

# Regional Pedestrian Plan

Eudora, Baldwin City, Lecompton

LAWRENCE - DOUGLAS COUNTY

# MPO



METROPOLITAN PLANNING ORGANIZATION



**Adopted by:**

MPO Policy Board: Date TBD

Eudora City Commission: Date TBD

Baldwin City Council: Date TBD

Adopted by the Lecompton City Council: Date TBD

DRAFT

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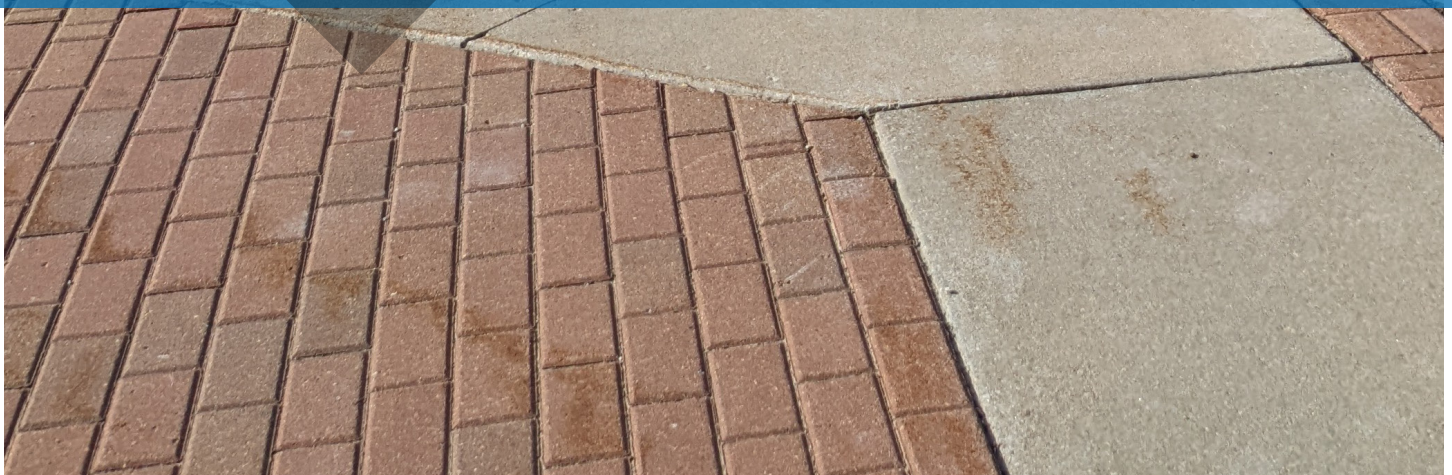
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# Chapter 1: Introduction





# INTRODUCTION

This plan was developed by the Lawrence-Douglas County Metropolitan Planning Organization (MPO) and the Cities of Eudora, Baldwin, and Lecompton. Most of the planning process occurred during the fall/winter of 2021-2022, but due to staff turnover was not completed until 2024. The plan was approved by the MPO Policy Board on [insert date].

This plan updates and replaces the first regional pedestrian plan for Douglas County, which was completed in 2016. The 2016 plan included all the cities in Douglas County, however this plan establishes unique recommendations for Eudora, Baldwin City, and Lecompton. A plan update was necessary to engage with the community on next steps to continue advancing regional walkability.



## VISION

The residents of Eudora, Baldwin City and Lecompton envision communities that invite people of all ages and abilities to walk for enjoyment, exercise, and daily transportation by providing an equitable, safe, accessible, convenient, and attractive pedestrian environment. This includes the following focus areas:

**Safety:** Improve safety by reducing the number and severity of crashes through infrastructure design along and across roadways, and by promoting safe driving, walking, and bicycling behaviors through education and enforcement.

**Equity:** Provide accessible pedestrian facilities for all users through public engagement, accessible design, and capital investments.

**Health:** Develop a pedestrian network that promotes active lifestyles and sustains a healthy environment.

**Economy:** Enhance economic vibrancy by creating safe and aesthetically pleasing walking environments with easy connections to commercial centers and front doors of businesses.

**Connectivity:** Plan and build pedestrian infrastructure creating a network to connect neighborhoods to employment, retail, community services, schools, recreation, and cultural amenities.

**Multimodal Connections:** Develop pedestrian facilities that provide opportunities to access other modes of transportation (bicycling, carpooling, or vanpooling).

**Land Use and Design:** Employ land use planning and site design requirements that encourage pedestrian travel by making trips by foot pleasant, convenient and safe.

# BENEFITS OF WALKING

Quality pedestrian environments can positively impact both individuals and the wider community. While health and access may be improved for pedestrians only, reduced traffic congestion, economic gains, and improved air quality can benefit everyone in the city. Cities within Douglas County could take advantage of several of the following benefits with enhanced pedestrian facilities.

## SOCIAL

- A walkable environment helps people stay physically active. People who are physically active live longer and have a lower risk of chronic disease and obesity, but only half of adults and one quarter of high school students get the amount of physical activity recommended by national guidelines.<sup>1</sup>
- Walking can improve mental health by reducing the risk of stress, anxiety and depression. A study found that those who walk for more than 8.6 min per day are 33% more likely to report better mental health.<sup>2</sup>
- Walkable communities help reduce social isolation among older adults. More than 50% of Americans 65 and older who do not drive stay home on a given day because they lack transportation options. Older non-drivers take 65% fewer social, family, and religious trips than older people who still drive.<sup>3</sup>
- More people walking means more “eyes on the street,” which can improve the sense of safety and security for everyone.
- A walkable community better connects all residents to jobs, education, and services, which is especially important for those unable to drive (one-third of all Americans are unable to drive either due to age-related loss of function, being too young to drive, being unable to afford a vehicle, or having some type of disability that prevents the ability to drive).<sup>4</sup> In Douglas County 5.6% of households have no access to a vehicle (10% in Baldwin City, 3% in Eudora, and <1% in LeCompton).<sup>5</sup>

1 U.S. Department of Health and Human Services. Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities. Washington, DC: U.S. Dept of Health and Human Services, Office of the Surgeon General; 2015. Accessed from <http://www.surgeongeneral.gov/library/calls/walking-and-walkable-communities/call-to-action-walking-and-walkable-communities.pdf>

2 Sinnett, D., Williams, K., Chatterjee, K., & Cavill, N. (2011). Making the case for investment in the walking environment: A review of the evidence. University of West England. UWE.

3 Surface Transportation Policy Institute. Aging Americans: Stranded Without Options Fact Sheet. 2012. Accessed from [www.transact.org/library/reportshtml/seniors/fact\\_sheet.asp](http://www.transact.org/library/reportshtml/seniors/fact_sheet.asp)

4 Rails to Trails Conservancy. Active Transportation for America: A Case for Increased Federal Investment in Bicycling and Walking. Published 1/1/2008. Accessed from <http://www.railstotrails.org/resource-library/resources/active-transportation-for-america/>

5 U.S. Census Bureau, American Community Survey 2021 5-Year Estimates, Table B25044. Accessed on June 20, 2023 from <https://data.census.gov>



## HEALTH

Only half of adults and one quarter of high school students get the amount of physical activity recommended in national guidelines. Regular walking can help prevent or manage various conditions, including heart disease, high blood pressure, and type 2 diabetes.



## EQUITY

One-third of all Americans are not able to drive, either because they are too old, too young, too poor, or have some form of disability. Safe non-motorized transportation options, combined with access to public transportation, are critical components of a transportation network that connects people - especially low income households - with jobs, education, and essential services, providing “ladders of opportunity”



## ENVIRONMENTAL

- A leading cause of air pollution in many urban regions is household vehicle travel.<sup>6</sup> The more people who walk instead of drive, the less pollution is emitted from automobiles. Automobile pollution contributes to ground-level ozone which can lead to shortness of breath and asthma.
- In 2016, transportation accounted for approximately 28% of total U.S. greenhouse gas emissions.<sup>7</sup> Shifting short automobile trips to walking can help reduce those emissions. In Douglas County short trips of one mile or less make up 27% of all vehicle trips.<sup>8</sup>
- Reducing the need for parking and paved surfaces benefits the urban heat island effect and habitat destruction required for car dependent development patterns.

## ECONOMIC

- Walkability can help boost prosperity by attracting employment. Investing in walkable public spaces can be a catalyst for regeneration, making cities attractive to private investments and providing economic benefits to communities.
- Pedestrian friendly cities are more desirable places to live, helping attract an educated workforce. When deciding where to live, one study found 64% of people choose the city before the company or the job.<sup>9</sup>
- A pleasant pedestrian environment can help drive tourism as walking is the best way to experience a city. A walkable environment creates public spaces that are a pleasure to spend time strolling through and enjoying local services, shops, and landmarks
- Reducing dependence on automobiles can free up discretionary income for other uses. In 2020, driving a newer medium sized sedan costs an average of \$9,880 per year and driving a newer medium sized SUV costs \$11,518 per year.<sup>10</sup>

## COMPREHENSIVE APPROACH TO PEDESTRIAN PLANNING

It is necessary to have a comprehensive approach to multimodal planning. This is called the 5 E's. It is important to recognize that walkability and a pedestrian-oriented culture rely on sustained improvements across the elements rather than only focusing on one element. The five E's are Education, Encouragement, Engineering, Evaluation, and Enforcement.

**Education** – Providing community members with the skills to walk and bicycle safely, educating about benefits of walking and bicycling, deterring unsafe behaviors and encouraging safe habits by people when walking, bicycling, and driving.

**Encouragement** – Generating enthusiasm and increased walking through events, activities, and programs.

**Engineering** – Creating physical improvements to streets and neighborhoods that make walking safer, more accessible, more comfortable, and more convenient.

6 Frank, L. D., Stone, B., & Bachman, W. (2000). Linking land use with household vehicle emissions in the central Puget Sound: Methodological framework and findings. *Transportation Research D*, 5(3).

7 United States Environmental Protection Agency. (2018, August 27). Fast Facts on Transportation Greenhouse Gas Emissions. Accessed on November 12, 2018 from <https://www.epa.gov/greenvehicles/fastfacts-transportation-greenhouse-gas-emissions>

8 U.S. Department of Transportation Bureau of Transportation Statistics. Trips by Distance - Annual. Accessed on June 20, 2023 from <https://data.bts.gov/Research-and-Statistics/Trips-by-Distance-Annual/famd-xfhk>

9 Helgesen, S. (2010) Charles Landry Knows What Makes Cities Great: Distinction, Variety, and Flow: Accessed on June 20, 2023 from <http://www.strategy-business.com/article/10306?gko=232cd>

10 AAA, (2020) AAA Your Driving Costs accessed on February 7, 2022 <https://newsroom.aaa.com/wp-content/uploads/2020/12/2020-Your-Driving-Costs-Brochure-Interactive-FINAL-12-9-20.pdf>

**Evaluation** – Providing a baseline understanding of what is happening in the community, such as how many people currently walk and bike, what the barriers are, and which strategies are most effective at addressing them. Measuring the growth of pedestrian facilities in the region

- Measuring the mode share of trips in the region or the number of users on a specific pedestrian facility through pedestrian counts
- Measuring driver yielding behavior
- Evaluating crash data (injuries and fatalities) for patterns or frequency

**Enforcement** – Monitoring drivers for adherence to traffic laws, and enforcing those laws in a way that minimizes or eliminates potential for bias

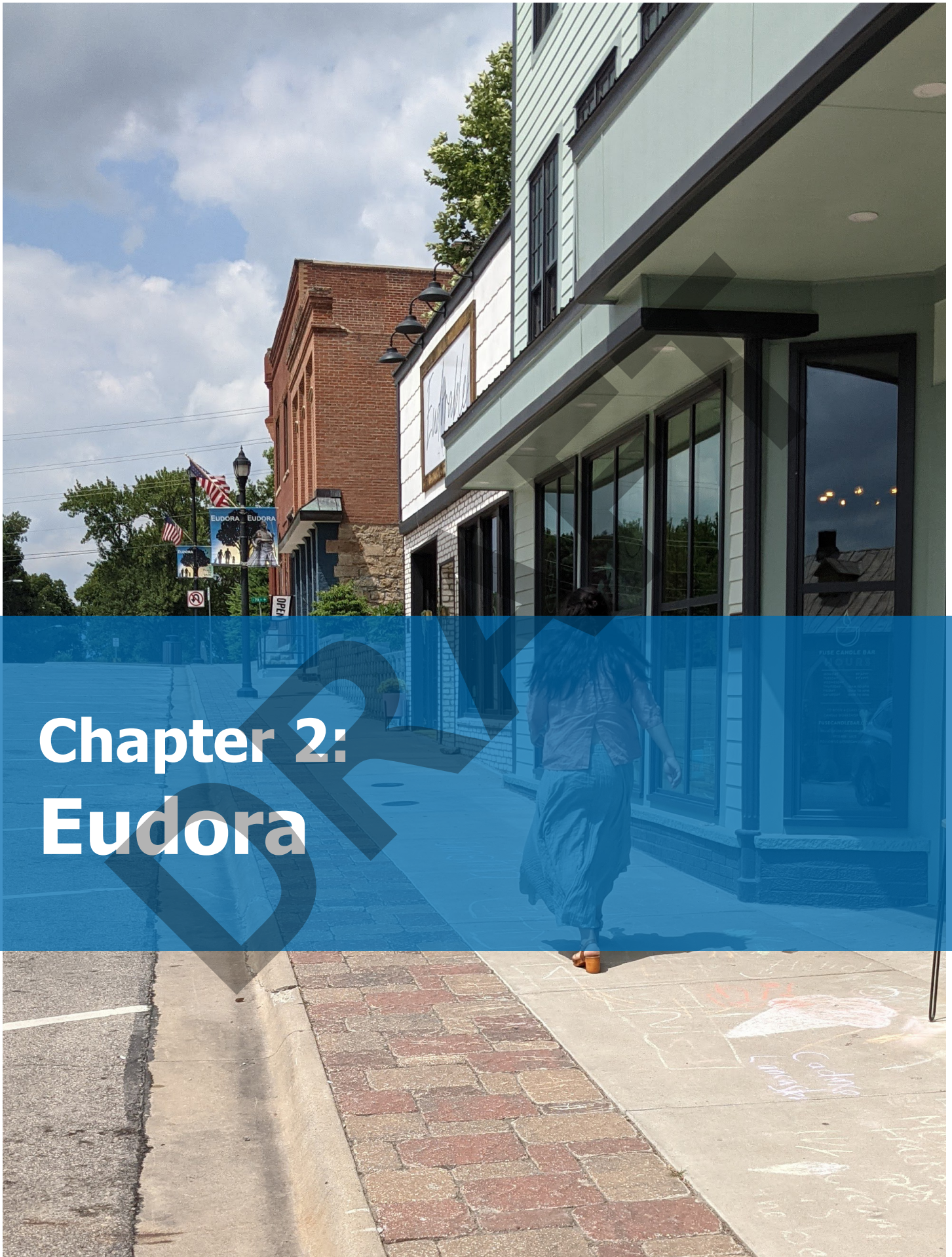
## THE PLANNING PROCESS

Technical Advisory Committee established subcommittees with each cities' voting member and worked with them to invite stakeholders to the process to oversee the update to the regional pedestrian plan. The process included a public survey to understand local preferences and concerns. Appendix # includes what we heard from the public surveys and the recommendations that evolved from the feedback.

## CONCLUSION

The recommendations in this document aim to focus investment in pedestrian infrastructure so that the network is less fragmented. These recommendations are not mutually exclusive and can be implemented incrementally as funding becomes available. This Pedestrian Plan is an important document because it enables city staff to make consistent decisions to improve the pedestrian environment. It sets the stage for policy discussion regarding sidewalk requirements, helps protect streets with developed pedestrian infrastructure, and prioritizes streets with underdeveloped pedestrian infrastructure for upgrades. While funding is limited, yearly improvements help improve the system by bringing existing facilities into compliance with current standards, and providing programming, education, and policy changes that can lead to more people choosing to walk. The ultimate goal is to have a complete citywide system of quality pedestrian infrastructure paired with policies and programs that encourage more people to walk. Measured progress towards this will continue to support overall walkability and economic development opportunities throughout the region.





## Chapter 2: Eudora



# EXISTING PEDESTRIAN CONDITIONS

## SIDEWALK NETWORK

Sidewalks mostly exist in Eudora's newer neighborhoods and on some streets around downtown. The city lacks sidewalks on one or both sides of many streets but has made progress in recent years completing sidewalks, including along 10th Street from Church Street to Peach Street and the shared use path along Winchester Drive to Blue Jacket Park. The 2016 Regional Pedestrian Plan identified a priority pedestrian network of key pedestrian routes, largely focused on Safe Routes to Schools (SRTS). Figure 2-2 is an inventory of the existing sidewalk network.

To quantify missing sidewalk segments, the following goal is used: sidewalks on both sides of arterial streets (portions of Church Street and 10th Street) and major collector streets (portions of Church Street and 10th Street, Main Street, Winchester Street, 20th Street, and East 2300 Road,) and on one side of local streets (all other streets). Using that metric, 40% of the sidewalk network is complete and there are 30 miles of missing sidewalk\*. A high level cost estimate can be calculated based on the missing mileage. Costs in 2024 for sidewalk construction range from \$23 - \$54 per square foot. Assuming 5' wide sidewalks (minimum recommended), costs would range from \$7 million to \$17 million to fill in missing sidewalks. This does not include design/ inspection (estimated at 25% of the construction cost) or consider future inflation.

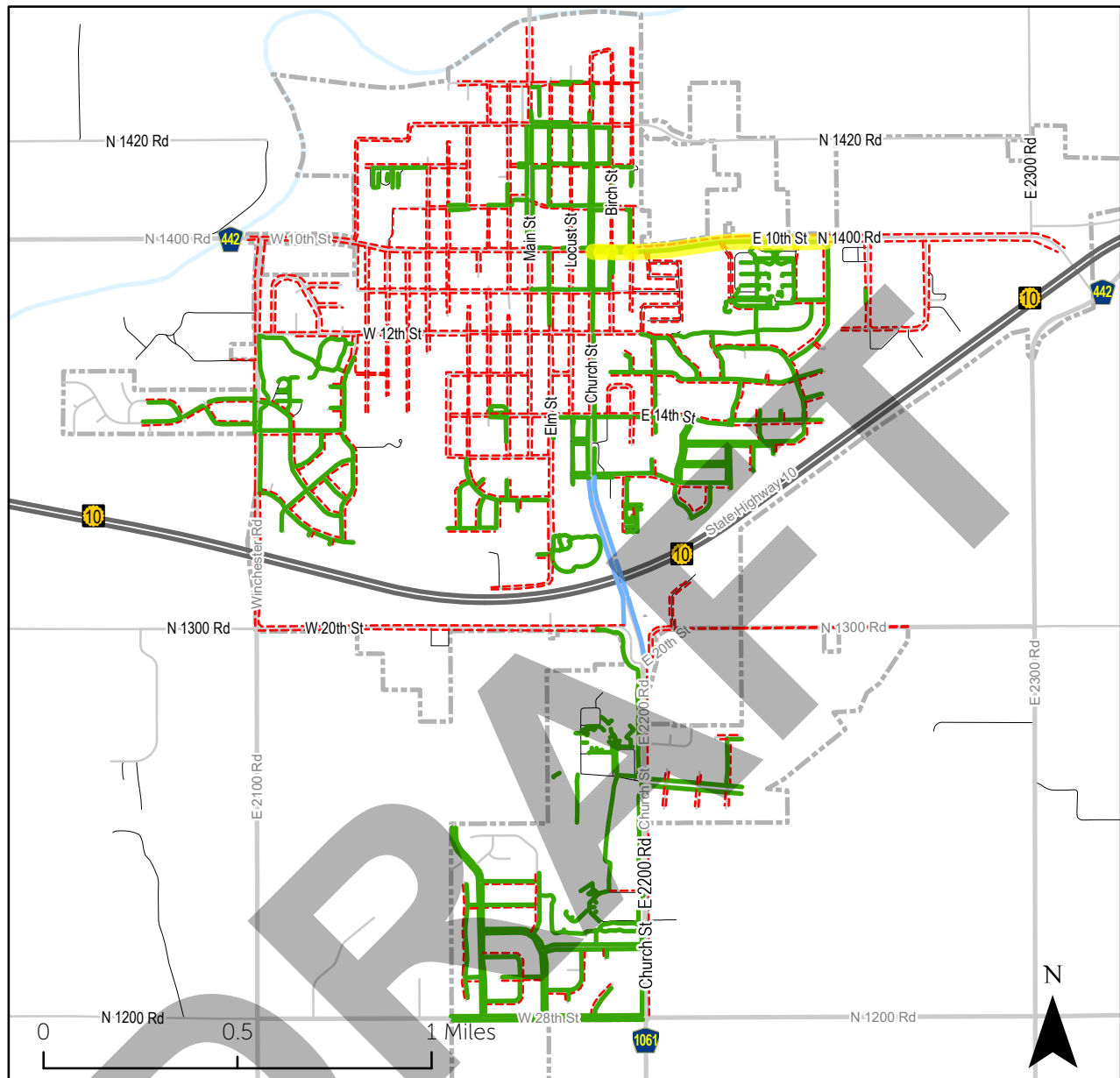
Figure 2-1: Blue Jacket Trail











\*Measurements are based off centerline miles of roadway which over counts actual sidewalk miles since sidewalks do not continue through street intersections.



Figure 2-2: Eudora Sidewalk Inventory



-  Existing Sidewalk
  Recently Completed
  Water
-  Missing Sidewalk
  Roads
  City Limits
-  Pending Sidewalk
  Highway

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While sidewalk may be desired on most streets, the significant costs associated with construction necessitates identifying the highest priority needs. Thus, the pedestrian priority network established in the 2016 Pedestrian Plan focused on providing the most people with access to the most parts of town, particularly to schools, grocery stores, and other landmark destinations. Significant progress to building the original priority network has been made and an expanded priority network is established in Figure 2-5. Resources should continue to be targeted to complete the priority network.

Figure 2-3: Blue Jacket Trail

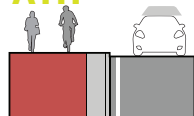


Figure 2-4: 10th Street Sidewalk Completed in 2023



## SHARED USE PATH

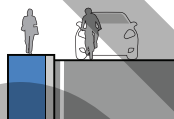
**0.6 MILES**



A >8-foot wide sidewalk which provides a continuous corridor for bicycle riders and pedestrians that is separate from vehicular roadways. Paths work best when connected to an on-street network which meets robust safety and design standards. According to national standards, 10-foot shared use paths are recommended; however, under certain constraints 8-foot may be approved.

## SIDEWALK

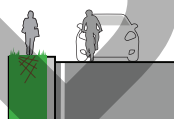
**23 MILES**



A sidewalk is a path along the side of a road. It is often constructed of concrete or cement, though occasionally bricks or stones, and is designed for pedestrians. According to national standards, 6-foot sidewalks are recommended; however, under certain constraints 5-foot may be approved.

## MISSING SIDEWALK\*

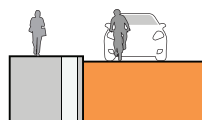
**30 MILES**



Sidewalk does not exist causing pedestrians to either walk in the street or across yards.

## ROADWAY

**43 MILES**



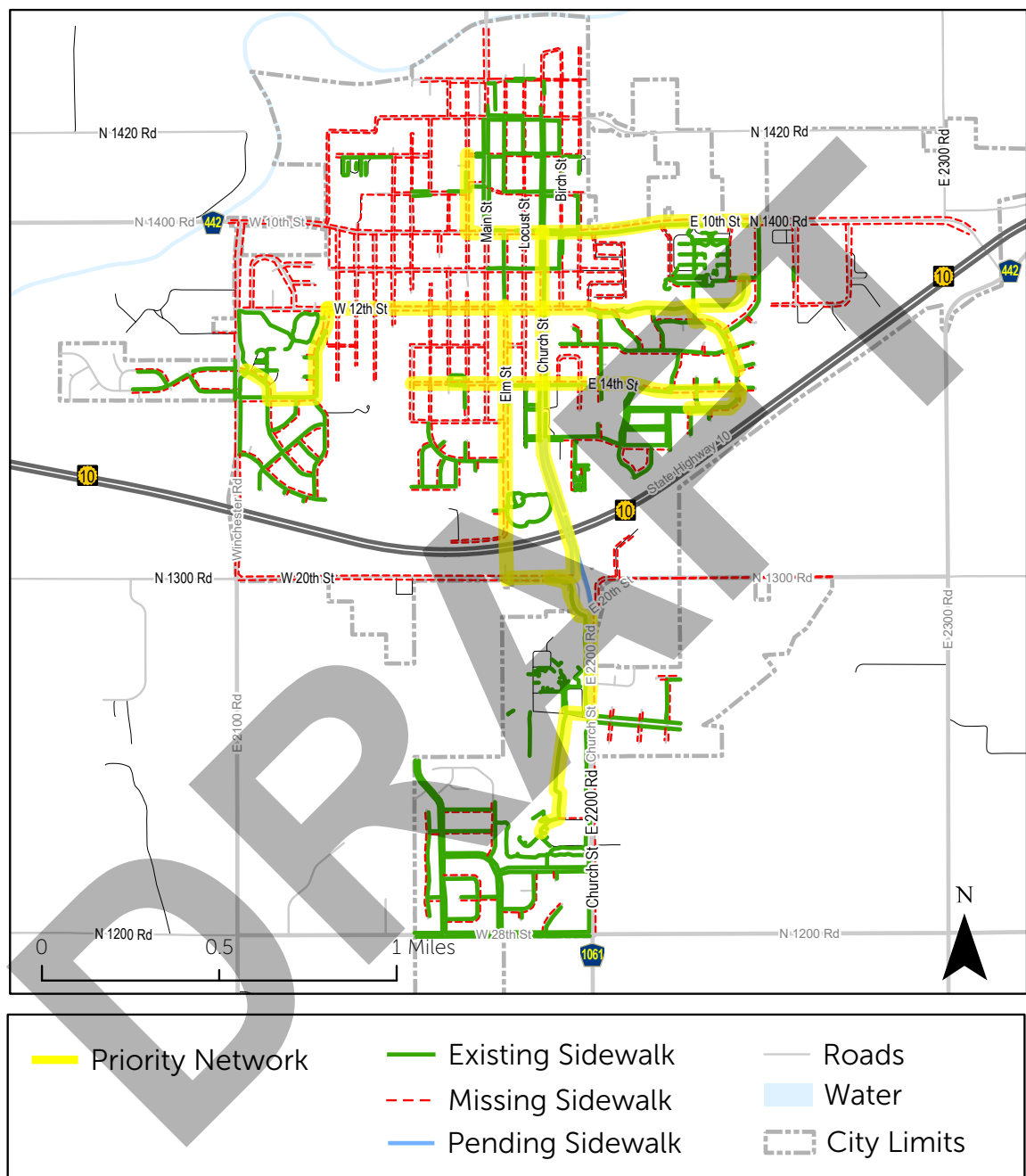
Total miles of roadways within Eudora city limits or immediately adjacent roads that form a part of the sidewalk network. Some of these roads may be owned/maintained by the county and not Eudora.

\*Missing sidewalk means local and minor collector streets with no sidewalks and major collector or arterial streets where there is not a sidewalk on both sides.



Figure 2-5: Eudora Priority Sidewalk Network

# Eudora Priority Network



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## ACCESSIBILITY

The Americans with Disabilities Act (ADA) addresses accessible sidewalks within the public rights-of-way. The ADA does not mandate the installation of sidewalks, but it does require curb ramps at intersections where existing sidewalks are provided on both sides of the roadway. Sidewalks are an integral part of the transportation system and allow individuals to work, live, participate and thrive in their communities. Therefore, design, maintenance, and repairs should include accessibility and usability for all potential users, especially people with disabilities

An inventory of sidewalk condition in 2014 revealed many intersections lacked curb ramps or did not meet ADA standards while many other areas needed sidewalk maintenance or replacement. Routes with a high number of defects, such as deflections in the walking surface, can impede the easy travel of a wheelchair, cause trips and falls, and discourage pedestrian use. While some areas in need of maintenance may have been repaired since 2014, many issues likely remain today along with new defects that may have emerged.

The current city code (Sec. 13-216) for sidewalk maintenance states that “It shall be unlawful for the owner of any property having a sidewalk adjacent thereto to permit any plank, brick, stone or segment of the sidewalk to be raised above the established level of the sidewalk more than one-half inch, in any manner which might catch the foot of a pedestrian, or to permit any holes or depressions to occur in the sidewalk in which a pedestrian might drop or catch his or her foot in a manner liable to cause injury.” The current condition of some sidewalks suggests that the existing policy is not creating a compliant sidewalk network. If the city determines that enforcement of this policy is not feasible, alternative programs or ordinances should be explored.

## OTHER PEDESTRIAN FACILITIES BESIDES SIDEWALKS

Since people walking typically take the most direct route, gaps in the sidewalk network often force them to walk in the street or onto the adjacent grass, dirt, gravel, etc. Many local streets without sidewalks have low enough traffic volumes and speeds to feel comfortable and safe to a segment of the population. Walking in the street may be a comfortable option for able bodied adults, but may not be appropriate for everyone, including children or those with mobility challenges. While sidewalks are preferable for those walking, other facilities such as yield roadways and advisory shoulders can be an interim or long term solution when costs or other factors make a sidewalk infeasible.

Figure 2-6: Crosswalk





## YIELD ROADWAY

A yield roadway is a neighborhood street designed to serve pedestrians, bicycle riders, and motor vehicle traffic in the same slow-speed travel area. Yield roadways need to be sufficiently narrow to encourage slow travel, with recommended widths of 12 to 20 feet. Yield roadways do not have sidewalks or lane markings. Currently, many Eudora streets act as unofficial yield roadways. Signage can help raise awareness for the use of the roadway for walking.

Figure 2-8: Yield Roadway



Locust Street in Eudora serves as an unofficial yield roadway. Street view image obtained from <https://maps.google.com>

Sign image obtained from Small Town and Rural Multimodal Networks

## ADVISORY SHOULDERS

An **advisory shoulder** is a type of a shared roadway with mixed traffic. Pedestrians or bicycle riders share the low-volume, low-speed streets. A single motor vehicle lane is established where drivers share the single lane with oncoming vehicles. When two vehicles meet, they yield to pedestrians and bicycle riders before merging into the dashed shoulder. This roadway type would require education and encouragement to make people feel for more comfortable with using it.

Figure 2-9: Advisory Shoulders



Street view image obtained from <https://maps.google.com>

Sign image obtained from Alta Planning + Design

## PEDESTRIAN LANE

A **pedestrian lane** is an interim or temporary pedestrian accommodation on streets without sidewalks which have low to moderate vehicle speeds and volumes. They are used to fill short gaps between sidewalks until a more permanent solution can be implemented. They must meet accessibility guidelines for a pedestrian access route.

Figure 2-7: Pedestrian Lane



Image obtained from Lynden Tribune

Figure 2-10: Pedestrian Lane

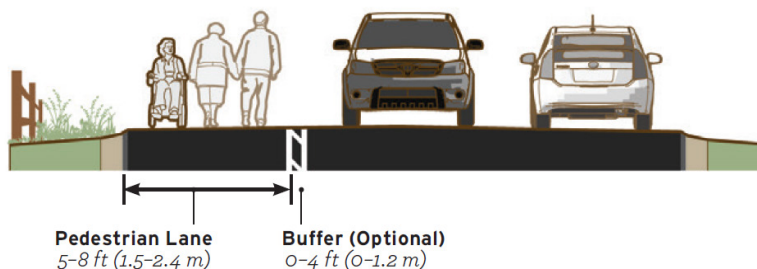


Image obtained from Small Town and Rural Multimodal Networks

## CROSSINGS

The perceived and actual safety of street crossings is one of the major barriers to walking in any community. Built environment crossing improvements are one approach to making people who walk more visible and reducing exposure and risk. There are two types of crossings – controlled (stop sign or traffic light) and uncontrolled (Figures 2-11 and 2-12). Marking a crosswalk with paint or other materials can help indicate where people should cross and alert motorists that people may be crossing. While crosswalks exist legally at all public intersections where there is a sidewalk on at least one side of the street, marking the crosswalk can increase awareness and reinforce that motorists must yield to people in crosswalks.

Marked crosswalks exist on some of the busier streets such as Main Street downtown, Church street, 10th Street and a few other locations. In some locations marked crosswalks are faded and require maintenance.

Figure 2-11: Uncontrolled, Marked Crossing

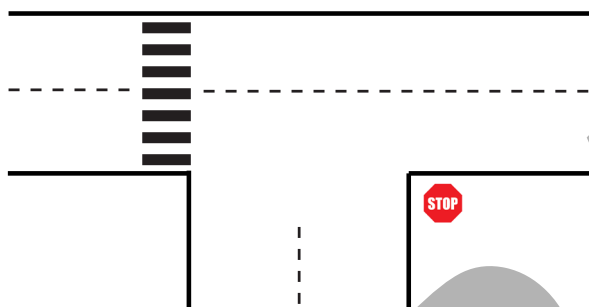
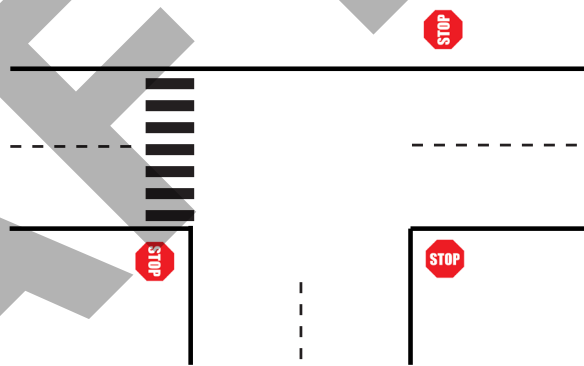


Figure 2-12: Controlled, Marked Crossing



## CROSSING IMPROVEMENTS

Improving crossings requires not only built environment improvements but also new policy/design criteria and education/enforcement. This section includes the recommendations related to the built environment improvements and policy/design. Both types of crossings can pose challenges that present real and perceived concerns for safety. Crossing improvements should be part of roadway reconstruction and maintenance or as standalone crossing projects.

The Federal Highway Administration's [Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations](#) provides the appropriate crossing improvement based on the characteristics of the roadway including speed, number of lanes, and number of vehicles which typically use it. Table 2-1 displays the application of crash countermeasures by roadway feature and Table 2-2 explains the safety issue addressed by each countermeasure. While this table addresses uncontrolled intersections, many of the countermeasures may be appropriate at controlled intersections, such as numbers 1, 2, 4, 5, and 6. The City should reference these tables when considering crossing improvements or other maintenance activities.



Table 2-1: Safety Countermeasure Recommendations

Roadway Configuration	Vehicle AADT <9,000			
	≤30 mph	35 mph	≥40 mph	
<b>2 lanes</b> (1 lane in each direction)	① 2 4 5 6	① 5 6 7 9	① 5 6 ⑦ ⑨	<p>Given the set of conditions in a cell,</p> <p># Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.</p> <p>● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.</p> <p>○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*</p> <p>1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs</p> <p>2 Raised crosswalk</p> <p>3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line</p> <p>4 In-Street Pedestrian Crossing sign</p> <p>5 Curb extension</p> <p>6 Pedestrian refuge island</p> <p>7 Rectangular Rapid-Flashing Beacon (RRFB)**</p> <p>8 Road Diet</p> <p>9 Pedestrian Hybrid Beacon (PHB)**</p>
<b>3 lanes with raised median</b> (1 lane in each direction)	① 2 3 4 5	① ③ 5 7 9	① ③ 5 ⑦ ⑨	
<b>3 lanes w/o raised median</b> (1 lane in each direction with a two-way left-turn lane)	① 2 3 4 5 6 7 9	① ③ 5 6 7 9	① ③ 5 6 ⑦ ⑨	

Table 2-2: Safety Issue Address by Countermeasure

Pedestrian Crash Countermeasure for Uncontrolled Crossings	Safety Issue Addressed				
	Conflicts at crossing locations	Excessive vehicle speed	Inadequate conspicuity/visibility	Drivers not yielding to pedestrians in crosswalks	Insufficient separation from traffic
Crosswalk visibility enhancement	🚶	🚶	🚶	🚶	🚶
High-visibility crosswalk markings*	🚶		🚶	🚶	
Parking restriction on crosswalk approach*	🚶		🚶	🚶	
Improved nighttime lighting*	🚶		🚶		
Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line*	🚶		🚶	🚶	🚶
In-Street Pedestrian Crossing sign*	🚶	🚶	🚶	🚶	
Curb extension*	🚶	🚶	🚶		🚶
Raised crosswalk	🚶	🚶	🚶	🚶	
Pedestrian refuge island	🚶	🚶	🚶		🚶
Pedestrian Hybrid Beacon	🚶	🚶	🚶	🚶	
Road Diet	🚶	🚶	🚶		🚶
Rectangular Rapid-Flashing Beacon	🚶		🚶	🚶	🚶

\*These countermeasures make up the STEP countermeasure "crosswalk visibility enhancements." Multiple countermeasures may be implemented at a location as part of crosswalk visibility enhancements.

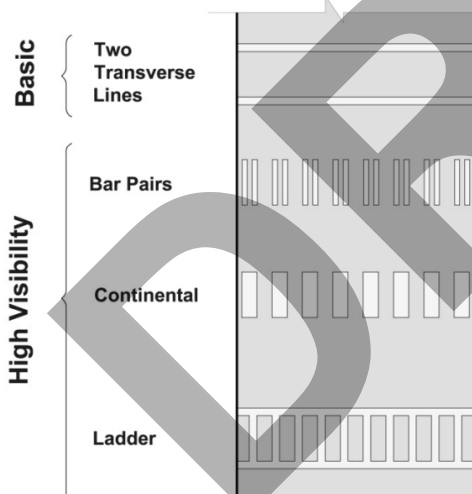
## 1 - HIGH VISIBILITY CROSSWALK MARKINGS, PARKING RESTRICTIONS, LIGHTING, & CROSSWALK WARNING SIGNS

The typical crosswalk uses two transverse lines. High visibility crosswalks can be seen from farther distances and use ladder, continental or bar pairs (Figure 2-13). Crosswalk warning signs (Figure 2-14) can be used to further increase visibility.

Parking restrictions, such as daylighting (Figure 2-15) can improve the visibility of pedestrians at crosswalks which was limited due to closely parked vehicles. Daylighting is the practice of converting a parking space at the crosswalk to a red painted curb, or installing vertical delineators in the street to prevent vehicles from parking too close to intersections.

According to the National Highway Traffic Safety Administration, 76% of pedestrian fatalities in 2019 occurred in dark conditions. Crosswalk lighting, placed carefully in forward locations to avoid a silhouette effect of the pedestrian, improve safety by making it easier for drivers to see people walking.

Figure 13: HIGH VISIBILITY CROSSWALK MARKINGS



*Image obtained from National Committee on Uniform Traffic Control Devices*

## 2 - RAISED CROSSWALK

Raised crosswalks (Figure 2-16) are long, raised speed humps with a flat section in the middle and ramps on the ends. They are typically used collector or local streets with posted speeds of 30 mph or less.

Figure 14: Crosswalk Warning Signs



Figure 15: Daylighting



*Image obtained from curbed.com*

Figure 16: RAISED CROSSWALK



*Image obtained from City of Ann Arbor [www.a2gov.org](http://www.a2gov.org)*



### 3 - ADVANCE “YIELD HERE FOR PEDESTRIANS” SIGN & YIELD LINE

Signs that state “Yield Here For Pedestrians” indicate where a driver should yield to pedestrians and may be supplemented by “shark’s teeth” yield line 20 to 50 feet in advance of a marked crosswalk (Figure 2-17).

### 4 - IN STREET PEDESTRIAN CROSSING SIGN

In-street pedestrian crossing signs (Figure 2-18) can be placed between travel lanes or in conjunction with a refuge island or raised median. The sign may be used to remind road users of laws regarding right-of-way.

### 5 - CURB EXTENSION

Curb extensions (Figure 2-19), also known as bulb-outs or neckdowns, extend the sidewalk or curb line out into the parking lane, which reduces the effective street width. Curb extensions significantly improve pedestrian crossings by reducing the pedestrian crossing distance; visually and physically narrowing the roadway; improving the ability of pedestrians and drivers to see each other; and reducing the time that pedestrians are in the street.

Figure 2-18: In-Street Pedestrian Crossing Sign



Image obtained from citybeat.com

Figure 2-19: Curb Extension



Figure 2-17: Various Countermeasures

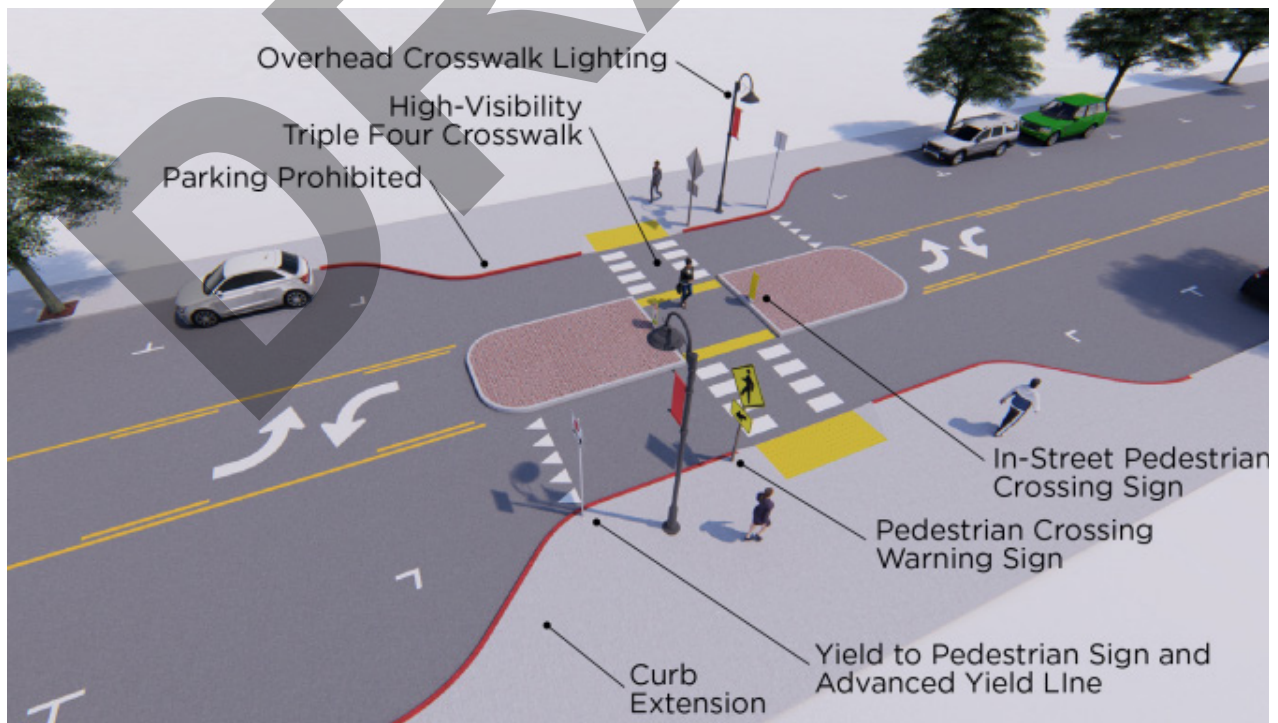


Image obtained from Federal Highway Administration



## 6 - PEDESTRIAN REFUGE ISLAND

A pedestrian refuge island (Figure 2-20) is a median with a refuge area that is intended to help protect pedestrians who are crossing the road. Refuge islands can help improve safety by allowing pedestrians to cross one direction of traffic at a time.

## 7 - RECTANGULAR RAPID-FLASHING BEACON

An RRFB (Figure 2-21) consists of two, rectangular-shaped yellow indications, each with a light-emitting diode (LED)-array-based light source. RRFBs flash with an alternating high frequency when activated to enhance visibility of pedestrians at the crossing to driver. Research suggests RRFBs have resulted in motorist yielding rates as high as 98 percent at marked crosswalks, but varies based on various factors.

## 8 - ROAD DIET

Road Diet is a roadway reconfiguration resulting in a reduction in the number of travel lanes, which is usually achieved by converting a four-lane undivided road to three lanes. This countermeasure is not applicable in Eudora given the lack of four lane roads.

## 9 - PEDESTRIAN HYBRID SIGNAL

A PHB (Figure 2-22) is a hybrid beacon used to control traffic and rests in dark until a pedestrian activates it via pushbutton or other form of detection. When activated, the beacon displays a sequence of flashing and solid lights that indicate when pedestrians should cross and when it is safe for drivers to proceed.

Figure 2-20: Pedestrian Refuge Island



*Image obtained from AARP*

Figure 2-21: Rectangular Rapid-Flashing Beacon



*Image obtained from Carmanah Technologies*

Figure 2-22: Pedestrian Hybrid Signal



## VEHICLE SPEED

Lower vehicle speeds reduce the severity of crashes and give people more time to react. Current posted speed limits generally range from 20 MPH to 35 MPH in Eudora. Most new residential streets have a posted speed limit of 30 MPH, while most older residential streets do not have a posted speed limit, meaning a 25 MPH speed limit applies in accordance with the Eudora city code. Main Street downtown has a speed limit of 20 MPH.

Field of vision, the amount of space a person can view while driving, decreases as speed increases (Figure 2-23). Thus higher speeds can lead to more crashes when drivers are not be able to view people walking or bicycling in the street soon enough to react. According to the AAA Foundation for Traffic Safety the average risk for death of a pedestrian increases as the speed of the vehicle increases (Table 2-3).

Table 2-3: Average Risk of Pedestrian Severe Injury or Death Based on Vehicle Speed

	Severe Injury	Death
<b>10.0%</b>	16 mph	23 mph
<b>25.0%</b>	23 mph	32 mph
<b>50.0%</b>	31 mph	42 mph
<b>75.0%</b>	39 mph	50 mph
<b>90.0%</b>	46 mph	58 mph

Figure 2-23: Field of Vision Based on Speed of Driver

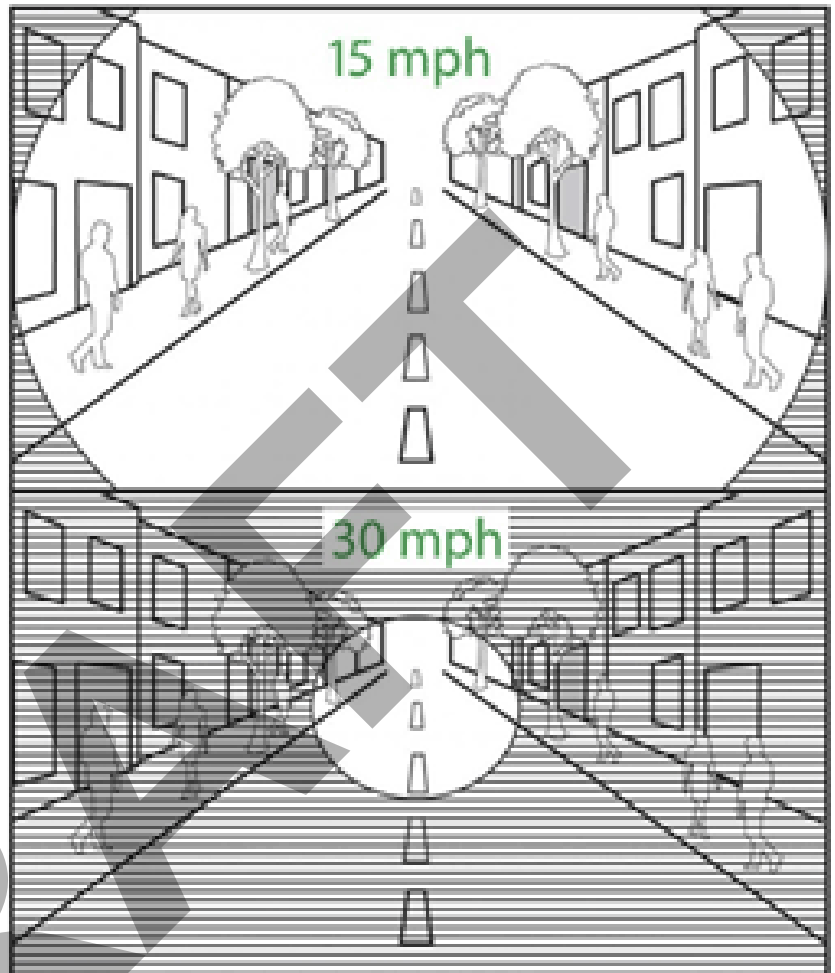


Image obtained from Congress for New Urbanism. Source: Jeff Speck, Walkable City Rules 2018

## SPEED MANAGEMENT

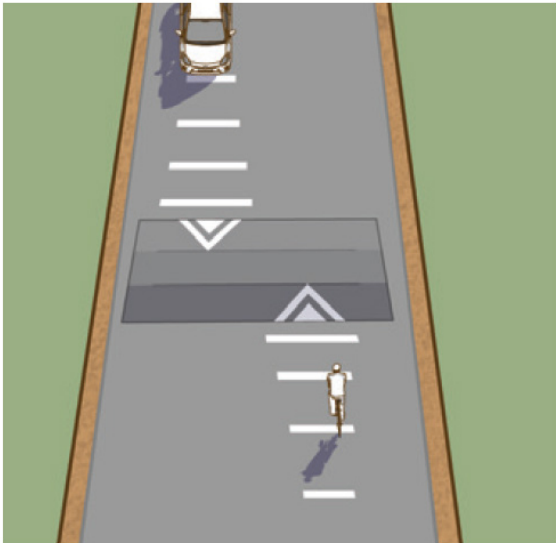
Lowering speed limits is one low cost measure to increase the safety of people walking. However, speed limits alone are often not enough to achieve desired speeds. Speed management uses physical changes to the roadway, signage and road markings, and/or operational changes to reduce driver speeds thereby increasing safety for pedestrians and all road users. It is sometimes referred to as a “silent policeman” enforcing speed limits when no actual law enforcement is present. Any roadway where speeding is a concern is a potential candidate for speed management. Particular locations that might benefit from speed management are near activity centers such as schools and parks or where speed limits transition near the edge of town.

The Crossing Improvements section includes some countermeasures that can also help with speed management, such as curb extensions and pedestrian refuge islands. Furthermore, the following tools can assist with speed management (illustrations and descriptions from *Small Town and Rural Multimodal Networks*, Federal Highway Administration, 2016):



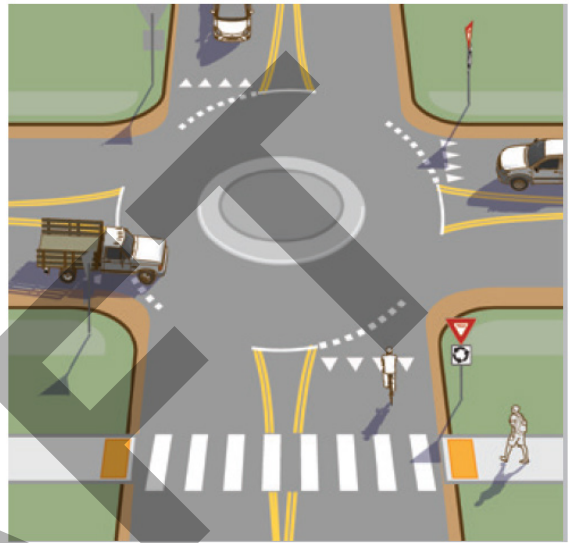
## **SPEED HUMPS AND SPEED TABLES**

Speed humps and tables apply vertical deflection in the roadway that is designed to limit the speed of traffic. The main difference between humps and tables are length and profile. For more information on speed humps refer to the MUTCD 2009.



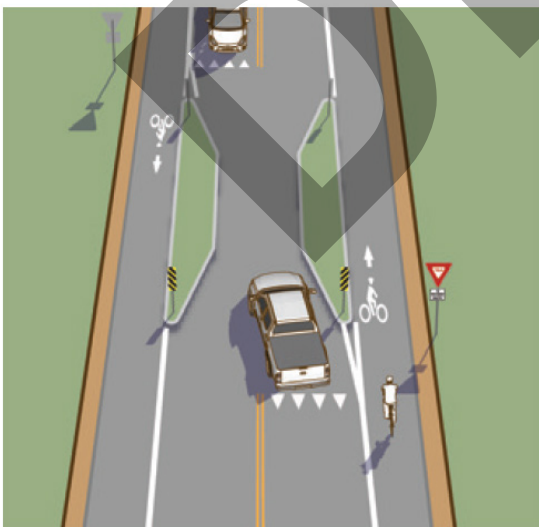
## **MINI ROUNDABOUT**

Mini roundabouts are roundabouts with a small footprint and fully traversable central island. For more information on mini roundabouts refer to the MUTCD 2009, and NCHRP 672.



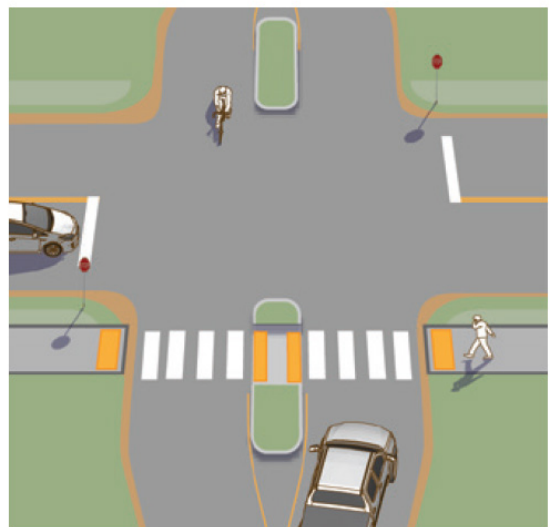
## **PINCH POINT**

Pinch points, also called chokers, are curb extensions or edge islands at mid-block locations which narrows the road for a short distance, forcing all motorists to merge into a single lane.



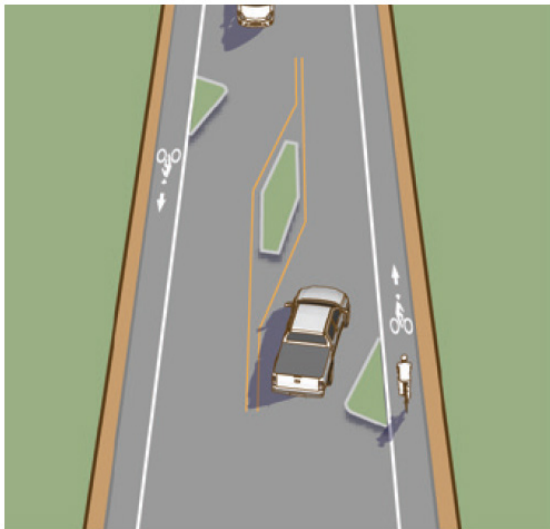
## **MEDIAN ISLAND**

Median island are raised islands located along the centerline of a street that narrow the travel lanes and require deflection of an otherwise straight travel path. Median islands are an FHWA Proven Safety Countermeasure.



## LATERAL SHIFT

Lateral shifts are realignments of an otherwise straight travel path. When multiple lateral shifts are applied to form an S-shaped curve it is called a chicane. For traffic calming, the taper lengths may be as much as half of what is suggested in traditional highway engineering.



## SPEED FEEDBACK SIGN

Police departments and transportation agencies use speed feedback signs as educational tools that can enhance enforcement efforts directed at speed compliance. Speed feedback signs educate drivers as to their operating speed, and remind them of the posted speed limit on the roadway..



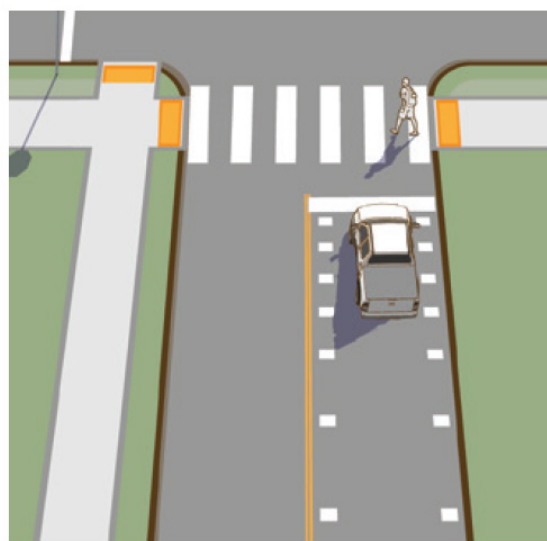
## SLOW OR SPEED LIMIT PAVEMENT LEGENDS

Use SLOW or speed limit pavement markings as a supplement to speed limit signs and reinforce the lawful speed limit.



## SPEED REDUCTION MARKINGS

Speed reduction markings are a series of white rectangular markings typically 1 foot wide placed just inside both edges of the lane and spaced progressively closer to create the illusion of traveling faster as well as the impression.





## QUICK-BUILD IMPROVEMENTS

Many of the examples pictured in this plan require time to plan, budget for, and install. However, many improvements can be implemented using a quick-build approach that is faster and more affordable. Quick-build projects are reversible, adjustable traffic and pedestrian safety improvements that use materials like paint, posts, and signs rather than more permanent and costly improvements like concrete and asphalt. This allows for quick implementation when a safety concern is identified and also allows for pilot projects prior to more permanent investment. Quick-build improvements tend to be less durable but with appropriate maintenance can last many years.

## RECOMMENDATIONS

### A. Leverage Safe Routes to School (SRTS) Funding

The City should continue to pursue this funding which could significantly improve the pedestrian environment for kids attending one of the three schools in Eudora. This funding could be used for education, encouragement programs, and infrastructure.

### B. Adopt Design Standards and Policies that Result in Pedestrian Friendly Development

Consider policies and standards that support walkability such as:

1. A Complete Streets policy (see sidebar).
2. Zoning Regulations to require sidewalks that connect from the public right-of-way to public entrances of buildings.
3. Subdivision Standards that encourage connectivity between developments, such as requiring street stubs to adjoining properties to allow for future connectivity.
4. Subdivision Standards that require an interconnected network of streets and sidewalks in residential developments rather than curvilinear streets and cul-de-sacs that limit connectivity.
5. Zoning Regulations that require substandard sidewalks be brought into compliance during redevelopment or expansion

### C. Improve pedestrian safety and comfort at locations with real and perceived risk

1. Eudora should continue to partner with the City of Lawrence and Baldwin City to complete the regional Vision Zero Safety Action Plan. The Plan should engage with a variety of public and private stakeholders, seek to adopt innovative evidence based technologies or strategies to promote safety and equity, and employ low-cost, high-impact strategies to improve safety.

Figure 2-24: Quick-Build Project



Image obtained from Alta Planning + Design

### Complete Streets



A Complete Streets Policy specifies how a community will plan, design, and maintain streets so they are safe for all users of all ages and abilities. A strong policy begins transforming a community's practices, processes, and plans. Learn more at [Smart Growth America](#).

## Proven Safety Countermeasures



FHWA's [Proven Safety Countermeasures initiative](#) is a collection of 28 countermeasures and strategies effective in reducing roadway fatalities and serious injuries

## Encouragement



The Eudora Community Library may be a potential partner with the city to promote walking. Examples from libraries in other communities include connecting stories and walking in outdoor programs such as story walks, heritage walks, and walking book clubs; walking programs without a literary component; partnerships with other community groups; and efforts to increase safe walking routes to libraries. For more information see [Public Libraries and Walkable Neighborhoods](#) in the International Journal of Environmental Research and Public Health

2. Consider using a residential speed limit of 20 MPH throughout the city as a means of traffic calming and implementing speed management tools (pages 18-20) where needed .
3. Consider Federal Highway Administration Proven Safety Countermeasures (pages 13-17) at crosswalks with higher use or safety concerns.
4. Consider quick-build improvements (page 21) to improve safety and comfort.

### D. Track and Measure Progress of Eudora's Pedestrian Network, Amenities and Programming

It is important to understand the type, magnitude, and location of pedestrian improvements that are being implemented each year. The City and MPO should work together to track miles of sidewalk construction and sidewalk gap infill, sidewalk maintenance, shared-use path construction, installation of other pedestrian amenities, and results of education, encouragement, and enforcement campaigns. Tracking cost, location, and program data for pedestrian improvements will demonstrate the progress Eudora is making on the pedestrian environment and where more work still needs to be done to further address the region's focus areas.

### E. Target Resources to the Priority Network

Funding should be prioritized to complete the Priority Network routes first (Figure 5), creating continuous, quality pedestrian facilities.

### F. Create or Support Encouragement Programs

Encouragement programs help create awareness of pedestrian issues and the benefits of walking. Encouragement activities focus on increasing walking through fun and interesting activities. Encouragement activities may include: art walks, walk to school day, workplace wellness programs, walking route maps or way-finding signage, open streets, walking clubs, and Fitbit or pedometer giveaways



DRAFT



## Chapter 3: Baldwin City





# EXISTING PEDESTRIAN CONDITIONS

## SIDEWALK NETWORK

Baldwin City's existing sidewalk network is largely concentrated around downtown and Baker University, with additional routes to public schools. The city lacks sidewalks on one or both sides of many streets but has made significant progress in recent years completing sidewalks on the priority network. The 2016 Regional Pedestrian Plan identified a priority pedestrian network of key pedestrian routes, largely focused on Safe Routes to Schools (SRTS). Figure 3-2 is an inventory of the existing sidewalk network.

A number of recently completed or pending sidewalk projects are also shown on 3-2. These additions have largely been funded as SRTS projects, improving access not only to schools but other destinations such as downtown, Baker University campus and sports facilities, and the Baldwin City Swimming Pool.

To quantify missing sidewalk segments, a goal of sidewalks on both sides of arterial streets (US 56/ Ames St) and major collector streets (6th St) and on one side of local streets (all other streets) was used. Using that metric, 37% of the sidewalk network is complete and there are 25 miles of missing sidewalk\*. A high level cost estimate can be calculated based on the missing mileage. Costs in 2024 for sidewalk construction range from \$23 - \$54 per square foot. Assuming 5' wide sidewalks (minimum recommended), costs would range from \$15 million to \$36 million to fill in missing sidewalks. This does not include design/ inspection (estimated at 25% of the construction cost) or consider future inflation.

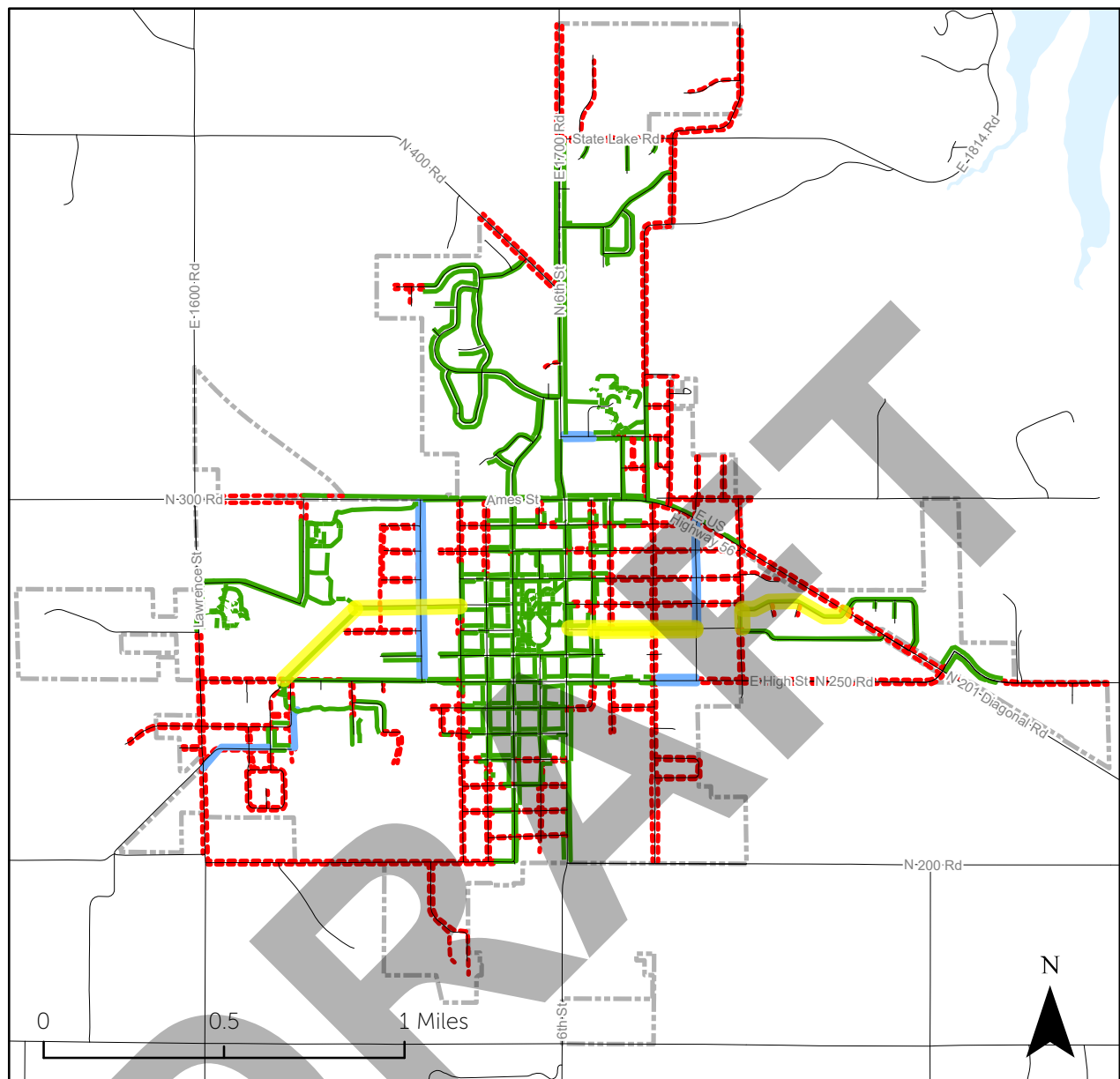
Figure 3-1: Sidewalk Downtown



\*Measurements are based off centerline miles of roadway which overcounts actual sidewalk miles since sidewalks do not continue through street intersections.



Figure 3-2: Baldwin City Sidewalk Inventory



- |   |  |   |
|---|--|---|
| <span style="color: green;">—</span> Existing Sidewalk  | <span style="color: yellow;">—</span> Recently Completed | <span style="color: lightblue;">—</span> Water              |
| <span style="color: red;">- - -</span> Missing Sidewalk | <span style="color: grey;">—</span> Roads                | <span style="border: 1px dashed grey;"> </span> City Limits |
| <span style="color: blue;">—</span> Pending Sidewalk    | <span style="color: grey;">—</span> Highway              |   |

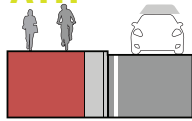
**DISCLAIMER NOTICE**

The map is provided "as is" without warranty or any representation of accuracy, timeliness or completeness. The burden for determining accuracy, completeness, timeliness, merchantability and fitness for or the appropriateness for use rests solely on the requester. The City of Lawrence makes no warranties, express or implied, as to the use of the map. There are no implied warranties of merchantability or fitness for a particular purpose. The requester acknowledges and accepts the limitations of the map, including the fact that the map is dynamic and is in a constant state of maintenance, correction and update.

Date Exported: 10/23/2023  
Produced: Lawrence-Douglas County MPO

## SHARED USE PATH

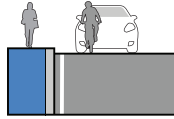
**1.3 MILES**



A >8-foot wide sidewalk which provides a continuous corridor for bicycle riders and pedestrians that is separate from vehicular roadways. Paths work best when connected to an on-street network which meets robust safety and design standards. According to national standards, 10-foot shared use paths are recommended; however, under certain constraints 8-foot may be approved. This does not include the Maple Trail Transportation Alternative (TA) project being constructed in 2024.

## SIDEWALK

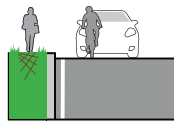
**20 MILES**



A sidewalk is a path along the side of a road. It is often constructed of concrete or cement, though occasionally bricks or stones, and is designed for pedestrians. According to national standards, 6-foot sidewalks are recommended; however, under certain constraints 5-foot may be approved. # miles of sidewalk are currently pending installation and are not included in the missing or existing categories.

## MISSING SIDEWALK

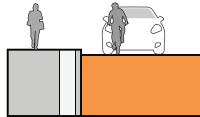
**25 MILES\***



Sidewalk does not exist causing pedestrians to either walk in the street or across yards. A missing sidewalk in this context is defined as any local street or minor collector without at least one sidewalk and any major collector or arterial without sidewalks on both sides of the street.

## ROADWAY

**37 MILES**



Total centerline miles of roadways within Baldwin City limits or immediately adjacent roads that form a part of the sidewalk network. Some of these roads are owned/maintained by the state or county and not Baldwin City.

Figure 3-3: Maple Leaf Trail



While sidewalk may be desired on most streets, the significant costs associated with construction necessitates identifying the highest priority needs. Thus, the pedestrian priority network established in the 2016 Pedestrian Plan focused on providing the most people with access to the most parts of town, particularly to schools, grocery stores, and other landmark destinations. Significant progress to building the original priority network has been made and an expanded priority network is established in Figure 3-4. Resources should continue to be targeted to complete the priority network.

\*Missing sidewalk is defined as a lack of sidewalk on both sides of arterial and major collector streets and a lack of a sidewalk on at least one side of local streets and minor collectors

# Baldwin City Priority Network

The map displays the Baldwin City Priority Network. A yellow line traces the priority network route, starting from the west, passing through the center, and heading east. Green lines indicate existing sidewalks, while red dashed lines show missing sidewalks. The map includes major roads such as N-400 Rd, N-300 Rd, N-200 Rd, E-1600 Rd, E-1700 Rd, E-1800 Rd, E-1900 Rd, E-200 Rd, E-2100 Rd, E-2200 Rd, E-2300 Rd, E-2400 Rd, E-2500 Rd, E-2600 Rd, E-2700 Rd, E-2800 Rd, E-2900 Rd, E-3000 Rd, E-3100 Rd, E-3200 Rd, E-3300 Rd, E-3400 Rd, E-3500 Rd, E-3600 Rd, E-3700 Rd, E-3800 Rd, E-3900 Rd, E-4000 Rd, E-4100 Rd, E-4200 Rd, E-4300 Rd, E-4400 Rd, E-4500 Rd, E-4600 Rd, E-4700 Rd, E-4800 Rd, E-4900 Rd, E-5000 Rd, E-5100 Rd, E-5200 Rd, E-5300 Rd, E-5400 Rd, E-5500 Rd, E-5600 Rd, E-5700 Rd, E-5800 Rd, E-5900 Rd, E-6000 Rd, E-6100 Rd, E-6200 Rd, E-6300 Rd, E-6400 Rd, E-6500 Rd, E-6600 Rd, E-6700 Rd, E-6800 Rd, E-6900 Rd, E-7000 Rd, E-7100 Rd, E-7200 Rd, E-7300 Rd, E-7400 Rd, E-7500 Rd, E-7600 Rd, E-7700 Rd, E-7800 Rd, E-7900 Rd, E-8000 Rd, E-8100 Rd, E-8200 Rd, E-8300 Rd, E-8400 Rd, E-8500 Rd, E-8600 Rd, E-8700 Rd, E-8800 Rd, E-8900 Rd, E-9000 Rd, E-9100 Rd, E-9200 Rd, E-9300 Rd, E-9400 Rd, E-9500 Rd, E-9600 Rd, E-9700 Rd, E-9800 Rd, E-9900 Rd, E-10000 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## ACCESSIBILITY

The Americans with Disabilities Act (ADA) addresses accessible sidewalks within the public rights-of-way. The ADA does not mandate the installation of sidewalks, but it does require curb ramps at intersections where existing sidewalks are provided on both sides of the roadway. Sidewalks are an integral part of the transportation system and allow individuals to work, live, participate and thrive in their communities. Therefore, design, maintenance, and repairs should include accessibility and usability for all potential users, especially people with disabilities.

An inventory of sidewalk condition in 2014 revealed many intersections lacked curb ramps or did not meet ADA standards while many other areas needed sidewalk maintenance or replacement. Routes with a high number of defects, such as deflections in the walking surface, can impede the easy travel of a wheelchair, cause trips and falls, and discourage pedestrian use. While some areas in need of maintenance may have been repaired since 2014, many issues likely remain today along with new defects that may have emerged.

The current city code for sidewalk maintenance states that “it shall be the duty of the owner of the abutting property to keep the sidewalk in repair, but the city may, after 15 days’ notices to the owner”, make all necessary repairs and assess the cost to the property taxes to the abutting owner. The current condition of sidewalks as seen suggests that the existing policy is not creating a compliant sidewalk network. If the City of Baldwin City determines that enforcement of this policy is not feasible, alternative programs or ordinances should be explored.

## OTHER PEDESTRIAN FACILITIES BESIDES SIDEWALKS

Since people walking typically take the most direct route, gaps in the sidewalk network often force them to walk in the street or onto the adjacent grass, dirt, gravel, etc. Many local streets without sidewalks have low enough traffic volumes and speeds to feel comfortable and safe to a segment of the population. Walking in the street may be a comfortable option for able bodied adults, but may not be appropriate for everyone, including children or those with mobility challenges. While sidewalks are preferable for those walking, other facilities such as yield roadways and advisory shoulders can be an interim or long term solution when costs or other factors make a sidewalk infeasible.

Figure 3-5: Sidewalk Defects



Figure 3-6: Sidewalk Downtown



## YIELD ROADWAY

A **yield roadway** is a neighborhood street designed to serve pedestrians, bicycle riders, and motor vehicle traffic in the same slow-speed travel area. Yield roadways need to be sufficiently narrow to encourage slow travel, with recommended widths of 12 to 20 feet. Yield roadways do not have sidewalks or lane markings. Currently, many Baldwin City streets act as unofficial yield roadways. Signage can help raise awareness for the use of the roadway for walking.

## ADVISORY SHOULDERS

An advisory shoulder is a type of a shared roadway with mixed traffic. Pedestrians or bicycle riders share the low-volume, low-speed streets. A single motor vehicle lane is established where drivers share the single lane with oncoming vehicles. When two vehicles meet, they yield to pedestrians and bicycle riders before merging into the dashed shoulder. This roadway type would require education and encouragement to make people feel for more comfortable with using it.

## PEDESTRIAN LANE

A **pedestrian lane** is an interim or temporary pedestrian accommodation on streets without sidewalks which have low to moderate vehicle speeds and volumes. They are used to fill short gaps between sidewalks until a more permanent solution can be implemented. They must meet accessibility guidelines for a pedestrian access route.

Figure 3-7: Pedestrian Lane



Image obtained from Lynden Tribune

Figure 3-8: Yield Roadway



Elm Street in Baldwin City serves as an unofficial yield roadway. Street view image obtained from <https://maps.google.com>

Sign image obtained from Small Town and Rural Multimodal Networks

Figure 3-9: Advisory Shoulders



Street view image obtained from <https://maps.google.com>

Sign image obtained from Alta Planning + Design

Figure 3-10: Pedestrian Lane

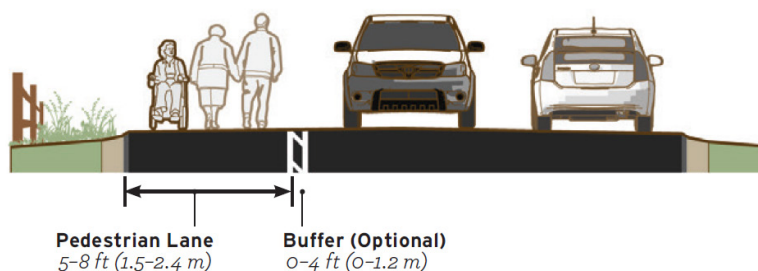


Image obtained from Small Town and Rural Multimodal Networks



## CROSSINGS

The perceived and actual safety of street crossings is one of the major barriers to walking in any community. Built environment crossing improvements are one approach to making people who walk more visible and reducing exposure and risk. There are two types of crossings – controlled (stop sign or traffic light) and uncontrolled (Figures 3-11 & 3-12). Marking a crosswalk with paint or other materials can help indicate where people should cross and alert motorists that people may be crossing. While crosswalks exist legally at all public intersections where there is a sidewalk on at least one side of the street, marking the crosswalk can increase awareness and reinforce that motorists must yield to people in crosswalks.

Marked crosswalks exist on Ames Street/ US Highway 56 at the signalized intersection of 6th Street and at uncontrolled crossings at 4th and 6th Street. Marked crosswalks are also found around Baker University, on High Street downtown, and a few other locations. In some locations marked crosswalks are faded and require maintenance.

Figure 3-11; Uncontrolled, Marked Crossing

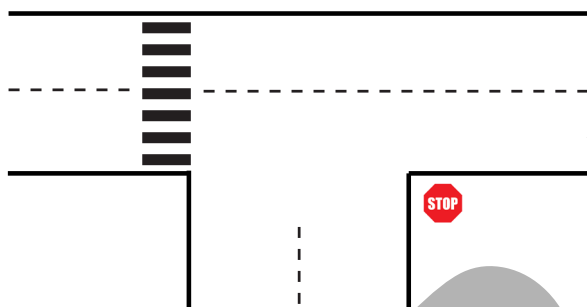
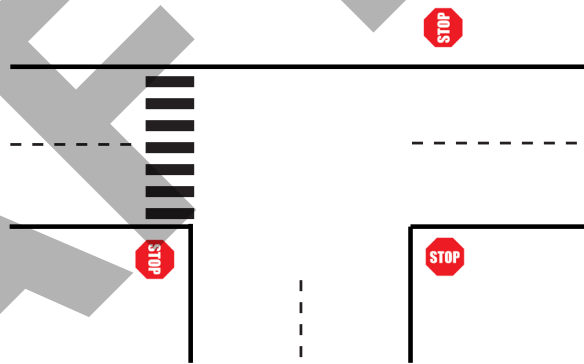


Figure 3-12: Controlled, Marked Crossing



## CROSSING IMPROVEMENTS

Improving crossings requires not only built environment improvements but also new policy/design criteria and education/enforcement. This section includes the recommendations related to the built environment improvements and policy/design. Both types of crossings can pose challenges that present real and perceived concerns for safety. Crossing improvements should be part of roadway reconstruction and maintenance or as standalone crossing projects.

The Federal Highway Administration's [Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations](#) provides the appropriate crossing improvement based on the characteristics of the roadway including speed, number of lanes, and number of vehicles which typically use it. Table 3-1 displays the application of crash countermeasures by roadway feature and Table 3-2 explains the safety issue addressed by each countermeasure. While this table addresses uncontrolled intersections, many of the countermeasures may be appropriate at controlled intersections, such as numbers 1, 2, 4, 5, and 6. The City should reference these tables when considering crossing improvements or other maintenance activities.



Table 3-1

Roadway Configuration	Vehicle AADT <9,000			
	≤30 mph	35 mph	≥40 mph	
<b>2 lanes</b> (1 lane in each direction)	① 2 4 5 6	① 5 6 7 9	① 5 6 ⑦ ⑨	<p>Given the set of conditions in a cell,</p> <p># Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.</p> <p>● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.</p> <p>○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*</p> <p>1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs</p> <p>2 Raised crosswalk</p> <p>3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line</p> <p>4 In-Street Pedestrian Crossing sign</p> <p>5 Curb extension</p> <p>6 Pedestrian refuge island</p> <p>7 Rectangular Rapid-Flashing Beacon (RRFB)**</p> <p>8 Road Diet</p> <p>9 Pedestrian Hybrid Beacon (PHB)**</p>
<b>3 lanes with raised median</b> (1 lane in each direction)	① 2 3 4 5	① ③ 5 7 9	① ③ 5 ⑦ ⑨	
<b>3 lanes w/o raised median</b> (1 lane in each direction with a two-way left-turn lane)	① 2 3 4 5 6 7 9	① ③ 5 6 7 9	① ③ 5 6 ⑦ ⑨	

Table 3-2

Pedestrian Crash Countermeasure for Uncontrolled Crossings	Safety Issue Addressed				
	Conflicts at crossing locations	Excessive vehicle speed	Inadequate conspicuity/visibility	Drivers not yielding to pedestrians in crosswalks	Insufficient separation from traffic
Crosswalk visibility enhancement	🚶	🚶	🚶	🚶	🚶
High-visibility crosswalk markings*	🚶		🚶	🚶	
Parking restriction on crosswalk approach*	🚶		🚶	🚶	
Improved nighttime lighting*	🚶		🚶		
Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line*	🚶		🚶	🚶	🚶
In-Street Pedestrian Crossing sign*	🚶	🚶	🚶	🚶	
Curb extension*	🚶	🚶	🚶		🚶
Raised crosswalk	🚶	🚶	🚶	🚶	
Pedestrian refuge island	🚶	🚶	🚶		🚶
Pedestrian Hybrid Beacon	🚶	🚶	🚶	🚶	
Road Diet	🚶	🚶	🚶		🚶
Rectangular Rapid-Flashing Beacon	🚶		🚶	🚶	🚶

\*These countermeasures make up the STEP countermeasure "crosswalk visibility enhancements." Multiple countermeasures may be implemented at a location as part of crosswalk visibility enhancements.

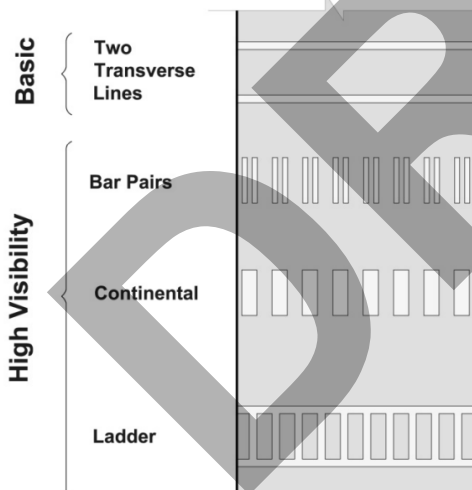
## 1 - HIGH VISIBILITY CROSSWALK MARKINGS, PARKING RESTRICTIONS, LIGHTING, & CROSSWALK WARNING SIGNS

The typical crosswalk uses two transverse lines. High visibility crosswalks can be seen from farther distances and use ladder, continental or bar pairs (Figure 3-13). Crosswalk warning signs (Figure 3-14) can be used to further increase visibility.

Parking restrictions, such as daylighting (Figure 3-15) can improve the visibility of pedestrians at crosswalks which was limited due to closely parked vehicles. Daylighting is the practice of converting a parking space at the crosswalk to a red painted curb, or installing vertical delineators in the street to prevent vehicles from parking too close to intersections.

According to the National Highway Traffic Safety Administration, 76% of pedestrian fatalities in 2019 occurred in dark conditions. Crosswalk lighting, placed carefully in forward locations to avoid a silhouette effect of the pedestrian, improve safety by making it easier for drivers to see people walking.

Figure 3-13: High Visibility Crosswalk Markings



*Image obtained from National Committee on Uniform Traffic Control Devices*

## 2 - RAISED CROSSWALK

Raised crosswalks (Figure 3-16) are long, raised speed humps with a flat section in the middle and ramps on the ends. They are typically used collector or local streets with posted speeds of 30 mph or less.

Figure 3-14: Crosswalk Warning Signs



Figure 3-15: Daylighting



*Image obtained from curbed.com*

Figure 3-16: Raised Crosswalk



*Image obtained from City of Ann Arbor [www.a2gov.org](http://www.a2gov.org)*



### 3 - ADVANCE “YIELD HERE FOR PEDESTRIANS” SIGN & YIELD LINE

Signs that state “Yield Here For Pedestrians” indicate where a driver should yield to pedestrians and may be supplemented by “shark’s teeth” yield line 20 to 50 feet in advance of a marked crosswalk (Figure 3-19).

### 4 - IN STREET PEDESTRIAN CROSSING SIGN

In-street pedestrian crossing signs (Figure 3-17) can be placed between travel lanes or in conjunction with a refuge island or raised median. The sign may be used to remind road users of laws regarding right-of-way.

### 5 - CURB EXTENSION

Curb extensions (Figure 3-18), also known as bulb-outs or neckdowns, extend the sidewalk or curb line out into the parking lane, which reduces the effective street width. Curb extensions significantly improve pedestrian crossings by reducing the pedestrian crossing distance; visually and physically narrowing the roadway; improving the ability of pedestrians and drivers to see each other; and reducing the time that pedestrians are in the street.

Figure 3-17: In-Street Pedestrian Crossing Sign



Image obtained from citybeat.com

Figure 3-18: Curb Extension



Figure 3-19: Various Countermeasures

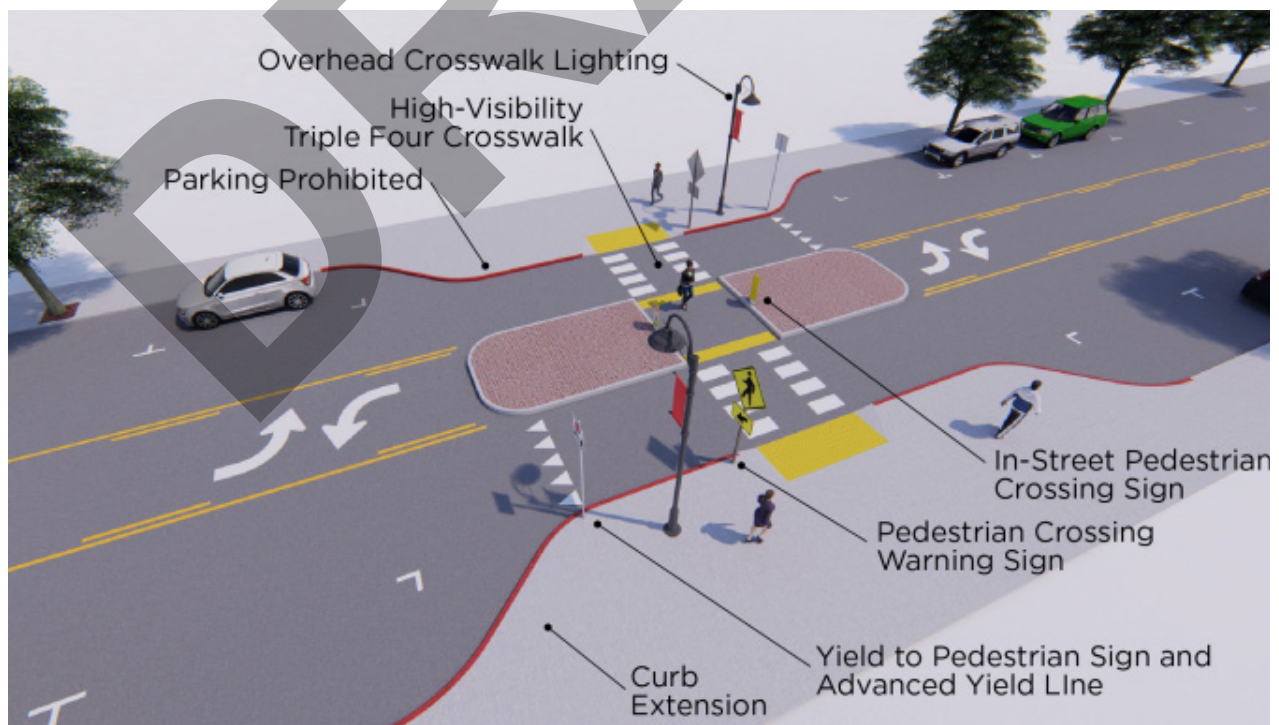


Image obtained from Federal Highway Administration



## 6 - PEDESTRIAN REFUGE ISLAND

A pedestrian refuge island (Figure 3-20) is a median with a refuge area that is intended to help protect pedestrians who are crossing the road. Refuge islands can help improve safety by allowing pedestrians to cross one direction of traffic at a time.

Figure 3-20: Pedestrian Refuge Island



*Image obtained from AARP*

## 7 - RECTANGULAR RAPID-FLASHING BEACON

An RRFB (Figure 3-21) consists of two, rectangular-shaped yellow indications, each with a light-emitting diode (LED)-array-based light source. RRFBs flash with an alternating high frequency when activated to enhance visibility of pedestrians at the crossing to driver. Research suggests RRFBs have resulted in motorist yielding rates as high as 98 percent at marked crosswalks, but varies based on various factors.

Figure 3-21: Rectangular Rapid-Flashing Beacon



*Image obtained from Carmanah Technologies*

## 8 - ROAD DIET

Road Diet is a roadway reconfiguration resulting in a reduction in the number of travel lanes, which is usually achieved by converting a four-lane undivided road to three lanes. This countermeasure is not applicable in Baldwin City given the lack of four lane roads.

## 9 - PEDESTRIAN HYBRID SIGNAL

A PHB (Figure 3-22) is a hybrid beacon used to control traffic and rests in dark until a pedestrian activates it via pushbutton or other form of detection. When activated, the beacon displays a sequence of flashing and solid lights that indicate when pedestrians should cross and when it is safe for drivers to proceed.

Figure 3-22: Pedestrian Hybrid Signal



## VEHICLE SPEED

Lower vehicle speeds reduce the severity of crashes and give people more time to react. Current posted speed limits on residential streets in Baldwin City range from 20-30 MPH, and U.S. Highway 56 has posted speed limits of 45 MPH on the periphery of town and 35 MPH in the center of town.

Field of vision, the amount of space a person can view while driving, decreases as speed increases (Figure 3-23). Thus higher speeds can lead to more crashes when drivers are not be able to view people walking or bicycling in the street soon enough to react. According to the AAA Foundation for Traffic Safety the average risk for death of a pedestrian increases as the speed of the vehicle increases (Table 3-3).

Table 3-3 Average Risk of Pedestrian Severe Injury or Death Based on Vehicle Speed

	Severe Injury	Death
<b>10.0%</b>	16 mph	23 mph
<b>25.0%</b>	23 mph	32 mph
<b>50.0%</b>	31 mph	42 mph
<b>75.0%</b>	39 mph	50 mph
<b>90.0%</b>	46 mph	58 mph

Figure 3-23: Field of Vision Based on Speed of Driver

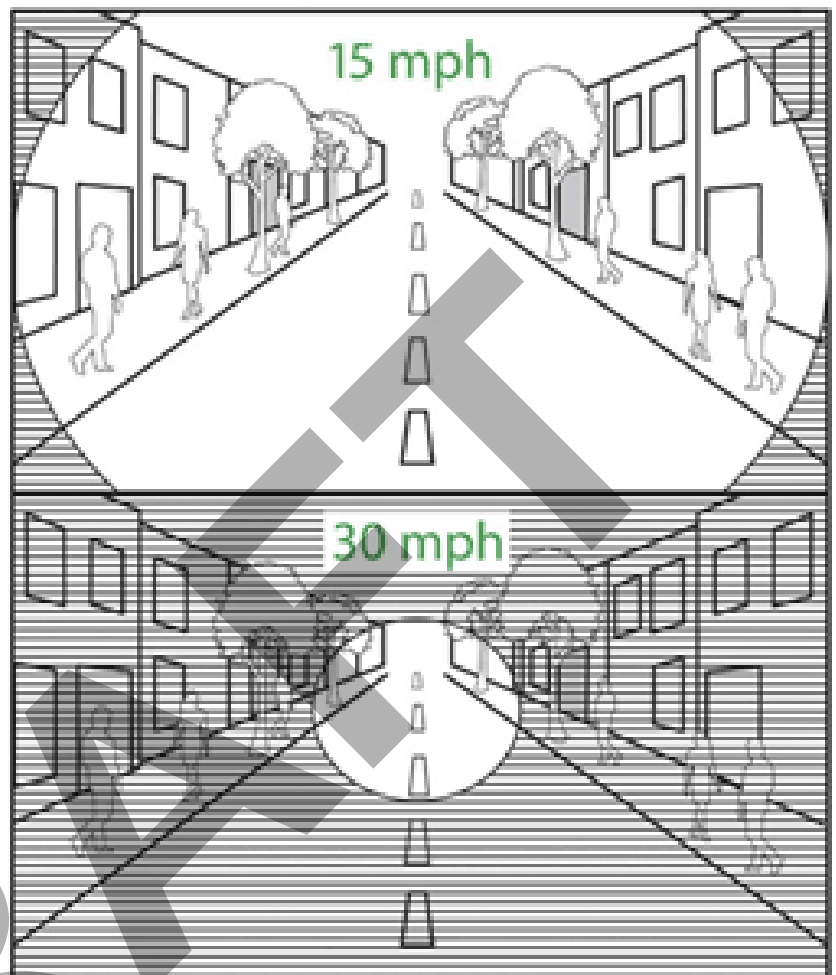


Image obtained from Congress for New Urbanism. Source: Jeff Speck, Walkable City Rules 2018

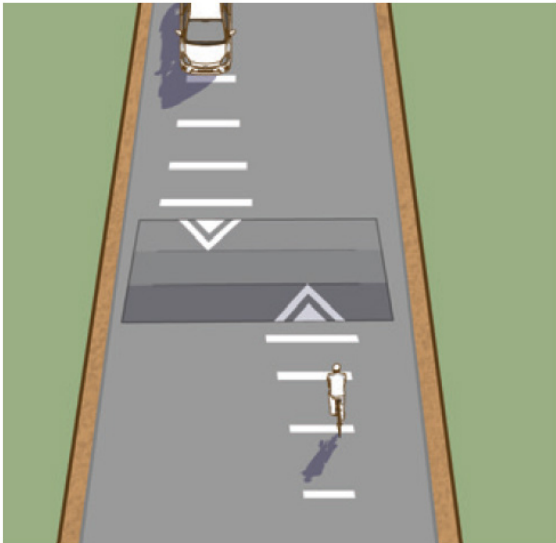
## SPEED MANAGEMENT

Lowering speed limits is one low cost measure to increase the safety of people walking. However, speed limits alone are often not enough to achieve desired speeds. Speed management uses physical changes to the roadway, signage and road markings, and/or operational changes to reduce driver speeds thereby increasing safety for pedestrians and all road users. It is sometimes referred to as a “silent policeman” enforcing speed limits when no actual law enforcement is present. Any roadway where speeding is a concern is a potential candidate for speed management. Streets such Ames Street/ US 56 (in coordination with KDOT) and North 6th Street might benefit from speed management.

The Crossing Improvements section includes some countermeasures that can also help with speed management, such as curb extensions and pedestrian refuge islands. Furthermore, the following tools can assist with speed management (illustrations and descriptions from *Small Town and Rural Multimodal Networks*, Federal Highway Administration, 2016):

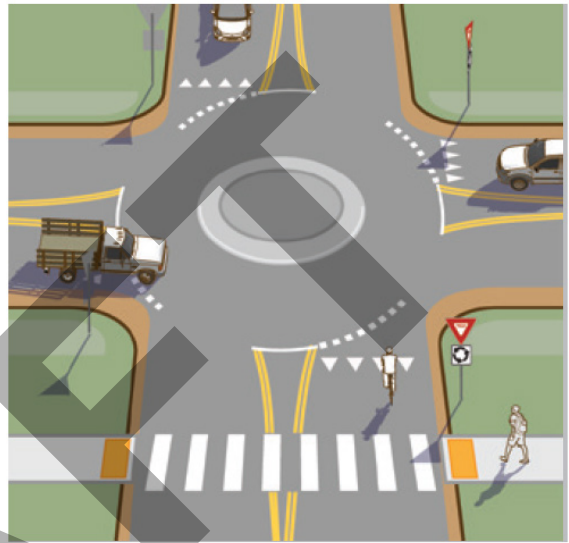
## **SPEED HUMPS AND SPEED TABLES**

Speed humps and tables apply vertical deflection in the roadway that is designed to limit the speed of traffic. The main difference between humps and tables are length and profile. For more information on speed humps refer to the MUTCD 2009.



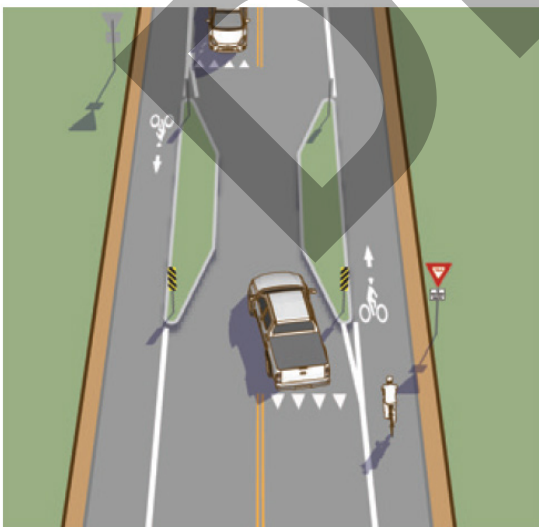
## **MINI ROUNDABOUT**

Mini roundabouts are roundabouts with a small footprint and fully traversable central island. For more information on mini roundabouts refer to the MUTCD 2009, and NCHRP 672.



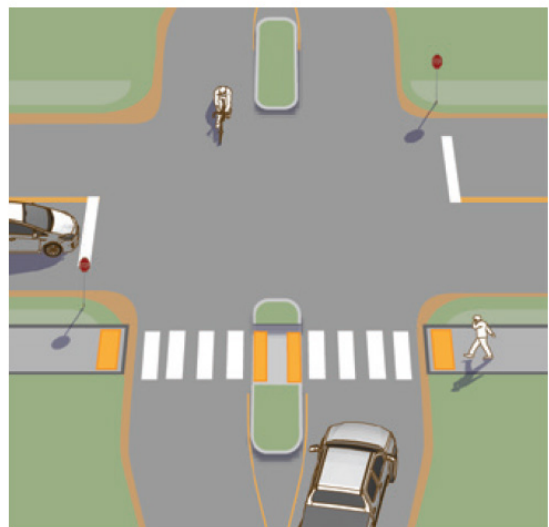
## **PINCH POINT**

Pinch points, also called chokers, are curb extensions or edge islands at mid-block locations which narrows the road for a short distance, forcing all motorists to merge into a single lane.



## **MEDIAN ISLAND**

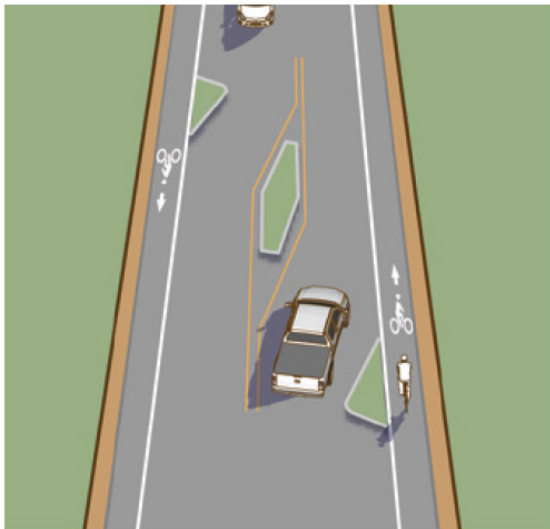
Median island are raised islands located along the centerline of a street that narrow the travel lanes and require deflection of an otherwise straight travel path. Median islands are an FHWA Proven Safety Countermeasure.





## LATERAL SHIFT

Lateral shifts are realignments of an otherwise straight travel path. When multiple lateral shifts are applied to form an S-shaped curve it is called a chicane. For traffic calming, the taper lengths may be as much as half of what is suggested in traditional highway engineering.



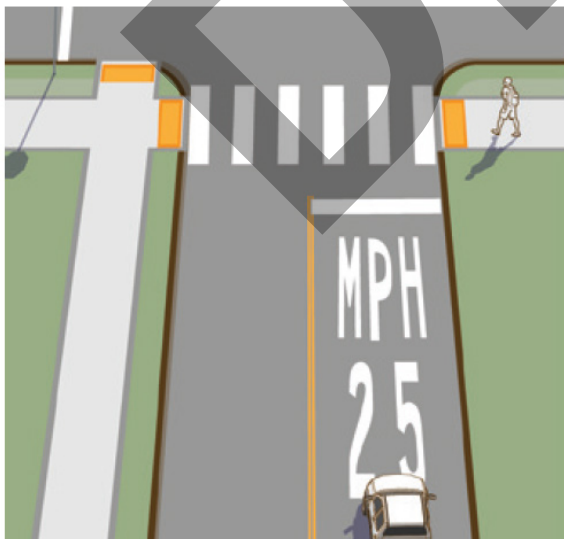
## SPEED FEEDBACK SIGN

Police departments and transportation agencies use speed feedback signs as educational tools that can enhance enforcement efforts directed at speed compliance. Speed feedback signs educate drivers as to their operating speed, and remind them of the posted speed limit on the roadway..



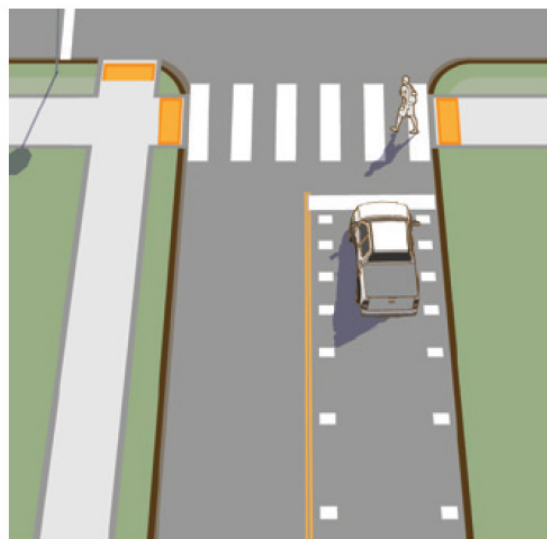
## SLOW OR SPEED LIMIT PAVEMENT LEGENDS

Use SLOW or speed limit pavement markings as a supplement to speed limit signs and reinforce the lawful speed limit.



## SPEED REDUCTION MARKINGS

Speed reduction markings are a series of white rectangular markings typically 1 foot wide placed just inside both edges of the lane and spaced progressively closer to create the illusion of traveling faster as well as the impression.



## QUICK-BUILD IMPROVEMENTS

Many of the examples pictured in this plan require time to plan, budget for, and install. However, many improvements can be implemented using a quick-build approach that is faster and more affordable. Quick-build projects are reversible, adjustable traffic and pedestrian safety improvements that use materials like paint, posts, and signs rather than more permanent and costly improvements like concrete and asphalt. This allows for quick implementation when a safety concern is identified and also allows for pilot projects prior to more permanent investment. Quick-build improvements tend to be less durable but with appropriate maintenance can last many years.

## RECOMMENDATIONS

### A. Leverage Safe Routes to School (SRTS) Funding

The safe routes identified in the SRTS plan have either been completed or are pending construction. Adding more routes could be considered in the next SRTS plan. Additionally, any existing routes with maintenance issues should be addressed.

### B. Adopt Design Standards and Policies that Result in Pedestrian Friendly Development

Consider policies and standards that support walkability such as:

1. A Complete Streets policy (see sidebar).
2. Zoning Regulations to require sidewalks that connect from the public right-of-way to public entrances of buildings.
3. Subdivision Standards that encourage connectivity between developments, such as requiring street stubs to adjoining properties to allow for future connectivity.
4. Subdivision Standards that require an interconnected network of streets and sidewalks in residential developments rather than encouraging use of curvilinear streets and cul-de-sacs.
5. Zoning Regulations that require substandard sidewalks be brought into compliance during redevelopment or expansion
6. Zoning Regulations that explicitly require street trees with all new development (see sidebar).

### C. Improve pedestrian safety and comfort at locations with real and perceived risk

1. Baldwin City should continue to partner with the City of Lawrence and the City of Eudora to complete the regional Vision Zero Safety Action Plan. The Plan should engage with a variety of public and private stakeholders, seek to adopt innovative evidence based technologies or strategies to promote safety and equity, and employ low-cost, high-impact strategies to improve safety.

Figure 3-24: Quick-Build Project



Image obtained from Alta Planning + Design

### Complete Streets



A Complete Streets Policy specifies how a community will plan, design, and maintain streets so they are safe for all users of all ages and abilities. A strong policy begins transforming a community's practices, processes, and plans. Learn more at [Smart Growth America](#).

### Street Trees Best Practices



The FHWA publication [Small Town and Rural Multimodal Networks](#) recommends a 3ft horizontal clearance between trees and sidewalks to minimize pavement cracking and heaving of the paved surface. They also recommend that when trees are desired within the roadway separation area to consider planting small caliper trees with a maximum diameter of 4 inches to alleviate concerns about fixed objects or visual obstructions between the roadway and the pathway.

## Proven Safety Countermeasures



FHWA's [Proven Safety Countermeasures initiative](#) is a collection of 28 countermeasures and strategies effective in reducing roadway fatalities and serious injuries

## Encouragement



Baldwin City Library may be a potential partner with the city to promote walking. Examples from libraries in other communities include connecting stories and walking in outdoor programs such as story walks, heritage walks, and walking book clubs; walking programs without a literary component; partnerships with other community groups; and efforts to increase safe walking routes to libraries. For more information see [Public Libraries and Walkable Neighborhoods](#) in the International Journal of Environmental Research and Public Health

2. Consider using a residential speed limit of 20 MPH throughout the city as a means of traffic calming and implementing speed management tools (pages 36-38) where needed .
3. Consider Federal Highway Administration Proven Safety Countermeasures (pages 33-35) at crosswalks with higher use or safety concerns.
4. Consider quick-build improvements (page 39) to improve safety and comfort

### D. Track and Measure Progress of Baldwin City's Pedestrian Network, Amenities and Programming

It is important to understand the type, magnitude, and location of pedestrian improvements that are being implemented each year. The City and MPO should work together to track miles of sidewalk construction and sidewalk gap infill, sidewalk maintenance, shared-use path construction, installation of other pedestrian amenities, and results of education, encouragement, and enforcement campaigns. Tracking cost, location, and program data for pedestrian improvements will demonstrate the progress Baldwin City is making on the pedestrian environment and where more work still needs to be done to further address the region's focus areas.

### E. Target Resources to the Priority Network

Funding should be prioritized to complete the Priority Network routes first (Figure 3-4), creating continuous, quality pedestrian facilities.

### F. Pursue Construction of the Maple Leaf Trail Shared Use Path

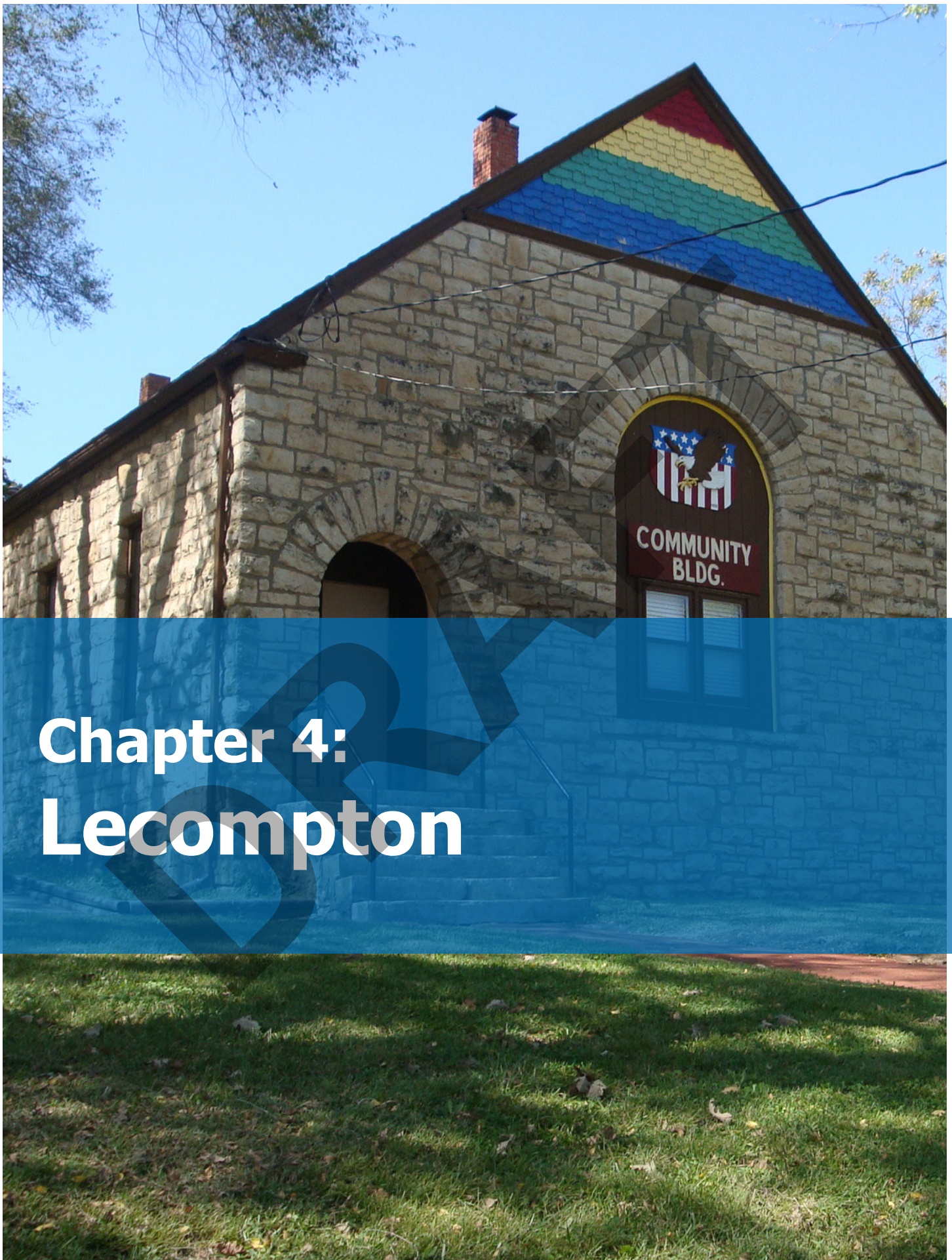
The Maple Leaf Trail is envisioned to use the Midland Railroad right-of-way to connect Baldwin City to Ottawa, providing access to both the Flint Hills Nature Trail and the Prairie Spirit Rail Trail. Phase One of the Maple Leaf Trail between Elm Street and High Street is being constructed in 2024. Phase two from High Street to N 200 Road was awarded funding for 2024 construction.

### G. Create or Support Encouragement Programs

Encouragement programs help create awareness of pedestrian issues and the benefits of walking. Encouragement activities focus on increasing walking through fun and interesting activities. Encouragement activities may include: art walks, walk to school day, workplace wellness programs, walking route maps or way-finding signage, open streets, walking clubs, and Fitbit or pedometer giveaways



DRAFT



## Chapter 4: Lecompton



# EXISTING PEDESTRIAN CONDITIONS

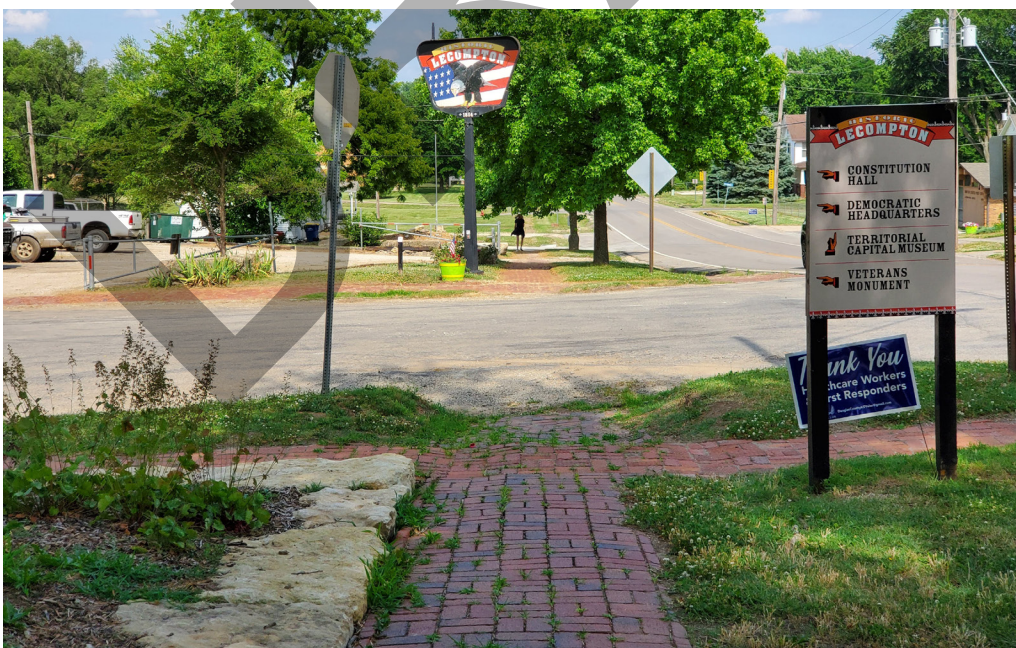
## SIDEWALK NETWORK

Lecompton's small size, historic development patterns, and rural nature mean there is a limited sidewalk network in town. The city lacks sidewalks on one or both sides of many streets but is poised to make significant progress with the pending Lecompton Sidewalk Loop project to add 1.75 miles of new sidewalk and replace other sidewalk in poor condition. The 2016 Regional Pedestrian Plan identified a priority pedestrian network of key pedestrian routes, largely focused on Safe Routes to Schools (SRTS). Figure 4-2 is an inventory of the existing sidewalk network.

To quantify missing sidewalk segments, a goal of sidewalks on at least one side of all streets was used. Using that metric, 33% of the sidewalk network is complete and there are 7 miles of missing sidewalk\*. Taking into account the pending sidewalk project, 50% of the network is complete and there are 5.25 miles of missing sidewalk. A high level cost estimate can be calculated based on the missing mileage. Costs in 2024 for sidewalk construction range from \$23 - \$54 per square foot. Assuming 5' wide sidewalks (minimum recommended), costs would range from \$3.2 million to \$7.5 million to fill in missing sidewalks. This does not include design/ inspection (estimated at 25% of the construction cost) or consider future inflation.

While sidewalk may be desired on most streets, the significant costs associated with construction necessitates identifying the highest priority needs. Thus, the pedestrian priority network established in the 2016 Pedestrian Plan focused on providing the most people with access to the most parts of town, particularly to schools, stores, and other landmark destinations. Significant progress to building the original priority network is pending with the completion of the Lecompton Sidewalk Loop project. Resources should continue to be targeted to complete the priority network.

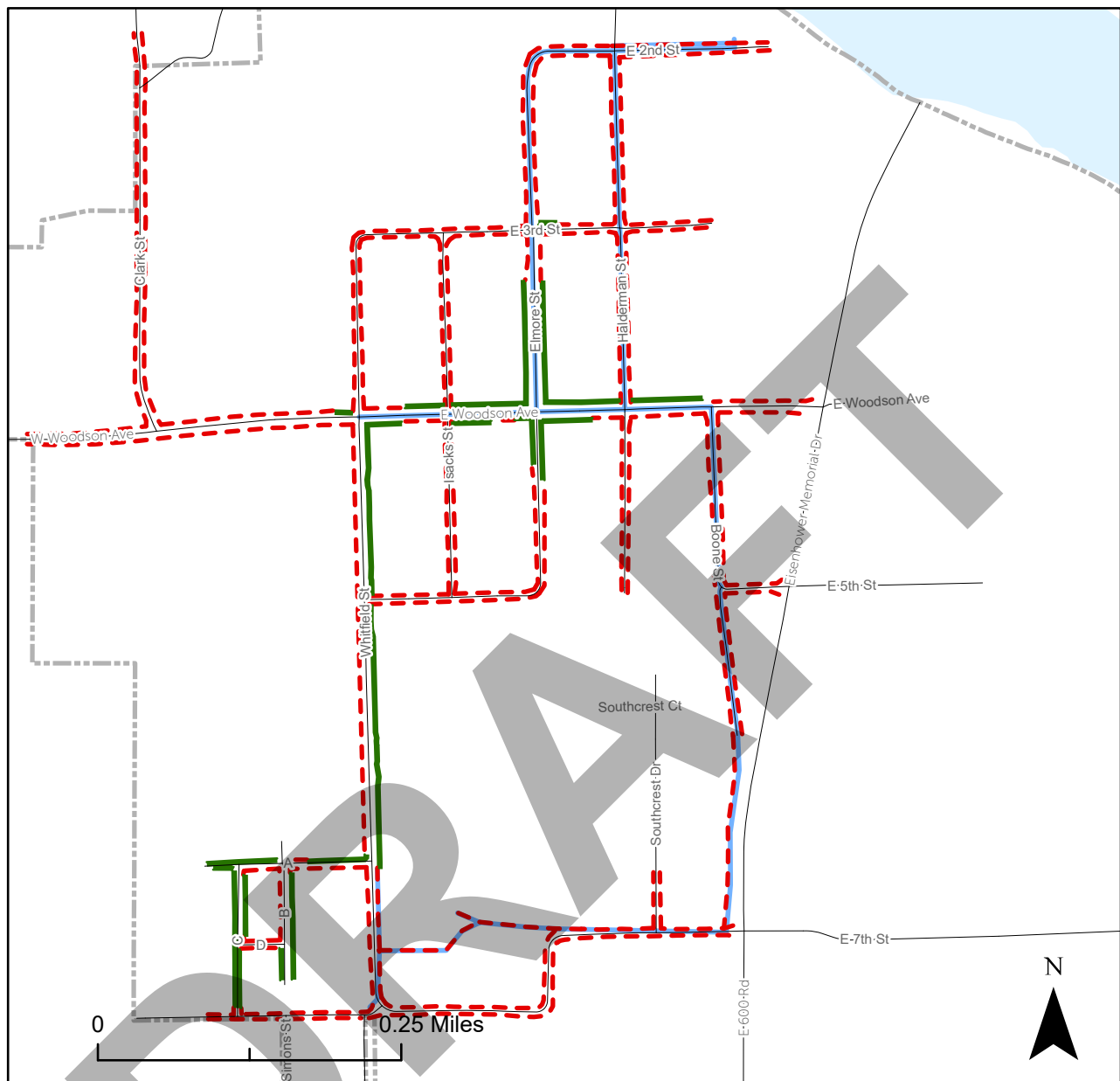
Figure 4-1: Lecompton Sidewalk



\*Measurements are based off centerline miles of roadway which overcounts actual sidewalk miles since sidewalks do not continue through street intersections.



Figure 4-2: Lecompton Sidewalk Inventory



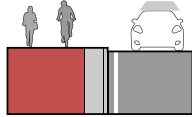
<span style="color: green;">—</span> Existing Sidewalk	<span style="color: yellow;">—</span> Recently Completed	<span style="color: lightblue;">—</span> Water
<span style="color: red;">- - -</span> Missing Sidewalk	<span style="color: grey;">—</span> Roads	<span style="border: 1px dashed grey; display: inline-block; width: 20px; height: 10px;"></span> City Limits
<span style="color: blue;">- - -</span> Pending Sidewalk	<span style="color: grey;">—</span> Highway	

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Date Exported: 10/23/2023  
 Produced: Lawrence-Douglas County MPO

## SHARED USE PATH

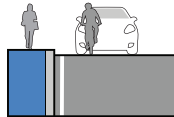
**0 MILES**



A >8-foot wide sidewalk which provides a continuous corridor for bicycle riders and pedestrians that is separate from vehicular roadways. Paths work best when connected to an on-street network which meets robust safety and design standards. According to national standards, 10-foot shared use paths are recommended; however, under certain constraints 8-foot may be approved. This does not include the Maple Trail Transportation Alternative (TA) project being constructed in 2023.

## SIDEWALK

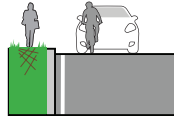
**7.75**



A sidewalk is a path along the side of a road. It is often constructed of concrete or cement, though occasionally bricks or stones, and is designed for pedestrians. According to national standards, 6-foot sidewalks are recommended; however, under certain constraints 5-foot may be approved. 1.75 miles of sidewalk are currently pending installation and are included in the existing category

## MISSING SIDEWALK

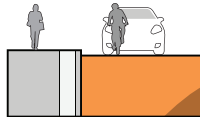
**5.25 MILES\***



Sidewalk does not exist causing pedestrians to either walk in the street or across yards. A missing sidewalk in this context is defined as any street without a sidewalk on at least one side of the street. 1.75 miles of sidewalk are currently pending installation and are not included in the missing category

## ROADWAY

**10 MILES**



Total centerline miles of roadways within Lecompton city limits or immediately adjacent roads that form a part of the sidewalk network. Some of these roads may be owned/maintained by entities other than Lecompton.

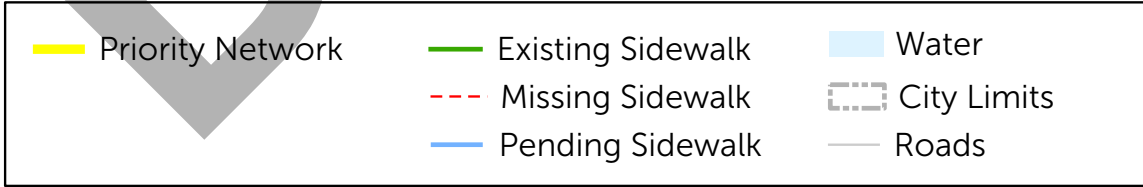
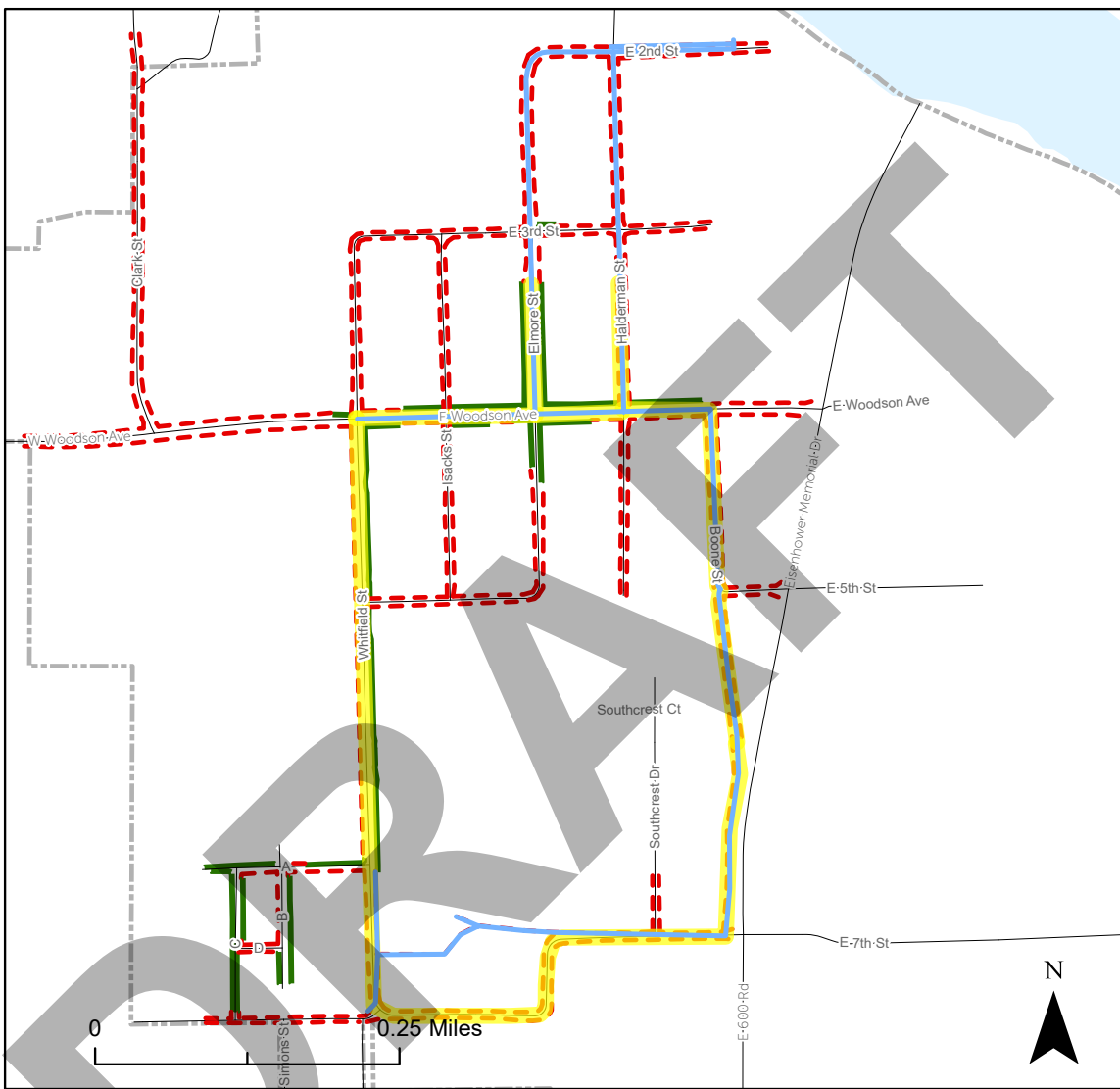
\*Measurements are based off centerline miles of roadway which over-counts actual sidewalk miles since sidewalks do not continue through street intersections.

Figure 4-3: Brick Sidewalk



Figure 4-4: Lecompton Priority Sidewalk Network

# Lecompton Priority Network



**DISCLAIMER NOTICE**  
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Date Exported: 11/21/2023  
Produced: Lawrence-Douglas County MPO



## ACCESSIBILITY

The Americans with Disabilities Act (ADA) addresses accessible sidewalks within the public rights-of-way. The ADA does not mandate the installation of sidewalks, but it does require curb ramps at intersections where existing sidewalks are provided on both sides of the roadway. Sidewalks are an integral part of the transportation system and allow individuals to work, live, participate and thrive in their communities. Therefore, design, maintenance, and repairs should include accessibility and usability for all potential users, especially people with disabilities

An inventory of sidewalk condition in 2014 revealed many intersections lacked curb ramps or did not meet ADA standards while many other areas needed sidewalk maintenance or replacement. Routes with a high number of defects, such as deflections in the walking surface, can impede the easy travel of a wheelchair, cause trips and falls, and discourage pedestrian use. While some areas in need of maintenance may have been repaired since 2014, many issues likely remain today along with new defects that may have emerged.

The current condition of sidewalks as seen suggests that existing policies on sidewalk maintenance are not creating a compliant sidewalk network. Lecompton may wish to consider alternative policies or enforcement measures.

Figure 4-5: Sidewalk Defects



Figure 4-6: Sidewalk Downtown



## OTHER PEDESTRIAN FACILITIES BESIDES SIDEWALKS

Since people walking typically take the most direct route, gaps in the sidewalk network often force them to walk in the street or onto the adjacent grass, dirt, gravel, etc. Many local streets without sidewalks have low enough traffic volumes and speeds to feel comfortable and safe to a segment of the population. Walking in the street may be a comfortable option for able bodied adults, but may not be appropriate for everyone, including children or those with mobility challenges. While sidewalks are preferable for those walking, other facilities such as yield roadways and advisory shoulders can be an interim or long term solution when costs or other factors make a sidewalk infeasible.

## YIELD ROADWAY

A yield roadway is a neighborhood street designed to serve pedestrians, bicycle riders, and motor vehicle traffic in the same slow-speed travel area. Yield roadways need to be sufficiently narrow to encourage slow travel, with recommended widths of 12 to 20 feet. Yield roadways do not have sidewalks or lane markings. Currently, many Lecompton streets act as unofficial yield roadways. Signage can help raise awareness for the use of the roadway for walking.

## ADVISORY SHOULDERS

An **advisory shoulder** is a type of a shared roadway with mixed traffic. Pedestrians or bicycle riders share the low-volume, low-speed streets. A single motor vehicle lane is established where drivers share the single lane with oncoming vehicles. When two vehicles meet, they yield to pedestrians and bicycle riders before merging into the dashed shoulder. This roadway type would require education and encouragement to make people feel for more comfortable with using it.

## PEDESTRIAN LANE

A **pedestrian lane** is an interim or temporary pedestrian accommodation on streets without sidewalks which have low to moderate vehicle speeds and volumes. They are used to fill short gaps between sidewalks until a more permanent solution can be implemented. They must meet accessibility guidelines for a pedestrian access route.

Figure 4-7: Pedestrian Lane



Image obtained from Lynden Tribune

Figure 4-8: Yield Roadway



Whitefield Street in Lecompton serves as an unofficial yield roadway. Street view image obtained from <https://maps.google.com>

Sign image obtained from Small Town and Rural Multimodal Networks

Figure 4-9 Advisory Shoulders



Street view image obtained from <https://maps.google.com>

Sign image obtained from Alta Planning + Design

Figure 4-10: Pedestrian Lane

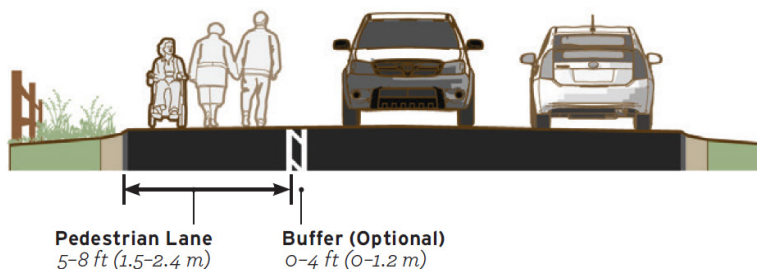


Image obtained from Small Town and Rural Multimodal Networks



## CROSSINGS

The perceived and actual safety of street crossings is one of the major barriers to walking in any community. Built environment crossing improvements are one approach to making people who walk more visible and reducing exposure and risk. There are two types of crossings – controlled (stop sign or traffic light) and uncontrolled (Figures 4-11 & 4-12). Marking a crosswalk with paint or other materials can help indicate where people should cross and alert motorists that people may be crossing. While crosswalks exist legally at all public intersections where there is a sidewalk on at least one side of the street, marking the crosswalk can increase awareness and reinforce that motorists must yield to people in crosswalks. There appear to be no marked crosswalks in Lecompton.

Figure 4-11: Uncontrolled, Marked Crossing

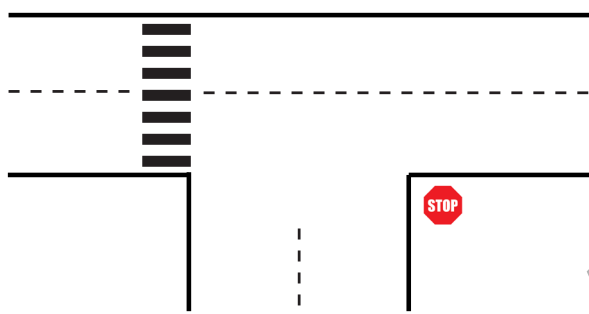
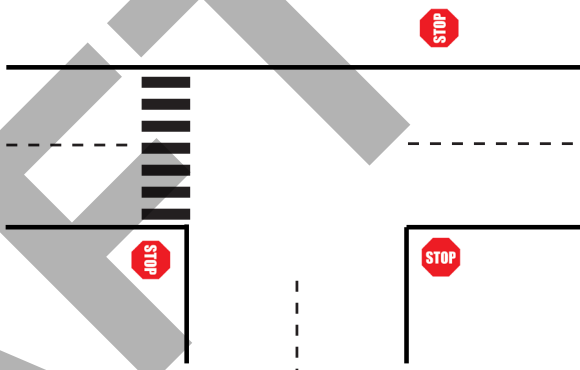


Figure 4-12: Controlled, Marked Crossing



## CROSSING IMPROVEMENTS

Improving crossings requires not only built environment improvements but also new policy/design criteria and education/enforcement. This section includes the recommendations related to the built environment improvements and policy/design. Both types of crossings can pose challenges that present real and perceived concerns for safety. Crossing improvements should be part of roadway reconstruction and maintenance or as standalone crossing projects.

The Federal Highway Administration's [Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations](#) provides the appropriate crossing improvement based on the characteristics of the roadway including speed, number of lanes, and number of vehicles which typically use it. Table 4-1 displays the application of crash countermeasures by roadway feature and Table 4-2 explains the safety issue addressed by each countermeasure. While this table addresses uncontrolled intersections, many of the countermeasures may be appropriate at controlled intersections, such as numbers 1, 2, 4, 5, and 6. The City should reference these tables when considering crossing improvements or other maintenance activities.



Table 4-1

Roadway Configuration	Vehicle AADT <9,000			Given the set of conditions in a cell, # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location. ● Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location. ○ Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*
	≤30 mph	35 mph	≥40 mph	
<b>2 lanes</b> (1 lane in each direction)	① 2 4 5 6	① 5 6 7 9	① 5 6 ⑦ ⑨	
<b>3 lanes with raised median</b> (1 lane in each direction)	① 2 3 4 5	① ③ 5 7 9	① ③ 5 ⑦ ⑨	1 High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs 2 Raised crosswalk 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line 4 In-Street Pedestrian Crossing sign 5 Curb extension 6 Pedestrian refuge island 7 Rectangular Rapid-Flashing Beacon (RRFB)** 8 Road Diet 9 Pedestrian Hybrid Beacon (PHB)**
<b>3 lanes w/o raised median</b> (1 lane in each direction with a two-way left-turn lane)	① 2 3 4 5 6 7 9	① ③ 5 6 7 9	① ③ 5 6 ⑦ ⑨	

Table 4-2

Pedestrian Crash Countermeasure for Uncontrolled Crossings	Safety Issue Addressed				
	Conflicts at crossing locations	Excessive vehicle speed	Inadequate conspicuity/visibility	Drivers not yielding to pedestrians in crosswalks	Insufficient separation from traffic
Crosswalk visibility enhancement	🚶	🚶	🚶	🚶	🚶
High-visibility crosswalk markings*	🚶		🚶	🚶	
Parking restriction on crosswalk approach*	🚶		🚶	🚶	
Improved nighttime lighting*	🚶		🚶		
Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line*	🚶		🚶	🚶	🚶
In-Street Pedestrian Crossing sign*	🚶	🚶	🚶	🚶	
Curb extension*	🚶	🚶	🚶		🚶
Raised crosswalk	🚶	🚶	🚶	🚶	
Pedestrian refuge island	🚶	🚶	🚶		🚶
Pedestrian Hybrid Beacon	🚶	🚶	🚶	🚶	
Road Diet	🚶	🚶	🚶		🚶
Rectangular Rapid-Flashing Beacon	🚶		🚶	🚶	🚶

\*These countermeasures make up the STEP countermeasure "crosswalk visibility enhancements." Multiple countermeasures may be implemented at a location as part of crosswalk visibility enhancements.

## 1 - HIGH VISIBILITY CROSSWALK MARKINGS, PARKING RESTRICTIONS, LIGHTING, & CROSSWALK WARNING SIGNS

The typical crosswalk uses two transverse lines. High visibility crosswalks can be seen from farther distances and use ladder, continental or bar pairs (Figure 4-13). Crosswalk warning signs (Figure 4-14) can be used to further increase visibility.

Parking restrictions, such as daylighting (Figure 4-15) can improve the visibility of pedestrians at crosswalks which was limited due to closely parked vehicles. Daylighting is the practice of converting a parking space at the crosswalk to a red painted curb, or installing vertical delineators in the street to prevent vehicles from parking too close to intersections.

According to the National Highway Traffic Safety Administration, 76% of pedestrian fatalities in 2019 occurred in dark conditions. Crosswalk lighting, placed carefully in forward locations to avoid a silhouette effect of the pedestrian, improve safety by making it easier for drivers to see people walking.

Figure 4-13: High Visibility Crosswalk Markings

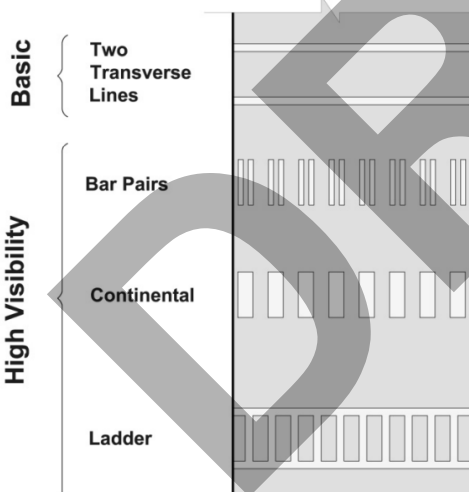


Image obtained from National Committee on Uniform Traffic Control Devices

## 2 - RAISED CROSSWALK

Raised crosswalks (Figure 4-16) are long, raised speed humps with a flat section in the middle and ramps on the ends. They are typically used collector or local streets with posted speeds of 30 mph or less.

Figure 4-14: Crosswalk Warning Signs



Figure 4-15: Daylighting



Image obtained from curbed.com

Figure 4-16: Raised Crosswalk



Image obtained from City of Ann Arbor [www.a2gov.org](http://www.a2gov.org)



### 3 - ADVANCE “YIELD HERE FOR PEDESTRIANS” SIGN & YIELD LINE

Signs that state “Yield Here For Pedestrians” indicate where a driver should yield to pedestrians and may be supplemented by “shark’s teeth” yield line 20 to 50 feet in advance of a marked crosswalk (Figure 4-19).

### 4 - IN STREET PEDESTRIAN CROSSING SIGN

In-street pedestrian crossing signs (Figure 4-17) can be placed between travel lanes or in conjunction with a refuge island or raised median. The sign may be used to remind road users of laws regarding right-of-way.

### 5 - CURB EXTENSION

Curb extensions (Figure 4-18), also known as bulb-outs or neckdowns, extend the sidewalk or curb line out into the parking lane, which reduces the effective street width. Curb extensions significantly improve pedestrian crossings by reducing the pedestrian crossing distance; visually and physically narrowing the roadway; improving the ability of pedestrians and drivers to see each other; and reducing the time that pedestrians are in the street.

Figure 4-17: In-Street Pedestrian Crossing Sign



Image obtained from citybeat.com

Figure 4-18: Curb Extension



Figure 4-19: Various Countermeasures

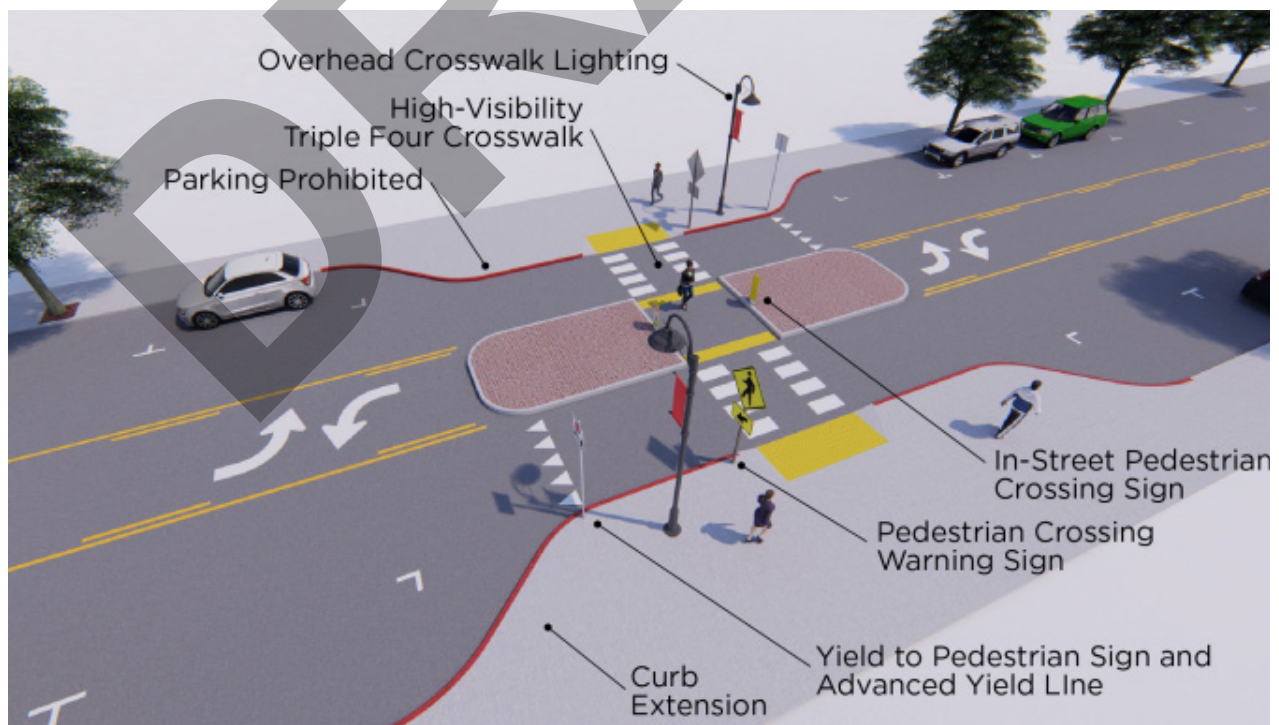


Image obtained from Federal Highway Administration



## 6 - PEDESTRIAN REFUGE ISLAND

A pedestrian refuge island (Figure 4-20) is a median with a refuge area that is intended to help protect pedestrians who are crossing the road. Refuge islands can help improve safety by allowing pedestrians to cross one direction of traffic at a time.

Figure 4-20: Pedestrian Refuge Island



*Image obtained from AARP*

## 7 - RECTANGULAR RAPID-FLASHING BEACON

An RRFB (Figure 4-21) consists of two, rectangular-shaped yellow indications, each with a light-emitting diode (LED)-array-based light source. RRFBs flash with an alternating high frequency when activated to enhance visibility of pedestrians at the crossing to driver. Research suggests RRFBs have resulted in motorist yielding rates as high as 98 percent at marked crosswalks, but varies based on various factors.

Figure 4-21: Rectangular Rapid-Flashing Beacon



*Image obtained from Carmanah Technologies*

## 9 - PEDESTRIAN HYBRID SIGNAL

A PHB (Figure 4-22) is a hybrid beacon used to control traffic and rests in dark until a pedestrian activates it via pushbutton or other form of detection. When activated, the beacon displays a sequence of flashing and solid lights that indicate when pedestrians should cross and when it is safe for drivers to proceed.

Figure 4-22: Pedestrian Hybrid Signal



## VEHICLE SPEED

Lower vehicle speeds reduce the severity of crashes and give people more time to react. Post streets in Lecompton do not have a posted speed limit. Woodson Avenue has a speed limit of 30 PMH and East 600 Road has a speed limit of 40 MPH through town.

Field of vision, the amount of space a person can view while driving, decreases as speed increases (Figure 4-23). Thus higher speeds can lead to more crashes when drivers are not be able to view people walking or bicycling in the street soon enough to react. According to the AAA Foundation for Traffic Safety the average risk for death of a pedestrian increases as the speed of the vehicle increases (Table 4-3).

Table 4-3 Average Risk of Pedestrian Severe Injury or Death Based on Vehicle Speed

	Severe Injury	Death
<b>10.0%</b>	16 mph	23 mph
<b>25.0%</b>	23 mph	32 mph
<b>50.0%</b>	31 mph	42 mph
<b>75.0%</b>	39 mph	50 mph
<b>90.0%</b>	46 mph	58 mph

Figure 4-23: Field of Vision Based on Speed of Driver

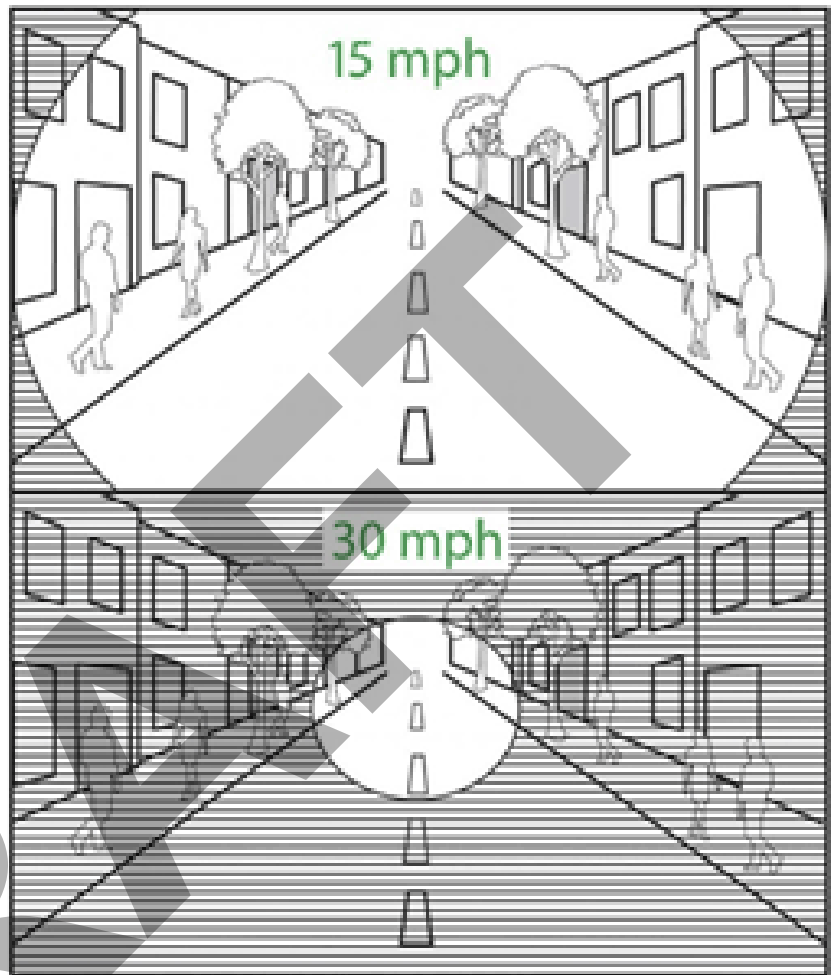


Image obtained from Congress for New Urbanism. Source: Jeff Speck, Walkable City Rules 2018

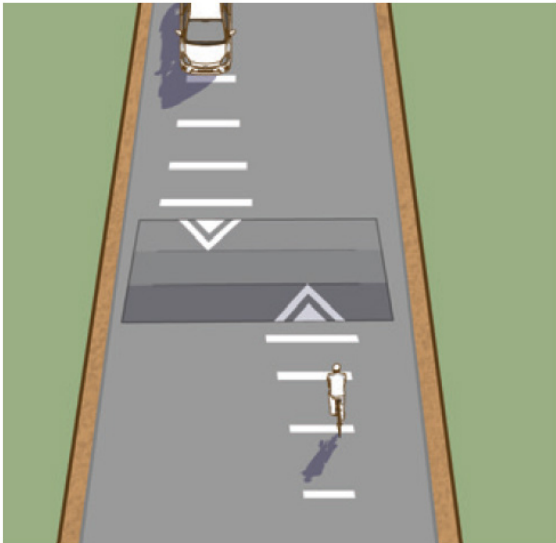
## SPEED MANAGEMENT

Lowering speed limits is one low cost measure to increase the safety of people walking. However, speed limits alone are often not enough to achieve desired speeds. Speed management uses physical changes to the roadway, signage and road markings, and/or operational changes to reduce driver speeds thereby increasing safety for pedestrians and all road users. It is sometimes referred to as a “silent policeman” enforcing speed limits when no actual law enforcement is present. Any roadway where speeding is a concern is a potential candidate for speed management. Streets such Woodson Avenue and East 600 Road might benefit from speed management.

The Crossing Improvements section includes some countermeasures that can also help with speed management, such as curb extensions and pedestrian refuge islands. Furthermore, the following tools can assist with speed management (illustrations and descriptions from *Small Town and Rural Multimodal Networks*, Federal Highway Administration, 2016):

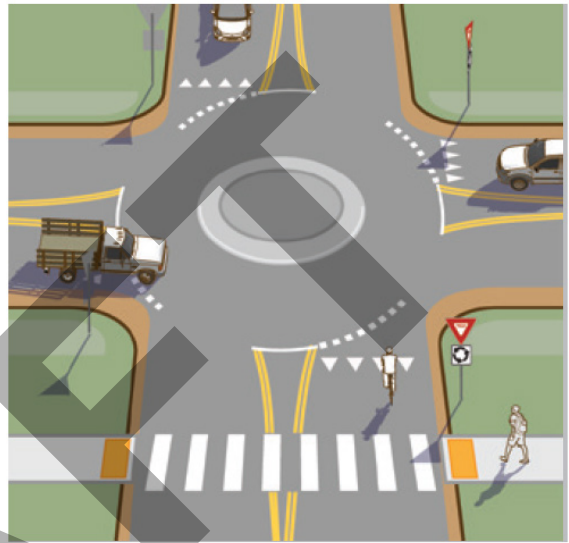
## **SPEED HUMPS AND SPEED TABLES**

Speed humps and tables apply vertical deflection in the roadway that is designed to limit the speed of traffic. The main difference between humps and tables are length and profile. For more information on speed humps refer to the MUTCD 2009.



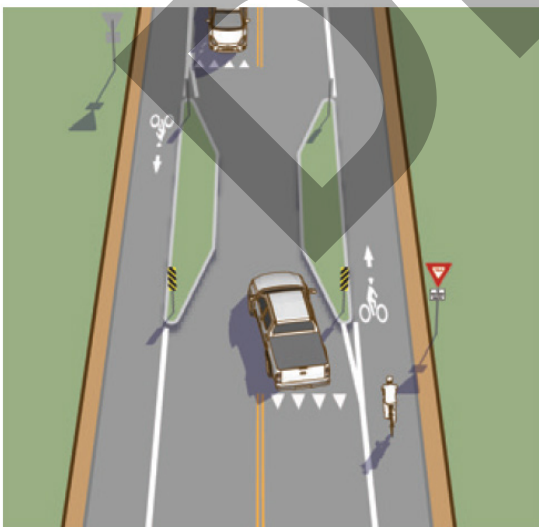
## **MINI ROUNDABOUT**

Mini roundabouts are roundabouts with a small footprint and fully traversable central island. For more information on mini roundabouts refer to the MUTCD 2009, and NCHRP 672.



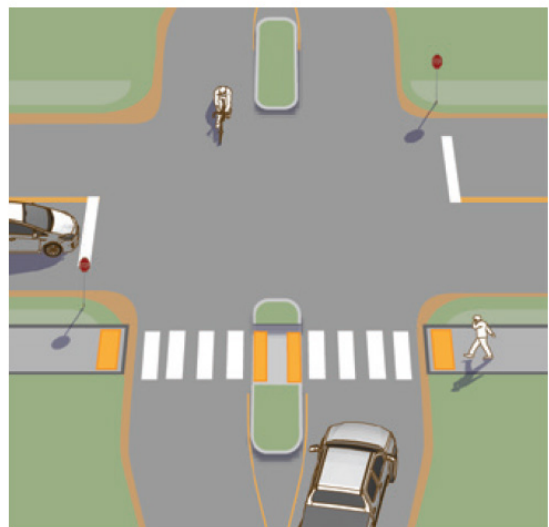
## **PINCH POINT**

Pinch points, also called chokers, are curb extensions or edge islands at mid-block locations which narrows the road for a short distance, forcing all motorists to merge into a single lane.



## **MEDIAN ISLAND**

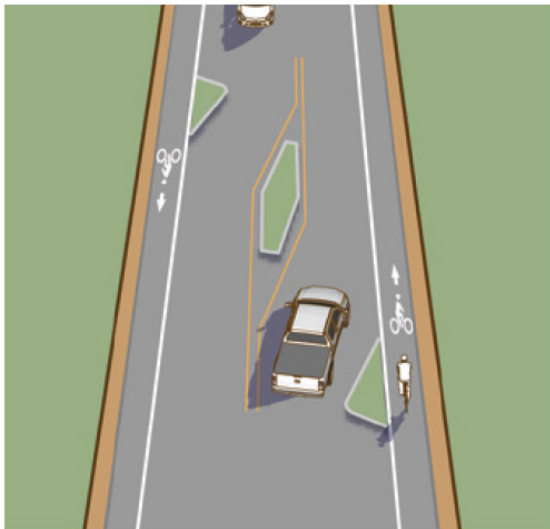
Median island are raised islands located along the centerline of a street that narrow the travel lanes and require deflection of an otherwise straight travel path. Median islands are an FHWA Proven Safety Countermeasure.





## LATERAL SHIFT

Lateral shifts are realignments of an otherwise straight travel path. When multiple lateral shifts are applied to form an S-shaped curve it is called a chicane. For traffic calming, the taper lengths may be as much as half of what is suggested in traditional highway engineering.



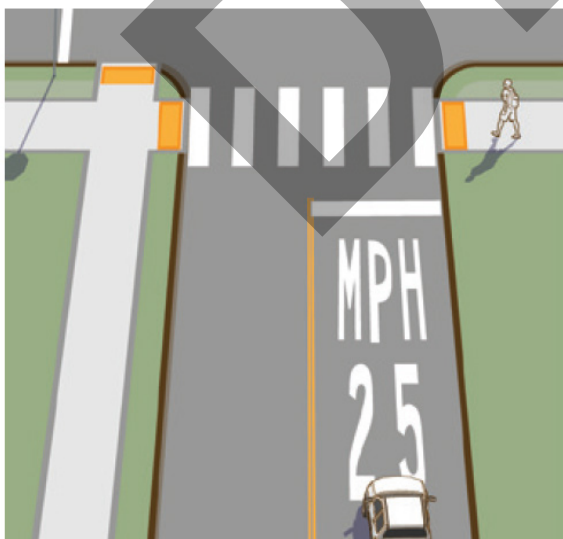
## SPEED FEEDBACK SIGN

Police departments and transportation agencies use speed feedback signs as educational tools that can enhance enforcement efforts directed at speed compliance. Speed feedback signs educate drivers as to their operating speed, and remind them of the posted speed limit on the roadway..



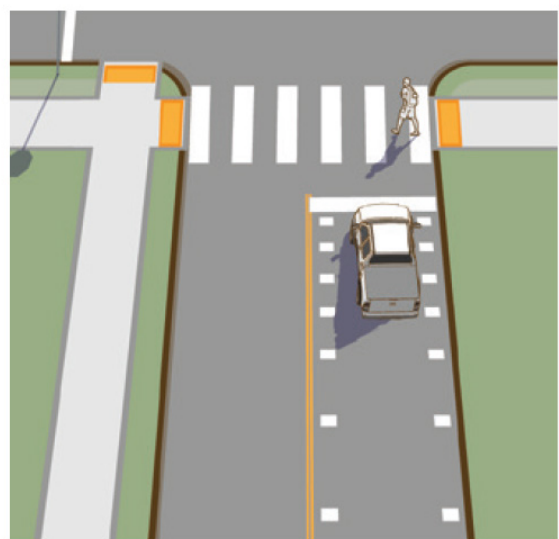
## SLOW OR SPEED LIMIT PAVEMENT LEGENDS

Use SLOW or speed limit pavement markings as a supplement to speed limit signs and reinforce the lawful speed limit.



## SPEED REDUCTION MARKINGS

Speed reduction markings are a series of white rectangular markings typically 1 foot wide placed just inside both edges of the lane and spaced progressively closer to create the illusion of traveling faster as well as the impression.



# QUICK-BUILD IMPROVEMENTS

Many of the examples pictured in this plan require time to plan, budget for, and install. However, many improvements can be implemented using a quick-build approach that is faster and more affordable. Quick-build projects are reversible, adjustable traffic and pedestrian safety improvements that use materials like paint, posts, and signs rather than more permanent and costly improvements like concrete and asphalt. This allows for quick implementation when a safety concern is identified and also allows for pilot projects prior to more permanent investment. Quick-build improvements tend to be less durable but with appropriate maintenance can last many years.

## RECOMMENDATIONS

### A. Leverage Safe Routes to School (SRTS) Funding

Apply for Safe Routes to Schools funding through Transportation Alternatives Program administered by KDOT.

### B. Adopt Design Standards and Policies that Result in Pedestrian Friendly Development

Consider policies and standards that support walkability such as:

1. A Complete Streets policy (see sidebar).
2. Require sidewalks that connect from the public right-of-way to public entrances of buildings.
3. Require substandard sidewalks be brought into compliance during redevelopment or expansion.
4. Require street trees be planted with new development and redevelopment (see sidebar).

### C. Improve pedestrian safety and comfort at locations with real and perceived risk

5. Consider using a residential speed limit of 20 MPH throughout the city as a means of traffic calming and implementing speed management tools (pages 54-56) where needed .
6. Consider Federal Highway Administration Proven Safety Countermeasures (pages 51-53) at crosswalks with higher use or safety concerns.
7. Consider quick-build improvements (page 57) to improve safety and comfort.

Figure 4-24: Quick-Build Project



Image obtained from Alta Planning + Design

### Complete Streets



A Complete Streets Policy specifies how a community will plan, design, and maintain streets so they are safe for all users of all ages and abilities. A strong policy begins transforming a community's practices, processes, and plans. Learn more at [Smart Growth America](https://www.smartgrowthamerica.org/).

### Street Trees Best Practices



The FHWA publication [Small Town and Rural Multimodal Networks](https://www.fhwa.gov/publications/smalltownandmultimodalnetworks/) recommends a 3ft horizontal clearance between trees and sidewalks to minimize pavement cracking and heaving of the paved surface. They also recommend that when trees are desired within the roadway separation area to consider planting small caliper trees with a maximum diameter of 4 inches to alleviate concerns about fixed objects or visual obstructions between the roadway and the pathway.

### Proven Safety Countermeasures



FHWA's [Proven Safety Countermeasures initiative](https://www.fhwa.gov/publications/proven-safety-countermeasures-initiative/) is a collection of 28 countermeasures and strategies effective in reducing roadway fatalities and serious injuries



## Encouragement

Perry-Lecompton Community Library may be a potential partner with the city to promote walking. Examples from libraries in other communities include connecting stories and walking in outdoor programs such as story walks, heritage walks, and walking book clubs; walking programs without a literary component; partnerships with other community groups; and efforts to increase safe walking routes to libraries. For more information see [Public Libraries and Walkable Neighborhoods](#) in the International Journal of Environmental Research and Public Health

### **D. Track and Measure Progress of Lecompton's Pedestrian Network, Amenities and Programming**

It is important to understand the type, magnitude, and location of pedestrian improvements that are being implemented each year. The City and MPO should work together to track miles of sidewalk construction and sidewalk gap infill, sidewalk maintenance, shared-use path construction, installation of other pedestrian amenities, and results of education, encouragement, and enforcement campaigns. Tracking cost, location, and program data for pedestrian improvements will demonstrate the progress Lecompton is making on the pedestrian environment and where more work still needs to be done to further address the region's focus areas.

### **E. Target Resources to the Priority Network**

Funding should be prioritized to complete the Priority Network routes first (Figure 4-4), creating continuous, quality pedestrian facilities.

### **G. Create or Support Encouragement Programs**

Encouragement programs help create awareness of pedestrian issues and the benefits of walking. Encouragement activities focus on increasing walking through fun and interesting activities. Encouragement activities may include: art walks, walk to school day, workplace wellness programs, walking route maps or way-finding signage, open streets, walking clubs, and Fitbit or pedometer giveaways.