



COMPLETING THE STREET

a complete streets toolkit

COMPLETING THE STREET

A COMPLETE STREETS TOOLKIT

EVANSVILLE METROPOLITAN PLANNING ORGANIZATION
Civic Center Complex, Room 316
1 NW Martin Luther King, Jr. Blvd.
Evansville, IN 47708

Phone: 812.436.7833
www.evansvillempo.com

Made possible with funding from the Centers for Disease Control and Prevention.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION	1
Complete Street Basics	2
Component Zones.....	3
Land Use Context	3
Street Network Context.....	4
 CHAPTER 2: PEDESTRIAN FACILITIES.....	 5
Sidewalk Component Zones.....	5
Sidewalks/Width	7
Sidewalk Buffers – Planting Strips and Paved Buffers.....	8
Planting Strips	8
Paved Buffers	8
Multi-Use Paths	9
 CHAPTER 3: BICYCLE FACILITIES	 11
Shared Lanes (bike route)	11
Marked Shared Lanes	12
Bike Lane.....	14
Paved Shoulders	15
Wide Curb Lanes	16
Road Diets	17
 CHAPTER 4: STREET CROSSINGS, SIGNALS AND SIGNAGE	 21
Marked Crosswalks	21
Types of Marked Crosswalks	22
Raised Crosswalk	23

Raised or Lowered Medians..... 24

Advanced Stop Bars 25

Pedestrian Island 26

Midblock Crossings 27

Signals 29

Mid-block Crossing Treatment: Rectangular-Shaped Rapid Flashing with LED Crosswalk Beacon
(Enhancer) Device..... 29

International Pedestrian Signals..... 30

Countdown Signals 30

Pedestrian Signal Timings 30

Concurrent Signal Timings 31

Leading Pedestrian Indicator (LPI)..... 31

Signage 32

Wayfinding 32

Warning 33

CHAPTER 5: STREETScape DESIGN.....35

Curb Zone 36

Furniture Zone..... 36

Pedestrian Zone 37

Planting Strips 37

Street Trees 37

Lighting 39

Pedestrian-Scale Lighting..... 40

Vehicle-Scale Lighting..... 40

Combination Pedestrian and Vehicle Scale Lighting..... 41

In-Pavement Lighting 41

Catenary Lighting 41

Street Furniture 41

Transit Stops..... 42

CHAPTER 6: TRAFFIC CALMING MEASURES45

Traffic Circles 46

Roundabouts..... 47

Speed Humps..... 48

Speed Tables..... 48

Curb Extensions 49

Textured Pavements..... 50

Landscaping..... 51

CHAPTER 7: OTHER RESOURCES53

APPENDIX A: EVANSVILLE MPO COMPLETE STREETS POLICY..... A-1

APPENDIX B: EVANSVILLE MPO SHARROW PLACEMENT GUIDELINES B-1

INTRODUCTION

In order to promote a multi-modal transportation system in the Evansville region, the Evansville MPO created and adopted a Complete Streets Policy in March of 2012. The Policy supports the creation of a multi-modal, safe and efficient transportation system that ensures accessibility to all roadway users. The main objective of the Complete Streets Policy is to design and build roads that safely and comfortably accommodate all users of roadways, including motorists, cyclists, pedestrians, transit and school bus riders, delivery and service personnel, freight haulers, and emergency responders, and includes people of all ages and abilities. See Appendix A for the Evansville MPO Complete Streets Policy.

Providing complete streets can benefit many residents, business owners, developers, and the community as a whole. Embracing a complete streets concept will create a balanced transportation system by providing people with a mode choice between destinations. It will encourage economic growth and stability while increasing property values, and can boost job growth, reduce crashes through safety improvements, improve public health and fitness, reduce harmful emissions, and reduce the overall demand on roadways by giving other modal options for users. Integrating sidewalks, bike facilities, transit amenities, and/or safe crossings into the initial design of a project spares the expense and complications of retrofits later.

This Complete Streets Toolkit is intended to create awareness and provide guidance on a variety of street design measures available to municipalities in planning and engineering a safe and comfortable complete street for all users of all abilities. The measures provided within this toolkit are examples of various treatment options that can be used to help provide alternative transportation choices to users. A description of the treatment option, issues to consider about that treatment option, and generalized guidelines are provided. The specific design and dimensions should be studied individually for each project.

COMPLETE STREET BASICS

A complete street is a street that is accessible to all users, and accommodates people of all ages and abilities. There is no single solution for a complete street – it is “complete” once it speaks to the context of the surrounding area. While not every street needs (or should) include all of the elements of a complete street, there are several basic concepts that make a street complete for all users. These concepts include:

PEDESTRIANS

Quality pedestrian facilities include adequate unobstructed walking space, adequate lighting, benches, trees, shading, roadway separation by green space or on-street parking, easy access to walkable destinations, and safe and frequent crossings.

BICYCLISTS

Quality bicycle facilities include spaces comfortably shared with traffic, clearly marked bike lanes (or appropriate separation based on speed and volume of vehicle traffic), adequate bicycle parking, intersection treatments, and destinations accessible by bike.

TRANSIT

Quality transit facilities include connectivity to the bicycle and pedestrian network, functional shelters, separated/prioritized travel ways, coordinated land use planning, bike parking, lighting, and walkable and bikeable distances between stops and stations.

PLACE

Complete streets are places. They do not simply link destinations: they are destinations in themselves, including places for sidewalk dining, social gatherings, exercising, and relaxing.

VALUE

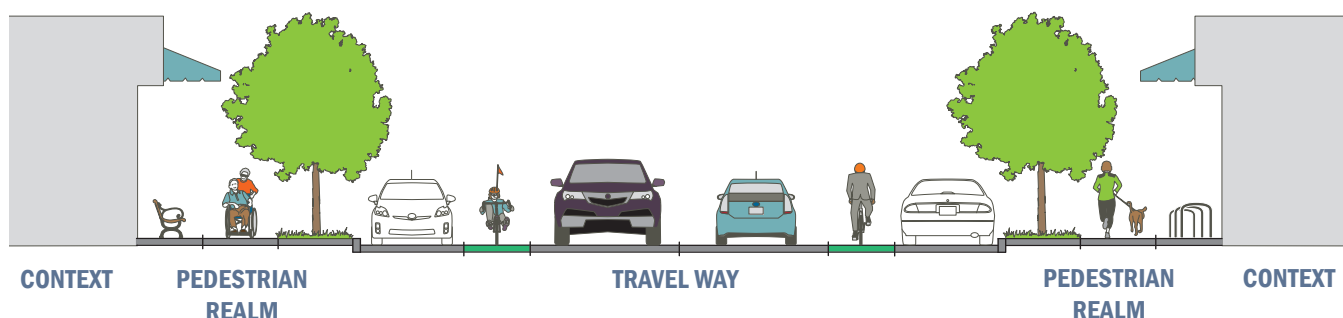
Complete streets can enhance property value. The street design can support commerce through such tools as sidewalk dining, street sales, and bike parking.

COMPONENT ZONES

A complete street is a combination of smaller sub-areas, or zones. A typical street can be split into three zones:

- ① Travel way – the space dedicated to on-street vehicular travel, which includes bicyclists and often times, dedicated space for parking.
- ② Pedestrian realm – the area within the public right-of-way adjacent to the travel way. This zone includes sidewalks, landscaping and street trees, lighting, furniture, and other streetscaping elements.
- ③ Context – the private and quasi-public realms just adjacent to the public right-of-way.

Complete streets planning considers land uses that are adjacent to the travel way. Whether privately held or public, as in parks or public institutions, land is subject to state regulations and is controlled through planning, zoning, and other ordinances. It is essential that planning also considers the quasi-public realm – property that may be privately held but “works” as public space, either by design or by function, such as storefronts, building facades, and any other area that interacts with the streetscape.

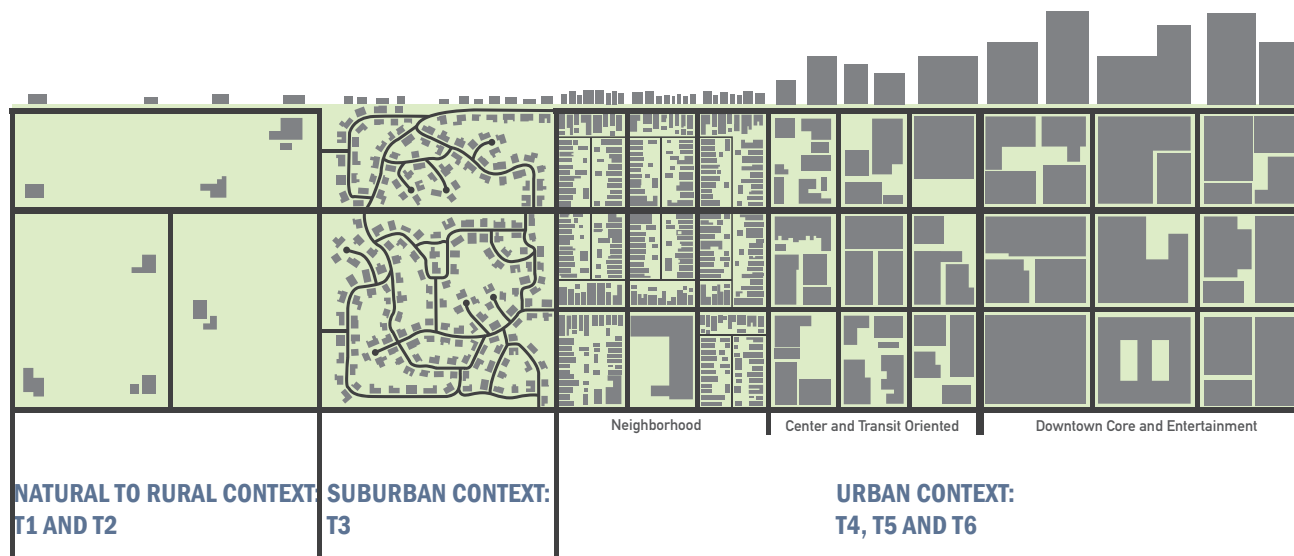


Source: atpolicy.org; Complete Streets, Complete Networks

LAND USE CONTEXT

Land use planning can (and is recommended to) be incorporated into complete streets by defining a context zone that describes the transition of the built environment from rural to urban. Context zones can be used as planning tools that consider building spacing, street network density, land use, special districts, and placemaking. Applying complete streets principles to roadway design will allow decisions to be made based on the changing environmental context.

The transition of the built environment from rural to urban is broken into six transect zones (T-zones) and can provide the basis for neighborhood structure. Neighborhood structure can be defined by walkable streets, mixed use, transportation options, and housing diversity. The roadway and pedestrian elements in each T-zone designation varies depending on the ratio and level of intensity of the natural, built, and social components in each zone. When communities are implementing complete streets elements, it is important to reflect local character and form.

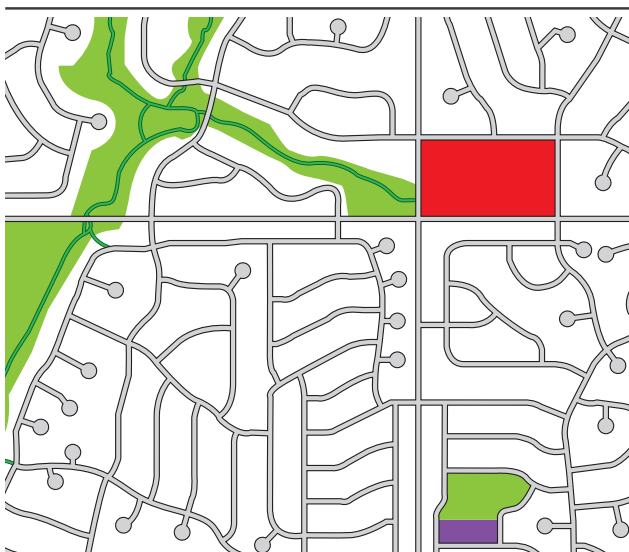


Source: atpolicy.org; Complete Streets, Complete Networks

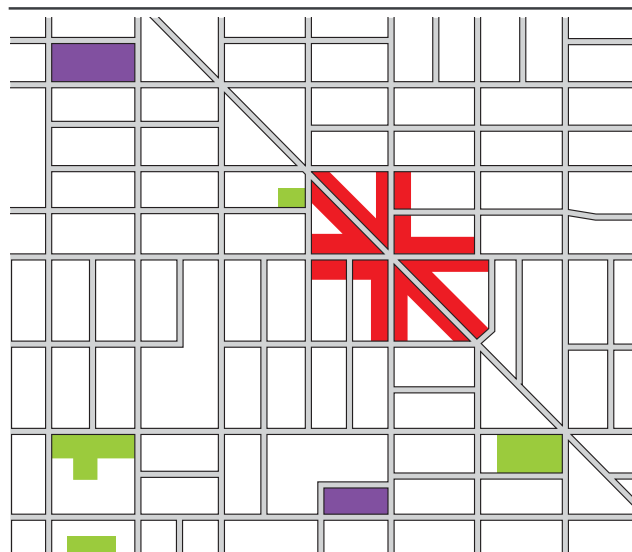
STREET NETWORK CONTEXT

A complete streets network is a series of corridors that serve as the connection between people and places. While a project-based approach might focus on just the nearby context, a network context will consider all users' needs and expectations of the entire network. The focus is then moved away from just how a particular corridor or intersection and its adjacent land uses function, to how that particular corridor or intersection will improve the entire network as a whole. When individuals that travel these corridors are given transportation options, they will choose the mode that best fits their needs and the purpose of the trip.

CONVENTIONAL SUBURBAN NETWORK



TRADITIONAL URBAN GRID NETWORK



Source: atpolicy.org; Complete Streets, Complete Networks

PEDESTRIAN FACILITIES

Pedestrian facilities are designed to accommodate walking – the most basic form of transportation. Sidewalks also provide for other users such as runners, roller skaters and most importantly, wheelchairs. All pedestrian facilities should be made easily accessible for disabled persons. Facilities for pedestrians should be provided in all places where people can be expected to walk, for example, from neighborhoods to schools to work to shopping centers. Sidewalks should always be included in new developments.

SIDEWALK COMPONENT ZONES

A sidewalk can be broken down into smaller sub-areas, or zones, just like a complete street can be (the travel way, pedestrian realm, and context). These zones include:

- ① Curb Zone – the curbed area between the sidewalk and the vehicle ways; usually includes drain inlets.
- ② Furniture Zone – area of sidewalk where trash cans, benches, lighting, planters, utilities, and other objects are placed.
- ③ Pedestrian Zone – area of sidewalk that is clear for pedestrian use.
- ④ Frontage Zone – area of sidewalk that transitions to adjacent land uses; commonly used for quasi-public activities, such as outdoor cafes and sidewalk sales.

	RESIDENTIAL STREET	COMMERCIAL STREET
CURB ZONE	Can vary between 1 and 2 ft. Residential areas with open drainage do not have curb zones. Where there is urban drainage, the shoulder is often considered part of the curb zone.	Can vary between 1 and 2 ft.
FURNITURE ZONE	Can vary in width. This zone is often a planting strip with trees or grass. Most trees require 6 ft. of open space around the trunk to reach maturity and maintain health. Utilities and other structures can be located in this zone.	Should be at least 2 ft. wide; widths at least 5 to 6 ft. needed for trees and plantings. Typically part of the paved walkway. Any potential obstacle, such as benches, trash cans, transit shelters, planters, should be placed here
PEDESTRIAN ZONE	Typically 5 to 6 ft. wide in residential areas.	At least 8 to 10 ft. wide of continuous, unobstructed sidewalk
FRONTAGE ZONE		Minimum of 1 to 2 ft., however, a 6 to 10 ft. zone provides better access to buildings and allows space for sidewalk sales, café seating, and other uses
Source: atpolicy.org ; Complete Streets, Complete Networks		

See Chapter 5: Streetscape Design for more information regarding Sidewalk Component Zones.



SIDEWALKS/WIDTH

Sidewalks are the most common facility for pedestrian transportation within the public right of-way, often times adjacent to, but separate from automobile traffic. In many ways, they act as the seam between private residences, stores, businesses, and the street by providing a safe place for pedestrians. Sidewalks are spaces where children play, neighbors meet and talk, shoppers meander casually, parents push strollers, and commuters walk to transit stops or directly to work. Because of the social importance of these spaces, great attention should be paid to retrofit and renovate areas with disconnected, dangerous, or otherwise malfunctioning sidewalks.

A sidewalk can be defined as “walkways that are parallel to a street or highway” and walkways as generally being “pedestrian paths, including plazas and courtyards.” (FHWA)

CONSIDERATIONS:

1. Width of sidewalk
 - a. It is generally accepted that a minimum travel path width of five (5) feet for a sidewalk or walkway is the standard. A sidewalk width of six (6) feet is considered sufficient for two people to walk side-by-side or for two pedestrians to pass each other.
 - b. Multi-use paths and sidewalks near schools and other areas of high pedestrian activity call for wider walkways. Areas with significant pedestrian traffic should consider eight (8) to ten (10) feet wide sidewalks.
 - c. Consider construction of sidewalks on all city or town streets, including those in rural areas. It is recommended that sidewalks be installed on both sides of the street, whenever possible, for new urban and suburban streets, especially in commercial areas, residential areas with four (4) or more units per acre, or residential areas on major arterials and collectors. If sidewalks on both sides of the road are not possible, lower density rural residential areas might adequately serve its pedestrians with a sidewalk on only one side or with paved shoulders on both sides of the road.
 - d. It is important to note the potential for conflict between pedestrians and bicyclists on paved shoulders. Bicyclists and pedestrians must exercise caution in order to avoid potential crashes on paved shoulders. In low density rural areas the potential for conflict is generally lower, so paved shoulders are a reasonable accommodation on many rural roads.
2. Streetscaping elements should not interfere with pedestrian flow.
3. Retrofit areas that do not have sidewalks, giving a priority to streets that connect with bus stops, schools, parks, public buildings and other areas with heavy pedestrian traffic.

ROADWAY CLASSIFICATION AND LAND USE	SIDEWALK/WALKWAY	FUTURE PHASING RECOMMENDATIONS
Rural Highways (< 400 ADT)	Shoulders preferred, with minimum of 3 ft.	Secure/preserve right-of way (ROW) for future sidewalks
Rural Highways (400 to 2,000 ADT)	5 ft. shoulders preferred, minimum of 4 ft. required	Secure/preserve ROW for future sidewalks
Rural/Suburban Highway (ADT >2,000 and less than 1 dwelling unit)	Sidewalks or side paths preferred; minimum of 6 ft. shoulders required	Secure/preserve ROW for future sidewalks
Suburban Highway	Sidewalks on both sides required	
Major Arterial (residential)	Sidewalks on both sides required	
Urban Collector and Minor Arterial (residential)	Sidewalks on both sides required	
Urban Local Street (residential)	Sidewalks on both sides preferred; minimum of 5 ft. shoulders required	Secure/preserve ROW for future sidewalks
Urban Local Street (residential)	Both sides preferred	Second side required if density becomes greater than 4 d.u. / acre or if schools, bus stops, etc. are added
Local Street (residential)	Sidewalks on both sides required	
All Commercial Urban Streets	Sidewalks on both sides required	
All Streets in Industrial Areas	Sidewalks on both sides preferred; minimum of 5 ft. shoulders required	

Source: FHWA; PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System, 2004

SIDEWALK BUFFERS – PLANTING STRIPS AND PAVED BUFFERS

Buffer zones between sidewalks and pedestrian paths and vehicular traffic provide a sense of security to anyone on-foot or in wheelchairs, and gives the path comfortable scale and clear definition. Not only can buffers be used as a safety barrier, they can also be used to create a more aesthetically pleasing streetscape. Buffer zones may either be paved or landscaped, and they may involve a planting strip, depending on the character of the area.

PLANTING STRIPS

A continuous zone of landscaping, located between the sidewalk and the street curb or the edge of the road pavement, is useful for many reasons. These planting strips contribute to the beautification and walkability of a street by providing space for shade trees, helps reduce urban temperatures, improves water quality, lowers stormwater management costs, and creates an overall better experience for users. For additional information on planting strips, see Chapter 5: Streetscape Design.

PAVED BUFFERS

Paved buffers are commonly used in a downtown or commercial area. These buffers typically include the same elements as the furniture zone. Strategically placing planters, lighting, benches, trash cans, and other useful streetscaping elements will create a buffer between the pedestrian zone (sidewalk) and the street. The separation from motorized traffic with these elements will increase the users sense of security and comfort.

CONSIDERATIONS:

1. Buffers in residential and suburban areas are typically landscaped with grass, plants or trees.
2. Buffers in more dense residential and commercial areas may not be just plantings, but typically contain more streetscaping elements, such as benches, planters, light poles, and signage.
3. On-street parking and bike lanes can serve as a buffer between vehicle traffic and pedestrians on the sidewalk.
4. A continuous planting strip buffer may not be appropriate in all situations, particularly where there is a high degree of foot traffic between the sidewalk and the street (i.e. adjacent to on-street parking).

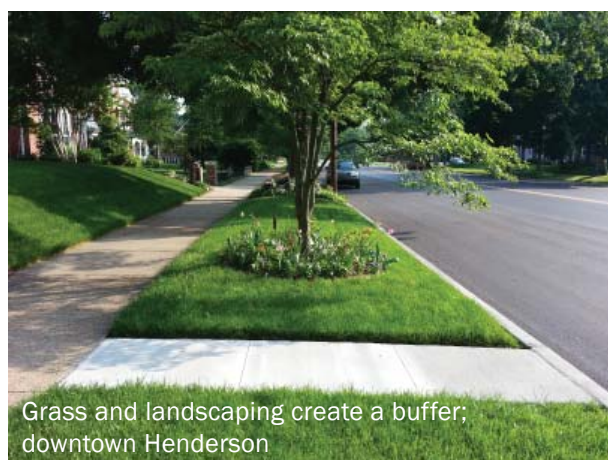
GUIDELINES:

	BUFFER WIDTH	BUFFER TYPE
LOCAL OR COLLECTOR STREET	2-4 ft.	Paved or planting strip
ARTERIAL OR MAJOR STREET	5-6 ft.	Paved or planting strip

Source: AASHTO; Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004



Streetscaping elements create a buffer; downtown Evansville



Grass and landscaping create a buffer; downtown Henderson

MULTI-USE PATHS

Multi-use paths are paved road-like facilities designed to accommodate many users, including pedestrians, bicyclists, those on roller blades, skateboards and other non-motorized modes of transportation. Multi-use paths can be paved or unpaved depending on their location and target use.

The alignment of these corridors should avoid road right-of-way whenever possible to minimize intersection and driveway crossings. Ideally, paths cross roads at signalized intersections to take advantage of pedestrian crosswalks and signals.



CONSIDERATIONS

- 1. Paths located along roadways could create a challenge when designing for safety due to intersecting roadways.
- 2. Future maintenance needs can be reduced by good initial designs.
- 3. Vegetation should be thinned along a path to increase sight lines and distances and to enhance safety for the path users. This can include the removal of underbrush and limbs to create open pockets within a forest canopy (but does not include the removal of the forest canopy itself).
- 4. Shade and rest areas with benches should be considered along multi-use paths or at trailheads.
- 5. Wayfinding signs (e.g., how far to the library or the next rest area, or directions to an on-street bike facility) are helpful for users.
- 6. Shoulders can consist of grass, sand, finely crushed rock or gravel, natural groundcover, or other similar material.

GUIDELINES

	WIDTH	GRADED AREA ADJACENT TO BOTH SIDES OF PATH	VERTICAL CLEARANCE
MINIMUM	10 ft. *	2 ft.	8 ft.
*the width of the path can be reduced to 8 ft. depending upon physical or right-of-way constraints; can be increase to 12+ ft. depending upon expected user volumes			
Source: AASHTO; Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004			

When selecting streets for bicycle facilities, factors such as surrounding land use, vehicle speeds and volumes, and connectivity should be considered. As a general rule, the separation between vehicles and bicycle should increase as the speeds and volumes of vehicles increase. It is important to note that the following guidelines must be weighed against design objectives, network plans, and residents' expectations. Right-of-way constraints may also limit bicycle facility selection, especially in projects that are being retrofitted. Other factors to consider include modal conflicts at intersections, pedestrian crossings, driveways, curb inlets, vehicle parking bays, and transit stops.

SHARED LANES (BIKE ROUTE)

Bicycles may be operated on any roadway (except if it is prohibited by statute or regulation), and often times may use the same travel lane as a vehicle. These routes can exist anywhere – on local neighborhood streets, city streets, and on urban, suburban and rural highways. A bike route typically does not have any pavement markings, but “SHARE THE ROAD” signs instead. These signs alert motorists that bicyclists may be present and remind them to give the cyclists space. The signs in turn remind the cyclists to follow the same rules of the road as a motorist.

CONSIDERATIONS

- 1. Suitable on an existing roadway that is open to both vehicles and bicycles.
- 2. Existing roadways that have wide curb lanes or paved shoulders where bicyclists are likely to ride.

GUIDELINES

There are no specific dimensions or guidelines for shared lanes, but various design features can be considered that would make bicycling more compatible as a shared lane.



SHARE THE ROAD Sign;
Newburgh

EXISTING ROADWAY CHARACTERISTICS THAT ARE CONDUCTIVE TO CYCLISTS	DESIGN FEATURES THAT ARE MORE COMPATIBLE WITH A SHARED LANE
<ul style="list-style-type: none">• Roadways that carry very low to low volumes of traffic• Roadways with traffic generally operating at lower speeds• Rural roadways with good sight distance with low traffic volume and speeds less than 55 mph	<ul style="list-style-type: none">• Good pavement quality• Adequate sight distances• Roadway designs that encourage slower vehicle speeds• Bicycle compatible drainage grates, bridge expansion joints and railroad crossings
Source: AASHTO; Guide for the Development of Bicycle Facilities, 2012	

MARKED SHARED LANES

In situations where a higher level of guidance to motorists and bicyclists is needed, the shared lane may be marked with a pavement marking symbol. This symbol, known as either a shared-lane marking or sharrow, is useful in locations where there is not enough space to provide a dedicated bike lane. The marking helps guide cyclists on their placement in the street, as well as alert motorists that cyclists may be present.

CONSIDERATIONS

- 1. Used to provide continuity to other bicycle facilities (usually bike lanes or greenway systems).
- 2. Can designate preferred routes through high-demand corridors.

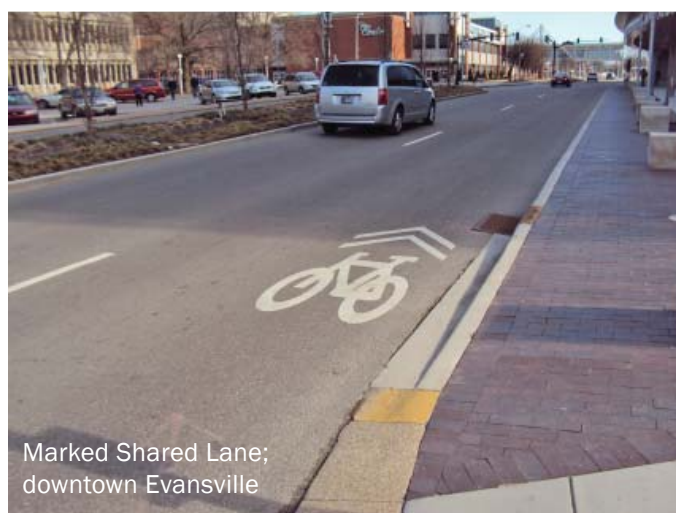
GUIDELINES

WHEN A MARKED SHARED LANE IS APPROPRIATE:	
If shared lane is adjacent to on-street parallel parking:	Symbol helps position cyclist to reduce the chances of a conflict between the cyclist and a vehicle's open door
For wide outside lanes:	Symbol helps position cyclist away from the curb or edge of roadway
For creating links:	On a section of roadway with shared lanes, to fill a gap between two sections of roadway that have other bike facilities, and to connect destinations
On narrow roadways:	If a roadway is too narrow for a dedicated bike lane
On hilly terrain:	Marked shared lanes are typically more suitable for steep downgrades (a dedicated bike lane should be used on uphill grades due to the slower speed of cyclists)
Multi-lane intersections:	When there is insufficient width to provide a bike lane
At transit stops:	Provides visual cues to motorists and cyclists on the proper path alignment in the street
WHEN A MARKED SHARED LANE IS NOT APPROPRIATE:	
Shared lane marking in bike lane (bike lanes have their own different markings)	
Roadways where the speed limit is above 35 mph	
Source: AASHTO; <i>Guide for the Development of Bicycle Facilities</i> , 2012	

The Evansville MPO has created a set of sharrow placement guidelines that can be referred to when determining the marking placement (see Appendix B).



Marked Shared Lane;
downtown Henderson



Marked Shared Lane;
downtown Evansville

BIKE LANE

Bike lanes are designated spaces on each side of the street reserved for bicycle use. Bicyclists can have an increased level of confidence with a designated bike lane as opposed to a signed shared route, as it clearly marks where the vehicle lane and bicycle lane are in relation to one another. With a bike lane, motorists are less likely to infringe on the bicyclists' space and more likely to stay in their lane without swerving left into oncoming traffic.

CONSIDERATIONS

1. The road or street should be assessed to determine if a bike lane is the safest way to accommodate a bike facility.
2. There should be adequate space for at least the minimum width of a bike lane to be constructed.
3. Bike lanes should be kept free of road debris.
4. The “door zone” should be considered – bike lanes (or the on-street parking lane) should be wide enough so that a vehicle's open door will not interfere with a bicyclist in the bike lane.
5. Consider the end of a bike lane's location and try to avoid leaving the bicyclist in a vulnerable situation.
6. Analyze the area to determine if special signs or markings are needed, such as a high-volume of bicyclists making left turns on a busy roadway.



GUIDELINES

1. A six (6) inch solid white line should be used to separate bike lanes from on-street parking lanes.
2. When measuring the width of the usable surface of a bike lane, the gutter should not be included.
3. Bike lanes should never be placed between the on-street parking lane and the curb.
4. Drain inlets and utility covers should be placed in a way that will not interfere with bicyclists path.
5. Raised pavement markings, raised curbs and other raised devices can cause complications for bicyclists.

	MINIMUM LANE WIDTH	PREFERRED LANE WIDTH
With on-street parallel parking	5 ft.	6 ft.
With on-street parallel parking (with high vehicle turnover)	6 ft.	7 ft.
Shared bicycle and parking lane (on-street parallel parking exists but line markings do not)	12 ft.	13 ft.
High bicycle usage and no on-street parking	6 ft.	8 ft.
Source: AASHTO; Guide for the Development of Bicycle Facilities, 2012		

PAVED SHOULDERS

Paved, wide shoulders can greatly expand the bikeway network within a community, especially on rural roadways. Paved shoulders are typically intended to provide a temporary space for vehicles that have broken down or stalled and are not considered an actual travel lane for users, whereas a dedicated bike lane is considered a travel lane for cyclists. One major difference between a bike lane and a paved shoulder is the bicyclists approach at an intersection. Bike lanes are typically to the left of right-turn lanes because they are intended to serve through movements for bicyclists. Paved shoulders are typically on the right side of a turn lane.

CONSIDERATIONS

1. A good bicycle facility option on a corridor that cannot accommodate bike lanes.
2. Adequate space should be provided by taking into account the amount of bicycle usage, motor vehicle speeds, percentage of truck and bus traffic, etc.
3. If rumble strips are present, provide enough space for bicyclists away from the rumble strips.
4. Shoulder will have to be kept free of debris.

GUIDELINES

1. It is recommended that wide paved shoulders are included on both sides of a two-way road.
2. In some cases, a wide shoulder on one side of the roadway will be more efficient than providing narrow shoulders on both sides of the roadway, for example:
 - a. On an uphill roadway section to provide slow-moving cyclists additional space (in turn reducing conflicts with faster moving vehicle traffic).
 - b. On roadways with vertical or horizontal curves that limit sight distance, wide shoulders can be helpful to cyclists over the crest of a hill, and on the downgrade of a vertical curve, and on the inside of a horizontal curve.

ROADWAY SITUATION	PAVED SHOULDER MINIMUMS
Uncurbed sections with no vertical obstructions (utility poles, etc.)	4 ft.
From face of guardrail, curb, or other roadside barrier to provide additional operating width	5 ft.
If higher bicycle usage is expected	Can be wider than 5 ft.
If motor vehicle speeds exceed 50 mph	Greater width than 5 ft. is desired
Source: <i>Guide for the Development of Bicycle Facilities</i> , 1999	

WIDE CURB LANES

A wide curb lane is the outside lane that is nearest to the curb and is wider than a standard lane, providing extra space for a bicyclist and motorist to travel together. A wide curb lane can be included on two-lane or multi-lane roads, and are sometimes designated when right-of-way constraints prevent the installation of full dedicated bike lanes. A wide curb lane can be constructed when a roadway is restriped, resurfaced, or if other lanes are narrowed to create more space in the curb lane.

CONSIDERATIONS

1. Ensure proper width is provided, especially where drainage grates or gutters reduce the usable lane width.
2. Consider using “SHARE THE ROAD” signage if placed on a heavily traveled roadway.
3. Consider using sharrow markings to help guide bicyclists in their proper location, and also to alert motorists that bicyclists may be present.
4. Truck traffic should not exceed five (5) percent of the total motor vehicle traffic.
5. A road that does not have a curb can have this same type of lane configuration, but is typically referred to as a wide outside lane.

GUIDELINES

	DESIRABLE WIDTH
Not including the gutter pan area	14 ft.
If drainage grates, raised reflectors, or on-street parking reduce the usable lane width	15 ft.
Source: FHWA; BIKESAFE: Bicycle Countermeasure Selection System, 2006	

ROAD DIETS



Lincoln Avenue before;
Evansville

A road diet can be achieved by reconfiguring travel lanes on roadways with enough right-of-way so that bicyclists and/or pedestrians can be accommodated. Roadway retrofits can be most effective if completed during a repaving or reconstruction project, as this eliminates hints of old lane markings. Three ways a road diet can be achieved are:

- ① Reduce or reallocate the travel lane widths.
- ② Reduce the number of travel lanes.
- ③ Reconfigure or reduce on-street parking.

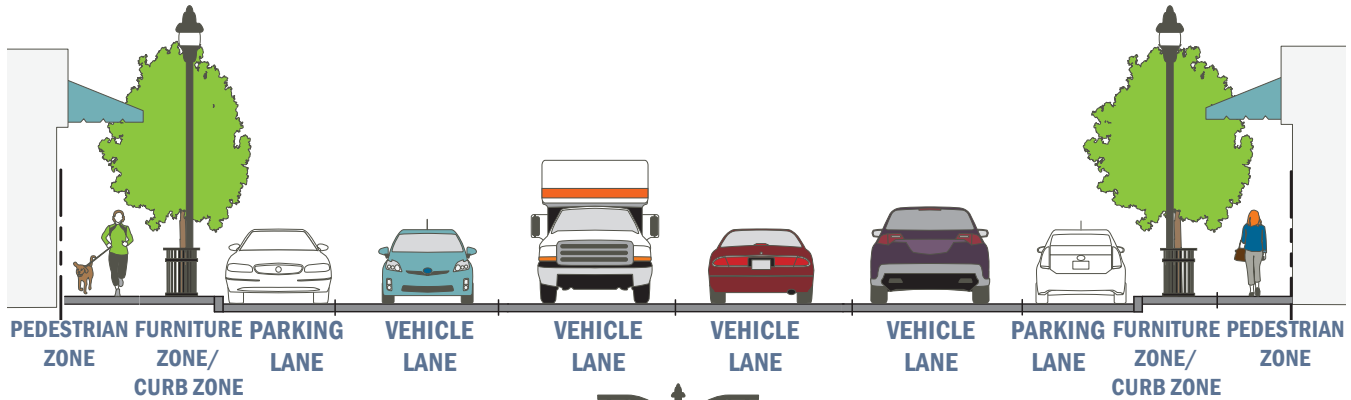
Travel lane width, in most cases, can be reduced without creating a significant change in the level of service for motorists. However in some cases, travel lanes can be reduced to a width of 10 feet. Before a lane is reduced to this width, the operating speeds, vehicle volumes, traffic mix, on-street parking, and surrounding context should be taken into consideration to ensure optimum safety to all users.



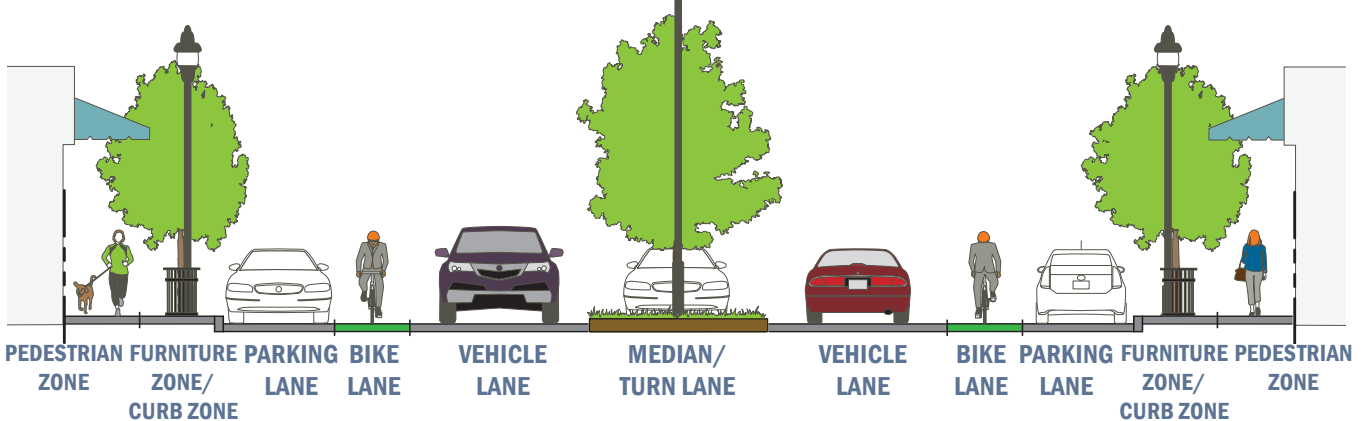
Lincoln Avenue after;
Evansville

COMPLETING THE STREET: A COMPLETE STREETS TOOLKIT

BEFORE



AFTER



Source: atpolicy.org; Complete Streets, Complete Networks

Most road diets consist of reducing the number of travel lanes, typically from a four-lane road (two lanes traveling each way) to a three-lane road (one lane traveling each way with a center turn lane). Not only can a road diet allow room for bicyclists, it can also improve safety for motorists. Benefits of a road diet can include:

1. Bike lanes or shoulders can be designed in the additional space gained by removing a travel lane.
2. Crash severity may be reduced by the top-end travel speeds being moderated by those following the posted speed.
3. Pedestrian crossings may be enhanced by the inclusion of a pedestrian island in the center turn lane at major intersections and crossings.
4. Reducing travel lanes from four (4) lanes to three (3) lanes greatly removes the likelihood of “multiple threat” crashes for pedestrians and left-turning motorists and bicyclists – when a motorist in one lane stops to yield, but the driver in the adjacent lane continues.
5. Center left-turn lanes provide a place for motorists and bicyclists to wait when making a left turn while through-traffic continues on – this reduces left-turn and rear-end crashes.

6. Sideswipe crashes are reduced as motorists no longer need to pass a left-turning vehicle.
7. Road noise is reduced from reduced speeds.
8. Pedestrians, residents and businesses are more separated from traffic.

GUIDELINES

When a roadway is being retrofitted with reconfigured lanes to accommodate space for bicycle facilities, the width guidelines for bike lanes and paved shoulders should be applied. However, there may be a situation where undesignated paved shoulders will be present and can improve the conditions for bicyclists on constrained roadways where obtaining the preferred shoulder width is not practical. It is generally preferred to provide a paved shoulder that is between three (3) and four (4) feet rather than a narrower shoulder. For example, if an outside lane is 14 feet, it is preferred that a 10 to 11 foot travel lane and a three (3) to four (4) foot paved shoulder for bicyclists over a 12 foot travel lane with a two (2) foot shoulder that would provide limited space for bicyclists.

	MINIMUM WIDTH FOR BICYCLE OPERATION
If curb and gutter is used	3 ft.
If no curb is present, or curb is used without a gutter	4 ft.
Source: AASHTO; <i>Guide for the Development of Bicycle Facilities</i> , Fourth Edition; 2012	

PAGE INTENTIONALLY LEFT BLANK

STREET CROSSINGS, SIGNALS AND SIGNAGE

Walking is the most common form of transportation, and no matter the primary mode of transportation used, walking is always included within the trip. Vehicle users have to walk from parking lots to work or to stores for shopping and transit riders have to walk to and from the bus stops and to their destinations once they have arrived. Having proper street markings, crossings, signals and signage is important for all users. It is especially important that these elements are visible to users, particularly motorists.

MARKED CROSSWALKS

A marked crosswalk designates a preferred pedestrian right-of-way across a street. It is often installed at controlled intersections or at key locations along the street (i.e. mid-block crossings). Marked crosswalks serve two purposes: to inform motorists of the location of a pedestrian crossing so that they have time to lawfully yield to a crossing pedestrian, and to assure the pedestrian that a legal crosswalk exists at a particular location. Indiana state law permits crossing at all intersections, even if no crosswalk is marked, unless crossing is expressly prohibited.

Typically, marked pedestrian crosswalks are used under one of the following conditions:

- ① At locations with stop signs or traffic signals,
- ② At non-signalized street locations in designated school zones, and
- ③ At non-signalized locations where engineering judgment dictates that the use of specifically designated crosswalks are desirable.

A study should be completed prior to placing crosswalks to determine the need and type of crosswalk.

CONSIDERATIONS

- 1. Crosswalk locations should be convenient for pedestrian users.
- 2. Crosswalk markings alone are unlikely to promote a safe environment for pedestrians; other measures, such as curb extensions, should be used in conjunction with crosswalks.
- 3. Marked crosswalks are important for pedestrians with vision loss.
- 4. For wheelchair access, crosswalk markings must be placed to include the ramp so that a wheelchair does not have to leave the crosswalk to access the ramp.
- 5. Median islands should be considered if the crosswalk will span across a wide street with many lanes.
- 6. Crosswalks should not be placed too close together.

GUIDELINES

Marked crosswalks should be a minimum of six (6) feet wide. In business districts and other locations of high pedestrian traffic, a width of 10 feet or greater should be considered. An engineering study may need to be performed to determine the appropriate design of a crosswalk on a multi-lane, high-speed roadway or a mid-block crossing (when applicable).

If multiple crosswalks are to be placed within close proximity to one another, it is recommended that a higher priority be placed on the crosswalk location that would serve a minimum of 20 pedestrians per peak hour.

Marked crosswalks should be supplemented with other treatments whenever any of the following conditions exist:

- 1. Where the speed limit exceeds 40 mph.
- 2. On a roadway with four (4) or more lanes without a raised median or crossing island that has (or is projected to have) an ADT of 12,000 or greater.
- 3. On a roadway with four (4) or more lanes with a raised median crossing island that has (or is projected to have) an ADT of 15,000 or greater.

	WIDTH
Preferred minimum	6 ft.
High pedestrian traffic areas; business districts	10 + ft.

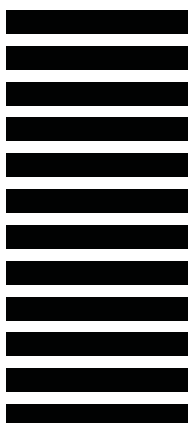
Source: FHWA; PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System, 2004

TYPES OF MARKED CROSSWALKS

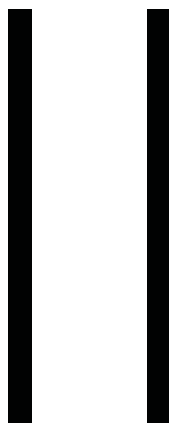
- ① Transverse – solid lines not less than six (6) inches and not greater than two (2) feet wide; the gap between the lines should not be less than six (6) feet wide
- ② Longitudinal (Continental) – should be one to two (1-2) feet wide and spaced one to five (1-5) feet apart so the markings will avoid wheel paths; should not be less than six (6) feet wide if used without transverse markings. Longitudinal markings are typically used to increase visibility to motorists and can be used in school zones or areas where there is a substantial pedestrian presence.

- ③ **Diagonal (Zebra)** – diagonal line markings should also be placed to avoid wheel paths and should not exceed 2.5 times the line width. Like longitudinal markings, diagonal markings are typically used to increase visibility to motorists and can be used in school zones or areas where there is a substantial pedestrian presence.
- ④ **Pavement treatment** – Colored and textured crosswalks can be used to improve aesthetics. It is important that these treatments are smooth, nonslip and visible. Paving systems that could shift and/or settle can create difficulties for wheelchair users and should be avoided.

**LONGITUDINAL
(CONTINENTAL)**



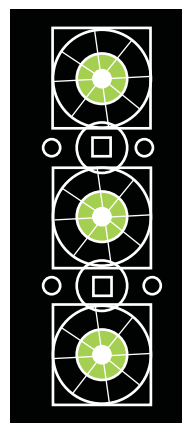
**TRANSVERSE
(STANDARD)**



**DIAGONAL
(ZEBRA)**



STAMPED PAVEMENT



RAISED CROSSWALK

A raised crosswalk (sometimes referred to as a speed table) is a crosswalk that is elevated above street level. Construction involves providing ramps on each vehicle approach, which elevates the entire intersection to the level of the sidewalk to provide a continuous route for the pedestrian. Raised crosswalks reduce vehicle speeds while enhancing the pedestrian environment at the crossing. The raised crosswalk also encourages motorists to yield to a pedestrian more than just the typical “yield” signs.

CONSIDERATIONS

1. Especially effective in areas with a high volume of pedestrian traffic or mid-block crossings.
2. Typical on two-lane streets with a speed limit of less than 35 miles per hour.
3. Detectable warning strips must be used at edges to assist pedestrians with vision impairments to detect the crossing.
4. Should not be used on a sharp curve or a steeply graded slope.
5. May not be appropriate if the street is a bus route or an emergency route.

GUIDELINES

The width of a raised crosswalk is typically 10 to 15 feet wide (the flat, raised portion of the crosswalk). However, this will vary by each crosswalk and will be dependent upon the height of existing sidewalks.

RAISED MEDIANS

Medians are raised barriers in the center of the street that serves as a place of refuge for crossing pedestrians. A median also allows for less interaction between cars and bicycles by separating opposite-traveling traffic. From a visual standpoint, medians can provide space for trees and landscaping to help improve the character of the street. A center turn lane can be converted into a median, where appropriate, to increase motorist's safety by providing left-turning pockets and eliminating a continuous center lane.

While a center median has benefits, it is important to ensure that there is adequate space for wider sidewalks, bike lanes and planting strips before construction of a median.

CONSIDERATIONS

1. Landscaping within the median should not hinder visibility between motorist and pedestrian.
2. If a median is constructed at a mid-block or intersection crossing, it must be fully accessible by either ramps or cut-throughs and include detectable warnings.
3. An intermittent median, rather than a continuous median, is often the most logical choice if the median will stretch a great distance. Breaking the median up to provide left-turn lanes or pedestrian crossings/islands can increase safety by creating obstacles for motorists and encouraging a reduced speed.
4. Medians can be most useful on high-volume, high-speed roads to reduce traffic speeds and can help provide a safe environment for pedestrians/non-motorized vehicle users.



Raised crosswalk;
University of Southern Indiana campus



Landscaped median;
Henderson



Landscaped median;
Evansville

GUIDELINES

Because a median's dimension will vary depending on surrounding treatments, i.e. travel lane width, bike lanes, sidewalks or planting strips, no set guidelines for a median will be provided. The design of a median should be determined on a project by project basis, and if a pedestrian refuge island is to be included, should adhere to the pedestrian island guidelines.

ADVANCED STOP BARS

Advanced stop bars can be used at pedestrian crossings to show motorists where to stop in relation to the marked crossing, allowing for pedestrians and drivers to have a clearer view of one another. This also permits a pedestrian to advance into a crosswalk before a motorist turns.

CONSIDERATIONS

1. Placing advanced stop bars slightly farther back from the crosswalk can increase safety and improve visibility of pedestrians.
2. However, motorists could potentially ignore the stop bar if it is placed too far in advance of the crosswalk.
3. Placing signs such as "Stop Here For Pedestrian" signs have been proven to help reduce motorist/pedestrian accidents.



Advanced stop bar; downtown Newburgh



Advanced stop bar; downtown Henderson

PEDESTRIAN ISLANDS

Pedestrian islands are a dedicated space in the center of the street at a crosswalk crossing at an intersection or mid-block crossing and help protect pedestrians from vehicle traffic. The islands can provide a place for users to wait in the middle of opposite-traveling traffic, meaning pedestrians only have to focus on crossing one side of the street at one time.

CONSIDERATIONS

1. Design pedestrian islands to accommodate pedestrians in wheelchairs, including ADA curb ramps and a wide enough space for wheelchairs to maneuver while waiting in the island.
2. Ensure adequate signage is installed to alert motorists of pedestrians that may be present.
3. Skewed crosswalks, or offset crosswalks, can allow pedestrians to have a better angle of sight as they approach and cross each side of the street.

GUIDELINES

The width of the pedestrian island should be determined by the expected volume of pedestrian or bicycle users and the traffic characteristics of the street. An island should be considered where the crossing distance exceeds 60 feet. A pedestrian island can also be used at intersections or mid-block crossings with a shorter crossing distance where a need has been identified. Other streets that could be considered for a pedestrian island include:

1. Two-way arterial streets with high traffic volumes, high travel speeds, and large pedestrian volumes.
2. Wide two-way intersections with high traffic volumes and significant numbers of crossing pedestrians.
3. Two-way collector and local access streets where they function as traffic calming devices and street crossing aids.
4. Complex or irregularly shaped intersections where islands could provide a pedestrian with the opportunity to rest and become oriented to the flow of oncoming traffic.



Pedestrian island; downtown Evansville



Pedestrian island; Henderson

	NEW CONSTRUCTION	EXISTING CONDITIONS	OTHER
Width of island	6 ft. or more	4 ft. can work, but should be widened in reconstruction projects to be at least 6 ft. wide*	Could be 8 ft. or more when practical, if a large amount of pedestrian/wheelchair/bicycle traffic is expected
*Travel lanes can be decreased to 11 feet, and sometimes 10 feet (depending on location) to provide adequate space for a crossing island. (Considerations such as traffic volume, vehicle mix, speed and the presence of bicyclists should be taken into account before narrowing travel lanes.) The width of the crosswalk, and therefore the island, can be widened to accommodate users if narrowing the travel lane is not practical.			
Source: AASHTO; Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004			

MID-BLOCK CROSSINGS

Mid-block crossings can help increase pedestrian crossing needs and safety, particularly in areas where intersections are spaced relatively far apart or where a substantial amount of pedestrian generators (commercial uses, residential uses, neighborhoods, parks and recreation areas, schools, etc.) are located. Mid-block crossings can be considered as a way to prevent the pedestrian from making excessive or inconvenient alterations to their travel path to cross at an intersection crossing. However, motorists generally do not expect a crossing to be placed mid-block. Mid-block crossings should only be used where there is a major need for it, and should be well signed and lighted. Mid-block crossings could be most effective where:

1. There is already a substantial volume of people crossing mid-block.
2. New development is predicted to generate the need for mid-block crossings.
3. There are surrounding land uses that encourage people to naturally cross at mid-block instead of back-tracking to cross at an intersection.
4. The safety and capacity of adjacent intersections or large turning volumes create a situation where it is difficult for a pedestrian to cross the street.
5. Spacing between adjacent intersections is greater than 660 feet.
6. The vehicular capacity of the roadway would not be effected by installing a mid-block crossing.
7. Adequate sight distance is available for both pedestrians and motorists.

It is important that mid-block crossings be identifiable to pedestrians with vision impairments. If a signal is present, a locator tone at the crossing button may be sufficient. A tactile strip across the sidewalk that leads to the crosswalk can be used to alert pedestrians of the mid-block crossing.

COMPLETING THE STREET: A COMPLETE STREETS TOOLKIT

CONSIDERATIONS

1. When deciding if a mid-block crosswalk is suitable, several factors should be considered including:
 - a. Pedestrian volume,
 - b. Traffic volume,
 - c. Roadway width,
 - d. Traffic speed and type,
 - e. Desired paths for pedestrians, and
 - f. Adjacent land uses.
2. Should not be installed within 300 feet from another signalized crossing point.
3. Should not be installed where sight distance or sight lines are limited for either the motorist or pedestrian.
4. Crosswalks alone should not be installed – appropriate signage and/or lighting should also be installed.
5. Should not be installed, in most cases, in an uncontrolled environment where vehicle speeds are higher than 40 mph.

GUIDELINES

Mid-block crossings should be considered when adjacent intersection crossings are greater than 660 feet apart, if the length of the crossing is greater than 60 feet, or there is a limited amount of gaps in traffic. A pedestrian island should not be installed within 300 feet of another signalized crossing.



Midblock crossing; downtown Henderson



Midblock crossing; University of Evansville campus

SIGNALS

Traffic signals assign the right-of-way to motorists and pedestrians and produce openings in traffic flow, allowing pedestrians time to cross the street. When used in conjunction with pedestrian-friendly design, proper signalization should allow for an adequate amount of time for an individual to cross the street. For the purpose of timing traffic signals, the typical pedestrian walking speed is 3.5 feet per second (according to the MUTCD). However, a longer crossing time may be necessary to accommodate the walking speed of the elderly or children.

Engineering, as well as urban design judgment, should be used when determining the location of traffic signals and the accompanying timing intervals. Although warrants for pedestrian signal timing have been produced by the MUTCD, each site must be analyzed to determine if these standards are sufficient for the location. If the signal is located at a crossing that leads to a popular park or a shopping center, pedestrian usage may be higher, resulting in a longer crossing signal.

Refer to the MUTCD for detailed information and guidelines regarding pedestrian symbol types.

	MINIMUM HEIGHT ABOVE SIDEWALK	MAXIMUM HEIGHT ABOVE SIDEWALK
Bottom of the signal housing (including brackets)	7 ft.	10 ft.
	CROSSWALK WIDTH LESS THAN 100 FT.	CROSSWALK WIDTH MORE THAN 100 FT.
Height of walking symbol	Symbols should be at least 6 in. high	Symbols should be at least 9 in. high

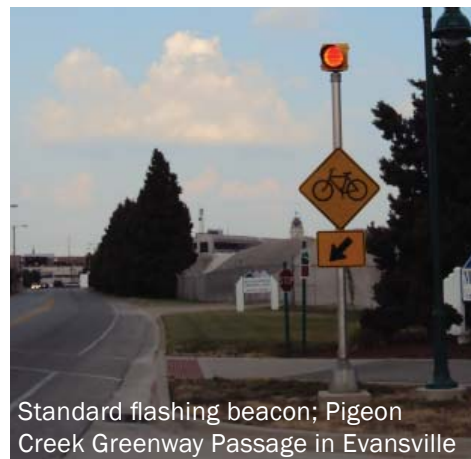
Source: AASHTO; *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, 2004

MID-BLOCK CROSSING TREATMENT: RECTANGULAR-SHAPED RAPID FLASHING WITH LED CROSSWALK BEACON (ENHANCER) DEVICE

Installing yellow LED beacons that have a stutter flash pattern (similar to emergency vehicle lights) can help increase yielding rates on multi-lane roads. In addition to crosswalks, these lights can be used at stop-controlled intersections or mid-block crossings. Studies across the country have shown that no other flashing beacon has obtained and sustained the high rate of motorist yielding compliance as this device. Currently, there are no rectangular-shaped rapid flashing devices installed in the MPO planning area. There are, however, standard flashing beacons installed at pedestrian crossings throughout the planning area.



Standard flashing overhead beacons;
University of Evansville campus



Standard flashing beacon; Pigeon
Creek Greenway Passage in Evansville

INTERNATIONAL PEDESTRIAN SIGNALS

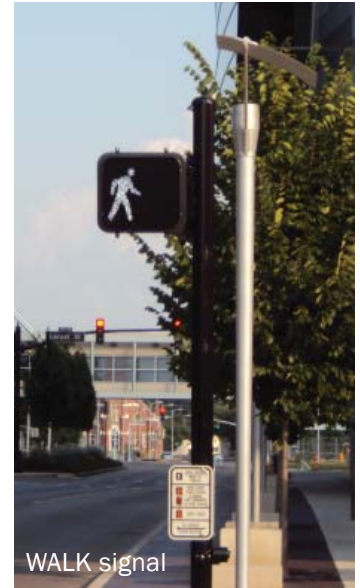
An international pedestrian signal indication should be used at traffic signals whenever warranted. These signals feature a WALKING PERSON (symbolizing WALK) and an UPRaised HAND (signaling DON'T WALK). These signals are replacing the commonly used WALK and DON'T WALK signals, and are now required in the MUTCD. Symbols should be of adequate size and clearly visible to make crossing safe for all pedestrians.

CONSIDERATIONS

1. Ensure that signals are visible to pedestrians.
2. Provide a walk interval for every cycle if possible.
3. Ensure pedestrian push-buttons are well positioned and within easy reach for all approaching pedestrians.



DO NOT WALK signal



WALK signal

COUNTDOWN SIGNALS

Countdown signals are pedestrian signals that display an interval countdown to inform users of the number of seconds remaining in the pedestrian change interval. The countdown signal is to be placed directly adjacent to the UPRaised HAND (symbolizing DON'T WALK). The countdown numbers are only displayed while pedestrians have the signal. When the UPRaised HAND is shown, the countdown portion of the signal is to remain black.

CONSIDERATIONS

1. Pedestrian signals need to indicate the crossing interval by visual, audible, and/or tactile means to accommodate pedestrians with vision impairments.



Crosswalk signal explanation

PEDESTRIAN SIGNAL TIMINGS

The timing of these or other pedestrian signals needs to be adapted to a given situation. There are three types of signal timing generally used: concurrent, exclusive, and leading pedestrian interval (LPI).



Countdown signal

CONCURRENT SIGNAL TIMING

Concurrent signal timing refers to a situation where motorists traveling parallel to the crosswalk are allowed to turn into and through the crosswalk, left or right, after yielding to pedestrians. This condition is not considered as safe as some of the latter options, however, this type of signal crossing generally allows for more pedestrian crossing opportunities and less wait time. In addition, traffic is allowed to flow a bit more freely. Concurrent signal timing is best used where lower volume turning movements exist.

Where there are high-volume turning situations that conflict with pedestrian movements, the exclusive pedestrian interval is the preferred solution. The exclusive pedestrian interval stops traffic in all directions. In order to keep traffic flowing regularly, there is often a greater pedestrian wait time associated with this system.

LEADING PEDESTRIAN INDICATOR (LPI)

A leading pedestrian indicator (LPI) works in conjunction with a concurrent signal timing system and simply gives the pedestrian a few seconds head start. An advance walk signal is received prior to a green light for motorists. This creates a situation where the pedestrian can better see traffic, and more importantly, the motorists can see and properly yield to pedestrians. As with the exclusive pedestrian interval, an audible cue will need to accompany the WALK signal for visually impaired users.

CONSIDERATIONS

1. An exclusive phase usually creates a longer cycle length and a longer wait between crossings, and may prevent synchronizing the timing of adjacent traffic signals.
2. Exclusive phasing is more applicable to areas where a high pedestrian volume is present (typically more than 1,200 pedestrians per day), where there are higher conflicts with turning vehicles, or where there are high speed turns that would affect a crossing pedestrian.
3. The benefits of this treatment may not extend to vision impaired users.
4. Wider intersections require longer cycle lengths.

Infrared or microwave pedestrian detectors replace the traditional pushbutton system. Although still experimental, they appear to be improving pedestrian signal compliance, as well as reducing the number of pedestrian and vehicle conflicts. Perhaps the best use of these devices is when they are employed to extend crossing time for slower moving pedestrians. Whether these devices are used or the traditional pushbutton system is employed, it is best to provide instant feedback to pedestrians regarding the length of their wait. This is thought to increase and improve pedestrian signal compliance.

Passive pedestrian detection equipment is becoming more common, and can be recommended in high-volume locations where many pedestrians are crossing a five-lane (or greater) street cross-section.

SIGNAGE

Signage, if used appropriately, can be an effective tool in communicating important information to roadway users.

CONSIDERATIONS

1. Signs should include consistent and descriptive graphics that identify pedestrian routes.
2. Overuse of signs could lead to clutter and may cause roadway users to become non-compliant and ignore the sign messages.
3. Signs should be checked periodically to ensure adequate nighttime reflectivity meets MUTCD standards.
4. Refer to the MUTCD when planning school zone improvements. Additional guidance is available for school crossing treatments and needed signage.

GUIDELINES

Signs should be placed on an as-needed basis. The MUTCD provides sign regulations and guidance. The Evansville MPO is also available to provide assistance in determining appropriate signs and locations.

WAYFINDING

Wayfinding signage communicates directions and distances of attractions or destinations in a clear, concise, and functional manner. The signs should enhance pedestrian circulation and increase the comfort of visitors and residents traveling by foot. Wayfinding signage should be designed in a way that will contribute to and enhance the streetscape, and can include destination points, mileage, directions, maps and other nearby amenities and information.



School crossing sign; Evansville



Bike route wayfinding signage; Evansville



Downtown information and map; Henderson



Wayfinding signage to downtown attractions; Evansville

WARNING

Warning signs are used to alert motorists or pedestrians of upcoming potential situations. Advance pedestrian warning signs should be placed where there is a pedestrian crossing that a motorist would not expect. Regulatory signs (STOP, YIELD, or turn restrictions) provide information that can be enforced; warning signs tend to provide helpful information to motorists and pedestrians that may be in an unfamiliar place. Warning signs can include pedestrian warning signs, motorist warning signs, NO TURN ON RED signs and guide signs.



Pedestrian crossing warning sign; University of Southern Indiana campus



Separated path warning sign; Newburgh's Rivertown Trail

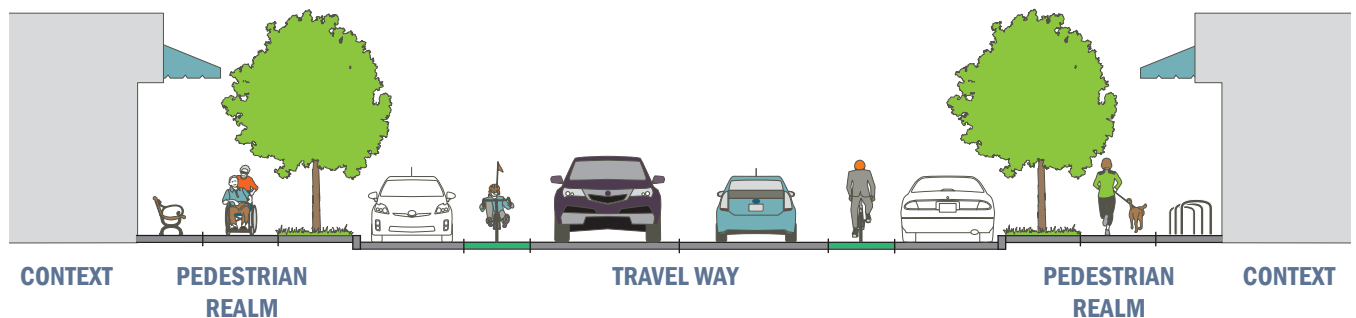
PAGE INTENTIONALLY LEFT BLANK

5

STREETSCAPE DESIGN

Streets can be broken down into different walking areas, or zones. These zones can vary depending on the location, surrounding land uses, and functionality of the street. Each zone has a specific, important function, and leaving out a zone could have a negative impact on the walking experience and overall aesthetics of the street.

Sidewalks in a residential neighborhood should always be considered. Typically, a well-designed residential sidewalk has a minimum five (5) foot unobstructed width that will allow for two pedestrians to walk side-by-side with ease. If possible, a separation between the street and sidewalk, such as a planting strip for street trees, should be provided as well. If room allows, a six (6) to eight (8) foot separation is preferable, but can be smaller.



Source: atpolicy.org; Complete Streets, Complete Networks

CURB ZONE

RESIDENTIAL

The curb zone of a residential neighborhood can vary between one (1) and two (2) feet. This area includes the space between the sidewalk and the vehicle way, and usually includes drain inlets. A curb zone does not exist if there is open drainage, however, if there is drainage, the shoulder is often considered part of the curb zone.

COMMERCIAL

The curb zone in a commercial area can vary between one (1) and two (2) feet.



Curb Zone (between the “sharrow” marking and yellow curb; downtown Henderson

FURNITURE ZONE

RESIDENTIAL

The furniture zone is the area between the sidewalk and the curb or vehicle way. This zone provides a separation between pedestrians and motorists. For a residential area, this is typically a planting strip that can include trees, grass, or landscaping. Most street trees require six (6) feet minimum around the trunk in order to grow properly. Utility poles and other structures, such as speed limit signs or crosswalk signs, can be located within the furniture zone to ensure the pedestrian zone is kept free of clutter.



Residential Furniture Zone; downtown Henderson

COMMERCIAL

In a commercial area, the furniture zone is often an extension of the sidewalk or pathway. Unlike the furniture zone in the residential area that is typically some form of landscaping, in a commercial area, the furniture zone is typically pavement of some sort. Objects such as benches, trash cans, street lights, planters, informational signs, and bike parking should be placed in the furniture zone of a commercial area.



Commercial Furniture Zone; downtown Newburgh



Commercial Furniture Zone; downtown Newburgh

PEDESTRIAN ZONE

RESIDENTIAL

The pedestrian zone is the sidewalk or pathway area for pedestrians. This zone is typically five (5) to six (6) feet wide in a residential area.

COMMERCIAL

The pedestrian zone in a commercial area should be slightly wider than a pedestrian zone in a residential area. The sidewalk or pathway in a commercial area should be between eight (8) and 10 feet of unobstructed walking space.



Residential Pedestrian Zone; downtown Evansville

PLANTING STRIPS

Continuous zones of landscape, located between the sidewalk and the street curb or edge of the road pavement, enhances the aesthetics of a street while providing a safety buffer for pedestrians. Planting strips contribute to the walkability of a street by providing space for shade trees. These trees and other plantings can also help reduce urban temperatures, improve water quality, and lower stormwater management costs while making the street a more attractive place.

A planting strip also creates a separation from motorized traffic that decreases road noise while increasing the pedestrian's sense of security and comfort. Added benefits of this separation include space for signage, utilities, and vegetation.



Commercial Pedestrian Zone; downtown Henderson

STREET TREES

Trees and other plantings are important elements along any sidewalk. Too many times, trees are planted in constricted, unhealthy locations that limit their ability to grow properly. Street trees must have adequate uncompacted soil, water, and air to thrive. The location of utilities, both elevated and underground, should be taken into consideration when planting street trees and other landscaping.

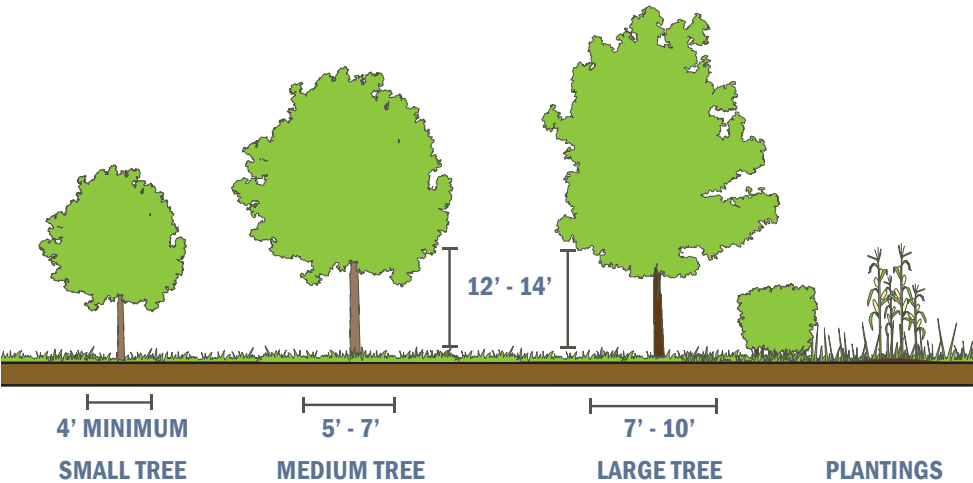
Before a street tree is selected, the climate, roadway conditions, and land use context should be determined because it is important to ensure trees receive the proper light and water, and that there is enough room for the canopy and roots to expand. In general, it is best to select native, hardwood trees that are resilient to inclement weather.

CONSIDERATIONS

- 1. Seek and reclaim space for trees. A surprising number of residual spaces suitable for planting can be found on streets between areas required for travel lanes and parking, such as traffic circles, medians, channelization islands, and curb extensions.
- 2. Select the right tree for the space. Consider what canopy and height the tree will grow into during its lifetime. A tree that is full-grown should not interfere with overhead electrical transmission lines or hang over potentially sensitive structures. In commercial areas that use façade-mounted signs, tree species with the lowest branch of 12 to 14 feet above the ground are recommended. Trees with non-aggressive root systems should be used to avoid damaging sidewalks.
- 3. Ensure trees have adequate space for growing branches and underground root extension. For optimum growth, a typical medium sized street tree requires a clear sidewalk furniture zone at least six (6) to seven (7) feet wide, with uncompacted soil that is at least three (3) feet deep.

GUIDELINES

- 1. Small trees can be planted in planters or tree wells, and can survive in a commercial area sidewalk with a tree grate. Small trees can include Dogwood, Prunus, Service Berry, Crabapple, and Fir.
- 2. Medium trees can be planted in large planters, as well as in residential lawns lining the sidewalks. Medium trees can include Maple, Cherry, Honey Locust, and White Pine.
- 3. Large trees generally require to be planted in a lawn. Wide frontage zones and landscaped medians are ideal locations for large trees. Large trees can include Sycamore, Elm, Chestnut, Red Oak, and Beech.
- 4. Plantings, such as native grasses and other plants, can help to protect and restore soil conditions in urban settings. Native plants typically have a long root system that is able to assist in processing stormwater on site. Groundcover options can include Bluegrass, Sedum, and Periwinkle.



Source: atpolicy.org; Complete Streets, Complete Networks

	PLANTING AREA MINIMUM WIDTH
Small Tree	4 ft.
Medium Tree	5 ft. - 7 ft.
Large Tree	7 ft. - 10 ft.

Source: atpolicy.org; Complete Streets, Complete Networks

LIGHTING

Proper lighting – quality, placement and sufficiency – can enhance any streetscape, and most importantly, increase safety for pedestrians and bicyclists. Without proper lighting, it is very likely that a motorist will not see pedestrians and bicyclists until it is too late to stop. Lighting can also bring more character to an area by creating an inviting atmosphere with pedestrian-scale street lighting or lighting within landscaped areas or trees.

CONSIDERATIONS

1. Ensure that pedestrian walkways and crosswalks are well lit.
2. It is common practice to install lighting on both sides of streets and in commercial areas.
3. Consider the surrounding architecture and character of the area to ensure the new lighting fixtures will enhance the area.

GUIDELINES

1. Historically accurate or complementary street light poles and fixtures should be used where appropriate.
2. Streetlights should be placed on both sides of arterial or wide streets.
3. Provide a consistent level of lighting along the roadway by spacing street lights evenly.
4. Pedestrian crosswalks and approaches to the crosswalks may be lit with additional or brighter lighting for added awareness at night.
5. Provide specialty pedestrian-level lighting along sidewalks to help create a safe and comfortable environment for the pedestrian.
 - a. Mercury vapor or incandescent are the preferred pedestrian-level lights (low-pressure sodium lights can create color distortion, therefore are undesirable).
6. Cobra head lights and fixtures that send light into the atmosphere should be avoided if at all possible.

	STYLE OPTIONS	DIMENSIONS	SPACING	DESIGN CONSIDERATIONS	CONTEXT
Pedestrian Scale	Straight Pole	12 ft. - 17 ft. high	20 ft. - 40 ft.	Lamps - acorn, globe, lantern, historic	commercial/mixed use, entertainment districts, park zones, pedestrian priority areas, some residential neighborhoods
	Arm	4 ft. long	20 ft. - 40 ft.	width of sidewalk	
	Dual Arm	8 ft. long	20 ft. - 40 ft.	presence of bikeway or on-street parking	

(CONT.)

	STYLE OPTIONS	DIMENSIONS	SPACING	DESIGN CONSIDERATIONS	CONTEXT
Vehicle Scale	Pole	27 ft. - 30 ft. high	40 ft. - 80 ft.	Lamps - shoe box, historic	commercial, mixed-use
	Arm	4 ft. - 8 ft. long	40 ft. - 80 ft.	Lamps - historic, cobra. Width of arm length for travel way	commercial areas, residential areas
	Dual Arm	8 ft. - 16 ft. long	40 ft. - 80 ft.	Median: width of travel way for arm length	
Other lighting types (in-pavement lighting, catenary)	Varies	Varies	Varies	Depends on location	entertainment districts, pedestrian priority areas, park zones

Source: atpolicy.org; Complete Streets, Complete Networks

TYPES OF LIGHTING

PEDESTRIAN-SCALE LIGHTING

Pedestrian-scale lighting is essential for creating safe and inviting streets. Typically, conventional street lighting that is primarily designed to light the way for vehicles, does not provide adequate lighting for pedestrians and creates shadows and leaves unlit spaces on the sidewalk. Pedestrian-scale lighting helps pedestrians see tripping hazards in the sidewalk, and also makes pedestrians more noticeable to motorists. This lighting style can also illuminate bikeways near walking areas. Retrofits of existing street lights and new installations should provide lighting on sidewalks and multi-use paths. If pedestrian-scale lighting is used, it should be coordinated with building and property owners to include building-mounted lighting for sidewalks, alleys, paths, and stairways where poles would obstruct the pedestrian zone. While pedestrian-scale lighting is important to the vitality of the street, it is also important to make sure that light does not shine directly through windows of near-by residential units. Types of pedestrian-scale lighting can include acorn, globe, and lantern lamps.



VEHICLE-SCALE LIGHTING

Vehicle-scale lighting is typically needed on major roadways. In smaller-scale streets, pedestrian-scale lighting can provide enough light to illuminate the street. When vehicle-scale lighting is needed, it is best to locate the poles in the furnishing zone so they do not block the pedestrian way or interfere with pedestrian or wheelchair travel.



In-pavement lighting;
Ford Center, downtown Evansville

COMBINATION PEDESTRIAN AND VEHICLE SCALE LIGHTING

In many cases, pedestrian-scale lighting provides adequate lighting to light the pedestrian way. In some contexts, however, a better multi-modal environment can be created by supplementing vehicle-scale lighting with pedestrian-scale lighting. Where feasible, typical streetlights can be retrofitted by hanging a pedestrian-scale lighting arm from the existing pole. The lighting arm, if added, should be between 12 and 17 feet high. Pedestrian-scale lighting can also be installed between existing streetlight poles if the streetlight spacing does not provide enough lighting for pedestrian needs.

IN-PAVEMENT LIGHTING

In-pavement lighting illuminates the streetscape from the bottom up. Installation can include solar-lamp bricks placed in walkways or crossings, or lights placed in the travel way to further delineate bikeways, crosswalks, or vehicle lanes. In-pavement lighting can increase safety in travel ways, but should not replace traditional pavement markings, as they can be difficult to see during the day.



Catenary lighting over outdoor seating at Cafe
Arazu; downtown Newburgh

CATENARY LIGHTING

Catenary lighting is suspended from wires affixed to poles or buildings. This lighting technique can reduce infrastructure costs, such as installation of utility poles or underground conduit. Catenary lighting can be useful in pedestrian priority areas, cultural districts, and other areas designated for placemaking. This type of lighting creates an “outdoor room”, using the lights as the “ceiling”. These lights also reduce the need for light poles that can clutter or obstruct the pedestrian way.

STREET FURNITURE

A well-designed, inviting street is one that provides amenities to its users and enhances the pedestrian environment. Benches, bus shelters, trash cans, and water fountains are elements that will beautify the street, as well as make it more functional and user-friendly. It is very important to remember that sidewalks and walkways should be kept clear of poles, signposts, and other obstacles that could block the path, become a tripping hazard, or block motorist’s abilities to see pedestrians. Street furniture such as benches or seating, bicycle parking racks, and water fountains should be carefully placed within the pedestrian realm to ensure the walking path remains free for walking. It is also important to maintain landscaping and trees to ensure they are not overgrown into the pedestrian space.



Street furniture; downtown Newburgh



Cafe seating; downtown Newburgh



Cafe seating in alleyway; downtown Newburgh

CONSIDERATIONS:

1. Consider quality furniture to show that the community values its public spaces. Higher quality pieces are also more cost-effective in the long run.
2. Ensure the proper placement of furniture – do not block the pedestrian way or curb ramps.
3. Ensure that there is adequate detectability of protruding objects for pedestrians that are blind or visually impaired.

TRANSIT STOPS

To accommodate as many users as possible, a transit system must include well-planned routes and safe, accessible stops. Bus stops should be designed to accommodate the appropriate number of users and should be highly visible to pedestrians and motorists.

Bus or other transit stops should be located in places that are most suitable for passengers. For example, stops should be provided near higher density residential areas, commercial or business areas, and schools, and connected to these areas by sidewalk.

As with any human-scale design element, safety is an important factor to consider when locating bus stops. In the case of a bus stop, special attention should be paid to the number of lanes and direction of traffic when deciding to locate a stop on the near or far side of an intersection. Also, special consideration must be paid to wheelchair lifts in terms of how and where the mobility impaired will exit and enter the bus. It is good practice to construct a transit stop just beyond an intersection, which encourages riders to cross the intersection behind the bus and in full view of approaching motorists. The location also should be set back enough from the roadway to buffer users from traffic without impeding pedestrian activity.

Safety and comfort at a bus stop is determined by the amenities offered to users. Bus stop signage, including route information, shelter with seating, trash cans, and bicycle parking, encourages transit use. Pedestrian-level lighting improves the visibility of pedestrians to motorists and increases the level of safety for users. At a minimum, marked crosswalks (especially at mid-block stops), curb ramps, and proper sidewalk widths should be considered.



METS main transfer terminal; downtown Evansville



HART stop; Henderson



WATS stop; Newburgh

PAGE INTENTIONALLY LEFT BLANK

TRAFFIC CALMING MEASURES

Traffic calming is a type of street design that uses physical measures to encourage people to drive more slowly. Physical and visual cues are created that induce drivers to travel at slower speeds. Traffic calming is self-enforced, meaning the desired effect is the result of the design of the roadway, instead of relying on compliance with traffic control devices. Elements such as landscaping and lighting do not force a change in driver behavior, but they provide visual cues that naturally encourage people to drive more slowly.

There are overall considerations that are applicable to both traffic management and traffic calming, including:

- ① Vehicle speed is more critical than volume in terms of safety and should be addressed first where there are monetary constraints.
- ② Neighborhood involvement is important to successful implementation.
- ③ Traffic calming elements should fit into and enhance the street environment.
- ④ Traffic calming elements should also be predictable and easy to understand for motorists and other users.
- ⑤ Devices should accommodate emergency vehicles.
- ⑥ Traffic calming elements should be adequately signed, marked, and lit to be visible to motorists.
- ⑦ Elements should be spaced appropriately to have the desired effect on speed – too far apart and they will have a limited effect, too close and they will be an unnecessary cost and annoyance.
- ⑧ Elements should accommodate bicyclists and pedestrians with disabilities.

TRAFFIC CIRCLES

Traffic circles are a form of traffic calming that are typically used on local streets. The traffic circle is built in the center of an intersection to create an obstacle that motorists have to maneuver around, causing speeds to be reduced.

CONSIDERATIONS

1. Traffic circles can reduce crashes and the turning angle of a standard intersection.
2. Can reduce vehicle speeds in the immediate vicinity of the circle.
3. Traffic circles can be a more costly solution to traffic calming – can require extensive analysis to determine their effectiveness.
4. If designed improperly, the circle could interfere with pedestrian travel through the intersection.

GUIDELINES

1. If a traffic circle is considered a solution to a local street, an extensive study should be conducted to ensure they will be more effective than a different form of traffic calming



Traffic circle; Beaver Creek, Newburgh



Roundabout; University of Southern Indiana campus

ROUNDABOUTS

A roundabout is similar to a traffic circle, but is typically constructed in larger, busier intersections that experience a high number of angle collisions. Those entering a roundabout must yield to traffic already in the circulatory roadway. Roundabouts help to improve traffic flow efficiencies, reduce speeds at intersections and can create a gateway into an area.

CONSIDERATIONS

1. Roundabouts are appropriate for collector and arterial streets that carry up to 20,000 vehicles per day (traffic capacity analysis should be conducted to study the specific intersection traffic dynamic).
2. Roundabouts require more space than a traffic circle, so adequate street widths and/or right-of way need to be obtained.
3. If designed improperly, a roundabout could create problems for pedestrians and bicyclists. It is important to plan for safe crossings or space for bicyclists when designing a roundabout.
4. Roundabouts are typically not a suitable solution for an intersection of two multi-lane roads.
5. Typically, roundabouts work best where the traffic flows are balanced on all approaches.

GUIDELINES

1. Splitter islands can be used to slow vehicles approaching the roundabout, and can allow pedestrians to cross one direction of travel at a time – much like a pedestrian refuge island.
2. Bike lanes within a roundabout have not been proven to be safe or effective. One solution can involve creating an off-road bicycle path and even though it is inconvenient, it will improve safety for all users.

TYPE OF ROUNDABOUT	RECOMMENDED MAXIMUM ENTRY SPEEDS
Mini-roundabouts	15 mph
Single-lane roundabouts (urban setting)	20 mph
Single-lane roundabouts (rural setting)	25 mph
Source: FHWA; Roundabout: Informational Guide, 2000	

The following table shows differences between a traffic circle and roundabout.

TRAFFIC CIRCLE	ROUNDABOUT
<ul style="list-style-type: none"> • Stop sign, stop signal, or giving priority to entering vehicles • Allow weaving areas to resolve conflicted movement • Some large circles provide straight paths for higher speed • Some large circles permit parking within the circle • Some large circles allow pedestrians on central island 	<ul style="list-style-type: none"> • Entering vehicles yield • Vehicles in the roundabout have priority over the entering vehicle • Use deflection to maintain low speed operation • No parking is allowed • Pedestrians are (usually) prohibited from the central island
Source: FHWA; Roundabout: Informational Guide, 2000	

SPEED HUMPS

Speed humps are raised sections of pavement in a roadway that are designed to slow traffic, primarily in residential areas and near parks and schools. The purpose of a speed hump is similar to that of a speed bump, but a speed hump is wider and has a sloping side taper so they are easy to navigate at slower speeds. The physical impact on passing vehicles is less severe at slower speeds than at higher speeds. Studies indicate that speed humps reduce speeds by approximately six (6) miles per hour.

CONSIDERATIONS

- 1. Typically not appropriate on collector streets or arterials.
- 2. Speed humps should not be used if it is located on a sharp curve or if the street is on a steep grade.
- 3. If the street is a bus route or emergency route, the installation of a speed hump should be coordinated with operators – one speed hump may serve the need, but several along one street could be disruptive.
- 4. There may be an increase of noise, especially if large trucks regularly use the route.
- 5. Depending on the design and location, drainage problems could arise.

GUIDELINES

- 1. Speed humps can provide an opportunity to use different paving materials, such as bricks or colored concrete, to create a more visually pleasing traffic calming element (other than typical pavement).
- 2. The longer the speed hump, the more gentle they are for cars.

HUMP LENGTH	DESIGN SPEED
12 ft.	15 to 20 mph
14 ft.	20 to 25 mph
22 ft.	25 to 30 mph

Source: PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System

SPEED TABLES

A speed table is a long and flat speed hump and is typically wide enough for the entire wheelbase of a passenger car to rest on the flat section. Often times a speed table will include a pedestrian crossing. They can either be parabolic (more like a speed hump) or trapezoidal (used more frequently in Europe) and can be used with curb extensions where parking exists.

Because of the similar characteristics between a speed hump and speed table, the same considerations can be taken into effect.



CURB EXTENSIONS

Curb extensions, also known as bulb-outs or neck-downs, extend the sidewalk or curb line out into the parking lane to reduce the effective street width. Intersections with curb extensions provide a safer crossing environment for pedestrians as their crossing distance is reduced. For motorists, the roadway becomes narrower, making the motorists slow down through the intersection. Curb extensions also prevent motorists from parking in or too close to the pedestrian crosswalk. Vehicles parked too close to the intersection or crosswalk pose a threat to pedestrian safety and other motorists.

CONSIDERATIONS

1. Can provide adequate space on narrow sidewalks for curb ramps and landings.
2. Should only be used where there is on-street parking.
3. Should not interfere with transit stops or bicyclists.
4. Can be used at mid-block crossings, as long as it does not block motorist's view of pedestrians.
5. Should be designed to accommodate large trucks or buses if the intersection is on a bus or truck route.
6. Emergency access can be improved by having a curb extension in place instead of a parked car – fire trucks and other emergency vehicles can climb a curb while turning if necessary, where they would not be able to do so if maneuvering around parked cars.
7. Can provide additional space for curb ramps, landscaping, and furniture.

COMPLETING THE STREET: A COMPLETE STREETS TOOLKIT

GUIDELINES

Because every intersection is designed based on its surrounding context and is different from the next, it is difficult to determine a standard set of guidelines for curb extensions. Curbs should be designed in a way that will enable larger vehicles and emergency vehicles room to turn. In general, it is best to not extend the curb extension more than six (6) feet away from the curb.



Curb extension; downtown Newburgh



Curb extension; downtown Newburgh

TEXTURED PAVEMENTS

The use of different paving materials is an easy way to add a unique character and function to the street. Paving materials can also be used as a form of traffic calming in and of themselves when the street is paved in brick or cobble stone, or when a pedestrian crosswalk is a different material or color than the street. This will cause vehicles to reduce their speeds. Some of these materials, however, may create noise and could be difficult for cyclists, pedestrians, wheelchairs or snowplows.

CONSIDERATIONS

1. Some surfaces can become slippery, such as granite and paint, and should not be used in a primary pedestrian or bicycle path.
2. Bumpy surfaces, such as cobblestone and uneven bricks, can create hazards for pedestrians and bicyclists, and can make wheelchair travel difficult.
3. Selected materials and placement should be coordinated with maintenance agencies.
4. The design and maintenance must ensure that the crosswalk is visible over time.
5. Some materials, such as cobblestones or brick, may slightly increase the cost and maintenance of the project.

GUIDELINES:

1. Textured crosswalks should be marked with a reflective marking or lines to make the crosswalk more visible to motorists.

PEDESTRIAN, CYCLIST AND WHEELCHAIR FRIENDLY	MORE DIFFICULT FOR PEDESTRIANS, CYCLISTS AND WHEELCHAIRS
<ul style="list-style-type: none"> • Concrete • Stamped concrete for a distinctive look – can be used to make a crosswalk or bike path/greenway crossing stand out • Colored concrete – can be used to enhance bike lanes • Concrete pavers – can be more smooth than bricks or cobblestones 	<ul style="list-style-type: none"> • Slick materials, such as granite, marble and paint • Uneven materials, such as cobblestone and brick
Source: PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System, 2004	



LANDSCAPING

The use of landscaping along a street not only enhances the street environment, but also serves as a form of traffic calming. When landscaping or trees are placed along a roadway, within a buffer, or in a median, it creates a visual narrowing of the street. When the street feels narrower, the motorists naturally reduce their vehicle speeds. Landscaping can include a variety of trees, bushes, and/or flowerpots, which can be planted in the buffer area between the sidewalk or walkway and the street. The most significant issue with landscaping is maintenance. In some communities, homeowners associations or volunteers throughout the neighborhood will pay for the landscaping and maintenance. Other communities have budgeted money for maintenance from city funds.

CONSIDERATIONS

1. Maintenance is a key factor when planning for landscaping, so an understanding of who is responsible for maintenance should be made prior to installation.
2. Plants and trees should be carefully chosen to ensure the plant style will fit the character of the area.

GUIDELINES:

- 1. Plants should be adapted to local climates.
- 2. Plants should fit into the surrounding character of the area.
- 3. Should not need protection or intensive irrigation to survive.
- 4. Plant’s growth patterns should not obscure signs or pedestrian and motorist views.

HEIGHT	
Shrubs and low-growing trees	Trimmed to 8 ft. – 10 ft.*
*or high enough to ensure that sight distances and head room is maintained	
Source: PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System, 2004	



Small street trees; downtown Newburgh

OTHER RESOURCES

The following resources can be useful in providing additional information on treatments and concepts presented in this toolkit, as well as other treatment options for completing the streets.

- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities
- AASHTO Guide for the Development of Bicycle Facilities
- AASHTO's Policy on Geometric Design of Highways and Streets (Green Book)
- Manual on Uniform Traffic Control Devices (MUTCD)
- Highway Capacity Manual (HCM)
- Uniform Vehicle Code (UVC)
- Pedestrian Right-of-Way Accessibility Guidelines (PROWAG)
- ITE's Traffic Calming: State of the Practice

EVANSVILLE MPO COMPLETE STREETS POLICY

PAGE INTENTIONALLY LEFT BLANK

COMPLETE STREETS POLICY

MARCH 2012

EVANSVILLE METROPOLITAN PLANNING ORGANIZATION

RESOLUTION COMPLETE STREETS NO. 12-01

A RESOLUTION APPROVING A COMPLETE STREETS POLICY AS PRESENTED TO THE POLICY COMMITTEE OF THE EVANSVILLE METROPOLITAN PLANNING ORGANIZATION ON MARCH 1, 2012

WHEREAS, the Evansville Metropolitan Planning Organization is the organization designated by the Governor as the Metropolitan Planning Organization responsible, together with the State, for carrying out the provisions of 23 U.S.C. 134 (Federal-Aid Highway planning requirements), and capable of meeting the requirements of 49 U.S.C. 1603(a) (Federal Transit planning requirements) in the Evansville Urbanized Area; and

WHEREAS, it is the intent of the Evansville Metropolitan Planning Organization to establish a Complete Streets Policy so that roads may be designed and built to accommodate all users including motorists, cyclists, pedestrians, transit and school bus riders, delivery and service personnel, freight haulers, and emergency responders, regardless of age and ability; and

WHEREAS, the Evansville Metropolitan Planning Organization has included the development of a multi-modal transportation network in the Vision Statement of the Long Range Transportation Plan; and

WHEREAS, the Evansville Metropolitan Planning Organization's Transportation Improvement Program identifies implementation of capital improvements within the planning areas of Vanderburgh, Warrick and Henderson Counties; and

WHEREAS, the technical expertise provided by the Evansville Metropolitan Planning Organization's Technical Committee and active public participation process as outlined in the Public Participation Plan can ensure that investment in transportation infrastructure address the needs of all roadway users.

NOW, THEREFORE, BE IT RESOLVED, that the Evansville Metropolitan Planning Organization hereby approves the Complete Streets Policy herein attached.

ADOPTED by the Policy Committee of the Evansville Metropolitan Planning Organization on this 1st day of March, 2012.



Mr. Jack Corn, Jr., Chairperson
Evansville Metropolitan Planning Organization
Policy Committee

Complete Streets Policy

Evansville Metropolitan Planning Organization

A. BACKGROUND

The Evansville Metropolitan Planning Organization (MPO) supports the creation of a multimodal, safe and efficient transportation system that ensures accessibility to all roadway users. The local jurisdictions in the MPO have constructed numerous projects that provide this accessibility. These projects include; Outer Lincoln Avenue with shoulders for biking in Warrick County, expanded trail systems in Henderson, Newburgh, and Evansville, a Road Diet on Lincoln Avenue in Evansville, and the reconstruction of Oak Hill Road as a complete street in Evansville.

This Complete Streets Policy builds upon these efforts and promotes a multimodal transportation system that is integrated with sustainable land use developments. Its main objective is to design and build roads that safely and comfortably accommodate all users of roadways, including motorists, cyclists, pedestrians, transit and school bus riders, delivery and service personnel, freight haulers, and emergency responders. It includes people of all ages and abilities.

Building complete streets provides many benefits to residents, business owners, developers, and the community as a whole. First and foremost, embracing the complete streets concept will create balanced transportation systems by providing accessible, safe, and efficient connections between destinations. It will encourage economic growth and stability while increasing property values. It will ensure job growth, reduce crashes through safety improvements, improve public health and fitness, reduce harmful emissions, and reduce the overall demand on our roadways by allowing people to replace motor vehicle trips with active transportation options. Secondly, integrating sidewalks, bike facilities, transit amenities, or safe crossings into the initial design of a project spares the expense and complications of retrofits later.

B. DEFINITION

Complete streets are roadways designed to safely and comfortably accommodate all users, including, but not limited to motorists, cyclists, pedestrians, transit and school bus riders, delivery and service personnel, freight haulers, and emergency responders. "All users" includes people of all ages and abilities.

C. VISION AND PURPOSE

The desired outcome of the Complete Streets Policy is to create an equitable, balanced, and effective transportation system where every roadway user can travel safely and comfortably and where sustainable transportation options are available to everyone.

The goals of this Complete Streets policy are:

- To create a comprehensive, integrated, and connected transportation network that supports compact, sustainable development and provides livable communities.
- To ensure safety, ease of use, and ease of transfer between modes for all users of the transportation system.
- To provide flexibility for different types of streets, areas, and users.

3/1/2012

D. POLICY

- The Evansville MPO will promote the complete streets concept throughout the region and, therefore, recommends that all local jurisdictions adopt a comprehensive complete streets policy.
- The Evansville MPO requires that all local projects receiving MPO allocated federal funding adhere to this policy. Projects utilizing any other funding sources are also encouraged to adhere to this policy.

1. Applicability

This Complete Streets Policy applies to new construction and reconstruction (excluding resurfacing activities that do not alter the current/existing geometric designs of a roadway) of local roadways and other transportation facilities that will use Federal funds through the Evansville MPO for any phase of project implementation including planning, design, right-of-way acquisition, construction, or construction engineering.

2. Requirements

- a. Designs shall consider accommodations for all users and be sensitive to the context of the project setting. It is important to note that complete streets may look different for every project and road type. For example, wide lanes or paved shoulders may be sufficient in a rural area, whereas sidewalks and/or bike lanes are needed in an urban setting. Also, when re-striping projects are considered, where the right-of-way will not change, options such as bike lanes, sharrows, and pedestrian crosswalks could still be implemented.
- b. Each project shall use the most appropriate design standards and procedures. However, the Local Public Agency (LPA) shall retain the design decision authority over its projects.
- c. Project sponsors shall fill out the appropriate project application and provide the completed form to the Evansville MPO. MPO application forms will be revised to include complete streets information.
- d. LPAs should coordinate their projects with adjacent LPAs to ensure consistency of facilities.
- e. Logical termini should be chosen to include connections through “pinch points,” such as overpasses, railroad crossings, and bridges. Logical termini should not be chosen so that the project ends before such a “pinch point” unless there is a compelling reason to do so.
- f. Every project shall involve the local transit agency in the project development process to ensure that sufficient accommodation of transit vehicles and access to transit facilities is provided.
- g. Public transit facilities shall be designed with the goals of complete streets in mind by including bicycle and pedestrian connections. Additional facilities such as benches and bike parking should be considered where appropriate.
- h. Every project shall ensure that the provision of accommodations for one mode does not prevent safe use by another mode (e.g., a bus shelter should not block the clear walking zone on the sidewalk).

3/1/2012

3. Recommendations

- a. Local Public Agencies are encouraged to view all transportation improvements as opportunities to create safer, more accessible streets for all users.
- b. If the project serves a destination point, such as a school, recreational facility, shopping center, hospital, or office complex, the project shall provide the opportunity for the destination to have access to the project's pedestrian and bicycle facilities.
- c. Street furniture, such as bike racks or benches, should be considered as part of all projects as long as they do not impede any user.
- d. When designing a facility that includes or crosses an existing or future transit route, ensure that the appropriate pedestrian and wheelchair access is provided to and from the transit stops.
- e. Traffic-calming elements including, but not limited to, landscaping, street trees, and narrowing of lanes, should be considered where safe and appropriate.
- f. Project sponsors should consider including street trees and landscape components, with careful analysis of tree, site, and design considerations.
- g. Each project design should be coordinated with appropriate access management strategies. Access management strategies should consider the placement of sidewalks and ramps to eliminate sight distance issues.
- h. Each local community should regularly update its project design standards and procedures and train its staff to adhere to them.
- i. Local governments are encouraged to adopt Complete Streets Policies consistent with this regional policy and federal and state design standards. State governments should work with the local Metropolitan Planning Organizations to ensure consistency in policies at the state, regional and local level.

E. PROCESS

1. Call for Projects

In response to an MPO issued Call for Projects that seek to use federal funding and to be programmed in the Transportation Improvement Program, the LPA shall submit a Project Application with the following information to the Evansville MPO:

- a. a detailed project description (e.g. project scope, reconstruction/new construction, vehicular elements, non-vehicular elements);
- b. the intent for the project to be Complete Streets Compliant or to seek a Complete Streets Exemption;
- c. project phases and key milestones;
- d. anticipated costs for design, rights-of-way acquisition, construction, and construction inspection;
- e. amount of federal funding requested by phase (e.g. preliminary engineering, rights of way, construction, construction inspection);
- f. anticipated project schedule, from design initiation to construction letting;
- g. the Employee in Responsible Charge (ERC) .

3/1/2012

If certain information required above is not yet known at the time of the Project Description submittal, the LPA shall provide general details on the required submittal information, but shall state, "specific information has not yet been determined".

2. Project Review and Approval

Evansville MPO staff will perform an initial screening of new requests and will be available to the applicant to discuss concerns and provide compliance guidance. Because of the flexibility of the policy and the variety of approaches that a sponsor may take to complete a street, MPO staff, as stewards of the Complete Streets Policy, will work with the project sponsor throughout the project development to find an acceptable solution for both parties. A Complete Streets Guidance Document will be developed to provide additional assistance. Project descriptions, including a Complete Streets compliance assessment, will be reviewed by the Technical Advisory Committee prior to being submitted to the Policy Committee for their consideration to adopt into the TIP. The Policy Committee shall certify by resolution that relevant projects identified in the TIP are Complete Streets compliant unless a project receives an exemption under certain circumstances.

3. LPA Quarterly Project Tracking

Once a project is programmed into the adopted TIP, the Local Public Agency shall fulfill the scope of work as detailed in the approved Project Description. Quarterly project tracking will maintain current information of issues identified, significant accomplishments since the initial Project Description submittal or last quarterly report, new details on project implementation, and the preferred design solutions as they pertain to fulfilling the project parameters detailed by the Project Description.

4. Project Description Change

The LPA shall report to the Evansville MPO immediately if a significant change to the roadway project is warranted, especially any change that affects the project's accommodations for one of the users of the corridor. The Policy Committee will review the requested change(s) to the project and determine if the change(s) affects the intent (as detailed by the most recently approved Project Description) to be Complete Streets compliant, Complete Streets exempt, or Complete Streets noncompliant. If the changes significantly affect the intent the Policy Committee shall certify a revised Project Description and determine the roadway project's standing to be Complete Streets compliant or Complete Streets exempt. If a capital roadway project is determined to be Complete Streets noncompliant the Policy Committee shall consider removing the project from the Transportation Improvement Program until such time that the project can be brought back into compliance with the Complete Streets Policy. If the changes do not significantly affect the intent then no action by the Policy Committee is required.

5. Exemptions

Project sponsors may request an exemption, or re-review, of their projects by the Policy Committee if they cannot reach an agreement with MPO staff. Instead of an exemption, the Policy Committee may also suggest an alternative accommodation. The Policy Committee may allow such an exemption under certain circumstances, including the following:

- a. Ordinary maintenance activities designed to keep assets in serviceable condition (e.g. mowing, cleaning, sweeping, spot repair, and regular/seasonal maintenance);

3/1/2012

- b. The project involves a roadway that bicyclists and pedestrians are prohibited by law from using. In such case, efforts should be made to accommodate bicyclists and pedestrians elsewhere;
- c. There are extreme right-of-way topographic or natural resource constraints;
- d. The Long Range Transportation Plan's Average Daily Traffic projection is less than 1000 vehicles per day;
- e. When other available means or factors indicate an absence of need presently and in the Long Range Plan;
- f. A reasonable and equivalent alternative already exists for certain users or is programmed in the TIP as a separate project;
- g. The project is not a roadway improvement project and/or the Evansville Metropolitan Planning Organization has no programming authority (e.g. State, Transit and other projects).

F. IMPLEMENTATION

Upon approval and adoption of this Complete Streets Policy, it will become part of the Evansville MPO's planning process and project selection for MPO allocated funding. The principles of this policy will also guide the MPO staff in the preparation of the Regional Transportation Plan and other plans it prepares or to which it contributes.

A Complete Streets Guidance Document will be developed to assist project sponsors in developing Complete Streets projects. The Complete Streets Guidance Document will contain design standards and implementation guidance.

G. EVALUATION

The Evansville MPO shall, at a minimum, evaluate this policy and the documents associated with it in conjunction with the Transportation Plan update. This evaluation may include recommendations for amendments to the Complete Streets Policy and subsequently be considered for adoption by the Policy Committee utilizing its current procedures.

H. PERFORMANCE MEASURES

In order to measure the performance of complete streets planning, a broad look at how the system is serving all users is crucial. The intent of the Complete Streets Policy is to create a safe and effective transportation system that accommodates all users and modes of transportation. Performance measures include:

- Total miles of on-street bicycle routes defined by streets with clearly marked or signed bicycle accommodation
- Linear feet of new pedestrian accommodation
- Number of new curb ramps installed along streets

3/1/2012

PAGE INTENTIONALLY LEFT BLANK

EVANSVILLE MPO SHARROW PLACEMENT GUIDELINES

In 2011, the Evansville MPO created a set of guidelines to assist street department crews in determining where to mark sharrows on the roadways. While the MUTCD has recommendations for how far apart sharrow markings should be placed, there are not recommendations for how far into the travel lane the markings should be placed. Using examples from other cities, such as San Francisco, the Evansville MPO devised a set of standards for the MPO planning area to keep bikeways consistent.

PAGE INTENTIONALLY LEFT BLANK

LATERALLY

WITH ON-STREET PARKING		
①	outside lane greater than 22'	12' from curb
②	outside lane less than 22'	center of travel lane
WITHOUT ON-STREET PARKING		
③	outside lane greater than 14'	4' from curb
④	outside lane less than 14'	center of travel lane

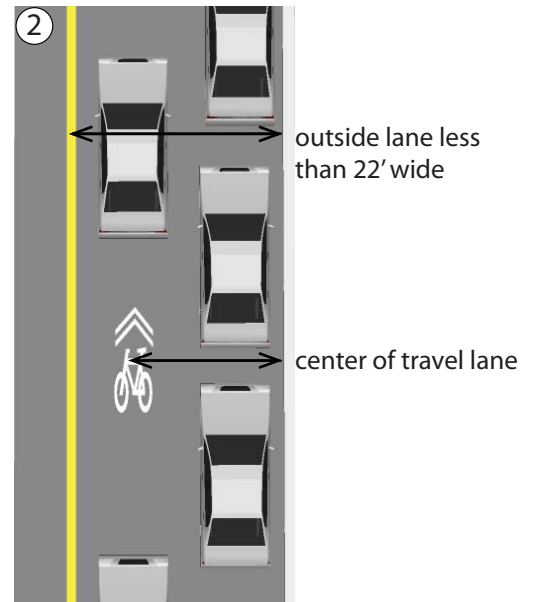
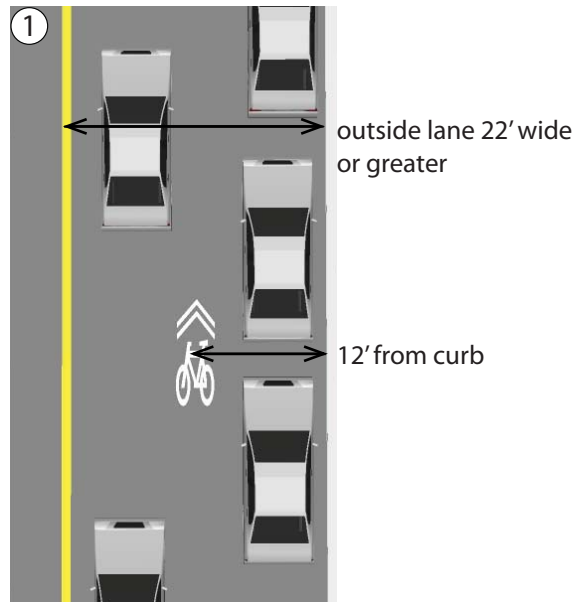
LONGITUDINALLY

MUTCD suggests that a sharrow "should be placed immediately after an intersection and spaced at intervals not greater than 250 feet thereafter."

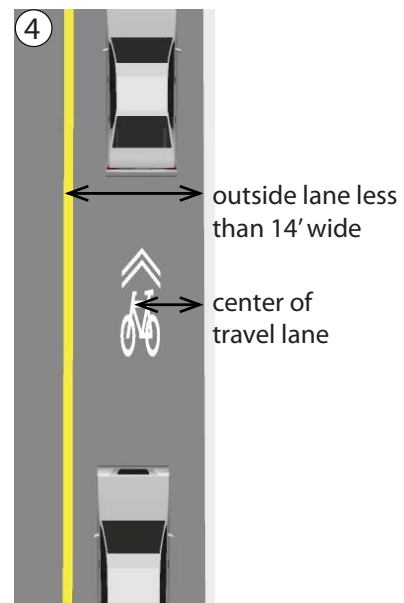
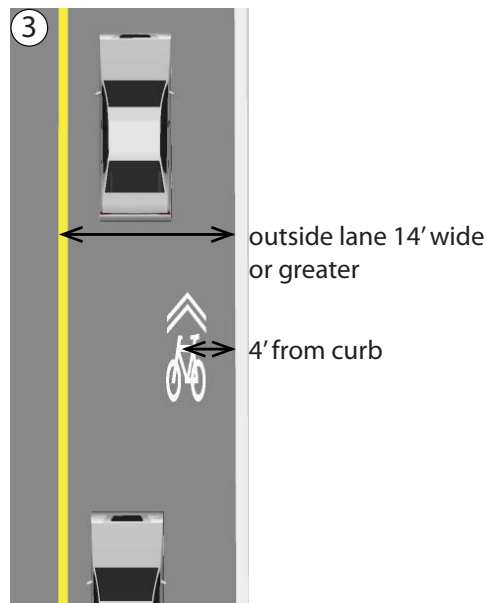
HOWEVER:

MPO suggests that longitudinal sharrow placement for future bike routes should be studied on a route-by-route basis to determine appropriate placement.

WITH ON-STREET PARKING



WITHOUT ON-STREET PARKING



PAGE INTENTIONALLY LEFT BLANK

COMPLETING THE STREET

A COMPLETE STREETS TOOLKIT

Evansville Metropolitan Planning Organization

Civic Center Complex, Room 316
1 NW Martin Luther King, Jr. Blvd.
Evansville, IN 47708

Phone: 812.436.7833
www.evansvillempo.com