

**DEPARTMENT OF TRANSPORTATION  
STATE OF GEORGIA**

**Uncontrolled Pedestrian Crosswalk Study**

September 2025



PRIMARY ROUTE: SR 11

SECONDARY ROUTE: Near Underwood St.

GDOT DISTRICT: 1

CONGRESSIONAL DISTRICT: 9

COUNTY: White

CITY: Cleveland

PREPARED BY: Madison Dorminey, District 1 Traffic Operations

## Summary

This pedestrian crossing evaluation originated as a request from local government officials. A four step process is used to study the potential for a pedestrian crossing at SR 11 near Underwood St. This process includes 1) evaluating if the surrounding land use and community amenities generate the need for pedestrian crossings, 2) identification of the appropriate crosswalk treatment, 3) identifying the optimal crosswalk location, and 4) an economic analysis of the crosswalk and associated improvements.

A crossing is recommended based on the need to address a crossing location that is already being heavily used by pedestrians. The optimal location for this crossing is approximately 105' south of Underwood Street at the existing sidewalk stub in front of Chick-fil-a. The long-term recommendation is a PHB when funding is available. However, a RRFB is recommended as an interim measure.



Figure 1: Project Location

## CROSSING DESIRABILITY

Before selecting a crosswalk location, an evaluation of the existing conditions including pedestrian generators, sociodemographic data from the CDC’s Social Vulnerability Index (SVI), crash history, and land use are used to determine the need for a marked pedestrian crossing.

**Table 1: Pedestrian Crossing Desirability Data**

Pedestrian Facilities		Census Tract SVI <sup>1</sup>	
Transit	Rural location, no public transit	Overall SVI	.6643
Schools	Elementary, Middle, and 9 <sup>th</sup> Grade Academies located ~.5mi north of proposed crosswalk	Socioeconomic Status	.4523
Sidewalk	Sidewalk is present on both sides of SR 11	Household Characteristics	.7072
Multimodal paths	There are no shared used paths or bike facilities	Racial & Ethnic Minority Status SVI	.1207
Gas stations, hotels, apts., restaurants, residential, stores, parks, etc.	Many restaurants, convenience store, downtown shopping, Freedom Park, and residential area to the east	Housing Type & Transportation SVI	.9007

- **Site Visit Observations:** This location is the most popular location for pedestrians to cross south of Downtown. People come to/from the convenience store, Freedom Park, and government offices to get to businesses across SR 11. There is a sidewalk stub out in front of Chick-fil-a that pedestrians gravitate towards. Majority of people choose to cross in front of the convenience store.
- **Community Engagement:** The City of Cleveland is in support of the crosswalk and has requested the crosswalk for several years
- **Planning Documents:** A new commercial development is proposed just east of downtown.
- **Ongoing Projects:** There are no ongoing or upcoming projects identified.
- **Crash Analysis:** There are no relevant recorded pedestrian crashes in the area.

Crash Type	2020	2021	2022	2023	2024	Total
Angle		1		1	1	3
O		1		1	1	3
Rear End				3		3
B				1		1
C				1		1
O				1		1
Head On		1				1
O		1				1
Sideswipe		1			1	2
O		1			1	2
Not with a Motor Vehicle		1				1
A		1				1

**Figure 2: All Crash Data**

<sup>1</sup> [https://www.atsdr.cdc.gov/placeandhealth/svi/interactive\\_map.html](https://www.atsdr.cdc.gov/placeandhealth/svi/interactive_map.html)

- **Pedestrian and Bicyclist Crossing Counts**

Pedestrian counts were collected by D1 Traffic Operations staff on Thursday, August 18<sup>th</sup>, 2025. Data collected is shown in Table 2.

**Table 2: Pedestrian Bicycle Volumes Observed Crossing Roadway**

	Peak Hour		Peak (2 Hours)		Peak (3 Hours)		Ped Count Total
	Time	Count	Time	Count	Time	Count	
Thursday, August 18 <sup>th</sup> , 2025	10am	6	10am-12pm	8	10am-1pm	12	17 (8am-4pm)

## TREATMENT SELECTION

The treatment selection is based primarily on the roadway geometry, annual average daily traffic (AADT) and both travel and posted speed data. This data is evaluated together using the “FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations”<sup>2</sup> referenced in the GDOT pedestrian and streetscape guide. For this study, Probe Speed Data was pulled from RITIS.

**Table 3: Roadway and Speed Data**

Roadway Data		Speed Data July 9 <sup>th</sup> , 2025 from 12:00 to 23:59		
		Posted Speed Limit	NB/SB Major Road (mph)	Minor Road (mph)
AADT <sup>3</sup> (veh/day)	13,620	25	30	N/A
Functional Class	Rural Principal Arterial			
# Through Lanes	1 in both directions			
Lighting Presence	Streetlights are present at Underwood St. The gas station and Chick-fil-a also have overhead lighting that is visible at the crosswalk location.	85 <sup>th</sup> Percentile Speed	30	N/A
# Turn lanes	TWLTL	Median Speed	27.3	N/A
Median Presence	None			

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	1	1	1	1	1	1	1	1
	4 5 6	5 6	5 6	4 5 6	5 6	5 6	4 5 6	5 6	5 6
	7 9	7 9	7 9	7 9	7 9	7 9	7 9	7 9	7 9
3 lanes with raised median (1 lane in each direction)	1 2 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3
	4 5	5	5	4 5	5	5	4 5	5	5
	7 9	7 9	7 9	7 9	7 9	7 9	7 9	7 9	7 9
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	1 2 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3
	4 5 6	5 6	5 6	4 5 6	5 6	5 6	4 5 6	5 6	5 6
	7 9	7 9	7 9	7 9	7 9	7 9	7 9	7 9	7 9
4+ lanes with raised median (2 or more lanes in each direction)	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3
	5	5	5	5	5	5	5	5	5
	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9
4+ lanes w/o raised median (2 or more lanes in each direction)	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3	1 3
	5 6	5 6	5 6	5 6	5 6	5 6	5 6	5 6	5 6
	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9	7 8 9

- 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)\*\*
- 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.

**Figure 3: Application of pedestrian crash countermeasures by roadway feature<sup>8</sup>**

The countermeasures potentially applicable for this crossing are 1, 3, 4, 5, 6, 7, and 9. Countermeasures listed in alternative 1 such as high-visibility markings and adequate lighting would be handled as a supplemental measure to the selected alternative. Alternatives 3, 4, and 6 would also be potential supplemental options depending on the selected treatment. Alternative 5 is not feasible at this location as there is no additional area to install a curb extension. Alternatives 7 and 9 are feasible treatments along with supplemental measures described above.

<sup>2</sup> [https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-07/STEP\\_Guide\\_for\\_Improving\\_Ped\\_Safety\\_at\\_Unsig\\_Loc\\_3-2018\\_07\\_17-508compliant.pdf](https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-07/STEP_Guide_for_Improving_Ped_Safety_at_Unsig_Loc_3-2018_07_17-508compliant.pdf)  
<sup>3</sup> <https://www.dot.ga.gov/GDOT/Pages/RoadTrafficData.aspx>

## CROSSWALK LOCATION

- **Proposed Location Details:** Proposed location is to connect to the existing sidewalk stub between Chick-fil-a and the convenience store, which is also a central point of the commercial area.
- **Nearby Traffic Signal:** The closest traffic signal is SR 11 @ SR 115 which is ~600ft to the north of the proposed location.
- **Nearest Midblock Crossing:** No nearby midblock crossings.
- **Driveways & Intersections:** There are ~20 driveways within .25mi of the proposed location. The nearest side street is Underwood St. ~105ft to the north.
- **Right of way (ROW):** There are no unique ROW elements, and installation will be handled by the local government.
- **Pedestrians Crossing Zones:**

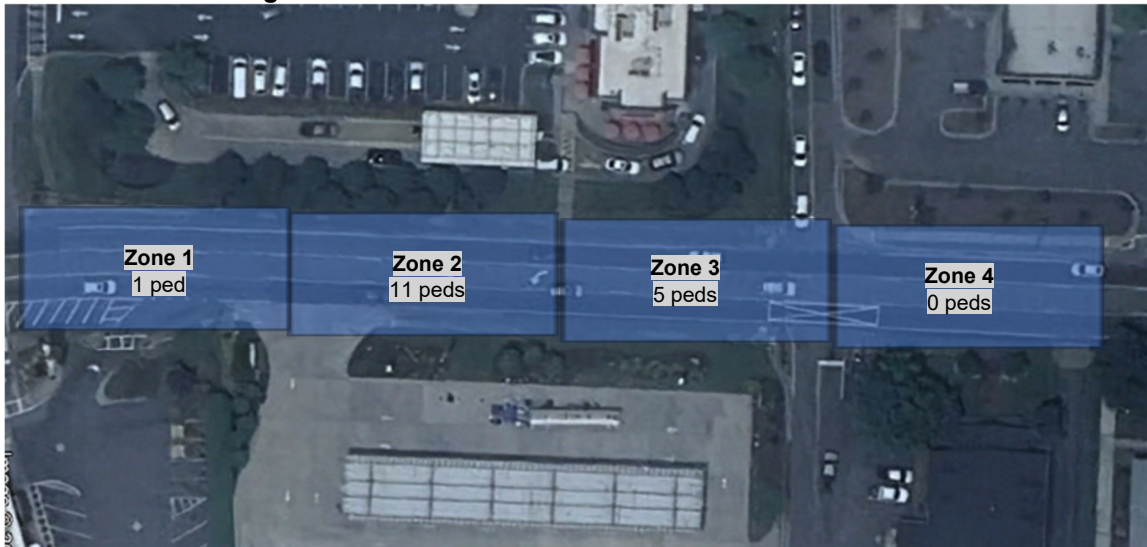


Figure 2: Pedestrian Crossing Zones (counts collected from 8:00am to 4:00pm)

- **Sight Distance Evaluation:** There is a horizontal curve to the south of the intersection. Sight Distance calculations are shown below. Proposed crosswalk is between 25mph and 35mph zones, so the 85<sup>th</sup> percentile speed of 30mph was used for calculations.

Table 4: Stopping and Decision Sight Distance

	Stopping Sight Distance (ft) (Required)				Decision Sight Distance (ft) Recommended for non-PHB			
	Direction 1 (Northbound)		Direction 2 (Southbound)		Direction 1 (Northbound)		Direction 2 (Southbound)	
	Inner Lane (CFA side)	Outer Lane (BP side)	Inner Lane (BP side)	Outer Lane (CFA side)	Inner Lane (CFA side)	Outer Lane (BP side)	Inner Lane (BP side)	Outer Lane (CFA side)
Measured	356	311	715	663	356	311	715	663
Calculated	200	200	200	200	490	490	490	490
Criteria Met (Y/N)	Y	Y	Y	Y	N	N	Y	Y

**Table 5: Pedestrian Sight Distance without Median**

Pedestrian Sight Distance (ft) Recommended for non-PHB				
	Crossing Direction 1 (To CFA)		Crossing Direction 2 (To BP)	
	Traffic Direction 1 (Left)	Traffic Direction 2 (Right)	Traffic Direction 1 (Left)	Traffic Direction 2 (Right)
Measured	311	715	663	356
Calculated	550	550	550	550
Criteria Met (Y/N)	N	Y	Y	N

## ECONOMIC ANALYSIS

### Delivery Mechanism

- **Local agency funded** – The local agency (City of Cleveland) has obtained limited funding to install this crossing as an RRFB.

### Recommendations

The request for this crossing originated as a request from local government officials (City of Cleveland). There are several pedestrian generators nearby including restaurants, a BP convenience store, Freedom Park, and local government offices. During an 8-hour weekday, 17 pedestrians were counted crossing in this area with 16 of those crossing between the BP convenience store and the Chick-fil-a (see Figure 6). A crosswalk is recommended at this location based on the volume of pedestrians crossing under existing conditions. Based on the location of where pedestrians are currently crossing, this crossing would be most effectively placed between the Chick-fil-a and the BP convenience store at the existing sidewalk stub in front of the Chick-fil-a, which is approximately 105' south of Underwood Street. There have not been any pedestrian related crashes in this area. While stopping sight distance is met, there are decision and pedestrian sight distance concerns with the northbound approach on SR 11. For this reason, the long-term recommendation is for the installation of a PHB. However, due to limited funding and the need for an immediate solution to a potential safety issue where pedestrians are already crossing, an RRFB is recommended as an interim solution until funding can be identified for a PHB. The RRFB is recommended to be a single stage crossing. Additionally, a raised median is recommended to be constructed within the limits of the two-way left turn lane along with lighting assemblies, pedestrian ahead signs, and in-street pedestrian crossing signs.

PREPARED BY: \_\_\_\_\_ DATE \_\_\_\_\_

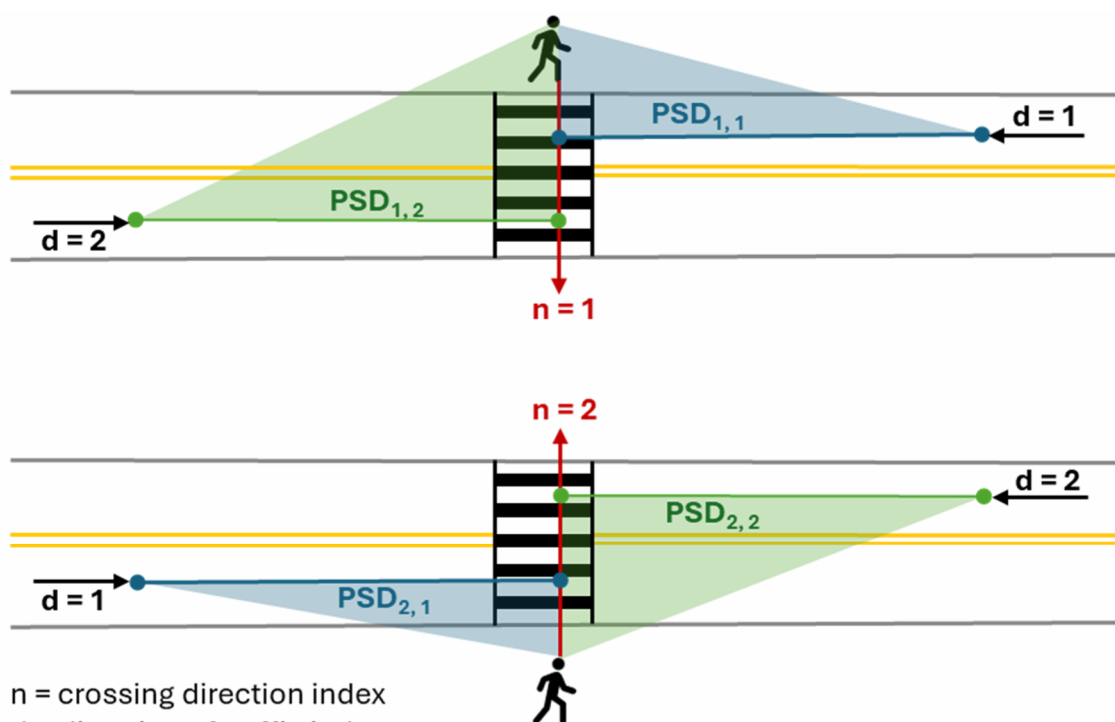
RECOMMENDED BY: \_\_\_\_\_ DATE \_\_\_\_\_

District 1 Traffic Engineer

## Appendix A: Sight Distance Equations

Section 3 specifies that an evaluation of three different sight distance measurements, including stopping sight distance, decision sight distance, and pedestrian sight distance, should be performed for a crosswalk screening or during the final TE study. Such measurements should be taken from various approaches, lanes, and pedestrian crossing points.

For pedestrian sight distance, a crossing of an undivided road would typically have two locations where pedestrians could decide to cross. If the undivided roadway is one-way, this would result in two measurements. If the undivided roadway is two-way, this would result in four measurements (both directions at each decision point). On roadways that are divided by a median, these decision points double, resulting in four measurements (two in each direction with one from the curb/roadside and one from the median).



$n$  = crossing direction index

$d$  = direction of traffic index

$PSD_{n,d}$  = pedestrian sight distance for crossing direction,  $n$  in direction of traffic,  $d$

### Equation 1: Pedestrian Crossing Sight Distance<sup>4</sup>

$$PedSD = 1.47S \left( \frac{L}{S_p} + t_s \right)$$

Where:

- PedSD= Pedestrian Sight Distance
- Where  $S$  = posted speed or 85 percentile speed (*per engineering judgment*) (mph)
- $L$ = crossing distance without refuge (ft).
- $S_p$  = average walking speed of (3.5 ft/s). A speed of 3 ft/s may be used if a high population over 65 years old or for use by elementary school children.
- $T_s$  =pedestrian start- up and clearance time (s). default of 3 seconds (

<sup>4</sup> <https://www.dot.ga.gov/DriveSmart/Travel/BikePed/PSG.pdf>

**Table 6: Stopping Sight Distance from AASHTO Greenbook 7<sup>th</sup> Edition**

U.S. Customary					U.S. Customary						
Design Speed (mph)	Brake Reaction Distance (ft)	Braking Distance on Level (ft)	Stopping Sight Distance		Stopping Sight Distance (ft)						
			Calculated (ft)	Design (ft)	Downgrades			Upgrades			
			3%	6%	9%	3%	6%	9%			
15	55.1	21.6	76.7	80	80	82	85	75	74	73	
20	73.5	38.4	111.9	115	116	120	126	109	107	104	
25	91.9	60.0	151.9	155	158	165	173	147	143	140	
30	110.3	86.4	196.7	200	205	215	227	200	184	179	
35	128.6	117.6	246.2	250	257	271	287	237	229	222	
40	147.0	153.6	300.6	305	315	333	354	289	278	269	
45	165.4	194.4	359.8	360	378	400	427	344	331	320	
50	183.8	240.0	423.8	425	446	474	507	405	388	375	
55	202.1	290.3	492.4	495	520	553	593	469	450	433	
60	220.5	345.5	566.0	570	598	638	686	538	515	495	
65	238.9	405.5	644.4	645	682	728	785	612	584	561	
70	257.3	470.3	727.6	730	771	825	891	690	658	631	
75	275.6	539.9	815.5	820	866	927	1003	772	736	704	
80	294.0	614.3	908.3	910	965	1035	1121	859	817	782	
85	313.5	693.5	1007.0	1010	1070	1149	1246	949	902	862	

**Table 7: Decision Sight Distance From AASHTO Greenbook 7<sup>th</sup> Edition**

U.S. Customary					
Design Speed (mph)	Decision Sight Distance (ft)				
	Avoidance Maneuver				
	A	B	C	D	E
30	220	490	450	535	620
35	275	590	525	625	720
40	330	690	600	715	825
45	395	800	675	800	930
50	465	910	750	890	1030
55	535	1030	865	980	1135
60	610	1150	990	1125	1280
65	695	1275	1050	1220	1365
70	780	1410	1105	1275	1445
75	875	1545	1180	1365	1545
80	970	1685	1260	1455	1650
85	1070	1830	1340	1565	1785

Avoidance Maneuver:

- A: Rural area
- B: Arban area
- C, D, E (not applicable for this type of study)

## Appendix B: Benefit Cost Analysis

Below is an example of a benefit cost analysis using the predictive benefit cost analysis at bus stops spreadsheet. Please contact one of the emails listed in the instructions if you would like access to this spreadsheet or a similar file. Multiple B/C spreadsheets exist. Please replace this sheet with one specific to the analysis.

Benefit Cost Analysis for Pedestrian Improvements at Bus Stops



Legend	
XXXX	Input your data into this cell
XXXX	Cell contains a formula
XXXX	Cell references another cell
XXXX	Heading
XXXX	Cell used to explain contents of another cell

Crash Data			
<i>5 years of crash data preferred</i>	Start Date	End Date	<i>Enter date in format .XX/XX/XXXX</i>
Date range of crash data	1/1/2018	12/31/2022	
Severity	Severity Abbreviation	Crash Cost	Pedestrian Crashes
Fatal Crash	K	\$12,450,000	
Serious Injury	A	\$2,740,000	
Visible Injury	B	\$600,000	1
Complaint of Injury	C	\$129,000	
Property Damage Only	O	\$28,000	1

Risk Factors			Speed limit or 85th percentile speed	Dollar Value Per predicted crash
Risk factor/Measure of Exposure	Relationship to crashes (+/-)	Value		
Ridership (Passengers per day)	+	2.00	< 25	\$628,853
Intersection Presence (1= 150 ft of intersection, 0 = midblock)	+	1	25 - 30	\$742,719
Lane Number (both directions)	+	4	35	\$970,672
AADT (veh/day)	+	26,600	40	\$1,559,792
SVI (CDC's social vulnerability index)	+	0.85	45	\$2,010,057
Division (1= divided, 0 = undivided)	-	1	> 45	\$3,304,778
Speed Limit or *85th percentile speed	Related only to severity	45		
Predicted Ped Crash frequency (crashes/yr) =	$e^{-(4.38 + (1.3E-10) \times AADT + .26 \times \text{Lanes} - .438 \times \text{Div} + .47 \times \text{LN}(\text{Rider} + 1) + .85 \times \text{LN}(\text{SVI} + 1) + 1.23 \times \text{Int})}$			0.22
Predicted Crash Cost (\$/yr)	\$444,989			

Countermeasure Name	Service Life	Crash Reduction Factors (CRF)	
		Capital Recovery factor	CRF Ped
Raised Crosswalk	15	0.102	54.0%
User over ride of values			

*Capital recovery is based on service life*

*You may look up any countermeasure with a source and enter the CRFs (i.e., the percent reduction in crashes)*

Cost		
	<i>It is recommended that you define your own cost. Predefined costs are high level</i>	User override values
Engineering	\$20,000.00	
Right of Way	\$0.00	
Utility	\$0.00	
Construction	\$80,000.00	
Total	\$100,000.00	

Expected Benefit Cost B/C	
Observed Life Cycle Benefit	\$67,824.00
Predicted Life Cycle Benefit	\$240,294.14
Expected Life Cycle Benefit (B)	\$154,059.07
Life Cycle Cost (C)	\$10,200.00
<b>B/C</b>	<b>15.10</b>