

“To Develop a local road safety plan that, when implemented, will reduce the number and severity of vehicular crashes.”

-Mission of the Citizen’s Steering Committee

Howard County Safety Action Plan

February, 2025

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2 FORWARD

This plan was developed pursuant to a competitive Safe Streets Four All (SS4A) grant from Federal Highway. The SS4A grant requirements require the establishment of a steering committee. The steering committee was made up of invested and experienced stakeholders from across the community who are dedicated to improving road safety.

The mission of the steering committee is:

“To Develop a local road safety plan that, when implemented, will reduce the number and severity of vehicular crashes while supporting our stated Vision Zero goal.”

The stakeholders, including those that are responsible for the implementation of these strategies, are committed to carrying out the policies and projects to the best of their ability, to ensure that vehicle crashes are minimized, and that all road users’ safety is prioritized. This developed plan requires a focused approach. Stakeholders will need to be diligent in its implementation and evaluation to gain the maximum benefit from the ideas stated herein.

3 PURPOSE, GOALS, AND ELIGIBILITY

The purpose of this plan is to provide Howard County Jurisdictions with the data and strategies needed to move towards achieving the goals set below. While this is primarily an engineering-based plan, the goals cannot be met with engineering solutions alone. Psychology and sociology play key roles in creating an environment that has the potential to be successful.

The goals below were developed to meet the requirements of the SS4A grant, as well as the needs of all of Howard County.

3.1 GOALS

3.1.1 Reduce Injuries and Fatalities

Injury and fatal crashes have the most significant negative impact of all crashes. Finding trends in historical data will help identify locations and conditions that increase the likelihood of a severe crash. However, most fatalities, and many injury crashes, have mitigating factors that are not site specific. Systemic strategies will need to be employed as well, to reduce these most severe crashes. These systemic strategies will include non-transportation policies that reduce the conditions that contribute to these crashes.

3.1.2 Reduce Property Damage Crashes

While property damage crashes do not contribute nearly as much to individual and societal suffering as injury and fatal crashes, they are resource intensive, both for the owners of vehicles and structures, as well as public safety agencies. The cost of repair to damaged vehicles and property has increased significantly in recent years. As vehicles become more advanced, repairs will continue to rise. Furthermore, public safety and public works departments expend significant funds responding to and repairing infrastructure damage caused by vehicle crashes. Property damage crashes can also be indicators of potential future injury and fatal crashes.

3.1.3 Reduce Vehicle Miles Travelled per Vehicle

The surest way to reduce vehicle crashes is to create conditions that don't require the use of a vehicle in the first place. Reducing the number and length of trips has several tangential benefits as well, including reduced air and noise emissions, as well as improved physical and mental well-being. Because alternative transportation can also be less expensive, non-vehicular trips also have the potential to reduce poverty and improve access to services.

3.1.4 Focus on At-Risk Populations

At-risk populations include those living in areas of persistent poverty, as well as vulnerable road users. In many instances, these populations overlap. Users tend to have less access to safe, reliable transportation, and have historically lived in areas of underinvestment with infrastructure that does not meet their needs. They also tend to be more vulnerable to injury and fatal crashes.

This plan meets the eligibility criteria located in SS4A Self-Certification Eligibility Worksheet. A completed worksheet that demonstrates this is found in Appendix E.

3.2 ELIGIBILITY

This report meets the eligibility criteria set forth in Appendix D, which includes the Self-Certification Eligibility Worksheet, as well as resolutions by the City of Kokomo Board of Public Works and Safety and the Howard County Commissioners.

A steering committee was formed in early 2024 and includes the members shown in Appendix A. The committee met on three separate occasions. The first meeting on March 14, 2024, served to provide background information and allowed for the sharing of ideas and concerns between the members. The purpose of the second meeting, held on June 28, 2024, was to cover specific systemic, systematic, and site-specific strategies to reduce crashes. The last meeting on November 14, 2024, was used to discuss the study's conclusions, recommendations, as well as review current data and trends.

Between meetings, committee members were given the opportunity to ask questions and submit ideas on how best to develop a plan that meets our community's needs within their specific areas of expertise. Upon completion of the draft plan, the plan was posted for public comment on the City of Kokomo's website on December 2, 2024.

Prior to the adoption of the plan, it was made available on the front page of the City of Kokomo's website for public review. Upon completion of the plan, members of the committee will be tasked with implementing and monitoring the improvements through normal job duties, as identified in Section 6.

4 BACKGROUND INFORMATION

According to INDOT, Howard County has a total of 1,012.15 certified miles broken down in the following responsible parties:

Owner	Centerline Miles	Lane Miles
Howard County	586.17	1,166.085
INDOT	83.94	203.612
Greentown	12.684	38.052
Kokomo	321.498	674.889
Russiaville	7.861	15.723

The mileage has not changed significantly over the last 20 years. The estimated number of vehicle miles traveled have also remained steady at approximately 2.1 million miles per year. This information is useful when determining, on the county level, if there are significant differences over the years that would impact the number of crashes. In the case of Howard County, the volumes and centerline miles have remained basically unchanged.

4.1 HOWARD COUNTY COMPARED TO OTHER COUNTIES

The Indiana University Public Policy Institute published crash statistics for 2022¹, which can be used to compare Howard County’s crash statistics with similar counties. The next page provides a table that compares Howard County to four other counties of similar population.

¹ <https://www.in.gov/cji/research/files/2022-TS-Fact-Book-Full-Report-1-22-24-with-crash-form.pdf>

2022 Crash Data	Bartholomew	Floyd	Hancock	Howard	Kosciusko
Population	84,003	80,809	86,166	83,831	80,364
Median Household Income	\$76,912	\$75,686	\$85,262	\$62,014	\$70,945
Median Age	38.0	39.8	39.6	41.2	39.0
Poverty Rate ²	8.3%	6.6%	2.8%	8.7%	5.8%
Daily VMT (2022, in millions) ³	3.236	2.147	3.448	2.120	2.432
Vehicle Registrations (Non Rec) ⁴	80,803	77,341	86,658	82,106	80,823
Total Crashes	1,719	2,445	1,896	2,098	2,612
Fatal Crashes	8	11	12	7	10
Non-fatal Injury Crashes	411	332	277	287	375
Property Damage Only Crashes	1,300	2,102	1,607	1,804	2,227
Collisions per 100 MVMT	155.7	331.0	161.7	268.6	310.1
Fatalities per 100k population	9.6	13.6	15.6	8.4	12.4
Alcohol Impaired Collisions per 10k drivers	5.5	6.2	4.9	6.2	7.0
Percent of collisions involving deer	7.6%	5.1%	5.0%	7.3%	22.1%
Percent of unrestrained injured occupants	16.1%	17.3%	25.3%	29.5%	7.1%
Young Drivers in Collisions per 1k Licensed Young Drivers	79.7	118.2	78.8	98.8	115.1
Motorcyclists in Collisions per 1k Individuals Involved in Collisions	15.7	8.3	8.8	8.1	9.7
Hit-and-run Percentage	6.9	11.2	8.4	4.1	5.3
Work Zone Collisions per 10k Collisions	56.4	30.7	78.1	20.5	26.4

Table 1 – 2022 Crash data comparison *Worst value for all counties* *Best value for all counties*

Howard County crash statistics are in line with other counties of similar population. Howard County is the worst in one road safety metric and is the best in four of the safety metrics. Other notes:

- ⊕ Howard County has the lowest Median Household Income
- ⊕ Howard County has the highest median age
- ⊕ Howard County has the highest poverty rate
- ⊕ Howard County has the lowest daily VMT
 - The combination of lowest MHI and highest poverty rate, along with relatively shorter commutes, would likely contribute to Howard County having the lowest daily VMT
- ⊕ Howard County has the highest percentage of unrestrained injured occupants at 29.5%. The statewide average is 26.9%. While Howard County is just higher than the state average, there is

² <http://Indiana-demographics.com>
³ <https://www.in.gov/indot/files/HistoricINVMTByCounty-1992-2023-20240612.xlsx>
⁴ <https://www.in.gov/oed/resources-and-information-center/vehicle-fuel-dashboard/>

certainly room for improvement. Improving restraint use would reduce the percentage of injury crashes.

Bartholomew County is remarkably like Howard County in terms of demographics and has, in general, better crash statistics than Howard County. Building relationships between Howard and Bartholomew Counties, as well as tracking the progress between the two counties, could help both to decrease the number and severity of crashes.

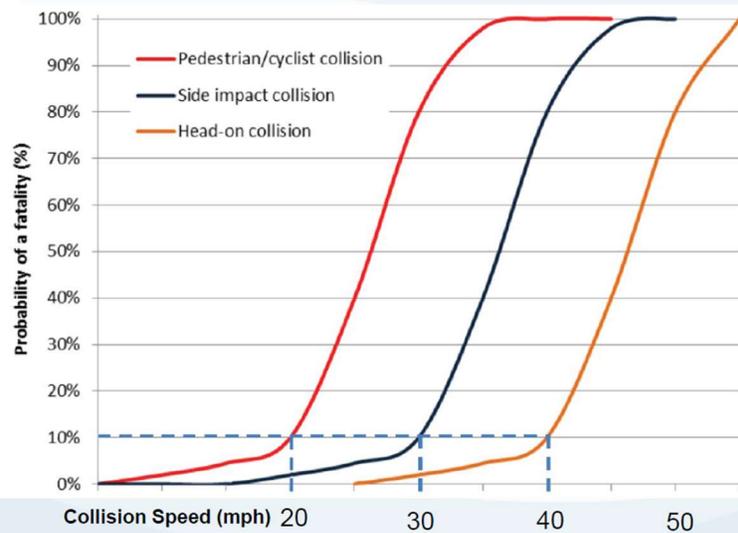
4.2 INJURIES AND FATALITIES BY VEHICLE SPEED

To understand the strategies that need to be proposed, it is important to understand the causes of crashes and what aspects contribute to their severity.

Many historical studies of the relationship between speed and crash severity have come to the same conclusion: The higher the speed, the more likely the crash will be severe. Other studies have concluded that not just the severity, but the number of crashes increase with speed. This is due to the reduced reaction times available to avoid a crash.

Speed and Safety Outcomes

RELATIONSHIPS BETWEEN COLLISION SPEED AND PROBABILITY OF A FATALITY FOR DIFFERENT CRASH CONFIGURATIONS



Jurewicz, C., Sobhani, A., Woolley, J., Dutschke, J., & Corben, B. (2015). *Proposed vehicle impact speed: Severe injury probability relationships for selected crash types*. Paper presented at the Proceedings of the 2015 Australasian Road Safety Conference, Gold Coast, Australia.

Figure 1 – Speed and safety outcomes

The increase of injuries and fatalities are particularly noticeable with respect to vulnerable road users. The conclusion from these studies is that pedestrians are between 3.5 and 5.5 times more likely to die in a 40 MPH crash versus a 30 MPH crash⁵.

4.3 CRASH FREQUENCY AND SEVERITY AS A FUNCTION OF ROADWAY CHARACTERISTICS

The number and severity of crashes along a roadway are a function of many factors, including:

⊕ Lane widths⁶

In urban areas, wider lane widths tend to increase vehicle speeds. Reducing lanes widths can often be a beneficial design tool to reduce speeds, and therefore, injury crashes. Note that local data indicates a reduction in lanes widths on medium to high volume thoroughfares, especially truck routes, have the potential to increase property damage crashes, especially immediately after improvements are made.

In rural areas with few driveways and intersections, narrow lanes widths don't noticeably reduce travel speeds. In contrast, they tend to increase the number of ran off road and head on crashes. Therefore, increasing lane widths, either in the travel lane or in the shoulder, can reduce crashes.

⊕ Number and spacing of controlled intersections

Every intersection increases the number of conflict points, which can be related to the number of crashes. However, reducing the number of intersections can also increase speeds, as well as the number of driveways, resulting in increased crash severity. Designing intersections with the optimal control (all-way stop, two-way stop, traffic signal, or roundabout) is especially important to intersection safety.

⊕ Presence of on-street parking

The presence of on-street parking tends to reduce vehicle speeds, but only when that parking is occupied. Installing unused parking gives drivers a perspective of a wider roadway, increasing speeds. It is important to include on-street parking only where it will be used, as well as encouraging development to utilize that on-street parking.

⊕ Number of driveways

Much like intersections, every driveway is an additional conflict point, but also tends to reduce speeds. Proper location of driveways is essential to encourage lower speeds without increasing the number of crashes. Techniques such as ensuring drives are far enough away from intersections, as well as lining up drives with opposing drives on the opposite side of the street is important.

⁵https://nacto.org/docs/usdg/relationship_between_speed_risk_fatal_injury_pedestrians_and_car_occupants_richards.pdf

⁶ <https://nacto.org/publication/urban-street-design-guide/street-design-elements/lane-width/>

⊕ Traffic volume

Obviously, higher traffic volumes tend to relate to a higher number of crashes. However, because higher volumes also tend to reduce speeds, the severity of crashes can sometimes be reduced.

⊕ Roadway environment (rural vs. urban)

Urban environments, which are characterized by dense development, higher volumes, and mixed modes, require different design approaches than rural environments.

⊕ Design speed, which influences:

- curve radii
- acceleration and deceleration lanes
- super-elevation

The design of roadways, based on either their existing or proposed built environment will directly influence the travel speeds, as well as the travel volume and crash characteristics of the roadway. In designing or redesigning a roadway, it is important to balance the improvements to minimize the number and severity of crashes while keeping travel times to a minimum.

4.4 POLICY, STRUCTURE, AND PROCEDURE REVIEW

The following policies, structure, and procedures exist within the various jurisdictions of Howard County:

4.4.1 Traffic Commissions

Both Howard County and the City of Kokomo each operate a Traffic Commission. These commissions meet monthly or as needed. By ordinance, the City of Kokomo's Traffic Commission powers and duties are:

It shall be the duty of the Traffic Commission to coordinate traffic activities, carry on educational activities in traffic matters, supervise the preparation and publication of traffic reports, receive complaints having to do with traffic matters, and to recommend to the Common Council ways and means for improving traffic conditions and the administration and enforcement of traffic regulations.

Any proposed ordinances of a traffic nature are referred to the Traffic Commissions for review and recommendation prior to being considered by the City Council/County Commissioners. Greentown and Russiaville do not have standing Traffic Commissions.

4.4.2 Technical Staff

Both Howard County and the City of Kokomo have technical staff that respond to and coordinate the implementation and maintenance of traffic control devices. The City of Kokomo has a dedicated Traffic Systems Manager. His duties include:

- ⊕ Investigating traffic complaints to determine if a change in traffic control or an ordinance modification is required,

- ⊕ Collecting and evaluating traffic related data, including traffic speed and volume, as well as crash data,
- ⊕ Evaluating data to develop improvements to reduce crashes,
- ⊕ Reviewing development plans to ensure the roadway network is not adversely affected by developments.

These similar duties are performed by the Howard County Highway Department under the supervision of the County Highway Engineer.

4.4.3 Development Standards

Kokomo and Howard County development standards are in several different documents:

- ⊕ Subdivision Ordinance – This document standardizes pavement widths, subdivision geometry, and multimodal requirements that affect the transportation network.
- ⊕ Zoning Ordinance – This document includes density requirements, use standards, driveway spacing standards, and site distance standards that affect how the private transportation system influences the public network.
- ⊕ Street Cut Ordinance – This ordinance includes specific requirements for work zones by private contractors in the public right of way.
- ⊕ Speed Hump installation policy – Kokomo recently adopted a speed hump installation policy to address specific requests to reduce speeds in neighborhoods.

4.4.4 Public Safety

Each jurisdiction maintains their own public safety personnel, and each jurisdiction has responded to vehicular crashes in all Howard County Jurisdictions. In all, 20 different agencies have submitted at least one crash record in Howard County in the study period. Furthermore, there is one professional fire department and five different volunteer departments (including Galveston in Cass County) that regularly respond to crashes. Both Howard Regional Health Systems and Ascension St. Vincent Kokomo provide ALS and BLS service. Lastly, the Howard County Emergency Management Agency provides traffic control for accidents, fires, school events, as well as funeral escort.

The Kokomo Police Department recently established a Traffic Safety Division, which include officers dedicated to enforcing traffic laws.

5 SAFETY DATA ANALYSIS AND STRATEGIES

5.1 DATA PROCEDURE

This report relies heavily on ARIES crash data. This dataset is compiled by the Indiana State Police and is the authoritative dataset for crashes in Indiana. The data originates from standard reports created by officers at crash sites. The officers use visual information, measurements, and eyewitness accounts to complete dozens of data fields, including date and time of the crash, location, manner and primary factors. The data also includes environmental factors such as weather and road conditions, as well as information on the vehicles and individuals.

The study period is defined as January 1, 2019, through December 31, 2023. The period includes the entire COVID-19 pandemic, which reduced traffic volumes in 2020. INDOT estimates that vehicle miles travelled reduced from 2,117,000 in 2019 to 1,951,000 (-8%) in 2020, then rebounded to 2,140,000 in 2021⁷.

To develop the statistics contained herein, all data was downloaded from ARIES and placed into a relational database. The next step was to confirm the location of each crash by comparing the provided latitude and longitude to the other data in the record, such as the street, cross street, and narrative. While many of the locations were accurate for this analysis, some records were improperly located, and some records lacked any geographic coordinates. Each record was reviewed and corrected as needed.

Crashes involving fatalities (52), and vulnerable road users (126) were reviewed by two different reviewers to confirm their locations and other data were consistent.

Once the crashes were georeferenced, their jurisdictions were updated based on the current corporate limits of Kokomo, Russiaville, and Greentown. A 50-foot buffer around the city limits was used as the boundary to identify crashes near city limits as being inside the city limits.

Finally, other updates were made as necessary, such as officer dispatch and arrival times that were clearly incorrectly entered. However, for the most part, only the locations and jurisdictions were modified from their original conditions.

5.2 TOTAL CRASHES, INJURY CRASHES, AND FATAL CRASHES BY JURISDICTION

The total crashes, injury crashes, and fatal crashes are as follows:

⁷ <https://www.in.gov/indot/files/HistoricINVMTByCounty-1992-2023-20240612.xlsx>

Jurisdiction	Total Crashes	Property Damage Crashes	Injury Crashes	Fatal Crashes
County wide	10,838	9,070 (83.7%) -	1,716 (15.8%) -	52 (0.5%) -
Kokomo	8,484 (78.3%) -	7,194 (84.8%) +	1,266 (14.9%) +	24 (.28%) +
Unincorporated	2,148 (19.8%) -	1,698 (79.1%) +	422 (19.6%) +	28 (1.3%) +
Greentown	150 (1.4%) -	127 (84.7%) +	23 (15.3%) +	0 (0%) +
Russiaville	56 (0.5%) -	51 (91.1%) +	5 (8.9%) +	0 (0%) +

Table 2 – Total crashes - (Percent of total crashes) + (Percent of total jurisdiction)

The city of Kokomo contains 71.2% of the population of Howard County yet has 78.3% of the crashes in Howard County. This could be attributed to the higher than proportional share of miles travelled due to out-of-city and out-of-county residents.

Another observation is that the percentage of crashes in the unincorporated areas related to the entire county increase as the severity increases. This is likely due to the relatively higher speeds encountered in the unincorporated areas of Howard County.

5.3 CRASH TRENDS BY JURISDICTION

The table below indicates the trend in number of crashes per six months through the study period. This was calculated by first summing the number of the previous six months of crashes for every month, then performing a linear regression on the result. The higher the number, the higher the increase in crashes.

Jurisdiction	Total Trend	Property Damage Trend	Injury Trend	Fatality Trend
Countywide	-1.024	-1.545	+ .504	+ .016
Kokomo	-1.499	-1.687	+ .178	+ .009
Unincorporated	+ .535	+ .216	+ .312	+ .007
Greentown	+ .016	+ .002	+ .015	0
Russiaville	- .076	- .077	0	0

Table 3 – Crash trends

There are several conclusions to be drawn from this data:

- ⊕ Countywide, total crashes are decreasing.
- ⊕ Total crashes in Kokomo and Russiaville are decreasing.
- ⊕ Greentown and Unincorporated Howard County are seeing increased crashes.
- ⊕ All jurisdictions are seeing an increase in the number of injury crashes.

5.4 VULNERABLE ROAD USERS

According to INDOT, vulnerable road users (VRUs) are users that are human powered. In the ARIES data, they are defined as “pedestrians” or “pedalcyclists.” VRUs are much more susceptible to injury. Within the study period, there were 126 crashes involving VRUs. 99 (78.6%) were injury

crashes. For comparison, only 15.3% of crashes not involving VRUs were injury crashes. Four of the VRU crashes were fatal.

Jurisdiction	Total VRU Crashes (+)	Property Damage Crashes	Injury Crashes	Fatal Crashes
Countywide	126	23 (18.2%) -	99 (78.6%) -	4 (3.2%) -
Kokomo	114 (90.4%) -	19 (16.7%) +	91 (79.8%) +	4 (3.5%) +
Unincorporated	9 (7.1%) -	3 (33.3%) +	6 (66.7%) +	0
Greentown	2 (1.5%) -	0	2 (100%) +	0
Russiaville	1 (0.8%) -	1 (100%) +	0	0

Table 4 – Vulnerable Road Users

- (Percent of total crashes) + (Percent of total jurisdiction)

The conclusion to draw from this data is that, while only 1.2% (126/10,838) of all crashes involved vulnerable road users, pedestrians and pedalcyclists were five times more likely to be injured if they are involved in a crash. Another conclusion is that, because 90.4% of all VRU crashes occurred in Kokomo, the city should perform an in-depth study on how to reduce crashes involving VRUs.

While the trend in VRU crashes is steady, 2023 saw a tie (with 2019) for the highest number of vulnerable road users involved in crashes over the evaluation period at 32. 2023 also saw the highest number of injury crashes involving vulnerable road users at 30.

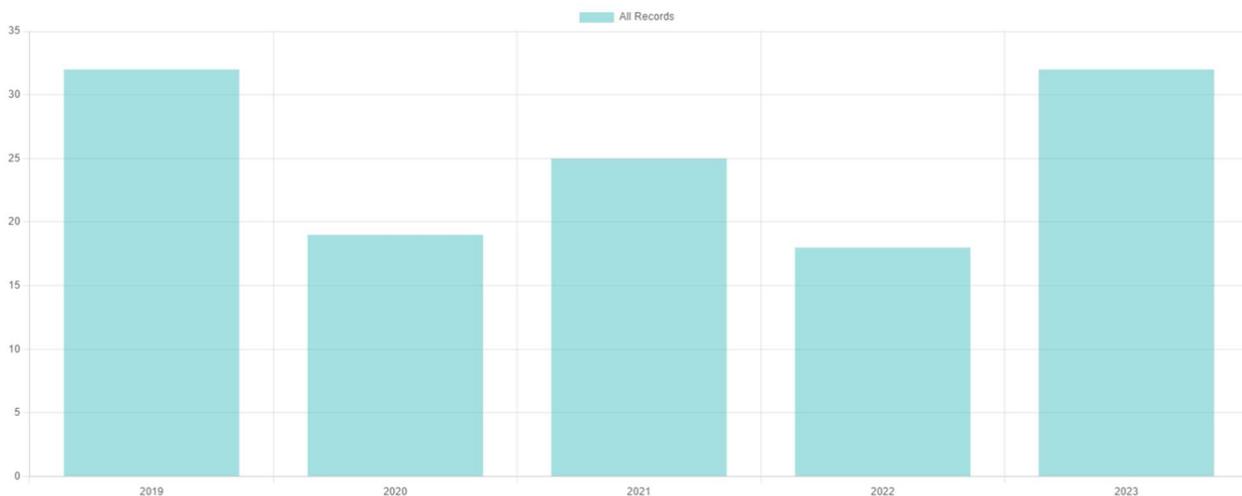


Figure 2 – Annual VRU crashes

Improving lighting may help reduce crashes in all locations. 38 of the 114 VRU crashes in Kokomo occurred at night (21 were lighted, 17 were not). Kokomo is currently in the process of upgrading roadway lighting in much of the city. The lighting is expected to be brighter and will improve visibility of VRUs. A post installation evaluation (after three years) should be considered to determine if the improved lighting contributed to a reduction in nighttime VRU crashes.

A common type of vulnerable road user is a student going to school, either as a pedestrian or a on a bicycle. A map of school walking zones is provided in Appendix D.

The data indicates up to four crashes occurred between vehicles and students traveling to or from school. They are described as follows:

- ⊕ Apperson Way at Sycamore – After school, an 11-year-old bicyclist crossed Apperson ahead of a vehicle that had the right-of-way.
- ⊕ Apperson Way south of Superior Street – A driver hit a 12-year-old pedestrian. The driver was driving on a suspended license.
- ⊕ Lincoln Road near Kokomo High School – After school, a pedestrian of unknown age had just exited a city bus and crossed the road in front of a driver.
- ⊕ Southlea Drive – Prior to school, a 10-year-old pedestrian was struck by a driver that left the scene of the crash.

To focus on improving student safety traveling to and from school, consider the implementation of the following strategies:

- ⊕ Install speed feedback signs near school zones
- ⊕ Review and update school zone signage
- ⊕ Ensure all crosswalks in school zones are enhanced piano-key type and in good to excellent condition.
- ⊕ Coordinate pedestrian and bicycle safety training for students walking and riding to school.
- ⊕ Develop pedestrian corridors away from cars that lead between residential areas and schools.

Strategy: Perform a comprehensive evaluation of all school walk zones and determine deficiencies in sidewalk construction and condition, as well as intersection safety.

5.5 AREAS OF PERSISTENT POVERTY

Areas of persistent poverty are required to be evaluated as a part of the development of this plan. The census tracts that meet these qualifications are shown below. They total 64.5% of the area of the City of Kokomo, but just 57.8% of the population. The area contains 63.8% of the crashes in the City of Kokomo and 62.7% of the injury crashes. None of these statistics indicate a disproportionate number of crashes within the areas of persistent poverty. However, 81% of crashes involving vulnerable road users are located within this area. This could be the result of several factors. Firstly, this area likely has a lower percentage of vehicle owners, which increases the number of vulnerable road users on and near the roadway. Secondly, because there are a significant number of businesses within this area, this results in some of the crashes involving VRUs occurring on private property.

Obviously, addressing the vulnerable road users in general will reduce the number of crashes within the area of persistent poverty. However, focusing on infrastructure for vulnerable road users within areas of persistent poverty will reduce conflicts and improve safety.

Strategy: Prioritize improvements that increase safety for vulnerable road users within areas of persistent poverty.

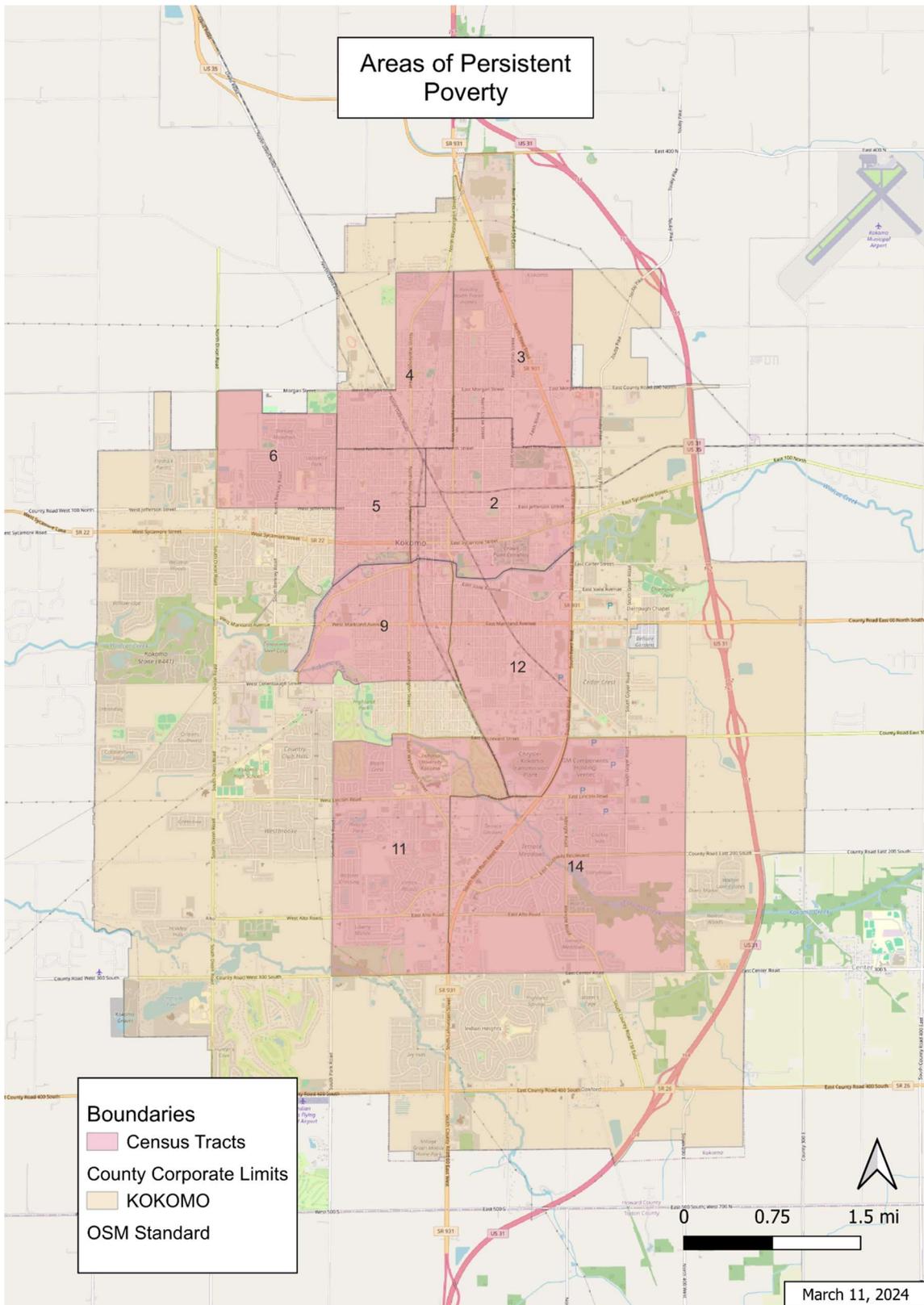


Figure 3 – Areas of Persistent Poverty

5.6 FATALITIES

There were 52 fatal crashes in the study area resulting in 54 fatalities. 28 fatal crashes occurred in the unincorporated areas and 24 fatal crashes occurred inside Kokomo. Of the 28 in unincorporated areas, 14 occurred on state highways.

Each of the 52 fatal crashes were evaluated to determine if specific factors were present. The factors and the number of fatal crashes where they were identified are below:

Factor	Number of Crashes	Percentage of Crashes
Speed	9	17.3%
No Restraint	21	40.4%
Drugs/Alcohol	16	30.8%
Motorcycle	12	23.1%
Pedestrian	4	7.7%
Any Factor	39	75%

Table 5 – Fatal crashes

What conclusion can be drawn from this data? A lack of restraint is the highest factor at 40.4%. Also considering that 29.5% of injured drivers in 2022 lacked the use of a restraint, and it becomes clear that a focus should be made on increasing the use of restraints.

The next highest factor is drugs and alcohol. A compounding issue is the fact that the fatality is not always the person at fault. Many times, the impaired driver survives the crash and not others that were involved. Regardless, impaired driving is a significant contributor to fatalities.

A further investigation into speed related crashes indicate that five were in Kokomo while four were in the unincorporated areas. Six of the speed related crashes had at least one other factor. Even the other three had indications of other issues that contributed to the fatality. Regardless, studies clearly show that speed increases crash severities and can also cause crashes that would otherwise not have occurred.

Motorcycle fatalities as a percentage of all fatalities is extremely high. In 2019, motorcycle crashes as a share of all crashes in Howard County, were just over 2%⁸, yet over the study period were 23% of fatalities. In Indiana, approximately 15% of all fatalities are motorcycle fatalities⁹. Six of the motorcycle crashes were single vehicle crashes.

Strategy: Programs to encourage the use of restraints, as well as increased enforcement of seat belt laws could reduce this factor in fatal crashes, as well as injury crashes.

Strategy: Increase awareness of the effects of drugs and alcohol on fatal crashes and increase enforcement of impaired driving laws.

⁸ <https://policyinstitute.iu.edu/research-analysis/traffic-safety/county/2019/Howard.pdf>

⁹ <https://policyinstitute.iu.edu/research-analysis/traffic-safety/crash-fact-books/Indiana-Crash-Facts-2021.pdf>

5.7 AGE

While it seems evident that younger drivers are more susceptible to being involved in crashes, the data indicates that younger drivers are much more likely, not only to be involved in a crash, but to be responsible for a crash.

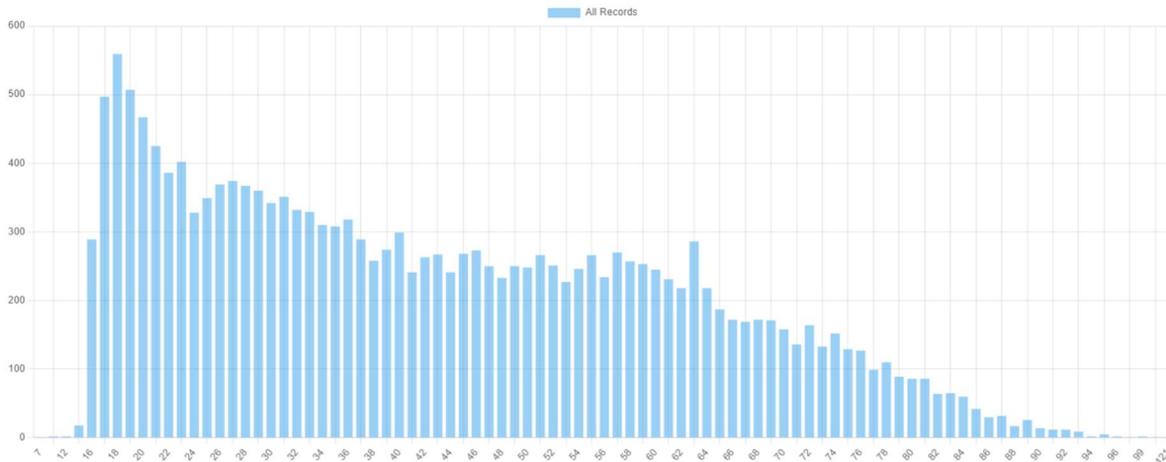


Figure 4 – Histogram of the number of crashes by age

The histogram above shows the number of drivers in each age. Drivers under 20 are noticeably more likely to be involved in crashes.

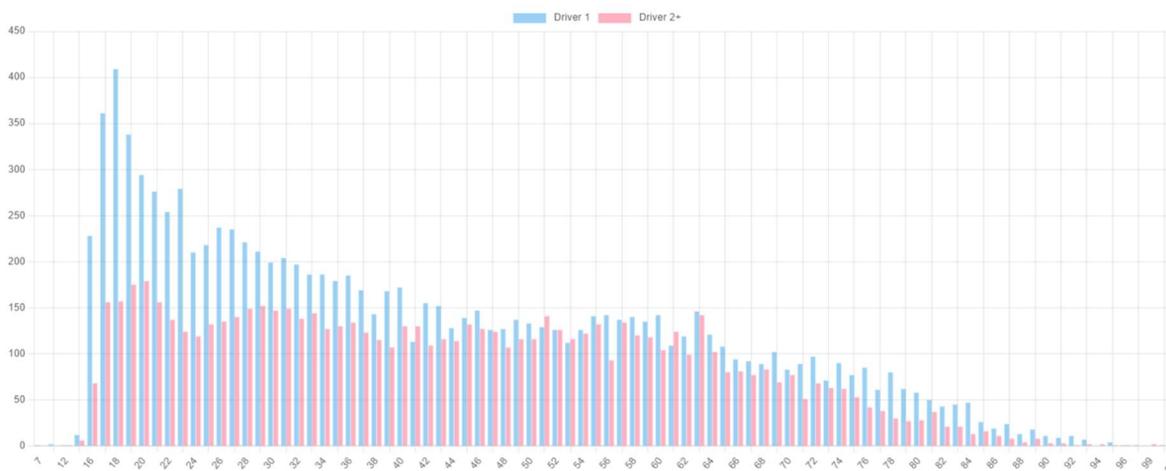


Figure 5 – Histogram of the number of crashes by age and driver

This histogram splits the crashes by “Driver 1” and “Driver 2+”. Driver 1 is normally defined as the driver that is most likely responsible for the crash. Driver 2+ are the other drivers in the crash. This graph shows the increased tendency younger drivers are to be responsible for crashes. This trend could be due to several factors:

- ⊕ Inexperience – Younger drivers lack time behind the wheel that older drivers have. The disparity in crashes is even more evident when looking at crashes that occurred during poor weather conditions, which indicates that younger drivers tend to underestimate how the conditions will affect the performance of their vehicles.
- ⊕ Inattention – Crash manners that are typically the result of inattention, such as rear end crashes and ran off road crashes, tend to have a higher disparity between younger and older drivers.
- ⊕ Driver trip decisions – Younger drivers tend to be more intent on traveling to their destination regardless of the time or weather. Therefore, they are more likely to drive when the conditions are less than favorable, which could lead to a disparity between younger and older drivers.

Strategy: Develop programming to engage younger drivers to teach “soft skills”, such as eliminating distractions, driving an appropriate speed for the weather conditions, and making good decisions regarding when and when not to venture out on the road.

5.8 SYSTEMIC IMPROVEMENTS

Systemic improves are “system wide.” These improvements address many locations without prioritizing the locations. Consider these improvements “best practices” that should be implemented across the system.

County-wide, the highest number of injury crashes by manner are below. These five crash manners comprise 82% of all injury crashes. Therefore, it is worthwhile to develop specific systemic strategies to reduce these manners of crashes.

- ⊕ Right angle – 624 (921 injuries, 15 fatalities) 1.50 injuries/fatalities per injury crash
- ⊕ Rear end – 307 (430 injuries, six fatalities) 1.42 injuries/fatalities per injury crash
- ⊕ Ran off road – 301 (341 injuries, 19 fatalities) 1.20 injuries/fatalities per injury crash
- ⊕ Left turn – 101 (140 injuries) 1.39 injuries/fatalities per injury crash
- ⊕ Head on between two vehicles - 84 (122 injuries, 8 fatalities) 1.55 injuries/fatalities per injury crash

5.8.1 Right Angle Crashes

The most common primary factor in right angle crashes is failure to yield (372 of 624). This occurs when a driver approaches a stop sign or signal, then enters the intersection without yielding to another driver that has the right of way. This behavior can be the result of confusion as to who has the right of way, not observing the other driver, or overestimating the gap available to make the movement. Strategies for addressing these types of crashes include:

- ⊕ Improving lighting – Especially at driveway approaches on higher speed roadways and two-way stop intersections, improving lighting can help approaching drivers see a vehicle entering the roadway. Improving

Strategy: Install lighting at every intersection in urban areas, and along the approaches to two-way stop intersections where the main street speed limit is greater than 30 MPH.

lighting on the approaches can also help those drivers exiting onto the roadway to see approaching vehicles.

- ⊕ Notifying the driver that cross traffic has the right of way (CROSS TRAFFIC DOES NOT STOP signs) – This placard under a stop sign helps drivers to be aware that vehicles approaching from the left and right are not required to stop.
- ⊕ Ensuring adequate site distance at intersections, including driveways.



The next most common primary factor is disregarding a signal or regulatory sign (176 of 624). This occurs when a driver approaches a stop sign or signal and simply ignores it. This type of action can be caused by inattention or by some type of obstruction, which could be permanent (a tree), or temporary (a vehicle or fog). Strategies for addressing these types of crashes include:

- ⊕ Advanced warning signs (stop ahead/signal ahead) – These signs notify drivers of an upcoming signal or stop sign. Traditionally, they have been installed when the geometrics of the intersection prohibit the driver from seeing the upcoming intersection. However, they can also have the benefit of giving the driver an additional queue that an intersection is approaching, especially along truck routes, where the intersection can be obstructed by traffic ahead.

5.8.2 Rear End Crashes

There was a total of 307 rear end injury crashes within the study area. This manner of crash also resulted in 430 injuries. The highest primary factor was “Following too closely” at 159 crashes. What’s worse is that these crashes are increasing steadily from 49 in 2020 to 73 in 2023. This is most likely due to distracted driving, which appears to be on the rise.

Some of the strategies for right angle crashes, such as additional signage, can also reduce rear end crashes by making the following vehicles more aware of upcoming traffic control devices. Additional strategies include the installation of dedicated left turn lanes and right turn lanes. Road diets that convert four-lane sections to three-lane sections can also reduce rear end crashes.

Strategy: Install “CROSS TRAFFIC DOES NOT STOP SIGNS” (WP4-4P) on two-way stop approaches where the main street speed limit is greater than 30 MPH.

Strategy: Enforce site distance triangles currently in the zoning ordinance, evaluate high crash driveways for site distance issues.

Strategy: Install stop ahead (W3-1)/signal ahead (W3-3) signs whenever there is at least 2000 feet between signals or stop signs in urban areas, and 4000 feet in rural areas. Also consider intersection warning (W2-1) signs with cross street name placards (W16-8P) at high volume intersections.



5.8.3 Ran Off Road Crashes

While ran off road crashes are just 11.83% of all crashes in the study area, they were identified as the manner in 30.12% (647/2,148) of all crashes in the unincorporated area. 301 (23.48%) of those crashes resulted in injuries. 13 of the 28 fatal crashes on county roads were identified as ran off road. Only 7.34% of crashes in Kokomo, Greentown, and Russiaville were identified as ran off road. The contributing factors to these types of crashes include:

⊕ Roadway width without a recovery area – While a narrow roadway can reduce speeds in urban areas, their effect on speed is negligible when the volume is low. Also, a lack of a paved or stone shoulder can result in serious crashes when a vehicle leaves the roadway and can't recover. Below are strategies to reduce these crash manners on narrow roadways:

- Safety edge – Require a 45-degree angle asphalt fillet “Safety Edge” as a contract specification in all pavement resurfacing projects.
- Edge lines – Include edge line pavement markings on all roadways that lack curb and gutter. Not only does this help drivers identify the roadway, it also can help drivers see obstructions and animals moving into the roadway from a further distance, especially at night.
- Edge line rumble strips – Where the pavement is wide enough, include edge line rumble strips to help drivers know when they are leaving the roadway. This can also assist fatigued drivers, as 72% (16/22) of crashes on county roads where the primary factor was “Driver asleep or fatigued” were ran off road crashes.
- Shoulders – Include stone shoulders to allow for recovery. Focus on roadways that have the highest roadway departures.

Strategy: Reduce run off road crashes by including safety edges, edge lines, rumble strips, and shoulders whenever warranted and feasible.

Strategy: Evaluate signage at curves that exhibit a significant number of crashes. Consider adding lighting if crashes are occurring at night at a higher rate and if there are blind intersections. Focus on shoulder improvements in these areas as well.

⊕ Horizontal Curves – The unincorporated area has several locations with curves that require driver action to stay on the roadway. Even a subtle curve can cause crashes if the driver is unaware. The highest concentration of crashes on curves occurs on 100 North east of US31, on Sycamore Road west of 400 West, and 300N/350N west of Davis Road.

5.8.4 Left Turn Crashes

91% (474/521) of all left turn crashes occurred within the city limits, and 92% (93/101) of all left turn injury crashes occurred within city limits. 58% of all left turn crashes had a primary factor of failure to yield. Left turn crashes typically occur at intersections, or they can occur between intersections when entering or exiting a driveway. SR931 had 14% (72/521) of all left turn crashes, but 27% (27/101) of all injury crashes. 38 of the 72 left turn crashes occurred between noon and 6pm.

Strategy: Encourage INDOT to consider modifying their signals to prohibit permissive left turns between noon and 6pm. Also encourage INDOT to consider eliminating left turns at unsignalized intersections.

5.8.5 Head on Between Two Vehicles Crashes

Head on crashes are typically less likely to occur than other crash manners but are more severe. There are two approaches to reducing head-on collisions. The first is to reduce the chances that opposing vehicles will collide. The second is to reduce the speeds along the roadway to reduce the severity crashes, as well as provide additional time for drivers to correct and ultimately avoid a crash.

While head on collisions in Howard County result in nearly the same number of injuries per injury crash as other crash manners, they resulted in eight fatalities. Six of those eight were on state highways. One was on US31, which is a divided highway. Two were on highways that have centerline rumble strips. Surprisingly, only 16 head on injury crashes occurred in unincorporated areas, only four were on county roads, and no fatal head on crashes occurred on county roads. Based on this data, it does not appear worthwhile to incorporate centerline rumble strips on rural roads in unincorporated areas as this time. If traffic volumes or head on collisions increase, centerline rumble strips should be considered.

A significant number of head on injury crashes (66 of 84) occurred inside the Kokomo city limits. Many appear to be driver inattention, medical issue, or occurred during a turning movement. Many were on thoroughfares, indicating a strong correlation with speed, as well as the number of lanes. Speed reduction efforts are the most effective at eliminating injury crashes of this manner.

5.8.6 Severity Reductions

As shown earlier, reducing speed has the highest potential to reduce the severity of crashes, as well as reducing the number of total crashes. Speed reduction should include the following:

- ⊕ Systematically evaluating speed complaints to determine the extent.
- ⊕ Designing street improvements to allow speeds to fit the environment.
- ⊕ Separate different modes of vehicles, especially on high volume roads.
- ⊕ Institute speed countermeasures strategically, such as speed bumps, raised intersections, and on street parking.

Strategy: Agencies should align speed limits and target speeds to prioritize injury minimization. This alignment often requires changing the roadway environment to slow driver speeds.

5.9 SYSTEMATIC IMPROVEMENTS

Systematic improvements are proactive, proven countermeasures installed at high-risk locations, and are based on roadway features. The key terms are, “Identify” “Prioritize” and “Treat.” Some potential systematic improvements include:

- ⊕ Doubling/increasing the size of/or installing LED flashers on stop signs – These improvements increase visibility to make drivers aware of the upcoming stop-controlled intersection. Potential locations include:
 - Apperson Way/North Street (8 disregarding a stop sign crashes)
 - Markland Avenue/Webster Street (7 disregarding a stop sign crashes)
 - Ohio Street and Sycamore Street (5 disregarding a stop sign crashes)
 - Elm Street and Webster Street (5 disregarding a stop sign crashes)
- ⊕ Rumble strips – Rumble strips can be installed in advance of signals or stop signs to increase driver attention. Typically, these are warranted where the driver experiences a long stretch of roadway where their attention could wane. The only location with more than one disregarding a sign/signal crash in the unincorporated area of Howard County is Smith Road and Davis Road. Rumble strips may have benefit on the minor approaches at that intersection. Inside Kokomo, SR931 and Savoy has a large and increasing percentage of rear end crashes northbound, which could benefit from rumble strips.
- ⊕ Signals

The Federal Highway Administration estimates that 75% of the nation’s 330,000 traffic signals could be improved by updating equipment or timing plans¹⁰. Furthermore, poor signal timing accounts for up to 10% of all traffic delay in the United States¹¹. Some potential signal improvements include:

 - Re-time signals

Every signal has a signal timing plan, which determines the amount of green time for each phase. These plans can be overly complicated if there are different plans based on the time of day and day of the week. They can also be complicated by actuation and coordination between signals.

Many of Kokomo’s signal timing plans are substantially like what they were when the signal was most recently upgraded. Some timing plans date back to the late 80’s and early 90’s. A review of the city’s traffic volumes from that timeframe indicates the timing is based on significantly different (typically higher) traffic volumes than the city currently experiences. Re-timing these signals could result in increased efficiency and improved safety.
 - Install Leading Pedestrian Intervals at every signal with crosswalks

Leading Pedestrian Intervals are a short all red interval that allows pedestrians to enter the crosswalk prior to the initiation of vehicular turning movements. This improves the visibility of pedestrians and reduces the chances of a turning vehicle colliding with a

¹⁰ <https://highways.dot.gov/public-roads/novemberdecember-2004/red-light-green-light>

¹¹ https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/asct_brochure.pdf

pedestrian. In cases where pedestrian movements are actuated, this interval would only be necessary when pedestrians are present.

- Upgrades to actuation
City traffic signals are currently actuated with a mixture of traffic loops and pucks that detect vehicles as they approach the intersection. There are many other options on the market that are more accurate, flexible, and dependable. They include cameras, radar, and infrared sensors. Upgrading the sensors at each intersection, as well as installing actuation on non-actuated signals, could improve efficiency, which can reduce the number and severity of crashes.

5.10 SITE SPECIFIC IMPROVEMENTS

A detailed crash analysis was performed at major roadway intersections that exhibited the highest number of crashes.

5.10.1 High Injury Locations

Intersections are the most likely source of injuries, especially in urban areas. To determine the intersections with the highest impact to the community, the following procedure was developed:

1. All intersections in the county were located using GIS.
2. The intersections were buffered 150 feet along the segments and 96 feet perpendicular to the segments. Buffers were modified as necessary to ensure all the crashes related to the intersection were included.
3. Each crash was assigned a cost based on the Federal Highway Administration "Crash Costs for Highway Safety Analysis"¹². In Indiana, the following costs are used:
 - a. Fatal (K) - \$373,000
 - b. Incapacitating (A) - \$373,000
 - c. Non-Incapacitating (B) - \$35,200
 - d. Possible (C) - \$35,200
 - e. Property Damage Only (O) - \$6,300
4. The crash costs within each buffer were summed and divided by five (there were five years in the study period) to develop an average annual cost for each buffer.
5. After quantifying the intersection costs, the same was done for the segments, which included removing the intersection related crashes from the segments.
6. The top 10% of the non-zero cost intersections and the segments were identified for Kokomo, the remaining portion of Howard County, and INDOT, which resulted in the data below. The intersections and segments are ordered by their annual cost, from highest to lowest.
7. At a minimum, the top 5 intersections in each category were evaluated, as well as several of the top roadway segments.

¹² <https://safety.fhwa.dot.gov/hsip/docs/fhwasa17071.pdf>

5.10.2 Non-Kokomo High Injury Locations

For areas outside of Kokomo, the highest 10% of intersections and segments are identified below.

ID	Intersections	Cost / Year	K	A	B	C	O
CI-1	Smith Rd., Davis Rd., Davis Rd	\$ 432,140	0	5	4	1	19
CI-2	200 S, 400 E	\$ 235,880	0	3	1	0	4
CI-3	100 S, 400 E., 400 E	\$ 232,620	0	3	0	0	7
CI-4	500 E, 400 N	\$ 228,840	0	3	0	0	4
CI-5	50 N, 400 E	\$ 168,320	0	2	1	1	4
CI-6	100 N, 600 E	\$ 167,060	0	2	1	1	3
CI-7	750 W, 00 Ns	\$ 163,800	0	2	1	0	6
CI-8	100 N, 1350 E	\$ 162,540	0	2	1	0	5
CI-9	Phillips St. Pike, 150 W	\$ 156,760	0	2	0	0	6
CI-10	500 S, 500 W	\$ 152,980	0	2	0	0	3
CI-11	600 N, 1000 E	\$ 151,720	0	2	0	0	2
CI-12	Phillips St. Pike, Smith Rd., Phillips St.	\$ 150,460	0	2	0	0	1
CI-13	400 N, 1300 E	\$ 150,460	0	2	0	0	1
CI-14	50 N, 600 E	\$ 149,200	0	2	0	0	0
CI-15	900 E, 100 N	\$ 113,580	0	1	4	1	3
CI-16	250 S, Co. Rd. 350 W., Co. Rd. 250 S., 350 W	\$ 100,020	0	1	2	0	9
CI-17	50 S, 800 E	\$ 98,240	0	1	3	0	2
CI-18	1150 W, 400 N	\$ 96,980	0	1	2	1	1
CI-19	500 E, 100 N	\$ 89,200	0	1	1	0	6
CI-20	500 S, 600 W	\$ 85,420	0	1	1	0	3
CI-21	250 S, 600 W	\$ 83,420	0	1	0	0	7
CI-22	600 E, 500 N	\$ 82,900	0	1	1	0	1
CI-23	500 S, 900 W	\$ 81,640	0	1	1	0	0

Table 6 – Non-Kokomo high crash intersections

ID	Street	Length (ft)	Cost / Mile	K	A	B	C	O
CS-1	W Alto Rd	732	\$ 103.60	0	1	0	0	1
CS-2	E 100 N	2717	\$ 91.52	1	2	2	1	3
CS-3	S 680 W	843	\$ 89.98	0	1	0	0	1
CS-4	W 250 S	926	\$ 81.90	0	1	0	0	1
CS-5	S 200 W	2709	\$ 61.20	0	2	2	0	2
CS-6	N 150 W	1422	\$ 60.06	0	1	1	0	3
CS-7	S 750 W	1278	\$ 59.36	0	1	0	0	1
CS-8	N 300 W	1278	\$ 59.34	0	1	0	0	1
CS-9	Sycamore Rd	1869	\$ 47.73	0	1	1	0	6
CS-10	S 850 E	1774	\$ 42.77	0	1	0	0	1
CS-11	S Harrison St	449	\$ 37.01	0	0	2	0	2
CS-12	N 400 E	2257	\$ 33.62	0	1	0	0	1
CS-13	Hobson St	2417	\$ 31.91	0	1	0	0	2
CS-14	E 400 N	2392	\$ 31.71	0	1	0	0	1
CS-15	E 300 S	4884	\$ 30.55	0	2	0	0	0
CS-16	N 300 W	2587	\$ 29.32	0	1	0	0	1

Table 7 – Non-Kokomo high crash segments

Each of these locations should be prioritized for systematic improvements.

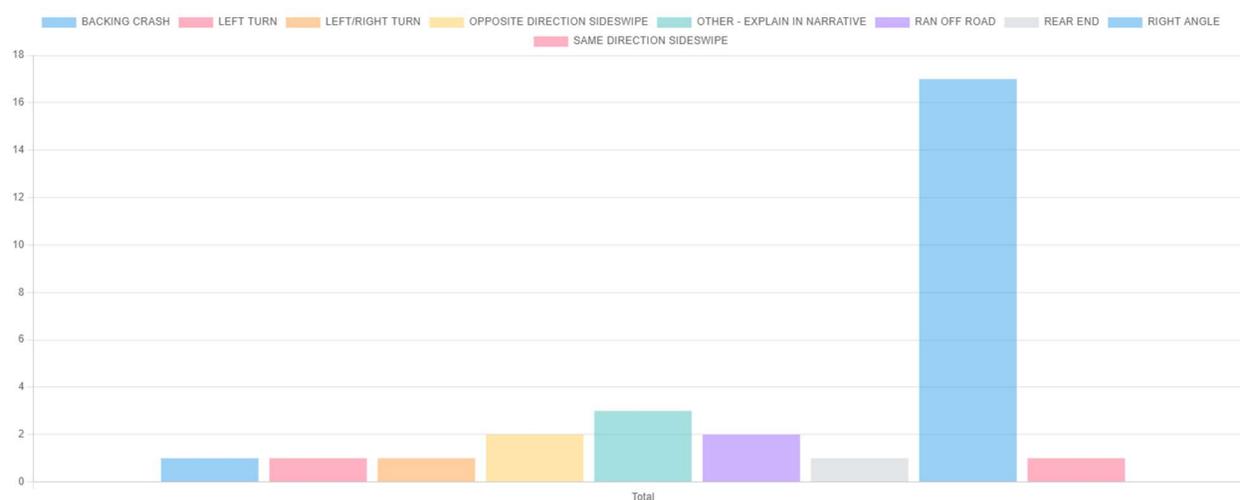
5.10.3 Davis Road and Smith Road (CI-1)

This intersection is just outside of the Kokomo corporate limits, and the east leg is considered within the limits. Davis Road is a thoroughfare with relatively high speeds.

5.10.3.1 Crash History

There were 28 crashes at this intersection during the study period. 12 resulted in injuries. It has the highest number of crashes of any non-INDOT intersection outside of Kokomo. 17 (7 injury) of the 29 crashes were right angle crashes.

The main contributing factors are certainly speed, as well as the skew of the intersection.



5.10.3.2 Strategies

- ⊕ Make preliminary minor improvements – Prior to a substantial improvement, additional considerations include adding “CROSS TRAFFIC DOES NOT STOP” signs to the stop signs on Davis, as well as installing stop bars. Also, ensure that there is adequate sight distance for westbound Smith Road looking south (and vice versa). There does not appear to be an abundance of crashes at night, so lighting does not appear to be beneficial. Upgrading the advanced intersection signage by doubling them up, installing a placard for the cross-street name, and using solar powered LED lit signs could all be implemented.
- ⊕ Realign Smith Road to be perpendicular to Davis – This would shift the intersection to the north and require a compound curve on the east side. Additional challenges include the rail crossing and drainage ditch on the east side and the utility poles on the west side.
- ⊕ Realign Davis Road to be perpendicular to Smith Road – This would shift the intersection west and require compound curves on Davis Road both north and south of the intersection. They would be the only curves on Davis Road between Washington Street and US35. This could increase roadway departures and may not increase site distance significantly.
- ⊕ Install a roundabout – This would require the intersection to shift west, and either north or south. Because the speed limit is currently 55 MPH, it would require additional improvements

north and south to reduce speeds entering the intersection. Traffic volumes would need to be analyzed to determine if there is enough traffic on Smith Road to warrant a roundabout.

- ⊕ Install a traffic signal – This option would eliminate the need to realign the intersection and could be actuated to only provide the right of way to Smith Road as needed. A signal warrant analysis would need to be conducted to determine if the traffic volume is high enough. Additional improvements may be necessary due to the proximity of the rail crossing.

5.10.4 200 South and 400 East (CI-2)

This intersection is two-way stop controlled, with 400 East stopping for 200 S. There were three incapacitating crashes, one non-incapacitating crash, and four property damage crashes in the study period. Five of these crashes have a primary factor of failure to yield and one was disregarding a sign. The high severity is also a function of the speeds on 200 South. Recommendations include installing advanced warning signs on 400 East, as well as installing “cross traffic does not stop” placards and reflective strips on the stop signs. Stop bars should also be considered. Adding stop signs on the left sides of the 400 East approaches is also recommended. On 200 South, the installation of intersection advanced warning signs will improve driver awareness of the approaching intersection.

5.10.5 100 South and 400 East (CI-3)

This intersection is two-way stop controlled, with 400 East stopping for 100 S. There were three incapacitating crashes and seven property damage crashes in the study period. Five of these crashes have a primary factor of failure to yield and two were disregarding a sign. The high severity is also a function of the speeds on 100 South. Recommendations include installing advanced warning signs on 400 East, as well as installing “cross traffic does not stop” placards and reflective strips on the stop signs. Stop bars should also be considered. On 100 South, the installation of intersection advanced warning signs will improve driver awareness of the approaching intersection.

5.10.6 400 North and 500 East (CI-4)

This intersection is two-way stop controlled, with 500 East stopping for 400 N. There were three incapacitating crashes and four property damage crashes in the study period. Three of these crashed have a primary factor of failure to yield. The high severity is also a function of the speeds on 400 North. Recommendations include installing advanced warning signs on 500 East, as well as installing “cross traffic does not stop” placards and reflective strips on the stop signs. Stop bars should also be considered. On 400 North, the installation of intersection advanced warning signs will improve driver awareness of the approaching intersection.

5.10.7 50 North and 400 East (CI-5)

This intersection is two-way stop controlled, with 400 East stopping for 50 North. There were two incapacitating crashes, one non-incapacitating crash, one possible injury crash, and four property damage crashes in the study period. Five of these crashes have a primary factor of failure to yield and one was disregarding a sign. The high severity is also a function of the speeds on 50 North. Recommendations include installing advanced warning signs on 400 East, as well as installing “cross traffic does not stop” placards and reflective strips on the stop signs. Stop bars should also

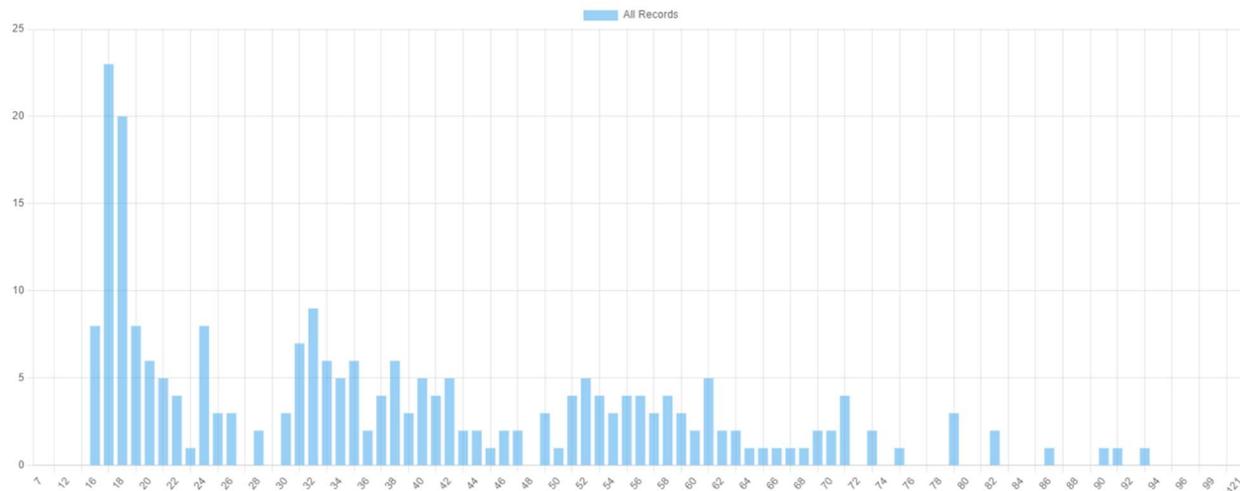
be considered. On 50 North, the installation of intersection advanced warning signs will improve driver awareness of the approaching intersection.

5.10.8 Alto Road – County line west to 300 West (Includes CS-1 and CS-4)

Alto Road from the west county line to 300 West is approximately 10.1 miles in length. The roadway is entirely in the unincorporated area except for the intersection of Alto and Malfalfa. The road transverses the unincorporated town of West Middleton.

5.10.8.1 Crash History

This 10-mile segment of roadway has experienced 158 crashes (31 injury crashes) within the study period. This results in 15.6 crashes per mile, and 3.1 injury crashes per mile. For comparison, SR26 on the same boundaries (just 6.7 miles) experienced 14.78 crashes per mile but only 1.6 injury crashes per mile. SR22 on the same boundaries experienced 149 crashes and 25 injury crashes. The histogram of the driver ages (below) indicates many young drivers are involved in crashes on Alto.



While there were 34 crashes involving deer, none of them resulted in injury. Of the 38 ran off road crashes, 14 resulted in injuries.

5.10.8.2 Strategies

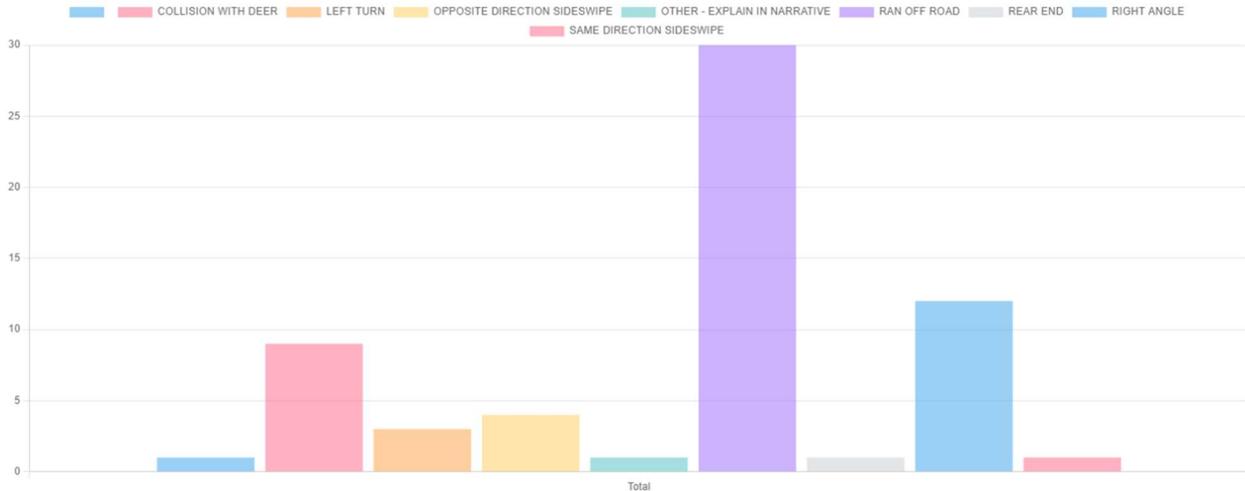
Prioritize the strategies for ran off road crashes on this segment. These strategies should include edge line rumble strips or shoulder stone where the roadway is not wide enough. There were also 40 rear end crashes on this roadway. To address this risk, increase the site distance by reducing vertical curves, install intersection warning signs, as well as install left turn lanes, acceleration and deceleration lanes.

5.10.9 100 North – 250 East to 700 East (Includes CS-2)

This 4.53-mile segment is in the unincorporated area of Howard County and includes numerous horizontal curves, as well as road and driveway intersections with limited site distance.

5.10.9.1 Crash History

The roadway experienced 53 crashes (14 injury crashes) within the study period. This results in 11.7 crashes per mile and 3.1 injury crashes per mile, including 1 fatality. 30 of the crashes were ran off road crashes. Of the 14 injury crashes, ran off road was the manner in 6, and failure to yield was the primary factor in 7.



5.10.9.2 Strategies

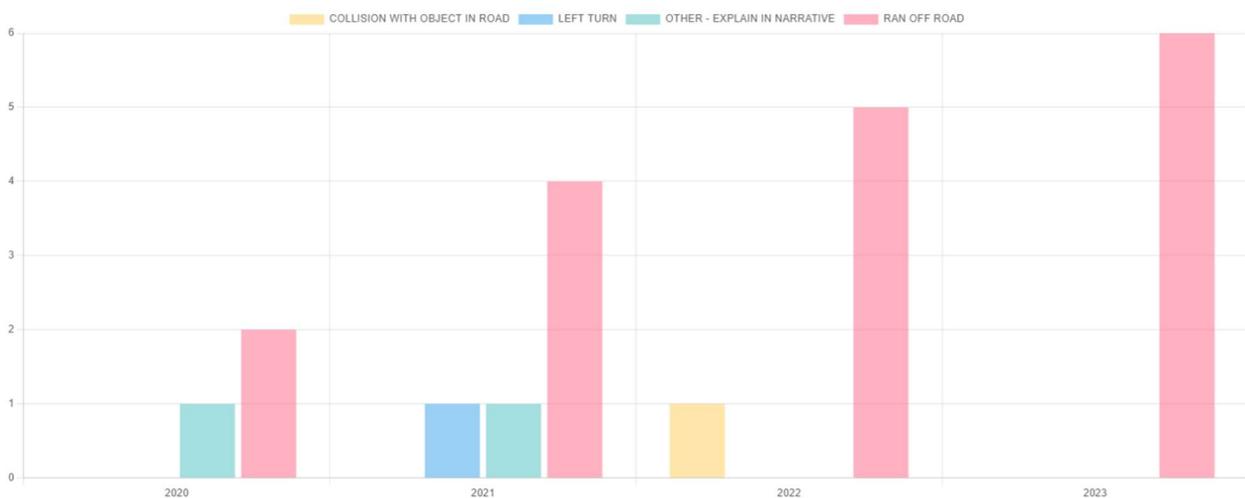
Because the roadway has sufficient width, install edge line rumble strips and edge lines. Improve site distance at intersections to reduce right-angle crashes.

5.10.10 Sycamore Road west 1.66 miles from 400 West (Includes CS-9)

This segment of roadway is 1.66 miles in length and contains several horizontal and vertical curves. It is also heavily wooded and adjacent to Wildcat Creek.

5.10.10.1 Crash History

There were 21 crashes with 3 injury crashes. This calculates to 12.65 crashes per mile and 1.8 injury crashes per mile. 17 of the 21 crashes and all 3 of the injury crashes were roadway departures. The crash history does not indicate an issue with intersection site distance.



5.10.10.2 Strategies

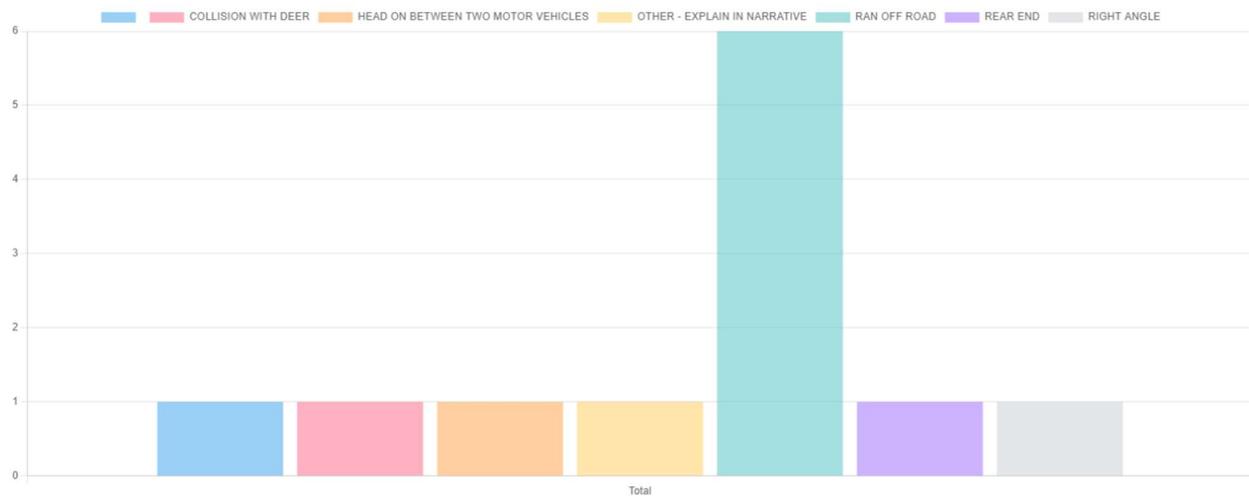
Prioritize this area for ran off road strategies, including edge line rumble strips, edge lines, and curve signage. Also consider vertical curve improvements.

5.10.11 New London Area Roads

While none of these segments or intersections are in the top 10%, due to the multiple horizontal and vertical curves, the area experiences a high number of crashes. Additionally, there are little to no shoulders, and no edge lines.

5.10.11.1 Crash History

While there were only been 12 crashes during the study period, four were injury crashes, which includes one fatality. The fatality was partially due to the driver being unaware of an approaching curve. Half of the crashes were ran off road.



5.10.11.2 Strategies

Implement additional signage notifying drivers of curves, as well as install edge lines, consider rumble strips, and shoulder improvements in conjunction with any resurfacing activities.

5.10.12 City of Kokomo High Injury Locations

For Kokomo, the highest 10% of intersections and segments are identified below.

ID	Intersection	Cost/Year	K	A	B	C	O
KI-1	Sycamore St., Dixon Rd.	\$ 600,200	0	6	6	1	82
KI-2	Alto Rd., Southway Blvd.	\$ 429,920	1	4	2	0	34
KI-3	Lafountain St., Southway Blvd.	\$ 370,440	0	4	1	1	46
KI-4	Markland Av., Webster St.	\$ 363,620	0	4	3	0	35
KI-5	Washington St., Espanol Dr.	\$ 362,360	0	4	3	0	34
KI-6	Ohio St., Morgan St.	\$ 354,280	0	4	3	1	22
KI-7	Lafountain St., Lincoln Rd.	\$ 347,760	0	4	0	2	28
KI-8	Home Av., Lincoln Rd.	\$ 340,200	0	4	2	0	22
KI-9	Washington St., Lincoln Rd.	\$ 323,780	1	2	3	1	57
KI-10	Washington St., Sycamore St.	\$ 300,360	0	3	2	1	44
KI-11	Lincoln Rd., Webster St.	\$ 275,680	0	3	2	0	30
KI-12	Defenbaugh St., Dixon Rd.	\$ 265,600	0	3	2	0	22
KI-13	Sycamore St., Lody Ln., Berkley Rd., Walnut St.	\$ 258,780	0	3	1	2	11
KI-14	Apperson Way, Sycamore St.	\$ 257,300	0	3	1	0	21
KI-15	Washington St., Superior St.	\$ 255,520	0	3	2	0	14
KI-16	Lafountain St., Alto Rd.	\$ 242,580	0	2	7	0	35
KI-17	Webster St., West Boulevard, Stadium Dr.	\$ 242,180	0	3	0	1	9
KI-18	Washington St., Defenbaugh St.	\$ 238,920	0	3	0	0	12
KI-19	Jefferson St., Lody Ln., Berkley Rd.	\$ 236,400	1	2	0	0	10
KI-20	Washington St., King St.	\$ 232,620	0	3	0	0	7
KI-21	Monroe St., Apperson Way	\$ 231,360	0	3	0	0	6
KI-22	Washington St., Park Av.	\$ 227,020	0	2	3	0	45
KI-23	Main St., Markland Av.	\$ 225,460	0	2	5	1	27
KI-24	Apperson Way, Harrison St.	\$ 225,060	0	3	0	0	1
KI-25	Markland Av., Park Av.	\$ 222,500	0	2	1	1	47
KI-26	Dixon Rd., West Boulevard	\$ 219,160	0	2	3	3	22
KI-27	Markland Av., Goyer Rd., Markland Ave.	\$ 210,640	0	2	2	1	32
KI-28	Jefferson St., Dixon Rd.	\$ 210,340	0	2	4	2	15
KI-29	Markland Av., Belvedere Dr.	\$ 209,900	0	2	2	0	37
KI-30	Washington St., Morgan St.	\$ 209,600	0	2	4	1	20
KI-31	Dixon Rd., Co. Rd. 250 S., Alto Rd., Co. Rd. 200 W.	\$ 199,080	0	2	1	0	34
KI-32	Cartwright Dr., Kimberly Dr., Center Rd.	\$ 197,300	0	2	1	1	27

ID	Intersection	Cost/Year	K	A	B	C	O
KI-33	Hoffer St., Washington St.	\$ 196,780	0	2	3	0	21
KI-34	300 W, 100 N, Co. Rd. 100 N.	\$ 196,260	0	2	2	2	15
KI-35	Ohio St., Sycamore St.	\$ 192,260	0	2	2	0	23
KI-36	Lincoln Rd., Park Rd.	\$ 187,220	0	2	2	0	19
KI-37	Markland Av., Plate St.	\$ 187,220	0	2	1	1	19
KI-38	Markland Av., Washington St.	\$ 183,920	0	1	3	0	70
KI-39	Jay St., Markland Av.	\$ 183,440	0	2	2	0	16
KI-40	Washington St., Harrison St.	\$ 182,920	0	2	2	1	10
KI-41	Wabash Av., West Boulevard, Country Club Ln.	\$ 175,880	0	2	2	0	10
KI-42	East Boulevard, Elizabeth St.	\$ 175,880	0	2	2	0	10
KI-43	Markland Av., Calumet St.	\$ 172,100	0	2	2	0	7
KI-44	Apperson Way, Superior St.	\$ 171,360	0	2	1	0	12
KI-45	Dixon Rd., Carter St.	\$ 169,580	0	2	1	1	5
KI-46	Park Av., Philips St.	\$ 165,060	0	2	0	1	7
KI-47	Jefferson St., Ohio St.	\$ 165,060	0	2	1	0	7
KI-48	Western Av., Sycamore St.	\$ 163,800	0	2	0	1	6
KI-49	North St., Touby Pike	\$ 162,540	0	2	0	1	5
KI-50	Philips St., Madison St.	\$ 162,540	0	2	1	0	5
KI-51	Jefferson St., Witherspoon Dr.	\$ 161,800	0	2	0	0	10
KI-52	Elm St., Washington St.	\$ 158,020	1	1	0	0	7
KI-53	Washington St., Jackson St.	\$ 155,500	0	2	0	0	5
KI-54	Courtland Av., Harrison St.	\$ 155,500	0	2	0	0	5
KI-55	Jefferson St.	\$ 151,720	0	2	0	0	2
KI-56	Indiana Av., North St.	\$ 150,460	0	2	0	0	1
KI-57	Purdum St., Superior St.	\$ 149,200	0	2	0	0	0
KI-58	Main St., Broadway St.	\$ 149,200	1	1	0	0	0
KI-59	Jefferson St., Washington St.	\$ 140,340	0	1	1	1	41
KI-60	East Boulevard, Goyer Rd., Co. Rd. 100 S.	\$ 138,780	0	1	5	0	23
KI-61	Davis Rd., Morgan St., Courtland Av.	\$ 135,000	0	1	5	0	20
KI-62	Home Ave., Markland Av., Markland Ave.	\$ 134,480	0	1	6	0	14
KI-63	Markland Av., Cooper St.	\$ 121,440	0	1	2	0	26
KI-64	Berkley Rd., West Boulevard	\$ 120,400	0	1	3	1	14
KI-65	Home Av., East Boulevard	\$ 119,140	0	1	2	2	13
KI-66	North St., Washington St.	\$ 116,400	0	1	1	1	22
KI-67	Lafountain St., Rainbow Dr.	\$ 115,660	0	1	1	0	27

ID	Intersection	Cost/Year	K	A	B	C	O
KI-68	Philips St., Sycamore St.	\$ 114,400	0	1	1	0	26
KI-69	Apperson Way, North St.	\$ 111,880	0	1	1	0	24
KI-70	West Boulevard, Washington St.	\$ 110,100	0	1	1	1	17
KI-71	Markland Av., Courtland Av.	\$ 108,840	0	1	1	1	16
KI-72	Zartman Rd., Dixon Rd., Co. Rd. 200 S.	\$ 108,320	0	1	2	1	10
KI-73	Apperson Way, Jefferson St.	\$ 107,580	1	0	2	0	15
KI-74	Co. Rd. 250 S., Co. Rd. 300 W.	\$ 106,320	0	1	1	1	14
KI-75	Purdum St., Markland Av.	\$ 105,060	0	1	0	2	13
KI-76	Washington St., Lafountain St.	\$ 101,800	0	1	1	0	16
KI-77	North St., Ohio St.	\$ 100,540	0	1	1	0	15
KI-78	Philips St., Havens St.	\$ 98,760	0	1	1	1	8
KI-79	Webster St., King St.	\$ 97,500	0	1	2	0	7
KI-80	Sycamore St., Main St.	\$ 97,280	0	1	0	0	18
KI-81	Markland Av., Buckeye St.	\$ 96,760	1	0	1	0	12
KI-82	Foster St., 17th Street	\$ 95,500	0	1	1	0	11
KI-83	Washington St., Edgewater Dr.	\$ 95,500	0	1	1	0	11
KI-84	Co. Rd. 100 S., Izaak Walton Rd., 100 S	\$ 94,980	0	1	2	0	5
KI-85	Sams Club Entrance	\$ 94,980	0	1	2	0	5
KI-86	North St., Rank Parkway	\$ 94,980	0	1	1	1	5
KI-87	Lincoln Rd., Berkley Rd.	\$ 92,240	0	1	0	0	14
KI-88	Dixon Rd., Lincoln Rd.	\$ 92,240	0	1	0	0	14
KI-89	Washington St., Havens St.	\$ 91,720	1	0	0	1	8
KI-90	Monroe St., Washington St.	\$ 91,720	0	1	0	1	8

Table 8 - Kokomo high crash intersections

ID	Street	Length (ft)	Cost / Mile	K	A	B	C	O
KS-1	E Markland Ave	265	\$ 655.01	0	2	1	0	14
KS-2	N Dixon Rd	377	\$ 408.84	0	2	0	0	4
KS-3	Council Ring Blvd	618	\$ 241.52	0	2	0	0	0
KS-4	Home Ave	405	\$ 187.53	0	1	0	0	1
KS-5	S Lafountain St	466	\$ 175.22	0	1	1	0	0
KS-6	S Apperson Way	456	\$ 169.21	0	1	0	0	2
KS-7	N Washington St	549	\$ 138.08	1	0	0	0	1
KS-8	S Washington St	1119	\$ 133.33	0	2	0	0	0
KS-9	N Apperson Way	670	\$ 121.85	0	1	1	0	0
KS-10	W Lincoln Rd	652	\$ 116.28	0	1	0	0	1
KS-11	Home Ave	707	\$ 107.34	0	1	0	0	1
KS-12	E Markland Ave	203	\$ 105.34	0	0	0	0	17
KS-13	Essex Dr	72	\$ 105.21	0	0	0	0	6
KS-14	S Dixon Rd	1023	\$ 81.03	0	1	1	0	1
KS-15	W Markland Ave	977	\$ 78.92	0	1	0	0	2
KS-16	S Dixon Rd	1182	\$ 71.62	0	1	0	0	8
KS-17	E Alto Rd	1163	\$ 66.32	0	1	0	0	2

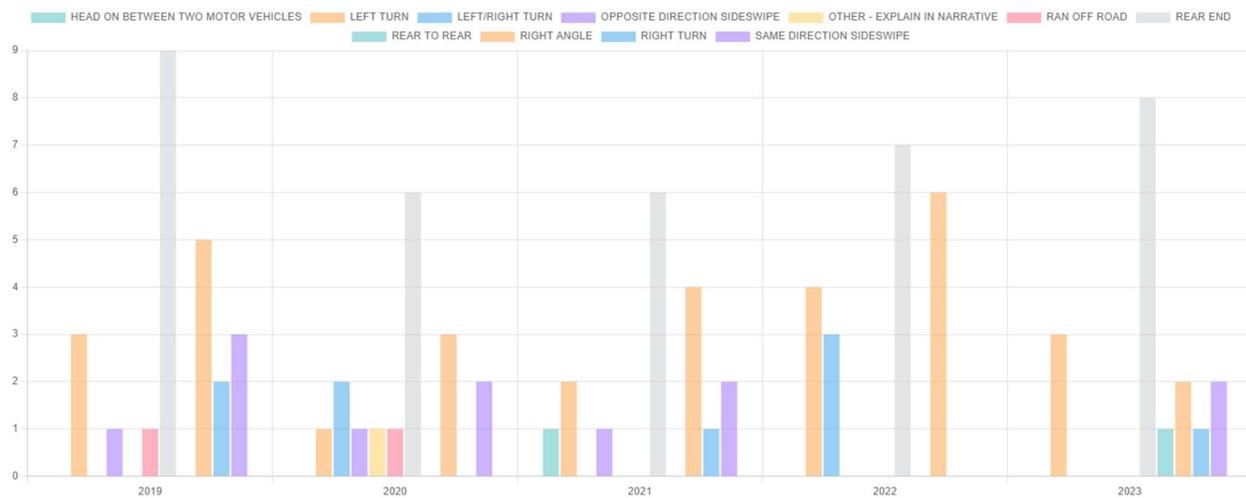
Table 9 – Kokomo high crash segments

5.10.13 Dixon Road and Sycamore Street (KI-1)

This signalized intersection was reconstructed in 2006. There are two through lane approaches northbound and southbound, and single lane approaches with right turn lanes eastbound and westbound. All approaches include a dedicated left turn lane that is protected/permissive. There are numerous drive approaches in close proximity.

5.10.13.1 Crash History

There have been 95 crashes in the study period. Six crashes were incapacitating, six were non-incapacitating, one was possible, and 82 were property damage only crashes. 31 crashes had a primary factor of failure to yield, while 22 crashes were following too closely. There was one crash involving a vulnerable road user. Overall, the trend is decreasing, but only slightly. Rear end crashes have increased since 2021.



5.10.13.2 Strategies

The intersection does not meet the standard of having one signal head per lane. Meeting this standard could increase driver awareness regarding the signal status. Reviewing and updating the signal timing may reduce the arrivals on red, which could reduce rear end crashes. Refreshing the lane markings will also improve driver awareness, as well as pedestrian visibility.

5.10.14 Alto Road, Southway Boulevard, and Webster Street (KI-2)

This intersection has five legs. The west and northeast legs have two lane approaches. The north, south, and east legs have single lane approaches. The east leg has a dedicated right turn lane not controlled by the signal. There is a large, landscaped island separating the east leg from the east right turn lane.

5.10.14.1 Crash History

This intersection experienced 41 crashes during the study period, including one fatal crash, four incapacitating crashes, two non-incapacitating crashes, and 34 property damage crashes. There was one crash involving a vulnerable road user. The overall trend is decreasing.

5.10.14.2 Strategies

Evaluating the volumes and retiming the signal could reduce congestion and rear end crashes. There were 10 crashes in dark conditions. The lighting should be upgraded, especially at the curves ahead of the intersection. There were six crashes related to unsafe lane movements, which could be the result of driver confusion about which lane to be in. Advanced intersection warning and directional signage could reduce these types of crashes. Long term, the installation of a roundabout could decrease congestion, crash frequency, and crash severity.

5.10.15 LaFountain Street and Southway Boulevard (KI-3)

This intersection was reconstructed in the 1990s. There are two through lanes and a left turn lane on each approach. All the left turn lanes have protected/permissive movements. There are no sidewalks or crosswalks. There are bus stops on both sides of the north leg. Lighting on the approaches appear to be adequate.

5.10.15.1 Crash History

There were 52 crashes in study period, which includes four incapacitating injury crashes, one non-incapacitating crash, one possible injury crash, and 46 property damage crashes. The overall trend is downward. There were 19 crashes in 2020 and only eight in 2023. This is one location where rear end crashes are decreasing. No vulnerable road users were involved in a crash.

5.10.15.2 Strategies

To meet the standard of having one signal head per lane, a signal head needs to be installed for the westbound outside approach. The traffic volume should be analyzed and the signal retimed. Special attention should be made to providing adequate protected left turn timing. 20 of the crashes have a primary factor of failure to yield. Advanced intersection warning signs with street name placards could driver confusion and inattention.

5.10.16 Markland Avenue and Webster Street (KI-4)

The signal was removed at this four-way stop-controlled intersection in 2017. The intersection has single lane approaches in each direction.

5.10.16.1 Crash History

There were 42 crashes during the study period, including four incapacitating injury crashes, three non-incapacitating injury crashes and 35 property damage crashes. The overall trend is steeply declining. In 2019, there were 15 crashes. In 2023, there were three. The most significant reduction is in right angle crashes, from seven in 2019 to one in 2023.

5.10.16.2 Strategies

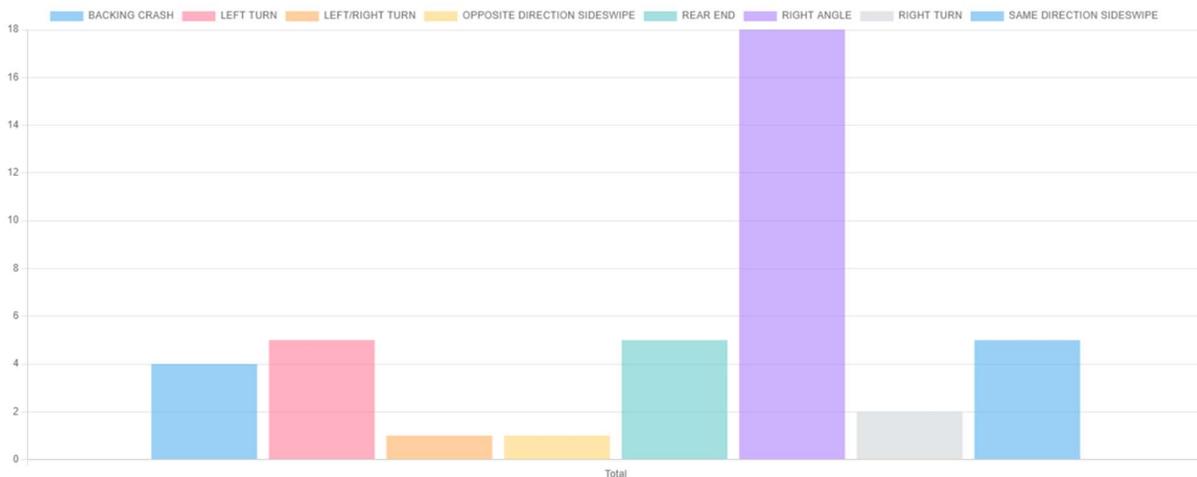
While the most recent crash history is positive, there are still improvements that can be made. The dense vegetation on the northbound and southbound approaches can obscure the stop signs in the summer. Advanced warning signs should be installed and stop signs doubled on these approaches. If the crash frequency increases, evaluating the intersection to modify to a two-way stop control (Webster stopping for Markland) could be considered.

5.10.17 Washington Street and Espanol Drive (KI-5)

This is a two-way stop-controlled intersection on Washington Street between Lincoln Road and LaFountain Street. The west leg is the entrance to Maplecrest Shopping Center. Washington Street has two lanes in each direction and Espanol/Maplecrest Shopping Center has a single lane approach. The intersection is slightly skewed. The lighting is good.

5.10.17.1 Crash History

There have been 41 crashes at this intersection, including four incapacitating injury crashes, three non-incapacitating injury crashes, and 34 property damage crashes. Failure to yield was the primary factor in 23. The overall trend is decreasing, but failure to yield crashes are steady.



5.10.17.2 Strategies

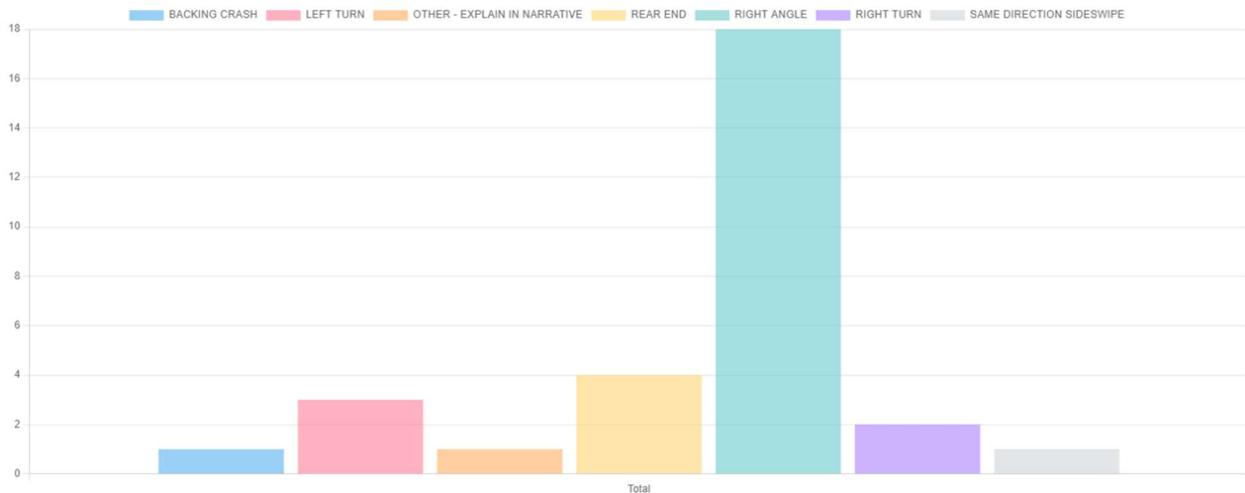
Simple improvements like cross traffic does not stop placards may reduce the failure to yield crashes. A more substantial improvement would be to either reduce the Maplecrest driveway width to ensure there is only one exit lane, either by narrowing the approach or by installing a median.

5.10.18 Ohio Street and Morgan Street (KI-6)

This is a two way stop controlled intersection, with northbound and southbound Ohio stopping for Morgan. There is a slight incline on the northbound approach.

5.10.18.1 Crash History

This intersection has experienced 30 crashes during the study period. 18 of the crashes were right-angle, 6 of which resulted in 9 injuries. 19 of the crashes indicated a primary factor of “Failure to Yield”. This indicates drivers on Ohio Street are stopping, then proceeding into the intersection without enough gap to do so safely. This could be the result of either not seeing the vehicle on Morgan Street or misjudging the amount of time it will take to make the through or turning movement. For northbound traffic, the incline could cause the movement to take additional time.



5.10.18.2 Strategies

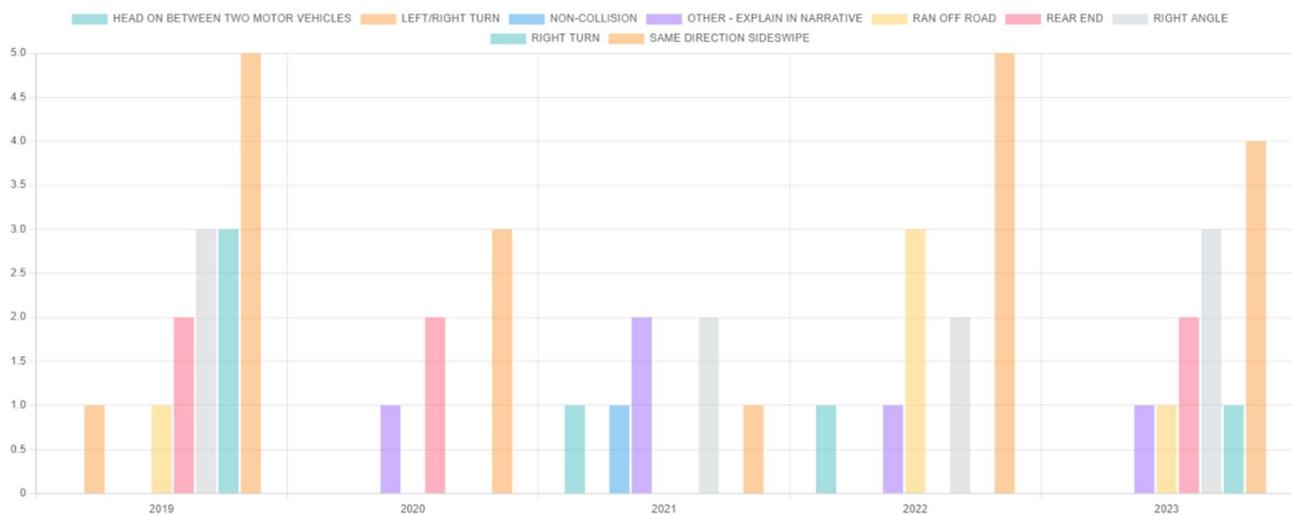
To increase drivers’ understanding of the intersection, place “CROSS TRAFFIC DOES NOT STOP” signs on the north and south stop signs. A long term alternative is to evaluate the intersection for an all-way stop. The side-street approach volume should be at least 40% of the total entering volume to justify a change to an all-way stop.

5.10.19 Markland Avenue and Park Avenue (KI-25)

This roundabout was constructed in 2017. The four-legged intersection includes multilane approaches on the east and west legs, and single lane approaches on the north and south legs.

5.10.19.1 Crash History

There were 51 total crashes in the study period, six resulting in injuries. Both the total number of crashes and the number of injury crashes has increased since 2021. In 2020, there were only 6 crashes. In 2022 and 2023, there were 12 each. Same direction sideswipe crashes increased significantly in 2022 and 2023. While this may be due to volume increases, other potential causes are faded pavement markings, vegetation causing site distance issues, or signage being faded or removed.



5.10.19.2 Strategies

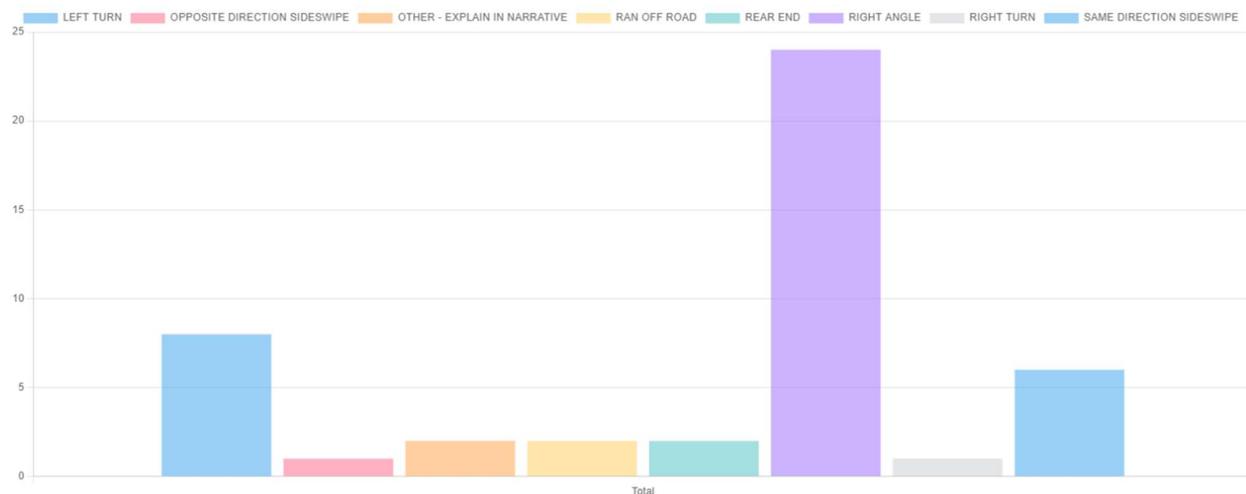
Update the pavement markings to help drivers identify the lanes. Increase the lighting wattage to improve nighttime visibility. Investigate the landscaping and the signage to ensure they are not causing site distance issues.

5.10.20 Center Road between SR931 and Arrowhead Boulevard (Includes KI-32)

This segment is a heavily travelled commercial four-lane roadway with multiple drives and an offset intersection at Cartright Drive/Kimberly Drive. A Kokomo fire station is on the corridor and several hotels are nearby. The traffic volume is approximately 9,000 and the 85th percentile speed has varied between 42 MPH and 50 MPH. A new residential development to the northeast will include over 500 new single-family residences.

5.10.20.1 Crash History

During the study period, the segment experienced 46 crashes, including six injury crashes. 24 of the crashes (four injury crashes) were right angle crashes. The intersection of Cartright Drive/Kimberly Drive alone experienced 31 crashes (five injury crashes) within the study period. 15 were right angle crashes and 22 had a primary factor of failure to yield.



5.10.20.2 Strategies

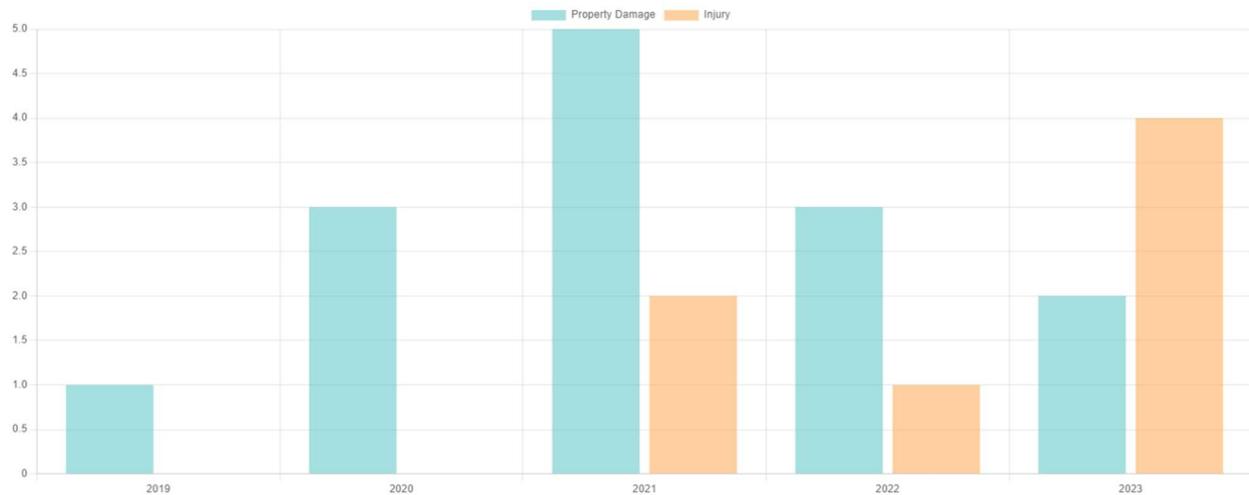
- ⊕ Make Center Road a three-lane section to provide a dedicated center-turn lane. This would also allow bike lanes to be constructed from SR931 to Arrowhead and would eliminate the right turn drop-off eastbound at Arrowhead. A traffic study to include the new development should be undertaken to ensure a three-lane segment could service the additional volume.
- ⊕ Install an access drive on the north side of Center Road between Pizza Hut and Cartright to eliminate the drives on the north side of Center Road.
- ⊕ Shift Cartright Drive west to line up with Kimberly Drive.

5.10.21 Markland Avenue and Home Avenue (KI-62)

This signalized intersection has single lane through approaches with dedicated left turn lanes on each approach. Each approach has a protected/permissive movement, and all approaches are actuated.

5.10.21.1 Crash History

There was a total of 21 crashes and 7 injury crashes at this intersection. 14 of the crashes were rear end crashes (67%), six involving injuries. Most of the rear end crashes were on Markland.



5.10.21.2 Strategies

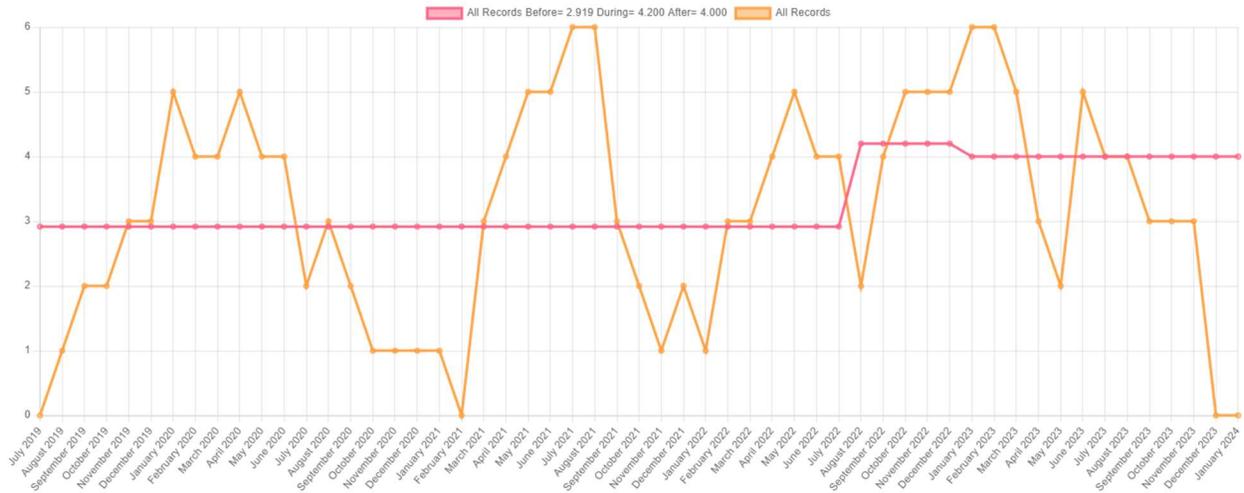
Add intersection advanced warning signage to help drivers anticipate stopped vehicles ahead. Additionally, adjust the signal timing to allow for more green time on Markland to decrease the number of arrivals on red, which typically correspond to rear end crashes.

5.10.22 Markland Avenue and Cooper Street (KI-63)

Markland, formerly SR22, underwent a reconstruction in 2022, which included the addition of a left turn lane for both directions of Markland, as well as a sidewalk on the north side of Markland east of Cooper. Elwood Haynes Elementary School is at the northeast corner. It is unknown if the signal is warranted due to volume, as its primary purpose is to provide traffic control for Elwood Haynes Elementary. The signal is on a fixed time, with no side street or left turn actuation.

5.10.22.1 Crash History

This intersection has experienced 29 crashes and 3 injury crashes during the study period. 15 of the crashes were rear end crashes. The reconstruction project was completed in August of 2022, and 2023 saw a reduction in crashes. While there were 10 crashes in 2022, there were only four in 2023. The graph below shows the 6-month moving sum of the crashes, as well as the average before, during, and after construction.



5.10.22.2 Strategies

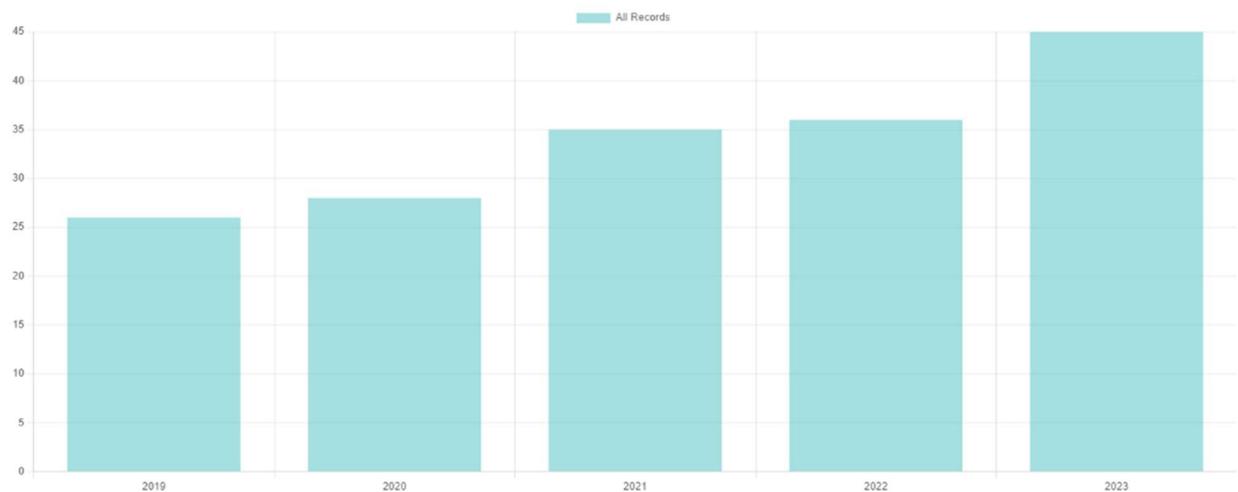
Monitor the intersection to determine if the improvements are making a lasting reduction in crashes. Actuate Cooper Street to reduce arrivals on red, thereby reducing congestion, as well as the opportunity for rear end crashes. This will also require the installation of push button actuation for the side street pedestrians.

5.10.23 Washington Street from Jefferson Street to Smith Road (KS-7, KI-30, KI-52, KI-59, KI-66, KI-89, KI-90)

This segment of Washington Street was originally constructed as US31 and relinquished when the US31 bypass was completed in the 1950s. Upgrades occurred in the late 1970s and late 1980s. Traffic volumes have held generally steady between 6,000 and 9,000 North of North Street, and approximately 12,000 between Jefferson and North Street.

5.10.23.1 Crash History

There were 169 crashes, including 28 injury crashes and three fatal crashes. There were 56 rear end (33%) and 53 right angle (31%) crashes.



5.10.23.2 Strategies

Analyze this corridor to determine if a three-lane section could be installed to reduce the number of rear end crashes, which typically occur on left turns from the inside thru lane. Many of the left turn crashes could also be a result of the same movement and be due to vehicles in the opposing left lane obscuring vehicles behind. This type of improvement could also include the installation of on-street parking and pedestrian enhancements at intersections. Reconfigure the intersection of Davis and Washington to require southbound Davis Road drivers to enter Washington Street at a right angle.

5.10.24 State Roads

While the community does not have jurisdiction over state roads, residents and visitors are still the overwhelming users, and local agencies are responding to crashes on these roads. This list is intended to begin a conversation with INDOT about improvements that will reduce overall crashes in Howard County.

The top 10% of segments and intersections are as follows:

ID	Intersection	Cost/Year	K	A	B	C	O
NI-1	Hoffer St., In 931	\$ 927,620.00	0	11	4	1	57
NI-2	In 931, Center Rd.	\$ 920,160.00	2	8	11	3	60
NI-3	St. Rt. 26, In 931, 400 S	\$ 880,220.00	0	10	6	0	73
NI-4	Markland Av., In 931	\$ 863,460.00	0	8	11	2	139
NI-5	In 931, Vaile Av.	\$ 708,040.00	1	7	8	1	38
NI-6	In 931, Sycamore St.	\$ 693,840.00	0	7	11	3	58
NI-7	In 931, Southway Blvd.	\$ 615,580.00	0	7	5	2	35
NI-8	In 931, Lincoln Rd.	\$ 593,900.00	0	6	6	1	77
NI-9	In 931, Alto Rd.	\$ 537,280.00	0	6	2	0	60
NI-10	East Boulevard, In 931	\$ 477,800.00	0	5	2	0	72
NI-11	400 N, In 931, Naphew Ln.	\$ 356,800.00	1	3	3	1	24
NI-12	In 931, North St.	\$ 348,500.00	0	4	1	2	23
NI-13	Carter St., In 931	\$ 344,500.00	1	3	0	1	31
NI-14	100 S, 500 E	\$ 334,120.00	1	3	4	0	6
NI-15	00 N S, 500 E	\$ 328,860.00	0	4	1	1	13
NI-16	100 W, St. Rt. 26, Park Rd.	\$ 318,560.00	0	4	0	0	16
NI-17	00 N S, 600 E	\$ 313,000.00	0	4	1	0	6

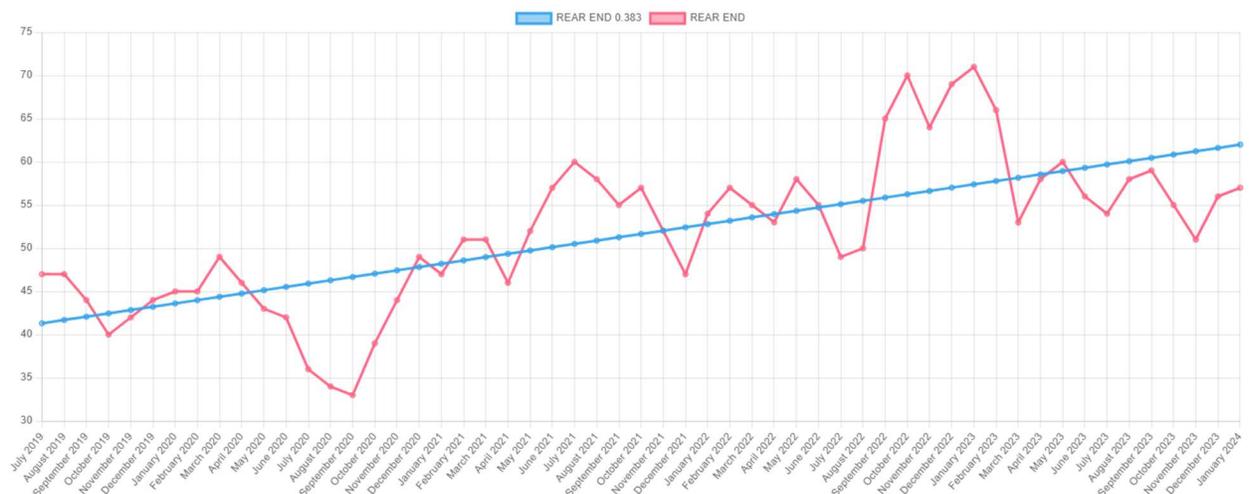
Table 10 – INDOT high crash intersections

ID	Street	Length (ft)	Cost / Mile	K	A	B	C	O
NS-1	SR26 B/W 460E and SR19	1063	\$ 78.00	0	1	1	0	1
NS-2	SR931 00NS to 100N	5287	\$ 67.82	0	4	3	0	31
NS-3	SR931 100S to 00NS	5162	\$ 64.43	0	4	2	0	16
NS-4	US35 East of 700E	1164	\$ 64.08	1	0	0	0	0
NS-5	SR26 B/W Russiaville and 680W	1393	\$ 57.18	0	1	0	0	4
NS-6	SR931 100N to 200N	5511	\$ 48.33	0	3	2	1	17
NS-7	SR26 B/W 125E and 150E	1686	\$ 45.73	0	1	0	0	2
NS-8	SR931 200S to 100S	8055	\$ 44.61	0	4	3	1	26
NS-9	SR931 300N to 400N	5465	\$ 43.02	0	3	0	0	9
NS-10	SR22 B/W 550W and 500W	2247	\$ 40.03	0	1	2	0	1
NS-11	SR26 B/W 750E and 800E	2124	\$ 35.71	1	0	0	0	1
NS-12	SR22 B/W 950E and 1000E	2645	\$ 32.02	0	1	0	0	8
NS-13	SR22 B/W 480W and Spring Hill Rd	2786	\$ 31.57	1	0	1	0	5
NS-14	US35 B/W 300E and 400E	2640	\$ 29.21	0	1	0	0	2
NS-15	US35 B/W 1000E and 1100E	2645	\$ 29.16	1	0	0	0	2
NS-16	SR26 B/W 600E and Finn Ditch	2830	\$ 27.25	0	1	0	0	2
NS-17	SR22 B/W 1240W and 1150W	2774	\$ 26.89	0	1	0	0	0

Table 11 – INDOT high crash segments

5.10.24.1 State Road 931 (NS-2, NS-3, NS-6, NS-8, NS-9, NI-1, NI-2, NI-3, NI-4, NI-5, NI-6, NI-7, NI-8, NI-9, NI-10, NI-12, NI-13)

By far, Howard County experiences more crashes on this roadway than any other. Approximately 1,256 crashes occurred during the study period (11.6% of all Howard County crashes), and of those, 269 were injury crashes. Seven were fatal. Eight crashes were on SR931, two of which were fatal. While overall crashes are decreasing, rear end crashes have seen a significant increase. Shown below, the trend of the 6-month moving total of rear end crashes has increased from 41 in July 2019, to 61 in January of 2024. This could be due to several factors, including driver inattention, friction losses due to poor pavement condition, increased traffic volume, or signal timing issues. The potential improvements are far ranging, from access restrictions, intersection upgrades, and lighting.



INDOT should perform a comprehensive review of crashes along the corridor with an eye towards reducing the most severe. The city should consider partnering with INDOT on access improvements, such as reduced-conflict intersections. As discussed earlier, Kokomo should coordinate with INDOT on lighting improvements in areas where pedestrians are known to walk, as well as other locations with high percentages of crashes under other than daylight conditions.

5.10.24.2 State Road 931 and Hoffer Street (NI-1)

While not the highest number of crashes of any intersection in Howard County, this intersection experiences the highest crash cost. The trend is downward, especially with respect to right angle crashes. In 2019, there were 16 right angle crashes. Since then, there have only been 10 total. It is unknown if INDOT has made a change at the intersection, but the trend is positive.



5.10.24.3 State Road 931 and Center Road (NI-2)

This is the only intersection in Howard County that experienced more than one fatality in the study period. The crash trend is basically flat. Failure to yield was the primary factor in 33 crashes and both fatalities. Both fatalities were left turns from SR931. One was northbound, and one was southbound. INDOT should consider two improvements. Initially, eliminate permissive left turns from SR931. The next would be to reconstruct the intersection to line up the northbound and southbound left turn lanes to improve visibility.

5.10.24.4 State Road 931 and State Road 26 (NI-3)

The congestion at this intersection certainly contributes to the safety. Furthermore, the intersection geometry is not ideal, in that neither the SR931, nor the SR26 left turns align with the opposing approach. INDOT has indicated that an intersection improvement project is being programmed, which may also include dedicated right turn lanes on SR26.

5.10.24.5 State Road 931 and Markland Avenue (NI-4)

This intersection has the highest number of crashes of any intersection in Howard County. There were 160 crashes at this intersection during the study period. 21 of the crashes resulted in injuries (13.13%), which is less than the city-wide average of 15.03%. This indicates the crashes are less severe than average. Like the rest of SR931, rear end crashes are increasing. They more than

doubled between 2022 and 2023 (11 versus 25). As a part of the Markland Avenue reconstruction project in 2022, the west leg alignment was improved, which appears to be resulting in a reduction in crashes. INDOT has expressed an interest in installing a dedicated right turn lane for eastbound traffic, which could reduce congestion and rear end crashes.

Eight of the 126 vulnerable road user crashes occurred on SR931 in other than daylight conditions. Four of those eight occurred at or near the intersection of SR931 and Markland. Improving the lighting condition could improve pedestrian safety at this intersection without encouraging additional pedestrian activity in an area that is not designed for it. Furthermore, because 50 of the 160 vehicular crashes at the intersection occurred under other than daylight conditions, improving the lighting has the potential to reduce all crashes at this intersection.

Strategy: Prioritize installing lighting at the intersection of Markland and SR931 with the approval of INDOT. Upon completion, evaluate the improvement and consider lighting additional intersections along SR931.

5.10.24.6 SR931 and Vaile Avenue (NI-5)

This is the highest cost unsignalized intersection in the county. INDOT has proposed, and Kokomo has agreed, to eliminate through and left turn movements to and from Vaile Avenue. INDOT is planning to restrict the side street through and all left turn movements during an upcoming project in 2025.

5.10.24.7 500 East (SR19) and 100S (NI-14)

This intersection has experienced only 14 crashes in the study period, but those crashes resulted in 10 injury crashes and one fatality. Seven of the nine right angle crashes resulted in injury, including the fatality. Seven of the injury crashes were also “Failure to Yield” crashes. There are no obvious site distance issues. There are advanced intersection warning signs both northbound and southbound. Possible improvements include installing “Cross traffic does not stop” placards under the eastbound and westbound stop signs, as well as installing LED flashers on the advanced intersection warning signs.

5.10.24.8 State Road 931 and Savoy Drive (NI-18)

While this intersection is just outside of the top 10%, the data is significant enough to discuss. Unlike SR931, this intersection is seeing an increase in all crash manners. There were just two crashes at this intersection 2019. In 2023, there were 15. By far the largest increase is in rear end crashes, and most were drivers going northbound. Fortunately, only two rear end crashes have resulted in injury.



Advanced rumble strips should be considered to make drivers aware of the upcoming intersection, especially northbound.

5.10.25 Site Specific Improvements Conclusion

INDOT, in conjunction with Indiana LTAP, has developed a table of countermeasures¹³ that are most suitable for Indiana. These include 82 safety countermeasures in 16 different categories. While not all categories pertain to local governments, these countermeasures allow communities to anticipate the benefits of implementation for different crash types. Jurisdictions should review this list during the development of all projects to determine if additional crash reduction strategies can be implemented.

5.11 DRIVER BEHAVIOR IMPROVEMENTS

Previous analysis has indicated that Howard County is above the state average in the number of unrestrained injury and fatal crashes. Lap and shoulder combination seat belts, when used, reduce the risk of fatal injury to front-seat passenger car occupants by 45% and the risk of moderate-to-critical injury by 50%¹⁴. Below are strategies that can be implemented to improve the use of vehicle restraints. These strategies also apply to the goal of reducing distracted driving:

- ⊕ Directed patrols to enforce Indiana’s seatbelt law. As seatbelt compliance tends to be lower at night, directed patrols should be emphasized in evening and early morning hours.
- ⊕ Install advisory signage in areas with high traffic and a high number of crashes.
- ⊕ Including public awareness campaigns, such as Indiana’s “Buckle Up, Phone Down” icons on public information messages, as well as signage at the exit to public parking lots. Other opportunities include public events, such as Kokomo Jackrabbits games, and high school football and basketball games.

¹³ https://www.in.gov/indot/doing-business-with-indot/files/CRF-CMF_Table.pdf

¹⁴ <https://www.nhtsa.gov/book/countermeasures-that-work/seat-belts-and-child-restraints>

- ⊕ Public education in high schools regarding the importance of restraint use and the dangers of distracted driving.

5.12 NON-TRANSPORTATION PUBLIC POLICIES

5.12.1 Support higher density mixed use development

Mixed use developments allow residents access to daily services without the need to drive or take public transportation. Lowering the number of vehicles on roadways will reduce conflicts, as well as the potential for crashes. Increasing the density of the housing not only allows more residents to reach commercial services, but it also provides businesses with a local market. Finally, from a community development perspective, high-density mixed-use developments attract young people, providing a sustainable base to grow a community.

5.12.2 Improve transit services

Kokomo's free-to-the rider bus services is tailored to those without a vehicle and allows them access to businesses and services. The fixed-route system also includes a parallel transit system (paratransit), which provides door-to-door services for seniors and those with disabilities. Both systems operate weekdays between from 6:30am to 6pm.

Aside from the added mobility for residents, improvements to the system that increases ridership have the potential to reduce single vehicle trips, as well as trips conducted by vulnerable road users. The following are the most likely ways of improving overall service:

- ⊕ Increase hours of operation – Operating later in the evening could allow access to jobs that don't follow a normal workday. 18% (21/114) of all crashes involving vulnerable road users occurred between 7pm and 9pm. Extending the hours of operation to 9pm could reduce the number of pedestrians in dusk or dark conditions.
- ⊕ Provide weekend operation – While this could reduce crashes involving VRUs, Saturdays and Sundays have the two lowest number of crashes involving VRUs (13 & 11 respectively). Providing weekend service would also be more expensive than increasing the hours of operation.
- ⊕ Expanding routes – Expanding the fixed route system by adding or modifying routes can be very efficient, in that it does not require an expansion of the paratransit system. It is important to design any expansion of routes in a way that maximizes the potential additional riders without sacrificing existing ridership. Kokomo is in the process of investigation the expansion of its routes.
- ⊕ Improve the quality of service of existing routes – This can be accomplished by any number of the following improvements:
 - Upgrading traffic signals to provide transit pre-emption, which will provide signal priority to busses behind schedule.
 - Upgrading bus stops with shelters, benches, and trash cans will improve the rider experience.
 - Improving the accessibility to bus stops by installing additional infrastructure such as sidewalks and bike paths will make it easier for users to access the system.

5.12.3 Improve off-road alternative transportation infrastructure

Kokomo has done an excellent job of developing an off-road alternative transportation network, which includes the Industrial Heritage Trail, Walk of Excellence, and the Cloverleaf Trail. Expanding this network, especially into areas of persistent poverty, will allow trips to occur without the use of a car. Opportunities include extending the Cloverleaf Trail to the west county line, converting the Beltline railroad east of Defenbaugh Street and Home Avenue to a trail, which could include extending a trail on the Penn Central Railroad from SR931 to Madison Street.

6 FUTURE ACTIVITIES

6.1 FURTHER STUDIES AND INITIATIVES

The following are opportunities for further investigation:

- ⊕ A comprehensive walkability study within school walking routes, which would include school zone signage, pavement markings, sidewalk conditions, and lighting.
- ⊕ Because over 90% of county-wide VRU crashes occur inside the city of Kokomo, Kokomo should update their Alternative Transportation Master Plan to include opportunities to separate VRUs from vehicular traffic.
- ⊕ Develop a comprehensive outreach program to address young drivers. This program would focus on distracted and impaired driving, seatbelt usage, as well as driving in inclement weather.
- ⊕ A review of the comprehensive plans, subdivision and zoning ordinances with a focus on modifications that will improve traffic safety and reduce total vehicle miles travelled.
- ⊕ Develop relationships with similar sized communities to share traffic related successes and concerns.
- ⊕ When enough data is available, evaluate the effectiveness of improved lighting on crashes, particularly with respect to VRUs.
- ⊕ Perform a comprehensive city-wide plan to analyze speed limits so they are set appropriately for the roadway environment.

6.2 REFINE CRASH ANALYSIS PROCEDURES

The recommendations in this plan are the result of a tremendous amount of data analysis. However, this process has the potential to be refined to find additional ways to reduce crashes. Some opportunities include:

- ⊕ The use of AI,
- ⊕ Introducing traffic volumes systematically,
- ⊕ Including connected vehicle or cell phone telemetry to determine areas of high risk, and
- ⊕ Developing a systematic approach to evaluating longer roadway. This would use a linear approach be able to analyze a corridor without regard to the individual segments, like the method in this plan for intersections.

6.3 TRACK IMPROVEMENTS / EVALUATE COUNTERMEASURES

Howard County's roadway network changes on an almost daily basis. Each of these changes have the potential to improve or reduce safety. Tracking these changes will allow the jurisdictions to decide if and how much of a safety improvement a change causes, or to what effect a new traffic generator has on crashes. Improving safety is an ongoing process, and only by measuring progress can it be made.

As countermeasures are installed and post installation evaluations are completed, the jurisdictions can build their own crash modification factors, as well as a knowledge base of improvements, that can be used to inform additional improvements. Armed with this information, jurisdictions can have the confidence to make changes to the transportation system and be able to convey that confidence to their residents.

6.4 IMPLEMENTATION ACCOUNTABILITY

Each jurisdiction should commit to reviewing their progress on a regular basis. The most appropriate entity to enforce accountability is the respective Traffic Commissions. Accountability should come in the form of quarterly updates on the initiatives from technical staff and public safety personnel, as well as results on those initiatives.

7 APPENDIX

7.1 APPENDIX A – STEERING COMMITTEE MEMBERS

Tyler Moore, Mayor, City of Kokomo

Jon Pyke, Director of Engineering, City of Kokomo

Amber Tolle, Engineer, Howard County

Brad Bray, Commissioner, Howard County

Stephanie Collins, Director of Nursing, Community Health Network

Darren Metz, Traffic Systems Manager, City of Kokomo

Dean Hockney, Director of Transportation, Kokomo School Corporation & City of Kokomo Traffic Commission Member

Dennine Smith, Director, Coordinated Assistance Ministries, Inc.

Gary Cook, Deputy, Howard County Sheriff's Department

Greg Sheline, Director, Kokomo-Howard County Plan Commission & Howard County Traffic Commission Member

Heath Haalck, Town Marshall, Town of Greentown

Janice Hart, Director, Howard County Emergency Management Agency

Landen Bartley, Fire Chief, Town of Russiaville

Paul Edwards, Fire Chief, City of Kokomo

Tammy Corn, Director, Kokomo Howard County Governmental Coordinating Council (MPO)

Tom Mygrant, Kokomo Police Department

Tony Stewart, Member, Kokomo City Council & City of Kokomo Traffic Commission Member

7.2 APPENDIX B – STEERING COMMITTEE MEETING PRESENTATIONS

Howard County Road Safety Citizen Steering Committee

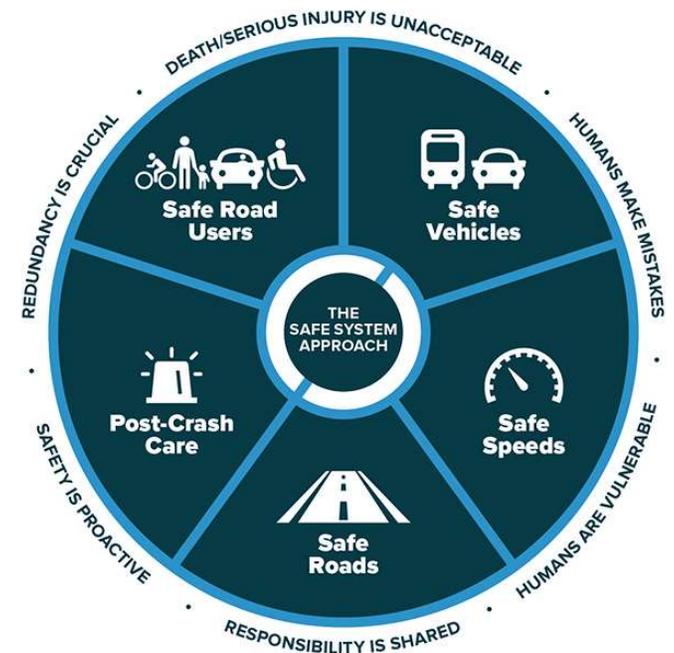
Meeting #1 - March 14, 2024

Mission

To develop a local road safety plan that, when implemented, will reduce the number and severity of vehicular crashes

Safe System Approach Elements

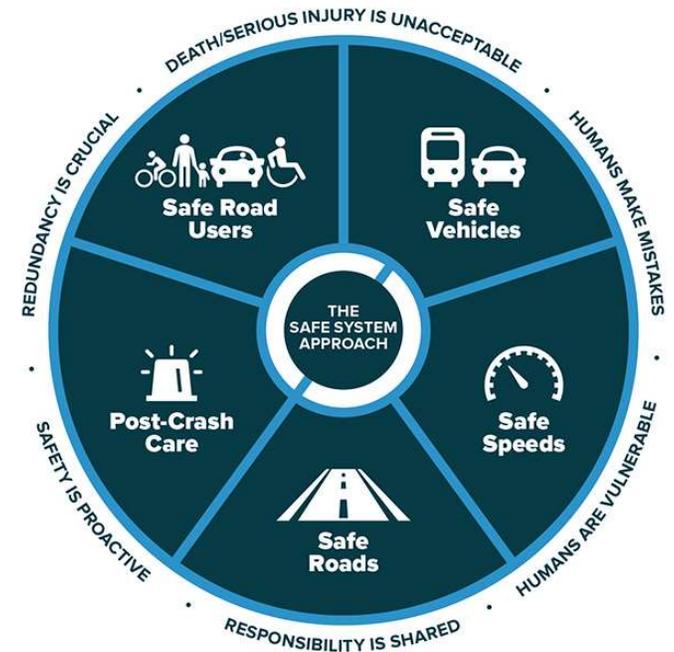
- Safe Road Users
 - The safety of all road users is equitably addressed, including those who walk, bike, drive, ride transit, or travel by other modes.
- Safe Vehicles
 - Vehicles are designed and regulated to minimize the frequency and severity of collisions using safety measures that incorporate the latest technology.
- Safe Speeds
 - Humans are less likely to survive high-speed crashes. Reducing speeds can accommodate human-injury tolerances in three ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility.



Source: FHWA.

Safe System Approach Elements

- Safe Roads
 - Designing transportation infrastructure to accommodate human mistakes and injury tolerances can greatly reduce the severity of crashes that do occur. Examples include physically separating people traveling at different speeds, providing dedicated times for different users to move through a space, and alerting users to hazards and other road users.
- Post-Crash Care
 - People who are injured in collisions rely on emergency first responders to quickly locate and stabilize their injuries and transport them to medical facilities. Post-crash care also includes forensic analysis at the crash site, traffic incident management, and other activities.



Source: FHWA.

Safe System Approach Principles

Deaths and serious injuries are unacceptable

Humans make mistakes

Humans are vulnerable

Responsibility is shared

Safety is proactive

Redundancy is crucial

Strategies

- Site Specific
 - Intersection improvements
 - Access control
- Systematic
 - Signage at all curves
 - Leading pedestrian intervals
- Systemic
 - Edgelines
 - Rumble strips

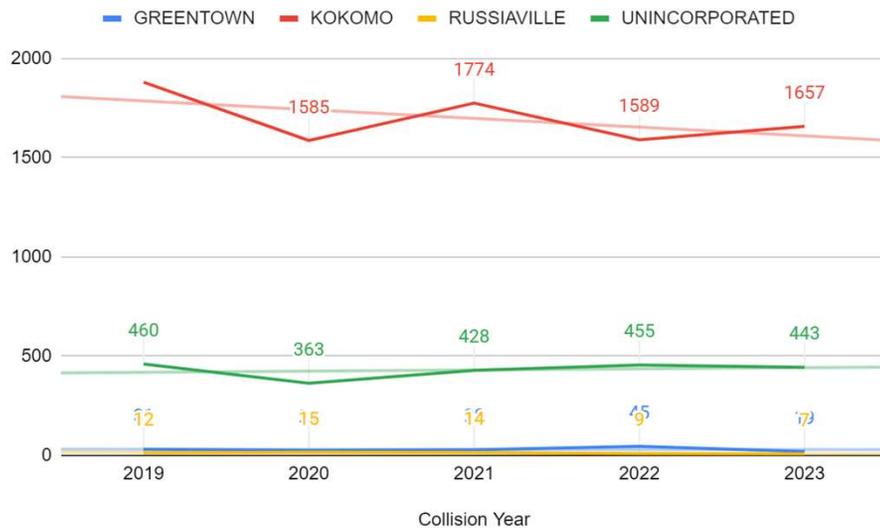


Quiz

Total Crash Trend

- Total – Average 2,168 crashes annually (5.9/day)
- Kokomo – Average 1,694 annually, decreasing by 45
- Unincorporated – Average 433 annually, increasing by 6.8
- 21.4% (463/2164) of unincorporated crashes involve deer! They are increasing by 4.5/year.
- 641 total deer related crashes. Only 7 injury crashes from deer

Total Crashes

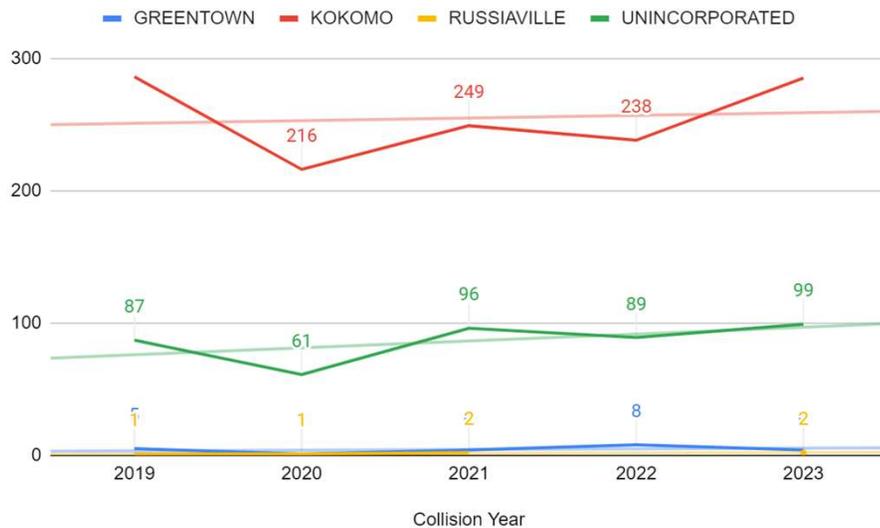


Year	GREENTOWN	KOKOMO	RUSSIAVILLE	UNINCORPORATED	Grand Total
2019	31	1879	12	460	2382
2020	25	1585	15	363	1988
2021	28	1774	14	428	2244
2022	45	1589	9	455	2098
2023	19	1657	7	443	2126
Grand Total	148	8469	57	2164	10838

Injury Crash Trend

- Total – Average 347 crashes annually (.95/day), increasing by 7.8 annually
- Kokomo – Average 255 annually, increasing by 2.1
- Unincorporated – Average 86.6 annually, increasing by 5.1

Total Crashes

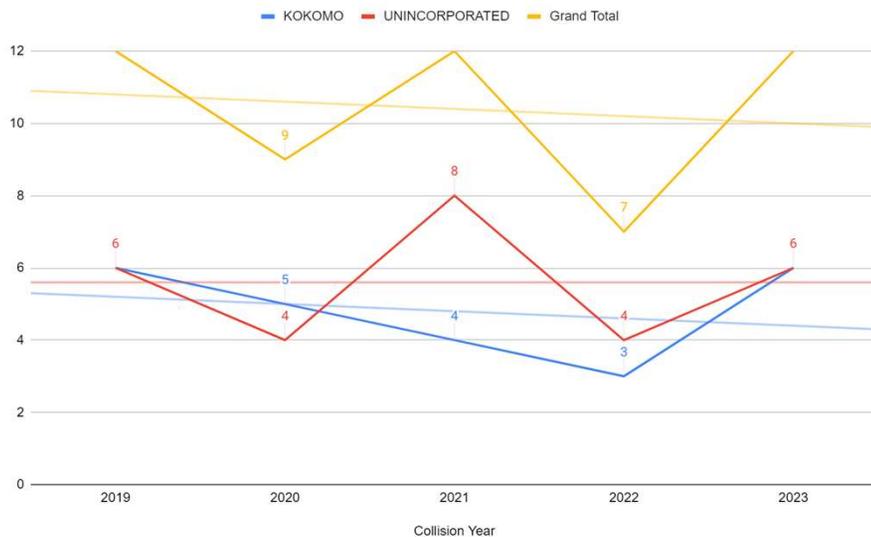


YEAR	GREENTOWN	KOKOMO	RUSSIAVILLE	UNINCORPORATED	GRAND TOTAL
2019	5	286	1	87	379
2020	1	216	1	61	279
2021	4	249	2	96	351
2022	8	238		89	335
2023	4	285	2	99	390
Grand Total	22	1273	6	433	1734

Fatal Crash Trend

- Total – Average 10 crashes annually
- 63.5% occurred in the north half of the county
- 75% included speed, lack of a restraint, impairment, or a motorcycle/pedestrian (4)
- Sunday has the most fatal crashes (11)

Injury Crashes

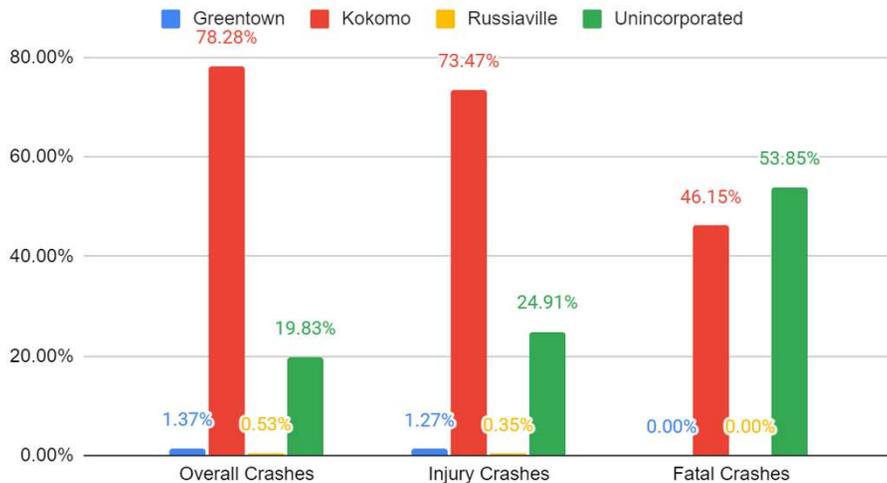


YEAR	KOKOMO	UNINCORPORATED	GRAND TOTAL
2019	6	6	12
2020	5	4	9
2021	4	8	12
2022	3	4	7
2023	6	6	12
Grand Total	24	28	52

Crashes by Jurisdiction

- Kokomo has 78% of all crashes, but only 46% of fatal crashes

Overall Crashes, Injury Crashes and Fatal Crashes

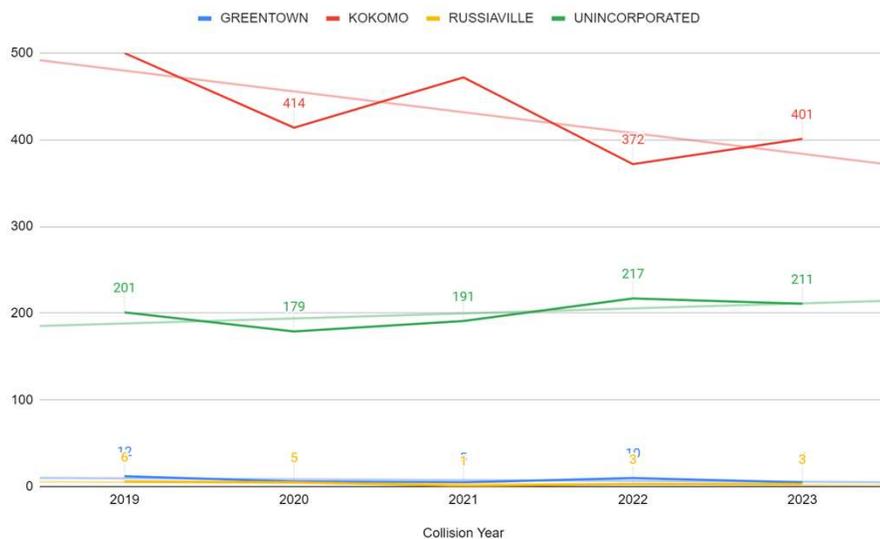


JURISDICTION	OVERALL CRASHES	INJURY CRASHES	FATAL CRASHES
Greentown	1.37%	1.27%	0.00%
Kokomo	78.28%	73.47%	46.15%
Russiaville	0.53%	0.35%	0.00%
Unincorporated	19.83%	24.91%	53.85%

Lighting Trend

- 74% of Kokomo crashes happen in daylight
- 55% of all other crashes happen in daylight

Dark Crashes

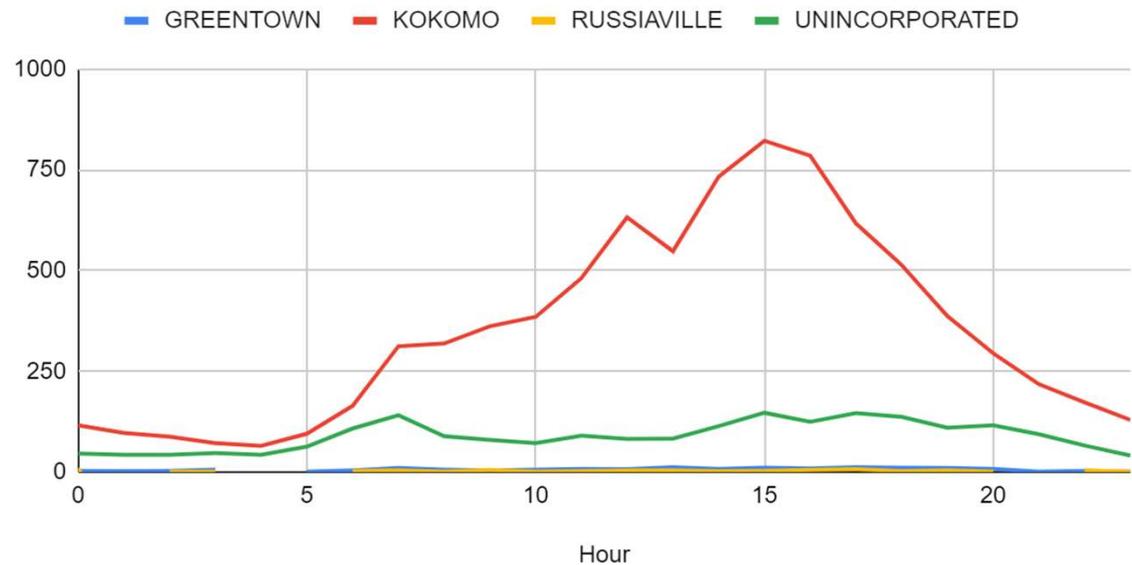


	2019	2020	2021	2022	2023	Grand Total
GREENTOWN	12	6	5	10	5	38
KOKOMO	500	414	472	372	401	2159
RUSSIAVILLE	6	5	1	3	3	18
UNINCORPORATED	201	179	191	217	211	999
Grand Total	719	604	669	602	620	3214

Time Trend

- 3pm-4pm has the highest number of crashes for all jurisdictions
- Kokomo peaks at 13x of its minimum
- Unincorporated peaks at 4x of its minimum

GREENTOWN, KOKOMO, RUSSIAVILLE and UNINCORPORATED



Break

Vulnerable Road Users

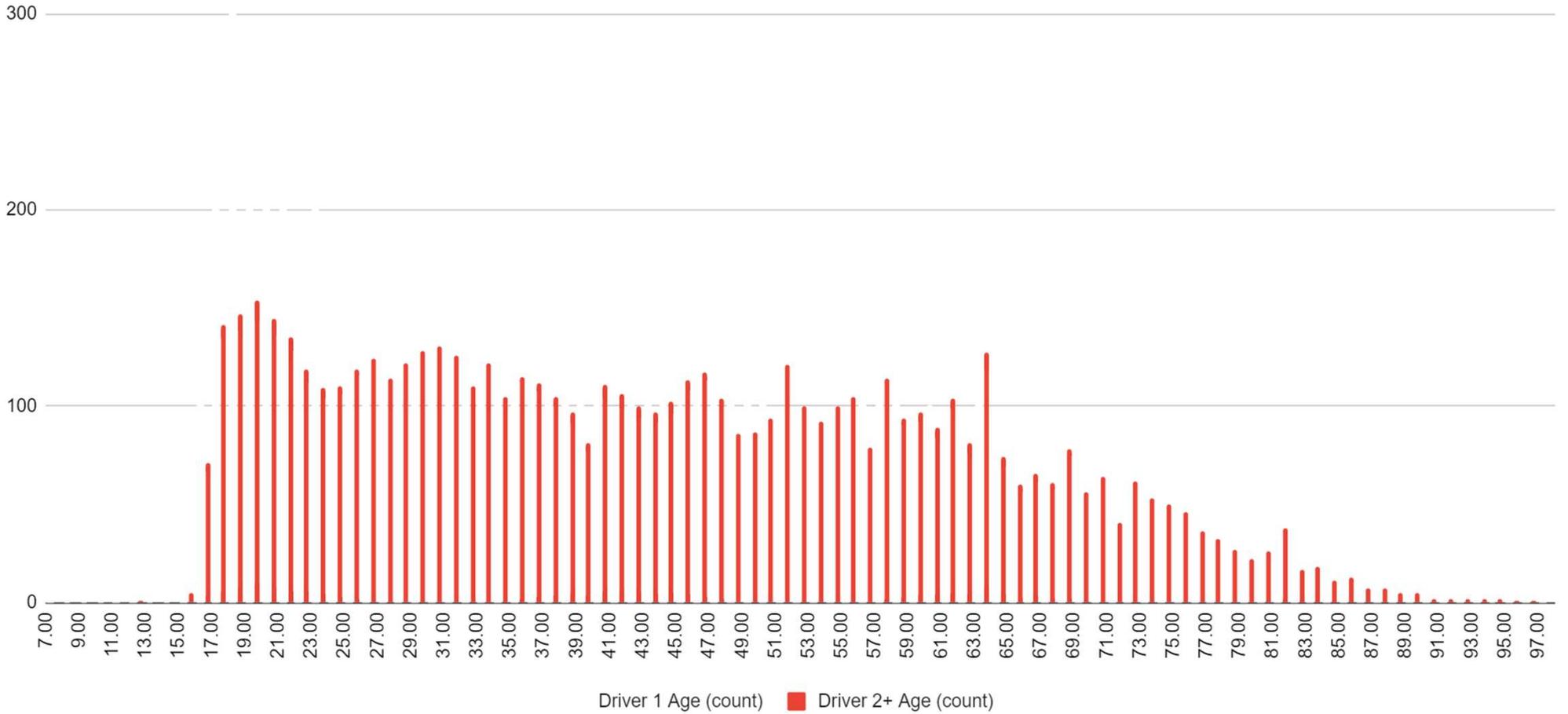
- A vulnerable road user is a nonmotorist with a fatality analysis reporting system (FARS) person attribute code for pedestrian, bicyclist, other cyclist, and person on personal conveyance or an injured person that is, or is equivalent to, a pedestrian or pedalcyclist as defined in the ANSI D16.1-2007. (See 23 U.S.C. 148(a)(15) and 23 CFR 490.205). A vulnerable road user may include people walking, biking, or rolling. Please note that a vulnerable road user:
 - Includes a highway worker on foot in a work zone, given they are considered a pedestrian.
 - Does not include a motorcyclist.

Vulnerable Road Users

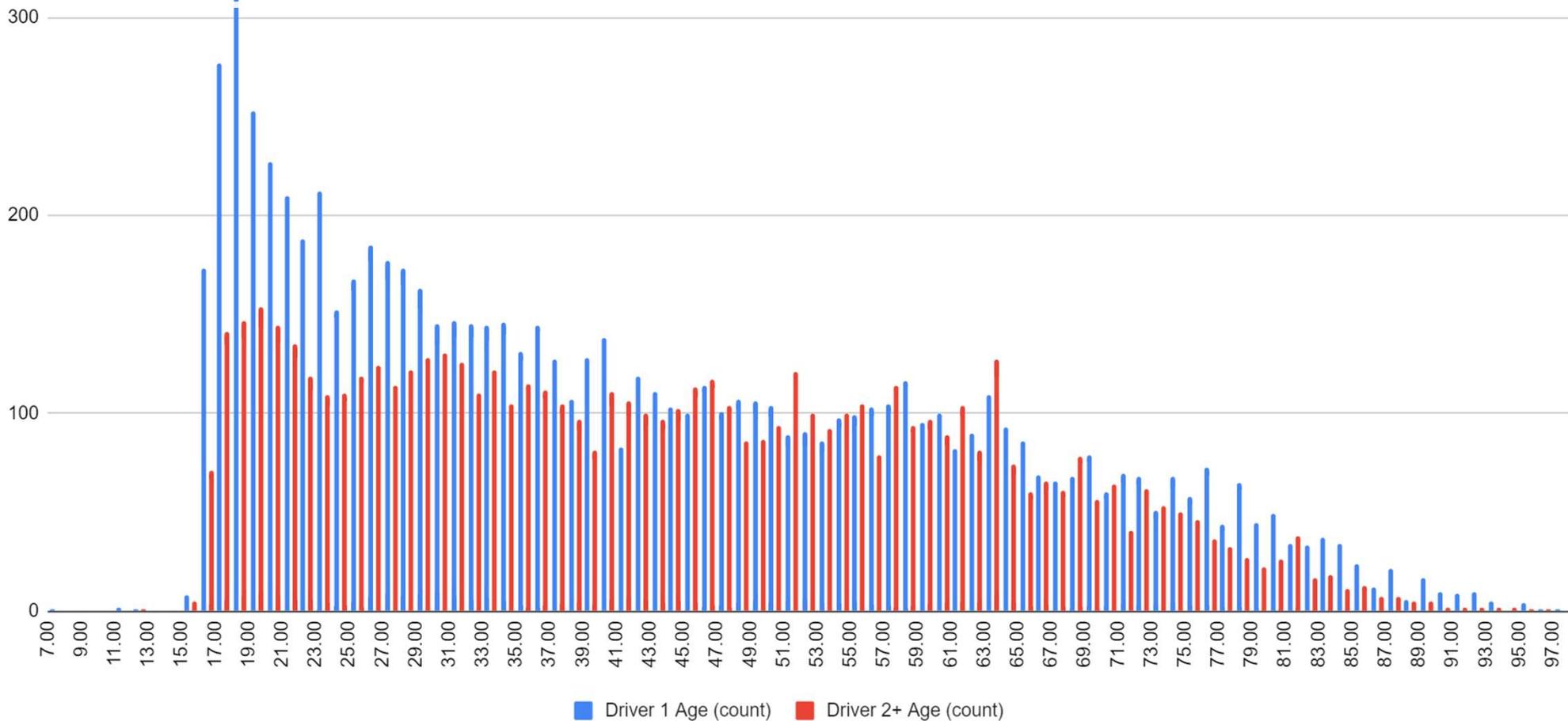
- Total – 129. Average 25.8 Vulnerable Road Users/Year
- Trend – Basically flat (+0.3/year).
- 2023 was the highest year (34)
- Approximately 76% suffered incapacitating injuries
- 90.7% occurred in Kokomo/6.98% occurred in unincorporated
- “Pedestrian Action” noted in 49

Year	UNKNOWN	FATAL	INCAPACITATING	NON-INCAPACITATING	POSSIBLE	REFUSED	UNKNOWN	Total
2019	6	1	19	4	2			32
2020	5	1	11	2				19
2021	10		12	2		2		26
2022	2	1	6	6	2	1		18
2023	1	1	10	11	5	2	4	34
Total	24	4	58	25	9	5	4	129

Crashes By Age

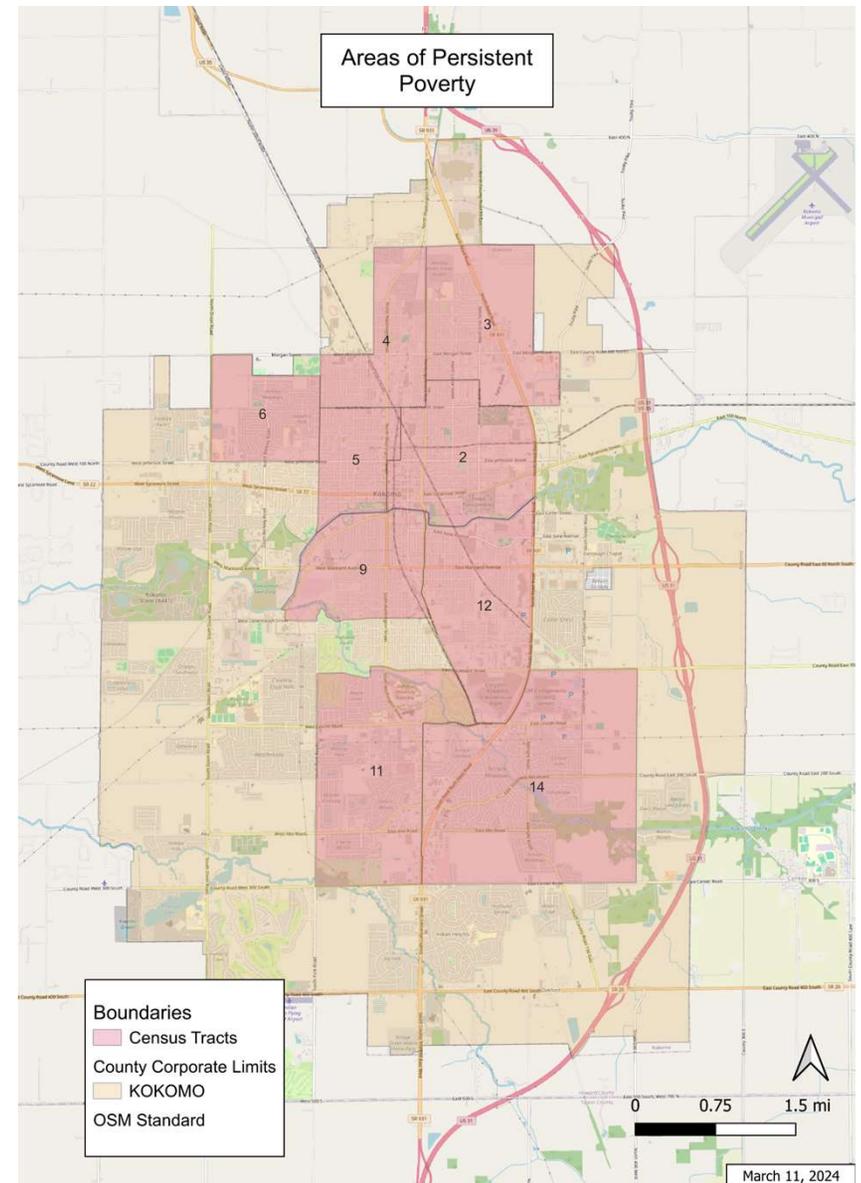


Crashes By Age



Areas of Persistent Poverty

- 64.5% of the City of Kokomo
- 63.8% of Kokomo crashes (-44/year)
- 62.7% of Kokomo injuries (+2.7/year)
- 81% of VRU crashes



Post-Crash Care

- Emergency Response
- Dispatch

Next Steps

- Develop draft systemic and systematic strategies
- Determine post-crash care metrics and potential strategies
- Offer site specific improvement locations to consider

Howard County Road Safety Citizen Steering Committee

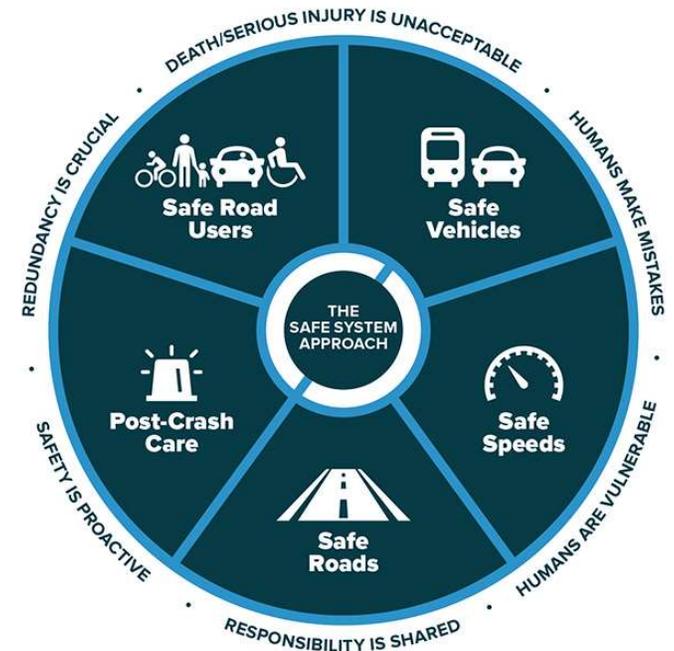
Meeting #2 – June 28, 2024

Mission

To develop a local road safety plan that, when implemented, will reduce the number and severity of vehicular crashes

Safe System Approach Elements

- Safe Road Users
 - The safety of all road users is equitably addressed, including those who walk, bike, drive, ride transit, or travel by other modes.
- Safe Vehicles
 - Vehicles are designed and regulated to minimize the frequency and severity of collisions using safety measures that incorporate the latest technology.
- Safe Speeds
 - Humans are less likely to survive high-speed crashes. Reducing speeds can accommodate human-injury tolerances in three ways: reducing impact forces, providing additional time for drivers to stop, and improving visibility.

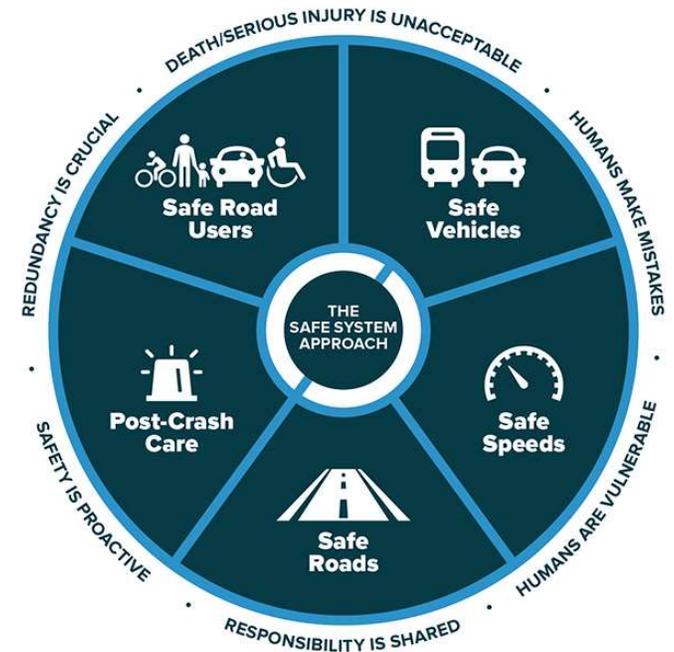


Source: FHWA.

To develop a local road safety plan that, when implemented, will reduce the number and severity of vehicular crashes

Safe System Approach Elements

- Safe Roads
 - Designing transportation infrastructure to accommodate human mistakes and injury tolerances can greatly reduce the severity of crashes that do occur. Examples include physically separating people traveling at different speeds, providing dedicated times for different users to move through a space, and alerting users to hazards and other road users.
- Post-Crash Care
 - People who are injured in collisions rely on emergency first responders to quickly locate and stabilize their injuries and transport them to medical facilities. Post-crash care also includes forensic analysis at the crash site, traffic incident management, and other activities.



Source: FHWA.

To develop a local road safety plan that, when implemented, will reduce the number and severity of vehicular crashes

Safe System Approach Principles

Deaths and serious injuries are unacceptable

Humans make mistakes

Humans are vulnerable

Responsibility is shared

Safety is proactive

Redundancy is crucial

To develop a local road safety plan that, when implemented, will reduce the number and severity of vehicular crashes

Strategies

- Site Specific
 - Intersection improvements
 - Access control
- Systematic
 - Signage at all curves
 - Leading pedestrian intervals
- Systemic
 - Edgelines
 - Rumble strips



To develop a local road safety plan that, when implemented, will reduce the number and severity of vehicular crashes

Right Angle Crashes

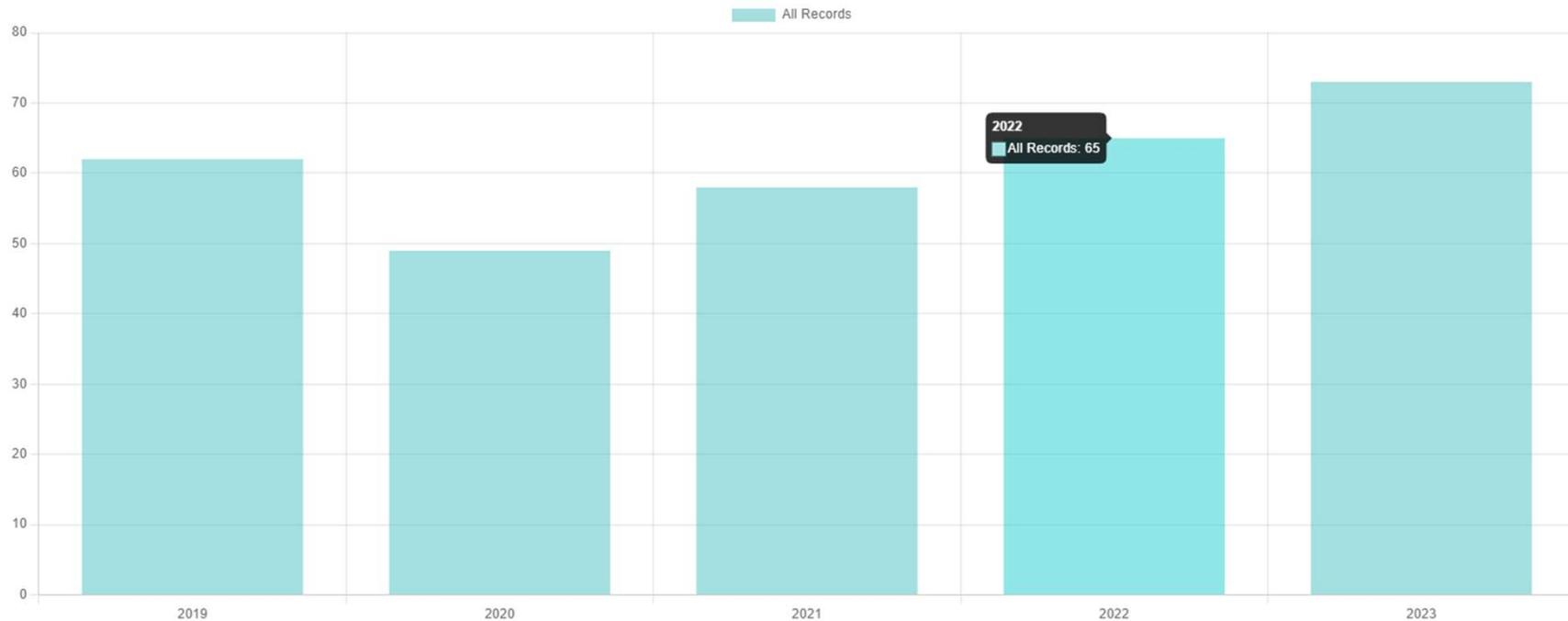


- 624 injury crashes (921 injuries, 14 fatalities) 1.47 injuries per crash
- Recommendations
 - Install lighting at every intersection in urban areas, and along the approaches to two-way stop intersections where the main street speed limit is at least 35 MPH.
 - Install “CROSS TRAFFIC DOES NOT STOP SIGNS” on two-way stop approaches where the main street speed limit is at least 35 MPH.
 - Enforce site distance triangles currently in the zoning ordinance and evaluate high crash driveways for site distance issues.
 - Install stop ahead/signal ahead signs whenever there is at least 2000 feet between signals or stop signs and 4000 feet in rural areas. Also consider intersection warning signs with the cross-street name placards.

To develop a local road safety plan that will reduce the number
and severity of vehicular crashes

Rear End Crashes

- 307 injury crashes (430 injuries, 6 fatality) 1.4 injuries per crash
- Increasing from 49 in 2020 to 73 in 2023
- Recommendations
 - Many of the same recommendations for right angle crashes will help with rear end crashes



To develop a local road safety plan that will reduce the number and severity of vehicular crashes

Ran Off Road Crashes

- 301 injury crashes (341 injuries, 19 fatalities) 1.13 injuries per crash
- 30.12% of all crashes on county roads (647/2,148)
- Recommendations
 - Include a safety edge on all resurfacing projects
 - Include edge line pavement marking on all roadways that lack curb and gutter
 - Where the pavement is wide enough, include edge line rumble strips to help drivers know when they are leaving the roadway
 - Include stone shoulders to allow for recovery

Systemic Improvements

- Recommendations
 - Doubling/increasing the size of stop signs
 - Enhanced stop signs (LED flashers)
 - Rumble strips
 - Signals
 - Install leading pedestrian intervals at every signal with crosswalks
 - Retime every signal and evaluate for actuation
 - Add “Turning vehicles must yield to pedestrians”



To develop a local road safety plan that will reduce the number and severity of vehicular crashes

Site Specific Locations

- Top Three Intersections
 - Dixon / Sycamore
 - 95 crashes, 16 injury crashes, 1 vulnerable user
 - Recommendations
 - Evaluate and update signal timing
 - Refresh pavement markings
 - Washington / Markland
 - Washington / Lincoln

Dixon and Sycamore

- 95 Crashes, 16 injury crashes, 1 vulnerable road user
- Recommendations
 - Evaluate and update signal timing
 - Refresh pavement markings

Washington and Markland

- 74 Crashes, 6 injury crashes, 2 vulnerable road users
- Recommendations
 - Evaluate and update signal timing
 - Install intersection advance warning signs (32 crashes were rear end)
 - Add a northbound and southbound signal head
 - Install skip lane markings in the intersection for northbound and southbound

Washington and Lincoln

- 64 Crashes, 6 injury crashes, 1 fatal crash
- Recommendations
 - Evaluate and update signal timing
 - Install signal ahead signage
 - Consider walk/wait lights and push button actuation if needed

Ohio Street and Morgan Street

- 30 crashes total, 18 right angle, 6 of which resulted in injuries
- 19 crashes were “Failure to Yield”
- Recommendations
 - Install “Cross Traffic Does Not Stop” signs on the north and south stop signs
 - Evaluate for an all-way stop

Alto Road – County Line to 300 West*

- 146 crashes (28 injury crashes), 30 involved deer
- 36 ran off road crashes (14 injury crashes)
- 37 rear end crashes (14 injury crashes)
- Recommendations
 - Increase site distance by reducing vertical curves
 - Install intersection warning signs
 - Install left turn lanes
 - Install acceleration and deceleration lanes

Address high curve, high crash segments

- 100 North – 250 East to 700 East
- Sycamore Road west of 400 West
- Roads near New London
- Recommendations
 - Implement ran off road and right-angle crash reduction strategies

Davis Road and Smith Road

- 28 crashes (12 injury crashes)
- Highest non-INDOT crash location in the unincorporate area
- Recommendations
 - Add “Cross Traffic Does Not Stop” signs
 - Ensure there is adequate sight distance for westbound Smith Road
 - Investigate an intersection improvement project
 - Realignment
 - Flashing warning signal
 - Traffic signal
 - Roundabout

State Roads

- 500 East (SR19) and 100 S
 - Only 14 crashes, but 10 injury crashes and one fatality
- Savoy and SR931
 - Steadily increasing number of crashes
 - Consider advance rumble strips
- SR931
 - Consider intersection lighting to help reduce VRU crashes
 - At Vaile – Remove the crossing

Alternative Strategies

- Increased patrols for speed/alcohol/drugs
- Mandatory/voluntary defensive driving
- Funding for rides home
- High School convocations
- Ordinance updates to reduce roadway widths, require traffic calming, and reduce car dependent development

Next Steps

- Review FHWA technical evaluation of high crash areas
- Determine post-crash care metrics and potential strategies
- Prioritize site specific improvement locations
- Finalize crash evaluation tool
- Complete draft plan

Howard County Safety Action Plan

Steering Committee

Meeting #3 – November 14, 2024

Mission

To develop a local road safety plan that, when implemented, will reduce the number and severity of vehicular crashes

Study Conclusions

- Total crashes are decreasing slightly
- Injury crashes are increasing
- Vulnerable Road Users (VRUs) are more likely to be injured, and almost all VRU crashes occur inside Kokomo. Areas of persistent poverty (APP) are more likely to include VRU crashes, with 81% of VRU crashes occurring in the APP.
- Younger drivers are more likely to be responsible for crashes than older drivers
- Lack of a restraint is a significant contributor to injury and fatal crashes

Systemic Improvement Recommendations

- Upgrade signage
 - Cross traffic does not stop
 - Stop ahead/signal ahead
 - Intersection warning
- Install and maintain pavement markings
 - Edgelines
 - Rumble strips
 - Cross walks and stop bars
- Improve lighting
- Improve shoulder conditions to reduce road departure crashes
- Enforce site distance regulations
- Review Speed limits

To develop a local road safety plan that will reduce the number and severity of vehicular crashes

Systematic Improvement Recommendations

- Increase intersection awareness, especially in rural areas
- Review and upgrade signal equipment, phasing, and timing
 - Leading pedestrian intervals
 - Update timing
 - Improve actuation
- Focus on high crash rural curves

Site Specific Locations (Unincorporated)

- Smith Road/Davis Road (\$432,140/year)
 - Preliminary improvements of signage and stop bar pavement markings
 - Long term, consider an intersection upgrade
- West Alto Road from 300 West to the west county line (\$84,540/year/mile)
 - Prioritize ran off road strategies, including edge line rumble strips and stone shoulders
 - Address rear end crashes by reducing vertical curves, installing intersection warning signs, left turn lanes, acceleration and deceleration lanes
- 100 North from 250 East to 700 East (\$143,333/year/mile)
 - Edge line rumble strips, edge lines, and curve signage
 - Consider vertical curve improvements

Site Specific Locations (Kokomo)

- Sycamore Street/Dixon Road (\$600,200/year)
 - Add signal heads to meet one signal per lane
 - Evaluate signal timing
 - Refresh pavement markings
- Alto Road/Southway Boulevard/Webster Street (\$429,920/year)
 - Evaluate signal timing
 - Upgrade lighting
 - Install advanced intersection warning and lane guidance signage
 - Consider a roundabout
- LaFountain Street/Southway Boulevard (\$370,440/year)
 - Evaluate signal timing
 - Install advanced intersection warning

Non-Engineering Considerations

- Increased patrols for speed/alcohol/drugs/distracted driving
- Mandatory/voluntary defensive driving training
- Funding for rides home
- Youth education/public awareness campaigns
- Public transit improvements
- Ordinance updates to reduce roadway widths, require traffic calming, and reduce car dependent development

Next Steps

- Release the draft report for public comment
- Submit the report to the City of Kokomo BOW and Howard County Commissioners
- Submit the report to FHWA
- Implement the recommendations
- Perform periodic reviews and updates

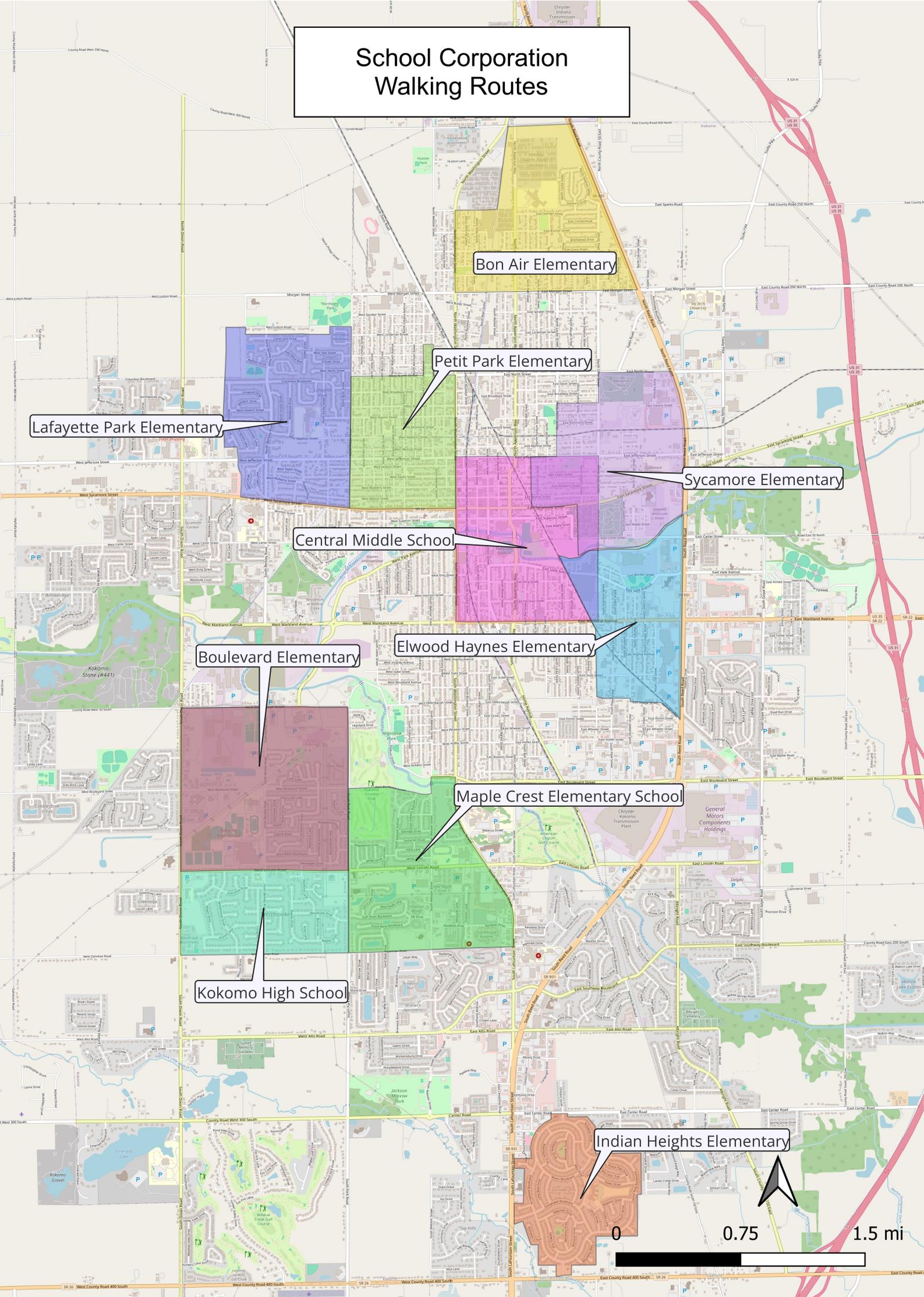
2024 Preliminary Analysis (through 11/1)

- **Countywide**
 - Total crashes have increased 9% over 2023 (1,883 vs 1,723)
 - Injury crashes have increased 22% over 2023 (344 vs 283)
- **Kokomo**
 - Total crashes have increased 10% over 2023 (1,477 vs 1,337)
 - Injury crashes have increased 26% over 2023 (255 vs 202)
- **Unincorporated**
 - Total crashes have increased 3% over 2023 (375 vs 365)
 - Injury crashes have increased 9% over 2023 (86 vs 79)
- **By manner**
 - Ran off road, rear end, right angle, and same direction sideswipe all increasing
 - Rear end crashes have increased 21% over 2023 (409 vs 339)
 - Rear end injury crashes have increased 30% over 2023 (69 vs 53)
 - Distracted driver crashes have increased 56% over 2023 (128 vs 82)

To develop a local road safety plan that will reduce the number
and severity of vehicular crashes

7.3 APPENDIX C – KOKOMO SCHOOL WALKING ROUTES

School Corporation Walking Routes



7.4 APPENDIX D – ELIGIBILITY WORKSHEET AND APPROVALS

All applicants should follow the instructions in the NOFO to correctly apply for a grant. See the [SS4A website](#) for more information.

Table 1 of the SS4A NOFO describes [eight components of an Action Plan](#), which correspond to the questions in this worksheet. Applicants should use this worksheet to determine whether their existing plan(s) contains the required components to be considered an eligible Action Plan for SS4A.

This worksheet is required for all SS4A **Implementation Grant** applications and any **Planning and Demonstration Grant applications to conduct Supplemental Planning/Demonstration Activities only**. Please complete the form in its entirety, do not adjust the formatting or headings of the worksheet, and upload the completed PDF with your application.

Eligibility

An Action Plan is considered eligible for an SS4A application for an Implementation Grant or a Planning and Demonstration Grant to conduct Supplemental Planning/Demonstration Activities if the following two conditions are met:

- You can answer "YES" to Questions **3, 7, and 9** in this worksheet; *and*
- You can answer "YES" to **at least four of the six remaining** Questions, **1, 2, 4, 5, 6, and 8**.

If both conditions are not met, an applicant is still eligible to apply for a Planning and Demonstration Grant to fund the creation of a new Action Plan or updates to an existing Action Plan to meet SS4A requirements.

Applicant Information

Lead Applicant: _____

UEI: _____

Action Plan Documents

In the table below, list the relevant Action Plan and any additional plans or documents that you reference in this form. Please provide a hyperlink to any documents available online or indicate that the Action Plan or other documents will be uploaded in Valid Eval as part of your application. Note that, to be considered an eligible Action Plan for SS4A, the plan(s) coverage must be broader than just a corridor, neighborhood, or specific location.

Document Title	Link	Date of Most Recent Update



Action Plan Components

For each question below, answer "YES" or "NO." If "YES," list the relevant plan(s) or supporting documentation that address the condition and the specific page number(s) in each document that corroborates your response. This form provides space to reference multiple plans, but please list only the most relevant document(s).

1. Leadership Commitment and Goal Setting

Are **BOTH** of the following true?

- A high-ranking official and/or governing body in the jurisdiction publicly committed to an eventual goal of zero roadway fatalities and serious injuries; and
- The commitment includes 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

Note: This may include a resolution, policy, ordinance, executive order, or other official announcement from a high-ranking official and the official adoption of a plan that includes the commitment by a legislative body.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

2. Planning Structure

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

Note: This should include a description of the membership of the group and what role they play in the development, implementation, and monitoring of the Action Plan.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)



3. Safety Analysis

Does the Action Plan include **ALL** of the following?

- Analysis of existing conditions and historical trends to provide a baseline 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, as needed (e.g., high-risk road features or specific safety needs of relevant road users); and,
- A geospatial identification (geographic or locational data using maps) of higher risk locations.

YES

NO

Note: Availability and level of detail of safety data may vary greatly by location. The [Fatality and Injury Reporting System Tool \(FIRST\)](#) provides county- and city-level data. When available, local data should be used to supplement nationally available data sets.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

4. Engagement and Collaboration

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

Note: This should be a description of public meetings, participation in public and private events, and proactive meetings with stakeholders.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)



5. Equity Considerations

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 developed in collaboration with appropriate partners, including population characteristics and initial equity impact assessments of proposed projects and strategies.

YES

NO

Note: This should include data that identifies underserved communities and/or reflects the impact of crashes on underserved communities, prioritization criteria that consider equity, or a description of meaningful engagement and collaboration with appropriate stakeholders.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

6. Policy and Process Changes

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

Note: This may include existing and/or recommended Complete Streets policy, guidelines for community engagement and collaboration, policy for prioritizing areas of greatest need, local laws (e.g., speed limit), design guidelines, and other policies and processes that prioritize safety.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)



7. Strategy and Project Selections

Does the plan identify a comprehensive set of projects and strategies to address the safety problems in the Action Plan, with information about time ranges when projects and strategies will be deployed, and an explanation of project prioritization criteria?

YES
NO

Note: This should include one or more lists of community-wide multi-modal and multi-disciplinary projects that respond to safety problems and reflect community input and a description of how your community will prioritize projects in the future.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

8. Progress and Transparency

Does the plan include **BOTH** 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

Note: This should include a progress reporting structure and list of proposed metrics.

If "YES," please list the relevant document(s) and page number(s) that corroborate your response.

Document Title	Page Number(s)

9. Action Plan Date

Was at least one of your plans finalized and/or last updated between 2019 and April 30, 2024?

YES
NO

Note: Updates may include major revisions, updates to the data used for analysis, status updates, or the addition of supplemental planning documents, including but not limited to an Equity Plan, one or more Road Safety Audits conducted in high-crash locations, or a Vulnerable Road User Plan.

If "YES," please list your most recent document(s), date of finalization, and page number(s) that corroborate your response.

Document Title	Date of Most Recent Update	Page Number(s)



RESOLUTION 2025-01

A RESOLUTION OF THE BOARD OF PUBLIC WORKS AND SAFETY OF THE CITY OF KOKOMO CONCERNING THE KOKOMO “TOWARDS ZERO” RESOLUTION

WHEREAS, the City of Kokomo (the “City”) is home to residential neighborhoods of various sizes and characters, as well as a thriving historic downtown including local restaurants, shopping and art galleries; and

WHEREAS, to ensure that Kokomo remains a great place to live, work, and play every person must be safe as they travel in the city; and

WHEREAS, the City has undertaken the implementation of a Safety Action Plan (“SAP”) to assist in implementing the City Capital Improvement Plan; and

WHEREAS, the City recognizes that traffic deaths and serious injuries are not inevitable, is committed to take steps to attempt to eliminate traffic deaths and serious injuries by 2050.

IT IS THEREBY RESOLVED by the Board of Public Works and Safety of the City of Kokomo as follows:

1. The Board of Public Works and Safety of the City of Kokomo hereby resolves that to make City streets safer for all, no matter age, ability, or community, Kokomo is dedicated to collaborating with all partners including residents, community stakeholders, local and regional governments, and State agencies. Moving towards zero by 2050 is an ambitious goal, but together we can take actions to help save lives and make Kokomo’s streets safer for all.
2. That the Kokomo “Toward Zero” Resolution is hereby approved.

Approved on this 19th day of February 2025 by the Board of Public Works and Safety of the City of Kokomo, Indiana.

APPROVED BY BOARD OF PUBLIC WORKS AND SAFETY

FEB 19 2025

BOARD OF PUBLIC WORKS

Weston Reed

Weston Reed, President

T.J. Rethlake

T.J. Rethlake, Member

Cornelia Campbell

Cornelia Campbell, Member

ATTEST:

Sarah White

Sarah White, Secretary

RESOLUTION 2025 BCCR 9

**A RESOLUTION OF THE BOARD OF COMMISSIONERS OF HOWARD COUNTY
CONCERNING THE HOWARD COUNTY “TOWARDS ZERO” RESOLUTION**

WHEREAS, Howard County (the “County”) is home to residential neighborhoods of various sizes and characters, as well as thriving historic downtowns including local restaurants, shopping and art galleries; and

WHEREAS, to ensure that Howard County remains a great place to live, work, and play every person must be safe as they travel in the County; and

WHEREAS, the County has undertaken the implementation of a Safety Action Plan (“SAP”) to assist in implementing the County Capital Improvement Plan; and

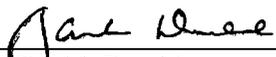
WHEREAS, the County recognizes that traffic deaths and serious injuries are not inevitable, is committed to take steps to attempt to eliminate traffic deaths and serious injuries by 2050.

**NOW, THEREFORE, IN CONSIDERATION OF THE FOREGOING
RECITALS, BE IT RESOLVED THAT:**

1. The Commissioners of Howard County hereby resolves that to make County streets safer for all, no matter age, ability, or community, Howard County is dedicated to collaborating with all partners including residents, community stakeholders, local and regional governments, and State agencies. Moving towards zero by 2050 is an ambitious goal, but together we can take actions to help save lives and make Howard County’s streets safer for all.
2. That the Howard County “Toward Zero” Resolution is hereby approved.

Approved this 21st day of April, 2025.

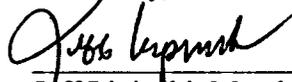
HOWARD COUNTY BOARD OF COMMISSIONERS



Jack Dodd, President



Brad Bray, Vice President



Jeff Lipinski, Member

ATTEST:



Jessica Secrease, Auditor