



EVANSVILLE, INDIANA BICYCLE AND PEDESTRIAN CONNECTIVITY MASTER PLAN APPENDIX VOLUME 2: SUPPORTING DOCUMENTS

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A. REVIEW OF RELEVANT PLANS AND POLICIES

INTRODUCTION

Strong and thoughtful policy for land-use, development and transportation are important to institutionalize good practices for supporting bicycling and walking-friendly development. The following section presents a review of plans and policies regarding improving conditions for bicycling and walking at the local, state and federal levels.

US DOT BICYCLE & PEDESTRIAN POLICIES

Former US Department of Transportation Secretary LaHood signed a statement of support in March 2010 for the need to provide an integrated bicycle and pedestrian plan. This policy statement promoted the development of transportation plans that provided fully integrated and active transportation systems. These systems should include a robust component allowing for the involved jurisdictions to benefit from the results of a bicycle-pedestrian plan. These provide for the ancillary benefits of general improvement in health, livability, and opportunities to reduce vehicle emissions. Continuing this statement, Sec. LaHood recommended that these plans extend beyond the minimum requirements and be reflected by states, local governments, professional associations, community organizations, public transportation agencies, and other government agencies in policy statements to confirm their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system.¹

This statement put forth guidance to all DOTs to “proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when

appropriate.”² This reflected previous legislative actions requiring incorporation of these facilities into existing transportation plans.

With federal and state support, jurisdictions have fostered greater planning efforts to accommodate the increasing desire by communities for more accessible and appropriate facilities as part of the overall transportation network. Federal policies have been founded on numerous statutes. Metropolitan Planning Organizations have followed the guidance presented in 23 CFR 450.200, 23 CFR 450.300, 23 U.S.C. 134(h), and 135(d)) to meet the requirements for adequate facility planning. Also detailed in the same notation by the Federal Highway Administration specific portions state:

The scope of the metropolitan planning process “will address the following factors... (2) Increase the safety for motorized and non-motorized users; (3) Increase the security of the transportation system for motorized and non-motorized users; (4) Protect and enhance the environment, promote energy conservation, improve the quality of life...” 23 CFR 450.306(a). See 23 CFR 450.206 for similar State requirements.

Metropolitan transportation plans “...shall, at a minimum, include...existing and proposed transportation facilities (including major roadways, transit, multimodal and intermodal facilities, pedestrian walkways and bicycle facilities, and intermodal connectors that should function as an integrated metropolitan transportation system...” 23 CFR 450.322(f). See 23 CFR 450.216(g) for similar State requirements.

The plans and transportation improvement programs (TIPs) of all metropolitan areas “shall provide for the development and integrated management and operation of transportation systems and facilities (including accessible pedestrian walkways and bicycle transportation facilities).” 23 U.S.C. 134(c) (2) and 49 U.S.C. 5303(c) (2). 23 CFR 450.324(c) states that the TIP “shall include ...trails projects, pedestrian walkways; and bicycle facilities...”

23 CFR 450.316(a) states that “The MPOs shall develop and use a documented participation plan that defines a process for providing...representatives of users of pedestrian walkways and bicycle transportation facilities, and representatives of the

¹ USDOT, *United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations*, http://www.fhwa.dot.gov/environment/bikeped/policy_accom.htm, March 2010

² *Ibid.*, USDOT, March 2010

disabled, and other interested parties with reasonable opportunities to be involved in the metropolitan planning process.” 23 CFR 450.210(a) contains similar language for States. See also 23 U.S.C. 134(i)(5), 135(f)(3), 49 U.S.C. 5303(i)(5), and 5304(f)(3) for additional information about participation by interested parties.

Other specific language exists as well, expounding on pedestrian facilities :

“In any case where a highway bridge deck being replaced or rehabilitated with Federal financial participation is located on a highway on which bicycles are permitted to operate at each end of such bridge, and the Secretary determines that the safe accommodation of bicycles can be provided at reasonable cost as part of such replacement or rehabilitation, then such bridge shall be so replaced or rehabilitated as to provide such safe accommodations.” 23 U.S.C. 217(e). Although this statutory requirement only mentions bicycles, DOT encourages States and local governments to apply this same policy to pedestrian facilities as well.

Public rights-of-way and facilities are required to be accessible to persons with disabilities through the following statutes: Section 504 of the Rehabilitation Act of 1973 (Section 504) (29 U.S.C. §794) and Title II of the Americans with Disabilities Act of 1990 (ADA) (42 U.S.C. §§ 12131-12164).

The Federal Highway Administration’s Office of Human and Natural Environment actively promotes bicycle and pedestrian planning efforts. Within each state Department of Transportation, a State Coordinator has been designated to facilitate the planning and implementation efforts. The FHWA Bike and Pedestrian office provides these coordinators with guidance and education on evolving programs and requirements, as well as information related to avenues for funding mechanisms. This guidance is additionally provided to all agencies and bodies with responsibilities for the maintenance and expansion of Bike-Pedestrian plans.

STATE LEVEL POLICIES AND PROGRAMS

The State of Indiana has several programs to address bicycling, walking and trails/ greenways.

Hoosiers on the Move

In 2006, the Indiana Department of Natural Resources (DNR) adopted Hoosiers on the Move: The Indiana State Trails, Greenways & Bikeway Plan. It set a goal of having a trail within 7.5 miles, or 15 minutes by car, of all Indiana residents by 2016. The plan also established a visionary system of statewide interconnected arterials. As of July 2013, 97.9 % of all residents lived within 7.5 miles of a trail and 93.2 % lived within 5 miles of a trail.

Bike and Pedestrian Suitability Rating Map

In addition, the state created a Bike and Pedestrian Suitability Rating Criteria for key state jurisdiction roadways. The criteria are based on roadway conditions, with three levels: Suitable, Moderately Suitable and Not Recommended. Ratings for roads in the Evansville may be viewed on the map.

Indiana State Vehicle Code and Bicycling Laws

These laws are in the Driver’s Handbook under the heading “Sharing the Road with Other Vehicles”.

Bicycles

- Drivers must routinely share the roadway with bicycles. On most roadways, bicyclists have the same rights and responsibilities as other roadway users.
- Drivers may pass a bicyclist only when there is a safe amount of room beside the bicyclist (3 foot minimum) and when there is no danger from oncoming traffic.
- Drivers must yield the right-of-way to a bicyclist just as they would to another vehicle.
- Bicyclists are prohibited on limited-access highways, expressways and certain other marked roadways.
- A bicyclist is not required to ride in a designated bike lane. Bicyclists have the right to use either the bike lane or the travel lane.
- Avoid turning across the path of a bicyclist.
- When a motorist is turning left and there is a bicyclist entering the intersection from the opposite direction, the driver should wait for the bicyclist to pass before making the turn. Also, if a motorist is sharing the left turn lane with a bicyclist, stay behind the cyclist until he/she has safely completed the left turn.
- If a motorist is turning right and a bicyclist is approaching on the right, let the bicyclist go through the intersection first before making a right turn. After parking and before opening vehicle doors, a motorist should first check for bicyclists.

Bicycle Lanes

Bicycle paths and lanes shall be used exclusively for the operation of bicycles unless:

- Signage specifies joint use with pedestrians
- The driver is on official duty, such as delivering mail
- The person is peddling a moped

Other rules for drivers or operators of any vehicle include:

- Do not drive in or park in bicycle paths or lanes, or place the vehicle in such a manner as to impede bicycle traffic on such path or lane.
- Yield the right-of-way to an individual operating a bicycle on a designated bicycle path or lane.
- Do not move into a bicycle path or lane in preparation for a turn.
- Cross a bicycle path or lane only when turning or when entering or leaving an alley, driveway or private road.

Sharrows

Sharrow markings are pavement markings of a bike with two arrows above it and are intended to help bicyclists position themselves away from parked cars and to alert other road users to expect bicyclists to occupy travel lanes.

Pedestrian Safety

Crosswalks or a pedestrian signal indicate that pedestrians are nearby. Follow these rules and guidelines when pedestrians are in the vicinity:

- Always yield the right-of-way to pedestrians.
- Do not make a turn that causes a pedestrian to stop, slow down or make some other special effort to avoid a collision.
- If children are in the vicinity, take special care, because children are not fully aware of the dangers of traffic.
- Be respectful of others who have difficulty in crossing streets, such as elderly persons or persons with a visual disability.

Blind Pedestrians

- Traveling aids for a person who is blind are often a white cane or a trained guide dog.
- Independent travel for people with visual disabilities involves some risk that can be greatly reduced when drivers are aware of the use and meaning of a white cane or guide dog.
- Drivers always yield the right of way to persons who are blind.
- When a pedestrian is crossing a street or highway guided by a dog or carrying a white cane, vehicles must come to a complete stop.

LOCAL PLANS AND POLICIES

The following local plans and policies have shaped and will continue to shape bicycle and pedestrian planning, design, construction and funding for years to come. A summary of each of these documents provides a better understanding of the context in which the Evansville Bicycle and Pedestrian Connectivity Master Plan will be developed.

Evansville MPO Transportation Improvement Program (2015)

The Transportation Improvement Program (TIP) for 2016-2019 lists transportation projects that have been awarded funding through the MPO. The TIP identified funding allocated and timeframe for each stage of the process. The following projects include a bicycle and/or pedestrian component:

- **Covert Ave** road diet conversion to three lanes and sidewalk improvements from US Highway 41 to Interstate 69.
- **Weinbach Ave** road diet conversion to three lanes and sidewalk improvements from Walnut St to Pollack Ave.
- **Pigeon Creek Greenway** trail along Hi Rail Corridor from Riverside Dr to Walnut St.

Evansville MPO Metropolitan Transportation Plan 2040 (2014)

The MPO's 2040 plan includes a vision for multimodal transportation throughout the region. There is a clear desire throughout the EMPO planning area for a range of bicycle and pedestrian improvements. The survey conducted by the EMPO for the 2040 plan shows that pedestrian and/or bicycle safety or facilities improvements were among the most frequently-cited responses to the top three priorities section of the survey.

Bicycle and pedestrian travel is covered in Chapter 3, Existing Conditions; Chapter 4, Recommendations; and Chapter 5, Financing.

Existing Conditions

Since the adoption of the Regional Bicycle and Pedestrian Plan in 2000, the City of Evansville has worked to implement several of the proposed bicycle and pedestrian improvements, with the overall goal to achieve a city-wide bike and pedestrian network. As of 2011, the City had implemented around 20+ miles of urban signed

bike routes. These routes connect the westside, downtown, eastside, and some neighborhoods to the north and south. These bike routes include:

- An eastside-to-downtown route along Lincoln Avenue from the Vanderburgh/Warrick County line to Rotherwood Avenue, and along Bellemeade Avenue from Rotherwood to SE Eighth Street downtown. Much of the Lincoln Avenue section includes a 4-lane to 3-lane road diet that slows traffic speeds and improves safety for all road users.
- A westside-crosstown route from Howell Park to West Franklin Street, where the route links to the Greenway, and across town to Oak Hill Road using Michigan and Virginia Streets.
- A north-south route along Oak Hill Road, from Lynch Road to US 41, which will link to a planned segment of the Greenway along US 41. This bikeway is Evansville's first dedicated bike lane (and first complete streets project), and is currently complete from US 41 to just north of Morgan Avenue. The next phase will complete the dedicated bike lane up to Lynch Road.
- A downtown bike route on Martin Luther King, Jr. Boulevard (from Mary Street to Cherry Street), with spurs on Cherry Street leading south to the riverfront and Greenway, and north to the Bellemeade Avenue route and the downtown Library.
- A bike route on East Franklin Street and Michigan Street, linking Oak Hill Road and Wesselman Park.

In addition, the pedestrian facilities in Evansville include over 500 miles of sidewalks, primarily in the downtown and older sections of the city.

Recommendations

The recommendations for bicycle and pedestrian facilities are intentionally left open-ended, to give individual jurisdictions within the MPO leeway to complete their own, more detailed plans in the future. This Bicycle and Pedestrian Connectivity planning process is the City of Evansville's update to the 2000 EUTS Regional Bicycle and Pedestrian Plan. The plan is expected to fully begin in early 2014.

Following are the MPO's recommendations for strategies to improve conditions for bicycling and walking are, expressed as "Target" strategies followed by general directions:

Target: Communities within the MPO planning area are encouraged to adopt the Complete Streets Policy, or a policy with similar goals, on the local level.

In March, 2012, the MPO adopted the region's first Complete Streets Policy. The Policy requires that all projects receiving MPO allocated federal funding adhere to the policy. Because this is an MPO-level policy, local jurisdictions completing

projects with only local funds are encouraged, but not required to adhere to the policy. Communities in the MPO planning area would benefit from adopting a local-level Complete Streets Policy that would guide future roadway projects. With a policy in place, local jurisdictions would evaluate facilities for opportunities to accommodate all roadway users, where appropriate, for locally funded projects

Target: Expand the multi-use path systems in the region.

Target: Increase the number of people within ¼ mile of a dedicated walkway.

Target: Increase the number of people within 1 mile of a dedicated bikeway.

Greenway Connections: Build connections between the two existing greenway networks on the west side of Evansville and Vanderburgh County.

Greenway North Expansion: Continue to expand the Pigeon Creek Greenway Passage along the Pigeon Creek on the north side of Evansville.

Greenway South Expansion: Continue to expand the Pigeon Creek Greenway Passage through the south side of Evansville along the I-164 Bypass to ultimately connect to Newburgh

Target: Increase the bicycle network to provide more connections between neighborhoods, shopping areas, and recreational area.

Westside Connections: Designate additional on-street bicycle connections to expand the network. Potential routes and destinations include Hilltop Neighborhood, Mesker Park Zoo, and extending the Franklin Street route.

Northside Connections: Expand the on-street bicycle network with additional designated routes on the northside of Evansville. Potential routes and destinations include Jacobsville and Diamond-Stringtown neighborhoods, North Park shopping area, and the Town of Darmstadt.

Bicycle and Pedestrian Facilities Included in Roadway Projects

The 2040 MTP recommends 19 roadway projects, 16 of which include bicycle and/or pedestrian facilities. However, the tables in the document show that a given project include "Bicycle and Pedestrian" but does not specify if the roadway will include one or the other or both. Another question is whether best practices in bicycle and pedestrian planning, scoping, and design had been employed in determining what accommodations each roadway is slated to receive. It is recommended that the Bicycle and Pedestrian Connectivity planning process currently underway revisit the 2040 MTP for additional opportunities to improve conditions for bicycling and walking.

Non-Motorized Investment Strategy

MTP 2040 endorses a funding strategy which reserves 10% of Federal Surface Transportation Program (STP/SHN) funds, the largest federal funding source for roadways in the MPO region, for bicycle and pedestrian infrastructure and activities. Eligible projects may include, but are not limited to: infrastructure such as crosswalks, trails and sidewalks, and related support activities. This strategy to increase available funding for active transportation facilities will result in greater mode choice in the MPO region as the active transportation network is expanded. This is an outstanding, visionary policy that is rare in the U.S. and demonstrates this region's commitment to a balanced transportation system and livability

Estimated Funding

The Indiana portion of the MPO planning area is projected to have approximately \$16.7 million in federal funds available between the years 2016 and 2040 for bicycle and pedestrian improvements and programs. This includes Transportation Alternative Program (TAP) funds and the 10% Surface Transportation Program (STP) set-aside funds as described in the Non-Motorized Investment Strategy. Projects eligible for these funds may include, but are not limited to, infrastructure such as crosswalks, trails and sidewalks, on-street bicycle facilities, and related support activities

Sustainable Evansville Area Coalition Millennial Plan 2040 (2014)

This document is a high-level vision for sustainability throughout the region. It includes many goals and objectives pertaining to livability, multimodal transportation, complete streets, and urban design that is bicycle friendly and walkable. It is a vision document only and not proscriptive, or "implementable". However, it reflects a commitment from leading stakeholders and could therefore result in continued political support for bicycling and walking.

The Millennial Plan includes an ambitious set of goals and objectives in a variety of areas including Transportation, Housing, Environment, Building and Development and Economic Development. Several areas in addition to Transportation include goals and objectives related to bicycle and pedestrian initiatives, however the complete list is too lengthy to for this report. Following is a sampling of Goals and Objectives in the area of transportation.

Transportation Goals

- Supply a regional transportation system that encompasses all modes and is user-friendly.
- Improve accessibility options for all residents.
- Encourage all new developments to be walkable.
- Promote "complete streets" in all neighborhoods and districts, thereby creating safe, convenient access and travel for pedestrians, bicyclists and motorists.

Transportation Objectives ("Connectivity")

- Reduce total vehicle miles traveled (VMT) by promulgating compact, mixed-use zones.
- Provide alternatives to the "single-driver" auto mode, including walking, bicycling, carpooling, car-sharing and bus transit by fostering complete streets, road diets, dedicated bus rapid transit lanes, connected pedestrian trails and bikeway corridors.
- Encourage neighborhood street design that will discourage higher traffic speeds while encouraging safer walking and bicycling.
- Implement street designs that enhance access and connectivity to and between neighborhoods, including commercial and mixed land uses in between residential neighborhoods.
- Promote green streets with ample native vegetation and indigenous trees in rights of way and boulevards, forming canopies and linear alleys.
- Promote neighborhood street grids and smaller block developments by granting developers a range of incentives for compact, dense residential development.
- Implement multimodal arterials and collector streets to form boundaries and edges around well-defined neighborhoods.
- Implement a Regional Transit Authority and a Bus Rapid Transit (BRT) system to serve the three-county area.

Evansville Multimodal Connector TIGER Grant Application (2014)

In April 2014 the City applied for a TIGER 6 grant for the Evansville Multimodal Connector, a center-city, multimodal transportation system to connect citizens, workers, economically distressed neighborhoods, and visitors to the best of Evansville. The Evansville Connector would provide new choices for walking, biking

and bus transit to connect the city's most economically distressed citizens and racially concentrated areas of poverty to manufacturing, health care, educational, and other jobs centers that encompass 35,000+ jobs, as well as to a brand new Indiana University Medical School, the University of Evansville, health care facilities, parks and recreational areas, and the Ohio River waterfront.

While Evansville did not win the grant, it proved to be a catalytic process that built support and momentum for capital projects that support economic development, equity, non-motorized transportation, and other important community goals. Evansville sought \$1.5 million in TIGER 6 Planning grant funding matched with \$1.4 million in local funds plus up to \$730,000 in leverage from the Evansville Metropolitan Planning Organization (MPO) for a \$3.63 million total project.

Following is a summary of the key case made in the proposal:

"Although Evansville has vibrant job centers and opportunities, and a strong Metropolitan Evansville Transit System with more than 70% of residents within walking distance of a fixed bus transit route, the community has not taken advantage of this readily available transit. Of 87,000 workers in Evansville, a mere 2,000 walk to work, although 68,000 people in the community have no automobile. A comprehensive analysis by Evansville of fair housing and equity in the community has found that, while racial minorities and the poor are located in areas that have the greatest proximity to jobs, these same distressed populations fare the worst in labor market engagement, or getting those jobs. Further, between 1966 and 2009, the number of children in Evansville who biked or walked to school fell by 75%, while the percentage of obese children rose 276%.

Evansville thus set out to create a strategy for an inter-connected system of side-walks, bicycle trails, greenways, and bus transit access.

The core of this strategy is the Evansville Multimodal Connector, which will create an 8.5 linear mile network of dedicated, shared-use pedestrian/bike facilities and improved transit access, that will directly serve 25,000 residents and 35,000 workers in the focused project area, and connect the community to the best of Evansville including:

- **Distressed Neighborhoods:** The poorest neighborhoods and those that are Racially Concentrated Areas of Poverty will be connected to major jobs centers, educational institutions, civic and community facilities, the downtown, and the Metropolitan Evansville Transit System (METS) at its central multimodal station and numerous bus stops;
- **Job Centers:** Workers will be connected to major, growing job centers including manufacturing plants and industrial corridors with 14,500 jobs; centers of health care, education, public sector, and utility businesses with 15,000 jobs; banking

and financial centers with 2,000 jobs; and commercial/retail/entertainment corridors and jobs centers providing 2,000+ jobs;

- **Schools & Educational Institutions:** The Connector will be directly accessible for the students and families at more than 20 primary and secondary schools, the University of Evansville, and the planned new, \$70 million, 6-square-block Indiana University Medical School campus;
- **Health Care:** The Connector will provide access to major healthcare institutions and facilities including Deaconess Hospital, the Deaconess Health Clinic, and the future Indiana University Medical School in Evansville;
- **Community Institutions:** The Connector will link to major community institutions including the Evansville-Vanderburgh Civic Center Complex, the METS Central Terminal, the WorkOne Southwest jobs training and workforce development center, a number of community libraries, the YMCA, the United Way of Southwestern Indiana, the Carver Community Center, & the CK Newsome Center;
- **Cultural Opportunities:** The Connector will provide direct access to wonderful cultural and artistic centers including the Evansville Historic District, the Ford Center Arena, the Evansville African American Museum, the Evansville Museum for Arts, History & Science, the Victory Theatre and the Evansville Philharmonic Orchestra, Innovation Pointe on Main Street, the West Franklin Cultural District, the Evansville Arts District, and many other great locations;
- **Parks & Open Space:** The Connector will link to seven major community and regional parks, including the Ohio River and its existing waterfront Esplanade.

The Evansville Multimodal Connector is truly the key to linking citizens across the region to the best of Evansville, and to providing ladders of opportunity for the workers, families and neighborhoods that are in most need of these links to the community."

Evansville MPO Complete Streets Policy (2012)

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. The Evansville MPO has taken a bold step in developing a solid policy for complete streets, and requiring any project using Federal funding to adhere to the policy. While MPO's are not implementers and cannot force design parameters on local agencies, the region's communities are cooperating in the visions and working to support the effort. Following are the stated vision and goals for the policy:

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.

Goals

- 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.

Highlights

- Any project using federal funding shall adhere to the Complete Streets Policy.
- Designs are encouraged to be context-sensitive, noting that Complete Streets may look different for every project and roadway type.
- Projects should have logical termini and promote connectivity through pinch points such as interchanges, railroad crossings, and bridges.
- Every project shall involve the local transit agency in concept development
- Projects will undergo an initial screening by MPO staff to ensure Complete Streets principles are adhered to.
- While project sponsors may request an exemption, the policy includes a process for MPO staff to work closely with the agency to find an alternative accommodation.
- Performance measures are recommended to evaluate the policy for effectiveness.

Complete Streets Toolkit (2012)

To support local agencies in achieving the goals of the Complete Streets Policy, the MPO created the Toolkit to provide design guidance. The measures provided within the 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 Toolkit provides excellent and effective guidance for all aspects of implementing a Complete Street including a basic urban and roadway design overview;

comprehensive details of all elements in a Complete Street including vehicle, bicycle and pedestrian accommodation in the roadway; descriptions of each of four zones and their functions within the street environment, such as curb zone, furniture zone, pedestrian zone, and frontage zone. Drawings, photographs and various graphics illustrate guide the user from broad approach such as street network planning down to how wide a bike lane should be for the specific conditions.

The Toolkit is an important step and a good start, however since it was produced in 2012, it may be beneficial to update certain sections. The field of bicycle and pedestrian planning and design is rapidly progressing with new solutions and innovations developing constantly. For example, the bicycle section does not include separated cycle tracks that are being implemented all over the U.S. or mention of the Urban Bikeway Design Guide produced by NACTO, the National Association of City Transportation Officials. Similarly, the pedestrian section omits some best practices in crossing treatments such as Pedestrian Hybrid Beacon (or HAWK) and latest guidance on mid-block crossing spacing.

Evansville-Vanderburgh County APC Comprehensive Plan (2004)

The Transportation section of the comprehensive plan discussed roads, air, public transit, water, rail, bicycles and pedestrians. A defining statement of this section was, “The transportation system of an urban area is interrelated with and affects many different elements of community life, including land use patterns. These interrelationships must be considered in land use and transportation planning.”

Transportation planning for Vanderburgh County is primarily conducted by the Evansville Urban Transportation Study (EUTS). EUTS is the federally designated Metropolitan Planning Organization (MPO) for the Evansville urbanized area which includes the City of Evansville

In 2003, EUTS completed the 2030 Transportation Plan. This Plan recommends the major transportation system improvements in the EUTS study area for the next 25 years.

To address the critical lack of bicycle and pedestrian transportation opportunities in the City and County, the EUTS Transportation Plan recommends the following:

- Construct the remainder of the Pigeon Creek Greenway, as proposed in the Master Plan for this project and sections are included in the current TIP.
- Incorporate bicycle and/or pedestrian accommodations into various planned road projects.

- Encourage the City and County to require sidewalks and street interconnections in proposed subdivisions or cul-de-sacs linked with bicycle/pedestrian facilities.
- Implement the EUTS 2000 Regional Bicycle and Pedestrian Plan. This update of the 1981 Bicycle Master Plan was expanded to include the entire EUTS Study Area. It recommends development of a future bikeway network addressing public education, and scheduling projects by phase.

EUTS Regional Bicycle and Pedestrian Plan (2000)

The Evansville MPO (named the Evansville Urban Transportation Study at the time) adopted a bicycle and pedestrian plan in 2000. The goal of the plan was to improve the safety and viability of bicycling and walking, first for their value as modes of transportation, and secondly as forms of recreation. The plan acknowledged that while autos will undoubtedly continue to be the main mode of transportation in the region, improving conditions for bicyclists and pedestrians is important for many reasons:

- To improve the safety of those who currently bicycle and/or walk
- To improve accessibility for all residents
- To achieve more efficient use of the existing transportation system
- To enhance the region's quality of life
- To encourage more active and healthier residents
- To help address the local air quality problem

The plan included recommendations in the areas of infrastructure improvements, changes to policies, codes and laws, planning programs, and education/encouragement activities. Emphasis was placed on early participation in planning and design of all locally funded transportation projects to ensure accommodations of bicyclists and pedestrian as appropriate, and to support the Pigeon Creek Greenway Master Plan.

The recommended bikeway network was broken into three phases: within 5 years; within 10 years; and within 20 years. The 5-year plan included over 38 different roadway segments in Evansville for a variety of bikeway improvements including signed routes, wide curb lanes, and bike lanes. The Existing Conditions section of this 2014 Bicycle and Pedestrian Connectivity Plan report will discuss how many of those proposed facilities have been implemented to date (the plan did not include network improvements for the 10- and 20-year time horizons.)

The pedestrian portion of the 2000 plan proposed many robust priorities for improving the pedestrian environment in the areas of subdivision and zoning ordinances

changes; sidewalk funding, construction, and maintenance; a strategy to catalog unsafe pedestrian crossings; safety campaigns; and law enforcement initiatives relating to how pedestrian collisions and mishaps are reported. The pedestrian section did not recommend specific locations for new sidewalks or repairs.

Pigeon Creek Greenway Passage Master Plan (1994)

The Pigeon Creek Greenway Passage has been under development since the early 1990s by the City of Evansville Parks Department. It is a linear park, or pathway, that provides a safe place for walking, jogging, bicycling, roller-skating, and other activities. The vision for the Greenway is to create a 42-mile pathway that encircles Evansville and connects to Newburgh and possibly other communities.

As of 2012, just over 6 miles of Greenway had been completed. The Greenway connects downtown to the Heidelberg Canoe Launch and Trailhead. The Greenway links attractions such as the Evansville Museum, Pagoda and Visitor's Center, Tropicana Evansville, the Shirley James Gateway Plaza, Lamasco Park, and Kleymeyer and Garvin Parks. A spur of the Greenway breaks away from the Shirley James Gateway Plaza to the historic Marchand Bridge Overlook.

Planning and/or design work is underway for the Hi-Rail Corridor and the Mid Levee Connection segments of the greenway.

B. BICYCLE AND PEDESTRIAN DEMAND ANALYSIS

INTRODUCTION

The consultant team conducted a bicycle and pedestrian demand analysis, also called a Live, Work, Play Analysis for the Evansville Bicycle and Pedestrian Connectivity Master Plan. The Live, Work, Play model identifies expected demand for pedestrian and bicycle travel overlaying the locations where people live, work, play, and go to school into a composite sketch of regional demand. The results can be used to identify areas in need of improvement and where there is high demand for pedestrian and bicycle facilities.

This appendix section summarizes the method and results of the Live, Work, Play Analysis for the project study area. The models were tailored to Evansville, Indiana using the data available. The demand model analyzed the City as well as into Vanderburgh County to account for demand generators near the boundary of the study area.

DATA SOURCES

The following data inputs were incorporated into the Live, Work, Play model. Table B.1 displays each variable, its source, and notes on limitations of the available data and assumptions that were made.

Table B.1: Sources of the Live, Work, Play Model Inputs

Model Input	Source	Notes
Total Population	2010 US Census	Summarized by census block
Total Employment	2010 US Census	Summarized by census block
School Locations	City of Evansville	Includes elementary, middle, and high schools; parochial schools; and colleges
Parks	City of Evansville	
Commercial Destinations	2010 US Census	Commercial destinations are approximated by service sector jobs (Retail trade; arts, entertainment, recreation; accommodation and food services; other services)

LIVE, WORK, PLAY ANALYSIS METHODOLOGY

Overview

The Live, Work, Play Analysis is an objective, data-driven process to identify the demand for pedestrian and bicycle travel. The demand potential was measured based on the proximity and density of trip generators (such as homes and workplaces) and trip attractors (such as shopping centers and parks) to establish potential for walking and bicycling trips. The resulting models represent “heat maps” that displays hot spots based on the live, work, play and learn factors and then as a heat map showing a composite of all the factors.

Demand Model

Approach

The demand model identifies expected pedestrian and bicycle activity by overlaying the locations where people live, work, play, and go to school into a composite sketch of regional demand. Figure B.1 summarizes this approach.

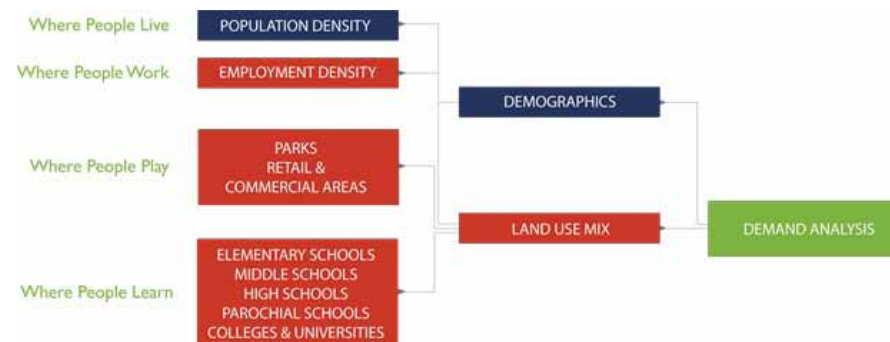


Figure B.1: Demand Model Approach

Scale of Analysis

The demand model relies on spatial consistency in order to generate logical distance and density patterns. It is for this reason that all scores are aggregated to a central location at the census block level, the census block corner. Census blocks closely represent the street network and therefore census block corners closely represent street corners, where foot and bicycle traffic is prevalent. This method is based on the Low-Stress Bicycling and Network Connectivity report (Mineta Transportation Institute, May 2012). The report discusses the benefits of using a smaller geographic setting for pedestrian and bicycle demand analyses rather than using more traditional traffic model features such as census block groups, census tracts, or traffic analysis zones. Due to the low speed of pedestrian movement, a much smaller geographic unit of analysis is needed.

Scoring Method

The demand model's scoring method is a function of density and proximity. Scores are a result of two complementing forces: distance decay – the effect of distance on spatial interactions yields lower scores for features farther away from other features; and spatial density – the effect of closely clustered features yields higher scores. Scores will increase in high feature density areas and if those features are close together. Scores will decrease in low feature density areas and if features are further apart.

The “learn” component of the analysis was weighted to establish the demand for pedestrian and bicycling trips based on the institution. The weighting of features is provided in the table below:

Table B.2: Weighting of Demand Inputs

Category	Input	Weight
Where People Learn	Higher Education	5
	Elementary Schools	5
	Middle Schools	1
	High Schools	1

LIVE, WORK, PLAY ANALYSIS RESULTS

Demand Model

The results of the demand analysis are described below and presented in the series of maps on the following pages.

Where People Live

This category includes 2010 census block level population density. These locations represent potential trip origin locations. More trips can be made in areas with higher population density if conditions are right. The areas with the highest population densities are along First Ave, up Oak Hill Rd, and east of Downtown in the Goosetown neighborhood and along Covert Ave. Note that the bike lanes that were just added on Oak Hill Rd match well with the high population density along that corridor.

As for all maps, the areas shaded more deeply in red represent higher demand areas relative to other colors on the ramp.

Where People Work

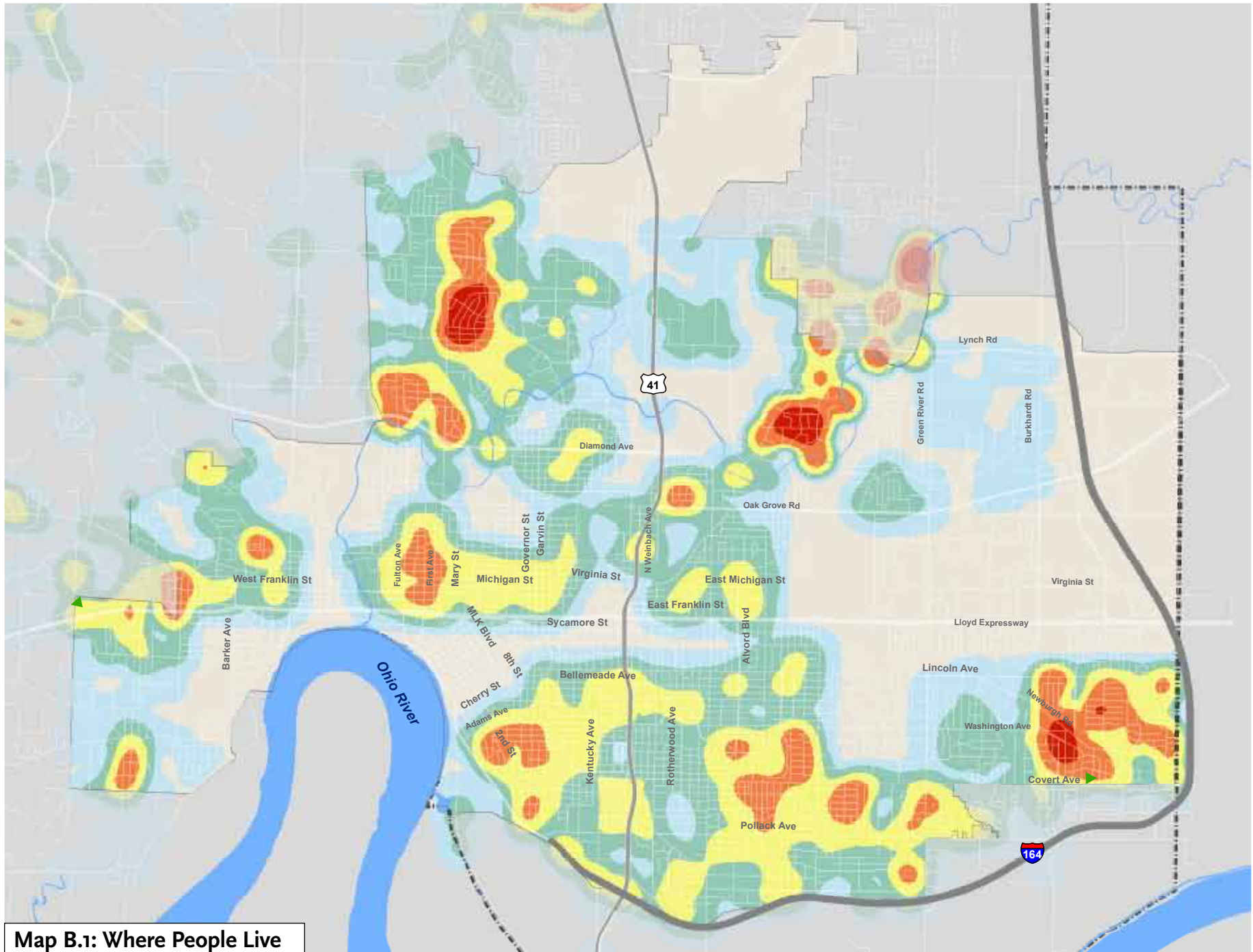
This category represents trip ends for people working throughout Evansville and Vanderburgh County regardless of residency. Its basis is 2010 total employment by census block. The highest levels of employment density are concentrated downtown and in the retail and commercial areas surrounding Green River Rd.

Depending on the type of job, employment can act as a trip attractor (i.e., retail stores or cafes) or trip generator (i.e., office parks and office buildings) or both. Specific employment types, such as retail, are therefore also used in the where people play category.

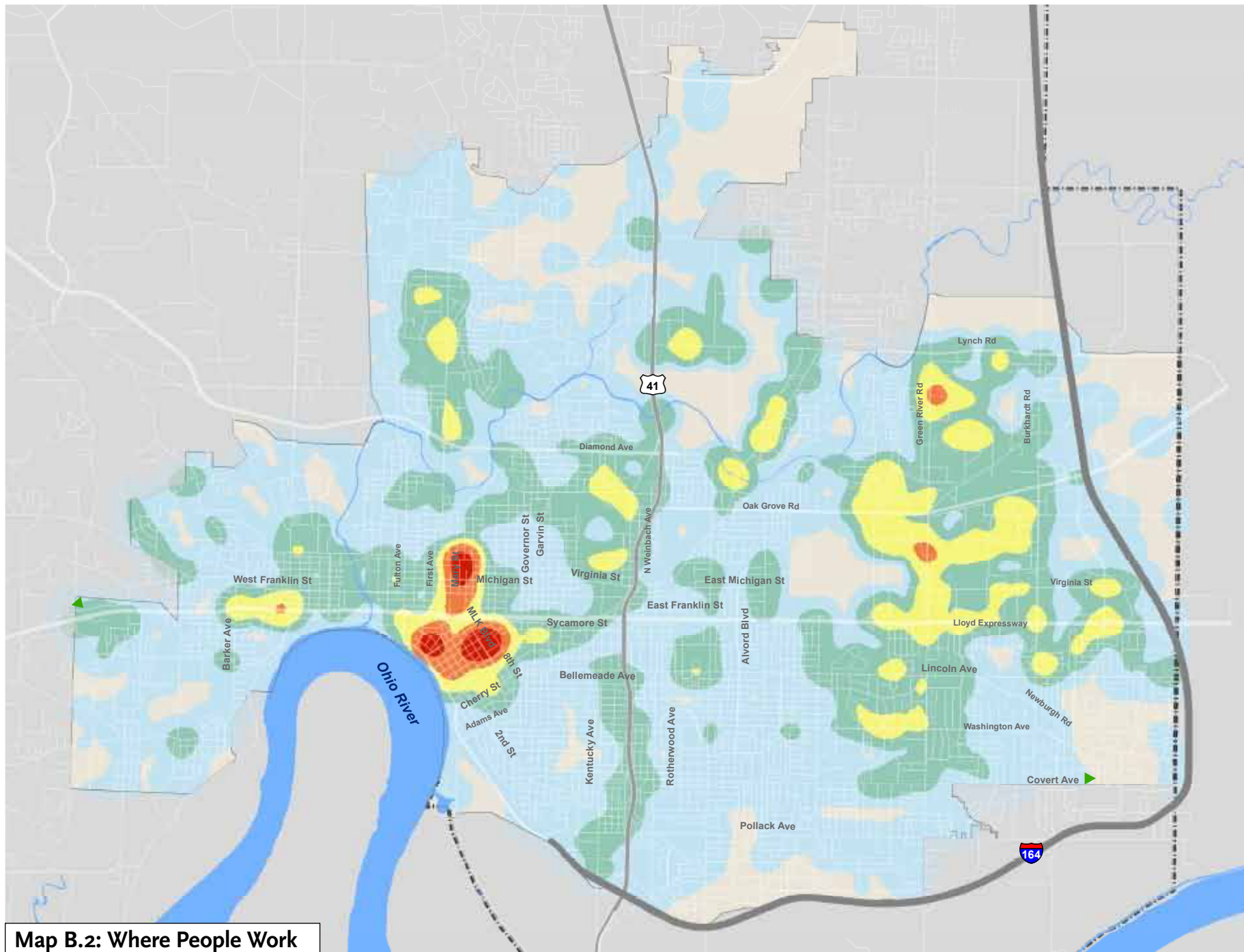
Where People Play

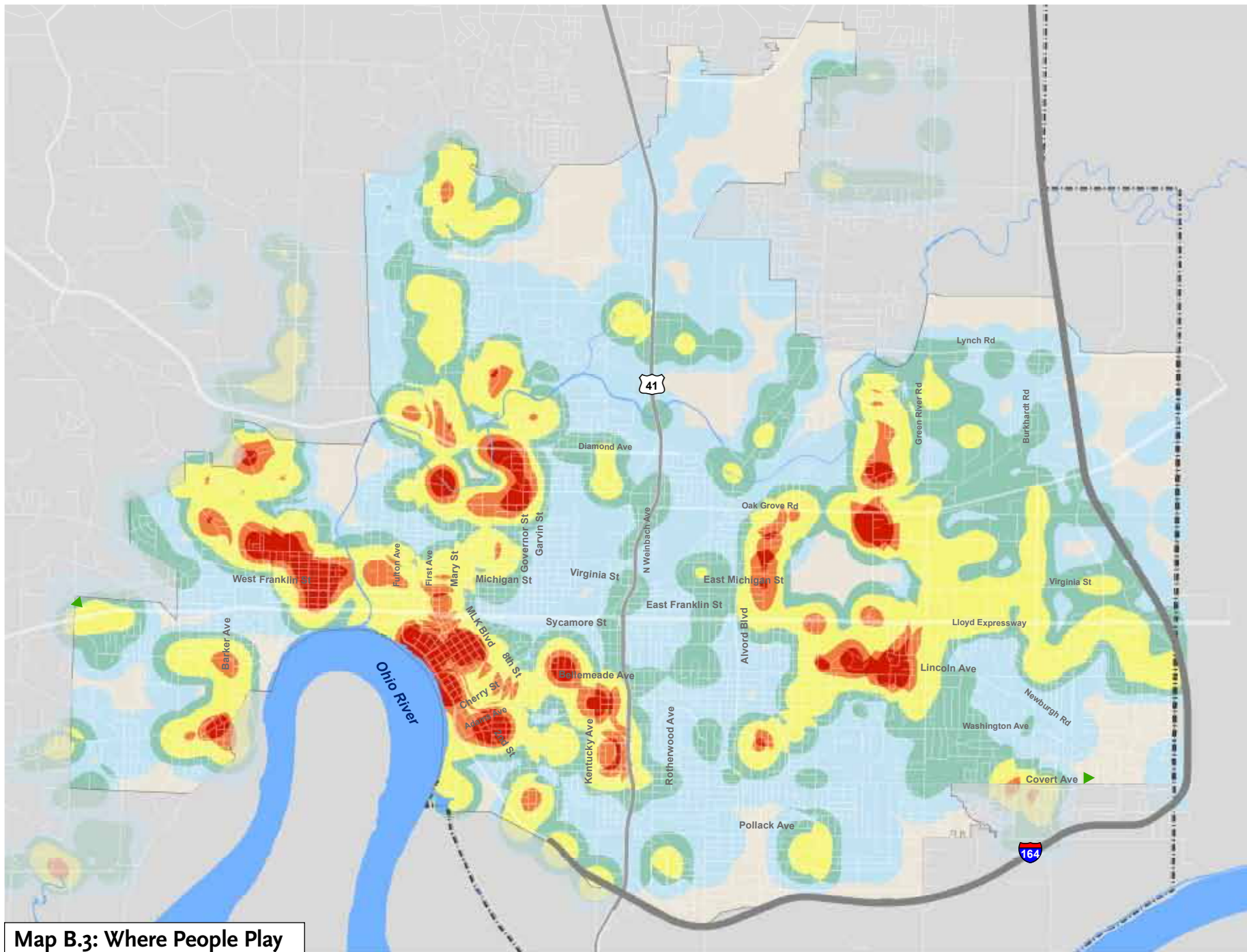
This category is a combination of varied land use types and destinations. Retail destinations and parks were selected because they are land use types where people most often “play.” In addition to where residents often “play,” this layer is also a good predictor of where tourist will be attracted.

The analysis shows that the primary destinations are downtown, the riverfront and Pigeon Creek Greenway, the Franklin Street retail district, Golfmoor Park, Garvin Park and the Mesker Park Zoo, Wesselman Park, and Eastland Mall.

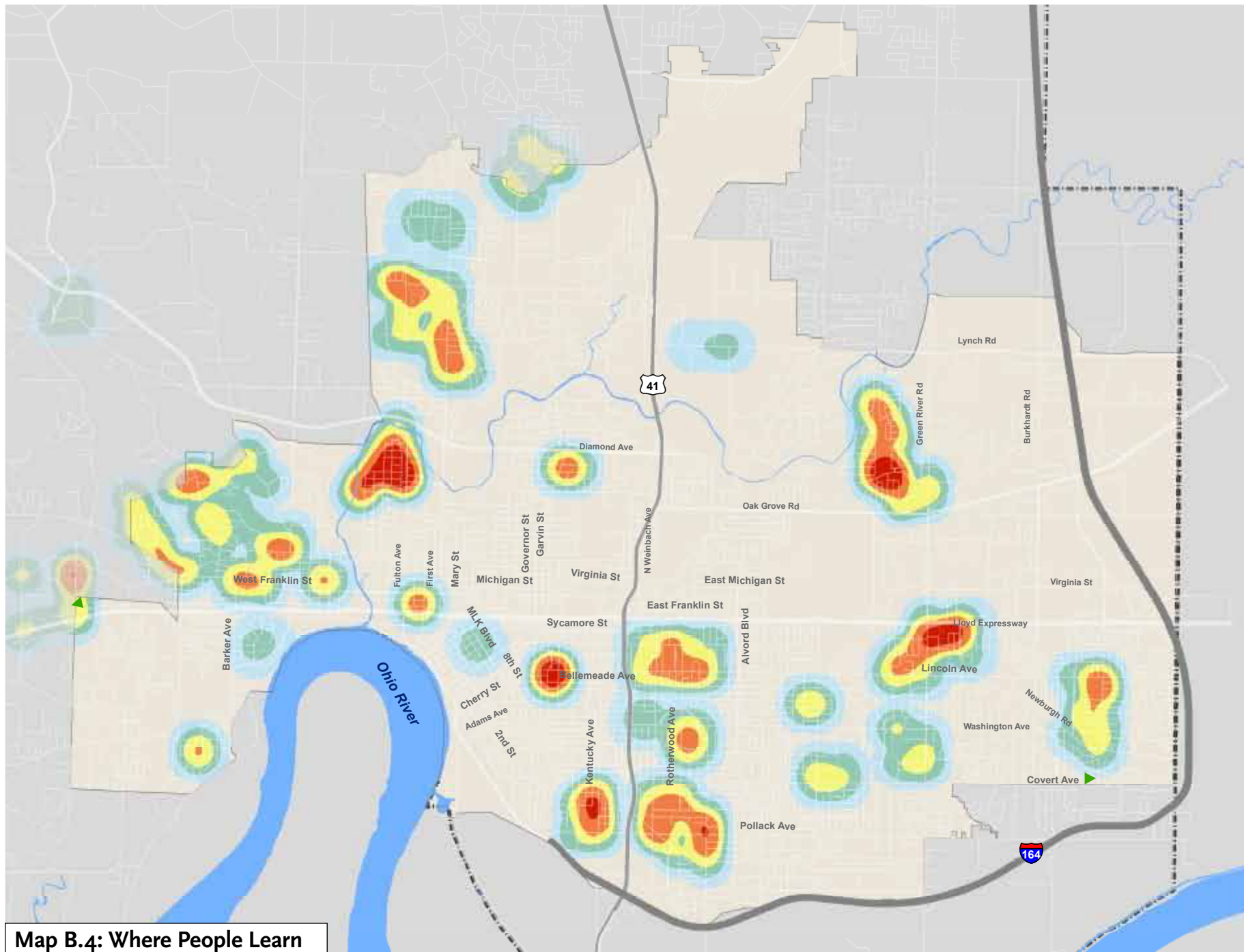


Map B.1: Where People Live

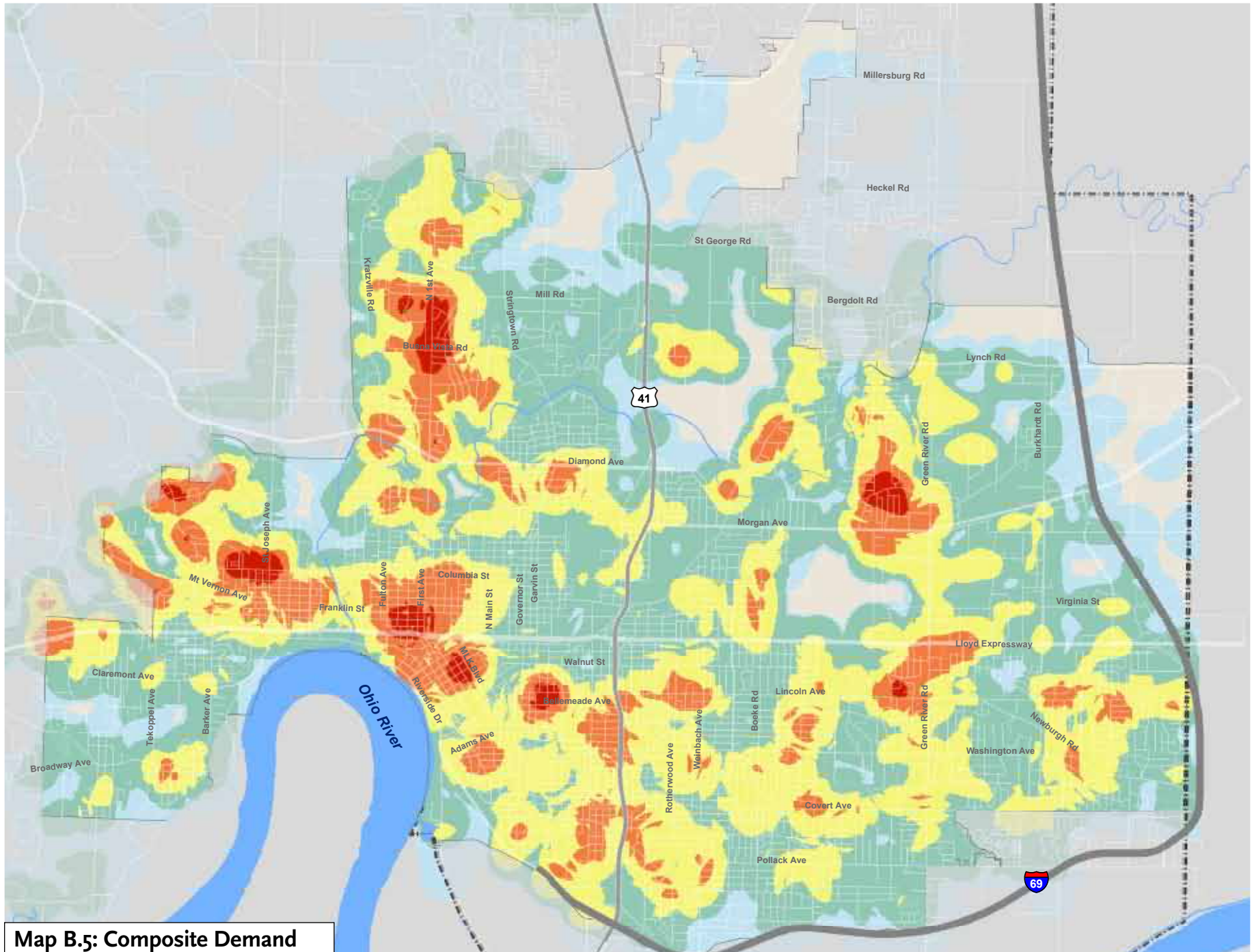




Map B.3: Where People Play



Map B.4: Where People Learn



Where People Learn

This category shows the locations of all school levels, from elementary schools to universities. The analysis reveals that school and university locations are evenly distributed throughout the community. Special attention will need to be given to schools or universities along major corridors that may act as barriers to walking and bicycling.

Composite Demand

The following map displays the composite demand for the live, work, play and learn factors. The analysis shows that there is a strong composite density in Downtown, North Park Shopping Center, and Mesker Park and Mesker Park Zoo areas. There is also strong demand in the Eastland Mall area, with strong commercial and recreation densities, pockets of residential densities, and educational facilities nearby. There is a strong linear connection along First Avenue from Downtown to the North Park Shopping Center area; this corridor is a strong preliminary candidate for upgraded pedestrian and bicycle facilities to connect the two areas.

It is important to note that this analysis also discovered areas of demand that are not being sufficiently served by the current pedestrian and bicycle facilities. To better represent this, a Pedestrian Suitability Index will be completed in the next iteration of this report to establish the reach of the park and greenway facilities and where the supply can be improved to match the current demand.

CONCLUSIONS

The Live, Work, Play Analysis for the Evansville Bicycle and Pedestrian Connectivity Master Plan provides a data-driven illustration of the demand for pedestrian and bicycling trips in the study area. The results demonstrate strong composite demand in downtown and in pocket areas along major corridors and recreation attractions.

This analysis, coupled with the Pedestrian Level of Service Analysis and Bicycle Level of Traffic Stress Analysis will establish a strong starting point for determining facility needs and guide prioritization of infrastructure investments.

C. PLOS / BLTS ANALYSIS

INTRODUCTION

This report details the methods and results of a Pedestrian Level of Service Analysis (PLOS) and Bicycle Level of Traffic Stress Analysis (BLTS) for the City of Evansville. Each analysis incorporates the recent research on factors that impact bicycle and pedestrian comfort and safety, and was tailored to the City of Evansville using the data available. Each model analyzed the full roadway network within Evansville excluding limited access highways, alleys, and service roads, to provide a full picture of connectivity around the city.

DATA SOURCES

The following data inputs were incorporated into the PLOS and BLTS analyses. Table C.1 displays each variable, its source, and notes on limitations of the available data and assumptions that were made.

Table C.1: Sources of Model Inputs

Model Input	Source	Notes
Posted Speed Limit	Evansville MPO	
AADT	Evansville MPO	Not available for all streets. Streets without data were analyzed without this input.
Number of Travel Lanes	Evansville MPO	Not available for all streets. Streets without data were assumed to contain two travel lanes.
Shared Lane Markings	Evansville MPO	
On-Street Parking	Evansville MPO / Aerial Photography	Assumption made that local roads allow parking, while arterials and collectors do not.
Sidewalks	Evansville MPO	

PEDESTRIAN CONDITIONS – LEVEL OF SERVICE ANALYSIS

Pedestrian Level of Service Analysis Methodology

A level of service was identified for each roadway segment in the study area, apart from limited access highways, alleys, and service roads. The selected segment-based Pedestrian Level of Service Analysis (PLOS) is rooted in the concept that a doubling of travel speed results in a four-fold increase in stopping time and resulting crash severity. According to one study, speed has the following impact on pedestrian fatalities .

- At 20 mph the odds of pedestrian fatality are 5%
- At 30 mph the odds of pedestrian fatality are 45%
- At 40 mph the odds of pedestrian fatality are 85%

While other studies have found some variation, these approximate numbers are reported consistently across the literature.

It is imperative that dedicated travel facilities are provided to create safe travel conditions for pedestrians. This PLOS analysis is based primarily on safety and does not consider factors of the built environment known to make walking an attractive and preferred form of transportation. While built environment factors are not explicitly considered, lower posted speeds and more dedicated pedestrian space will typically correlate with places people want to walk based on the surrounding land uses and urban form (e.g., residential neighborhoods and commercial uses in lower speed urban areas).

The segment-based Pedestrian Level of Service Analysis (PLOS) measures pedestrian safety using four factors: posted speed limit, roadway width (number of travel lanes), pedestrian buffer (on-street parking or bicycle lanes), and the presence of sidewalks. Table C.2 outlines the scoring methodology of the PLOS analysis. The PLOS follows a five-point scale, with 1 representing the highest comfort level.

Generally, more pedestrian space on a lower speed roadway segment correlates to a higher comfort level. Where sidewalks are only provided on one side of the roadway, pedestrian comfort degrades on multi-lane roadways since pedestrians are forced to cross more than two lanes of traffic to reach that sidewalk. Bicycle lanes or on-street parking act as buffers between pedestrians and motor vehicle traffic, increasing comfort.

Morgan Ave that have well-connected sidewalk networks, but these safe walking environments are segmented from one another by low comfort links.

Table C.2: Sources of Model Inputs

Pedestrian Space	Speed Limit (mph)					
	<= 25 mph		30 - 35 mph		>= 40 mph	
	2 lanes	> 2 lanes	2 lanes	> 2 lanes	2 lanes	> 2 lanes
Complete Sidewalk on both sides next to a buffer*	1	1	1	1	2	3
Complete sidewalk on both sides	1	1	2	3	3	4
Complete sidewalk on one side next to a buffer*	2	2	2	3	3	4
Complete sidewalk on one side	2	3	3	4	4	5
No dedicated space next to a buffer*	2	3	3	4	4	5
No dedicated space	2	3	4	5	5	5

*Bicycle lanes and/or on-street parking

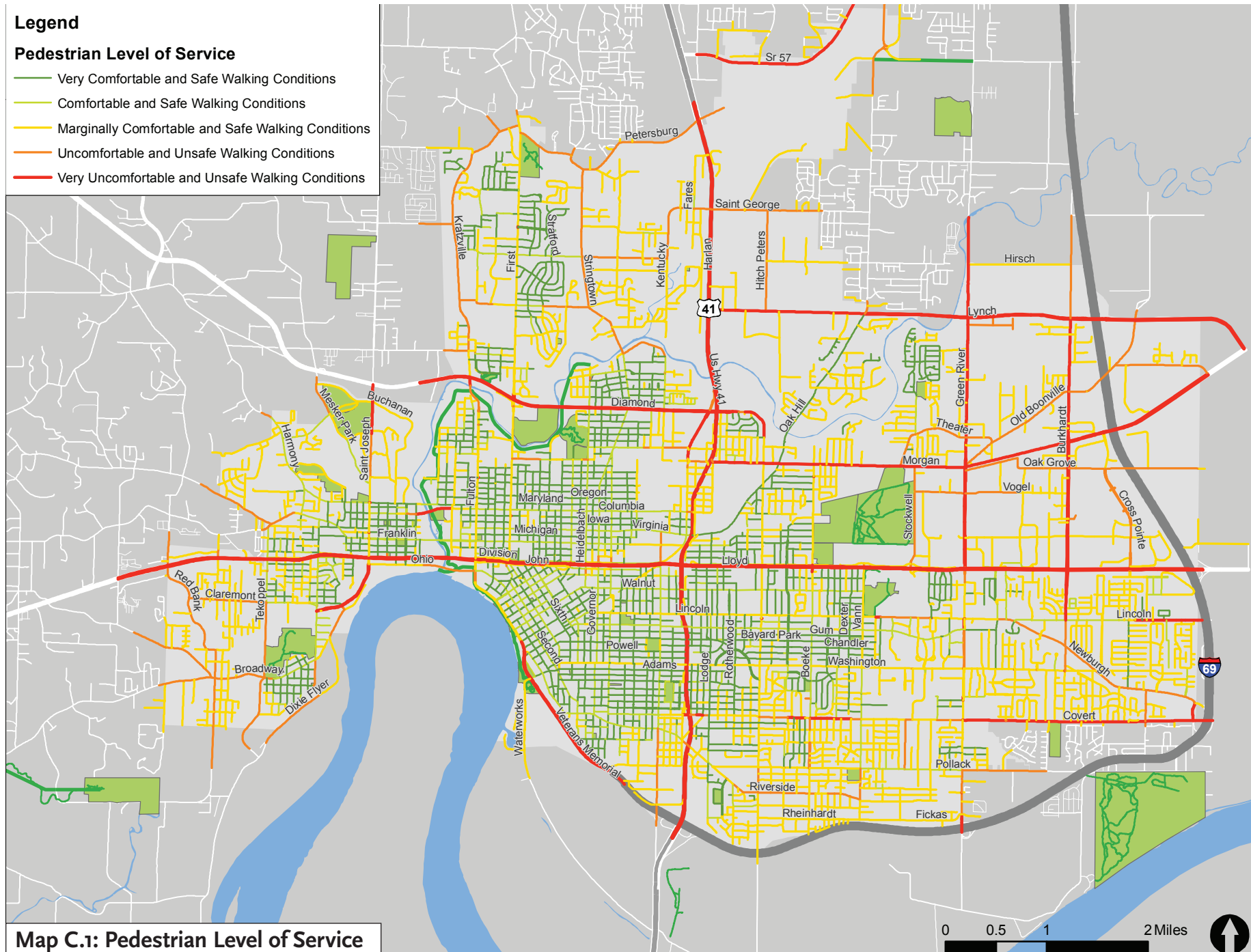
Pedestrian Level of Service Analysis Results

The results of the pedestrian segment-based supply analysis can be seen in Map C.3 on the following page. Low speed roadways with buffers and sidewalks, the links with the highest level of pedestrian comfort, are shown in dark green. Roads with a higher level of stress for pedestrians are shown in orange and red. The highest levels of comfort are found in the in Downtown Evansville and many surrounding neighborhoods, including Jacobsville, Center City, Ballard, Wheeler, Culver, Tepe Park, and Lamasco. This is largely due to the extensive sidewalk network in these areas, as well as the traditional grid street network, which allows pedestrians to incorporate low-volume residential streets into their travel routes. Collector and arterial corridors radiating from Downtown Evansville have medium levels of comfort due to sidewalks and moderate speed limits, but comfort decreases on major roadways further out as speed limits and numbers of lanes increase and sidewalk infrastructure disappears. In addition, many neighborhoods further from the city's core lack sidewalks altogether. There are scattered subdivisions north of Diamond Ave and

Legend

Pedestrian Level of Service

- Very Comfortable and Safe Walking Conditions
- Comfortable and Safe Walking Conditions
- Marginally Comfortable and Safe Walking Conditions
- Uncomfortable and Unsafe Walking Conditions
- Very Uncomfortable and Unsafe Walking Conditions



Map C.1: Pedestrian Level of Service

BICYCLE CONDITIONS - LEVEL OF TRAFFIC STRESS ANALYSIS

Introduction to Level of Traffic Stress

The methods used for the Level of Traffic Stress Analysis were adapted from the 2012 Mineta Transportation Institute (MTI) Report 11-19: Low-Stress Bicycling and Network Connectivity. The approach outlined in the MTI report uses roadway network data, including posted speed limit, number of travel lanes, and presence and character of bicycle lanes, as a proxy for bicyclist comfort level. Road segments are classified into one of four levels of traffic stress based on these factors. The lowest level of traffic stress, LTS 1, is assigned to roads that would be tolerable for most children to ride, and also to multi-use paths that are separated from motorized traffic; LTS 2 roads are those that could be comfortably ridden by the mainstream adult population; LTS 3 is the level assigned to roads that would be acceptable to current “enthused and confident” cyclists; and LTS 4 is assigned to segments that are only acceptable to “strong and fearless” bicyclists, who will tolerate riding on roadways with higher motorized traffic volumes and speeds. The definitions for each level of traffic stress are shown Table C.3.

Table C.3: Levels of Traffic Stress (LTS) Definitions. Source: Mineta Transportation Institute Report 11-19.

LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS3.

Level of Traffic Stress Plus Methodology

The Level of Traffic Stress analysis completed for the City of Evansville builds on the MTI approach, expanding it to incorporate the impact on comfort of traffic volumes and sharrows. The resulting categorization of each segment of Evansville’s road network is termed ‘Level of Traffic Stress Plus’, to highlight it’s divergence from the original model. Scoring in LTS Plus is based off of the four basic categories defined in the MTI report, but allows half points between each category to represent a more nuanced continuum of bicycle comfort for use in project prioritization. The scoring methodology is summarized in Table C.4.

Table C.4: Segment Scoring Matrix for Bicycle Level of Traffic Stress Plus.
1 = Highest Comfort Level

Number of Travel Lanes	Traffic Volume (AADT)	Shared Street			Street with Sharrows		Street with Bike Lane		
	<= 25 mph	Speed Limit							
	2 lanes	<= 20	30	>= 30	All Other	35	<= 30	35	>= 40
2 lanes (residential)	No data	1	2	3.5	See shared street	2	1	3	3.5
2-3 lanes	<=3k	1.5	2.5	3.5		2.5	1.5	2.5	3.5
	3k - 10k	2	3	4		3	2	3	4
	10k - 20k	3	3.5	4		3.5	2.5	3.5	4
	>20k	4	4	4		4	3	4	4
4 - 5 lanes	<=3k	2.5	3.5	3.5		3.5	2	2.5	3.5
	3k - 10k	3	4	4		4	3	3	4
	10k - 20k	3.5	4	4		4	3.5	3.5	4
	>20k	4	4	4		4	4	4	4
6+ lanes	All volumes	4	4	4			4	4	4

At its core, the LTS Plus scoring decreases comfort (1 is the highest comfort level) as the number of lanes, posted speed limit, and traffic volumes increase. Traffic volumes reduce comfort more where bicyclists share the road with motorized vehicles, but comfort also decreases in bicycle lanes as traffic volumes next to those bicycle lanes increase. Shared lane markings are scored to have a limited impact on comfort, reducing scores to the equivalent of a 30 mph roadway where they are marked on a 35 mph roadway, but otherwise having no impact on the comfort of a shared street environment.

Unsignalized crossings increase stress for cyclists along otherwise low-stress routes. An intersection level of service analysis was completed to identify difficult crossings. Crossing comfort decreases as the number of lanes and posted speed increase. While median refuges can reduce the stress of an unsignalized crossing, refuges were not included in this analysis because of insufficient data.

Table C.5: Intersection Scoring Matrix for Bicycle Level of Traffic Stress Plus.
1 = Highest Comfort Level

Number of Travel Lanes	Posted Speed Limit		
	<= 30 mph	35 mph	>= 35 mph
Up to 3 lanes	1	2	3
4 -5 lanes	2	3	4
6+ lanes	4	4	4

The results of this intersection level of service analysis were then used to refine the segment Bicycle Level of Traffic Stress Plus by identifying road segments that have higher levels of traffic stress at intersections than mid-block. In these instances, the lower score was assigned to the roadway segment, as it ultimately would lead cyclists to the higher-stress intersection.

Bicycle Level of Traffic Stress (LTS) Plus Analysis Results

The results of the Level of Traffic Stress Plus Analysis are shown in Map C.2 on the following page. Much of the network consists of disconnected clusters of moderately low-stress (LTS 2) streets, shown in yellow. Individually, these islands of low-stress streets are comfortable to ride for most adults, but they are isolated from one another by larger roads with higher traffic speeds that disrupt bicycle mobility. Both Highway 41 and Lloyd Expressway bisect the City of Evansville completely. Along with other arterial and collector roadways, including 1st Ave, Diamond Ave, Morgan Ave, Washington Ave, and Green River Rd, these busier, high-stress roads serve as barriers, reducing bicyclists' trip distance or causing many to travel by different means altogether. Not only do most bicyclists find it challenging to travel along these roadways, they also find it difficult to travel across them as well. The only bike lanes in Evansville are on Oak Hill Road from Highway 41 to Lynch Rd. This lack of dedicated space for bicyclists, particularly on arterial and collector roadways severely limits connectivity.

Connectivity Analysis

While major roadways act as barriers at unsignalized crossings, signals provide a connection for cyclists to move between low-stress neighborhood roadways. Map c.3 displays connected clusters of roadways that can be travelled without using any link or crossing with a level of stress higher than 2. In Downtown Evansville and surrounding neighborhoods where the road network was built in a grid pattern, a large low-stress network is accessible. The Pigeon Creek Greenway, Tekoppel Ave and Heidelberg Ave provide access across Lloyd Expressway, greatly extending the bicycle mobility to and from the central core, but barriers like Highway 41 to the east and Pigeon Creek and Diamond Ave to the north limit connectivity to neighborhoods and destinations further from the Downtown. Outside of this central core, however, low-stress roads have been built without connectivity across major roadways such as Lloyd Expressway (east of Highway 41), Morgan Ave, Stringtown Rd, Newburgh Rd, Lincoln Ave, and Tekoppel Ave, making travel between neighborhoods inaccessible to most adults. This display makes apparent the gaps in the bicycle network that could be targeted for improvements to create connected bicycling routes that are comfortable for the mainstream adult population. Along with improvements along high-stress corridors, safe crossing opportunities across those corridors will greatly increase bicycling mobility.

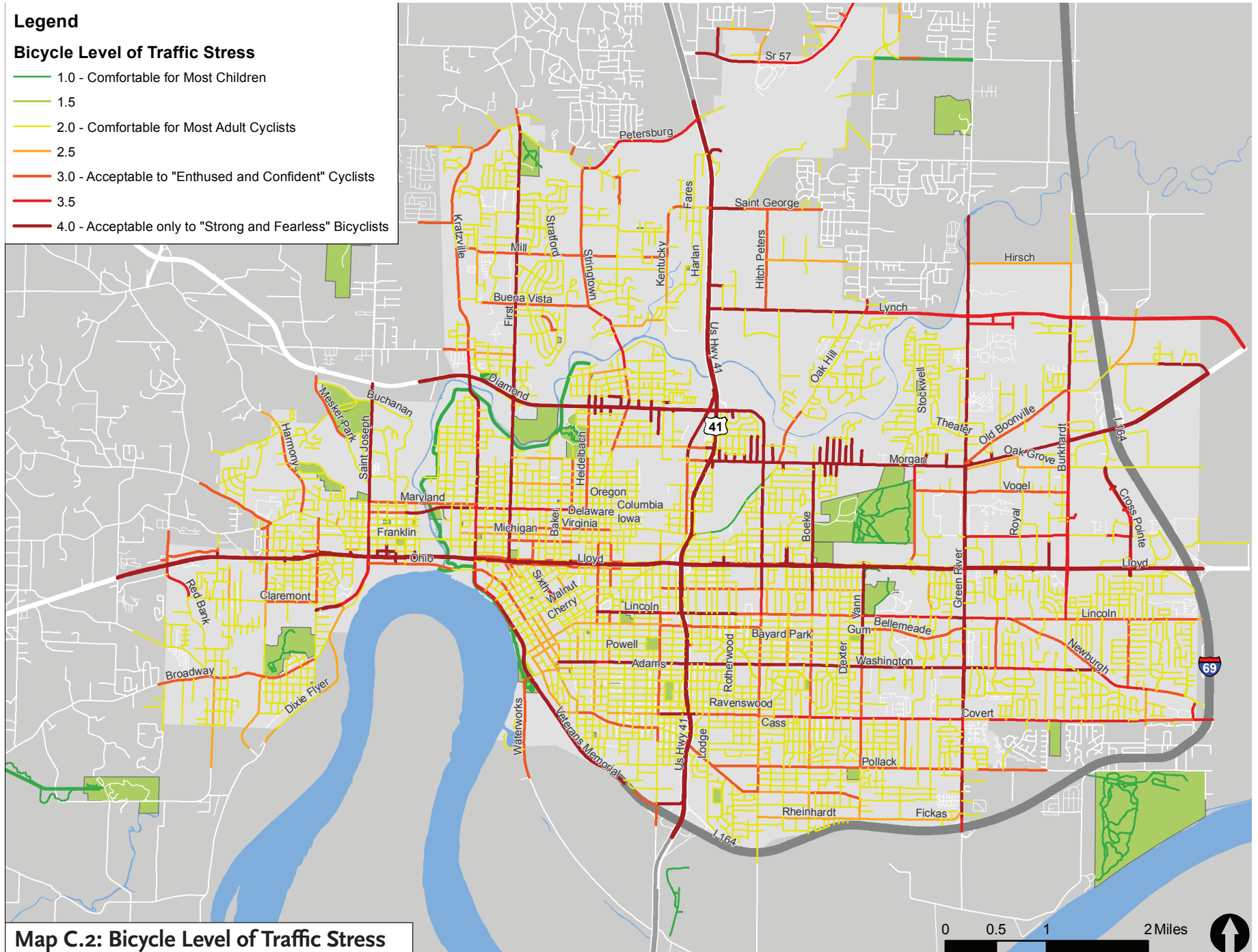
CONCLUSIONS

The pedestrian level of service analysis and bicycle level of stress analyses described in this memo provide a picture of the quality of infrastructure in the City of Evansville that serves bicyclists and pedestrians. Bicyclists and pedestrians enjoy a safer, more comfortable experience on local roads around the city core, due in large part to low motor vehicle speeds, contiguous sidewalks, and a high level of connectivity. However, arterial and collector roadways present challenges for non-motorized transportation. The results of these analyses will be used later in this planning process to inform the recommendations for new bicycle and pedestrian infrastructure to improve connectivity, safety, and comfort.

Legend

Bicycle Level of Traffic Stress

- 1.0 - Comfortable for Most Children
- 1.5
- 2.0 - Comfortable for Most Adult Cyclists
- 2.5
- 3.0 - Acceptable to "Enthusiased and Confident" Cyclists
- 3.5
- 4.0 - Acceptable only to "Strong and Fearless" Bicyclists



Map C.2: Bicycle Level of Traffic Stress

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D. BICYCLE AND PEDESTRIAN CRASH ANALYSIS

INTRODUCTION

Crashes with motor vehicles represent a significant threat, both real and perceived, to the safety of bicyclists and pedestrians. National and local surveys show that safety concerns are the most common reason people do not bicycle more often. Many bicyclists feel that motorists do not see them or are openly hostile to them on roadways, particularly at intersections. An examination of the debilitating impacts of crashes on bicyclists and pedestrians emphasizes the vulnerability of these road users. In 2012, bicyclists and pedestrians constituted less than 1% of all individuals in traffic collisions in Indiana, but 10% of all traffic fatalities. Similarly, only 0.2% of motor vehicle occupants involved in traffic collisions were killed, compared to 3.7% of all bicyclists and pedestrians.

Local traffic collision data can be a valuable source of information for identifying trends in bicycle and pedestrian crashes, understanding specific crash characteristics, and developing countermeasures to create a safer environment for non-motorized roadway users. This section of the Plan summarizes reported crashes in Vanderburgh County that involved bicyclists and pedestrians between 2009 and 2013.

Certain caveats are necessary when interpreting crash data. First, bicycle crashes, and in particular incidents that do not result in serious injury, are generally considered to be significantly under-reported. A Street or intersection that did not experience a crash during the analysis period is not an indication that people are not bicycling or walking there, nor is it evidence that the area does not present hazards to bicycling or walking. Crash data also do not take into consideration “near misses”, which characterize conditions at many high-risk locations without reported incidents. Second, in the absence of bicycle, pedestrian, and vehicle counts, there is no way to measure “exposure” to crashes, defined as crashes per mile traveled. For example, consider two streets that experienced the same number of crashes but different cyclist volumes. The street with greater bicycle traffic is likely to be less dangerous than the street that saw the same number of crashes despite seeing little bicycle traffic (measured by crashes per bicyclist or crashes per miles traveled).

Third, coding of crash data may be inaccurate, incomplete, or biased, which can limit the explanatory power of the data.

BICYCLE CRASHES

One hundred and forty-five bike-related collisions were reported in Vanderburgh County from 2009 to 2013. Of these 145 collisions, more than 90% occurred in the City of Evansville. One hundred and sixteen resulted in injury, and five resulted in a fatality. These crashes are further analyzed below to identify common themes that can influence the development of recommendations for capital improvements and programs to make bicycling a safer, more enjoyable option for transportation and recreation.

Crashes by Month, Day of Week, Time

Figure D.1 through Figure D.3 show reported bicycle crashes by month, day of the week, and time of day, respectively. As shown in Figure D.1, the greatest number of crashes were reported in summer months, with the frequency of reported incidents peaking in August and falling off in September. This is consistent with observed patterns of bicycle use in Evansville, which peaks between Memorial Day and Labor Day and roughly coincides with summer vacation and increased activity downtown and throughout the park system.

Figure D.2 shows the frequency of reported crashes by day of the week. Crashes were most frequently reported on Wednesday and Friday, while the fewest crashes were reported on Sunday and Monday. Anecdotally, the rise in bicycle crashes during the latter half of the week may correlate to an increase in bicycle trips made for commuting, social, and recreational trips. This trend can be confirmed in Evansville with the development of a bicycle count program which quantifies the number of weekday and weekend cyclists.

The reported bicycle collisions occurred most frequently during the afternoon hours; more than half of all crashes occurred between 1 PM and 6 PM (Figure D.3), and more than one in every four bicycle crashes occurred between 4 PM and 6 PM. This

Figure D.1: Bicycle Crashes by Month

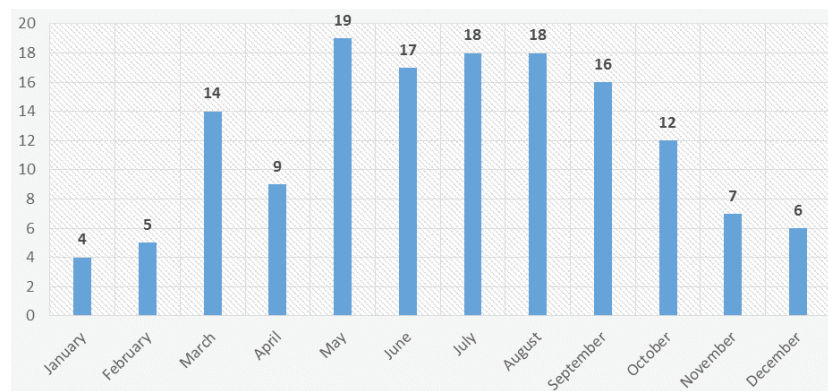


Figure D.2: Bicycle Crashes by Day of the Week

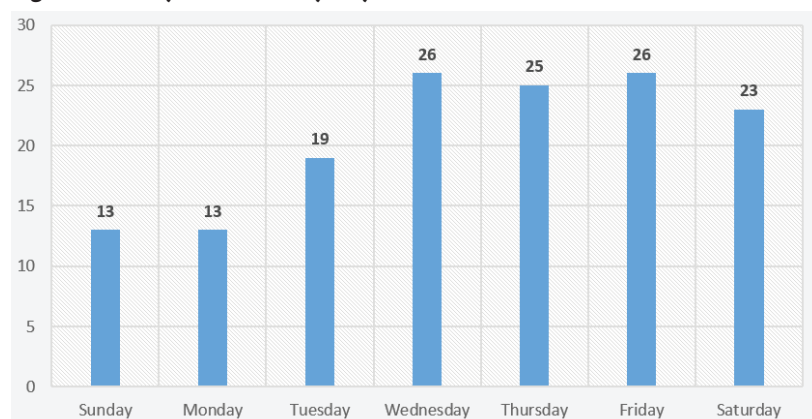
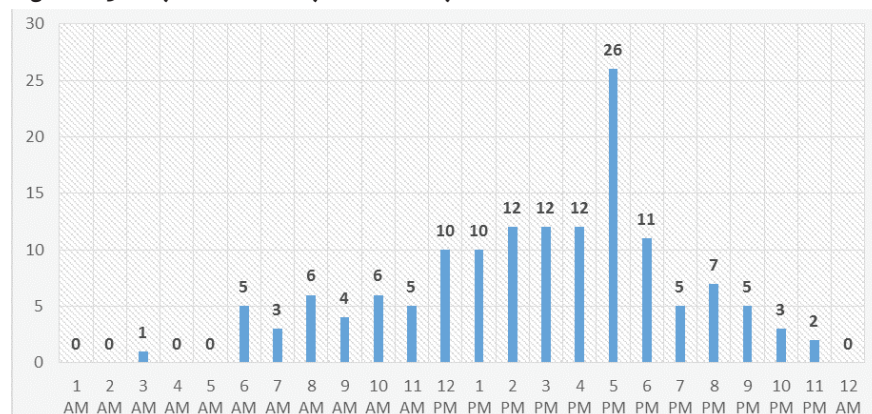


Figure D.3: Bicycle Crashes by Time of Day



late afternoon spike in reported crashes roughly correlates with the evening work commute, as well as children traveling home from school. The Evansville MPO's reported cyclist crash database does not contain age information, so it is not possible to compare the age of crash victims. There was only one crash reported between midnight and 6 AM.

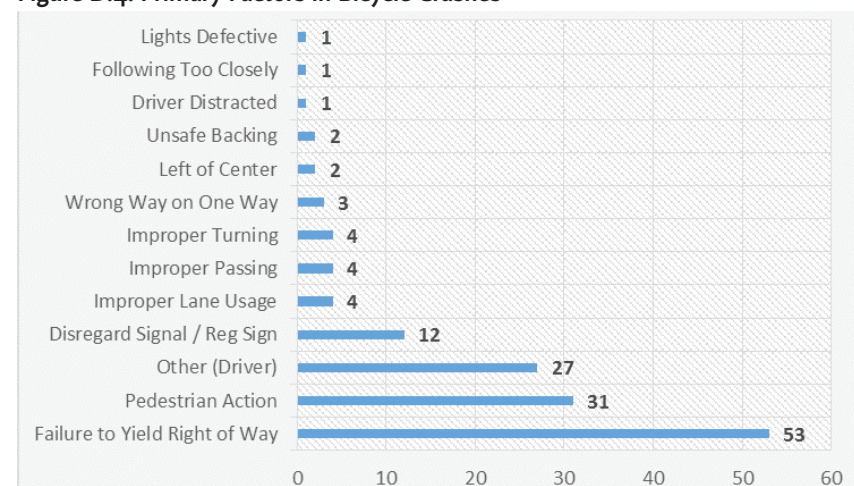
Crash Characteristics

The detailed information collected by law enforcement agencies for each reported crash can be instrumental in determining countermeasures and solutions for reducing future risk of collisions between bicyclists and motor vehicles. By analyzing crashes by primary factors and crash type, the City of Evansville can identify common characteristics and trends among the data and pursue education programs or capital improvements to positively influence bicyclist and motor vehicle driver behavior.

Of more than fifty primary factors from which a reporting officer can choose when detailing a crash, failure to yield right of way was the most frequently cited primary cause of bicycle crashes, accounting for 37%. Other commonly cited primary causes included pedestrian (bicyclist) action, other (driver), and disregarded signal or regulatory sign, as shown below in Figure D.4.

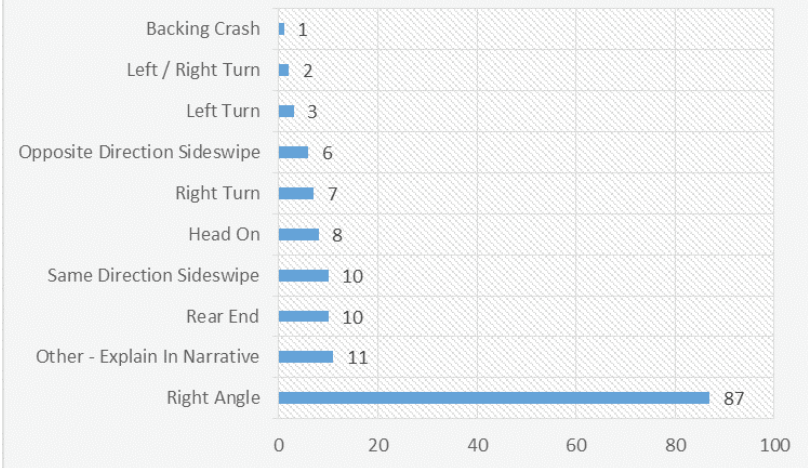
While the responsible party is not identified in the data, some crash types can be more readily attributed to bicyclist behavior, such as left of center and wrong way on a one way road. These behaviors can be reduced through targeted education classes and outreach campaigns that aim to provide bicyclists with the proper knowledge to safely and effectively travel on the road.

Figure D.4: Primary Factors in Bicycle Crashes



Bicycle crash type data indicates the manner in which the bicyclist(s) and vehicle(s) collided. As seen in the Figure D.5 below, right angle crashes constitute 60% of all bicycle crashes. Eighty-two percent of these right angle crashes occurred at intersections (not pictured). Other common crash types included rear end crashes, same direction sideswipe crashes, and head on crashes. However, it should be noted that no other bicycle crash type represented more than 10% of all bicycle crashes.

Figure D.5: Primary Factors in Bicycle Crashes



Reported Crash Locations

Map D.1 on the following page shows the locations of reported crashes in Evansville. In the absence of bicycle count data, crash location data can provide some insight regarding roadways commonly used by bicyclists. The geographic distribution of bicycle collisions correlates to both population density and street network density. Heavier concentrations of bicycle collisions are located in the neighborhoods immediately north and east of downtown, where the traditional neighborhood street grid and a mixture of land uses encourage bicycle transportation. These crashes are distributed among local, collector and arterial roadway types. Further from the urban core, suburban development patterns limit local connectivity and impel cyclists to ride on or cross higher volume, higher speed roadways. Crash data reflects this shift in bicyclists' route options, as the majority of bicycle crashes occur on arterials and collectors, including Green River Rd, Covert Ave, Washington Ave, and Morgan Ave.

Table D.1 lists roadway corridors on which five or more crashes occurred. The number of crashes for each roadway listed includes crashes in which a particular roadway was listed as the road on which the crash occurred, or listed as the nearest intersecting roadway.

Table D.1. High-Frequency Bicycle Crash Roadways in Evansville 2009-2013

Roadway	Classification	Number of Crashes
Fulton Ave	Minor Arterial	14
Washington Ave	Minor Arterial	10
First Ave	Minor Arterial	9
Covert Ave	Minor Arterial	7
Columbia St	Minor Arterial	7
Garvin St	Minor Arterial	7
Virginia St	Major Collector	7
Diamond Ave	Principal Arterial / Major Collector	6
US Hwy 41	Principal Arterial	6
Main St	Major Collector	6
Division St	Local	5
Franklin St	Minor Arterial / Major Collector	5
Governor St	Minor Arterial	5
Green River Rd	Minor Arterial	5
Weinbach Ave	Minor Arterial	5

The roadways with the highest frequency of bicycle crashes were Fulton Ave (14 crashes), Washington Ave (10), and First Ave (9). Fourteen of the fifteen roadways on which five or more crashes occurred are functionally classified as either principal arterials, minor arterials, or major collectors, labels applied to roadways to specify their importance within the roadway network. This indicates that many bicyclists either choose to ride on these roadways for their directness, or must ride on these roadways due to a lack of feasible parallel alternatives.

When the data is further extrapolated by location along the roadway, it becomes clear that the majority of bicycle crashes occur at intersections. Figure D.6 identifies the type of roadway junction at which all bicycle crashes occurred. Fifty-two percent of these crashes occurred at four-way intersections, while an additional 20% occurred at T-intersections. In comparison, bicycle crashes in which no junction was involved account for 27% of all bicycle crashes.

Legend

Bicycle Crash Locations



Fatal Crash



Non-Fatal Crash

Existing Facilities

Shared Use Path / Greenway



Trailheads

Park or Forest Trail

Bike Lane

Signed Route

Signed and Marked Route

Previously Planned Facilities

Greenway - Long Range

Greenway - In Design

Bike Lane

Signed / Marked Route

Hi-Rail Connector Alternatives

Proposed Multi-modal Connector

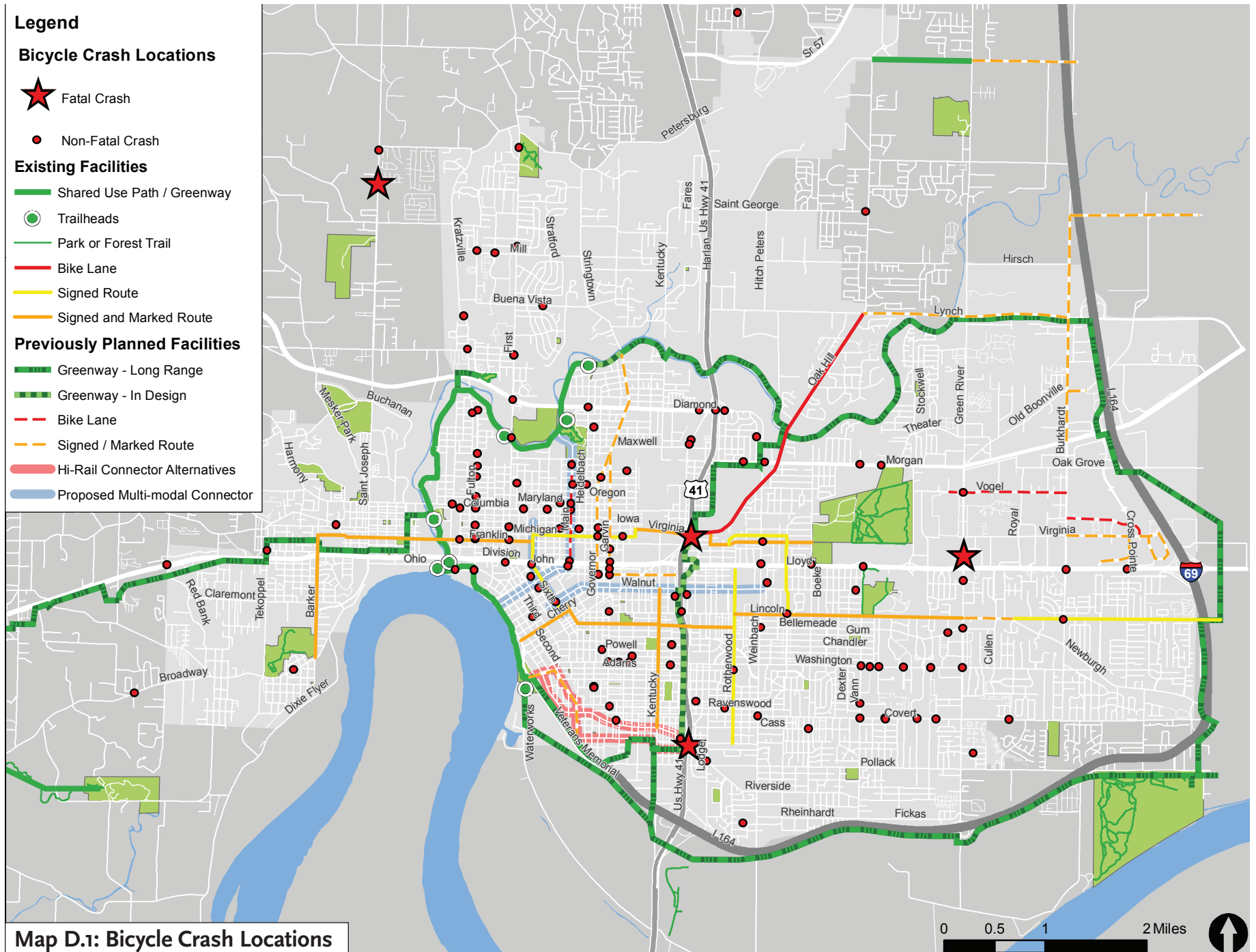
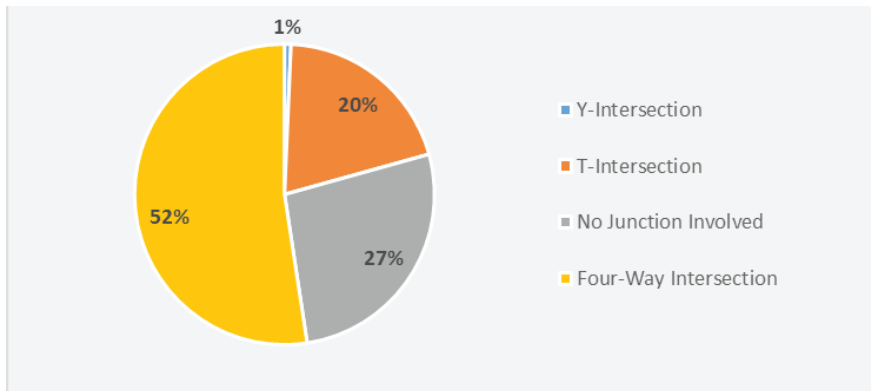


Figure D.6: Bicycle Crashes by Roadway Junction Type



These figures are generally consistent with national bicycle crash research, which shows that the most commonly reported bicycle/vehicle crashes occur at major arterial intersections. Given the volume of traffic, number of turning movements, and potential conflict points that a bicyclist may encounter at an intersection, especially when compared to a roadway segment between intersections, it is imperative that bicycle facilities consider and address approaching and through movements at intersections in order to provide the greatest awareness, predictability, and most importantly, safety for all road users.

While the higher number of reported collisions on arterial and collector roadways create compelling case for bicycle safety improvements, especially at roadway intersections, consideration of improvements should not be limited to only these roadway types. Where local roadways provide a suitable, parallel alternative to arterial and collector roadways, these lower volume, lower speed roadways should be considered for the development of shared roadways such as bicycle boulevards, which provide a safe and comfortable experience for bicyclists of varying levels of skill and experience.

PEDESTRIAN CRASHES

Data for pedestrian crashes involving motor vehicles from 2009-2013 was provided by the Evansville MPO early in the planning process. It is important to note that not all pedestrian-related crashes are reported to the police, and only reported crashes are included in this evaluation. A total of 187 pedestrian-related crashes occurred in Vanderburgh County during this five-year period. Of these 187 crashes, 173 were located within the City of Evansville. One hundred and seventy-one crashes resulted in injury, 25 in incapacitating injury, and six resulted in a fatality. Five of the six fatal crashes occurred in Evansville.

Crashes by Month, Day of Week, Time

Figures D.7 through D.9 show reported pedestrian crashes by month, day of the week, and time of day, respectively. As shown in Figure D.7, the greatest number of pedestrian crashes were reported during the mild weather months of spring and fall, with May and October, with the frequency of reported incidents peaking in the month of October. The lowest number of crashes were reported during the winter months of December, January and February.

Figure D.8 shows the frequency of reported crashes by day of the week. Crashes were most frequently reported on Wednesday and Friday, with one in every four pedestrian crashes occurring on Friday, the day on which weekday traffic patterns overlap with weekend social activities, thereby increasing the potential for pedestrian-auto crashes. The fewest crashes were reported on Sunday and Tuesday.

A time-of-day analysis reveals that at least one pedestrian crash was reported in each hour of the day, though crashes occurred most frequently during the afternoon and early evening hours. More than half of all crashes occurred between 2 PM and 7 PM (Figure D.9), and nearly one in every three pedestrian crashes occurred between 5 PM and 7 PM. This late afternoon spike in reported crashes coincides with school dismissal and the evening work commute, times of the day during which higher numbers of both pedestrians and motorists are moving about the community.

Crash Characteristics

Law enforcement agencies responding to crashes throughout Vanderburgh County collect a variety of information to provide a detailed and accurate account of the crash, determine primary and contributing factors, and document the testimony of those involved and of those who witnessed the crash. This information can then be used to determine patterns in motorist or pedestrian behavior, analyze crash characteristics, and identify countermeasures to address high-crash locations or

Figure D.7: Pedestrian Crashes by Month

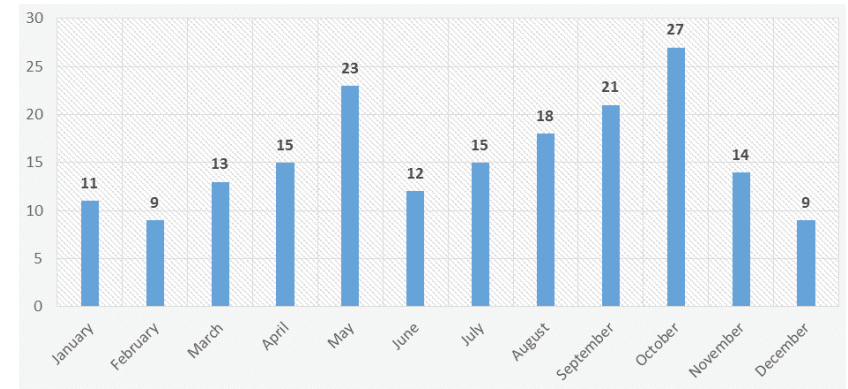


Figure D.8: Pedestrian Crashes by Day of Week

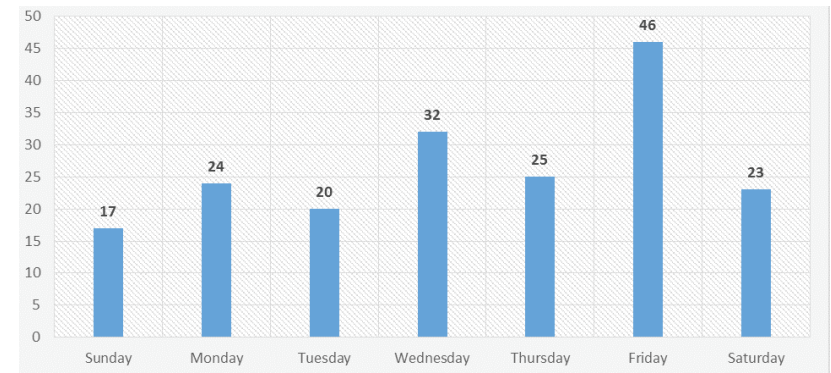
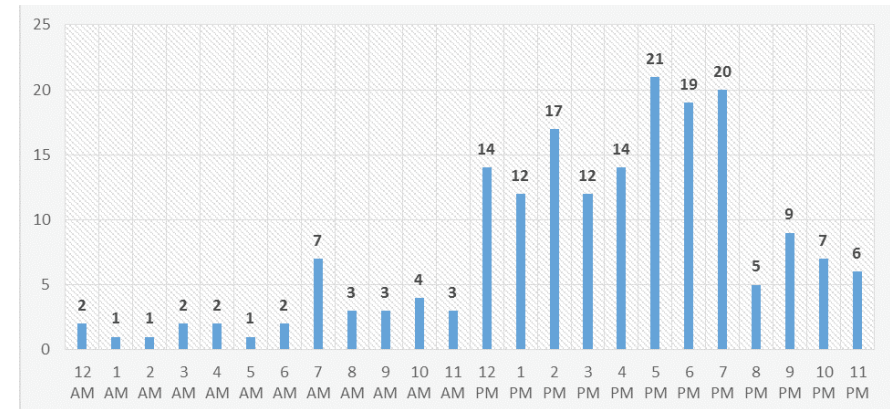


Figure D.9: Pedestrian Crashes by Time of Day



corridors, such as safer pedestrian crossings, targeted speed enforcement, traffic calming measures, and other improvements.

The Indiana Officer's Standard Crash Report lists more than fifty circumstances, or factors, that can contribute to a crash. These factors are categorized into driver (including pedestrian and bicyclist), vehicle, and environment contributing factors, as shown in Figure D.10. One of these driver factors is "influenced by pedestrian action," labeled on the crash report as "pedestrian's action." Unfortunately, without data regarding responsible party, it is difficult to ascertain who is responsible, the pedestrian or the motor vehicle driver. While specific pedestrian actions influencing the driver's movements or decisions are not listed for a reporting officer to choose from, the form does include fields in which the officer can select typical pedestrian actions like walking, standing, or getting out of a vehicle, to describe their activity at the time of the crash. This information is frequently included in the officer's narrative as well; however, full narratives were not included in the dataset used for this study.

Figure D.10: Indiana Officer's Standard Crash Report, Contributing Factors Section

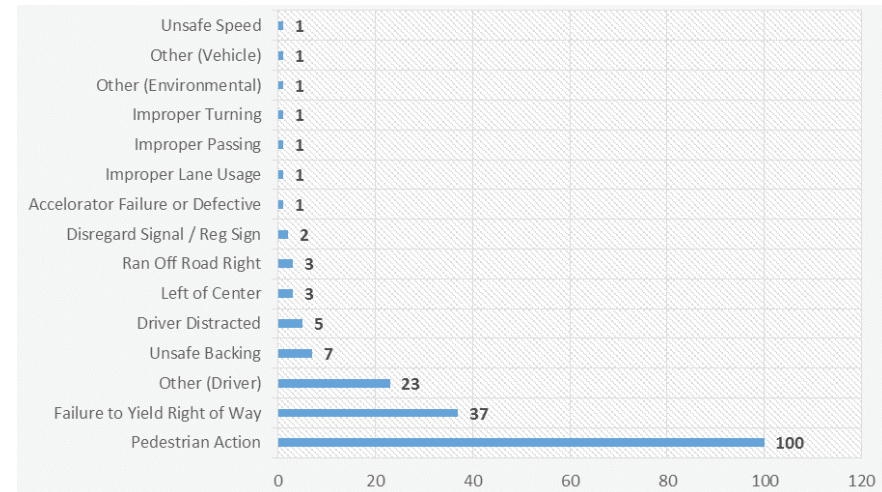
Primary Cause	Vehicle 1	Vehicle 2	Vehicle 3	Vehicle 4	Driver Contributing Circumstance
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Alcoholic Beverages
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Illegal Drugs
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Prescription Drugs
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Driver Asleep or Fatigued
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Driver Illness
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Unsafe Speed
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Failure to Yield Right of Way
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Disregard Signal/Regulatory Sign
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Left of Center
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Improper Passing
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Improper Turning
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Improper Lane Usage
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Following Too Closely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Unsafe Backing
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Overcorrecting/Oversteering
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Ran off Road
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Wrong Way on One Way
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Pedestrian's Action
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Passenger Distraction
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Violation of License Restriction
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Jackknifing
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Cell Phone Usage
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Other Telematics in Use
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Driver Distracted (Explain in Narrative)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Speed Too Fast for Weather Conditions
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Other (Explain in Narrative)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> None

Primary Cause	Vehicle 1	Vehicle 2	Vehicle 3	Vehicle 4	Vehicle Contributing Circumstance
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Engine Failure or Defective
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Accelerator or Failure or Defective
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Brake Failure or Defective
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Tire Failure or Defective
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Headlights(s) Defective or Not On
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Other Lights Defective
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Steering Failure
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Window/Windshield Defective
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Oversize/Overweight Load
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Insecure/Leaky Load
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Tow Hitch Failure
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Other (Explain in Narrative)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> None

Primary Cause	Vehicle 1	Vehicle 2	Vehicle 3	Vehicle 4	Environment Contributing Circumstance
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Glare
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Roadway Surface Condition
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Holes/Ruts in Surface
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Shoulder Defective
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Road Under Construction
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Severe Crosswinds
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Obstruction Not Marked
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Lane Marking Obscured
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> View Obstructed
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Animal/Object in Roadway
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Traffic Control Inoperative/Missing/Obscured
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Utility Work
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> Other (Explain in Narrative)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> None

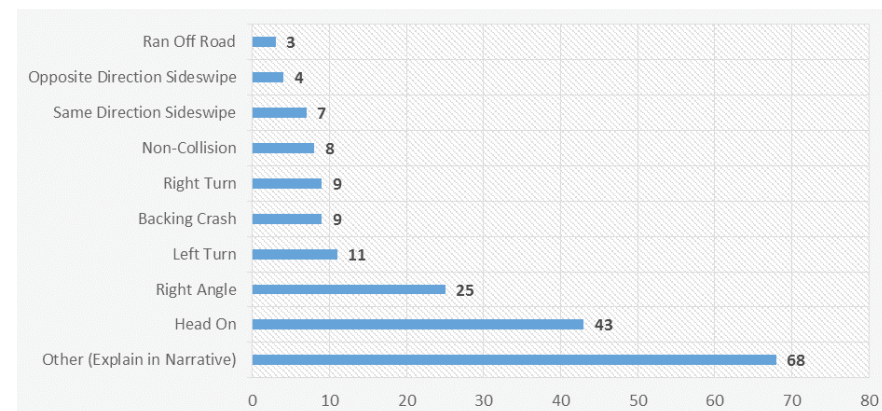
The influence of pedestrian action on responsible vehicle driver accounted 100 (53%) pedestrian crashes in Vanderburgh County from 2009 to 2013. Other frequent primary factors include failure to yield right of way (20%), unsafe backing (4%), and distracted driving (3%). All primary factors for pedestrian crashes are listed in Figure D.11. Primary factors not attributable to driver or pedestrian circumstances, such as accelerator failure or animal in the roadway, accounted for only three crashes.

Figure 11: Primary Factors in Pedestrian Crashes



The crash report form lists twelve possible crash types, with an additional option for "other" crash types. Pedestrian crashes by crash type are shown below in Figure D.12. Aside from "Other", the most common crash types involving pedestrians are head on crashes (23%), right angle crashes (13%), and left turn crashes (6%).

Figure D.12: Pedestrian Crash Types



Legend

Pedestrian Crash Locations

● Non-Fatal Crash

★ Fatal Crash

Existing Facilities

— Shared Use Path / Greenway

— Sidewalk

— Park or Forest Trail

○ Trailheads

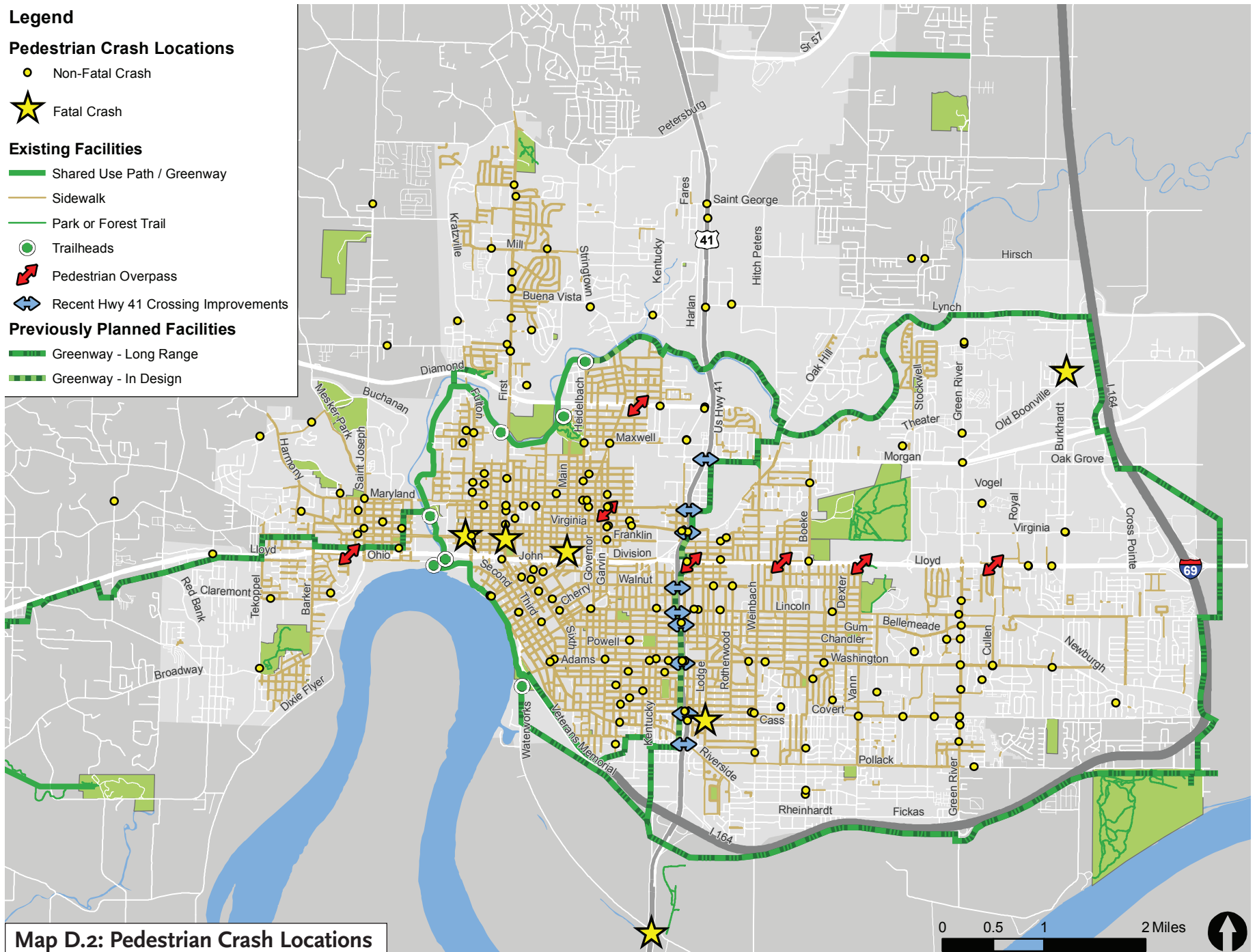
↗ Pedestrian Overpass

↔ Recent Hwy 41 Crossing Improvements

Previously Planned Facilities

— Greenway - Long Range

— Greenway - In Design



Reported Pedestrian Crash Locations

The map on the following page displays all 173 pedestrian crashes reported from 2009 to 2013 in the City of Evansville. Table D.2 contains a listing of pedestrian-auto crash locations and crash frequencies. The crash locations are similar to those for bicycle crashes, with the majority occurring in the more dense neighborhoods north and east of Downtown. Farther from the urban core, most pedestrian crashes are located along collector and arterial roadways such as First Ave, Green River Rd, and even US Hwy 41.

Table D.2 lists roadway corridors on which five or more pedestrian crashes occurred. Only four roadways saw more than ten crashes: Washington Ave, and First Ave, US Hwy 41, and Green River Road.

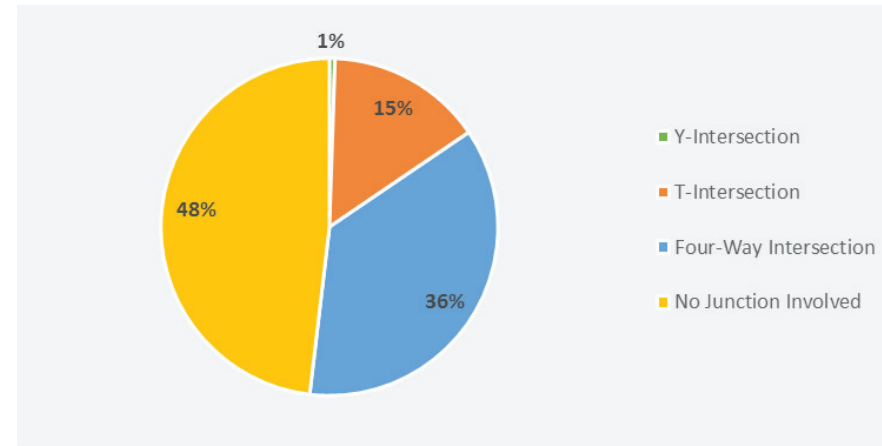
Table D.2. High-Frequency Pedestrian Crash Roadways in Evansville 2009-2013

Roadway	Classification	Number of Crashes
Washington Ave	Minor Arterial	17
First Ave	Minor Arterial	14
US Hwy 41	Principal Arterial	14
Green River Rd	Minor Arterial	13
Covert Ave	Minor Arterial	9
Virginia St	Major Collector	9
Columbia St	Minor Arterial	8
Garvin St	Minor Arterial	8
Franklin St	Minor Arterial / Major Collector	6
Lincoln Ave	Minor Arterial	6
Fourth St	Minor Arterial / Local	5
Fulton Ave	Minor Arterial	5
Lloyd Expy	Principal Arterial	5
Riverside Dr	Principal Arterial / Minor Arterial / Major Collector	5

Further analysis of pedestrian crashes by roadway junction type shows that just over half of all pedestrian crashes occur at intersections, as displayed in Figure D.13. Thirty-six percent of all crashes occurred at a four-way intersection, while an additional 15% occurred at a T-intersection, again emphasizing the intrinsic characteristics of intersections that increase risk for pedestrian crashes, including turning movements and potential conflict points between pedestrians and motor vehicles.

Equally important are the 48% of crashes that occur where no junction is involved. This crash type can be due to pedestrians crossing the road outside of a designated crossing area, pedestrians walking along the roadway, motor vehicles turning onto or from the roadway into private drives, and other contributing actions or factors.

Figure D.13: Pedestrian Crashes by Junction Type



In order to function effectively, a pedestrian system relies on safe, continuous pedestrian facilities, including sidewalks, street crossings, and other paths and trails. Where gaps are present in the system, pedestrians are presented with difficult and often dangerous situations that increase the potential for conflict with automobiles. Addressing these gaps, both along more heavily-traveled pedestrian corridors and across major intersections, can have a significant impact on the safety, accessibility and connectivity of the pedestrian system.

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E. CODES AND ORDINANCES EVALUATION

INTRODUCTION

The Evansville region is supporting a vision toward a more bikeable and walkable environment to varying degrees in comprehensive planning, Complete Streets policies, trails and greenway plans, and development codes related to urban design. The City's municipal code was reviewed for a variety of urban environment elements including sidewalks, bicycle facilities, urban forms such as setbacks, block lengths, parking regulations, streetscape standards, connectivity and bicycle parking. The following tables provide a comprehensive inventory of bicycle and pedestrian-related codes and compare these regulations to best practices from peer cities across the United States in order to recognize strengths and identify opportunities for improvement.

Table E.1: Definitions

Topic	City of Evansville Code	Comments / Recommendations	Peer City Example
1.1. Does "Street" definition include pedestrian and cyclist reference?	YES, for pedestrians and vehicles, but does not specifically mention bicycles in Code.. "Street, public" means a street dedicated, owned, and maintained by a public entity for the purpose of vehicle and pedestrian access.	Incomplete: Definition of a street should include consideration for pedestrian and bicycle traffic and safety.	Portland, OR A right-of-way that is intended for motor vehicle, pedestrian or bicycle travel or for motor vehicle, bicycle or pedestrian access to abutting property.
1.2. Definition of Sidewalk	"Sidewalk" means that portion of a street between the curb lines, or the lateral lines of a roadway, and the adjacent property lines, intended for the use of pedestrians.	Incomplete: Definition should mention surface type. For example: "Sidewalks have a hard, smooth surface (e.g., concrete), with separation from the roadway, typically consisting of a curb and/or planter strip."	Boulder's definition: that portion of the sidewalk areas paved or otherwise improved, designed, or ordinarily used for pedestrians and every such walk parallel and adjacent to a roadway, and every other paved exterior walkway publicly maintained.
1.4 Definition of Traffic	"Traffic" means pedestrians, ridden or herded animals, street cars, vehicles, and other conveyances either singly or together while using any highway for purposes of travel.	Good: The traditional definition of traffic included motor vehicles only. All modes of travel are "traffic"; terminology and policy language should reflect this.	Boulder is the only peer city with a definition: "Traffic" means pedestrians, ridden or herded animals, and vehicles, either singly or together, while using any street for purposes of travel.

Table E.2: Street Elements and Configuration

Topic	City of Evansville Code	Comments / Recommendations	Peer City Example
2.1. Pedestrian facilities (sidewalks, crosswalks, etc. required during new or redevelopment)	Requires sidewalks in new development and does not specify that it can be on only one side of the street. Some waivers are allowed depending on lot size and on streets not meeting threshold for "connector" or "arterial"	Incomplete: Pedestrian travel is accommodated and enhanced by walkways, traffic signals, crosswalks, curb ramps, etc. The waiver for streets below arterial or collector status should be evaluated. Sidewalks are crucial on neighborhood streets in most conditions.	Ann Arbor requires sidewalks on both sides of all public streets in new developments. There is no mention of waivers in the City's street design standards.
2.2. Bicycle facilities (bike lanes, shoulders, parking, etc.) required during new or redevelopment	No requirement found. Bicycles not mentioned anywhere in subdivision or development code. MPO Complete Streets Policy does include bicycles for projects using federal funds.	Needs improvement: Generally, as traffic volumes exceed 3,000 vehicles per day and traffic speeds exceed 25mph, facilities to separate bicycle and motor vehicle traffic are recommended. Multi-lane roads are typically more dangerous for all users because of the increased traffic volume, the potential for higher speeds, and the additional number of conflict locations due to turning vehicles."	Ann Arbor requires bike facilities in new development as directed by bicycle coordinator or other City leaders. Eugene requires bike lanes on arterials and collectors. Boulder requires new development to adhere to adopted bike/ped plans with limited exceptions.
2.3. Sidewalks or bike facilities required by roadway type	States that roads and streets must conform to the thoroughfare plan, but that plan doesn't mention bicycle or pedestrian accommodations.	Needs improvement: A better standard would be one that requires or provides sidewalks on both sides of all collector and arterial streets and on at least one side of local streets where warranted by density and/or system connectivity.	Ann Arbor defers to the AASHTO Bikeway Guide and Canadian Guide for Sustainable Transportation. Eugene's Public Improvement Design Standards include bike/ped specifications for different roadway conditions.
2.4. New sidewalks, bike facilities, greenways, etc. connect to existing facilities	None found.	Needs improvement: Connectivity is critical, especially since bicyclists and pedestrians operate under human-power, and circuitous routes can discourage bicycling and walking.	Boulder works to ensure that commercial, public, and mixed-use and multi-unit residential sites provide direct, safe and convenient internal bicycle circulation oriented along the line of sight from external connections to areas near building entrances and other on-site destinations.
2.5. Block size	Sets minimum block length at 1,320 feet.	Incomplete: Development density should determine the length of a block, with shorter blocks being more appropriate in areas of higher density. Maximum block length in any situation should not exceed 800-1000 feet	The City of Eugene reduced their block length minimums from 1,200 feet to 600 feet to reflect block lengths in their older neighborhoods.
2.6. Dead-end streets or cul-de-sacs	Does not explicitly discourage cul-de-sacs but limits them to 1,200 linear feet unless approved by APC.	Incomplete: Dead end streets or Cul-de-sacs, while good at limiting vehicular traffic in an area are a severe hindrance to connectivity for pedestrian and bicycle users. Consider requiring other traffic calming measures that allow for connectivity.	The City of Charlotte banned the use of cul-de-sacs in 2003, and in 2006 developed a program for identifying and reconnecting discontinuous links between communities, either by trail connection or the development of new roadways.

Table E.3: Bicycle and Pedestrian-Friendly Building and Site Design Standards

Topic	City of Evansville Code	Comments / Recommendations	Peer City Example
3.1. Reduced vehicle parking minimums and maximums	Sample: Restaurant - 1 space per 3 seats; Bar - 1 per 2; supermarket 1 or 1.5 per 200 sq ft; multi-family housing - 1 per 1 bedroom.	Incomplete: Smaller parking lots in some types of developments can enhance the human-scale feel and attraction of a business, as well as encourage bicycling, walking and transit use. Sharing parking among businesses, or allowing bike parking spaces to substitute for car spaces can help meet minimum requirements.	Boulder has much smaller parking minimums and maximums than most cities, e.g. Bar - 1 per 2 seats; supermarket - 1 per 300 to 400 sq ft; multi-family housing - 1 for a one-bedroom apt, 1.5 per 2 bedrooms, 2 per 3 bedroom, 3 per 4. Boulder allows shared and bicycle parking to reduce the number of required spaces.
3.2. Off-street automobile parking is behind or to side of building	No guidance found.	Needs improvement: Having building entrances (rather than parking lots) closer to the sidewalk creates a human-scaled street that's more pleasurable for walking. For example: consider the differences in the walking environment of a downtown versus that of a strip mall.	
3.3. Bicycle parking requirements	None found.	Needs improvement: Bicycles should receive equal consideration when calculating parking needs with specific calculations provided for determining the amount of bicycle parking provided by district type. Design and location standards for bicycle parking should be clearly stated to provide for safe and convenient access to all commercial areas.	Boulder and other cities define and require both short and long-term/protected parking per development type. Ann Arbor requires bicycle parking on every land use except for single-family and funeral homes.
3.4. Pedestrian entrances required on street frontage (regardless of parking location)	None found.	Needs improvement: Buildings should have direct access to the street and sidewalk to promote pedestrian connectivity.	Eugene requires that buildings fronting on a street must provide a main entrance facing the street on any facade of the building within the front yard setback. A main entrance is a principal entrance through which people enter the building.
3.5. Set-back or build-to requirements	10 to 25 feet for commercial and residential districts.	Good: Large setback minimums reduce the walkability of neighborhoods and commercial areas. Consider reducing minimums for residential areas to 10-15 feet and allowing 0-foot setbacks for commercial development.	Ann Arbor has good minimum setback for walkability: 10 feet for commercial zones; 15 feet for higher-density residential. In special Downtown district, min. setback is 0 ft.
3.6. Mixed-use buildings or blocks	None found.	Needs improvement: Mixed use should be encouraged in most zoning districts. This increases the number of destinations that can be reached by walking or biking.	Boulder, Ann Arbor, Bloomington and Eugene all allow mixed-use development in many land use zones.
3.7. Site amenities for cyclists and others (showers, changing areas, etc.)	None found.	Needs improvement: This can be an effective method of promoting cycling in a community.	Boston has minimum shower facility requirements for all new or rehabbed office, commercial, industrial, retail and campus buildings that expect 100 or more users, or are over 40,000 square feet.
3.8. Limits on curb cuts	None found.	Needs improvement: High numbers of driveways or conflict points are unsafe and hostile to bicyclists and pedestrians. One guideline requires a 200-foot minimum between cuts, regardless of relationship of parcels.	Bloomington limits curb cuts to every 100 feet for arterials and collectors, to every 50 feet on local residential streets. Boulder limits driveway access to one per parcel.

Table E.4: Pedestrian Facility Design

Topic	City of Evansville Code	Comments / Recommendations	Peer City Example
4.1. ADA Standards	Construction of curb ramps is the responsibility of City. Priority given to full-block face sidewalks. Vanderburgh County has an ADA Transition Plan.	Needs improvement: A good guideline for ADA standards is a report developed by the Public Rights of Way Access Committee called Accessible Public Rights of Way: Planning and Designing for Alterations. A copy can be found through the Access Board's website: (http://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/guidance-and-research/accessible-public-rights-of-way-planning-and-design-for-alterations).	Eugene updated its ADA Transition Plan in 2009. The City's works to ensure accessible construction areas as well as the construction of new sidewalks and curb ramps. Approximately 66% of all intersections now have ramps on all four corners. The ADA transition plan should identify dedicated funding sources and funding levels for implementation.
4.2. Minimum sidewalk width by context	None found in City of Evansville Code, but Complete Streets Policy Toolkit contains guidance. Any project using Federal funds must adhere to Complete Streets Policy. Code does require sidewalks be at least 4' ft wide.	Incomplete: 5' sidewalks along local streets and 6' sidewalks along collectors and arterials are preferred widths and should be required along both sides of the roadway. In areas of higher density and mixed-use development, the minimum required width for sidewalks should be .6' In areas such as downtown with buildings at the back of the sidewalk and ground level retail, sidewalks should be as wide as 10-18 feet wide.	Eugene requires minimum of 5' for most conditions; minimum of 10' for "downtown" and high pedestrian areas.
4.3. Street Trees	None found in City of Evansville Code, but some guidance in Complete Streets Policy Toolkit.	Incomplete: In addition to their aesthetic value, street trees can slow traffic and improve safety for pedestrians. In hot weather shade is a crucial element in encouraging walking and bicycling. Should be required by the City on all streets regardless of funding source.	Bloomington requires 1 canopy tree every 40 ft along public ROW. Ann Arbor requires 1 tree every 30 ft along "vehicle use areas".
4.4. Mid-block crossings	None found in City of Evansville Code, but Complete Streets Policy Toolkit contains guidance on min. and max distance between crossings.	Incomplete: One goal is to reduce the maximum allowed block-size and provide pedestrian crossing provisions at street intersections, reducing the need for mid-block crossings. When retrofitting, however, apply best practices in innovative mid-block crossing treatments.	Bloomington allows mid-block crossings <600 ft from the nearest signalized intersection. Allows Pedestrian Hybrid Beacons.

Table E.5: Bicycle Facility Design

Topic	City of Evansville Code	Comments / Recommendations	Peer City Example
5.1. Types of facilities specified or allowed	Bikeway classifications (I - III) could be interpreted to restrict bicycling on streets not specifically designated as bikeways "in some manner". Board of Safety makes the designation, but code does not state if each road must be visibly identified as such.	Incomplete: Need to define bicycle facilities and require certain facility types based on street size, speed, and traffic volume. Code should not confine bicycling to current definitions of "bikeways", which must be designated "in some manner. As being open to bicycle travel".	Boulder County requires bikeable shoulders or bike lanes as a minimum treatment along all major roadways. There is also the policy position that roadways can only be widened after other methods of managing congestion have been explored, such as multimodal improvements and/or Transportation Demand Management.
5.2. Minimum shoulder width	None found in city code, but Complete Streets Toolkit sets min. width at 4', with wider shoulder needed for certain traffic conditions. Federally-funded projects must adhere to the Complete Streets policy.	Good: Roadway shoulders often serve as pedestrian routes in rural areas. On roadways with <3000 ADT roadway shoulders may be adequate for pedestrian travel. Also used as "shoulder bikeways", these facilities should be wide enough to accommodate both pedestrians and bicyclists.	Bloomington's bikeway design guidelines specify shoulder widths on streets/roadways without curb and gutter. The minimum is 4' with 6' the preferred width.
5.3. Bicycle accommodations at intersections	No specific intersection guidelines in city code or Complete Streets Toolkit.	Needs improvement: Defining how cyclists should move through busy intersections is an important safety consideration. Good intersection design guidelines can be found in the NACTO Urban Bikeway Design Guide: (http://nacto.org/cities-for-cycling/design-guide/).	Bloomington, IN guide to bicycle markings and signals on web site includes bike boxes, buffered bike lanes, green conflict markings. Boulder, CO has officially endorsed the NACTO guide which includes detailed intersection treatments.
5.4. Mandatory sidepath laws	Language in the Code is ambiguous, prohibiting bicyclists from riding in the roadway if a "usable" path has been provided. Definition of "usable" may be open interpretation.	Incomplete: Some conditions on sidepaths can be unsafe or inefficient for bicyclists, e.g., exceedingly high volumes of pedestrians, runners, people walking dogs, children, etc. Cyclists should be allowed to use the roadway if desired.	None of the four peer cities includes a mandatory sidepath law in its traffic code.
5.5. Bicycles allowed on sidewalks	No person may ride a bicycle on a sidewalk within a business district. However there is no definition for "business district" in the code.	Incomplete: While it is optimum to provide bicycle facilities on roadways, when this is impossible, sidewalks can serve as key connectors for short distances. In general this should be discouraged. Education and enforcement strategies should be employed to assure safety of pedestrian and bicyclists.	Bloomington does not allow bikes on sidewalks. Eugene allows it except in one specifically defined district of the city. Boulder allows it in specified land use zones.

Table E.6: Facility Maintenance

Topic	City of Evansville Code	Comments / Recommendations	Peer City Example
6.1. Sidewalk maintenance policy	Detailed prioritization scale for city-managed repairs; some require adjacent property owner to contribute cost.	Incomplete: Sidewalk surfaces that have settled or heaved over time can be a significant barrier for pedestrians. regular maintenance procedures can help ensure that differences in level between adjacent units do not exceed the limits of usability. Cities should cover the full cost just as they do for streets.	Boulder will share cost of sidewalk repairs with the adjacent property owner up to 50%. Very short segments will often be covered 100% by the city if it can be combined with another project nearby. Ann Arbor is covering 100% of the costs to repair high-priority sidewalks.
6.2. Vegetation management (trimming, pruning, mowing, etc.)	Unknown	Overgrown landscaping, trees branches that protrude into sidewalk or bike lane area can be hazardous or block access. It is unreasonable to expect the city to monitor private property; it is most expedient for property owners to manage vegetation growth.	Ann Arbor: Plant materials shall be located to avoid interference with vehicular and pedestrian movement. Plant materials shall not project over sidewalks, paths, or trails below a height of eight (8) feet. Plant materials shall not project over street curbs or pavement within rights-of-way or access easements below a height of fifteen (15) feet.
6.3. Street sweeping schedule	Unknown	This should include clearing of bike lanes as well. Impediments such as rocks, glass, and sand, which generally don't affect motorists, can be huge obstacles for skinny bike tires. Often these impediments get swept off of car lanes and into bike lanes.	Boulder" routinely" performs street and bike path sweeping;services include sweeping and cleaning streets and gutters to remove dirt, debris, and hazards to increase safety, improve drainage, and reduce dust and air pollution. Citizens can also request sweeping online.
6.4. Bicyclist and pedestrian accommodations in work zones	Temporary sidewalks must be provided, not less than five feet in width in the outer portion of the permissible occupied space, and the temporary sidewalk shall be protected on the building side by a tightly constructed fence of not less than eight feet in height. No bicyclist guidelines were found.	Incomplete: Cities should provide specific guidance on for maintaining access for on-street bicycle facilities and multi-use paths during roadway construction. Guidelines should describe in what situations detours are required and provide specific guidelines on appropriate temporary facilities and detour routing.	Boulder requires, and provides guidance for bicycle detours for key bicycle connections and lane closures on busier/faster roadways. San Francisco's "Blue Book" includes specific examples for accommodating bicyclists and pedestrians during construction.
6.5 Snow removal	Adjacent property owner is responsible for clearing snow and ice from sidewalks, as soon as weather permits.		Ann Arbor requires sidewalk be cleared of snow by adjacent property owner by noon for commercial property or within 24 hours if residential.

Table E.7: Supporting Policies and Manuals

Topic	City of Evansville Code	Comments / Recommendations	Peer City Example
7.1. Complete Streets Policy	MPO adopted Complete Streets Policy in 2012, followed by a Toolkit for design guidance. Applies to federally-funded projects only, but City of Evansville is working to apply policy to all projects.	Incomplete at City-level: The National Complete Streets Coalition provides great guidelines for designing streets that cater to all users. A complete streets policy allows cities to work towards creating a street network that encourages pedestrian and bicycle travel.	Ann Arbor and Bloomington have stand-alone Complete Streets policies. Boulder has "Complete Streets Action Plans" for each of transit, bicycle and pedestrian. Eugene is currently working on a new Complete Streets policy.
7.2. Design manual for bicycle and/or pedestrian facilities	City Engineer has standard details for sidewalks. No bicycle facility guidance in Code. Complete Streets Toolkit offers guidance.	Incomplete: This is an important step in creating a more pedestrian and bicycle friendly community. A design manual will give guidelines for bicycle and pedestrian consideration in new development. City should create design standards for bicycle facilities on projects funded with all sources.	Bloomington, IN has a bicycle Design Guide. Eugene has design standards within their codes and development standards. Boulder uses the NACTO Urban Bikeway Design Guide.
7.3. Roadway Connectivity Requirements for cyclists and pedestrians	None found in City code, but Complete Streets Toolkit includes guidance on network planning. The MPO Complete Streets policy includes connectivity parameters.	Incomplete: Connectivity is a key component of a pedestrian and bike friendly environment. Its benefits include: "decreased traffic on arterial streets, continuous and more direct routes for travel by walking and biking, greater emergency vehicle access, Improved utility connections, easier maintenance, and more efficient trash and recycling pick up. Should be a requirement in City Code for all projects regardless of funding source.	Boulder proposes breaking up large blocks of existing development in their Transportation Master Plan – new development must adhere to these proposed roads and trails. Charlotte, NC and Austin, TX also have policies that support bicycle/pedestrian connectivity.
7.4. Bicycle and/or pedestrian master plans	Regional bicycle and pedestrian plan completed in 2000. This plan is the first City-specific Plan.	Good: A bike and pedestrian plan will create a roadmap for moving towards a more bike and pedestrian friendly community.	All four peer cities have current or in-progress bicycle and pedestrian plans.
7.5. Consideration of pedestrian or bicyclist concerns in site planning	Sidewalks included but not bicycle facilities.	Incomplete: Requiring pedestrian and bicycle concerns in site planning is an important step towards achieving a more bike and pedestrian friendly community.	Ann Arbor requires a traffic impact analysis that includes bicycle and pedestrian considerations for new development; a written analysis of the impact of any automobile-related development proposal on the existing public street; vehicular, bicycle, or pedestrian traffic; and parking. In boulder new development must adhere to bicycle and pedestrian plans.
7.6. Traffic Calming programs, policies and/or manuals	None found.	The National Complete Streets Coalitions provides excellent guidance for traffic calming strategies.	Eugene has an ongoing traffic calming program wherein neighborhood leaders can request a study, then be placed on a list for funding and projects. Boulder and Bloomington have design guidelines for traffic calming.

Table E.7: Supporting Policies and Manuals (Continued)

Topic	City of Evansville Code	Comments / Recommendations	Peer City Example
7.7. Sidewalk retrofit/infill program or policy	For sidewalk petitions submitted to the Board of Public Works on or after January 1, 2006, the cost sharing will be 50 percent City and 50 percent abutting property owners.	Incomplete: City staff periodically inventory the street network to identify sidewalk gaps, and develop strategies, project prioritization criteria and funding for completing these gaps. Some priority pedestrian routes should have 100% city funding to construct sidewalks.	Boulder's Missing Sidewalk Links program takes requests from community members then prioritizes projects, dividing into small and large scale. Local bond funding is used.
7.8. Trails and/or Greenway Plan	Pigeon Creek Greenway Passage, 1994. Multi-use trail recommendations are being considered in the update of this Plan as well.	Good: Evansville has been working on expanding its trail network systematically, and should continue the progress that has been made, making sure that it is well integrated and complimentary of the on street walking and bicycling network.	Each of the four peer cities has a trail/greenway plan.

F. PEER CITIES BENCHMARKING AND BEST PRACTICES

INTRODUCTION

While each city finds its own unique path to becoming a Bike and Walk Friendly Community, best practices and innovations from peer cities can offer valuable lessons and examples, and should be adapted when applicable to local context and conditions.

This section investigates best practices observed in the following peer cities: Ann Arbor, Michigan; Bloomington, Indiana; Boulder, Colorado and Eugene, Oregon. These cities are similar in terms of size, governance, geography or other characteristics to Evansville. Each city has varying levels of implementation and success, yet all are working towards specific and quantitative goals to integrate bicycling and walking into the fabric of the community.

The section begins with an inventory of Evansville and peer city characteristics pertaining to walking and bicycling, including population size, mode share, and current

Bike and Walk Friendly Community status. This inventory serves as a benchmark for Evansville as it works to identify strengths, weaknesses, and opportunities for improvement. Following this inventory and benchmarking are a review of these peer cities' best practices in each of the Five E's: engineering, education, encouragement, enforcement, and evaluation.

INVENTORY AND BENCHMARKING

The following tables compare peer cities to Evansville on a number of different characteristics that affect and demonstrate Bike and Walk Friendliness. This information will be used to help determine bicycling- and walking-related goals and benchmarks for Evansville. The tables show how improvements and investments made within these peer cities correlate with higher bicycling and walking levels in these communities.

Table F.1: Inventory and Benchmarking

	Evansville, IN	Ann Arbor, MI	Bloomington, IN	Boulder, CO	Eugene, OR
Demographics, Mode Share, and Safety Characteristics					
Population	120,235	114,925	71,819	97,385 (2010)	156,185
Bicycle-friendly Community Award	Honorable Mention	Silver	Silver	Platinum	Gold
Walk-friendly Community Award	N/A	Gold	Bronze	Gold	Gold
% Bicycle Commute Mode Share	0.8%	3.74%	3.75%	10.5%	10.5%
% Walking Commute Mode Share	2.3%	15.38%	13.4%	9.1%	6.41%
% Transit Commute Mode-share	3.9%	10.59%	6.15%	9.5%	3.25%
Cyclist Crashes, Fatalities (Five years)	145, 4 fatalities (2009-2013)	299, 0 fatalities (2008-2012)	172, 0 fatalities (2005-2009)	807, 3 fatalities (2008-2012)	301, 5 fatalities (2008-2012)

Table F.1: Inventory and Benchmarking (Continued)

	Evansville, IN	Ann Arbor, MI	Bloomington, IN	Boulder, CO	Eugene, OR
Transportation Planning and Infrastructure Characteristics					
Dedicated Funding Source	No City dedicated source. 10% of MPO STP funds dedicated to bike/ped projects	\$218,963 dedicated (5% of roadway funds) \$1,273,000 in capital projects (2014-2015, \$700k ADA ramp, \$538k sidewalk replacement, \$25k bike share, \$10k education, encouragement programs)	Revenue from neighborhood parking permits supplies this fund for transportation projects. The city spends about \$500,000 annually from this fund on bicycling, sidewalk, and traffic calming projects.	Approximately \$4M for bicycling maintenance and enhancements.	No dedicated source, but priority projects are funded through \$35.9M pavement rehab bond measure (\$350,000 is dedicated to trail resurfacing).
Number of Dedicated Bicycle Staff	0.6	3	2	14.5 (11.5 city, 3 county)	3.6 (does not include engineering staff)
Complete Streets Policy	MPO – Yes				
City- No	Yes	Yes	Yes	Yes	
Number of Bike Parking Spaces	Unknown	9,364 spaces	6935 spaces	Thousands	>10,000
Street Network Density (road miles per square mile)	12.45 mi/sq. mi	>15 mi/sq. mi	10.1 - 15.0 mi/sq. mi	10-15 mi/sq. mi	10-15 mi/sq. mi
% Roadways with Speed Limits 25mph or lower	0%	76-90%	51-75%	51-75%	76-90%
% of road network with separated on-street bikeways	0.2%	6.0%	5.0%	15.6%	16.5%
% of road network with arterial bike lanes	1-25%	26-50%	75%	76-100%	51-75%

FIVE E'S BEST PRACTICES

Using the Five E's framework for creating Bike and Walk Friendly Communities, the following is a summary of peer city best practices in engineering, education, encouragement, enforcement, and evaluation. These creative and unique approaches to increasing bicycle and pedestrian activity and safety offer valuable lessons for the City of Evansville. The programs, policies and activities listed below are also summarized in a table at the end of this chapter.

Engineering

Engineering developments represent the framework of a city's bicycle and pedestrian network. The completeness of the system is a key indicator in the city's overall provision of amenities that support and encourage increased bicycle and pedestrian traffic. Engineering includes on- and off-street facilities: everything from cycle track to bicycle boulevards. City staff must carefully decide new facilities' specifications. Roadway speed and ADT prevent some facility types from successfully producing a low-stress walking or biking environment. Arterials, for example, usually warrant more separation than do low-speed neighborhood streets. Other elements, such as two-stage turning boxes and pedestrian refuge islands are added in certain circumstances to increase users' protection from vehicular car traffic. Engineering also includes ancillary amenities such as bicycle parking.

Sidewalk Installation, Infill Programs, and ADA Improvements

Peer cities have differing approaches for ensuring sidewalk construction and maintenance over time. Ann Arbor has a published goal of installing over 8,000 feet of sidewalk in 2014. Over 90% of the City's arterial streets feature sidewalks on both sides.

The Walk Friendly Community Program praised Boulder's Missing Sidewalk Links Program because of the program website's user-friendliness and clarity. The Missing Sidewalk Links Program prioritizes key sidewalk construction projects throughout the city.

Eugene updated the City's ADA Transition Plan in 2009. The City's Public Works Department works to ensure accessible construction areas as well as the construction of new sidewalks and accessible curb ramps. Approximately 66% of all intersections now have ramps on all four corners. Arterial and collector streets require sidewalks on both sides.

Bike Share System

Boulder is the only peer city with an active bicycle share system. Ann Arbor's system is scheduled to begin in 2014, although it is not yet operational. Boulder's bike share began in 2011 and uses 150 bikes across 22 stations (just under one bike for 649 residents). Ann Arbor's, by comparison, will contain 120 bikes and 14 stations (one bike per 958 residents).

The Bicycle Friendly Community application asks about the presence of bicycle rental or bicycle share in each community it audits. The application asks applicants about station data: number of bikes, number of stations, and number of trips made annually. Bicycle share systems encourage hesitant users by providing cost-effective strategies to try bicycling, especially if they are located near bicycle facilities and points of interest. Bicycle share offers a new form of commuting, a bike for quick errands, connections to other forms of transit, and more.

Greenway System or Major Bicycle/Pedestrian Signature Infrastructure Project

Creating signature projects allow communities a spotlight for high levels of bicycle-friendliness. The New York High Line, Golden Gate Park Trail, and other high-profile examples from large cities have become synonymous with high-quality public spaces and amenities. Smaller communities too can build world-class infrastructure given political resolve and requisite funding. Indianapolis' Cultural Trail, for example, attracts tourists, businesses, and new residents. Although other peer cities feature more highly-developed bikeway networks, Bloomington offers the most high-profile infrastructure example: the B-Line Trail. The B-Line Trail connects neighborhoods to the central business district. The 3.2 mile trail also incorporates public art, human and pet drinking fountains, plazas, fitness stations, and street name pavers at each crossing. Some sections also include energy-efficient LED lighting. The B-Line offers opportunities for trail users to stop at local businesses, commute to work, and create new civic gathering spaces. The B-line has become so popular and such a staple of downtown that it has spurred trail-oriented development in several spots, such as homes and retail with main entrances facing the trail.

NACTO Endorsement and Design Innovations

Boulder is the only peer city to have endorsed the NACTO Urban Street Design Guide. The Guide was created as a resource for city leaders to design streets that prioritize multi-modal travel in urban environments. All infrastructure elements included within the Guide are designed to increase bicyclists' and pedestrians' comfort. As such, Cities can use NACTO guidance to construct specific facilities such as

cycle track and bicycle boulevards that provide maximum comfort and safety. It also contains guidance about specific elements such as two-stage turning boxes, bicycle-specific signals, crosswalks, and others.

Boulder uses the Guide in its “Living Laboratory” to test potential design solutions. The living laboratory, created after the 2013 Transportation Master Plan (TMP) update, installs new demonstration projects and programs on a trial basis. In the City’s own words, the laboratory:

“Provides an opportunity to better understand what additional and cost-effective bike design treatments and programs would make people more comfortable and confident to complete every day trips by bike, rather than by car”.

All peer cities have developed design standards for bicycle and pedestrian facilities. Boulder’s Pedestrian Crossing Treatment Installation Guide (2011), for instance, describes warrants for pedestrian crossing facilities as well as design considerations.

Complete Streets Policies

Complete Streets are designed to balance the needs of all roadway users – making roadways safer, more accessible and more comfortable for pedestrians, bicyclists and transit users; and in general, more attractive places to be. Since the beginning of the Complete Streets movement in the early 2000’s, 34 states and over 550 jurisdictions nationwide have adopted Complete Streets policies or resolutions.

According the National Complete Streets Coalition, an effective Complete Streets policy :

- Includes a vision for how and why the community wants to complete its streets
- Specifies that ‘all users’ includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses and automobiles.
- Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way.
- Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions.
- Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes.
- Is adoptable by all agencies to cover all roads.
- Directs the use of the latest and best design criteria and guidelines while recognizing the need for flexibility in balancing user needs.
- Directs that Complete Streets solutions will complement the context of the community.

- Establishes performance standards with measurable outcomes.
- Includes specific next steps for implementation of the policy.

The National Complete Streets Coalition ranked Bloomington/Monroe County MPO’s Complete Streets Policy among the highest rated Complete Streets policies of 2011. The plan excels through an incorporation of users of all ages and abilities. It clearly describes the policy’s intent and mandates the policy’s design principles for new and reconstruction projects. Clearly listing the project approval process and exceptions means a streamlined construction process resulting in a more comprehensive system. One of the policy’s goals is to create a “comprehensive, integrated, and connected transportation network that supports compact, sustainable development”.

Ann Arbor implemented Complete Streets legislation through Public Act 134 in 2010. The policy formally documents MDOT’s recognition of the City’s approach to a Complete Streets-oriented project approach. With the resolution’s passing, Ann Arbor resolves to set aside 5% of the State’s transportation funds (Public Act 51 Michigan Transportation Fund) to non-motorized projects. Each road construction project would incorporate non-motorized transportation options.

While Boulder doesn’t have a specific Complete Streets ordinance, Complete Streets principles are well-integrated into their city code and institutionalized in roadway development practices. One of the innovative features of Boulder’s 2008 Transportation Master Plan is that it budgets specific spending amounts based on projected available funds, with investments in alternative transportation comprising a substantial portion of this investment. The City produces regular progress updates to ensure that funding and other goals (such as mode share) are being met.

Similarly, Eugene is currently considering adopting a Complete Streets policy through City ordinance. Adopting the ordinance would provide additional mandates for non-motorized transportation. The City of Eugene is internally reviewing the draft policy to ensure its compliance with the Complete Streets Coalition recommendations (see the list of effectiveness measures, provided above). The Public Works Department also advocates for performance standards and a monitoring program.

Bicycle Carrying Capacity on Transit Vehicles

Multi-modal travel, sometimes termed “inter-modal travel” or “intermodality”, creates connections across various modes of transportation. Cities can achieve multi-modal travel by ensuring transit vehicles’ carrying capacity for bicycles, by establishing programs to investigate infrastructure connections—such as pedestrian paths—to and from transit facilities, by creating policy directives, and through other means.

Bicycle racks on buses and trains are becoming de facto elements in communities across the country. These connections enable first or last mile transportation for bicycle users, among other purposes. 100% of buses in Boulder, Eugene, Ann Arbor, and Bloomington have bicycle racks installed. Eugene's bus rapid transit (BRT) system, the EmX, also allows bicycles.

Online or Cell Phone Applications for Maintenance Reporting

Maintenance reporting allows citizens to pinpoint issues in real time. Reporting can occur using websites, mobile applications, or by calling an Operator. Most importantly, City staff must respond to requests and correct the reported problems in a timely fashion. Eugene is the only peer city with a unique smart phone application for maintenance reporting specific to bicycles. IBikeEugene app users can take a picture of the problem, classify it, and submit it to the City. The phone's GPS location marks the problem's location.

Education

Education programs in peer cities are targeted for all residents. Programs encourage more understanding among roadway users and improve safety. They come in many forms- media efforts, such as billboards, signs, decals, or pamphlets; adult and child bicycle and pedestrian safety classes; or training for public employees involved in the implementation and upkeep of bicycle and pedestrian infrastructure.

Bicycle and Pedestrian Safety Courses and Workshops

Courses and workshops increase the public's exposure to bicycling and helps reduce citizens' perceived barriers to entry.

All four peer cities have bicycle advocacy groups that support programming for children and adults. GEARs, Greater Eugene Area Riders, offers educational programming including League of American Bicyclists' Safe Cycling and Traffic Skills courses. The group also hosts a Traffic Skills for Families course, which is priced at an affordable \$5. Employers or groups can coordinate a Bicycle Commuting 101 course, also provided by GEARs. Ann Arbor's local non-profit organization, called Programs to Educate All Cyclists (or PEAC for short) provides bicycling education courses to people of all ages. The program serves residents regardless of residents' physical, mental, and emotional abilities.

A Boulder-based non-profit organization called Community Cycles offers a Rolling Bike Clinic (RBC), an Earn-A-Bike program, and other educational courses. These resources serve the entire city, but are especially valuable to low-income residents.

RBCs, for instance, travel to low-income neighborhoods to fix adults' and children's bicycles.

The Earn-A-Bike course operates on a sliding scale and uses to teach participants how to build their own bicycle from donated or salvaged parts. Participants claim the bike as their own after the program concludes. Common Cycle, a local community-based organization from Ann Arbor offers courses in bicycle repair. Common Cycle assembled flat tire repair kits housed in all five of Ann Arbor's public libraries. The kits contain an illustrated guide, a pump, patches, and glue. Common Cycle also operates a volunteer-led portable bike workshop called Mobile Repair Stand (MRS). The workshop arrives by bicycle trailer and visits a local farmers market every Sunday from April until October. Similarly, the organization's Bike Labs visit neighborhoods to help the area's children learn about bicycles.

Municipal governments and other public agencies also offer courses and workshops for the public. Eugene, for example, operates pedestrian education courses for youth. Ann Arbor's "getDowntown" program hosted a number of winter bicycling workshops throughout November and December 2013. Winter Bike Commuting 101 courses offer citizens easy answers to questions pertaining to winter cycling. The courses use a lecture format and are held at a variety of days, times, and locations. They also involve free snacks and giveaways. Holding the courses in close proximity to the start of the Conquer the Cold winter commuting challenge sparks interest in the challenge and offers another motivation to learn about year-round commuting options. Other courses are offered throughout the year on various topics. Boulder offers bicycle courses more frequently than peer communities. Since commuter classes and bicycle maintenance courses are offered two to four times per month, citizens know where to turn when considering bicycling for transportation.

Online and Print Walking/Bicycling Safety and Mobility Resources

Bicycle and pedestrian infrastructure guides are similar to those offered motorists during drivers' education courses to explain common pavement markings, signage, and physical infrastructure. Guides that include bicycles and pedestrians educate road users about interaction with other modes. Inspired by the City of Minneapolis Bicycling Program, Bloomington created a "Guide to Understanding Bicycle and Pedestrian Infrastructure in Bloomington". The guide explains users' required actions when encountering each element. The categories are labeled "When You Drive" and "When You Bike". The language shows how one may use each mode instead of subscribing to a rigid either/or identity as cyclist or as motorist. This may help abate an "us versus them" mentality among road users. Ann Arbor uses

Michigan DOT's "What Every Motorist Should Know about Bike Lanes" to educate the public. These materials are printed and distributed as a free resource.

School-Based Bicycle Education

Schools are an ideal setting to teach bicycle handling and related skills as well as the value of walking and pedestrian safety. Teaching these messages elevates the position of alternative transportation choices in the community; bicycling and walking are viewed as part of students' requisite life skills.

Peer city schools' level of involvement in bicycle and pedestrian matters varies:

- Boulder: More than 90% of elementary and middle schools offer opportunities for bicycle education. BVSD BLAST is a program designed to "enrich our school district's bike culture by valuing cycling as a basic life skill". BLAST training occurs during students' physical education classes and includes a pre-ride bicycle check and helmet fitting guidelines in addition to on-bike drills.
- Bloomington: 51-75% of elementary schools and 26-50% of middle schools offer bicycle education programs such as bicycle rodeos. Bicycle rodeos offer obstacle courses for students to try their hand at various maneuvers and skills within a fun setting.

Safe Routes to School (SRTS)

Safe Routes to School is a federally-funded program to install and improve pedestrian and bicycle infrastructure connecting schools to neighborhoods. Non-infrastructure grants support these amenities. Non-infrastructure programs include in-class bicycle education presentations, safe walking and biking route maps, school toolkits, and more.

The Eugene SRTS program is unique in that the school district studies the effects of various incentives on program participation rates. Participating schools also have access to a fleet of children's bicycles, maintenance equipment, and other accessories. The bikes are transported from school to school using a trailer reserved for the purpose. Eugene employs two full-time SRTS managers, one per school district. Walking school buses help students regularly walk to school as well as during International Walk and Bike to school Day and Walk and Bike Challenge Month.

League Certified Instructor (LCI) Training

The League of American Bicyclists (LAB) organizes and teaches Smart Cycling courses to increase children's and adults' confidence in their abilities to use bicycles for transportation. Courses are led by League Certified Instructors (LCIs).

LAB organizes League Certified Instructor trainings to certify individuals who are interested in volunteering to teach Smart Cycling when the courses are held in their community. Certification course participants spend about 1/3 of the class time on-bike and finish the course with basic skills to teach Smart Cycling courses or other courses that develop bicycling skills.

The City of Bloomington operates a Bicycle Instructor Corps Program to train residents who enroll in the Program. The program pays for the participants' LCI certification. In exchange, participants agree to teach at least one course per year for two years and participate in two Bicycle Instructor Corps meetings per year. Ann Arbor and Eugene also host regular LCI trainings.

Conferences and Trainings for Transportation Professionals

Conferences and trainings for transportation professionals mean city staff receive the latest in best practice research from pedestrian and bicycle experts across the country and throughout the world. Trainings should be integrated in staff schedules at regularly occurring intervals and would optimally include transportation engineers, designers, planners, and others who do not work exclusively with bicycle and pedestrian access. Doing so can help create an organizational awareness of how to include non-motorized users within future plans and day-to-day operations.

All peer cities send engineers and other staff to trainings and conferences pertaining to bicycle and pedestrian infrastructure and program development. The Pedestrian and Bicycle Information Center (PBIC) and Association of Pedestrian and Bicycle Professionals (APBP) webinars and other online trainings are popular tools.

Bloomington's annual Bike Summit continues the City's mission of obtaining Platinum-level BFC designation by 2016. The last Summit focused on education. Ann Arbor's engineers have participated in the Training Wheels program. Training Wheels is operated by the state DOT and brings design experts from other cities for on-bike and in-classroom workshops.

Encouragement

Encouragement programs offer special events and other incentives that entice resident to try out bicycling and walking for transportation and recreation. Specific programs such as employer-offered incentives and bike-themed celebrations support a burgeoning culture shift towards embracing active transportation. User-friendly tools such as wayfinding signage, free maps, and information about available resources make walking and bicycling easy and logical choices.

Transportation Demand Management (TDM)

Transportation Demand Management (TDM) programs aim to reduce the number of single-occupancy vehicle trips during peak hour periods (i.e. - commuter rush hour). Instead of constructing new roads that would result in increased traffic, the programs provide incentives, policy directives, and information to employers with the aim of influencing employee commute behavior. Transit passes, employee car sharing programs, tax benefits, flexible working schedules, guaranteed ride home programs, and bicycle/walking promotion and education are some of the tools available through TDM programs. Although listed here in the Encouragement section, TDM programs have a strong educational focus, since they connect employees with information about transportation options.

Commuter Challenge and Reward Programs

Ann Arbor's Commuter Challenge is in its seventh year. City employees' participation in the program has steadily increased since 2011. The number of commutes logged by employees in all sectors has increased by 48.9% since the same year. The City evaluates the program's effects in terms of miles traveled and pounds of prevented CO₂ emissions.

Eugene's 2014 Business Commute Challenge participants collectively burned 120,438 kilocalories throughout the week, an equivalent of 218 Big Macs. The challenge uses a multi-modal perspective: each day of the challenge focused on a different form of transportation. The event ended with an ice cream party and carnival. Eugene also hosts a Business Commute "Mini" Winter Challenge.

Transportation Resources and Media

Ann Arbor's "getDowntown" program provides employees and employers with commuting options to reach downtown. The website is an information hub covering public transit, car/vanpooling, car share, bicycling, and walking. A separate page specifically focuses on employers by advertising commuting consultations such as a free commuting audit. Services for employers also describe special events (such as "Conquer the Cold", which encourages active transportation in the winter months), incentives gained from transit passes (such as discounts at downtown stores), and examples from other employers.

Resources specific to bicycling include:

- City bicycle map; instruction on how to enable the "bicycling" layer in Google Maps; Border to Trail Map
- A separate hyperlink button entitled, "First time bike commuter?", with information about route planning, safety, and other information
- Bike Parking Request Form

- Bikes on transit
- Commuting tips
- Commuter Challenge final results
- Maynard Bike House (secure, indoor bicycle parking)
- Guide to Winter Commuting
- Locker rental

Walking resources include:

- A chart that describes when it is preferable to walk versus take the bus (inputs are based on time until the bus arrives and distance to destination)
- Walking mileage calculator
- Walk Score link (<http://www.walkscore.com/>)
- Downtown pedestrian map
- Walking tips; pedestrian safety tips

The getDowntown blog is regularly updated with changes to regularly scheduled transit service and other information. Ann Arbor also maintains a general non-motorized transportation blog. Posts include information about becoming a Bicycle Friendly Community reviewer and an update about the bicycle share program's launch.

Employer Toolkits and Individualized Marketing ("Residential TDM")

Designed for new commercial and residential developments, GO Boulder's TDM Toolkit allows developers to select from packages of TDM strategies. Each package is designed to reduce single-occupancy vehicle commuting trips. One of the tools, a subsidized transit pass called the Eco Pass, encourages transit use. Employees with the pass travel less than half the annual vehicle commute miles compared to employees without a pass.

Eugene's SmartTrips Program also incentivizes alternatives to driving alone. Instead of working with employers, the program interacts with residents. Modelled after SmartTrips Portland, Eugene uses individualized marketing (IM) to work with a specific neighborhood each year. The program highlights community assets and provides focus area residents with a wealth of materials and tools to explore Eugene's transportation options. Special events, such as guided walking tours and group walks and rides to community events helped engage residents.

Open Streets Events

Open streets events are the quintessential celebration of a city that embraces pedestrian and bicycling opportunities. By “opening” a street to non-motorized users, residents and visitors can regale in all types of activities: from strolling with family to hula hooping to impromptu dance lessons.

Ann Arbor’s Bike Fest occurs simultaneously with the City’s annual Green Fair. The Fair is an open streets event in the downtown area that showcases ways to become involved with local environmental initiatives along with free entertainment, walking tours, and over 100 exhibits. Bike Fest offers food vendors and bike-themed activities.

Bloomington’s first open streets event was held in September 2013. The Clips Film & Beer Festival, sponsored by New Belgium Brewery, helped raise money for Open Streets. The open streets event also featured temporary installation art. Residents could volunteer to host a free activity along the route such as a dance class.

Eugene Sunday Streets are annual open streets events. The first was organized to correspond with the city’s SmartTrips TDM program. Sunday Streets have activity centers in parks along the route with entertainment and games. Bike rental is also available.

Media Campaigns

Transportation Option Promotion

Like any market, transportation options need creative branding, clever marketing principles, and easily obtainable information about their operation and use. Media campaigns provide a bridge between the public and a city’s transportation network.

GO Boulder is an educational and promotional campaign for the City of Boulder’s transportation options. The GO Boulder website contains easily accessible material about bicycling, walking, public transit, carpools/vanpools, and car/bike sharing in one website. The program also uses a blog to communicate with residents. The frequently updated site features easily digestible information and attractive pictures. The blog also mentions upcoming chances to provide feedback for new plans.

Short-term Awareness Campaigns

Media resources can also include short-term campaigns to highlight certain issues, raise awareness, and communicate with residents. Boulder’s Heads Up Campaign brought attention to the city’s crosswalks at a time when City engineers were strategically improving these facilities. The campaign reminds pedestrians and motorists about crossing responsibilities. Stickers were placed on sidewalks near crossings, on bus shelters, and other places throughout Boulder. Bloomington’s Civil Streets

initiative encourages safer, more predictable, and more courteous behavior from all who use Bloomington’s streets. Campaign posters spotlight Bloomington residents while stickers for bicycles and bumpers use a variety of messages including, “Run late. Not stop signs”, “I stop at stop signs”, and “I drive nice”. Materials were distributed at the city’s farmers market and to downtown businesses.

Local Grant Programs

Local grant programs offer money to initiatives that promote non-motorized transportation. Although they cannot substitute other, larger funding pools, the programs can provide seed money to programs that may otherwise be less effective due to lack of start-up funds.

Local organizations, businesses, and Neighborhood Associations can apply for a Local-Motion Grant organized through the Bloomington Bicycle and Pedestrian Safety Commission (BPSC) and maintained through local funds. A maximum of \$1,500 is available to projects that encourage bicycling and walking. Greater Eugene Area Riders (GEARs), a Eugene-based bicycle advocacy group offers mini-grants totaling up to \$4,000 for area 501(c)(3) non-profit organizations and governmental entities. Past projects have assisted a variety of causes: from providing a high school bike club with lights to printing materials for a “green home” biking tour.

Bike Month or Other Special Events

Bloomington hosts a Bloomington Bikes Month each May, to coincide with National Bike Month. The month involved a variety of events, classes, and bike rides.

Bloomington Bikes Month celebrated National Bike to Work Day. Participants were automatically registered to win a \$50 gift certificate to a local bicycle shop. Refueling stations around the city provided free snacks to commuters on the morning of Bike to Work Day. Businesses and organizations sponsored the stations. The City website hosted a map of all 14 stations. The event ended with a Bike to Work Day Celebration at a local grocery store. Everyone was welcome to join the celebration and enjoy food, drinks, live music, and raffle prizes.

Policy changes can help make special events more accommodating to those arriving by foot, bike, and public transit. For example, the 2013-2014 Boulder Transportation Master Plan draft update suggests Special Events Access Plans to include bicycle parking and instructions for arriving to events by walking, biking, and transit. Accepting these changes would help manage transportation demand at special events to minimize complaints about parking supply and traffic congestion. The Plan also suggests revising Special Event Permitting for bicycling and walking events to make these events easier to host.

Low-Stress Group Rides

Low-stress group rides for transportation help less confident or would-be bicycle users learn about biking in a relaxed setting. Group rides should have an attractive beginning and ending destination such as a community event or a popular coffee shop. Organizers often represent advocacy organizations, although municipally-sponsored programs also exist. Eugene's GEARs group coordinates the annual Blackberry bRamble and Celebration, a family ride through residential streets and off-street paths. The ride offers families a change in pace and a chance to experience a route through low-volume streets.

Enforcement

Enforcement encompasses three major forms:

- Laws and regulations applying to roadway conduct for all users
- Programs to enforce compliance with the rules of the road
- Programs to train law enforcement officers who enforce the rules of the road

Passing laws that protect vulnerable users helps acknowledge these individuals in a transportation system that may historically discount their presence. Enforcement activities should target behaviors that often contribute to the Primary Collision Factors (PCF) of a given area. Since high speeds decrease the likelihood that a pedestrian or bicyclist will survive a collision, enforcement should take these infractions seriously. Law enforcement officers are important to any city's bicycle and pedestrian planning program, since they provide first-hand observation of the city's transportation culture as well as opportunities for growth. Establishing regular training for these officers ensures they treat bicyclists and pedestrians as they would motorists and also ensures that the Department is aware of any new laws.

Targeted Enforcement Activities to Protect Bicyclists and Pedestrians

Targeted enforcement activities choose specific behaviors and/or locations in an effort to catch law-breaking behavior as it occurs. Targeted enforcement is led by a city's law enforcement department although advocacy groups may assist in distributing literature alongside law enforcement officers or assisting by other means.

Ann Arbor changed its pedestrian safety ordinance in 2010 to more clearly mandate stopping for pedestrians waiting at a crosswalk as well as harsher penalties for drivers who fail to yield. After the City noticed that motorists were not obeying the law, the Ann Arbor Police Department began targeted enforcement campaigns at 18 locations for 28 total hours over a two week time span. The enforcement campaign

was supplemented with short-term outreach campaigns in the form of print materials, in-person presentations to community groups, information to employers, and media segments. The Washtenaw Bicycling and Walking Coalition was the outreach campaign's primary project manager and also involved professional drivers.

Eugene held a targeted crosswalk enforcement effort during summer 2013 in three areas throughout the City. The enforcement effort was specifically targeting motorist failure to yield to pedestrians in a crosswalk as well as pedestrian failure to obey a traffic control device. Fines for motorists parking in bikeways and on sidewalks increased in 2010. The change was meant to more effectively motivate drivers to "make better and safer parking decision". Residents can use the City's parking services hotline to report cars parked in bicycle lanes and on sidewalks.

Bicycle Theft Education or Outreach

Educating the public about proper locking techniques can help reduce bicycle theft. Bicycle theft is the number one crime on University of Colorado-Boulder's campus. The CU-Boulder Police Department holds U-lock giveaway competitions for students who follow the Department on social media. The Department also encourages students to register their bikes.

Law Enforcement Interaction with Bicycles and Pedestrians

Officer interaction with bicycles and pedestrians means the city has a formal liaison between law enforcement and constituents. Law enforcement officers may serve on a city's Bicycle Advisory Committee (Ann Arbor, Bloomington, Eugene) as a regular or visiting member. Other communities have an identified point person who interacts with the bicycling community (Bloomington). Some cities have staff who serve in both capacities (Ann Arbor, Bloomington, Eugene).

Additional interaction with the public occurs when officers assist with bike light giveaways and explain bike light laws. Bloomington's officers have assisted in this capacity along with City staff and the Bloomington Bicycle Club.

Vulnerable Users Laws

Both Eugene, OR and Boulder, CO benefit from strong state level legislation that protects pedestrians and bicyclists. Oregon was the first state to pass a "vulnerable road users law" in 2007. The Oregon Vulnerable User Law (ORS 811.135) enforces harsher penalties for careless driving resulting in injury or death to pedestrians, bicyclists, and others classified as vulnerable road users. Punishments include completion of a traffic safety course and 100-200 hours community service. The perpetrator can also receive a fine up to \$12,500 and suspension of driving privileges.

The Colorado Bicycle Safety Act was passed in 2009. The Colorado Three Feet to Pass law dictates that motorists must provide bicyclists at least three feet clearance when passing. Motorists may cross the center line to pass cyclists, provided there is no oncoming traffic. City of Boulder ordinances address motorists, bicyclists, and pedestrians, including the three feet passing law. Throwing anything at a bicyclist is a Class II misdemeanor.

The following three laws were added to City of Boulder legislation in 2012:

- Bicyclists should approach and traverse crosswalks at a slow speed (8mph) to remain attentive to pedestrians
- Pedestrians must activate a warning signal when entering a flashing crosswalk.
- Motorists cannot overtake another car when stopped at a crosswalk to yield for pedestrians.

The City conducted stings in 2012 to enforce the above laws.

Evaluation

Evaluating a bike and pedestrian program helps benchmark the department's progress and set goals for improving all Five "E's". Ideally, evaluation occurs at least once yearly and audits progress toward both infrastructure and non-infrastructure goals. Some cities create annual "Bicycle Accounts" or similarly named records of the year's major projects, bike/ped count results, survey results, or other developments. These documents are usually attention-grabbing, graphically rich public-facing documents. Such an account tells the department's story and spotlights the City's commitment to its residents.

Benchmarking Audits

Ann Arbor inventoried all asphalt paths in 2013 to track these facilities' development. The inventory included off-road non-motorized paths, paths within the park system, and select connections between lots. The City inventoried paths to maintain a record of existing conditions and to illustrate new paths added as a result of recent planning initiatives. Multiple agencies assisted with the effort. The Non-Motorized Progress report also summarizes progress made to install pedestrian refuge islands and new sidewalks, although the bulk of the report focuses on bicycle infrastructure.

Evaluative efforts track the percentage of near-term pedestrian and bicycle goals that the City has achieved since the Plan's publication. As of the 2013 report, the City has achieved 47.5% of near-term goals for bicycle infrastructure as specified in the 2007 Plan. The City has also installed pedestrian improvements outside of those described in the Plan.

Ann Arbor conducts a bike lane inventory on an annual basis. In addition to the sum of lane miles installed within the last twelve months, the report also quantifies the average pavement condition, the average stripe integrity, and the average symbol integrity throughout the city. Each bike lane in the city is audited for the three measures. Top needs are described as high-priority projects.

Longitudinal analysis shows that average symbol quality was greatly improved from 2007-2011. Symbol quality has remained stable since 2011. Pavement and striping quality have increased slightly and then remained stable.

Annual Bicycle and Pedestrian Counts

Cities conduct bicycle and pedestrian counts using volunteers (a "manual" system) or automatic data collecting units. The National Bike and Pedestrian Documentation Project (NBPD) works to help cities across the US collect standardized data samples. Participating cities deploy count volunteers at peak hours (7-9am; 4-6pm) on national count days. Cities that collect count data can use the information as a measure of bicycle-friendliness according to specific geographic areas. Data on ridership behavior (i.e. - wrong-way cycling) understand the effectiveness of recent infrastructure projects, particularly if used as "before" and "after" data.

Counts are also integral to calculating exposure information for bicycle and pedestrian collision data. Collision data devoid of some measure of ridership and walking levels is inaccurate; it fails to compare number of crashes with the total frequency of biking and walking.

Bicycle Counts

Ann Arbor's 2013 program collected pedestrian and bicycle data from six intersections in twelve corridors. Counts occur annually, although they do not necessarily occur on NBPD selected study days. Four of these locations were repeated from a previous year. One new location was added to study pedestrian and bicycle traffic flows in and out of downtown. The new location also allows the City to collect pre-installation data for a future bike lane project. Another location was added to study connection to the University of Michigan and open green space as well as to obtain post-installation counts from facilities installed in 2013. Manual count volunteers observe each location for three 90 minute time frames (morning, afternoon, evening). Volunteers also observe whether riders position themselves with traffic, against traffic, or on the sidewalk. Planners wish to expand the department's use of automatic counters.

Bloomington conducts annual bicycle counts using volunteers. Volunteers count the number of cyclists passing through given intersections. The study captured data between 8am-7pm, or approximately 70-75% of bicycle traffic. The City then

extrapolated data according to five estimation methods. Volunteers also counted the number of bicycles parked in a given area, in an effort to estimate facility demand.

The City of Boulder conducts a similar parking study. Bicycle parking data is also collected by volunteers as part of the Downtown Boulder Bicycle Count. The study has occurred annually since 2007.

Both Eugene and Boulder use automatic counting equipment. In Boulder, fourteen permanent, automatic counting stations are spread throughout the city. Data is analyzed along with crash data (described in previous sections). Boulder will install an EcoTotem counter in 2014 to show real-time count information for one location. Eugene has used one permanent count station on the Fern Ridge off-street path since 2012. Eugene's MPO uses short-term portable automatic pneumatic tube counters in its regional bicycle counting program.

Travel Diaries and Survey Techniques

Boulder conducts bi- and tri-annual travel diary surveys that contain questions on walking and bicycling routines. The survey asks a segment of the Boulder Valley population to log all trips greater than two blocks in length for a 24-hour period.

The Annual Transportation Survey of Residents, conducted each fall, asks citizens to rate aspects of the local transportation system, including the ease of traveling throughout Boulder. Dividing the survey into two sections captures a variety of metrics: the first (described in the previous section) contains standard questions that remain the same every year. The second section asks topical questions related to specific areas of interest (i.e. - photo enforcement).

Transportation monitoring is reported in a biennial report called the Transportation Report on Progress, first compiled in 2010.

Pedestrian Counts

Although bicycle counts are standard practice in many cities, fewer estimate pedestrian data. Bloomington conducts pedestrian counts when gathering motor vehicle turning movement counts. These counts occur on an as-needed basis when considering improvements to specific intersections.

Eugene and Ann Arbor utilize annual manual downtown pedestrian counting programs using 12 locations and 31 locations, respectively. Both programs deviate from the NBPD format since they occur for 15 minutes at noon (Eugene) and exclusively during the summer months (Ann Arbor).

Bicycle and Walking Committees and Task Forces

Each of the peer cities have regularly convening committees or other task forces dedicated to walking and bicycling planning. The committees are formed according to mandates from existing bodies. Although they do not have authority outside of the committees' functions, their recommendations help their respective cities follow bike/ped plan objectives and provide feedback about projects' potential impacts to the non-motorized transportation system.

Committees that convene frequently and according to a regular schedule help provide timely support. Their members are commonly-known point people for upcoming projects. Some cities' committee meetings are open to the public. Doing so helps provide transparency since the group's goals, plans, and action items become open for public viewing and comment.

Eugene convenes a Bicycle and Pedestrian Advisory Committee (BPAC) and a Safe Routes to School advisory council within the City's governing structure. Eugene's BPAC works to implement the Pedestrian and Bicycle Strategic Plan, provides feedback on projects, and works as a liaison with residents. The City's Bicycle and Pedestrian Coordinator serves as the voluntary group's staff liaison. The liaison helps the group gain recognition from other staff members and assures they have a contact person within City government. The group meetings are open to the public.

The City of Boulder contains several boards and commissions. Transportation-focused commissions are included in the list of advisory boards. Boulder's Transportation Advisory Board's (TAB) five members are appointed by City Council. Each member serves a five-year term consisting of monthly meetings, work with neighborhood groups and other stakeholders, and planning document reviews. The TAB advises city staff including the Planning Board and City Council. The Greenways Advisory Committee (GAC) preserves Boulder's natural areas and resources. Although not exclusively devoted to bike/ped issues, the GAC helps develop recreation and transportation opportunities near the area's many waterways, including Boulder Creek. Finally, Boulder organizes two commissions regarding Boulder Junction, a mixed-use, pedestrian-scale redevelopment area. Property owners and citizens-at-large with interests in the area are appointed to the Boulder Junction Access District (BJAD) TDM Commission. The Commission meets jointly with the BJAD Parking Commission

Bloomington's municipal code authorizes the formation of the Bloomington Bicycle and Pedestrian Safety Commission. The code outlines the Commission's purpose, appointment methods, duties, and other details. Four of the group's seven members are appointed by the Mayor. The Common Council appoints the other three. The Commission is structured as a citizens' forum that creates reports for city staff

including the Mayor, Common Council, and Plan Commission. The Commission must convene no less than six times per calendar year. They are also encouraged to host events and develop programs.

Similar to the committees discussed above, Ann Arbor's Pedestrian Safety & Access Task Force was created through a Council Resolution. The group maintains a Google Group to house pertinent documents including meeting minutes, notes on agenda items that require further action or next steps, input from citizens, and other items. The Google Group is open to the public. Ann Arbor's Walk Friendly Communities profile recognizes the Task Force due to the diversity of its members' affiliations including legal staff, university officials, city employees, advocates and others devoted to transportation options.

Collision Analysis

Collision analysis gives planners and engineers insight into crash patterns and potential for infrastructure and non-infrastructure improvements. The crash rate, represented as a statistic per 10,000 daily commuters is expected to decline with increasing attention to bicycle and pedestrian improvements. A Bronze level bicycle friendly community has an average of 320 fewer crashes per 10,000 residents than a Diamond level community. As discussed in the Evaluation section, crash rate data hinges in part on reliable bicycle and pedestrian traffic data.

Boulder's GIS database of motor vehicle collision reports uses data from Pedestrian and Bicycle Crash Analysis Tool (PBCAT). The 2012 Safe Streets Boulder Report used 40 months of motor vehicle collisions involving a bicyclist or pedestrian to search for common characteristics between the incidents. The report also studies the involved parties' demographic information compared to the Boulder population.

Ann Arbor conducts an annual internal report to study crash trends and citywide data points pertaining to crashes. Some cities, such as Eugene also allocate resources to work with law enforcement to create a better system for reporting crashes. The team is working to geocode all non-motorized crash locations for further analysis. The City's goal is to use the focus on safety to launch a safety committee that would work on solving particular traffic concerns.

Published Goals Pertaining to Pedestrians and Bicyclists

Boulder and Eugene plan for increased bicycling and walking rates with the following published goals within municipal plans :

- Increase walking
- Increase bicycling

- Increase pedestrian facilities
- Increase bicyclist facilities
- Increase physical activity
- Decrease pedestrian fatalities
- Decrease bicyclist fatalities

Furthermore, the first Objective listed in the 2012 updated Eugene Pedestrian and Bicycle Master Plan calls for the following:

Objective 1—Network: Create 20-minute neighborhoods by providing accessible, efficient, and convenient methods for pedestrians and bicyclists to travel to the places where they live, shop, work, and play by expanding and improving Eugene's bicycle and pedestrian network.

Boulder publishes an infographic using goals, objectives, and statistics from the 2013 Transportation Master Plan Update. The online format uses hyperlinked illustrations to provide users with a range of content available at their fingertips. The well-executed illustration entices viewers to continue scrolling through the webpage to read the entirety of its information.

Table F.2: Five E's Best Practices

	Evansville, IN	Ann Arbor, MI	Bloomington, IN	Boulder, CO	Eugene, OR
Engineering					
1.1 - Sidewalk Construction/ Infill Program		Installing over 8,000 feet in 2014.	X	X (Missing Sidewalk Links Program)	
1.1 - Sidewalk ADA Improvement Program	X (ADA transition plan)	X			
1.2 - Bike Share		X		X	X
1.3 - Signature Bike/Ped Infrastructure Project	X (Pigeon Creek Greenway)	X (Border to Border Trail)	X (B-line trail)	X (Valamont Bike Park)	X (Willamette Trails)
1.4 - NACTO Endorsement		X		X	
1.5 Complete Streets Policy	MPO Policy, none at City-level	X	X	X (no specific policy, but integrated into policies)	X (in progress)
1.6 - Bicycle Carrying Capacity on Transit Vehicles	X	X	X	X	X
1.7 - Online or Cell Phone Applications for Maintenance Reporting					X
Education					
2.1 - Bicycle/Pedestrian Safety Courses and Workshops	X	X	X	X	X
2.2 - Online and print walking/bicycling safety and mobility resources	X	X	X	X	X
2.3 - School-Based Bicycle Education	X		X	X	X
2.4 - Safe Routes to School (SRTS)	X	X	X	X	X
2.5 - League Certified Instructor (LCI) Training		X	X		X
2.6 - Conferences and Trainings	X	X	X	X	X
Encouragement					
3.1 - Transportation Demand Management (TDM)	X	X		X	X
3.2 - Open Streets Events	X	X	X	X	X
3.3 - Media Campaigns	X	X	X	X	X
3.4 - Local Grant Programs for Infrastructure and Programs			X		X
3.5 - Bike Month or Other Special Events	X	X	X	X	X
3.6 - Low-Stress Group Rides					X

Table F.2: Five E's Best Practices (Continued)

	Evansville, IN	Ann Arbor, MI	Bloomington, IN	Boulder, CO	Eugene, OR
Enforcement					
4.1 - Targeted Enforcement Activities to Protect Bicyclists and Pedestrians		X		X (at new crosswalks and in school zones)	X
4.2 - Bicycle Theft Education or Outreach				X	
4.3 - Law Enforcement Interaction with Bicycles and Pedestrians	X	Bicycle Advisory Committee and Point Person	Point Person	Bicycle Advisory Committee and Point Person	Bicycle Advisory Committee and Point Person
4.4 – Vulnerable Users Laws		X	X	X	X
Evaluation					
Planning Document(s)	X (update in progress)	X	X (Implementation Plan)	X	X
5.1 - Bike/Ped Benchmarking Audits		X		X	
5.2 - Annual Bike Counts		X		X	X
5.2 - Annual Pedestrian Counts		X			X
5.2 - Annual Travel Diaries or Other Evaluative Surveying				X	
5.3 - Bicycle and Walking Committees and Task Forces		X	X		X
5.4 - Collision Analysis	X	X	X	X	X
5.5 - Published Goals Pertaining to Pedestrians and Bicyclists	X	X	X	X	X

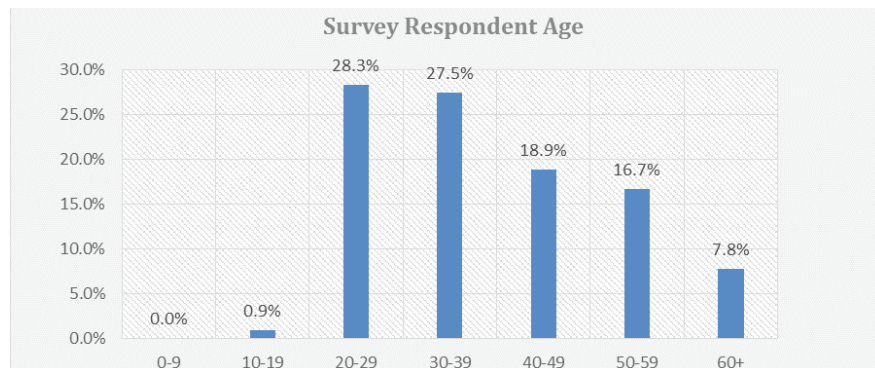
G. ONLINE SURVEY SUMMARY

INTRODUCTION

Online surveys provide a quick, accessible platform for interested community members to share their input and ideas for bicycling and walking. More than 1,050 individuals completed the online survey, a reflection of the community's interest in improving conditions for walking and bicycling. The 24-question survey asked respondents about their perceptions of current conditions, their walking and bicycling habits, destinations they would like to access on bike or foot, preferred bicycle and pedestrian facility types, improvements to address specific barriers that discourage residents from being more active, and new facilities that would encourage more walking and bicycling.

RESPONDENT DEMOGRAPHICS

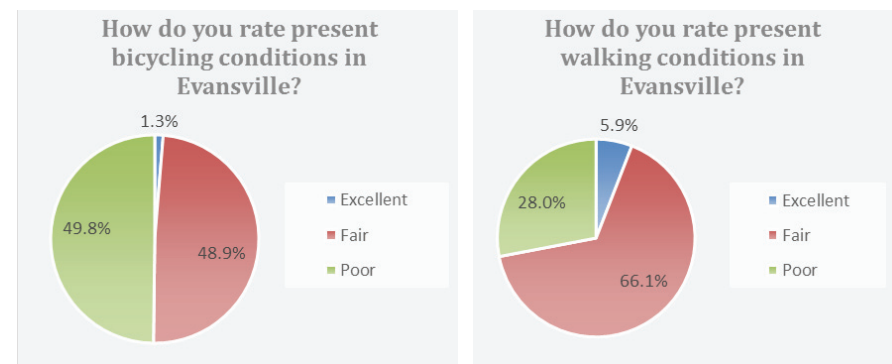
Demographic information provided by survey respondents provides a general overview of the community, particularly those interested in bicycling and walking. Respondent gender is evenly divided, with slightly more male respondents (52% to 48%). Nearly three out of every ten respondents are between the ages of 20 and 29, and more than 55% of respondents are between the age of 20 and 39. These age groups include both young adults and parents with young children. Nationally, these age groups have expressed a great interest in bicycle and pedestrian infrastructure



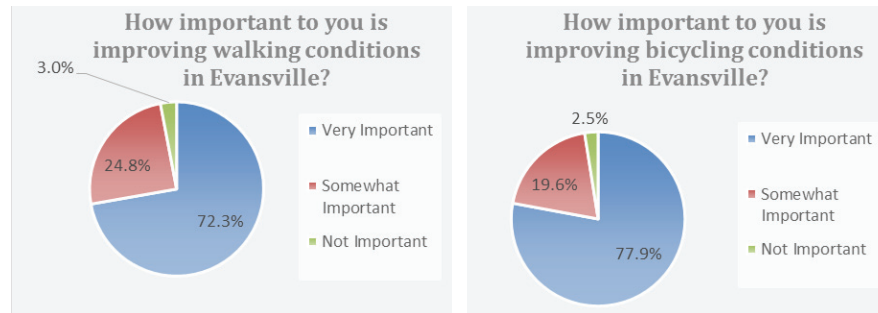
for the value they provide in terms of transportation options, family-oriented recreation activities, and quality of life.

IMPORTANCE OF BICYCLING AND WALKING

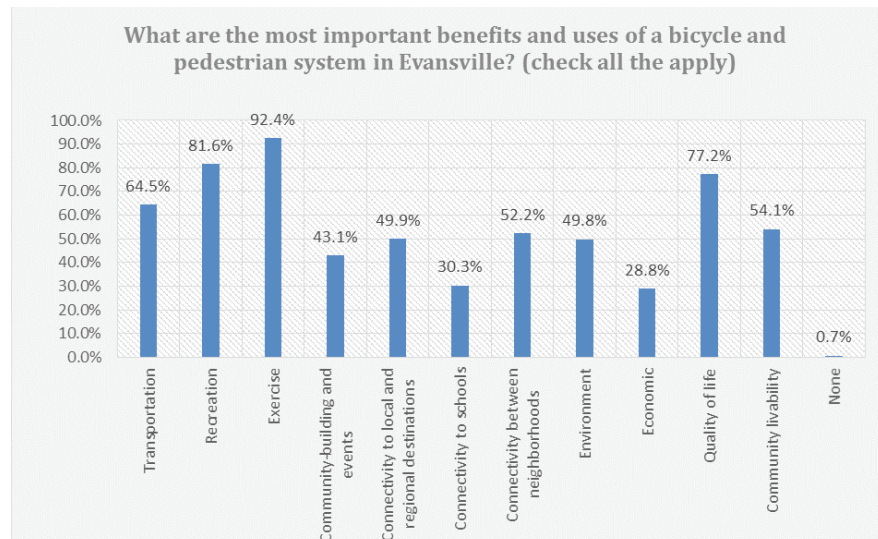
Evansville residents and other survey respondents feel strongly about the importance of walking and bicycling and acknowledge the shortcomings of existing infrastructure to support non-motorized travel. Nearly 50% of survey respondents felt that present bicycling conditions were lacking, and only 1% felt they were excellent. Respondents viewed present conditions for walking more favorably. Two of every three respondents described walking conditions as fair, and only 28% described walking conditions as poor.



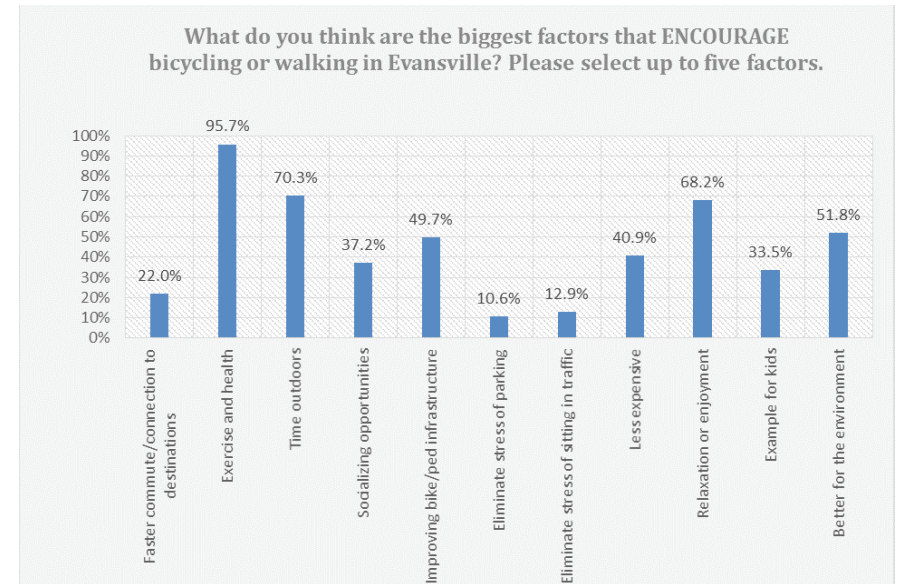
Regardless of the current conditions for walking and bicycling, the community feels very strongly about the need to improve conditions for non-motorized travel. Seventy-seven percent of respondents felt that improving bicycling conditions is very important, and 72% felt that improving walking conditions is very important.



The reasons that community members feel strongly about walking and bicycling vary widely, pointing to the diverse impacts that bicycle and pedestrian infrastructure can have on both individuals' and a community's quality of life. While the basic function of a bicycle and pedestrian system is to facilitate movement between destinations in the community, the benefits of such as system touch a community in a variety of ways, including increased transportation choices, additional opportunities for recreation and exercise, reduction or mitigation of negative environmental impacts of motorized transportation, and improved individual and community health. Respondents identified exercise, recreation, quality of life, and transportation as the most important benefits and uses for a bicycle and pedestrian system.



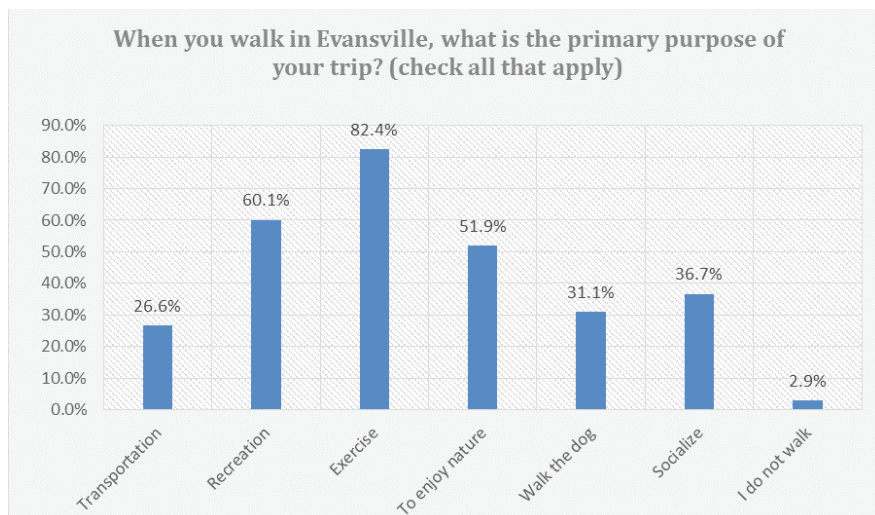
Respondents also acknowledged the diversity of bicycling and walking benefits that encourage individuals to use a bicycle and pedestrian system. The most important factors encouraging residents to walk and bike in Evansville include exercise and health, spending time outdoors, relaxation and enjoyment, and the positive impact their making on the environment.



CURRENT BICYCLING AND WALKING ACTIVITY

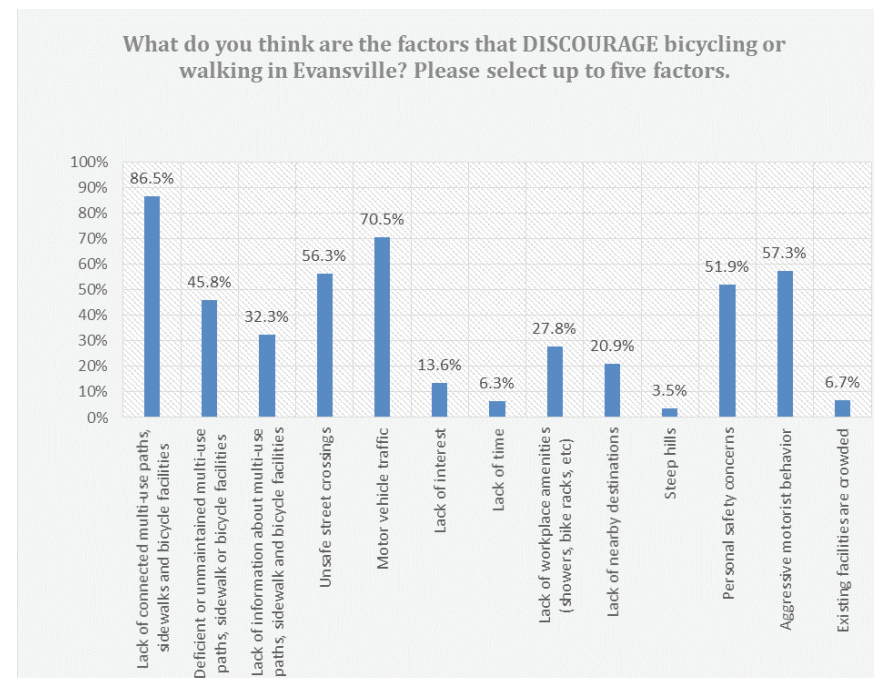
Walking and bicycling are already common modes of transportation and recreation in the City of Evansville. Ninety-four percent of survey respondents currently bicycle, and 97% walk, jog, or run. Trail use is also very high. More than 95 percent of respondents have use a trail or multi-use path in the City of Evansville. Seventy-five percent of people also travel outside the City to use nearby trails and multi-use paths, suggesting that the development of high-quality trails and greenways will be positively received and frequently used by area residents.

Bicycling and walking trip purpose are, to a certain degree, dependent on the bicycle and pedestrian facilities available to support different trip types. In Evansville, the most common trip purposes are exercise (82%), recreation (60%), and enjoyment of nature (52%), while transportation-oriented trips rank far lower at 26%.



This can be seen as a reflection of the bicycling and walking facilities available. The extensive sidewalk system, numerous park trails, and the Pigeon Creek Greenway Passage support recreation-oriented trips in both natural and neighborhood settings. Conversely, the lack of an extensive on-street bikeway network can be seen as a deterrent to transportation-oriented bicycle trips.

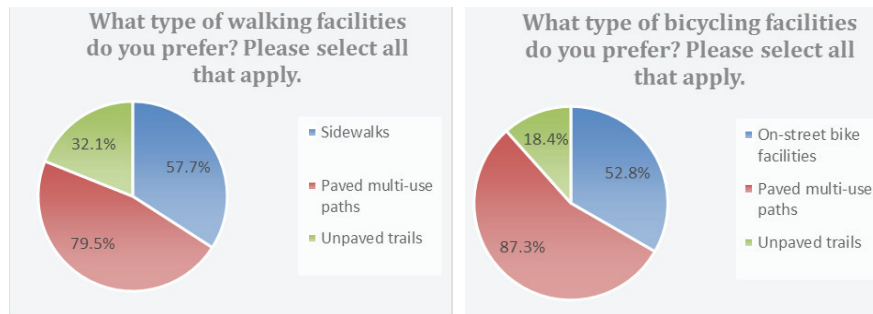
In order to identify deficiencies in the current bicycling and walking systems and gain a better understanding of the factors deterring bicycle and pedestrian activity, survey respondents were asked to identify factors that discourage them from bicycling and walking. Eighty-five percent of respondents pointed to the lack of connected multi-use paths, sidewalks and bicycle facilities as a discouraging factor. Other common barriers to bicycling and walking included motor vehicle traffic (70%), aggressive motorist behavior (57%), unsafe street crossings (56%), and personal safety concerns (52%). Aside from the issue of connectivity, real and perceived safety play an important role people's travel and recreation choices. Many people do not want to bike or walk along and across collector and arterial roads that carry high volumes of motor vehicles without additional separation that can provide greater levels of safety and comfort.



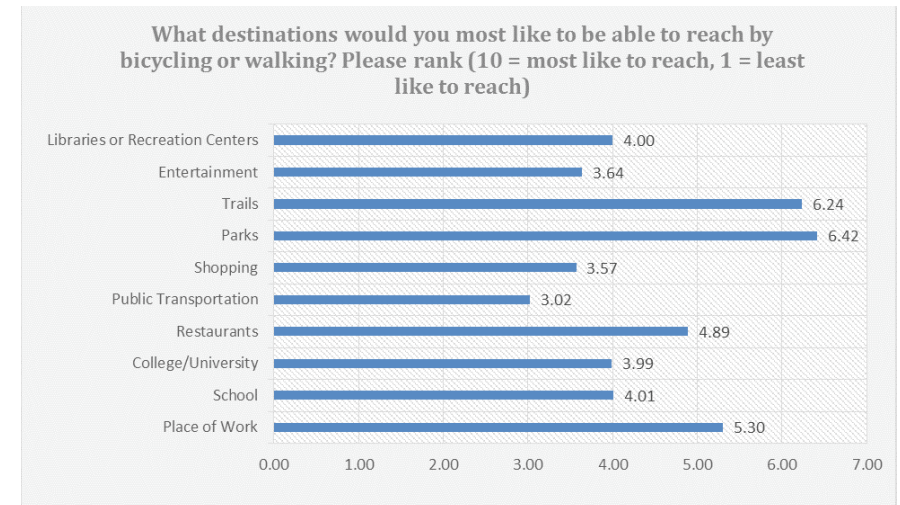
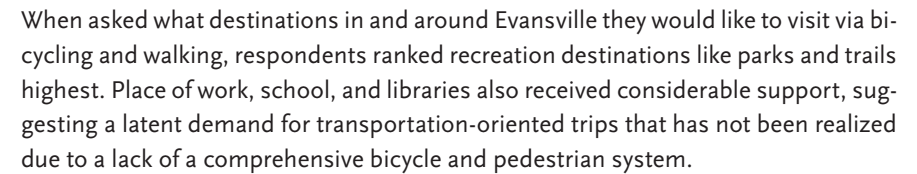
BICYCLE AND PEDESTRIAN SYSTEM PREFERENCES

As the City of Evansville continues to expand the bicycle and pedestrian networks, an understanding of the types of facilities that will encourage more activity and meet the needs and desires of residents and visitors will be imperative. To gain that understanding, the survey asked a number of questions related to desired facility types, destinations to be reached on bike or foot, and specific locations for bicycle and pedestrian improvements. This input will help to identify and prioritize projects in a manner that maximizes the City's return on investment in bicycle and pedestrian infrastructure and programs.

The survey asked respondents to identify their preferred walking and bicycling facility types. Paved multi-use paths like the Pigeon Creek Greenway Passage were received the greatest support for both bicycling (87% of respondents) and walking (80% of respondents). On-street bicycling facilities received considerable support as well (52%), as did sidewalks (57%).



Respondents also identified specific locations for bicycle and pedestrian improvements, as well as destinations to access by bicycling and walking. The most common destinations were Downtown Evansville, the Ohio River, and the neighboring town of Newburgh. Other frequently listed destinations included Wesselman Park & Woods, Angel Mounds, University of Evansville, University of Southern Indiana, IU Medical School, Mesker Park Zoo, shopping areas, neighborhoods, and schools. Roads identified by respondents for bicycle and pedestrian improvements included Franklin St, Green River Rd, Red Bank Rd, Burkhardt Rd, Morgan Ave, and Lloyd Expressway. The word cloud below displays the most frequent words in all of the responses provided.



H. COST ESTIMATES

INTRODUCTION

Based on estimated costs per linear mile as identified in Chapter Five of the Evansville Bicycle and Pedestrian Connectivity Master Plan, the following tables provide cost estimate ranges for individual recommended projects. These projects are grouped by facility type.

Table H.1: Sidewalks

Street Name	Limit From	Limit To	Length (Miles)	Cost (Low)	Cost (High)	Implementation Actions
Boeke Rd	South of Covert Ave	Rheinhardt Ave	0.95	\$95,240	\$142,860	Construct sidewalk
Broadway Ave	Speaker Rd	Tekoppel Ave	1.00	\$99,657	\$149,486	Construct sidewalk
Burkhardt Rd	Lloyd Expy	Washington Ave	0.99	\$99,044	\$148,566	Construct sidewalk
Claremont Ave	Rechtin Ave	Tekoppel Ave	0.68	\$67,564	\$101,345	Construct sidewalk
Covert Ave	Green River Rd	East of I-69	2.54	\$254,379	\$381,568	Construct sidewalk
Covert Ave	Weinbach Ave	Vann Ave	1.01	\$101,045	\$151,568	Construct sidewalk
Diamond Ave	Heidelberg Ave	North of Keck Ave	1.82	\$182,434	\$273,651	Construct sidewalk
Green River Rd	Theater Dr	North of Lloyd Expy	1.22	\$122,352	\$183,529	Construct sidewalk
Lincoln Ave	Martin Ln	East of I-69	1.17	\$117,344	\$176,017	Construct sidewalk
Lincoln Ave	Green River Rd	Newburgh Rd	0.50	\$49,938	\$74,908	Construct sidewalk
Lloyd Expy (parallel)	Green River Rd	Cross Pointe Blvd	1.62	\$162,273	\$243,410	Construct sidewalk
Oak Hill Rd	Lynch Rd	Millersburg Rd	2.53	\$252,880	\$379,321	Construct sidewalk
Red Bank Rd	Broadway Ave	Nolan Ave	0.33	\$33,265	\$49,898	Construct sidewalk
Stringtown Rd	Mill Rd	Cardinal Dr	1.08	\$107,607	\$161,411	Construct sidewalk
Tekoppel Ave	Claremont Ave	Broadway Ave	0.74	\$74,402	\$111,603	Construct sidewalk
Theater Dr	Morgan Ave	Green River Rd	0.89	\$88,500	\$132,751	Construct sidewalk
Virginia	Green River Rd	Burkhardt Rd	1.02	\$101,583	\$152,375	Construct sidewalk
Vogel Rd	Stockwell Rd	Burkhardt Rd	1.52	\$151,640	\$227,460	Construct sidewalk
Total			21.61	\$2,161,150	\$3,241,725	

Table H.2: Shared Use Paths

Street Name	Limit From	Limit To	Length (Miles)	Cost (Low)	Cost (High)	Implementation Actions
Kratzville - Buena Vista Connector	Buena Vista Rd	Kratzville Rd	0.79	\$737,022	\$1,474,044	Construct path
Pigeon Creek - 1st Ave Connector	Greenway / Baker Ave	Shopping Center Access Dr	1.68	\$1,567,532	\$3,135,065	Construct path
Pigeon Creek - Kentucky Ave Connector	Greenway	Kentucky Ave	0.25	\$235,819	\$471,637	Construct path
Total			2.72	\$2,540,373	\$5,080,746	

Table H.3: Sidepaths

Street Name	Limit From	Limit To	Length (Miles)	Cost (Low)	Cost (High)	Implementation Actions
1st Ave	Kratzville Rd	Kleymeyer Park	3.06	\$473,468	\$946,937	Widen existing sidewalk to adequate width for sidepath
Broadway Ave	Tekoppel Ave	Speaker Rd	1.00	\$935,227	\$1,870,455	Construct path
Buena Vista Rd	Stringtown Rd	Vista Dr	0.96	\$894,440	\$1,788,880	Construct path
Burkhardt Rd	Covert Ave	Olmstead Rd	3.17	\$2,962,512	\$5,925,024	Construct path
Burkhardt Rd	Covert Ave	Virginia St	1.84	\$1,714,921	\$3,429,842	Construct path
Claremont Ave	Tekoppel Ave	Red Bank Rd	0.76	\$714,476	\$1,428,952	Construct path
Cross Pointe Blvd	Oak Grove Rd	Eagle Crest Blvd / Martin Ln	1.20	\$1,124,477	\$2,248,954	Construct path
Cullen Ave	Virginia St	Lloyd Expy	0.39	\$359,728	\$719,455	Construct path
Fuquay Rd	Pollack Ave	Newburgh Rd	0.80	\$751,363	\$1,502,726	Construct path
Golfmoor Rd	Harmony Way	Wessel Ln	0.65	\$606,684	\$1,213,367	Construct path
Green River Rd	Covert Ave	Millersburg Rd	6.53	\$6,098,961	\$12,197,922	Construct path
Green River Rd	Fickas Rd	Planned Greenway	0.29	\$274,219	\$548,437	Construct path
Heckel Rd	Green River Rd	Oak Hill Rd	0.99	\$924,021	\$1,848,042	Construct path
Hogue Rd	Rosenberger Ave	Tekoppel Ave	0.50	\$464,034	\$928,068	Construct path
Kentucky Ave	St George Rd	Pfeiffer Rd	1.13	\$1,060,110	\$2,120,221	Construct path
Lynch Rd	Burkhardt Rd	US HWY 41	3.58	\$3,342,773	\$6,685,546	Construct path
Mesker Park Dr	Summit Dr	Saint Joseph Ave	0.78	\$120,622	\$241,243	Widen existing sidewalk to adequate width for sidepath
Mill Rd	Kentucky Ave	Stringtown Rd	0.84	\$786,508	\$1,573,016	Construct path
Morgan Ave	Burkhardt Rd	Princeton Ct	1.86	\$1,735,288	\$3,470,575	Construct path
Morgan Ave	Princeton Ct	Weinbach Ave	1.18	\$1,105,612	\$2,211,225	Construct path
Newburgh Rd	Lincoln Ave	Covert Ave	2.19	\$2,046,785	\$4,093,569	Construct path
Oak Grove Rd	Royal Ave	Burkhardt Rd	0.50	\$464,807	\$929,614	Construct path
Oak Grove Rd	Burkhardt Rd	Cross Pointe Blvd	0.37	\$344,653	\$689,306	Construct path

Table H.3: Sidepaths (Continued)

Street Name	Limit From	Limit To	Length (Miles)	Cost (Low)	Cost (High)	Implementation Actions
Olmstead Rd	Burkhardt Rd	Lost Bend Ln	1.28	\$1,192,123	\$2,384,246	Construct path
Ray Becker Pkwy	Claremont Ave	Ohio St	0.52	\$481,277	\$962,555	Construct path
Red Bank Rd	Pennington Ave	Pearl Dr	1.00	\$932,283	\$1,864,567	Construct path
Red Bank Rd	Pennington Ave	Ogden Ave	0.73	\$685,044	\$1,370,088	Construct path
Rosenberger Ave	Lloyd Expy	Hogue Rd	0.27	\$256,045	\$512,090	Construct path
Royal Ave	Oak Grove Rd	Virginia St	0.69	\$643,008	\$1,286,015	Construct path
Royal Ave	Oak Grove Rd	Morgan Ave	0.13	\$125,451	\$250,901	Construct path
Shopping Center Access Drive	Mill Rd	Woodbridge Dr	0.63	\$588,557	\$1,177,114	Construct path
Speaker Rd	Burdette Park	Broadway Ave	0.97	\$910,576	\$1,821,152	Construct path
St George Rd	Oak Hill Rd	Kentucky Ave	1.95	\$1,822,188	\$3,644,376	Construct path
Stockwell Rd	Lloyd Expy	Morgan Ave	1.02	\$949,134	\$1,898,268	Construct path
Stringtown Rd	Springhaven Dr	Buena Vista Rd	1.19	\$1,110,043	\$2,220,087	Construct path
Stringtown Rd	Cardinal Dr	Buena Vista Rd	0.59	\$552,823	\$1,105,647	Construct path
Tekoppel Ave	Broadway Ave	Claremont Ave	0.74	\$695,143	\$1,390,286	Construct path
Theater Dr	Shepherd Dr	Green River Rd	0.40	\$373,340	\$746,679	Construct path
US HWY 41	Airport	Columbia	5.39	\$5,035,811	\$10,071,621	Construct path
Virginia St	Circle Front Dr	Burkhardt Rd	0.92	\$858,039	\$1,716,077	Construct path
Wessel Ln	Golfmoor Rd	Maryland St	0.14	\$21,348	\$42,696	Widen existing sidewalk to adequate width for sidepath
Total			53.13	\$46,537,921	\$93,075,842	

Table H.4: Cycle Tracks

Street Name	Limit From	Limit To	Length (Miles)	Cost (Low)	Cost (High)	Implementation Actions
3rd St / Parrett St	Bond St	Washington Ave	1.05	\$166,391	\$332,783	Remove parking and add striping and bollards
Claremont Ave	Barker Ave	Tekoppel Ave	0.50	\$79,330	\$158,661	Remove parking and add striping and bollards
Columbia St	US HWY 41	Pigeon Creek	2.63	\$417,120	\$834,239	Remove parking and add striping and bollards
Delaware St	Pigeon Creek	St. Joseph Ave	0.58	\$91,411	\$182,823	Remove parking and add striping and bollards
Franklin St	St Joseph Ave	9th Ave	0.46	\$73,216	\$146,433	4-lane to 2-lane road diet, add striping and bollards
Fulton Ave	Franklin St	Diamond Ave	1.37	\$217,057	\$434,115	4-lane to 3-lane road diet, add striping and bollards
Main St	Garvin Park	Lloyd Expy	1.16	\$184,041	\$368,082	Reconstruct bumpouts and add striping and bollards
Main St	Sycamore St	Lloyd Expy	0.12	\$18,727	\$37,455	Two-way cycle track, add striping and bollards
Martin Luther King Jr Blvd	8th St	Division St	0.72	\$114,296	\$228,592	4-lane to 2-lane road diet, add signage, markings, and bollards
Mary St	Division St	Virginia St (Deaconess Hospital)	0.40	\$63,514	\$127,029	Add signage, markings, and bollards
Pollack Ave	Green River Rd	Vann Ave	1.00	\$158,959	\$317,918	Remove parking and add striping
St Joseph Ave	Moutoux Park	Ohio St	3.22	\$509,699	\$1,019,398	Standard bike lanes / cycle track as space allows. Add striping
Sycamore St	Martin Luther King Jr Blvd	Main St	0.23	\$35,886	\$71,773	Two-way cycle track, add striping and bollards
Walnut St	Vann Ave	Riverside Dr	3.58	\$566,256	\$1,132,512	4-lane to 2-lane road diet, add striping and bollards
Total			17.03	\$2,695,906	\$5,391,812	

Table H.5: Buffered Bike Lanes

Street Name	Limit From	Limit To	Length (Miles)	Cost (Low)	Cost (High)	Implementation Actions
Bellemeade Ave	Green River Rd	Vann Ave	1.03	\$58,130	\$116,260	Remove parking and restripe
Fares Ave	Franklin St	Virginia St	0.11	\$6,054	\$12,107	Add striping
Franklin St	9th Ave	1st Ave	0.93	\$52,503	\$105,005	Lane diet and restripe
Fulton Ave	Franklin St	Columbia St	0.32	\$17,870	\$35,740	5-lane to 3-lane road diet, add striping
Garvin St	Riverside Dr	Stringtown Rd	2.70	\$152,159	\$304,319	Remove parking on one side and add striping for buffered bike lane or standard bike lane
Governor St	Riverside Dr	Maxwell Ave	2.69	\$151,857	\$303,714	Remove parking (as necessary) and add striping and buffered bike lane or standard bike lane
Tekoppel Ave	Claremont Ave	Hogue Rd	0.74	\$41,927	\$83,855	Remove parking and add striping
Total			8.51	\$480,500	\$961,001	

Table H.6: Standard Bike Lanes

Street Name	Limit From	Limit To	Length (Miles)	Cost (Low)	Cost (High)	Implementation Actions
8th St	Martin Luther King Jr Blvd	Washington Ave	0.42	\$14,570	\$29,140	Remove parking and restripe
Barker Ave	Broadway Ave	Franklin St	1.19	\$41,266	\$82,533	Remove parking in places and add striping
Boeke Rd	Washington Ave	Morgan Ave	2.00	\$114,322	\$228,644	4-lane to 3-lane road diet and restripe
Boeke Rd	Covert Ave	Washington Ave	0.52	\$17,936	\$35,872	Remove parking and add striping
Claremont Ave	Ray Becker Pkwy	Barker Ave	0.25	\$8,734	\$17,469	Remove parking and restripe
Covert Ave	I-69	US HWY 41	5.25	\$300,771	\$601,541	4-lane to 3-lane road diet and restripe
Covert Ave	US HWY 41	Garvin St	0.80	\$27,776	\$55,551	Remove parking and add striping
Green River Rd	Covert Ave	Fickas Rd	0.93	\$42,176	\$84,352	Road / lane diet and restripe
Harmony Way	Virginia St	Golfmoor Rd	0.62	\$21,467	\$42,935	Remove parking on both sides and add striping
Kentucky Ave	Sycamore St	Riverside Dr	1.51	\$52,559	\$105,118	Add striping
Lincoln Ave	Green River Rd	Rotherwood Ave	2.26	\$102,369	\$204,738	Lane diet and restripe
Lincoln Ave	I-69	Burkhardt Rd	1.80	\$62,525	\$125,050	Remove parking and add striping
Lincoln Ave	Martin Luther King Jr Blvd	Rotherwood Ave	1.67	\$95,690	\$191,380	4-lane to 3-lane road diet and restripe
Lincoln Ave	Burkhardt Rd	Green River Rd	0.51	\$35,261	\$70,522	Add striping
Lincoln Ave	Newburgh Rd	Green River Rd	0.50	\$143,966	\$287,933	Widen road to include bike lanes
Maryland St	Saint Joseph Ave	Harmony Way	0.68	\$23,724	\$47,449	Remove parking and add striping
Mill Rd	Stringtown Rd	1st Ave	0.64	\$22,381	\$44,761	Remove parking and add striping
Mill Rd	1st Ave	Kratzville Rd	0.61	\$34,659	\$69,318	4-lane to 3-lane road diet and restripe
Oak Hill Rd	Millersburg Rd	Lynch Rd	2.53	\$729,024	\$1,458,048	Add shoulders and striping for bike lane
Ohio St	Pigeon Creek Greenway	Ray Becker Pkwy	0.85	\$245,136	\$490,272	Widen road to include bike lanes
Riverside Dr	US HWY 41	Chandler Ave	1.92	\$66,637	\$133,274	Remove parking one side and restripe
Riverside Dr	Pollack Ave	US HWY 41	0.33	\$93,838	\$187,677	Widen roadway to add bike lanes (add shared lane markings as interim measure)
Stringtown Rd	Louisiana St	Cardinal Dr	1.36	\$47,318	\$94,636	Remove parking and add striping
Taylor Ave	Garvin St	Culver Dr	0.30	\$10,568	\$21,136	Remove parking and add striping
Vann Ave	Washington Ave	Walnut St	0.75	\$42,883	\$85,767	4-lane to 3-lane road diet and restripe
Vann Ave	Pollack Ave	Washington Ave	1.00	\$34,925	\$69,849	Remove parking and add striping
Vann Ave	Pollack Ave	Riverside Dr	0.32	\$91,321	\$182,641	Add shoulders and striping for bike lane
Virginia St	Burkhardt Rd	Green River Rd	1.02	\$292,853	\$585,705	Widen road to include bike lanes
Virginia St	US HWY 41	Fulton Ave	2.14	\$74,475	\$148,950	Remove parking and add striping
Vogel Rd	N Burkhardt Rd	N Stockwell Rd	1.52	\$52,763	\$105,527	Remove parking and add striping
Washington Ave	Newburgh Rd	2nd St	5.36	\$306,778	\$613,557	4-lane to 3-lane road diet and restripe
Weinbach Ave	Walnut St	Pollack Ave	1.75	\$155,042	\$310,084	4-lane to 3-lane road diet and restripe
Weinbach Ave	Morgan Ave	Walnut St	1.26	\$72,368	\$144,736	4-lane to 3-lane road diet and restripe
Total			44.55	\$3,478,082	\$6,956,163	

Table H.7: Bike Boulevards

Street Name	Limit From	Limit To	Length (Miles)	Cost (Low)	Cost (High)	Implementation Actions
3rd Ave	7th Ave	Bond St	0.07	\$4,625	\$10,645	Add markings, signage, and traffic calming
4th Ave	Old Post Rd	Park Dr	0.84	\$54,355	\$125,118	Add markings, signage, and traffic calming
5th St	Bond St	Ingle St	0.08	\$4,950	\$11,395	Add markings, signage, and traffic calming
7th Ave	Fulton Ave	3rd Ave	0.20	\$12,782	\$29,422	Add markings, signage, and traffic calming
Bellemeade Ave	Vann Ave	Kentucky Ave	2.01	\$130,399	\$300,162	Add markings, signage, and traffic calming
Boeke Rd	Riverside Dr	Covert Ave	0.75	\$48,788	\$112,303	Add markings, signage, and traffic calming
Bond St	3rd Ave	5th St	0.26	\$16,816	\$38,707	Add markings, signage, and traffic calming
Chandler Ave	Riverside Dr	Bedford Ave	1.19	\$77,199	\$177,702	Add markings, signage, and traffic calming
Cullen Ave	Lloyd Expy	Monroe Ave	1.25	\$81,070	\$186,612	Add markings, signage, and traffic calming
Franklin St	US HWY 41 / Greenway	Boeke Rd	1.23	\$79,704	\$183,469	Add markings, signage, and traffic calming
Franklin St	Tekoppel Ave	Mt Vernon Ave	0.81	\$52,286	\$120,356	Add markings, signage, and traffic calming
Hanover Rd	1st Ave	Winston Rd	0.47	\$30,542	\$70,304	Add markings, signage, and traffic calming
Ingle St	5th St	Martin Luther King Jr Blvd	0.14	\$9,132	\$21,021	Add markings, signage, and traffic calming
Martin Ln	Newburgh Rd	Sycamore St	1.04	\$67,417	\$155,186	Add markings, signage, and traffic calming; construct bike/ped cut through at Eagle Crest Blvd
Monroe Ave	Royal Ave	Cullen Ave	0.17	\$11,205	\$25,793	Add markings, signage, and traffic calming; bike/ped cut through required
Old Post Rd	1st Ave	4th Ave	0.22	\$14,171	\$32,621	Add markings, signage, and traffic calming
Park Dr	4th Ave	Access Drive	0.24	\$15,347	\$35,327	Add markings, signage, and traffic calming
Pollack Ave	Vann Ave	Riverside Dr	1.46	\$94,866	\$218,369	Add markings, signage, and traffic calming
Read St	Franklin St	Greenway	1.02	\$65,957	\$151,824	Add markings, signage, and traffic calming
Riverside Dr	Green River Rd	Weinbach Ave	2.04	\$132,388	\$304,741	Add markings, signage, and traffic calming
Rotherwood Ave	Sweetser Ave	John St	1.72	\$111,573	\$256,827	Add markings, signage, and traffic calming
Royal Ave	Somerset Ave	Monroe Ave	0.12	\$7,784	\$17,917	Add markings, signage, and traffic calming; bike/ped cut through required
Shepherd Dr	Morgan Ave	Theater Dr	0.37	\$24,131	\$55,547	Add markings, signage, and traffic calming
Somerset Ave	Victoria Green Blvd	Royal Ave	0.06	\$3,982	\$9,165	Add markings, signage, and traffic calming; bike/ped cut through required
Springhaven Dr	Winston Rd	Stringtown Rd	0.15	\$9,979	\$22,969	Add markings, signage, and traffic calming
Victoria Green Blvd	Somerset Ave	Covert Ave	0.14	\$8,964	\$20,634	Add markings, signage, and traffic calming; bike/ped cut through required
Virginia St	Harmony Way	Barker Ave	0.18	\$11,725	\$26,989	Add markings, signage, and traffic calming
Winston Rd	Hanover Rd	Springhaven Rd	0.13	\$8,739	\$20,117	Add markings, signage, and traffic calming
Total			18.35	\$1,190,876	\$2,741,243	

Table H.8: Shared Lane Markings

Street Name	Limit From	Limit To	Length (Miles)	Cost (Low)	Cost (High)	Implementation Actions
Barker Ave	Virginia St	Franklin St	0.08	\$994	\$1,988	Install shared lane markings and signage
Broadway Ave	Barker Ave	Tekoppel Ave	0.55	\$6,665	\$13,329	Install shared lane markings and signage
Franklin St	Fares Ave	1st Ave	1.71	\$20,711	\$41,422	Install shared lane markings and signage
Franklin St	St Joseph Ave	Mt Vernon Ave	0.24	\$2,887	\$5,774	Shared lane markings and signage
Weinbach Ave	Pollack Ave	I-69 / Planned Greenway	0.96	\$11,556	\$23,111	Install shared lane markings and signage
Total			3.54	\$42,812	\$85,623	

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I. MODEL BICYCLE PARKING ORDINANCE

INTRODUCTION

Bicycle parking racks, bicycle lockers, secure parking areas, and other end-of-trip facilities are a critical and necessary component of a complete bicycle transportation system. A lack of bicycle parking limits transportation choices and deters individuals from choosing bicycling as a means of transportation. As the City of Evansville continues on its course to becoming a Bike Friendly Community, adopting a bicycle parking ordinance can help to institutionalize the development of bicycle parking into future developments. This sample bicycle parking ordinance was developed by ChangeLab Solutions, a California-based non-profit working to promote active living and other quality of life issues through the context of land use and transportation planning, childhood obesity prevention, school environments, and more. This model parking ordinance should be adapted to meet local context and plan goals and objectives. Additional guidance for bicycle parking facilities can be found in the Association of Pedestrian and Bicycle Professional's Bicycle Parking Guidelines, 2nd Ed. (2010).

Model National Bicycle Parking Ordinance

WITH ANNOTATIONS

Developed by the National Policy & Legal Analysis Network
to Prevent Childhood Obesity (NPLAN), a ChangeLab Solution

changelabsolutions.org | nplan.org

ChangeLab Solutions is a nonprofit organization that provides legal information on matters relating to public health. The legal information provided in this document does not constitute legal advice or legal representation. For legal advice, readers should consult a lawyer in their state.

Support provided by a grant from the Robert Wood Johnson Foundation.

July 2012

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An Ordinance of [Jurisdiction (e.g. *the City of _____*)] Providing for Bicycle Parking and Adding to the [Jurisdiction] [Zoning/Planning/Municipal/County] Code.

The [Adopting Body] does ordain as follows:

SECTION I. FINDINGS. The [Adopting Body] hereby finds and declares as follows:

COMMENT: Ordinances often include “findings of fact” (“whereas” clauses) that support the need for the jurisdiction to adopt the ordinance. From a legal standpoint, they provide the justification for expending resources (both monetary and non-monetary), and taking actions to support the purpose of the ordinance. While such findings are part of the ordinance, they are not usually codified in the local code. An adopting body should select those findings it views as most significant for its community and add any findings related to local conditions or concerns. The footnotes are provided in order to provide documentation for the findings but are not intended to be included in the adopted ordinance.

1. WHEREAS, the [Adopting Body] has a goal of improving the health of its residents and the air quality of the community;

2. WHEREAS, both obesity and insufficient physical activity are creating significant health problems for Americans, leading to increased risk of heart disease, diabetes, endometrial, breast, and colon cancers, high blood pressure, high cholesterol, stroke, liver and gallbladder disease, sleep apnea, respiratory problems, and osteoarthritis;¹

3. WHEREAS, a primary contributor to obesity is lack of sufficient physical activity;²

4. WHEREAS, bicycling is a safe, low-impact aerobic activity, enjoyed by millions of Americans, and provides a convenient opportunity to obtain physical exercise while traveling to work, shops, restaurants, and many other common destinations;³

5. WHEREAS, bicycling frequently provides a practical alternative to driving, since 28 percent of all car trips are to destinations within 1 mile of home,⁴ 40 percent of all trips are two miles or less from home,⁵ and around 30 percent of commuters travel 5 miles or less to work;⁶

6. WHEREAS, bicycling can greatly increase access to important services and provide more range of travel for people who do not own or cannot operate a car, including our increasing aging population, children and youth, people who are low-income, and those with disabilities or medical restrictions on driving due to issues like seizure disorders or vision impairments;⁷

7. WHEREAS, replacing car trips with bicycle trips improves air quality by reducing the amount of carbon dioxide emissions, in light of the fact that transportation sources account for nearly one third of all such emissions in the United States, an average motor vehicle emits 8.8 kilograms of carbon dioxide per gallon of gasoline that it burns, and biking emits essentially none;⁸

8. WHEREAS, asthma rates are at their highest levels ever, with nearly one in 10 children and almost one in 12 Americans of all ages suffering from asthma, and replacing motor vehicle trips with bicycle trips reduces the pollutants that directly contribute to asthma in both children and adults;⁹

9. WHEREAS, replacing car trips with bicycle trips reduces congestion and wear and tear on roads, improving quality of life for residents and providing a financial benefit for [Jurisdiction];

10. WHEREAS, providing safe, convenient, and adequate bicycle parking is necessary to encourage increased use of bicycles as a form of transportation;¹⁰

11. WHEREAS, cities that have improved bicycle infrastructure, including parking, have seen a measurable increase in bicycle trips;¹¹

12. WHEREAS, in light of the foregoing, [Adopting Body] desires to add new bicycle

parking requirements to increase the availability of safe and convenient bicycle parking; and

13. WHEREAS, it is the intent of the [Adopting Body] in enacting this Ordinance to (1) encourage healthy, active living, (2) reduce traffic congestion, air pollution, wear and tear on roads, and use of fossil fuels, and (3) improve safety and quality of life for residents of [Jurisdiction] by providing safe and convenient parking for bicycles;

**SECTION II. [ARTICLE/CHAPTER] OF THE [JURISDICTION]
[ZONING/PLANNING/MUNICIPAL/COUNTY CODE] IS HEREBY ADDED TO
READ AS FOLLOWS: “BICYCLE PARKING REQUIREMENTS FOR NEW
DEVELOPMENT AND MAJOR RENOVATIONS.”**

COMMENT: Jurisdictions that adopt an integrated set of bicycle-friendly policies designed to improve safety and convenience achieve higher ridership because of the synergistic effect of complementary policies. Thus jurisdictions adopting bicycle parking requirements may wish to consider adopting complementary laws as well. A report on “Pedestrian and Bicycle Friendly Policies, Practices, and Ordinances,” prepared by the Delaware Valley Regional Planning Commission (November 2011) discusses some of these complementary policies including bike-friendly traffic laws, Complete Streets, and Share the Road campaigns. (Available at: www.dvrpc.org/reports/11019.pdf).

§ 1. PURPOSE: The purpose of this section is to provide sufficient safe and convenient bicycle parking in New Developments and Major Renovations to encourage bicycling as a form of transportation, reducing traffic congestion, air pollution, wear and tear on roads, and use of fossil fuels, while fostering healthy physical activity.

COMMENT: Jurisdictions may include additional reasons or tailor these reasons to their individual community.

§ 2. DEFINITIONS: Unless the context clearly requires otherwise, the following terms shall have the following meanings:

- (A) **“Bicycle Parking Space”:** A physical space that is a minimum of [2.5] feet in width by [6] feet in length with a vertical clearance of at least [7] feet that allows for the parking of one bicycle, and if located outside, is hard surfaced and well drained.
- (B) **“Bike Locker”:** A lockable enclosure consistent with industry standards that (i) can hold one bicycle, (ii) is made of durable material, (iii) is designed to fully protect the bicycle against [insert specific local weather concerns, e.g.: rain, snow, ice, high winds], (iv) provides secure protection from theft, (v) opens sufficiently to allow bicyclists easy access, and (vi) is of a character and color that adds aesthetically to the immediate environment.

COMMENT: This provision allows for flexibility in the manner in which Bike Lockers are locked. Options include lockers designed for use with (1) bicyclist-provided locks, (2) leased keys, or (3) a smartcard or similar system.

If improper use of lockers is a concern in a particular community, this definition can be modified to expressly allow for an optional opening of up to 9 inches at the base of the locker to allow for security inspections.

- (C) **“Bike Rack”:** A device consistent with industry standards that (i) is capable of supporting a bicycle in a stable position, (ii) is made of durable materials, (iii) is no less than [36] inches tall (from base to top of rack) and no less than [1.5] feet in length, (iv) permits the securing of the bicycle frame and one wheel with a U-shaped lock, and (v) is of a character and color that adds aesthetically to the immediate environment.

COMMENT: U-shaped locks are one of the most effective bike locks.

- (D) **“In-Street Bicycle Parking”:** A portion of a vehicle parking lane or other area on a roadway that is set aside for the parking of bicycles.
- (E) **“Long-Term Bicycle Parking”:** Bicycle parking that is primarily intended for bicyclists who need bicycle parking for more than 3 hours and is fully protected from the weather.

COMMENT: As recognized by most bicycle parking laws enacted in recent years, it is important to provide for not only the short-term bicycle parking needs of community residents out shopping, eating, attending appointments, etc., but also the long-term bicycle parking needs of employees, multi-family housing residents, and students who park their bikes at work, school, or home for many hours or overnight. The two types of bicycle parking have different requirements. Security is a heightened concern for long-term bicycle parking, while immediate proximity to the destination is a greater priority for short-term bicycle parking. Additionally, short-term bicycle parking is generally not required to protect bicycles from the weather, while long-term bicycle parking necessitates full weather protection.

- (F) **“Long-Term Bicycle Parking Space”:** A Bicycle Parking Space that provides Long-Term Bicycle Parking.
- (G) **“Major Renovation”:** Any physical improvement of an existing building or structure, excluding single-family dwellings and multi-family dwellings with 4 or fewer units, that requires a building permit and has an estimated construction cost equal to or exceeding [\$250,000], excluding cost of (1) compliance with

accessibility requirements for individuals with disabilities under governing federal, state, or local law, and (2) seismic or other structural safety retrofit.

COMMENT: Since construction costs can vary widely by region, the suggested amount of \$250,000 may need to be adjusted up or down depending on local conditions. If inflation is a concern, the jurisdiction may want to indicate that the dollar amounts will be adjusted based on a particular index, such as a regional building cost index, the Engineering News-Record (ENR) cost indices, or the Producer Price Index - New Office Building Construction as reported in the *PPI Detailed Report* published by the U.S. Bureau of Labor Statistics.

- (H) **“New Development”:** Any construction of a new building or facility that requires a building permit, excluding single-family dwellings and multi-family dwellings with 4 or less units.
- (I) **“Short-Term Bicycle Parking”:** Bicycle parking primarily intended for bicyclists who need bicycle parking for 3 hours or less.
- (J) **“Short-Term Bicycle Parking Space”:** A Bicycle Parking Space that provides Short-Term Bicycle Parking.

§ 3. BICYCLE PARKING SPACES REQUIRED: Short-Term and Long-Term Bicycle Parking Spaces shall be required for all New Development and Major Renovations.

COMMENT: While many bicycle parking ordinances focus on new development, some cities, like Oakland and San Francisco, CA, and Tucson, AZ extend bicycle parking requirements to major renovations as well. This is particularly important because many cities are already substantially built-out.

- (A) **Required Number of Bicycle Parking Spaces:** All New Development and Major Renovations shall provide at least the number of Short-Term and Long-Term Bicycle Parking Spaces identified in the table in this subsection [Section II, § 3(A)]; however, the number shall not fall below a minimum of [2] Short-Term and [2] Long-Term Bicycle Parking Spaces, regardless of other provisions herein, except that multi-family dwellings that have private garages (or equivalent separate storage space for each unit) are not required to provide any Long-Term Bicycle Parking Spaces. Where the calculation of total required spaces results in a fractional number, the next highest whole number shall be used. Up to half of the required Short-Term Bicycle Parking Spaces may be replaced with Long-Term Bicycle Parking Spaces.

General Use Category	Specific Use	Number of Short-Term Bicycle Parking Spaces Required	Number of Long-Term Bicycle Parking Spaces Required
Residential	Multi-Family Dwelling with more than 4 units:		
	(a) <i>without</i> private garage or equivalent separate storage space for each unit	[.05] per bedroom or [1] per [20] units	[.5] per bedroom or [1-4] per [4] units
	(b) <i>with</i> private garage or equivalent separate storage space for each unit	[.05] per bedroom or [1] per [20] units	None
Commercial	Office Building	[1] per each [20,000] sq.ft. of floor area	[1-1.5] per [10,000] sq.ft. of floor area
	General Retail	[1] per each [5,000] sq.ft. of floor area	[1] per [10,000-12,000] sq.ft. of floor area
	Grocery	[1] per each [2,000] sq.ft. of floor area	[1] per [10,000-12,000] sq.ft. of floor area
	Restaurant	[1] per each [2,000] sq.ft. of floor area	[1] per [10,000-12,000] sq.ft. of floor area
	Parking Garage	[2] spaces	[1] per [20] motor vehicle spaces
	Outdoor Parking Lot	[1] per [20] motor vehicle spaces	[2] spaces
Civic	Non-assembly cultural (e.g., library, government buildings)	[1] per each [8,000 -10,000] sq. ft. of floor area	[1 -1.5] per each [10-20] employees
	Assembly (e.g., church, theater, stadiums, parks)	Spaces for [2-5] per cent of maximum expected daily attendance	[1- 1.5] per each [20] employees
	Schools (K-12)	[1] per each [20] students of planned capacity	[1] per each [10-20] employees and [1] per each [20] students of planned

	Colleges and Universities	[1] per each [10] students of planned capacity	capacity for grades 6-12 [1] per each [10-20] employees and [1] per each [10] students of planned capacity or [1] per each [20,000] sq. feet of floor area, whichever is greater
Industrial	Manufacturing and Production, Agriculture	[2] spaces (Can be increased at discretion of Planning/Zoning Administrator)	[1] per 20 employees

COMMENT: The recommended numbers of required spaces in this table are based on the Bicycle Parking Guidelines, 2nd Ed., prepared by the Association of Pedestrian and Bicycle Professionals, as well as a review of bicycle parking ordinances adopted in various locales around the country. Where ranges are provided, the higher range is recommended for areas that are more urban or have (or anticipate having) higher levels of bicycle use. The required number of spaces typically varies by zoning district (e.g. residential, commercial, industrial) as well as specific land use (e.g. restaurant, hotel, senior center). In the interests of simplicity, the above table only includes requirements for a limited number of specific uses. If a jurisdiction is interested in including requirements for a more detailed list of uses, Tucson, Arizona's bicycle parking law provides an example: http://cms3.tucsonaz.gov/sites/default/files/bicycle/Parking_Ordinance.PDF (see pages 31-34).

Jurisdictions usually link the number of required spaces to one or more of the following measurements that are already used in their zoning process: residential dwelling unit or number of bedrooms, square footage, building occupancy/number of employees, or automobile parking spaces. This allows for easy incorporation of bicycle parking into the planning process. Thus, if a jurisdiction's zoning law uses different measurements than those used in this table, the jurisdiction may want to modify the above table to reflect the measurements used by its specific zoning law -- with one caveat. Linking the number of required bicycle parking spaces to a percentage of the required motor vehicle parking spaces, as some jurisdictions have done, is not recommended. This is because jurisdictions may decide to decrease the required number of motor vehicle parking spaces in order to encourage use of alternative forms of transportation. If such a decrease also automatically decreases the number of required bicycle parking spaces, the goal of encouraging use of alternative forms of transportation would be undermined.

Note also that in some states, public schools, colleges, and universities may not be required to comply with local zoning constraints, in which case the above requirements will not apply. In addition, some jurisdictions may prefer to address bicycle parking requirements for government-owned property by internal regulation, in which case government buildings should be excluded from the above chart and separate internal regulations should be adopted.

Jurisdictions that anticipate future growth in population and/or bicycle ridership due to introduction of a bike share program or other policies or programs designed to increase ridership may want to consider including a provision that either encourages or requires locating bicycle parking in an area that would allow for later expansion.

- (B) If the New Development or Major Renovation is for a use not listed in the above table, the number of Bicycle Parking Spaces required shall be calculated on the basis of a similar use, as determined by the [Planning Director/Zoning Administrator].
- (C) If the Major Renovation has an estimated construction cost of between [\$250,000] and [\$1,000,000], excluding the cost of (1) compliance with accessibility requirements for individuals with disabilities under governing federal, state, or local law, and (2) seismic or other structural safety retrofit, the number of Bicycle Parking Spaces required by subsections [Section II, § (3)(A)-(B)], shall be reduced by 50 percent; however, the minimum requirement of [2] short-term and [2] long-term bicycle parking spaces shall still apply.

COMMENT: The purpose of this section is to distinguish between Major Renovations that are very extensive and Major Renovations that are less extensive, but still qualify as major. While Major Renovations that fall in the first category are subject to the same bicycle parking requirements as New Development, the requirements for Major Renovations that fall within the second category are reduced by 50%.

Since construction costs can vary widely by region, the suggested range of \$250,000 – \$1,000,000 may need to be adjusted up or down depending on local conditions. If inflation is a concern, the jurisdiction may want to indicate that the dollar amounts will be adjusted based on a particular index, such as a regional building cost index, Engineering News-Record (ENR) cost indices, or the Producer Price Index - New Office Building Construction as reported in the *PPI Detailed Report* published by the U.S. Bureau of Labor Statistics.

§ 4. BUILDING PERMITS AND CERTIFICATES OF OCCUPANCY: Prior to issuance of a building permit for New Development or a Major Renovation, the submitted plans must include specific provisions for bicycle parking that are consistent with the requirements of this Ordinance. No certificate of occupancy for said building permit shall issue at the conclusion of the project until [Jurisdiction] finds that the applicable provisions of this Ordinance have been complied with.

§ 5. EXISTING BICYCLE PARKING AFFECTED BY CONSTRUCTION: In the event that the [Jurisdiction] has authorized a permit holder to remove existing bicycle parking in the public right-of-way due to construction, the permit holder shall replace such bicycle parking no later than the date of completion of the construction. At least [7] days prior to removal of such bicycle parking, the permit holder shall post, in the immediate vicinity of the bicycle parking area, a weather-proof notice, with a minimum type size of [1] inch, specifying the date of removal. In the event that any bicycles remain parked on the date of the removal, such

bicycles shall be stored for a reasonable period, not less than [45] days, and a conspicuous, weather-proof notice shall be placed as close as feasible to the site of the removed bicycle parking containing information as to how to retrieve a removed bicycle.

If bicycle parking is likely to be removed, pursuant to this section, for more than [120] days, it shall, to the extent possible, be temporarily re-sited, in coordination with *[insert appropriate department, such as Department of Public Works]*, to a location as close to the original site as feasible, pending completion of the construction. If the temporary site is not clearly visible from the original site, the permit holder shall post a conspicuous, weather-proof notice in the immediate vicinity of the original site informing bicyclists of the location of the temporary site.

COMMENT: This provision is designed to ameliorate the reduction of bicycle parking that occurs when existing bicycle parking is eliminated as an unavoidable byproduct of the construction process. Providing advance notice and a way to retrieve bicycles also addresses a problem that has been experienced in some communities, in which bicycles are confiscated or destroyed without notice or recourse when existing bicycle parking is removed. Just as there is typically signage informing motorists how a towed car can be retrieved, this provision is designed to provide bicyclists with a similar form of recourse. Note that this provision applies to all construction projects requiring a permit, regardless of whether the project is subject to the bicycle parking requirements of this ordinance.

§ 6. BICYCLE PARKING STANDARDS - GENERAL:

(A) All Bicycle Parking Spaces shall be:

- (1) well lit if accessible to the public or bicyclists after dark;
- (2) located to ensure significant visibility by the public and building users, except in the case of Long-Term Bicycle Parking that is located in secured areas;

COMMENT: Good lighting and a general sense that the area is publicly visible (often known as “eyes on the street”) provide a strong deterrent against theft, attacks, and vandalism.

- (3) accessible without climbing more than one step or going up or down a slope in excess of [12] percent, and via a route on the property that is designed to minimize conflicts with motor vehicles and pedestrians.

(B) All In-Street Bicycle Parking and Bicycle Parking Spaces located in a parking facility shall be:

(1) clearly marked; and

(2) separated from motor vehicles by some form of physical barrier (such as bollards, concrete or rubber curbing or pads, reflective wands, a wall, or a combination thereof) designed to adequately protect the safety of bicyclists and bicycles.

- (C) All Bike Racks shall be located at least [36] inches in all directions from any obstruction, including but not limited to other Bike Racks, walls, doors, posts, columns, or exterior or interior landscaping.

COMMENT: The 36 inch clearance requirement allows for easy access for bikes with all kinds of handlebars and panniers and is best practice.

- (D) Unless Bicycle Parking Spaces are clearly visible from an entrance, a sign indicating their location shall be prominently displayed outside the main entrance to the building or facility, and additional signs shall be provided as necessary to ensure easy way finding. A “Bicycle Parking” sign shall also be displayed on or adjacent to any indoor room or area designated for bicycle parking. All outdoor signs required by this subsection [Section II, § 6(D)] shall be no smaller than [12] x [18] inches and utilize a type size of at least [2] inches. All indoor signs required by this subsection [Section II, § 6(D)] shall be no smaller than [8] x [10] inches and utilize a type size of at least [5/8] inch.

COMMENT: Cities should ensure that outdoor signs are large enough to be easily seen and understood. The Manual on Uniform Traffic Control Devices (2009 Ed.), published by the U.S. Dep’t. of Transportation, recommends a minimum size of 12 x 18 for outdoor bicycle parking signs. Available at: http://mutcd.fhwa.dot.gov/pdfs/2009/pdf_index.htm (Part 9 (Traffic Control for Bicycle Facilities), Table 9B-1 (p. 792). A sample sign design is also set forth in Figure 9B-4 (sign D4-3) at p. 800.

Standard letter visibility charts indicate that every one inch of letter height provides 10 feet of readability with the best impact. For example, two-inch tall letters make the best impact within 20 feet; however, they are still readable from much further away (48-58 feet) depending on color, capitalization and design. Three-inch tall letters have their best impact within 30 feet but are readable up to 100 feet. A 5/8 inch type size for indoor signs is consistent with ADA signage requirements.

If a jurisdiction already has an ordinance governing signage, it should be consulted to ensure consistency.

§ 7. ADDITIONAL REQUIREMENTS APPLICABLE TO SHORT-TERM BICYCLE

PARKING ONLY: All Short-Term Bicycle Parking Spaces shall contain Bike Racks and shall meet the following requirements, in addition to the requirements in [Section II, § 3] above:

(A) Location:

- (1) Short-Term Bicycle Parking must be located either (a) within [50] feet of the main public entrance of the building or facility, or (b) no further than the nearest motor vehicle parking space to the main public entrance (excluding parking for individuals with disabilities), whichever is closer. If the New Development or Major Renovation contains multiple buildings or facilities, the required Short-Term Bicycle Parking shall be distributed to maximize convenience and use.

COMMENT: After security, convenience is the most important factor for bicyclists. Fifty feet is generally considered the maximum distance bicyclists are willing to lock their bikes up to a rack before looking for another object to lock to. Many jurisdictions, including Fort Worth, TX, and Palo Alto and Emeryville, CA, require that the furthest bicycle parking rack be no further away from an entrance than the nearest vehicle parking space.

- (2) Short-Term Bicycle Parking Spaces may be located either (a) on-site or (b) in the public right-of-way (e.g., sidewalk or In-Street Bicycle Parking), provided that an encroachment permit is obtained for the installation and the installation meets all other requirements of [indicate the law governing encroachments on public rights-of-way]. If Bike Racks are located on public sidewalks, they must provide at least [5] feet of pedestrian clearance, and up to [6] feet where available, and be at least [2] feet from the curb.

COMMENT: Sufficient clearance requirements are necessary to ensure that bicyclists can easily access and lock their bikes while avoiding interference with pedestrians. While six feet for pedestrian clearance is best practice, and is particularly important in areas with many pedestrians, an acceptable alternative is 5 feet. This is consistent with guidelines developed by the U.S. Architectural and Transportation Barriers Compliance Board and the U.S. Department of Transportation for designing public sidewalks (available at: www.access-board.gov/prowac/guide/PROWguide.pdf), and ensures that the sidewalk is fully accessible to individuals with disabilities.

In-Street Bicycle Parking (in place of one or more vehicle parking spaces) can be an attractive option in dense commercial areas where demand for bicycle parking is high and there are limited off-street options or sidewalk clearance. In-street bicycle

parking provides commercial districts with 8-12 bicycle parking spaces to each vehicle space and clearly advertises that it is a bike friendly area.

- (B) Bike Rack Requirements:** Bike Racks used for Short-Term Bicycle Parking must be securely attached to concrete footings, a concrete sidewalk, or another comparably secure concrete surface, and made to withstand severe weather and permanent exposure to the elements.

COMMENT: Bike racks bolted to asphalt, dirt, or grass can become dislodged over time or due to theft or vandalism, and do not provide secure parking. Bike racks made with powder-coated metal or stainless steel can withstand severe weather and permanent exposure to the elements.

While more expensive up front, high quality racks require less maintenance, last longer, and look better. Also, even a good quality bike rack costs a fraction of a vehicle parking space, particularly considering that 8-12 bicycles parking spaces can typically fit in one vehicle parking space. According to the Pedestrian and Bicycle Information Center, the cost to purchase and install a bike rack is generally \$150-\$300, and \$1,000 - \$4,000 for a bike locker. In contrast, a parking space can cost from \$2,200 per space in a surface lot to \$23,000 per space in a garage.

§ 8. ADDITIONAL REQUIREMENTS APPLICABLE TO LONG-TERM BICYCLE PARKING ONLY: Long-Term Bicycle Parking shall be provided in either (1) Bike

Lockers or (2) indoor rooms or areas specifically designated for bicycle parking (including designated areas of an indoor parking facility), and shall satisfy the following requirements, in addition to those set forth in [Section II, § 3] above:

- (A) Location:** Long-Term Bicycle Parking may be located either on- or off-site. If located off-site, it shall be no more than [300 feet] from the main public entrance.

COMMENT: Jurisdictions should select an appropriate distance based on population size and local conditions. Smaller cities, like Boulder, Colorado and Tucson, Arizona, tend to use 300 feet; larger cities may allow a greater distance, like 500 feet (Oakland) or 750 feet (Portland). Some large cities allow this requirement to be expanded, upon a showing that a proposed or existing bike station or similar high-capacity bicycle parking facility is located within 1,000 feet (around three or four city blocks).

- (B) Requirements for Indoor Long-Term Bicycle Parking:** Long-Term Bicycle Parking located in designated indoor rooms or areas shall contain Bike Racks or comparable devices. Such rooms shall be designed to maximize visibility of all portions of the room or designated area from the entrance. Supplemental security

measures (such as limiting access to a designated indoor bike parking room to persons with a key, smart card, or code) are optional.

COMMENT: Providing adequate security is critical to the willingness of bicyclists to use Long-Term Bicycle Parking. This model ordinance requires that, at a minimum, Long-Term Bicycle Parking shall be provided either in lockable Bike Lockers or in indoor rooms or areas (including parking garages) that contain lockable Bike Racks. It also provides flexibility, however, in the event that local conditions warrant additional security measures.

§ 9. MOTOR VEHICLE PARKING SPACE CREDITS:

- (A) For every [6] Bicycle Parking Spaces provided, the number of required off-street motor vehicle parking spaces (excluding parking spaces for individuals with disabilities) on a site shall be reduced by [1] space.

COMMENT: This type of “parking exchange formula” is very popular with developers, allowing them to reduce the number of vehicle parking spaces (which are more costly than bike parking spaces) when they provide bicycle parking. Such a provision is an effective incentive for both increasing bicycle parking and reducing the amount of land devoted to off-street vehicle parking. If a community is concerned about maintaining a certain minimum number of vehicle parking spaces, a provision can be added that caps the available credit, e.g. “The total number of required off-street vehicle parking spaces shall not be reduced by more than [20]% pursuant to this credit.”

- (B) To encourage the installation of showers at non-residential sites, the number of required off-street motor vehicle parking spaces for such sites shall be reduced as follows: A credit of [1] space shall be provided for the first shower installed, with additional off-street motor vehicle parking credits available at a rate of [1] space for each additional shower provided per [25] required Bicycle Parking Spaces. In order to claim these credits, which shall be in addition to the bicycle parking credits provided for in [Section II, § 9(A)], shower facilities must be readily available for use by all employees of the New Development or Major Renovation.

COMMENT: Destination amenities (such as showers, lockers and changing rooms) in commercial or industrial buildings are designed to encourage more people to commute (or commute further) to work by bicycle. Particularly where climates are warm or humid, the ability to shower can help make commuting by bicycle or by foot a more feasible alternative to driving. Like bike parking generally, these provisions can be viewed as a “win-win” situation. Developers can promote these facilities as a benefit for tenants, businesses can promote employee health and fitness, and employees receive improved options for bicycling to work. Such showers often benefit non-bicycling employees as well, such as those who exercise during lunch or who spend long hours at the office.

Some jurisdictions that anticipate large, high-density commercial developments may choose to make the installation of showers (and/or other destination amenities) in such developments mandatory rather than optional. Currently, a few cities (such as Seattle, WA, Oakland, San Francisco, and San Jose, CA, Boston, MA, and Minneapolis, MN), require shower facilities in new commercial developments if they exceed a specified square footage (ranging widely from 10,000 sq. ft. (San Francisco) to 500,000 sq. ft. (Minneapolis)). If a community wishes to make this a mandatory requirement, the following provision can be substituted: “Non-residential uses shall provide [4] showers, along with [4] clothing lockers per shower, for buildings that are [] square feet or more. [Two] additional showers shall be provided for each additional

[] square feet). An off-street vehicle parking credit of [1] space per shower shall be provided, up to one shower per [25] required Bicycle Parking Spaces. In order to claim this credit, which shall be in addition to the other bicycle parking credits provided for, showers must be easily accessible to all employees of the New Development or Major Renovation."

It is also worth noting that in areas that contain existing fitness clubs, employers can also be encouraged to subsidize memberships for employees in a nearby gym that already has showers. This additional option, or alternative to on-site showers, not only provides showers for bicycle commuters but benefits all employees, as well as the employer, since healthier employees tend to have higher productivity.¹² Such programs can be linked to employee commuter programs, physical activity promotions or other similar local initiatives.

§ 10. (optional) MODIFICATION OF REQUIREMENTS: In the event that satisfying all of the requirements of [Section II] would be (a) infeasible due to the unique nature of the site, or (b) cause an unintended consequence that undermines the purpose of this Ordinance, a property owner (or designee) may submit a written request to the [Planning Director/Zoning Administrator/other Local Administrator or designee] for a modification of the requirements of [Section II]. The request shall state the specific reason(s) for the request, provide supporting documentation, and propose an alternative action that will allow the purposes of this Ordinance to be fulfilled as much as possible.

COMMENT: Jurisdictions should consult their local laws and regulations to determine if they already include procedures for modifications or waivers that would either conflict with, or duplicate, this provision.

SECTION III. [ARTICLE/CHAPTER] OF THE [JURISDICTION] [ZONING/PLANNING/MUNICIPAL/COUNTY CODE] IS HEREBY ADDED TO READ "BICYCLE PARKING REQUIREMENTS FOR PARKING FACILITIES."

§ 1. PURPOSE: The purpose of [Section III] is to provide sufficient safe and convenient bicycle parking in parking facilities so as to encourage bicycling as a form of transportation, which in turn reduces traffic congestion, air pollution, wear and tear on roads, and use of fossil fuels, while fostering healthy physical activity.

COMMENT: Since vehicle parking lots and garages are already in the business of providing parking, it is relatively easy for these uses to include bicycle parking, and thus significantly expand bicycle parking options in locations already identified as desirable destinations.

This section is designed to apply to existing parking facilities licensed by the jurisdiction, as well as new parking facilities, once they become established and are licensed. Note that the bicycle parking requirements for *new* parking facilities (see Section II, § 3) are consistent with the requirements of this section.

§ 2. DEFINITIONS: The definitions set forth in [Section II, § 2] shall apply to [Section III], unless the context clearly requires otherwise.

§ 3. LICENSING CONDITIONS: As a condition of the issuance or renewal of a license required by the [Jurisdiction] for a parking facility, parking facilities shall provide [1] Bicycle Parking Space per each [20] vehicle parking spaces provided, with a minimum of [6] Bicycle Parking Spaces. Where the calculation of total required spaces results in a fractional number, the next highest whole number shall be used.

COMMENT: Cleveland requires bicycle parking in all licensed parking lots and garages at a rate of 1 per 20 vehicle spaces. San Francisco has a similar provision, but reduces the ratio to 1 per 40 vehicle spaces for garages that provide over 500 spaces. In Cincinnati, the rate is also 1 per 20 vehicles although the law is limited to new and expanded parking garages. If desired, the ordinance can impose a cap on the maximum number of bicycle parking spaces that can be required (San Francisco has a cap of 50; Cleveland and Cincinnati have a cap of 24).

Since most cities require businesses to obtain an annual license to operate, linking compliance to licensing should achieve the goals of this section in a relatively efficient manner. Parking facilities that face an imminent renewal at the time the ordinance becomes effective are afforded a grace period in which to comply by Section VIII of this ordinance. It is recommended, however, that all licensed parking facilities in existence at the time the ordinance is enacted receive a notice of Section III of the ordinance ["Bicycle Parking Requirements for Parking Facilities"], along with Section VIII ["Effective Date of Ordinance"] in order to facilitate prompt compliance. In the event that a jurisdiction's business licenses remain valid for more than one year, the jurisdiction may want to consider expediting compliance by adding the new bicycle parking requirements to existing licenses. State law on this issue varies, however, so jurisdictions should consult their own state law to determine whether such a modification can be undertaken and if so, under what conditions.¹³

§ 4. LOCATION: All Bicycle Parking Spaces required by [Section III] shall be located in an area, preferably on the ground floor, that (i) can be conveniently and safely accessed by bicycle and by foot in a way that minimizes conflicts with motor vehicles, (ii) is not isolated, and (iii) maximizes visibility by parking facility patrons and attendants. If the licensed parking facility has multiple entrances, the required Bicycle Parking Spaces may be spread out among the multiple entrances. Bicycle Parking Spaces shall be accessible without climbing more than one step or going up or down a slope in excess of [12] percent.

§ 5. BIKE RACKS: All Bicycle Parking Spaces required by [Section III] shall contain Bike Racks and shall be well lit if accessible to the public or bicyclists after dark or if in an interior or darkened location. All Bike Racks shall also provide a clearance of at least [36] inches in all directions from any obstruction (including but not limited to other bike racks, walls, doors, posts, columns or landscaping), and shall be separated from vehicles by some form of physical barrier (such as bollards, concrete or rubber curbing or pads, reflective wands, a wall, or a combination thereof) designed to adequately protect the safety of bicyclists and bicycles. All Bike Racks located outdoors shall also be securely attached to concrete footings and made to withstand severe weather and permanent exposure to the elements.

§ 6. SIGNAGE: Parking facilities shall also install prominent signs, no smaller than [12] x [18] inches and utilizing a type size of at least [2] inches, in or near each entrance that advertise the availability of bicycle parking, and the location, if it is not visible from the entrance.

COMMENT: See Comment to Section II, § 6(D) regarding signage.

§ 7. CONTRACTUAL LIMITS ON LIABILITY: [Section III] shall not interfere with the rights of a parking facility owner (or designee) to enter into agreements with facility users or take other lawful measures to limit the parking facility's liability to users, including bicycle users, with respect to parking in the parking facility, provided that such agreements or measures are otherwise in accordance with the requirements of [this Ordinance] and the law.

COMMENT: This provision simply permits parking facilities to extend to bicyclists the same contractual limitations that they ordinarily apply to motorists.

SECTION IV. [ARTICLE/CHAPTER] OF THE [JURISDICTION] [ZONING/PLANNING/MUNICIPAL/COUNTY CODE] IS HEREBY ADDED TO READ "BICYCLE PARKING REQUIREMENTS FOR SPECIAL EVENTS INVOLVING STREET CLOSURES."

§ 1. PURPOSE: The purpose of [Section IV] is to provide sufficient safe and convenient bicycle parking at special events involving street closures to encourage bicycling as a form of transportation, which in turn reduces traffic congestion, air pollution, wear and tear on roads, and use of fossil fuels, while fostering healthy physical activity.

COMMENT: Monitored bicycle parking at large civic and sporting events has become increasingly popular around the country as event organizers and local governments see the many benefits: (1) it encourages attendees to leave their cars at home and arrive by bicycle, which is a healthy, non-polluting form of transport; (2) it can increase the number of attendees by encouraging residents who might not otherwise attend at all because of concerns regarding traffic congestion, car parking hassles, and lack of safe, secure bicycle parking; and (3) it helps reduce traffic congestion caused by the street closures and the increased number of people attracted to the area.

§ 2. CONDITIONS ON STREET CLOSURE PERMITS: As a condition of a permit for the closure of a street for a special event in which the daily number of participants is projected to be [1,000] or more, monitored bicycle parking shall be provided by the event sponsor (or a designee) for at least [1] % of expected daily participants beginning [½ hour] before and ending [½ hour] after the time of the event each day of the event.

COMMENT: The cities of Alameda and San Francisco, California both implement their monitored bicycle parking requirement for large events involving street closures through their temporary street closure and event permit application and review process. If, over time, the demand for monitored bicycle parking increases, jurisdictions can easily increase the amount of monitored bicycling parking required through a simple amendment to the ordinance.

§ 3. REQUIREMENTS FOR MONITORED PARKING: Monitored bicycle parking shall include the presence, at all times, of one attendant, or more as needed, to receive bicycles, dispense claim checks, return bicycles, and provide security for all bicycles.

§ 4. LOCATION: All monitored bicycle parking shall be located within [500] feet of at least one regular entrance or access point to the event.

COMMENT: Possible locations for monitored parking would include school yards, in-street vehicle parking spaces, garages, or designated sections of closed streets. Generally, 8-12 bicycles will fit in 1 vehicle parking space.

§ 5. PUBLICITY AND SIGNAGE: All publicity, including signs, for the event shall state the availability of monitored bicycle parking, its location, and cost, if any. All event maps shall include the location of monitored bicycle parking. If monitored bicycle parking is not within eyeshot of each entrance, signs shall be provided to ensure easy way finding.

§ 6. INSURANCE COVERAGE AND FEES: The event sponsor or designee must provide insurance coverage for the monitored bicycle parking in case of damaged or stolen bicycles, and may charge users a fee to cover the cost of providing the monitored parking.

COMMENT: According to the San Francisco Bicycle Coalition, it has never had a bicycle lost or stolen in the 10 years it has provided monitored bicycle parking at local events. Bicycling organizations that offer monitored bike parking at events (commonly referred to as “valet bike parking”) generally have insurance coverage as a precautionary measure, and such a requirement is recommended.

SECTION V. [ARTICLE/CHAPTER] OF THE [ZONING/PLANNING/MUNICIPAL/COUNTY CODE] IS HEREBY ADDED TO READ “REMOVAL OF ABANDONED BICYCLES.”

§ 1. PURPOSE: The purpose of [Section V] is to ensure the reasonably prompt removal of bicycles abandoned in Bicycle Parking Spaces so as to encourage bicycling as a form of transportation, which in turn reduces traffic congestion, air pollution, wear and tear on roads, and use of fossil fuels, while fostering healthy physical activity.

§ 2. DEFINITIONS: The definitions set forth in [Section II, § 2] of this Ordinance shall apply to [Section V], unless the context clearly requires otherwise.

§ 3. REMOVAL REQUIREMENTS: On [a quarterly basis], owners of property (or a designee) subject to [Sections II or III of this Ordinance] shall remove, from all Bicycle Parking Spaces associated with their property, including those located on the public right-of-way, bicycles that have been abandoned. A bicycle shall be deemed to be abandoned if it has not been removed after having been tagged with a notice of removal for [2] weeks for Short-Term Bicycle Parking Spaces or [4] weeks for Long-Term Bicycle Parking Spaces. However, a bicycle shall not be deemed to be abandoned if the bicyclist and property owner (or designee) have a written agreement regarding provision of long term storage covering the time period in question. Abandoned bicycles may be donated to non-profits that reuse bicycles or may be disposed of in any lawful manner.

COMMENT: Removal of abandoned bicycles is critical. Not only do they effectively eliminate bicycle parking spaces, but they are also an eyesore, deter bicycle users, and turn others against bicycle parking. Some cities, like Emeryville, California, require property owners to remove abandoned bicycles from short-term spaces on a monthly basis.

Since state law governs abandoned personal property, the law in this area can vary by state. Typically, however, state law provides that personal property is abandoned when it is thrown away, or its possession is intentionally forsaken by the owner. The first person who finds and takes possession of abandoned property acquires all right, title and interest in the property, and thus may dispose of it in any lawful manner.

In the event that the original owner later disputes the abandonment, the issue of whether the item was “intentionally forsaken,” usually turns on the original owner’s actions and the specific circumstances. Evidence that a bicycle has been neglected for an extended period in a public bicycle parking area, particularly after having been tagged with an abandonment notice, would provide evidence of abandonment. Jurisdictions can also encourage property owners to post a sign near bicycle parking that notifies bicyclists that abandoned bicycles will be donated or disposed of in a lawful manner, and identifies the criteria for finding abandonment set forth in the ordinance. Such a sign could provide additional evidence of abandonment in the event a dispute arose.

As state laws can vary, municipalities should consult their individual state’s law on abandonment of personal property to ensure their ordinance is consistent.

SECTION VI. [ARTICLE/CHAPTER] OF THE [JURISDICTION] [ZONING/PLANNING/MUNICIPAL/COUNTY CODE] IS HEREBY ADDED TO READ “IMPLEMENTATION OF ORDINANCE.”

§ 1. REGULATIONS AND PROCEDURES: The [Planning Director/Zoning Administrator and/or other relevant local administrator(s)] [is/are] authorized to promulgate new and amend existing rules, regulations, procedures or forms as necessary or appropriate to implement the provisions of [this Ordinance].

§ 2. TRAINING: [Jurisdiction] shall periodically make trainings or training materials available to planners and other employees involved in the implementation and enforcement of [this Ordinance].

COMMENT: Local planners or staff may not be familiar with the multitude of different bike parking design and site lay-out issues that arise in the context of bicycle parking. Providing training or training materials can be crucial to the effective implementation of a bicycle parking ordinance. Resources that could be used to develop training materials are available from some bicycling organizations such as the Association of Pedestrian and Bicycle Professionals (www.apbp.org) and the Bicycle Transportation Alliance (www.bta4bikes.org/resources/bikeparking.php). Also, some bicycle parking ordinances, such as Portland’s, include helpful diagrams of possible bike parking site layouts. (Portland’s ordinance is available at: www.portlandonline.com/bps/index.cfm?a=53320 (see pages 25-27).)

§ 3. REPORTING: The [Planning Director/Zoning Administrator] shall provide an annual report to the [Adopting Body] regarding the implementation of this Ordinance that shall, at a minimum, include the following information relevant to the preceding year: (1) the number of Short and Long-Term Bicycle Parking Spaces created pursuant to [Sections II and III], and the number of events for which special event bicycle parking was provided under

[Section IV] ; (2) *(if applicable)* a brief summary of each request for modification received and action taken in response thereto; and (3) any other information learned that would improve future implementation of [this Ordinance] and its goals.

COMMENT: This crucial accountability provision enables local law-makers and the public to assess the effectiveness of the ordinance. If desired, jurisdictions can include additional reporting requirements designed to assist with future bicycle programs or plans. Such requirements could include reporting on actual use of bicycle parking spaces or on changes in bicycling rates.

SECTION VII. STATUTORY CONSTRUCTION:

- (A) All ordinances or parts thereof that conflict or are inconsistent with this Ordinance are repealed to the extent necessary to give this Ordinance full force and effect.
- (B) If any section or portion of this Ordinance is judicially invalidated for any reason, that portion shall be deemed a separate and independent provision, and such ruling shall not affect the validity of the remaining portions of this Ordinance.

COMMENT: These standard provisions ensure there is no conflict with any other existing laws and that any partial invalidation does not affect the remainder of the ordinance. Your jurisdiction's attorney may wish to substitute a different version of this language

SECTION VIII. EFFECTIVE DATE: This Ordinance shall be effective [upon passage *(insert other date if desired)*] ("Effective Date"), except that:

- (A) [Section II, § 3] ("Bicycle Parking Spaces Required"), and [Section II, § 4] ("Building Permits and Certificates of Occupancy") shall only apply to New Development and Major Renovations for which a building permit is issued on or after [120] days from the Effective Date.

COMMENT: The 120 day grace period seeks to provide a reasonable balance between (1) a jurisdiction's interest in achieving the goals of the ordinance without delay, and (2) allowing developers and local planners reasonable notice of, and time to prepare for implementation of, the ordinance. Depending on local conditions, jurisdictions can adjust the length of this grace period to best effectuate this balance.

- (B) [Section III] ("Bicycle Parking Requirements for Parking Facilities") shall apply to Parking Facilities that were licensed prior to the Effective Date, and have less than [180] days remaining on their license, as follows: [1/2] of the required number of

Bicycle Parking Spaces shall be provided no later than [120] days from the expiration of the parking facility's license, with full implementation required no later than [180] days from the expiration of the parking facility's license.

- (C) [Section IV] ("Bicycle Parking Requirements for Special Events Involving Street Closures") shall not apply to events for which the temporary street closure was authorized pursuant to an application submitted prior to the Effective Date.

- ¹ Centers for Disease Control and Prevention. *Overweight and Obesity: Health Consequences*. Atlanta: CDC, 2012. Available at: www.cdc.gov/obesity/causes/health.html.
- ² Centers for Disease Control and Prevention. *Overweight and Obesity: Causes and Consequences*. Atlanta: CDC, 2012. Available at: www.cdc.gov/obesity/causes/index.html.
- ³ See Active Living Research. *Active Transportation: Making the Link from Transportation to Physical Activity and Obesity, Research Brief*. 2009. Available at: www.activelivingresearch.org/files/ALR_Brief_ActiveTransportation.pdf.
- ⁴ See America Bikes, League of American Bicyclists. *Factsheet: National Household Travel Survey*. Available at: www.bikeleague.org/resources/reports/pdfs/nhts09.pdf; see also T. Litman. "Short and Sweet Analysis of Shorter Trips Using National Personal Travel Survey Data." Victoria Transport Policy Institute (February 22, 2012) at 3. (41% of all trips are 3 miles or less (and 67% of those are by car), and 19% of all trips are 1 mile or less (and 42% of those are by car)). Available at: www.vtpi.org/short_sweet.pdf.
- ⁵ See America Bikes, League of American Bicyclists. *Factsheet: National Household Travel Survey*. Available at: www.bikeleague.org/resources/reports/pdfs/nhts09.pdf; see also Rails-to-Trails Conservancy. *Turning Potential into Practice: Walking and Biking as Mainstream Transportation Choices*. 2007. Available at: www.railstotrails.org/resources/documents/whatwedo/TrailLink%2007%20Program_Mobility.pdf (citing FHWA 2006).
- ⁶ Research and Innovative Technology Administration, Bureau of Transportation Statistics. "Figure 2 On a typical day, how many miles one-way do you travel from home to work?" *Omnistats*, 3(4): 2003. Available at: www.bts.gov/publications/omnistats/volume_03_issue_04/html/figure_02.html.
- ⁷ US Department of Transportation, Federal Highway Administration. *Federal Highway Administration University Course on Bicycle and Pedestrian Transportation, Lesson 8: Pedestrian Characteristics*. July 2006, p. 1-10. Available at: www.fhwa.dot.gov/publications/research/safety/pedbike/05085/pdf/lesson8lo.pdf; Office of the Prime Minister, Social Exclusion Unit. *Making the Connections: Final Report on Transport and Social Exclusion*. Feb. 2003, p. 1-7. Available at: http://webarchive.nationalarchives.gov.uk/+/http://www.cabinetoffice.gov.uk/media/cabinetoffice/social_exclusion_task_force/assets/publications_1997_to_2006/making_transport_2003.pdf.
- ⁸ U.S. Department of Transportation, Federal Highway Administration. *The 'Carbon Footprint' of Daily Travel: NHTS Brief*. 2009. Available at: <http://nhts.ornl.gov/briefs/Carbon%20Footprint%20of%20Travel.pdf>.
- ⁹ See, e.g., C. Paige. "Pediatric Asthma Linked to Car Emissions." *Boston Globe*, March 2, 2008. Available at: www.boston.com/news/local/articles/2008/03/02/pediatric_asthma_linked_to_car_emissions/; Environmental Working Group's Auto Asthma Index (and sources cited therein). Available at: www.ewg.org/sites/asthmaindex/about/; R. Rabin. "Asthma Rate Rises Sharply in U.S., Government Says." *New York Times*, May 3, 2011. Available at: www.nytimes.com/2011/05/04/health/research/04asthma.html?_r=1.
- ¹⁰ See, e.g., Vanderbilt T. "What Would Get Americans Biking to Work? Decent Parking." *Slate*, Aug. 17, 2009. Available at: www.slate.com/id/2225511/; see also, e.g., City of New York Department of City Planning, Transportation Division. *The New York City Bicycle Survey: A Report Based on the Online Public Opinion Questionnaire Conducted for Bike Month 2006*. 2007. Available at: www.nyc.gov/html/dcp/pdf/transportation/bike_survey.pdf at p.15 (NYC commuters report a lack of safe storage for bicycles as a leading reason for not commuting by bike).
- ¹¹ See, e.g., Marin County Bicycle Coalition. *Economic Benefits of Bicycling in Urban Environments*. Available at: www.marinbike.org/Resources/EconomicBenefitsOfBicycling.pdf (citing a 118%-125% increase in bicycle use in Marin County over the last ten years due to improvements in infrastructure, including pathways, shared use lanes, intersection improvements and bicycle parking; and pointing to increased revenue due to retail purchases by bicyclists with adequate access to infrastructure and parking; see also J. Dill and T. Carr. "If You Build Them, Commuters Will Use Them - Another Look." Transportation Research Board 2003 Annual Meeting (cities with higher levels of bicycle infrastructure (bike lanes and paths) witnessed higher levels of bicycle commuting). Available at: www.palgrave-journals.com/jphp/journal/v30/nS1/full/jphp200856a.html).
- ¹² See Centers for Disease Control and Prevention. *Workplace Health Promotion: Increase Productivity*. Atlanta: CDC, 2011. Available at: www.cdc.gov/workplacehealthpromotion/businesscase/benefits/productivity.html.
- ¹³ See, e.g., 53 Corpus. Juris. Secundum, Licenses § 77.

J. BICYCLE AND PEDESTRIAN COUNT PROGRAM

INTRODUCTION

Establishing a citywide bicycle and pedestrian count program is essential to tracking implementation and measuring the success of projects, programs, and activities to increase bicycling and walking. The League of American Bicyclists commonly recommends developing a regular count program as part of a holistic approach to creating a Bike Friendly Community. This appendix item outlines a bicycle and pedestrian count program and methodology for the City of Evansville.

Whether tracking project outcomes or comparing larger trends in bicycling and walking to peer cities, Evansville can gather valuable information from regular, recurring counts. Table J.1 to the right identifies a number of unique count-related considerations and desired outcomes, and their impacts on count methodology. These factors have been taken into account in order to develop a comprehensive and effective count program to track bicycle and pedestrian activity for years to come.

APPLICATIONS OF COUNT DATA

Trend Analysis

Count data is typically used for tracking trends over time (are more people walking and biking in our community?). If limited sample size manual counts is the only data available, this question can be answered by aggregating the entire manual counts into an area-wide total. If larger sample size automatic counts are available, then longitudinal trends can be analyzed at the area and site-specific levels.

Before and After Counts

As pedestrian, bicycle, and greenway infrastructure projects are planned, pre- and post-construction evaluation should be conducted to measure existing conditions, identify the areas of greatest need for walking and bicycling improvements, and track the influence of new facilities on walking and bicycling rates and safety. A pre/post evaluation program will help build public and political support for future projects.

Table J.1: Bicycle and Pedestrian Count Considerations

Local Consideration	Impact on Count Methodology
Mixed traffic conditions (i.e.- shared motor vehicle/ bicycle travel lanes)	Mixed traffic raises issues about tech compatibility. Although initial recommendations involve manual counters, mid- and long-term recommendations will consider automated technology compatible with existing mixed traffic conditions as well as proposed separated facilities (i.e. - cycle track).
Well-developed local and regional trail system	Evansville's Pigeon Creek Greenway, including the Riverfront Corridor and the Industrial Corridor, are well used by bicyclists and pedestrians. These locations offer opportunities for counting in the near- and long-term.
Interest in evaluating existing conditions and ridership increases	The program will benchmark existing ridership. This section's recommendations also provide advice for capturing "before/after" studies of new facilities.
Desire to compare Evansville, IN to regional and national "peer cities"	The methodology will ensure Evansville's program conforms to current national best practice. Evansville's program will be similar to BFC-rated communities' data collection practices, including South Bend and Indianapolis.
Evansville residents are interested in supporting local bicycling and walking initiatives	A number of organizations such as the Welborn Baptist Foundation support initiatives to encourage increased walking and bicycling. These groups may help support the manual count program.

One example program is New York City's "Measuring the Street" campaign, which tracks changes in crashes, traffic speeds, congestion, foot traffic, retail sales, and bike, walk, and transit rates after street improvements are made. These data help to show how bicycle and pedestrian improvements can provide universal benefits to road users and local businesses, and allow city staff to measure and track this progress over time. Baseline user counts are also useful data for making the case for needed pedestrian and bicycle improvements; many people in Evansville already walk and bike, and counts help to quantify the existing demand for a new facility or intersection improvement.

PRIORITY COUNT LOCATIONS

The 15 priority counting locations were chosen to complement the Plan's highest priority locations for bikeway and pedestrian improvements. Priority counting locations are also designed to benchmark current walking and bicycling levels. Therefore, some of the locations may have very low activity, at least in the near-term. Priority counting locations may shift over time. Adding new locations throughout the city, according to varying street typologies and levels of use, will result in a clear estimate of walking and biking levels. Counts of bicyclists and pedestrians are recommended for the following 15 locations:

- Barker Ave between Claremont Ave and Howell Park
- Boeke Rd near Wesselman Park
- Covert Ave near Green River Rd
- Franklin St between Weinbach Ave and Boeke Rd
- Franklin St near Franklin Park
- Green River Rd near Eastland Mall
- Main St near Garvin Park
- Martin Luther King Jr Blvd near Ford Center
- Oak Hill Rd near Morgan Ave
- Pigeon Creek Greenway near Evansville Museum
- Pigeon Creek Greenway near Heidelberg Ave
- Walnut St near Central Library
- Washington Ave near Washington Middle School
- Weinbach Ave near Fairlawn Elementary School
- Weinbach Ave near University of Evansville

NEAR TERM RECOMMENDATIONS: 0 - 6 MONTHS

Evansville's data collection methodology is comprised of near-term, preliminary recommendations as well as recommendations for future implementation (mid- or long-term time frame).

Main Data Collection Method: Manual Counts

Cycle traffic counts have historically been undertaken by means of manual (i.e. a human surveyor) counts. Sample sizes are necessarily limited by resource availability. The program should tally the number of pedestrians and bicyclists at key locations around the community, particularly at pinch points, in downtown, near schools, and on greenway trails. This program should build off of any existing counts and should be performed at least once per year.

Bear in mind that count volunteers or staff are usually overwhelmed when tasked with counting pedestrians and bicyclists in one counting session. Each volunteer or staff person should focus on either one road/trail user type or the other, not both concurrently, especially in high traffic areas.

Manual program methodology is generally the same for counting both user types, although obvious differences do occur. For example, counters may note whether pedestrians are jogging. They will not note their helmet usage. It is recommended that the data collection program use methods developed by the National Bicycle and Pedestrian Documentation Project (NBPD).

Manual Count Program Logistics

The information below presents recommendations for launching a near-term manual count program in Evansville.

Counter Type: Manual

Frequency: The Official National Count/Survey days always fall during the second week of September. Additional NBPD counts occur once per quarter.

Time of Day, Day of Week:

- Perform at least one weekday count on a Tuesday, Wednesday, or Thursday during morning peak hours (7 - 9am) and evening peak hours (5 - 7pm)
- Perform one Saturday count from noon - 2pm.

Duration: Two hours, following the time frames listed above. Although longer data collection periods (between 4-8 hours) are preferable from a statistics perspective, manual counters should only be asked to complete two-hour counts.

Number of Locations: 15 locations as an initial start to the program. Statistical accuracy may be greater if using 17-20 counters.

Screenline versus Intersection Counts

Screenline counts draw an imaginary line across the roadway. The volunteer counts each trail/roadway user that passes the imaginary line. Although this method does not capture turning movements, it does allow for the identification of trends in volume and other factors influencing bicycling and walking. ***The manual count program should rely on screenline counts, unless specifically interested in locations with a substantial crash history.***

Intersection counts count roadway users who pass through the intersection. This type of count collects turning movement information. This method is often used at high collision locations and can be used to conduct exposure and safety analyses.

Counter Recruitment and Training

Counters can be city staff or volunteers, as long as proper training is provided. If desired, the data collection effort can also include surveys to learn more about walking and bicycling demographics, where people are traveling to and from, and roadway/sidewalk user needs.

The NBPD provides free training materials, including a PowerPoint slideshow. All volunteers should be required to participate in a short training session. Since organizing in-person training sessions may discourage volunteer participation and use valuable City employee time, Evansville may instead ask participants to review NBPD slideshows and any customized City material, such as short training videos, in advance of their scheduled counting time slot.

To ensure accurate data, city staff or “lead” volunteers should visit each count site during a respective volunteer’s shift. City staff should stand next to the participant and count passing roadway/trail users for a defined time frame (five to 15 minutes). The staff person should compare their count with the volunteer’s to capture any discrepancies. City staff should not use any data that is grossly different from the staff members’ count.

STANDARD SCREENLINE COUNT FORM

Name: _____ Location: _____

Date: _____ Start Time: _____ End Time: _____

Weather: _____

Please fill in your name, count location, date, time period, and weather conditions (fair, rainy, very cold). Count all bicyclists and pedestrians crossing your screen line under the appropriate categories.

- Count for two hours in 15 minute increments.
- Count bicyclists who ride on the sidewalk.
- Count the number of people on the bicycle, not the number of bicycles.
- Pedestrians include people in wheelchairs or others using assistive devices, children in strollers, etc.
- People using equipment such as skateboards or rollerblades should be included in the “Other” category.

	Bicycles		Pedestrians		Others
	Female	Male	Female	Male	
00-:15					
15-:30					
30-:45					
45-1:00					
1:00-1:15					
1:15-1:30					
1:30-1:45					
1:45-2:00					
Total					

Figure J.1: The National Bicycle and Pedestrian Documentation Project’s standard Screenline count form.

Data Reporting, Analysis, and Database-building

Using a standardized data collection template from the start will streamline Evansville's subsequent data collection endeavors. The 2013 edition of the FHWA *Traffic Monitoring Guide, Chapter 7.10: Non-Motorized Count Data Format* provides an overview for creating a .CSV file template to log all bike/pedestrian count data within a variable length, fixed field record. The content within non-motorized data records differ from those used for motorized data records.

Additional Considerations

Manual counts are inexpensive to implement and help gather behavioral data (gender, age group, sidewalk versus roadway riding). However, manual counts necessarily gather a very small sample size and are subject to significant variability, and as a result, year-on-year comparisons of manual count sites are not statistically robust. Manual counts should therefore be one part of a complete evaluation program that also includes automatic machine counters. The National Bicycle and Pedestrian Documentation Project website can be consulted for additional information pertaining to count and survey instructions, forms, and participant training materials: <http://www.bikepeddocumentation.org>

Ancillary Data Collection Method: Automatic Counts

Combining manual and automated counting methods will result in a more statistically robust dataset, when compared to using only manual count data. Existing automated counting technologies tested for accuracy in other jurisdictions include: active infrared, passive infrared, video technology, inductive loops, and pneumatic tubes.

A limited number of automatic counters can be rotated around the city in a mobile counting program, thus saving time. Using rotating counters to capture data from several locations means the city would not have to purchase one counter per location. This represents considerable savings, when one considers that each device's purchase cost is typically around \$3,000.

Automatic Pedestrian Count Technology and Specifications

Below are two options for implementing automated pedestrian counts. If interested in using automated pedestrian counters at the same time as beginning a manual counting program, the City should choose one of the following options and place them in high-interest counting locations for the recommended duration. Locations with automated devices would not receive regular manual counters, except to ensure the equipment is calibrated correctly.

Option A uses active infrared sensors, while Option B uses passive infrared sensors. Both devices have been used in similar applications across the country and both technology types have high accuracy and precision. Details pertaining to each option are listed below in Table J.2.

Table J.2: Automated Pedestrian Count Information

Characteristic	Option A: Active Infrared Sensor	Option B: Passive Infrared Sensor
Potential supplier	TrailMaster	TRAFx
Counting duration	Minimum of two weeks. Deployment may be subject to shorter durations, depending on the device's storage capacity, especially in downtown areas. In this case, staff may need to empty the devices in the field and redeploy them in order to capture two weeks' worth of data.	Minimum of two weeks. TRAFx devices have larger storage capacity than active infrared counters.
Counting time of year	Peak summer months	Peak summer months
Price	\$470 for one TrailMaster 1550 with capacity to store 16,000 counts. Software costs \$150.	\$2245 for three counters, sold as one package. The bundle includes one dock, DataNet software, cables, manual, and CD.
Number of devices	At least one, rotating between locations.	At least one, rotating between locations.

Automatic Bicycle Count Technology and Specifications

The two technologies are also chosen because of their ability to work in mixed traffic conditions and on trails, two prominent facility types found in Evansville. Equipment siting is dependent on the technology's ability to work within that location. Additional research is needed to determine a match between proposed counter type and suggested counting location. Criteria for equipment siting include distance from an intersection (mid-block locations produce better counts), absence of parking spaces, absence of extremely heavy motorized traffic, and other concerns.

If interested in using automated bicycle counters at the same time as beginning a manual counting program, the City should choose between the following options or some combination thereof (i.e.-one rotating pneumatic tube counter OR one

continuous thermal camera OR one rotating pneumatic tube and one continuously counting thermal camera).

Option A recommends a rotating tube counter for deployment of two weeks per site. Option B recommends a thermal camera to collect data for up to one year. This counter could be deployed for shorter time frames, or could stay in the fixed location for the entire time period. Details pertaining to each option are listed below in Table J.3.

Table J.3: Automated Bicycle Count Information

Characteristic	Option A: Bicycle-specific Pneumatic Tubes	Option B: Thermal Sensor
Potential supplier	EcoCounter	FLIR
Counting duration	Two weeks minimum duration. 4 Tubes may be used for longer durations (i.e. - three to four weeks) in separated facilities such as cycle track or trails, but should be deployed for a maximum of two weeks in mixed traffic conditions. Longer use in mixed traffic roadways risks equipment damage. Staff should routinely check the devices during deployment.	One year +
Counting time of year	Peak summer months	All year
Price	\$3350 - \$3900 for one EcoCounter TUBES device, including an approximation for needed accessories. Estimated labor/time for installation is about \$200 - \$350 per counter.	\$4,500 per unit. Additional supplies may be required for installation.
Number of devices	At least one, rotating between locations.	At least one, counting for an entire year.

Additional Considerations

Many cities fund count programs through an existing motor vehicle count budget. Researching this option for Evansville may result in streamlined integration of bicycle and pedestrian counts within the City's normal counting framework.

Investigating new technology may save money, although these devices are much more experimental. Nonetheless, these counters may offer Evansville the chance to try automated testing with lower monetary barriers to entry. Potential new technology options include:

- Data collection using cellular data – AirSage: <http://www.airsage.com>
- Combination magnetometer and infrared sensor device for detecting bicyclists and pedestrians – Knock Software: <http://bikeportland.org/2015/01/13/50-device-change-bike-planning-forever-130891>

Resources: Guidebook on Pedestrian and Bicycle Volume Data Collection Methods, published January 2015 based on NCHRP Report 797 from Project #07-19

Other Near-term Non-motorized Counting Methods

Surveys

Survey methods include national survey data (such as the Household Travel Survey and the Census), local intercept interview or destination surveys (which are often time consuming and unsuitable for time-series analysis), parked bicycle counts and school “hands-up” tallies (which can be influenced by external factors such as peer pressure).

Collision Data

Crash data can likewise help to identify areas where bicycle and pedestrian improvements are needed and help make the case for investments to improve safety. Crash data is a useful indication of potential issues, but it should be recognized that under-reporting issues, small numbers and regression to the mean effects are key limitations. Furthermore, just because no crashes have been reported at a given location does not mean that there are no engineering deficiencies: it may simply be that the location is so challenging to navigate on foot or on a bike that people avoid it. Another limitation is crash causation reporting biases. Attending police officers may not have the training to provide an unbiased attribution of fault and causation.

This Plan has used collision data as one input when generating information related to existing conditions, network recommendations and facility selection, and prioritization.

MID- TO LONG-TERM RECOMMENDATIONS: 6 – 12 MONTHS

A future program would utilize a higher proportion of automated counter locations to manual count locations.

Main Data Collection Method: Automatic Counts

The team proposes using automated counters as the major type of counting method in the mid- to long-term. The program would consist of counters deployed for between two – four weeks (“short duration”) and counters deployed for one year (“continuous”). Using both types helps cities run advanced statistical analysis as they collect their count dataset.

Manual counts could still be used for “one-off” counts and to ensure automated equipment is calibrated correctly.

Evansville should begin to consider mid- to long-term recommendations once high priority projects are programmed for construction.

Long-term technology would utilize two types of counts:

- Short duration counters to capture between two weeks – one month of data. These counters rotate between sites (see: near-term recommendations for more information).
- Continuous counters to capture 365 days’ of data. Count technology includes inductive loops and thermal counters.

The long-term program would use approximately 17-20 locations throughout the city. The mix of short duration to continuous counters depends on the City’s budget, and desired level of statistical accuracy.

Establishing a long-term counting program means additional considerations in terms of location selection, so that the locations accurately reflect present ridership levels. Although near-term recommendations suggest using locations with high ridership, continuous counting programs incorporate locations that may have lower ridership levels.

Mid- to Long-term Pedestrian Counting Technology and Specifications

Evansville can use the same active infrared or passive infrared devices as were used to create the near-term program. Depending on data storage needs, the City

may need to research additional options or strategies for year-round, continuous pedestrian counting.

Mid- to Long-term Bicycle Counting Technology and Specifications

Short Duration Counters

Evansville can continue using the pneumatic tubes purchased during the near-term counting program. These devices are appropriate short duration counters. Using these tubes would reduce the need to buy new short duration monitoring equipment.

Continuous Counters

Evansville can choose to use one or both pneumatic tubes or thermal sensors options as continuous counters. Although additional options, such as magnetometers, are available, some cities have reported under- or over-counting when using these devices.

K. 2014 BIKE FRIENDLY COMMUNITY REPORT CARD AND FEEDBACK

INTRODUCTION

In 2014, the City of Evansville, in partnership with the Evansville-area Trails Coalition, applied for designation from the League of American Bicyclists as a Bicycle Friendly Community. This designation is given to communities across the country that have created a supportive environment for bicycling through engineering, education, encouragement, enforcement, and evaluation efforts.

While the City of Evansville was not awarded the designation, three positive outcomes resulted from the application process. First, the process itself galvanized support for bicycling, with the application itself as a testament to the community's desire to make bicycling a part of the transportation and recreation culture of Evansville. Second, a considerable amount of base data and information was collected, creating a snapshot of bicycling in Evansville. The data can be used as a baseline against which future data can be compared. Third, the League of American Bicyclists have provided the City of Evansville with action-oriented feedback designed to help the City improve bicycling conditions through the Five E's framework. From physical improvements to supporting programs, these recommendations have been internalized and incorporated into the Bicycle and Pedestrian Connectivity Master Plan.

Included in this section of the appendix are two documents provided the City of Evansville in response to the City's application: the Bicycle Friendly Community Report Card, and the Bicycle Friendly Community Application Feedback. These documents are invaluable resources and have informed both the planning process and the resulting recommendations.



EVANSVILLE, IN

TOTAL POPULATION
117,429

TOTAL AREA (sq. miles)
47.3

POPULATION DENSITY
2457

OF LOCAL BICYCLE
FRIENDLY BUSINESSES 0

OF LOCAL BICYCLE
FRIENDLY UNIVERSITIES 0

10 BUILDING BLOCKS OF A BICYCLE FRIENDLY COMMUNITY

	Average Bronze	Evansville
Arterial Streets with Bike Lanes	33%	15%
Total Bicycle Network Mileage to Total Road Network Mileage	26%	4%
Public Education Outreach	SOME	VERY GOOD
% of Schools Offering Bicycling Education	33%	3%
Bike Month and Bike to Work Events	GOOD	GOOD
Active Bicycle Advocacy Group	MAYBE	NO
Active Bicycle Advisory Committee	MAYBE	YES
Bicycle-Friendly Laws & Ordinances	SOME	NO
Bike Plan is Current and is Being Implemented	MAYBE	NO
Bike Program Staff to Population	PER 77K	PER 73K

CATEGORY SCORES

ENGINEERING <i>Bicycle network and connectivity</i>	2/10
EDUCATION <i>Motorist awareness and bicycling skills</i>	2/10
ENCOURAGEMENT <i>Mainstreaming bicycling culture</i>	2/10
ENFORCEMENT <i>Promoting safety and protecting bicyclists' rights</i>	2/10
EVALUATION & PLANNING <i>Setting targets and having a plan</i>	1/10

KEY OUTCOMES

	Average Bronze	Evansville
RIDERSHIP <i>Percentage of daily bicyclists</i>	1.2%	0.81%
SAFETY MEASURES CRASHES <i>Crashes per 10k daily bicyclists</i>	370	124
SAFETY MEASURES FATALITIES <i>Fatalities per 10k daily bicyclists</i>	4	2.1
PUBLIC RATING	BRONZE	HONORABLE MENTION



- » Adopt a Complete Streets policy and offer implementation guidance.
- » Increase the amount of high quality bicycle parking at popular destinations throughout the community.
- » Continue to expand the bike network and to increase network connectivity through the use of different types of bike lanes and cycle tracks.
- » Work with your local bicycle groups or interested parents to expand the Safe Routes to School program to all schools.
- » Continue to expand your public education campaign promoting the share the road message.
- » Expand efforts to evaluate bicycle crash statistics and produce

a specific plan to reduce the number of crashes in the community.

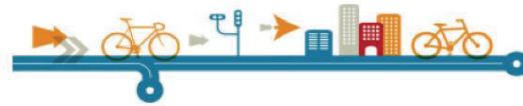
- » Appoint a staff member Bicycle & Pedestrian Coordinator (but eventually create a new position).
- » Ask police officers to target both motorist and cyclist infractions to ensure that laws are being followed by all road users. Ensure that bicycle/motor vehicle crashes are investigated thoroughly and that citations are given fairly.
- » Encourage the University of Southern Indiana to promote cycling to students, staff, and faculty and to seek recognition through the Bicycle Friendly University program.

LEARN MORE » WWW.BIKELEAGUE.ORG/COMMUNITIES

SUPPORTED BY **TREK**



BICYCLE FRIENDLY COMMUNITY FEEDBACK



EVANSVILLE, IN

Spring 2014

Our Bicycle Friendly Community review panel was very pleased to see the current efforts and dedication to make Evansville a safe, comfortable and convenient place to bicycle.

Below, reviewers provided recommendations to help you further promote bicycling in Evansville. **Key recommendations are highlighted in bold.**

We strongly encourage you to use this feedback to build on your momentum and improve your community for bicyclists.

There may also be initiatives, programs, and facilities that are not mentioned here that would benefit your bicycling culture, so please continue to try new things to increase your ridership, safety, and awareness.

The cost of bicycle facilities and possible funding options are discussed on the last page of this report.

RECOMMENDATIONS

Engineering

Adopt a **Complete Streets** policy and offer implementation guidance. By adopting a Complete Streets policy, communities direct their transportation planners and engineers to routinely design and operate the entire right-of-way to enable safe access for all users,

regardless of age, ability, or mode of transportation. This means that every transportation project will make the street network better and safer for drivers, transit users, pedestrians, and bicyclists – making your community a more desirable place to live and do business.

Develop and implement streetscape design guidelines that foster a pleasant and comfortable environment for pedestrians and cyclists. Beautiful streetscaping has also shown to increase community livability and pride, reduce crime and increase property values.

Develop a design manual that ensures the safe and appropriate accommodation of bicyclists in every new road project or endorse the NACTO Urban Street Design Guide.

Ensure good connectivity of your street network by adopting connectivity policies or standards. A well connected street network is associated with more walking, biking, and transit use due to greater directness of travel and more route choice options.

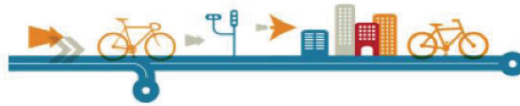
Regulations that require bike parking for new developments can secure private funding. See this bicycle parking model ordinance for guidance.

Pass an ordinance that would require larger employers to provide shower and locker facilities.

Adopt standards for bike parking that conform to APBP guidelines.



BICYCLE FRIENDLY COMMUNITY FEEDBACK



Increase the amount of high quality bicycle parking at popular destinations throughout the community.

Continue to expand the bike network and to increase network connectivity through the use of different types of bike lanes and cycle tracks. Note that shared lane markings should be used sparingly and only on low speed roads. On-street improvements coupled with the expansion of the off-street system will encourage more people to cycle and will improve safety. Ensure smooth transitions for bicyclists between the local and regional trail network, and the street network. These improvements will also increase the effectiveness of encouragement efforts by providing a broader range of facility choices for users of various abilities and comfort levels.

Promote active transportation by reducing traffic speeds. Lower the speed limit to a maximum of 25 mph especially downtown, around schools and shopping centers, and in neighborhoods. Use traffic calming measures and low speed design principles to achieve higher compliance rates. Speed has been identified as a key risk factor in road traffic injuries, influencing both the risk of a road traffic crash as well as the severity of the injuries that result from crashes. For instance, pedestrians and cyclists have a 90% chance of survival if hit by a car travelling at a speed of 20 mph or below, but less than a 50% chance of surviving an impact of 30 mph or above. Studies also generally report a positive association between traffic safety (perceived

and/or measured) and walking and cycling, particularly among women.

Develop a system of bicycle boulevards, utilizing quiet neighborhood streets, that creates an attractive, convenient, and comfortable cycling environment welcoming to cyclists of all ages and skill levels. Use the Bicycle Boulevards section of the NACTO Urban Bikeway Design Guide for design guidelines. See Bicycle Boulevards in action.

Expand your bicycle wayfinding system with distance and destination information to more strategic locations around the community, integrating preferred on street routes and off-street facilities.

Arterial roads are the backbone of your transportation network and often there are no safer alternative routes for people on bikes to access stores and places of employment. On roads with posted speed limits of more than 35 mph, it is recommended to provide protected bicycle infrastructure, such as cycle tracks, buffered bike lanes or parallel 10ft wide shared-use paths. Shared lane markings (Sharrows) should not be used on high speed roads.

Adequately maintain your off road bicycle infrastructure to ensure usability and safety. Set aside funding for regular sweepings and surface repair.

Make intersections safer and more comfortable for cyclists. Include elements such as color, signage, medians, signal detection, and pavement markings. The level of treatment



BICYCLE FRIENDLY COMMUNITY FEEDBACK



required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, the adjacent street function and land use. See the [NACTO design guidelines](#) (preferred) and the 2012 [AASHTO Guide for the Development of Bicycle Facilities](#) for recommended intersection treatments.

Education

Bicycle-safety education should be a routine part of primary and secondary education, and schools and the surrounding neighborhoods should be particularly safe and convenient for biking and walking. Work with your local bicycle groups or interested parents to expand the Safe Routes to School program to all schools. For more information, see the [National Highway Traffic Safety Administration's Safe Routes To School Toolkit](#) or visit www.saferoutesinfo.org.

It is essential to make both [motorists and cyclists](#) aware of their rights and responsibilities on the road. Continue to expand your public education campaign promoting the share the road message. Take advantage of your local bicycle groups for content development and staffing.

Offer bicycling skills training opportunities for adults more frequently and encourage your local bicycle advocacy group or bike shop to help. You can set up a class by [contacting an instructor](#) in your area. There are options from

[short videos](#) and 1-2 hour courses to more in-depth training incorporating in-classroom and on-bike instruction. Other education materials, such as the League Quick Guide, offer the opportunity to share bike education in an easily accessible format. For more information visit: <http://bikeleague.org/ridesmart>.

Host a League Cycling Instructor (LCI) seminar to increase the number of certified LCIs in your community. Having local instructors will enable your community to expand cycling education, recruit knowledgeable cycling ambassadors, deliver education to motorists, provide cycling education to adults and kids, and have experts available to assist in encouragement programs. Visit <http://bikeleague.org/content/become-instructor> for more information.

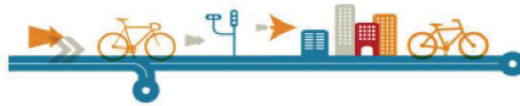
Encouragement

Expand your current encouragement efforts during Bike Month in partnership with local bicycle advocacy groups. Proclaim May (or a month with mild and dry weather) as Bike Month. Host, sponsor and encourage more bicycle-themed community events, campaigns and programs. Increase your efforts on Bike to Work Day and Bike to School Day. Ensure to widely advertise all bicycle-themed community events and programs. For ideas and more information, visit <http://bikeleague.org/bikemonth>.

Encourage local businesses to provide discounts for customers arriving by bicycle or promote existing [bicycle discount programs](#).



BICYCLE FRIENDLY COMMUNITY FEEDBACK



Promote cycling throughout the year by offering or supporting shorter family-oriented community and charity rides, free bike valet parking at events, and bicycle-themed festivals, parades or shows.

Launch a bike share system that is open to the public. Bike sharing is a convenient, cost effective, and healthy way of encouraging locals and visitors to make short trips by bike and to bridge the “last mile” between public transit and destinations. See what is being done across the country at <http://nacto.org/bikeshare/>

Encourage more local businesses, agencies, and organizations to promote cycling to their employees and customers and to seek recognition through the Bicycle Friendly Business program. Businesses will profit from a healthier, happier and more productive workforce while the community will benefit from less congestion, better air quality, increased amenities and new destinations for cyclists, new and powerful partners in advocating for bike infrastructure and programs, and business-sponsored public bike events or classes. Your community’s government should be the model employer for local businesses, and your chamber of commerce or local business association can help promote the program and its benefits. The League offers many tools to help promote the Bicycle Friendly Business program in your community.

Encourage the University of Southern Indiana and other local institutions of higher education to promote cycling to

students, staff, and faculty and to seek recognition through the Bicycle Friendly University program. Many colleges and universities have embraced the growing enthusiasm for more bicycle-friendly campuses by incorporating bike share programs, bike co-ops, bicycling education classes and policies to promote bicycling as a preferred means of transportation. The community will benefit as well: Communities near BFUs have a higher number of regular bicyclists (as many students hike to campus, shops and restaurants), less congestion around campus, safer streets, and university-hosted public bicycle events, programs, and classes. The League offers many tools to help promote the Bicycle Friendly University program in your community.

Enforcement

Ask police officers to target both motorist and cyclist infractions to ensure that laws are being followed by all road users. Ensure that bicycle/motor vehicle crashes are investigated thoroughly and that citations are given fairly.

Provide safety amenities such as adequate street and path lighting to allow for safe commuting before dawn and after dusk.

Pass ordinances as well as support and enforce laws that protect cyclists, e.g. implement specific penalties for motorists for failing to yield to a cyclist when turning, make it illegal to park or drive in a bike lane (intersections excepted), implement penalties for



BICYCLE FRIENDLY COMMUNITY FEEDBACK



motor vehicle users that 'door' cyclists, ban cell phone use and texting while driving, pass laws/ordinances protecting all vulnerable road users, formalize a legal passing distance of at least 3 feet, and make it illegal to harass a cyclist.

Adopt fair and equitable traffic laws. Local laws that discriminate against cyclists, restrict their right to travel, or reduce their relative safety should be repealed.

Evaluation & Planning

Appoint a staff member Bicycle & Pedestrian Coordinator (but eventually create a new position). A Bicycle & Pedestrian Coordinator works with advocates, state and local elected officials, business leaders, media, law enforcement, public health officials, transit providers and the general public to build partnerships providing leadership and vision so these groups may embrace and implement facilities and programs that increase the number of residents that are safely bicycling and walking. This staff person should also review development proposals to ensure that local bicycle/pedestrian requirements are incorporated and to assess bicycling and walking impacts, develop and implement educational and promotional programs, write grant proposals, serve as the public contact for bicycling/walking inquiries and complaints, educate other staff about state and federal facilities standards and guidelines, and coordinate with

neighboring cities, transit agencies and other departments to implement policies and projects. See [this report](#) on the importance of Bicycle & Pedestrian program staff.

Ensure that your regional [comprehensive bike plan](#) update focuses on developing a seamless on and off street bicycling network that creates short distances between residential areas and popular destinations. Complement infrastructure planning with encouragement, education, and enforcement programs to increase usage. Develop a clear vision statement and set ambitious but attainable targets. The overarching goal should be to encourage residents to bike more often for recreation and transportation. See examples from [Davis, CA](#); [Denver, CO](#); [Greenville, SC](#); and [Seattle, WA](#).

Ensure that there is dedicated funding for the implementation of the updated bicycle master plan.

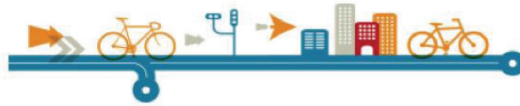
Regularly conduct research on bicycle usage beyond the U.S. Census' Journey to Work report to more efficiently distribute resources according to demand. Conduct at least yearly counts using automated or manual counters in partnership with advocacy organizations. Consider participating in the [National Bicycle and Pedestrian Documentation Project](#).

Ensure that your bicycle counts capture the gender of cyclists.

Adopt a target level of bicycle use (percent of trips) to be achieved within a specific



BICYCLE FRIENDLY COMMUNITY FEEDBACK



timeframe, and ensure data collection necessary to monitor progress.

Expand efforts to evaluate bicycle crash statistics and produce a specific plan to reduce the number of crashes in the community. Available tools include Intersection Magic and the Pedestrian and Bicyclist Crash Analysis Tool.

Establish a mechanism that ensures that bicycle facilities and programs are implemented in traditionally underserved neighborhoods.

COSTS AND FUNDING OPTIONS

Costs

Building a new roadway for motor vehicles can cost millions of dollars to construct, and many of the pedestrian and bicycle infrastructure facilities are extremely low-cost in comparison. Use [this database](#) to review up-to-date estimates of infrastructure costs of pedestrian and bicycle treatments from states and cities across the country.

Federal Funding

Since 1992 bicycle and pedestrian projects have been eligible for federal transportation funding. To learn more about what federal funds are available for bicycle projects, use Advocacy Advance's interactive [Find it, Fund it tool](#) to search for eligible funding programs by bike/ped project type or review the same information as a PDF [here](#).

State Funding

Biking and walking dollars aren't only available from the federal government. States can also have their own revenue sources that can be used to fund active transportation. Use this [report](#) and an [online tool](#) to explore your state's funding sources for bicycle and pedestrian improvements.

Local Funding

Local governments can also create their own revenue streams to improve conditions for bicycling and walking. Three common approaches include: special bond issues, dedications of a portion of local sales taxes or a voter-approved sales tax increase, and use of the annual capital improvement budgets of Public Works and/or Parks agencies. Bicycle facility improvements can also be tagged on to larger projects to create economies of scale that results in reduced costs and reduced impacts to traffic, businesses, and residents. For example, if there is an existing road project, it is usually cheaper to add bike lanes and sidewalks to the project than to construct them separately. To learn more about public funding of bicycle infrastructure improvements, visit pedbikeinfo.org/planning/funding_government.cfm.

Resources and Support

[Advocacy Advance](#) offers several tools, resources, and workshops to help advocates and agency staff maximize eligible funding programs.

L. BIKE AND WALK FRIENDLY COMMUNITY ACTION PLAN

INTRODUCTION

The League of American Bicyclists' Bicycle Friendly Community designation and the Pedestrian and Bicycle Information Center's Walk Friendly Community designation are prestigious awards bestowed upon communities that have active built and fostered social, physical and policy environments that support safe bicycling and walking. These designations can be difficult to attain. The City's 2014 application for Bicycle Friendly Community designation, subsequent feedback and honorable mention attest to the stringent nature of these requirements. With a clear, coordinated and holistic Five E's approach, the City of Evansville can make significant strides towards becoming a Bike and Walk Friendly Community.

There are several benefits for communities that participate in these programs:

- National recognition for bicycle and walking provisions that can help attract residents and visitors to the community
- Upon submission of the application, the community's bicycling and walking progress is evaluated and specific feedback is given to the communities on how they can improve their walking and bicycling environment.
- Resources to assist in implementation of recommendations such as workshops, webinars and online materials.

Evansville's actions today are the building blocks toward transformation into a community where walking and bicycling are pleasant, normal and daily activities. Strong public interest in the Bicycle and Pedestrian Connectivity Master Plan, the mayor-appointed Bicycle Friendly Community Task Force, and active campaigns led by community organizations are all steps that support a bicycle-friendly community. Similarly, the charming Riverfront Esplanade, "Open Streets" events, and a walkable downtown combine to form a strong foundation for increased walkability.

OBTAINING DESIGNATION

Bicycle Friendly Communities (BFC)

The infographic on the following page describes qualities frequently found among bicycle friendly communities. Each arch depicts a BFC level, from Bronze to Diamond. Shading describes the degree to which communities have accomplished each metric. Darker shading means a city excels in the corresponding indicator (i.e. providing bicycle education courses for adults under the "Education" category). This report uses this infographic to highlight methods to obtain BFC designation.

Walk Friendly Communities (WFC)

The Walk Friendly Community program published the Community Assessment Tool in August 2012. The report serves as a template for cities interested in applying for WFC designation. It also provides case studies of cities with outstanding examples of target area success. For instance, this source highlights Ann Arbor's sidewalk and ramp repair program when discussing sidewalk retrofitting and repair.

The application follows the "5 E's" approach used in the BFC program, and the Tool asks communities to reflect on their community profile (i.e.- demographic information) and the current status of walking. An additional section asks about community strengths, opportunities for improvement, and intentions for using WFC designation to benefit their city or town.

BFC AND WFC ACTION PLANS

The tables presented on the following pages constitute the BFC and WFC action plans and should be used to further create a supportive environment for bicycling and walking, and in turn achieve these valuable community designations. The recommendations included in these tables mirror, and in some cases supplement, the recommendations included in Chapters Five and Six of the Bicycle and Pedestrian Connectivity Master Plan.

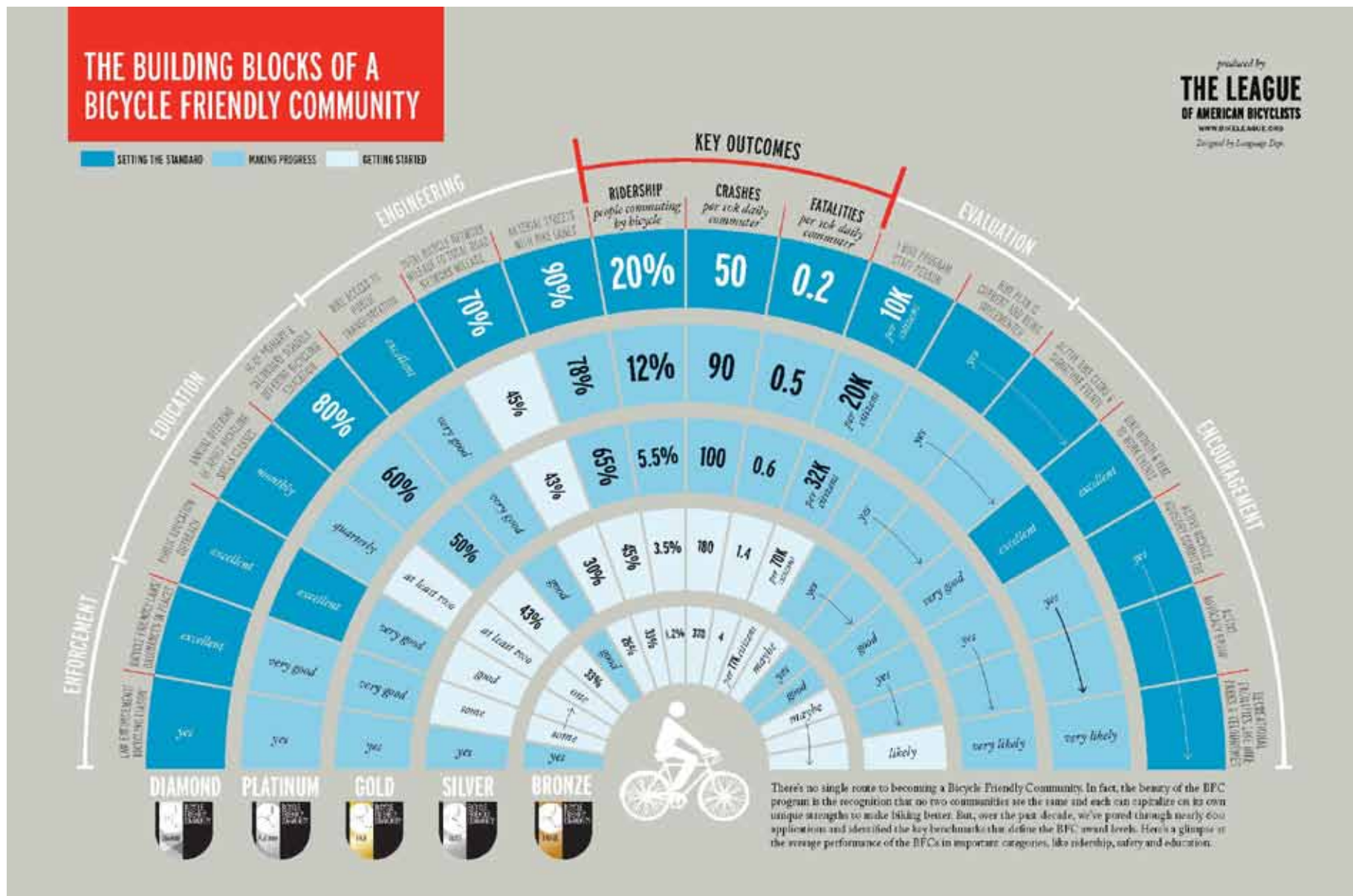


Figure L.1: The Building Blocks of a Bicycle Friendly Community (source: League of American Bicyclists).

Table L.1: Bicycle Friendly Community Action Plan

Category	Recommendation for Current Efforts	Priority	Recommendation for Future Efforts and Programs	Priority
Engineering	Strictly enforce MPO-level Complete Streets Policy requirements.	1	Develop and pass City Wide Complete Street Policy, Ordinance or Resolution consistent with the MPO policy.	1
	Implement planned road diets.	1	Prepare Complete street guidelines in coordination with updated street design standards consistent with the design guidelines included in the Connectivity Plan.	2
			Develop maintenance program for maintaining active transportation facilities.	1
			Develop a network of bicycle boulevards as shown in the plan network, at least one segment per year.	1
			Develop a dedicated funding source for active transportation projects and programs.	1
			Adopt a City resolution endorsing the NACTO Urban Design Guide.	2
			Revise the maximum travel speeds on city roadways to 25 mph maximum except as posted.	1
			With any implementation of bikeways make sure that property intersection design is included to account for green markings, signage, medians, detection and pavement markings for the safe interaction between bicyclists, pedestrians and motor vehicle operators.	1
			Implement bike lanes, protected bikeways and cycle tracks as indicated in the Connectivity Plan at least 5-10 miles per year.	1
Education	Coordinate bicycle and walk education efforts community-wide and add to the active transportation web page.	1	Promote National Walk & Bike to School Day throughout public schools. Encourage all public schools to apply for SRTS funding. Aim for SRTS activities in all schools by the end of the 2016 school year.	1
	Continue outreach to the Evansville Bicycle Club (EBC) and other advocacy organizations so the City can publicize upcoming bicycle education classes for children (bike rodeos, helmet fitting) and adults.	1	Offer a minimum of two adult bicycling skills classes per year and track the number of people trained each year.	1
			Hold a NACTO Training for City Staff, Design Professionals and Planners working for the City.	1
			Offer at least two bike rodeos in coordination with local schools or at Parks and Recreation events each year.	2
			Host one League of American Bicyclist League Certified Instructor (LCI) training one every two years.	3

Table L.1: Bicycle Friendly Community Action Plan (Continued)

Category	Recommendation for Current Efforts	Priority	Recommendation for Future Efforts and Programs	Priority
Encouragement	Continue and expand current Bike to Work Day efforts to include additional educational and encouragement resources and events for businesses and schools, as well as a bike to work month challenge event.	1	Continue to hold ETC Streets Alive! Events, and hold additional events to highlight future walking and bicycling projects around the community (N Main, Riverside Dr, etc.)	1
	Continue marketing efforts on billboards and publications, tracking each of these for reporting each year.	1	Develop bike month events in coordination with bike to work day that include a Mayor's bike ride and rides in each district with council members.	1
			Transition the Plan's Technical Advisory Committee/Task Force after the Plan's adoption to a permanent and ongoing Active Transportation Committee.	1
			Adopt the APBP Bicycle Parking Guidelines as a City policy, and either add high quality short term parking on City property at key destination or develop a city bike rack request program that allows businesses to request bike racks for a to be defined fee, with city purchasing, installing and maintaining the racks on City ROW.	1
			Initiate program such as an "Earn-a-Bike" program for low income residents, especially youth in partnership with local businesses and foundations.	3
			Initiate a bike share feasibility study to determine the possibility of a bike share operation for Evansville.	3
			Develop a way finding signage program to define the on-street and trail network in coordination with the existing pedestrian way finding signage program.	2
			Update to the Evansville webpage to add an active transportation page that makes the existing webpage more graphically appealing and user-friendly and provides a resource for information on enforcement, education opportunities, encouragement events, project, plan information and evaluation of activities and actions.	1
			When implementing new bikeways associated with the plan, develop press releases and additional media for public consumption regarding the objective of the bikeway and expected interactions between bicycles and motorist, as well as the benefits associated with the new bikeway.	1
			Sponsor cycling events through the year that includes family bicycling events, charity rides, bike-themed festivals and offer bike valet at city events.	1

Table L.1: Bicycle Friendly Community Action Plan (Continued)

Category	Recommendation for Current Efforts	Priority	Recommendation for Future Efforts and Programs	Priority
Enforcement	Maintain police officers' training as it applies to pedestrian and bicycle laws.	1	Review and update local ordinances to ensure bicyclists 'and pedestrians' equitable treatment under the law in coordination with the police department and city attorney.	2
	Continue neighborhood bicycle patrols and expand these bicycle patrols across the	1	Continue public service announcements that include safety tips for bicyclists and pedestrians as developed by the police department in coordination with the Bicycle Friendly Task Force.	1
	Continue resident bicycle registration program and use the program to provide safety training and information regarding ne bikeways.	1	Enhance bicycle crash reporting and collect information in addition to police reports so that even if a report in not prepared it can be captured on a on-line mapping tool or similar method.	1
			Establish a targeted safety enforcement program focused on of areas that have a high number of documented bicycle and pedestrian related incidents.	1
Evaluation and Planning	Review vehicular parking supply requirements such as parking minimums.	2	Develop a bicycle and pedestrian count program using screen line counts according to National Bike & Pedestrian Project (NBPD) days and times and/or set up automatic counters around the community. Utilize advocacy organizations to coordinate volunteers.	1
	Publicize the Evansville Bicycle and Pedestrian Connectivity Master Plan to constituents	1	Develop a process for regularly tracking progress on the plan implementation that incorporates and annual or biannual report card of progress.	2
			Hire or designate a City Active Transportation Coordinator that will coordinate across departments, MPO and stakeholders who actively participate in plan implementation.	1
			Inventory existing bike racks in the city to document the number and type of bike racks. And update annually.	2
			Add bicycle parking guidelines to the City development code to include both short and long term high quality parking in new commercial development or redevelopment of existing commercial properties. Suggest shower and locker facilities to support the addition of bike access to developments where practical.	1
			Define a specific target mode share for biking as a target goal.	1
			Partner with the University of Evansville, Ivy Tech Community College and University of Southern Indiana to promote bicycle transportation to students, visitors and faculty, as well as support efforts of the university to participate in the Bike Friendly University program.	3

Table L.2: Walk Friendly Community Action Plan

Category	Recommendation for Current Efforts	Priority	Recommendation for Future Efforts and Programs	Priority
Engineering	Use MPO-level Complete Streets Policy requirements to develop City Policy, Ordinance or Resolution.	1	Develop and pass City Wide Complete Street Policy, Ordinance or Resolution consistent with the MPO policy.	1
	Continue and expand sidewalk and curb ramp inventory efforts to document condition, widths and segments into a GIS format for tracking.	1	Prepare Complete street guidelines in coordination with updated street design standards.	1
			Develop maintenance program for maintaining active transportation facilities.	2
			Continue updating curb ramps for ADA compliance as specified in the 2012 Vanderburgh County ADA Transition Plan.	1
			Begin implementation of this Plan's recommended sidewalk network improvements, sidewalk missing links and other pedestrian amenities.	1
			Develop traffic calming program and guidelines as a part of the Complete Street Guidelines.	2
Education	Formally adopt the 2012 ADA Transition plan recommendation dedicating \$25,000 per year for curb-ramp improvements and increase to \$50,000 for sidewalk construction and rehabilitation to current standards.	1		1
Education	Coordinate bicycle and walk education efforts community-wide. Work with community partners to establish an on-line repository for information on walking and bicycling in Evansville (i.e. information on events, preferred routes, and safe operation). This could be in the form of an update to the existing Evansville MPO Bike/Ped webpage that makes the existing webpage more graphically appealing and user-friendly.	1	Promote National Walk & Bike to School Day throughout public schools. Encourage all public schools to participate in the SRTS program to expand on the four presently involved. Set the goal for SRTS activities to be initiated in all schools by the end of the 2017 school year.	1
	Continue outreach to healthcare providers and other advocacy organizations so the City can publicize plan information and education classes for children and adults.	1	Coordinate active transportation education efforts community-wide.	2

Table L.2: Walk Friendly Community Action Plan (Continued)

Category	Recommendation for Current Efforts	Priority	Recommendation for Future Efforts and Programs	Priority
Encouragement	Continue to provide Trail map and safety brochures in government buildings as free takeaway information about walking routes.	1	Continue to hold ETC Streets Alive! Events, and hold additional events to highlight future walking and bicycling projects around the community (N Main, Riverside Dr, etc.)	1
			Transition the Plan's Technical Advisory Committee/Task Force after the Plan's adoption to a permanent and ongoing Active Transportation Committee.	1
			Implement SRTS Program supported by the City and coordinated with local schools.	1
			Update the Evansville webpage to add an active transportation page that makes the existing webpage more graphically appealing and user-friendly and provides a resource for information on enforcement, education opportunities, encouragement events, project, plan information and evaluation of activities and actions.	1
			Expand pedestrian signage and wayfinding in the downtown and surrounding areas	2
			Hold walk to school day events and include additional educational and encouragement resources and events for businesses and schools, as well as a challenge event.	2
Enforcement	Maintain police officers' training as it applies to pedestrian and bicycle laws.	1	Review and update local ordinances to ensure pedestrians' equitable treatment under the law in coordination with the police department and city attorney.	1
			Establish a targeted safety enforcement program focused on areas that have a high number of documented bicycle and pedestrian related incidents.	1
			Include police department representation on the Active Transportation Committee.	1
			Enhance pedestrian crash reporting and collect information in addition to police reports so that even if a report is not prepared it can be captured on a on-line mapping tool or similar method.	1
			Continue public service announcements that include safety tips for bicyclists and pedestrians as developed by the police department in coordination with the Bicycle Friendly Task Force.	1

Table L.2: Walk Friendly Community Action Plan (Continued)

Category	Recommendation for Current Efforts	Priority	Recommendation for Future Efforts and Programs	Priority
Evaluation and Planning	Adopt Bicycle and Pedestrian Connectivity Master Plan as an addendum to the Comprehensive Plan.	1	Send staff members to regularly attend meetings hosted by community groups dedicated to elderly residents, members of the blind community and residents with physical or mental disabilities.	2
	Publicize the Bicycle and Pedestrian Connectivity Master Plan to constituents	1	Develop a process for regularly tracking progress on the plan implementation that incorporates an annual or biannual report card of progress.	1
			Hire or designate a City Active Transportation Coordinator that will coordinate across departments, MPO and stakeholders who actively participate in plan implementation.	1
			Continue to expand upon policy and policy enforcement efforts, such as Subdivision Code, Section 17.05.150 (B, 2), to ensure that future development is walk-friendly	1
			Work with community partners to establish an online repository for information on walking and bicycling in Evansville (i.e. information on events, preferred routes, and safe operation) whether it is with the City or the MPO	2