

SIGNAL NOTES

1. THE COMPLETE SIGNAL INSTALLATION SHALL CONFORM TO ALL APPROPRIATE PARTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES CURRENT EDITION, INCLUDING SUBSEQUENT PUBLISHED RULINGS, GEORGIA DEPARTMENT OF TRANSPORTATION (GDOT) STANDARDS AND SPECIFICATIONS.
 2. SIGNAL HEADS SHALL BE ERECTED TO PROVIDE AT LEAST 17 FEET BUT NO MORE THAN 19 FEET CLEARANCE FROM BOTTOM OF SIGNAL HEADS TO TOP OF ROAD SURFACE AND A MINIMUM OF 8 FEET MEASURED HORIZONTALLY BETWEEN CENTERS OF SIGNAL FACES.
 3. SHIELDED CABLE WILL BE USED FOR DETECTOR RUNS AS SHOWN ON THE DETAIL SHEET. DETECTORS SHALL HAVE SEPARATE LEAD-INS TO THE CONTROL CABINET.
 4. THE CONTRACTOR SHALL LOCATE UNDERGROUND UTILITIES IN VICINITY OF NEW TRAFFIC SIGNAL POLES BEFORE INSTALLATION. MINOR SHIFTS (UP TO A MAXIMUM OF 5 FEET) IN LOCATION OF NEW SIGNAL POLES, AT THE DISCRETION OF THE ENGINEER, ARE ACCEPTABLE TO AVOID UNDERGROUND AND OVERHEAD UTILITIES. MINIMUM CLEARANCES FROM EDGE OF PAVEMENT AND UTILITIES SHALL BE MAINTAINED. PLACEMENT OF THE SIGNAL HEADS MUST BE RETAINED AS SHOWN ON THE PLANS.
 5. THE CONTRACTOR SHALL MAINTAIN EXISTING TRAFFIC SIGNALS DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC SIGNAL AND/OR CONTROL SYSTEM ADJUSTMENTS, INCLUDING TEMPORARY SUPPORT POLE LOCATION(S) REQUIRED BY THE PROJECT DURING THE INTERIM PERIOD THROUGH INSTALLATION OF NEW SIGNAL EQUIPMENT. AT NO TIME SHALL THE CONTRACTOR CAUSE ANY PART OF THE SIGNAL OPERATION TO BE INOPERABLE.
 6. NEW SIGNAL POLES AND MAST ARMS SHALL MEET REQUIRED GDOT SPECIFICATIONS.
 7. INSTALLATION IS TO BE CHECKED AND ACCEPTED BY THE COUNTY TRAFFIC ENGINEER AND GEORGIA DEPARTMENT OF TRANSPORTATION PRIOR TO FINAL ACCEPTANCE. A COMPLETE SET OF WIRING DIAGRAMS SHALL BE FURNISHED TO THE TRANSPORTATION DEPARTMENT, 1475 JESSE JEWELL PARKWAY SUITE 100, GAINESVILLE, GA 30501 BY THE CONTRACTOR PRIOR TO FINAL ACCEPTANCE.
 8. WHEN REMOVED, EXISTING EQUIPMENT SHALL BE DELIVERED BY THE CONTRACTOR TO GDOT AS DIRECTED BY THE MAINTAINING AGENCY. DELIVERY OF EQUIPMENT SHALL BE COORDINATED WITH GDOT.
- CONTACT INFORMATION (MARCH 2025)
 JONATHAN PEEVY (770-533-8276)
9. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING POLE FOUNDATION DESIGNS TO THE MAINTAINING AGENCY AND GDOT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
 10. MATERIAL CERTIFICATION IS REQUIRED PRIOR TO BEGINNING ANY SIGNAL INSTALLATION WORK. THE CONTRACTOR SHALL FOLLOW PROCEDURES OUTLINED IN THE SPECIFICATION. ALL MATERIALS SHALL BE APPROVED BY GDOT AND THE MAINTAINING AGENCY PRIOR TO ORDERING OF ANY MATERIALS.
 11. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FROM GDOT PRIOR TO START OF CONSTRUCTION.
 12. THE CONTRACTOR IS TO COORDINATE WITH POWER COMPANY FOR SERVICE FEED FOR TRAFFIC SIGNALS.
 13. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL VERTICAL AND HORIZONTAL AERIAL CLEARANCE PER NESC AND GDOT SPECIFICATIONS.
 14. ALL SIGNAL POLES AND CONTROLLERS SHALL BE GROUNDED SEPARATELY.
 15. CONTRACTOR SHALL LABEL CONDUIT IN PULLBOXES WITH WEATHERPROOF TAGS AS TO DIRECTION OF OF CONDUIT RUNS, EXAMPLE, TO NW, TO SE, ETC.
 16. ANY SIDEWALK, PAVERS, HARDSCAPE OR LANDSCAPE DISTURBED BY THE CONTRACTOR SHALL BE RETURNED TO ITS ORIGINAL CONDITION. THE COST FOR THIS SHALL BE INCLUDED IN THE OVERALL BID PRICE AND WILL NOT BE PAID FOR SEPARATELY.
 17. THE INSTALLATION SHALL BE CAPABLE OF MONITORING OVER ETHERNET NETWORKS FROM EXISTING CENTRAL COMPUTERS OR VIA "CLOSED LOOP" MONITORING, PER THE DISTRICT SIGNAL ENGINEER. CENTRAL COMPUTERS ARE LOCATED AT 2594 GILLSVILLE HWY, GAINESVILLE, GEORGIA 30507. NETWORK ABILITIES DEMONSTRATION IS REQUIRED AT CENTRAL SITES PRIOR TO FINAL ACCEPTANCE.
 18. ALL EXISTING STOP BARS, WORDS, ARROWS, AND CROSSWALKS THAT ARE NOT REMOVED OR RELOCATED SHALL BE REPLACED IN ACCORDANCE WITH CURRENT GDOT STANDARDS.

19. THE CONTRACTOR SHALL REPLACE IN KIND AND SIZE, AT NO SEPARATE EXPENSE TO THE DEPARTMENT, ANY BARRIER WALL, FENCE, DITCH PAVING, CURBING, SIDEWALK, GUTTER, SLOPE PAVEMENT, SIGNS, GUARDRAILS, LANDSCAPING, GRASSINGS, UTILITY SERVICE LINES, STORM DRAIN PIPES, MASONRY WALLS, AND PAVING THAT IS REMOVED, DAMAGED OR DESTROYED, DUE TO CONTRACTOR'S ACTIVITY.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EROSION CONTROL MEASURES TO ENSURE COMPLIANCE TO ALL STATE AND FEDERAL LAWS AND GUIDELINES. THE COST SHALL BE CONSIDERED INCIDENTAL AND BE INCLUDED IN THE OVERALL BID PRICE. NO ADDITIONAL PAYMENTS SHALL BE MADE TO THE CONTRACTOR FOR EROSION CONTROL.
21. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL FEES ASSOCIATED WITH MODIFYING EXISTING AND ESTABLISHING NEW POWER AND COMMUNICATIONS SERVICES FOR TRAFFIC SIGNALS, VIDEO DETECTION SYSTEMS AND/OR CCTV SIGNAL CAMERAS ON THIS PROJECT. IF A UTILITY TRANSFORMER IS REQUIRED FOR TRAFFIC SIGNAL EQUIPMENT, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INCLUDE THE COST, AS PART OF THEIR BID PRICE, FOR THAT TRAFFIC SIGNAL INSTALLATION, IF THE RESPECTIVE UTILITY REQUIRES PAYMENT FOR INSTALLATION.
22. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL MONTHLY POWER AND COMMUNICATION SERVICE TO THE TRAFFIC SIGNAL INSTALLATION AND SUPPORT DEVICES, UNTIL THE NEW TRAFFIC SIGNAL INSTALLATION HAS SATISFACTORILY COMPLETED A TEST PERIOD, 30 DAYS, OF UNINTERRUPTED OPERATION. THE CONTRACTOR WILL COMPLETE A TRANSFER OF UTILITY COST TO THE MAINTAINING AGENCY.
23. THE CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING POWER SERVICE, ROUTED TO CABINET.

TRAFFIC SIGNAL LEGEND

EXISTING SIGNAL	PROPOSED SIGNAL
CONTROLLER CABINET	CONTROLLER CABINET
STRAIN POLE	STRAIN POLE
TIMBER POLE	TIMBER POLE
DOWN GUY	DOWN GUY
MAST ARM	MAST ARM
STREET LIGHT	STREET LIGHT
3 SECTION HEAD	3 SECTION HEAD W/ BACKPLATE
5 SECTION HEAD	4 SECTION HEAD W/BACKPLATE
OVERHEAD SIGN	3 SECTION T-HEAD W/BACKPLATE
PEDESTAL POLE	OVERHEAD SIGN
PED SIGNAL HEAD	PEDESTAL POLE
CURB CUT RAMP	PED SIGNAL HEAD
PULLBOX, TP 2	CURB CUT RAMP
PULLBOX, TP 4	PULLBOX, TP 2
PULLBOX, TP 5	PULLBOX, TP 3
6x6 CALL LOOP/VIDEO ZONE	PULLBOX, TP 4s
6x18 CALL LOOP/VIDEO ZONE	PULLBOX, TP 7
6x40 PRESENCE LOOP (DIPOLE)/VIDEO ZONE	6x6 VIRTUAL DETECTION ZONE
6x40 PRESENCE LOOP (QUADRUPOLE)	6x18 VIRTUAL DETECTION ZONE
CONDUIT	6x40 VIRTUAL DETECTION ZONE
RAILROAD CONTROLLER	6x40 PRESENCE LOOP (QUADRUPOLE)
SIGN POST	CONDUIT
EXISTING CCTV CAMERA	RAILROAD CONTROLLER
EXISTING VIDEO DETECTION UNIT	SIGN POST
	PROPOSED CCTV CAMERA
	DIRECTIONAL BORE
	VIDEO DETECTION UNIT



Kimley»Horn

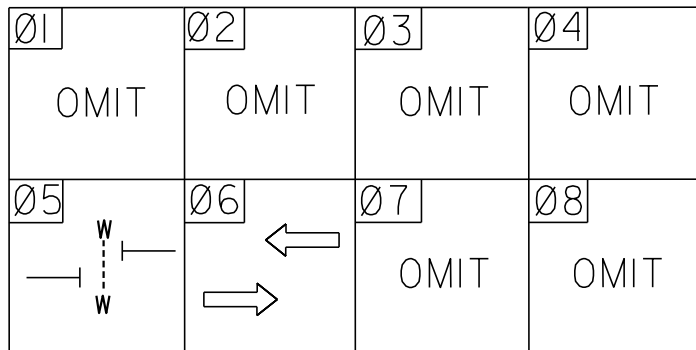
N.T.S

REVISION DATES	

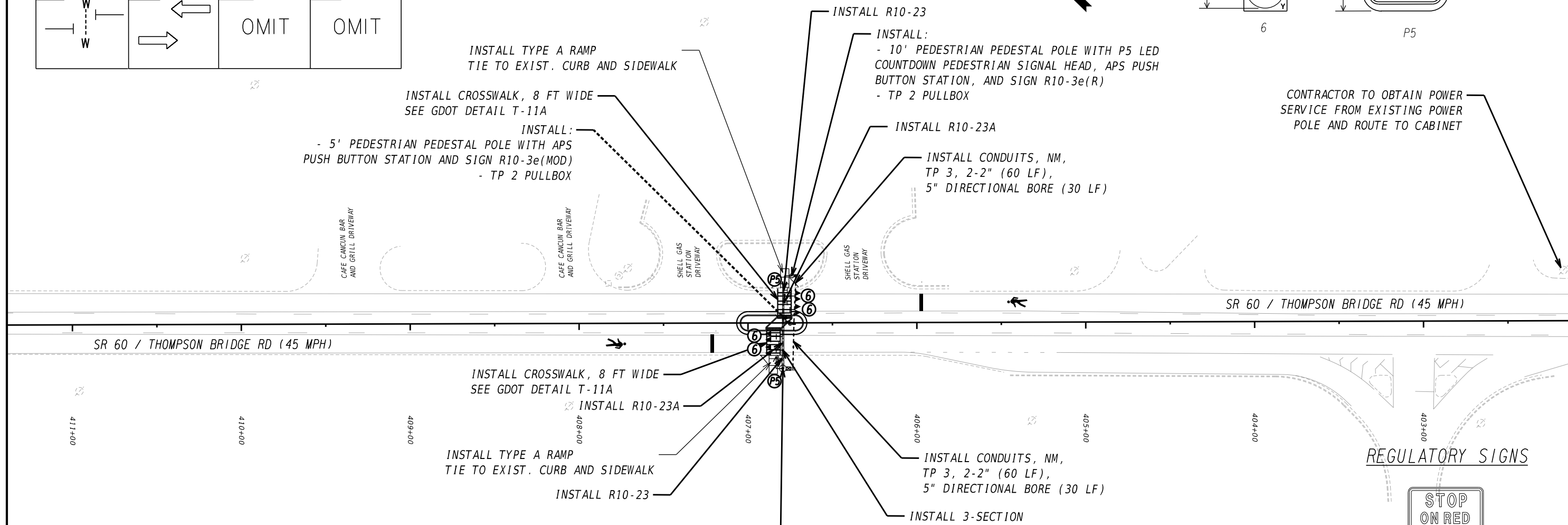
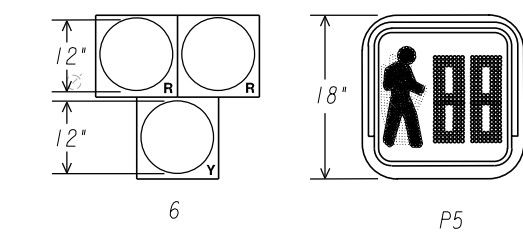
SIGNAL LEGEND
 SR 8; SR 20; SR 60 & GWINNETT
 DRIVE @ 4 LOCS

CHECKED:	DATE:	DRAWING No.
BACKCHECKED:	DATE:	27-0000
CORRECTED:	DATE:	
VERIFIED:	DATE:	

PHASING DIAGRAM



LED INCANDESCENT LOOK SIGNAL HEADS WITH TP IX
RETRO-REFLECTIVE TAPE ON BACKPLATES



SR 60 / THOMPSON BRIDGE RD (45 MPH)

SR 60 / THOMPSON BRIDGE RD (45 MPH)

411+00

410+00

409+00

408+00

407+00

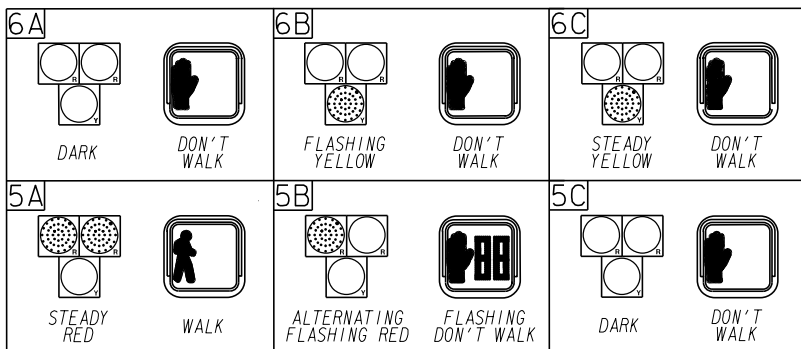
406+00

405+00

404+00

403+00

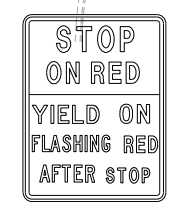
SIGNAL DISPLAY SEQUENCE



- STEEL STRAIN POLE, TP IV, WITH 50' MAST ARM
- 336S POLE-MOUNTED CABINET EQUIPPED WITH 2070LX CONTROLLER AND 4G CELLULAR MODEM
- POWER METER AND DISCONNECT UNIT
- TP 4 PULLBOX
- P5 LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, APS PUSH BUTTON STATION, AND SIGN R10-3e(L)

NOTE:
1. INSTALL ACCESSIBLE / AUDIBLE PEDESTRIAN SIGNAL PUSH BUTTON ASSEMBLIES PER PROWAG AND MUTCD.

REGULATORY SIGNS

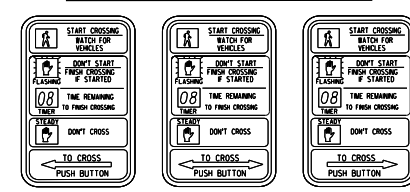


R10-23a (24" X 30")



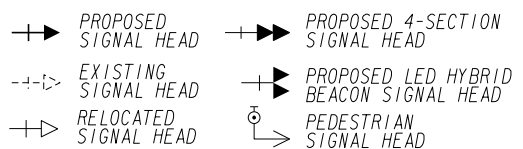
R10-23 (24" X 30")

PEDESTRIAN SIGNS

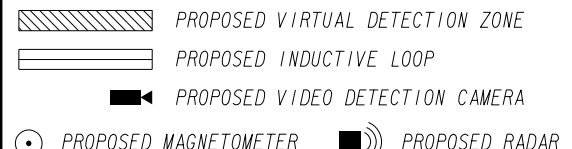


R10-3e(L) 9" X 15" R10-3e(MOD) 9" X 15" R10-3e(R) 9" X 15"

SIGNAL LEGEND



DETECTION LEGEND



REVISION DATES

NO.	DATE	DESCRIPTION

SIGNAL PLANS

SR 8; SR 20; SR 60 & GWINNETT DRIVE @ 4 LOCS; SIGNAL INSTALLATION NO. 4 SR 60 - 600'S OF HUBERT STEPHENS RD

CHECKED:	DATE:	DRAWING No.
BACKCHECKED:	DATE:	27-0007
CORRECTED:	DATE:	
VERIFIED:	DATE:	

LIST OF MATERIALS FOR TRAFFIC SIGNAL INSTALLATION - NO. 4
LOCATION: SR 60 / THOMPSON BRIDGE RD
CITY OF MURRAYVILLE
QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY
CONTRACTOR SHALL FIELD VERIFY PRIOR TO ORDERING MATERIALS

336S CABINET INPUT FILES ASSIGNMENT															
SLOT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
TYPE									DC	TBA	TBA	DC	DC	DC	
CARD									DC 150			DC 150	DC 150	DC 150	
CHANNEL 1	CI PIN	56	39	58	41	55	40	57	42	51	71	72	67	68	81
	FUNCTION	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6	Ph 7	Ph 8	SE 1	EVA	EVB	Ph 2 PED	Ph 6 PED	FLASH
	FIELD TERM	TB7 1,2	TB7 5,6	TB7 9,10	TB8 1,2	TB8 5,6	TB8 9,10	TB9 1,2	TB9 5,6	TB5 1,2	TB5 5,6	TB5 9,10	TB4 1,2	TB4 5,6	N/C
	DET. NUMBER	1	3	9	11	19	21	29	31						
LN. ASSIGN.															
CHANNEL 2	CI PIN	47	43	49	45	48	44	50	46	52	73	74	69	70	82
	FUNCTION	Ph 2 CALL	Ph 2	Ph 4 CALL	Ph 4	Ph 6 CALL	Ph 6	Ph 8 CALL	Ph 8	R/R	EVC	EVD	Ph 5 PED	Ph 8 PED	STOP TIME
	FIELD TERM	TB7 3,4	TB7 7,8	TB7 11,12	TB8 3,4	TB8 7,8	TB8 11,12	TB9 3,4	TB9 7,8	TB5 3,4	TB5 7,8	TB5 11,12	TB4 3,4	TB4 7,8	N/C
	DET. NUMBER	7	4	15	12	25	22	35	32						
LN. ASSIGN.												PHASE 5			

LIST OF MATERIALS	UNIT	QUANTITY
CONTROLLER CABINET ASSEMBLY, MODEL 336S (EIGHT PHASE)	EA	1
A. CONTROLLER UNIT, MODEL 2070LX	EA	1
B. SWITCH PACK	EA	5
C. DC ISOLATOR	EA	3
E. 2018 KCLIP CONFLICT MONITOR (EXTENDED FEATURE, ETHERNET CAPABLE)	EA	1
CPU CARD	EA	1
SURGE PROTECTOR, PC642-200 (OR EQUIVALENT)	EA	1
IN-CABINET UNINTERRUPTIBLE POWER SUPPLY (ETHERNET CAPABLE)	EA	1
POWER METER AND DISCONNECT UNIT FOR ELECTRICAL SERVICE (INCLUDES 5' PEDESTAL POST, COMPLETE WITH BASE)	EA	1
LOOP/PED LEAD-IN WIRE, 3 PAIR, 18 AWG; SHIELDED, TWISTED PER 1000 FT	REEL	1
SIGNAL CABLE, 7 CONDUCTOR, 14 AWG; PER 1000 FT	REEL	1
3-SECTION (T-SHAPED), ONE-WAY, 12" EXPANDED VIEW SIGNAL HEAD, LED "INCANDESCENT LOOK", PLASTIC (STANDARD PEDESTRIAN HYBRID BEACON CONFIGURATION - RED, RED, YELLOW)	EA	4
BACKPLATE FOR ONE-WAY, 3-SECTION, 12" SIGNAL HEAD (T-SHAPED), ABS PLASTIC, LOUVERED, BLACK	EA	4
1-SECTION, ONE-WAY, 18" LED COUNTDOWN PEDESTRIAN SIGNAL HEAD, FULL HAND/MAN OVERLAP 9" HIGH NUMBERS AND 12" SYMBOLS	EA	2
PEDESTRIAN PUSH BUTTON STATION, w/ BUTTON AND SIGN, TP B 9" X 15", R10-3e, (L)EFT OR (R)IGHT OR (MOD)IFIED, COUNTDOWN	EA	3
HARDWARE FOR MAST ARM MOUNTING	EA	4
HARDWARE FOR SIDE-OF-POLE MOUNTING, ONE-WAY, BRACKET ASSEMBLY	EA	1
HARDWARE FOR TOP-OF-POLE MOUNTING, ONE-WAY, BRACKET ASSEMBLY	EA	1
PULLBOX, TP 2	EA	2
PULLBOX, TP 4	EA	1
CONDUIT, NONMETAL, TP 3, 2"	LF	120
DIRECTIONAL BORE - 5"	LF	60
GRS FOR POWER	LS	1
PEDESTAL POLE, 5', COMPLETE WITH SQUARE BASE	EA	1
PEDESTAL POLE, 10', COMPLETE WITH SQUARE BASE	EA	1
MISC MATL TO COMPLETE INSTALLATION	LS	1

NO.	LIST OF PAY ITEMS	UNIT	QUANTITY
150-1000	TRAFFIC CONTROL, NO - 4	LS	1
636-1036	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 11	SF	20
639-3004	STEEL STRAIN POLE, TP IV, w/ 50' MAST ARM	EA	1
647-1020	PHB INSTALLATION, NO-4	LS	1
926-2104	WIRELESS SYSTEM, TYPE 4	EA	1
937-4100	PEDESTRIAN DETECTION SYSTEM, NO - 4	LS	1



N.T.S

REVISION DATES

SIGNAL PLANS
 SR 8; SR 20; SR 60 & GWINNETT DRIVE
 @ 4 LOCS; SIGNAL INSTALLATION NO. 4
 SR 60 - 600'S OF HUBERT STEPHENS RD

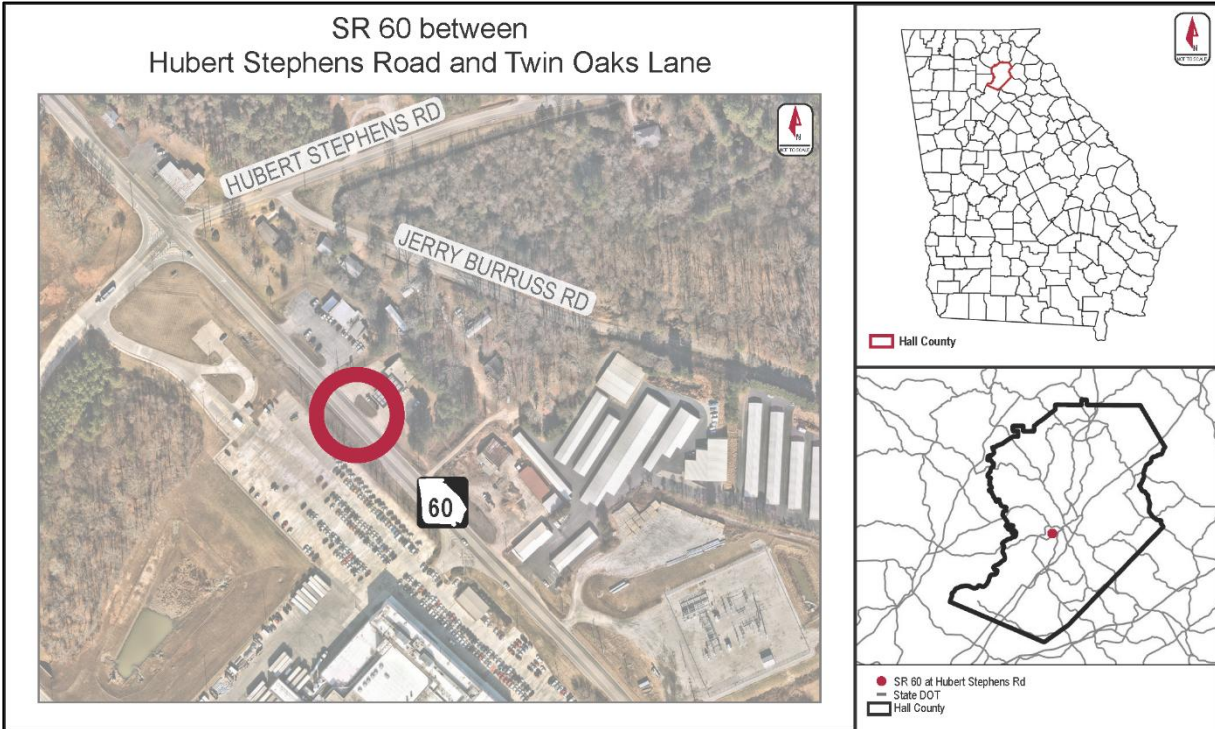
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**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

Traffic Engineering Study

Pedestrian Crossing

October 2025



PRIMARY ROUTE: SR 60 (Thompson Bridge Road)

SECONDARY ROUTE: Hubert Stephens Road

GDOT DISTRICT: 1

CONGRESSIONAL DISTRICT: 9

COUNTY: Hall

CITY: Murrayville

PREPARED BY: Clark Kennedy, P.E., PTOE, RSP₁, Kimley-Horn

The Georgia Department of Transportation (GDOT) Office of Traffic Operations is evaluating locations with high incidences of bicycle and pedestrian crashes occurring in District 1. A network screening completed in early 2023 considered risk factors such as crash data from January 1, 2013, to December 31, 2022, roadway traffic volumes, and roadway geometry. Based on this analysis, four locations in District 1 were identified for the installation of a mid-block pedestrian crossing treatment to improve safety for vulnerable road users. These locations with pedestrian enhancements were packaged together and programmed as project P.I. 0020197.

One of the locations is a segment of SR 60 (Thompson Bridge Road) between Hubert Stephens Road and Twin Oaks Lane in Hall County, Georgia. A four step process was used to study the potential for a pedestrian crossing at SR 60 near Hubert Stephens Road. The process includes:

1. Evaluating if a pedestrian crossing (of any kind) is desirable at this location;
2. Identifying the optimal crossing location;
3. Identifying the appropriate crossing treatment; and
4. Completing an economic analysis of this crossing.

1. CROSSING DESIRABILITY

Existing Conditions

Figure 1 shows the proposed location of the mid-block crossing, as well as pedestrian trip generators/attractors in the surrounding area, posted roadway speed limits, and the locations and severities of pedestrian crashes.

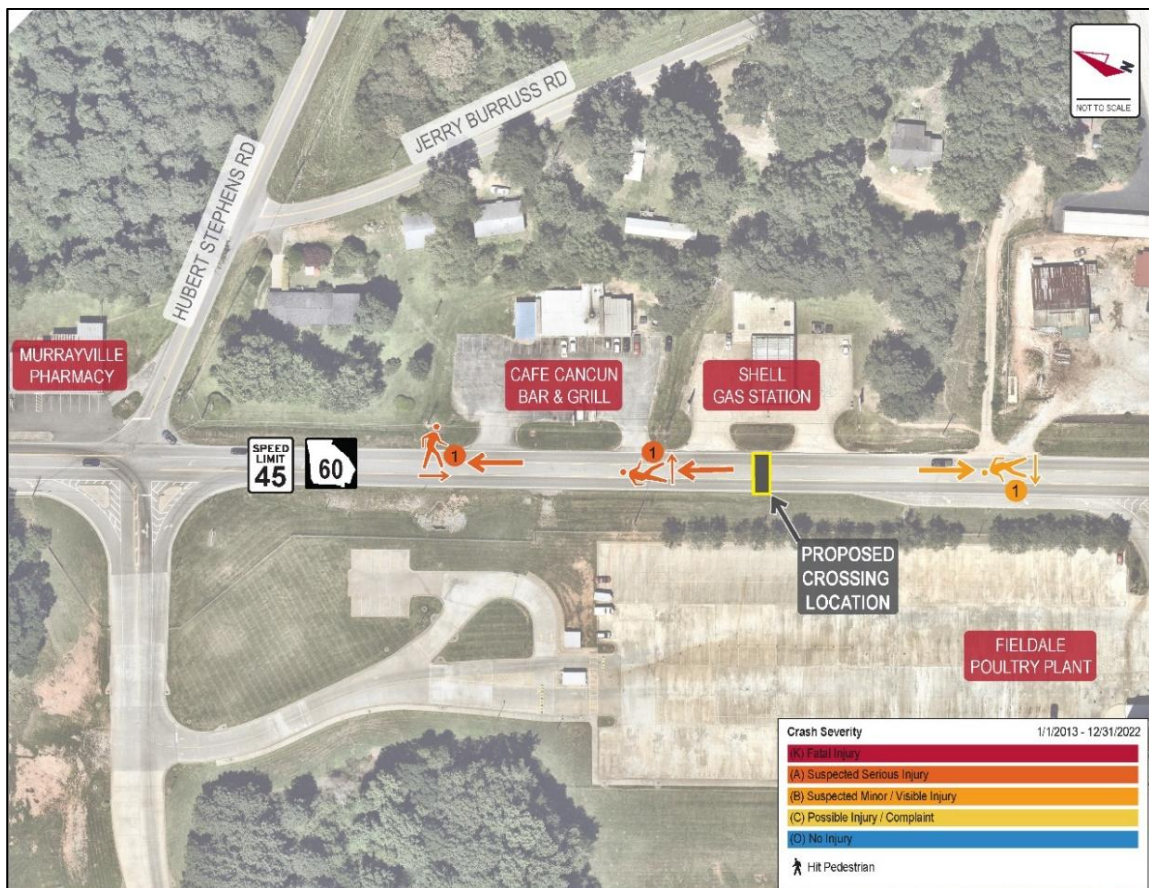


Figure 1: Project Location

The section of SR 60 (Thompson Bridge Road) between Hubert Stephens Road and Twin Oaks Lane was identified as a potential location for implementation of a mid-block pedestrian crossing. This segment of SR 60 is a three-lane principal arterial located in Murrayville in Hall County, Georgia. The corridor has a posted speed limit of 45 miles per hour (mph) with commercial development on both sides of the roadway. There are no sidewalks provided on SR 60 throughout the segment. Overhead street lighting is absent from both sides of the roadway but there is supplemental lighting from surrounding businesses adjacent to the study area. This segment of SR 60 has an 85th percentile speed of approximately 57 mph southbound and 58 mph northbound, which are both higher than the posted speed limit of 45 mph. The current roadway cross-section is comprised of one northbound travel lane, one southbound travel lane, and a center two-way left-turn lane (TWLTL).

Figure 2 depicts approximate property lines surrounding the study intersection. Approximately 100 feet of public right-of-way (ROW) is available along SR 60 at the proposed crossing site.

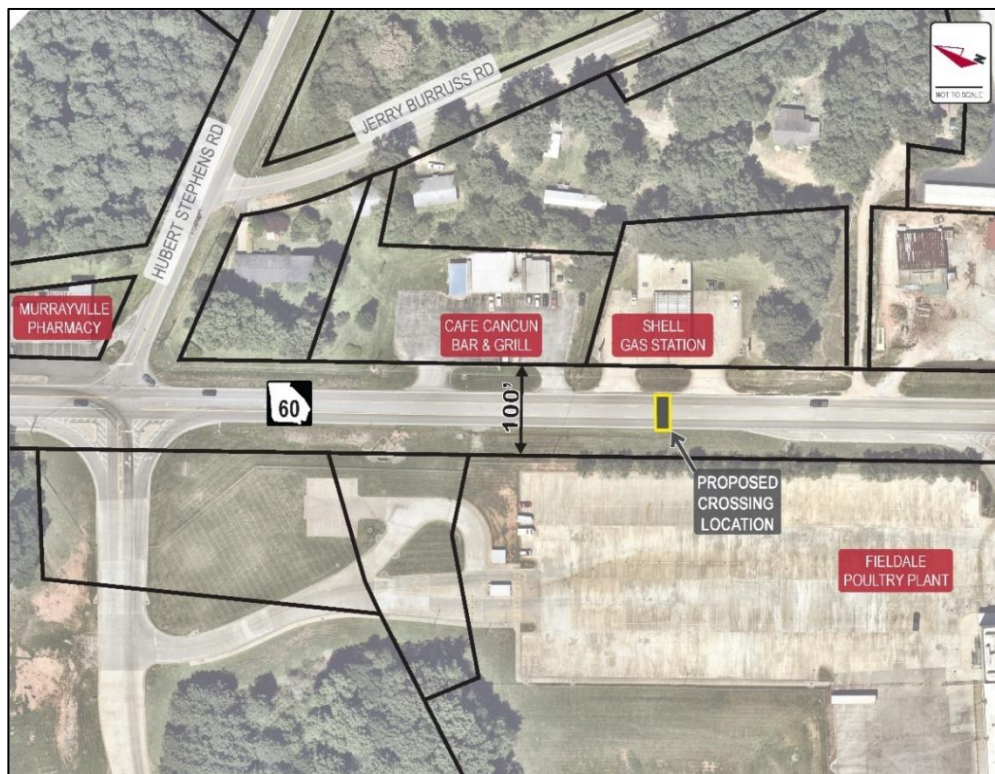


Figure 2: Approximate Available Right-of-Way

Ongoing Projects

The GDOT GeoPI database, the Georgia Operational and Safety Information System (GOASIS), the Georgia Permit Application System (GPAS), and historical aerial imagery were reviewed to identify any recently completed, programmed, and/or planned projects near the study location. SR 60 from south of SR 136 to north of CR 158 (Yellow Creek Road) (P.I. 132610) is a long-range widening project with a projected construction year of 2030 and includes a proposed roundabout at the intersection of SR 60 at Hubert Stephens Road.

Pedestrian Generators

The pedestrian trip generators in the area include the following:

- Murrayville Pharmacy
- Café Cancun Bar and Grill
- Shell Gas Station
- Fieldale Farms Poultry Farm

Gas station convenience stores and restaurants are typically large generators of pedestrian traffic. With the other land use in the area being a large poultry processing plant, the convenience store and restaurant will act as large generators for the people who work at the plant.

Demographic Data

In addition to the nearby land uses, the Social Vulnerability Index (SVI) data was also considered when determining pedestrian travel needs of the area. SVI data from the Centers of Disease Control and Prevention (CDC) shows the study area is located between two census tracts with an overall SVI score of 0.4653. In addition to the overall score, SVI data for the census tract is broken further into four sub-categories, the average scores for which are as follows:

- Socioeconomic status: 0.3369
- Household characteristics: 0.5448
- Racial and Ethnic Minority Status: 0.1130
- Housing Type and Transportation: 0.6606

The overall SVI score and the scores of the four subcategories all indicate a low to medium level of vulnerability for this area.

Pedestrian Crashes

Between January 1, 2015 and December 31, 2024, three pedestrian crashes were reported along the study section of SR 60. Using the National Safety Council's (NSC) "KABCO" injury severity scale, two were "serious injury" crashes (KABCO "A" rating) and one was a "visible injury" crash (KABCO "B" rating). These crashes occurred at the following times:

- On November 2, 2016 at 10:40 PM, a B-injury crash occurred approximately 350 feet south of the proposed crossing during dark conditions.
- On September 27, 2017 at 4:52 PM, an A-injury crash occurred approximately 100 feet north of the proposed crossing during daylight conditions.
- On July 24, 2020 at 10:45 PM, an A-injury crash occurred approximately 300 feet north of the proposed crossing during dark conditions.

A 10-year crash history is provided as justification for this project location. Given that crashes are random and may occur at a similar rate over time, the justification for the project is anticipated to remain valid throughout the project lifecycle.

Pedestrian and Vehicular Volumes

Pedestrian counts were collected on Wednesday, April 10, 2024 from 6:00 AM to 6:00 PM for the segment of SR 60 located between the Shell Gas Station driveway and the Fieldale Farms Poultry driveway, and a total of 48 pedestrians were observed crossing SR 60 at the study location. Vehicular average annual daily traffic was gathered from the GDOT Traffic Analysis and Data Application (TADA!) website. The collected pedestrian counts are provided in **Attachment A**, and the count data for both pedestrians and vehicles are summarized in **Table 1** and **Table 2** respectively.

Table 1: Pedestrian Count Data

Peak Period	Peak Hour		Peak (2 Hours)		Peak (3 Hours)		Daily Count Total
	Time	Ped Count	Time	Ped Count	Time	Ped Count	Ped Count
Weekday Count Data	7:15 AM - 8:15 AM	13	6:15 AM - 8:15 AM	16	6:15 AM - 9:15 AM	18	48

Table 2: GDOT TADA! Count Station Data

Count Station ID	Location	2022 AADT (vpd) and Peak Hour Volume (AM/PM)	Heavy Vehicle Percentage
139-0323	SR 60, 1.3 miles south of Hubert Stephens Rd	10,800 (828 vph/1,040 vph)	9%

2. TREATMENT SELECTION

Federal Highway Administration (FHWA) Guidance

Table 1 from the Federal Highway Administration (FHWA) *Guide for Improving Pedestrian Safety at Uncontrolled Locations* provides guidance for evaluating various pedestrian-crossing treatment types based on vehicular traffic volumes, vehicle speeds, and roadway configuration at a given location. This table is shown in **Figure 3** with a red outline highlighting the relevant crossing treatments for the study location.

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	① 2 4 5 6	① 5 6 7 9	① 5 6 7 9	① 4 5 6	① 5 6 7 9	① 5 6 7 9	① 4 5 6	① 5 6 7 9	① 5 6 7 9
3 lanes with raised median (1 lane in each direction)	① 2 3 4 5	① 5 7 9	① 5 7 9	① 3 4 5	① 5 7 9	① 5 7 9	① 3 4 5	① 5 7 9	① 3 5
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	① 2 3 4 5 6 7 9	① 3 5 6 7 9	① 3 5 6 7 9	① 3 4 5 6 7 9	① 3 5 6 7 9	① 3 5 6 7 9	① 3 4 5 6 7 9	① 3 5 6 7 9	① 3 5 6 7 9
4+ lanes with raised median (2 or more lanes in each direction)	① 3 5 7 8 9	① 3 5 7 8 9	① 3 5 7 8 9	① 3 5 7 8 9	① 3 5 7 8 9	① 3 5 7 8 9	① 3 5 7 8 9	① 3 5 7 8 9	① 3 5 7 8 9
4+ lanes w/o raised median (2 or more lanes in each direction)	① 3 5 6 7 8 9	① 3 5 6 7 8 9	① 3 5 6 7 8 9	① 3 5 6 7 8 9	① 3 5 6 7 8 9	① 3 5 6 7 8 9	① 3 5 6 7 8 9	① 3 5 6 7 8 9	① 3 5 6 7 8 9

Given the set of conditions in a cell,
 # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
 ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
 ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*
 The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
 2 Raised crosswalk
 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
 4 In-Street Pedestrian Crossing sign
 5 Curb extension
 6 Pedestrian refuge island
 7 Rectangular Rapid-Flashing Beacon (RRFB)**
 8 Road Diet
 9 Pedestrian Hybrid Beacon (PHB)**

*Refer to Chapter 4, "Using Table 1 and Table 2 to Select Countermeasures," for more information about using multiple countermeasures.
 **It should be noted that the PHB and RRFB are not both installed at the same crossing location.

Figure 3: FHWA Pedestrian Crossing Treatment Recommendation

Based on the corridor's existing cross-section, posted speed limit of 45 mph, and an Annual Average Daily Traffic (AADT) of 10,800 vehicles per day (vpd), Table 1 indicates the following crossing treatments are appropriate for this location:

- High-visibility crosswalk markings with signage and lighting (in conjunction with other identified countermeasures)
- Advance "Stop Here for Pedestrians" signage with stop lines
- Curb extensions
- Pedestrian refuge island
- Pedestrian hybrid beacon (PHB)

Some alternatives included in Table 1, such as an in-street pedestrian crossing sign, a raised crosswalk, or a rectangular rapid-flashing beacon (RRFB), are explicitly not recommended by

FHWA due to the existing roadway’s three-lane cross-section, speed limit of 45 mph, and traffic volume characteristics. In-street pedestrian crossing signs are less conspicuous, and thus less effective, and more susceptible to damage on higher speed, higher volume roads. Although raised crosswalks provide a traffic calming effect and reduce the need for pedestrian ramps at a mid-block crossing, they often create larger safety concerns for roadways with travel speeds higher than 30 mph since motorists may have difficulty seeing the raised portion of the road while traveling at higher speeds and subsequently may not slow down. Additionally, raised crosswalks also can make it more difficult for large trucks to navigate the roadway. RRFBs typically are not recommended for higher speed, higher volume roadways since higher travel speeds reduce the visibility of the device’s flashing beacons—vehicles traveling at higher speeds require more stopping distance and the flashing beacons may not provide enough advanced warning to motorists.

Of the Table 1 treatments that may be appropriate for the study location, a pedestrian hybrid beacon (PHB) with high-visibility crosswalk markings and a pedestrian refuge island were determined to be an appropriate crossing treatments for this location based on the location’s risk factors, including the concentration of pedestrian generators and high vehicular travel speeds (57 mph southbound and 58 mph northbound). Additionally, there is a documented history of pedestrian crashes at the location (three injury crashes in the past ten years), pedestrian crossing activity is high (48 pedestrians during a 12-hour data collection period), and the study area has an SVI score of 0.4653, indicating that this community may be susceptible to fatal and serious-injury pedestrian crashes. FHWA recommends PHBs for higher speed, higher volume roadways since they provide a stronger, more explicit command for traffic to stop. PHBs provide a solid red indication, requiring motorists to stop, instead of flashing yellow lights, which relies on motorists to yield.

Although the east side of SR 60 has some sections of curb near the study location, the west side does not and therefore, the curb extension treatments would require the installation of curb and gutter on the west side of SR 60. Additionally, the curb extension treatments would require the capacity of SR 60 to be reduced and are therefore not recommended. Advance “Stop Here for Pedestrians” signage with stop lines were not selected, since other signage and pavement markings are used with PHBs.

Manual on Uniform Traffic Control Devices (MUTCD) Guidance

In addition to the guidance provided by FHWA, Figure FJ-2 in the MUTCD can be used to assist in determining whether a PHB would be appropriate based on traffic and pedestrian volume criteria as well as the roadway characteristics. The criteria in Figure 4J-2 of the MUTCD are satisfied if the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrian per hour crossing (for any four consecutive 15-minute periods) falls above the applicable curve.

Figure 4 depicts the study area’s traffic and pedestrian volume data against the curve provided in Figure FJ-2. Using the data from the 12-hour pedestrian counts and crossing distance of 35 feet, this location does not satisfy the volume thresholds for a PHB. However, the MUTCD still allows for installation of a PHB at locations where the criteria are not satisfied, based on engineering judgment and the needs of the location. Therefore, a PHB is still an appropriate crossing treatment for this location based on the location’s risk factors and need, including the concentration of pedestrian generators, high vehicular travel speeds (57 mph southbound and 58 mph northbound), AADT volume (10,800 vpd), and documented crash history.

Figure 4J-2. Guidelines for the Installation of Pedestrian Hybrid Beacons on High-Speed Roadways

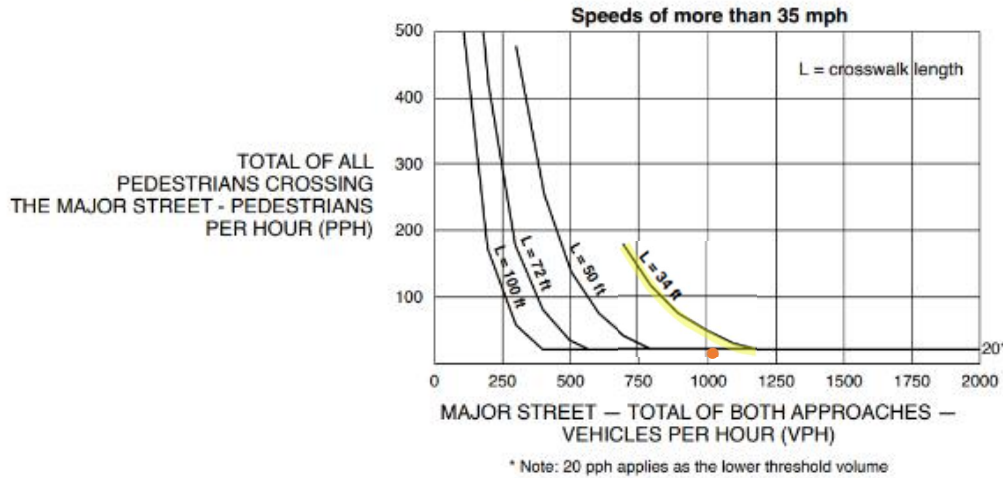


Figure 4: MUTCD PHB Guidelines Based on Volumes

Preferred Treatment

Based on guidance provided by FHWA and the MUTCD and considering the crash history, high vehicular travel speeds (57 mph southbound and 58 mph northbound), traffic volume (10,800 vpd), and concentration of pedestrian generators, a PHB is the recommended pedestrian crossing treatment for this section SR 60. High-visibility crosswalk markings, advanced warning signage, stop lines, and a pedestrian refuge island are recommended to be installed in conjunction with the PHB. However, due to the adjacent proposed roundabout project, this is proposed as a temporary pedestrian crossing facility and is anticipated to be removed upon completion of a future project that would construct enhanced pedestrian facilities at the adjacent intersection of SR 60 at Hubert Stephens Road.

GDOT is proactively building a safe system by designing infrastructure for our most vulnerable road users for maximum compliance since humans make mistakes and are vulnerable. The proposed design is recommended to include a slight shift in direction for pedestrians in the center refuge island, which also allows for a larger refuge in the center median island and positions pedestrians to face conflicting traffic within the median. The proposed PHB is recommended to provide sufficient pedestrian clearance time, or pedestrian countdown indication, to allow a pedestrian to cross both directions of travel in a single stage, but the proposed median provides refuge for pedestrians that are able to cross one direction of travel but not both. Additionally, pedestrian push buttons are proposed to be provided in the median to activate the PHB if a pedestrian were to cross one direction of travel and stop in the median refuge.

The benefits of this crossing treatment are:

- Assigns right-of-way to pedestrians and provides positive stop control
- Improves motorist awareness of pedestrians
- Reduces crash potential for both pedestrians and vehicles
- Reduces vehicular delay in comparison to a traffic signal by allowing motorists to proceed once all pedestrians have cleared the travel lane

3. CROSSING LOCATION EVALUATION

Pedestrians crossing SR 60 mid-block between Hubert Stephens Road and Twin Oaks Lane are likely traveling between the Fieldale Farms Poultry Farm on the west side of SR 60 and the commercial businesses on the east side of SR 60. Potential desire lines for pedestrians

crossing traffic are between the poultry plant on the west side of SR 60 and the businesses, such as the convenience store and restaurant, located on the east side of SR 60. The American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Planning, Design, and Operation of Pedestrian Facilities* recommends that mid-block crossings be installed more than 100 feet from any driveway or intersection, and more than 300 feet from any signalized intersection. It is not feasible to install the crossing facility 100 feet away from any driveway or intersection at this location due to the concentration of access points along this section of SR 60; however, the proposed crossing location is more than 300 feet away from the nearest signalized intersection at Price Road/Village View Drive, and more than 550 feet from Hubert Stephens Road, the nearest side street.

The proposed design location for the mid-block crossing, south of Hubert Stephens Road and directly in front of the Shell gas station, was selected to best capture pedestrian trips between the poultry plant and two businesses on the east side of SR 60 that workers would likely frequent. This location is also located north of the right-turn lane for vehicles turning into the Fieldale Farms driveway to the south. There is a culvert with rock outlet as well as a drainage ditch located along the west side of SR 60 within the study limits. This drainage area was avoided when selecting the proposed crossing location due to the placement of the mast arm, which is proposed to be installed on the west side of the roadway. There are no significant horizontal or vertical curves within the study area.

Additionally, this location was chosen due to the pedestrian crashes from this study segment occurring near the proposed crossing location, as well as anecdotal evidence of pedestrian activity, such as a worn trail, being seen here on Google Street View and proximity to pedestrian generators, such as the Shell gas station.

Stopping sight distance (SSD) was evaluated based on AASHTO *A Policy on Geometric Design of Highways and Streets*, Table 3-1. SSD requirements and measurements are summarized in **Table 3**.

Table 3: Sight Distance

SR 60 between Hubert Stephens Rd and Twin Oaks Ln		Required (AASHTO Green Book Table 3-1)	Measured
Stopping Sight Distance (ft)	SB	360	1000
	NB	360	950

4. ECONOMIC ANALYSIS

Improvement: The recommended improvement is a PHB crossing SR 60 south of Hubert Stephens Road with a pedestrian refuge island—via **Menu of Services Design (MOSD)**.

The individual B/C for the proposed mid-block crossing located on SR 60 is 9.90. The B/C for the combined package of all four PHB locations proposed as part of P.I. 0020197 is 9.23. A detailed Benefit-Cost Analysis spreadsheet is included in **Attachment B**.

Estimated Cost

PE	\$55,000
UTL	\$15,000
ROW	\$0
CST	\$250,000
Total	\$320,000

Estimated Safety Benefit Cost

The Federal Highway Administration (FHWA) Crash Modification Factors (CMF) Clearinghouse suggests a reduction of 56 percent in pedestrian crashes (CMF ID 9021) of all severities.

$$\frac{\text{Design Life Benefit}}{\text{Design Life Cost}} = \frac{\$372,680}{\$37,640}$$

Safety B/C = 9.90

5. RECOMMENDATIONS

A pedestrian crossing facility is recommended across the section of SR 60 near Hubert Stephens Road based on the volume of pedestrians crossing SR 60 at this location, the history of pedestrian crashes in the study area, the number of lanes, and the vehicle AADT along SR 60. There have been three pedestrian crashes at this location since 2013, all of which were injury crashes. Additionally, 48 pedestrians were observed crossing this section of SR 60 between 6:00 AM and 6:00 PM during data collection on April 10, 2024. Pedestrian trip generators in the area include a gas station and restaurant, and a pedestrian hybrid beacon (PHB) with a median refuge island at the proposed location will provide safer crossing treatment for pedestrians in the study area. The proposed design also recommends a staggered crossing path, allowing pedestrians refuge in the median island if needed, but with sufficient pedestrian clearance time to cross in a single stage for most pedestrians. This is proposed as a temporary pedestrian crossing facility and is anticipated to be removed upon completion of a future project that would construct enhanced pedestrian facilities at the adjacent intersection of SR 60 at Hubert Stephens Road.



RECOMMENDED BY: _____ DATE: 10/9/2025

Clark Kennedy, P.E., PTOE, RSP₁
 Kimley-Horn Project Manager

RECOMMENDED BY: _____ DATE: _____

Ron Knezevich, PE, RSP_{2i}
 State Safety Engineering Supervisor

RECOMMENDED BY: _____ DATE: _____

Jonathan Peevy, P.E.
 District Traffic Engineer

6. LIST OF ATTACHMENTS

- Attachment A: Pedestrian Volume Counts
- Attachment B: B/C Calculation

Attachment A:

Pedestrian Volume Counts

Pedestrian Count || EB WB 15min

Gwinnett & Hall County, GA



Ped Zone 4

Date
Wednesday, April 10, 2024

Weather
Cloudy
65°F

Lat/Long
34.413047, -83.900566

[Click here for Detailed Weather](#)



[Click here for Map](#)

0600 - 1800 (12h Session)

EB WB 15min

TIME	Eastbound			Westbound		
	Peds	P/Cycle	Total	Peds	P/Cycle	Total
0600 - 0615	0	0	0	0	0	0
0615 - 0630	0	0	0	0	0	0
0630 - 0645	0	0	0	0	0	0
0645 - 0700	1	0	1	1	0	1
0700 - 0715	1	0	1	0	0	0
0715 - 0730	0	0	0	1	0	1
0730 - 0745	3	0	3	2	0	2
0745 - 0800	3	0	3	1	0	1
0800 - 0815	0	0	0	3	0	3
0815 - 0830	0	0	0	0	0	0
0830 - 0845	0	0	0	0	0	0
0845 - 0900	1	0	1	0	0	0
0900 - 0915	0	0	0	1	0	1
0915 - 0930	0	0	0	0	0	0
0930 - 0945	0	0	0	0	0	0
0945 - 1000	0	0	0	0	0	0
1000 - 1015	0	0	0	0	0	0
1015 - 1030	0	0	0	0	0	0
1030 - 1045	2	0	2	1	0	1
1045 - 1100	1	0	1	1	0	1
1100 - 1115	2	0	2	2	0	2
1115 - 1130	0	0	0	1	0	1
1130 - 1145	0	0	0	0	0	0
1145 - 1200	0	0	0	0	0	0
1200 - 1215	0	0	0	0	0	0
1215 - 1230	0	0	0	0	0	0
1230 - 1245	0	0	0	0	0	0
1245 - 1300	0	0	0	0	0	0
1300 - 1315	0	0	0	0	0	0
1315 - 1330	0	0	0	0	0	0
1330 - 1345	0	0	0	0	0	0
1345 - 1400	3	0	3	1	0	1
1400 - 1415	1	0	1	3	0	3
1415 - 1430	0	0	0	0	0	0
1430 - 1445	0	0	0	0	0	0
1445 - 1500	0	0	0	0	0	0
1500 - 1515	0	0	0	0	0	0
1515 - 1530	0	0	0	0	0	0
1530 - 1545	0	0	0	0	0	0
1545 - 1600	0	0	0	0	0	0
1600 - 1615	1	0	1	1	0	1
1615 - 1630	0	0	0	1	0	1
1630 - 1645	2	0	2	1	0	1
1645 - 1700	1	0	1	2	0	2
1700 - 1715	1	0	1	1	0	1
1715 - 1730	1	0	1	0	0	0
1730 - 1745	0	0	0	0	0	0
1745 - 1800	0	0	0	0	0	0

15min Total	60min Total
0	
0	
0	
2	2
1	
1	
5	
4	11
3	
0	
0	
1	4
1	
0	
0	
0	1
0	
0	
3	
2	5
4	
1	
0	
0	5
0	
0	
0	0
0	
0	
0	
4	4
0	
0	
0	4
0	
0	
0	0
2	
1	
3	
3	9
1	
0	
0	
0	3

Session Total	24	0	24	24	0	24
Session Average	0.50	0.00	0.50	0.50	0.00	0.50
Session Percentage	100.00	0.00	50.00	100.00	0.00	50.00

48
1.00

Attachment B:

Benefit-Cost Calculations

BENEFIT COST ANALYSIS WORKSHEET

23-1021 D1 Pedestrian Improvements - SR 60

Gwinnett County, GA

Pedestrian Hybrid Beacon (PHB)

Years for Crash Data = 10

CRASH DATA for 10 YEARS (KABCO System)			
Severity Description	Severity Symbol	No. Crashes	Crash Rate (per year)
Fatal	K	0	0.00
Incapacitating injury	A	2	0.20
Non-incapacitating injury	B	1	0.10
Possible injury	C	0	0.00
Property Damage Only (PDO)	O	0	0.00
All	KABCO	3	0.30

Crash Costs		
Severity Description	Symbol	Value
Fatal	C_K	\$13,580,000
Incapacitating injury	C_A	\$3,000,000
Non-incapacitating injury	C_B	\$655,000
Possible injury	C_C	\$140,000
Property Damage Only	C_O	\$30,000
Maintenance	C_m	\$5,000

BC CALCULATION PARAMETERS AND VALUES		
Description	Symbol	Value
Reduction Factor (Fatal and Injury Crashes, KABC)	CRF_{KABC}	56%
Reduction Factor (PDO Crashes, O)	CRF_O	56%
Capital Recovery Factor	E_k	0.102
Initial Improvement Cost (Itemized Cost Estimate)	C_i	\$320,000
Maintenance / Operating Cost (per year)	C_m	\$5,000

CMF ID 9021

CMF ID 9021

$$Q = \text{Weighted Cost of Fatal and Injury Crashes} \Rightarrow \frac{(C_K \times K) + (C_A \times A) + (C_B \times B) + (C_C \times C)}{K + A + B + C} = \$2,218,333$$

$$B = \text{Benefit} \Rightarrow Q (K + A + B + C) (CRF_{KABC}) + C_O (O) (CRF_O) = \$372,680$$

$$C = \text{Cost} \Rightarrow C = E_k (C_i) + C_m = \$37,640$$

$$B/C = \text{Benefit/Cost Ratio} \Rightarrow \frac{B}{C} = 9.9$$

BENEFIT COST ANALYSIS FACTOR DEFINITIONS

K: Average annual number of collisions involving fatalities during study period

A: Average annual number of collisions involving incapacitating injuries for the period of the study

B: Average annual number of collisions involving non-incapacitating injuries for the period of the study

C: Average annual number of collisions involving possible (not visible) injuries for the period of the study

C: Average annual number of collisions involving only property damage for the period of the study

CRF_{KABC} : Percentage of reduction in fatal and injury crashes by type (correctable crashes)

CRF_O : Percentage of reduction in property damage only crashes by type (correctable crashes)

C_k : Average cost per fatal crash

C_A : Average cost per incapacitating injury crash

C_B : Average cost per non-incapacitating injury crash

C_C : Average cost per possible injury (not visible injury) crash

C_O : Average cost per property damage only crash

Q: Weighted cost of fatal and injury crashes

E_k : Capital recovery factor based on countermeasure (proposed alternative) life

C_i : Estimated initial cost of the countermeasure (cost of the improvement including Right of Way)

C_m : Estimated annual maintenance and operating cost of the countermeasure

BENEFIT COST ANALYSIS WORKSHEET
 23-1021 D1 Pedestrian Improvements - All Locations
 Gwinnett County, GA
 Pedestrian Hybrid Beacon (PHB)

Years for Crash Data = 10

CRASH DATA for 10 YEARS (KABCO System)			
Severity Description	Severity Symbol	No. Crashes	Crash Rate (per year)
Fatal	K	1	0.10
Incapacitating injury	A	3	0.30
Non-incapacitating injury	B	3	0.30
Possible injury	C	2	0.20
Property Damage Only (PDO)	O	0	0.00
All	KABCO	9	0.90

Crash Costs		
Severity Description	Symbol	Value
Fatal	C _K	\$13,580,000
Incapacitating injury	C _A	\$3,000,000
Non-incapacitating injury	C _B	\$655,000
Possible injury	C _C	\$140,000
Property Damage Only	C _O	\$30,000
Maintenance	C _m	\$20,000

BC CALCULATION PARAMETERS AND VALUES		
Description	Symbol	Value
Reduction Factor (Fatal and Injury Crashes, KABC)	CRF _{KABC}	56%
Reduction Factor (PDO Crashes, O)	CRF _O	56%
Capital Recovery Factor	E _k	0.102
Initial Improvement Cost (Itemized Cost Estimate)	C _i	\$1,280,000
Maintenance / Operating Cost (per year)	C _m	\$20,000

CMF ID 9021
 CMF ID 9021

$$Q = \text{Weighted Cost of Fatal and Injury Crashes} \Rightarrow \frac{(C_K \times K) + (C_A \times A) + (C_B \times B) + (C_C \times C)}{K + A + B + C} = \$2,758,333$$

$$B = \text{Benefit} \Rightarrow Q (K + A + B + C) (CRF_{KABC}) + C_O (O) (CRF_O) = \$1,390,200$$

$$C = \text{Cost} \Rightarrow C = E_k (C_i) + C_m = \$150,560$$

$$B/C = \text{Benefit/Cost Ratio} \Rightarrow \frac{B}{C} = 9.23$$

BENEFIT COST ANALYSIS FACTOR DEFINITIONS

K: Average annual number of collisions involving fatalities during study period

A: Average annual number of collisions involving incapacitating injuries for the period of the study

B: Average annual number of collisions involving non-incapacitating injuries for the period of the study

C: Average annual number of collisions involving possible (not visible) injuries for the period of the study

C: Average annual number of collisions involving only property damage for the period of the study

CRF_{KABC}: Percentage of reduction in fatal and injury crashes by type (correctable crashes)

CRF_O: Percentage of reduction in property damage only crashes by type (correctable crashes)

C_k: Average cost per fatal crash

C_A: Average cost per incapacitating injury crash

C_B: Average cost per non-incapacitating injury crash

C_C: Average cost per possible injury (not visible injury) crash

C_O: Average cost per property damage only crash

Q: Weighted cost of fatal and injury crashes

E_k: Capital recovery factor based on countermeasure (proposed alternative) life

C_i: Estimated initial cost of the countermeasure (cost of the improvement including Right of Way)

C_m: Estimated annual maintenance and operating cost of the countermeasure

District Traffic Engineer

Date

State Traffic Engineer

Date

Director Of Operations

Date