

PEDESTRIAN CROSSING STUDY IL ROUTE 13 MARION, IL

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PREPARED FOR:



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EXECUTIVE SUMMARY

This report summarizes a feasibility study conducted for the Southern Illinois Metropolitan Planning Organization (SIMPO). The study was limited to the viability of an enhanced pedestrian crossing through the IL Route 13 (DeYoung Street) corridor at Ray Fosse Park, between Garfield and Otis Streets in Marion, IL.

Originally a 2-lane highway, IL Route 13 was widened to 5-lanes approximately 20-years ago. The widened roadway greatly improved the capacity of IL Route 13 within the City limits; however, it has become a barrier for pedestrian traffic moving across the roadway corridor.

This study analyzed the existing conditions, studied vehicular and pedestrian traffic patterns/volumes and met with numerous stakeholders in order to develop potential options for a safer, ADA-compliant pedestrian crossing. Four options were considered for crossing pedestrians from the park to the local convenience store: an overpass structure, an underpass structure, an at-grade crossing and a continuous sidewalk/signal option. The study analyzed each option on the basis of cost, adjacent property impacts, other infrastructure needs and stakeholder impacts.

Ultimately, based on an analysis of the various criteria, the at-grade option was chosen as the preferred option. While the at-grade option is preferred, the exact location of the crossing is to be determined during Phase I Engineering. This study does consider three locations for the at-grade crossing and the pros/cons for each. There are impacts to adjacent properties that must be considered when the project is funded and engineering begins.

EXISTING CONDITIONS

As IL Route 13 (DeYoung Street) approaches the city from the east, it is a rural section with shoulders and open ditches. About ½ mile east of the park, at the Marion city limits, the roadway transitions to an urban, 5-lane section, with curb and gutter. The speed is 55 mph in the rural areas, but once in town, the speed limit is posted at 35 mph. Sidewalk is nearly continuous from Court Street to Fair Street on the south side of the highway. There is no sidewalk on the north side of the highway from State Street to Fair Street. Traffic signals are placed approximately every ½ mile at the major roadway crossings, with the closest ones to the study area at State Street, two blocks west of Garfield, and Fair Street, two blocks east of Otis Street.

The park is situated on approximately 20 acres in northeast Marion. The IL Route 13 corridor is lined with commercial businesses, while the surrounding area is residential. There are grade schools to the northwest (Lincoln School) and southeast (Jefferson School) of the park. While the school district lines generally follow IL Route 13, there are exceptions as kids move into the district mid-semester and assigned a school to keep class sizes more equal. Therefore, there may be some children who are forced to cross IL Route 13 to get to grade school.



Looking West along IL Route 13 at Park

The park has a continuous fence along the south property line, abutting the IL Route 13 right-of-way which prohibits pedestrians from crossing into the highway corridor except at Garfield and Otis Streets. Park amenities include the city pool, tennis courts, picnic pavilions, playground equipment (including a new fully accessible play area), mini golf,

and multiple ball fields. The ball fields are utilized by little league and by adult leagues. Because of the large number of ball diamonds, the park is able to host large tournaments many weekends throughout the summer. Other city events are also hosted at the park from time to time.

There are no existing or planned bikeways nearby. However, it appears there are many pedestrians who cross IL Route 13 as part of a recreation route, either walking, jogging, pushing strollers, or biking.



Location of Existing Pedestrian Crossing at Garfield Street (SE)

There are old, worn pedestrian crosswalk pavement markings across IL Route 13 at Garfield Street. These were placed near the pool many years ago, and advance warning signs are also present. There are sidewalks and a ramp at the southeast corner of the intersection, but at the other end of the crosswalk at the northeast quadrant there are no ramps or sidewalks. There are no crossing markings or warning signage at Otis Street.

While there is a concession stand near the ball fields, there has been an abundance of pedestrians crossing IL Route 13 to access the Huck’s convenience store that is located at the southwest corner of the park at DeYoung Street & Otis Street. It appears the concession leaser is only open for games, not practices. Often the concession stand staff become overwhelmed during large events and service suffers. Both of these contribute to the interest in the Huck’s convenience offerings. A second convenience store (Casey’s General Store) was constructed in early 2018. It is located on IL Route 13, two blocks west of the park, which was expected to draw some of the foot traffic from the original convenience store. However, it does not appear to have made a big difference in the foot traffic to Huck’s during the 2018 season.



Location of Pedestrian Crossings at Otis Street

See *Attachment 01* for an overall project study map depicting features described above. Additionally, the pedestrian generators in the area were mapped and plotted, along with the location of existing traffic signals on IL Route 13.

Crossing the street can be a complex task for pedestrians. They must estimate vehicle speeds, adjust their own walking speeds, determine adequacy of gaps, predict vehicle paths, and time their crossings appropriately. Similarly, drivers must see pedestrians, estimate vehicle and pedestrian speeds, determine the need for action, and react.

-from FHWA

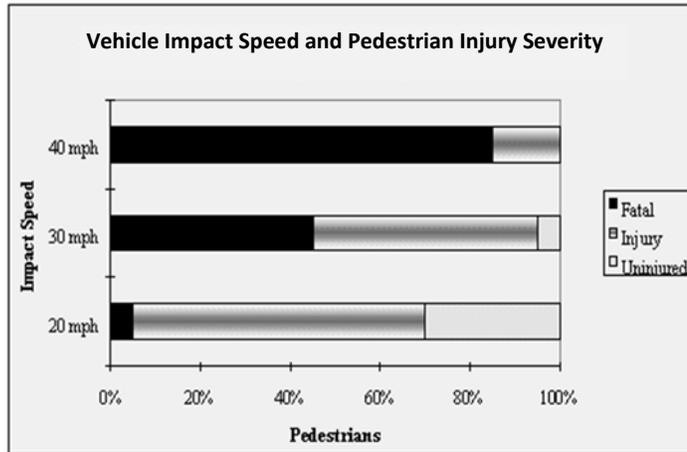
MEASURED DATA

The following factors were measured, observed or otherwise collected along the project study area and will be discussed in detail: Vehicular Traffic Counts, Pedestrian Counts, Vehicular Speed, and Crashes (Vehicular and Pedestrian/Bike).

Vehicular Speed

The posted speed limit along IL Route 13 is 35 mph in the study area. The vehicular speed data, as collected from IDOT’s Traffic Count Database System (TCDS), indicates the average travel speed is at or just below the posted speed of 35 mph. However, this data may be lower than the expected travel speed due to the presence of the traffic lights within the limits. See *Attachment 02* for a graph of the raw data.

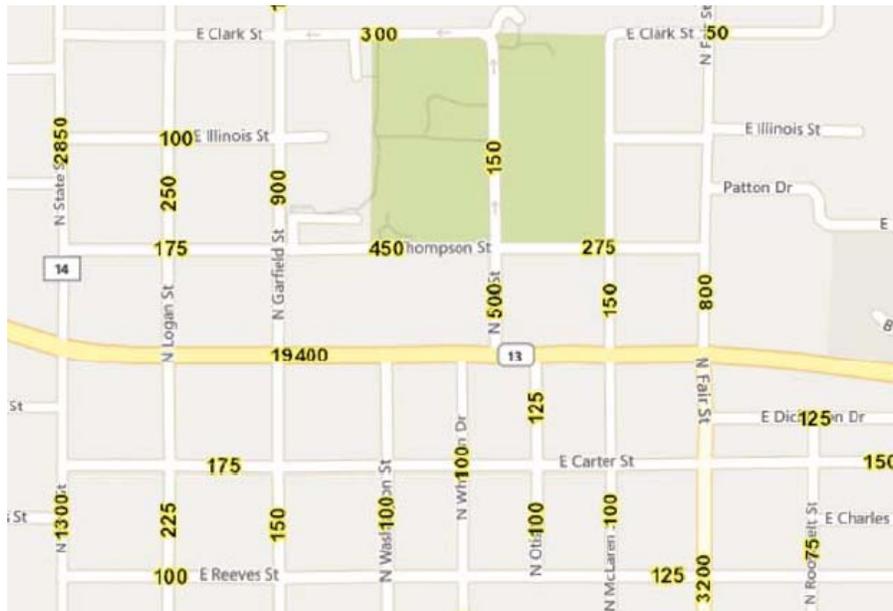
Speed is the dominant variable for pedestrian survivability of a crash. The faster a vehicle is going, the less likely the driver is to be able to stop in time to avoid a crash. When hit by a vehicle traveling at 40 miles per hour, a pedestrian has an 85% chance of being killed; at 30 miles per hour, the likelihood decreases to 45%; and at 20 miles per hour the pedestrian fatality rate is only 5% (see inset).



U.K. DOT, 1987 and Traffic Advisory Unit,

Vehicular Traffic Counts

This section of IL Route 13 is heavily traveled, with an average of 19,400 vehicles per day traversing the project study area in 2017. This number is projected to be 24,900 vehicles in 20 years.



Map illustrating IDOT's average daily traffic within the project area.

Due to the heavy volume of traffic entering and exiting the park during tournament days, video counts were conducted on April 28, 2018 to better illustrate this impact. A traffic diagram depicting this information is shown in *Attachment 03* based on the collected counts.

Pedestrian Counts

Pedestrian counts were collected by video camera. Cameras were positioned at Garfield and Otis Streets and 24-hour counts were collected by SIMPO. Results are summarized below:

There are approximately 7 pedestrian crossings/day at Garfield and 27 crossings/day at Otis on a typical non-tournament day. The camera has captured many unsupervised children crossing IL Route 13 at Otis Street to obtain snacks and concessions at Huck's during events at the park

(mostly ballgames and practices). On tournament weekends the number expands upward to 195 crossings/day at Otis. See *Attachment 04* for pedestrians counted per day data.

We cross studied the vehicular traffic counts and the pedestrian traffic counts to see if there were any patterns. Plotting typical weekday and weekend pedestrian traffic with the typical speed traffic, we found the data to be fairly random, but there are a few trends. There are more bikers on weekends and more wheelchairs during the week. There are more children in the afternoon and early evening (probably due to ballgames). Note that this is data for average, non-tournament days.

Crashes

Vehicular Crash history was obtained from 2010 to 2016. The study area saw 24 vehicle-to-vehicle crashes, from Garfield Street to South Otis Street. The majority of the crashes occurred in dry weather, in the daylight. They were mostly turning and angle type crashes. Most crashes resulted in only property damage, and none of these crashes had a fatality. This data is summarized in the table below. See *Attachment 05* for crash spot map and raw data for crashes from State Street to Fair Street.

Location	Number	Vehicular Crash Type				Lighting Condition		Pavement Condition			Injury Severity				
		Rear End	Angle	Turning	Sideswipe	Daylight	Darkness	Dry	Snow	Rain	Fatal	A-Injury	B-Injury	C-Injury	PD
Garfield	4	1	2		1	4		4				1			3
Whitman	6		3	3		5	1	5		1		1	1		4
N. Otis	8		3	5		2	6	8				1	1	1	5
S. Otis	6			5	1	5	1	5	1			1	1		4
Total	24	1	8	13	2	16	8	22	1	1	0	4	3	1	16
		4%	33%	54%	8%	67%	33%	92%	4%	4%	0%	17%	13%	4%	67%

There have been 7 vehicular-bike/pedestrian crashes along the IL Route 13 corridor (from Carbon to Fair) since 2012, with 2 fatalities. Most of the pedestrian accidents seemed to occur during darkness. Unfortunately, because of the speed, 72% of the crashes have severe consequences - 2 fatalities, and another 3 A-Injury crashes. See *Attachment 06* for crash location map and raw data on crashes from Carbon Street to Fair Street.

Location	Year	Type		Lighting Condition		Pavement Condition		Injury Severity			
		Pedestrian	Bicyclist	Daylight	Darkness	Dry	Wet	Fatal	A-Injury	B-Injury	C-Injury
W of Russel	2015	1			1	1		1			
Russel	2015	1			1	1				1	
Russel	2016	1		1		1					1
Johnson	2018	1			1	1			1		
Court	2012	1			1		1	1			
Glendale	2015		1		1	1			1		
Fair	2016	1			1	1			1		
Total		6	1	1	6	6	1	2	3	1	1
		86%	14%	14%	86%	86%	14%	29%	43%	14%	14%

STAKEHOLDER INVOLVEMENT

Throughout this study, conversations were held with various stakeholders and those are summarized below. Overall, everyone seemed aware that they are a lot of pedestrian crossings from the ball fields at the city park to the convenience store on Otis. It appears the various concession stands at the park (ball fields, Goofy Golf, and swimming pool) do not have the options, hot food, hours, competitive pricing, and/or capacity for large crowds. These factors

are drawing the patrons to the convenience store. Most people thought the crossings would continue into the future. For a complete summary see [Attachment 07](#)

[Swimming Pool](#) – Swim patrons generally arrive by car (not pedestrians). They generally use the pool concession stand. They do not feel the highway crossing is a major issue for their patrons.

[Marlin's Swim Club](#) – Members generally dropped off via car. Snacks are not needed for early morning practices. Swim meets are held on weekends. Again, arrival is by car. Teams generally bring coolers and picnic in the park. They do not feel the highway crossing is a major issue for them.

[Youth Sport Organization](#) – Participants generally dropped off via car. Concessions are not open during practices (only during ball games). Aware there is pedestrian traffic to the convenience store.

[Goofy Golf](#) – Owner has observed much foot traffic across the highway to convenience store. His business offers soda and candy as concessions. However, he feels the Huck's offers items not available in the park such as pizza and other hot food as well as very inexpensive drinks with ice.

[Huck's Convenience Store](#) – Management agrees there is foot traffic to their store, and they are interested in cooperating with the project. If pedestrian at-grade crossing is constructed with a median, they are concerned about a decrease in vehicular access to their property from IL Route 13.

[Jefferson School](#) – Not many kids cross the highway to get to this school. They do like to take classes to the park for outings, however, the logistics of getting across the highway make it difficult to do.

[Lincoln School](#) – Again, not many kids cross the highway to get to this school, but a few could. There was a recent Safe Routes to School Project in the area, but it did not address crossing IL Route 13 in the study area. If they do take excursions to the park, they do not have to cross the highway. The principal does not feel the highway crossing is a major issue for their students.

[Marion Park District](#) – Large tournaments are held multiple weekends during spring/summer. Concessions are through a leasing arrangement (not directly by Park District). Park is constructing an accessible play area during 2018. They do not have much park space to dedicate to long earthen ramps for bridge or tunnel options.

[IDOT District 9](#) - Due to the high ADT and speeds, the District had concerns with any non-signalized crossing of IL Route 13, because any crossing enhancements would give a false sense of security. While IDOT prefers to direct pedestrians to signalized intersections (825' away), they have agreed to support a mid-block crossing with proper safety enhancements.

[City of Marion](#) – As study sponsor, they have attended many of the stakeholder meetings.

DESIGN STANDARDS

Below are various design standards and descriptions for the pedestrian safety measures considered within this study. These safety measures can be considered standalone, or in conjunction with others.

Pedestrian Bridges

Bridge design must follow AASHTO LRFD Guide Specifications for Design of Pedestrian Bridges. Some notable criteria include:

- Minimum Vertical Clearance over roadways = 17.25'
- Minimum width = 6' for walkway only; 10' for shared bicycle/walkway
- Design for 90 psf (unfactored) pedestrian live load and H-5 or H-10 vehicles depending on width of bridge.
- Piers within 30 feet of the edge of roadways with relatively high ADTT must be designed to resist a 600-kip vehicular collision force or protected by an embankment or Test Level 5 barrier either 4.5' or 3.5' high. The height depends on the distance between the barrier and the pier.
- Railings on bridges over roadways designed to prevent object being thrown to roadway below. Generally, 9' tall with top portion curved inward and extending approximately 2' from the inside face of the post (IDOT Railing Standard R-33).
- Walk surfaces meet ADA, with maximum continuous running slope of 5%. Grades as steep as 8.3% can be used if a 5' long landing is provided between each 30' long ramp.



Pedestrian Tunnels

Tunnel design must follow AASHTO LRFD Bridge Design Specifications. Some notable criteria include:

- Minimum vertical clearance for tunnel = 8' with preferred of 10'
- Minimum width = 10'
- Walk surfaces meet ADA, with maximum continuous running slope of 5%. Grades as steep as 8.3% can be used if a 5' long landings is provided between each 30' long ramp.
- Lighting preferred since closed tunnel length would be minimum of 75'
- Drainage sump pit and pump required due to proximity of drainage ditch and water levels
- Underground Utilities will be "cut off" by construction of the tunnel. Therefore, utilities would be rerouted either deeper or outside of the influence area of the ramp excavation
- If precast box culvert segments are used to construct tunnel, joints would be waterproofed and an HMA wearing surface on top of the bottom slab is recommended.



- If top slab of tunnel is exposed to traffic to minimize the depth of the tunnel, cast-in-place construction and approach slabs would be required.

Marked Crosswalk

Preferred pedestrian crossing location indicated by pavement markings on the pavement, which can be provided at roadway intersections or at midblock locations. Vehicles are legally required to stop for a pedestrian in a marked crosswalk. However, marked crosswalks must also provide clearly visible warning and adequate sight distance to allow vehicles adequate time to stop.



Typical Marked Crosswalk

- Stopping Sight Distance = 8 x posted speed limit
- Detectable warning surfaces at the edges of the sidewalk ramps
- Designed in accordance with ADA and PROWAG

Median Refuge Island

Raised curbing provided in the middle of a roadway, which protects an accessible pathway. Allows pedestrians to cross one direction of traffic lanes at a time, with a relatively safe location to wait for a gap in the opposing traffic lanes before completing their crossing. These typically have marked crosswalk on either side of the island and advanced warning signage. May be incorporated with other safety enhancements such as traffic signals or flashing beacons.



Typical Median Refuge Island Refuge Island

- Desired width (perpendicular to roadway) = 10' to accommodate a bicycle with a trailer
- Minimum width (parallel to roadway) = 6'
- Detectable warning surfaces at the edges of the sidewalk ramps and the refuge island
- Designed in accordance with ADA and PROWAG

Rectangular Rapid Flashing Beacons (RRFB)

Remains dark (unlit) until a pedestrian activates the system by pressing a push button. The lights then flash brightly in a random pattern for a set period of time. A RRFB can be used only for marked crosswalks, and are designed in accordance with MUTCD. RRFBs do not legally require a vehicle to stop, but only warn vehicles of a crossing pedestrian.



Typical Rectangular Rapid Flashing Beacon

Pedestrian Hybrid Beacon or High-Intensity Activated Crosswalk (HAWK)

Remains dark (unlit) until a pedestrian activates the system by pressing a push button. The lights flash yellow then solid red to indicate traffic is to come to a full stop. It was developed for high-pedestrian, high-speed, and/or wide-crossing conditions, and is considered an intermediate option between RRFBs and a full traffic signal, stopping road traffic only as needed. The MUTCD gives various warrants that must be met before a HAWK signal can be added to a state highway. A HAWK beacon can be used only for marked crosswalks, and are designed in accordance with MUTCD.



Typical HAWK Signal

Traffic signals

Traffic signals are in constant operation, directing opposing vehicular traffic movements by means of colored lights, usually placed at crossroads, to control the flow of traffic. Traffic signals also provide for safe crossing for pedestrians, and pedestrian phasing can be incorporated into signal timing, along with pedestrian push buttons and marked crosswalks. The MUTCD gives various warrants that must be met before a traffic signal can be added to a state highway.



Typical Traffic Signal with Pedestrian Head

SUMMARY OF MUTCD WARRANTS

The Manual on Uniform Traffic *Control* Devices for Streets and Highways (MUTCD) defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel. IDOT will require the following warrants to be met before allowing signals in their right-of-way.

Warrants for signals – Traffic signals are an effective way to provide for safe crossing for pedestrians. However, whenever a traffic signal is added to a roadway, this increases the possibility for vehicular crashes, especially for rear-end type crashes. The MUTCD gives various warrants that must be met before a traffic signal can be added to a state highway. These warrants were studied using average daily pedestrian counts. For this study, the warrants for standard traffic signals (with pedestrian push buttons) was not met for either the 4-hour or the 1-hour criteria.

Warrants for HAWK signal – Again, HAWK signals can be an effective way to provide safer crossing for pedestrians. For typical day of this study, warrants were not met. However, using the high-traffic tournament days, the warrants are met for multiple hours of those days. Since this condition only occurs 5-10 weekends a year, this will not be sufficient to allow for the installation of this signal type.

Warrants for Refuge Islands - The warrants for a refuge island were also studied. These warrants are met. This option will be discussed further in the report.

See *Attachment 08* for a full analysis of these warrants.

TECHNICAL RESOURCES FOR UNSIGNALIZED PEDESTRIAN CROSSINGS

A few relevant studies on unsignalized pedestrian crossings became available during our study. These were reviewed and relevant information is summarized below:

[Champaign-Urbana Pedestrian Crossing Enhancement Guidelines](#) (Sept 2017) by Champaign County Regional Planning Commission

- A crosswalk should only be installed at an uncontrolled location when sufficient demand exists to justify its installation.
- A design table is provided to assist with decision making for various types of roadway crossings (See *Attachment 09*)

[Establishing Procedures and Guidelines for Pedestrian Treatments at Uncontrolled Locations](#) (Aug 2017) by Illinois Center for Transportation, written by Southern Illinois University Edwardsville and Auburn University staff. The paper also includes a Guidelines Document.

- Pedestrians are the most vulnerable users of our surface-transportation system. When they cross at uncontrolled midblock locations or unsignalized intersections, the collision and severe injury risks to them are much higher than at signalized intersections. It is critical to select pedestrian-crossing sites and treatments properly at uncontrolled locations to ensure pedestrians' safety. Currently, no systematic guidelines regarding pedestrian-treatment implementation at uncontrolled locations in Illinois are available. To address this need, IDOT initiated this research study to develop procedures and guidelines for pedestrian-crossing treatments at uncontrolled locations.
- An Illinois guidebook for improving pedestrian safety at uncontrolled locations was developed as part of this document. It is intended to supplement, not to replace or supersede, existing standards and manuals
- A design table was provided to assist with decision making for various types of roadway crossings (See *Attachment 10*)

Additionally, FHWA has a treasure trove of pedestrian safety information on its website. Below are a few of the more notable items:

[Guide for Improving Pedestrian Safety at Uncontrolled Crossing](#) Locations (2017) by FHWA

- By focusing on uncontrolled crossing locations, agencies can address a significant national safety problem and improve quality of life
- Comprehensive matrix lists roadway features vs. suggested safety countermeasures based on safety research, best practices, and established national guidelines (see *Attachment 11*)

FHWA's [Safe Transportation for Every Pedestrian](#) (STEP) Initiative promotes cost effective countermeasures that can be easily deployed.

- Pedestrians account for over 17.5 percent of all fatalities in motor vehicle traffic crashes, and the majority of these deaths occur at uncontrolled crossing locations such as mid-block or un-signalized intersections. These are among the most common locations for pedestrian fatalities generally because of inadequate pedestrian *crossing facilities* and

insufficient or inconvenient *crossing opportunities*, all of which create barriers to safe, convenient, and complete pedestrian networks.

- Expecting pedestrians to travel significantly out of their way to cross a roadway to reach their destination is unrealistic.
- By focusing on uncontrolled locations, agencies can address a significant national safety problem and improve quality of life for pedestrians of all ages and abilities.
- Focus on five main countermeasures. (Note three of these are applicable to this project):
 - Crosswalk visibility enhancements
 - Raised crosswalk
 - Pedestrian refuge island
 - Pedestrian Hybrid Beacon (PHB)
 - Road Diet

Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations (Sept 2005)
by FHWA

- Crosswalk markings should not be used at all intersections. “At uncontrolled pedestrian crossing locations, installing marked crosswalks should not be regarded as a magic cure for pedestrian safety problems.”
- Raised medians provided significantly lower pedestrian crash rates on multilane roads, compared to roads with no raised median.
- For multilane roads with traffic volumes above about 12,000 vehicles per day, having a marked crosswalk alone (without other substantial improvements) was associated with a higher pedestrian crash rate compared to an unmarked crosswalk.

Many other sources exist as well. All the sources cited are converging on the same basic solution, which should be implemented in ONE safety package, not piecemealed together. For a 5-lane roadway, with a striped median, 35mph, ADT>15,0000, at a minimum provide:

- ✓ Marked High-visibility Crosswalk
- ✓ Median Refuge Island
- ✓ Advanced Warning Signage
- ✓ Rectangular Rapid Flashing Beacon

DESCRIPTION OF DESIGN OPTIONS

Ultimately, four options were considered and studied which provide for safer pedestrian crossing of IL Route 13. Each of option is summarized below. For each of these options, the pros, cons, and various impacts have been determined, as well as development of a detailed aerial view and a cost estimate. See *Attachment 12* for these detailed items.

Option 1 – Pedestrian Bridge over IL Route 13



The pedestrian bridge option provides for complete separation of pedestrians and vehicles. Additionally, once constructed, the bridge will not impact the traffic flow on IL Route 13 in any way. The overpass option will need 17'-3" clearance over IL Route 13. A 115' long pedestrian truss structure will span the highway and provide necessary clearance zones between the roadway and the bridge piers. It is assumed the width of the bridge would be 10' minimum. A 350' long earthen approach ramp to the north will provide access into Ray Fosse Park.

Dual 350' approach ramps (for EB and WB foot traffic) will be provided on the south side of the highway. Note these ramps will be in lieu of the existing at-grade sidewalk, so pedestrians walking continuously along IL Route 13 will have to transverse up the approach ramp and back down as the sidewalk will no longer fit within the right-of-way. Approaches must be at no more than 5% grade to meet ADA requirements, making the approaches at least 350' long—nearly a block's length. Additionally, a 75' long pedestrian truss over Washington Street could be added before the approach ramp to maintain access for that side street. The fencing/handrail for the pedestrian structure will need to have overhead arches per IDOT policy to prevent items from being thrown down to traffic below.

The bridge option impacts the surroundings in many ways:

- Access to IL Route 13 will be cut off for Whitman Street and the alley between Garfield and Washington. Must determine alternate access.
- Significant commercial property access impacts on south side of IL Route 13 (Land acquisition from 7 commercial parcels, plus damages for loss of IL 13 access)
- Park property affected (likely Section 4(f) property)
- Aerial power lines to be buried or relocated to north side of roadway, beyond ramp in park
- Possible other minor utility adjustments

Studies have shown that adverse travel can be an impediment to bridge use if approach ramps are not properly placed in their surroundings. For this project, the adverse travel distance is 620' (0.12 miles), and with the large vertical rise, conditions may discourage use. Most pedestrians will not voluntarily accept the added inconvenience of this additional travel length to their trip.

The overpass structure provides for the possibility of a “signature” structure in this area of town, and is a real opportunity to have a welcoming presence through signage or other features on the bridge. The total cost for this option was estimated at \$3,617,000. See [Attachment 12.1](#) for aerials, cost estimates, and other information.

Option 2 – Tunnel Under IL Route 13



The tunnel (underpass) option also provides for complete separation of pedestrians and vehicles. Additionally, once constructed, the bridge will not impact the traffic flow on IL Route 13 in any way. The tunnel will have 8' minimum vertical clearance and be 10' wide. The top slab should be at least 1' below the pavement, to protect top slab from salts. This makes the walking surface approximately 9' to 10' below the highway surface.

The tunnel would be approximately 80' with a 350' long earthen approach ramp cut into the park with 1:3 sideslopes. 240' long vertical retaining walls will enclose sidewalk approach ramps on south side of roadway, which will replace the at-grade sidewalk.

The tunnel would be in close proximity to a drainage tributary which runs under IL Route 13 and through Roy Fosse Park. It drains approximately 250 acres and is known for flooding. The flowline of the creek is 6' to 7' higher than the proposed bottom of the tunnel, so the surface will likely remain damp. The ramps and the tunnel itself will require a drainage system and sump pump. This system would need a back-up source of power.



Drainage Culvert under IL Route 13 at Park. Tunnel would be east of this.

Because access will be limited, safety will be some concern. Due to the 90-degree corners in the traveled way, there will be “blind” areas. Lighting should be considered due to the length of the tunnel.

The tunnel option impacts the surroundings in many ways:

- Access to IL Route 13 will be cut off for Washington Street
- Storm sewer line on north and south side of roadway will be interrupted. May be able to reroute piping to gravity drain to drainage ditch in park.
- Storm sump pump will be required for tunnel drainage, and will require perpetual power and maintenance
- Gas, water, and communication utility adjustments required
- Commercial property easements required from 7 commercial parcels on south side of roadway
- Park property affected (likely Section 4(f) property)

Because the tunnel is located at the same position in the park, the adverse travel distance is the same. It is thought this could limit its usefulness to the community. The total cost for this option was estimated at \$ 1,105,000. See [Attachment 12.2](#) for aerials, cost estimates, and other information.

Option 3 – At-Grade crossing with IL Route 13



Pedestrians can only cross IL Route 13 at Garfield and Otis Street since there is continuous fence along the entire length of the park. An at-grade crossing concept ([Option 3A](#)) was developed mid-block of the park to be accessible to both Garfield and Otis Street pedestrians. The crossing has continental (zebra) pavement markings, a raised refuge island built within width of existing bi-directional turn lane, and 4 Pedestrian activated flashing beacons (for each direction of travel, in advance of crossing as well as on median surface) with push buttons. See [Attachment 12.3, Option 3A](#).

It is located approximately 220’ west of Otis Street, and is positioned to allow for EB left turning movements into the park, as well as WB left turning movements onto Whitman and Washington. The location was chosen to be closer to Otis, as that location was considered more critical. Sidewalk would need to be provided the entire length of the park on the north side of IL Route 13, to allow for access from Garfield as well. While it does provide for safe crossing, there was concern the adverse travel distance of 440’ to cross Otis Street would be too big of an impediment.

[Option 3B](#) was developed on the west side of the Otis Street intersection. This location eliminates the adverse travel issue, but because of its proximity to the intersection, it also eliminates EB left turning movements into the park, forcing north Otis to become only RIRO or one-way south. Because the Park District indicated this was the major entry point for ball diamonds, there was concern about the traffic movements for ball games and tournaments. The traffic counts from Otis were re-routed into the following system and analyzed:

- Both Clark and Otis to change their direction from one-way west and north, to one-way east and south. This would also require the diagonal parking stalls on Otis to be restriped for the other direction of travel – See [Attachment 12.3, Option 3B](#).
- Traffic simulations were run for tournament day traffic, with Garfield accepting all NB turns (both Otis and Garfield traffic). This model did not result in backups forming on IL Route 13 waiting to turn north into Garfield.

However, the Park District and the City thought the disruption would be too severe. Therefore, Option 3C was also developed for the east side of the Otis Street intersection. This does have about 50' of adverse travel assuming the destination is the front door of the Huck's convenience store, but that is within the range of acceptable distances. This option is located so that EB vehicles will be able to utilize the center turn lane to turn left into the park, however it impacts Huck's center access point. See *Attachment 12.3, 3C*.

The potential for pedestrian-vehicular conflict still exists for all three of the at-grade options. There will be minor disruption for left turning vehicles on IL Route 13, as the continuous bi-directional turn lane will be truncated at the refuge island and IL 13 vehicles must become aware of pedestrians crossing at crosswalk. However, all at-grade options allow pedestrians ability to cross one direction of travel at a time. No additional right-of-way is required, nor would major utility adjustments be required. The cost for Option 3 ranges from \$156,000 - \$172,000 - See *Attachment 12.3*.



Location of Existing Crosswalk at Garfield Street

An additional issue for the at-grade crossing option is that IDOT has made it clear they will only allow ONE unsignalized, marked crossing between the signals at State and Fair Streets. There is an existing crossing at the west end of the park, near the aquatic center. The pavement markings for the crossing are nearly worn through and no curb ramp exists at the NE quadrant. Advance warning signs for are in place for this crossing. If any of these at-grade options are implemented, IDOT will force the elimination of this existing crossing.

Option 4 – Extend IL Route 13 Sidewalk and Enhance Traffic Signals at State & Fair Streets



Provide continuous sidewalk corridor on both sides of the roadway between upgraded signalized intersections, where a safe crossing can occur. This option was suggested to be added to this study by IDOT. The traffic signals at State Street have recently been upgraded for pedestrian push buttons and painted crosswalks were added. Fair Street traffic signals currently have no pedestrian accommodations and would have to be updated. No sidewalk exists on north side of roadway, so 2500' of sidewalk would be necessary. Sidewalk is generally in place on south side of IL Route 13, but may need spot ADA upgrades.

This option would likely not require additional right-of-way, and would have minimal utility conflicts (except at Fair Street intersection). There would be no change in IL Route 13 traffic patterns, besides adjusted signal timings when pedestrian button was activated.

There are significant adverse travel distances (2 blocks each direction - 1650' or 0.31 miles) and it is highly unlikely anyone crossing IL Route 13 at Otis or Garfield would proceed this far to Fair or State Street to cross the roadway, so unsafe crossings will likely continue at same locations. Technically it does give a safe location to cross the highway, but potential for pedestrian-vehicular conflict still exists even at traffic signals. The total cost for this option was estimated at \$415,000 See *Attachment 12.4*.

RECOMMENDED ALTERNATE

After consultation with SIMPO, the City of Marion, and IDOT District 9, it was determined the at-grade option was the preferred alternate (See *Attachment 12.3*). The exact location of the at-grade crossing will be determined during Phase I Engineering and in consultation with adjacent

property owners. There are three different crossing locations that are feasible, as described below:

- 200' west of Otis (3A) – this option minimizes property and turn lane impacts. However, it has a long adverse travel distance, which would reduce the likelihood of it being used by pedestrians at either Otis or Garfield.
- Just west of Otis (3B) – this option is the most likely to be used, because it is in the location where the most pedestrian crossings occur today. It also minimizes impacts to the Huck's convenience store property. However, it does eliminate the possibility of EB IL Route 13 turning north into the park at Otis, which is a major access point to the park.
- Just east of Otis (3C) – this option is at the same intersection where pedestrian crossings occur today. This option impacts the Huck's convenience store property the most, as it closes the entrance right in front of the gas pumps. It appears it can be located to minimize the impact to EB IL Route 13 left turning traffic to Otis.

This alternate will have a cost from \$156,000 - \$172,000, depending on the exact location and the final scope of the improvement.

As a summary, the safety features that would be included are:

- Advance signage with retroreflective-mounting posts
- Marked, high-visibility crosswalk
- Raised refuge island
- Rectangular rapid flashing beacons
- Consider additional street lighting at crossing point, depending on final location and existing lighting conditions

FUNDING SOURCES

For any potential project, Marion would likely be sponsor. IDOT may consider assisting Marion with the local match since the roadway is IDOT jurisdiction. The following programs are available for these types of projects:

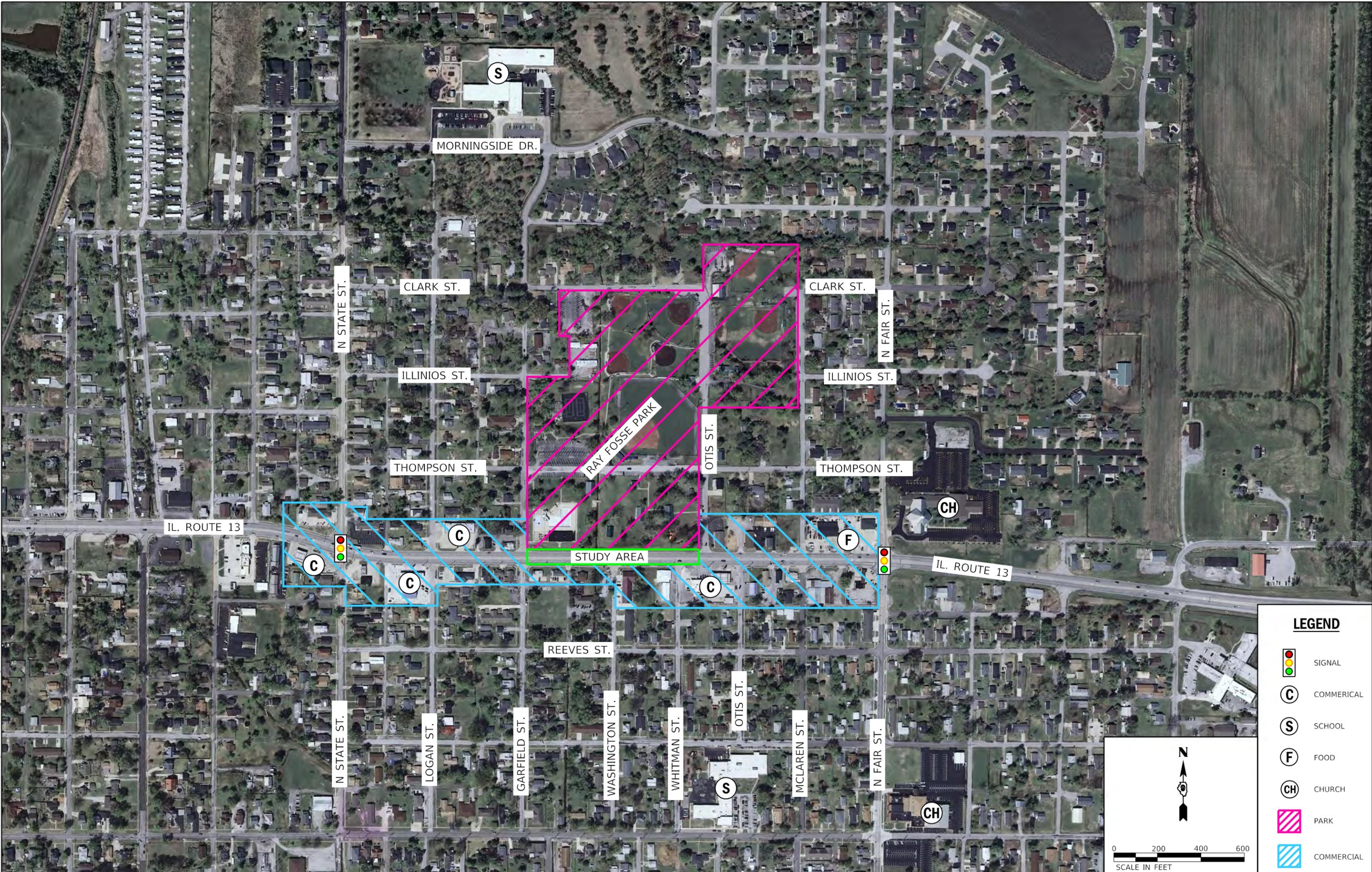
- Federal Safety (90%). HSIP Applications in early spring. Statewide competitive grant that is data driven, will require analysis for application.
- Federal STP (80%). Applications in September. Competitive grant within the SIMPO boundary for the preservation and improvement of the transportation system, including bicycle and pedestrian infrastructure.
- Federal ITEP (80%). Applications every year or two, no certain schedule. Promotes and develops alternative transportation options. Statewide competitive grant focuses on improving the cultural, historic, aesthetic and environmental aspects of transportation infrastructure.
- Federal SRTS (80% - 100%). Applications every year or two, no certain schedule. Enables and encourages children to walk and/or bike to school, making these options

more appealing, and reduce fuel consumption and air pollution in the vicinity of schools. Must be within 2 miles of a primary or middle school.

ADJACENT PROJECTS

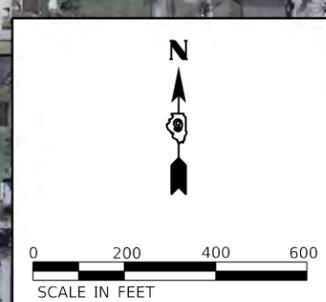
- Marion – Construct sidewalk on north side of highway between State and Fair Streets, and upgrade traffic signal at Fair Street to accommodate pedestrians (presented as Option 4 in this report). Approved in 2018 STU for 2021 Construction.
- IDOT - Overlay IL Route 13, from IL 37 (Court St) to Old IL 13 (Main St/Norman Rd) in Marion. Project in 2020-2025 MYP, but currently planned for FY 2020.

ATTACHMENT 01
OVERALL STUDY AREA



LEGEND

- SIGNAL
- COMMERCIAL
- SCHOOL
- FOOD
- CHURCH
- PARK
- COMMERCIAL



MODEL: Default
 FILE NAME: P:\1703994_CADD - DWG\4.7_Traffic\1703994-CADD-01_StudyArea.dwg

USER NAME = jstein	DESIGNED - _____	REVISED - _____
DRAWN - _____	REVISED - _____	
PLOT SCALE = 400,0000' / in.	CHECKED - _____	REVISED - _____
PLOT DATE = 11/18/2018	DATE - _____	REVISED - _____

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**ATTACHMENT 01
PROJECT STUDY AREA**

SCALE: _____ SHEET _____ OF _____ SHEETS STA. _____ TO STA. _____

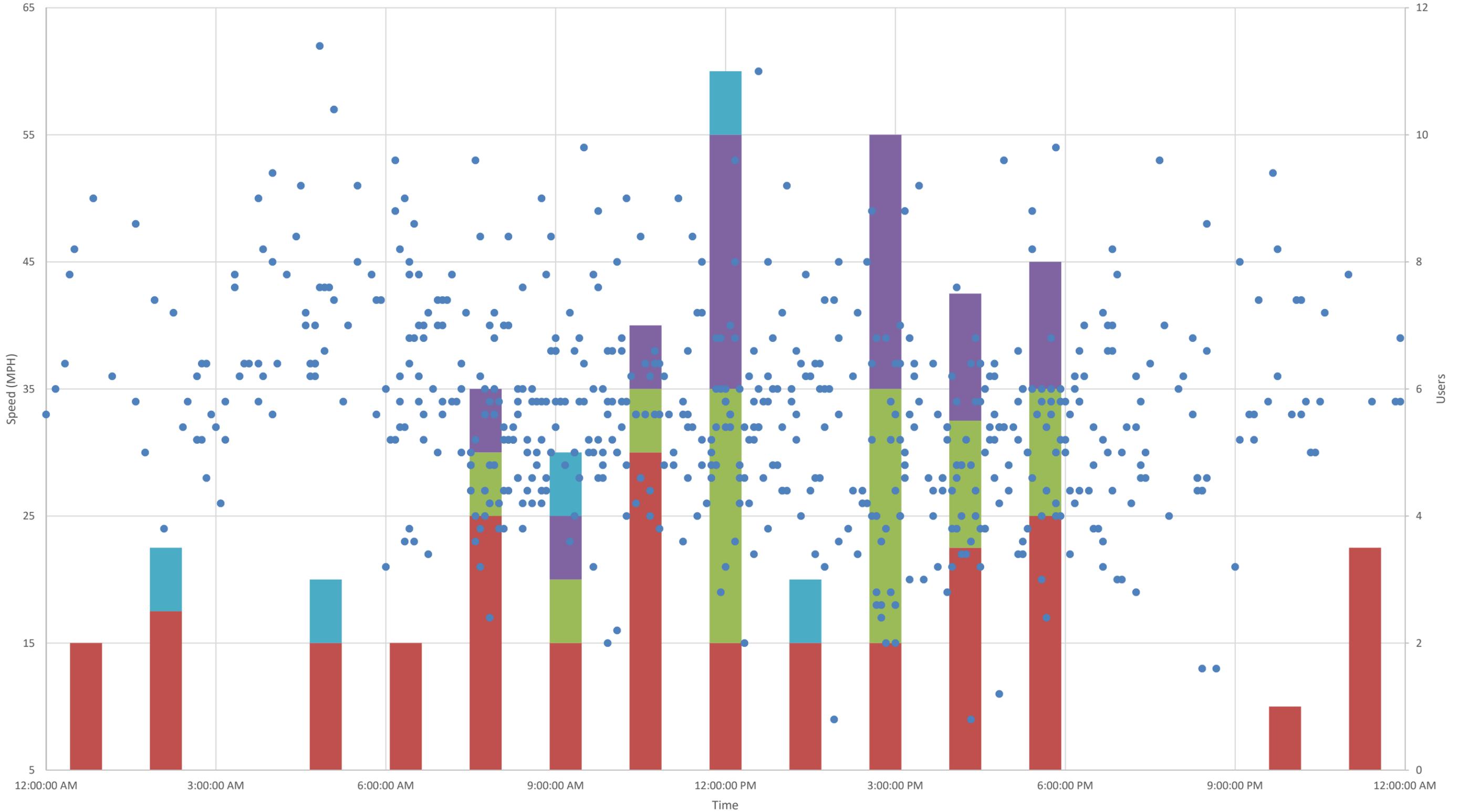
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CONTRACT NO. _____				
ILLINOIS FED. AID PROJECT				

ATTACHMENT 02

SPEED DATA

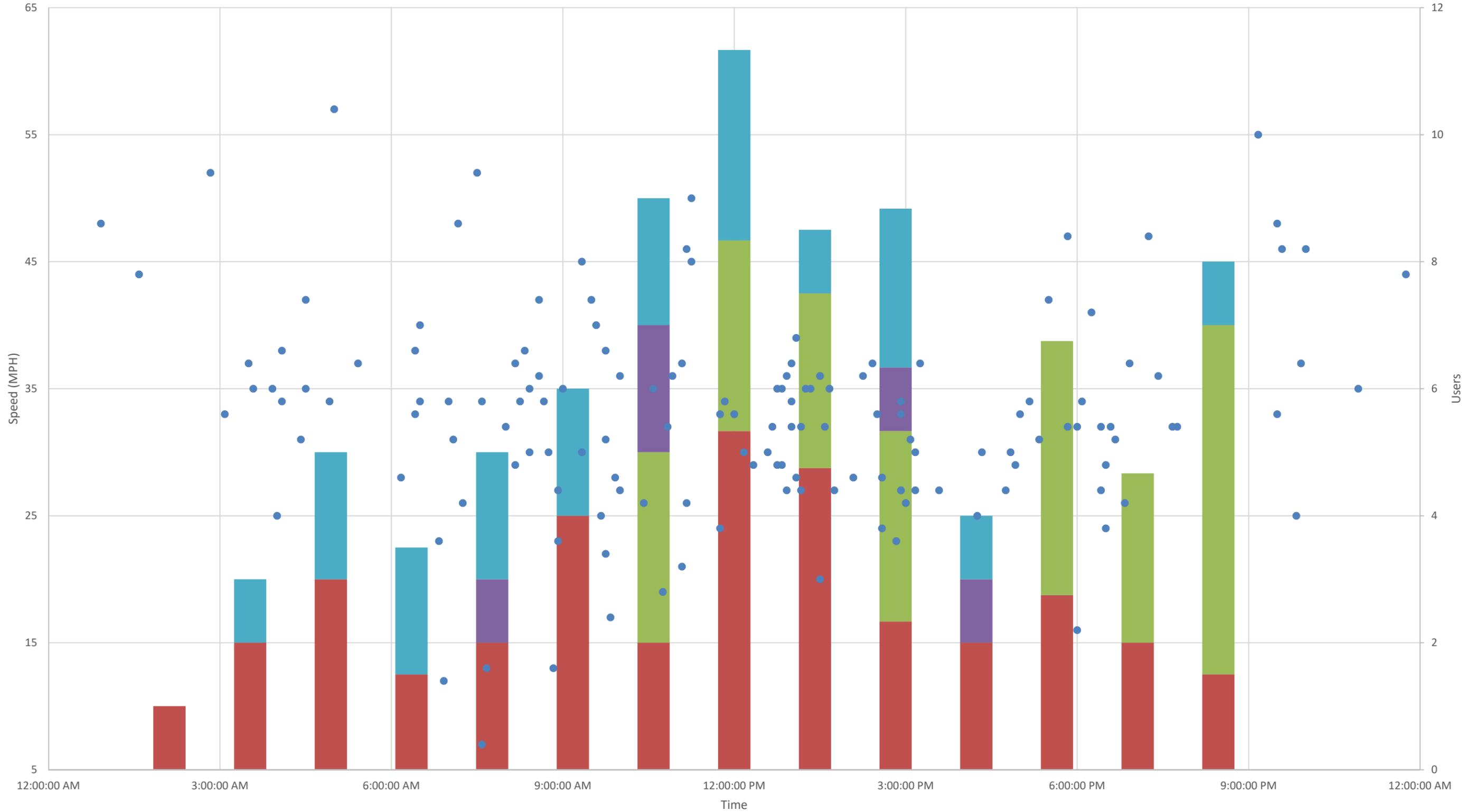
24-Hr Avg. Weekday

■ Adult Peds. ■ Children (under 12) ■ Wheel Chairs ■ Bikes ● Speed Data Point



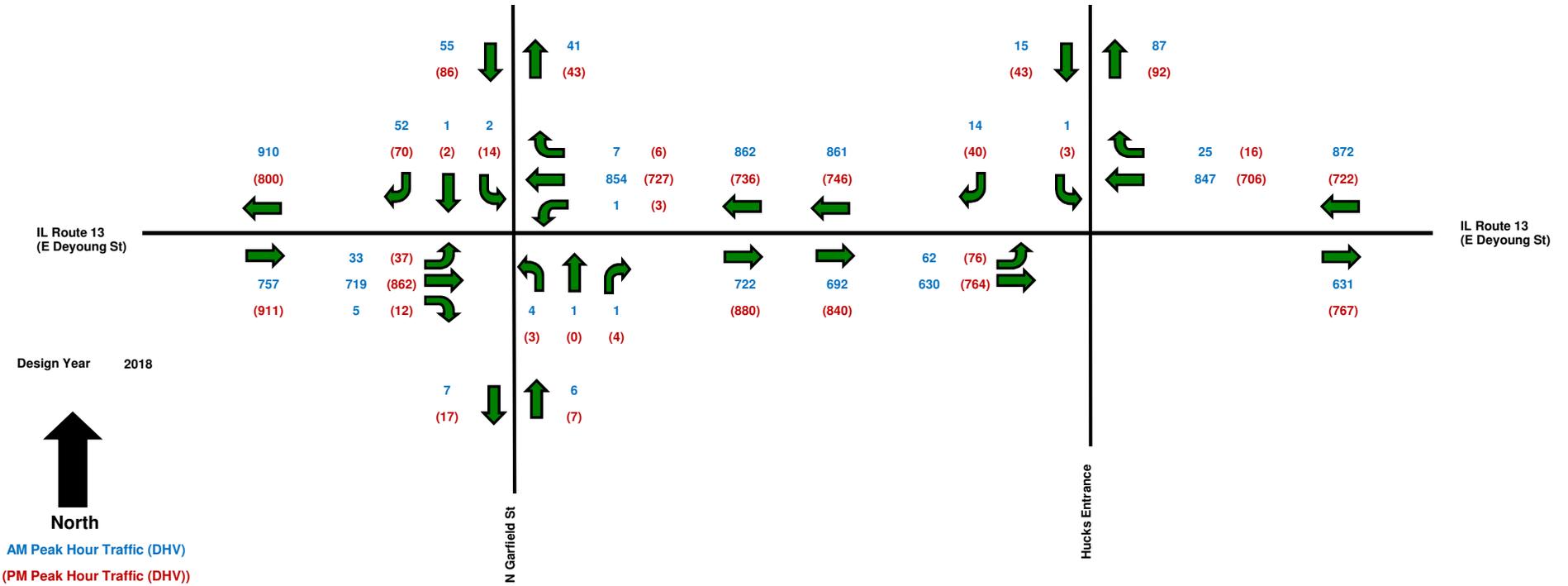
24-Hr Avg. Weekend

■ Adult Peds. ■ Children (under 12) ■ Wheel Chairs ■ Bikes ● Speed Data Point



ATTACHMENT 03
TRAFFIC COUNTS

Existing Traffic
 Otis St. Garfield St.
 w/ IL Route 13



ATTACHMENT 04
PEDESTRIAN COUNTS

Numbers are 24 hour continuous counts

PPD = People per Day
 PPH = People per Hour

Both include Bikes in total

OTIS		<u>Crossing IL 13 at Otis</u>		
2018		<u>Bikes</u>	<u>PPD</u>	<u>Max PPH</u>
Fri	4/27/2018	n/a	23	10
Sat	4/28/2018	n/a	195	41, 36, 25
Sun	4/29/2018	n/a	71	19, 15
Fri	5/4/2018	n/a	16	6
Sat	5/5/2018	n/a	75	17, 12
Sun	5/6/2018	n/a	63	19
Tues	8/28/2018	2	23	6
Wed	8/29/2018	0	9	6
2018 Average			59	
2018 Average Tournament			101	
2018 Average Non-Tourn			18	
2017				
Thur	6/29/2017	3	41	9
Fri	6/30/2017	3	36	6
Sat	9/9/2017	11	46	10, 9
Sun	9/10/2017	4	32	6
Sat	9/16/2017	7	45	11, 9, 9
Sun	9/17/2017	8	35	8
2017 Average			6	39
2017 Average Tournament			46	
2017 Average Non-Tourn			36	
Overall Average			51	
Average Tournament			83	
Average Non-Tourn			27	

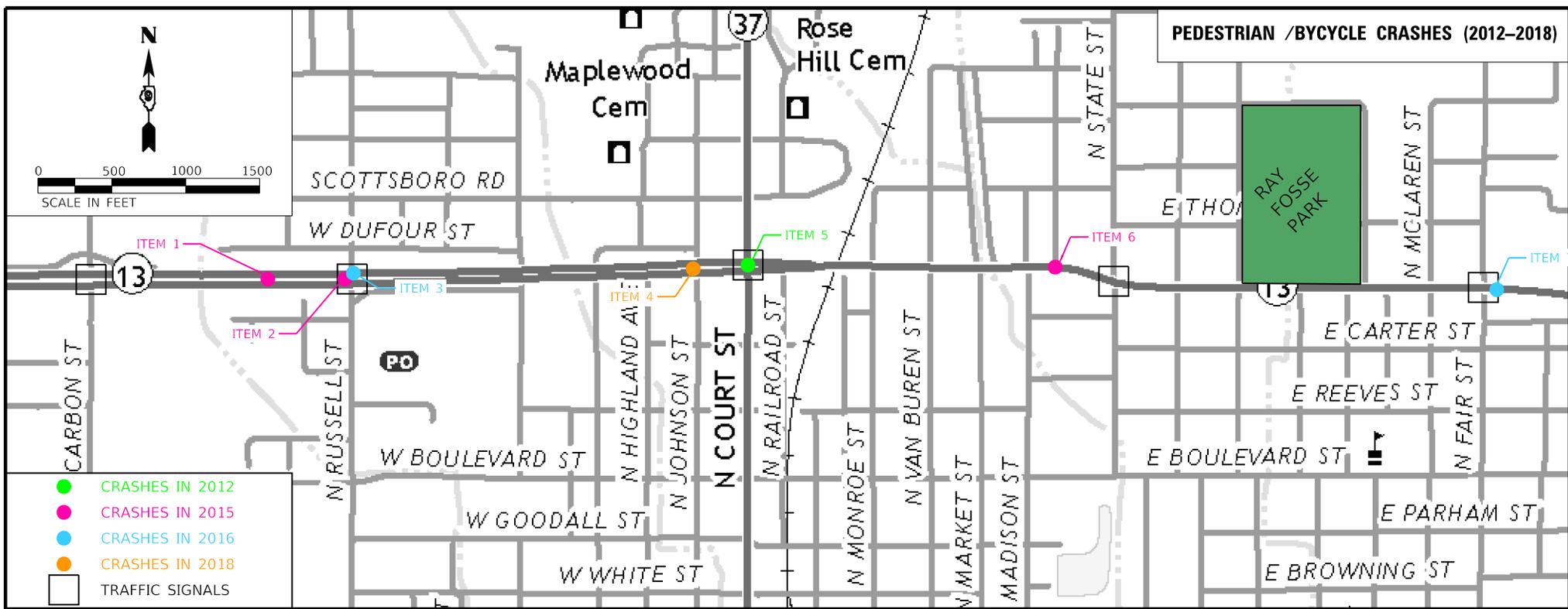
tournament
 tournament
 tournament
 tournament
 no school crossings
 rainy, no school crossings

GARFIELD		<u>Crossing IL 13 at Garfield</u>			<u>Crossing Garfield (E-W)</u>		
2018		<u>Bikes</u>	<u>PPD</u>	<u>Max PPH</u>	S - IL 13	N - IL 13	Thompson
Fri	4/27/2018		15	6	3	2	4
Sat	4/28/2018		24	9	11	8	0
Sun	4/29/2018		10	4	1	2	1
Fri	5/4/2018		5	6	6	1	3
Sat	5/5/2018		8	4			15
Sun	5/6/2018		7	6	2	3	46
Tues	8/28/2018		5	1			
Wed	8/29/2018		2	1			
2018 Average Tournament			12		4	3	12
2018 Average Non-Tourn			7				
Fri	7/7/2017	2	7	4			
Sat	7/8/2017	1	9	2			
2017 Average			2	8			
Overall Average			9				
Average Tournament			12				
Average Non-Tourn			7				

tournament
 tournament
 tournament
 tournament
 no school crossings
 rainy, no school crossings

ATTACHMENT 05
VEHICLE CRASH
SPOT MAP

ATTACHMENT 06
PEDESTRIAN CRASH
SPOT MAP



ITEM NO.	CASE ID	YEAR	INJURIES	INJURIES TYPE	FATALITIES	COLLISION TYPE	WEATHER	LIGHTING	VEH1 MANUV	EXCEED SPEED	CELL PHONE USE
1	201501106672	2015	0	FATAL	1	PEDESTRIAN	CLEAR	DARKNESS	N/A	NO	NO
2	201501300167	2015	1	B-INJURY	0	PEDESTRIAN	CLEAR	DARKNESS LIGHTED ROAD	CHANGING LANES	NO	NO
3	201601291524	2016	2	C-INJURY	0	PEDESTRIAN	CLEAR	DAYLIGHT	SLOW/STOP LEFT-TURN	NO	NO
4	201801030533	2018	1	A-INJURY	0	PEDESTRIAN	CLEAR	DARKNESS	N/A	NO	NO
5	201201292401	2012	0	FATAL	1	PEDESTRIAN	RAIN	DARKNESS LIGHTED ROAD	N/A	NO	NO
6	201501248783	2015	1	A-INJURY	0	PEDALCYCLIST	CLEAR	DARKNESS	N/A	NO	NO
7	201601149535	2016	1	A-INJURY	0	PEDESTRIAN	CLEAR	DARKNESS	STRAIGHT AHEAD	YES	NO

ATTACHMENT 07
STAKEHOLDER MEETINGS
SUMMARY

Stakeholder Involvement

2017-09-12 Kick off Meeting

Jack Reed (Marion Park Dist), Doug Phillips (City of Marion)

- Garfield became a marked cross walk 6-7 years ago
- Proposed Casey's Store at Logan Street will likely have an impact to the pedestrian traffic in the area
- Inclusive Playground area coming to Ray Fosse Park
- Concession stands at the Park are leased out

2017-Sept Individual Stakeholder Phone Calls

9/15 Christy Underwood (Marlins Swim Team and Swimming Pool Manager)

- Swim Club members are mostly dropped off in cars
- For swim meets, teams generally bring coolers and blankets and just picnic in the park
- For regular pool hours (Wed-Sun), the pool concession stand seems to keep everyone happy. She doesn't notice too many people leaving to go to Huck's for snacks.

9/15 Dayna Will (**Swimming Pool Assistant Manager, Marlins Swim Team, Baseball**)

- Concession stands at ball fields have very slow service, so it is faster to actually go somewhere else and come back than to wait in line
- Concession stand isn't open during practices, so kids go to Huck's for snacks or drinks. There is a vending machine, but it isn't always working. (Also, during games the concession stand puts a sign on machines that they are out of order so people will use the concession stand instead)
- She suggested if there is a flashing light at the crossing, it doesn't flash continuously, because it will be ignored eventually (mentioned flashing light out by Pepsi Plant)
- She agrees Swim Club and Pool don't really have patrons who cross IL 13 regularly

9/15 Nancy Deason (**Huck's Manager**)

- She agreed safety is an issue for pedestrians. Willing to meet to discuss in more detail.
- Suggested we also talk to Jefferson School, as they take outings to the park once in a while.

9/17 Kim Brave (**Jefferson School Principal**)

- School does like to do outings to Ray Fosse Park, but hard to get across IL 13 safely. Need extra adult volunteers for a typical class size, so doesn't happen very often.
- There are no longer has hearing impaired kids at the school.
- She is aware of baseball kids crossing IL 13 to get to Huck's for snacks.

9/17 Anthony Rinella (**Goofy Golf owner, also City of Marion council member**)

- Lincoln School is 2 blocks north of school, and biggest school. They built sidewalks near the park
- Golf is open daily in the summer, after 4pm. And weekends once school starts until mid-October. He offers soda and candy only.
- Pool concession open Wed-Sun in summer. Some pool patrons come over to Goofy Golf because his prices are cheaper.
- He said Huck's snacks are cheaper than the ball field concession stand, and kids react accordingly.
- When he was fire chief, he remembers Marion approached IDOT about a signal near this area for a new Fire Station, and it was not allowed.

9/17 John Fletcher (**Lincoln School Principal**)

- Lincoln School does have outings to the Park from time to time – easier because it is only a few blocks and they don't have to cross IL 13.
- IL 13 is supposed to be a school boundary line, but that can get blurred when new students enter the system they are assigned depending on existing class sizes, etc. not just home address. So kids do cross IL 13 to get to school.
- He mentioned a group called the *Walking and Riding Alliance* that was requesting a separated crossing on IL 13 back when their school sponsored a Safe Routes to School Grant. The Grant built sidewalks on Garfield, State, and Logan Streets. It also improved the signal at State Street.
- He is aware of baseball kids crossing IL 13 to get to Huck's for snacks.

2017-10-05 Stakeholder Meeting

Jack Reed (Marion Park Dist), Doug Phillips (City of Marion), Dave Clark (Youth Sport Org), Anthony Rinella (Goofy Golf owner)

- Proposed Casey's Store at Logan Street will likely have an impact to the pedestrian traffic in the area
- Reviewed the reported number of pedestrian accidents on IL 13 corridor
- Discussed various options for crossing IL 13 (bridge, tunnel, at-grade crosswalk)
- Inclusive Playground area coming to Ray Fosse Park
- Discussed the Concession Stands – offerings and hours

2017-12-04 Stakeholder Meeting

Carrie Nelson, Keith Miley, Travis Emery (IDOT D9)

- Reviewed data gathered to date (# ped crossings, etc)
- Discussed proposed Casey's Store at Logan Street will likely have an impact to the pedestrian traffic in the area
- Reviewed pedestrian generators in the area. Viewed existing video clips of typical pedestrian crossings
- Pedestrian crash data was reviewed (2 fatalities, 9 crashes since 2010). IDOT thought this may allow safety money to be used.
- Discussed Bridge, Tunnel, and at-grade options in detail. Various at-grade enhancements such as RRFB, refuge island, HAWK signals, etc were discussed. Warrants for traffic signals are NOT met.
- District had concerns due to high ADT and speeds, a non-signalized crossing may not be safe. They do not want pedestrians to have a false sense of security. They

are generally opposed to a mid-block crossing, and prefer to direct pedestrians to signalized intersections.

- IDOT encouraged an additional alternate of sidewalk on both sides of highway to State & Fair Streets, and upgrading signals at Fair Street to pedestrian push buttons (State has been recently updated).
- Study is planned to go on hold until ball season starts back up, to see the effect of the new Casey's Convenience Store on pedestrian traffic in the area.

2018-08-13 SIMPO Policy Committee Meeting

Carrie Nelson, Doug Keirn, Travis Emery (IDOT D9), Mayor Rinella (Marion), Bill Jung (RIDES Mass Transit), Joe Zdankiewicz, Cary Minnis (SIMPO)

- Newest pedestrian counts and accident presented. New convenience store does not seem to draw more pedestrians to Garfield – still large numbers at Otis. Highest daily count was 195 during large tournament day.
- Four Alternates presented (bridge, tunnel, at-grade, and continuous sidewalk & accessible traffic signals at State & Fair Street).
- Multiple alternates for at-grade were presented. Some of them impact the turning movements from IL 13 to NB Otis. TWM was asked to study this further to see if eliminating NB movements from Otis (and moving all NB park entrance movements to Garfield) had an adverse effect on traffic.
- TWM researched recently published studies. These all seem to point to a raised refuge island and flashing beacons as a proper application for a 5-lane, 35 mph, <20,000 ADT location for a crossing.
- IDOT has an overlay planned for IL 13 in FY 2020 -2025 MYP. They need to know if City wants to keep the existing (quite worn, barely visible) cross walk at Garfield. Cameras will be placed to count the number of children who are using this existing crossing to walk to school. IDOT will only allow ONE at-grade crossing in this area.
- IDOT agreed that an enhanced at-grade option at the Park has some merit.
- It was decided a Public Meeting was not necessary. Additional stakeholder meeting to be held with Marion park District and City to get their input.

2018-09-20 Stakeholder Meeting

Jack Reed (Marion Park Dist), Doug Phillips (Marion Streets), Anthony Rinella (Marion Mayor)

- Newest pedestrian counts and accident data presented. New convenience store does not seem to draw more pedestrians to Garfield – still large numbers at Otis. Highest daily count was 195 during large tournament day.
- Four Alternates presented (bridge, tunnel, at-grade, and continuous sidewalk & accessible traffic signals at State & Fair Street).
- Multiple alternates for at-grade were presented. One of them eliminates the NB movements on N. Otis. Doing this forces all NB movements into the Park to Garfield.
- Traffic models were presented for these cases. An alternate of changing the traffic flow around the park from clockwise to counterclockwise was presented. It would also require restriping the diagonal parking to align with the traffic flow. It was felt this would be too hard to implement.

- The at-grade option, with the crossing just east of N. Otis, was selected as the preferred alternate.
- IDOT has an overlay planned for IL 13 in FY 2020. They need to know if City wants to keep the existing (quite worn, barely visible) cross walk at Garfield. Cameras will be placed to count the number of children who are using this existing crossing to walk to school. IDOT will only allow ONE at-grade crossing in this area.
- It was noted that there will be some land use changes around the Park in the near future. Multi family housing is proposed on east side of park.
- The City of Marion wants to have the options presented at their Oct 8 Council Meeting.
- The Park District will present to their board on Oct 30.
- Joe would like to have both entities endorse the preferred alternate.

2018-10-08 Marion City Council Meeting

- Overall scope of Study was explained. Pedestrian counts and accident data presented. New convenience store does not seem to draw more pedestrians to Garfield – still large numbers at Otis. Highest daily count was 195 during large tournament day.
- Cameras were placed, and it does not appear children are crossing at either Garfield or N. Otis before or after school.
- Four Alternates presented (bridge, tunnel, at-grade, and continuous sidewalk & accessible traffic signals at State & Fair Street) and discussed in detail.
- Multiple alternates for at-grade option were presented. The at-grade option, with the crossing just east of N. Otis, is suggested as the preferred alternate.
- It was noted that IDOT has an overlay planned for IL 13 in FY 2020. They want to know if City wants to keep the existing (quite worn, barely visible) cross walk at Garfield. This location does not connect to sidewalk at the NE quadrant. IDOT will only allow ONE at-grade crossing in this area.
- Funding options were discussed for the suggested preferred alternate (estimated at \$150,000). It would be good to have this built in conjunction with IDOT's overlay project.
- The council generally agreed with the preferred alternate. They will make a formal resolution at their next meeting.

2018-10-24 Hucks Meeting

- Overall scope of Study was explained. Pedestrian counts have been taken with the maximum count 195/day during a tournament this spring. The new Casey's convenience store west of the park does not seem to be changing the pedestrian count to Hucks. It was also noted that many of the crossings are school-aged children who are getting concessions for the ballgames. This corridor has seen 7 pedestrian crashes over the past 5-6 years, with two of them being fatalities.
- The group discussed four options that have been developed for the study, with the focus on the City preferred alternate - at-grade crossing just east of North Otis. This option requires that the center entrance into Hucks would have to be abandoned and curbed over, allowing only pedestrian movements at that location. It was

noted that Hucks does have three entrances to IL Route 13, as well as full side access via the sideroads.

- The group thought that if the other two existing entrances could be widened and repositioned slightly, then the effects to Hucks would not be as impactful. It was also noted that their overhead sign would likely have to be relocated.

2018-Nov

Hucks Follow-up Emails

- After seeing a layout of the entrances described above, Hucks had concerns with the entrance layout and median location.
- A second layout was presented, with crossing on the west side of North Otis. Additionally, the option with the crossing 220' west of North Otis was also presented via email.

ATTACHMENT 08
MUTCD WARRANTS

Summary of MUTCD Warrants:

Assume 19,400 ADT (2017) on IL 13 would give → 1940 DHV (est. 10% of ADT for Peak Hour)

Average vehicular speed on IL 13 appears to be 35 mph

Average overall pedestrian crossings at IL 13 are about 9/day at Garfield and 51/day at Otis.
Largest Hourly Volume was 41 bikes & peds / hour (Tournament Saturday 11:00a-noon)

Assume average pedestrian speed of 3.5 ft/sec (per MUTCD)

IL 13 Roadway Width ~ 65' (5 x 12' + 2.58' C&G each side) divided by 3.5 ft/sec average speed
=18.6 sec gap required to cross IL 13

1. Traffic Signal Warrant

A. 4 Hour

- 4 Hours of DHVs vs. Pedestrians per hour – MUTCD Fig 4C-5.
- Need minimum 107 pph to warrant a signal
- If 85th percentile of speed >35mph, we can drop this to min. 75 pph (Fig 4C-6)
- *Don't meet this warrant*

B. 1 Hour

- DHV vs. Pedestrians per hour – MUTCD Fig 4C-7.
- Need minimum 133 pph to warrant a signal
- If 85th percentile of speed >35mph, we can drop this to min. 93 pph (Fig 4C-8)
- *Don't meet this warrant*

C. Can reduce by as much as 50% if the 15th percentile crossing speed of pedestrians is less than 3.5 ft/sec

- *Don't meet this criterion*

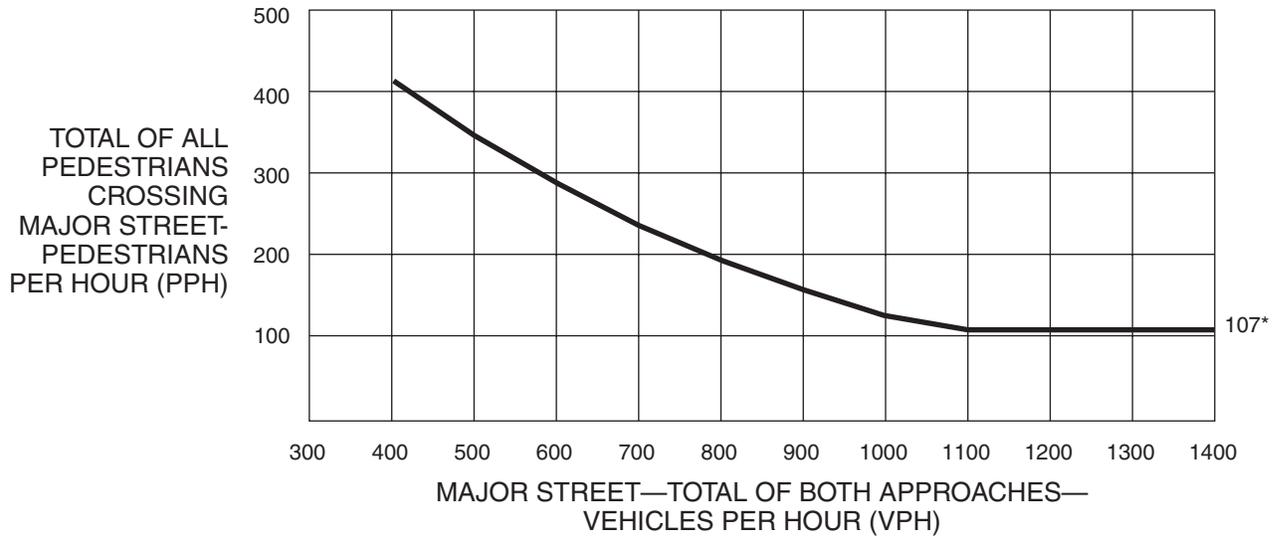
2. Hybrid Signal (HAWK)

- DHV vs. Pedestrians per hour – MUTCD Fig 4F-1.
- Need 20 pph to warrant a HAWK
- *Don't meet this warrant in general. However, on big tournament days, the warrant is met for multiple hours (max was 41 pph)*

3. Median Refuge Island (Based on web research FHWA)

- Install when >15,000 ADT
- Consider for <20 pph, 35 mph, 4-6 lanes
- Total length along median would be 100' to 250' long, within the TWLTL
- *Meet this criteria*

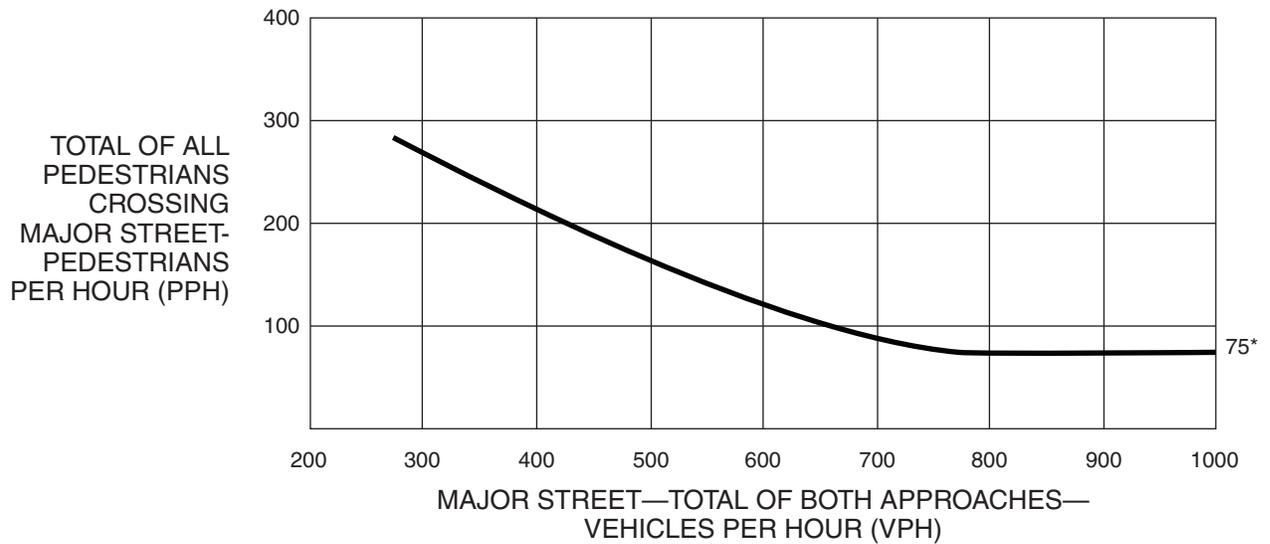
Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume



*Note: 107 pph applies as the lower threshold volume.

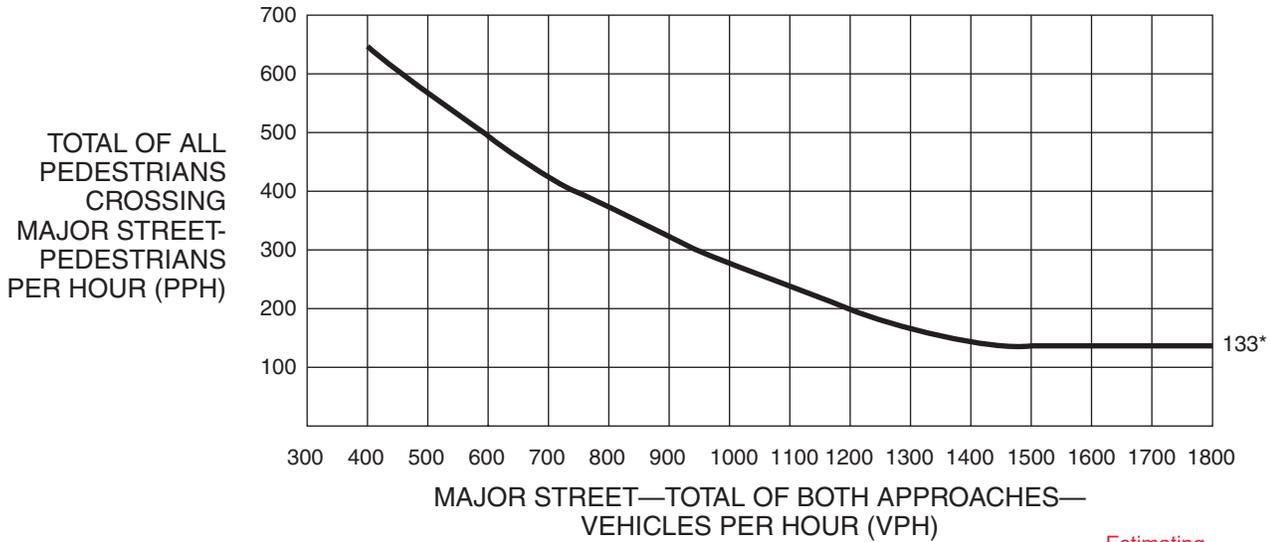
Estimating 1940 DHV (design hourly vehicles) & 41 DHP (design hourly peds), would not warrant.

Figure 4C-6. Warrant 4, Pedestrian Four-Hour Volume (70% Factor)



*Note: 75 pph applies as the lower threshold volume.

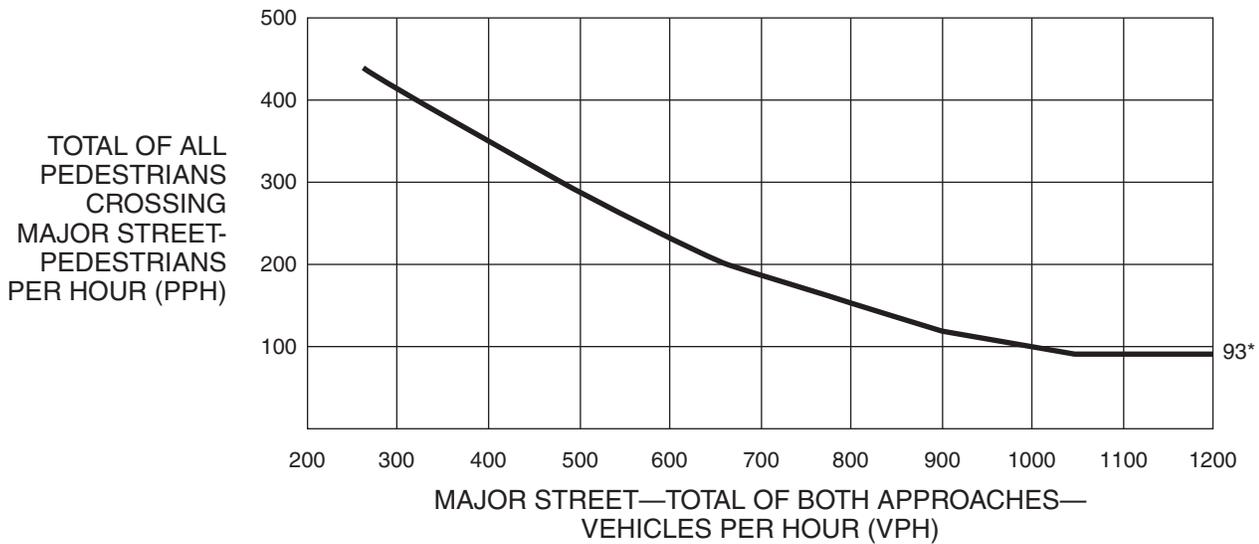
Figure 4C-7. Warrant 4, Pedestrian Peak Hour



*Note: 133 pph applies as the lower threshold volume.

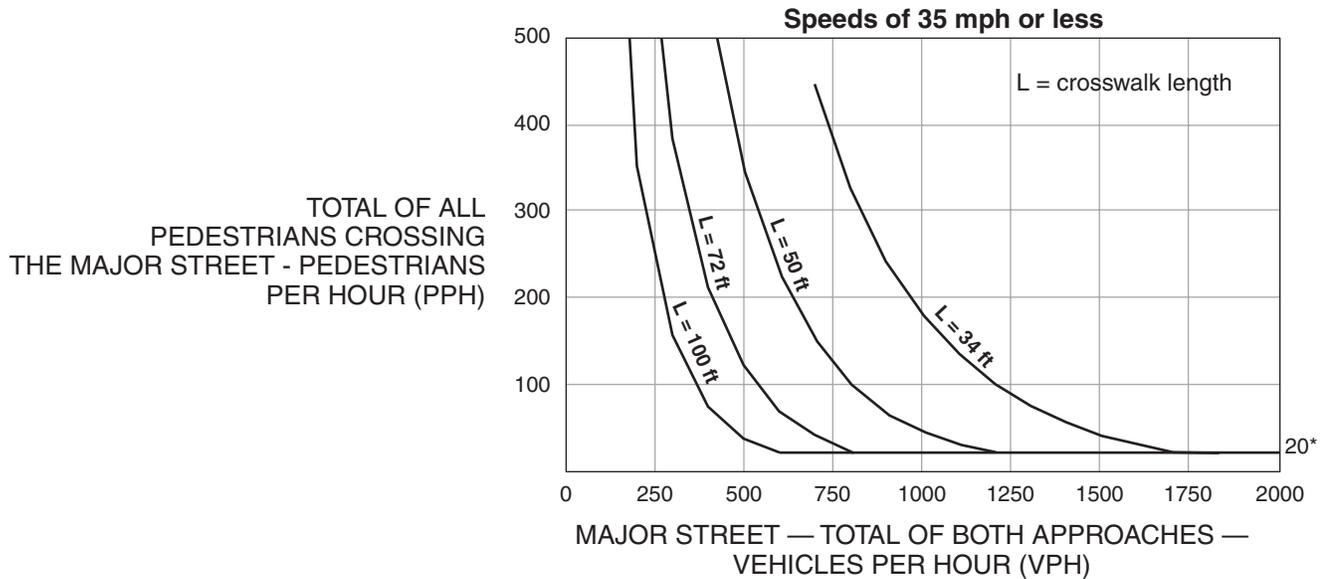
Estimating
 DHV = 1940
 DHP= 41
 Does not warrant

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



*Note: 93 pph applies as the lower threshold volume.

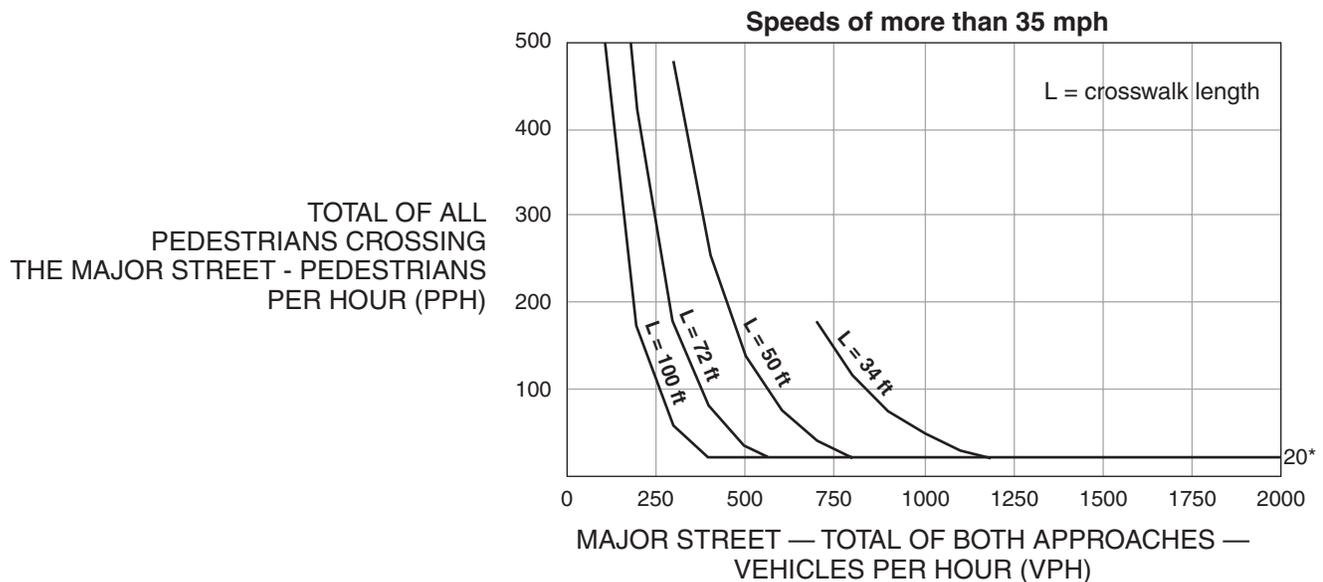
Figure 4F-1. Guidelines for the Installation of Pedestrian Hybrid Beacons on Low-Speed Roadways



* Note: 20 pph applies as the lower threshold volume

Estimating 1940 DHV (design hourly vehicles) & 10 DHP (design hourly peds), would not warrant.

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



* Note: 20 pph applies as the lower threshold volume

ATTACHMENT 09
STUDY
CHAMPAIGN-URBANA

Champaign-Urbana Pedestrian Crossing Enhancement Guidelines

SEPTEMBER 2017



TABLE 1 - CRITERIA FOR CROSSING TREATMENTS AT UNCONTROLLED LOCATIONS

Roadway Configuration	# of lanes crossed to reach a refuge	# of multiple threat lanes per crossing	Roadway ADT (i.e. VPD = vehicles per day) and Posted Speed															
			1,500-9,000 vpd				9,000-12,000 vpd				12,000-15,000 vpd				> 15,000 vpd			
			≤ 30 mph	35 mph	40 mph	≥ 45 mph	≤ 30 mph	35 mph	40 mph	≥ 45 mph	≤ 30 mph	35 mph	40 mph	≥ 45 mph	≤ 30 mph	35 mph	40 mph	≥ 45 mph
2 Lanes (one way street)	2	1	A	B	C	E	A	B	C	E	B	B	C	E	B	C	C	E
2 Lanes (two way street with no median)	2	0	A	B	C	E	A	B	C	E	A	B	C	E	B	C	C	E
3 Lanes w/ Raised Median	1 or 2	0 or 1	A	B	D	E	A	C	D	E	B	D	D	E	C	D	D	E
3 Lanes w/ Striped Median	3	0 or 1	C	C	D	E	C	C	D	E	C	C	D	E	C	D	D	E
4 Lanes (two way street with no median)	4	2	A	D	D	E	B	D	D	E	B	D	D	E	D	D	D	E
5 Lanes w/ Raised Median	2 or 3	2	A	B	D	E	B	C	D	E	B	C	D	E	C	C	D	E
5 Lanes w/ Striped Median See Note 1	5	2	D	D	D	E	D	D	D	E	D	D	D	E	D	D	D	E
6 Lanes (two way street with or without median)	3 to 6	4	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

Notes:

1. Painted medians can never be considered a refuge for a crossing pedestrian. Similarly, a 4 foot wide raised median next to a left turn lane can only be considered a refuge for pedestrians if the left turning volume is less than 20 vehicles per hour (meaning that in most cases the left turn lane is not occupied while the pedestrian is crossing).
2. A multiple threat lane is defined as a through lane where it is possible for a pedestrian to step out in front of a stopped vehicle in the adjacent travel lane (either through or turn lane).

Table 1: Criteria for Crossing Treatments at Uncontrolled Locations

Existing Conditions:
ADT = 19,400
5 Lanes (incl center turn lane)
Posted 35 mph

Additional Evaluation Considerations

The following information should be considered by the user of these guidelines when determining the appropriate pedestrian crossing treatment:

Types of Crossing Treatments at Uncontrolled Locations (See also Table 1)

Table 1 identifies six primary types of uncontrolled crossing treatments for consideration depending on the physical roadway conditions, vehicle volume, pedestrian volume at the potential crossing location, etc. The crossing types are as follows:

Crossing Type A:

- Marked crosswalk
- Pedestrian crossing warning signs (W11-2) mounted on the side of the roadway at the crossing, with diagonal down arrow placards (W16-7P)
- Standard advance pedestrian warning signs (W11-2) mounted in advance of the crossing
- If the location is a school crossing, then standard S1-1 signs should be used

Crossing Type B:

- Same as Type A above, plus
- “State Law – Stop for Pedestrians” signs (R1-6) mounted on sign posts in the median when present. If no median is present, sign posts can be considered for installation on flexible bollards on the centerline.

Crossing Type C:

- Same as Type B above plus
- Add curb extensions and/or median refuge island to shorten the pedestrian crossing distance and increase the visibility of pedestrians to approaching motorists

Crossing Type D:

- **Marked crosswalk**
- **Median refuge island** [Note: If a median refuge cannot be constructed on a 2-way street, then go to Crossing Type F]
- **Pedestrian crossing warning signs** (W11-2) mounted on the side of the roadway and in the median at the crossing, with diagonal down arrow placards (W16-7P)
- **Pedestrian actuated Rectangular Rapid Flash Beacons** (RRFBs) mounted with the Pedestrian crossing signs

- **Standard advance pedestrian warning signs** (W11-2) mounted in advance of the crossing
- **If there are 2 approach lanes in a single direction, installation of advance stop bars and “Stop Here For Pedestrians”** (R1-5b) signs is required in the University District, and should be considered outside of the University District
- If the location is a school crossing, then standard S1-1 signs should be used
- Consider adding curb extensions if on-street parking exists and storm drainage can be accommodated
- If pedestrian volumes are extremely high, go to Crossing Type F

Crossing Type E:

- Where speed limit is initially greater than or equal to 45 miles per hour
- Determine if the speed limit can be effectively reduced to 40 mph AND a raised median refuge island can be installed
- If so, go to Crossing Type D
- If not, go to Crossing Type F

Crossing Type F:

- Crossing has 3 or more through lanes in a given direction or is otherwise not suitable for an uncontrolled marked crosswalk
- Consider HAWK beacon, pedestrian traffic signal, or grade-separated pedestrian crossing
- Refer to *City of Boulder Pedestrian Crossing Treatment Installation Guidelines* Figure 2 when considering crossing treatment type
- Must consider corridor signal progression, grades, physical constraints, and other engineering factors

In Table 1 there are two columns that list:

- The number of lanes crossed to reach a refuge
- The number of “multiple threat” lanes per crossing

This information does not directly play in to the use of Table 1, but they do provide important context for the user as they help distinguish the crossing types and support the difference in recommended crossing treatments.

ATTACHMENT 10

STUDY

SIU-E

CIVIL ENGINEERING STUDIES

Illinois Center for Transportation Series No. 17-021

UIIU-ENG-2017-2021

ISSN: 0197-9191

ESTABLISHING PROCEDURES AND GUIDELINES FOR PEDESTRIAN TREATMENTS AT UNCONTROLLED LOCATIONS

Prepared By

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Research Report No. FHWA-ICT-17-016

A report of the findings of

ICT PROJECT R27-167

**Establishing Procedures and Guidelines for Pedestrian
Treatments at Uncontrolled Locations**

**ILLINOIS CENTER FOR
TRANSPORTATION**



Table A3. Summary of Recommended Minimum Treatments at Uncontrolled Pedestrian Crossings

*Lane Configuration	ADT ≤ 9,000				9,000 < ADT < 15,000				15,000 < ADT ≤ 25,000				25,000 < ADT ≤ 35,000				ADT > 35,000	
	posted speed, mph																	
	vi 30	35	40	45	vi 30	35	40	45	vi 30	35	40	45	vi 30	35	40	45	≤ 30 to 45	
2 lanes or 3 lanes <u>with</u> raised median	BT	In-street sign	RRFB (or FB) + ASLS	uncontrolled pedestrian crossing is not recommended	BT	FB	RRFB (or FB) + ASLS	Uncontrolled pedestrian crossing is not recommended	In-street sign	FB	RRFB (or FB) + ASLS	Uncontrolled pedestrian crossing is not recommended	In-street sign	RRFB (or FB) + ASLS	RRFB (or FB) + ASLS	Uncontrolled pedestrian crossing is not recommended	Uncontrolled pedestrian crossing is not recommended	
3 lanes <u>without</u> raised median	BT	In-street sign	RRFB (or FB) + ASLS		BT	RRFB (or FB) + ASLS	RRFB (or FB) + ASLS		FB	RRFB (or FB) + ASLS	RRFB + ASLS		RRFB (or FB) + ASLS	RRFB (or FB) + ASLS	RRFB (or FB) + ASLS			**PHB+ CSOR
4 lanes <u>with</u> raised median	In-street sign	ASLS	4RRFB (or overhead FB) + ASLS		ASLS	ASLS (consider 4RRFB)	4RRFB (or overhead FB) + ASLS		4RRFB (or overhead FB) + ASLS	4RRFB (or overhead FB) + ASLS	4RRFB (or overhead FB) + ASLS Refuge Island		**4 RRFB (consider PHB)+ ASLS	4 RRFB (or overhead FB)+ ASLS	** PHB + CSOR			**PHB+ CSOR
6 lanes <u>with</u> raised median	ASLS	4RRFB (or overhead FB) + ASLS	4RRFB (or overhead FB) + ASLS		ASLS	4RRFB (or overhead FB)+ ASLS	PHB+ ASLS		4RRFB (or overhead FB)+ ASLS	4RRFB (or overhead FB)+ ASLS	4RRFB (or overhead FB) + ASLS		**PHB+ ASLS	PHB+ CSOR	** PHB + CSOR			**PHB+ CSOR
4, 5, or 6 lanes <u>without</u> raised median	Consider pedestrian refuge island or road diet, if feasible. If raised median, or road diet is feasible then follow the recommendations for the above lane configurations, other wise follow the recommendation below for 4-lane without raised median to decide pedestrian crossing treatments, providing uncontrolled crossings of more than four lanes without a raised median is not recommended																	
4 lanes, raised median not feasible	ASLS	ASLS	PHB+ CSOR	ASLS	RRFB (or overhead FB)+ ASLS	PHB +CSOR	RRFB (or overhead FB)+ ASLS	PHB +CSOR	** PHB+ CSOR	PHB +CSOR	** PHB +CSOR	**PHB +CSOR	PHB +CSOR	** PHB +CSOR	**PHB +CSOR			

BT= Basic Treatment (W11-2 with W16-7P)
 In-street sign= In-street stop for pedestrian sign (R1-6a);
 Overhead sign= Overhead crossing sign (R1-9a) may be used based on engineering judgment
 ASLS= Advanced stop line and sign (R1-5b and R1-5c)
 FB= Pedestrian activated flashing beacon (pole mounted)
 RRFB= Non-median installation of RRFB; 4 RRFB= Median installation of RRFB
 PHB=Pedestrian Hybrid Beacon; CSOR=Crosswalk Stop on Red line and sign

**Existing Conditions:
 ADT = 19,400
 5 Lanes (incl center turn lane)
 Posted 35 mph**

*= Lane configuration includes turn lanes, through lane, and bi-directional lanes.

**= Check IL MUTCD signal warrants and consider the feasibility of a grade-separated crossings. Pedestrian hybrid beacons, when installed, create a controlled crossing. Check PHB warrants and comply with IL MUTCD. If PHB is not warranted then consider signal or grade separated crossing.

Notes:

1. These treatments are recommended for existing uncontrolled crossings where enhancement is sought, and for new uncontrolled crossings where an engineering study indicates a clear warrant for a crossing.
2. Provision of lighting is recommended at midblock crossings. Refer to (Section 6.3.3) for guidance on lighting requirements for pedestrian crossings.
3. Ensure that adequate sight distance is provided for both drivers and pedestrians at uncontrolled crossings. Refer to (Section 6.1.4) for guidance.
4. At densely developed urban areas and on multi-lane roadway (4 or more lanes), curb extension should be considered when street parking is allowed and posted speed limit is ≤ 35 mph.
5. Uncontrolled crosswalk is not recommended if the speed limit is above 40 mph.
6. RRFB should not be installed within 300 ft. of a traffic signal.
7. At places where motorists do not expect crossing (mid-blocks and crossings in rural areas) and in school zones, advanced warning signs with AHEAD/distance plaque (W16-9P or W16-2P) should be considered.

ATTACHMENT 11

STUDY

FHWA



U.S. Department of Transportation
Federal Highway Administration



Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations

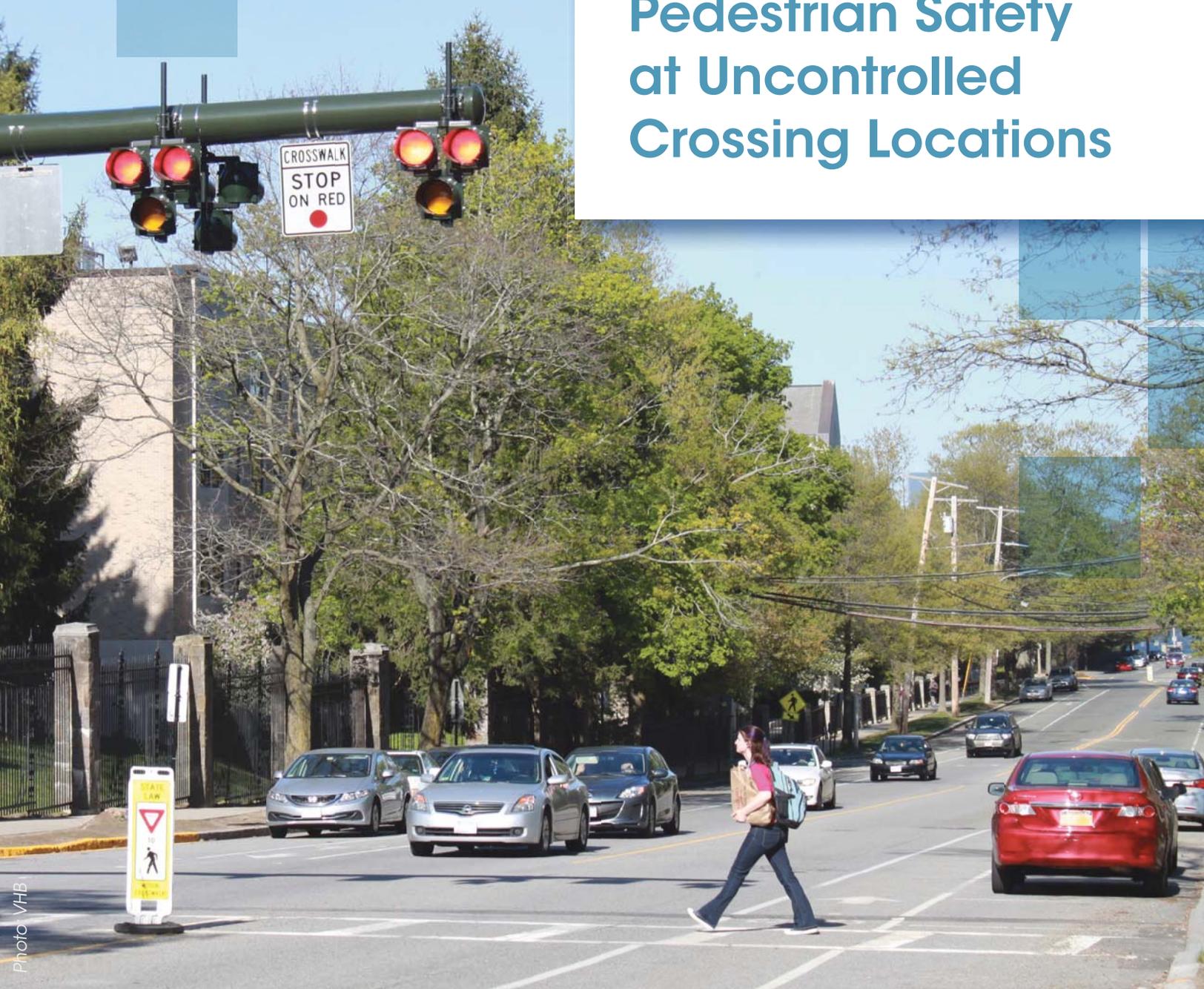


Table 1. Application of pedestrian crash countermeasures by roadway feature.

Roadway Configuration	Speed Limit								
	≤30 mph			35 mph			≥40 mph		
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
2 lanes*	1 2 3 4 5 6	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7
3 lanes with raised median*	1 2 3 4 5	1 3 5 7	1 3 5 7	1 3 4 5 7	1 3 5 7	1 3 5 7	1 3 4 5 7	1 3 5 7	1 3 5 7
3 lanes w/o raised median†	1 2 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7	1 3 4 5 6 7	1 3 5 6 7	1 3 5 6 7
4+ lanes with raised median‡	1 3 5	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7	1 3 5 7
4+ lanes w/o raised median‡	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8	1 3 5 6 7 8

*One lane in each direction †One lane in each direction with two-way left-turn lane ‡Two or more lanes in each direction

Given the set of conditions in a cell,

- ⊕ 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 the countermeasure is a candidate treatment at a marked uncontrolled crossing location.

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 restriction on crosswalk approach, adequate nighttime lighting levels
- 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 Pedestrian Hybrid Beacon
- 8 Road Diet

This table was developed using information from: Zegeer, C. V., Stewart, J. R., Huang, H. H., Lagerwey, P. A., Feaganes, J., & Campbell, B. J. (2005), Safety effects of marked versus unmarked crosswalks at uncontrolled locations: Final report and recommended guidelines (No. FHWA-HRT-04-100); Manual on Uniform Traffic Control Devices, 2009 Edition, Chapter 4F. Pedestrian Hybrid Beacons; the Crash Modification Factors (CMF) Clearinghouse website (<http://www.cmfclearinghouse.org/>); and the Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE) website (<http://www.pedbikesafe.org/PEDSAFE/>).

Existing Conditions:
ADT = 19,400
5 Lanes (incl center turn lane)
Posted speed 35 mph

ATTACHMENT 12.1
BRIDGE CROSSING
OPTION 1

Option 1 – Bridge over IL Route 13

DESCRIPTION:

115' long pedestrian truss structure over IL 13, with additional 350' long earthen approach ramp to the north and dual 350' approach ramps (for EB and WB foot traffic), on the south side of the highway. Could add 75' long pedestrian truss over Washington Street to maintain access to IL 13. See sketch.

DESIGN DETAILS:

- 17'-3" minimum vertical clearance over highway
- Locate piers 30' from edge of roadway or shield with crash barrier
- Assume 10' width
- Fencing/handrail on bridge curved inward to prevent throwing objects to roadway below
- 5% max running slope for ADA (350' minimum length ramps)

IMPACTS:

- Access to IL 13 will be cut off for Whitman Street and the alley between Garfield and Washington. Must determine alternate access.
- Commercial property access impacts on south side of IL 13
- Park property affected (likely Section 4(f) property)
- Aerial power lines to be buried or relocated to north side of roadway
- Possible other minor utility adjustments

PROS:

- Complete separation of pedestrians and vehicles
- No change in IL 13 traffic patterns
- Opportunity for signature structure in Marion

CONS:

- Cost
- Access to IL 13 will be cut off for Whitman Street and the alley between Garfield and Washington
- Adverse travel distance (620', 0.12 miles) and vertical rise may discourage use
- Land acquisition from 7 commercial parcels, plus 'damages' for loss of IL 13 access
- Bridge will be visual domination of residential and commercial district

APPROXIMATE COST:

- \$3,617,000 total cost

Engineer's Opinion of Probable Construction Cost



Project: IL Route 13 Pedestrian Crossing - Bridge Option

Project No.: **17 0299**
 Date of Opinion: **July 2018**
 Client: **SIMPO**

Pre-Design Opinion of Cost
Based on 2018 Unit Pricing

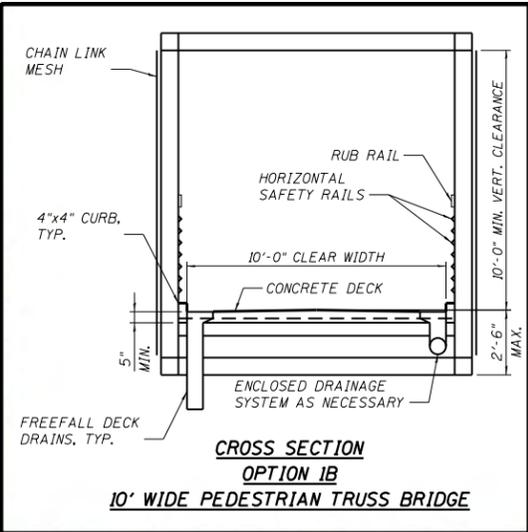
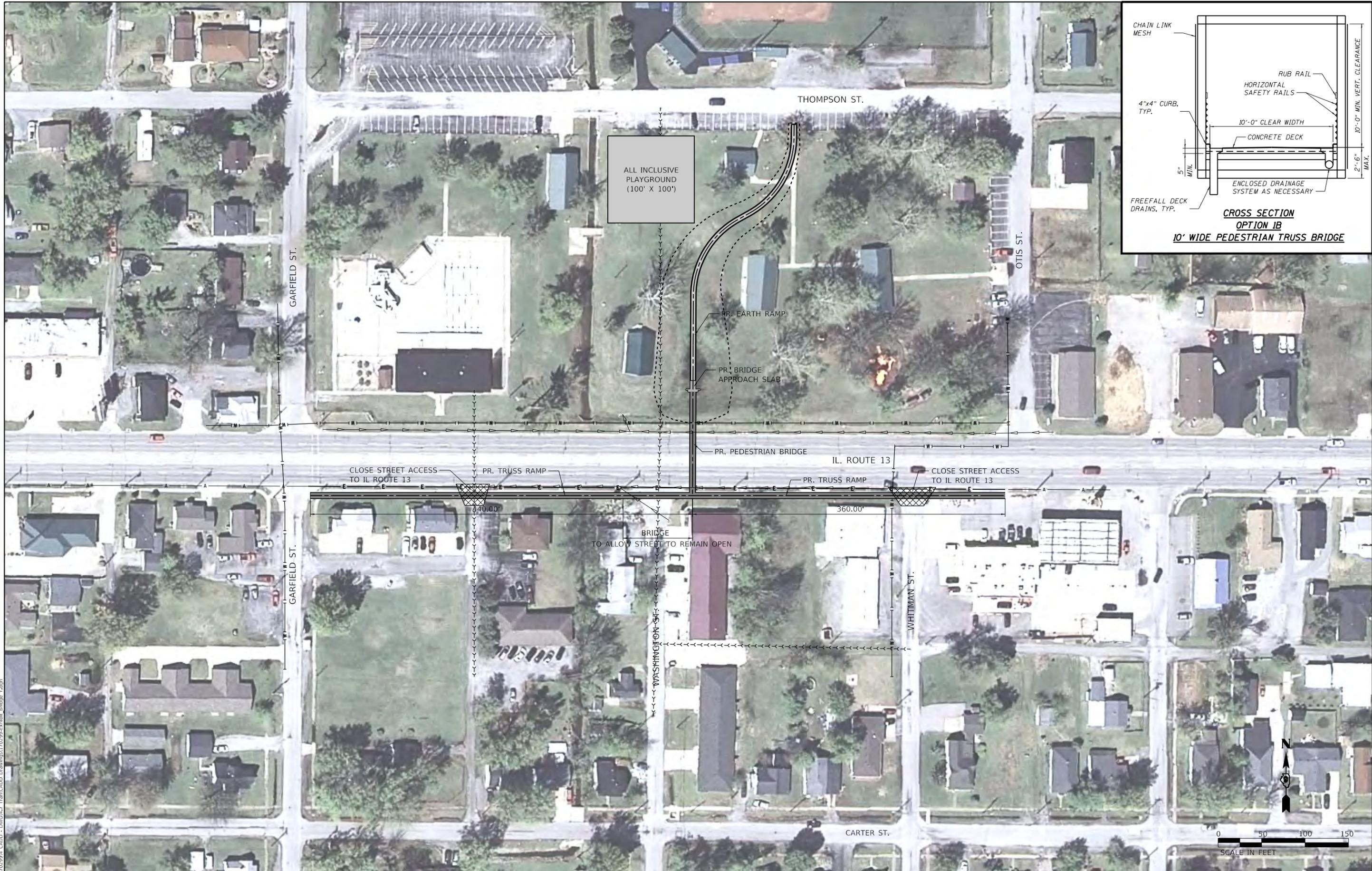
Description: 115' Truss bridge IL 13
 75' truss bridge Washington
 2x350' approach ramps (assume 4-88'spans)
 =890' truss bridges total

 350' earthen ramp to north

Item Number	Item Description	Quantity	Unit	Unit Price	Item Price	Group Price
A Park						
1	Earthwork Estimate for ramp (3:1 sideslopes)	8000	CU YD	\$ 15.00	\$ 120,000.00	
2	Asphalt surface for ramp	30	TON	\$ 100.00	\$ 3,000.00	
3	Aggregate base for ramp	960	TON	\$ 60.00	\$ 57,600.00	
4	Misc/Contingency Items	20%			\$ 36,120.00	\$ 216,720.00
B Road ROW						
1	Replace ADA Sidewalk Ramps at approach spans	3	EACH	\$ 2,000.00	\$ 6,000.00	
2	Traffic Control	1	L SUM	\$ 30,000.00	\$ 30,000.00	
3	Crash Barrier to protect piers	300	FOOT	\$ 700.00	\$ 210,000.00	
4	Misc/Contingency Items	20%			\$ 7,200.00	\$ 253,200.00
C Bridge						
1	Pedestrian Truss Bridges (10' wide)	890	FEET	\$ 1,500.00	\$ 1,335,000.00	
2	Foundations & Substructure units	11	EACH	\$ 12,000.00	\$ 132,000.00	
3	Misc/Contingency Items	20%			\$ 293,400.00	\$ 1,760,400.00
D Misc Items						
1	Bury or move 34 kV Electrical Line	650	FEET	\$ 600.00	\$ 390,000.00	
2	Misc Utility Adjustments	1	L SUM	\$ 15,000.00	\$ 15,000.00	
3	Land Acquisition estimate (\$1500 + \$2500 + \$6000 ave)	7	EACH	\$ 10,000.00	\$ 70,000.00	
4	Land Acquisition - damages/access	1	L SUM	\$ 500,000.00	\$ 500,000.00	
5	Signing & Striping	1	L SUM	\$ 5,000.00	\$ 5,000.00	
6	Erosion Control	1	L SUM	\$ 5,000.00	\$ 5,000.00	
7	Misc/Contingency Items	20%			\$ 197,000.00	
8	6% Mobilization	1	L SUM	\$ 204,739.20	\$ 204,739.20	\$ 1,386,739.20

* 6' wide bridge would be a reduction of \$200/lin. ft. = \$178,000

Project Total	\$ 3,617,059.20
Based on 2018 Unit Pricing	
Not including planning & engineering	



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	DATE -	REVISED -

**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

IL 13 PEDESTRIAN STUDY BRIDGE OPTION				
SCALE:	SHEET	OF	SHEETS	STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

ATTACHMENT 12.2
TUNNEL CROSSING
OPTION 2

Option 2 – Tunnel under IL Route 13

DESCRIPTION:

80' long pedestrian tunnel. 350' long earthen approach ramp cut into the park with 1:3 sideslopes. Long vertical retaining walls enclose sidewalk approach ramps on south side of roadway.

DESIGN DETAILS:

- 8'x 10' wide culvert for shared use path (SUP)
- Provide 1' cover below highway to protect top slab from salts
- 5% max running slope for ADA (240' minimum length ramps)
- Lighting to be provided in tunnel
- Handrail to be provided on top of retaining walls to prevent falls
- Guardrail to be provided along curb line to protect errant vehicles
- 1000' structural retaining walls required along ramps

IMPACTS:

- Access to IL 13 will be cut off for Washington Street
- Storm sewer line on north and south side of roadway will be interrupted. May be able to reroute piping to gravity drain to drainage ditch in park.
- Storm sump pump will be required for tunnel drainage
- Gas, water, and communication utility adjustments required
- Commercial property easements required
- Park property affected (likely Section 4(f) property)

PROS:

- Complete separation of pedestrians and vehicles
- Blends into existing surroundings
- No change in IL 13 traffic patterns

CONS:

- Cost
- Access to IL 13 will be cut off for Washington Street
- Tunnel walk surface will likely remain wet/moist as walk surface will be ~ 7' below elevation of adjacent creek.
- Land acquisition from 7 commercial parcels on south side of roadway
- Adverse travel distance (620', 0.12 miles) and below grade depth may discourage use
- Pump to be maintained
- Safety perception – tunnel will be relatively dark (even with lighting), blind 90° corners

APPROXIMATE COST:

- \$1,105,000 total cost

Engineer's Opinion of Probable Construction Cost



Project: IL Route 13 Pedestrian Crossing - Tunnel Option

Project No.: 17 0299

Date of Opinion: 10-Dec-18

Client: SIMPO

Pre-Design Opinion of Cost

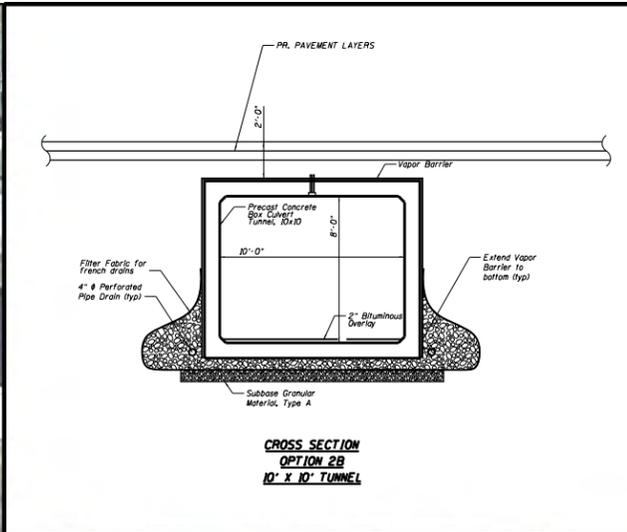
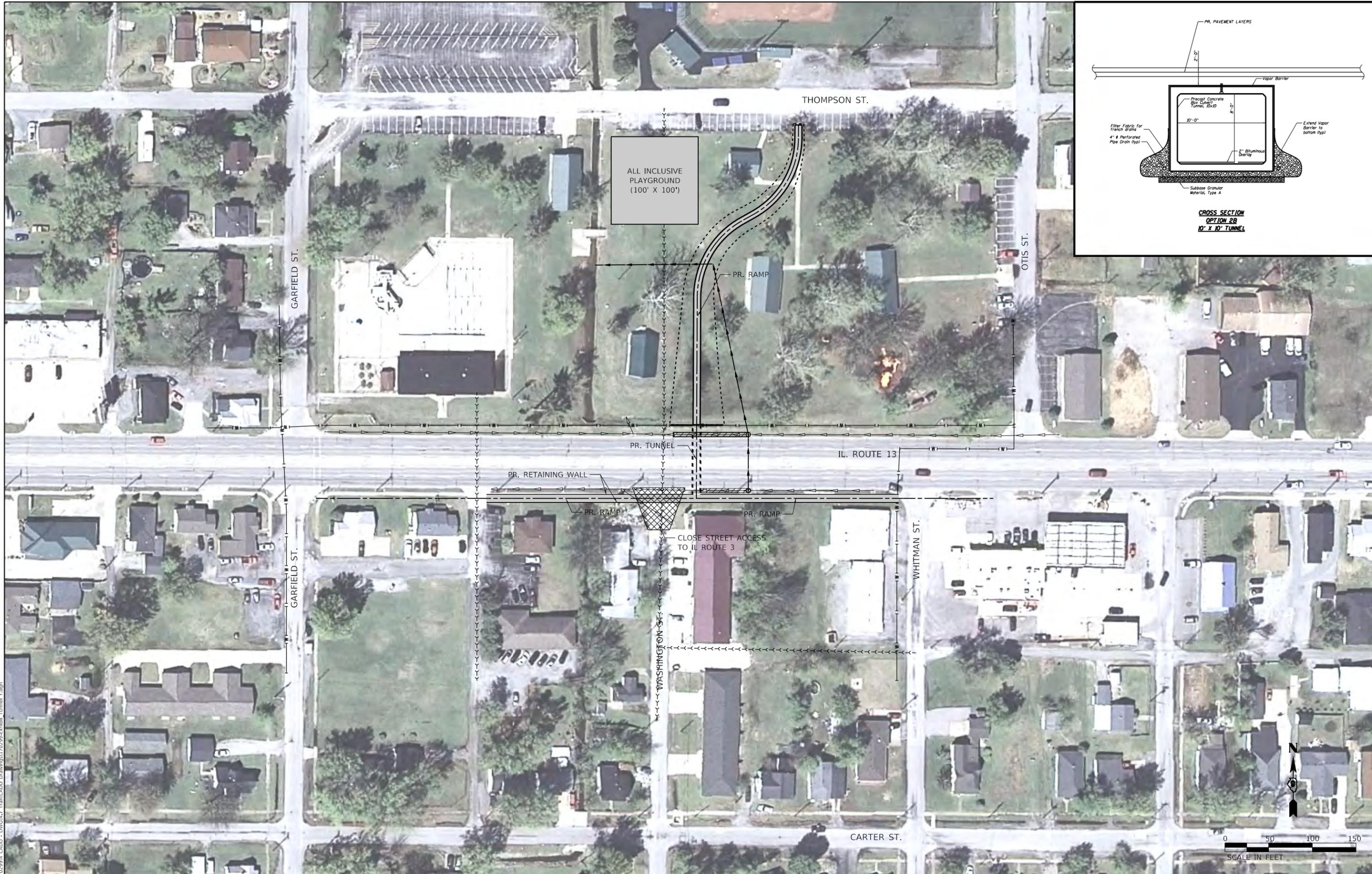
Based on 2018 Unit Pricing

Description:
 80' Long x 8' tall x 10' wide Tunnel
 2-240' ramps with 960' of retaining walls
 350' ramp to north cut into park surface
 Storm Water Sump Pump
 Patching roadway surface

Item Number	Item Description	Quantity	Unit	Unit Price	Item Price	Group Price
A Park						
1	Earthwork Estimate for earth ramp (3:1 sideslopes)	2100	CU YD	\$ 15.00	\$ 31,500.00	
2	PCC Sidewalk, 4" ramp	1750	SQ FT	\$ 8.00	\$ 14,000.00	
3	Storm water lines rerouted to creek	1	L SUM	\$ 50,000.00	\$ 50,000.00	
4	Misc/Contingency Items	20%			\$ 19,100.00	\$ 114,600.00
B Road ROW						
1	Replace ADA Sidewalk Ramps at approach spans	3	EACH	\$ 2,000.00	\$ 6,000.00	
2	Traffic Control	1	L SUM	\$ 60,000.00	\$ 60,000.00	
3	Earthwork Estimate for south side ramps	750	CU YD	\$ 20.00	\$ 15,000.00	
4	Earthwork Estimate for tunnel	300	CU YD	\$ 15.00	\$ 4,500.00	
5	Structural retaining walls for south side ramps (10' max depth)	5000	SQ FT	\$ 75.00	\$ 375,000.00	
6	Hand railing for top of retaining walls	970	FEET	\$ 80.00	\$ 77,600.00	
7	PCC Sidewalk, 4"	3250	SQ FT	\$ 8.00	\$ 26,000.00	
8	Guardrail	750	FEET	\$ 35.00	\$ 26,250.00	
9	Patching roadway pavement & base over sewers and tunnel	215	SQ YD	\$ 100.00	\$ 21,500.00	
10	Patching curb & gutter over sewers and tunnel	80	FEET	\$ 50.00	\$ 4,000.00	
11	Lighting for sidewalk ramps	1	L SUM	\$ 30,000.00	\$ 30,000.00	
12	Misc/Contingency Items	20%			\$ 13,200.00	\$ 659,050.00
C Tunnel						
1	8' x 10' Tunnel	80	FEET	\$ 750.00	\$ 60,000.00	
2	Tunnel Storm Water Sump Pump	1	L SUM	\$ 50,000.00	\$ 50,000.00	
3	Tunnel Lighting	1	L SUM	\$ 30,000.00	\$ 30,000.00	
4	Misc/Contingency Items	20%			\$ 22,000.00	\$ 162,000.00
D Misc Items						
1	Signing & Striping	1	L SUM	\$ 5,000.00	\$ 5,000.00	
2	Erosion Control	1	L SUM	\$ 5,000.00	\$ 5,000.00	
3	Misc Utility Adjustments	1	L SUM	\$ 30,000.00	\$ 30,000.00	
4	Land Acquisition estimate (\$1500 + \$2500 + \$3000 ave)	7	EACH	\$ 7,000.00	\$ 49,000.00	
5	Misc/Contingency Items	20%			\$ 17,800.00	
6	6% Mobilization	1	L SUM	\$ 62,547.00	\$ 62,547.00	\$ 169,347.00

Project Total \$ 1,104,997.00

Based on 2018 Unit Pricing
 Not including planning & engineering



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PLOT DATE = 8/22/2018	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 13 PEDESTRIAN STUDY TUNNEL OPTION				
SCALE:	SHEET	OF	SHEETS	STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

ATTACHMENT 12.3
AT-GRADE CROSSING
OPTION 3A, 3B, and 3C

Option 3A – At-Grade crossing with IL Route 13 - 220' west of Otis Street

DESCRIPTION:

Marked cross walk with refuge island approximately 220' west of intersection with Otis Street.

DESIGN DETAILS:

- Raised refuge island built within width of existing bi-directional turn lane
- Storage bays provided for left turning movements onto Otis Street and Washington Street
- Sidewalk and fence to be added to connect to park sidewalk
- Advance warning signage to be placed. Pedestrian activated flashing beacon added in advance of crossing as well as on median surface.
- Street lighting enhancements at the crossing location could also be considered

IMPACTS:

- Center turn lane storage length is reduced
- One or two perpendicular parking stalls at the park could be eliminated to provide better access to new sidewalk

PROS:

- Cost
- Blends into existing surroundings
- Refuge island provides pedestrians ability to cross one direction of travel at a time
- No additional ROW required
- No or minor utility adjustments
- Left turn lane storage bay still provided for Otis and Washington Streets

CONS:

- Adverse travel distance (220 feet each way, 440 feet total, 0.08 miles)
- Potential for pedestrian-vehicular conflict still exists
- Minor disruption for left turning vehicles on IL 13
- IL 13 vehicles must become aware of pedestrians crossing at crosswalk

APPROXIMATE COST:

- \$172,000 total cost

Engineer's Opinion of Probable Construction Cost



Project: IL Route 13 Pedestrian Crossing - At-Grade Crossing Option 3A

Project No.: 17 0299

Date of Opinion: 10-Dec-18

Client: SIMPO

Pre-Design Opinion of Cost

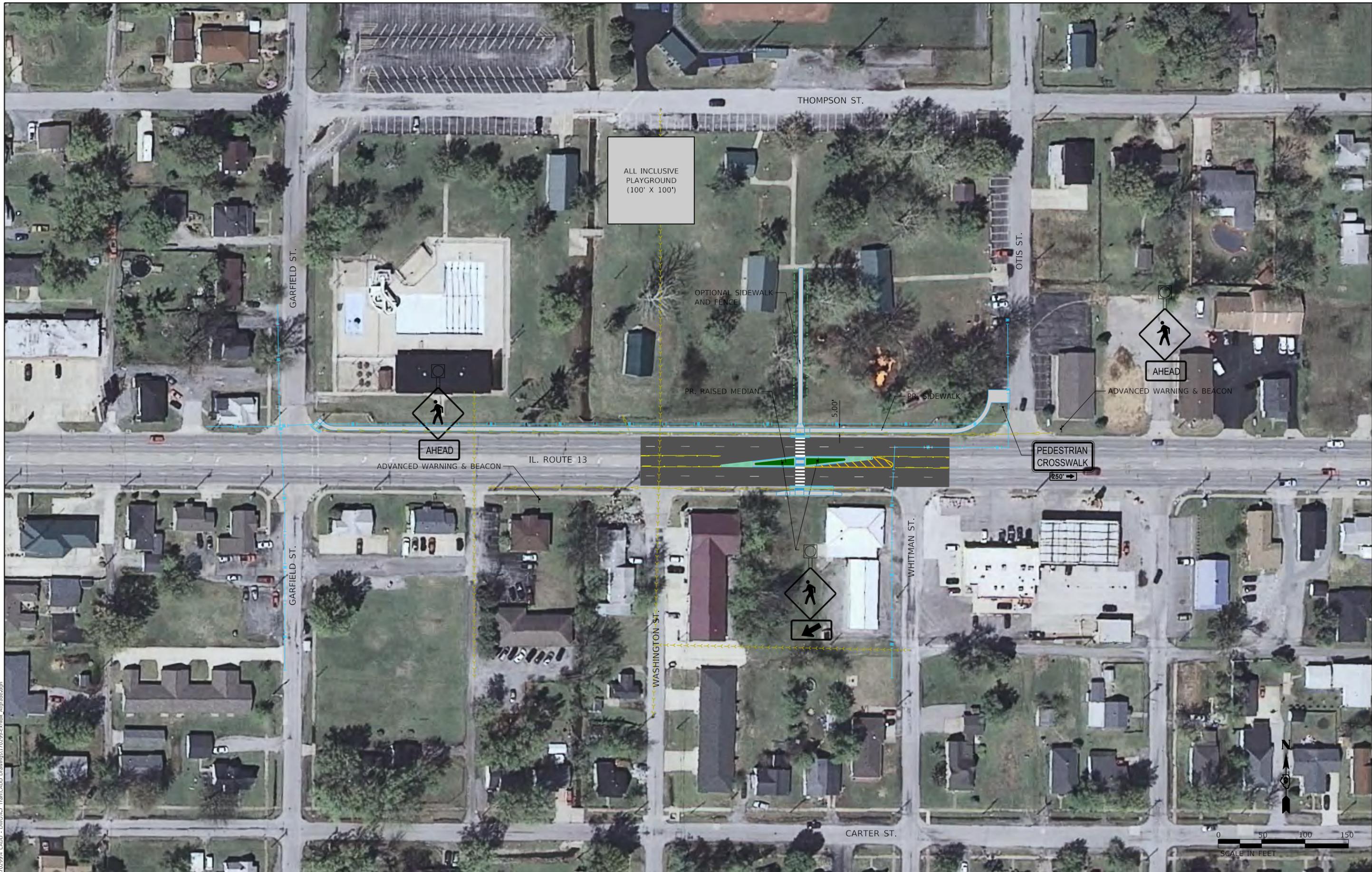
Based on 2018 Unit Pricing

Description: Sidewalk between Garfield & Otis, north side
 Refuge Island added to bi-directional turn lane
 Flashing beacons
 Advance warning signs
 Misc sidewalk, curbing, etc

Item Number	Item Description	Quantity	Unit	Unit Price	Item Price	Group Price
A Park						
1	PCC Sidewalk, 4"	940	SQ FT	\$ 8.00	\$ 7,520.00	
2	Chain Link Fence	85	FEET	\$ 20.00	\$ 1,700.00	
3	Misc/Contingency Items	15%			\$ 1,128.00	\$ 10,348.00
B Road ROW						
1	Replace ADA Sidewalk Ramps	3	EACH	\$ 2,000.00	\$ 6,000.00	
2	Traffic Control	1	L SUM	\$ 20,000.00	\$ 20,000.00	
3	Raised Median (dowelled to pvmt)	600	SQ FT	\$ 25.00	\$ 15,000.00	
4	PCC Sidewalk, 4" *	4500	SQ FT	\$ 8.00	\$ 36,000.00	
5	Advanced warning signage - flashing beacon	1	L SUM	\$ 40,000.00	\$ 40,000.00	
6	Lighting for crossing	1	L SUM	\$ 15,000.00	\$ 15,000.00	
7	Misc/Contingency Items	15%			\$ 19,800.00	\$ 151,800.00
C Misc Items						
1	6% Mobilization	1	L SUM	\$ 9,728.88	\$ 9,728.88	
						\$ 9,728.88

Project Total \$ 171,876.88

* Note: If north sidewalk is built first, then cost reduces by \$36,000 (\$136,000 total)
 Based on 2018 Unit Pricing
 Not including planning & engineering



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PLOT DATE = 11/19/2018	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 13 PEDESTRIAN STUDY
AT-GRADE OPTION

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

SCALE: SHEET OF SHEETS STA. TO STA.

Option 3B – At-Grade crossing with IL Route 13 - Just west of Otis Street

DESCRIPTION:

Marked cross walk with refuge island just west of intersection with Otis Street.

DESIGN DETAILS:

- Raised refuge island built within width of existing bi-directional turn lane
- Small storage area provided for left turning movements onto Whitman Street
- Hucks west entrance drive on IL 13 to be closed, and sidewalk constructed across entrance
- Right in Right out island to be constructed at Otis Street intersection
- Advance warning signage to be placed. Pedestrian activated flashing beacon added in advance of crossing as well as on median surface.
- Street lighting enhancements at the crossing location could also be considered

IMPACTS:

- Otis becomes Right in Right out only. Access from IL 13 to NB Otis is removed.
- Center turn lane storage length is reduced at Whitman
- Hucks loses one entrance off IL 13
- One or two perpendicular parking stalls at the park could be eliminated to provide better access to new sidewalk

PROS:

- Cost
- Blends into existing surroundings
- No (or very minor) adverse travel distance
- Refuge island provides pedestrians ability to cross one direction of travel at a time
- No additional R.O.W. required
- No or minor utility adjustments
- Left turn lane storage bay still provided for Whitman Street

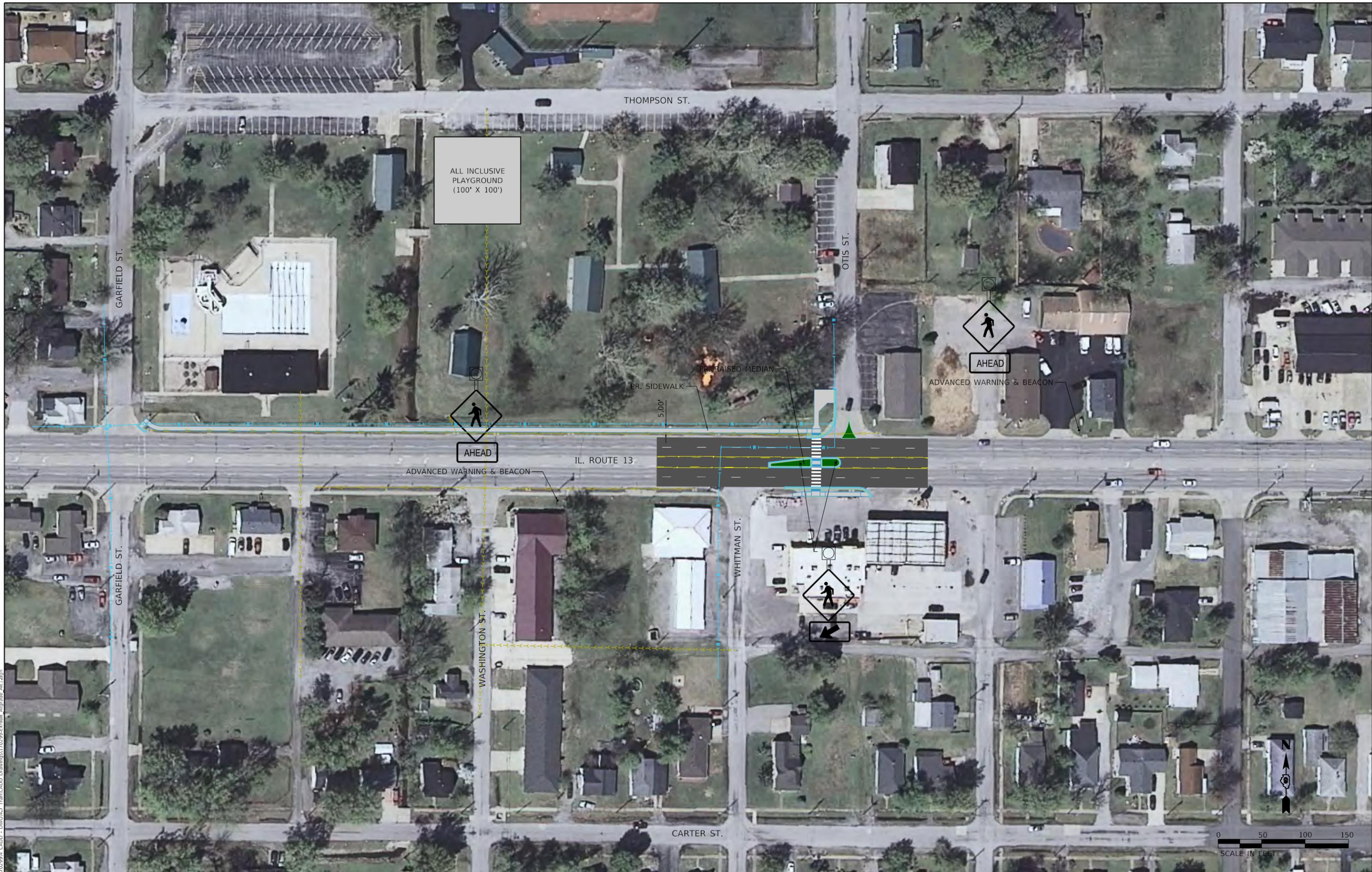
CONS:

- Otis becomes Right in Right out only. Access from IL 13 to NB Otis is removed.
- Hucks loses one entrance off IL 13
- Potential for pedestrian-vehicular conflict still exists
- Disruption for left turning vehicles on IL 13
- IL 13 vehicles must become aware of pedestrians crossing at crosswalk

PARK CIRCULATION TRAFFIC NOTE:

- Traffic circulation at park currently runs NB Otis to WB Clark. Traffic could be rerouted with this option, with Garfield being NB, Clark being EB, and Otis being SB. This would require restriping of 72 diagonal parking stalls near the ballfields.

APPROXIMATE COST: \$156,000 total cost



MODEL: Definit
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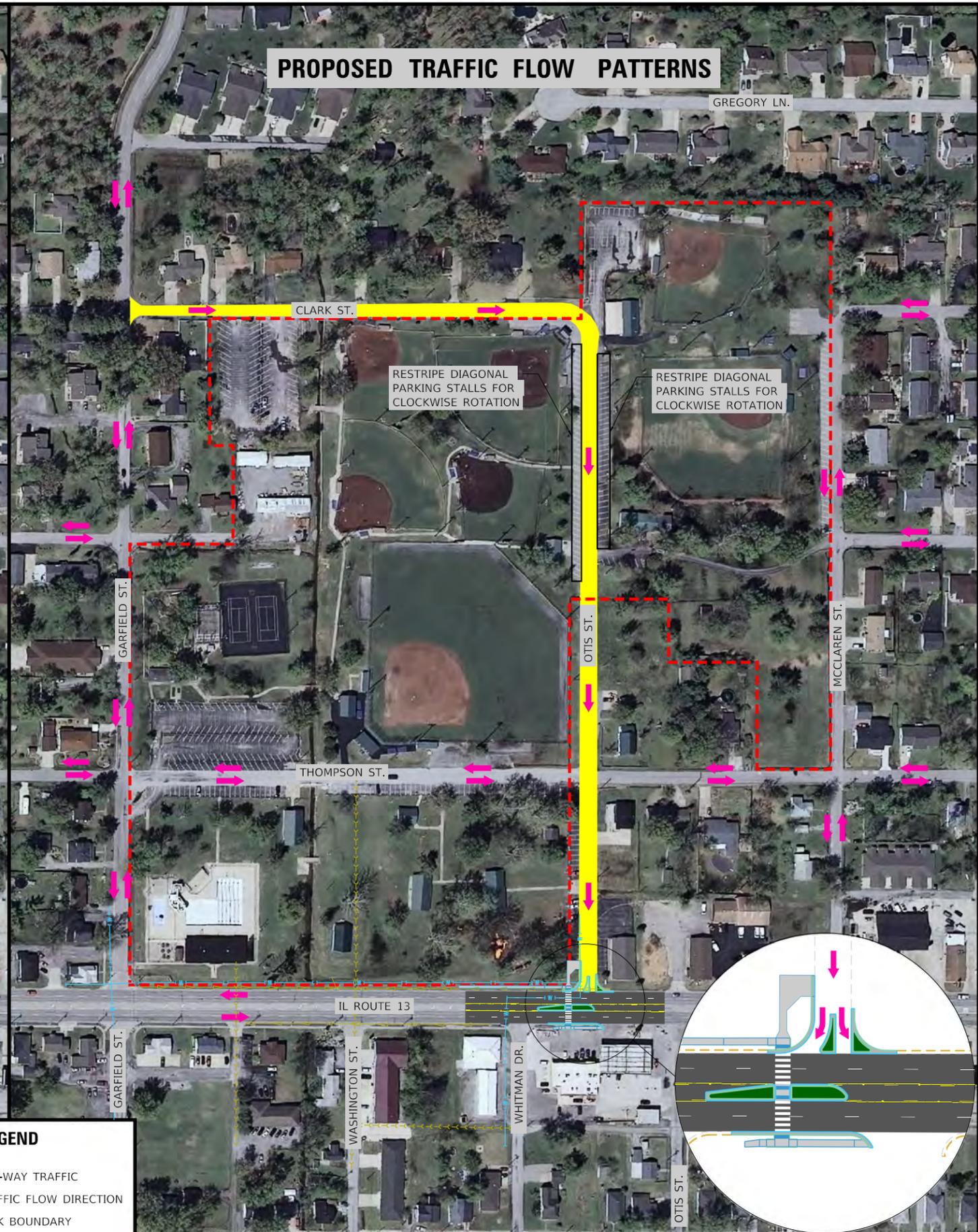
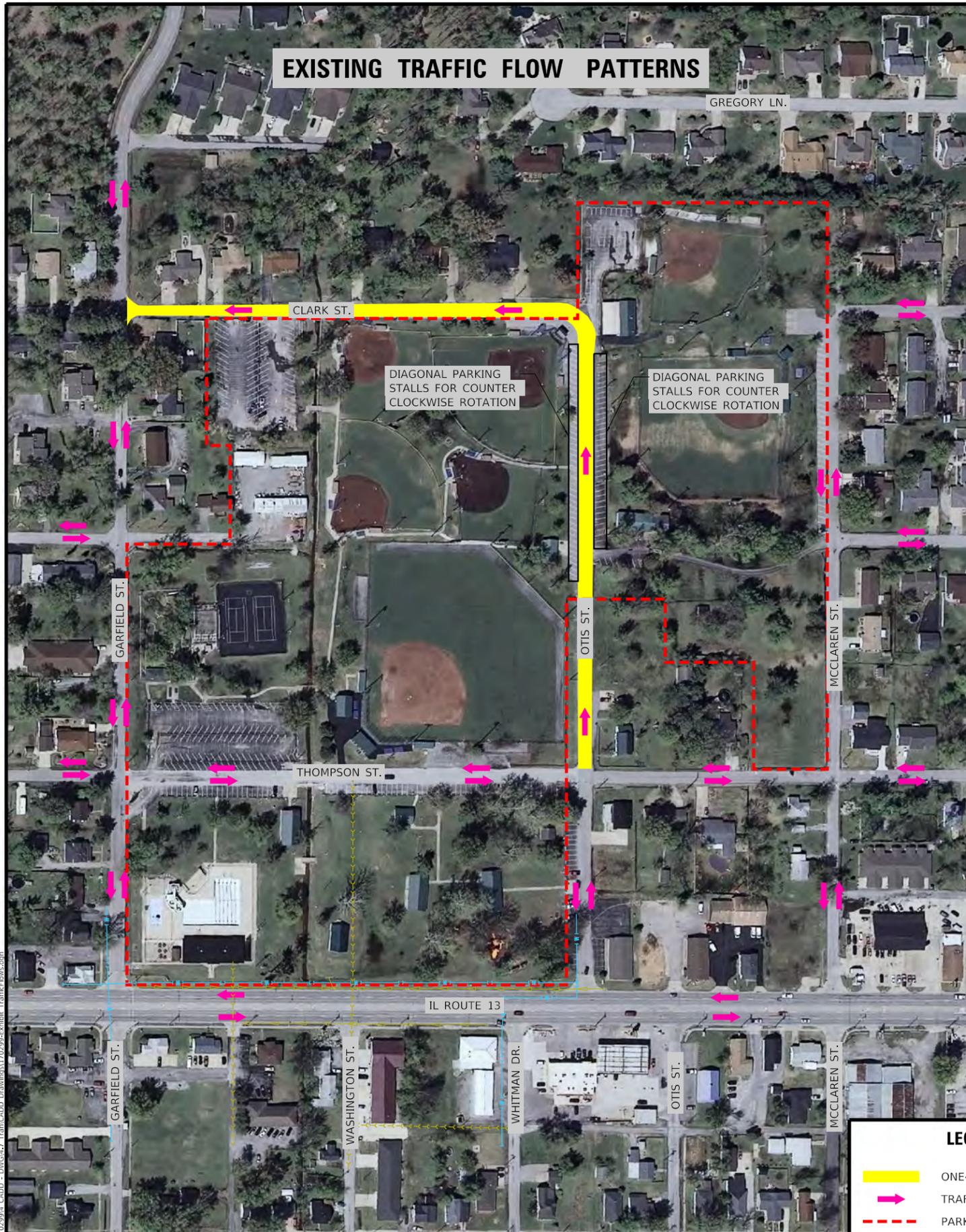
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 13 PEDESTRIAN STUDY AT-GRADE OPTION - ALTERNATE 1				
SCALE:	SHEET	OF	SHEETS	STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

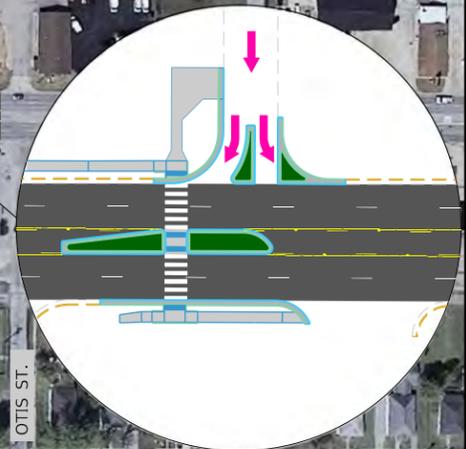
EXISTING TRAFFIC FLOW PATTERNS

PROPOSED TRAFFIC FLOW PATTERNS



LEGEND

- ONE-WAY TRAFFIC
- TRAFFIC FLOW DIRECTION
- PARK BOUNDARY



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PLOT DATE = 11/19/2018	CHECKED -	REVISED -
	DATE -	REVISED -

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

IL 13 PEDESTRIAN STUDY TRAFFIC FLOW PATTERNS	
SCALE:	SHEET OF SHEETS STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

Option 3C – At-Grade crossing with IL Route 13 - Just east of Otis Street

DESCRIPTION:

Marked cross walk with refuge island just east of intersection with Otis Street.

DESIGN DETAILS:

- Raised refuge island built within width of existing bi-directional turn lane
- Storage area provided for left turning movements onto Whitman Street
- Storage area provided for left turning movements onto Otis Street
- Hucks center entrance drive on IL 13 to be closed, and sidewalk constructed across entrance
- Advance warning signage to be placed. Pedestrian activated flashing beacon added in advance of crossing as well as on median surface.
- Street lighting enhancements at the crossing location could also be considered

IMPACTS:

- Hucks loses center entrance off IL 13
- Storage for left turns into Hucks' west entrance is limited
- Hucks overhead sign must be relocated

PROS:

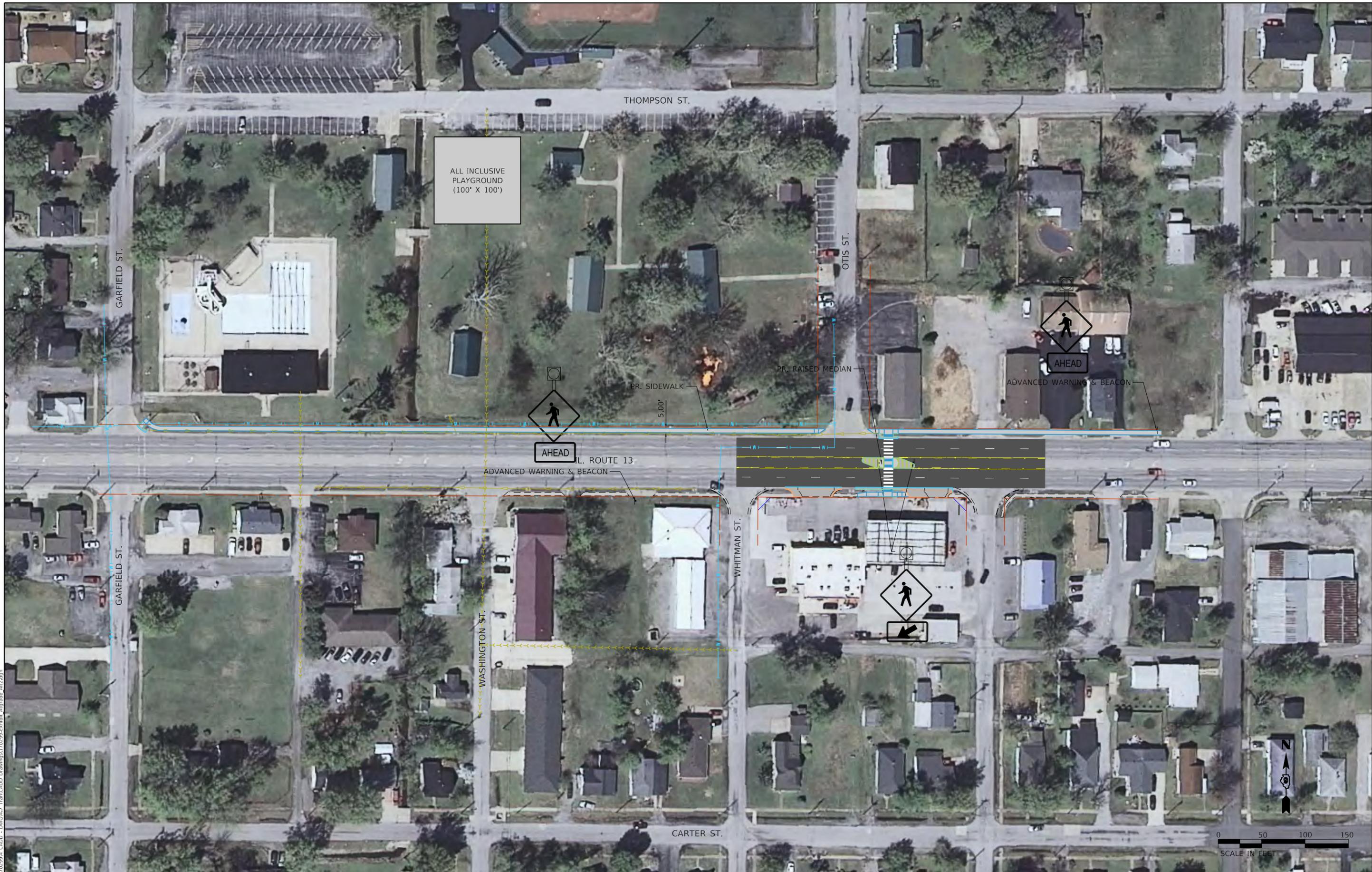
- Cost
- Blends into existing surroundings
- No (or very minor) adverse travel distance
- Refuge island provides pedestrians ability to cross one direction of travel at a time
- No additional R.O.W. required
- No or minor utility adjustments
- Traffic patterns on Otis Street are maintained

CONS:

- Hucks loses one entrance off IL 13
- Storage for left turns into Hucks' west entrance is limited
- Potential for pedestrian-vehicular conflict still exists
- Some disruption for left turning vehicles on IL 13
- IL 13 vehicles must become aware of pedestrians crossing at crosswalk

APPROXIMATE COST:

- \$171,000 total cost



MODEL: Default
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PLOT DATE = 11/19/2018	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 13 PEDESTRIAN STUDY
AT-GRADE OPTION - ALTERNATE 2

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

SCALE: SHEET OF SHEETS STA. TO STA.

ATTACHMENT 12.4
SIDEWALK & TRAFFIC SIGNALS
OPTION 4

Option 4 – Extend IL Route 13 Sidewalk and Enhance Existing Traffic Signals at State & Fair Streets

DESCRIPTION:

Provide continuous sidewalk on both sides of the roadway between upgraded signalized intersections, where a safe crossing can occur.

DESIGN DETAILS:

- No sidewalk exists on north side of roadway - Construct sidewalk full length (2500')
- Sidewalk is generally in place on south side of IL 13, but may need spot ADA upgrades
- State Street: existing upgraded signals with painted cross walks. No further upgrades necessary.
- Fair Street: full upgrade required including ADA push buttons, ramps, painted cross walks, etc.
- Lighting enhancements may be desired at traffic signals.

IMPACTS:

- Minor, if any

PROS:

- Protected pedestrian crossing with traffic signal
- No additional ROW required
- No or minor utility adjustments
- No change in IL 13 traffic patterns, besides signal timing when pedestrian button activated
- Blends into existing surroundings

CONS:

- Adverse travel of 2 blocks each direction (1650' total, or 0.31 miles) from edge of park will discourage use, and unsafe crossings will likely continue at same locations
- Potential for pedestrian-vehicular conflict still exists

APPROXIMATE COST:

- \$415,000 total cost

Engineer's Opinion of Probable Construction Cost



Project: IL Route 13 Pedestrian Crossing - Cont. Sidewalk & Signal Option

Project No.: 17 0299

Date of Opinion: July 2018

Client: SIMPO

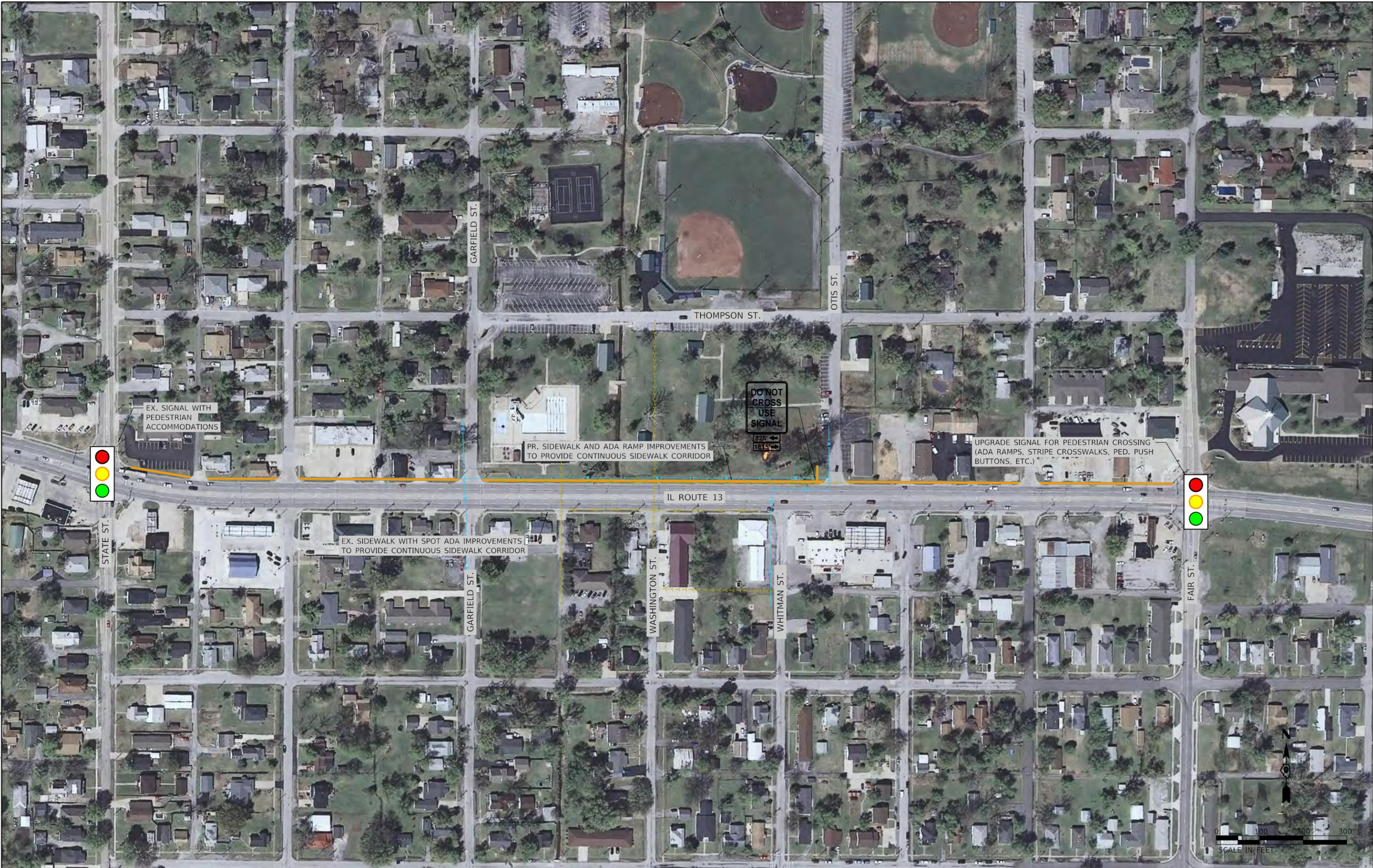
Pre-Design Opinion of Cost
Based on 2018 Unit Pricing

Description: Construct sidewalk between Fair & State Streets (north side)
Upgrade ADA ramps and driveway aprons
Upgrade Signals at Fair Street
Upgrade Lighting at Fair and State Streets

Item Number	Item Description	Quantity	Unit	Unit Price	Item Price	Group Price
A Park						
1					\$ -	
2	Misc/Contingency Items	20%			\$ -	\$ -
B Road ROW						
1	Replace/new ADA Sidewalk Ramps	28	EACH	\$ 2,000.00	\$ 56,000.00	
2	Traffic Control	1	L SUM	\$ 20,000.00	\$ 20,000.00	
3	PCC Sidewalk, 4"	11750	SQ FT	\$ 8.00	\$ 94,000.00	
4	Driveway apron pavement replacement	1100	SQ YD	\$ 60.00	\$ 66,000.00	
5	Upgrade Fair Street Signals	1	L SUM	\$ 100,000.00	\$ 100,000.00	
6	Lighting upgrades at Fair & State	1	L SUM	\$ 40,000.00	\$ 40,000.00	
7	Misc/Contingency Items	20%			\$ 15,200.00	\$ 391,200.00
C Misc Items						
1	6% Mobilization	1	L SUM	\$ 23,472.00	\$ 23,472.00	
						\$ 23,472.00

Project Total \$ 414,672.00

Based on 2018 Unit Pricing
Not including planning & engineering



MODEL: Default
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	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 13 PEDESTRIAN STUDY CONTINUOUS SIDEWALK AND SIGNAL OPTION				
SCALE:	SHEET	OF	SHEETS	STA. TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				