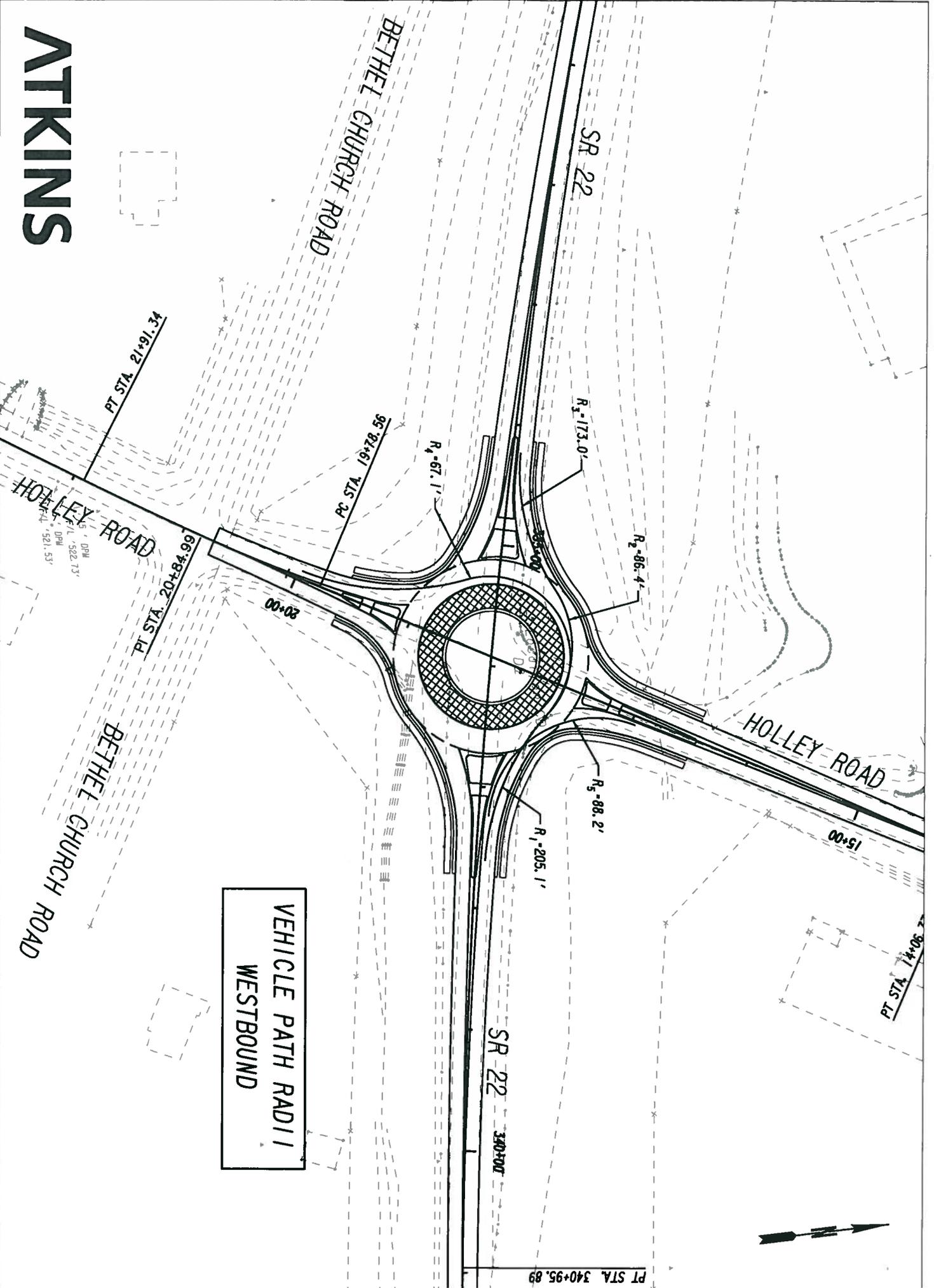
PT STA. 21+91.34

PT STA. 19+78.56

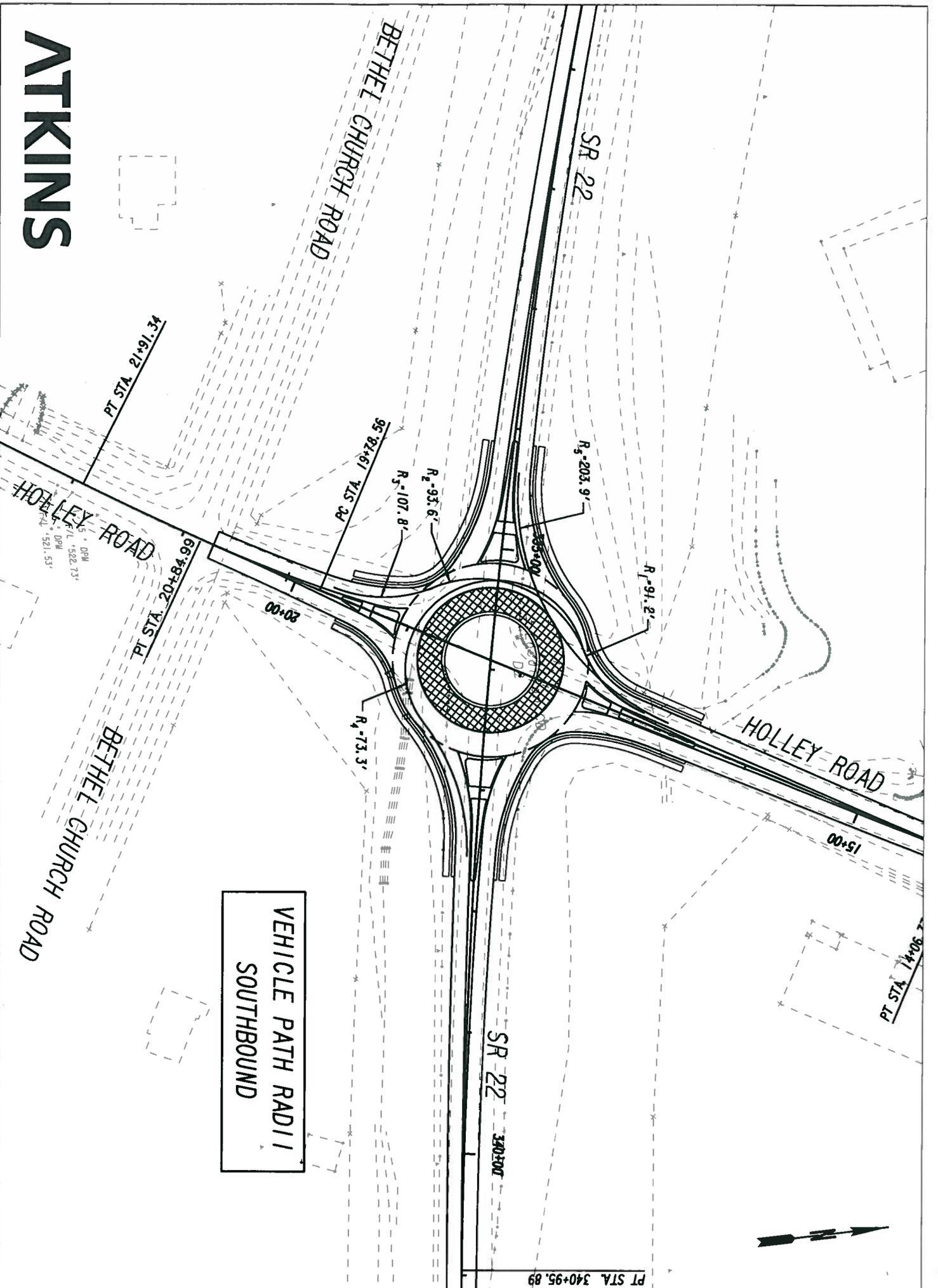
PT STA. 20+84.99

521.53'
522.73'
DPM
DPM
DPM

ATKINS



ATKINS



VEHICLE PATH RADI I
SOUTHBOUND

PT STA. 34+95.89

PT STA. 34+06.7

PT STA. 21+91.34

PT STA. 20+84.99

PT STA. 34+06.7

15+00

SR 22

SR 22

HOLLEY ROAD

BETHEL CHURCH ROAD

HOLLEY ROAD

BETHEL CHURCH ROAD

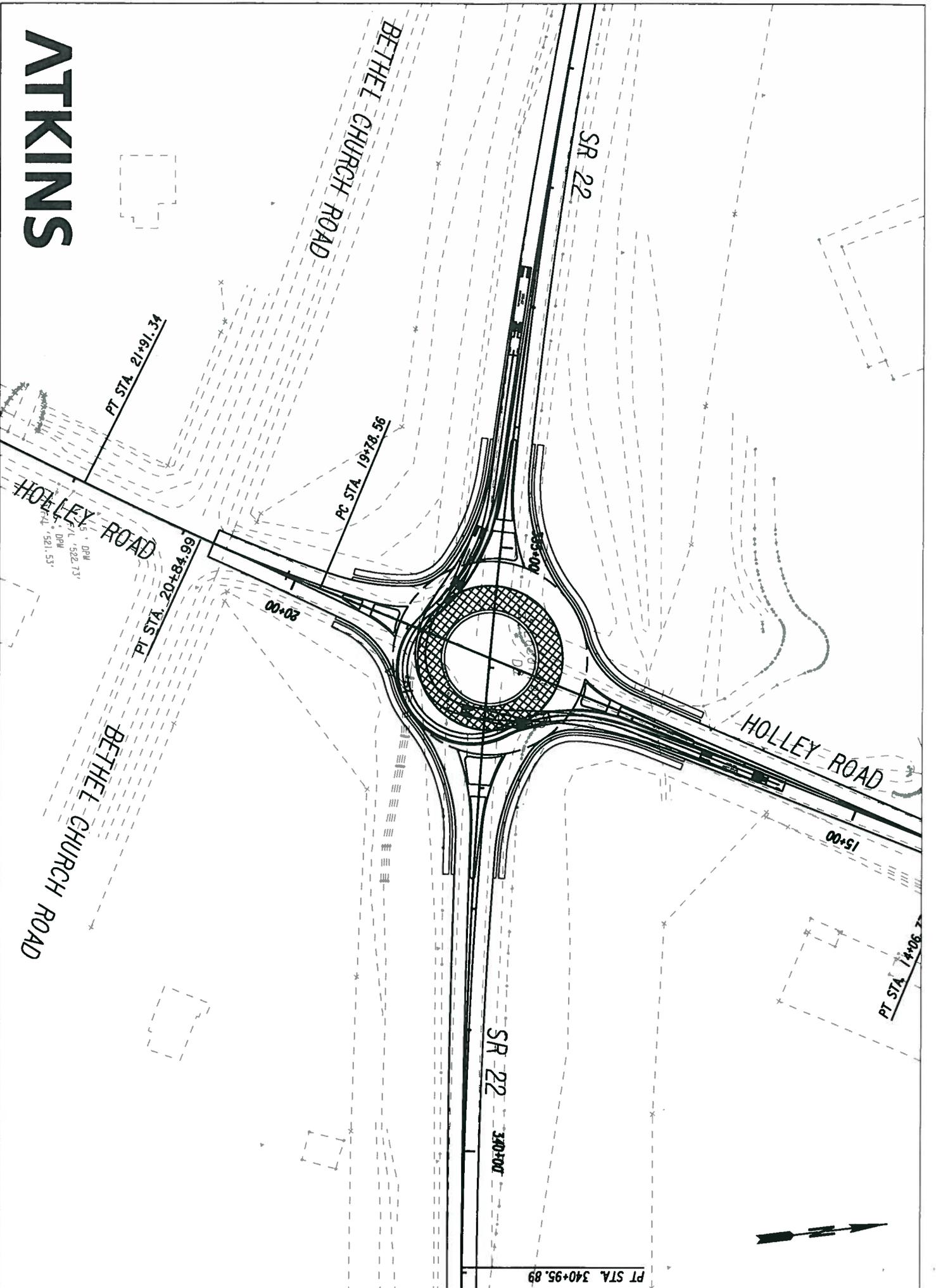
DPM
521.53'

DPM
522.73'

DPM
521.53'

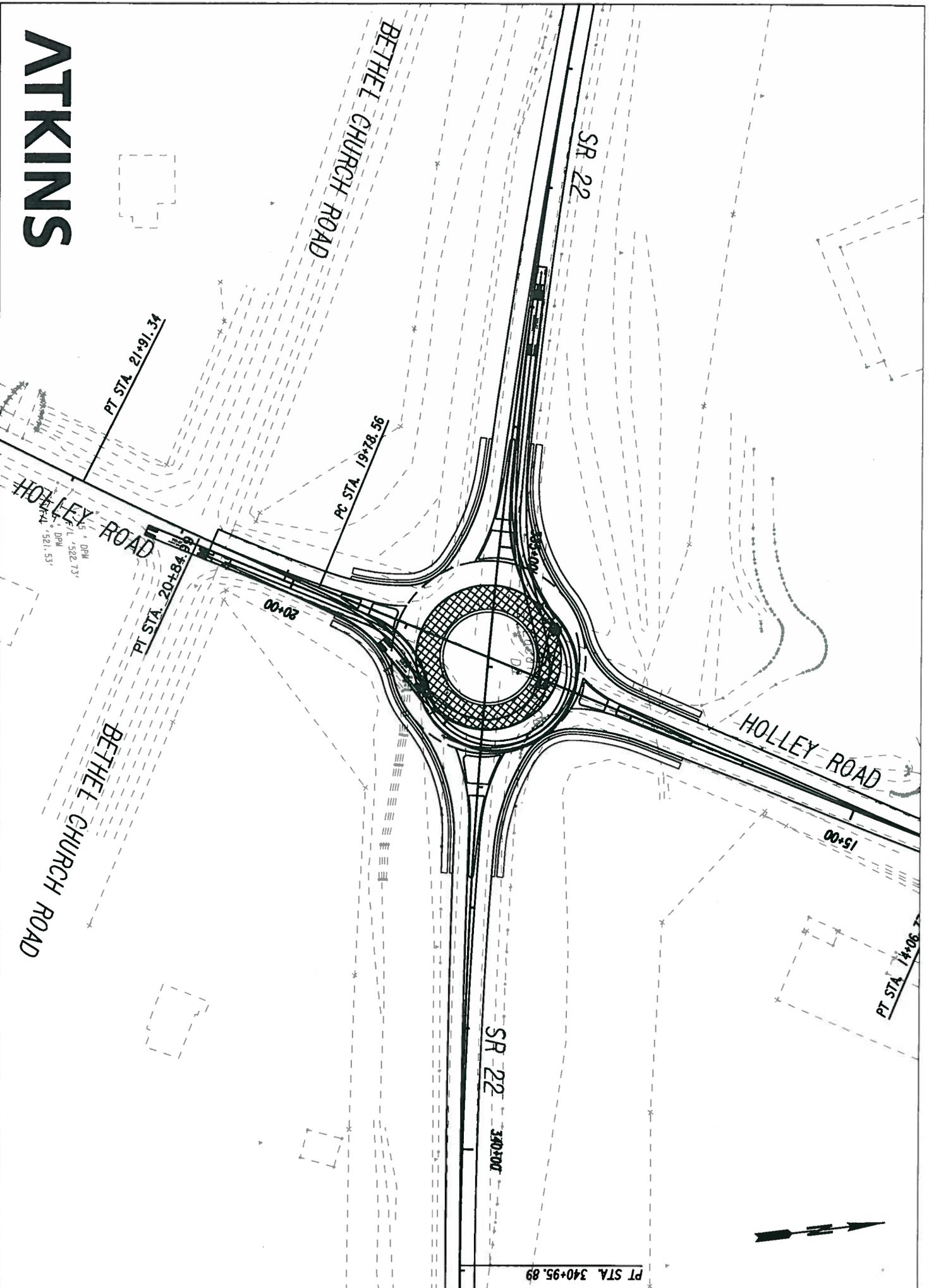


ATKINS



PT STA. 34+95.89

ATKINS



PT STA. 340+95.89

PT STA. 14+06.7

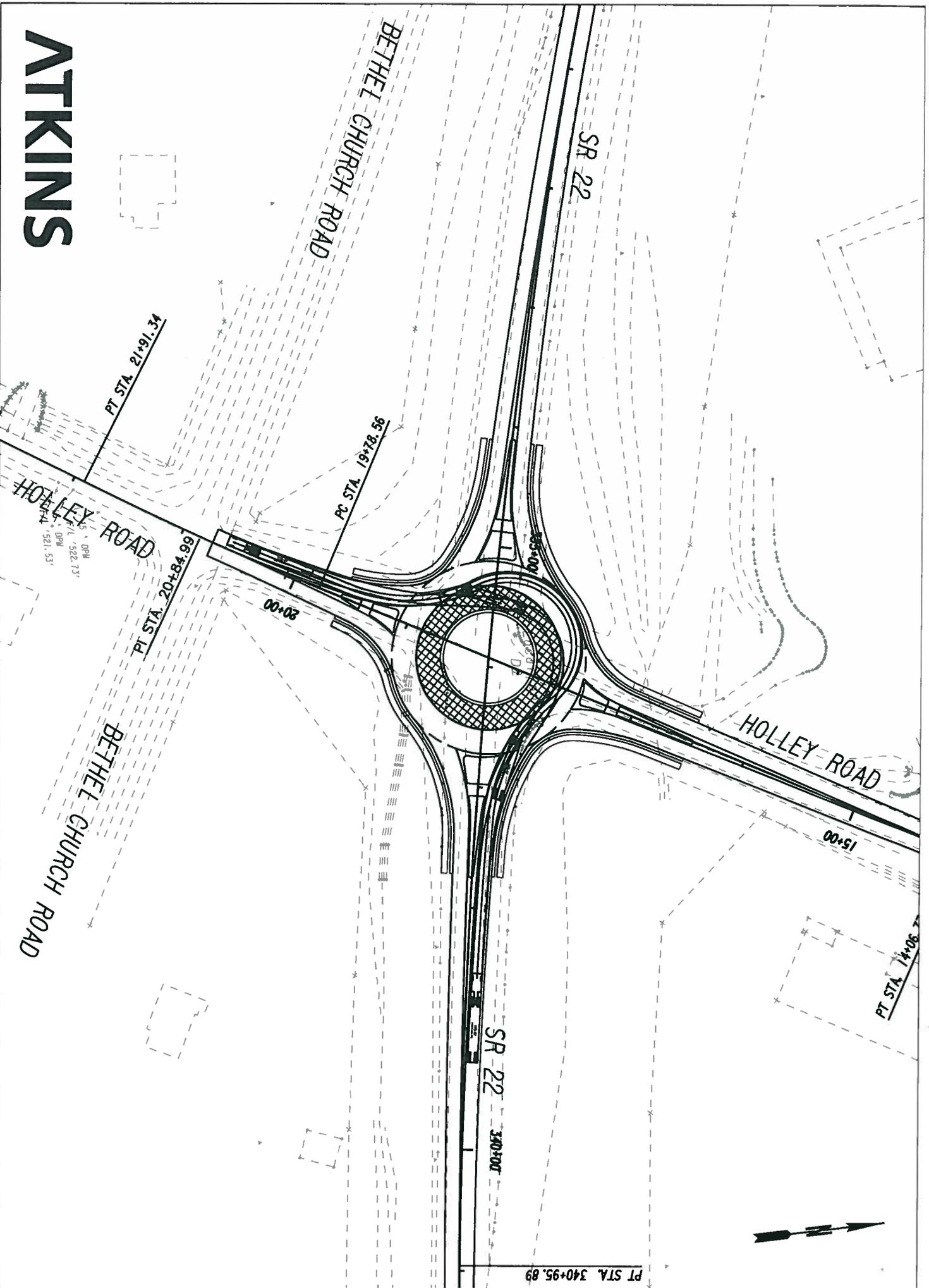
PT STA. 21+91.34

PT STA. 19+78.56

PT STA. 20+84.89

DPI
5' = 1' DPI
521.53'

ATKINS



PT STA. 340+95.89

SR 22 300+00

HOLLEY ROAD

BETHEL CHURCH ROAD

SR 22

PT STA. 21+91.34

PT STA. 19+78.56

HOLLEY ROAD

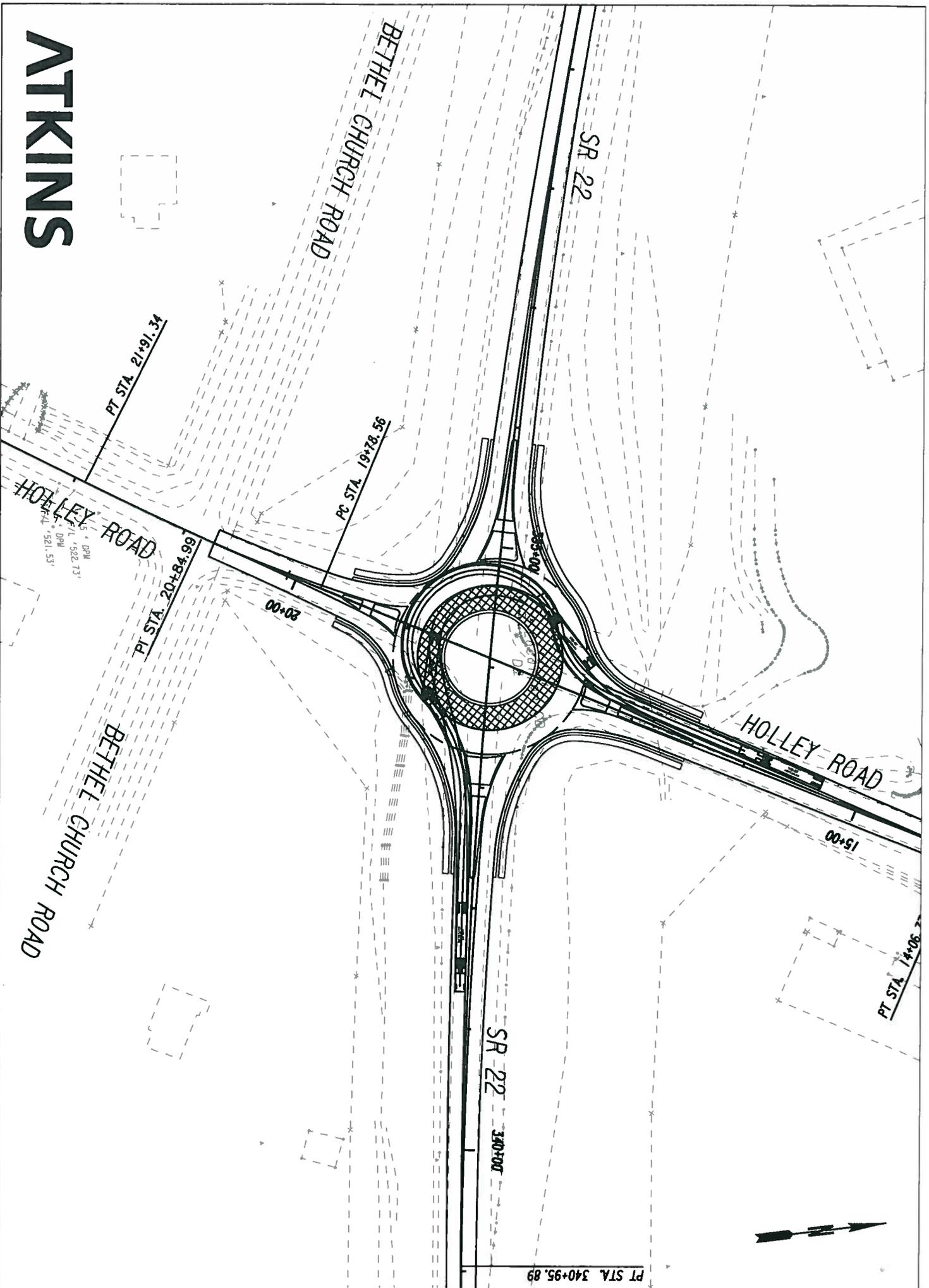
PT STA. 20+84.99

BETHEL CHURCH ROAD

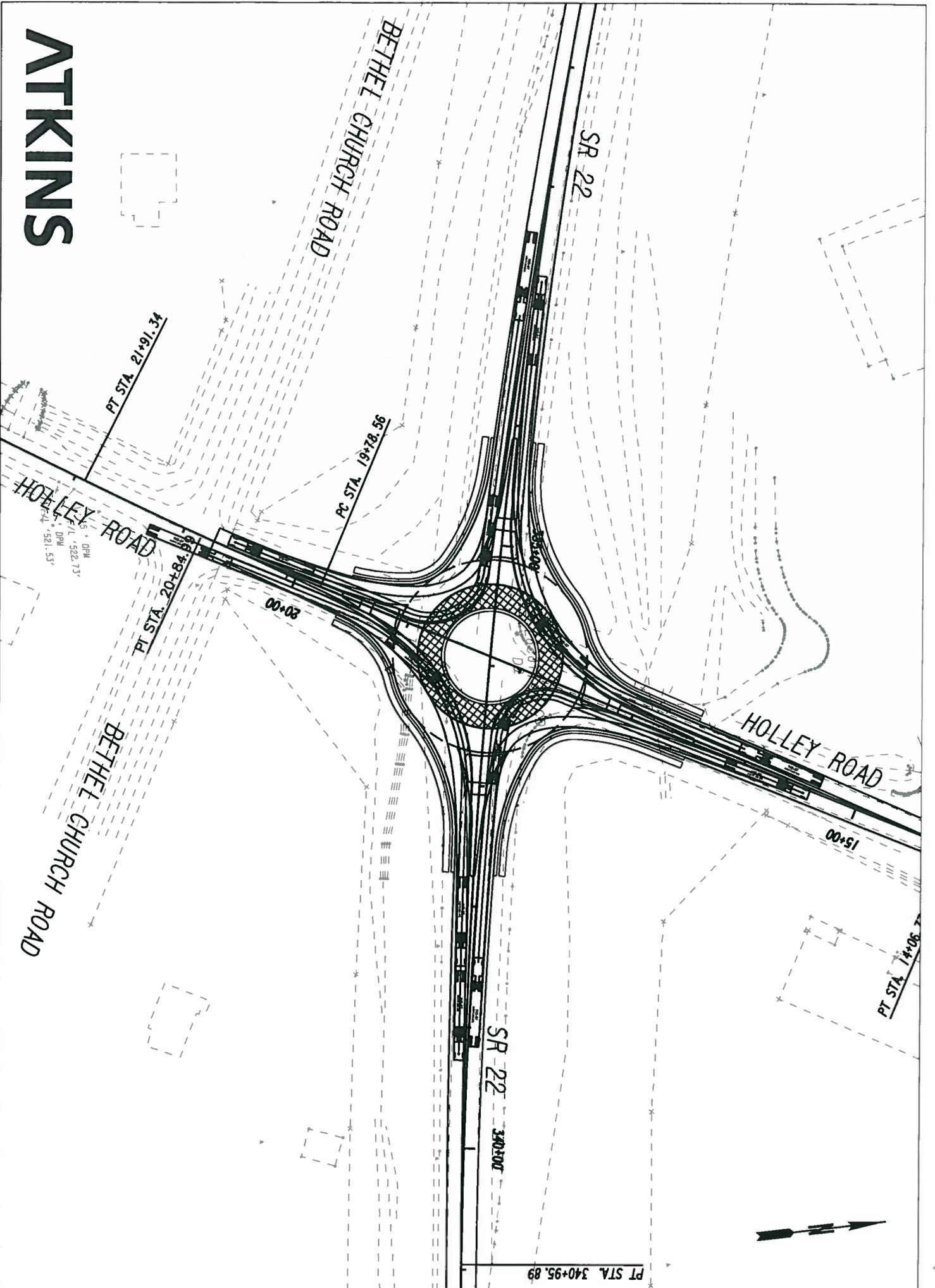
PT STA. 30+00



ATKINS



ATKINS



PT STA. 340+95.89

PT STA. 14+06.76

15+00

SR 22

340+00

BETHEL CHURCH ROAD

SR 22

HOLLEY ROAD

PT STA. 21+91.34

PT STA. 19+81.56

PT STA. 20+84.59

HOLLEY ROAD

BETHEL CHURCH ROAD

DPI
521.53'

DPI
522.73'

