Northeastern Indiana Regional Coordinating Council

Comprehensive Safety Action Plan

Allen County, Indiana

May 16, 2023

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Allen County Comprehensive Safety Action Plan

Call to Action

The Northeastern Indiana Regional Coordinating Council (NIRCC) has developed a Safety Action Plan Committee from various members of our Transportation Safety Forum Members and other transportation related partners. The committee will serve to provide input into the Comprehensive Safety Action Plan. Members were identified in various categories that include engineering, emergency services, law enforcement, judiciary, economic development, planning community outreach, public health and education.

Allen County CSAP – Transportation Safety Committee

Engineering
- City of Fort Wayne
- City of New Haven
- Allen County Highway Department
- INDOT Fort Wayne District

Emergency Services & Public Health
- Three Rivers Ambulance Authority
- Parkview Regional Medical Center
- Lutheran Ambulatory

Law Enforcement
- Indiana State Police
- Fort Wayne Police Department
- Allen County Sherriff's Department

Judiciary
- Allen County Prosecutors Office

Economic Development
- Department of Planning Economic Development

Planning
- Department of Planning Services
- Fort Wayne Community Development

Community Outreach
- Consolidated Communications Partnership
- Media Emergency Services Organization (MESO)

Public Transit
- Citilink

Education
- Fort Wayne Community School District
- Southwest Allen County School District
- East Allen County School District
- Northwest Allen County School District

Introduction

Safety in transportation planning and project development is a high priority for the Metropolitan Planning Organization (MPO). The Northeastern Indiana Regional Coordinating Council (NIRCC) serves as the planning agency, MPO, for the urbanized area in Fort Wayne, Indiana. NIRCC has developed a Safety Management System that identifies hazardous locations, analyzes crash records, develops solutions to mitigate future crashes, and assist in funding recommended improvements. The process of this system relies on input data from law enforcement agencies. Improved crash data and analytical tools have significantly assisted planners in evaluating the roadway system to identify problematic areas. NIRCC utilizes resources such as ARIES, ROADHAT, and GIS applications to optimize systemic analyses within the planning area.

The Infrastructure Investment and Jobs Act included Safe Streets for All (SS4A) which was approved for the purpose of improving roadway safety for all roadway users. This legislation is intended to specifically target reductions in fatal and serious injury crashes. The safety management system developed and operated by NIRCC supports this objective through statewide efforts that have been ongoing. Indiana has worked to develop various screening processes and analysis software such as ROADHAT as a tool to identify locations that are experiencing a higher-than-normal number of serious injury or fatal crashes.

The Comprehensive Safety Action Plan (CSAP) will serve NIRCC's metropolitan planning area (MPA) as well as areas outside of the MPA within Allen County. The development of the CSAP was accomplished through a collaborative effort of various public agencies and public input. The fundamental component of the plan was the use of all reported crashes in Allen County from 2018 to 2022. The crash data was analyzed to determine the frequency, crash type, contributing factor, and crash location for each incapacitating and fatal injury crash.

In addition to the committee involvement in the development of the CSAP, NIRCC also engaged with the public regarding transportation safety. The 2023 Transportation Improvement Program Open House and Long-Range Transportation Plan meetings documented comments from the public related to safety concerns. These concerns are reviewed by staff and the roadway owner. A response is then provided to address each concern.

Toward Vision Zero Policy Statement

The Urban Transportation Advisory Board (UTAB) believes the streets in Allen County and the cities and towns within must be safe for everyone — no matter where they live, no matter their means, and no matter their choice to walk, bike, drive or take transit. Traffic fatalities and severe injuries are preventable and unacceptable, and safety must be the most important consideration for every street. UTAB embraces the Safe Systems Approach that shares the responsibility and promotes a holistic approach to safety across the entire transportation system. The key focus of the Safe Systems Approach is to reduce death and serious injury through design that accommodates human mistakes and injury tolerances. The five major components of the Safe System Approach include: safe road users; safe vehicles; safe speeds; safe roads; and post-crash care.

UTAB believes that the following principles are important towards improving transportation safety:

- Safety, health, and welfare of the public are the highest priority in planning, engineering, and design. Transportation systems should be safe for all road users, for all modes of transportation, in all communities, and for people of all ages, incomes, and abilities.
- Transportation systems should be designed to account for human factors.
- Transportation systems should be designed to protect human life and set target speeds appropriate for the context and type of facility.
- Traffic laws, such as impaired driving, walking, and biking; car seat and seat belt usage; speeding, reckless, and distracted driving; should be enforced.
- UTAB will review crash data to understand safety issues, prioritize investments on high injury locations and ensure there are not disproportionate impacts on any disadvantaged communities.
- New technologies that promote safer vehicles and safer roads such as infrastructure to vehicle communication and vehicle to vehicle communication should be deployed when feasible.

Based on these principals and application of the Safe System Approach, the Urban Transportation Advisory Board has set a goal to reduce road related fatal and serious injury crashes by 50% in Allen County by the year 2045. The measure will be based on a five-year rolling average of “fatal crashes” and “personal injury crashes” occurring in Allen County. The current five-year averages and proposed targets are displayed in Table 1. The 2041-2045 average targets for fatal and personal injury crashes represent a 50% reduction of the 2017-2021 average.

Table 1. Fatal and Incapacitating Injury Crashes - Allen County 2017-2021 Average and 2041-2045 Average Target

Year	Number of Fatal Crashes	Number of Incapacitating Injury Crashes
2018	28	888
2019	36	851
2020	31	743
2021	43	763
2022	43	456
2018-2022 Average	36.0	739.8
2042-2046 Average Target	18.0	369.9

Emphasis Areas

The Allen County Comprehensive Safety Action Plan has identified crashes at intersections, ran off roadway crashes, rural roadway crashes, crashes involving vulnerable roadway users, and crashes impacting identified equitable areas. Local law enforcement agencies have also identified distracted and impaired drivers as emphasis areas for improvement.

The crash data identifies ran off roadway and right angle crashes at primary crash types resulting in incapacitating and fatal injury crashes in Allen County. Vulnerable roadway users accounted for 32 of the fatal crashes in Allen County in the past five years.

Performance Measures and Targets

NIRCC will monitor crash data and report annual summaries for fatal and incapacitating crashes. In addition, NIRCC will monitor and report annual summaries for vulnerable roadways users (motorcyclists, pedestrians, pedalcyclists, and animal drawn vehicles). Annual review of data will be provided to the Transportation Safety Committee to evaluate the effectiveness of implemented projects and policies. The annual analysis will use the previous 5 year average for each evaluation to determine changes from our baseline year average from 2018 to 2022.

Implementation and Evaluation – Crash Data

Automated Reporting Information Exchange System (ARIES) is the statewide database for all motor vehicle related crashes that occur. By law the Indiana State Police is the agency responsible for providing and maintaining crash reports. They have developed a portal, ARIES, as the mechanism for crash reports to be submitted into a single database for all reporting agencies throughout the state. NIRCC accesses this information and extracts all crash records for Allen County annually. This data is the essential building block of our safety management system. Each detail reported by officers for each crash is summarized within the extracted data.

Various annual reports and studies are prepared from the crash data for evaluation and planning purposes. The primary tool used is NIRCC's Geographical Information System (GIS) software which is a map-based database. This allows each crash report to be placed on a digital map accurately to represent where the crash occurred. All of the crash details, driver information, and vehicle information is associated to the crash location in the map. By having each crash mapped planners can query specific crash related elements for analysis.

Hazardous Location Identification Process

NIRCC evaluates geocoded crash data annually to identify high crash locations and to compare changes in previously identified areas. A review is also completed for locations where significant improvements or modifications have been made to the roadway. Additional reviews are completed for locations that were identified by citizens and areas of interest by local transportation officials are also reviewed. The analysis includes a GIS output that uses spatial analysis tool to select clusters of crashes in concentrated area. These are often near intersections, accesses, or interchange ramps. A comprehensive list of the identified areas is generated into a database file and includes a total frequency of crashes for each area by calendar year.

While the frequency listing has some drawbacks and limitations it serves as a starting point to determine what locations experience a greater number of crashes. It is common to find that the locations with the highest frequency of crashes are also locations with the higher traffic volumes, however this is not always the case. Occasionally a location will be identified with a high crash frequency and a low traffic volume. If the location is identified with a minimum number of crashes in a year it is included in a review list for further evaluation.

An identified crash location with a high crash frequency and a high traffic volume are often commonly known by the general public, law enforcement, engineers, and planners. Locations with high frequency and volume are not necessarily the most dangerous but may have elements that still need to be addressed. At this point they are not discounted but require additional information which occurs during the final step of the process, which is the severity analysis.

Another challenge for planners at this step is comparing each location to the historical data for the same location. The number of crashes at a location may increase or decrease. These changes create confusion and uncertainty in the process. This annual change is often referred to as regression to the mean. It is important to utilize more than one year of crash data in the process to account for regression to the mean. The process includes data for three years at all identified locations.

The next step is to calculate a crash rate for each identified location. A crash rate is calculated for each location. The crash rate, or Crash Rate per Million Vehicles (RMV) is the average annual number of crashes divided by the traffic volume multiplied by 365 and divided by 1,000,000. This is used to compensate for the wide discrepancy in traffic volumes between locations. The RMV provides a value to better compare the number of crashes occurring per entering vehicle at a location. This analysis is more accurate in comparing multiple locations. The drawback from simply using crash rates is that low volume and low frequency crash locations can indicate an unusually high rate that overestimates the actual hazard level. The crash rate can also lead to false assumptions of hazardous locations without proper review and evaluation.

To address the lower volume and lower crash frequency locations the final step of the first analysis is to determine a severity index. The Indiana Department of Transportation (INDOT) has worked with Purdue University to develop a software to calculate a crash index and severity index for a crash location. This tool requires specific inputs such as roadway type, location type, traffic volumes, intersection control types (if at an intersection or access), number of property damage only crashes, number of minor injury crashes, and number of serious injury and fatal crashes. Once input, the software will calculate a crash index value and severity index value. These values will represent the standard deviation of the identified intersection to other similar intersections throughout the state. If the intersection being reviewed is more than one standard deviation higher than typical it is something that should be evaluated further. If the location has a significantly lower index value, then it is generally not pursued further.

The final step of this analysis is to include all of the identified crash location with a frequency, crash rate, and severity index that meets the pre-determined thresholds established by our technical

committees into one list. This list is then added to previously completed lists from prior years. It is important to ensure that regression to the mean is addressed and also to evaluate annual changes. At this point planners may determine that a location previously identified is decreasing in one or more of the analysis areas. Conversely it is important to note locations where crash frequency, crash rates or severity indexes are increasing.

Systemic analyses are also performed using GIS tools. A systemic analysis is performed for various evaluations including crash type, crash severity, roadway type, vulnerable roadway users, and geographic areas (high schools, rural areas, and equitable areas). These analyses will target systemic improvements or policies to address identified concerns.

Review of Identified Crash Locations

The completed list of identified crash locations includes the locations that met all the criteria for three consecutive years. In addition to this list, locations that where recent modifications have occurred or have been previously identified to monitor are also reviewed. The list of locations is reviewed by the LPA (local public agency), NIRCC staff, the Transportation Technical Committee, law enforcement agency representatives, and the Transportation Safety Forum members. Each location is discussed to determine what may attributing to crashes at the location. For many locations a previous study has been completed. Depending on when a detailed analysis of the location was done or changes that may have occurred since then it may be repeated to determine if the same circumstance exist. For new locations it is often recommended that a site study, often called a micro-analysis, be completed.

Microanalysis

A site-specific study or micro-analysis is a detailed look of all the circumstances and characteristics of the crashes that have occurred. Information obtained through the site-specific analyses may alter the crash frequency and crash rate. Additional crashes may be attributed to intersections that were not identified in the initial frequency list, and conversely some originally identified crashes may be removed. The goal of this process is to determine what is attributing the crashes occurring and what proposed solutions exist to mitigate future crashes. Through the site-specific analysis and evaluation by staff and the Transportation Technical Committee, safety improvements are identified, projects are initiated including the consideration of low-cost and/or short-term solutions, and currently scheduled improvement are reviewed to ensure safety strategies are included.

Evaluation of crash locations within a community is a very important process. Many variables must be considered with the recognition that each location has unique characteristics that cannot always be quantified. Limited resources require a selection process to identify potentially hazardous crash locations that warrant additional analysis and evaluation.

Safety Forum

NIRCC utilized a group of transportation advisors to annually review the list of identified crash locations within Allen County. An annual Safety Forum is held to help local officials gain insight into what may be attributing to crashes at a particular location and also what proposed improvements may under consideration. Input from other engineering agencies and law enforcement personnel is extremely beneficial.

Roadway Safety Audits

The goal of identifying hazardous locations and pursuing projects to address the most severe safety issues is a very high priority for NIRCC. Locations that have had a micro-analysis completed are often discussed with the roadway owner and if requested to be pursed further. The last review is a roadway safety audit.

NIRCC facilitates roadway safety audits as requested by local public agencies. A roadway safety audit is a detailed engineering assessment of an identified location. NIRCC will solicit assistance from neutral parties to evaluate a location. This is often accomplished by identifying local consultant engineers, other municipal street engineers, and local law enforcement representatives. A team is identified and provided information about the location.

Common RSA Information

Traffic Data

- Traffic count data
- Turning movement information
- Signal timing

Crash Data

- Crash Summary
- Collision Diagrams
- ROADHAT Report
- Crash Element Summary

The team has a chance to review all the information independently prior to an in-person meeting. The in-person meeting is held, and the roadway owner is provided an opportunity to give an overview of the problems they have identified and answer questions of the team. The team then will discuss the location and hold a site visit to obtain more information, measurements, and information as well as observe the operation of the location. After the site visit, the team will reassemble to discuss their findings and make recommendations to address the identified issues.

Traffic Incident Management

NIRCC has been involved in traffic incident management since 2013. A committee was established to advance local efforts to train first responders on techniques to improve the safety of incident scenes on public roadways and assist in after action reviews. During the past ten years 1770 first responders have been through the four hour training. The trained responders represented 121 first responding agencies. A primary focus of this initiative is improving safety at incident scenes and reducing secondary crashes. Secondary crashes are often more severe that the primary incident. These are also often rear end collisions involving a vehicle approaching an incident that it unaware of stopped or slowed traffic.

The Safety Management System process has been very successful locally in addressing hazardous locations. NIRCC has followed this process and witnessed significant reductions in crashes and severe injury crashes at various locations throughout the area.

Transportation Safety Trends in Allen County

Within Allen County there have been 3,879 crashes that resulted in incapacitating or fatal injuries in the past five years. The CSAP addresses these crashes by determining the collision types, contributing factors, and the locations of the crashes. Action steps to address these crashes are also identified to assist in the target reductions for incapacitating and fatal injury crashes.

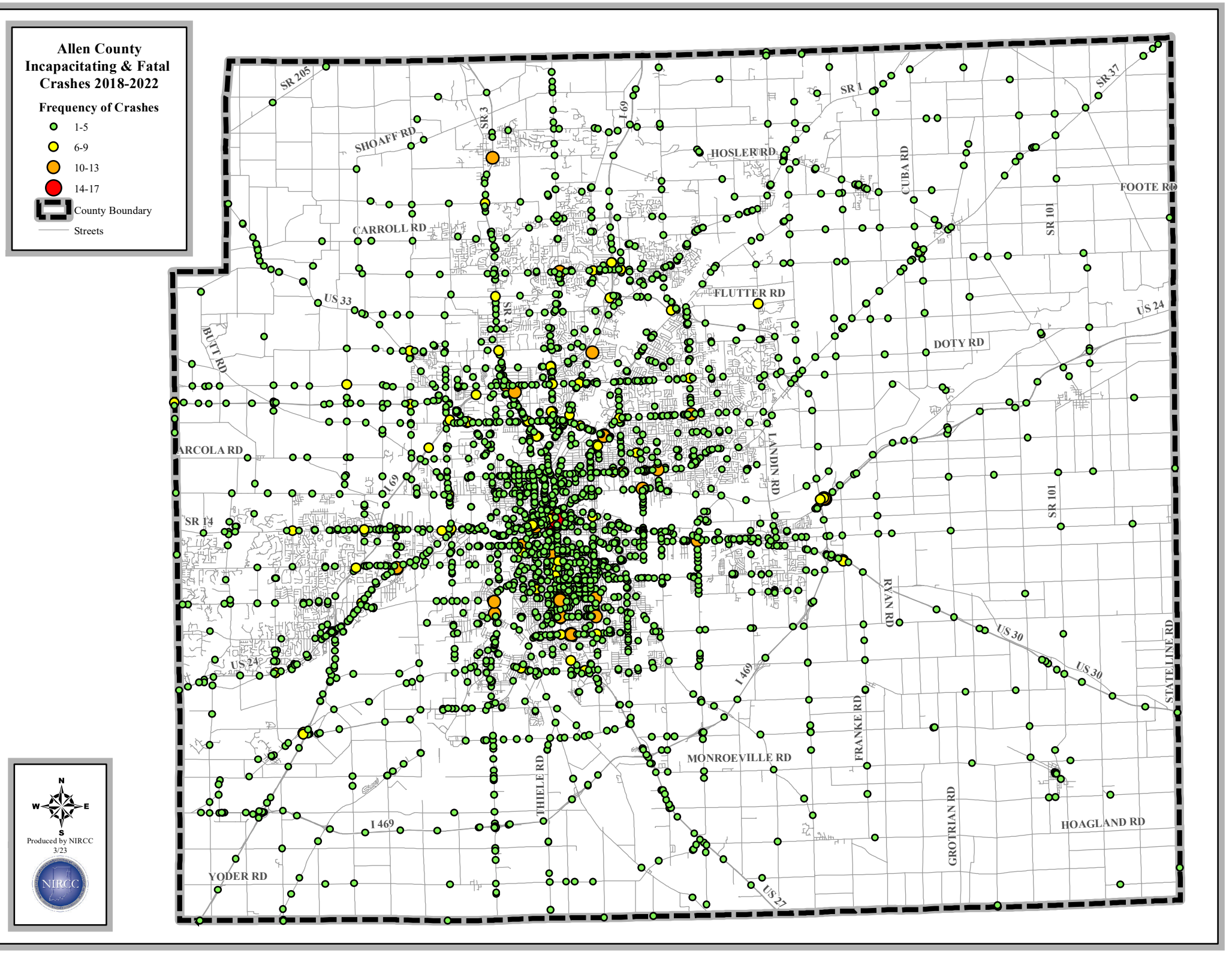
Table 2. Allen County Public Roadway Fatal/ Incapacitating Injury Crashes

Year	Total	Fatal	Fatal %	INC	INC %	Fat & INC	Fat & INC %
2018	12510	27	0.22%	888	7.10%	915	7.31%
2019	12635	36	0.28%	851	6.74%	887	7.02%
2020	10008	31	0.31%	744	7.43%	774	7.73%
2021	11719	43	0.37%	760	6.49%	803	6.85%
2022	11946	43	0.36%	456	3.82%	499	4.18%
Total	**58818**	**180**	**0.31%**	**3699**	**6.29%**	3879	**6.59%**

Table 2 provides data showing that 6.59% of all crashes in the past five years resulted in incapacitating and fatal injuries. These identified crashes were reviewed to determine which crash types were most frequent. Table 3 provides a summary for all crash types within Allen County in the past five years. The primary contributing factors is included in Table 4. Figure 1 shows the crash locations of each incapacitating and fatal injury crash.

Table 3. Allen County Public Roadway Crash Types 2018-2022

Collision Type	Total
Blank / Not Given	*15*
Backing Crash	8
Collision with Animal Other	5
Collision with Deer	9
Collision with Object in Roadway	47
Head On Between Two Motor Vehicles	177
Left Turn / Left Turn Right Turn	549
Non-Collision	63
Opposite Direction Sideswipe	56
Other - Explain In Narrative / Blank	186
Ran Off Road	**851**
Rear End	691
Rear to Rear	1
Right Angle	**1010**
Right Turn	55
Same Direction Sideswipe	156
Total	**3879**


Allen County
Incapacitating & Fatal
Crashes 2018-2022
Frequency of Crashes
1-5
6-9
10-13
14-17
County Boundary
Streets
SR 205
SHOAFF RD
SR 3
I-69
SR 1
HOSLER RD
CUBA RD
SR 37
FOOTE RD
SR 101
CARROLL RD
US 33
FLUTTER RD
US 24
BUTT RD
DOTY RD
ARCOLA RD
LANDIN RD
SR 14
RYAN RD
US 30
STATELINE RD
FRANKE RD
MONROEVILLE RD
THIELE RD
GROTRIAN RD
HOAGLAND RD
YODER RD
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US 27
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Produced by NIRCC
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NIRCC

Table 4. Allen County Public Roadway Primary Contributing Factor 2018-2022

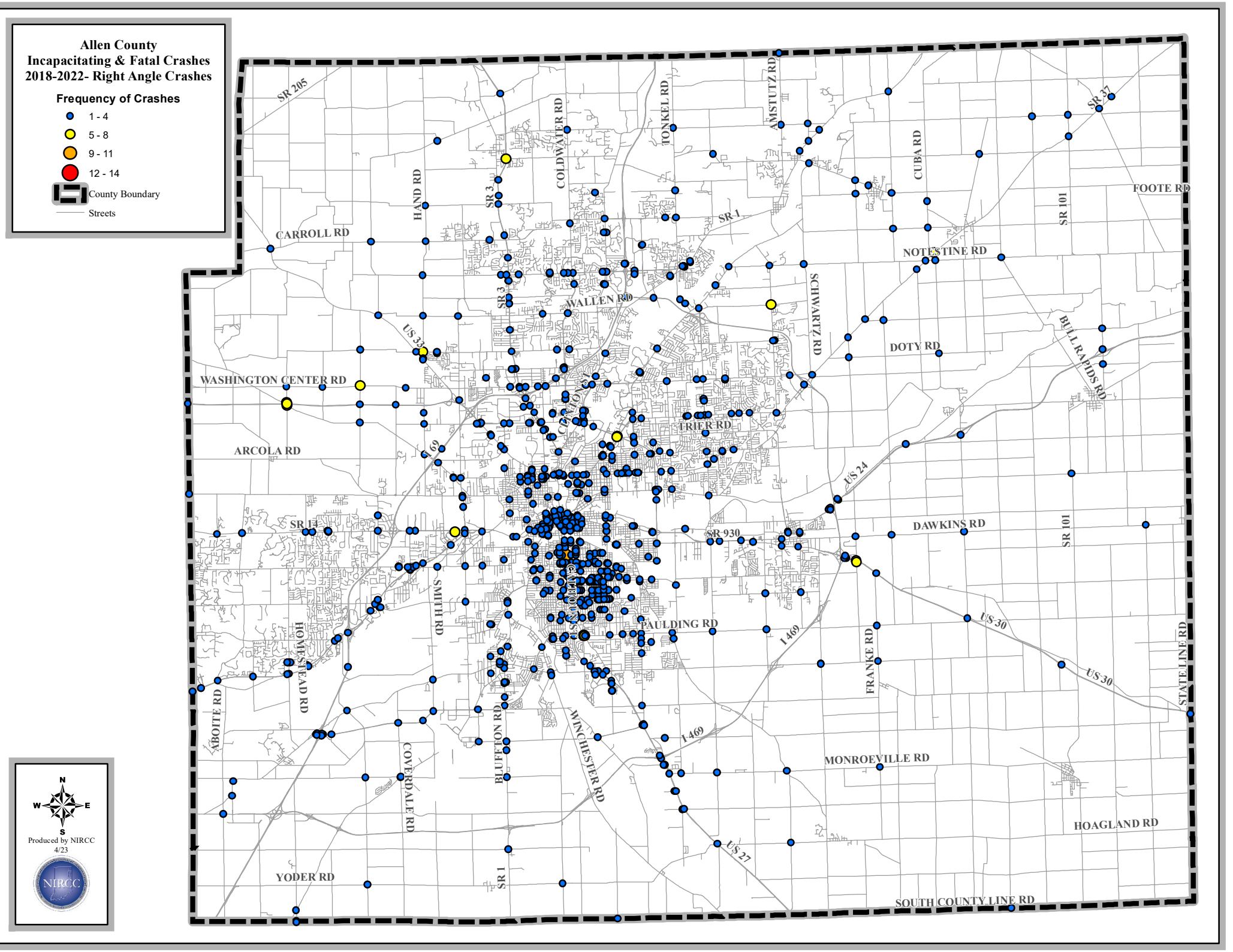
Primary Contributing Factor	Total Crashes	Percentage
ACCELERATOR FAILURE	1	0.0%
ALCOHOL BEVERAGES	1	0.0%
ANIMAL OR OBJECT IN ROADWAY	33	0.9%
BRAKE FAILURE OR DEFECTIVE	20	0.5%
CELL PHONE USAGE	4	0.1%
DISREGARD SIGNAL/REG. SIGN	**510**	**13.1%**
DRIVER ASLEEP OR FATIGUED	20	0.5%
DRIVER AVOIDANCE MANEUVER	1	0.0%
DRIVER DISTRACTED - EXPLAIN IN NARRATIVE	64	1.6%
DRIVER ILLNESS	52	1.3%
ENGINE FAILURE OR DEFECTIVE	1	0.0%
FAILURE TO MAINTAIN LANE	49	1.3%
FAILURE TO YIELD RIGHT OF WAY	**1024**	**26.4%**
FOLLOWING TOO CLOSELY	470	12.1%
HEADLIGHTS DEFECTIVE OR NOT ON	2	0.1%
HOLES/RUTS IN SURFACE	1	0.0%
IMPROPER LANE USAGE	65	1.7%
IMPROPER PASSING	31	0.8%
IMPROPER TURNING	80	2.1%
INSECURE OR LEAKY LOAD	3	0.1%
LEFT OF CENTER	101	2.6%
NOT GIVEN / BLANK	20	0.5%
OTHER (DRIVER) - EXPLAIN IN NARRATIVE	101	2.6%
OTHER (ENVIRONMENTAL) - EXPLAIN IN NARRATIVE	4	0.1%
OTHER (VEHICLE) - EXPLAIN IN NARRATIVE	11	0.3%
OTHER LIGHTS DEFECTIVE	1	0.0%
OVERCORRECTING/OVER STEERING	71	1.8%
OVERSIZE OR OVERWEIGHT LOAD	1	0.0%
PEDESTRIAN ACTION	113	2.9%
RAN OFF ROAD RIGHT	**467**	**12.0%**
ROADWAY SURFACE CONDITION	11	0.3%
SEVERE CROSSWINDS	3	0.1%
SPEED TOO FAST FOR WEATHER CONDITIONS	152	3.9%
STEERING FAILURE	3	0.1%
TIRE FAILURE OR DEFECTIVE	7	0.2%
TRAFFIC CONTROL INOPERATIVE/MISSING/OBSCURED	1	0.0%
UNDER STEERING/UNDER CORRECTING	1	0.0%
UNSAFE BACKING	10	0.3%
UNSAFE LANE MOVEMENT	151	3.9%
UNSAFE SPEED	198	5.1%
VIEW OBSTRUCTED	2	0.1%
WRONG WAY ON ONE WAY	18	0.5%

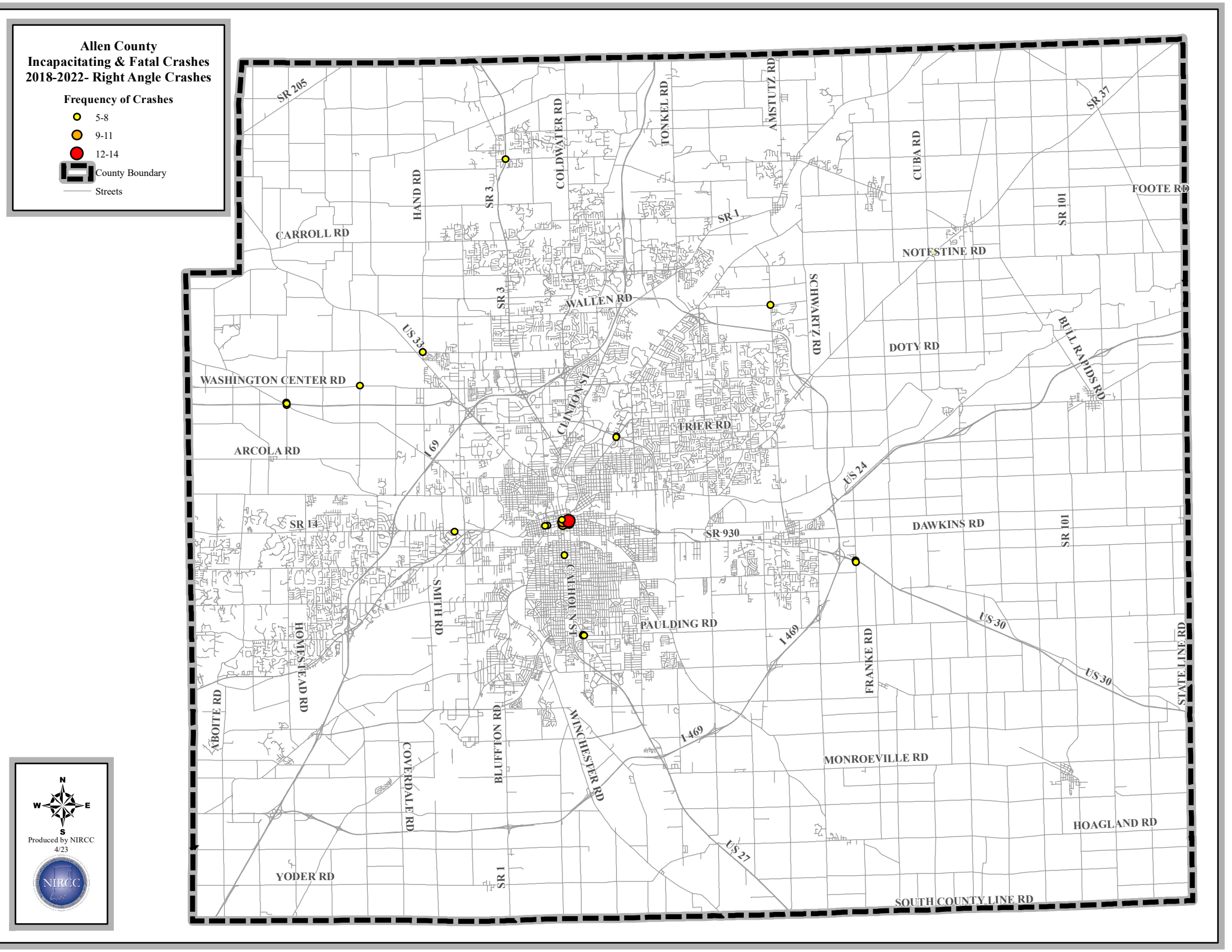
Intersection Crashes

Right angle crashes account for 26% of all the incapacitating and fatal injury crashes in Allen County. Right angle crashes occur at an intersection or access junction. Identification of intersections where incapacitating and fatal injury crashes have occurred in Allen County are displayed in maps Figures 2 to 4.

Table 5. Allen County Public Roadway Primary Factor for Right Angle Crashes 2018-2022

Primary Factor	Total Number of Crashes	Percentage of Total
ANIMAL OR OBJECT IN ROADWAY	1	0.1%
BRAKE FAILURE OR DEFECTIVE	4	0.4%
DISREGARD SIGNAL/REG. SIGN	**433**	**42.9%**
DRIVER ASLEEP OR FATIGUED	1	0.1%
DRIVER DISTRACTED - EXPLAIN IN NARRATIVE	4	0.4%
DRIVER ILLNESS	2	0.2%
FAILURE TO YIELD RIGHT OF WAY	**444**	**44.0%**
HEADLIGHTS DEFECTIVE OR NOT ON	1	0.1%
IMPROPER LANE USAGE	3	0.3%
IMPROPER PASSING	2	0.2%
IMPROPER TURNING	13	1.3%
LEFT OF CENTER	6	0.6%
OTHER (DRIVER) - EXPLAIN IN NARRATIVE	7	0.7%
OVERCORRECTING/OVER STEERING	2	0.2%
PEDESTRIAN ACTION	**32**	**3.2%**
RAN OFF ROAD RIGHT	3	0.3%
SPEED TOO FAST FOR WEATHER CONDITIONS	21	2.1%
TIRE FAILURE OR DEFECTIVE	1	0.1%
UNSAFE BACKING	1	0.1%
UNSAFE LANE MOVEMENT	7	0.7%
UNSAFE SPEED	17	1.7%
WRONG WAY ON ONE WAY	5	0.5%


Allen County
Incapacitating & Fatal Crashes
2018-2022- Right Angle Crashes
Frequency of Crashes
1 - 4
5 - 8
9 - 11
12 - 14
County Boundary
Streets
N
W
E
S
Produced by NIRCC
4/23
NIRCC
SR 205
HAND RD
SR 3
COLDWATER RD
TONKEL RD
AMSTUTZ RD
CUBA RD
SR 37
FOOTE RD
CARROLL RD
SR 1
SR 101
NOTESTINE RD
WALLEN RD
SCHWARTZ RD
US 33
DOTY RD
BULL RAPIDS RD
WASHINGTON CENTER RD
TRIER RD
ARCOLA RD
US 24
SR 14
SR 930
DAWKINS RD
SMITH RD
HOMESTEAD RD
FAULDING RD
I 469
US 30
FRANKE RD
STATE LINE RD
ABOITE RD
COVERDALE RD
BLUFFTON RD
WINCHESTER RD
MONROEVILLE RD
HOAGLAND RD
US 27
YODER RD
SOUTH COUNTY LINE RD


Allen County
Incapacitating & Fatal Crashes
2018-2022- Right Angle Crashes
Frequency of Crashes
5-8
9-11
12-14
County Boundary
Streets
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Produced by NIRCC
4/23
NIRCC
SR 205
HAND RD
SR 3
COLDWATER RD
TONKEL RD
AMSTUTZ RD
CUBA RD
SR 37
FOOTE RD
CARROLL RD
SR 1
NOTESTINE RD
SR 101
SCHWARTZ RD
WALLEN RD
US 33
DOTY RD
BULL RAPIDS RD
WASHINGTON CENTER RD
CLINTON ST
TRIER RD
ARCOLA RD
I 69
US 24
SR 14
SR 930
DAWKINS RD
SMITH RD
CLAYTON ST
PAULDING RD
I 469
US 30
FRANKE RD
STATE LINE RD
HOMESTEAD RD
ABOITE RD
BLUFFTON RD
WINCHESTER RD
COVERDALE RD
MONROEVILLE RD
HOAGLAND RD
US 27
YODER RD
SOUTH COUNTY LINE RD


Allen County
Incapacitating & Fatal Crashes
2018-2022- Right Angle Crashes
Frequency of Crashes
5-8
9-11
12-14
County Boundary
Streets
HIGH ST
COLUMBIA AVE
SUPERIOR ST
BERRY ST
WASHINGTON BLVD
MAIN ST
MAUMEE AVE
JEFFERSON BLVD
HILL
CLINTON ST
HANNA ST
TAYLOR ST
ANTHONY BLVD
WAYNE TRACE
BROOKLYN AVE
CREIGHTON AVE
HARRISON ST
PONTIAC ST
FREEMAN ST
BROADWAY ST
FAIRFIELD AVE
CALHOUN ST
OXFORD ST
ARDMORE AVE
NUTTMAN AVE
MCKINNIE AVE
MCKINNIE AVE
ENGLE RD
OLD MILL RD
HESSEN CASSEL RD
BLUFFTON RD
PETTIT AVE
PETTIT AVE
SANDPOINT RD
PAULDING RD
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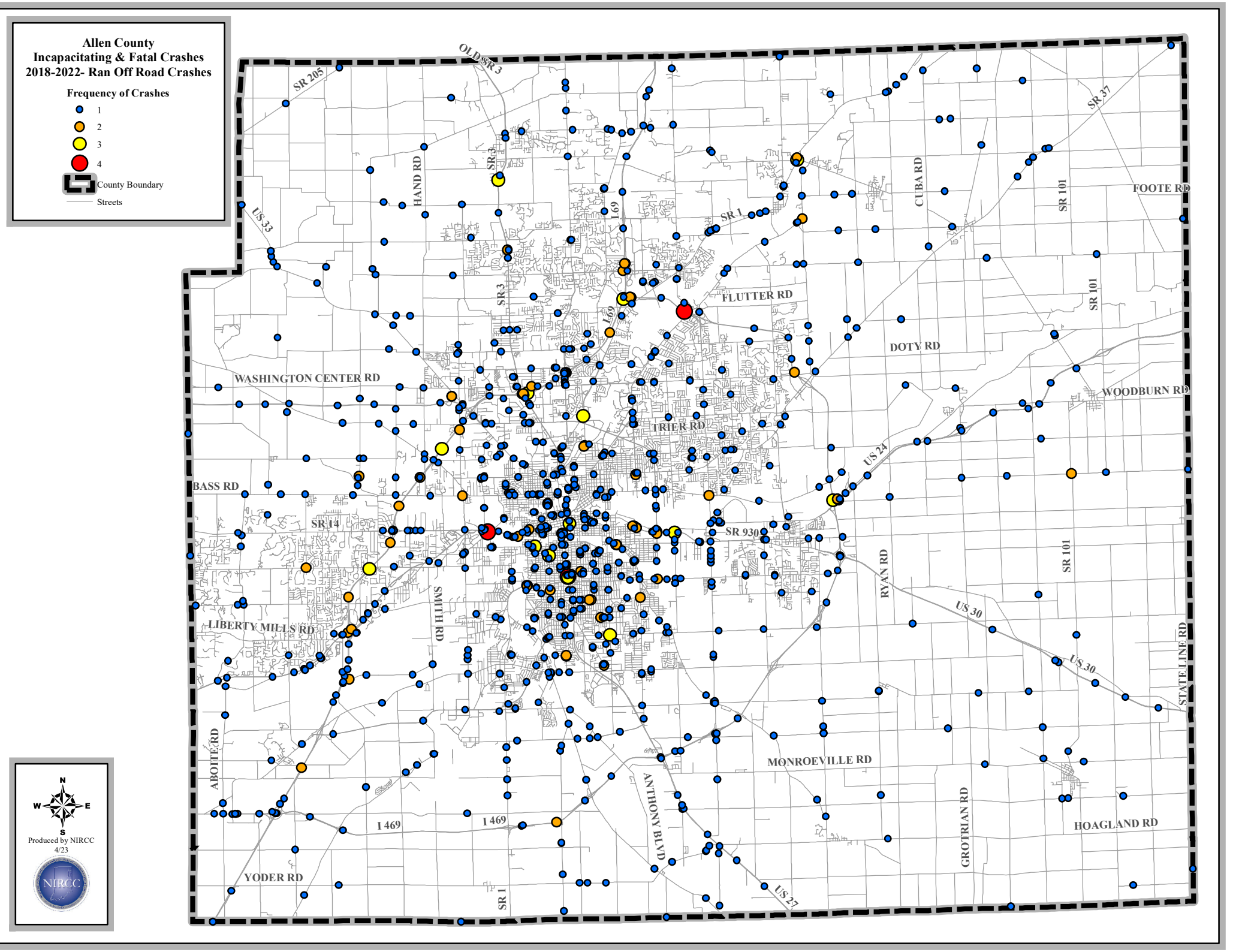
NIRCC

Ran Off Road Crashes

Ran off roadway crashes were also identified as a significant contributor to incapacitating and fatal injury crashes in Allen County. These crashes occur in both urban and rural areas. Table 6 provides a summary of the contributing factors related to ran off road crashes. Figures 5 to 7 show crash locations where ran off road crashes have occurred.

Table 6. Allen County Public Roadway Primary Factor for Ran Off Road Crashes 2018-2022

Primary Factor	Total Number of Crashes	Percentage of Total
ACCELERATOR FAILURE	1	0.1%
ALCOHOL BEVERAGES	1	0.1%
ANIMAL OR OBJECT IN ROADWAY	10	1.2%
BRAKE FAILURE OR DEFECTIVE	4	0.5%
CELL PHONE USAGE	2	0.2%
DISREGARD SIGNAL/REG. SIGN	10	1.2%
DRIVER ASLEEP OR FATIGUED	11	1.3%
DRIVER DISTRACTED - EXPLAIN IN NARRATIVE	8	0.9%
DRIVER ILLNESS	28	3.3%
FAILURE TO MAINTAIN LANE	37	4.3%
FAILURE TO YIELD RIGHT OF WAY	2	0.2%
FOLLOWING TOO CLOSELY	5	0.6%
IMPROPER LANE USAGE	8	0.9%
IMPROPER PASSING	1	0.1%
IMPROPER TURNING	8	0.9%
LEFT OF CENTER	6	0.7%
NOT GIVEN / BLANK	3	0.4%
OTHER (DRIVER) - EXPLAIN IN NARRATIVE	21	2.5%
OTHER (ENVIRONMENTAL) - EXPLAIN IN NARRATIVE	1	0.1%
OTHER (VEHICLE) - EXPLAIN IN NARRATIVE	3	0.4%
OVERCORRECTING/OVER STEERING	42	4.9%
RAN OFF ROAD RIGHT	**454**	**53.3%**
ROADWAY SURFACE CONDITION	1	0.1%
SPEED TOO FAST FOR WEATHER CONDITIONS	**71**	**8.3%**
STEERING FAILURE	1	0.1%
TIRE FAILURE OR DEFECTIVE	1	0.1%
UNDER STEERING/UNDER CORRECTING	1	0.1%
UNSAFE BACKING	2	0.2%
UNSAFE LANE MOVEMENT	24	2.8%
UNSAFE SPEED	**84**	**9.9%**


Allen County
Incapacitating & Fatal Crashes
2018-2022- Ran Off Road Crashes
Frequency of Crashes
1
2
3
4
County Boundary
Streets
N
W
E
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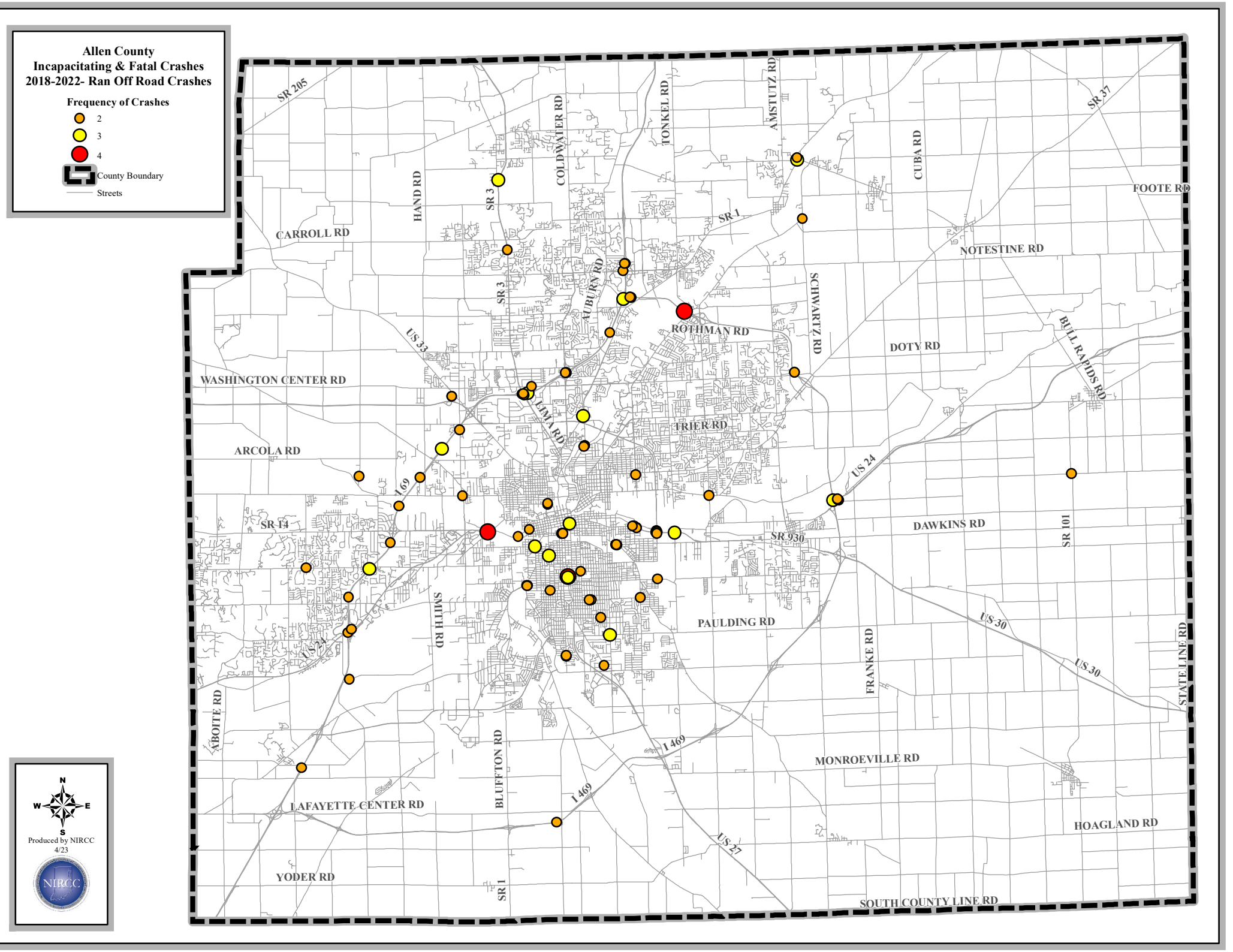
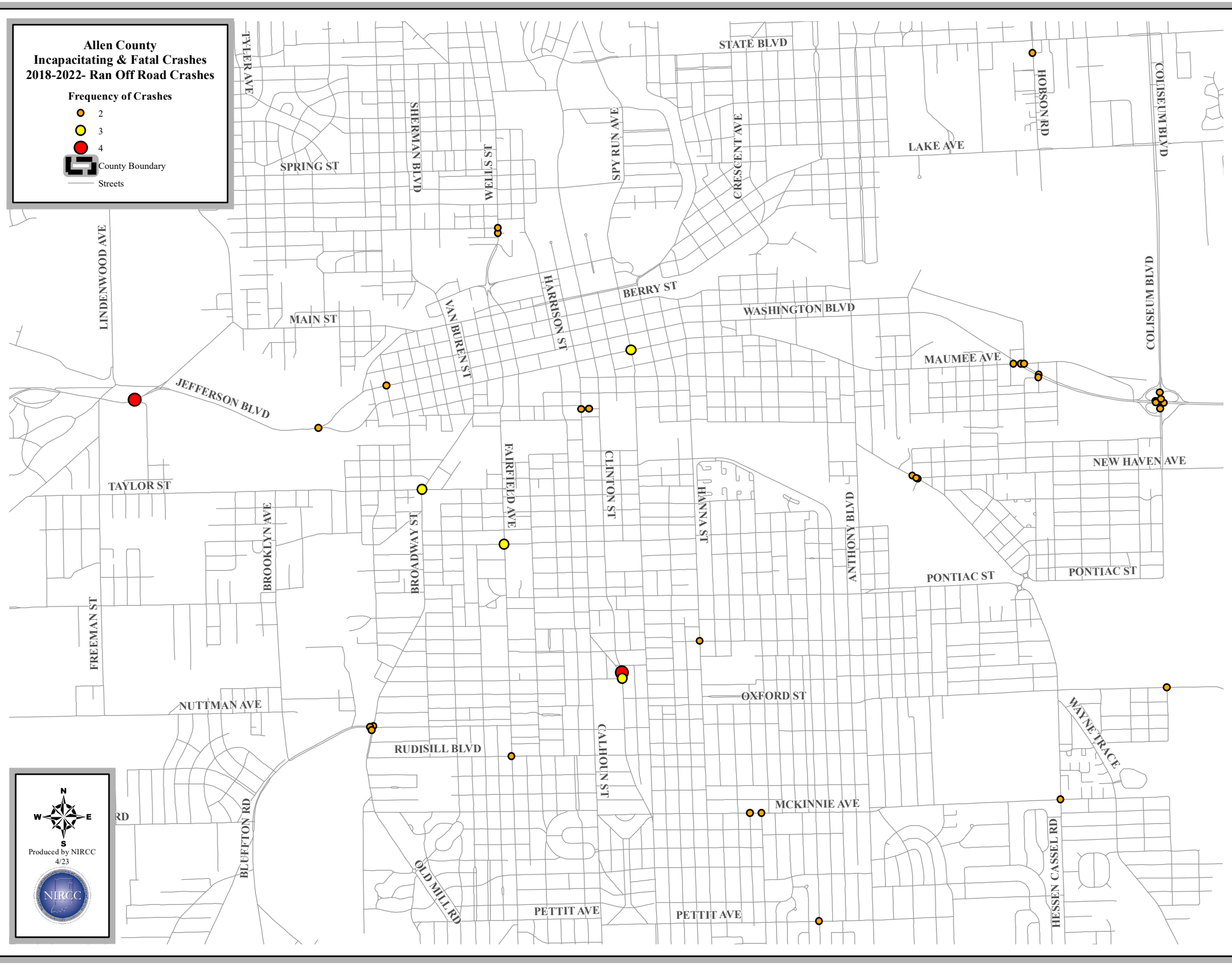
Produced by NIRCC
4/23
NIRCC
OLD SR 3
SR 205
HAND RD
SR 3
I 69
SR 1
CUBA RD
SR 37
SR 101
FOOTE RD
US 33
FLUTTER RD
DOTY RD
WASHINGTON CENTER RD
WOODBURN RD
TRIER RD
US 24
BASS RD
SR 14
SR 930
RYAN RD
US 30
LIBERTY MILLS RD
SMITH RD
STATE LINE RD
ABOITE RD
MONROEVILLE RD
I 469
ANTHONY BLVD
GROTRIAN RD
HOAGLAND RD
YODER RD
US 27


Allen County
Incapacitating & Fatal Crashes
2018-2022- Ran Off Road Crashes
Frequency of Crashes
2
3
4
County Boundary
Streets
N
W
E
S
Produced by NIRCC
4/23
NIRCC
SR 205
HAND RD
SR 3
COLDWATER RD
TONKEL RD
AMSTUTZ RD
CUBA RD
SR 37
FOOTE RD
CARROLL RD
SR 1
NOTESTINE RD
AUBURN RD
SCHWARTZ RD
ROTHMAN RD
DOTY RD
BULL RAPIDS RD
US 33
WASHINGTON CENTER RD
LIMA RD
TRIER RD
ARCOLA RD
I 69
US 24
SR 14
DAWKINS RD
SR 930
SR 101
SMITH RD
PAULDING RD
US 30
FRANKE RD
STATE LINE RD
ABOITE RD
BLUFFTON RD
I 469
MONROEVILLE RD
LAFAYETTE CENTER RD
HOAGLAND RD
US 27
YODER RD
SOUTH COUNTY LINE RD


Allen County
Incapacitating & Fatal Crashes
2018-2022- Ran Off Road Crashes
Frequency of Crashes
2
3
4
County Boundary
Streets
STATE BLVD
TYLER AVE
SHERMAN BLVD
WELLS ST
SPY RUN AVE
CRESCENT AVE
HOBSON RD
COLISEUM BLVD
LAKE AVE
SPRING ST
LINDENWOOD AVE
MAIN ST
VAN BUREN ST
HARRISON ST
BERRY ST
WASHINGTON BLVD
MAUMEE AVE
JEFFERSON BLVD
NEW HAVEN AVE
TAYLOR ST
FAIRFIELD AVE
CLINTON ST
HANNA ST
ANTHONY BLVD
PONTIAC ST
BROOKLYN AVE
BROADWAY ST
FREEMAN ST
OXFORD ST
NUTTMAN AVE
WAYNE TRACE
RUDISILL BLVD
CALHOUN ST
MCKINNIE AVE
BLUFFTON RD
OLD MILL RD
HESSEN CASSEL RD
PETTIT AVE
PETTIT AVE
N
W
E
S
Produced by NIRCC
4/23
NIRCC

Vulnerable Roadway Users

NIRCC monitors crash data related to various vulnerable roadway users in Allen County. The Fatality Analysis Report System (FARS) includes pedestrians, bicyclists, other cyclists, and persons on personal conveyance as vulnerable roadway users. NIRCC also included transit users and animal drawn vehicle operators / occupants as vulnerable roadway users. Each of these transportation user groups are monitored in Allen County. As part of the CSAP, NIRCC has included a summary of these crashes and action steps to aid in reducing the number of incapacitating injury and fatal crashes. The Agency Safety Plan for the local transit authority, Citilink, is included in Appendix B. This plan identifies safety concerns for transit vehicles and users.

Pedestrians

Pedestrian crashes from 2018-2022 in Allen County have resulted in 183 incapacitating and fatal injury crashes. This represents 4.7 percent of all the incapacitating and fatal injury crashes during this period.

Table 7. Allen County Pedestrian Crashes 2018-2022

Year	Total Crashes	Total Incapacitating / Fatal Crashes
2018	103	44
2019	75	38
2020	59	26
2021	84	44
2022	113	31
Total	**434**	**183**

Bicyclists

Pedalcyclist crashes from 2018-2022 in Allen County have resulted in 102 incapacitating and fatal injury crashes. This is 2.6 percent of all the incapacitating and fatal injury crashes during this period.

Table 8. Allen County Bicycle Crashes 2018-2022

Year	Total Crashes	Total Incapacitating / Fatal Crashes
2018	69	19
2019	71	21
2020	55	20
2021	55	28
2022	60	14
Total	**310**	**102**

Animal Drawn Vehicles

Animal drawn vehicle crashes from 2018-2022 in Allen County have resulted in __ incapacitating and fatal injury crashes. This is 0.46 percent of all the incapacitating and fatal injury crashes during this period.

Table 9. Allen County Animal Drawn Vehicle Crashes 2018-2022

Year	Total Crashes	Total Incapacitating / Fatal Crashes
2018	7	5
2019	6	3
2020	5	2
2021	10	4
2022	9	4
Total	**37**	**18**

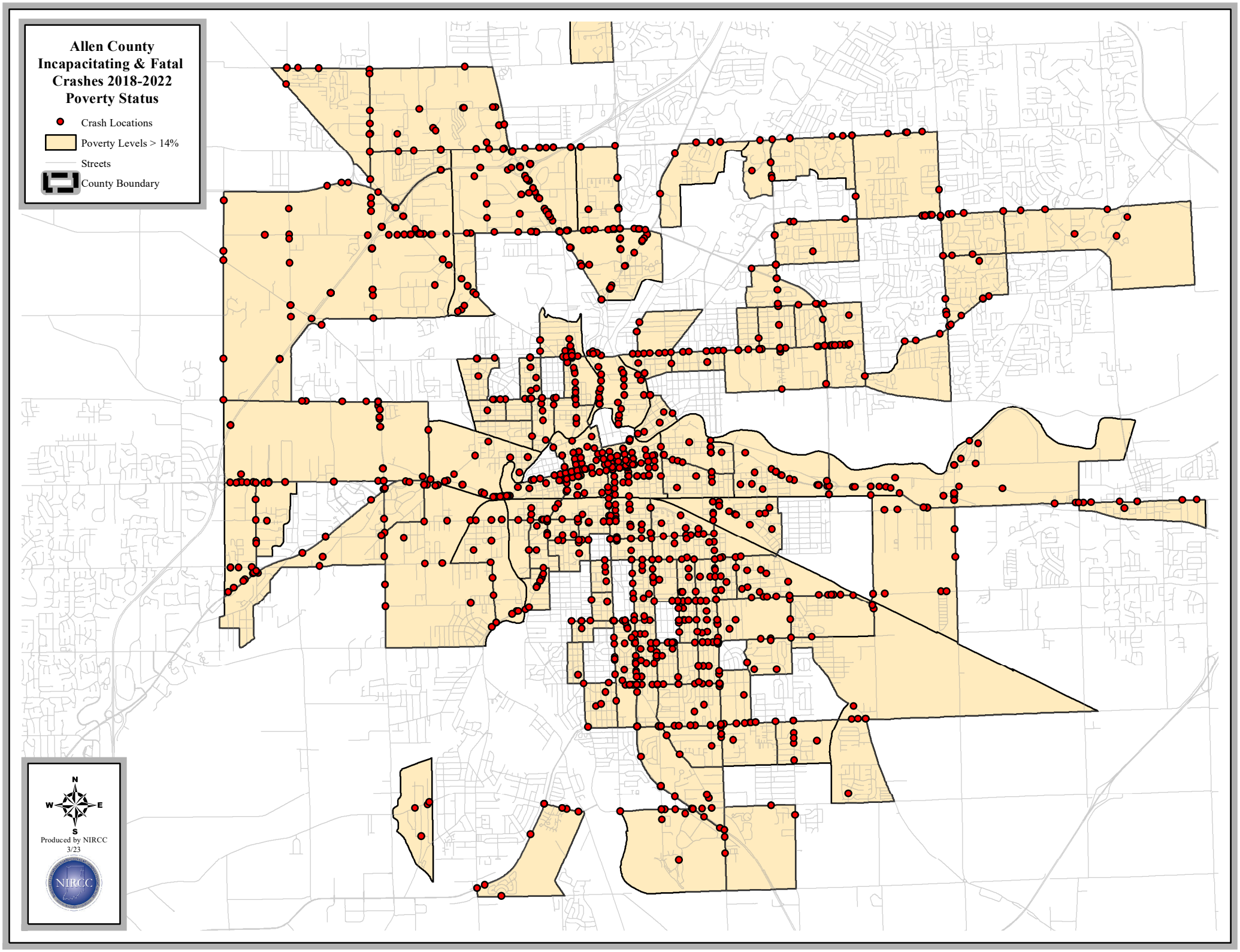
Equity Area Analysis

Two equitable areas were identified within Allen County related to incapacitating and fatal injury crashes. High poverty areas and rural areas were identified and analyzed to determine crashes within these areas.

High poverty areas were defined as areas with greater than 14 percent poverty. Within these areas there were 1703 incapacitating and fatal injury crashes. The primary crash type was right angle crashes. Figure 8 displays the location of the identified crashes in high poverty areas within Allen County.

Table 10. Allen County High Poverty Areas 2018-2022

Year	Total Incapacitating / Fatal Crashes
2018	425
2019	385
2020	351
2021	344
2022	198
Total	**1703**


Allen County
Incapacitating & Fatal
Crashes 2018-2022
Poverty Status
Crash Locations
Poverty Levels > 14%
Streets
County Boundary
N
W
E
S
Produced by NIRCC
3/23
NIRCC

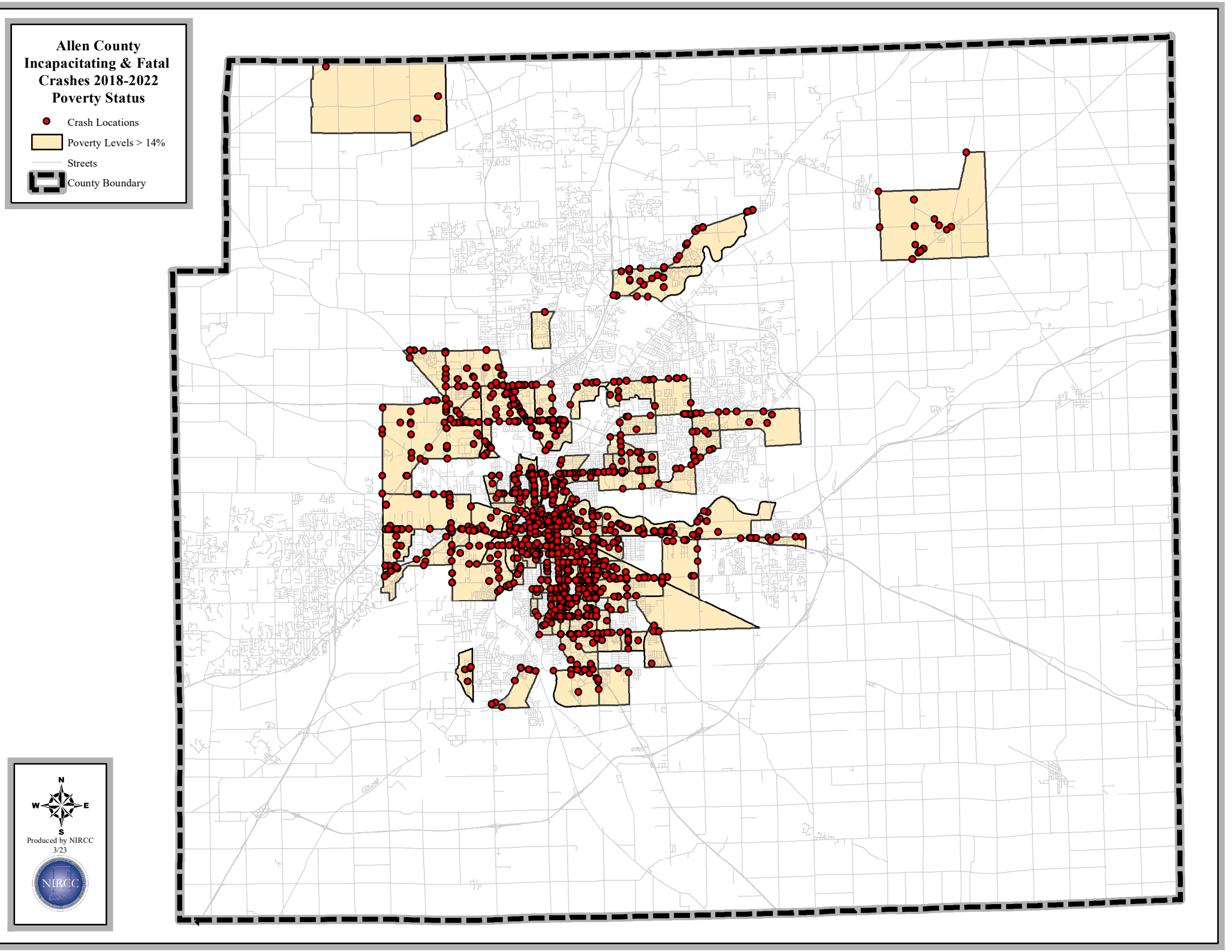

Allen County
Incapacitating & Fatal
Crashes 2018-2022
Poverty Status
Crash Locations
Poverty Levels > 14%
Streets
County Boundary
N
W
E
S
Produced by NIRCC
3/23
NIRCC

Table 11. Allen County High Poverty Areas Crash Types 2018-2022

Collision Type	Total
Blank / Not Given	7
Backing Crash	6
Collision with Animal Other	2
Collision with Deer	0
Collision with Object in Roadway	31
Head On Between Two Motor Vehicles	70
Left Turn / Left Turn Right Turn	247
Non-Collision	26
Opposite Direction Sideswipe	19
Other - Explain In Narrative	85
Ran Off Road	**297**
Rear End	**304**
Rear to Rear	0
Right Angle	**514**
Right Turn	20
Same Direction Sideswipe	75
Total	**1703**

The rural area was also reviewed as many of the roadways are unimproved or lack many of the urban safety designs. Additionally, the rural roadways often experience travel speeds much greater than in urban areas. Allen County's rural area had 790 incapacitating and fatal injury crashes from 2018 to 2022. The primary crash type was ran off road crashes. Figure 9 displays the location of the identified crashes in the rural area of Allen County.

Table 12. Allen County Rural Area 2018-2022

Year	Total Incapacitating / Fatal Crashes
2018	196
2019	167
2020	425
2021	136
2022	149
Total	**790**

Table 13. Allen County Rural Area Crash Types 2018-2022

Collision Type	Total
Blank / Not Given	*2*
Backing Crash	1
Collision with Animal Other	4
Collision with Deer	6
Collision with Object in Roadway	5
Head On Between Two Motor Vehicles	39
Left Turn / Left Turn Right Turn	45
Non-Collision	11
Opposite Direction Sideswipe	16
Other - Explain In Narrative	26
Ran Off Road	**303**
Rear End	89
Rear to Rear	1
Right Angle	**208**
Right Turn	10
Same Direction Sideswipe	24
Total	**790**

Project Implementation and Action Steps
NIRCC will identify programmed and planned projects to ensure safety countermeasures to address right angle crashes, ran off roadway crashes, crashes involving vulnerable roadway users, and crashes within equitable areas are incorporated. Systemic and site specific improvements will be implemented to meet the target reduction by 2046

Countermeasures which are currently proven effective and eligible for funding will all be considered by Allen County for implementation. Below are Federal and State countermeasures that will serve as baseline countermeasures.

Federal Highway Administration Proven Safety Countermeasures

Speed Management
- Appropriate Speed Limits for All Road Users
- Speed Safety Cameras
- Variable Speed Limits

Pedestrian/Bicyclist
- Bicycle Lanes
- Crosswalk Visibility Enhancements
- Leading Pedestrian Interval
- Medians and Pedestrian Refuge Islands in Urban and Suburban Areas
- Pedestrian Hybrid Beacons
- Rectangular Rapid Flashing Beacons (RRFB)
- Road Diets (Roadway Configuration)
- Walkways

Roadway Departure
- Enhanced Delineation for Horizontal Curves
- Longitudinal Rumble Strips and Stripes on Two-Lane Roads
- Median Barriers
- Roadside Design Improvements at Curves
- SafetyEdge^{SM}
- Wider Edge Lines

Intersections
- Backplates with Retroreflective Borders
- Corridor Access Management
- Dedicated Left and Right Turn Lanes at Intersections
- Reduced Left-Turn Conflict Intersections
- Roundabouts
- Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections
- Yellow Change intervals

Crosscutting
- Lighting
- Local Road Safety Plans
- Pavement Friction Management
- Road Safety Audits

INDOT HSIP Eligible Countermeasures

- Conduct inventory of traffic signs and upgrade warning and regulatory signs to meet MUTCD retroreflectivity requirements
- Improve the visibility of curves by upgrading curve warning signs and markings
- Improve visibility of unsignalized intersections by installing upgraded/new warning devices
- Install vehicle activated advanced warning systems at rural, unsignalized intersections
- Install new pedestrian crosswalk warning signs, flashing beacons or special pavement markings
- Install or upgrade pedestrian curb ramps and refuge areas at areas of high conflict between pedestrians and vehicular traffic
- Install pedestrian push button Countdown And Audible (APS) heads on traffic signals
- Make changes to yellow interval traffic signal timing or signal interconnect to improve safety
- Upgrade traffic signals to a minimum of one signal head per travel lane
- Install black backing plates with reflective border on all traffic signal heads
- Install UPS battery backup (emergency power) systems at traffic signal locations for continuous use during power outages
- Install emergency vehicle pre-emption systems at traffic signal locations to reduce response times and increase safety as the emergency vehicles pass through intersections
- Improve visibility of intersections by providing lighting
- Improve sight distance at intersections by installing slotted left turn lanes
- Install or upgrade passive or new active warning devices at railroad crossings
- Install railroad pre-emption systems at signalized intersections that are within the influence area of crossing railroad trains
- Install new centerline or edge line pavement markings on unmarked roadways
- Install raised medians for access control at intersections and roadway segments
- Add centerline and/or edge line rumble stripes (pavement markings over the rumble) to rural roads
- Complete road diet projects at locations that can be accomplished through the use of signs and pavement markings (Not Applicable to pavement reconstruction or geometric modifications)
- Add FHWA recommended High Friction Surface Treatments (HFST) to spot locations
- Upgrade guardrail end treatments to current standards
- Install guardrails or median barriers at locations where none existed previously
- Install median cable barrier systems on divided roads with grass medians
- Remove or shield permanent roadside safety obstructions

Additional Local Countermeasures

Right Angle Crash Countermeasures

- Improve intersection sight distance
- Increase the all-red signal phase at problematic intersections

Ran Off Road Countermeasures

- Traffic calming designs
    - Reduced lane widths
    - Enhanced curbing
    - Green Medians
    - Barriers behind curbing

Vulnerable Roadway User Countermeasures

- Remove skewed intersections to reduce distance needed to cross roadways
- Install improved shoulders or dedicated travel lanes for animal drawn vehicles

Programmed Projects include:

- Broadway and Taylor Street – FY30
- SR 930 and Maplecrest Road – FY24
- SR 37 from I 469 to Harlan – FY27
- US 30 and Kroemer Road – FY27
- US 30 and Flaugh Road – FY25
- US 30 and O'Day Road – FY25
- US 30 at Leesburg/Felger Road – FY28
- SR 37 and Notestine Road – FY25
- SR 37 and Cuba/Thimlar Road – FY25
- Leesburg Road from Main Street to Jefferson Boulevard – FY25
- Coverdale Road / Indianapolis Road / Winters Road – FY 27
- Tonkel Road and Union Chapel Road – FY 31
- Hursh Road and Tonkel Road – Tbd
- Butler Road / Goshen Road / Harris Road – FY 26
- Maplecrest Road South and Moeller Road – FY 28
- Linden Road and Rose Avenue – FY28
- Carroll Road / Coral Springs Drive / Shearwater Run – FY 26
- Gump Road and SR 3 Pedestrian Bridge – FY31
- Monroeville Road and Wayne Trace – FY26
- Pufferbelly Trail Bridge over Coliseum Boulevard – FY 28
- Flaugh Road and California Road – FY 27
- Kroemer Road and California Road – FY 27
- SR 1 at Hardisty Road – FY 26
- SR 3 at Cedar Canyons Road – FY 25
- I-469 at US 24 – FY 25
- Hanna Street Trail – FY 25
- Lake Avenue Trail – FY 26

- Northeast Trail – FY 25
- Pufferbelly Trail – FY 24
- Stellhorn Road Trail I – FY 25
- Stellhorn Road Trail II – FY 26
- Stellhorn Road Trail III – FY 28
- Wheelock Road Trail – FY 24

Conclusion

All crashes resulting in incapacitating or fatal injuries will continue to be analyzed to determine any potential corrective actions. The plan has focused on right angle and ran off roadway crashes as they were the primary crash types that resulted in incapacitating and fatal injuries. We recognize all crash types and contributing factors are important. The identified countermeasures will ensure that all collision types are addressed through the implantation of improvements to infrastructure, policies, and enforcement efforts. Safety countermeasures will be implemented as funding sources become available. NIRCC will continue to receive input from the Transportation Safety Committee, Transportation Technical Committee, law enforcement agencies, engineering agencies and highway departments, media, and citizens in a continuing effort to provide a safe and efficient transportation network for all citizens of Allen County.

Appendix A – Pedestrian Safety Action Plan

Pedestrian Safety Action Plan

Allen County, Indiana

December 2022

Produced by the
Northeastern Indiana Regional Coordinating Council

Draft 12/13/2022

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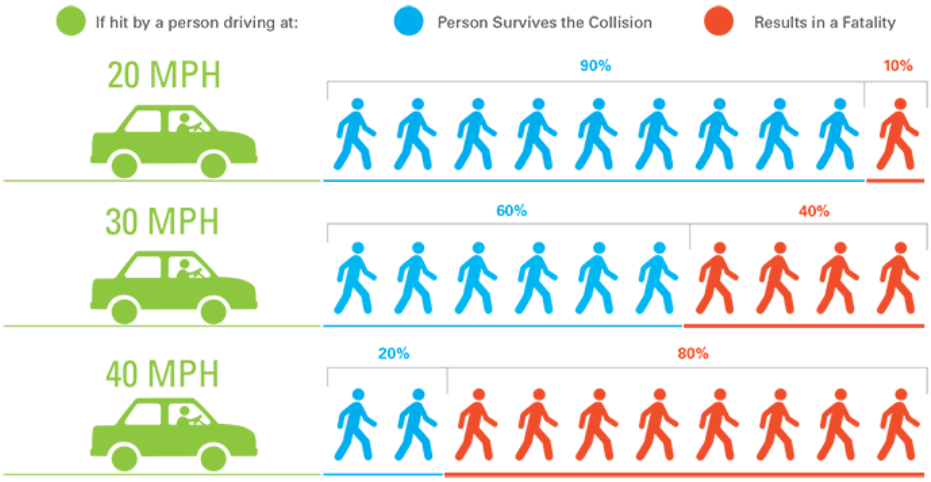
Pedestrian Safety Action Plan

Over the three year time period spanning from 2018 through 2020 there were around 35,100 recorded accidents involving motor vehicles, pedestrians, and bicyclists in Allen County. Accidents involving pedestrians accounted for about 0.7% of these. Fatalities for all accident types accounted for about 0.3% of the 35,100 accidents. Out of the 0.3% of total fatalities, 9.6% of them were pedestrian fatalities. These numbers are disproportionate when 99.3% of all accidents occurring in Allen County for these three years did not involve a pedestrian.

The nature of pedestrian accidents are usually much more severe than motor vehicle accidents. Since motor vehicles provide a significant amount of protection, people are less likely to be injured or killed when involved in an accident. From 2018 through 2020 about 18% of all motor vehicle accidents resulted in an injury or fatality. During this same time period nearly 89% of all pedestrian accidents resulted in an injury or fatality. As you can see from the graphic below, speeds in excess of just 20 mph produce a significant number of fatalities and injuries when there is an accident between a motor vehicle and a pedestrian. Since nearly every street throughout Allen County has speed limits that exceed 20 mph, pedestrian deaths and injuries can occur at almost any location.



Vehicle Speed comparison to chance of Pedestrian Injury and Fatality
Data source: US Department of Transportation, Literature Reviewed on Vehicle Travel Speeds and Pedestrian Injuries. March 2000.
Image credit: San Francisco MTA Vision Zero Action Plan, February 2015: https://view.joomag.com/vision-zero-san-francisco/06851970014235944 55?short

Since it is unreasonable to decrease speed limits on a system wide basis to create a safer impact speed for pedestrians, transportation engineers and planners must consider factors that can reduce the frequency and severity of pedestrian accidents through a multitude of countermeasures and action steps. These countermeasures and action steps must identify engineering (including special design characteristics), educational, enforcement, and encouragement strategies that will provide short term and long term solutions.

The purpose of creating a Pedestrian Safety Action Plan (PSAP) for Allen County is to create a plan that will be implemented throughout the transportation planning process and beyond for purposes of producing realized pedestrian safety improvements that are tailored to specific problems in our area. The PSAP goal is specifically to reduce the frequency and severity of pedestrian crashes, fatalities, and injuries for all users by establishing a framework to identify practical and achievable strategies to improve pedestrian safety, prioritize

improvements, and provide a means of development and implementation. To ensure a comprehensive approach, the plan will involve the four E's (Engineering, Education, Enforcement, and Encouragement) in identifying and implementing an effective PSAP. The following steps, as listed in the Federal Highway Administration's report titled "How to Develop a Pedestrian Safety Action Plan", will be incorporated into Allen County's PSAP:

- Define objectives.
- Identify Locations.
- Select countermeasures.
- Develop an implementation strategy.
- Institutionalize changes to planning and design standards.
- Consider land use, zoning and site design issues.
- Reinforce commitment.
- Evaluate results.

Several plans will be integrated into Allen County's PSAP. The "Bicycle-Pedestrian Transportation Plan" produced by NIRCC, the City of New Haven's "Comprehensive Trails and Pedestrian Walkways Master Plan", and Fort Wayne's "Walk Fort Wayne Plan". These plans provide insight to priorities throughout Allen County as well as identify key locations of pedestrian activity. Fort Wayne's "Bike Fort Wayne Plan", while its main focus is on bicycle infrastructure, will also complement Allen County's PSAP as it provides connectivity to pedestrian plans with on street bicycle facilities and multiuse trails.

NIRCC adopted the latest version of the Bicycle-Pedestrian Transportation Plan in 2018 which was included in the current long range transportation plan titled the 2040 Transportation Plan. The plan was originally developed by NIRCC in conjunction with the Northeastern Indiana Regional Bicycle and Pedestrian Forum and adopted in 2006. The Forum was made up of governmental parks, planning and highway agencies, advocacy groups, and special project organizations. One of the goals for creating the Forum was to develop a bicycle and pedestrian plan for the region. The Forum began this effort early in calendar year 2003 by focusing on Allen County's rural areas. By the end of fiscal year 2005 the Forum had completed the planning process for the Fort Wayne area, the rural areas of Allen County, and the connectivity with surrounding counties such as Adams, DeKalb, and Wells Counties. A number of plans were identified and used through a combined planning effort that included local plans from Aboite New Trails Inc., the Greenway Consortium, Northwest Allen Trails, Little River Wetlands, the City of Fort Wayne, the City of New Haven, and other regional groups outside of Allen County. The Forum had officially met from May of 2002 until August of 2007. Since 2007 NIRCC has relied on the Greenway Coalition for guidance as well as governmental plans and public input towards bicycle and pedestrian planning. The coalition, which is also made up of governmental parks, planning and highway agencies, advocacy groups, and special project organizations has been meeting since April of 2005 and continues to meet presently but only on a biannual basis.

This comprehensive bicycle and pedestrian plan includes the identification of on street and off street facilities. To create a more usable and detailed plan, the FY 2013 update to the Bicycle-Pedestrian Transportation Plan took what used to be one map, which included all bicycle and pedestrian infrastructure, and separated it into three individual maps. These three maps consist of a bike plan (**Figure 1-A**) which includes trails and on-street bike infrastructure, a trail plan (**Figure 1-B**), and a sidewalk plan (**Figure 1-C**). The combination of these three maps must be used to find out what is planned, proposed, or already exists for each corridor or alignment identified. For example, some corridors may only include proposed sidewalks while others may propose bike lanes in the street, a sidewalk on one side, and a trail on the other. Some corridors in the plan also identify which side of the street sidewalks and/or trails are proposed for.

Although the Bicycle-Pedestrian Transportation Plan identifies key pedestrian facilities whether proposed or

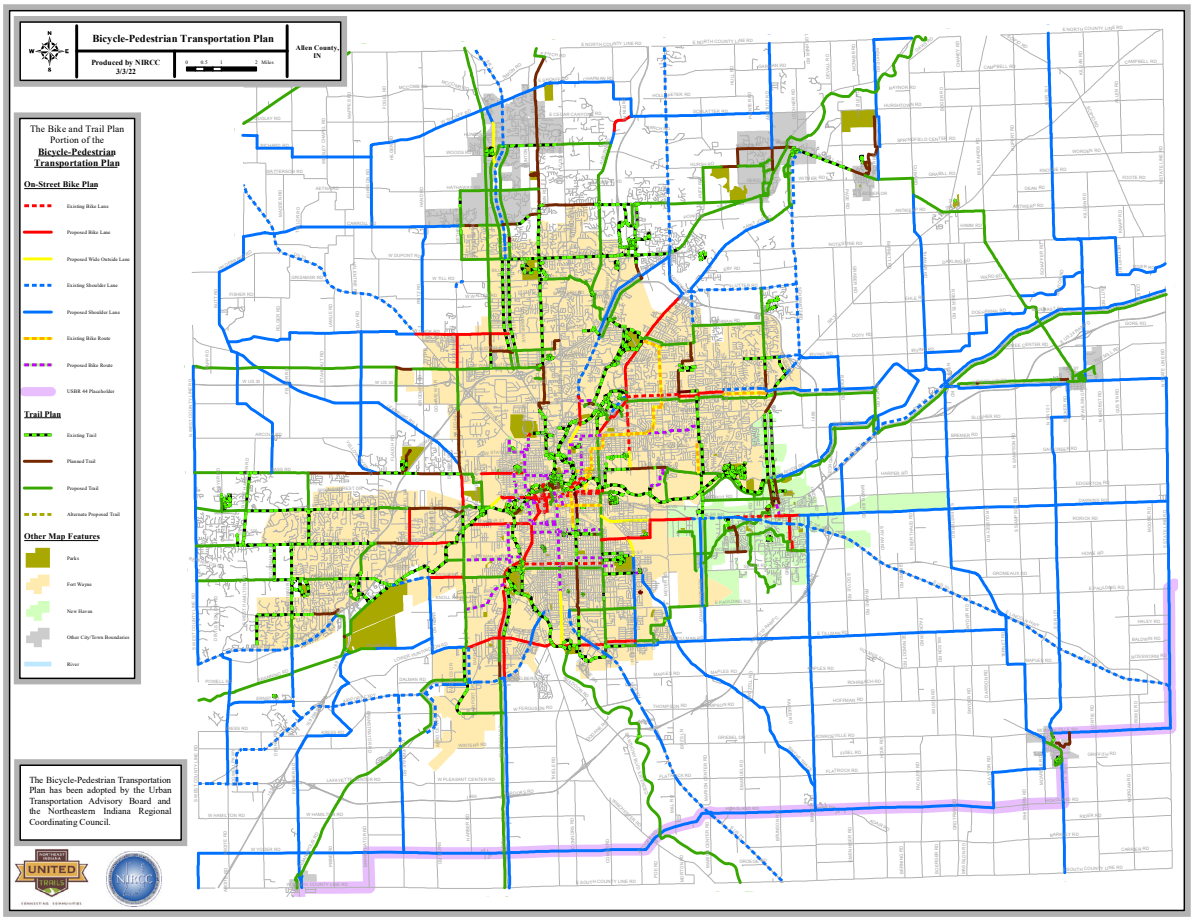


Figure 1-A

existing, the sidewalk component of the plan also uses a general policy which can be seen in **Appendix A**. This sidewalk policy makes recommendations for pedestrian accommodations according to street classification and location. On the sidewalk plan (**Figure 1-C**) the area shaded green identifies the areas covered by the policy. This area reflects the most current Federal Urban Area and expanded development patterns.

New Haven has produced a plan titled The City of New Haven Comprehensive Trails and Pedestrian Walkways Master Plan. This plan addresses the safety concerns of the residents of New Haven, provides a connection with New Haven's existing parks and trails to the residential neighborhoods, and provides safe access to the downtown area, neighboring commercial areas, and schools. New Haven expanded and refined this plan with the New Haven Master Trails Plan in July 2020. The purpose of this new plan is to help determine the proper approach to where new trails should be located to best serve the current and future population. The plan is intended to be adopted by the City of New Haven's Comprehensive Plan.

Fort Wayne is currently working on updating the Walk Fort Wayne Plan which was initially adopted as an amendment of the Comprehensive Plan in 2011. This plan was intended to be a 10 year plan to provide guidance on how and where to fill in sidewalk gaps along Fort Wayne's arterial and collector roadways through the use of new sidewalks and shared-use paths. Two teams initially worked on drafting the plan. The Primary Team (the internal departmental work group) and the Advisory Team. Members of Fort Wayne's planning department acted as the project coordinators. The Primary Team was charged with developing the plan while the Advisory Team reviewed, provided assistance, and offered input for the plan document. Members of these two teams as well as the scope of the original Walk Fort Wayne Plan can be seen in **Appendix B**.

Figure 1-B

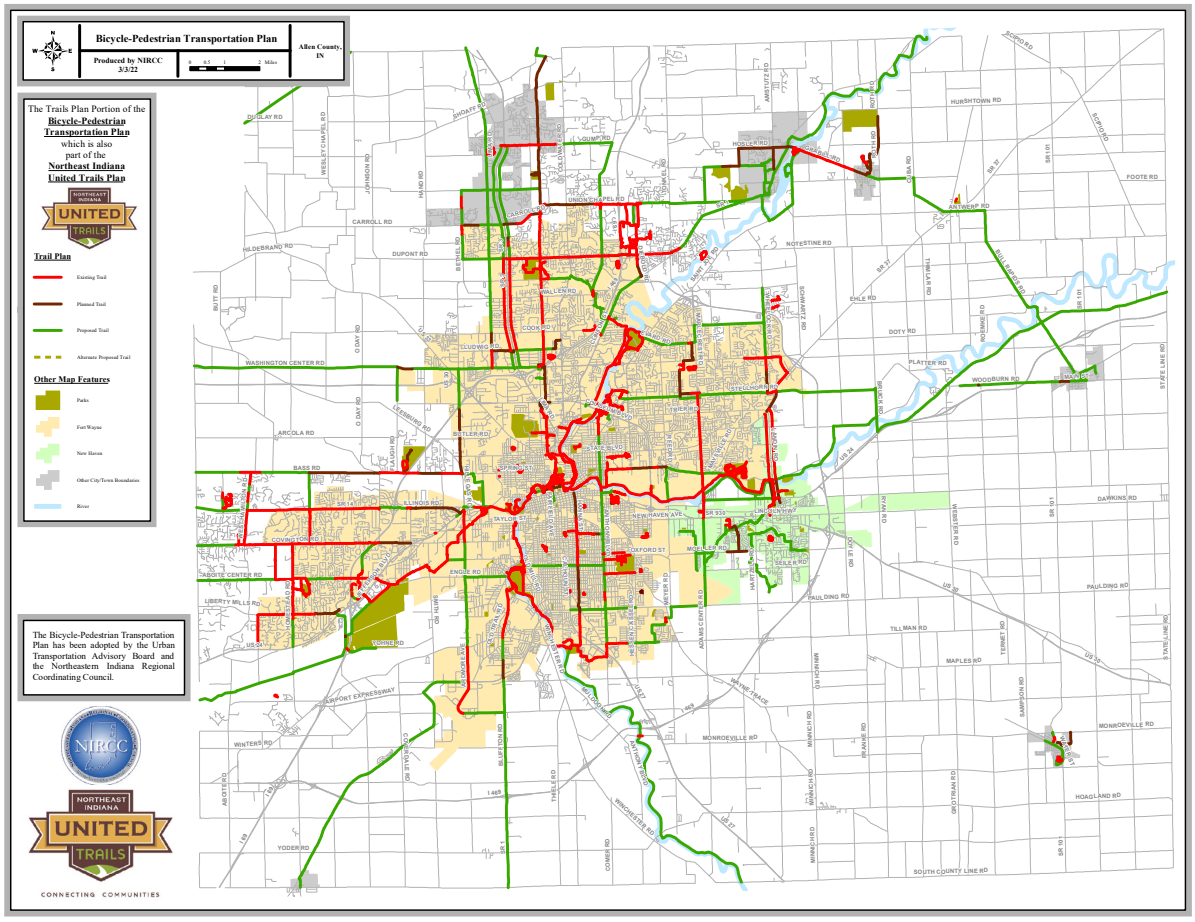
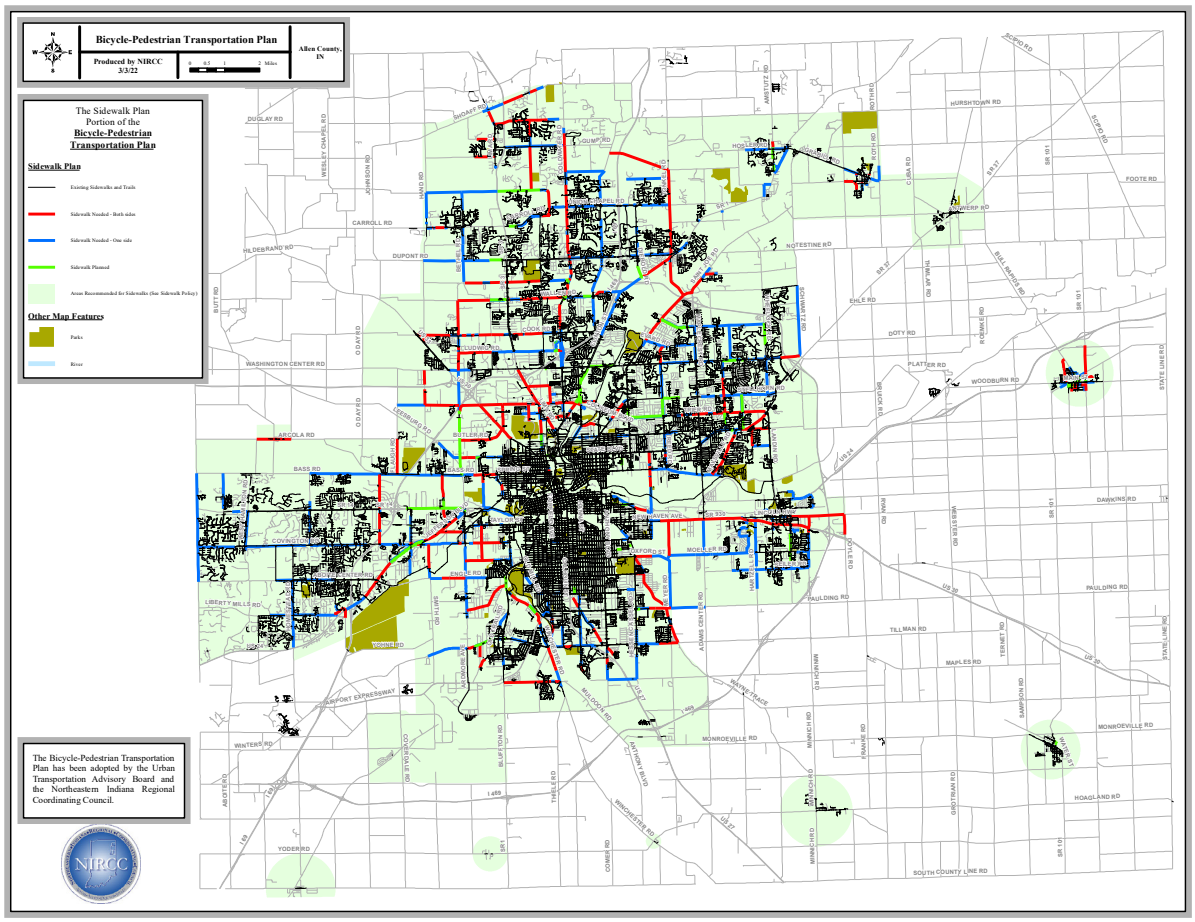


Figure 1-C



Step 1
Defining Objectives

To accomplish the goal of the pedestrian safety action plan there must be steps taken to measure the success of the plan as well as create a method for ensuring some sort of commitment to implement the plan. This can be done by creating a list of objectives that are measurable and provide a clear purpose for what they intend to achieve. It is important to define objectives that consider engineering, education, enforcement, and encouragement type solutions. This section will define a number of objectives that are unique and significant to the Allen County area. As the PSAP is implemented, more objectives may be defined and some may change. Results and impacts for these objectives can be viewed in **Appendix H** as they are implemented and measured for their effectiveness. The following objectives will be used to begin implementing the Allen County PSAP:

- **Objective 1: Reduce the 3 year average number of pedestrian accidents 15% by 2029.**
    - The first publication of the PSAP set the base numbers for a three year crash average at 113 pedestrian accidents per year for the years 2006-2008. It is important to note that an average 16 of these accidents occurred on private property and an average of 97 occurred on, or along public roadways. Many private property crash types appear more random in nature and many of the countermeasures available to decrease pedestrian accidents only affect those that are happening along our public roadway system. To get a true sense of how this objective relates to the pedestrian safety plan, the objective of decreasing pedestrian accidents should be measured as a decrease in those happening along public roadways and not on private property. It is important to still track the total number of pedestrian accidents for this report, but we will highlight the trends as they are associated with public roadway accidents for meeting goals and objectives. The previous PSAP specified a 25% reduction of pedestrian accidents by 2015 (see **Appendix H** for results). Therefore, a 25% decrease in public roadway pedestrian accidents using a 3 year average over the course of those 7 years would lower the base numbers from an average of 97 accidents from 2006-2008 to 73 pedestrian accidents per year during the period of 2013-2015. Setting this trend at 25% was found to be higher than what is attainable, therefore the trend line has been adjusted to a 15% decrease in pedestrian accidents. The last recorded 3 year average was 69 pedestrian accidents (2018-2020), which was actually less than the trend set at reducing pedestrian accidents by 15%. This objective continues this trend of reducing pedestrian accidents by 15% over the next period of 7 years which would set the objective to eventually meet an average of 60 pedestrian accidents by the time period of 2027-2029.

- **Objective 2: Update applicable manuals, guidelines, and standards to ensure safe and accessible pedestrian facilities within the design of facilities in the public right of way.**
    - This objective in the previous PSAP called for the update of the Access Standards Manual for Fort Wayne, New Haven, and Allen County with pedestrian safety recommendations by 2015 (see **Appendix H** for results). The primary objective of this manual is to establish guidelines for the location and design of driveways providing access from public streets and highways to developments on abutting properties. Recent updates to this manual added considerations for pedestrian facilities. This objective now calls for any applicable manuals, guidelines, or standards to consider all users of public right of way, including the need for safe and accessible pedestrian facilities.

- **Objective 3: Upgrade crosswalks throughout CBD's, downtown areas, and other business districts with longitudinal lines or piano key style crosswalk markings. As projects or developments occur in areas identified in Figure 5, longitudinal lines, like piano key style crosswalk markings, should**

be used.

- The purpose of upgrading crosswalks with the piano key style markings is to mitigate crashes at these conflict points by improving the awareness of the crossings to motorist. The current pavement markings are primarily transverse crosswalk lines which provide information for pedestrians as to where they can safely cross a roadway but do not provide enough visibility to create a distinctive awareness for motorists.

- **Objective 4: Upgrade traffic signals throughout CBD's, downtown areas, and other business districts with pedestrian countdown indicators. As projects or developments occur in areas identified in Figure 5, upgrades and pedestrian countdown indicators should be added.**
  - The purpose of upgrading signals with pedestrian countdown indicators is to mitigate crashes at these conflict points by providing improved pedestrian information. The countdown indicators will provide pedestrians the amount of time remaining to safely cross the intersection. This will reduce the number of incidents where pedestrians become trapped in the intersection without adequate time to complete their crossing.

- **Objective 5: Use priority areas listed in "Step 2 – Identifying Locations" to identify 5 intersection projects for each category of countermeasures (simple, moderately complex, and complex) by 2030.**
  - Through survey information and crash data analysis, intersections are shown to create some of the most frequent and dangerous conflict points for pedestrians. Many of the pedestrian related accidents can be reduced with intersection type countermeasures.

- **Objective 6: Identify high priority or high usage transit stops and transit stops that need special consideration for ADA compliant treatments.**
  - Access to public transportation can greatly affect or limit people's quality of life. It is important to address safety issues related to public transportation since it is the only mode of transportation for some individuals or families.

- **Objective 7: Prioritize areas around schools for safety improvements. Appendix G will provide a map of projects and needs that will be continually updated and expanded.**
  - Schools throughout Allen County have a variety of geographical environments or policies that either limit or require students to find alternate transportation such as walking to school. Prioritization for areas surrounding schools is necessary since not all of them are conducive to or even allow students to walk to them. Other schools require students to walk, or fine alternate modes of transportation, if their residence is within a specific distance from a particular school. These requirements vary depending on school location or district as well as the grade level for students. Priority should be given to the areas surrounding schools that do not provide bus transportation and that may have large numbers of students that walk. Priority may also be given to schools open to changing their "no walking" policies as new infrastructure allows safe accommodations for walking trips. The types of problems associated with these areas may also affect the prioritization process.

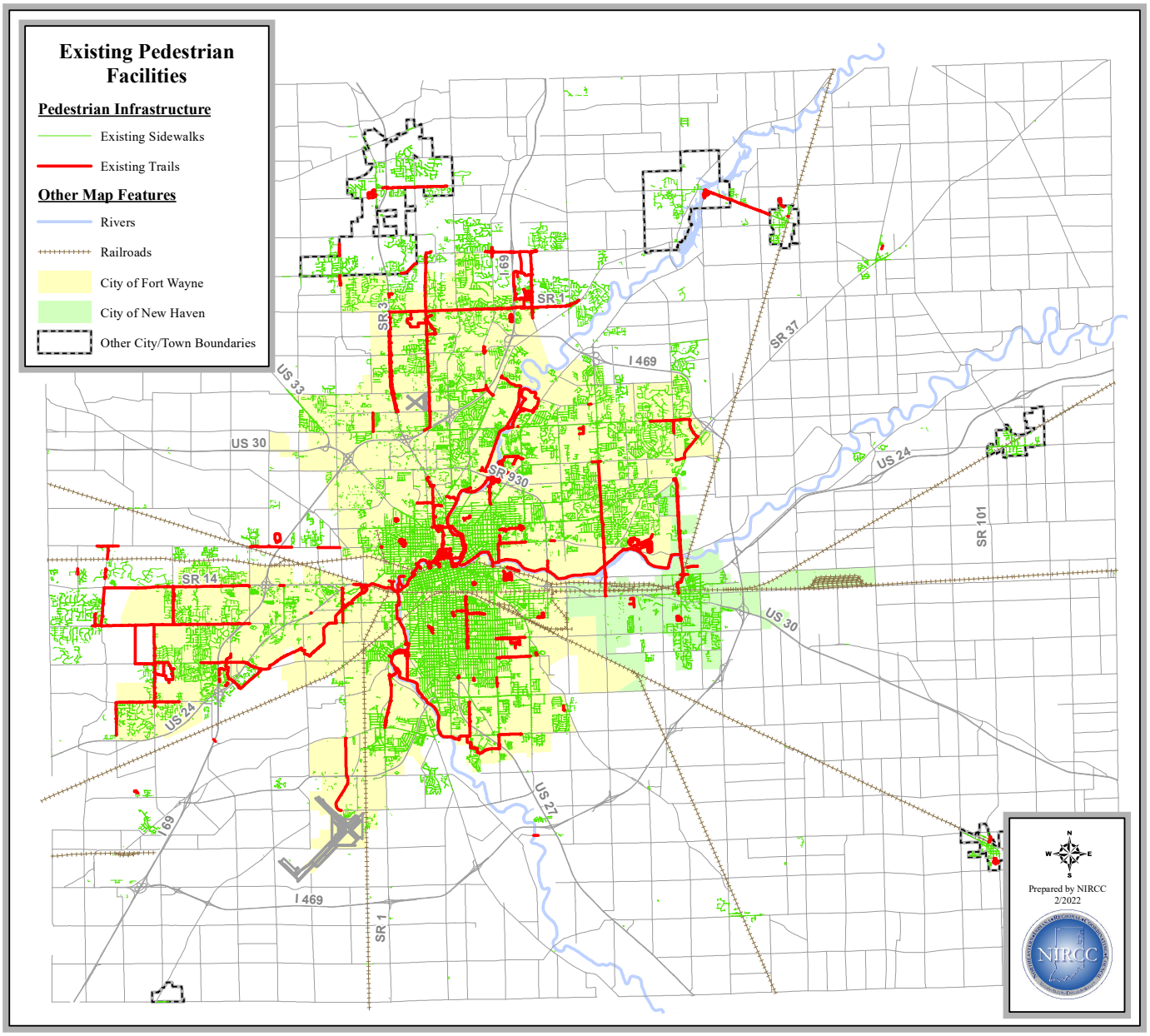
- **Objective 8: Select at least 5 corridors for possible pedestrian safety improvements by 2030.**
  - Through survey information and crash data analysis there seem to be corridors that experience high numbers of pedestrian conflicts or accidents. These corridors reveal a high level of pedestrian usage throughout and while they may exhibit sufficient benefits from spot location type safety treatments a much higher benefit may be achieved from safety improvements made to the entire corridor.

- **Objective 9: Based on analysis using tools from "Step 2 – Identifying Locations", select 5 educational or encouragement type countermeasures for spot specific locations, corridors, or larger areas by 2030.**
    - A number of conflicts between motor vehicles and pedestrians result from the lack of knowledge about the law or behaviors that produce unsafe actions. Also, the lack of pedestrian activity produces a lack of awareness for motorists. This lack of awareness creates behaviors that

Step 2
Identifying Locations

Identifying locations for safety improvements can be accomplished in a variety of ways. The goal of this section is to produce methods and products of data analysis that will identify problem areas for spot locations, corridors, specific areas (i.e. neighborhoods, districts, and sub-areas), and system wide deficiencies. Many organizations and governmental entities already recognize specific areas and goals that pertain to the accessibility and safety of their pedestrian transportation systems. This section will help identify these which will produce tools for

Figure 2



creating a prioritization method for pedestrian safety improvements.

NIRCC produces and maintains a large amount of data that is used to identify these types of locations. Examples of this data include a sidewalk and trail inventory for the entire Allen County area, traffic counts, locations of transit routes and stops, crash data, census data, intersection analysis data, and other various roadway characteristics. Other information utilized for identifying locations include maps that show land use types and patterns, schools, colleges and universities, parks, libraries, major destinations or attractions, etc.

One of the most important types of data for planning pedestrian safety improvements for the PSAP is knowing where pedestrian trips take place and what facilities currently exist. **Figure 2** displays NIRCC's existing sidewalk and trail inventory. Every sidewalk in Allen County has been digitized using aerial photography and a trail database is maintained and updated on a regular basis. Information derived from this map includes locations where gaps exist in the sidewalk network, densities of development, points of conflict where sidewalks and trails cross streets and driveways, and areas where you would expect significant amounts of pedestrian trips since there is already a precedence of existing infrastructure. Taking this type of information and combining it

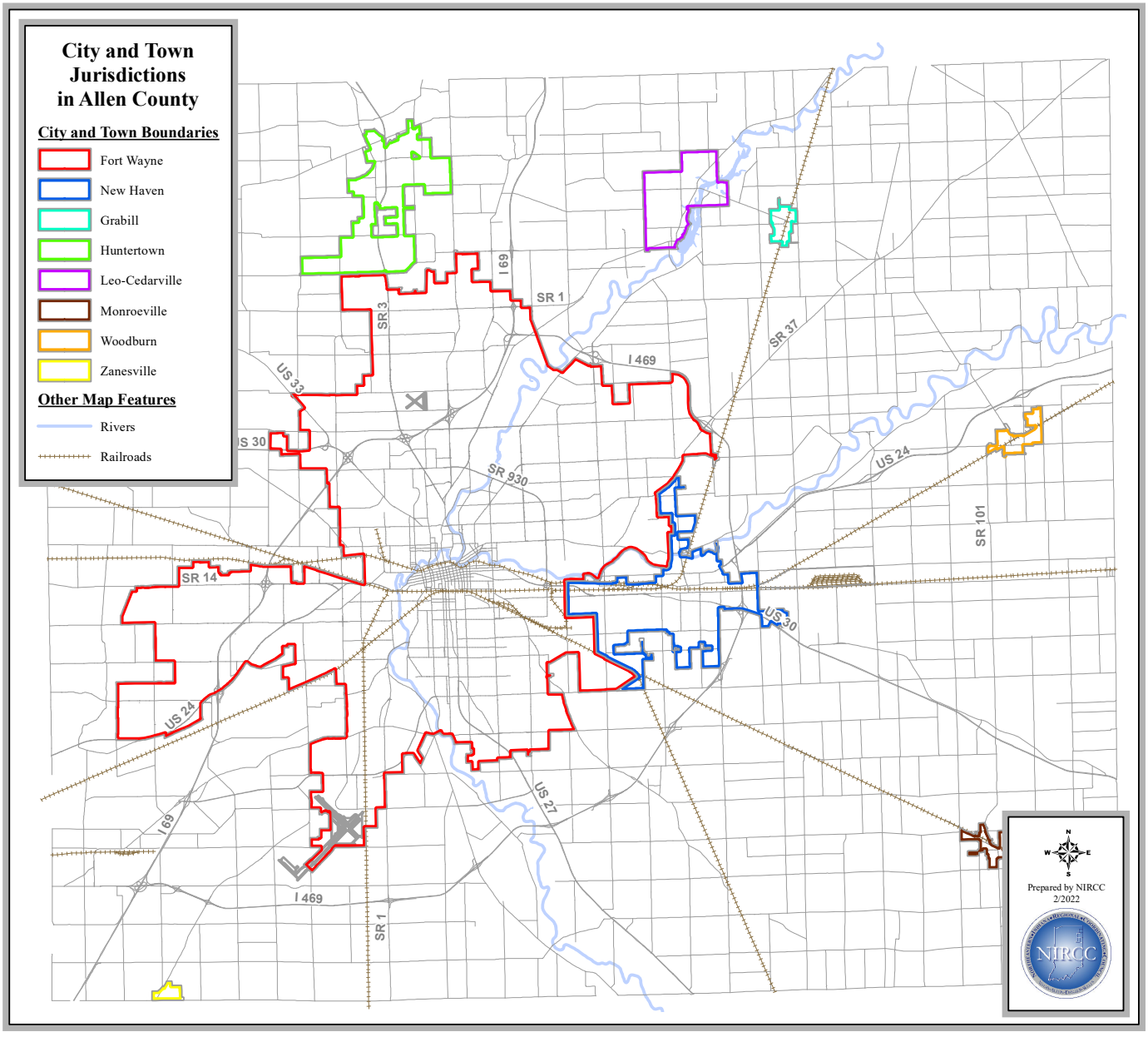


Figure 3

with crash data, points of interest, demographic patterns, etc. helps identify site specific areas, corridors, large areas, or even system wide deficiencies in pedestrian infrastructure.

Throughout Allen County there are a number of developed or developing areas that serve a variety of pedestrian trips. Certain parts of Allen County produce more pedestrian trips than others. In **Figure 3** you can see the

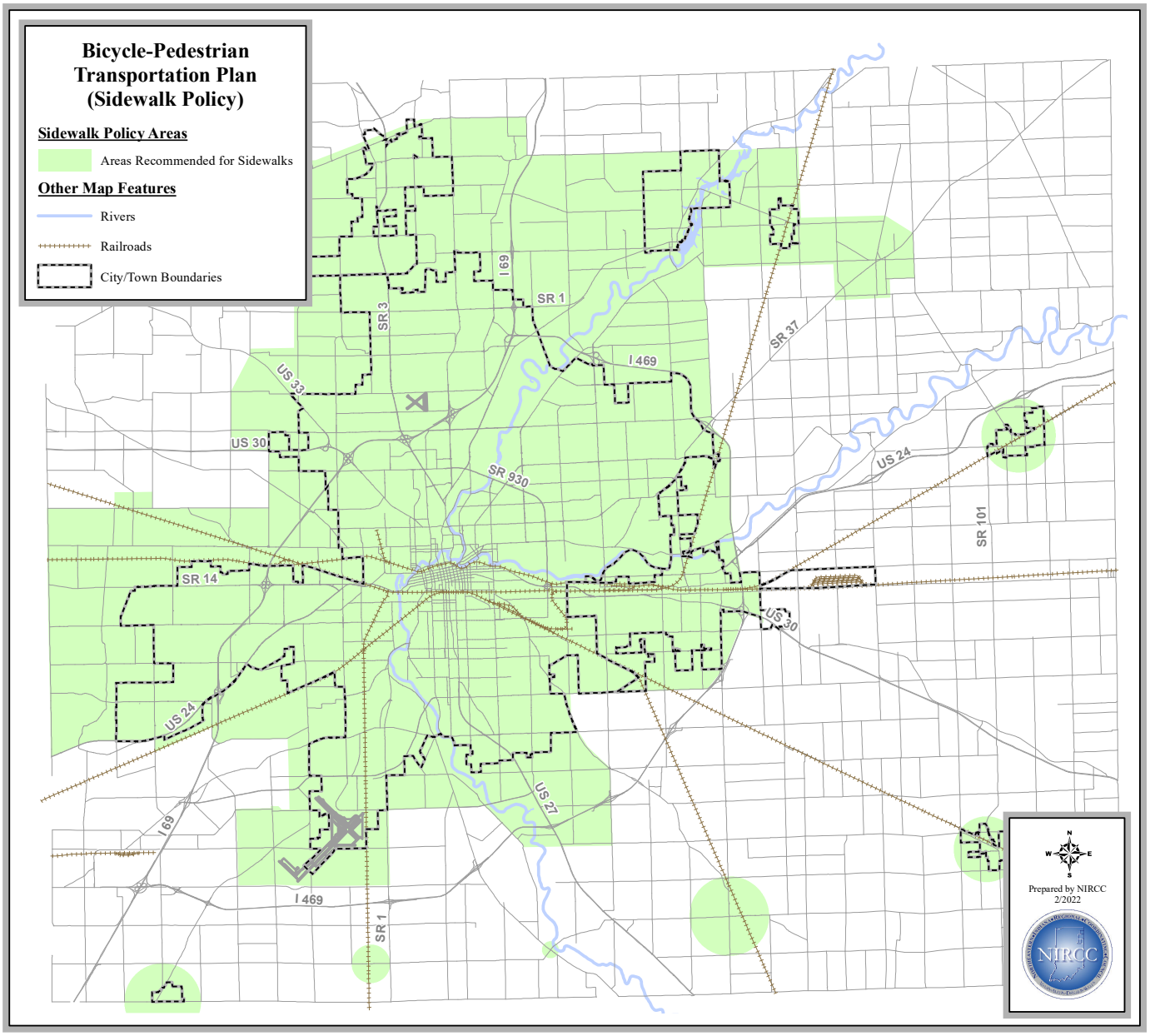


Figure 4

different city or town jurisdictions throughout Allen County. Each city and town represents an area where population density, population counts, and various types of development are concentrated. These jurisdictions have been included in the areas identified in **Figure 4**. **Figure 4** shows areas identified in **Appendix A** which is taken from the sidewalk policy included with NIRCC's Bicycle and Pedestrian Transportation Plan which is also included in the 2040 Transportation Plan. These areas identified are a combination of jurisdictions from all the cities and towns within Allen County, the urban area, and various developing areas throughout the county. These areas are recommended for pedestrian improvements which also creates a need for pedestrian safety to be a priority.

There are also specific areas that are identified as a priority for serving pedestrian trips. **Figure 5** shows

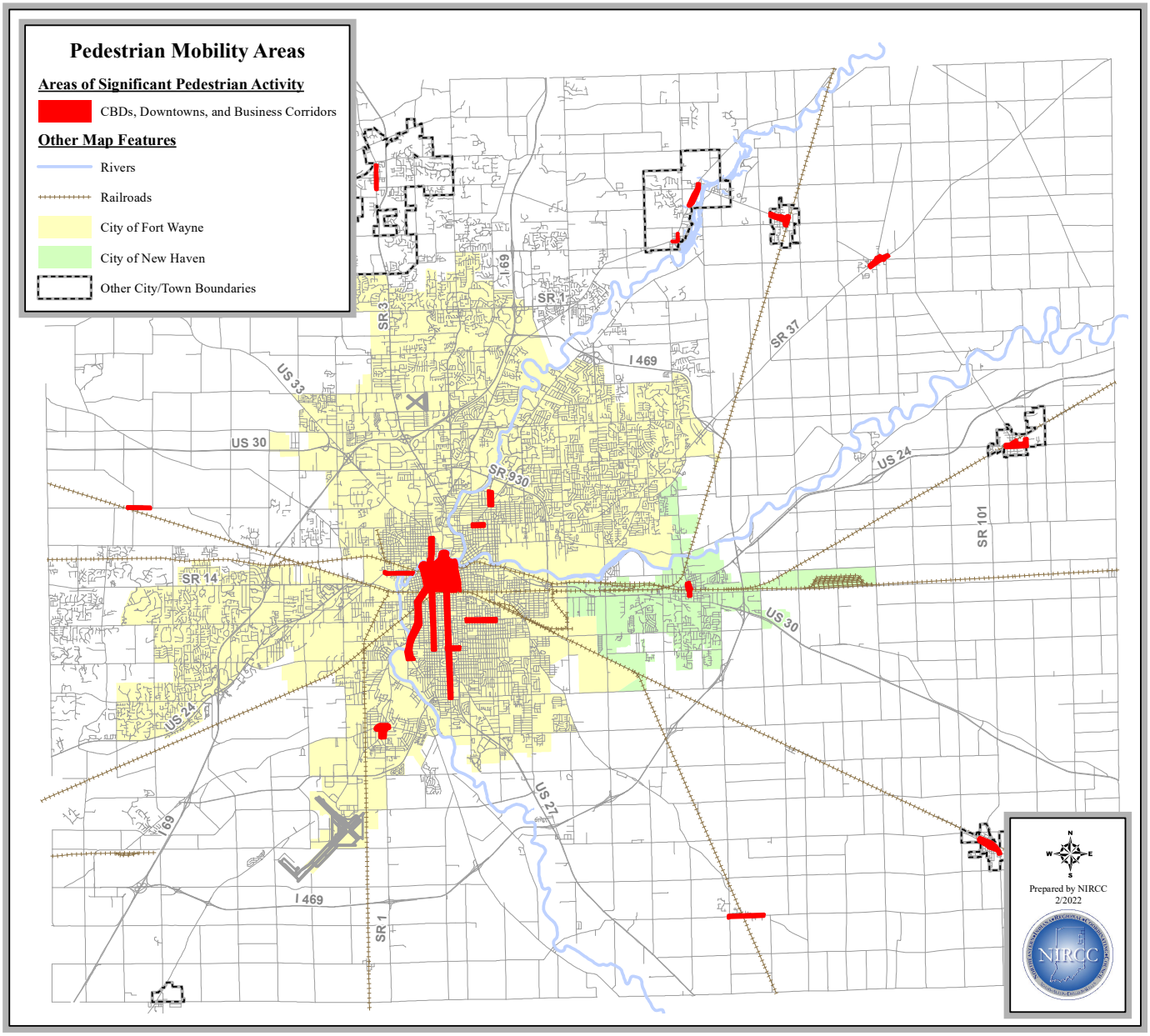


Figure 5

geographic areas that not only depend on, but are heavily influenced by pedestrian safety and mobility. These areas include the Central Business District (CBD) located in downtown Fort Wayne and the CBDs or downtown areas of surrounding communities throughout Allen County. These areas consist of urban type design characteristics with closely situated commercial, retail, and service related development that is surrounded by dense residential development. The identified areas in each community act as major destinations for vehicles and pedestrians. Within each of these destinations, conflicts between motorists and pedestrians are inevitable given the variety of uses provided in these areas. Pedestrian mobility is identified as a key factor for providing and maintaining the diverse development of each.

Figure 6 also displays geographic areas that serve a large number of pedestrian trips. These areas have been identified by Fort Wayne's "Walk Fort Wayne Plan" as pedestrian generating areas. These areas have been identified through the use of survey information (see **Appendix C**), information gathered from public meetings, a geographic analysis of development clusters, and input from the Primary Team who is charged with developing the Walk Fort Wayne Plan. These areas represent significant destinations and attractions for

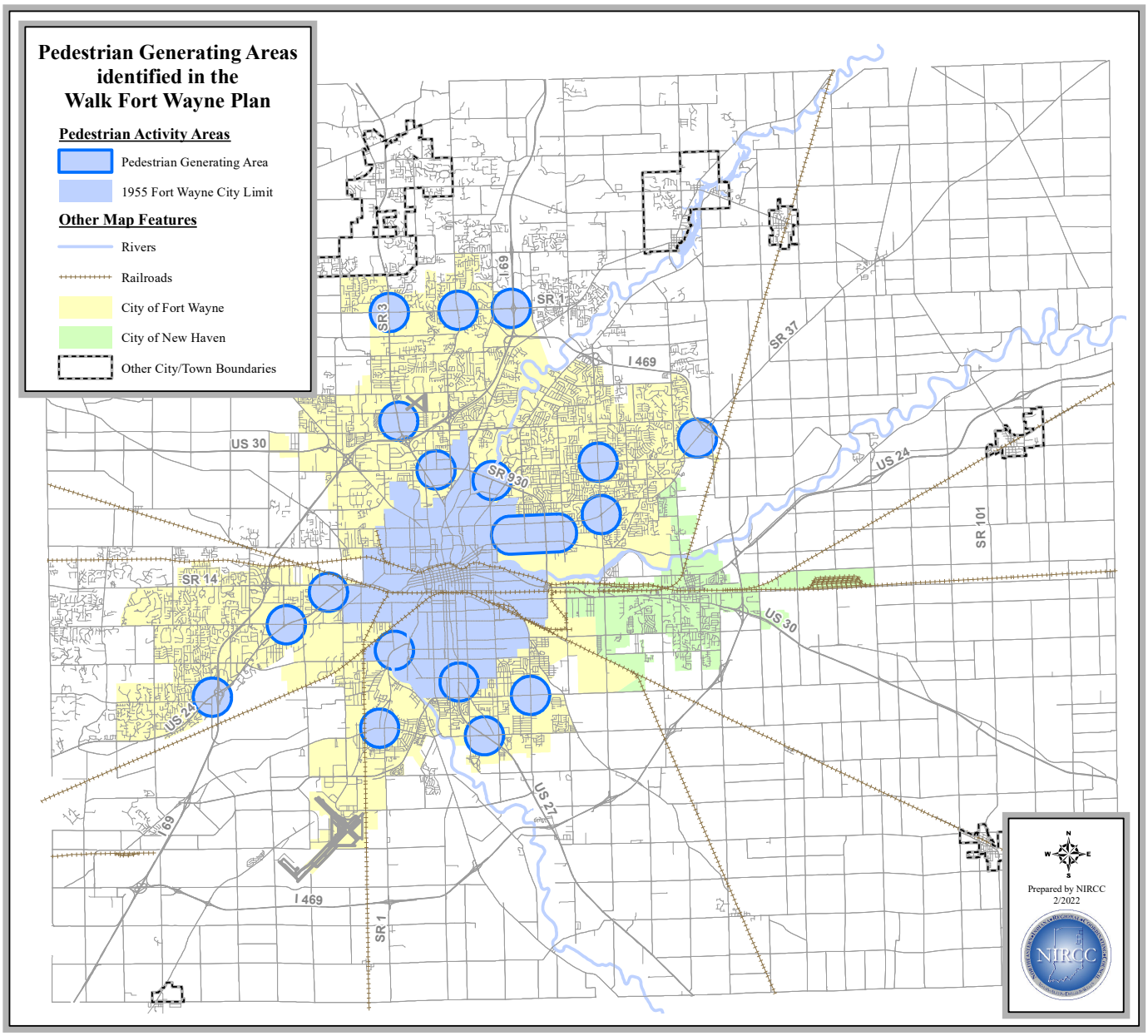


Figure 6

pedestrian interaction. They have received the highest priority for filling in sidewalk gaps. Each area contains a combination of many types of desirable pedestrian facilities. These include but are not limited to schools, colleges, universities, medical facilities, community facilities, shopping centers, retirement communities, transit corridors, residential development, and service related facilities. The City of Fort Wayne will be updating the Walk Fort Wayne Plan in 2022-2023.

Another destination that attracts large numbers of pedestrians are parks and recreational areas. **Figure 7** shows the locations of park facilities throughout Allen County. These areas provide a significant amount of pedestrian related activities on a regular basis. Large numbers of pedestrian trips occur within and around these areas which often create motorist and pedestrian conflict points.

Areas around schools are recognized as high priorities for pedestrian safety improvements as well. **Figure 8** shows areas considered Walk Zones or Proximity Areas throughout Allen County that may need pedestrian safety improvements to create safer walking environments for children and teenagers. Many schools within Fort Wayne, New Haven, and some of the cities and towns throughout Allen County require students to walk to

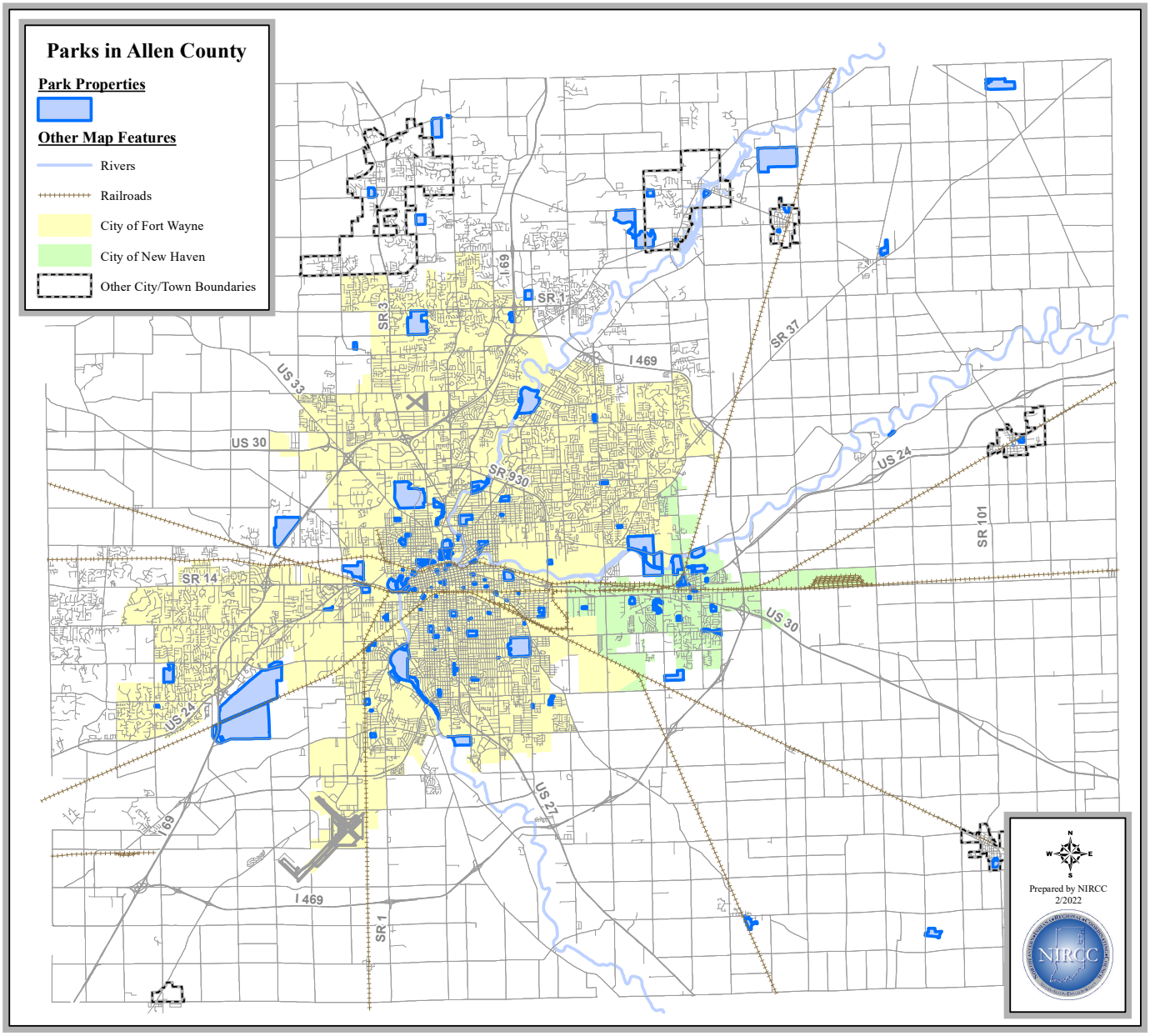


Figure 7

school depending on the proximity of their residence. To identify these walk zones or proximity areas, NIRCC used distance radii required by schools for walking zones, or, half mile radii for schools that do not identify walking zones. For instance, in 2015 Fort Wayne Community Schools (FWCS) instituted walking zones based on school classification. Elementary school students living within 1 mile of their school, middle school students living within 1.5 miles of their school, and high school students living within 2 miles of their school no longer received bus transportation. The areas identified in Figure 8 reflect these different zones located around schools.

Crash data from 2017-2020 reveals that almost 89% of all pedestrian related accidents occurred within these half mile radius areas. This does not necessarily imply that school locations and students themselves are the source of all these pedestrian accidents. In fact, by taking a closer look at some of these areas, the age range may seem random. What this data does reveal though is that these may be areas that system wide deficiencies or area specific needs for pedestrian safety improvements may be warranted. The proximity to schools for these areas may provide reasons for them to have a higher priority then others if there is a direct impact to the safety of students who must walk to school.

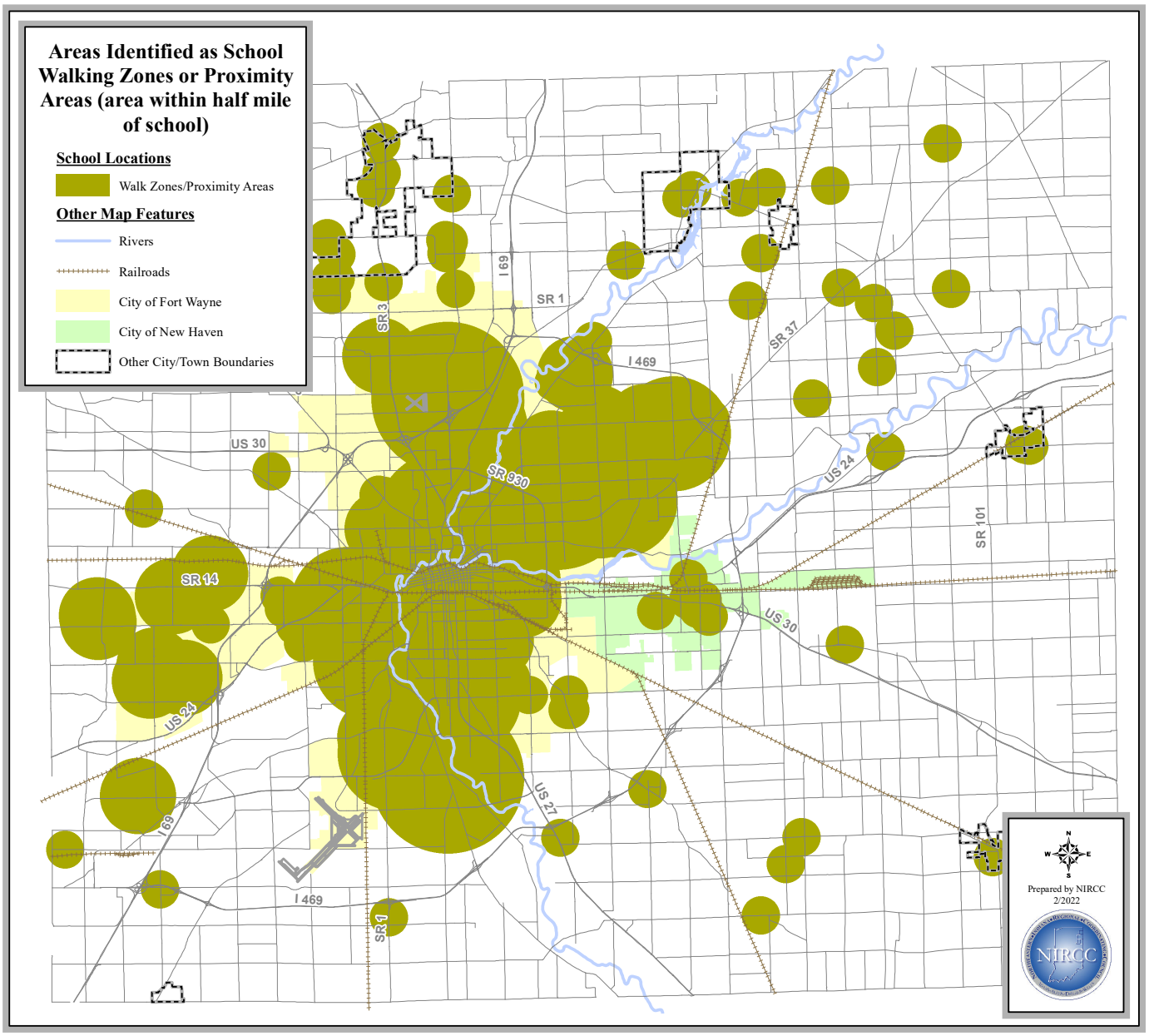


Figure 8

Specific safety needs have already been identified through discussions with area schools and school districts. The City of Fort Wayne's Walk Fort Wayne team and the Fort Wayne Greenways Manager met with schools and school districts to gather input on what kinds of safety improvements or pedestrian facilities are needed for their areas. These needs are identified in the Walk Fort Wayne Plan under the "Safe Routes to School" section and have been included in **Appendix G** of this report. **Appendix G** provides a map that will be updated as more needs are identified and continued stakeholder involvement is accomplished. The map also provides a reference for projects that have been completed or are in progress.

Many of the zones identified in **Figure 8** were the result of another Safe Routes to School effort involving Fort Wayne Community Schools (FWCS). Due to budget shortages, NIRCC was solicited by FWCS and Fort Wayne to participate in potential improvements to address the number of students that would no longer receive bus transportation beginning in the 2015-2016 school year. Details about the analysis and the results produced by NIRCC are included in **Appendix H**, Objective 7. A map titled "Proposed FWCS Sidewalk Needs for Elementary and Middle Schools"showing sidewalks and trails that have been completed as a result of the study are shown in **Appendix G**.

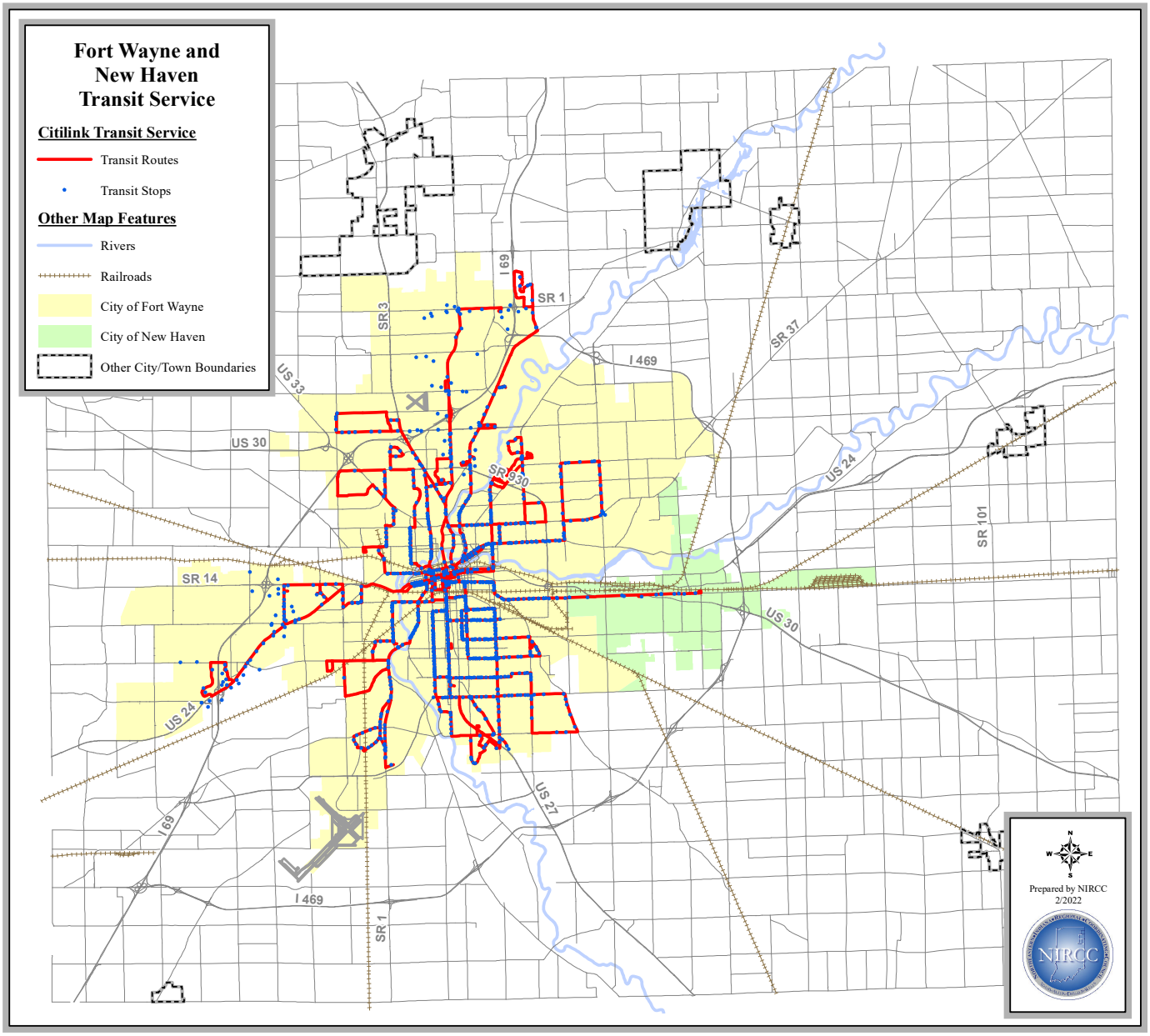


Figure 9

Transit service areas are another high priority concern for pedestrian safety. Almost 53% of all pedestrian accidents occurred within 100 ft of a transit route or transit stop (**see Figure 9**) throughout Fort Wayne and New Haven for the 3 year period of 2017-2020. This does not mean that all these pedestrian accidents are related to transit service locations, but it does provide evidence that pedestrian safe facilities may be deficient around transit routes and stops. Since accessibility to transit service is an important component to pedestrian mobility and the quality of life for many people, the presence of pedestrian safe facilities in these areas are of high concern.

There are a number of points or areas that stand out as pedestrian conflict points. **Figure 10** shows a density map which utilizes NIRCC's sidewalk inventory database. This map helps visualize areas that have a high concentration of points where sidewalks or trails directly cross or intersect roadways or driveway entrances to major developments. Once these areas are combined with crash data or pedestrian activity areas, NIRCC will be able to identify potential improvements to enhance pedestrian mobility. Several specific intersection or crossing locations have already been identified. **Figure 11** provides a view of trail crossing locations that

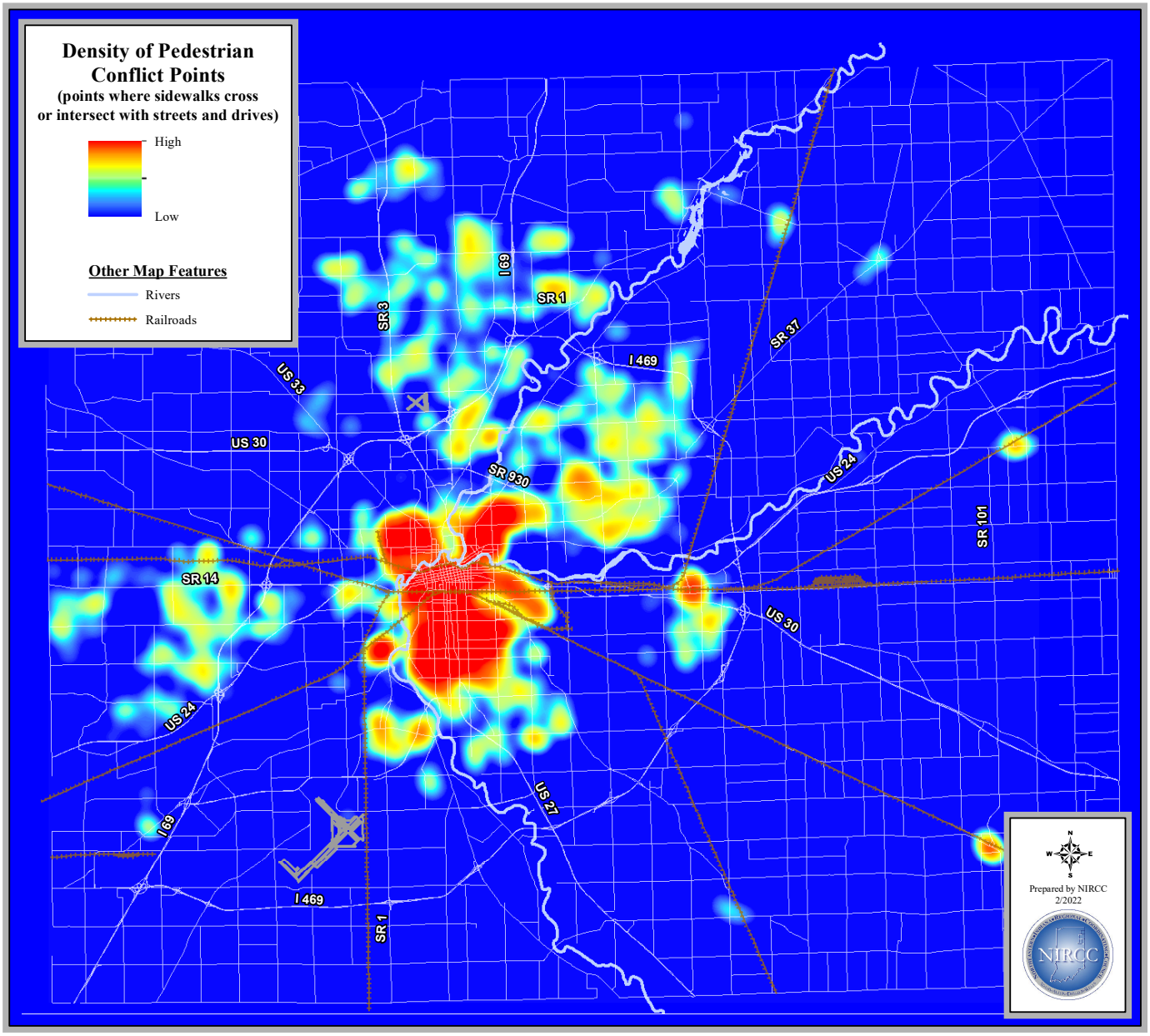


Figure 10

may need to be addressed with safety improvements. This map also shows trails that are planned in the near future. These planned trail corridors may be identified as needing enhanced pedestrian safety devices or facilities as well. The kinds of improvements for these types of facilities may include access management strategies, enhanced crosswalk treatments, pedestrian signals or countdown indicators, or even grade separated pedestrian crossings. In **Appendix G** there is a map displaying which of these crossings are painted as High Visibility Crosswalk (HVC) types. Most of these crossings have been upgraded to HVCs over the past 12 years.

Figure 12 shows a map of all the signalized intersections throughout Allen County. Depending on areas identified as priority areas in this plan, many of these signal locations may need to be upgraded with enhanced crosswalk treatments or pedestrian countdown indicators. Also, if there are areas or corridors where traffic signals are spaced further apart than what is reasonable for pedestrians to cross at signalized intersections, accommodations may need to be made to create a safer environment for pedestrians even if these accommodations may not achieve ideal conditions.

A significant factor that provides guidance for choosing potential safety improvement areas, locations, and

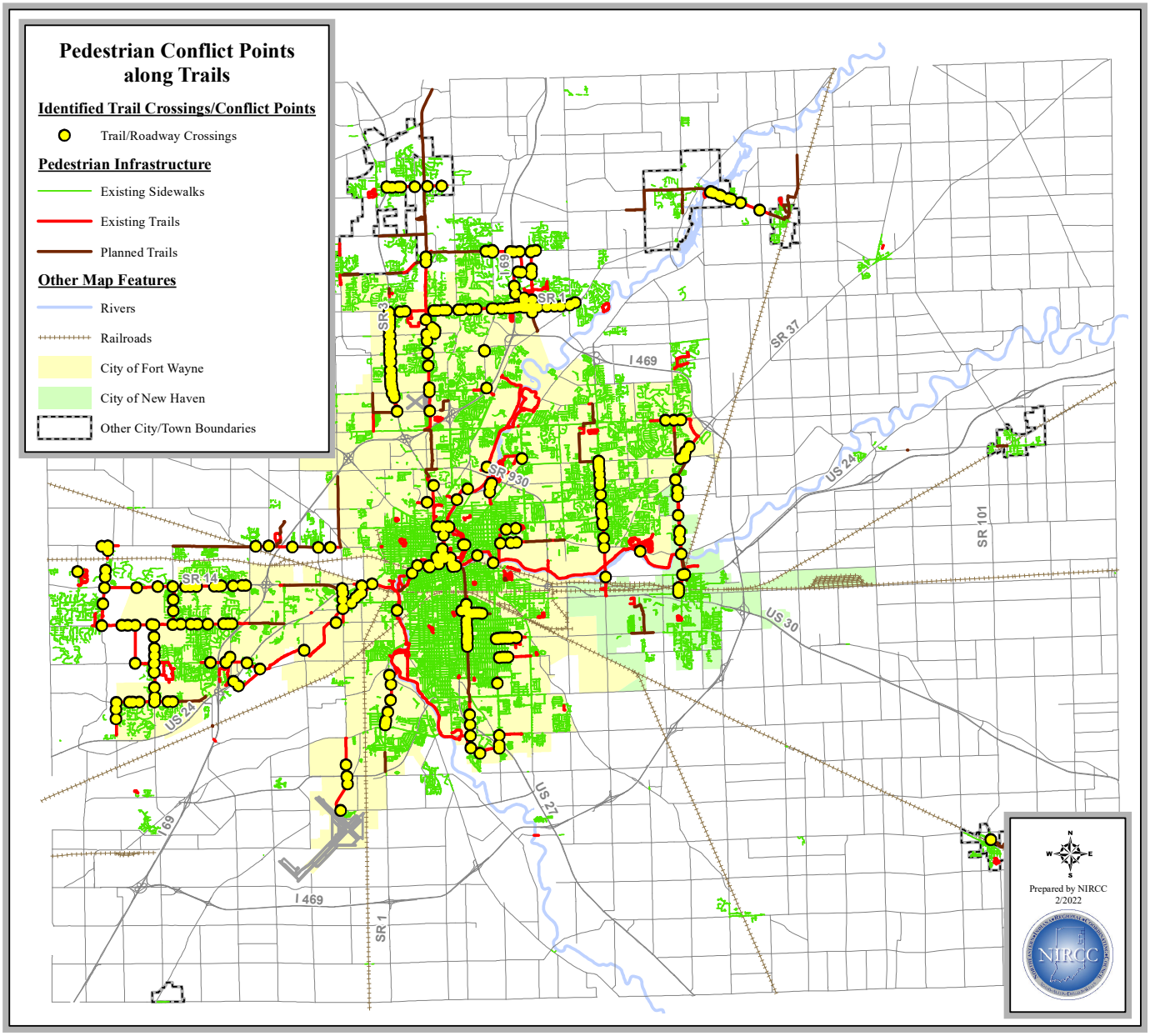


Figure 11

even project types is crash data. NIRCC maintains a crash database that is updated yearly with every reported accident that occurs in Allen County. From this database NIRCC has mapped pedestrian accidents throughout the entire county. **Figure 13** provides a visual of the areas with the highest density of pedestrian accidents over a period of 2017 through 2020. This data is used in conjunction with many of the points and areas listed throughout this section to help determine where safety improvements need to be made.

Crash data is also used to select specific locations where there are high frequencies of pedestrian related accidents. More detailed density maps show intersections and midblock locations that have high numbers of pedestrian accidents. Corridors can be selected for analysis based on crash data as well. One example of a way that NIRCC determines if corridors are experiencing higher than expected pedestrian related accidents is shown in **Figure 14**. This map takes road segments of different lengths and divides the segment length by the total number of pedestrian accidents along that segment. This formula gives a sense of which corridors are experiencing higher densities of pedestrian accidents regardless of its length. Corridors can also be selected based on adding together the number of pedestrian accidents that occur on a roadway with the same name. **Appendix E** shows streets with at least 2 pedestrian accidents that have occurred throughout its entire length

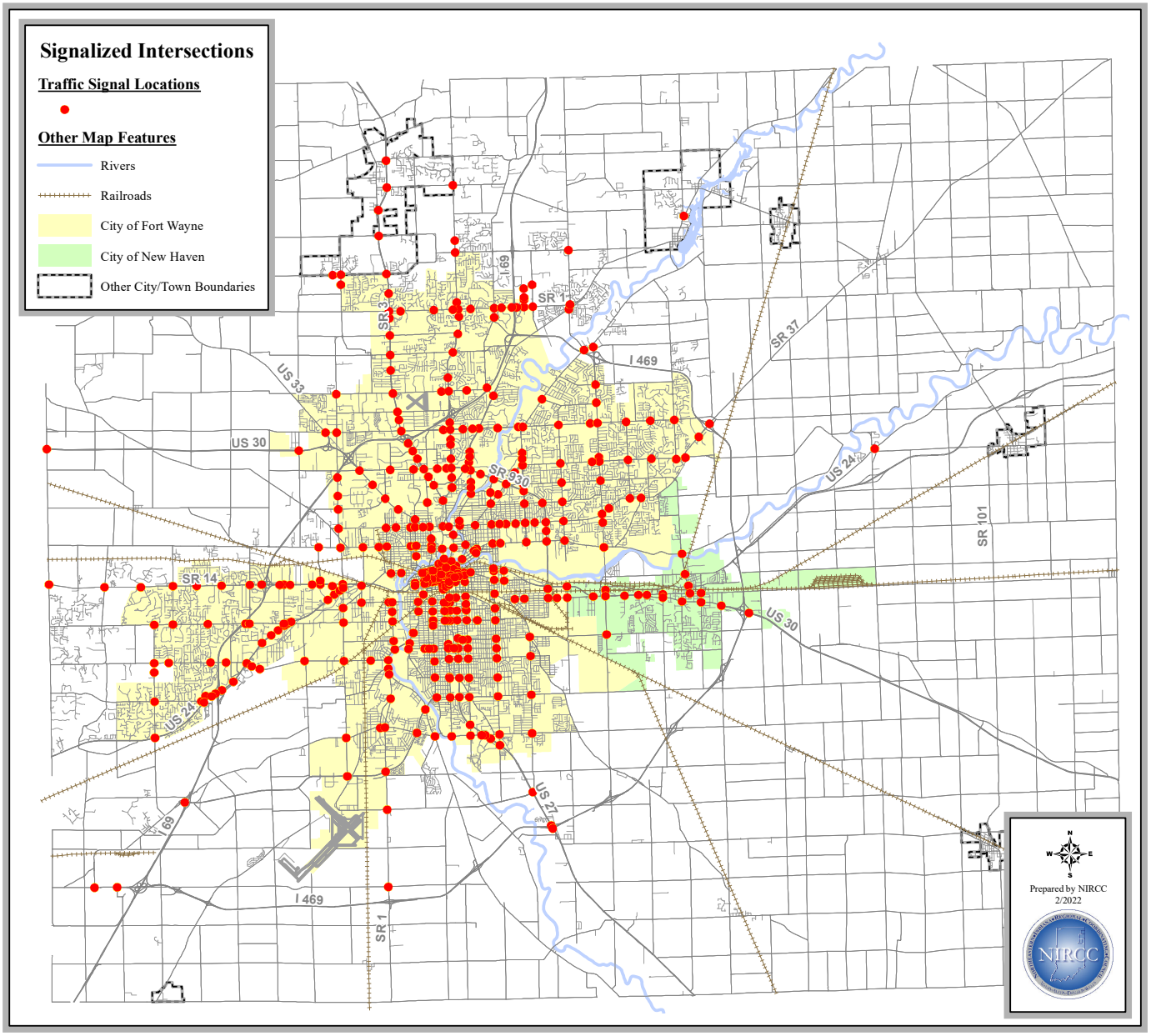


Figure 12

for the years 2017-2020 and at least 6 pedestrian accidents from 2009-2020.

Other types of areas that should be considered when planning where pedestrian improvements should be implemented can be determined based on demographic data. Locations of elderly populations, low income populations, and areas with lower than average vehicle rates per household are a few examples of areas that may depend on pedestrian safety and mobility because of the inability to use automobiles for transportation purposes. **Figure 15** takes these three types of demographics and combines them so that the areas that have the highest density of all three demographic types are shown. **Figure 16** takes this a step further and factors in the pedestrian crash density from **Figure 13** to show areas that have these three types of demographics in common and have the highest frequencies of pedestrian related accidents.

While crash data is a valuable tool for determining locations for these safety improvements, it is important to realize the limitations it possesses as well. A common variable that reduces the reliability of pedestrian related crash data is the fact that many accidents of this kind go unreported. Therefore, sometimes even a single accident or areas with low concentrations of pedestrian related accidents may be just as important to analyze

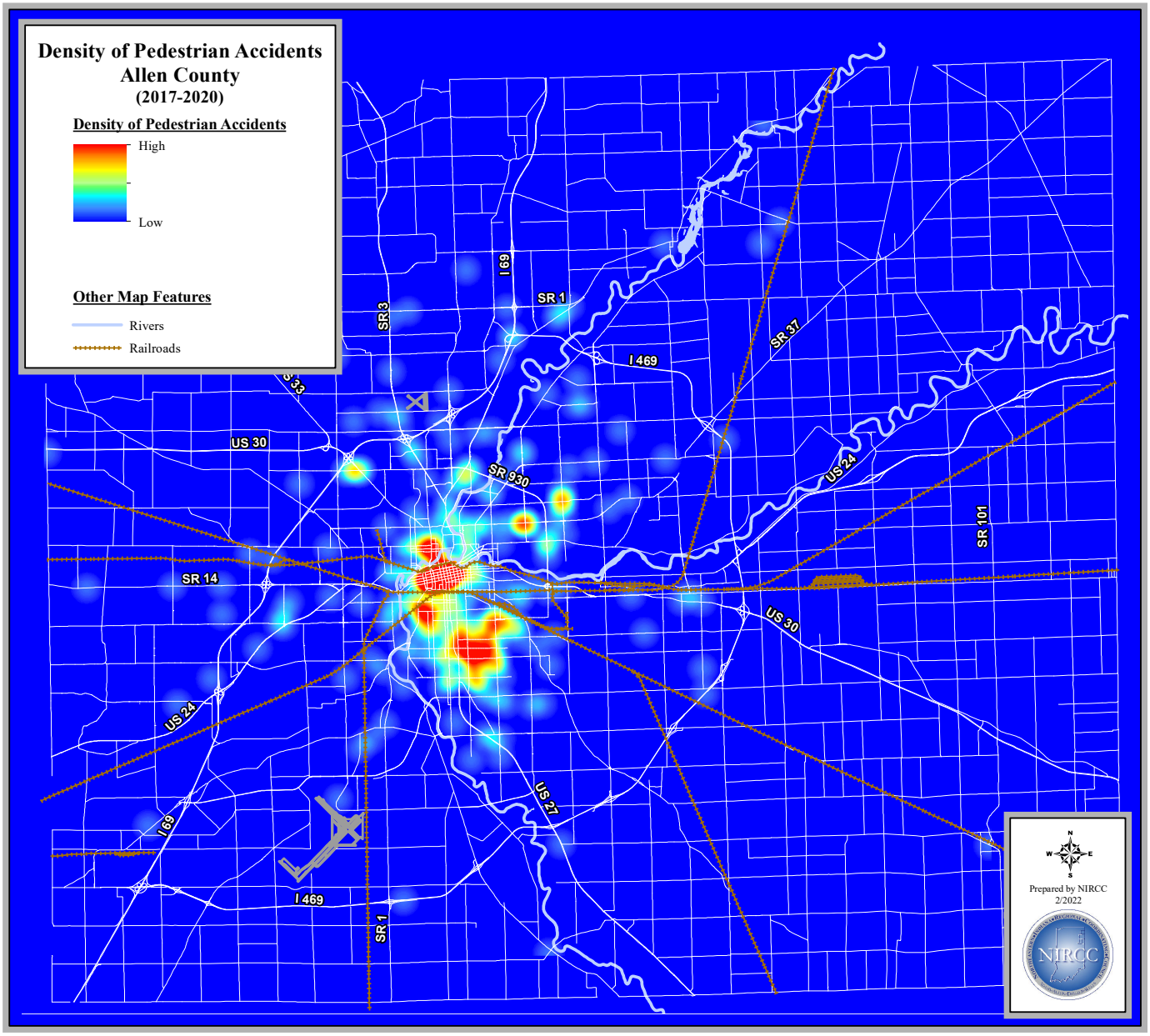


Figure 13

as areas with high frequencies of pedestrian accidents. There may also be locations that experience very few pedestrian accidents, have conditions that are considered unsafe, yet facilitate a very high rate of pedestrian trips. Sometimes these areas go undetected because people are either familiar with the area and expect unsafe conditions or motorists are accustomed to encountering pedestrian traffic. As a result, pedestrian and motorist behavior in these environments may be such that both proceed in a cautious manner to avoid conflict. With a lack of pedestrian related accidents these areas may cause a false perception of a pedestrian friendly environment.

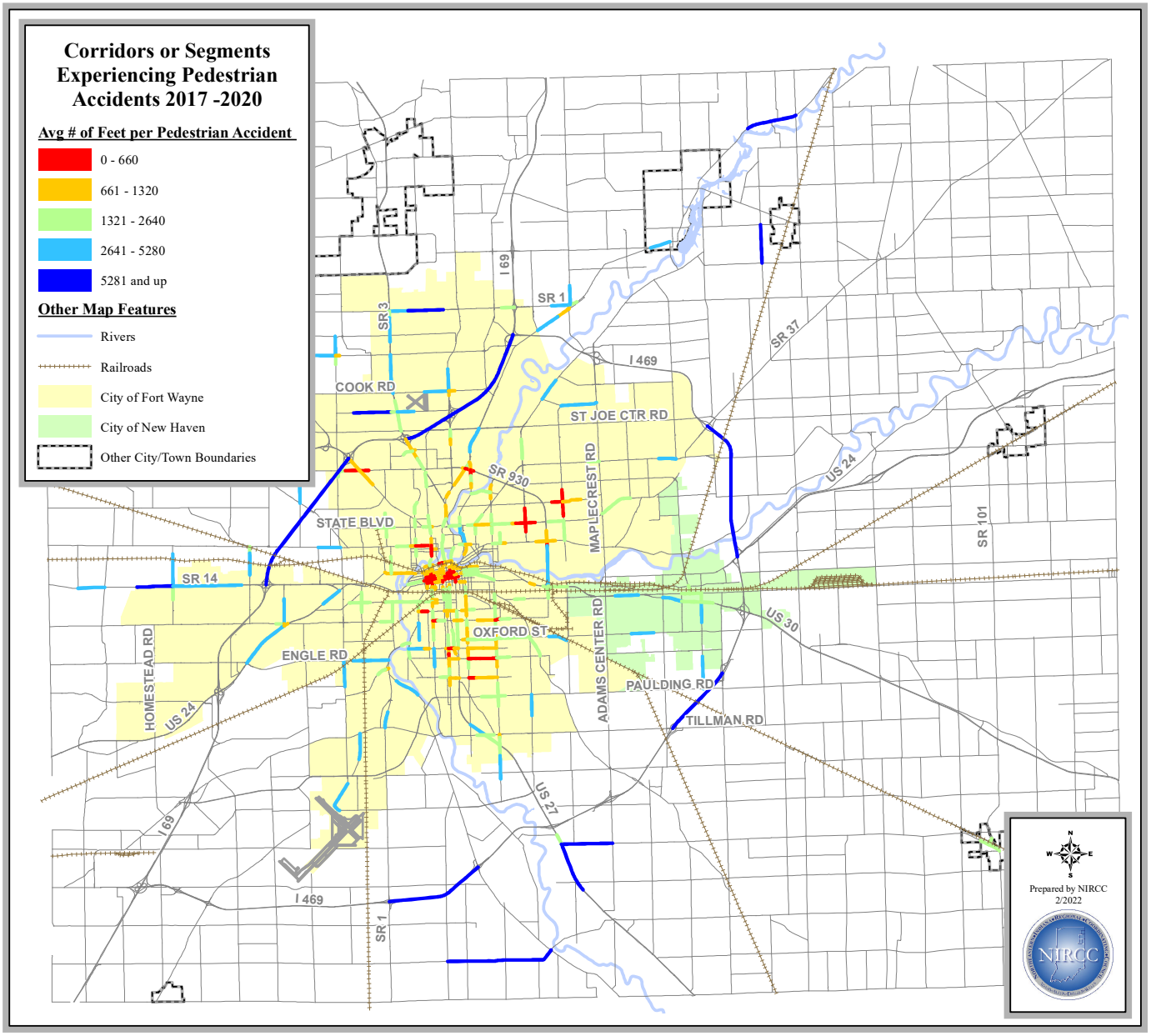

Corridors or Segments Experiencing Pedestrian Accidents 2017 -2020
Avg # of Feet per Pedestrian Accident
0 - 660
661 - 1320
1321 - 2640
2641 - 5280
5281 and up
Other Map Features
Rivers
Railroads
City of Fort Wayne
City of New Haven
Other City/Town Boundaries
I 69
SR 1
SR 3
I 469
SR 37
COOK RD
ST JOE CTR RD
SR 930
MAPLECREST RD
US 24
SR 101
STATE BLVD
SR 14
OXFORD ST
US 30
ADAMS CENTER RD
HOMESTEAD RD
ENGLE RD
PAULDING RD
TILLMAN RD
US 27
Prepared by NIRCC
2/2022
NIRCC

Figure 14

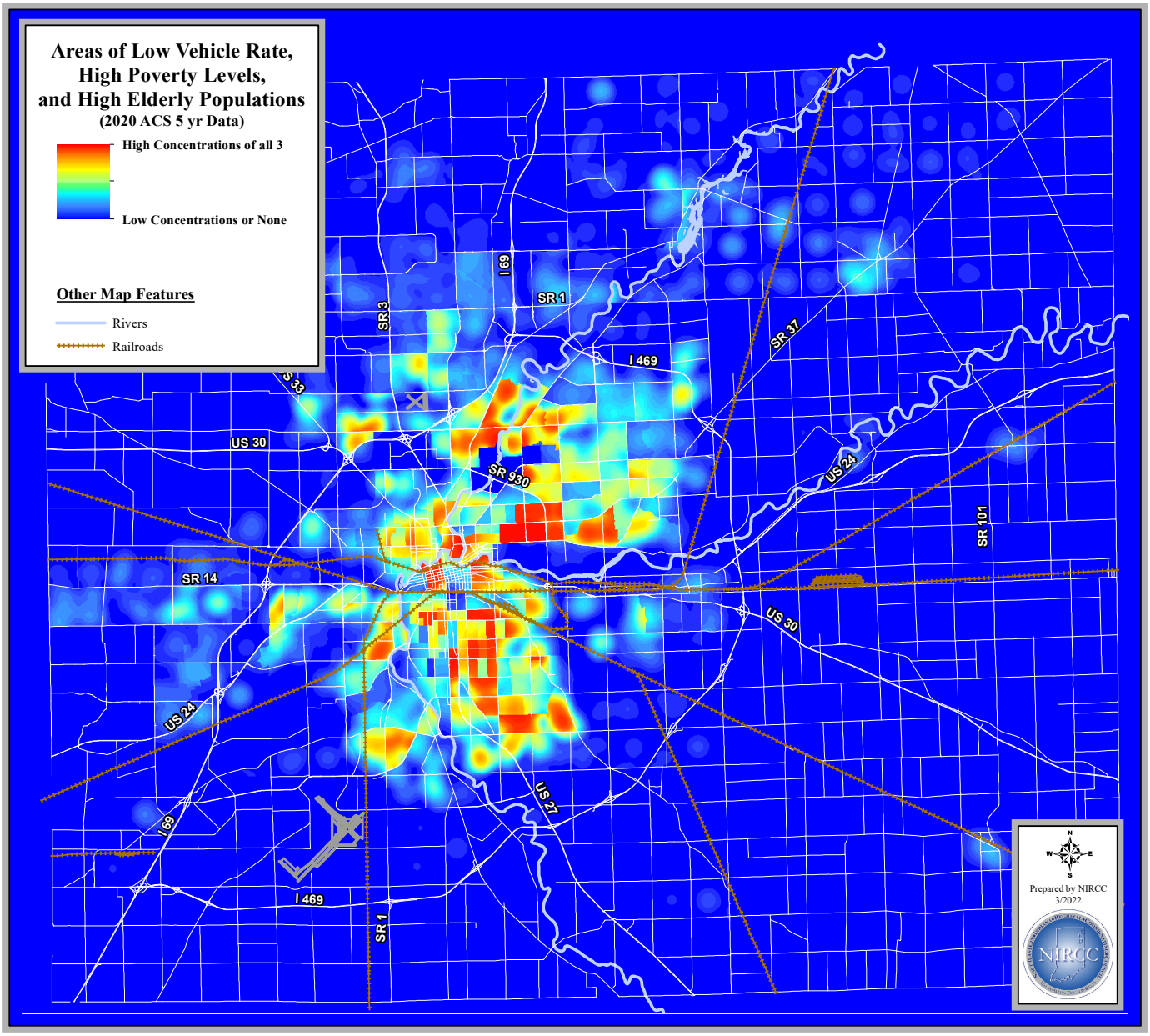

Areas of Low Vehicle Rate, High Poverty Levels, and High Elderly Populations
(2020 ACS 5 yr Data)
High Concentrations of all 3
Low Concentrations or None
Other Map Features
Rivers
Railroads
I 69
SR 1
SR 3
I 469
SR 37
US 30
SR 930
US 24
SR 101
SR 14
US 30
US 24
I 69
US 27
I 469
SR 1
Prepared by NIRCC
3/2022
NIRCC

Figure 15

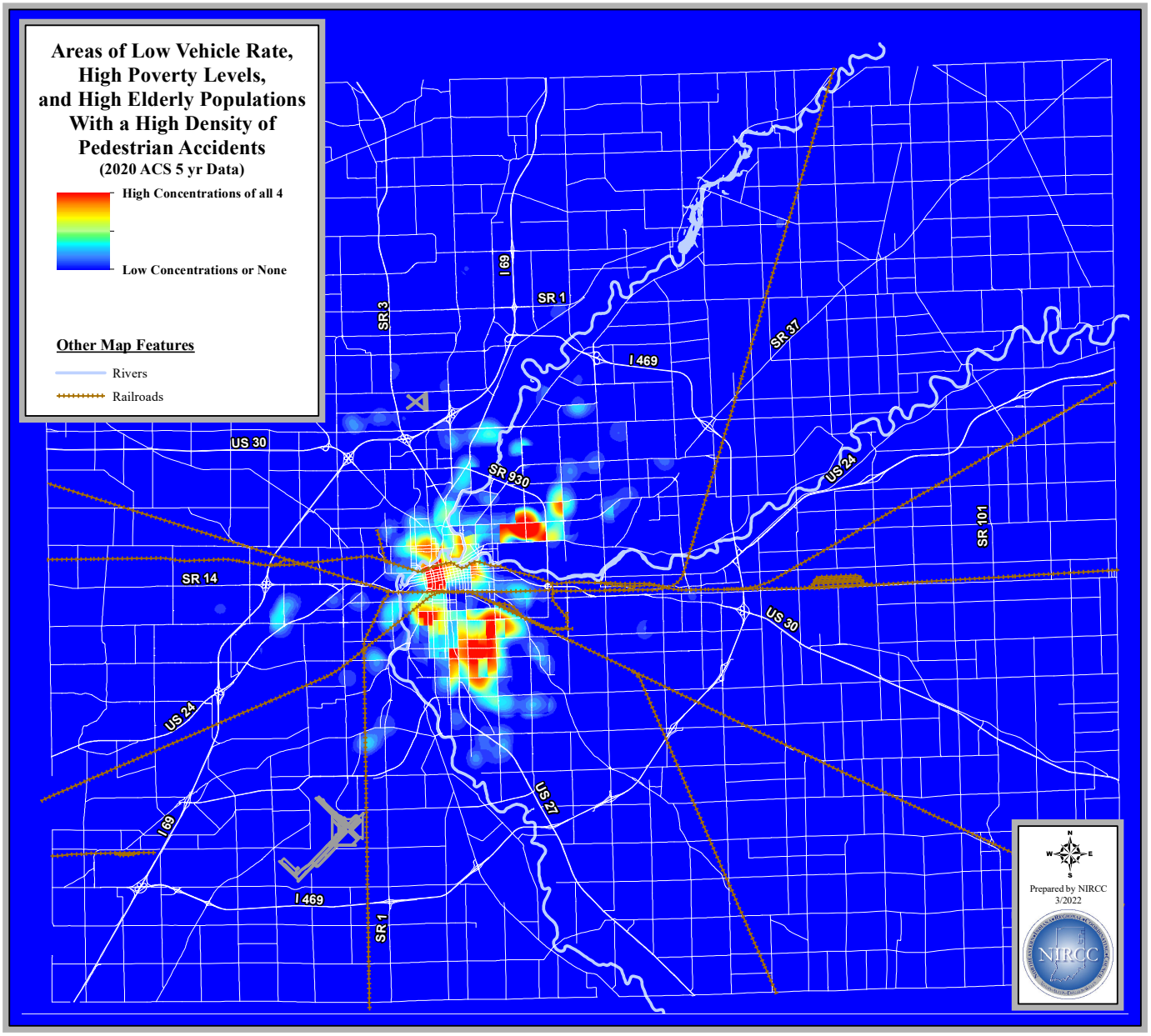

Areas of Low Vehicle Rate, High Poverty Levels, and High Elderly Populations With a High Density of Pedestrian Accidents
(2020 ACS 5 yr Data)
High Concentrations of all 4
Low Concentrations or None
Other Map Features
Rivers
Railroads
US 30
SR 930
SR 14
US 24
I 69
I 469
SR 1
SR 3
SR 37
US 27
SR 101
Prepared by NIRCC
3/2022
NIRCC

Figure 16

Step 3
Selecting Countermeasures

Selecting countermeasures for unsafe pedestrian conditions include a wide variety of project types and actions. A successful PSAP not only addresses infrastructure improvements, but includes a broad range of engineering, educational, enforcement, and encouragement type solutions. When selecting the appropriate countermeasures it is important to consider a variety of details about crash data, motorist and pedestrian behaviors, demographic patterns, transit service, roadway characteristics, and land use types. This section will identify several countermeasures that can be implemented for spot locations, corridors, specific areas (i.e. neighborhoods, districts, and sub-areas), and system wide improvements in the Allen County area.

In order to select the appropriate countermeasures to effectively create a safer pedestrian environment, it is necessary to understand the different types of solutions that accompany the Four Es (Engineering, Educational, Enforcement, and Encouragement) associated with pedestrian transportation improvements. There are numerous solutions, or countermeasures, that can accompany each of the Four Es. It is important to consider the variables that may cause a pedestrian safety problem before selecting a solution.

Engineering solutions are based on physical changes made to transportation infrastructure and involve some level of design, construction, and/or installation. Numerous variables impact the types of engineering solutions relevant to a safety problem. Once a problem has been identified these variables are used to implement a suitable solution. Data used to find this solution includes the following:

- Crash data (crash types, time of day, age, primary factor, etc.)
- Roadway characteristics (speed, traffic volumes, levels of service, traffic control types, sidewalk inventories, crosswalk locations, illumination, shoulder type, road width, etc.)
- Available right of way
- Locations of pedestrian generators
- Pedestrian counts
- Adjacent land use types
- Presence of specialized uses like transit.

Educational solutions involve educating pedestrians and motorists in ways that promote change in their behaviors or awareness of their actions. It is important to realize the types of problems associated with a lack of education and who the appropriate audience is for educational type solutions. The Federal Highway Administration's report titled "How to Develop a Pedestrian Safety Action Plan" gives several examples of pedestrian related problems that can benefit from educational solutions. They include the following:

- Pedestrians at an intersection don't appear to understand the newly-installed pedestrian signals and/or don't choose to activate them. The novelty of the signal requires some additional information on its meaning and use.
- Pedestrians do not think they have enough time to cross at a traffic signal.
- Drivers don't yield to pedestrians in crosswalks.
- Parents don't understand the need to supervise children under the age of 10 when they are walking.
- Children ages 10 to 18 don't know where or how to safely cross a street to get to school.
- Motorists are speeding in neighborhoods.
- Commuters in the downtown area aren't taking advantage of non-motorized modes of travel.
- Pedestrian crashes are occurring in an area with a concentration of bars due to pedestrian drinking and walking.
- Designers and engineers aren't using pedestrian-friendly design practices.

Enforcement solutions include ways that law enforcement can change or regulate pedestrian and motorist actions that create unsafe environments. It is important to understand behaviors that create these unsafe environments before determining the best enforcement solutions or programs. Examples of unsafe behaviors that drivers and pedestrians exhibit according to the Federal Highway Administration's report titled "How to Develop a Pedestrian Safety Action Plan" include the following:

Driver Behaviors

- Speeding, especially through residential streets and school zones. (Speed is directly related to crash severity and is also a likely factor in crash causation.)
- Failing to yield to pedestrians, especially in crosswalks. (The law requires drivers to yield or stop for pedestrians in crosswalks — it's a law that is often ignored.)
- Running red lights or STOP signs.
- Passing cars stopped for pedestrians crossing the street.
- Passing stopped school buses.
- Parking or stopping in crosswalks.
- Failing to yield to pedestrians when making right or left turns.
- Failing to yield to pedestrians on sidewalks when entering or leaving driveways or alleys.
- Driving while distracted.

Pedestrian Behaviors

- Crossing a street at an undesirable location.
- Not looking left, right and left again before crossing the street.
- Not continuing to look for traffic while crossing.
- Darting out between parked cars and trucks.
- Not stopping and looking every time before stepping in front of a vehicle or obstacle that is blocking the view of traffic.
- Wearing dark clothes when there is poor lighting.
- Not following the directions of traffic signals or crossing guards.
- Walking along a street with their back to traffic.

Encouragement solutions are ways to promote and increase walking type activities to help create a more walkable community. Once people are used to walking in their community they are more likely to continue to do so. With more people beginning to take a walking initiative, others will begin to do the same. As these numbers increase, motorists will begin to expect pedestrian traffic thus creating a safer walking environment for everyone. Also, these increased numbers will begin to create more support for future pedestrian improvements making the community more safe and walkable for all users.

Throughout "Step 2 - Identifying Locations" there are areas and locations identified that may benefit from multiple types of countermeasures. The U.S. Department of Transportation Federal Highway Administration provides several valuable tools for selecting countermeasures based on the types of safety problems being encountered. One tool is the Proven Safety Countermeasures initiative (PSCi) which is a collection of countermeasures and strategies effective in reducing roadway fatalities and serious injuries on our Nation's highways for all types of transportation. Transportation agencies are strongly encouraged to consider widespread implementation of PSCs to accelerate the achievement of local, State, and National safety goals. Another tool is the PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System which is even more focused on Pedestrian related safety countermeasures.

For the PSAP we will focus on PEDSAFE since it is specific to pedestrian related countermeasures. Even though

this guide discusses a large number of countermeasures, it is important not to limit pedestrian improvements based only on what is listed. The PEDSAFE guide offers a great resource for beginning to look at different types of countermeasures as well as providing other resources for guidance.

PEDSAFE lists 9 categories of countermeasures to consider while analyzing locations for pedestrian safety improvements. These categories include Along the Roadway, At Crossing Locations, Transit, Roadway Design, Intersection Design, Traffic Calming, Traffic Management, Signals and Signs, and Other Measures. Details about these categories and the countermeasures described for each can be found in **Appendix F**.

The PSAP for Allen County identified a number of areas and locations in the section titled "Step 2 - Identifying Locations" that, through further analysis, may identify several areas, corridors, or spot locations that can benefit from any number of countermeasure types. As NIRCC identifies projects and tracks the completion of projects, they will be displayed or added to **Appendix G** where NIRCC will provide maps or give details on the locations or areas identified and the appropriate countermeasures that have been selected or recommended.

Examples of spot location types of improvements that NIRCC may recommend include a variety of different countermeasures. The most common examples may include the following:

- Providing sidewalks or trails in locations.
- Providing grade separated pedestrian crossings or pedestrian bridges.
- Ensuring that curb ramps exist at high use locations.
- Providing marked crosswalks or crosswalk enhancements, pedestrian signals, traffic signals or traffic signal enhancements, or the appropriate signage for high use or dangerous locations.
- Implementing right-turn-on-red restrictions at intersections.
- Creating advanced stop lines to provide motorists a clearer view of pedestrians.
- Making improvements to high use transit stops.
- Making street lighting improvements.
- Making driveway improvements at locations where pedestrian usage is very high.
- Reducing curb radii.
- Constructing curb extensions, crossing islands, or raised medians.
- Applying specific paving treatments to create enhanced visibility.
- Utilizing law enforcement at specific locations.
- Implementing speed limit reductions for automobiles.

Pedestrian safety improvements made to specific corridors can use many of the same types of countermeasures used for spot locations. The difference is that these improvements may be carried out through entire corridors rather than utilized at one location. Examples of countermeasures NIRCC may recommend for corridor specific problem areas include the following:

- Providing sidewalks or trails along corridors.
- Ensuring that curb ramps exist along high use pedestrian corridors.
- Creating a walking environment by utilizing urban design elements and street furniture such as benches, bus shelters, trash receptacles, and water fountains throughout an identified corridor such as a downtown street or commercial corridor.
- Providing marked crosswalks or crosswalk enhancements, pedestrian signals, traffic signals or traffic signal enhancements, or the appropriate signage consistently throughout an identified corridor such as a downtown street, commercial corridor, or residential street.
- Implementing right-turn-on-red restrictions along corridors such as downtown streets, commercial

corridors, or residential streets.
- Creating advanced stop lines along corridors to provide motorists a clearer view of pedestrians.
- Providing bike lanes along with sidewalks to create a multimodal type corridor causing motorists to be more aware of bicycle and pedestrian type movements.
- Reducing travel lanes where traffic analysis and intersection analysis warrants this type of improvement.
- Making improvements along transit routes or corridors that facilitate a high number of passenger pick-ups or drop-offs.
- Making street lighting improvements along corridors.
- Making driveway and access point improvements utilizing access management strategies.
- Reducing curb radii along corridors such as a downtown streets, commercial corridors, or residential streets as long as anticipated traffic patterns continue to operate without excessive impedance for turning movements.
- Constructing curb extensions, crossing islands, or raised medians along corridors such as a downtown streets, commercial corridors, or residential streets.
- Utilizing law enforcement or speed-monitoring trailers.
- Implementing speed limit reductions for automobiles along corridors such as downtown streets, commercial corridors, or residential streets.
- Making school zone improvements.
- Creating neighborhood identities by establishing gateway corridors.

Other pedestrian safety improvements may be made to specific areas such as neighborhoods, districts, and sub-areas or could be applied on a system wide basis. These types of improvements can be similar to spot location or corridor specific countermeasures except that these will be done on a much broader scale. These will be used to address common problems for large areas and create consistency in improvement types. The types of countermeasures NIRCC may recommend for system wide or specific area improvements include the following:

- Filling in gaps throughout sidewalk and trail networks. This may include creating connectivity for adjacent neighborhoods.
- Ensuring that curb ramps exist.
- Creating a walking environment by utilizing urban design elements and street furniture such as benches, bus shelters, trash receptacles, and water fountains, throughout areas such as downtown business districts or commercial districts.
- Providing marked crosswalks or crosswalk enhancements, pedestrian signals, traffic signals or traffic signal enhancements, or the appropriate signage consistently throughout areas such as downtown business districts, commercial districts, residential areas, or within jurisdictional boundaries.
- Implementing right-turn-on-red restrictions.
- Making improvements throughout transit service areas.
- Making street lighting improvements.
- Utilize access management strategies to improve safety.
- Making safety improvements in areas that surround schools or within school districts.
- Utilizing law enforcement or community based enforcement programs.
- Utilizing or creating educational programs, techniques, and campaigns to create public awareness, support, and behavioral changes in motorist and pedestrian behaviors.
- Creating or utilizing programs that will increase pedestrian usage throughout the community.

Step 4
Implementation Strategy

Developing implementation strategies for pedestrian improvements requires the consideration of several variables. For implementation to be successful, recommended pedestrian safety projects need to have public, private, governmental, and political support before resources can be allocated or given priority over other types of projects. Other variables that affect implementation strategies include funding availability, opportunity, location, importance, time sensitivity, and complexity.

As NIRCC identifies improvement needs throughout Allen County, prioritization may need to be addressed. First, projects need to be categorized to understand how resources can be allocated to achieve the most benefit. There are three main project categories for implementing the PSAP that projects need to be classified under. Projects may fall under simple solutions (short term/low cost), moderately complex solutions (somewhat time consuming/money intensive), or complex solutions (long term/expensive).

It is important to realize while planning these types of improvements that projects from each of these categories will produce various levels of success. Small improvements, or simple solutions, may not create the immediate results accomplished by a complex solution, but these smaller improvement types may be critical for creating support and momentum for larger projects later on. Many of these cost effective solutions may also begin to change pedestrian or motorist behaviors. As a number of these are implemented, they could even have higher impacts on pedestrian safety than many of the complex project types.

Moderately complex or complex solutions are improvements that may be expensive, require several phases, and take extended periods of time to complete. These projects may need to be prioritized by the amount of funding available and the urgency of the improvement. These improvement types may be long term goals that take more significant amounts of planning to achieve. As moderately complex or complex solutions get prioritized, simple solutions may be utilized as temporary improvements until a permanent solution can be made. As NIRCC continues to develop the PSAP and improvements are identified, projects will be categorized into these three types and prioritized accordingly. **Tables 1, 2, and 3** on the following pages provide a guide showing how countermeasures from "Step 3 - Selecting Countermeasures" may be categorized.

To be successful in implementing safety improvements, there has to be more than just a commitment to address safety problems as they arise. A shift from reactive to proactive measures must be encouraged in planners, engineers, and local decision makers. A commitment by local public agencies to place a priority on pedestrian safety must be made by requiring new developments, additions to existing developments, street improvements, and utility upgrades to consider their effects on pedestrian safety and ensure that the proper actions are taken to create a safe pedestrian environment. Implementing safety improvements along with other projects can create opportunities that may otherwise be extremely difficult to achieve.

The following strategies can help facilitate a successful implementation plan for creating a safer pedestrian environment:

- Create support for implementing safety improvements by involving the general public, the private sector (business owners and developers), governmental officials and agencies, and media sources.
- Implement improvements that can be completed immediately.
- Identify short term (simple solutions), medium range (moderately complex solutions), and long term (complex solutions) projects.
- Produce a prioritization process that incorporates multiple jurisdictional involvement and input.

- Produce funding sources for projects.
- Incorporate pedestrian safety projects with new developments, additions to existing developments, street improvements, and utility projects.

Table 1 Countermeasures recommended for spot specific improvements:

Providing sidewalks or trails where necessary.	Moderate/Complex
Providing grade separated pedestrian crossings or pedestrian bridges in locations where safe or practical alternatives do not exist.	Complex
Ensuring that curb ramps exist at significant or vital locations.	Moderate
Providing marked crosswalks or crosswalk enhancements, pedestrian signals, traffic signals or traffic signal enhancements, or the appropriate signage as needed.	Simple/Moderate/Complex
Implementing right-turn-on-red restrictions at specific intersections.	Simple
Creating advanced stop lines at specific locations to provide motorists a clearer view of pedestrians.	Simple
Making improvements to specific transit stops.	Moderate/Complex
Making street lighting improvements.	Moderate
Making driveway improvements at specific locations.	Moderate/Complex
Reducing curb radii at certain intersections.	Moderate

Table 2 Countermeasures recommended for corridor specific problem areas:

Providing sidewalks or trails wherever gaps exist throughout entire corridors.	Complex
Ensuring that curb ramps exist throughout entire corridors.	Moderate
Creating a walking environment by utilizing urban design elements and street furniture such as benches, bus shelters, trash receptacles, and water fountains, throughout an identified corridor such as a downtown street or commercial corridor.	Moderate
Providing marked crosswalks or crosswalk enhancements, pedestrian signals, traffic signals or traffic signal enhancements, or the appropriate signage consistently throughout an identified corridor such as a downtown street, commercial corridor, or residential street.	Simple/Moderate/Complex
Implementing right-turn-on-red restrictions along specific corridors such as downtown streets, commercial corridors, or residential streets.	Simple
Creating advanced stop lines along corridors to provide motorists a clearer view of pedestrians.	Simple
Providing bike lanes along with sidewalks to create a multimodal type corridor causing motorists to be more aware of bicycle and pedestrian type movements.	Moderate/Complex
Reducing travel lanes where traffic analysis and intersection analysis warrants this type of improvement.	Complex
Making improvements along transit routes or corridors that facilitate a high number of passenger pick-ups or drop-offs.	Moderate/Complex
Making street lighting improvements along entire corridors.	Moderate
Making driveway and access point improvements utilizing access management strategies.	Moderate/Complex
Reducing curb radii along identified corridors such as a downtown streets, commercial corridors, or residential streets as long as anticipated traffic patterns continue to operate without excessive impedance for turning movements.	Moderate
Constructing curb extensions, crossing islands, or raised medians along identified corridors such as a downtown streets, commercial corridors, or residential streets.	Moderate/Complex
Utilizing law enforcement or speed-monitoring trailers.	Simple
Implementing speed limit reductions for automobiles along specific corridors such as downtown streets, commercial corridors, or residential streets.	Simple
Making school zone improvements.	Simple/Moderate
Creating neighborhood identities by establishing gateways on certain corridors.	Moderate/Complex

Table 3 Countermeasures recommended for system wide or specific area improvements:

Filling in gaps throughout sidewalk and trail networks. This may include creating connectivity for adjacent neighborhoods.	Complex
Ensuring that curb ramps exist throughout Allen County.	Moderate
Creating a walking environment by utilizing urban design elements and street furniture such as benches, bus shelters, trash receptacles, and water fountains, throughout an identified area such as a downtown business district or commercial district.	Moderate
Providing marked crosswalks or crosswalk enhancements, pedestrian signals, traffic signals or traffic signal enhancements, or the appropriate signage consistently throughout an identified area such as a downtown business district, commercial district, residential area, or an entire jurisdiction.	Simple/Moderate/Complex
Implementing right-turn-on-red restrictions throughout specific areas or districts.	Simple
Making improvements throughout transit service areas.	Moderate/Complex
Making street lighting improvements throughout specific areas or districts.	Moderate
Utilize access management strategies to improve safety throughout Allen County.	Moderate/Complex
Making safety improvements throughout areas that surround schools or school districts.	Moderate/Complex
Utilizing law enforcement or community based enforcement programs.	Simple
Utilizing or creating educational programs, techniques, and campaigns to create public awareness, support, and behavioral changes in motorist and pedestrian behaviors.	Simple
Creating or utilizing programs that will increase pedestrian usage throughout the community.	Simple

Step 5
Institutionalizing Changes to Planning and Design Standards

Institutionalizing changes to planning and design standards requires the incorporation of pedestrian safety improvements into design guidelines and traffic management practices so they become routine accommodations with every type of improvement or development. Development guidelines, planning documents, transportation plans, design manuals, emergency management practices, and maintenance plans or practices all need to include policies and guidelines that accommodate pedestrian safety. In the Federal Highway Administration's report titled "How to Develop a Pedestrian Safety Action Plan", Appendix F: Reference Guide and Plan Summaries provides a list of publications that address pedestrian policies and designs of this kind.

It is also important to note that local criteria and guidelines for the installation and maintenance of pedestrian facilities is considered to help institutionalize pedestrian safety improvements. Many traffic control devices and pedestrian facilities are installed to minimum standards and fail to take into consideration the needs for the area they serve. In order to create local guidelines that would ensure the appropriate considerations are made when these types of facilities are planned, the Allen County PSAP will support and work with local public agencies to develop a set of local criteria and guidelines. Fort Wayne's "Walk Fort Wayne Plan" discusses this specifically in one of their policies which can be seen on the following pages of this section.

There are several plans in Allen County that recommend these types of policies and practices. NIRCC's Comprehensive Bicycle-Pedestrian Transportation Plan provides a recommendation policy for sidewalk improvements (**Appendix A**) to be included with new developments and road projects. It also provides maps (**Figures 1-A, 1-B, and 1-C**) that recommends sidewalk, trail, and on-street bicycle accommodations throughout Allen County. These maps and recommendation policy provide planners and highway officials with tools that help coordinate bicycle and pedestrian improvements with present and future road projects and developments. To provide continuity throughout the region, the plan also includes recommendations for the 12 county area of Northeast Indiana. The regional plan can be seen on the following page in **Figure 17**.

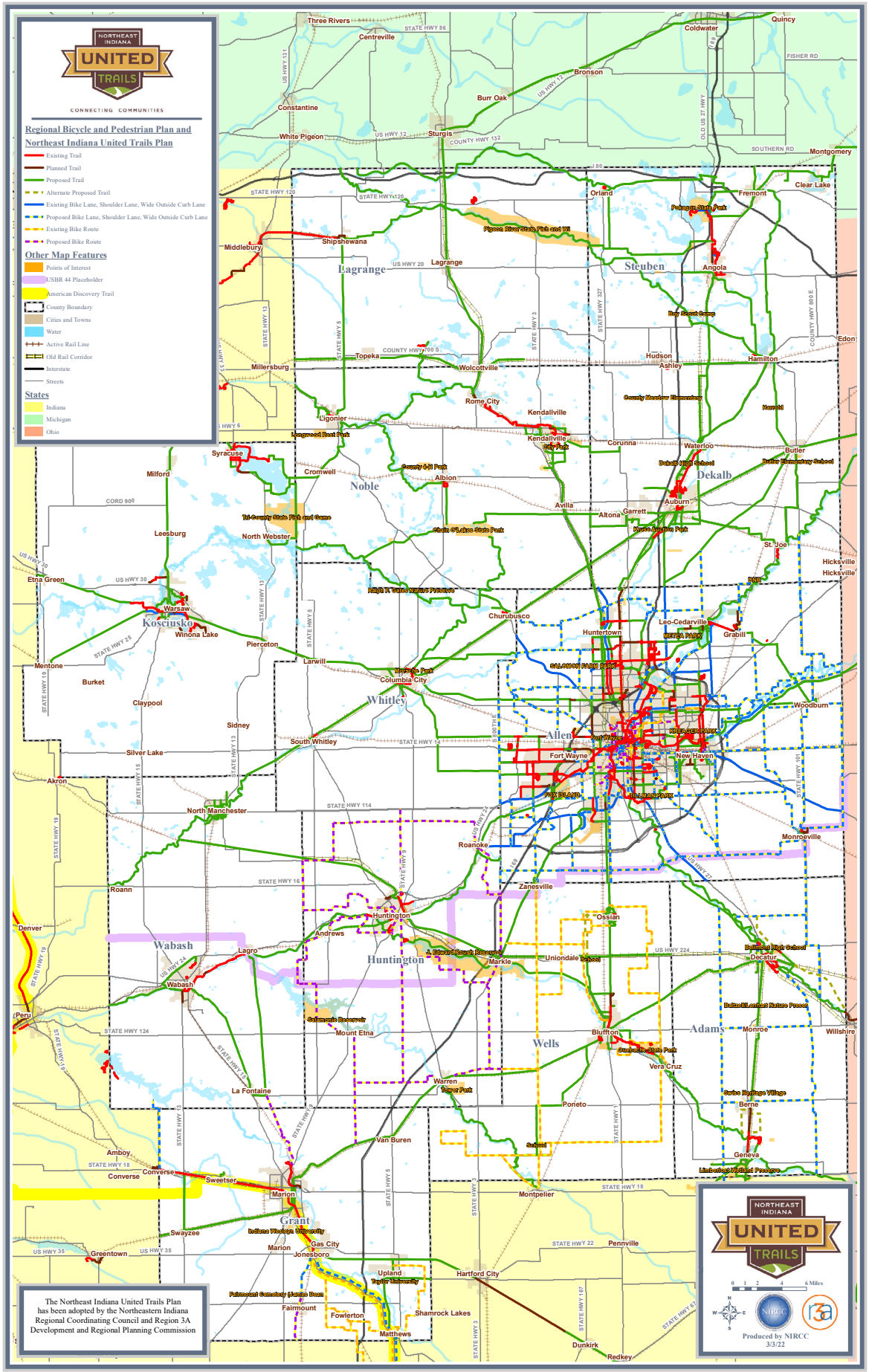
The Comprehensive Bicycle-Pedestrian Transportation Plan is also part of the 2040 Transportation Plan and is contained in Chapter 6, "The Selected Plan". It can be viewed on the web at https://www.nircc.com/transportation-plans.html. Being incorporated into the 2040 Transportation Plan ensures that these bicycle and pedestrian improvements are considered for all federal aid road projects and also creates more potential funding sources for implementing them.

The City of Fort Wayne's Planning and Policy Department has produced policies and action steps that are incorporated into the Walk Fort Wayne Plan, which was amended to the Comprehensive Plan, that will help work towards institutionalizing changes to planning and design standards. A list of all the Goals and Policies for this plan can be viewed in **Appendix D**. Specific policies and action steps this plan addresses that are related to institutionalizing changes into planning and design principles are as follows:

Special Note: The Walk Fort Wayne Plan was originally adopted in 2011. Passages from the Walk Fort Wayne Plan that are used in the PSAP will be updated as the Walk Fort Wayne Plan is updated in the future.
Policies from the City of Fort Wayne's "Walk Fort Wayne Plan" Network section:

- **Policy 3: Ensure that pedestrian facilities, such as sidewalks and other pedestrian safety facilities, are considered integral components in the design and development of all public street improvement projects.**
  In the past, public streets and thoroughfares were often designed and constructed with the primary

Figure 17


NORTHEAST INDIANA UNITED TRAILS
CONNECTING COMMUNITIES
Regional Bicycle and Pedestrian Plan and Northeast Indiana United Trails Plan
Existing Trail
Planned Trail
Proposed Trail
Alternate Proposed Trail
Existing Bike Lane, Shoulder Lane, Wide Outside Curb Lane
Proposed Bike Lane, Shoulder Lane, Wide Outside Curb Lane
Existing Bike Route
Proposed Bike Route
Other Map Features
Points of Interest
USBR 44 Placeholder
American Discovery Trail
County Boundary
Cities and Towns
Water
Active Rail Line
Old Rail Corridor
Interstate
Streets
States
Indiana
Michigan
Ohio
The Northeast Indiana United Trails Plan has been adopted by the Northeastern Indiana Regional Coordinating Council and Region 3A Development and Regional Planning Commission
NORTHEAST INDIANA UNITED TRAILS
Produced by NIRCC 3/3/22
Three Rivers
Centreville
Constantine
White Pigeon
Sturgis
Burr Oak
Bronson
Coldwater
Quincy
Montgomery
Orland
Fremont
Clear Lake
Middlebury
Shipshewana
Lagrange
Steuben
Angola
Millersburg
Topeka
Wolcottville
Hudson
Ashley
Hamilton
Edon
Rome City
Kendallville
Ligonier
Corunna
Waterloo
Butler
Syracuse
Milford
Cromwell
Albion
Noble
Dekalb
Auburn
Avilla
Altona
Garrett
Leesburg
North Webster
St. Joe
Hicksville
Etna Green
Warsaw
Kosciusko
Winona Lake
Churubusco
Huntertown
Leo-Cedarville
Grabill
Pierceton
Larwill
Mentone
Burket
Claypool
Columbia City
Whitley
Sidney
South Whitley
Woodburn
Allen
Fort Wayne
New Haven
Silver Lake
Akron
North Manchester
Roanoke
Monroeville
Roann
Zanesville
Huntington
Ossian
Denver
Wabash
Andrews
Lagro
Markle
Uniondale
Decatur
Peru
Mount Etna
Wells
Bluffton
Adams
Monroe
Willshire
Vera Cruz
La Fontaine
Warren
Ponteo
Berne
Van Buren
Amboy
Converse
Sweetser
Marion
Grant
Montpelier
Geneva
Swayzee
Gas City
Jonesboro
Pennville
Greentown
Upland
Hartford City
Fairmount
Fowlerton
Shamrock Lakes
Matthews
Dunkirk
Redkey

purpose of providing accommodation for automotive transportation. Shifting to a focus which encourages and promotes balancing the need for all forms and modes of transportation along public thoroughfares can best be accomplished through communication and coordinated planning in the design of all transportation projects.

Additionally, if all thoroughfares are designed and built to include pedestrian infrastructure, it expands the existing network and eventually will create a highly connected pedestrian system. Each new street improvement project that includes pedestrian facilities further connects Fort Wayne citizens to the destinations that they want/need to get to.

- **Action Step A:** Train city staff responsible for the review of city infrastructure projects, as well as staff issuing permits for private construction on the policies within this Plan.
- **Action Step B:** Stakeholders, such as representatives and staff from: City Planning, urban design, neighborhood leaders, forestry and parks, street lighting, traffic management/safety, and traffic engineering should be consulted at the scope-setting, design, and final construction plan phases of a project to assure project alignment with the goals and policies within this Plan.
- **Action Step C:** Include identified stakeholders in all planning and project review routings of Board of Works sidewalk, utility, and street and roadway projects to assure project alignment with the goals and policies within this Plan.

- **Policy 5: Ensure that the design and construction of new transportation facilities anticipate and accommodate the future demand for pedestrian facilities (bridges, interchanges, intersections, etc.).**
  In order to prevent future barriers to a connected pedestrian network, the design and construction of major transportation facilities should anticipate and accommodate pedestrian facilities, such as bridges, interchanges and intersections, even if connecting pedestrian infrastructure does not exist. This is especially important if the project is located in or near a Pedestrian Generating Area noted on the Connectivity Prioritization Map.

- **Policy 8: Ensure that appropriate pedestrian safety facilities are incorporated within street improvement projects, and at all intersections along major thoroughfares. Mid-block crossings should be provided in high pedestrian demand areas and where vehicle and pedestrian conflicts are minimal.**
  Safety and ease of accessibility for pedestrian transportation is paramount to this pedestrian plan and will enhance its use and utility. While there are design guidelines available from the AASHTO and the Federal highway Administration, planning and design decisions should reflect local expectations for user safety and comfort.

  Mid-block crossings in appropriate, safe locations of high pedestrian demand areas can be useful and beneficial to the entire transportation network. However, great care in their proper location and design is essential to their effective and safe use. The design of mid-block crossings should protect the pedestrian by using appropriate traffic control devices, such as refuge islands, lighting, striping, signs and signals.

- **Policy 10: Encourage and facilitate the incorporation of appropriate public transit access facilities at existing and anticipated high use transit stop locations and at new large scale developments, as warranted.**

As stated in Policy 9, public transit users need safe, easy access to transit stop locations. However, once pedestrians arrive at these locations, appropriate facilities, such as bus pads, shelters and lighting, are necessary to accommodate user safety and shelter from inclement weather conditions. Planning and coordination for such facilities can help to assure they are provided at high use locations and when new major developments are planned.

- **Action Step A:** Coordinate with Department of Planning Services, Public Works, NIRCC and Citilink to identify high use transit stop locations to ensure that facilities are appropriately planned, designed and provided.

Policies from the City of Fort Wayne's "Walk Fort Wayne Plan" Legislative section:

- **Policy 2: Develop and support adoption of a Complete Streets ordinance along with design standards that comply with Federal ADA standards, to ensure that all streets are built and maintained appropriately to accommodate pedestrians, bicyclists, motorists and transit users of all ages and abilities.**
  Pedestrian infrastructure should be provided full consideration in the planning and development of transportation facilities, including its incorporation into state, regional, and local transportation plans and programs. A complete streets policy will provide for safer non-vehicular transportation, as well as a more user-friendly system.

  - **Action Step A:** Gather input from the community and area stakeholders, including residential and commercial developers, to assist in the development of a Complete Streets Policy.
  - **Action Step B:** Coordinate with the Bike Fort Wayne Plan in the development and adoption of a Complete Streets ordinance.
  - **Action Step C:** Investigate best practices on how other communities have developed and implemented a Complete Streets ordinance.

- **Policy 3: Develop and adopt local criteria and guidelines for the installation and maintenance of pedestrian safety facilities, including appropriate traffic control devices, along the City's major thoroughfares where increased pedestrian safety is needed.**
  Traffic control devices for roadway users, including pedestrians and bicyclists, increase safety and efficiency for all users. To reduce confusion and cost, the national Manual on Traffic Control Devices (MUTCD) was created and is the law governing all traffic control devices. The MUTCD is an ever-changing document that provides Standards that *must* be followed, Guidance that *should* be followed and Options that *may* be used in certain circumstances.

  However, beyond the standards required in the manual, there is sometimes discretion on when, where and what type of traffic control device should be used. For example, (if not otherwise required in the MUTCD) a crosswalk location may either be marked with two parallel lines or marked with several wide "piano key" stripes. Both crosswalk scenarios are sending a message to the pedestrian that directs them where to cross the street, as well as, a message to the driver that indicates that pedestrians may be crossing in this location. Although, the "piano key" markings are often more visible to drivers than the parallel lines and can increase the safety for both the pedestrian and driver.

Often when the use and location of traffic control devices is left up to discretion, the results can vary depending on the funding source or engineer managing the project. This policy strives to set local minimum standards for when traffic control devices are discretionary and not specifically required by the MUTCD. By setting local minimum standards the City can better communicate and essentially increase the safety for all roadway users.

Another issue is the maintenance of traffic control devices. As time progresses, signs, signals and pavement markings will wear and become more difficult to recognize. This policy also aims to create local minimum standards and/or guidelines for when to repair or replace traffic control devices.

- **Action Step A:** Coordinate with Public Works, Department of Planning Services, Citilink, Fort Wayne Trails, Fort Wayne school systems, NIRCC and interest groups such as AARP and the Mayor's Senior Advisory Council (now called the Age Friendly Advisory Council) to develop safe pedestrian facility standards and/or guidelines.
- **Action Step B:** Examine all existing marked crosswalk locations in the city and ensure alignment with developed standards and/or guidelines.
- **Action Step C:** Examine all intersections and appropriate locations along all major thoroughfares to ensure alignment with developed standards and/or guidelines. Examination of pedestrian safety facilities should start within the Pedestrian Generating Areas and public and private schools and work outward.

Other planning documents such as the Comprehensive Plan for Allen County (Plan-it Allen) and the New Haven Comprehensive Land Use and Strategic Economic Plan address the need for a multimodal transportation system and stress the importance of safe pedestrian mobility and connectivity throughout the community. To accomplish this, additional strategies need to be formulated to ensure that pedestrian improvements are not overlooked. NIRCC will continue to update this section with strategies for institutionalizing changes to planning and design standards throughout Allen County.

Step 6
Land Use, Zoning, and Site Design Issues

Land use patterns, zoning regulations, and access management standards all play an essential role in pedestrian safety. Some of the most challenging conflicts between motor vehicles and pedestrians are caused by land use patterns and poor site design. Poor driveway access management, site designs that do not provide pedestrian access, lack of connectivity, sprawling development, and poor access to transit facilities are common problems for pedestrian safety. There are multiple countermeasures directly associated with these types of issues that need to be addressed as part of the planning requirements for land use development.

A strategy for addressing these issues is to work with the appropriate departments and elected officials to implement land use, zoning, and site design regulations that encourage pedestrian trips and require pedestrian infrastructure with new developments. Too often pedestrian facilities are not required with new developments and access to transit facilities is not considered. Also, transportation improvements that are required with new developments, such as controlled intersections and access points, often lack pedestrian safe facilities.

NIRCC's Comprehensive Bicycle-Pedestrian Transportation Plan provides a recommendation policy for sidewalk improvements (**Appendix A**) to be included with new developments. NIRCC also coordinates updates to the Access Standards Manual. As part of the latest update of the Access Standards Manual, some pedestrian safe design recommendations were added.

Fort Wayne and Allen County may need to update the proper zoning and subdivision control ordinances as well as any other related ordinances that may apply. One policy included in the Walk Fort Wayne Plan includes an action step that would work to modify these. Another policy addresses poor access to transit facilities. A list of the Goals and Policies for this plan can be viewed in **Appendix D**. The following policies address these issues.

Special Note: The Walk Fort Wayne Plan was originally adopted in 2011. Passages from the Walk Fort Wayne Plan that are used in the PSAP will be updated as the Walk Fort Wayne Plan is updated in the future.

Policy from the City of Fort Wayne's "Walk Fort Wayne Plan" Legislative section:

- **Policy 1: Encourage the development of regulations to require the incorporation of pedestrian facilities and connectivity within and between new development projects, as well as along all adjacent major thoroughfares.**
  Not only should pedestrian needs be considered in all transportation projects, sidewalk infrastructure and amenities should also be integrated into development and site plans within the City of Fort Wayne. The incorporation of pedestrian facilities will not only provide accessibility and connectivity to existing and adjacent sidewalks, but will strengthen our entire pedestrian network.

    - **Action Step A:** Gather input from the community and area stakeholders, including residential and commercial developers, to review the applicable portions of Fort Wayne City Code and explore ways to ensure pedestrian facilities are constructed with new development.

Policy from the City of Fort Wayne's "Walk Fort Wayne Plan" Network section:

- **Policy 9: Pedestrian facilities should be coordinated with public transit facilities to ensure that transit stop locations are safe and accessible to all pedestrians.**

All users of local public transit routes and stop locations must have safe and easy access to sidewalks and other connecting pedestrian facilities in order to reach desired destinations. Planning and designing sidewalks that connect to transit stop locations should be a reasonable priority.

Step 7
Commitment to the PSAP

For the Allen County PSAP to become successful there must be strategies that will ensure the commitment for an ongoing action plan. Listed below are a few strategies to begin the process of committing to and continuing this plan. Some of these strategies are from the Federal Highway Administration's report titled "How to Develop a Pedestrian Safety Action Plan". This is a work in progress and will be updated as NIRCC begins to implement the pedestrian safety action plan and present it to various governmental officials, departments, and members of the public.

- Update the plan every five years.
- Provide ongoing internal training to ensure that designs do not inadvertently impact pedestrian mobility and safety in a negative way.
- Provide ongoing external training to help the public focus on changes that will improve pedestrian safety.
- Have transportation agencies write Requests for Proposals (RFPs) that require appropriate pedestrian expertise.
- Institute an award system to acknowledge good projects that provide safer conditions for pedestrians.

Step 8
Evaluation of Results

This section is dedicated to evaluating results of projects related to the Allen County Pedestrian Safety Action Plan. As this plan is implemented, **Appendix H** will provide information or studies that demonstrate the resulting effectiveness of countermeasures produced or implemented from the PSAP. This section will also provide updates on the status of objectives listed in the section titled "Step 1 - Defining Objectives".

Evaluation methods for varying types of countermeasures will differ depending on what the improvement or program is intended to achieve. It is important to find out several things from an evaluation. The obvious information that needs to be gathered by an evaluation is if the improvement or program created positive results by creating a safer pedestrian environment or directly reduced pedestrian crashes. Another portion of the evaluation should study the results an improvement had on vehicular traffic. Negative affects on vehicular traffic could create a new problem. Also, the evaluation needs to consider the opinions of the general public or stakeholders for a particular improvement to find out if the intended results were achieved.

There are a number of tools and techniques to evaluate projects or programs. The following lists some of these tools and techniques that may be used for this process:

- Comparisons of crash data
- Surveys
- Interviews
- Pedestrian counts
- Stakeholder meetings
- Traffic studies
- Corridor impact studies
- Sub-area analysis
- Before and after studies

Appendix A

Sidewalk Recommendation Policy
from the
Bicycle-Pedestrian Transportation Plan

Sidewalk Recommendations

1. With new developments sidewalks should be provided within the dedicated right-of-way of all perimeter and internal streets as recommended by this article unless an adopted plan exists recommending a multi-use trail. Sidewalks should not supersede the multi-use trail where recommended. Road projects should also include sidewalks within the right-of-way as recommended by this article unless an adopted plan exists recommending a multi-use trail. Sidewalks should not supersede the multi-use trail where recommended.

2. Apart from new developments, implementation of sidewalks along highways, city streets, and county roads should be provided on streets within the urbanized boundary, city boundaries, and areas around small towns (Figure 1) that meet the standards shown in Table 1. Aside from new developments, implementation of sidewalks along highways, city streets, and county roads outside the areas shown in Figure 1 should be provided according to identification from the most recent Bicycle and Pedestrian Transportation Plan.

Table 1 ***(Minimum Sidewalk recommendations in Allen County, IN)***

Road Classification	***Recommended***	***Sides***	***Width (ft)***
Local & Residential	Yes	Both	5’ (6’ if curb face sidewalk)
Collector	Yes	Both	5’ (6’ if curb face sidewalk)
Arterial	Yes	Both	5’ (6’ if curb face sidewalk)
Expressway	No	***N/A***	***N/A***
Freeway	No	***N/A***	***N/A***
Interstate	No	***N/A***	***N/A***

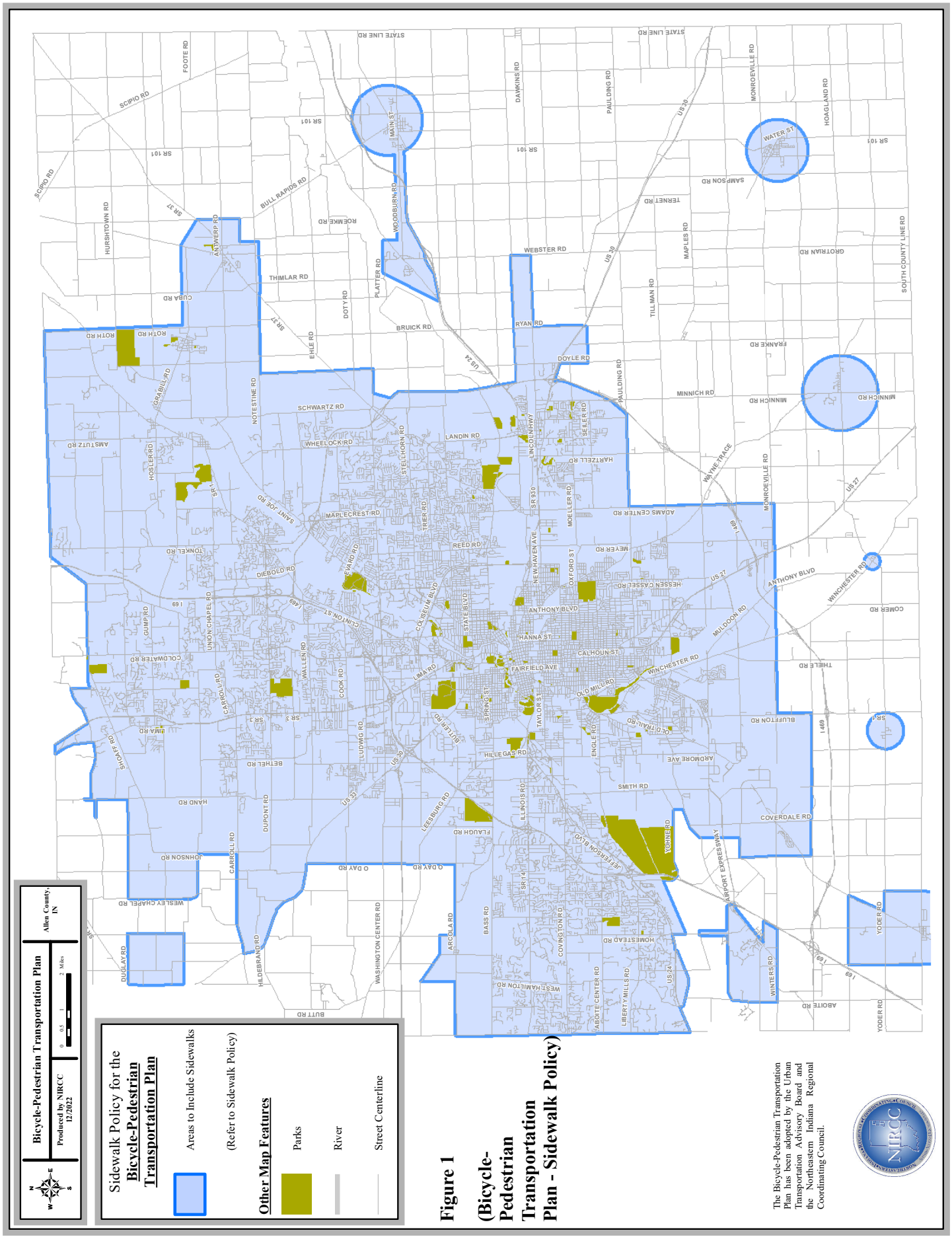


Figure 1 (Bicycle-Pedestrian Transportation Plan - Sidewalk Policy)

The Bicycle-Pedestrian Transportation Plan has been adopted by the Urban Transportation Advisory Board and the Northeastern Indiana Regional Coordinating Council.

3. Sidewalks should be provided within the dedicated right-of-way of all residential, office, commercial, retail, and private subdivision streets on both sides.

4. If residential, office, commercial, or retail development intersects an existing or planned Multi-Use Path, sidewalks should be provided for access.

5. Sidewalks should be provided along all industrial park streets on at least one side within the dedicated right-of-way.

6. A sidewalk connection should be provided if a gap in the sidewalk network exists between developments and there is no development within the gap.

7. Physical barriers or obstacles should not compromise network connectivity or public access.

8. Sidewalk surfacing should be of a character that is suitable for the expected use and should also be in harmony with the subdivision design.

9. Sidewalk locations and designs should make adequate provisions for culverts, drains, utilities, bridges, rights-of-way, driveways, and landscaping.

10. All sidewalks should be designed according to current AASHTO Standards.

11. All sidewalks should be designed according to ADA standards to allow disabled access.

Bicycle Parking Recommendations

1. Bicycle parking facilities should be provided for any new building or enlargement of an existing building when that enlargement triggers additional parking requirements.

2. Bicycle parking facilities should be provided in the ratio of one (1) bike-parking space per every twenty (20) required parking spaces.

3. Bicycle parking facilities should be provided in residential common areas (i.e. community centers, community playgrounds and pools) and parks.

4. Bicycle parking facilities should meet the Class 2 facility requirement described in Table 2 and shown in Figure 2. Class 1 bicycle parking facilities should be optional. The recommendations for bicycle facility distributions are shown in Table 3.

5. Bicycle parking should be located in close proximity to the building's entrance and clustered in lots not to exceed 16 spaces each.

6. Bicycle parking facilities should support bicycles in a stable position without damage to wheels, frame or other components.

7. Bicycle parking facilities should be located in highly visible well-lit areas to minimize theft and vandalism.

8. Bicycle parking facilities should be securely anchored to the lot surface so they cannot be easily removed and should be of sufficient strength to resist vandalism and theft.

9. Bicycle parking facilities should not impede pedestrian or vehicular circulation.

10. Racks should not be placed close enough to a wall or other obstruction so as to make use difficult. There should be sufficient space (at least 24 inches) beside each parked bike that allows access. This access may be shared by adjacent bicycles. An aisle or other space should be provided to bicycles to enter and leave the facility. This aisle should have a width of at least six (6) feet to the front or rear of a bike parked in the facility.

11. The outside ground surface should be treated in a way that avoids mud or dust.

12. Bike parking facilities within auto parking areas should be separated by a physical barrier such as curbs, wheel stops, poles or other similar features to protect bicycles from damage by cars.

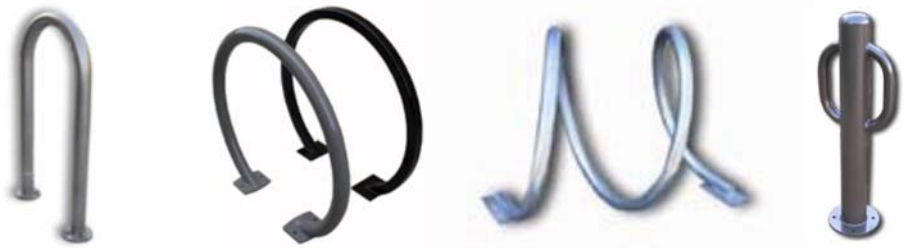
Table 2 ***(Bike Rack Classifications)***

Facility Class	*Facility Type*	*Security Levels*
Class I Facility	Bicycle Lockers	High - protects against theft of entire bicycle, accessories, and from weather
Class II Facility	Typical Bicycle Rack	Low – frame and wheels may be secured by cable/chain and lock

Figure 2 (***Bike Rack Classifications)***

Class I Facility

Class II Facility



Class II Facility
(Not Recommended)

Table 3 ***(Bike Rack Recommendations)***

Area Type	*Class 1*	*Class 2*
Office, Industrial, Commercial	**40 %	60 %
Retail, Service	**20 %	80 %
Multi-Family Residential (3 or more units)	*100 %	0 %
Public or Commercial Recreation	**10 %	90 %
Schools	0 %	100 %
Park and Ride Lots or Bus Transfer Stations	90 %	10 %

*Garages or secure accessible indoor areas may satisfy the Class 1 recommendation.
**A weather protected Class 2 may satisfy the Class 1 recommendation.

Appendix B

Fort Wayne Comprehensive Sidewalk Connectivity Plan
Scope

Special Note: The Walk Fort Wayne Plan was originally adopted in 2011. Passages from the Walk Fort Wayne Plan that are used in the PSAP will be updated as the Walk Fort Wayne Plan is updated in the future.

Walk Fort Wayne Plan

What is it?

The Walk Fort Wayne Plan is a 10 year plan that will provide guidance on how and where to fill in sidewalk gaps along Fort Wayne's arterial and collector roadways, through the use of new sidewalks and shared-use paths. The plan will prioritize pedestrian capital improvements within the city of Fort Wayne. Finally, the plan will assist with the drafting and passage of a "complete streets" ordinance through Common Council.

What's the Objective?

- To implement recommendations from the Fort Wayne / Allen Country Comprehensive Plan, *Plan-it Allen!*.
- To revisit recommendations from the Comprehensive Bicycle-Pedestrian Plan created by the Northeastern Indiana Regional Coordinating Council (NIRCC).
- To safely connect citizens to desired destinations through the use of sidewalk and shared-use path infrastructure, according to the Connectivity Needs Map.
- To make infrastructure, such as crosswalks and bus stops, accessible to all users where appropriate. (i.e. elderly, persons with disabilities, schools, etc.)
- To coordinate and interface with Citilink's transit planning team.
- To establish goals and policies for sidewalk connectivity.
- To work with the Bike Master Plan project team to both coordinate efforts and to evaluate the initiation of a "Complete Streets" ordinance or policy.
- To incorporate a local Safe Routes to School Program into the plan.

Why?

The Fort Wayne and Allen County Comprehensive Plan encourages a balanced transportation system so that individuals may choose their transportation mode to travel to work, for pleasure, to school, etc. Currently, the City of Fort Wayne has gaps in its sidewalk infrastructure along major thoroughfares which limits pedestrian connectivity to desired destinations. City staff has heard through several public input sessions that there is a desire for pedestrian connectivity to major destinations and to be able to use alternative forms of transportation. Communities with well balanced transportation systems that serve a variety of users most often see increased economic development as businesses become more connected to the multiple modes of transportation. The plan will also improve the quality of life for Fort Wayne's citizens, as well as improve air quality as more people are walking to destinations instead of driving in a motorized vehicle.

What is the Process?

- Timeframe - Draft Recommendations: 6 months
  Completed Plan: 10-12 months
- Multi-disciplinary project team. The primary team will meet weekly and work on drafting recommendations, goals and policies, the Connectivity Needs Map and completing the plan. The secondary team will be advisory to the primary team and meet monthly or as needed.
- **Phase I – Establish scope, timeline and finalize teams – March 26th – April 20th**.
- **Phase II – Draft Recommendations – April thru September.**

Walk Fort Wayne Plan

  - *Primary team* will create draft prioritization recommendations.
  - *Secondary team* to review and approve draft prioritization recommendations.
- **Phase III – Establish goals and policies and complete first draft of plan – June thru November.**
  - *Primary team* will create draft.
  - *Secondary team* to review and approve draft.
- **Phase IV – Public outreach – End of May 2009 thru January 2010.**
  - *Primary team* will conduct public input session's mid-way through the process to obtain stakeholder input.
  - *Primary team* will review the final draft with stakeholders for any last minute changes.
- **Phase V – Adoption by Common Council and UTAB – February 2010.**

Who?

Primary Team:

- Kienan O'Rourke, Planning and Policy – Co-Project Coordinator
- Bruce Johnson, Planning and Policy – Co-Project Coordinator
- Pam Holocher and/or Sherese Fortriede, Planning and Policy
- Michele Yamanaka, GIS/Special Projects
- Matt Peters, Northeastern Indiana Regional Coordinating Council (NIRCC)
- Dawn Ritchie, Greenway and Trails
- Rebecca Karcher, Office of Housing and Neighborhood Services
- Tom Cain, Redevelopment
- Christian Beebe, Department of Planning Services

Secondary Team (Advisory)**:**

- Dave Ross and/or Mario Trevino, Traffic Engineering
- Matt Land, City Utilities
- Lori Keys, Aboite New Trails
- Betsy Kachmer, Citilink
- Jim Deathe, Right-of-way
- (New Employee), Street Light Engineering
- Dan Avery, Northeastern Indiana Regional Coordinating Council (NIRCC)
- Palermo Galindo, Hispanic & Immigrant Liaison
- Liz Brown, City Council (at-large)
- Tom Didier, City Council (3rd district)
- (New Member), Mayor's Senior Advisory Committee
- David Nelson, League for the Blind and Disabled
- Donna Cusick, Allen County Council on Aging
- Curt Sylvester, AARP Indiana
- Kim Sabrosky, AEP – Indiana Michigan Power
- Matthew Kelley, Verizon
- Larry Graham, NIPSCO

Appendix C

Fort Wayne Comprehensive Sidewalk Connectivity Plan
Survey Results

Comprehensive Sidewalk Connectivity Plan
Public Input – Survey Results
July 2009-October 2009

Surveys were conducted using various methods. The following methods were used:

- Online (via the City's main webpage)
- City Utilities Bill Stuffers
- Survey Boxes (City of Ft. Wayne ACPL branches, YMCA Central Branch, IVY Tech Community College, IPFW, Indiana Tech, Wellspring Community Center, Burmese Advocacy Center, the lobby of the City-County Building, and the Fort 4 Fitness Health Expo)

There were a total of **2464** surveys collected and tallied.

- Number of Online surveys received: **290** (11.8%)
- Number of Utility Bill Stuffer surveys received: **1923** (78.0%)
- Number of Paper surveys received: **251** (10.2%)

76.7% of the surveys were filled out correctly, leaving **23.3%** being filled out either incorrectly or incompletely.

Key Trends

- Schools (K-8) was rated as the highest priority destination
- Work/Employment Centers was rated as the lowest priority destination
- Stellhorn Rd and Maplecrest Rd was the top rated intersection in need of crosswalks and or pedestrian signals
- Main purpose for using sidewalks was "Traveling to a destination" closely followed by "Exercise"
- Main reason people chose "Other" was listed as SAFETY
- Lake Avenue was the top rated roadway identified in the Northeast Quadrant
- Coliseum Blvd was the top rated roadway identified in the Northwest Quadrant
- Lafayette St was the top rated roadway identified in the Southeast Quadrant
- Jefferson Blvd was the top rated roadway identified in the Southwest Quadrant
- Reed Rd was identified as the most important roadway not listed on the survey in need of sidewalk connectivity
- Largest response was from the age group 40-59
- The Northeast Quadrant had the highest number of responses with 23% coming from the 46815 and 46835 zip codes
- 42 responses from the Burmese Advocacy Center; however more research needs to be gathered
- 0 responses from the Hispanic community; additional outreach to take place

Survey Results by Question

(2464 Results)

1. Please place the corresponding letter for each of the following destinations in one of the three categories for importance of having sidewalks.

A. Community Facilities & Major Attractions
B. Government Offices & Human Services Agencies
C. Libraries
D. Medical/Health Centers
E. Public Transit Stops
F. Schools (K-8)
G. Schools (HS, Colleges & Universities)
H. Shopping Centers/Areas
I. Work/Employment Centers

Most Important Need	%	Moderate Need	%	Least Important Need	%
(F) Schools (K-8)	55	(C) Libraries	37	(I) Work/Employment Centers	40
(G) Schools (HS & Up)	39	(E) Public Transit Stops	33	(B) Gov't Offices & Human Service Agencies	36
(D) Medical/Health Centers	28	(D) Medical/Health Centers	28	(H) Shopping Centers/Areas	36
				(A) Community Facilities & Major Attractions	26

2. Please identify no more than three (3) major roadway intersections where pedestrian crosswalks (i.e. painted lines) and/or signals are needed.

Top Five (5) Intersections

- Stellhorn Rd & Maplecrest Rd
- Coliseum Blvd & Coldwater Rd
- Dupont Rd & Coldwater Rd
- Coliseum Blvd & N. Anthony Blvd
- St. Joe Center Rd & Maplecrest Rd

3. Please place a check mark (✓) next to your purpose for using sidewalks.

Traveling to a destination	67%
Exercise	67%
Recreation	45%
Other	12%

4. For each of the following quadrant sets that you are familiar with, please place a check mark (✓) next to the roadway you feel is most in need of sidewalks.

Northeast Quad	%	Northwest Quad	%	Southeast Quad	%	Southwest Quad	%
Stellhorn Rd	13%	Lima Rd/ SR 3	8%	Wayne Trace	4%	Covington Rd	10%
St. Joe Center Rd	13%	Clinton St	9%	Hessen Cassel Rd	6%	Ardmore Avenue	8%
Maysville Rd	5%	Coldwater Rd	11%	Lafayette St	10%	Airport Expressway	2%
Trier Rd	7%	Cook Rd	4%	Paulding Rd	7%	Jefferson Blvd/US 24	15%
Maplecrest Rd	12%	Coliseum Blvd	15%	Tillman Rd	7%	Illinois Rd/SR 14	11%
Lake Avenue	16%	Dupont Rd	11%	Decatur Rd	4%	Bluffton Rd	12%

5. If there are sidewalk gaps along the City's major roadways not listed above, that you feel need to be addressed, please identify those below.

Top Five (5) Roadways

- Reed Rd
- Parnell Avenue
- State Blvd
- Aboite Center Rd
- Liberty Mills Rd

6. Age Range:

Under 18	1%
18-39	22%
40-59	43%
60 & up	27%

7. Zip Codes:

Zip Codes	Total	%
46802	47	1.91%
46803	19	0.77%
46804	179	7.26%
46805	186	7.55%
46806	79	3.21%
46807	126	5.11%
46808	121	4.91%
46809	78	3.17%
46812	1	0.04%
46814	50	2.03%
46815	323	13.11%
46816	66	2.68%
46818	56	2.27%
46819	54	2.19%
46825	168	6.82%
46828	1	0.04%
46835	268	10.88%
46845	108	4.38%
46774	3	0.12%
33715	1	0.04%
46748	2	0.08%
46765	1	0.04%
46705	1	0.04%

Appendix D

The Walk Fort Wayne Plan - Goals, Policies, and Action Steps (Chapter 2 - Pedestrian Network & Chapter 4 - Legislation)

Special Note: The Walk Fort Wayne Plan was originally adopted in 2011. Passages from the Walk Fort Wayne Plan that are used in the PSAP will be updated as the Walk Fort Wayne Plan is updated in the future.

Walk Fort Wayne Plan

Chapter 2 - Pedestrian Network

Goal:

Provide the community with an interconnected pedestrian network along all major thoroughfares that is safe, accessible and comfortable for a diverse group of users.

Policies and Action Steps:

Policy 1:
Ensure pedestrian connectivity by utilizing the Pedestrian Connectivity Needs Map as part of the design process of all right-of-way construction or improvement projects.

Policy 2:
Focus planning and prioritization of new pedestrian facilities on segments of major thoroughfares that are closest to pedestrian destination areas according to the Pedestrian Connectivity Needs Map within this Plan.

Policy 3:
Ensure that pedestrian facilities, such as sidewalks and other pedestrian safety facilities, are considered integral components in the design and development of all public street improvement projects.

Action Step A:
Train City staff responsible for the review of City infrastructure projects, as well as staff issuing permits for private construction on the policies within this Plan.

Action Step B:
Stakeholders, such as representatives and staff from: City Planning, urban design, neighborhood leaders, forestry and parks, street lighting, traffic management/safety, and traffic engineering should be consulted at the scope-setting, design, and final construction plan phases of a project to assure project alignment with the goals and policies within this Plan.

Action Step C:
Include identified stakeholders in all planning and project review routings of Board of Works sidewalk, utility, and street and roadway projects to assure project alignment with the goals and policies within this Plan.

Policy 4:
Collaborate with public utility providers to determine the most appropriate locations for new pedestrian and utility infrastructure, and to coordinate and balance the design and construction of new pedestrian facilities with the cost of relocating existing utility infrastructure.

Policy 5:
Ensure that the design and construction of new transportation facilities anticipate and accommodate the future demand for pedestrian facilities (bridges, interchanges, intersections, etc.).

Policy 6:
Ensure that the minimum standards for sidewalk construction and location are consistently applied to all public street improvement projects.

Action Step A:
Work with the Board of Works staff to develop specific criteria for waivers of minimum standards to be adopted by the Board of Works. These may include areas with low pedestrian demand, natural physical barriers, such as rivers and streams, or railroad rights-of-way.

Policy 7:
New pedestrian facilities along urban-designed major thoroughfares (where there are no street trees) should maintain the City's standard of a 5' minimum buffer between the vehicle travel lane and the pedestrian facility. In areas with existing street trees or where new plantings are required or planned, appropriate construction methods to guide tree roots to avoid damage to adjacent infrastructure, or a wider 6' minimum buffer, should be used in compliance with standards established by the Division of Parks and Recreation.

Action Step A:
Include the Division of Parks and Recreation in all planning and project review routings of Board of Works sidewalk, utility, and street and roadway projects to support implementation of this Plan.

Action Step B:
Provide trees adjacent to sidewalks, curbs and streets with favorable soil conditions or other devices or techniques to encourage deep root growth that will be less likely to disturb adjacent pavements or infrastructure.

Policy 8:
Ensure that appropriate pedestrian safety facilities are incorporated within street improvement projects, and at all intersections along major thoroughfares. Mid-block crossings should be provided in high pedestrian demand areas and where vehicle and pedestrian conflicts are minimal.

Policy 9:
Pedestrian facilities should be coordinated with public transit facilities to ensure that transit stop locations are safe and accessible to all pedestrians.

Policy 10:
Encourage and facilitate the incorporation of appropriate public transit access facilities at existing and anticipated high use transit stop locations and at new large scale developments, as warranted.

Action Step A:
Coordinate with Department of Planning Services, Public Works, NIRCC and Citilink to identify high use transit stop locations to ensure that facilities are appropriately planned, designed and provided.

Policy 11:
Develop various funding strategies to build and improve new and existing pedestrian facilities.

Action Step A:
Ensure that this Plan's priority improvements are included within the City's Capital Improvement Program (CIP).

Action Step B:
Encourage and foster public/private funding partnerships to promote the implementation of the Walk Fort Wayne Plan.

Policy 12:
Encourage the community to pursue private, not-for-profit, philanthropic and governmental funding resources to assist with the implementation of this Plan.

Action Step A:
Encourage cooperative relationships between government, not-for-profit agencies, and the private sector to develop potential funding sources.

Policy 13:
Encourage the exploration and development of safe alternatives to traditional sidewalk development along non-urbanized major thoroughfares, such as wide shoulder lanes, in areas where there is low pedestrian demand and/or infrastructure limitations.

Action Step A:
Investigate best practices on how other communities have implemented and are using safe alternatives to traditional sidewalk development.

Walk Fort Wayne Plan

Chapter 4 - Legislation

Goal:

To encourage and support legislation and policy adoption that enables the implementation of the Walk Fort Wayne Plan.

Policies and Action Steps:

Policy 1:

Encourage the development of regulations to require the incorporation of pedestrian facilities and connectivity within and between new development projects, as well as along all adjacent major thoroughfares.

Action Step A:

Gather input from the community and area stakeholders, including residential and commercial developers, to review the applicable portions of Fort Wayne City Code and explore ways to ensure pedestrian facilities are constructed with new development.

Policy 2:

Develop and support adoption of a Complete Streets ordinance along with design standards that comply with Federal ADA standards, to ensure that all streets are built and maintained appropriately to accommodate pedestrians, bicyclists, motorists and transit users of all ages and abilities.

Action Step A:

Gather input from the community and area stakeholders, including residential and commercial developers, to assist in the development of a Complete Streets Policy.

Action Step B:

Coordinate with the Bike Fort Wayne Plan in the development and adoption of a Complete Streets ordinance.

Action Step C:

Investigate best practices on how other communities have developed and implemented a Complete Streets ordinance.

Policy 3:

Develop and adopt local criteria and guidelines for the installation and maintenance of pedestrian safety facilities, including appropriate traffic control devices, along the City's major thoroughfares where increased pedestrian safety is needed.

Action Step A:

Coordinate with Public Works, Department of Planning Services, Citilink, Fort Wayne Trails, Fort Wayne school systems, NIRCC and interest groups such as AARP and the Mayor's Senior Advisor Council to develop safe pedestrian facility standards and/or guidelines.

Action Step B:

Examine all existing marked crosswalk locations in the City and ensure alignment with developed standards and/or guidelines.

Action Step C:
Examine all intersections and appropriate locations along all major thoroughfares to ensure alignment with developed standards and/or guidelines. Examination of pedestrian safety facilities should start within the Pedestrian Generating Areas and public and private schools and work outward.

Appendix E

Allen County Streets with at least 2 Pedestrian Accidents from 2018-2020
and
Allen County Streets with more than 5 Pedestrian Accidents from 2009-2020

Street Name	Number of Pedestrian Crashes 2018-2020	Number of Injury Crashes 2018-2020	Number of Fatal Crashes 2018-2020
CLINTON ST	15	13	1
WASHINGTON BLVD	14	13	0
STATE BLVD	13	10	1
JEFFERSON BLVD	10	9	0
ANTHONY BLVD	9	6	1
COLISEUM BLVD	9	7	2
FAIRFIELD AVE	9	9	0
HANNA ST	7	6	1
PETTIT AVE	7	5	1
LAFAYETTE ST	6	5	1
MCKINNIE AVE	6	6	0
REED RD	6	5	0
WELLS ST	6	4	0
BOWSER AVE	5	5	0
BROADWAY	5	5	0
HOBSON RD	5	5	0
PONTIAC ST	5	4	0
CALHOUN ST	4	4	0
CREIGHTON AVE	4	4	0
FOX AVE	4	4	0
HOAGLAND AVE	4	3	0
SR 3	4	4	0
VANCE AVE	4	3	0
BAKER ST	3	1	1
BARR ST	3	3	0
HARRISON ST	3	2	1
LIMA RD	3	3	0
MAIN ST	3	2	0
MCKEE ST	3	3	0
MONROE ST	3	3	0
OXFORD ST	3	3	0
PARNELL AVE	3	2	0
RUDISILL BLVD	3	3	0
SPRING ST	3	3	0
ST JOE RD	3	2	0
SUPERIOR ST	3	3	0
TAYLOR ST	3	3	0
THIRD ST	3	1	0
WAYNE ST	3	3	0
ABBOTT ST	2	1	0
BERRY ST	2	2	0
CANTERBURY BLVD	2	1	0
COLDWATER RD	2	2	0
DEWALD ST	2	2	0
DUPONT RD	2	2	0
FULTON ST	2	2	0
GELLER ST	2	2	0
GETZ RD	2	2	0
GREEN RD	2	1	0
I 69	2	0	1
LILLIE ST	2	1	0
LUDWIG RD	2	2	0
NELSON ST	2	2	0
REED ST	2	2	0
SMITH ST	2	2	0
SOUTH PARK DR	2	2	0
SR 14	2	2	0
SR 930	2	1	0
ST JOE RIVER DR	2	1	0
STELLHORN RD	2	2	0
WALLACE ST	2	2	0
WEISSER PARK AVE	2	1	0

Street Name	Number of Pedestrian Crashes 2009-2020	Number of Injury Crashes 2009-2020	Number of Fatal Crashes 2009-2020
CLINTON ST	53	42	3
CALHOUN ST	49	44	0
STATE BLVD	47	38	2
WASHINGTON BLVD	46	42	0
ANTHONY BLVD	35	29	2
FAIRFIELD AVE	34	33	0
COLISEUM BLVD	30	22	6
LAFAYETTE ST	30	26	1
BROADWAY	28	23	1
JEFFERSON BLVD	24	21	0
PONTIAC ST	22	16	1
CREIGHTON AVE	21	18	0
HANNA ST	19	18	1
MAIN ST	19	18	0
MCKINNIE AVE	19	19	0
PETTIT AVE	18	16	1
WELLS ST	18	15	0
RUDISILL BLVD	15	14	0
SR 930	15	12	2
BARR ST	14	13	0
OXFORD ST	14	14	0
TAYLOR ST	14	14	0
BOWSER AVE	13	13	0
SUPERIOR ST	13	12	0
WAYNE ST	13	13	0
BERRY ST	12	11	0
BLUFFTON RD	12	8	0
COLDWATER RD	12	10	0
HARRISON ST	12	10	1
REED RD	12	10	1
SHERMAN BLVD	11	10	0
PARNELL AVE	10	8	0
REED ST	10	10	0
HOBSON RD	9	9	0
I 69	9	6	2
PAULDING RD	9	9	0
FOX AVE	8	8	0
LIMA RD	8	6	2
SMITH ST	8	8	0
TENNESSEE AVE	8	7	0
BROOKLYN AVE	7	5	0
EWING ST	7	7	0
GAYWOOD DR	7	7	0
HOME AVE	7	6	0
LAKE AVE	7	6	1
LUDWIG RD	7	5	0
OLIVER ST	7	6	0
SPRING ST	7	7	0
ST JOE RD	7	5	0
THIRD ST	7	4	0
WEBSTER ST	7	6	0
BROADWAY ST	6	6	0
COVINGTON RD	6	5	0
DUPONT RD	6	6	0
FOURTH ST	6	6	0
LINCOLN HWY E	6	6	0
MAPLECREST RD	6	5	1
MONROE ST	6	5	1
SOUTH PARK DR	6	6	0
SR 3	6	5	0
ST JOE BLVD	6	5	0
VANCE AVE	6	5	0
WASHINGTON CENTER RD	6	5	0

Appendix F

Pedestrian Safety Countermeasures from
PEDSAFE: The Pedestrian Safety Guide and Countermeasure Selection System
FHWA

PEDSAFE: The Pedestrian Safety Guide and Countermeasure Selection System

All of the following information is taken directly from PEDSAFE: The Pedestrian Safety Guide and Countermeasure Selection System located at the following website:

http://www.pedbikesafe.org/pedsafe/countermeasures.cfm

For additional information or reference information please visit the PEDSAFE website listed above. The following information is only provided as a partial reference to the information contained from the PEDSAFE website.

Along the Roadway:

Sidewalks, Walkways and Paved Shoulders:

Sidewalks and walkways are "pedestrian lanes" that provide people with space to travel within the public right-of-way that is separated from roadway vehicles. They provide places for children to walk, run, skate, ride bikes, and play. Sidewalks are associated with significant reductions in pedestrian collisions with motor vehicles. Such facilities also improve mobility for pedestrians and provide access for all types of pedestrian travel: to and from home, work, parks, schools, shopping areas, and transit stops. Walkways should be part of every new and renovated road facility and every effort should be made to retrofit streets that currently do not have sidewalks.

While sidewalks are typically made of concrete, less expensive walkways may be constructed of asphalt, crushed stone, or other materials if they are properly maintained and accessible (firm, stable, and slip-resistant). In more rural areas, in particular, a "side path" made of one of these materials may be suitable. In areas where a separated walkway is not feasible, a wide paved shoulder on a roadway can provide a place for pedestrians to safely walk.

Both the FHWA and the Institute of Transportation Engineers (ITE) recommend a minimum width of 5 feet for a sidewalk or walkway, which allows two people to pass comfortably or to walk side-by-side. The preferred width for paved shoulders is at least 6 feet.3 Wider sidewalks should be installed near schools, at transit stops, in downtown areas, or anywhere high concentrations of pedestrians exist. Sidewalks should be continuous along both sides of a street and sidewalks should be fully accessible to all pedestrians, including those in wheelchairs.

A buffer zone of 4 to 6 feet is desirable to separate pedestrians from the street. The buffer zone will vary according to the street type. In downtown or commercial districts, a street furniture zone is usually appropriate. Parked cars or bicycle lanes can provide an acceptable buffer zone. In more suburban or rural areas, a landscape strip is generally most suitable. Careful planning of sidewalks and walkways is important in a neighborhood or area in order to provide adequate safety and mobility. For example, there should be a flat sidewalk provided in areas where driveways slope to the roadway.

Street Furniture/Walking Improvements:

Sidewalks should be continuous and should be part of a system that provides access to goods, services, transit, and homes. Well-designed walking environments are enhanced by urban design elements and street furniture, such as benches, bus shelters, trash receptacles, and water fountains. Walking areas should be interesting for pedestrians, provide a secure environment, should be well lit, and have good sightlines.

Sidewalks can be categorized by four zones: curb, furniture, pedestrian, and frontage. The curb zone provides a barrier from the street and a transition to the street from the sidewalk. The furniture zone is where all items

that could potentially block pedestrian traffic should be placed. Poles, signposts, newspaper racks, and other obstacles that could block the path, obscure a driver or pedestrian's view, or become a tripping hazard should be placed in the furniture zone. Benches, water fountains, bicycle parking racks, and transit shelters should also be placed there. Another benefit of the furniture zone is that it provides a barrier between pedestrians and the street. The pedestrian zone is where pedestrians walk and should be at least 5 feet but preferably wider. Even wider pedestrian zones may be desirable in active areas with high volumes of pedestrian traffic. Lastly, the frontage zone provides a space between pedestrians and buildings. Pedestrians subconsciously move away from vertical faces, so the frontage zone is an important buffer area that prevents the pedestrian from feeling confined.

Such areas must also be properly maintained and kept clear of debris, overgrown landscaping, tripping hazards, or areas where water accumulates. Snow removal is important for maintaining pedestrian safety and mobility. In most areas, local ordinances give property owners the responsibility of removing snow within 12 to 48 hours after a storm. More information on the requirements for street furniture can be found in the Draft Guidelines for Accessible Public Rights of Way and in the 2001 FHWA Guide by Kirschbaum.

Along the Roadway:

Curb Ramps:

Curb ramps provide access between the sidewalk and roadway for people using wheelchairs, strollers, walkers, crutches, handcarts, bicycles, or who have mobility restrictions that make it difficult to step up and down high curbs. Curb ramps must be installed at all intersections and midblock locations where there are pedestrian crossings, as mandated by federal legislation (1973 Rehabilitation Act and ADA 1990). Curb ramps must have a slope of no more than 1:12 (must not exceed 1 in/ft or a maximum grade of 8.33 percent) and a maximum slope on any side flares of 1:10. More information on the specifications for curb ramps can be found in the Proposed Guidelines for Accessible Public Rights of Way.

Separate curb ramps for each crosswalk at an intersection should be provided rather than a single ramp at a corner for both crosswalks. The separate curb ramps improve orientation for visually impaired pedestrians by directing them toward the correct crosswalk. Similarly, tactile warnings alert pedestrians to the sidewalk and street edge. All newly constructed and altered roadway projects must include curb ramps. In addition, all agencies should upgrade existing facilities. One way to start this process is to conduct audits of the pedestrian facilities to make sure transit facilities, schools, public buildings, and parks are accessible to pedestrians who use wheelchairs.

While curb ramps are needed for use on all types of streets, priority locations are located in downtown areas and on streets near transit stops, schools, parks, medical facilities, shopping areas, and residences with people who use wheelchairs.

Marked Crosswalks:

Marked crosswalks indicate optimal or preferred locations for pedestrians to cross and help designate right-of-way for motorists to yield to pedestrians. Pedestrians are sensitive to out-of-the-way travel, and reasonable accommodation should be made to make crossings both convenient and safe at locations with adequate visibility. Various crosswalk marking patterns are given in the Manual on Uniform Traffic Control Devices (MUTCD),8 including transverse lines, ladder, and continental markings. However, high-visibility crosswalks are preferred over parallel line crosswalks.

Marked crosswalks are desirable at some high pedestrian volume locations to guide pedestrians along a preferred walking path. Crosswalks are often installed at signalized intersections and other selected locations with appropriate levels of pedestrian and vehicle traffic. Crosswalks should be installed in conjunction with

other enhancements that physically reinforce crosswalks and reduce vehicle speeds. Recommended guidelines and priorities for crosswalk installation at uncontrolled locations are given in in the Resources section. These guidelines are based on a major study of 1,000 marked crosswalks and 1,000 unmarked crossings in 30 U.S. cities.

A marked crosswalk alone is typically not enough for multilane roadway crossings where annual average daily traffic is in excess of 10,000 vehicles. More substantial crossing improvements are also needed to prevent an increase in pedestrian crash potential. More substantial treatments include the refuge island, PHB, and RRFB.

Curb Extensions:
Curb extensions—also known as bulb-outs or neckdowns—extend the sidewalk or curb line out into the parking lane and reduce the effective street width. Curb extensions must not extend into travel lanes and should not extend across bicycle lanes. This countermeasure improves pedestrian crossings by reducing the pedestrian crossing distance, reducing the time that pedestrians are in the street, visually and physically narrowing the roadway, and improving the ability of pedestrians and motorists to see each other. Curb extensions also create space for the addition of a curb ramp.

Motorists are encouraged to travel more slowly at intersections or midblock locations with curb extensions, as the reduced street width sends a visual cue to motorists. Turning speeds at intersections can be reduced with curb extensions (curb radii should be as tight as is practicable). Additionally, curb extensions placed at an intersection essentially prevent motorists from parking in or too close to a crosswalk and from blocking a curb ramp or crosswalk. Motor vehicles parked too close to corners present a threat to pedestrian safety, since they block sightlines, obscure visibility of pedestrians and other vehicles, and make turning particularly difficult for emergency vehicles and trucks.

Crossing Islands:
A crossing island is a median with a refuge area that is intended to help protect pedestrians crossing a multilane road. This countermeasure is sometimes referred to as a pedestrian refuge island. Crossing islands should be considered as a supplement to the crosswalk. They are appropriate at both uncontrolled locations (i.e., where no traffic signals or stop signs exist) and signalized crossings. When installed at a midblock crossing, the island should be supplemented with a marked, high-visibility crosswalk.

The presence of a pedestrian refuge island at a midblock location or intersection allows pedestrians to focus on one direction of traffic at a time as they cross and provides space to wait for an adequate gap in oncoming traffic before finishing the second phase of a crossing. Crossing islands are highly desirable for midblock pedestrian crossings on roads with four or more travel lanes, especially where speed limits are 35 mph or greater and/or where annual average daily traffic (AADT) is 9,000 or higher. They are also a candidate treatment option for uncontrolled pedestrian crossings on 3-lane or 2-lane roads that have high vehicle speeds or volumes.

The factors contributing to pedestrian safety include reduced conflicts, reduced vehicle speeds approaching the island (when the approach is designed to influence driver behavior), greater attention called to the pedestrian crossing, opportunities for additional signs in the middle of the road, and reduced exposure time for pedestrians.

Raised Pedestrian Crossings:
Raised crosswalks or raised intersections are ramped speed tables spanning the entire width of the roadway or intersection. Raised crosswalks are often placed at midblock crossing locations and only the width of a crosswalk. The crosswalk is demarcated with paint and/or special paving materials, and curb ramps are eliminated because the pedestrians cross the road the same level as the sidewalk. Raised crossings make the pedestrian

more prominent in the driver's field of vision. Additionally, approach ramps may reduce vehicle speeds and improve motorist yielding. This countermeasure can reduce pedestrian crashes by 45%.

The crosswalk table is typically at least 10 feet wide and designed to allow the front and rear wheels of a passenger vehicle to be on top of the table at the same time. Detectable warnings (truncated domes) and curb ramps are installed at the street edge for pedestrians with impaired vision. In addition to their use on local and collector streets, raised crosswalks can be installed in campus settings, shopping centers, and pick-up/drop-off zones (e.g., airports, schools, transit centers). On one street in Cambridge, MA, motorists yielding to pedestrians crossing at the raised devices increased from approximately 10 percent before installation of the project to 55 percent after installation.

Lighting and Illumination:
Appropriate quality and placement of lighting can enhance an environment and increase comfort and safety. Pedestrians may assume that their ability to see oncoming headlights means motorists can see them at night; however, without sufficient lighting, motorists may not be able to see pedestrians in time to stop.

A single luminaire placed directly over the crosswalk does not adequately illuminate the pedestrian for the approaching motorist. It is best to place streetlights along both sides of arterial streets and provide a consistent level of lighting along a roadway. This includes lighting pedestrian crosswalks and approaches to the crosswalks. A study conducted by the Virginia Tech Transportation Institute found that 20 lx (a unit of illuminance) was necessary for motorists to detect a pedestrian in the crosswalk. To achieve 20 lx, the luminaire should be placed 10 feet from the crosswalk, in between the approaching vehicles and the crosswalk. At intersections, the luminaires should also be placed before the crosswalk on the approach into the intersection. This differs from traditional placement of luminaires over the actual intersection.13

In commercial areas or in downtown areas, specialty pedestrian-level lighting may be placed over the sidewalks to improve pedestrian comfort, security, and safety. Well-lit pedestrian areas make people walking through the area feel safer. Streetlights and building lights can enhance the ambiance of the area and the visibility of pedestrians in commercial areas with nighttime pedestrian activity. Nighttime pedestrian crossing areas may be supplemented with brighter or additional lighting.

Parking Restrictions (at Crossing Locations):
Parking restrictions help improve pedestrian and motorist sightlines through an intersection and can include the removal of parking space markings and/or installation of new "parking prohibition" pavement markings, curb paint, or signage. Removing a parking space on the approach into an intersection may help pedestrians to safely cross the street by providing them with a clearer view of oncoming vehicles. Removing a parking space also frees up roadway space for other uses.

Generally, vehicles should not be parked within at least 20 feet of an intersection and parking restrictions should consider adequate sightlines for motorists and pedestrians to be able to see and react to each other. The minimum setback is 20 feet in advance of the crosswalk where speeds are 25 mph or less, and 30 feet where speeds are between 26 and 35 mph.

However, it may also be important to provide physical roadway measures to prevent motorists from parking on the sidewalk or in areas intended for pedestrians to walk. Curb extensions improve sightlines and shorten the distance pedestrians need to cross a roadway.

Pedestrian Overpasses/Underpasses:
Pedestrian overpasses and underpasses allow for the uninterrupted flow of pedestrian movement separate

from vehicle traffic. However, they should be a measure of last resort, and it is usually more appropriate to use traffic-calming measures or install a pedestrian-activated signal that is accessible to all pedestrians because overpasses and underpasses are costly, visually intrusive, and poorly utilized when a more direct at-grade crossing is possible.

Overpasses and underpasses must accommodate all persons, as required by the ADA. More information on the specifications for accessing overpasses and underpasses can be found in the Proposed Guidelines for Accessible Public Rights of Way.5 These measures include ramps or elevators. Extensive ramping accommodates wheelchairs and bicyclists, but results in long crossing distances and steep slopes that discourage use.

Studies have shown that many pedestrians will not use an overpass or underpass if they can cross at street level in about the same amount of time.17 Overpasses work best when the topography allows for a structure without ramps, such as an overpass over a sunken highway. Underpasses work best when designed to feel open and accessible. Underpasses are significantly less expensive when built as part of a construction or reconstruction project and generally offer gentler grade changes than overpasses. Grade separation is most feasible and appropriate in extreme cases where pedestrians must cross roadways such as freeways and high-speed, high-volume arterials.

Entrances and exits to overpasses and underpasses should be clearly visible to encourage pedestrian use. The AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities recommends that pedestrian overpasses be at least 8 feet wide. The width should be increased if the sidewalk leading up to the overpass is wider. If the overpass also accommodates bicyclists, the width should be at least 14 ft. Depending on the length of the overpass, it might be necessary to increase its width in order to counteract any visual perceptions of narrowness.2 Similar guidelines apply to underpasses. Minimal widths should be between 14 and 16 ft, but underpass width should be increased if the underpass is longer than 60 ft.

Automated Pedestrian Detection:

Automated pedestrian detection devices are able to sense when a pedestrian is waiting at a crosswalk and automatically send a signal to switch to a pedestrian WALK phase. Some automated pedestrian detection devices are also able to determine whether a pedestrian needs more time to cross the roadway and will lengthen the crossing interval to accommodate the slower pedestrian. Automated pedestrian detection devices reduce the percentage of pedestrians who cross roadways at inappropriate times, such as when the DON'T WALK signal is visible.

There are generally two types of pedestrian detection technology: microwave and infrared. A delay can be built into either of the devices so that the Walk signal is called only if the pedestrian stays within the detection zone for a certain amount of time. The delay helps to prevent pedestrians who walk by the detection zone from accidentally activating the WALK signal.

Automated pedestrian detection devices called PUFFIN (Pedestrian User-Friendly Intelligent) crossings have been in use in the United Kingdom for several years. They use an infrared detector or pressure-sensitive mat to sense pedestrians waiting for a crosswalk signal. These devices also notice if a pedestrian leaves the area and can cancel the pedestrian walk signal, if necessary. If a pedestrian takes longer than the allotted amount of time to cross the crosswalk, the PUFFIN signal is able to lengthen the WALK signal. PUFFIN crossings reduce the waiting times for pedestrians and motorists by ensuring that no signal is unnecessarily short or long.

Leading Pedestrian Interval:

LPIs can be programmed into traffic signals to minimize conflicts between pedestrians crossing a roadway and left or right turning vehicles. LPIs give the pedestrian the WALK signal 3-7 seconds before the motorists are

allowed to proceed through the intersection.

By giving pedestrians a head start, it is less likely that there will be conflict between pedestrians and turning vehicles. LPIs increase the percentage of motorists who yield the right of way to pedestrians because pedestrians are in the crosswalk by the time the traffic signal turns green for parallel vehicle movements.

Advance Yield/Stop Lines:
Advance yield/stop line include the stop bar or "sharks teeth" yield markings placed 20 to 50 feet in advance of a marked crosswalk to indicate where vehicles are required to stop or yield in compliance with the accompanying "STOP Here for Pedestrians" or "YIELD Here to Pedestrians" (signs R1-6, R1-6a, R1-9, and R1-9a). This countermeasure can greatly reduce the likelihood of a multiple-threat crash at unsignalized midblock crossings. The multiple threat crash occurs at crosswalks on multilane roadways, and this occurs when a driver stops too close to the crosswalk and lets a pedestrian cross, masking visibility of the adjacent travel lane. This situation can result in a high-speed crash, which usually leads to fatalities or very severe injuries8 to allow for better visibility.

This countermeasure discourages drivers from stopping too close to crosswalks and blocking other drivers' views of pedestrians and pedestrians' views of vehicles. Pedestrians can see if a vehicle is stopping or not stopping and can take evasive action. Studies have found that advance yield markings at midblock crossings can be particularly useful when combined with signs and beacons, such as the Pedestrian Hybrid Beacon or Rectangular Rapid-Flashing Beacon (RRFB). One study found that use of a "sign alone reduced conflicts between drivers and pedestrians by 67 percent, and with the addition of an advanced stop or yield line, this type of conflict was reduced by 90 percent compared to baseline levels."

Transit:
Transit Stop Improvements:
Transit stops should be highly visible locations that pedestrians of all abilities can reach easily by means of accessible travel routes. The transit stop location should be fully accessible to pedestrians in wheelchairs, should have paved connections to sidewalks where landscape buffers exist, and should not block pedestrian travel on the sidewalk. Adequate room should exist to operate wheelchair lifts. Additional information on making bus stops accessible can be found in Chapter 3 of Accessible Rights-of-Way: A Design Guide. It is desirable to provide a continuous minimum 8 feet wide area to match the length of the longest bus in fleet, or at least the distance between the front and rear bus doors. A larger pad area, additional sidewalk capacity, or a bus bulb should be considered in areas with higher pedestrian volumes using the sidewalk and high transit use.

Other treatments that increase the comfort of transit stops include sufficient lighting, sheltered seating and lean bars, trash receptacles, and transit route information. Increasingly, bar or Quick Response (QR) codes at transit stops allow patrons with camera phones to obtain the latest schedule information including the arrival time of the next bus or train.

Access to Transit:
Bus stops should be highly visible locations that pedestrians can reach easily by means of accessible travel routes. Access to the bus stop via sidewalk connections from an adjacent intersection, sidewalk, or nearest land use should be as direct as possible. To accommodate wheelchairs, sidewalk connections should be a minimum of 5 feet wide (preferably, 6 feet wide) and equipped with wheelchair ramps at all street crossings. Other crossing improvements within the vicinity of transit stops may include marked crosswalks and pedestrian signals at intersections. In areas with limited or no sidewalk network installation of a sidewalk connection from the adjacent intersection to the bus stop is one way to achieve greater patron access to the bus stop.

It is often necessary for pedestrians to cross roadways when traveling to and from transit stops. Proper placement of bus stops is a key component of user safety. Bus stops should be located at intervals that are convenient for passengers in order to minimize crossing of the street at unmarked mid-block locations (especially on multi-lane roadways). Bus stops should be located at intersections wherever possible because intersections are generally more convenient for passengers intercepting other transit connections, accessing crosswalks, and connecting to pedestrian routes. At intersections, far-side placement is generally preferred; however, location selection should be done on a site-by-site basis. Placing bus stops on the near side of intersections or crosswalks may block the pedestrians' view of approaching traffic, and approaching motorists may be unable to stop in time when a pedestrian steps from in front of a stopped bus to cross vehicle travel lanes. Advantages of locating stops on the far-side of an intersection include encouraging pedestrians to cross the street behind the bus where they are more visible to approaching traffic, reduced delay for buses, and minimizing conflicts between buses and right turning motor vehicles.

Where bus stops are located mid-block and intersections are spaced greater than 800 to 1,000 feet, a mid-block crossing should be considered in order to provide more convenient transit access and reduce the number of transit-riding pedestrians that are likely to cross the street at unmarked mid-block locations. Where a signal is not warranted, pedestrian crossings near transit stops should incorporate other treatments such as crossing islands, high visibility crosswalks, curb extensions, active warning signals, and warning signage. Crosswalks at mid-block transit stops should be placed behind the bus stop so pedestrians cross behind the bus where they can see approaching traffic and approaching motorist can see them. This placement also enables the bus driver to pull away without endangering pedestrians. Bus stops should be set forward a minimum of 5 feet from crosswalks. Where feasible, 10-feet is preferred. More details on accommodating pedestrians with respect to transit are given in the FHWA Transit Guide.

Bus Bulb Outs:

Bus bulbs allow buses to stop in-lane thereby eliminating the need to re-enter the traffic flow. This increases bus reliability since the bus driver no longer needs to wait for a gap in traffic; and it increases safety by reducing the potential for conflict when entering the traffic flow. Additionally, where it is not possible to provide a pad or sidewalk of sufficient width for accommodating waiting passengers and passing pedestrians, bus bulb outs (i.e. elongated curb extensions) can provide additional space for passengers to board and alight transit vehicles without interfering with sidewalk flow. The bulb out should be long enough to allow passengers to board and alight at all doors of the bus. Bus bulb outs can also have positive traffic calming effects by narrowing the roadway, and when placed at intersections, can be designed with smaller curb radii that force right-turning vehicles to reduce speed. When coupled with a pedestrian crossing, bus bulb outs, like curb extensions, also reduce pedestrian exposure by shortening the crossing distance. Bulb outs also make pedestrians who are about to enter the crosswalk more visible to approaching traffic by putting them out beyond objects like parked cars or street trees, which may obstruct driver visibility.

Roadway Design:

Bicycle Lanes:

Bicycle facilities provide a shared or exclusive space to indicate where bicyclists can predictably travel along streets. Shared bicycle and motor vehicle travel lanes, as well as bicycle lanes, are typically designated by striping, symbols, and/or signage. Physically separated facilities such as cycle tracks (facilities for bicycle use only) or a shared use path for pedestrians and bicyclists are a great way to encourage more bicycling and often follow former railroad rights-of-way or may be desirable as sidepaths along high-speed, high-volume roads. Design and countermeasure details for bicyclist travel are provided in the AASHTO Bicycle Design Guide, the BIKESAFE Guide, the FHWA MUTCD, and the NACTO Guide.

Lane Narrowing:
Lane narrowing can be achieved in several different ways depending on the type and scope of a project. During all projects there are opportunities to reduce lane widths to the recommended minimums (See AASHTO Greenbook for further information):
• 9 feet lanes on rural roadways
• 10 feet for most vehicular travel lanes
• 10 feet for turn lanes
• 11 feet for lanes to accommodate large volumes of trucks, buses, or larger vehicles (typically where volumes of large vehicles are greater than 8 percent)

With the additional space created from narrowing travel lanes, space can be redistributed for the following uses:
• Bicycle lanes or cycle tracks, parking lanes, or transit lanes
• Widened sidewalks, landscaped buffers with street trees, and curb extensions at crossings where on-street parking is present

Lane Reduction (Road Diet):
Lane reductions and road diets can decrease the lane crossing distance and reduce vehicle speeds. Multilane roads can take longer for pedestrians to cross and vehicle speeds may be high. A typical road diet converts an existing four-lane, undivided roadway to two through lanes and a center, two-way left turn lane (TWLTL). This design allows left-turning drivers to exit the traffic stream while waiting for a gap to complete their turn and frees up space that can be reallocated to other uses, including:

• Pedestrian refuge island
• Crosswalk visibility enhancements, such as curb extensions
• On-street parking, with parking restrictions on crosswalk approaches
• Widened sidewalks and landscaped buffers
• Bicycle lane and/or transit lanes

There are many other opportunities to perform road diets, particularly on roadways with wider cross sections, one-way streets (which may have excess capacity), and although not as common, where volumes are low a three-lane road (one lane in each direction with a TWLTL) can be converted to two. Road diets are often supplemented with painted, textured, or raised center islands.

Driveway Improvements:
Several driveway design characteristics may cause safety and access problems for pedestrians, including excessively wide and/or sloped driveways, driveways with large turning radii, multiple adjacent driveways, driveways that are not well defined, and driveways where motorist attention is focused on finding a gap in congested traffic.

Examples of driveway improvements include narrowing driveways, tightening turning radii, and improving driveway definition. Smaller driveway radii of 15 to 20 feet are most compatible pedestrian movements because motorists have to slow down to complete the turn. However, on-street parking and bike lanes can increase the effective driveway radius, so care should be taken to balance vehicle and pedestrian safety. Closing (consolidating) driveways or converting driveways to right-in-right-out are additional design strategies that may be part of a larger access management strategy (see Driveway Access).

When driveways cross sidewalks, the sidewalk should be clearly delineated across the driveway (e.g. if the sidewalk is composed of concrete, the concrete surface treatment should be continuous across the driveway)

to make it clear to motorists that they must watch for pedestrians. Additionally, it is necessary to maintain a sidewalk level across the driveway with no more than 2 percent cross slope in order to safely accommodate pedestrians in wheelchairs and other mobility devices and to comply with ADA standards. Refer to Chapter 5 in Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide for further guidance.5 For narrow curbside sidewalks the sidewalk should be wrapped around the driveway apron as a means to maintain a level sidewalk surface. If this does nOt work due to a lack of right-of-way, it may be necessary to lower the sidewalk to the driveway level (still delineate the driveway). It is also important to minimize large signs and bushes at driveways to improve the visibility between motorists and pedestrians. In some communities it is not uncommon for parking areas, placed between the roadway and buildings, to have continuous or poorly defined driveways, which increase conflicts between pedestrians and vehicles and create uncomfortable walking environments. Existing driveways that are poorly defined, and are not likely to be reconstructed in the foreseeable future, may be improved using paint to define driveway flares and wheel stops, extruded curb, planters or railings in areas not intended for vehicle ingress/egress and to provide visual and physical separation between the sidewalk and parking area.

As a general rule, driveways should be designed to look like driveways, not roadway intersections. However, in locations where a driveway must function as part of an intersection, it should be designed with pedestrian safety features such as crosswalks, small corner radii, and pedestrian signal heads if signalized. Design guidance is available from several other sources.

Raised medians:
Raised medians are curbed sections that typically occupy the center of a roadway. They can facilitate pedestrian crossings by providing a crossing area that is physically separated from the automobile path of travel, reducing pedestrian crossing distances, and enabling pedestrians to focus on one direction of traffic at a time when crossing the street. Raised medians can be especially helpful for pedestrians who are unable to judge distances accurately or who have difficulty completing wide roadway crossings. They can also improve the visibility of crossing pedestrians to motorists by putting them in middle of the roadway and providing space for lighting to illuminate the crossing.

Trees and other landscaping elements can be added to raised medians as long as they do not restrict visibility. These elements can help change the character of a street and reduce speeds. Raised medians can also improve motorist safety when they replace two-way center turn lanes; however, desired turning movements need to be carefully studied and provided where necessary so that motorists are not forced to travel on inappropriate routes, such as residential streets, or make unsafe U-turns.

Continuous raised medians are not always appropriate. In some cases, separating opposing traffic flow and eliminating left-turn friction can increase traffic speeds by decreasing the perceived friction of the roadway. Raised medians may also take up space that can be better used for wider sidewalks, bicycle lanes, landscaped buffer strips, or on-street parking, and may cause problems for emergency vehicles. In some environments, raised medians can be constructed in sections, creating an intermittent rather than continuous raised median. Another good alternative device for two-, three- or four-lane roads is the crossing island, which provides a crossing landing for pedestrians and, in some designs, aids in decreasing vehicle speeds.

Raised medians are most useful on high-volume, high-speed roads, and they should be designed to provide tactile cues for pedestrians with visual restrictions to indicate the border between the pedestrian refuge area and the motorized vehicle roadway. Examples of designs demonstrating a range of quality for raised median crossings can be found in Chapter 8 of Designing Sidewalks and Trails for Access: Part II of II: Best Practices Design Guide.

One-way/Two-way Street Conversions:

Converting a one-way street to a two-way street is an increasingly popular way to manage traffic patterns, improve access, and change the character of an neighborhood from being a "pass-through" to a "destination" for motorists. Converting a one-way street to a two-way street can also help reduce motor vehicle speeds and vehicle miles traveled (i.e. less need to circumnavigate multiple streets to reach destinations in dense mixture of land uses) and provide improved conditions and access for bicyclists.

In terms of pedestrian safety, there are benefits of both one-way and two-way streets, so the decision to convert a two-way street to one-way (or vice versa) is context sensitive. Studies have shown that converting two-way streets to one-way generally results in fewer crashes involving pedestrians because there are fewer turning movements. However, one-way streets tend to encourage higher motor vehicle speeds, and intersections involving one-way streets may be more confusing for some roadway users, especially non-local residents and child pedestrians. In addition, left-turning motor vehicle drivers may be less cautious when turning from one-way streets and less inclined to see crossing pedestrians due to poorer sight lines. Two-way streets may reduce vehicle speeds due to increased turning movements and to increased perceived friction along the roadway. In addition, many one-way streets are multi-lane, which creates a multiple threat condition for pedestrians crossing the road. Converting a multi-lane one-way street to a two-lane two-way eliminates this safety issue.

If a street is converted to one-way, it should be evaluated to see if additional changes are should be made. Potential changes include lane diets, road diets, curb extensions, turning radius reductions, and signal timing that discourages high vehicle speeds. Also, traffic circulation in the surrounding area must be carefully considered before converting streets to one-way.

Improved Right-Turn Slip-Lane Design:

Well-designed right-turn slip lanes include several key features:

• The island (sometimes referred to as the "pork chop") that forms the channelized right-turn lane is raised and large enough to accommodate waiting pedestrians and accessibility features, such as curb ramps or cut-throughs).

• As they enter the right-turn lane, drivers can easily see pedestrians crossing or about to cross the right-turn lane, and have enough space to stop completely once a pedestrian is spotted.

• The right-turn lane is as narrow as possible while still enabling the design vehicle to make the turn. Edge lines and with cross-hatching can be used to narrow the perceived width of the lane while still accommodating larger vehicles.

• The crosswalk is oriented at a 90 degree angle to the right-turn lane to optimize sight lines, and is positioned one car length back from the intersecting roadway to allow drivers to move forward and wait for a gap in oncoming traffic after clearing the crosswalk.

• The visibility of the crosswalk to drivers is further enhanced through the use of high-visibility crosswalk striping, flashing beacons, and/or signage. Raised crosswalks may also be used to force motorists to slow down.

• The angle at which the right-turn lane intersects the cross street is relatively low (e.g., closer to 110 percent, rather than 140 percent). This feature lowers motor vehicle speeds and makes it easier for drivers to see oncoming traffic.

• Good design can be recognized by the long "tail" on the island (i.e. long tail means slower turning speed; short tail means faster turning speed – see illustrations below.

• Acceleration lanes are not provided where the right-turn lane intersects the cross street. Acceleration lanes enable drivers to navigate the channelized right-turn lane at higher speeds than would be possible if drivers had to yield to cross street traffic.

• The needs of visually impaired pedestrians are considered as part of the design. For example, rumble strips placed in the right-turn lane can help visually impaired pedestrians judge whether drivers are yielding as they

approach the crosswalk.
• Active warning beacons may be desirable in locations where there are high traffic volumes and vehicle speeds.

Intersection Design:

Roundabouts:

Unlike traditional signalized and stop-controlled intersections, vehicles generally flow and merge through roundabouts without having to stop; therefore roundabouts should be designed for slow speeds and geometry that facilitates motor vehicles yielding to pedestrians and bicyclists. ADA compliant pedestrian crosswalks and curb ramps should be provided at least 20 feet from the entry of the roundabout to give room for a vehicle to stop prior to the crosswalk but outside of the circulatory roadway. Channelization islands at the approaches can help slow vehicles and allow pedestrians to cross one direction of travel at a time. At-grade pedestrian cut-throughs should be provided at channelization islands with ADA compliant detectable warning strips.

Roundabouts present unique challenges for individuals with visual disabilities. Because traffic is governed by yield-control entry, as opposed to stop or signal control, pedestrians with visual disabilities must not only decide when to cross the road, but they also have to determine where and which direction to cross. Wayfinding and gap selection cues need to be adequately addressed in roundabout designs. Accessible pedestrian signals should also be considered for all crosswalks at single lane roundabouts, and are required for multilane roundabouts in accordance with the draft Public Right-of-Way Accessibility Guidelines (PROWAG).1

As stated in NCHRP 672, in order to better provide for visually-impaired pedestrians on multi-lane roundabouts, measures such as raised crossings or the pedestrian hybrid beacon should be considered. In general, multilane roundabouts are not recommended in areas with high levels of pedestrian and bicycle activity because of safety concerns of multiple threat crashes for pedestrians, especially those with visual impairments, and bicyclists. General guidance on roundabout design and control are given in several sources.

Modified T-Intersections:

A modified T-intersection is designed so that vehicles traveling straight along the top of the intersection are deflected slightly and forced to slow down using curb extensions, medians, or mini traffic circles (see diagram). Such intersection treatments may also be accompanied by signage and/or pavement markings to warn motorists of the treatment and to slow down. Modified T-intersections can also help to discourage cut-through traffic on local neighborhood streets by restricting certain traffic movements. Modified T-intersections should always provide bicycle and pedestrian access.

Intersection Median Barriers:

Median barriers, also called median diverters or island diverters, are raised islands located in the center of an intersection where a minor (local) street intersects a major (main) street; they are used to restrict left turn and cross-street movements of motor vehicle traffic at the minor street to reduce cut-through routes in local neighborhoods. Median islands should always provide bicycle and pedestrian access. Appropriate regulatory and warning signage should be provided to alert users of changes in the roadway.

Curb Radius Reduction:

Curb radii designs are determined based on the design vehicle of the roadway (i.e. the types of vehicles using the roadway, such as buses, tractor trailer trucks, fire trucks, etc.). The most important factor for design is using the “effective radius” rather than the “actual radius” to accommodate the chosen design vehicle. Actual curb radius refers to the curvature along the curb line; effective radius refers to the curvature vehicles follow when turning. Larger effective curb radii can be achieved by adding on-street parking, bicycle lanes, or striping advance stop lines on the destination street of multilane roadways.

The smallest practical actual curb radii should be chosen based on how the effective curb radius accommodates the design vehicle. An actual curb radius of 5 to 10 feet should be used wherever possible. An appropriate effective radius for urban streets with high volumes of pedestrians is 15 to 20 ft. For arterial streets with a substantial volume of turning buses and/or trucks, an appropriate effective curb radius is about 25 to 30 ft. Typically the maximum desired effective curb radius is 35 feet for large vehicles. Tighter turning radii are particularly important where streets intersect at a skew. Corners characterized by an acute angle may require a slightly larger radius to accommodate larger vehicles; corners with an obtuse angle should have the smallest feasible radius to prevent high-speed turns.

Modify Skewed Intersections:
Strategies for improving pedestrian safety at existing skewed intersection crossings include providing high visibility marked crosswalks and adding medians or channelization islands to reduce crossing distance. In some cases, it may be possible to reconfigure the intersection by straightening the skewed approach thereby reducing the speed of turning vehicles by creating a tighter turning radius, and reducing the crossing distance for pedestrians. Intersection guide strips for pedestrians with restricted vision may also be considered in some situations. Moving crosswalks back from the intersection to shorten crossing distances is generally not a preferred strategy because it is counter to pedestrian or motorist expectations, and it can create problems for visually impaired pedestrians.

When skewed intersections are unavoidable, the intersection should be designed so that the angle between intersecting streets is as close to 90 degrees as possible. In addition, if major alterations are being done to an existing skewed intersection, transportation agencies should consider whether it is possible to reconfigure the intersection so that the crossings are more perpendicular.

Pedestrian Accomodations at Complex Interchanges:
There are a variety of pedestrian facilities that should be considered in interchange areas in order to allow pedestrians to walk along streets and/or cross streets at or near interchange ramps. Providing sidewalks or walkways is needed to provide a space for pedestrians to walk parallel with motor-vehicle traffic without having to walk in the travel lane. Where pedestrians need to cross near interchange ramps, it is important to apply some of the same principles that have been discussed earlier for safe intersection design; that is, to the extent practical, intersection crossings should be kept relatively short, with turning radii balanced to meet the needs of pedestrians as well as turning trucks, and raised median islands may be needed.

Signal treatments (traffic and pedestrian signals) are often appropriate at the intersection of ramps on the surface streets, and these can be timed to facilitate safe pedestrian travel, as well. Free-flow vehicle lanes (right-turn slip lanes) should be designed to be pedestrian friendly, in terms of roadway approach angle, marked crosswalk and narrow turn lane. Features should also be provided to accommodate pedestrians with various typed of visual and mobility disabilities. Curb ramps, with tactile warning strips, accessible pedestrian signals, walkways clear of barriers and clutter, well-designed medians are examples of such measures. Also, roadway lighting may be essential for creating a safer pedestrian environment near interchange areas.

The design of the intersections, pedestrian features, and crossing movements will vary widely for different types of interchanges. Some of the types of interchanges which are currently in use include:
• Diamond interchanges
• Cloverleaf interchanges
• Single-point, urban interchange (SPUI)
• Superstreet interchange
• Double divergent diamond interchange
Some of the features of each type of newer interchange types and their measures for accommodating pedes-

trians are described in the FHWA report Alternative Intersections/Interchanges: Informational Report (AIIR).

Traffic Calming:

Temporary Installations for Traffic Calming:

In communities trying traffic calming for the first time, it may be useful to lay out a new design with cones or temporary markings to test it. This provides emergency vehicle drivers, residents, and others with an opportunity to test the design to ensure that they are comfortable with it. Some communities have constructed elaborate temporary devices with concrete or plastic ("jersey") barriers. These can instill a negative reaction in the community due to their unattractive appearance and they do not generally have any significant benefits over the simpler test devices. Another option is to install more aesthetic test devices, such as painted flexible curbs that are bolted into the pavement and can easily be adjusted or removed.

Chokers:

Chokers are curb extensions that narrow a street by widening the sidewalks or planting strips, effectively creating a pinch point along the street. Chokers can be created by bringing both curbs in, or they can be done by more dramatically widening one side at a midblock location. They can also be used at intersections, creating a gateway effect when entering a street.

Chokers can have a dramatic effect by reducing a two-lane street to one lane at the choker point (or two narrow lanes), requiring motorists to yield to each other or slow down. In order for this to function effectively, the width of the travelway cannot be wide enough for two cars to pass: 16 feet is generally effective (and will allow emergency vehicles to pass unimpeded). This kind of design is usually only appropriate for low-volume, low-speed streets.

Chicane:

Chicanes create a horizontal diversion of traffic and can be gentler or more restrictive depending on the design.

Diverting the Path of Travel

Shifting a travel lane has an effect on speeds as long as the taper is not so gradual that motorists can maintain speeds. For traffic calming, the taper lengths may be as much as half of what is suggested in traditional highway engineering. The taper lengths should reflect the desired speed which should be posted prior to the chicane.

Shifts in travelways can be created by shifting parking from one side to the other (if there is only space for one side of parking) or by building landscaped islands (islands can also effectively supplement the parking shift).

Diversion Plus Lane Restriction (Angled Slow Points)

Diverting the path of travel plus restricting the lanes (as described under "chokers") usually consists of a series of curb extensions, narrowing the street to two narrow lanes or one lane at selected points and forcing motorists to slow down to maneuver between them. Such treatments are intended for use only on residential streets with low traffic volumes.

If there is no restriction (i.e., the number of lanes is maintained), chicanes can be created on streets with higher volumes, such as collectors or minor arterials.

Mini-Circles:

Mini-circles are raised circular islands constructed in the center of residential street intersections (generally not intended for use where one or both streets are arterial streets). They reduce vehicle speeds by forcing motorists to maneuver around them. Mini-circles have been found to reduce motor vehicle crashes by an average

of 90 percent in Seattle, WA.8 Drivers making left turns are directed to go on the far side of the circle (see diagram at right) prior to making the turn. Signs should be installed directing motorists to proceed around the right side of the circle before passing through or making a left turn. Mini-circles are commonly landscaped (bushes, flowers, or grass), most often at locations where the neighborhood has agreed to maintain the plants. In locations where landscaping is not feasible, traffic circles can be enhanced through specific pavement materials.

Mini-circles are an intersection improvement as well as a traffic-calming device and can take the place of a signal or four-way stop sign. Many unwarranted four-way stop signs are installed because of the demand for action by the community.

Mini-circles must be properly designed to slow vehicles and benefit pedestrians and bicyclists. Right-turning vehicles are not controlled at an intersection with a mini-circle, potentially putting pedestrians and bicyclists at risk.

Therefore, tight curb radii should complement this treatment to discourage high-speed right-turn maneuvers. The occasional larger vehicle going through an intersection with a traffic circle (e.g., a fire truck or moving van) can be accommodated by creating a mountable curb in the outer portion of the circle.

Speed Humps:
Speed humps are paved (usually asphalt) and approximately 3 to 4 in. high at their center, and extend the full width of the street with height tapering near the drain gutter to allow unimpeded bicycle travel. Speed humps should not be confused with the speed "bump" that is often found in mall parking lots. There are several designs for speed humps. The traditional 12-ft hump has a design speed of 15 to 20 mi/h, 14-ft hump a few mph higher, and a 22-ft table has a design speed of 25 to 30 mi/h. The longer humps are much gentler for larger vehicles.

Speed humps can also be designed with two, 1-ft slots to allow for vehicles with wide wheelbases such as buses and emergency vehicles to pass through them without having to go over the measure. These are typically called speed cushions.

Speed Tables:
Speed humps are paved (usually asphalt) and approximately 3 to 4 in. high at their center, and extend the full width of the street with height tapering near the drain gutter to allow unimpeded bicycle travel. Speed humps should not be confused with the speed "bump" that is often found in mall parking lots. There are several designs for speed humps. The traditional 12 ft hump has a design speed of 15 to 20 mi/h, 14 ft hump a few mph higher, and a 22 ft table has a design speed of 25 to 30 mi/h. The longer humps are much gentler for larger vehicles.

In general, speed humps are a device of last resort. Other traffic calming solutions should be considered first. However, they may be the best solution is some situations, especially on long, straight residential streets where there are few intersections and no other visual cues to slow motorists.

A "speed table" is a term used to describe a very long and broad speed hump, or a flat-topped speed hump, where sometimes a pedestrian crossing is provided in the flat portion of the speed table. The speed table can either be parabolic, making it more like a speed hump, or trapezoidal. Speed tables can be used in combination with curb extensions where parking exists.

Gateways:
A gateway is a physical or geometric landmark that indicates a change in environment from a higher speed arterial or collector road to a lower speed residential or commercial district. They often place a higher emphasis on aesthetics and are frequently used to identify neighborhood and commercial areas within a larger urban setting. Gateways may be a combination of street narrowing, medians, signing, archways, roundabouts, or other identifiable feature. Gateways should send a clear message to motorists that they have reached a specific place and must reduce speeds. This can help achieve the goal of meeting expectations and preparing motorists for a different driving environment. Gateways are only an introduction and slower speeds are not likely to be maintained unless the entire area has been redesigned or other traffic-calming features are used.

Landscaping:
The careful use of landscaping along a street can provide separation between motorists and pedestrians, reduce the visual width of the roadway (which can help to reduce vehicle speeds), and provide a more pleasant street environment for all. This can include a variety of trees, bushes, and/or flowerpots, which can be planted in the buffer area between the sidewalk or walkway and the street.

The most significant issue with any landscaping scheme is ongoing maintenance. Some communities have managed effectively by creating homeowners associations to pay for landscape maintenance or through the volunteer efforts of neighbors. Others have found them to be unreliable and budget for public maintenance instead. Consider adding irrigation systems in areas with extensive planting.

Choosing appropriate plants, providing adequate space for maturation, and preparing the ground can help ensure that they survive with minimal maintenance, and don't buckle the sidewalks as they mature. The following guidelines should be considered: plants should be adapted to the local climate and fit the character of the surrounding area—they should survive without protection or intensive irrigation and plant's growth patterns should not obscure signs or pedestrians' and motorists' views of each other.

Specific Paving Treatments:
Paving materials are important to the function and look of a street, both in the road and on the sidewalk. Occasionally, paving materials in and of themselves act as a traffic-calming device (e.g., when the street is paved in brick or cobblestone). However, some of these materials may be noisy and unfriendly to bicyclists, pedestrians, wheelchairs, or snowplow blades. In particular, cobblestones should not be used in the expected pedestrian or bicycle path, although they may be used as aesthetic elements in a streetscape design. Smooth travel surfaces are best for all pedestrians.

The pedestrian walkway material should be firm, planar, and slip-resistant. Concrete is the preferred walking surface. A different look can be achieved by using stamped concrete or concrete pavers, which are available in a variety of colors and shapes; however, jointed surfaces may induce vibration, which can be painful to some pedestrians. They can also be used on the top of raised devices.

It is important to ensure crosswalk visibility. High visibility markings are often best. Textured crosswalks should be marked with reflective lines since these types of crosswalks are not as visible, especially at night or on rainy days.

Colored paving can enhance the function of portions of the roadway, such as a colored bicycle lane. This can create the perception of street narrowing, in addition to enhancing the travel facility for bicyclists.

Serpentine Design:
Serpentine design refers to the use of a winding street pattern with built-in visual enhancements through a

neighborhood, which allow for through movement while forcing vehicles to slow. The opportunities for significant landscaping can be used to create a park-like atmosphere.

Such designs are usually implemented with construction of a new neighborhood street or during reconstruction of an existing street corridor. This type of design can be more expensive than other traffic-calming options and needs to be coordinated with driveway access.

Traffic Management:

Diverter:

A diverter is an island built at a residential street intersection that prevents certain through and/or turning movements. Diverters affect people living in the neighborhood more than anyone else. Therefore, diverters should be considered only when less restrictive measures are not appropriate.

Four types of diverters are: diagonal, star, forced turn, and truncated. A diagonal diverter breaks up cut-through movements and forces right or left turns in certain directions. A star diverter consists of a star-shaped island placed at the intersection, which forces right turns from each approach. A truncated diagonal diverter is a diverter with one end open to allow additional turning movements. Other types of island diverters can be placed on one or more approach legs to prevent through and left-turn movements and force vehicles to turn right.

As with other traffic management tools, diverters must be used in conjunction with other traffic management tools within the neighborhood street network. Any of these diverters can be designed for bicycle and pedestrian access.

Full Street Closure:

A full street closure is accomplished by installing a physical barrier that blocks a street to motor vehicle traffic and provides some means for vehicles to turn around. Full street closures should be used only in the rarest of circumstances. Neighborhoods with cul-de-sac streets require extensive out-of-the-way travel, which is not a mere convenience issue, but has serious implications for impacts on other streets. All traffic is forced to travel on feeder streets, which has negative consequences for the people who live on those streets and forces higher levels of control at critical intersections.

If a street closure is done, it should always allow for the free through movement of all pedestrians, including wheelchair users, and bicyclists. Emergency vehicles should also be able to access the street; this can be done with a type of barrier or gate that is electronically operated, permitting only large vehicles to traverse it. Examples are mountable curbs or an access way with a raised element in the center that a low vehicle would hit, though those treatments may not be able to stop pickups or sport utility vehicles. This is usually only appropriate for places with no snow (otherwise the device would be covered with snow and the access way could not be cleared).

Partial Street Closure:

A partial street closure uses a semi-diverter to physically close or block one direction of motor vehicle travel into or out of an intersection; it could also involve blocking one direction of a two-way street. Partial street closures at the entrance to a neighborhood or area should consider the traffic flow pattern of the surrounding streets as well. The design of this measure should allow for easy access by bicyclists and all pedestrians.

A partial closure provides better emergency access than a full closure. Since this design also allows motorists to easily violate the prohibitions, police enforcement may be required. If the partial closure only eliminates an entrance to a street, a turnaround is not needed; closing an exit will generally require a turnaround.

Left Turn Prohibitions:
Left-turn prohibitions use a raised measure to physically prohibit left-turns at specific locations where the turning vehicle may present a conflict with pedestrians in the crosswalk. Ideally, the design of this measure should allow for easy access by bicyclists and all pedestrians who are crossing the street perpendicular to the measure.

As with other traffic management tools, left-turn prohibitions must be used in conjunction with other traffic management tools within the neighborhood street network. The result of this measure may also reduce the through-traffic of the cross-street, however additional right-turns and increased traffic at proximate intersections may occur.

Signals and Signs:
Traffic Signals:
Signals should allow adequate crossing time for pedestrians and an adequate clearance interval based upon a maximum walking speed of 3.5 ft/s. In areas where there is a heavy concentration of the elderly or children, a lower speed (typically 3.0 ft/s) should be used in determining pedestrian clearance time.1 In urban areas, signals are often closely spaced, sometimes every block. Timed sequencing of signals may reduce the amount of time allotted per cycle for pedestrian crossings to unsatisfactory lengths. Signals are usually spaced farther apart in suburban or outlying areas, but similar considerations for pedestrian timing should be made. Centralized traffic signal control allows traffic operators to identify signal malfunctions or adjust signal operations to address pedestrian demand spikes in real time. When pedestrian is significant throughout the day, fixed-time signals should be used to consistently allow crossing opportunities. Pedestrian actuation should only be used when pedestrian crossings are intermittent and should be made accessible to pedestrians of all abilities.

Pedestrian Signals:
The international pedestrian symbol signal is preferable and is recommended in the MUTCD. Existing WALK and DON'T WALK messages may remain for the rest of their useful life but should not be used for new installations.1 Pedestrian signals should be clearly visible to the pedestrian at all times when in the crosswalk or waiting on the far side of the street. Large pedestrian signals can be beneficial in some circumstances (e.g., where the streets are wide). Countdown pedestrian indications are required for all newly installed traffic signals where pedestrian signals are installed. They must be designed to begin counting down at the beginning of the clearance (flashing DON'T WALK) interval and can be on fixed-time or pushbutton operation.

Pedestrian detectors at traffic signals may be pushbuttons or passive detection devices, which register the presence of a pedestrian in a position indicative of a desire to cross, without requiring the pedestrian to push a button. Pedestrian pushbuttons should be well-designed and within reach and operable from a flat surface for pedestrians in wheelchairs and with visual disabilities. They should be conveniently placed in the area where pedestrians wait to cross and should clearly indicate which pedestrian signals will be activated. Quick response to the pushbutton or feedback to the pedestrian registering the signal's actuation should be programmed into the system. Section 4E.09 within the MUTCD provides detailed guidance for the placement of push buttons to ensure accessibility.

Some passive detection devices are capable of tracking the progress of a pedestrian as the pedestrian crosses the roadway for the purpose of extending or shortening the duration of certain pedestrian timing intervals. Accessible pedestrian signals that provide supplemental information in non-visual formats (such as audible tones, speech messages, and/or vibrating surfaces), as described in the MUTCD, may be provided.1 Much more extensive information on the use of accessible pedestrian signals (APS) and the types of APS technologies now available is provided online at www.walkinginfo.org/aps.

Pedestrian Signal Timing:
In general, shorter cycle lengths (ideally less than 90 seconds) and longer walk intervals provide better service to pedestrians and encourage better signal compliance. For optimal pedestrian service, fixed-time signal operation usually works best because it provides an automatic pedestrian phase.

Pedestrians usually receive more frequent crossing opportunities and experience less delay with concurrent signal phasing than with exclusive signal phasing, which must service vehicle traffic and pedestrian volumes separately. When pedestrians are required to wait a long time for a pedestrian interval, many will simply choose to ignore the signal and cross during a gap in traffic, negating the potential safety benefits of the exclusive signal. Exclusive pedestrian phases, without accessible pedestrian signal technology, introduce a problem for pedestrians with visual restrictions, as the audible cues associated with parallel traffic streams will lead pedestrians to cross at inappropriate times.

To be useful to pedestrians with vision restrictions, an LPI needs to be accompanied by an audible signal to indicate the WALK interval. There are some situations where an exclusive pedestrian phase may be preferable to an LPI, such as when high-volume turning movements conflict with pedestrians crossing.

Hot response signals may be particularly appropriate at midblock crossing locations where the distance to other signalized crossings is significant. Hot response signals help reduce unnecessary delay for both pedestrians and vehicles at locations where pedestrians will typically use the pushbutton but cross before the pedestrian signal is active.

Traffic Signal Enhancements:
Countdown signals may be designed to begin counting down at the beginning of the walk phase or at the beginning of the clearance (flashing DON'T WALK) interval. Countdown signals have been demonstrated to reduce pedestrian crossings when only a few seconds remain.

Since pedestrian pushbutton devices are not activated by about one-half of pedestrians (even fewer activate them where there are sufficient motor vehicle gaps), new "intelligent" microwave or infrared pedestrian detectors are now being installed and tested in some U.S. cities. These automatically activate the red traffic and WALK signals when pedestrians are detected. Detectors can also be used to extend the crossing time for slower moving pedestrians in the crosswalk (often called a PUFFIN crossing). Automatic pedestrian detectors have been found to improve pedestrian signal compliance and also reduce pedestrian conflicts with motor vehicles. However, they are still considered experimental and their reliability may vary under different environmental conditions.

Right-Turn-on-Red Restrictions:
Prohibiting RTOR should be considered where exclusive pedestrian phases or high pedestrian volumes are present. The standard regulatory sign included in the MUTCD states NO TURN ON RED, but alternative sign options include a circular red icon or a larger 762-mm by 914-mm (30-in by 36-in) NO TURN ON RED sign, both of which improve conspicuity. For areas where a right-turn-on-red restriction is needed during certain times, time-of-day restrictions may be appropriate. A variable-message NO TURN ON RED sign is also an option.

Advanced Stop Lines at Traffic Signals:
Placing a vehicle stop or yield line back from the crosswalk has benefits at both signalized intersections and midblock crossings.

At signalized intersections, placing an advance stop/yield line 4 feet from the crosswalk allows pedestrians and drivers to have a clearer view of each other and more time in which to assess each other's intentions.

Left Turn Phasing:
The protected left turn phase provides a green arrow for left turning vehicles while stopping both on-coming traffic and parallel pedestrian crossings to eliminate conflicts. Signal operators and designers should consider the possibility that pedestrians will assume it is safe to cross during the protected left turn phase because the cross-street is still receiving a red signal indication. Protected left turn phasing is particularly appropriate for locations with relatively high left turn volumes.

An alternative signal phasing option is a protected/permissive phase, which provides a protected period for left turning vehicles either preceded or followed by a permissive left turn phase. A protected/ permissive left turn phase only partially eliminates conflicts between left turning vehicles and pedestrians using the parallel crosswalk. This option may be appropriate where left turn traffic volumes are relatively manageable but opposing through volumes are relatively high. A "yellow trap" conflict may result from protected/permissive left turn phasing when the signal indication for left turning vehicles changes from green to yellow/red but opposing traffic continues to receive a green indication. In this case, a flashing yellow arrow turn signal would be appropriate to prevent the "yellow trap."

Implementing protected left turn phasing may reduce intersection vehicle capacity, impact signal system coordination, or require longer cycle lengths to manage combined vehicle and pedestrian traffic volumes. Related roadway geometry modifications to support protected left turn phasing include exclusive left turn lanes. Opposing left turn lanes may be provided at intersections without widening a roadway by converting existing median, two-way left turn lane, or travel lanes.

Push Buttons & Signal Timing:
The primary design and location attributes of pedestrian-friendly pushbuttons include the following:

• Pedestrian pushbuttons should be located at both ends of each crosswalk
• Pedestrian pushbuttons should be located within easy reach of pedestrians intending to cross, generally no more than 6 feet from the edge of the roadway
• The face of the pushbutton should be parallel to the crosswalk
• Supplemental signage should identify the crossing direction and signal indications associated with each pushbutton
• A visible indication that the push button has been activated may be provided and should remain illuminated until the WALK indication is activated.
Accessible pedestrian signals that provide supplemental information in non-visual formats (such as audible tones, speech messages, and/or vibrating surfaces), as described in the MUTCD, may be provided.1 In locations were pedestrian volumes are significant or compliance is poor, pushbuttons may be enabled to activate a "hot response" from the pedestrian signal, providing a pedestrian phase quickly after activation. Pushbuttons can also be enabled to allow pedestrians to request additional crossing time by depressing the button for at least two seconds. Signage indicating that extended time may be requested should be provided adjacent to the pushbutton.

Pedestrian signals may be equipped with passive detectors instead of pushbuttons. Passive detection devices register the presence of a pedestrian in a position indicative of a desire to cross, without requiring the pedestrian to push a button. Some passive detection devices are capable of tracking the progress of a pedestrian as the pedestrian crosses the roadway for the purpose of extending or shortening the duration of certain pedes-

trian timing intervals.

Pushbuttons are not required at locations where pedestrian signal intervals are automatically activated for every signal cycle. Automatic pedestrian signal intervals are preferred at locations with significant pedestrian activity. For instance, the City of Boston's policy is for the pedestrian phase to be automatic during every cycle at locations where pedestrians are present more than 50 percent of the time during peak hours, or where studies indicate reasonable benefit.

Pedestrian signal timings should be designed to provide at least the minimum required WALK and clearance intervals, based on MUTCD or State/Local timing guidelines, considering the length of the crossing and specified pedestrian walking speeds. At intersections on multi-lane highways, pedestrian signal intervals may exceed the necessary green time to serve vehicle volumes during concurrent signal phases. Pedestrian signal intervals can be reduced by shortening the crossing distance (i.e., construction curb extensions or road diets). Pedestrian signal intervals may also affect signal timing progression for coordinated traffic signal systems, particularly at closely-spaced urban intersections. Automatic pedestrian signal intervals may be used to provide a predictable pedestrian signal phase without affecting signal coordination.

Pedestrian Hybrid Beacon (PHB):
Pedestrian Hybrid Beacons (PHBs) can warn and control traffic at unsignalized locations and assist pedestrians in crossing a street or highway at a marked crosswalk. A PHB should be installed in conjunction with the following:

Overhead beacons with three sections (circular yellow signal indication centered below two horizontally aligned circular red signals) facing both directions on the major street.
Overhead signs labeled "CROSSWALK STOP ON RED" to indicate that the location is associated with a pedestrian crosswalk.
A marked crosswalk on the major street.
Countdown pedestrian signal heads to control pedestrian crossings at the crosswalk.
Pedestrian detectors, such as pushbuttons.
Unlike a traffic signal, the PHB rests in dark until a pedestrian activates it via pushbutton or other form of detection. When activated, the beacon displays a sequence of flashing and solid lights that indicate the pedestrian walk interval and when it is safe for drivers to proceed. A solid red light requires drivers to stop while pedestrians have the right-of-way to cross the street. The overhead beacon flashes red when the pedestrian signals display a flashing DONT WALK indication. Drivers may proceed if the crosswalk is clear.

The PHB is often considered for installation at locations where pedestrians need to cross and vehicle speeds or volumes are high, but traffic signal warrants are not met. These devices have been successfully used at school crossings, parks, senior centers, and other pedestrian crossings on multilane streets. PHBs are typically installed at the side of the road or on mast arms over midblock pedestrian crossings.

Rectangular Rapid-Flashing Beacon (RRFB):
RRFBs are pedestrian-actuated conspicuity enhancements used in combination with a pedestrian, school, or trail crossing warning sign to improve safety at uncontrolled, marked crosswalks. The device includes two rectangular-shaped yellow indications, each with an LED-array-based light source, that flash with high frequency when activated. The RRFB design differs from the standard flashing beacon by utilizing:

A different shape
A much faster rapid-pulsing flash rate.
A brighter light intensity.

The RRFB is a treatment option at many types of established pedestrian crossings. RRFBs are particularly effective at multilane crossings with speed limits less than 40 mph. Consider the Pedestrian Hybrid Beacon (PHB) instead for roadways with higher speeds.

RRFBs are placed on both sides of a crosswalk below the pedestrian crossing sign and above the arrow indication pointing at the crossing. The flashing pattern can be activated with pushbuttons or automated (e.g., video or infrared) pedestrian detection, and should be unlit when not activated.

The Federal Highway Administration has issued interim approval for the use of the RRFB (IA-21). State and local agencies must request and receive permission to use this interim approval before they can use the RRFB.

Puffin Crossing:
Pedestrians crossing multilane roadways face a number of serious challenges to their safety, especially those pedestrians who have difficulty walking. Even at locations where a crosswalk signaling device is available, the crossing time might not last long enough to allow the pedestrian to complete the crossing during the standard allotted time. The purpose of a Puffin crossing is to provide the opportunity for pedestrians to "call" a Walk phase and also to have a signal enhancement that can provide extra time for crossing the street when needed.

Signing:
Regulatory signs, such as STOP, YIELD, or turn restriction signs such as NO TURN ON RED require compliant driver actions and can be enforced. Warning signs can provide helpful information, especially to motorists and pedestrians unfamiliar with an area.

Advance pedestrian warning signs should be used where pedestrian crossings may not be expected by motorists, especially if there are many motorists who are unfamiliar with the area. A new fluorescent yellow/green color is approved for pedestrian, bicycle, and school warning signs (Section 2A.11 of the MUTCD).1 This bright color attracts the attention of drivers because it is unique.

All signs should be periodically checked to make sure that they are in good condition, free from graffiti, retroreflective at night, and continue to serve the intended purpose. In unusual cases, signs may be used to prohibit pedestrian crossings at an undesirable location and re-route them to a safer crossing location, or warn pedestrians of unexpected driver maneuvers. It is preferable to create safe crossings where there are clear pedestrian destinations. If unexpected driving maneuvers occur at what is an otherwise legal pedestrian crossing, an evaluation should be done to find ways to remedy or prevent the unsafe motorist maneuvers.

In-Street Pedestrian Crossing Sign:
In-street pedestrian crossing signs (MUTCD R1-6 or R1-6a) are placed within the roadway, either between travel lanes or in a median. The sign may be used to remind road users of laws regarding right-of-way at an unsignalized pedestrian crossing. The legends "STOP FOR" or "YIELD TO" may be used in conjunction with the appropriate symbol. This countermeasure is used with other crosswalk visibility enhancements to indicate optimal or preferred locations for people to cross and to help reinforce the driver requirement to yield the right-of-way to pedestrians at crossing locations.

For multilane roadway crossings where vehicle volumes are in excess of 10,000 AADT (annual average daily traffic), a marked crosswalk alone is typically not enough. These signs may be appropriate on 2-lane or 3-lane roads where speed limits are 30 mph or less.

Other Measures:

School Zone Improvement:

A variety of roadway improvements may be used to enhance the safety or mobility of children in school zones. The use of well-trained adult crossing guards has been found to be one of the most effective measures for assisting children in crossing streets safely. Sidewalks or separated walkways and paths are essential for a safe trip from home to school on foot or by bike. Adult crossing guards require training and monitoring and should be equipped with a bright and reflective safety vest and a STOP paddle. Police enforcement in school zones may be needed in situations where drivers are speeding or not yielding to children in crosswalks.

Other helpful measures include parking prohibitions near intersections and crosswalks near schools; increased child supervision at crossings; and the use of signs and markings, such as the school advance warning sign (which can be fluorescent yellow/green) and SPEED LIMIT 25 MPH WHEN FLASHING. Schools should develop "safe routes to school" plans and work with local agencies to identify and correct problem areas. Marked crosswalks can help guide children to the best routes to school. School administrators and parent-teacher organizations need to educate students and parents about school safety and access to and from school. Education, enforcement, and well-designed roads must all be in place to encourage motorists to drive appropriately.

One of the biggest safety concerns around schools is parents or caretakers dropping off and picking up their children. There are two immediate solutions: (1) a clearly-marked area where parents are permitted to drop off and pick up their children, and (2) drop-off/pick-up regulations provided to parents on the first day of school. Drop-off areas must be located away from where children on foot cross streets or access the school. Parent drop-off zones must also be separated from bus drop-off zones. If parents can be trained to do it right at the start of the school year, they are likely to continue good behavior throughout the year.

For a longer term solution, it is preferable to create an environment where children can walk or bicycle safely to school, provided they live within a suitable distance. One concept that has been successful in some communities is the concept of a "walking bus," where an adult accompanies children to school, starting at one location and picking children up along the way. Soon, a fairly sizeable group of children are walking in a regular formation, two by two, under the supervision of a responsible adult who is mindful of street crossings. The presence of such groups affects drivers' behavior, as they tend to be more watchful of children walking. Parents take turns accompanying the "walking school bus" in ways that fit their schedules.

More information can be found about walking to school on the Safe Routes to School website, which can be accessed at this link: http://www.saferoutesinfo.org/.

Neighborhood Identity:

Many neighborhoods or business districts want to be recognized for their unique character. This can enhance the walking environment and sense of community.

Treatments used to enhance the identity of a neighborhood include: gateways, traffic calming, welcome signs, flower planters, banners, decorative street lighting, and unique street name signs. Neighborhood identity treatments rarely provide any direct traffic improvements, but they help develop interest in enhancing the community and help create attractive and comfortable walking environments. Creating a sense of place can help solicit investment in a neighborhood and may lead to the provision of better walking amenities.

Speed-Monitoring Trailers:

Speed-monitoring trailers—sign boards on trailers that display the speed of passing vehicles—are used by police departments and transportation agencies as educational tools that can enhance enforcement efforts di-

rected at speed compliance. Speed radar trailers are best used in residential areas and may be used in conjunction with Neighborhood Speed Watch or other neighborhood safety education programs. Speed monitoring equipment may also be used in other types of areas where speeding is a problem, and/or where other roadway improvements have not been effective in keeping vehicle speeds at acceptable levels. Speed trailers help raise residents' awareness of speed, but are not substitutes for permanent actions, such as traffic-calming treatments, to address neighborhood speeding issues.

Speed-monitoring trailers can be used at several locations and should have police monitoring and enforcement to maintain driver respect. Many cities will place speed trailers at the requests of residents.

On-Street Parking Enhancements:

On-street parking can be both a benefit and a detriment to pedestrians. On-street parking increases positive "friction" along a street and can narrow the effective crossing width, both of which encourage slower speeds. Parking can also provide a buffer between moving motor vehicle traffic and pedestrians along a sidewalk. In addition, businesses that rely on on-street parking as opposed to parking lots are more geared toward pedestrian access; they are more likely to orient their building to the sidewalk. This attention can foster a more vibrant pedestrian commercial environment.

On the other hand, parking creates a visual barrier between motor vehicle traffic and crossing pedestrians, especially children and people using wheelchairs. Therefore, where there is parking, curb extensions (also called bulb-outs) should be built where pedestrians are expected to cross the road. Also, parking should be restricted at least 20 feet on both approaches to a marked or unmarked crosswalk.

Diagonal on-street parking has been provided on some downtown streets to provide additional parking and create "friction" for drivers (leading them to drive more slowly) that improves the pedestrian environment. Diagonal parking may require more attention to improve visibility at crossings and intersections, and it should not be used on high speed or busy streets. Back-in diagonal parking is preferred and has a number of advantages over pull-in parking, including: giving drivers access to their trunk from the curb rather than the street, protection of children as an open door directs them to the sidewalk, and giving the driver clear sight lines when pulling out of the parking space.

It is also important to consider the pricing of on-street parking. By charging the market-rate price for parking and ensuring that parking is not undervalued, people will be more likely to use alternate modes of transportation to reach their destinations. Free or undervalued parking creates an incentive to drive and encourages people to leave their cars for long periods of time. Donald Shoup, a parking expert and planning theorist, suggests setting parking prices to achieve a 12.5 percent vacancy, which effectively curtails driving, but also ensures that convenient parking is available for short shopping trips.

Pedestrian/Driver Education:

Providing education, outreach, and training is a key strategy in increasing pedestrian and motorist awareness and behavior. While efforts most certainly provide information, the primary goal of an educational strategy is to motivate people to alter their behavior and reduce reckless actions. To implement the strategy, an integrated, multidisciplinary approach that links hard policies (e.g., changes in infrastructure) and soft policies (e.g., public relations campaigns) and addresses both pedestrians and drivers has the greatest chance of success.

There are several broad approaches to education that can be conducted with moderate resources. They include:
1) highlighting pedestrian features when introducing new infrastructure;
2) conducting internal campaigns within the organization to build staff support for pedestrian safety programs;
3) incorporating pedestrian safety messages into public relations efforts;

4) developing relationships with sister state agencies and statewide consumer groups; and
5) marketing alternative travel modes.

There are three specific types of educational campaigns – public awareness, targeted campaigns, and individual campaigns. Public awareness campaigns are a great example of a vehicle used to garner public support. An effective campaign can "lay the groundwork" for subsequent pedestrian safety initiatives and can increase the likelihood of their success. Campaigns to target groups are usually aimed at changing behavior patterns in specific groups of people (e.g., motorists, elderly, school children). Since changing behavior in these groups can be a long and arduous task, these campaigns tend to be ongoing efforts aimed at long-term results. Individual campaigns differ from campaigns at target groups because the audience is reached through an intermediary. Intervention occurs at an individual level through safety guards, doctors and other authority figures. Using these different approaches in concert reaches a broader audience and increases the likelihood of long-term success in changing attitudes and behaviors.

For more information on how to provide education, see "The Maryland Pedestrian and Bicycle Safety Education Program Administrator's Guide."

Police Enforcement:
Police enforcement is a primary component in preserving pedestrian right-of-way and maintaining a safe environment for all modes of travel. Well-publicized enforcement campaigns are often effective in deterring careless and reckless driving and encouraging drivers to share the roadway with pedestrians and bicyclists when combined with strategically installed traffic control devices and public education programs. Most importantly, by enforcing the traffic code, police forces implant a sense of right and wrong in the general public and lend credibility to traffic safety educational programs and traffic control devices.

Over the years, police departments around the country have consistently enforced traffic laws pertaining to driving under the influence, speeding, and running red lights. They have developed effective and socially accepted methods for measuring this behavior and apprehending offenders. However, enforcement of right-of-way laws has proven more difficult, as police forces have focused attention on more objective violations and/or not provided appropriate training to police officers. Good enforcement requires enforcing traditional traffic laws as well as ensuring equal protection for drivers as well as pedestrians and bicyclists.

There are a number of actions that municipalities can use to implement enforcement campaigns designed to protect pedestrians. These include increased police presence around school zones, residential neighborhoods, and other areas with high pedestrian activity; "pedestrian stings" involving police officers in civilian clothing; and high profile, hard hitting mass media campaigns to sign-post change and help set the public agenda. Some enforcement campaigns require special legislation to provide a legal basis for stricter crosswalk codes or right of way changes while other campaigns operate under existing ordinances.

Automated Enforcement Systems:
Automated enforcement systems are electronic devices that detect traffic violations and document, through photo evidence, the vehicle at fault. The owner of the vehicle is then notified by mail of their infraction. Two of the most common types of automated enforcement systems are: red light cameras, used to prevent the running of red lights, and automated speed enforcement cameras, used to monitor and enforce posted speed limits.

Studies have found that automated enforcement systems substantially reduce the number of injury crashes, although some studies have noted an increase in rear-end collisions at intersections where red light cameras are installed. The use of speed enforcement cameras has also been found to lower the speed of cars and trucks

in work zones and school zones.

The use of automated enforcement systems should be accompanied by an extensive public awareness and information campaign, in order to gain public support and dispel common myths about automated enforcement systems. Engineering improvements can also increase the effectiveness of the systems, such as: increasing the size of traffic signal lamps from 8 to 12 inches; adding additional signal heads; having an all-red clearance interval of 1-3 seconds; having advanced warning signs/flashing lights; adjusting the approach speed; adding a green phase extension for cars in the dilemma zone; removing on-street parking and unwarranted traffic signals; having advanced traffic signals; and having the appropriate timing of yellow interval.

Pedestrian Streets/Malls:
A pedestrian street or mall as discussed in this section is defined as one that essentially prohibits motor vehicle traffic, aside from emergency access and time-limited essential activities such as trash pick-up and service deliveries. This is different from a shared street or space, which allows motor vehicles to travel at low speeds.

Pedestrian streets that eliminate all motor vehicle traffic have been successful in places that are thriving and have high volumes of pedestrians. Examples of successful pedestrian streets include Church Street in Burlington, VT; the Downtown Mall in Charlottesville, VA; Maiden Lane in San Francisco, CA; Occidental Street in Seattle, WA; Third Street Promenade in Santa Monica, CA; and, Fremont Street in Las Vegas, NV.

Work Zones – Pedestrian Detours:
Pedestrian detours can be used to protect the safety of pedestrians in work zones, and ensure they are not led into conflicts with work site vehicles or other motorists. All detours should seek to provide a safe, convenient, and accessible path that as closely as possible replicates the existing sidewalk(s) or footpath(s).

When using detours, advanced notification of the closure/detour should be provided, as well as channelizing devices to delineate the temporary route. This allows pedestrians to make timely decisions about routes through or around the work zone using the detour. The detour should be clearly defined, and minimize any additional time and distance the pedestrian must travel. Signs should be placed at intersections, rather than mid-block, to avoid mid-block crossings. All temporary crosswalks should be clearly marked, and have curb ramps. All detour routes must be compliant with the requirements of the Americans with Disabilities Act (ADA) of 1990. Pedestrians must be protected from all potential work site safety issues, using the arrangement of overhead protection, a boardwalk, and/or barrier separation. Finally, exit information should be provided to direct the pedestrian back to the original route.

Pedestrian Safety at Railroad Crossings:
There are a number of ways pedestrian safety can be improved at railroad crossings by selectively using passive and/or active devices. Passive devices include: fencing; channelization; swing gates; pedestrian barriers; pavement markings and texturing; refuge areas; and fixed message signs; raising the approaches to the track and the area between the tracks to the level of the top of the rail creating flat level areas to cross; designing crossings so that the pedestrian paths of travel intersect the railroad track at a 90 degree angle, minimizing problems with the flangeway gap width through design and/or an approved flangeway filler; and widening the crosswalk when a perpendicular crossing cannot be provided so that pedestrians have room to maneuver and position themselves to cross the tracks at a 90 degree angle. Active devices include flashers; audible active warning devices; automated pedestrian gates; pedestrian signals; variable message signs; and blank-out signs. The MUTCD requires the use of railroad crossing “crossbuck” signs whenever railroad tracks intersect a public roadway or pathway.

Crossings being considered for safety improvements should be reviewed by a diagnostic team and undergo an

engineering study to select the appropriate warning devices for each crossing. Crossing types that may benefit from such review and study include: crossings with a high volume of pedestrian traffic; frequent and/or high speed trains; extremely wide crossings; complex rail crossings; school zones; inadequate sight distance; and/or multiple tracks. All pedestrian railroad crossings should be designed to minimize the time required for pedestrians to cross, with emphasis on avoiding entrapment of pedestrians on or between sets of tracks.

The implementation of these measures should be accompanied by increased education, through Public Service Announcements, added information in a state's Driver's Education Manual, educational initiatives and school presentations, etc. In addition, rail safety laws that prohibit dangerous actions around rail crossings should be enforced. Operation Lifesaver is a program that promotes safety near rail facilities. More information may be found on this program at: http://oli.org/

Shared Streets:

"Shared street" is the term that is commonly used in English; its origins are based in the concept of a "woonerf," which is a Dutch term loosely meaning "street for living." In Seattle and other locations, they are sometimes referred to as "green streets".

A shared street is often referred to as a "pedestrian-priority street," or, in residential areas, as a "home zone." It is an integrated space used to better balance the needs of pedestrians, bicyclists, and low-speed motor vehicles. They are usually local-access, narrow streets without curbs and sidewalks, and vehicles are slowed by placing trees, planters, parking areas, and other obstacles in the street. A clear signal is given to designate entrance into the space, either through signage, narrowing of the roadway, and/or different paving materials. Motorists in these areas are encouraged to travel at much slower speeds – approximately 10-15 mi/h.23 Rather than relying on traffic controls, street users negotiate right of way in a cooperative manner. The streets often lack signs and markings necessary for the operation of conventional streets, with users instead guided by the physical design of the street. The intended result is that the street and any adjacent commercial businesses are more amenable to bicycle and pedestrian use.

While not technically shared streets, there are also ways streets can be utilized and/or engineered to accommodate a greater variety of street space uses. Many cities are now closing streets during different times of the day or week, such as Winthrop Street in Cambridge, MA, which is closed to vehicle traffic between 11 a.m. and 2 a.m. daily. During the times it is open to vehicles, the street operates as a shared street with vehicle traffic speeds limited to 10 mph. Other cities temporarily close roads on the weekend for local Farmer's Markets, and cities such as New Orleans, LA and Memphis, TN close specific streets nightly. Finally, Portland, OR has created Festival Streets in select areas; one-block streets that function for cars and parking but that do not have curbs, light poles, etc. In doing so, the streets can be converted to public use on weekends or for special events.

Streetcar Planning and Design:

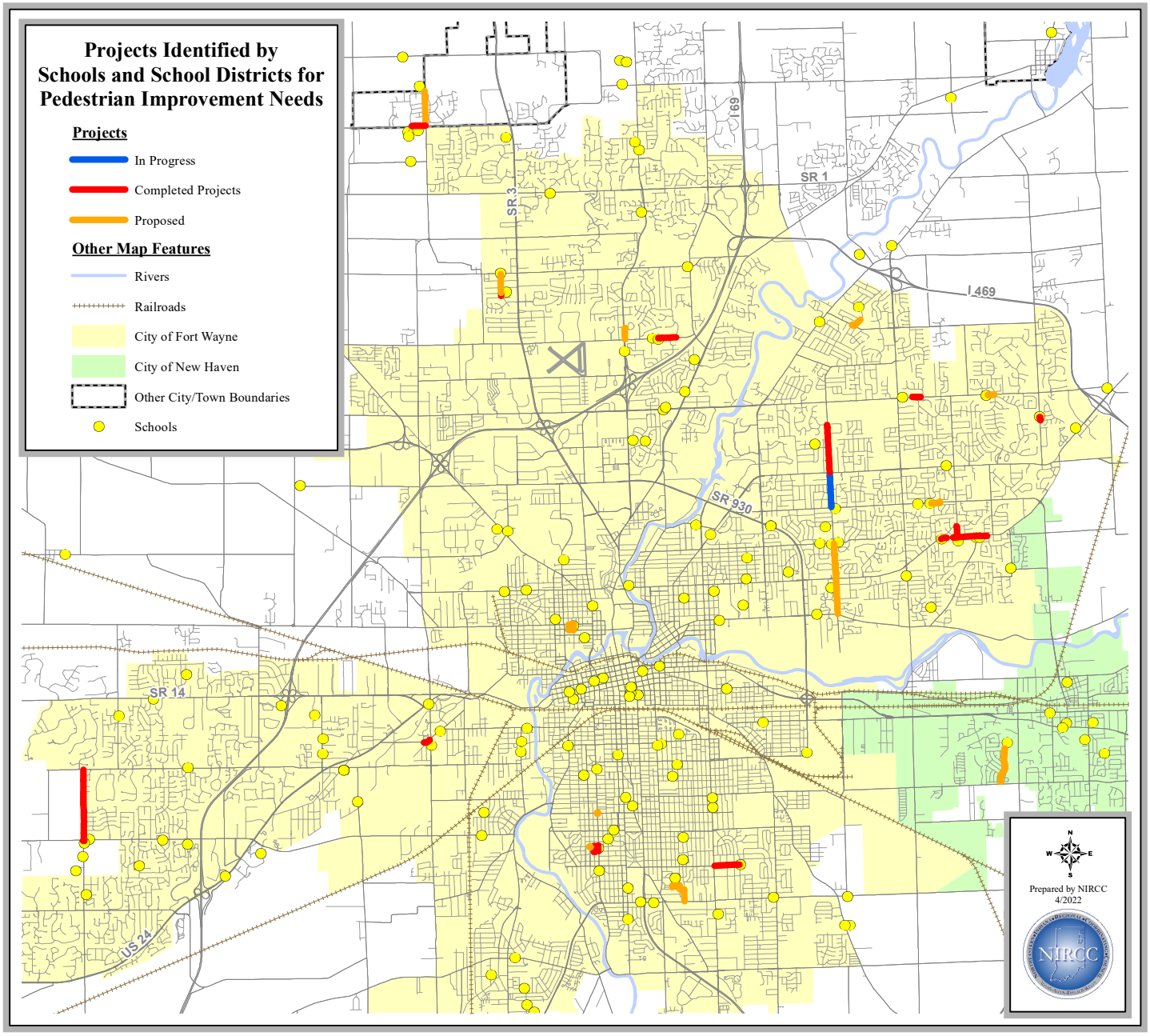
A well-designed streetcar connects multiple destinations with predictable routes and relatively frequent service. Streetcars typically provide a convenient option for short trips, connections to other transit systems, and an easily identifiable transit route for tourists and visitors who may be unfamiliar with other services. The fixed track infrastructure creates a sense of permanence that encourages ridership and can also influence investment in development. As most streetcar users are likely to walk to stops, increased pedestrian activity is also likely to result from the installation of a streetcar line. This combined with investment in supporting pedestrian facilities can help improve the urban environment and the livability of neighborhoods.

In comparison to light-rail, streetcars generally travel shorter distances between stops, are often shorter than light-rail cars, and have slower average speeds (usually between 7-12 mph, after factoring in platform stops and other delays). While streetcars share certain similarities with local bus service, the permanent tracks and

platforms help delineate to pedestrians and motorists the route of the streetcar and loading/unloading areas. It is important to note that streetcars should not be seen as a replacement for bus or light-rail service, but instead as a complementary part of a city's transit system.

Appendix G

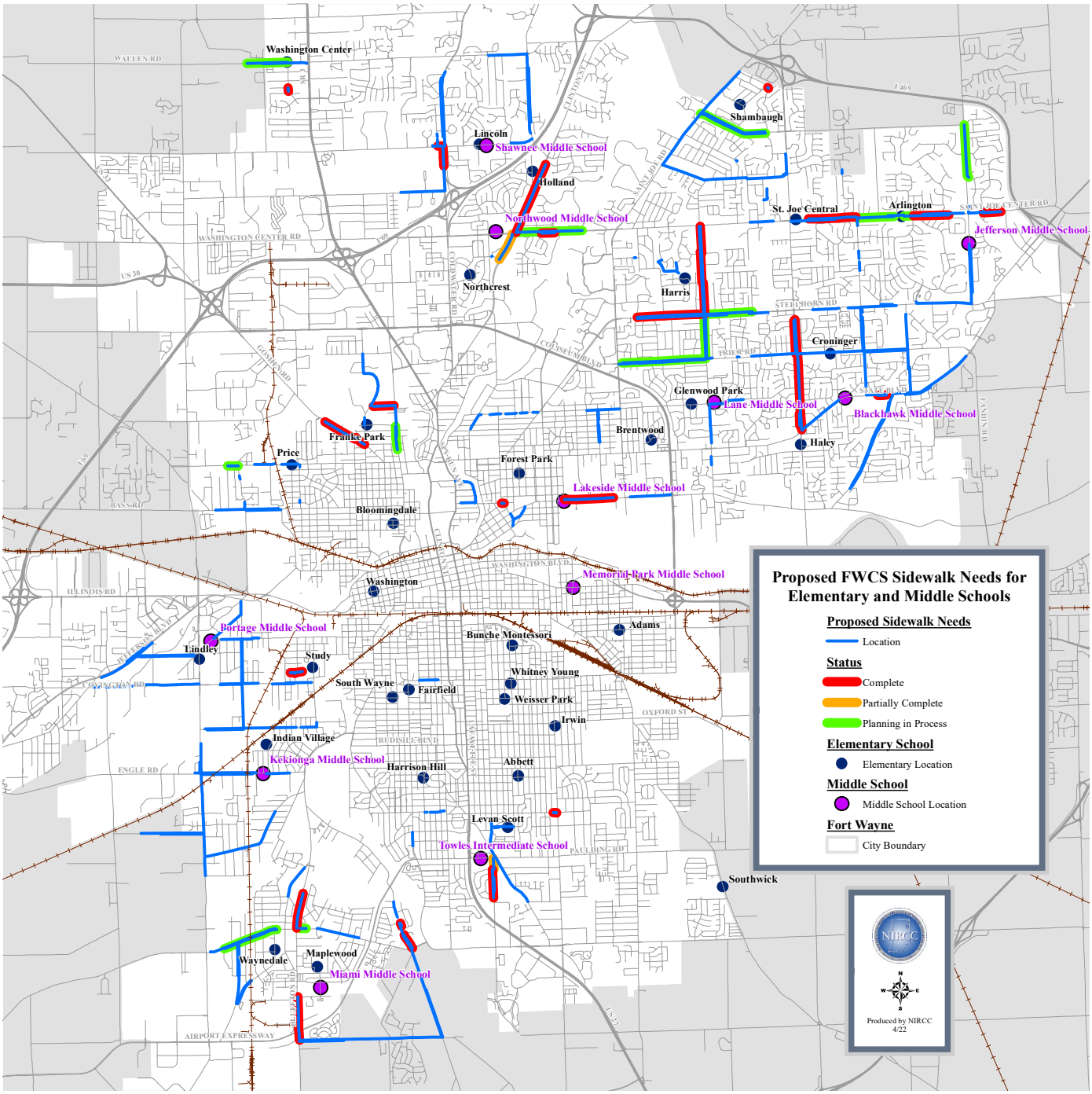
Projects Identified for Pedestrian Safety Improvements



Projects Affecting Areas Around Schools

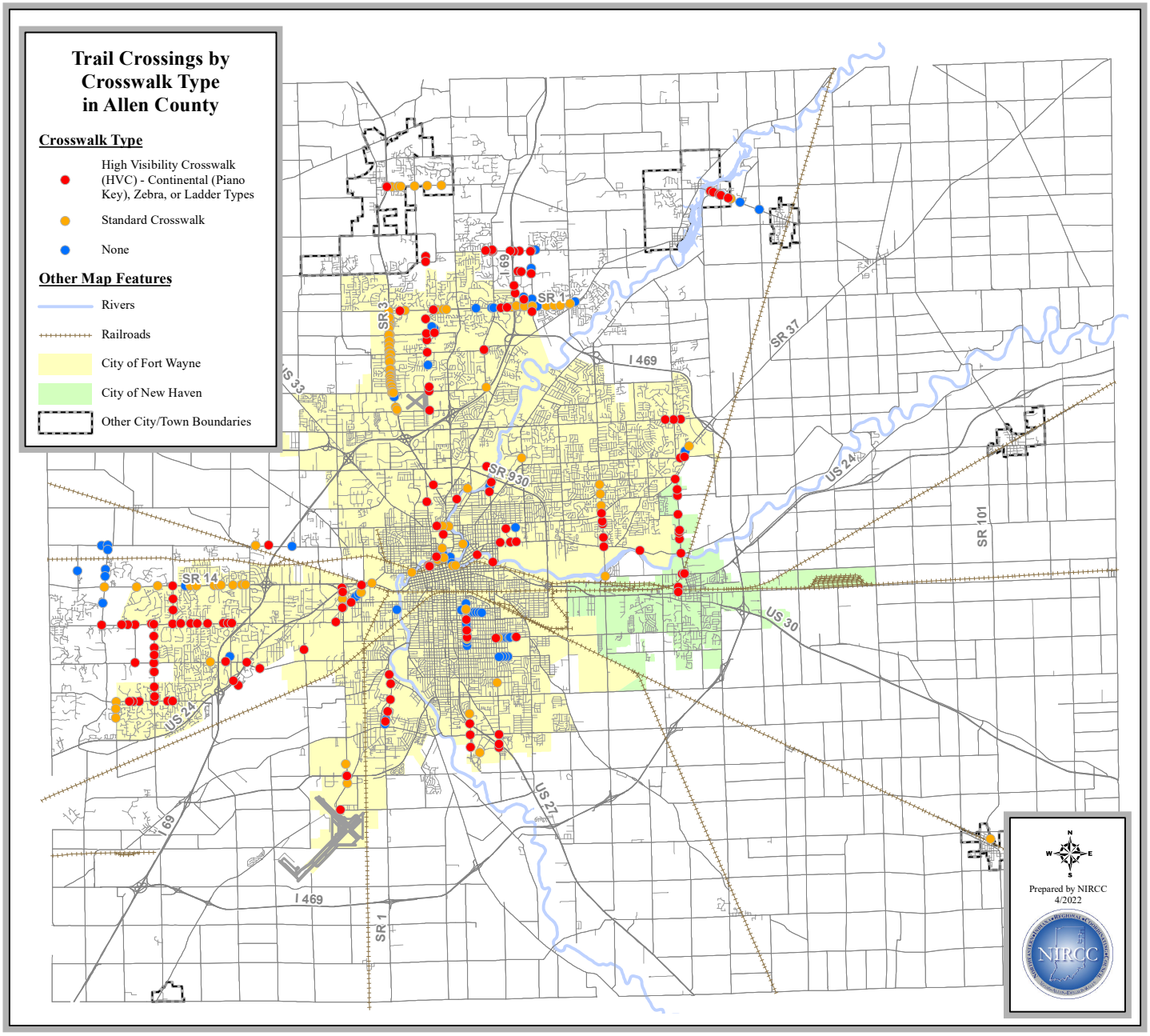
Along with the 2010 PSAP, specific safety needs had already been identified through discussions with area schools and school districts. The City of Fort Wayne's Walk Fort Wayne team and the Fort Wayne Greenways Manager met with schools and school districts to gather input on what kinds of safety improvements or pedestrian facilities are needed for their areas. These needs are identified in the Walk Fort Wayne Plan under the "Safe Routes to School" section and have been included in the map shown above titled "Projects Identified by Schools and School Districts for Pedestrian Improvement Needs. This map displays the progress that has been accomplished so far and will be updated as more projects progress or have been completed.

Another Safe Routes to School initiative was the result of bus transportation shortages for FWCS (Fort Wayne Community Schools) due to a lack of funding available. It was realized that starting August 11, 2015, an estimated 9,600 students would not be receiving bus service any longer. NTZs (No Transportation Zones) were determined for schools by setting up a specific radius around each school, creating boundaries, and then



specifying that any students within these areas would no longer receive bus service beginning with the 2015-2016 school year. Each class of school had a different radius followed as a guideline which was determined based on how far it would be practical for students to walk to school. Elementary schools used a 1 mile radius, middle schools used a 1.5 mile radius, and high schools used a 2 mile radius.

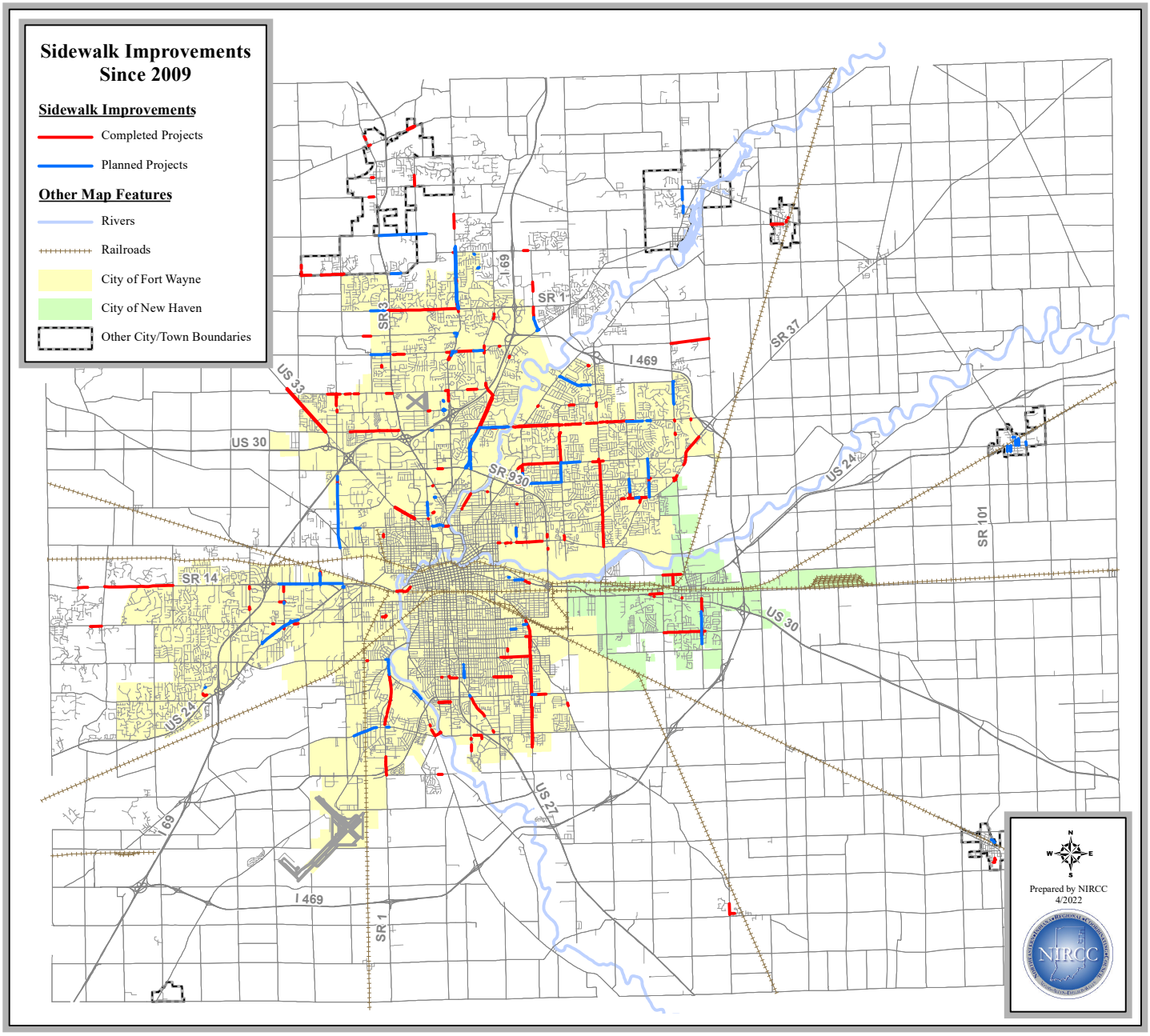
As a result of these transportation shortages, NIRCC was solicited by FWCS & the City of Fort Wayne to participate in studying potential improvements to address the number of students that would no longer receive bus transportation. Details about the analysis and the results produced by NIRCC are included in **Appendix H**, Objective 7. In the map above titled "Proposed FWCS Sidewalk Needs for Elementary and Middle Schools", proposed sidewalks identified during the study are displayed as well as the sidewalk and trail projects that have been completed as a result of the study.



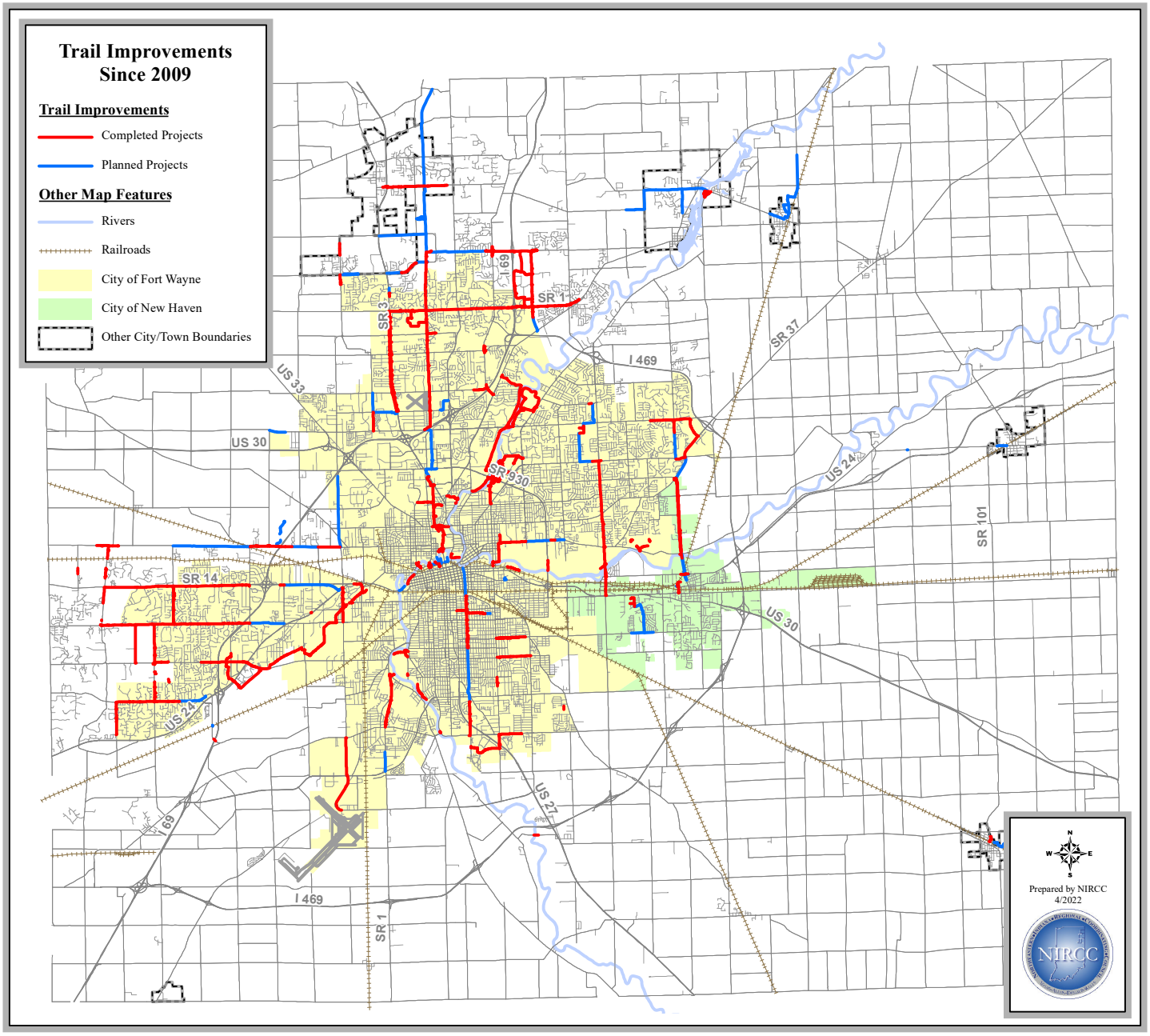
Pedestrian Infrastructure improvements

In the last 10-12 years more money has been invested for bicycle and pedestrian infrastructure than ever before. The map titled "Trail Crossings by Crosswalk Type in Allen County" identify 348 trail crossings, of which 156 of them are High Visibility Crosswalks (HVCs). HVCs include crosswalk types with painted patterns such as Continental (or piano key), Zebra (diagonal), and Ladder. These patterns allow motor vehicles a much greater site distance making it more apparent that a heavily used crossing is ahead. Not all 348 trail crossings warrant HVC type crossings, but where they are, these types of crossings have been added and continue to be added as more projects are completed.

The maps on the following pages titled "Sidewalk Improvements Since 2009" and "Trail Improvements Since 2009" display the large number of sidewalk and trail projects that have been completed since 2009. Over 50 miles of sidewalks have been built to fill in gaps in the sidewalk network and add sidewalks along major



roadways in Allen County. Over 90 miles of trails have been built as well. These maps also display the projects planned for the near future. New developments have also been building sidewalk and trail infrastructure. Overall, the pedestrian infrastructure has increased significantly in the Metropolitan Planning Area.


Trail Improvements
Since 2009
Trail Improvements
Completed Projects
Planned Projects
Other Map Features
Rivers
Railroads
City of Fort Wayne
City of New Haven
Other City/Town Boundaries
US 33
US 30
SR 14
US 24
I 69
I 469
SR 1
SR 3
SR 930
SR 37
SR 101
US 27
Prepared by NIRCC
4/2022
NIRCC

Appendix H

Evaluation Results for Pedestrian Safety Improvements

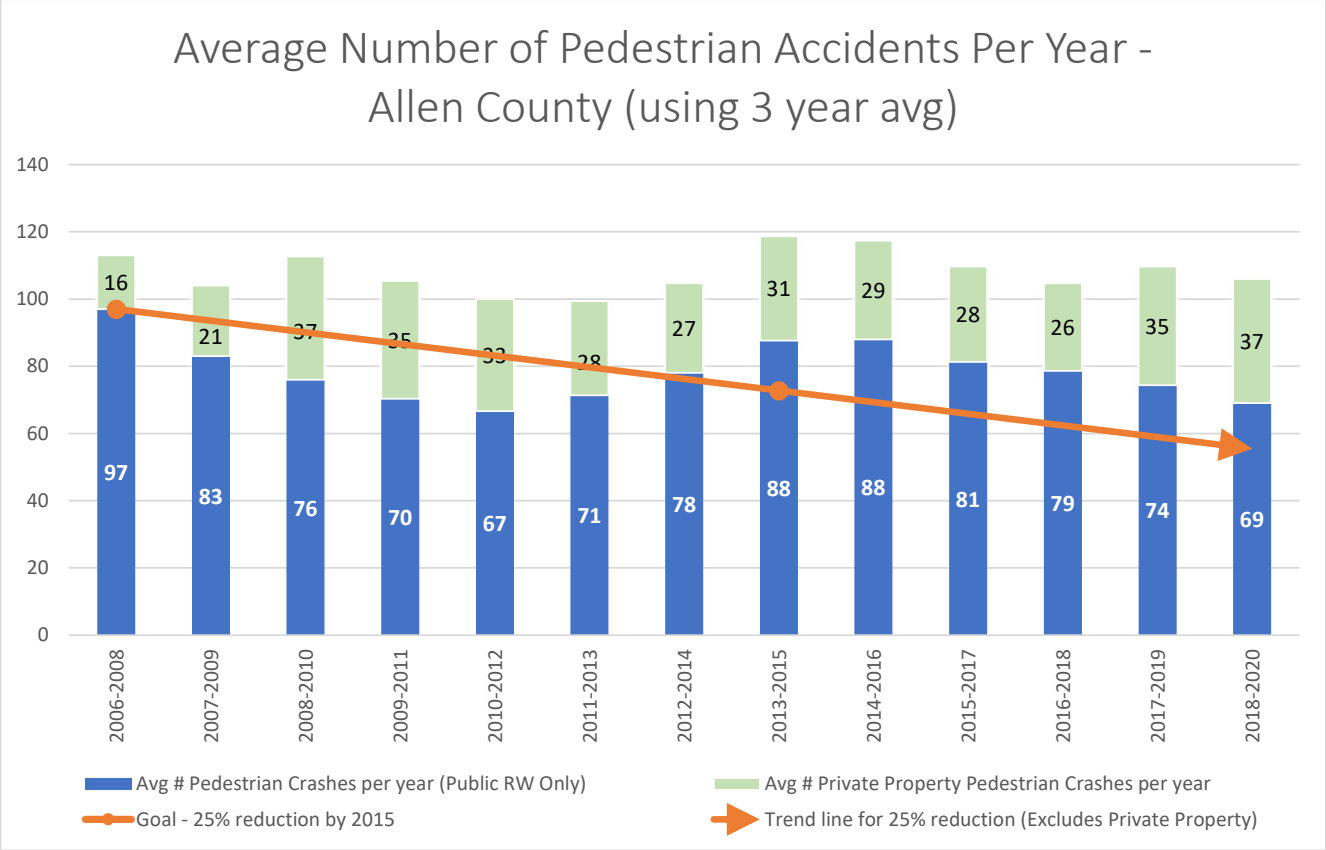
Objective 1

Reduce the 3 year average number of pedestrian accidents 15% by 2029:

The first publication of the PSAP in 2010 set the base numbers for a three year crash average at 113 pedestrian accidents per year for the years 2006-2008. It is important to note that an average 16 of these accidents occurred on private property and an average of 97 occurred on, or along public roadways. Many private property crash types appear more random in nature and many of the countermeasures available to decrease pedestrian accidents only affect those that are happening along our public roadway system. To get a true sense of how this objective relates to the pedestrian safety plan, the objective of decreasing pedestrian accidents should be measured as a decrease in those happening along public roadways and not on private property. It is important to still track the total number of pedestrian accidents for this report, but we will highlight the trends as they are associated with public roadway accidents for meeting goals and objectives.

The 2010 PSAP specified a 25% reduction of pedestrian accidents by 2015 (**Figure 1**). As you can see below in the graph, there were years that public right of way pedestrian crashes averaged less than the trend line and some years when they averaged above the trend line for the goal of a 25% decrease. With a 25% decrease in crashes, this set a target of 73 crashes by the year 2015 and 41 crashes by 2029. The actual three year average for the years 2013-2015 resulted in 88 public right of way pedestrian crashes which was only a 9% decrease from 2008. Setting this initial trend line at a goal of meeting a 25% reduction was found to be higher than what was attainable, therefore the trend line has been adjusted to a 15% decrease in pedestrian accidents (see new chart in **Figure 2**). This new objective continues this trend of reducing pedestrian accidents by 15% over the next period of 7 years which would set the objective to eventually meet 60 pedestrian accidents by 2029. The chart in **Figure 2** shows how this trend of decreasing pedestrian crashes by 15% in the public right of way

Figure 1



compares over the years from 2008 to 2020.

There are a number of reasons the trend was adjusted from a 25% reduction of pedestrian accidents to 15%. Fort Wayne, Allen County, and surrounding cities and towns have seen a significant amount of infrastructure built over the last 10 years. Trail mileage and sidewalk mileage has increased by historic numbers all while population continues to increase and development patterns and economic factors continue to affect the number of people using sidewalks and trails for transportation purposes and to access destinations. A 25% decrease did not consider how much foot traffic has increased due to the above mentioned reasons. With the additional foot traffic and infrastructure, a 25% reduction would not be an attainable goal.

Figure 2

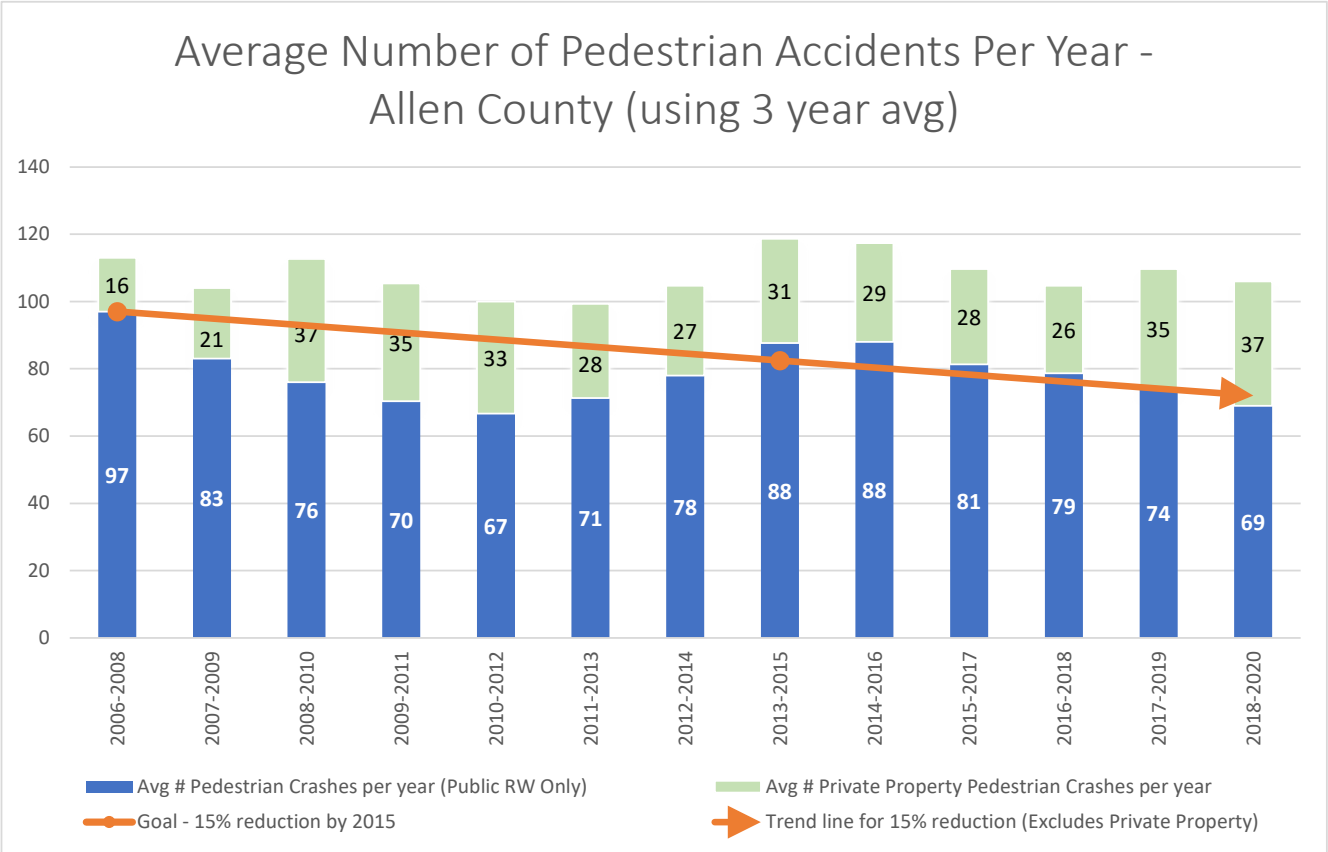
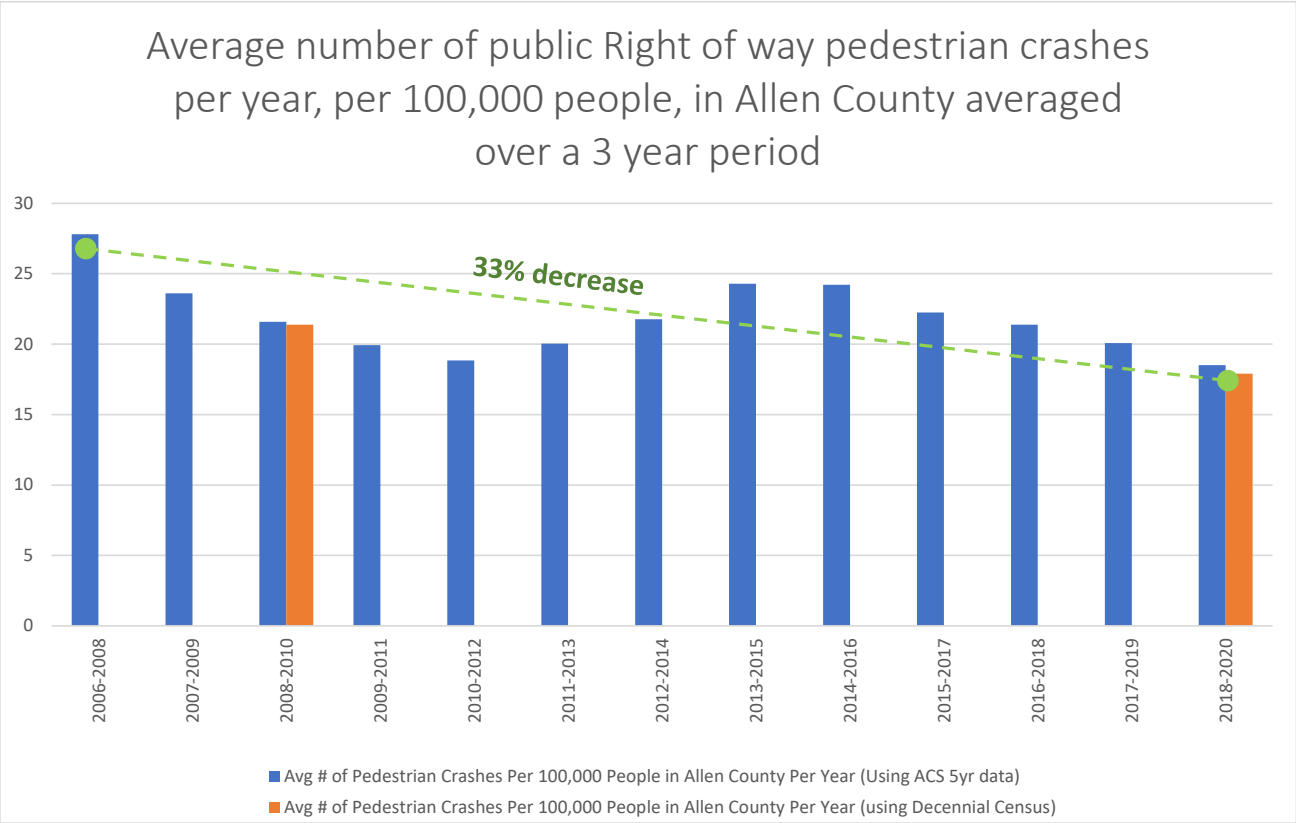


Figure 3 provides another way that pedestrian accidents can be measured. This chart takes population estimates and averages them for the same three year period that the pedestrian crash data is averaged for and creates a weighted value, or rate, that is dependent on how much the population changes. The population data used to figure these statistics comes from the annual estimates of resident population by county that the U.S. Census Bureau publishes each year. The three year average population for Allen County was nearly 24,000 higher from 2018-2020 than the population from 2006-2008. Since the frequency of accidents decreased between these two time periods the result was a higher percentage decrease of pedestrian accidents per 100,000 people than the trend shown in **Figure 2** which is only based on frequency of pedestrian accidents.

Figure 3



Objective 2

Update applicable manuals, guidelines, and standards to ensure safe and accessible pedestrian facilities within the design of facilities in the public right of way:

This objective in the previous PSAP called for the update of the Access Standards Manual for Fort Wayne, New Haven, and Allen County with pedestrian safety recommendations by 2015 (see Appendix H for results). The primary objective of this manual is to establish guidelines for the location and design of driveways providing access from public streets and highways to developments on abutting properties. Recent updates to this manual added considerations for pedestrian facilities. This objective now calls for any applicable manuals, guidelines, or standards to consider all users of public right of way, including the need for safe and accessible pedestrian facilities.

The following manuals, guidelines, and/or standards have been updated to include improvements to the pedestrian environment:

- 2021 Access Standards Manual for Fort Wayne, New Haven, and Allen County.
- Updated City of Fort Wayne Sidewalk design standards.
- City, Town, and County adoption of PROWAG standards.
- Comprehensive Plan updates
- City of Fort Wayne Complete Streets Policy
- Indiana's Statewide Trails, Greenways, and Bikeways Plan
- City, Town, and County Zoning Ordinance updates
- Northeast Indiana United Trails Branding and Wayfinding Signage Guidelines
- Fort Wayne Downtown Design Manual
- New Haven Master Trails Plan

Objective 3

Upgrade crosswalks throughout CBD's, downtown areas, and other business districts with longitudinal lines or piano key style crosswalk markings. As projects or developments occur in areas identified in Figure 5, longitudinal lines or piano key style crosswalk markings should be used. Below is a list of improvements that have been made since the 2010 PSAP report:

- Crosswalks in Fort Wayne's CBD have been upgraded with longitudinal lines or piano key style crosswalk markings.
- Crosswalks along the Wells Street corridor business district have been upgraded with longitudinal lines or piano key style crosswalk markings.
- A number of crosswalks along the Fairfield Ave corridor have been upgraded with longitudinal lines or piano key style crosswalk markings.
- Some crosswalks along the Calhoun St corridor have been upgraded with longitudinal lines or piano key style crosswalk markings.
- Crosswalks at major intersections along the Pontiac St corridor have been upgraded with longitudinal lines or piano key style crosswalk markings.
- Crosswalks at major intersections throughout the Waynedale Downtown Area have been upgraded with longitudinal lines or piano key style crosswalk markings.
- Crosswalks associated with school crossings within the State Blvd Corridor have been upgraded with longitudinal lines or piano key style crosswalk markings.
- Crosswalks along the North Anthony Blvd corridor have been upgraded with longitudinal lines or piano key style crosswalk markings.
- Crosswalks in New Haven's CBD have been upgraded with longitudinal lines or piano key style crosswalk markings.
- One major intersection in the Woodburn downtown business district has been upgraded with longitudinal lines or piano key style crosswalk markings.
- Crosswalks within the Leo-Cedarville downtown business district have been upgraded with longitudinal lines or piano key style crosswalk markings.

Objective 4

Upgrade traffic signals throughout CBD's, downtown areas, and other business districts with pedestrian countdown indicators. As projects or developments occur in areas identified in Figure 5, upgrades and pedestiran countdown indicators should be added. Below is a list of improvements that have been made since the 2010 PSAP report or existed before the 2010 report:

- The signalized intersections within Fort Wayne's CBD have been upgraded with pedestrian countdown indicators.
- The signalized intersections along the Wells Street corridor business district have been upgraded with pedestrian countdown indicators.
- The signalized intersections along the Main St Corridor west of Fort Wayne's CBD have been upgraded with pedestrian countdown indicators.
- The signalized intersections along the Broadway Corridor south of Fort Wayne's CBD have been upgraded with pedestrian countdown indicators.
- The signalized intersections along the Fairfield Ave Corridor have been upgraded with pedestrian count-

down indicators.
- The signalized intersections along the Rudisill Blvd Corridor have been upgraded with pedestrian countdown indicators.
- The signalized intersections within the Waynedale Downtown Area have been upgraded with pedestrian countdown indicators.
- The signalized intersections along the Pontiac St Corridor have been upgraded with pedestrian countdown indicators.
- The signalized intersections along the State Blvd Corridor have been upgraded with pedestrian countdown indicators.
- The signalized intersections along the Anthony Blvd Corridor have been upgraded with pedestrian countdown indicators.
- The signalized intersections within New Haven's CBD have been upgraded with pedestrian countdown indicators.

Objective 5

Use priority areas listed in "Step 2 – Identifying Locations" to identify 5 intersection projects for each category of countermeasures (simple, moderately complex, and complex) by 2030.

A large number of projects have been completed over the past 12 years. These projects have become institutionalized in planning and engineering projects in our area. These types of improvements have ranged from individual projects to being included with much larger corridor and intersection projects.

Objective 6

Identify high priority or high usage transit stops and transit stops that need special consideration for ADA compliant treatments.

Since the PSAP report in 2010, the transit stops throughout Fort Wayne and New Haven have been reinventoried for more current ADA information. Priority transit corridors have been identified through ridership numbers. Transit stops continue to be upgraded when coupled with other transportation projects and new development infrastructure. NIRCC has recently created a map and prioritized transit stop locations that are non compliant and prioritized those locations. Plans are being made to address transit stops by upgrading a number of locations each year until all locations are ADA compliant. This year NIRCC also plans to reinventory a large number of transit stop locations that have been identified as possibly being upgraded through various projects in recent years.

Objective 7

Prioritize areas around schools for safety improvements.

Schools throughout Allen County have a variety of geographical environments or policies that either limit or require students to walk to school. Prioritization for areas surrounding schools is necessary since not all of them are conducive to or even allow students to walk to them. Other schools require students to walk if their residence is within a specific distance from a particular school. These requirements vary depending on school

location or district as well as the grade level for students. Priority should be given to the areas surrounding schools that do require walking and that may have large numbers of students that do so. Priority may also be given to schools open to changing their "no walking" policies as new infrastructure allows safe accommodations for walking trips. The types of problems associated with these areas may also affect the prioritization process.

Safety programs throughout the country have been created to target safety concerns and needs with regards to schools and the safety of their students. Efforts are being made to identify these safety needs in Allen County as well. Specific safety needs have already been identified through discussions with area schools and school districts (see map in Appendix G under the "Pedestrian Needs Identified by Schools and School Districts" section). The City of Fort Wayne's Walk Fort Wayne team and the Fort Wayne Greenways Manager met with schools and school districts during the summer and fall of 2009 to gather input on what kinds of safety improvements or pedestrian facilities are needed for their areas. These needs are also identified in the Walk Fort Wayne Plan under the "Safe Routes to School" section. The map in Appendix G shows the progress that has been accomplished so far. This map will be updated as more projects progress or have been completed.

Another Safe Routes to School initiative was the result of bus transportation shortages for FWCS (Fort Wayne Community Schools) due to a lack of funding available. It was realized that starting August 11, 2015, an estimated 9,600 students would not be receiving bus service any longer. NTZs (No Transportation Zones) were determined for schools by setting up a specific radius around each school, creating boundaries, and then specifying that any students within these areas would no longer receive bus service beginning with the 2015-2016 school year. Each class of school had a different radius followed as a guideline which was determined based on how far it would be practical for students to walk to school. Elementary schools used a 1 mile radius, middle schools used a 1.5 mile radius, and high schools used a 2 mile radius.

NIRCC was solicited by FWCS & Fort Wayne to participate in potential improvements to address the number of students that would no longer receive transportation beginning in the 2015-2016 school year. The result was that NIRCC completed an analysis of the NTZs for elementary and middle school students as defined by Fort Wayne Community Schools. The analysis resulted in a summary that provided an overview of the primary issues identified and a list of proposed improvements needed to provide the option for students to safely walk to school who resided within these NTZs. The analysis was conducted using traffic data, roadway characteristics, posted speed limits, signage, student enrollment (2014-2015 registered students), and aerial imagery.

NIRCC first completed an infrastructure review for all of the elementary and middle schools which focused on roadways included in the Federal Functional Classification System. Functionally classified roadways are identified by public agencies which are deemed "significant" to the overall transportation network within a given geographical area. Roadways that are not included within the Federal Functional Classification System were not reviewed as part of this analysis. Residential streets such as those commonly found within residential areas may have deficiencies such as lack of sidewalks/trails, street illumination, or painted crosswalks but for the purposes of this analysis they were not deemed critical.

Student address data was a key component of this analysis. NIRCC staff utilized the 2014-2015 student registries to assist in project identification and prioritization. All residential areas were reviewed to determine whether or not students could access their school utilizing existing infrastructure. Through this process deficiencies were noted as well as any unique hazards. While many subjective decisions were necessary to complete this, assumptions were made to ensure consistency. Staff identified the most direct routes that would require the least amount of back tracking and attempted to identify common routes that would make most sense. Staff did not take into account students that would walk from locations other than their home address

such as daycare facilities, neighbors or relatives. Though we were aware this may occur it could not be accounted for within the analysis. In addition, staff did not adjust the student values for those that would be transported by parents or other vehicular means.

The results of this analysis provided a summary of what was deemed the most critical to accommodate students and also provided maps and databases listing all other improvements needed. These recommendations were then discussed further with FWCS officials, each school, and the City of Fort Wayne to ensure the recommendations were justified. NIRCC then worked with local engineering officials to review and prioritize identified infrastructure improvements. In total, NIRCC assisted or completed the following:

- Staff identified the most likely walking route for each residential area within each NTZ for all elementary and middle schools. As these routes were reviewed, staff documented the following needs to assist students in accessing their respective school.
    - o Overhead illumination (street lighting) - total of 13 miles identified as needed
    - o Sidewalks/Trails - total of 23 miles identified as needed (6.75 miles identified as needed in the future)
    - o School zone signage / Speed Limit Signage / School Zone Flashers
    - o Crossing improvements (Piano Key Crosswalks, Designated School Crossing Signs, and LED Flashing School Crossing Signs) - total of 181 locations identified as needed
    - o Pedestrian indicators at signalized intersections
    - o Locations in need of crossing guards
- Staff identified 111 elementary and middle school "CRITICAL AREAS" (residential areas where students resided that did not have safe passage to and from school)
- Staff identified over 2,100 elementary and middle school students with homes located in critical areas.
- Staff presented recommendations that included changes to the NTZ boundaries and the identified improvements to FWCS, Fort Wayne Board of Works, and the Fort Wayne Police Department (FWPD).
- Policy changes were made and FWCS made alterations to 11 elementary school NTZs and reinstated bus service to approximately 50% of the students that were located within critical areas.
- City of Fort Wayne Street Department began to implement crossing improvements by installing piano key crosswalks and designated school crossing signs at recommended locations agreed upon by FWCS.
- NIRCC has worked with Fort Wayne Engineering and Community Development to prioritize future projects to address sidewalks/trails, illumination and crossing improvements

The City of Fort Wayne and FWCS has partnered to accomplish a number of the identified improvements over the last 7 years and continues to work towards completing all the needed infrastructure to accommodate students who need to walk to school. To see a map of the sidewalk/trail projects that were identified as part of the analysis and to see how many of these projects have been completed, see map in Appendix G.

Objective 8

Select at least 5 corridors for possible pedestrian safety improvements by 2030.

Through survey information and crash data analysis there seem to be corridors that experience high numbers of pedestrian conflicts or accidents. These corridors reveal a high level of pedestrian usage throughout and while they may exhibit sufficient benefits from spot location type safety treatments a much higher benefit may be achieved from safety improvements made to the entire corridor.

There are a number of maps in Appendix G that demonstrate the vast number of projects that have been completed throughout the metropolitan area. One map titled "Trail Crossings by Crosswalk Type in Allen County" identify 348 trail crossings, of which 156 of them are High Visibility Crosswalks (HVCs). HVCs include crosswalk types with painted patterns such as Continental (or piano key), Zebra (diagonal), and Ladder. These patterns allow motor vehicles a much greater site distance making it is more apparent that a heavily used crossing is ahead. Not all 348 trail crossings warrant HVC type crossings, but where they are, these types of crossings have been added and continue to be added as more projects are completed.

Two other maps in Appendix G titled "Sidewalk Improvements Since 2009" and "Trail Improvements Since 2009" display the large number of sidewalk and trail projects that have been completed since 2009. In the last 10-12 years more money has been invested for bicycle and pedestrian infrastructure than ever before. Over 50 miles of sidewalks have been built to fill in gaps in the sidewalk network and add sidewalks along major roadways in Allen County. Over 90 miles of trails have been built as well. These maps also display the projects planned for the near future.

Objective 9

Based on analysis using tools from "Step 2 – Identifying Locations", select 5 educational or encouragement type countermeasures for spot specific locations, corridors, or larger areas by 2030.

A number of conflicts between motor vehicles and pedestrians result from the lack of knowledge about the law or behaviors that produce unsafe actions. Also, the lack of pedestrian activity produces a lack of awareness for motorists. This lack of awareness creates behaviors that contribute to unsafe environments for pedestrians.

There are a number of agencies, groups, advocates, and non-profits in Allen County that have worked to create educational opportunities, events, and support for creating a safe pedestrian environment while increasing the quality of life throughout the area. This objective has been far exceeded in Allen County with more programs and projects than can be listed here. This type of objective continues to be a major priority and will only continue to increase as more facilities are built and more emphasis on safety is made.

Appendix I

Public Comment/Review
(The public comment/review period for the PSAP draft plan was 9/20/22 through 10/24/22)

PSAP Public Comment/Review

Becky Weimerskirch (Mayor's Age Friendly Council Vice President)

1. The Age Friendly Advisory Council is meeting today. Please change the name in this document from Senior Advisory Council . I am going to recommend we endorse this plan and help in several ways. I assume this is a good place to ask that diagonal curbcuts are not the preferred design.
2. I am pleased to report that the Mayor's Age Friendly Council endorses the Pedestrian Safety Action Plan. In addition, this Council wants to participate in public safety campaigns and provide input on the projects. We also want to comment that we recommend far less use of the "pancake" curb cuts that provide a less direct path of travel at intersections for those with visual disabilities and those who use wheelchairs. This design is less safe, potentially directing people into vehicular traffic, and was included in the ADA regulations as a worst case scenario when other obstacles presented no other alternative. We have identified the area around the Turnstone campus as a high priority for these upgrades. Thanks for your efforts and please keep us informed as the Plan and resulting projects progress.
    a. *Response: Thanks Becky, we will keep you in the loop.*
    b. *As a side not, NIRCC has made comments regarding placement of curb cuts for projects and new developments in the past and stressed that "pancake" curb cuts should be eliminated.*

Megan McClellan (Ft Wayne Trails Executive Director)

1. On pages 58 and 59 you talk about the Walk Fort Wayne Plan. Obviously this is a draft but make sure that you update these pages to reflect that a new Walk Fort Wayne Plan is being developed. Or is this the replacement for the Walk Fort Wayne Plan? Either way, it currently reads as though you are working on the Walk Fort Wayne plan right now but the dates are 2009 and 2010 and clearly state that this is a 10 year plan.
    a. *Response: This is based on the original plan that was included in our safety action plan finished in 2010. We are currently working with Community Development on the update to this plan and will include new information once that plan is update.*
2. Are you considering doing another sidewalk needs survey? We just did a survey last summer and had over 1700 responses, without stuffing utility bills. We would be happy to help with a new sidewalk survey.
    a. *Response: This is based on the original plan that was included in our safety action plan finished in 2010. We are currently working with Community Development on the update to this plan and will include new information once that plan is update.*
3. I like that you include the Goals, Policies and Action Steps from the Walk Fort Wayne Plan. Could you also include what has been done towards reaching those Goals, Policies and Action Steps in the last 12 years?
    a. *Response: This is based on the original plan that was included in our safety action plan finished in 2010. We are currently working with Community Development on the update to this plan and will include new information once that plan is update.*
4. I love the Trail crossings map on page 113. What is a "standard crosswalk"? How many of the crosswalks were identified with no crosswalk? Could you send me a pdf of just this map?
    a. *Response: A Standard Crosswalk is just 2 parallel lines that cross the approach of an intersection. High Visibility Crosswalks are anything that is above and beyond that to make the crossing more visible.*
    b. *Response: Out of 348 crossings identified, 74 had no crosswalk markings. These are basically locations that are parallel to the main road like at subdivision entrances. See image example:*

5. The Walk Fort Wayne Plan is referenced frequently in this document. It is under review now and should be updated soon. Will the PSAP be updated to reflect any changes in the Walk FW plan?
    a. *Response: Yes*
6. Since the Walk FW Plan is referenced so frequently, would this plan recommend that Allen County, New Haven etc. adopt the Walk FW Plan or at least specific policies from the plan? If not, why not?
    a. *Response: The point of referencing the Walk FW Plan is because a significant amount of work was completed by a number of stakeholders and the plan is really the driving force for most of the urban developed area. If other LPAs would want to use the Walk FW plan that would be their*

decision. I'm sure it could be a source of information but each LPA probably has their own opinions and, if a plan is needed, they may want to have a plan tailored to their own jurisdiction.

7. A lot of new infrastructure and painting is recommended in this plan but there is very little in the plan about maintenance. I think that this is an oversight.
    a. *Response: This is not a maintenance plan. Maintenance is mentioned in the report but maintenance is a another topic, and perhaps report.*
8. The Greenways Coalition has met once in my 3.5 years as ED of Fort Wayne Trails. Who is in charge of organizing those meetings? I would be happy to help, just let me know who gets invited.
    a. *Response: This is a question for the FW Greenways Manager, Dawn Ritchie, since she organized it. Maybe if FW Trails held the meeting it could be rejuvenated or a new group could be formed.*
9. I would love to see these goals made more to the standard of "specific, measurable, attainable, realistic and time-bound", or at least measurable and provide a clear purpose. Also, they should clearly lay out how each goal considers the Es (either the ones noted in this plan or the new ones). I will include more specifics on this later in this review. Actionable goals also need to note who will be taking the action. Are these things that NIRCC will implement or is NIRCC recommending that all municipalities follow these goals? Will NIRCC be providing assistance (financial or with their expertise)? Will NIRCC be providing follow up to see what has and has not been accomplished in each municipality by the time provided in each goal? Is there a mid-way check in?
    a. *Response: The Es are listed out with descriptions in Step 3, Selecting Countermeasures. We are not an action agency, we are a recommending agency. We can only be so specific and can not mandate that any municipality follows this plan. NIRCC secures funding for these types of improvements with any projects we are associated with.*

Cornelia Schulz (Advocate)

1. Step 1 Objective 1 (Appendix H) Why would the goal with an increased population that desires more walkability/ bikeability be less ambitious? 15% reduction in pedestrian accidents for a visionary plan seems ineffective and insincere.
    a. *Response: There has been a significant amount of work done in recent years to build pedestrian infrastructure and make existing infrastructure safe. With more infrastructure and destinations, pedestrian activity has also increased significantly which creates more conflicts between pedestrians and motor vehicles. This can be changed in future updates if needed but with record breaking numbers of projects and funding being spent, the trend reduction of 15% seems to be more attainable. If targets are not attainable, or set within reason, it may not always be pursued.*
2. Figure 16 shows data that should be made a top priority for any CDAP or other plan. There doesn't need to be another traffic study, neighborhoods should demand actionable steps now.
    a. *Response: The point of this plan is to point out these types of needs so that neighborhoods, LPAs, etc can try for funding and grants to address problems.*
3. Objective 3. Piano Keys. We have had Piano Keys on Fairfield Avenue, they have not been more effective to slow traffic down and make for a safe crossing. Generally the quality of paint needs to improve dramatically. After a few weeks the crosswalk was no longer visible. Areas of greatest concern need to be maintained and prioritized. The two color scheme by and around Indiana Tech seems very visible for a driver.
    a. *Response: This should be shared with City of FW. We don't maintain or add crossings.*
4. Step 4 with newly approved spending on sidewalks by City Council, prioritize major thoroughfares, and while improving sidewalks make them into trails.
    a. *Response: This would need to be a decision by the City*
5. Step 5 references the Complete Street resolution by the Board of Public Works from 11/2/16 Is there one example where this resolution has been made a reality?
    a. *Response: This question should be directed to the City.*
6. Step 6 County still allows and approves new development without sidewalks as of last week. The concern is that all taxpayers will share the burden of retrofitting and redirecting resources again from historic neighborhoods.
    a. *Response: This would be an issue with the zoning ordinance or need to be addressed by Plan Commission. Most of the issues have been resolved now but perhaps not all. This is a question for the Department of Planning Services.*
7. Step 8, When was the last bike count on bike lanes? How can bike lanes become safer and user friendly through better roadway design barriers? For example make Wells Corridor one way from downtown to State Street, make the obsolete lane a bicycle track. Utilize improved State Street and Clinton for traffic going downtown.
    a. *Response: Fort Wayne Community Development conducted bike counts a number of years ago.*
    b. *Response: This is a question for Fort Wayne. These types of major changes need support and careful planning or study. Affects to area residents and businesses in the area, as well as local traffic would need studied and supported. This type of change would have significant impacts to the transportation network and Federal Aid Routes and could even impact users of all types in a negative way if not warranted or if not vetted through the planning process properly.*

8. The City seems to spend a lot of time researching why things can't be done. If Cities like Indianapolis, Chicago or Detroit have bicycle tracks in their downtown, how is it not an option in Fort Wayne? Wayne and Berry could easily be made one lane for cars and one for bikes.
    a. *Response: This is a question for Fort Wayne.*
9. NIRCC ped plan. What is this used for? By whom?
    a. *Response: It is used by LPAs to coordinate projects and bicycle and pedestrian needs. It is also used to secure funding for projects.*
10. Unreasonable to reduce speeds system wide? (This is said on one of the first pages. I think it needs to be justified, or removed from their thinking completely.)
    a. *Response: This just means that not all corridors or streets should just have speed reductions. Not all streets warrant reduced speeds. There may be streets and corridors that do warrant speed reductions but it needs to be justified and studied to avoid creating unintended negative consequences that may not be realized.*
11. The fatality reduction goal is ridiculous. It should be 0 deaths in maybe 5 years?
    a. *Response: The Pedestrian Safety Action Plan (PSAP) does not use or specify a "fatality reduction goal". Zero deaths are always preferred. The PSAP does not track pedestrian fatalities or set goals for fatality reductions. It sets goals to reduce pedestrian accidents. As NIRCC has looked at pedestrian data, a significant number of fatalities occur for reasons beyond roadway design. Tracking overall pedestrian accidents provides much better data for making the transportation network safer.*
12. Set speeds downtown and in neighborhoods to 20. Do traffic study. Find 85th percentile. Keep changing street until it gets down to 20.
    a. *Response: This would be a comment to share with City of Fort Wayne. In many instances though, the 85th percentile sets speeds higher.*
13. Ban right turn on red (and/or just do all of the suggestions listed)
    a. *Response: Banning all right turns on red would not be warranted but there certainly are many locations or areas this could be beneficial and is a safety countermeasure the PSAP includes in this report.*
14. Remove minimum parking requirements
    a. *Response: This is a comment/question for LPAs and Zoning.*
15. Encourage redevelopment of existing parking lots
    a. *Response: This is a comment for LPAs.*
16. Remove business curb cuts on busy streets (like Coliseum, Clinton, Lafayette)
    a. *Response: These are State Routes. But NIRCC and other departments do work at reducing unneeded curb cuts through new developments and project development/scoping. Access management is an important part of transportation and safety management.*
17. Get cars off the streets and reduce the speed of those that remain
    a. *Response: Motor Vehicles are the majority of all trips. Taking away one mode of travel for another does not always make things better. There need to be ways of compromise and reasons for changes to modes of travel without creating more negative affects then what were present in the first place.*

References

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Appendix B – Citilink: Agency Safety Plan

Agency Safety Plan

CITILINK, §673.11(b)

Fort Wayne Public Transportation Corporation

Adopted Date: December 10, 2020
Amended Date: February 17, 2022
Amended Date: December 22, 2022

Prepared by: Larry Wiggins Chief Safety Officer

CITILINK

Date: December 22, 2022

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Introduction

Document Organization

Citilink is committed to providing a safe work environment for employees and visitors and a safe operating environment for customers and travelers throughout Fort Wayne who interact with Citilink. To ensure the plan complies with 40 U.S.C 5329 and 40 Code of Federal Regulations (CFR) 673, sections following this introduction adhere to the sample structure provided by the Federal Transit Administration (FTA) in *Public Transportation Agency Safety Plan Template for Bus Transit* (December 31, 2019). The Appendix contains definitions, background, process, and supplementary documents.

This plan complements the Citilink Hazard and Security Communication & Response Plan (HSCRP). The current HSCRP (2008) overlaps in many of the topic areas identified through the federal guidance to be addressed in the ASP. Thus, to reduce duplication of effort in future updates and use application of actions from the plans, Citilink has reviewed each of the planning and operations documents addressing safety and has documented the primary source for information and direction. The ASP addresses hazards that arise during day-to-day operations, while the HSCRP addresses the agency's response to external threats, such as extreme weather and intentional attacks. A third plan, the Transit Development Plan, contains up-to-date information about the size, service schedule, and other characteristics of the Citilink system. Table 1 provides a quick guide to the contents of each document.

Plan Development

Citilink drafted the original Citilink Agency Safety Plan (ASP), with the assistance of SRF Consulting Group, Inc. During this process, a series of two workshops provided opportunities for input and collaboration by Citilink and other Fort Wayne staff. Participants included Sherese Fortriede, Board Chair; Claudia Harris-Stevens, Operations Manager; Junior Rodriguez, Shop Manager; Pam Schieber, Customer Service & Mobility Manager; Kylee Wagner, Marketing Manager; Ruth Vosmeier, Executive Assistant; and Jean Marie Boykins, Human Resources Director.

Topics covered in each workshop are provided below:

- Workshop 1 introduced the Public Transportation Agency Safety Plan (PTASP) and Safety Management Systems (SMS) process, identified the roles and responsibilities of the Accountable Executive and the Chief Safety Officer, and included a discussion on the desired deliverables. Workshop 1 also covered the current safety practices at Citilink and the revisions necessary to move towards a SMS approach, established the safety culture, set seven safety performance targets, introduced the hazard risk matrix, and identified hazards staff encountered over the past five years.

- Workshop 2 focused on risk management through assigning hazards to the hazard risk matrix. This workshop assessed the likelihood and severity of identified hazards and discussed concepts for mitigation for the hazards. By running through examples encountered over the past five years, personnel gained practice at identifying and mitigating hazards in the future.

The planning process ran from June 2020 through the approval of the plan by the City of Fort Wayne Transportation and Utilities Director and certification by the INDOT in December 2020.

Table 1. Plan Comparison Matrix

Element Descriptions	Resident Document		
	ASP	HSCRP	Transit Development Plan
Goals/Objectives/Targets			
Safety	■	■	
Security		■	
Transit System Description			■
Roles and Responsibilities			
Safety	■		
Security		■	
Safety Management Policy	■		
Safety Risk Management	■		
Threat and Vulnerability Identification/ Resolution		■	
Safety Assurance	■		
Safety Promotion	■		

Outcomes from the workshops are reflected throughout the plan in call-out boxes, and full meeting records are included in the Appendix. This plan is a "living document," tested and reaffirmed through daily executed processes and with annual reporting and updates to the plan to be recorded as revisions.

About Citilink

Information outlining Citilink operations and organization is provided in the Fort Wayne Public Transportation Corporation Development Plan (January 2020). Citilink directly operates both fixed

route bus service and paratransit demand response bus service (called "Access"). Both modes are covered in this Agency Safety Plan. Citilink employs approximately 127 staff members, with a majority in safety-sensitive positions.

The Citilink ASP and Safety Management Systems

Moving Ahead for Progress in the 21st Century (MAP-21) granted the FTA the authority to establish and enforce a comprehensive framework to oversee the safety of public transportation throughout the United States. It provided an opportunity for FTA to assist transit agencies in moving towards a more holistic, performance-based approach known as the Safety Management System (SMS).

Figure 1. SMS Elements

SMS is a formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of a transit agency's safety risk mitigation. It includes systematic procedures, practices, and policies for managing risks and hazards, and consists of four primary elements:

- **Safety Management Policy:** A transit agency's documented commitment to safety, which defines the transit agency's safety objectives and the accountabilities and responsibilities of its employees regarding safe practices.
- **Safety Risk Management**: A process within a transit agency's Agency Safety Plan for identifying hazards and analyzing, assessing, and mitigating safety risk.
- **Safety Assurance:** A process within a transit agency's Safety Management System that functions to ensure the implementation and effectiveness of safety risk mitigation, and to ensure that the

transit agency meets or exceeds its safety objectives through the collection, analysis, and assessment of information.

- **Safety Promotion**: A combination of training and communication of safety information to support SMS as applied to the transit agency's public transportation system.

Existing Citilink Policy & Protocol

Citilink has other plans and policies that complement the ASP by elaborating on detailed aspects of day-to-day operations. They include but are not limited to the following plans. Links to the listed plans are included in the Appendix.

- Citilink Maintenance Plan (January 2022)
- Citilink COVID – 19 Workplace Safety Plan (October 8, 2021)
- Disruptive Passenger Conduct Policy (Revised July 19, 2022)
- Drug and Alcohol Testing Program and Policy (December 27, 2019)
- Safety Committee MOU (November 30, 2022)

1. Transit Agency Information

Table 2 provides an overview of Citilink's contact persons and other information of immediate relevance to the FTA.

Table 2: Transit Agency Information

Transit Agency Name	Fort Wayne Public Transportation Corporation dba Citilink
Transit Agency Address	810 Leesburg Rd, Fort Wayne, IN 46808
Name and Title of Accountable Executive	Dr. Jean Marie Boykins, Human Resources Director
Name of Chief Safety Officer or SMS Executive	Larry Wiggins, Chief Safety Officer
Modes of Service Covered by This Plan	Motor Bus (Fixed Route) and Demand Response (Paratransit)
All FTA Funding Types	5307 and 5339
Modes of Service Directly Provided by the Transit Agency	Motor Bus (Fixed Route) and Demand Response (Paratransit)
Does the agency provide transit services on behalf of another transit agency or entity?	No
Description of Arrangement(s)	N/A
Name and Address of Transit Agency(ies) or Entity(ies) for Which Service is Provided	N/A

2. Plan Development, Approval, and Updates

The Agency Safety Plan for Citilink is a "living document." As major revisions occur, the entire plan will be reproduced and distributed. For minor revisions, only the affected pages will be issued. Upon reception, previous revisions of the document shall be destroyed. Table 3 documents the most recent approvals of this plan, and Table 4 records the complete history of successive versions.

Table 3: Plan Development, Approval, and Updates

Name of Entity That Drafted This Plan	Fort Wayne Public Transportation Corporation dba Citilink	
Approval by Safety Committee Members	Terry Rencher Jr.	12.22.22
	Jeff Haycox / Jeff H	12.22.22
	Steve Sustek Steve Sustek	12-22-22
	Arlene Townsend Arlene Townsend	12.22.22
	Jason Trabert	12-22-22
	Pam Schieber Pam Schieber	12-22-22
	/ Larry Wiggins	12-22-22
	Printed Names and Signatures	Date of Signatures
Signature by the Accountable Executive	Dr. Jeanmarie Boykins	12/22/2022
	Dr. Jean Marie Boykins, Human Resources Director	Date of Signature
Approval by the Board of Directors or an Equivalent Authority	Sherese Fortriede	1/19/2023
	Sherese Fortriede, Board Chair	Date of Approval

Table 4: Version Number and Updates

Version Number	Section/Pages Affected	Reason for Change	Date Issued
Rev. 0	Full Document	Initial ASP developed November 2020 by SRF Consulting Group, Inc., in consultation with Citilink management.	November 30, 2020
Rev. 1	Full Document	Updated name of Accountable Executive and Chief Safety Officer.	February 17, 2022
Rev. 2	Full Document	Updated name of Chief Safety Officer and Accountable Executive, Annual Review and update of the Agency Safety Plan, Safety Committee, Investigations, Safety Communication, and table of contents. Added page numbers, Appendices, Links, Definition of Terms, and a List of Acronyms	December 22, 2022

Annual Review and Update of the Agency Safety Plan

Annual Review and Update of the Agency Safety Plan The Citilink ASP, including the Safety Management Policy Statement, is reviewed annually to ensure it remains relevant and appropriate to the agency's safety objectives and safety performance targets, per § 673.11(a)(5).

The annual review of The Citilink ASP will be conducted by the Chief Safety Officer, and the Safety Committee, no later than the beginning of August of each calendar year. The Chief Safety Officer shall establish a timeline for all departments to complete their review and submit their comments. The annual review process shall include but not be limited to the following considerations:

- Determination of the effectiveness of mitigation strategies to address identified safety deficiencies
- When significant changes to service delivery are made
- The introduction of new procedures and processes that may affect safety
- Changes that may affect resources and their availability and impact upon the Safety Management System
- Significant organizational structural changes that may affect safety and the management of safety
- Regulatory changes and or updates that may affect the content of the ASP

Completion of the annual review process including the incorporation of approved departmental comments and or changes to the ASP shall be targeted for November 1st of each year.

Following review and updating as warranted, the plan is certified by the General Manager and approved by the Fort Wayne Public Transit Corporation Board of Directors and the Indiana Department of Transportation (INDOT) Transit Manager. As a component of the annual ASP review process, Citilink will communicate updated safety performance indicators to the INDOT and the Northeast Indiana Regional Coordinating Council (MPO), to aid in their planning processes. In coordination with the MPO, Citilink may adjust its safety performance targets or develop new safety performance measurement areas for tracking and monitoring by the agency. Updates to the ASP are recorded in the Version Number and Updates, including a version history. All documentation shall be retained for a minimum of three years

3. Safety Performance Targets

Clearly defined safety goals, objectives, and targets are key elements of Citilink's policy and strategic planning. Goals are general descriptions of desirable long-term impacts, while objectives are more specific statements that define measurable results. Citilink has established high-level goals and objectives that guide safety activities at the agency (Table 5).

Table 5: Citilink Safety Goals and Objectives

Goal 1: Citilink will create a culture that supports employee safety and security and safe system operation (during normal and emergency conditions) through motivated compliance, rules and procedures, the appropriate use and operation of equipment, and an active safety promoting role for everyone in the organization
Objectives
Establish a dedicated staff person as the Chief Safety Officer to manage the agency's transit safety program
Continue regular transit safety meetings to address training needs, review events, and develop safety awareness activities and programs
Enhance safety input and feedback processes
Increase employee safety training opportunities
Goal 2: Citilink encourages safe system operation through identifying hazards, mitigating risk, and reducing occurrences
Objectives
Implement and maintain a hazard identification and risk assessment program, and based on the results of this program, establish a course of action for improving safety and reducing hazards
Achieve a level of safety performance that meets or exceeds the agency's established performance targets

Where it is appropriate and feasible, Citilink assigns numerical metrics and target values to its safety performance. This ASP specifies seven performance targets for each service mode the agency operates, based on the safety performance measures established under the National Public Transportation Safety Plan. They are:

- Fatalities: Mean (or average) of reportable fatalities and rate per 100,000 vehicle revenue miles
- Injuries: Mean (or average) of reportable injuries and rate per 100,000 vehicle revenue miles
- Safety Events: Mean (or average) of reportable events and rate per 100,000 vehicle revenue miles (event, as defined in § 673.5)
- System Reliability: Mean (or average) revenue miles of service between major mechanical failures

The target for each performance measure was established as a trend rather than a specific numeric value. Across each measure, the target is to demonstrate an incremental improvement over an established baseline calculated from the most recent 3 year rolling average based on data submitted to the national transit data base according to § 5335. Current baselines were set as the averages of

the performance measures from October 2019 to October 2022. Citilink will seek annual improvements in performance targets. If the average was already at zero, the target will remain zero. The targets for each mode are shown in Table 6 and Table 7.

In a plan such as the ASP, it is critical to demonstrate a connection between the performance measures and system goals. Thus, which of the safety goals each performance measures supports by mode is included in the tables.

Table 6: Fixed Route Safety Performance Annual Baseline and Targets

Safety Performance Category		2019-2022 Baseline	Target	Goal Supported
Fatalities	Total	0.3	0	1|2
	Rate per 100,000 VRM	0	0	1|2
Injuries (Minor/Major)	Total	4.6	Reduction from baseline	1|2
	Rate per 100,000 VRM	0	0	1|2
Safety Events (Minor/Major)	Total	8.3	Reduction from baseline	1|2
	Rate per 100,000 VRM	0	0	1|2
System Reliability (Minor/Major)	VRM Between Failures (Total)	43,652	Increase from baseline	1|2

Table 7: Paratransit Safety Performance Annual Baseline and Targets

Safety Performance Category		2019-2022 Baseline	Target	Goal Supported
Fatalities	Total	0	0	1|2
	Rate per 100,000 VRM	0	0	1|2
Injuries (Minor/Major)	Total	0.6	Reduction from baseline	1|2
	Rate per 100,000 VRM	0	0	1|2
Safety Events (Minor/Major)	Total	1.3	0	1|2
	Rate per 100,000 VRM	0.0	0	1|2
System Reliability (Minor/Major)	VRM Between Failures (Total)	67,427	Increase from baseline	1|2

Major and Minor Events

In describing these categories, the definitions for "major" and "minor" from the National Transit Database (NTD) are as follows:

- **Reportable Event (Major):**

A safety event occurring on transit right-of-way or infrastructure, at a transit revenue facility, or at a transit maintenance facility during a transit-related maintenance activity or involving a transit revenue vehicle that results in one or more of the following conditions:

- A fatality confirmed within 30 days of the event
- An injury requiring immediate medical attention away from the scene for one or more person
- Property damage equal to or exceeding $25,000
- Collisions involving transit revenue vehicles that require towing away from the scene for a transit roadway vehicle or other non-transit roadway vehicle
- An evacuation for life safety reasons

- **Non-Major Summary Incident/Event (Minor)** are less severe incidents or events that do not meet the requirements of Reportable Events:
  - Other safety occurrences not otherwise classified (injuries); and
  - Fires
- **Major mechanical system failures,** as defined by the NTD, are those that limit actual vehicle movement or create safety issues. This includes but is not limited to failures involving:
  - Brakes
  - Doors
  - Engine cooling systems
  - Steering, axles, and suspension
- **Minor mechanical system failures** are failures of some other mechanical element of the revenue vehicle not caused by a collision, natural disaster, or vandalism, but that, because of local agency policy, prevent the revenue vehicle from completing a scheduled revenue trip or from starting the next scheduled revenue trip even though the vehicle is physically able to continue in revenue service. They include but are not limited to issues involving:
  - Fareboxes
  - Wheelchair lifts
  - Heating, ventilation, and air conditioning systems

ESTABLISHING A BASELINE

Introduced in Workshop 1, the process to establish the seven safety targets involved a discussion on what is measurable and what is achievable. The workshop participants considered multiple approaches to set the targets, including the five-year average for Citilink, the averages among its peers from the last TDP, and targets established in completed safety plans from across the county. Using internal safety numbers would require the smallest time commitment and would be the most practical to keep track of over time. All participants agreed to strive for an improvement over current performance.

Safety Performance Target Coordination

Citilink provides up-to-date editions of this plan, including safety performance targets, to the MPO in accordance with § 673.15(a) and § 673.15(b). The most recent dates of transmission are shown in Table 8.

Table 8: Safety Performance Target Coordination

	MPO Name	Date Targets Transmitted
Targets Transmitted to the MPO	Northeastern Indiana Regional Coordinating Council	01/20/2023

4. Safety Management Policy

Safety Management Policy Statement

Citilink prioritizes safety as the positive effects influence every aspect of service. Identifying and addressing potential threats and hazards can save lives, reduce injuries, improve service and help manage costs.

Citilink uses the Safety Management Systems (SMS) framework to make informed decisions appropriate for operations, passengers, employees and how we interact with the community. As an agency we are committed to the following objectives:

- Establish a dedicated staff person as the Chief Safety Officer to manage the agency's transit safety program
- Continue with regular transit safety meetings to address training needs, review events, and develop safety awareness activities and programs
- Enhance safety input and feedback processes
- Increase employee safety training opportunities
- Continue with hazard identification and risk assessment program, and establish a course of action for improving safety and reducing hazards
- Achieve a level of safety performance that meets or exceeds the agency's established performance targets

Promoting a non-punitive safety culture is a critical element of the SMS framework. Citilink management is fully committed to ensuring that the employee safety reporting processes established within this plan allow all employees to report safety hazards to senior management without concern of retribution. Except in the instance of willful safety rule violations as defined in the employee handbook, Citilink employees reporting safety hazards shall not be subject to disciplinary action.

Dr. Jeannine Bayliss
Accountable Executive

12/22/2022
Date

Therese Tatreau
Board Chair

1/19/2023
Date

Safety Management Policy Communication

Per § 673.23(c) and § 673.29(b), Citilink communicates its safety management policy within the organization in three ways. 1) All personnel receive the Rules and Regulations handbook that includes the safety policy statement. 2) Staff can access the complete ASP digitally and in hard copy at the Citilink main office. 3) During orientation new employees are introduced to agency safety programs.

Authorities, Accountabilities, and Responsibilities

The Citilink **Human Resources Director** serves as the agency's **Accountable Executive** and has the authority to develop and execute the Citilink ASP. The Human Resources Director is accountable for the agency's safety and the maintenance of the SMS program.

Citilink has established a position of **Chief Safety Officer.** When that position is filled, they will serve as Citilink's **SMS Executive/Chief Safety Officer** responsible for day-to-day implementation and management of the ASP and the SMS process. The Chief Safety Officer will report directly to the Human Resources Director, and they will meet regularly with the General Manager/CEO to discuss the agency's safety performance and advancement of the SMS within Citilink, in accordance with § 673.23(d)(2). In order to work effectively and maintain consistent lines of communication, the Chief Safety Officer will work with the current Safety Committee with executive managers and department representatives. Until this position is filled, the Human Resources Director will serve as both Accountable Executive and SMS Executive/Chief Safety Officer and fulfill the responsibilities assigned.

Other senior staff at Citilink hold important roles in ASP development, implementation, and management. Table 9 gives an overview of these roles and responsibilities.

Safety Reporting-Response Opportunities

Citilink is committed to providing a safe work environment for employees and visitors and for responsible operations throughout Fort Wayne. Thus, it is imperative that Citilink employees and stakeholders have convenient and available means to report incidents and occurrences which may compromise the safe conduct of Citilink operations. Citilink encourages employees, customers and community stakeholders to report activities/conditions that may affect the integrity of transit safety. Such communication must be completely free of any form of reprisal, per § 673.23(b) and § 673.23(c).

Citilink's Rules and Regulations handbook, as well as the Bus Operator's Manual, outline the reporting methods available to employees. Citilink will not take disciplinary action against any employee who discloses an incident or occurrence involving transit safety. This policy shall not apply to information received by Citilink from a source other than the employee, or which involves an illegal act, or a deliberate or willful disregard of Citilink regulations or procedures.

Table 9: ASP Senior Staff Tasks and Responsibilities

Legend P – Primary or Lead Responsibility S - Secondary Responsibility Task		General Manager/CEO	Chief Safety Officer	Human Resources Director
Plan Development	Establish PTASP policy	S	P	P
	Establish PTASP policies, goals, objectives	P	P	S
	Establish PTASP organization	S	P	P
	Establish PTASP roles and responsibilities	S	P	P
	Establish a PTASP review and renewal schedule	S	P	P
	Develop and track PTASP targets	S	P	S
	Conduct preliminary Hazard and Threat & Vulnerability Assessment	S	P	S
	Assess and resolve identified risks	S	P	S
Plan Implementation and Management	Document serious and/or repeated safety violation	S	P	S
	Conduct or monitor incident/mishap response and investigation (assess trends)	S	P	S
	Provide safety and security related training	S	P	S
	Develop annual safety and security report	S	P	S
	Develop standard operating procedures related to employee safety duties	S	P	S
	Develop an effective incident notification and reporting system	S	P	S
	Support and communicate safety as the top priority to all employees	S	P	S
	Develop relations with outside organizations that may participate in and contribute to the PTASP, including local public safety and emergency planning agencies	S	P	S

The Chief Safety Officer will be responsible for reviewing reported events and addressing events consistent with the Safety Risk Management process. The reporting and response process encompasses three phases in addressing events. Each phase is outlined below:

- Detection and reporting. Citilink provides a range of methods for employees, customers and/or others to report incidents/events covered in the safety program, including:
  - Employees: Citilink has developed an incident/event/condition reporting form through which employees can report an event that has occurred or a condition of concern that could result in a safety event. Employees are required to report accidents that involve operations, maintenance, vehicles, and/or injuries to employees.
  - Customers: Operators are instructed to contact the Operations or Maintenance Manager in the event of a customer reported incident/event. Reporting to the Operations or Maintenance Manager initiates the incident/event review process. Customers are able to call in to customer service and report an incident/event. The Operations Manager will give them

a call back when necessary. Additionally, the Citilink webpage provides information on how to contact Citilink to report an incident or to provide comment on service. Input from customers relative to safety incidents/concerns is directed to the Chief Safety Officer.

- Stakeholders: Persons Citilink comes in contact with through operations or a visit to any Citilink facility can report incidents to the customer service representative or through the Citilink website. The Chief Safety Officer will be responsible for creating displays of how stakeholders can provide their input.

- Response. Citilink is committed to open communication regarding employee, customer and stakeholder safety. Presently, there is not a formal program for wide dissemination of the outcome and/or actions with safety hazards or events reported through the range of means available. The Chief Safety Officer and Marketing Manager's responsibilities will include continuing to establish a range of digital, print, and verbal methods through which actions taken to address hazards or events reported to Citilink are communicated internally and externally.

  If the reporting employee provided their name during the reporting process, the Chief Safety Officer ensures that they learn of any actions taken in response to their report. The identity of the reporting employee is protected to the extent permissible by law when Citilink collects, records, or disseminates information obtained from transit safety reports.

Citilink Safety Committee

Citilink hereby establishes a joint labor-management safety committee (the Committee) pursuant to the federal Infrastructure Investment and Jobs Act (49 U.S.C. § 5329) in order to perform the tasks set forth in that statute. The Memorandum will govern the Committee's structure and functions. Further documentation can be found in the Appendix.

The Committee will consist of eight (8) members, with equal representation from management and frontline employees appointed by the Union, each of which will select their own representatives. Both management and the Union will decide unilaterally how each will select its representatives and how long those representatives will serve. Front line employees will include one representative from each of the following employee classifications:

a. Fixed Route Driver
b. Access Driver
c. Shop Department

The Committee will be led by the Chief Safety Officer, or as alternate, the Human Resources Director.

The Committee's purpose is as follows:

a. Identify and recommend risk-based mitigations or strategies necessary to reduce the likelihood and severity of consequences identified through Citilink's safety risk assessment;
b. Identify mitigations or strategies that may be ineffective, inappropriate, or were not implemented as intended; and
c. Identify safety deficiencies for purposes of continuous improvement.

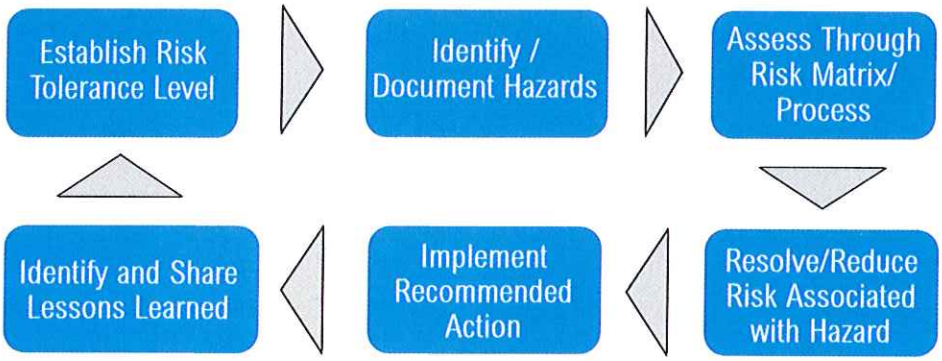
The Committee will perform tasks to identify ways to improve safety within the System consistent with the Purpose as identified above.

Neither management nor the Union will retaliate in any way against any Committee member on account of their Committee work. Likewise, neither management nor the Union will retaliate in any way against any other person employed by the Corporation on account of any assistance given by that person to the Committee.

5. Safety Risk Management

The Safety Risk Management process applies to all elements of the system, including operations and maintenance (facilities and vehicles) and administration. Citilink's risk management process begins with hazard identification, both internal and external to the Citilink facility. Citilink's approach focuses on prevention and/or control of hazards in a systematic manner to reduce the risk of identified hazards to the lowest practical level through effective use of resources. The hazard analysis process includes a feedback loop that re-incorporates lessons learned (Figure 1) through earlier assessments.

Figure 1. Hazard Assessment Feedback Loop



In carrying out the Safety Risk Management process, Citilink uses the following terms:

- Event – Any accident, incident, or occurrence
- Hazard – Means any real or potential condition that can cause injury, illness, or death; damage to or loss of the facilities, equipment, rolling stock, or infrastructure of a public transportation system; or damage to the environment
- Risk – Composite of predicted severity and likelihood of the potential effect of a hazard.
- Risk Mitigation – Method(s) to eliminate or reduce the effects of hazards
- Consequence – Means the potential outcome(s) of a hazard

Hazard Identification

Citilink has established formal requirements for proactive identification of hazards, per § 673.25(b). The primary methods used to identify hazards and threats to the transit system are input submitted to drivers or to customer service by riders or interested stakeholder and incident reports by employees. Copies of the Citilink customer complaint form and incident report are included in the Appendix.

Employees are encouraged to report near-miss incidents, known as precursors. These incidents are more numerous than accidents and including them in the process can help identify effective mitigation and avoid more serious events.

Potential sources regularly reviewed for hazard information include, but are not limited to, the following:

Table 10: Hazard Identification Sources

Hazard Information Source	Responsibility	Review Frequency
Dispatcher daily log	Operations Manager, Chief Safety Officer	Daily
Maintenance shift reports	Maintenance Manager	Daily
Facility inspection or walkaround reports	Maintenance Manager, Operations Manager	Weekly
Statistical reports / historical data	Operations Manager, Chief Safety Officer	Annually
Safety Assessment and System Review	Operations Manager, Chief Safety Officer	Annually
Facility Safety and Security Assessment	Operations Manager, Chief Safety Officer	Annually
Internal and external audits and inspections (including FTA and NDOT audits and inspections)	Operations Manager, Chief Safety Officer	As needed
Passenger/public customer service reports	Operations Manager, Chief Safety Officer	As needed
Incident/accident reports	Operations Manager	As needed
Information from public safety officials, local governments, and other major Citilink stakeholders	Operations Manager, Chief Safety Officer	As needed
Employee safety reports to supervisors or management	All	As needed

Citilink senior management, including the Operations Manager and other department heads are directly involved in hazard review and documentation. Initial hazard reports are provided to senior management through reports from Dispatch and discussion with supervisory personnel.

Risk Assessment

With implementation of the initial ASP in 2020, Citilink is committed to conducting a formal analysis and evaluation process of reported hazards to ensure they are addressed. The steps Citilink employs to assess risk are outlined in the bullet points below and are recorded in Table 11:

- **Step 1: Document the Risk or Event.** Sources of risks or events addressed through the assessment process include complaints received from customers/visitors/stakeholders, incident reports submitted by employees, and observations recorded by employees and submitted to the Chief Safety Officer or to a supervisor.
- **Step 2: Characterize the risk.** Consistent with the FTA Sample Safety Risk Assessment Matrices for Bus Transit Agencies (September 2019), Citilink identifies the likelihood and potential severity of consequences associated with each identified risk or event. Citilink employs

a "worst credible consequences" definition to characterization of risks, meaning the outcome is realistic and imaginable in day-to-day operations, but is not the worst possible consequence. Definitions applied in the process are provided in the next section.

- **Step 3: Describe the current actions to reduce risk.** Citilink employs a range of practices promoted to employees through pre-employment training in their profession, on-going safe operating and/or practices training, distributing operating and maintenance manuals, etc. Applicable actions currently being deployed are documented in the risk assessment process.
- **Step 4: Assess current practices.** Understanding new or modified methods for safe operations and maintenance practice are continuously being developed, Citilink acknowledges the need to periodically assess current practices and safety events to determine the need to revise promoted practices. Through regular application and documentation of the Risk Assessment process, Citilink staff included in risk evaluation workshops consider and discuss other actions to better address observed or anticipated events.

To assess the risk level of a given hazard, experienced personnel at Citilink will use a standardized tool, the Risk Assessment Matrix. Results of the risk assessment process will help determine whether the risk is being appropriately managed or controlled. If the risk is acceptable, the hazard will simply need monitoring. If the risk is unacceptable, Citilink will take steps aimed at lowering risk to an acceptable level, or to remove or avoid the hazard.

The Chief Safety Officer will be responsible for coordinating the risk assessment process, consulting with senior management, supervisors, external subject matter experts, and federal and state bodies as necessary. The goal is to consider all human factors, environmental factors, supervision elements, and organizational elements.

The Citilink senior management team, including the Operations Manager and Chief Safety Officer, is directly involved in the review of all hazards, with the exception of those that have been immediately mitigated by frontline employees or minor disciplinary actions in response to rule violations not constituting systematic, widespread issues.

Table 11: Hazard Identification and Risk Assessment Log

Risk Description	Risk Level			Current Measures to Reduce Risk	Further Action Required to Reduce Risk	Staff Responsibility
	Risk Likelihood	Risk Rating Severity	Hazard Risk Index			

Rating System

To organize and prioritize identified hazards, Citilink defines severity according to the following scale:

- Catastrophic – A: Conditions are such that human error, environment, design deficiencies, element, subsystem or component failure, or procedural deficiencies may commonly cause death or major system loss and require immediate termination of the unsafe activity or operation.
- Critical – B: Conditions are such that human error, environment, design deficiencies, element, subsystem or component failure or procedural deficiencies may commonly cause severe injury or illness or major system damage and require immediate corrective action.
- Marginal – C: Conditions may commonly cause minor injury or illness or minor systems damage such that human error, environment, design deficiencies, subsystem or component failure or procedural deficiencies can be counteracted or controlled without severe injury, illness or major system damage.
- Negligible – D: Conditions are such that personnel error, environment, design deficiencies, subsystem or component failure or procedural deficiencies will result in no, or less than minor, illness, injury or system damage.

Citilink has reviewed the generalized definitions of probability of an event occurring and have refined the operating hours between occurrences to reflect local conditions. Listed below are the Citilink probability of occurrence definitions:

- Frequent – I: Continuously experienced; mean time between events (MTBE) is less than 3,000 operating hours.
- Probable – II: Will occur frequently; MTBE is between 3,000 and 100,000 operating hours.
- Occasional – II: Will occur several times; MTBE is between 100,000 and one million operating hours.

- Remote – IV: Unlikely but can reasonably be expected to occur; MTBE between one and 10 million operating hours.
- Improbable – V: So unlikely, it can be assumed occurrence may not be experienced; more than 10 million operating hours between events.

Citilink determines the overall risk presented by each hazard using a composite measurement of the hazard severity and probability according to the risk assessment matrix shown in Table 12. The matrix is broken down into the categories of High, Moderate, and Low. This standardized hazard analysis matrix helps staff to focus first on the most serious safety hazards requiring resolution. Hazards identified as "High" will require Citilink to further evaluate the potential consequence/condition and identify a mitigation strategy. A "Moderate" rating in the matrix indicates that countermeasures should be implemented, within fiscal constraints of the agency. A "Low" rating means that Citilink may accept the risk without providing any countermeasures.

Table 12: Risk Assessment Matrix

Frequency of Occurrence	Hazard Categories			
	A Catastrophic	B Critical	C Marginal	D Negligible
(1) Frequent	1A	1B	1C	1D
(2) Probable	2A	2B	2C	2D
(3) Occasional	3A	3B	3C	3D
(4) Remote	4A	4B	4C	4D
(5) Improbable	5A	5B	5C	5D

Hazard Risk Index	Risk Decision Criteria	
1A, 1B, 1C, 2A, 2B, 3A	High (H)	Hazard must be mitigated.
1D, 2C, 2D, 3B, 3C, 4A, 4B, 5A	Medium (M)	Hazard should be mitigated if possible, within fiscal constraints.
3D, 4C, 4D, 5B, 5C, 5D	Low (L)	Hazard is acceptable with review by management.

Once a hazard analysis is performed to define its potential severity and probability of occurrence, the project team must work to address, or resolve, such hazards. Hazard resolution is defined as the analysis and subsequent actions taken to reduce to the lowest level practical the risk associated with an identified hazard.

Risk Mitigation

If the assessment process indicates a need for mitigation, then Citilink executive, operations, and maintenance management develop corrective actions in consultation with frontline personnel and subject matter experts as necessary.

Hazard Tracking and Recordkeeping

The Chief Safety Officer will be tasked with maintaining a record of current and past risk assessment reviews using the Hazard Identification and Risk Assessment Log. This document serves as a unified repository for data and information related to the proactive and reactive identification of hazards, as well as the results of the Citilink hazard analysis process and any corrective actions developed under the safety risk mitigation process.

Mitigation Actions

Mitigation can take a wide variety of forms, some of them standard and some creative. Actions fall into the following categories:

- Physical Defenses: These include objects and technologies that are engineered to discourage, or warn against, or prevent inappropriate action or mitigate the consequences of events (e.g. traffic control devices, fences, safety restraining systems, transit controls/signals, transit monitoring systems, etc.).
- Administrative Defenses: These include procedures and practices that mitigate the likelihood of accident/incident (e.g. safety regulations, standard operating procedures, personnel proficiency, supervision inspection, training, etc.).
- Behavioral Defenses: These include behavioral interventions through education and public awareness campaigns aimed at reducing risky and reckless behavior of motorists, passengers and pedestrians – factors outside the control of the agency.
- Infectious Disease Defenses: These include guidelines based on the Centers for Disease Control (CDC), Indiana Department of Health (DOH), the Indiana Department of Labor(INDOL) guidelines, as well as guidance from the Governor's office, the Transportation Security Administration (TSA) and the Federal Transit Administration (FTA).

TRAINING QUALITY CONTROL

During Workshop 2, participants discussed the safety event in which bus drivers pull out from a stop too quickly, causing passengers to fall. They rated it as 3C – marginal and occasional – because injuries are usually minor. Drivers are currently trained to wait until passengers are stable, but sometimes they are running late and feeling rushed. The group suggested several possible administrative defenses: bringing in recurring training, including questions about standard operating procedure in a driver's annual review, and running "secret shopper" audits with the intent to educate rather than punish. These actions would all fall to the Operations function to implement.

Documentation and Reporting

Citilink will incorporate the risk assessments completed within the period between ASP re-certifications. An updated risk matrix will be incorporated into the appendix of the re-certified document.

Citilink will provide updated re-certified versions of the ASP to the Safety Committee for their information.

6. Safety Assurance

Safety assurance processes clarify how safety performance is evaluated and how lessons learned will inform and improve the organizational culture. They provide the necessary feedback to ensure that the SMS is functioning effectively and that Citilink is meeting or exceeding its safety objectives.

Compliance Monitoring

Supervisors within the operations and maintenance functions directly monitor compliance with safety procedures. For example, facility walkarounds include an inspection of shop areas, parts storage, the maintenance facility bus wash, and vehicle storage to evaluate safety rules compliance and shop safety practices. Operators complete pre-service and post-service vehicle checks daily, reporting concerns to the Maintenance Manager for action. Operations personnel are observed on periodic ride-along'.

If a supervisor or other employee observes questionable actions that reasonably could lead to a potential hazard, they are encouraged to report the condition and it will be tracked and addressed through the mechanisms described in Chapter 5, Safety Risk Management.

Mitigation Monitoring

During the annual ASP review and update, Citilink executive managers will review records produced during Safety Risk Management activities and discuss the results of the program over the year to evaluate the effectiveness of the agency's Safety Risk Management process. This review process will extend to available safety risk evaluation records, hazard identification and analysis practices, the corrective action plan process, and reviews of the Hazard Identification and Risk Assessment Log.

Investigations

Safety events are investigated either formally or informally to identify causal factors. The Citilink Safety Committee established by the federal Infrastructure Investment and Jobs Act (49 U.S.C. § 5329) will meet upon a request to review any vehicle accident involving union employees when a driver feels that an accident documented as preventable should have been documented as non-preventable. The committee is to vote according to the safety committee memorandum. The board uses the accident report and any employee statements to determine whether the accident was preventable and what safety recommendations it may yield. The committee reviews board findings and may ask for reconsideration at the next meeting.

Internal Reporting

Many of the hazards reported to Citilink management arrive via internal safety reporting programs. Citilink does not differentiate between internal and external reports for most purposes. Information shared through internal safety reporting programs is reviewed, investigated, and addressed.

In accordance with §673.29(b), Citilink informs employees of safety actions taken in response to the information they report (Figure 2). This can take the form of a direct conversation with a supervisor, a companywide bulletin, an update to the training program, or another method, as appropriate to the nature of the report.

Figure 2: Employee Reporting Feedback Loop

7. Safety Promotion

Culture

Citilink believes safety promotion is critical to the success of SMS by ensuring that the entire organization fully understands and trusts the SMS policies, procedures, and structure. It involves establishing a culture that recognizes safety as a core value, training employees in safety principles, and allowing open communications of safety issues.

Positive safety culture must be generated from the top-down. The actions, attitudes, and decisions at the policy-making level must demonstrate a genuine commitment to safety. Safety must be recognized as the responsibility of each employee with the ultimate responsibility for safety resting with the Citilink Transit Manager. Employees must trust that they will have management support for decisions made in the interest of safety while recognizing that intentional breaches of safety will not be tolerated.

A positive safety culture at Citilink is defined as one which is:

An Informed Culture

- Employees understand the hazards and risks involved in their areas of operation
- Employees are provided with the necessary knowledge, training and resources
- Employees work continuously to identify and overcome threats to safety

A Just/Reporting Culture

- Employees know and agree on what is acceptable and unacceptable behavior
- Human errors must be understood but negligence and willful violations are not tolerated
- Employees are encouraged to voice safety concerns and to share critical safety information without the threat of punitive action
- When safety concerns are reported, appropriate action is taken

A Learning Culture

- Learning is valued as a lifetime process
- Employees are encouraged to develop and apply their own skills and knowledge to enhance safety
- Employees are updated on safety issues and informed of actions through feedback

Competencies and Training

Citilink maintains and implements a safety management training program to ensure employees and any contract personnel occasionally working for Citilink are trained and competent to perform their

SMS duties, per § 673.29(a). This training consists of several steps, including pre-employment screening of job-related skills for certain positions, new employee orientation, on-the-job training (OJT), and an ongoing process of refresher and refamiliarization training for current employees. Staff training is designed to be consistent with SMS principles. The Chief Safety Officer will provide a corporate perspective on SMS and the agency's safety culture.

Hiring and New Employee Orientation

Citilink uses pre-employment screening of job-related skills for certain positions in order to ensure new employees begin their employment with a minimum awareness and competency in core job duties and responsibilities. The HR department and department supervisors document minimum skills for new employees in job descriptions and postings.

New employee orientation represents Citilink's primary opportunity for delivery of one-on-one or small group training. Training on key safety-related topics including the drug and alcohol program policy, Citilink Personnel Policy, and Collective Bargaining Agreement Policies are delivered through new employee orientation programs. Documentation of these orientation programs are included in the Appendix.

Citilink rules and regulations available to all employees contain information on the employee safety reporting program, which encourages employees to report safety hazards, near misses, concerns, and issues. Citilink also includes discussion of the employee safety reporting program as a formalized component of new employee orientation.

Operator/Driver Training

Drivers demonstrate skill and performance competency in the type of vehicle to which they are assigned as a part of training requirements. Citilink provides ongoing/recurring training necessary to reinforce policies and procedures as well as to provide a mechanism to brief drivers on new policies, procedures and/or regulations. Retraining is a part of the discipline program for drivers involved in incidents.

Specific training subject areas for Citilink drivers include defensive driving training, ADA regulations, passenger assistance techniques, hazard identification, emergency procedures and crisis management training, which are delivered either by contractors or internally, as well as voluntary CPR and first aid training.

Some training on new policies and procedures is delivered directly to drivers by the Operations Manager, Supervisors, or Dispatchers on an individual basis or through bulletins and handouts.

Maintenance Training

The Maintenance Manager and senior maintenance staff provide the majority of training to junior Citilink maintenance personnel in an OJT format. Some training on new policies and procedures may also be delivered directly by Supervisors on an individual basis or through bulletins and handouts. Citilink primarily ensures that maintenance staff are sufficiently familiar with job

responsibilities through pre-employment screening and verification that new hires have completed sufficient job-specific training or experiential learning prior to becoming employees.

Management and Supervisor Training

Management-level training is delivered through staff meetings and can include videos covering safety training topics or other safety-focused material. Management personnel participate in outside training courses on topics related to their job including the National Incident Management System (NIMS) and Incident Command System (ICS). Supervisors spend five days a year in training.

Biannual Safety Training

All employees are required to attend safety trainings that are conducted in the Spring and Fall of each year. These are two hours sessions, that consist of video and instructor lead training topics. These training include but are not limited to blood borne pathogens, active shooter, distracted driving, customer service/de-escalation, a review of accidents and incidents.

Training Documentation

Fort Wayne Public Transportation/Citilink Human Resources Department maintains complete records of all personnel training and certification activities. Citilink management periodically reviews and assesses employee training files and records to ensure completeness.

A standard checklist provides documentation for the safety components of new employee orientation. Course instructors produce records in either hard copy or digital format, and they include the date training was delivered, the instructor and/or provider of the training, the subject of the training, and a passing/failing grade or an indication of whether the training was successfully completed by each individual.

The Maintenance Manager ensures that OJT delivered to maintenance staff and other frontline personnel is documented in a similar manner to classroom-based training. Signoff sheets or similar records placed in individual personnel files at the conclusion of OJT indicate the date training was delivered, the instructor and/or provider of the training, the name of the trainee, the subject of training, and an indication of whether the training was successfully completed by the individual.

Training Program Evaluation

In order to address safety-related job functions of operations and maintenance positions and ensure that training gaps are addressed as necessary, the Chief Safety Officer, Operations Manager, and Maintenance Manager periodically conduct informal analyses to determine whether gaps are present and develop new training material accordingly. The goal of these periodic analyses and assessments is to ensure that the agency has identified and provided all necessary skill training related to safe job performance for all job functions, to the level that all employees are competent to perform their safety-related duties.

Training curricula changes implemented by management for safety-related employees include updates to reflect new techniques, technologies, the results of investigations, corrective actions, and regulatory changes. New training courses or materials may also be developed in response to FTA guidance, state oversight activity, or other industry trends and best practices.

Safety Communication

Citilink uses a variety of means to formally communicate safety policies, processes, activities, and tools to all employees. Regular communication from management to agency employees includes hazard and safety risk information of direct relevance to employees' responsibilities.

The agency's Safety Management Policy and other SMS-related processes, activities, and tools relevant to employee job responsibilities are provided to all Citilink employees as part of the Rules and Regulations handbook. Key agency safety-related plans, including the ASP and HSCRP, are retained digitally and in hard copy and are accessible to all management and supervisory employees.

The Chief Safety Officer, Operations Manager, and Maintenance Manager post safety-related bulletins and other messages in areas visible to frontline operations and maintenance employees, including breakrooms and adjacent to time clocks, and occasionally distribute bulletins and memoranda directly to individual employees via their personal mailboxes.

The Chief Safety Officer, Operations Manager, and Maintenance Manager will be responsible to ensure numerical objectives, targets, and indicators are posted along with bulletins or other internal media to report on progress toward achievement of targets and indicators. Individual achievement is also recognized formally or informally. At the end of each year, any bus operator who had no preventable accidents wins a Safe Driver Award.

Sustaining a Safety Management System

To sustain a safety management system, Citilink will ensure that processes are employed to build an organizational foundation. Actions taken to sustain SMS include:

- **Create a measurement-friendly culture**: All staff, including department heads, should be actively engaged in creating measurement-friendly culture by promoting performance measurement as a means of continuous improvement. Senior managers will also lead by example and utilize performance metrics in decision making processes.
- **Build organizational capacity**: Investment in developing skilled human resources capacity is essential to sustaining an SMS. Both technical and managerial skills will be needed for data collection and analysis and setting goals. Managing staff and the governing board will commit the financial resources required for organizational capacity and maintaining an SMS on a continuous basis.
- **Reliability and transparency of performance results**: The SMS will be able to produce and report its results, both good and bad. Performance information should be transparent and made available to all stakeholders. Messengers should be protected to preserve the integrity of the

measurement system. The focus should be on opportunities for improvement rather than allocating blame.

- **Demonstrate continuous commitment to measurement**: Visible commitment to using metrics is a long-term initiative. Citilink will demonstrate a commitment to performance measurement by establishing a formal process of reporting performance results, such as including transit safety and performance measurement as a standing agenda item at Transit Advisory Board meetings and providing relevant information to the MPO.

8. Appendices

Links

- **Citilink Maintenance Plan:** O:\Citilink Agency Safety Plan\Policies\Citilink Vehicle, Equipment, & Facility Maintenance Plan 2022.docx
- **Citilink COVID – 19 Workplace Safety Plan:** O:\Citilink Agency Safety Plan\Policies\Citilink COVID-19 Work Place Safety Plan 10.08.21.docx
- **Disruptive Passenger Conduct Policy:** O:\Citilink Agency Safety Plan\Policies\Disruptive Passenger Policy 07.19.2022.docx
- **Drug and Alcohol Testing Program and Policy:** O:\Citilink Agency Safety Plan\Policies\Drug and Alcohol Program and Policy 12.27.2019.docx
- **Safety Committee MOU:** O:\Citilink Agency Safety Plan\Safety Committee\Citilink Joint Labor Mngmt Safety Committe MOU- signed Nov. 30 2022.pdf

Definition of Terms

- **Accident** means an Event that involves any of the following: A loss of life; a report of a serious injury to a person; a collision of public transportation vehicles; a runaway train; an evacuation for life safety reasons; or any derailment of a rail transit vehicle, at any location, at any time, whatever the cause.
- **Accountable Executive** means a single, identifiable person who has ultimate responsibility for carrying out the Public Transportation Agency Safety Plan of a public transportation agency; responsibility for carrying out the agency's Transit Asset Management Plan; and control or direction over the human and capital resources needed to develop and maintain both the agency's Public Transportation Agency Safety Plan, in accordance with 49 U.S.C. 5329(d), and the agency's Transit Asset Management Plan, in accordance with 49 U.S.C. 5326.
- **Chief Safety Officer** means an adequately trained individual who has responsibility for safety and reports directly to a transit agency's chief executive officer, general manager, president, or equivalent officer. A Chief Safety Officer may not serve in other operational or maintenance capacities, unless the Chief Safety Officer is employed by a transit agency that is a small public transportation provider as defined in this part, or a public transportation provider that does not operate a rail fixed guideway public transportation system.
- **Consequence** means the potential outcome(s) of a hazard.
- **Equivalent Authority** means an entity that carries out duties similar to that of a Board of Directors for a recipient or subrecipient of FTA funds under 49 U.S.C. Chapter 53, including sufficient authority to review and approve a recipient or subrecipient's Public Transportation Agency Safety Plan.
- **Event** means any Accident, Incident, or Occurrence.

- **Hazard** means any real or potential condition that can cause injury, illness, or death; damage to or loss of the facilities, equipment, rolling stock, or infrastructure of a public transportation system; or damage to the environment.
- **Hazard Analysis** means the formal activities to analyze potential consequences of hazards during operations related to provision of services
- **Incident** means an event that involves any of the following: a personal injury that is not a serious injury; one or more injuries requiring medical transport; or damage to facilities, equipment, rolling stock, or infrastructure that disrupts the operations of a transit agency.
- **Investigation** means the process of determining the causal and contributing factors of an accident, incident, or hazard, for the purpose of preventing recurrence and mitigating risk.
- **Lagging Indicators** provide evidence, through monitoring, that intended safety management outcomes have failed or have not been achieved.
- **Leading Indicators** provide evidence, through monitoring, that key safety management actions are undertaken as planned.
- **National Public Transportation Safety Plan** means the plan to improve the safety of all public transportation systems that receive Federal financial assistance under 49 U.S.C. Chapter 53.
- **Near miss** means a safety event where conditions with potential to generate an accident, incident, or occurrence existed, but where an accident, incident, or occurrence did not occur because the conditions were contained by chance or by existing safety risk mitigations
- **Occurrence** means an Event without any personal injury in which any damage to facilities, equipment, rolling stock, or infrastructure does not disrupt the operations of a transit agency.
- **Operator** of a public transportation system means a provider of public transportation as defined under 49 U.S.C. 5302.
- **Performance measure** means an expression based on a quantifiable indicator of performance or condition that is used to establish targets and to assess progress toward meeting the established targets.
- **Performance target** means a quantifiable level of performance or condition, expressed as a value for the measure, to be achieved within a time required by the FTA.
- **Public Transportation Agency Safety Plan (or Agency Safety Plan)** means the documented comprehensive Agency Safety Plan for a transit agency that is required by 49 U.S.C. 5329 and Part 673.
- **Risk** means the composite of predicted severity and likelihood of the potential effect of a hazard.
- **Risk mitigation** means a method or methods to eliminate or reduce the effects of hazards.
- **Safety** means the state in which the potential of harm to persons or property damage during operations related to provision of services is reduced to and maintained at an acceptable level through continuous hazard identification and safety risk management activities.
- **Safety Assurance** means processes within a transit agency's Safety Management System that function to ensure the implementation and effectiveness of safety risk mitigation, and to

ensure that the transit agency meets or exceeds its safety objectives through the collection, analysis, and assessment of information.

- **Safety Deficiency** means a condition that is a source of hazards and/or allows the perpetuation of hazards in time.
- **Safety Management Policy** means a transit agency's documented commitment to safety, which defines the transit agency's safety objectives and the accountabilities and responsibilities of its employees regarding safety.
- **Safety Management System** means the formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of a transit agency's safety risk mitigation. SMS includes systematic procedures, practices, and policies for managing risks and hazards.
- Safety Objective means a high-level, global, generic, and non-quantifiable statement regarding conceptual safety achievements to be accomplished by an organization regarding its safety performance.
- **Safety Performance Indicator** means a data-driven, quantifiable parameter used for monitoring and assessing safety performance.
- **Safety Performance Measurement** means the assessment of non-consequential safety-related events and activities that provide ongoing assurance that safety risk mitigations work as intended.
- **Safety Performance Monitoring** means the activities aimed at the quantification of an organization's safety effectiveness and efficiency during service delivery operations, through a combination of safety performance indicators and safety performance targets.
- **Safety Performance Target** means a specific level of performance for a given performance measure over a specified timeframe related to safety management activities.
- **Safety Promotion** means a combination of training and communication of safety information to support SMS as applied to the transit agency's public transportation system.
- **Safety Reporting Program** means a process that allows employees to report safety conditions to senior management, protections for employees who report safety conditions to senior management, and a description of employee behaviors that may result in disciplinary action.
- **Safety Risk** means the assessed likelihood and severity of the potential consequence(s) of a hazard, using as reference the worst foreseeable, but credible, outcome.
- **Safety Risk Assessment** means the formal activity whereby a transit agency determines Safety Risk Management priorities by establishing the significance or value of its safety risks.
- **Safety Risk Management** means a process within a transit agency's Agency Safety Plan for identifying hazards and analyzing, assessing, and mitigating safety risk.
- **Safety Risk Likelihood** means the likelihood that the consequence might occur, taking as reference the worst foreseeable-but credible-condition.
- **Safety Risk Severity** means the anticipated effects of a consequence, should it materialize, taking as reference the worst foreseeable-but credible-condition.
- **Serious injury** means any injury which: (1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date when the injury was received; (2) Results in a fracture of any bone (except simple fractures of fingers, toes, or noses); (3) Causes severe

hemorrhages, nerve, muscle, or tendon damage; (4) Involves any internal organ; or (5) Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

- **Transit Agency** means an operator of a public transportation system.
- **Transit Asset Management Plan** means the strategic and systematic practice of procuring, operating, inspecting, maintaining, rehabilitating, and replacing transit capital assets to manage their performance, risks, and costs over their life cycles, for the purpose of providing safe, cost- effective, and reliable public transportation, as required by 49 U.S.C. 5326 and 49 CFR Part 625.

List of Acronyms

ACRONYM	WORD OR PHRASE
ADA	The Americans with Disabilities Act
ASP	Agency Safety Plan
CEO	Chief Executive Officer
CSO	Chief Safety Officer
ESRP	Employee Safety Reporting Program
FTA	Federal Transit Administration
INDOT	Indiana Department of Transportation
MAP-21	Moving Ahead for Progress in the 21st Century
MPO	Metropolitan Planning Organization
NTD	National Transportation Database
OJI	On-The-Job Injury
PTASP	Public Transportation Agency Safety Plan
SMP	Safety Management Policy
SMS	Safety Management System
SPM	Safety Performance Monitoring
SPT	Safety Performance Target
SRM	Safety Risk Management
VRM	Vehicle Revenue Miles

Appendix C – SS4A Self-Certification Eligibility Worksheet

Safe Streets and Roads for All

Self-Certification Eligibility Worksheet

Applicants should follow the instructions in the NOFO to correctly apply for a grant. See the SS4A website for more information.

Instructions: The purpose of this worksheet is to determine whether an applicant's existing plan(s) is substantially similar to an Action Plan for purposes of applying for an Implementation Grant or to conduct Supplemental Planning/Demonstration Activities only. Use of this worksheet is required. Applicants should not adjust the formatting or headings of the worksheet.

For each question below, answer "yes" or "no." If "yes," cite the specific page in your existing Action Plan or other plan(s) that corroborate your response, or cite and provide other supporting documentation separately.

An applicant is eligible to apply for an Action Plan Grant that funds supplemental action plan activities, or an Implementation Grant, only if the following two conditions are met:

- **Answer "yes" to Questions** 3 7 9
- **Answer "yes" to at least four of the six remaining Questions** 1 2 4 5 6 8

If both conditions are *not met*, an applicant is still eligible to apply for an Action Plan Grant that funds creation of a new Action Plan.

Lead Applicant: **UEI:**

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1 Are both of the following true?

- Did a high-ranking official and/or governing body in the jurisdiction publicly commit to an eventual goal of zero roadway fatalities and serious injuries?
- Did the commitment include either setting a target date to reach zero, OR setting one or more targets to achieve significant declines in roadway fatalities and serious injuries by a specific date?

☒ YES ☐ NO

If yes, provide documentation:

UTAB Minutes 8/2/2022

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2 To develop the Action Plan, was a committee, task force, implementation group, or similar body established and charged with the plan's development, implementation, and monitoring?

☒ YES ☐ NO

If yes, provide documentation:

Allen County Safety Commit

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3 Does the Action Plan include all of the following?

- Analysis of existing conditions and historical trends to baseline the level of crashes involving fatalities and serious injuries across a jurisdiction, locality, Tribe, or region;
- Analysis of the location where there are crashes, the severity, as well as contributing factors and crash types;
- Analysis of systemic and specific safety needs is also performed, as needed (e.g., high risk road features, specific safety needs of relevant road users; and,
- A geospatial identification (geographic or locational data using maps) of higher risk locations.

☒ YES ☐ NO

If yes, provide documentation:

2023 CSAP Pages 9-21

Safe Streets and Roads for All

Self-Certification Eligibility Worksheet

4 **Did the Action Plan development include all of the following activities?**

- Engagement with the public and relevant stakeholders, including the private sector and community groups;
- Incorporation of information received from the engagement and collaboration into the plan; and
- Coordination that included inter- and intra-governmental cooperation and collaboration, as appropriate.

☒ YES ☐ NO

If yes, provide documentation:

CSAP Page 3

5 **Did the Action Plan development include all of the following?**

- Considerations of equity using inclusive and representative processes;
- The identification of underserved communities through data; and
- Equity analysis, in collaboration with appropriate partners, focused on initial equity impact assessments of the proposed projects and strategies, and population characteristics.

☒ YES ☐ NO

If yes, provide documentation:

CSAP Pages 21 to 25

6 **Are both of the following true?**

- The plan development included an assessment of current policies, plans, guidelines, and/or standards to identify opportunities to improve how processes prioritize safety; and
- The plan discusses implementation through the adoption of revised or new policies, guidelines, and/or standards.

☒ YES ☐ NO

If yes, provide documentation:

CSAP

7 **Does the plan identify a comprehensive set of projects and strategies to address the safety problems in the Action Plan, time ranges when projects and strategies will be deployed, and explain project prioritization criteria?**

☒ YES ☐ NO

If yes, provide documentation:

CSAP Pages 26 to 28

8 **Does the plan include all of the following?**

- A description of how progress will be measured over time that includes, at a minimum, outcome data.
- The plan is posted publicly online.

☒ YES ☐ NO

If yes, provide documentation:

CSAP

9 **Was the plan finalized and/or last updated between 2018 and June 2023?**

☒ YES ☐ NO

If yes, provide documentation:

UTAB Minutes 5/16/2023