Appendix A

Crash Analysis

High Injury Network

Predictive Crash Analysis

Equity Analysis

MEMO

To: Vermilion County Safety Action Plan Steering Committee

From: Lochmueller Group

Date: March 7, 2023

Subject: Vermilion County Safety Action Plan Technical Memo 1 – Crash Analysis and High Injury Network

Introduction

The Vermilion County Safety Action Plan (VCSAP) will establish an implementation strategy and recommendations to eliminate roadway deaths and serious injuries. The VCSAP relies on a complete understanding of crashes observed throughout the county to best inform effective strategies to improve safety. This technical memorandum summarizes crash trends, provides insight into key crash patterns, and identifies the high injury network (HIN).

Crash data analyzed as part of the crash analysis includes crashes from 2017 to 2021 in Vermilion County, which represents the most recent 5-year period of crash data that was available at the beginning of this project. Crash data was sourced from the Illinois Department of Transportation (IDOT). Crash attributes are detailed in the Illinois Traffic Crash Report SR1050 Instruction Manual for Law Enforcement Agencies. Each record in the crash data represents one crash incident and includes the following injury classifications (each crash is classified by the most severe injury of the crash):

- **K Fatal Injury** – any injury that results in death within 30 days of the crash.
- **A Suspected Serious Injury** – any injury other than fatal that results in:
    - Severe lacerations resulting in exposure of underlying tissues/muscle/organs or resulting in significant loss of blood
    - Broken or distorted extremity (arm or leg)
    - Crush injuries
    - Suspected skull, chest, abdominal injury other than bruises or minor lacerations
    - Significant burns (second and third degree burns over 10% or more of the body)
    - Unconsciousness when taken from the crash scene
    - Paralysis
- **B Suspected Minor Injury** – any injury that is evident at the scene of the crash other than fatal or serious injuries. Examples include:
    - Lump on the head
    - Abrasions
    - Minor lacerations resulting in minimal bleeding and no exposure of deeper tissue/muscle
- **C Possible Injury** – any injury reported or claimed which is not a fatal, suspected serious, or suspected minor injury. Possible injuries are those that are reported by the person or are indicated by his/her behavior, but no wounds or injuries are readily evident. Examples include:
    - Momentary loss of consciousness
    - Claim of injury
    - Limping

    - Complaint of pain or nausea
- **O No Apparent Injury** – any situation where there is no reason to believe that the person received any bodily harm from the crash.

To better summarize crash trends and patterns, injury classifications are grouped into the following categories:

- Killed or Serious Injury (KSI) – K and A crashes
- Minor Injury – B and C crashes
- Property Damage (PD) – O crashes

Excluded Crashes

To better focus the analysis, interpret the results, and develop successful implementation strategies, crashes that occurred on I-74 and associated ramps and crashes involving animals were excluded from this analysis. Crashes on I-74 were excluded because potential interstate safety improvements are not part of this project and not within the purview of Vermilion County officials nor the Danville Area Transportation Study (DATS). Vermilion County and DATS are committed to working with state and federal partners to improve interstate safety on I-74, but this plan will not directly address potential improvements on I-74. Animal involved crashes are also excluded from this analysis because this plan will not address potential infrastructure improvements to mitigate these crashes. While there are potential engineering solutions to animal involved crashes, such as wildlife crossings, those are not within the purview of Vermilion County and DATS at this time. To not take away focus from other potential patterns in the data, animal involved crashes are excluded, however programmatic recommendations such as educational campaigns may be considered later in the planning process. The number of excluded crashes is approximately 1,500, around 25% of all crashes in Vermilion County.

Key Takeaways

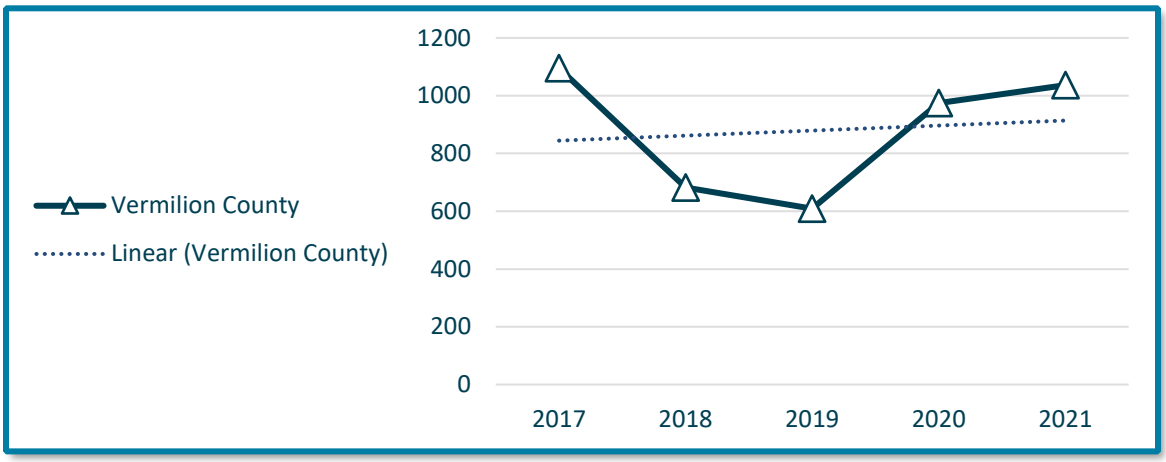
- 900 crashes per year from 2017 to 2021, trending up since 2019
- 7% of all crashes are KSI, around 60 per year on average
- $100 million each year in societal costs (over crash victim's lifespan)
- 97% of crashes involving a pedestrian or bicyclist results in injury (KSI or minor injury)
- A bicyclist or pedestrian involved in a crash is 5 times more likely to be killed or seriously injured than a person in a vehicle/vehicle crash
- Rural crashes are nearly 3 times more likely to result in a fatal or serious injury compared to urban crashes
- 40% of excessive speed crashes result in a fatal or serious injury, almost 6 times higher than when speed is not excessive (excessive speed is noted in the associated police reports)
- The HIN is 6% of the total road mileage but accounts for:
    - 62% of all crashes
    - 98% of all fatal crashes
    - 69% of KSI crashes
    - 79% of bicycle and pedestrian involved crashes and 90% of bicycle and pedestrian KSI crashes

Crash Analysis

Crash Trends

From 2017 to 2021, there were nearly 4,400 crashes in Vermilion County, an average of almost 900 crashes per year. Crashes in Vermilion County have increased each year since 2019. The decrease in total crashes observed in 2018 and 2019 is significant but the linear trendline shows crashes generally increasing during the 5-year period. Crashes per year in Vermilion County are shown in Figure 1.

FIGURE 1 - CRASHES PER YEAR, 2017-2021



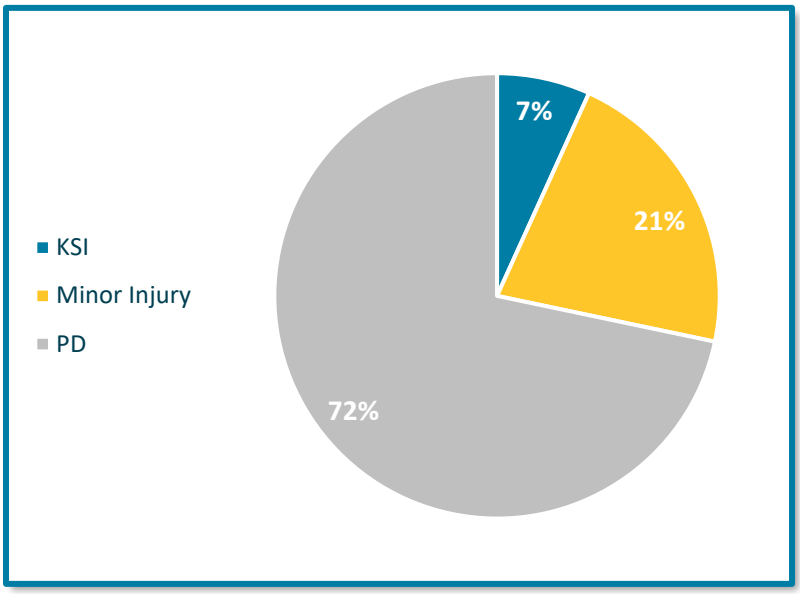
Crash Severity Analysis

From 2017 to 2021, there were a total of 45 fatal crashes, an average of 9 per year. Additionally, there were a total of 253 serious injury crashes (A-Injury), an average of 50 per year. Together fatal and serious injury crashes (KSI) made up 298 crashes (almost 7% of all crashes). B-Injury and C-Injury crashes make up the minor injury category and represent around 18% of crashes. Property damage only (PD) crashes make up most crashes, around 76%. Crashes per year, by severity are shown in Table 1 and crashes by level of severity are shown in Figure 2.

TABLE 1 - CRASHES PER YEAR, BY SEVERITY

Year	Fatal	A-Injury	B-Injury	C-Injury	PD	Total
2017	10	83	136	95	771	**1,095**
2018	11	43	75	60	493	**682**
2019	9	24	85	46	445	**609**
2020	7	52	138	92	685	**974**
2021	8	51	138	81	758	**1,036**
Total	**45**	**253**	**572**	**374**	**3,152**	**4,396**
	KSI		***Minor Injury***		***PD***	

FIGURE 2 - CRASHES BY LEVEL OF SEVERITY



After a high mark of 93 KSI crashes in 2017, KSI crashes have declined overall, despite an increase in 2020 and 2021. KSI crashes represent around 5% to 9% of crashes each year. Despite these patterns, fatal crashes alone have remained stable every year since 2017. KSI crashes per year are shown in Figure 3. KSI crashes in the county are shown on a map in Figure 4.

FIGURE 3 - KSI CRASHES PER YEAR, 2017-2021

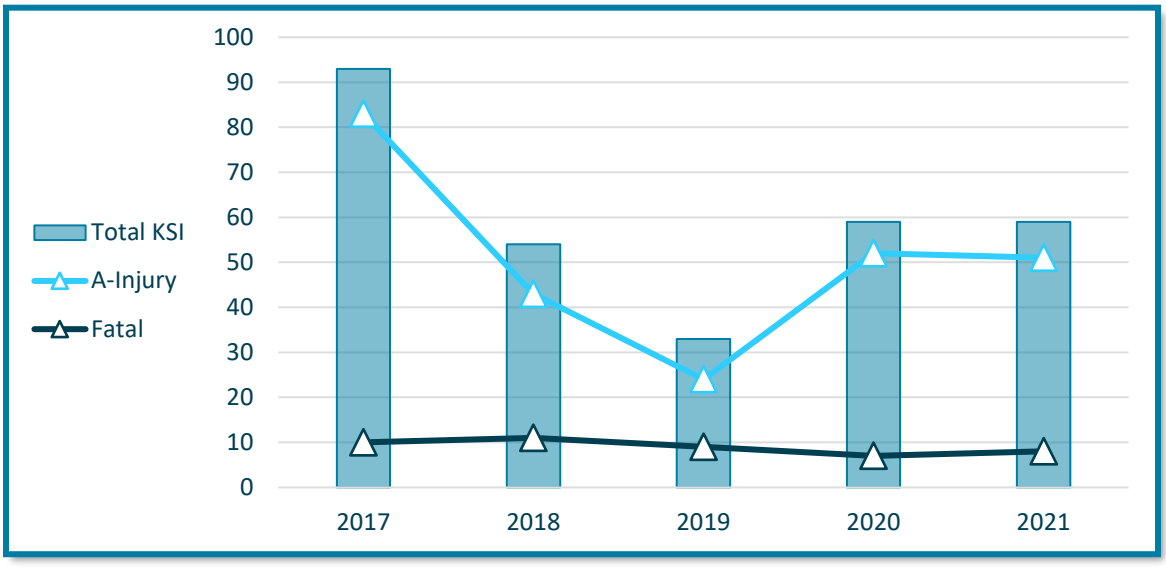
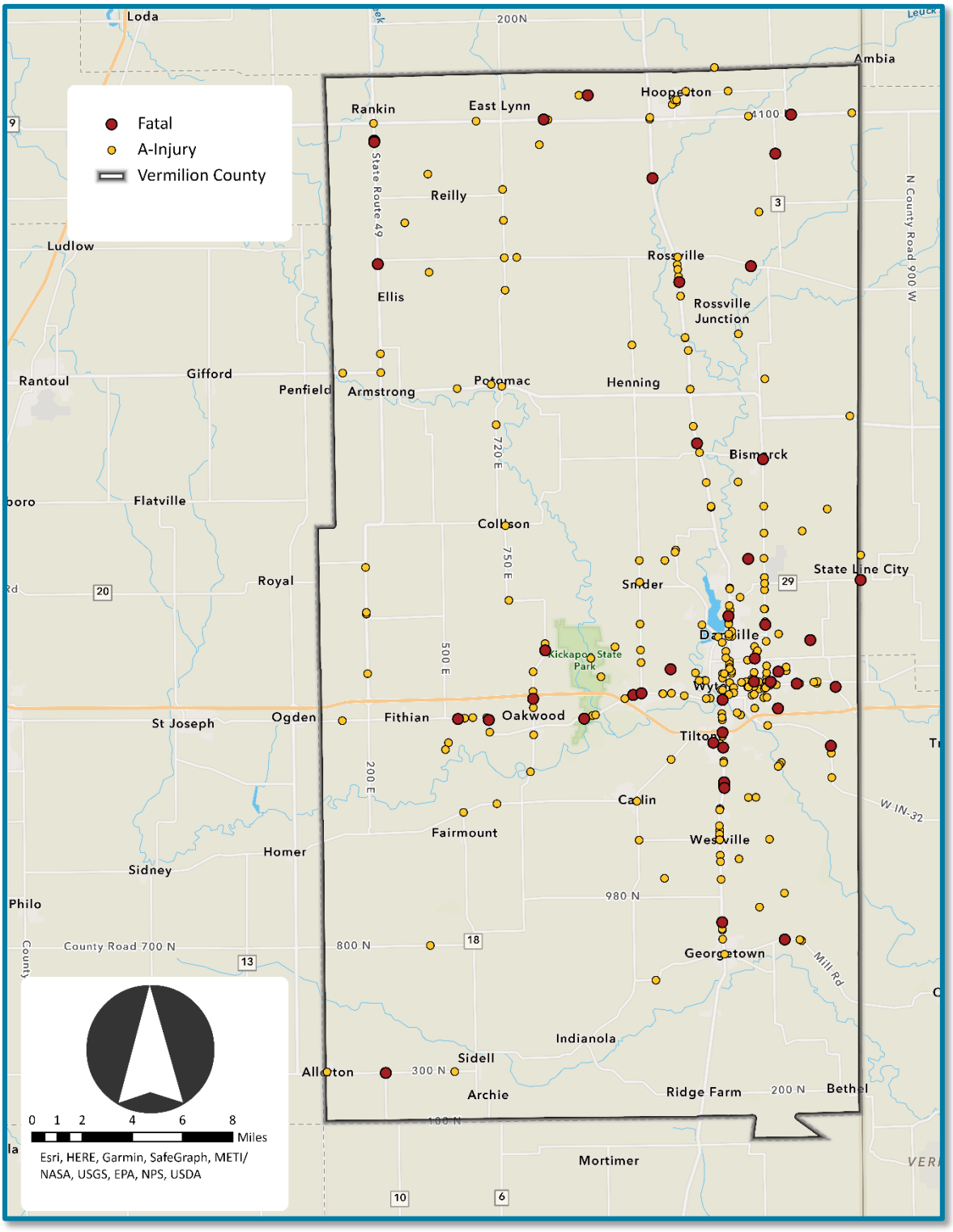


FIGURE 4 - KSI CRASHES, 2017-2021



Crash Types

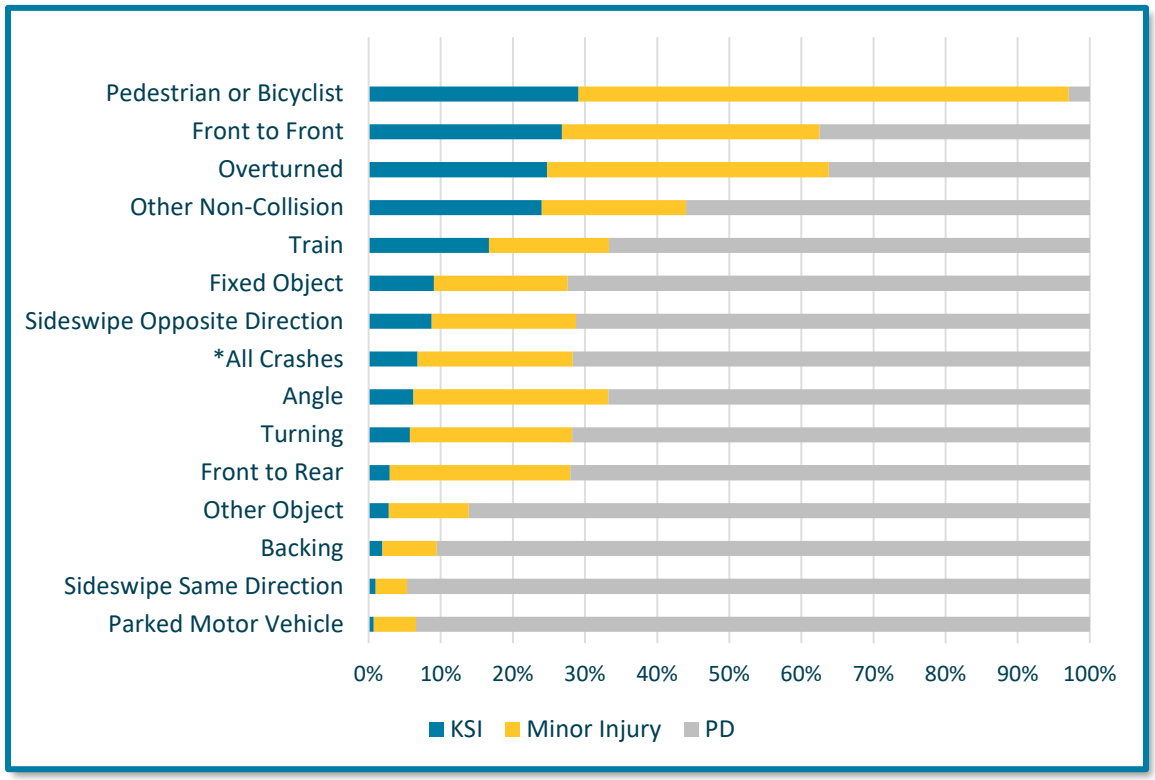
All crashes by type are listed in Table 2. The most prevalent type is fixed object crashes at 23%, followed by front to rear (rear end) crashes at 19% and turning movement crashes at 18%. A fixed object crash involves a prior ran-off-the-roadway event which in turn leads to a collision that occurs off the roadway. This indicates that a significant number of crashes in the county occur because drivers are departing their driving lanes.

TABLE 2 - CRASHES BY TYPE, 2017-2021

Crash Type	Number	Percent of all Crashes
Angle	614	14.0%
Backing	53	1.2%
Fixed Object	1004	22.8%
Front to Front	56	1.3%
Front to Rear	851	19.4%
Other Non-Collision	50	1.1%
Other Object	36	0.8%
Overturned	105	2.4%
Parked Motor Vehicle	427	9.7%
Pedestrian or Bicyclist	103	2.3%
Sideswipe Opposite Direction	80	1.8%
Sideswipe Same Direction	206	4.7%
Train	6	0.1%
Turning	805	18.3%
Total	**4,396**	**100.0%**

Figure 5 shows each crash type by level of severity and makes clear that crash type influences the level of severity. KSI crashes represent 29% of pedestrian and bicyclist crashes, 27% of front to front (head on) crashes, and 25% of overturned crashes, even though KSI crashes only represent 7% of total crashes. Conversely, parked vehicle, sideswipe same direction, and backing crashes have much lower rates of KSI and are more likely to be property damage only.

FIGURE 5 - CRASH TYPES BY LEVEL OF SEVERITY



Roadway Conditions

Factors that affect roadway and travel conditions such as lighting, weather, and surface conditions can influence the frequency and severity of crashes. Total crashes by lighting conditions are shown in Table 3. Most crashes occur in daylight (66%) while 29% occur after dark. There appears to be evidence that crashes at night without lighting are more likely to be severe (11% are KSI crashes vs 7% for all crashes). Lighting conditions by level of severity are shown in Figure 6.

TABLE 3 – CRASHES BY LIGHTING CONDITIONS, 2017-2021

Lighting Conditions	Number	Percent of all Crashes
Unknown	100	2%
Darkness	717	16%
Darkness, Lighted Road	578	13%
Dawn	47	1%
Daylight	2,891	66%
Dusk	63	1%
Total	**4,396**	**100%**

FIGURE 6 - LIGHTING CONDITIONS BY LEVEL OF SEVERITY

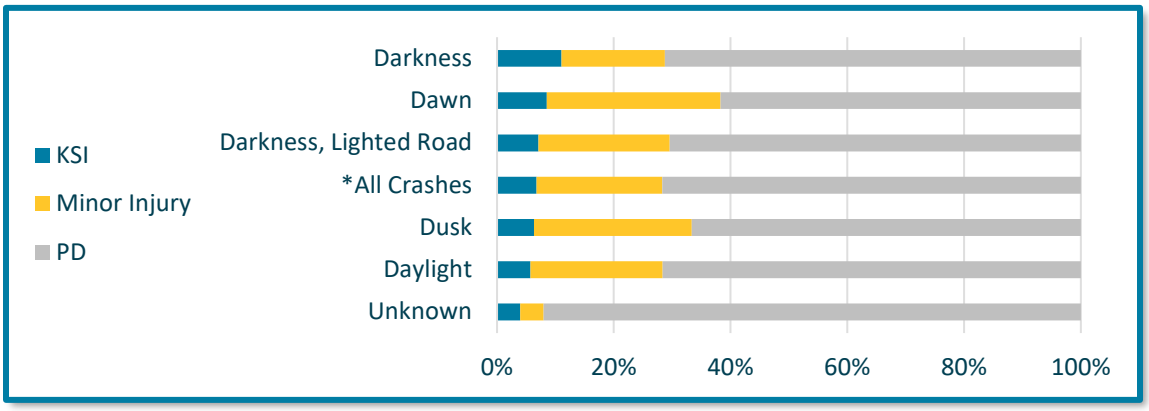


Table 4 indicates most crashes occur when the weather is clear (81%). Weather conditions that reduce visibility (fog/smoke/haze) or cause slick conditions (sleet/hail) are likely to cause crashes to be more serious as shown in Figure 7.

TABLE 4 - CRASHES BY WEATHER CONDITIONS, 2017-2021

Weather	**Number**	**Percent of all Crashes**
Blowing Snow	17	0%
Clear	3548	81%
Cloudy/Overcast	85	2%
Fog/Smoke/Haze	42	1%
Freezing Rain	11	0%
Other	107	2%
Rain	389	9%
Severe Cross Wind	5	0%
Sleet/Hail	13	0%
Snow	179	4%
Total	**4,396**	**100%**

FIGURE 7 - WEATHER CONDITIONS BY LEVEL OF SEVERITY

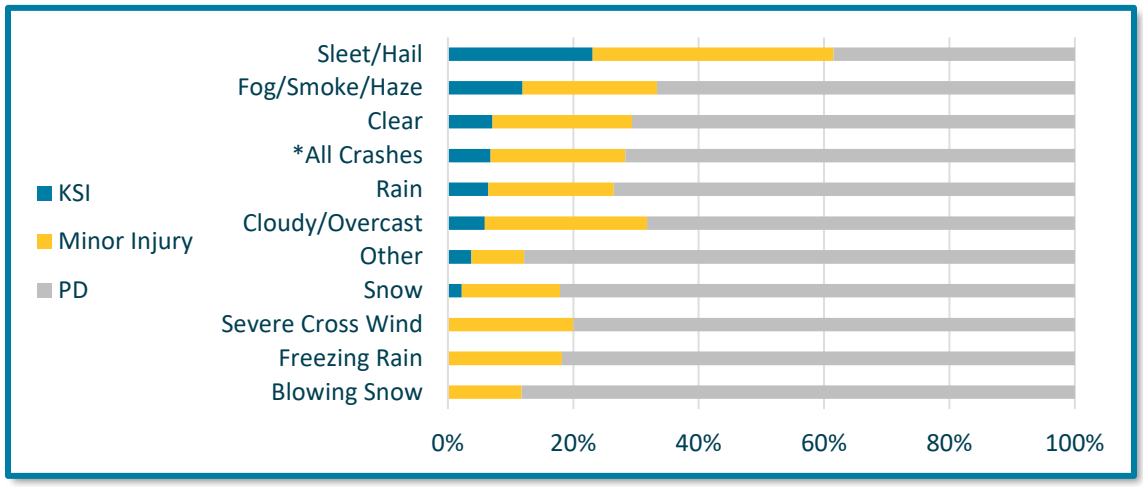
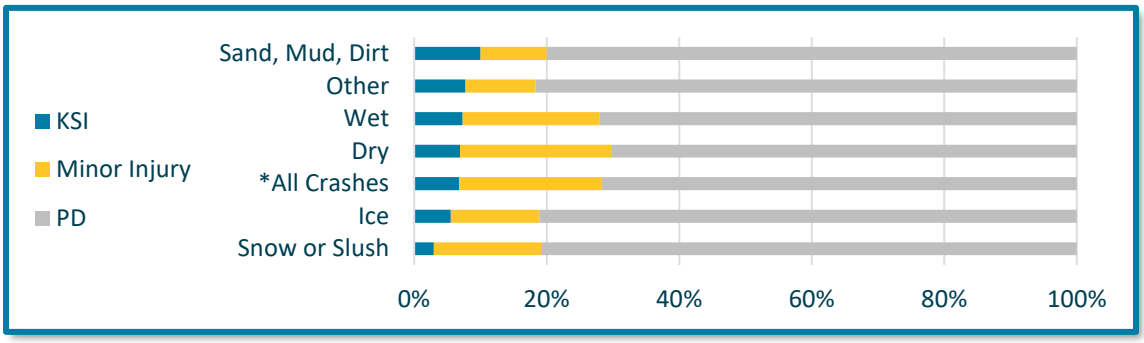


Table 5 indicates most crashes occur under dry roadway surface conditions (75%). While wet roadway surface conditions do not appear to increase severity, crashes with ice and/or snow surface conditions seem to lower rates of fatal and serious injuries (possibly because people are driving slower when ice/snow is present on the roadway). Road surface conditions by level of severity is shown in Figure 8.

TABLE 5 - CRASHES BY ROADWAY SURFACE CONDITIONS, 2017-2021

Surface Condition	Number	Percent of all Crashes
Dry	3,314	75%
Ice	127	3%
Other	142	3%
Sand, Mud, Dirt	10	0%
Snow or Slush	202	5%
Wet	601	14%
Total	**4,396**	**100%**

FIGURE 8 - ROAD SURFACE CONDITIONS BY LEVEL OF SEVERITY



Urban and Rural Analysis

The U.S. Census Bureau defines an urbanized area as a continuously built-up area with a population of 50,000 or more. The Danville, IL Urbanized Area is the only urban area in Vermilion County and comprises an area that is different from city of Danville limits. The urban area within Vermilion County is shown in Figure 9. The urban area comprises 62% of the population but only 19% of the total roadway centerline mileage.

For the purposes of this analysis, crashes that occur within the Danville, IL Urban Area are urban, while all other crashes are rural. The split in urban and rural area crashes has remained relatively stable from 2017 to 2021; rural crashes range from 30% to 35% of total crashes during the 5-year period. In total, rural crashes make up approximately 30% of all crashes (as shown in Figure 10) which is slightly less per capita than for urban areas. Urban and rural area characteristics are shown in Table 6.

TABLE 6 - URBAN AND RURAL CHARACTERISTICS

Area Type	Population (2021)	Centerline Mileage	Centerline Milage percent	Total Crashes	Total Crashes percent
Urban	46,354 (62%)	387	19%	3,067	70%
Rural	28,599 (38%)	1,661	81%	1,329	30%
Total	**74,953**	**2,049**	**100%**	**4,396**	**100%**

FIGURE 9 - URBAN AREA IN VERMILION COUNTY

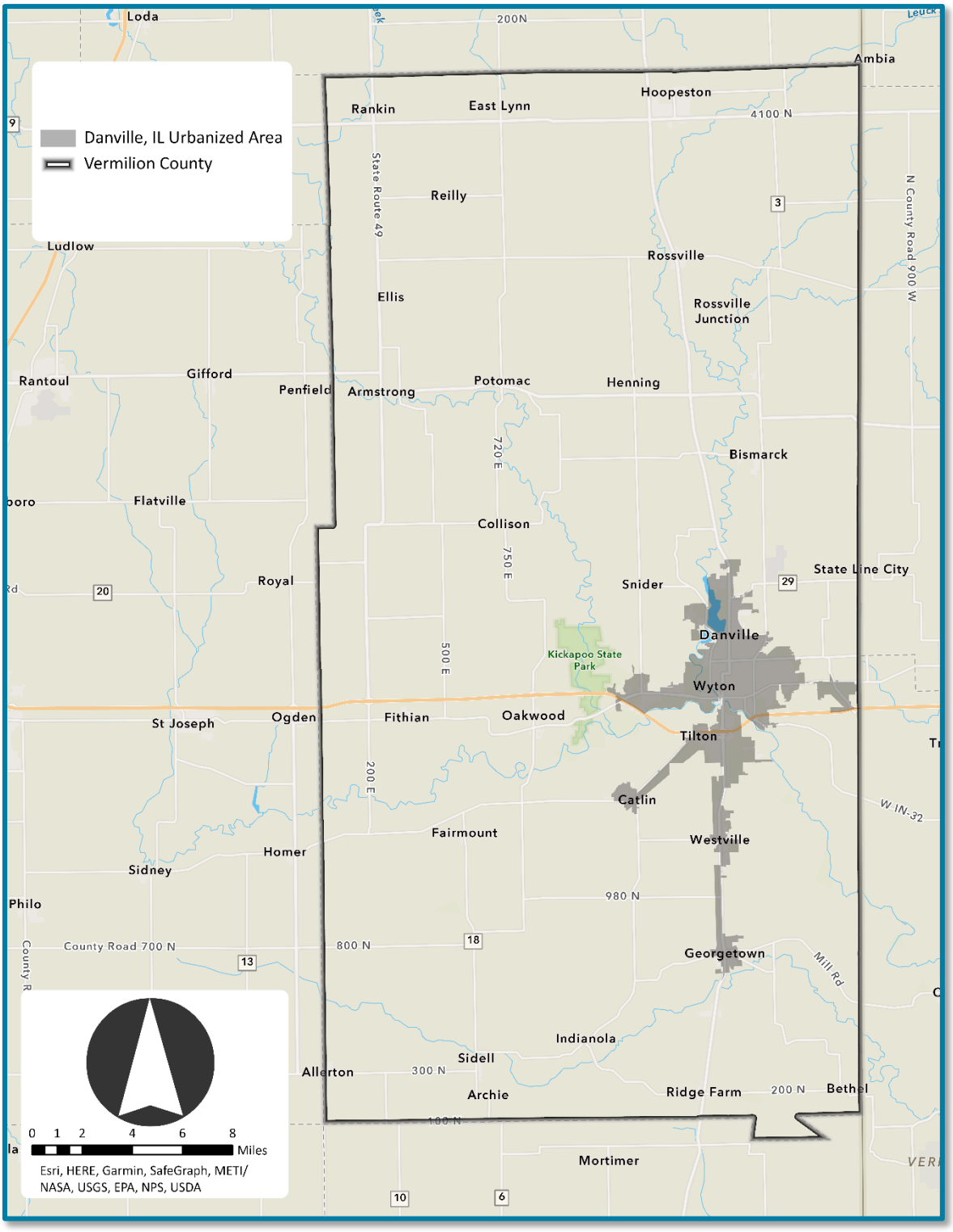
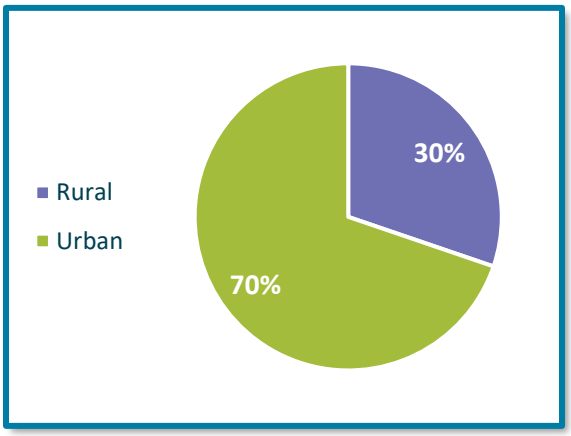
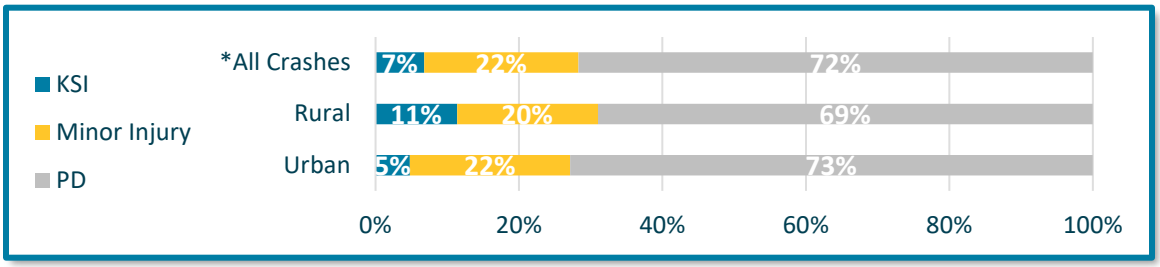


FIGURE 10 - TOTAL CRASHES BY URBAN OR RURAL



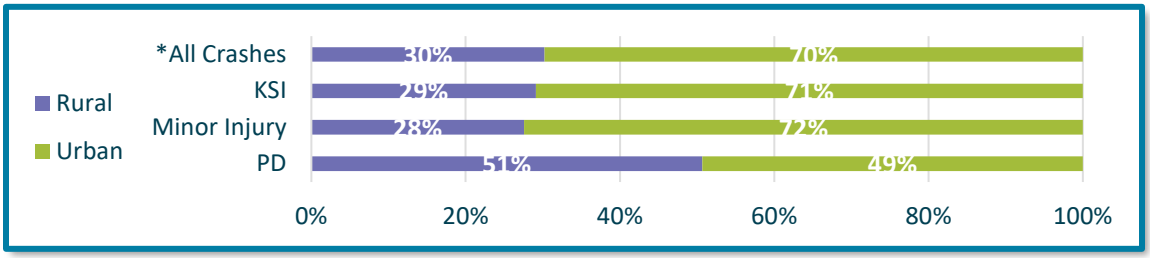
The urban area experiences a majority of all crashes (70%), but rural crashes are much more likely to be serious or fatal. 11% of rural crashes are KSI crashes compared to 5% of urban crashes. A rural crash is nearly 3 times as likely to result in a fatal or serious injury compared to an urban crash. Figure 11 shows rural and urban crashes by level of severity.

FIGURE 11 - RURAL AND URBAN CRASHES BY LEVELS OF SEVERITY



Similarly, Figure 12 shows the level of severity broken down by urban and rural areas. This shows that KSI crashes and minor injury crashes are split roughly the same as for all crashes (30% urban, 70% rural). Property damage only crashes are more likely to occur in the rural area.

FIGURE 12 – CRASH LEVELS OF SEVERITY BY URBAN OR RURAL



Bicycle and Pedestrian Crash Analysis

Bicyclists and pedestrians involved in crashes are significantly more likely to suffer a fatal or serious injury. Bicyclists and pedestrians are exposed and offered little or no protection from vehicles and are considered vulnerable road users. On average, there are 21 bicycle or pedestrian crashes each year in Vermilion County. 97% of bicycle or pedestrian crashes result in at least a minor injury and 29% are KSI crashes. A bicyclist or pedestrian involved in a crash is almost 5 times more likely to be killed or seriously injured than a person in a vehicle/vehicle crash. Bicycle and pedestrian crashes by level of severity are compared to all crashes as shown in Figure 13. Most bicycle and pedestrian crashes occur in or near the city of Danville as shown on the maps in Figure 14 and Figure 15.

FIGURE 13 - BICYCLE AND PEDESTRIAN CRASHES BY LEVEL OF SEVERITY

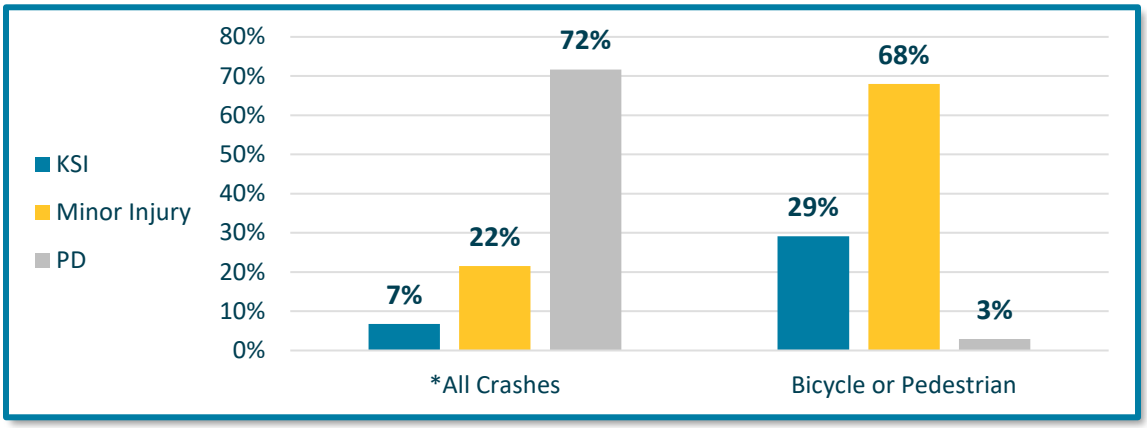


FIGURE 14 - BICYCLE AND PEDESTRIAN CRASHES (VERMILION COUNTY)

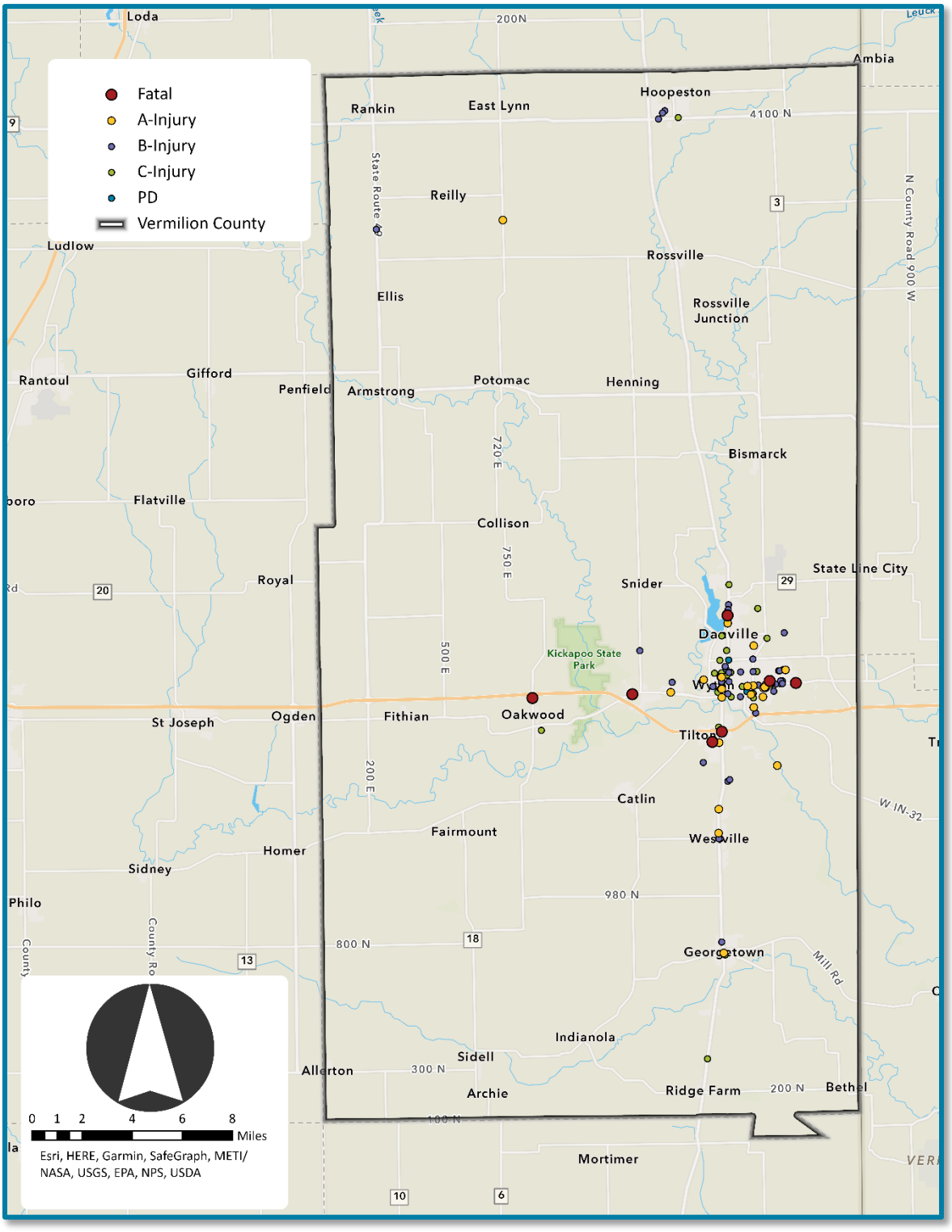
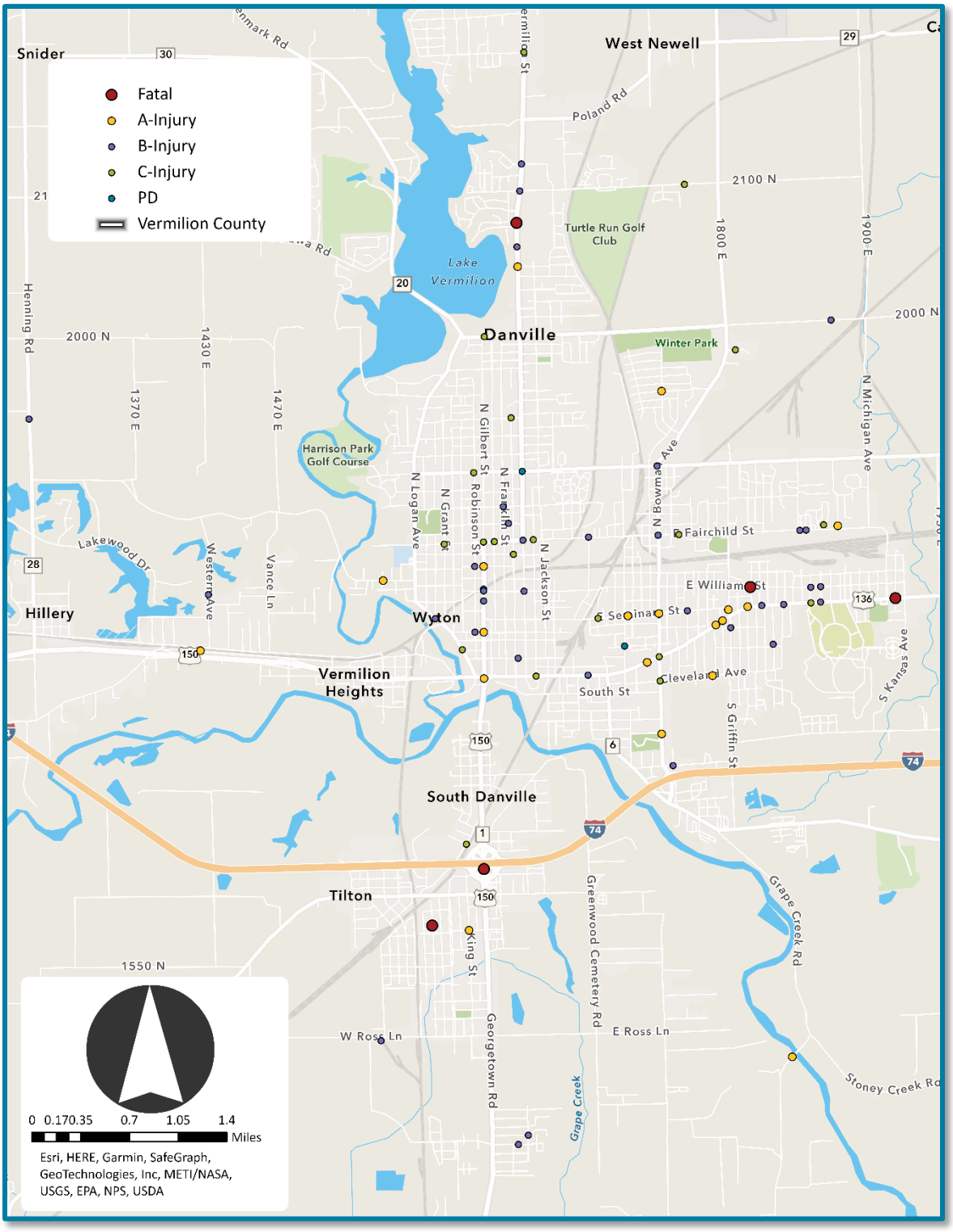


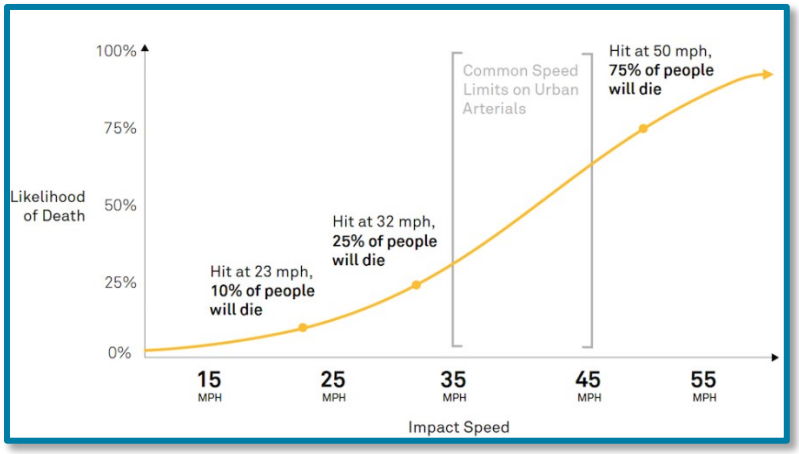
FIGURE 15 - BICYCLE AND PEDESTRIAN CRASHES (DANVILLE)



Speed Related Crash Analysis

Vehicle speed is one of the most important factors that determines the level of severity of a particular crash. The higher the vehicle speed, the more likely the crash will result in a fatal or serious injury. The relationship between speed and likelihood of fatality is illustrated in Figure 16.

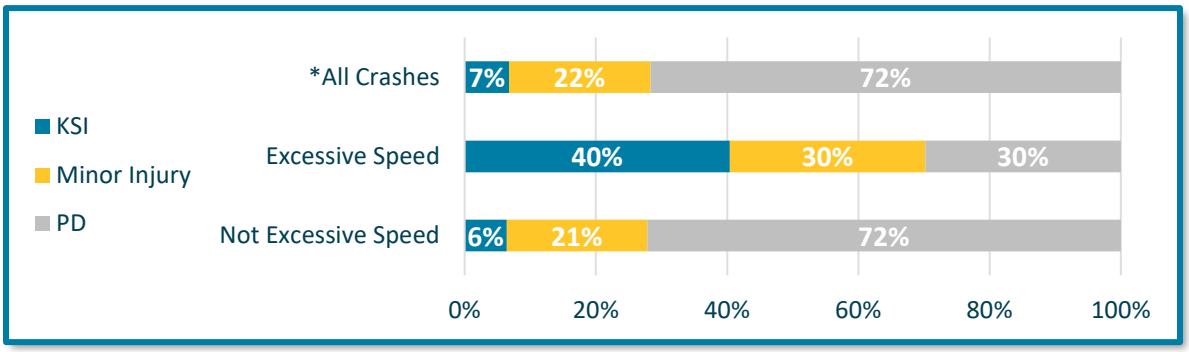
FIGURE 16 - SPEED AND CHANCE OF FATALITY FOR PEDESTRIANS



Source: NACTO (National Association of Transportation Officials)

47 crashes were noted in police reports as having occurred along with excessive speed. The 47 excessive speed crashes were much more likely to be KSI crashes. 40% of excessive speed crashes result in a fatal or serious injury, almost 6 times higher than when speed is not excessive. Figure 17 shows the crash levels of severity by whether excessive speed was a factor.

FIGURE 17 - CRASH LEVEL OF SEVERITY BY EXCESSIVE SPEED



To explore crashes from this analysis, please see the Vermilion County Crash Dashboard. (https://arcgis.lochgroup.com/portal/apps/opsdashboard/index.html#/d5c76deda2524c1d82834393ddb8ae60)

High Injury Network

The identification of the high injury network (HIN) is a critical step in a successful safety action plan. The HIN represents those elements of the network (streets/roads and intersections), that are observed to have relatively high crash frequencies and/or higher rates of fatal and serious injury crashes. The HIN is used to develop and prioritize locations for possible safety improvements or countermeasures.

Data Preparation

Multiple steps were taken in the data preparation process to ensure a valid, accurate, and valuable HIN was created. First, crash locations were validated in GIS by ensuring the stated location in the crash record matched the landed location. Approximately 10% of all crash records were manually validated including all KSI crash records.

The network used comes from the Illinois Department of Transportation (IDOT) Highway Information System (IHIS). The network file includes all public highways with associated data attributes as of 2021 (the most recent available). Since interstate crashes were not included in the analysis, interstate and ramp facilities were removed from the network. Next, segments were dissolved (aggregated) by functional classification and annual average daily traffic (AADT). Functional classification defines the way in which streets and roads function (mobility vs access) within the transportation network. Arterials function with greater mobility while locals function to provide land access. Functional classification in shown in Figure 18 and Figure 19. This step created segments of appropriate length by limiting the number of short segments and created segments that made logical sense (i.e., at intersections). Finally, since AADT is an input attribute into later calculations, missing AADT values were estimated based on the average AADT per functional class.

FIGURE 18 - FUNCTIONAL CLASS (VERMILION COUNTY)

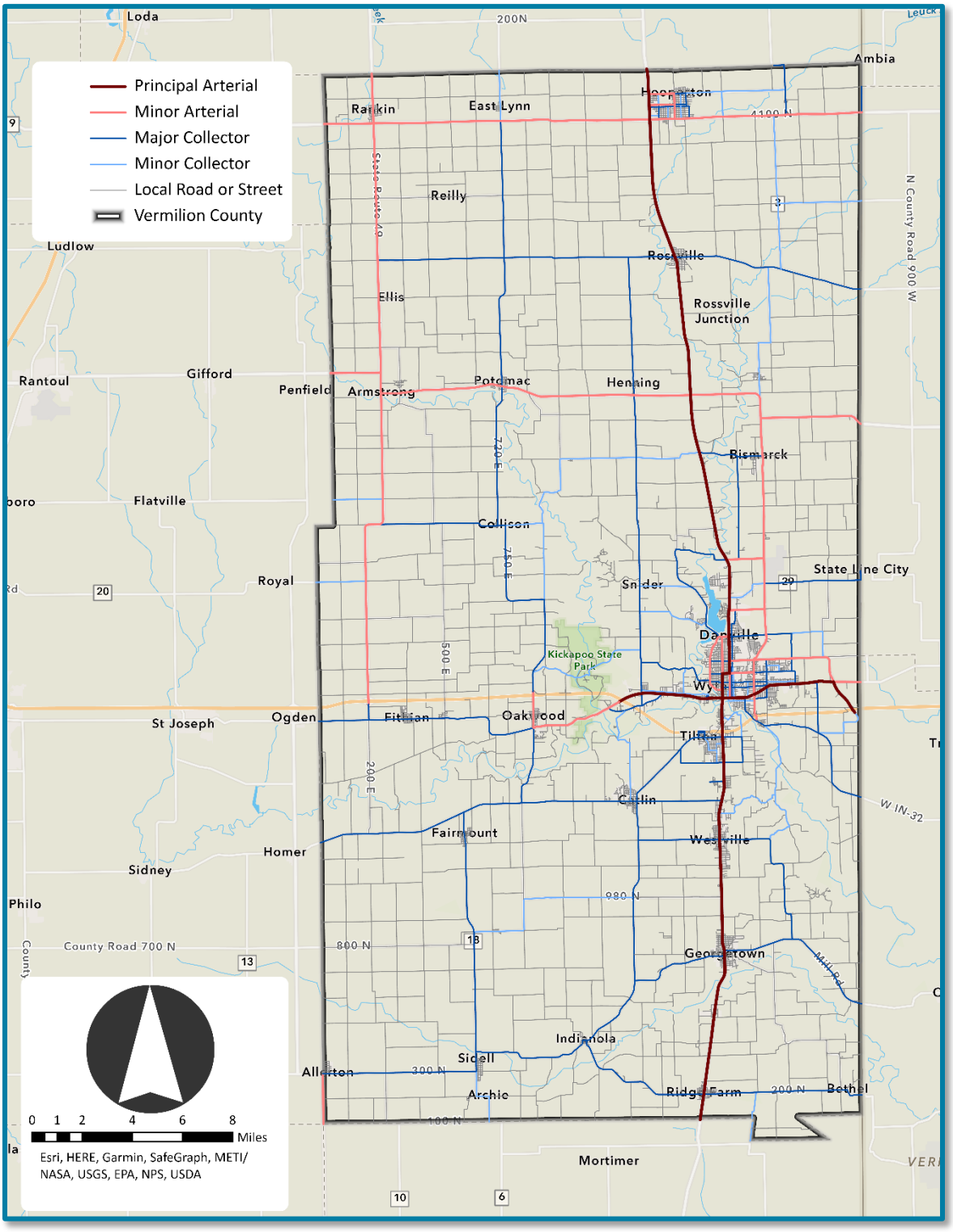
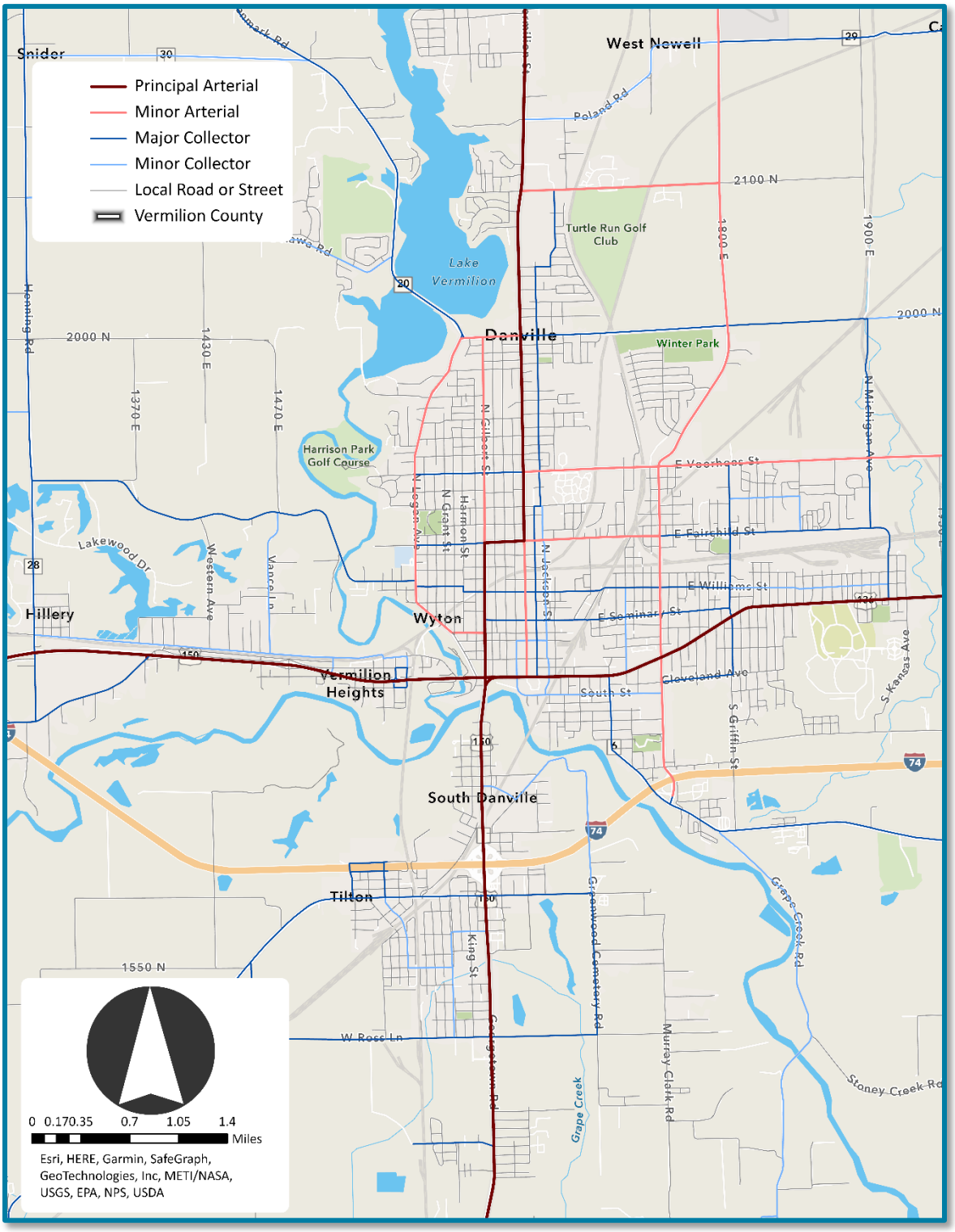


FIGURE 19 - FUNCTIONAL CLASS (DANVILLE)



Safety Index Score

To identify the HIN, Lochmueller Group created a safety index score for each segment and intersection. The safety index score evaluated each segment and intersection by the observed crash history. The safety index score represents a data-driven metric for overall roadway safety.

The safety index score relies on two input statistics:

1. Crash Frequency – number of crashes per mile, per year
2. Equivalent Property Damage Only (EPDO) Weighted Frequency – crash frequency weighted by crash costs

The input statistics captured both the number of crashes and the relative severity of crashes occurring at locations. Both input statistics were calculated by aggregating crashes along segments (within 75 feet) and at intersections (within 75 feet). Input statistics for intersections did not include length. The crash cost weights for the EPDO weighted frequency statistic were gathered from the FHWA Safety Program "Crash Costs for Highway Safety Analysis". The crash costs for Illinois used in this analysis are shown in Table 7 and represent the total societal costs for each crash type to be used in benefit-cost analysis in Illinois. Societal costs represent all costs over the victim's lifespan that result from the crash and include medical costs, emergency services, property damage, loss of productivity, and monetized Quality-Adjusted Life Years (QALYs) (FHWA-HRT-05-051). In an average year from 2017 to 2021, societal crash costs for Vermilion County were over $100 million (2022 dollars).

TABLE 7 - ILLINOIS DOT COMPREHENSIVE CRASH COST FOR BENEFIT COST ANALYSIS

Level of Severity	Comprehensive Crash Cost
Fatal	$6,245,736
A-Injury	$336,521
B-Injury	$123,079
C-Injury	$0
Property Damage Only	$0

Once both input statistics were generated, they were standardized. Standardization accomplished two main goals: allowed the data to be aggregated on a common scale and mitigated the influence of outliers. For this analysis, the robust standardization method was applied because of its effectiveness at mitigating the influence of outliers. After both input statistics were standardized, there were aggregated to create the safety index score. The safety index score should be used in comparison to other scores in the network, it should not be interpreted on its own as a standalone number.

To determine the HIN based on the safety index score, the safety index score was reclassified by quantile class. This method classified the safety index score by 20th percentile bins. The 80th percentile bin, top 20% of safety index scores, was identified as the HIN.

The HIN represents approximately 120 miles of roadway (6% of total county centerline miles) and accounts for 62% of all crashes, 98% of fatal crashes, 69% of KSI crashes, and 79% of bicycle and pedestrian crashes. Key HIN statistics are shown in Table 8.

TABLE 8 - HIGH INJURY NETWORK KEY STATS

	High Injury Network	Non-Interstate Network	HIN Percent of Non-Interstate Network
Mileage	127	2,049	6%
Crashes	2,709	4,396	62%
Bicycle/Pedestrian Crashes	81	103	79%
Fatal Crashes	44	45	98%
KSI Crashes	205	298	69%

The HIN is comprised of various functional classes including arterials, collectors, and local roads as shown in Table 9. Arterials make up 45% of the HIN while collectors make up 32% and local roads make up 23%. Not only do arterials make up the largest category of functional class within the HIN, but HIN arterials also have the highest average safety index score.

TABLE 9 - HIGH INJURY NETWORK BY FUNCTIONAL CLASS

Functional Class	**Miles**	**Percent of HIN**	**Average Safety Index (segments)**
Local Road or Street	27.4	23%	10.0
Minor Collector	7.1	6%	7.9
Major Collector	31.0	26%	12.7
Minor Arterial	30.5	25%	15.0
Other Principal Arterial	24.0	20%	16.9
Total	**119.9**	**100%**	**12.4**

The following maps illustrate the HIN in Vermilion County (Figure 20, Figure 21, and Figure 22). To further explore the HIN, please see the Vermilion County High Injury Network Web Map. (https://arcgis.lochgroup.com/portal/home/webmap/viewer.html?webmap=293cc1763e294573b308dc46c8d7a346)

FIGURE 20 - HIGH INJURY NETWORK (SEGMENTS ONLY)

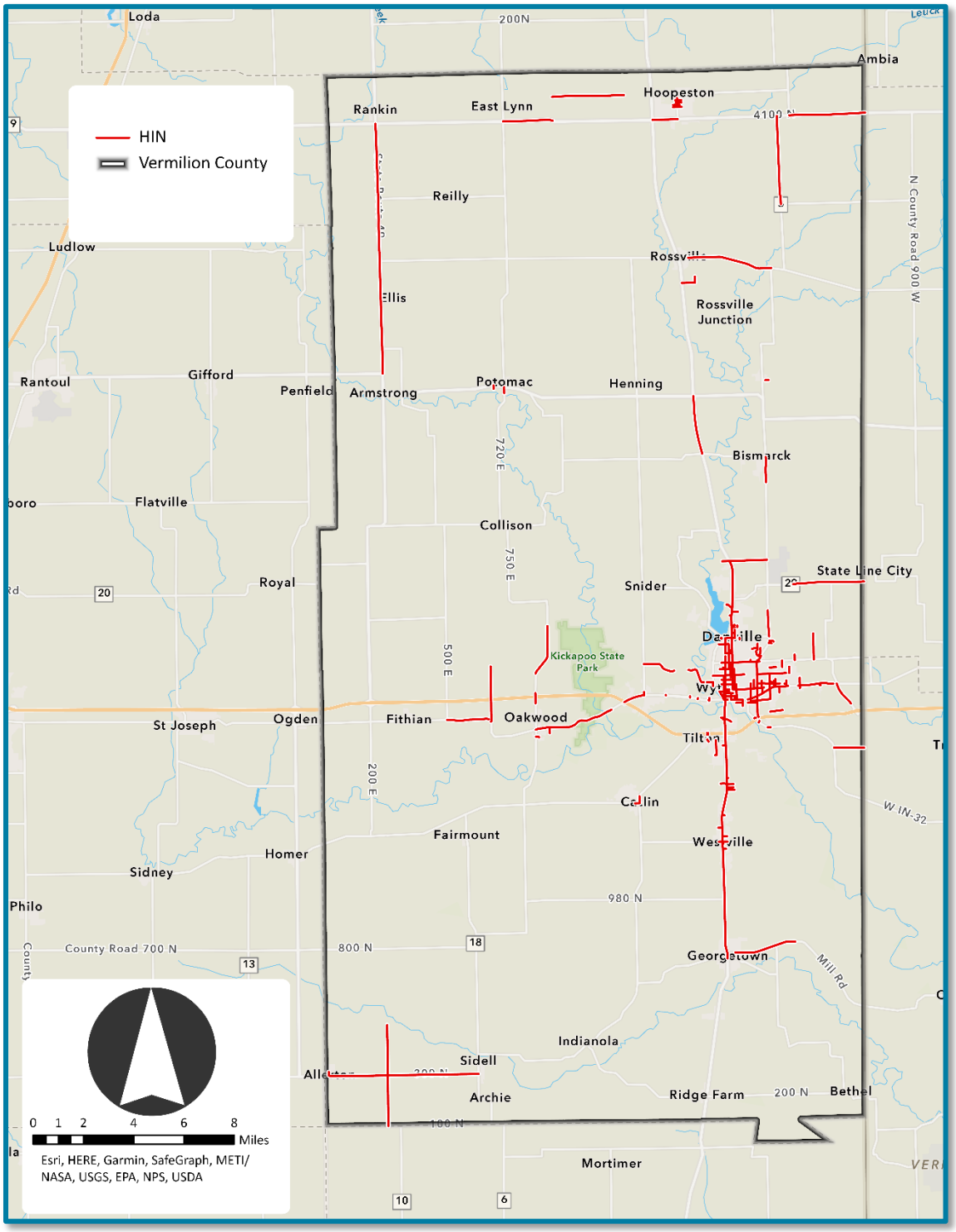


FIGURE 21 - HIGH INJURY NETWORK (INTERSECTIONS ONLY)

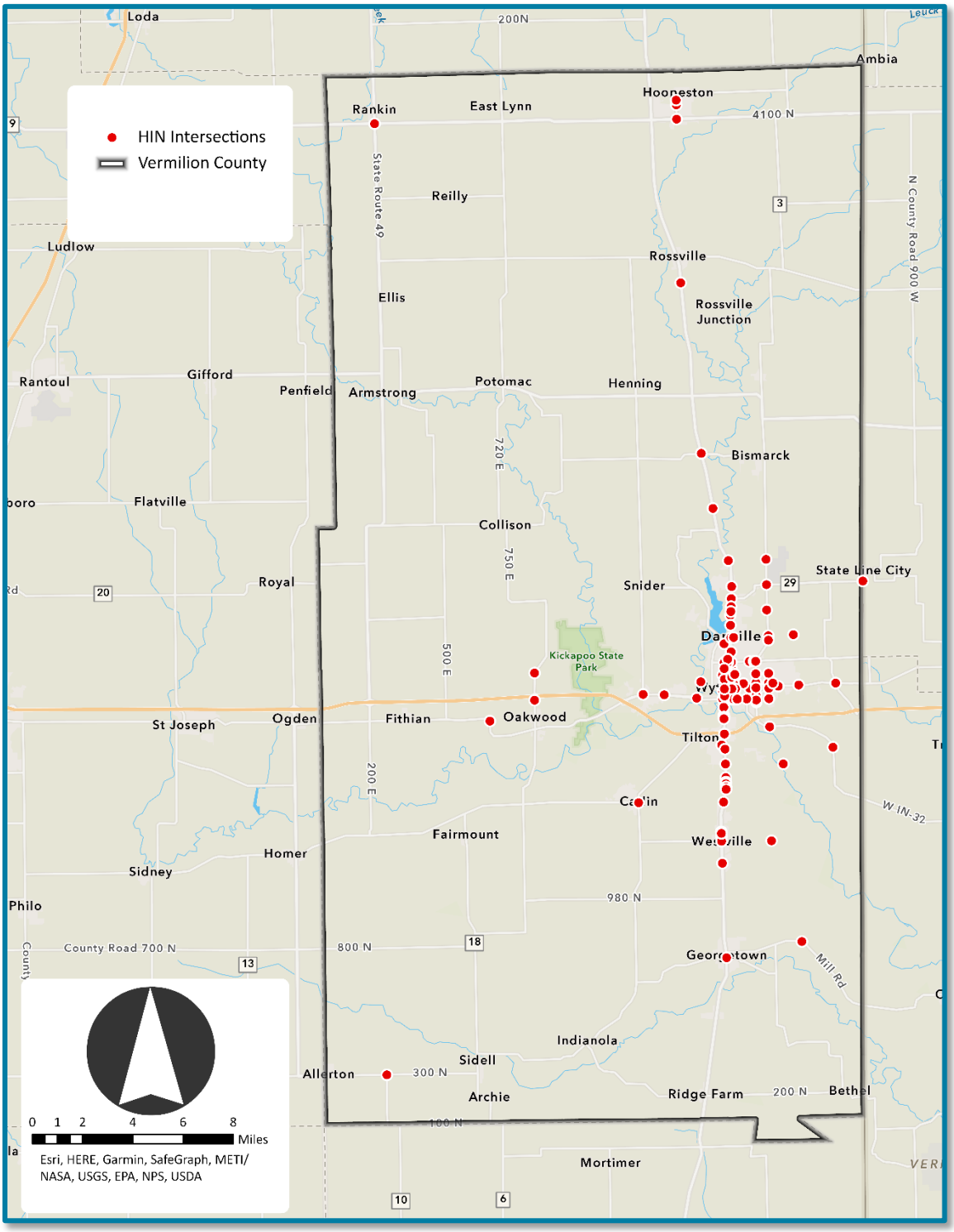
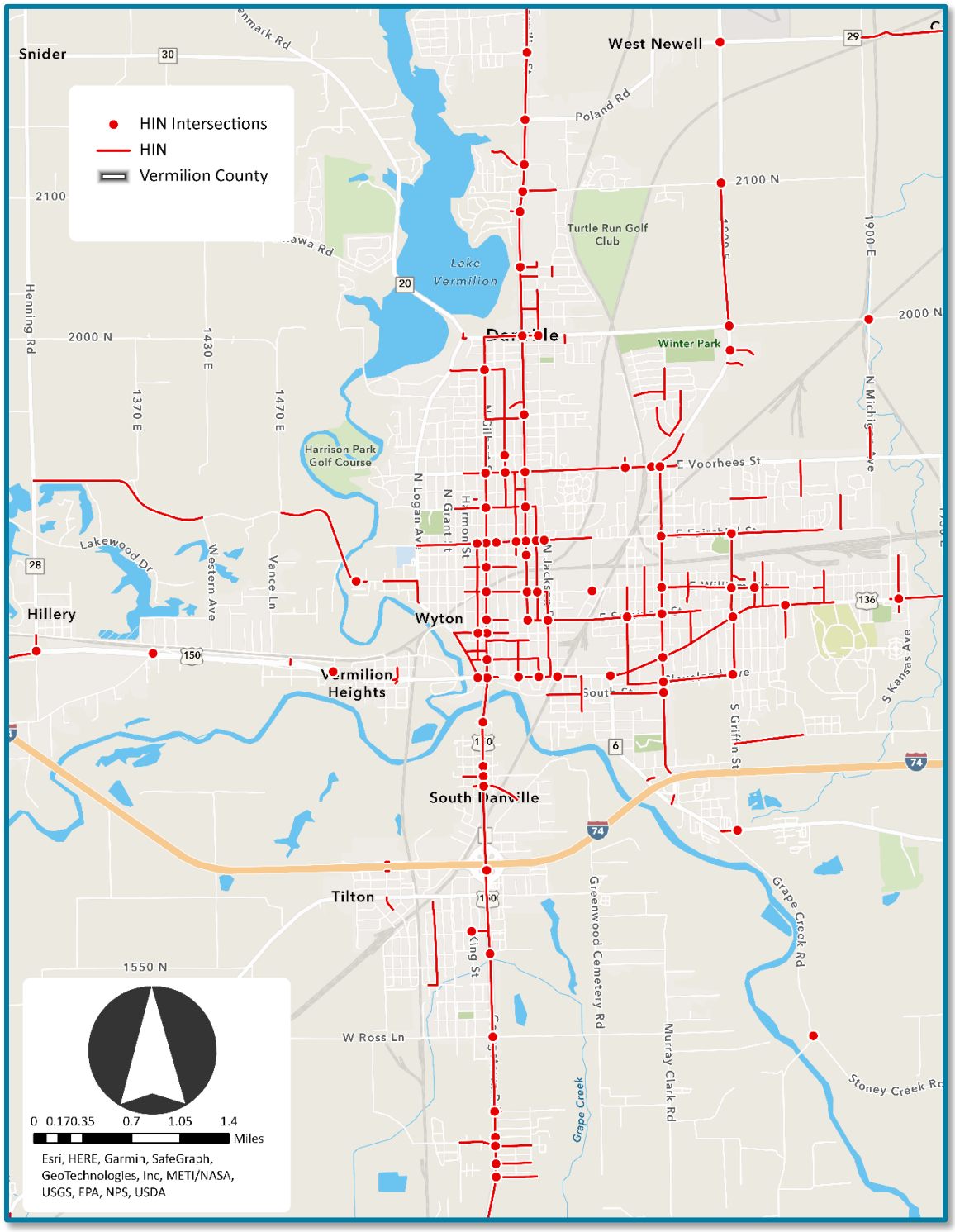


FIGURE 22 - HIGH INJURY NETWORK (DANVILLE)



MEMO

To: Vermilion County Safety Action Plan Steering Committee

From: Lochmueller Group

Date: April 5, 2023

Subject: Vermilion County Safety Action Plan Predictive Crash Analysis

Introduction to Wejo Connected Vehicle Data

A typical crash analysis that identifies prevailing crash patterns, high crash frequency locations, and a high injury network rely on historic crash data. Often, historic crash data prioritizes locations with high traffic volumes and minimizes crash risk on rural roadways with less traffic. With new advances in technology and connected vehicles, it is possible to analyze vehicle movements such as braking, acceleration, and speed separate from historic crash data. These vehicle movements can assist in identifying locations of near miss crashes or where vehicle movements indicate a serious injury crash is possible. Lochmueller Group partnered with Wejo, a data, analytics, and software-as-a-service provider that provides connected vehicle data, to investigate near miss crashes and high vehicle speeds. Wejo's connected vehicle data comes from over 13 million vehicles with 60+ sensors per vehicle to produce a rich and robust source of traffic insights. Key data points provided by Wejo include:

- Harsh braking events
- Harsh acceleration events
- Average speed (of all vehicles traveling along a roadway segment)

Lochmueller Group analyzed the Wejo connected vehicle data across four months from 2021 to account for any seasonal variations in traffic patterns. From the collection of data visualizations, key locations are identified as potential near miss or problematic locations. The goal with this analysis was to identify key locations in rural areas with increased crash risk that are not accounted for in the high injury network.

Data Limitations

As with any data source, the conclusions drawn from data are as good as the data used. As such, it is important to understand the Wejo connected vehicle data to provide context to our conclusions. Below are some limitations of the connected vehicle data:

- Does not represent all travel modes – the VCSAP is a plan to improve safety for all users of the transportation system including pedestrians, bicyclists, and transit riders. The Wejo connected vehicle data does not provide insights for all modes of travel and only reflects patterns and movements of vehicles.
- Does not represent all vehicles – connected vehicle technology is not necessarily a new technology but the amount and type of vehicle sensors is rapidly evolving. Because of this, the Wejo data may be bias towards newer vehicles. Additionally, Wejo sources the data directly from automakers but for reasons of propriety, it is unclear from which automakers Wejo does and does not obtain data. Therefore, there may be bias in terms of vehicle make, model, or class (truck vs car).

Huntington Tower, 201 W Springfield Avenue, Suite 1012
Champaign, Illinois 61820
PHONE: 217.673.7633

Harsh Braking Events

Harsh braking events were analyzed to show possible near miss crashes where vehicles were making aggressive or defensive maneuvers to slow down quickly. Harsh braking events can occur at intersections with limited visibility, along congested corridors, or anywhere else where vehicle speeds make safe slowdowns unsafe or impractical. Harsh braking events may also indicate distracted driving, aggressive driving, or otherwise unsafe driving behaviors. The harsh braking events data was normalized by the number of sample vehicles in each segment for each time period thereby showing a harsh braking density. Potential near miss locations include:

- 200E from US 150 to Caitlin Homer Rd (Fithian, IL)
- SR 49 at 2500N (Armstrong, IL)
- 2030E from Vorhees St to Poland Rd (Bismarck, IL)
- 2750N from 990E to SR 1/US 136 (Bismarck, IL)
- 3550N from SR 49 to SR 1 (Rossville, IL)
- N 1950E Rd from SR 9 to county line (Hoopeston, IL)

Harsh Acceleration Events

Harsh acceleration events were analyzed to show possible near miss crashes where vehicles were forced to make aggressive maneuvers to speed up quickly. Harsh acceleration events can occur at intersections with high-speed roadways. Harsh acceleration events may indicate aggressive driving behaviors or reflect a challenge to access roadways with high-speed traffic. The harsh acceleration events data was normalized by the number of sample vehicles in each segment for each time period thereby showing a harsh braking density.

Average Vehicle Speeds

Average vehicle speeds were analyzed to show locations where speed in consistently above the posted speed limit. These locations do not necessarily indicate the possibility of near miss crashes but rather the risk of serious injury due to speed if a crash were to occur. For each roadway segment, the average vehicle speed was compared to the speed limit. The difference between average speed and speed limit is notable in the rural areas of the county. Essentially all rural roadways experience excess speeding including:

- SR 9
- SR 49
- CR 14/3550N
- 770E
- N 600E
- Caitlin Homer Rd
- Caitlin Indianola Rd
- Indianola Ridge Farm Rd
- 7785N/Mill Rd

FIGURE 1: JANUARY HARSH BRAKING

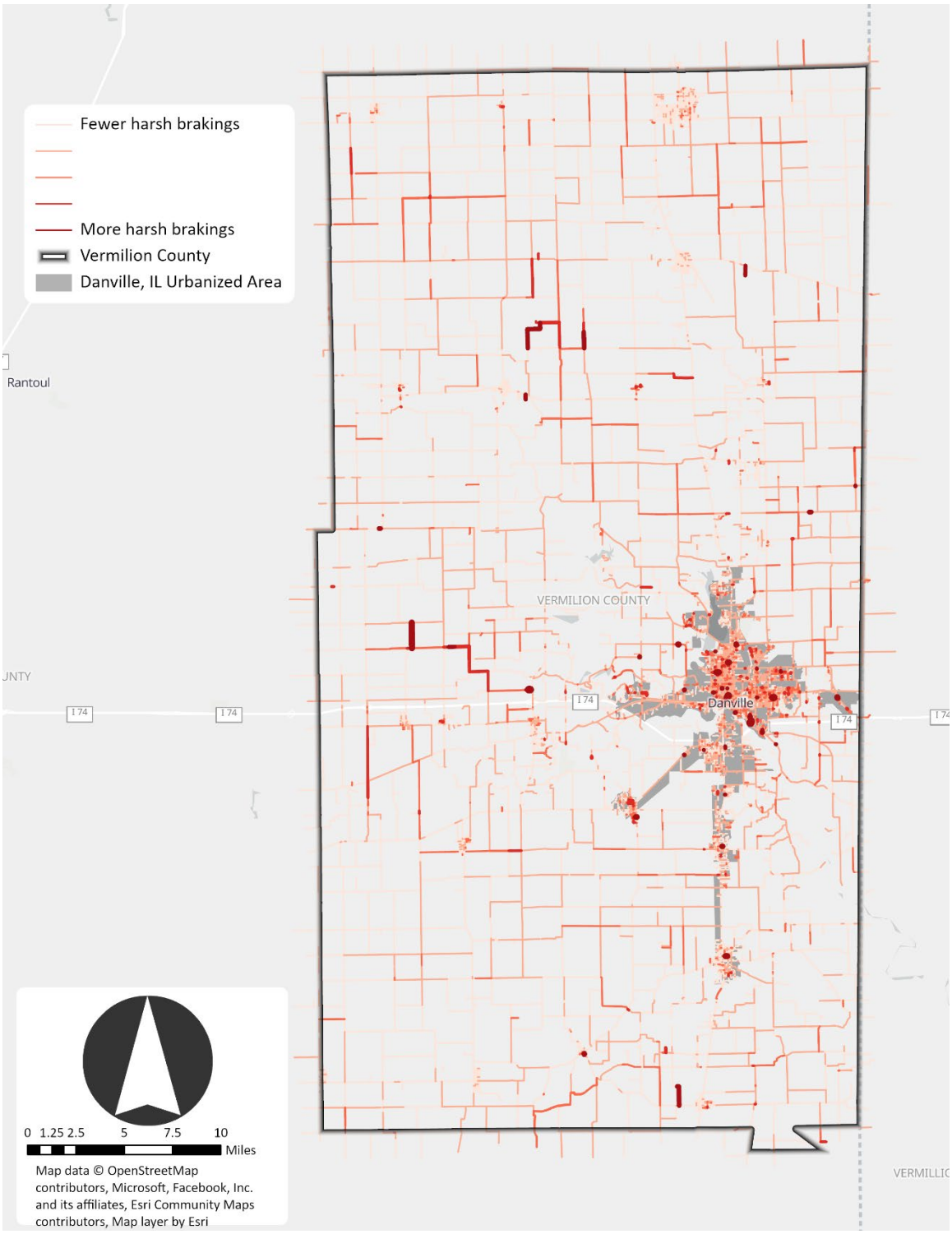


FIGURE 2: MAY HARSH BRAKING

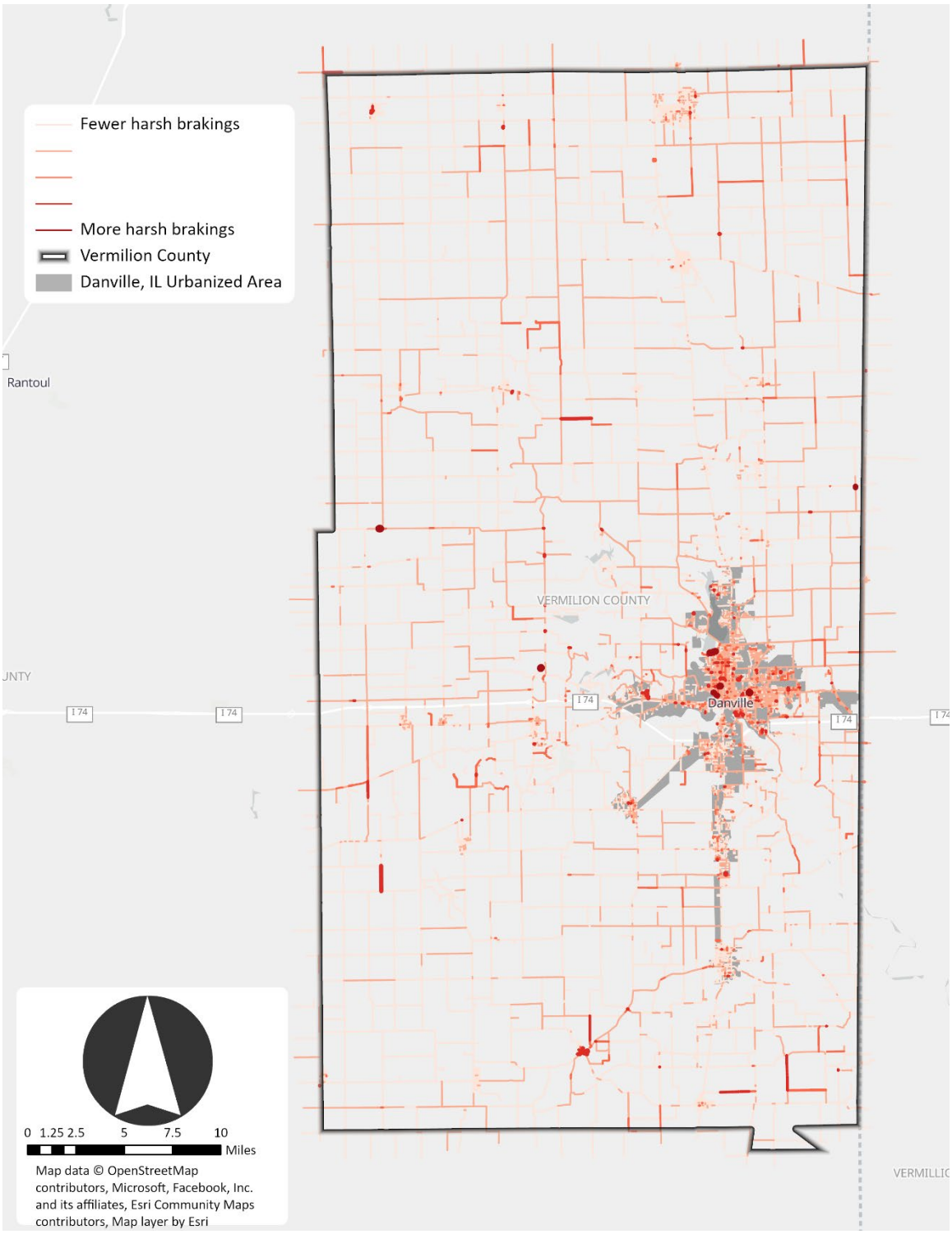


FIGURE 3: AUGUST HARSH BRAKING

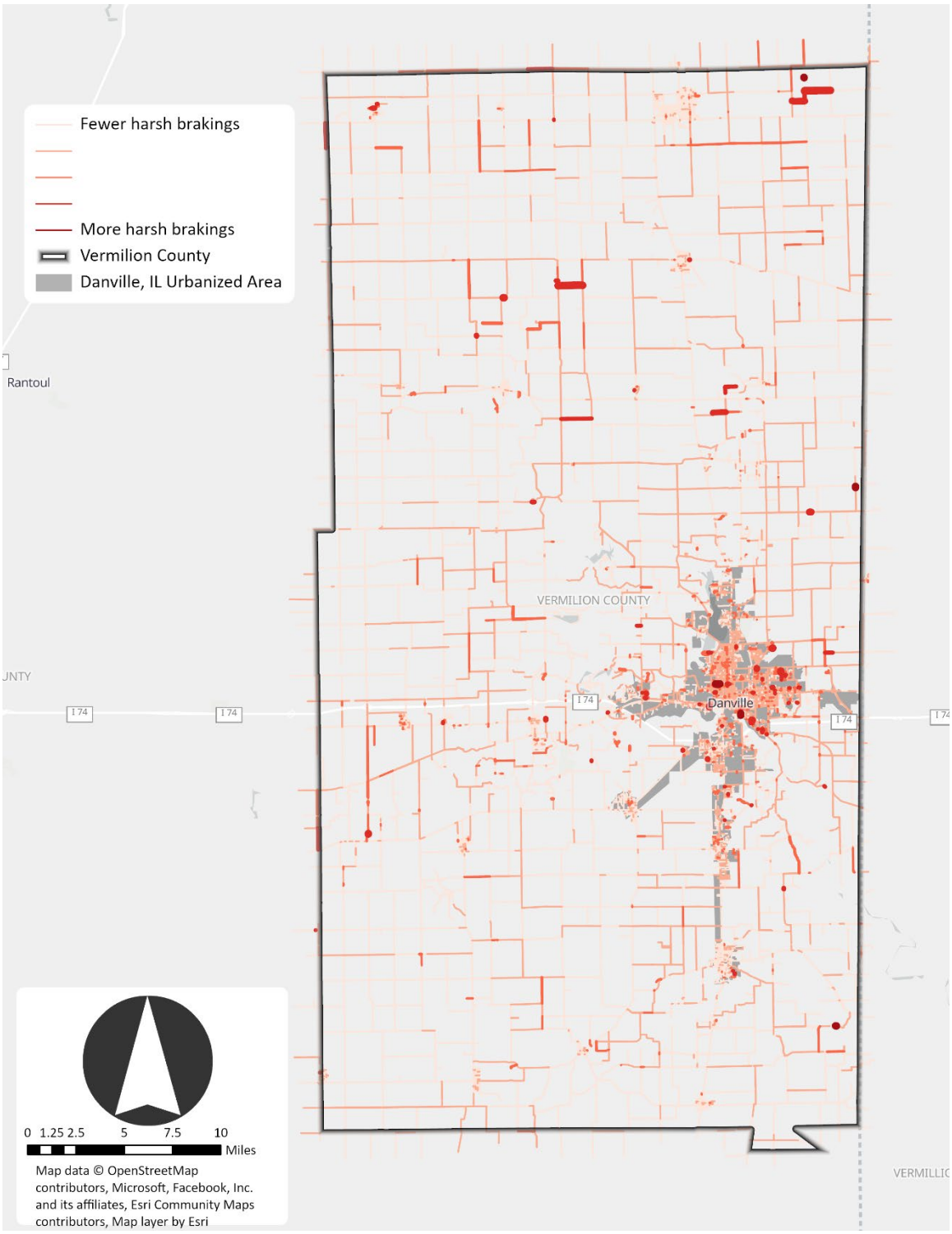


FIGURE 4: OCTOBER HARSH BRAKING

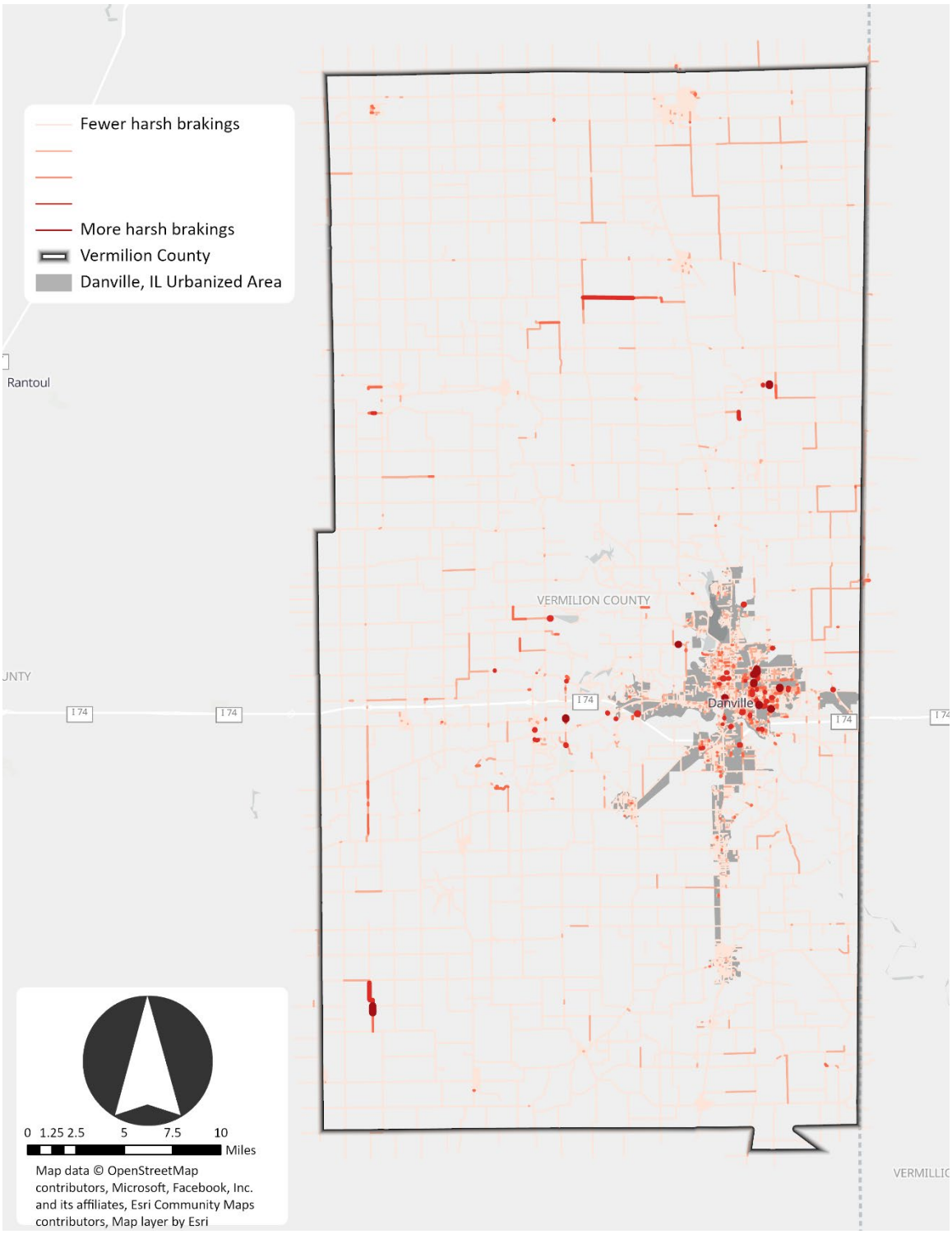


FIGURE 5: JANUARY HARSH ACCELERATION

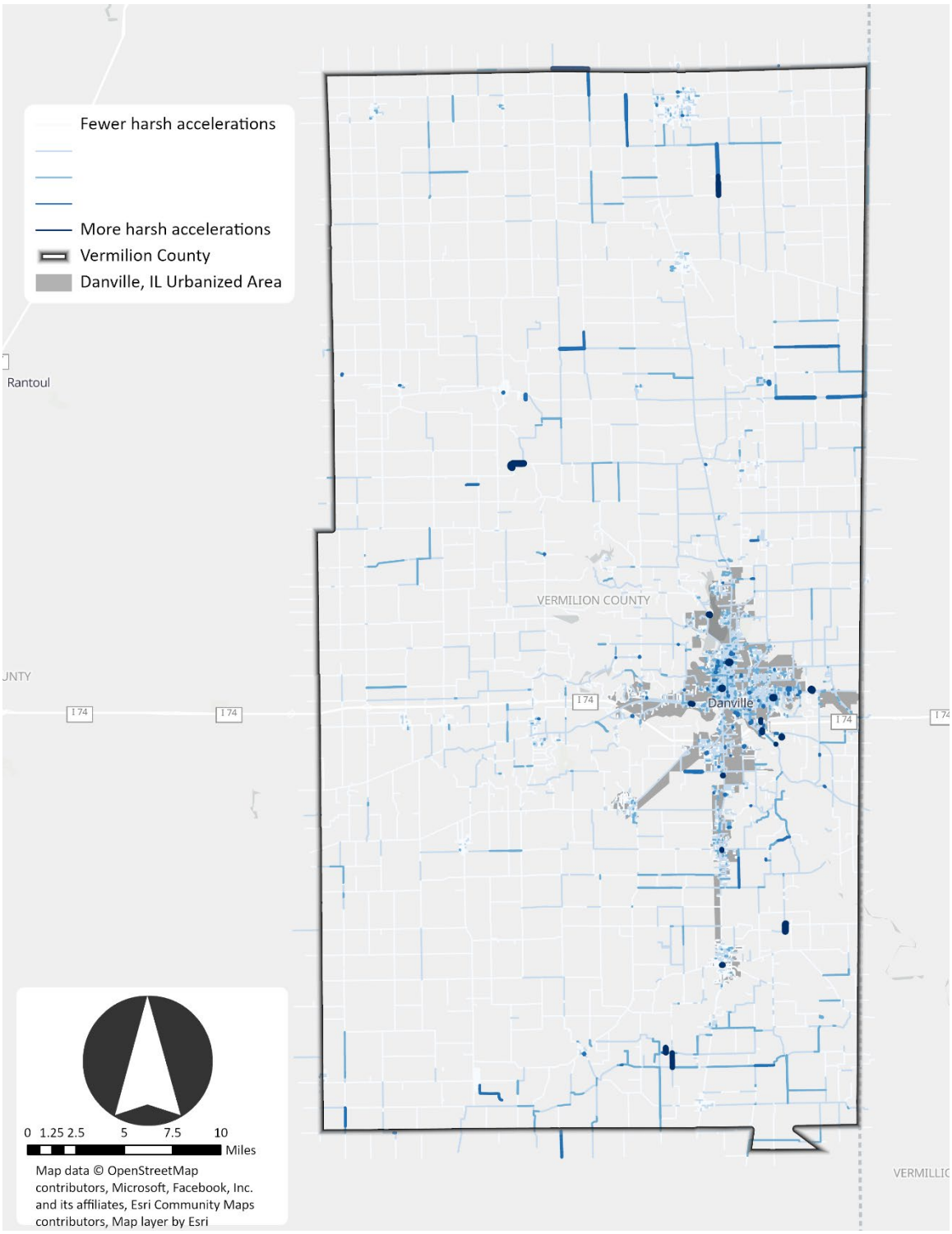


FIGURE 6: MAY HARSH ACCELERATION

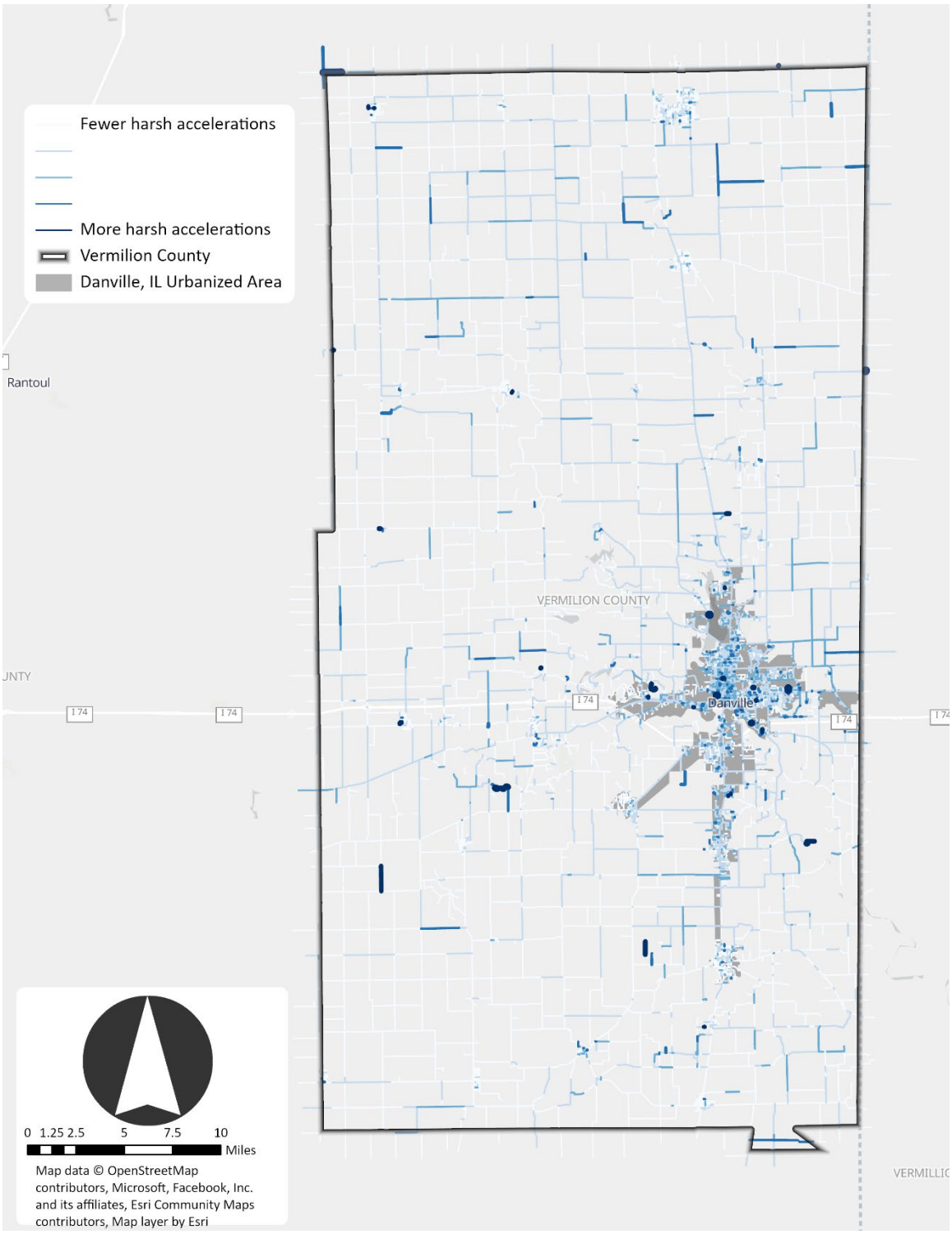


FIGURE 7: MAY HARSH ACCELERATION

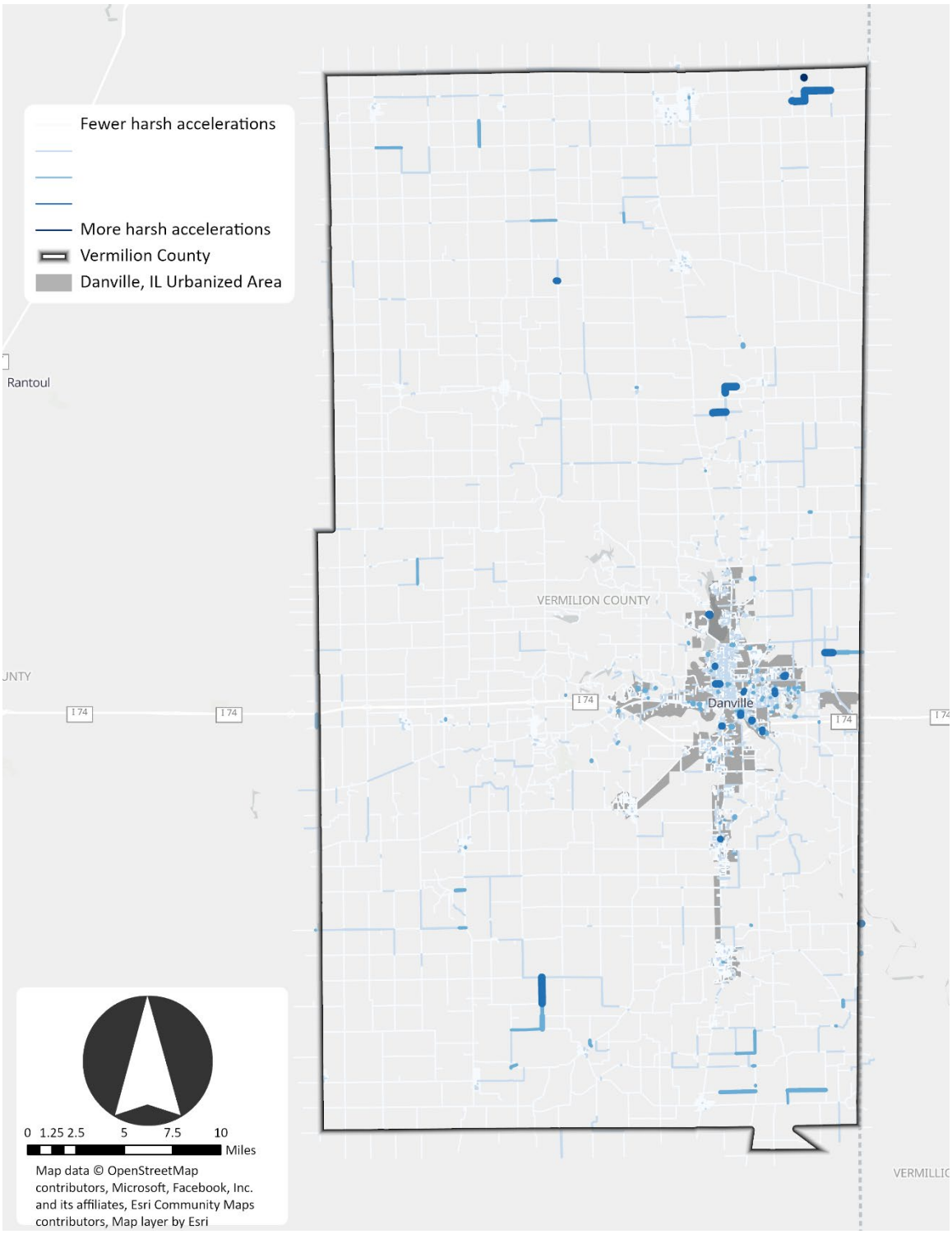


FIGURE 8: OCTOBER HARSH ACCELERATION

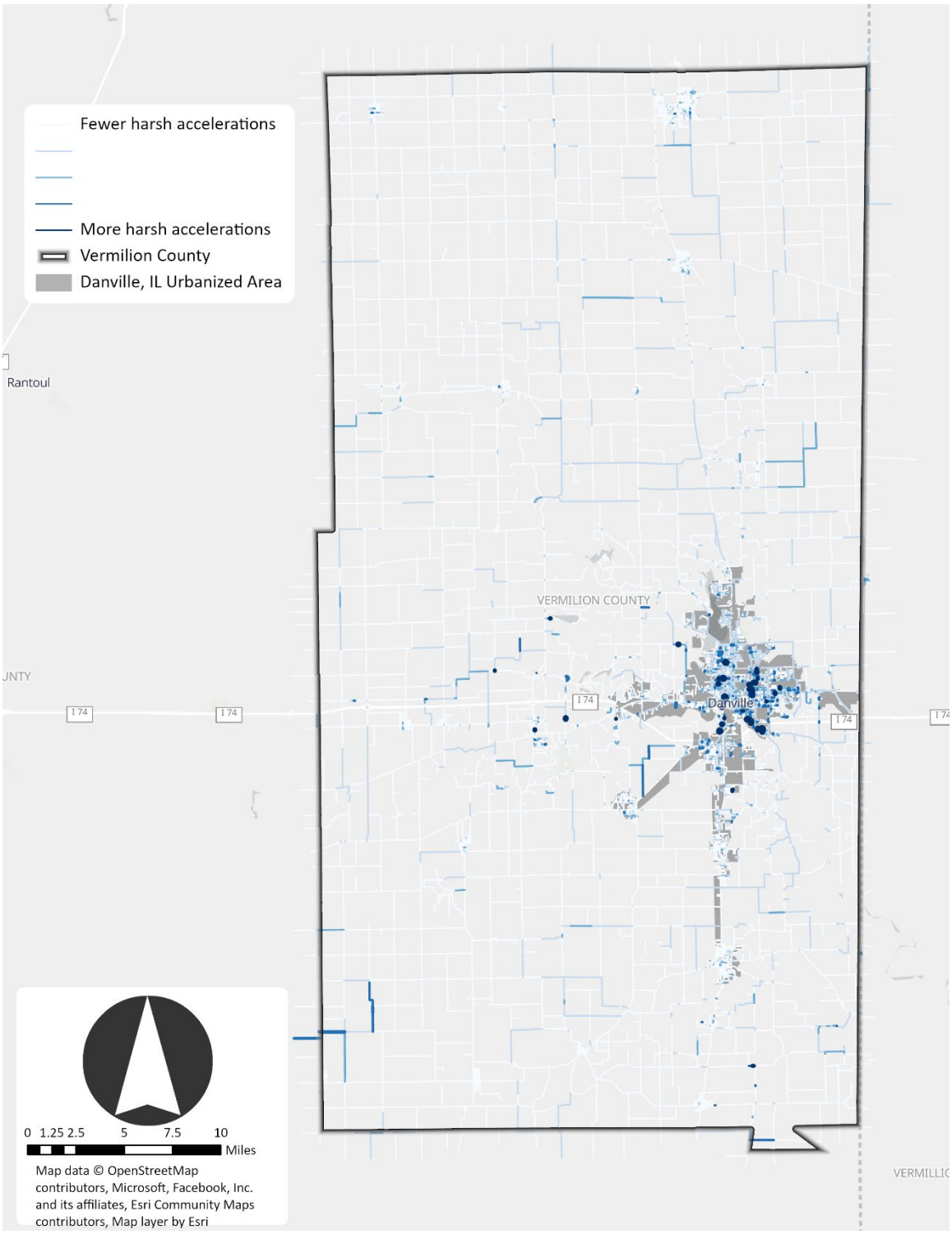


FIGURE 9: JANUARY AVERAGE SPEEDS

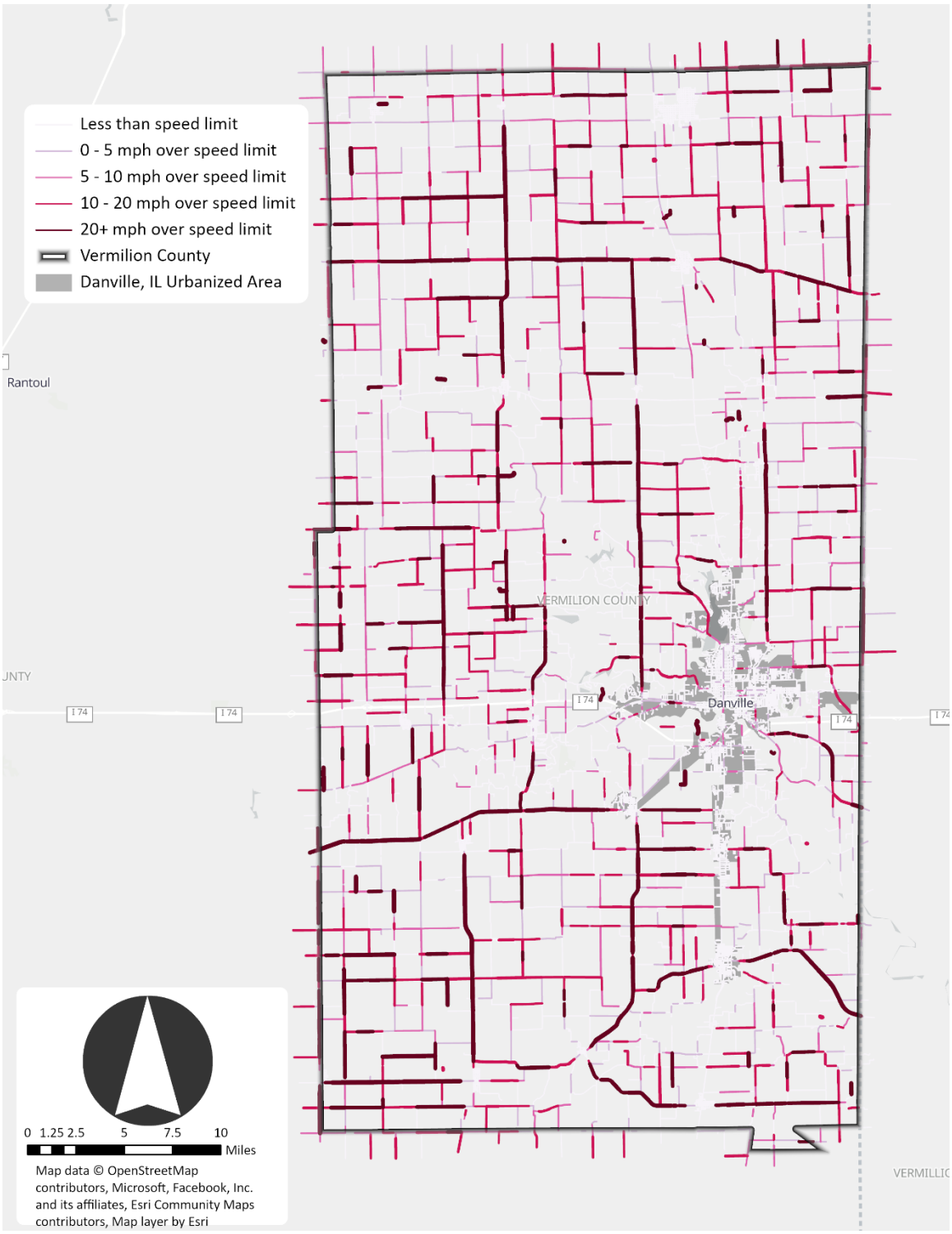


FIGURE 10: MAY AVERAGE SPEEDS

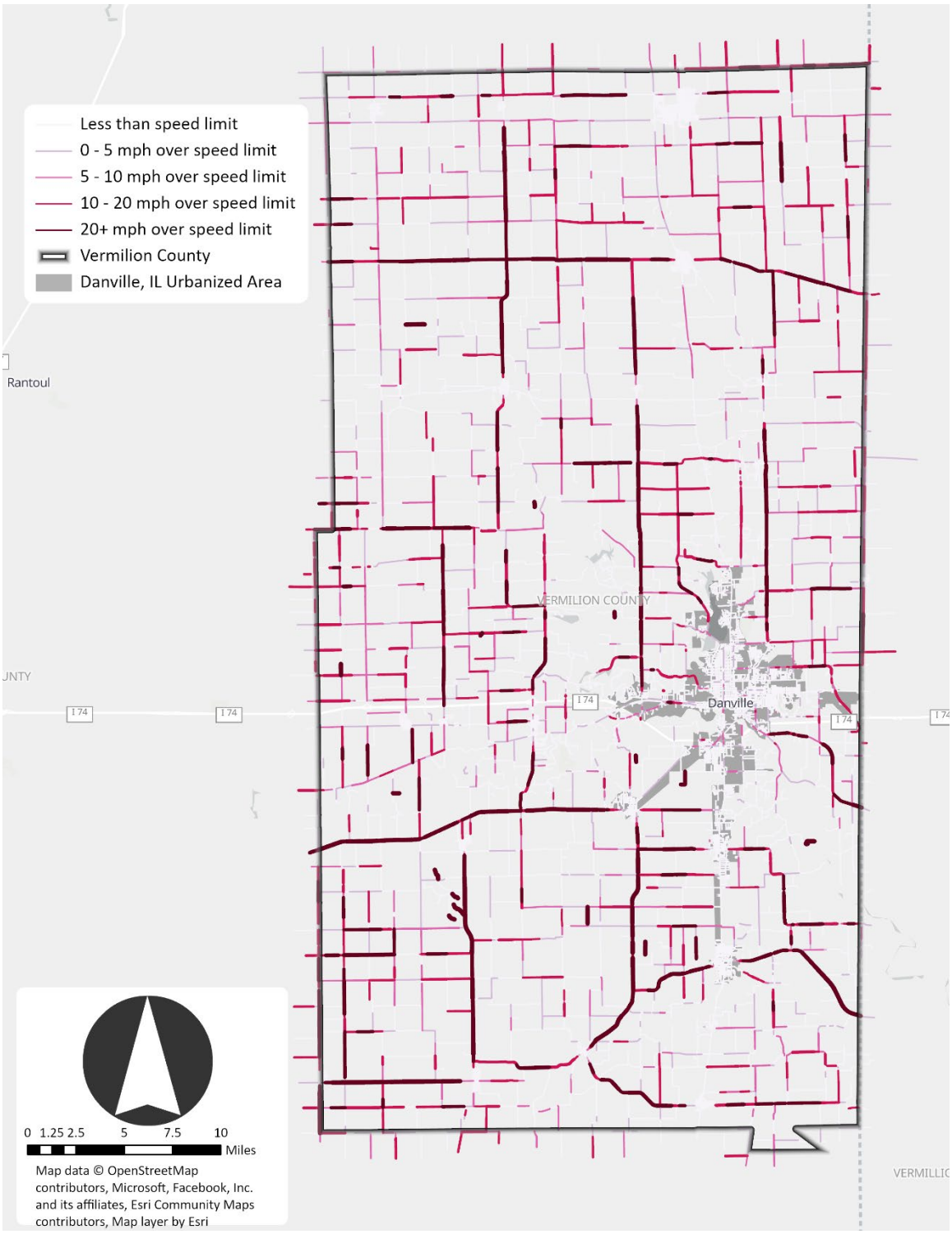


FIGURE 11: AUGUST AVERAGE SPEEDS

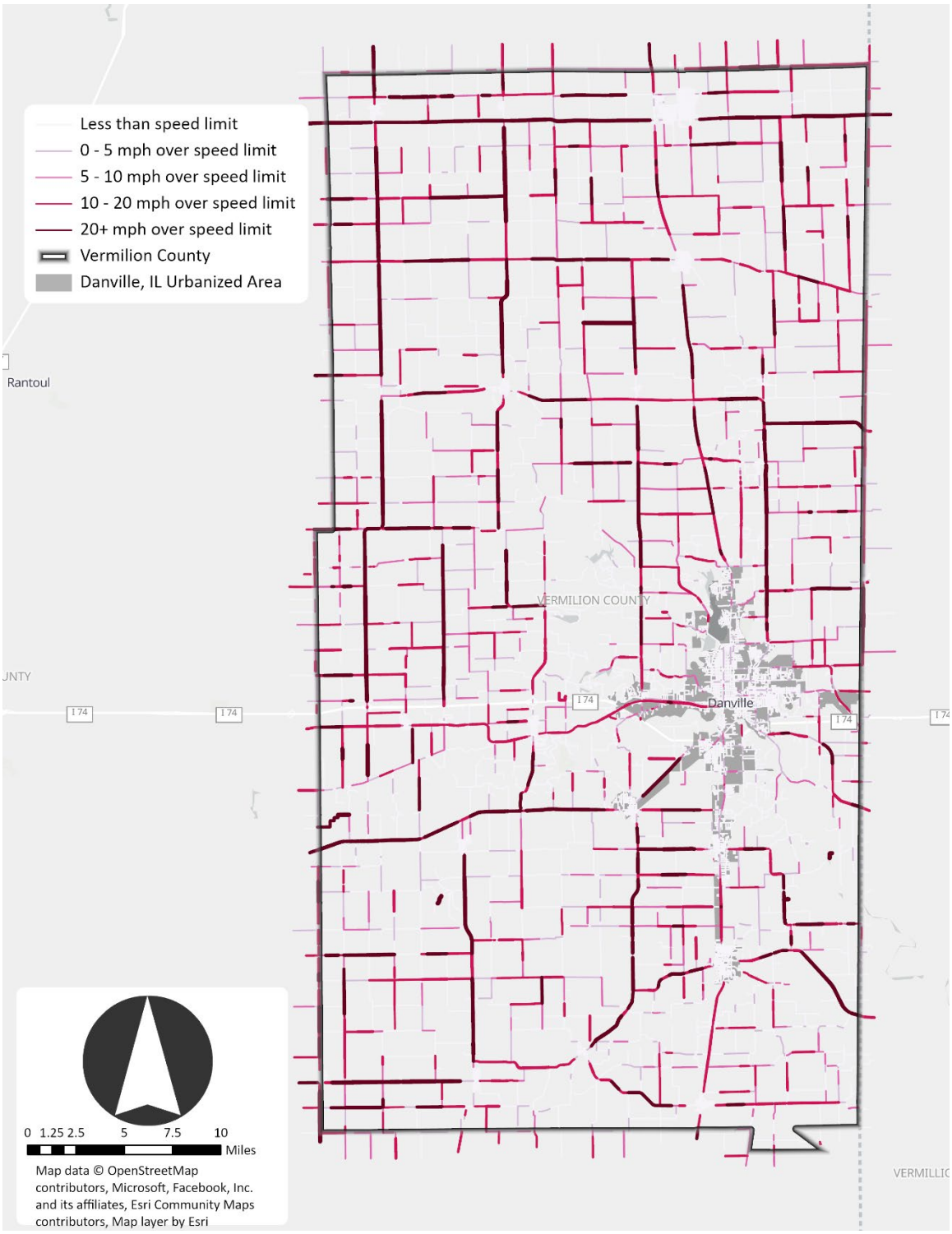
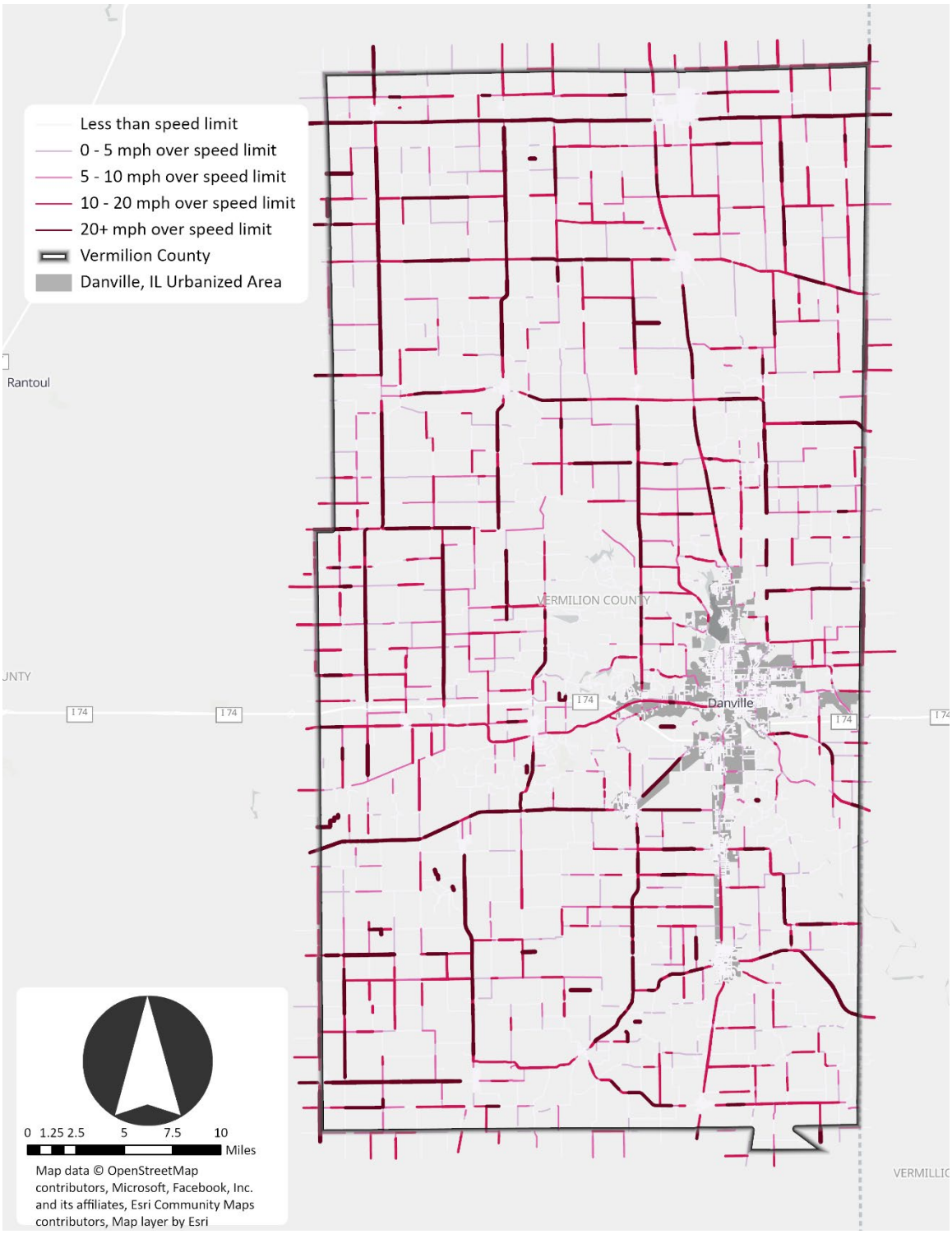


FIGURE 12: OCTOBER AVERAGE SPEEDS



MEMO

To: Vermilion County Safety Action Plan Steering Committee

From: Lochmueller Group

Date: March 9, 2023

Subject: Vermilion County Safety Action Plan Equity Analysis

Introduction

Without access to safe transportation choices, residents may have difficulty traveling to work, to school, to the doctor, or to friends and family. A safe transportation system creates more opportunities for all Vermilion County residents and helps to reduce the disparate economic, environmental, and health burdens experienced by disadvantaged and underserved communities. Historically disadvantaged populations such as people of color, people living in poverty, and people with limited English proficiency not only rely on alternative modes of transportation such as walking, biking, and transit, but may live in areas with limited or poor transportation infrastructure that contributes to unsafe travel conditions.

Vermilion County is committed to an equitable distribution of safety improvements so that all residents of all abilities can feel safe when traveling. This equity analysis identifies locations with higher concentrations of disadvantaged populations in order to more equitably prioritize safety improvements. The locations identified are termed Equitable Target Areas (ETA) and will serve the steering committee, Vermilion County, and the community as a valuable resource to improve equity throughout the community.

Demographic Indicators

Six demographic indicators were used to identify disadvantaged populations and develop the ETAs (shown in Table 1. For each demographic indicator, block group level data was used from the U.S. Census Bureau 2017-2021 American Community Survey (ACS) estimates.

TABLE 1 - DEMOGRAPHIC INDICATORS

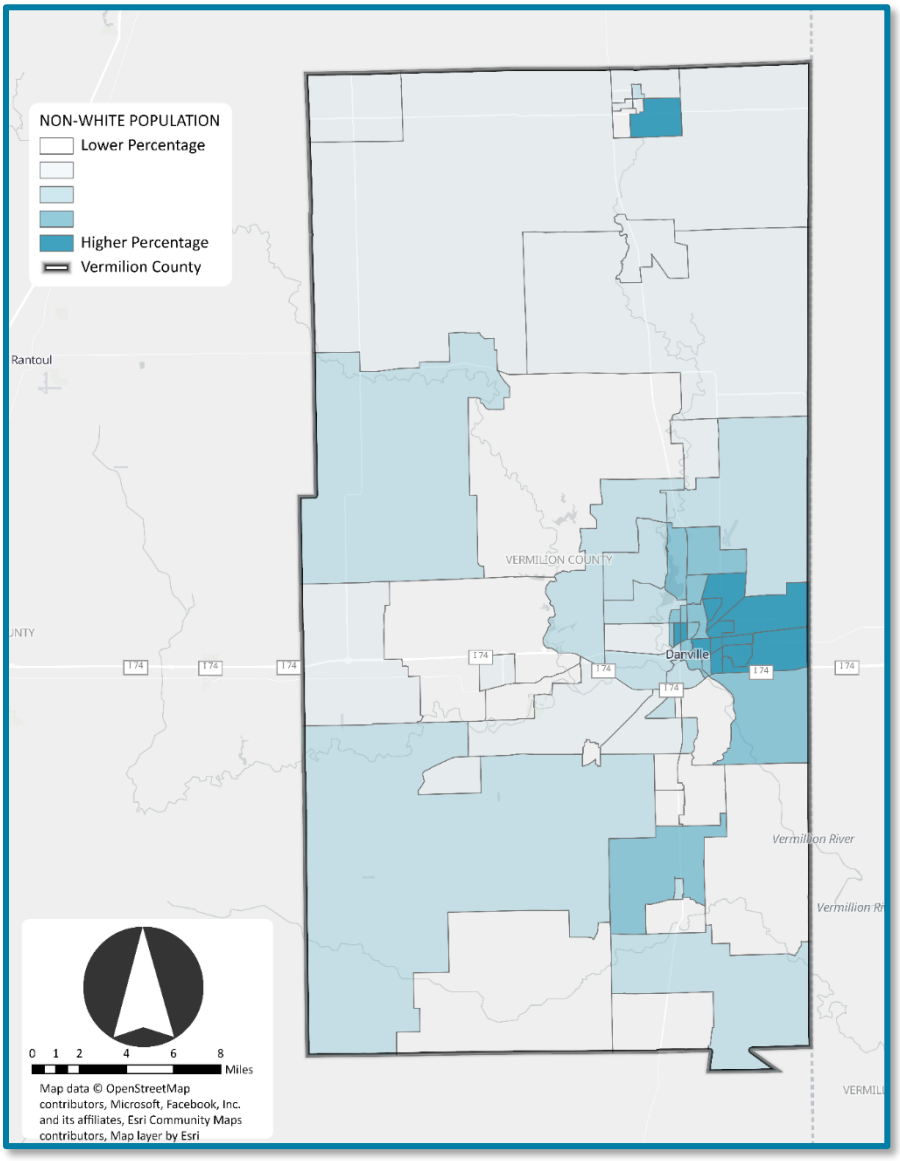
Demographic Indicator	Description
People of Color	Percent of total population reported as non-white.
Poverty	Percent of households with income in the past 12 months below poverty level.
Limited English Proficiency	Percent of households reported as limited English speaking.
Senior Citizens	Percent of total population age 65 and over.
Individuals with a Disability	Percent of population with a disability.
No Access to a Vehicle	Percent of households with no vehicles available.

People of Color

People of color are more likely to live in communities with poor transportation infrastructure and limited access to jobs and educational opportunities. Non-white populations are more dependent on active transportation (walking and biking) and transit and are disproportionally burdened by poor safety outcomes.

As shown in Figure 1, higher concentrations of people of color are found in the central and eastern portions of Danville, the eastern portions of the county, and near Hoopeston. The highest concentrations of people of color are found near East Vorhees St. in and northeast of Danville at 87% of the population reported as non-white.

FIGURE 1 - PEOPLE OF COLOR

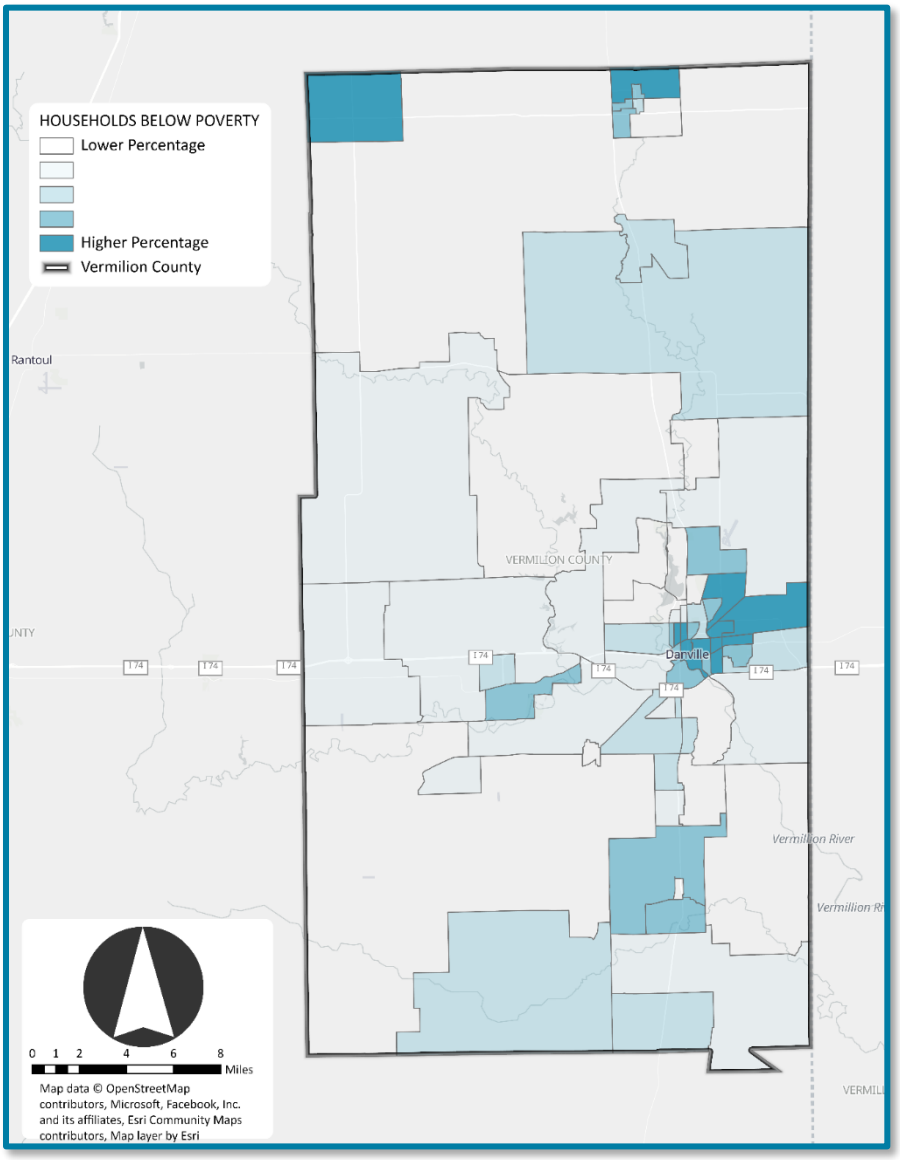


Poverty

Household below poverty have limited access to resources such as high-quality transportation infrastructure, jobs, and educational opportunities. Households in poverty are more burdened by the cost of vehicle ownership and are therefore more likely to rely on walking, biking, and transit.

Shown in Figure 2, high concentrations of poverty are found in central Danville, eastern Danville, and in northern portions of the county near Hoopeston and Rankin. The highest concentrations of poverty are found near East Vorhees St. in and northeast of Danville at 60% of households with income below poverty level.

FIGURE 2 - POVERTY

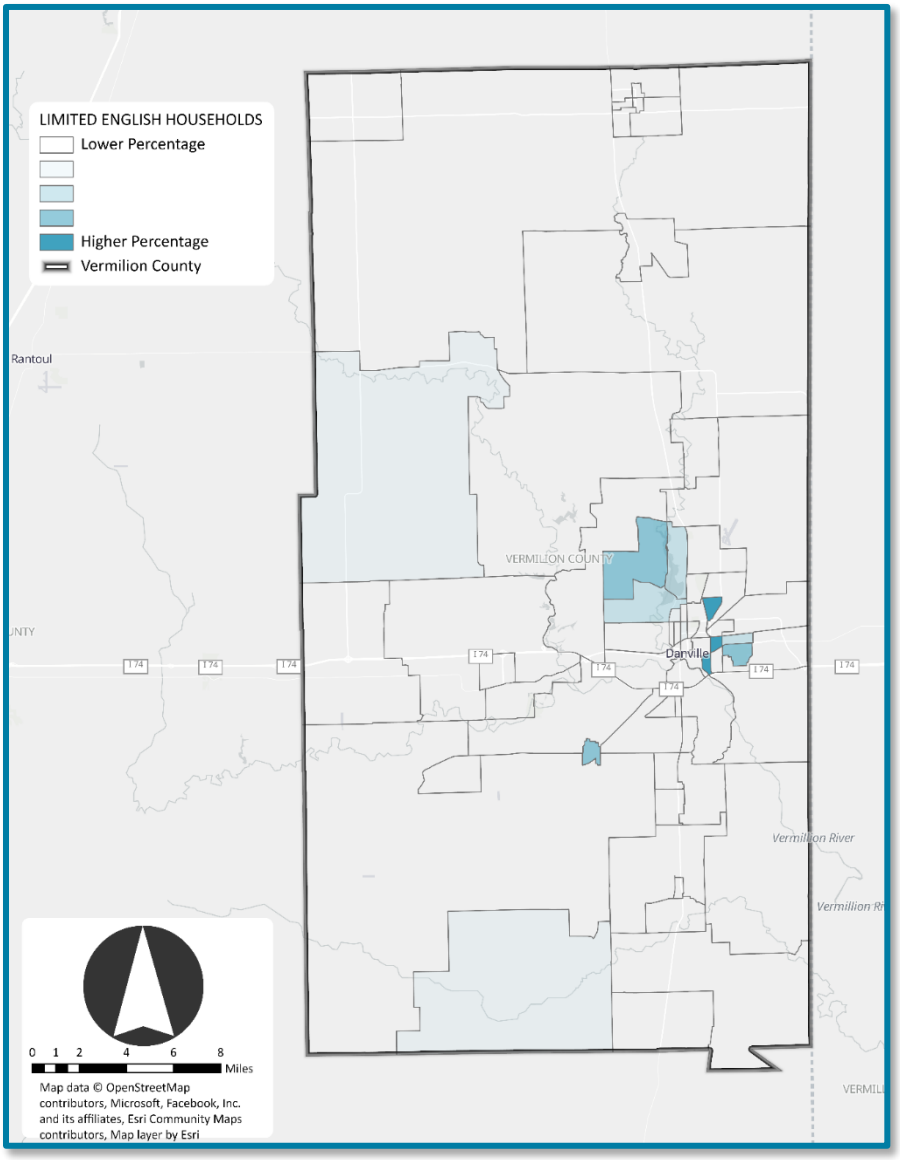


Limited English Proficiency

Individuals with limited English proficiency (LEP) are less likely to participate in public settings and can be overlooked during discussions of infrastructure improvements. LEP individuals are more dependent on walking, biking, and transit.

Although most households within Vermilion County speak English without limitations, there are some neighborhoods/areas in Danville where LEP households make up close to 10%. LEP households are shown in Figure 3.

FIGURE 3 - LIMITED ENGLISH PROFICIENCY

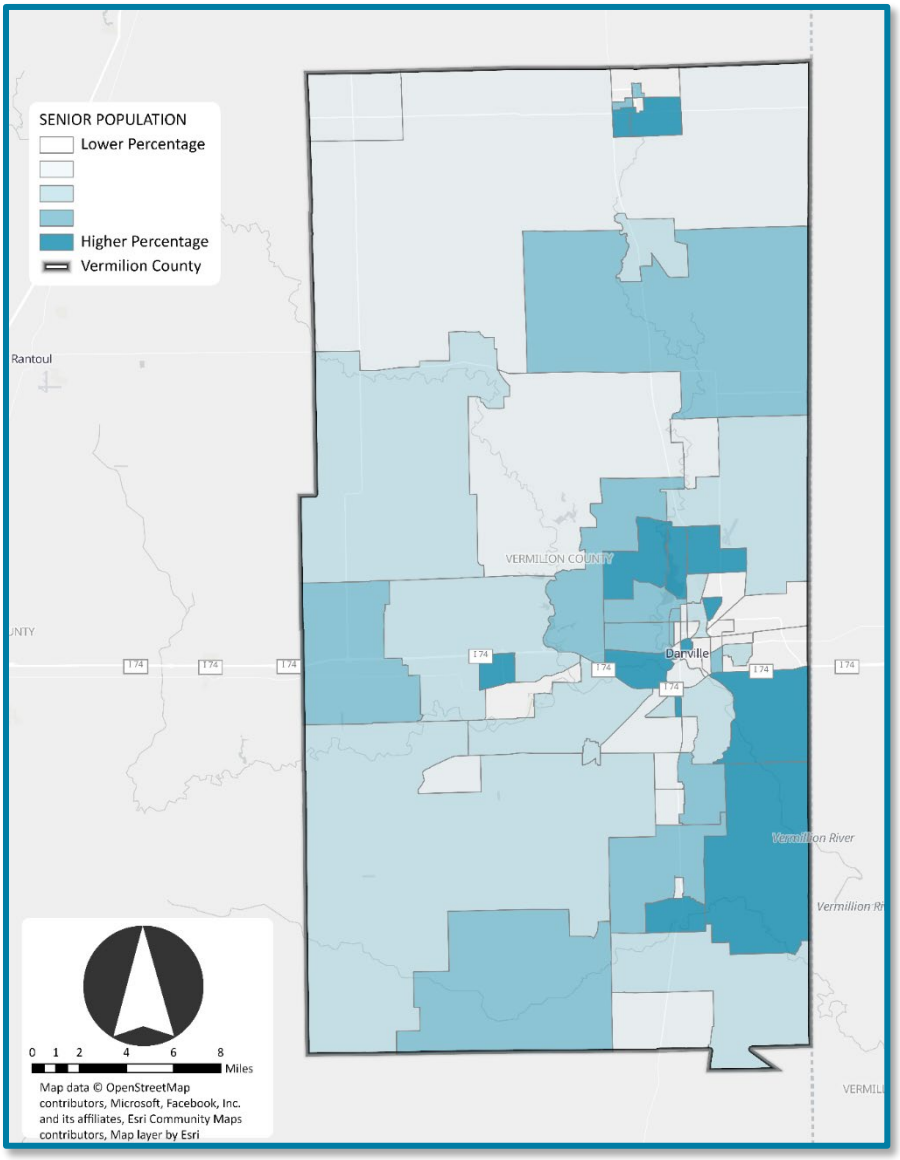


Senior Citizens

Persons aged 65 and over have mobility limitations and may need accommodations within the transportation system. As age limits or prohibits the ability to drive, senior citizens may increasingly rely on walking, biking, and transit to travel safety.

Figure 4 shows that senior populations are found in all part of Vermilion County but notably in higher concentrations in the rural areas southeast of Danville and north of Danville. However, the highest concentration of senior citizens (46%) is found near Hoopeston.

FIGURE 4 - SENIOR CITIZENS

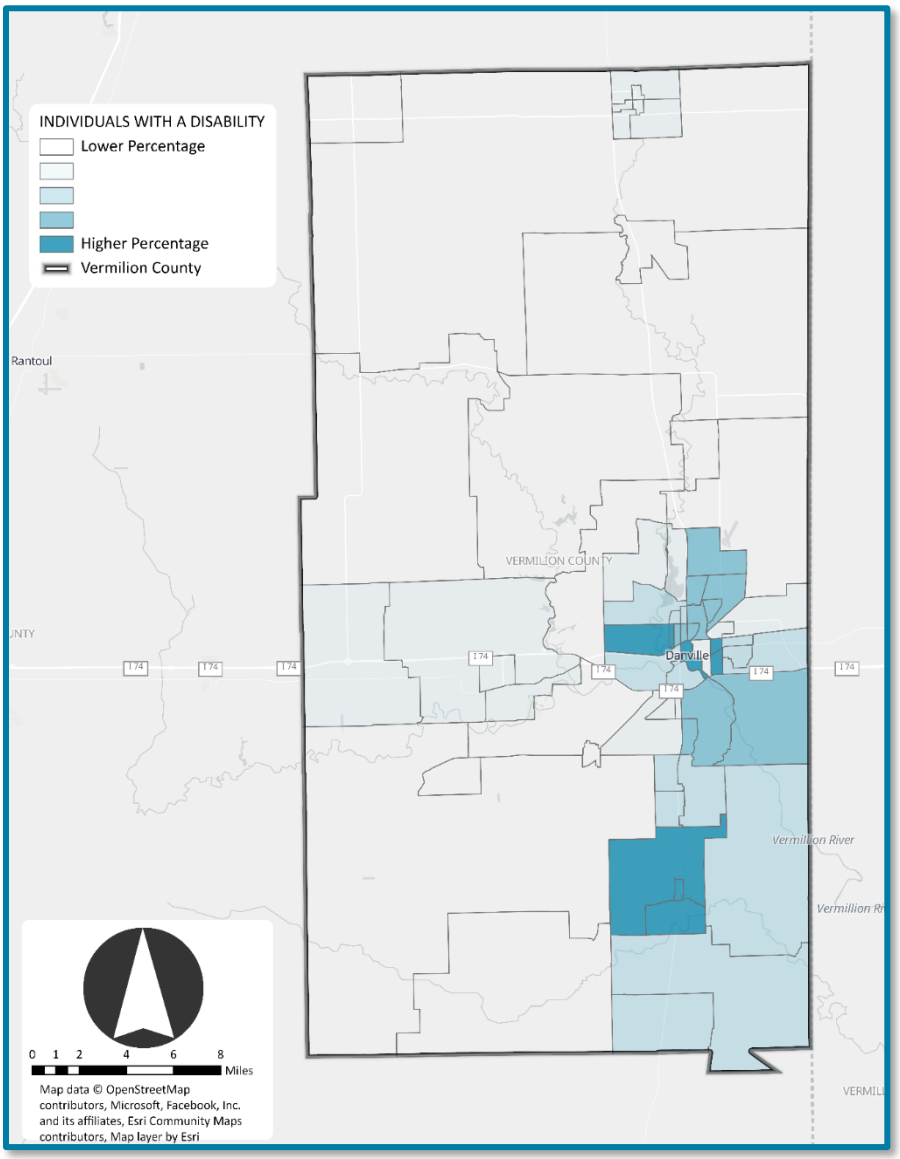


Individuals with a Disability

Individuals with a disability may have cognitive or mobility limitations that require accommodations within the transportation network such as universal design concepts.

Most likely due to proximity to social services and medical facilities, higher concentrations of individuals with disabilities are found in central Danville and in Georgetown (shown in Figure 5). The concentration of individuals with disabilities is significantly lower in rural areas.

FIGURE 5 - INDIVIDUALS WITH A DISABILITY

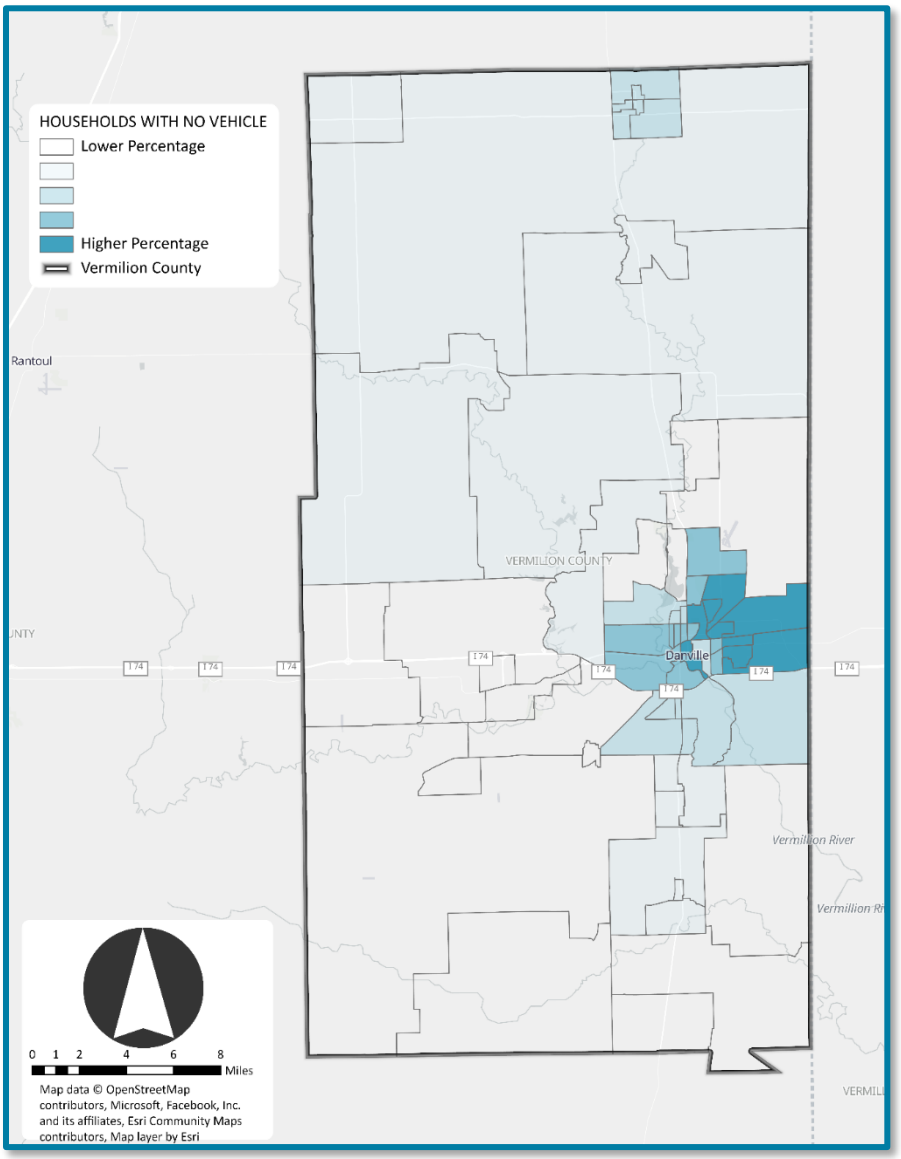


No Access to a Vehicle

Households without access to a vehicle rely on walking, biking, and transit to get to services such as jobs, medical facilities, grocery stores, and educational opportunities.

As expected, no access to a vehicle tracks closely with non-white populations as well as poverty. The highest concentrations of households without a vehicle are found throughout central and easter portions of Danville (shown in Figure 6).

FIGURE 6 - NO ACCESS TO A VEHICLE



Equity Index and Equitable Target Areas

The equity index is comprised of all six demographic indicators with equal weighting. The equity index is the average of the six demographic indicators; the indicators were aggregated, then divided by 6 in each block group. While the demographic indicators capture the geographic distribution and concentration of individual groups, the equity index represents the general extent to which an area is comprised of disadvantaged groups of people.

To determine the equitable target areas based on the equity index score, the equity index score was reclassified by quantile class. This method classified the equity index score by 20th percentile bins. The 80th percentile bin, top 20% of equity index scores, were identified as the ETA. The ETA represent a population of around 15,000 (20% of the county population) and almost 5,500 households (18% of county households). The equity index scores are shown in Figure 7 and the ETA are shown in Figure 8.

FIGURE 7 - EQUITY INDEX

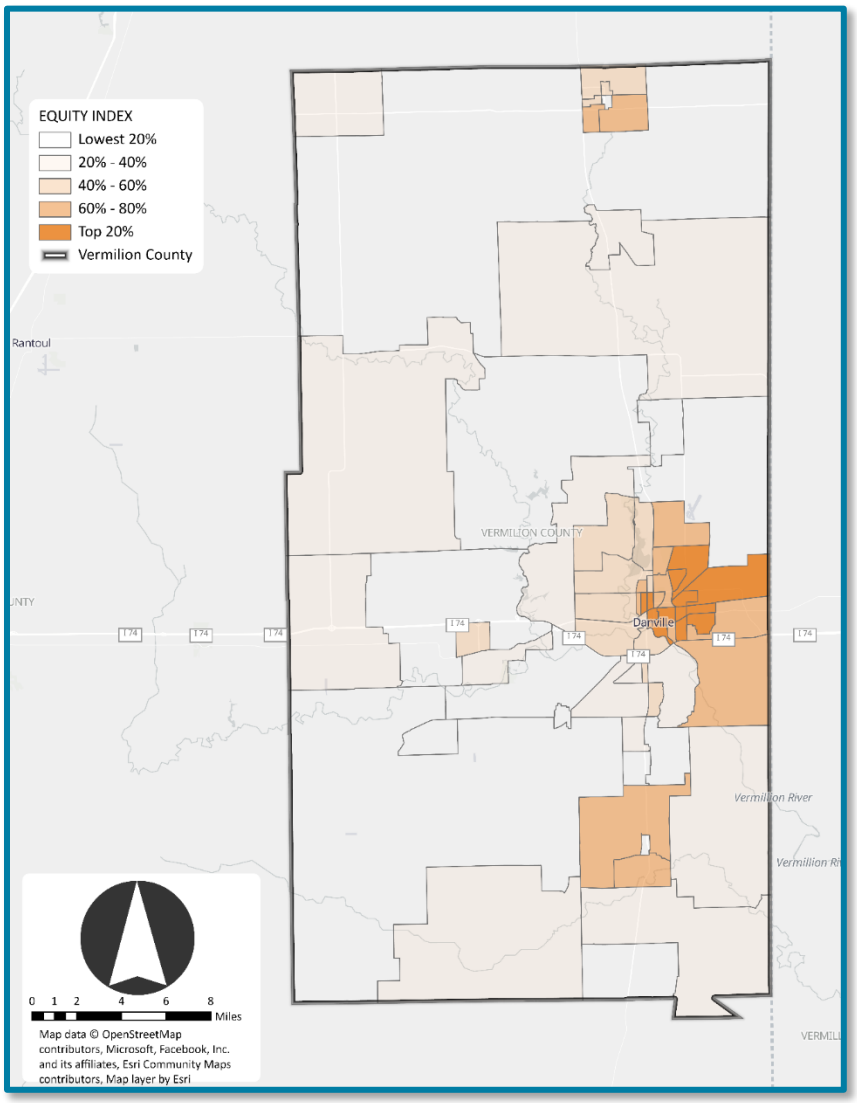
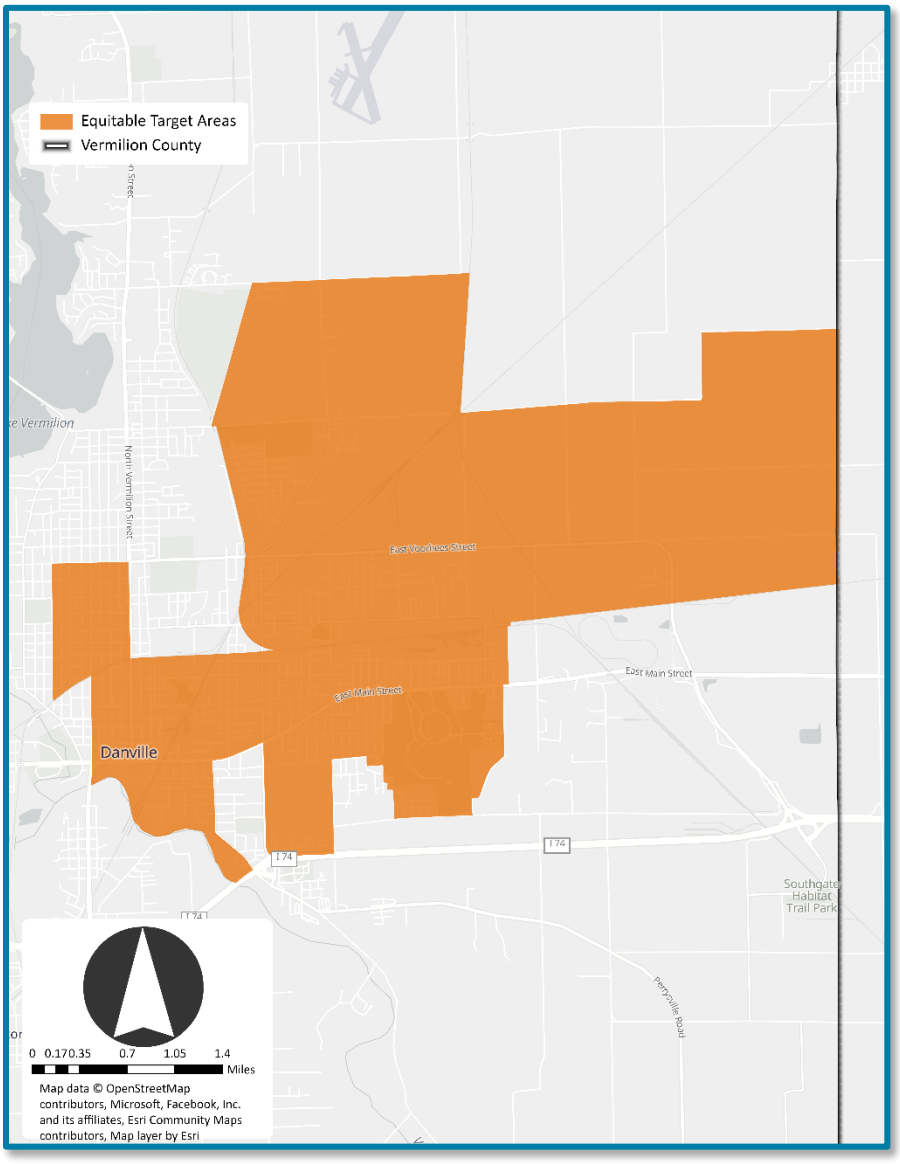


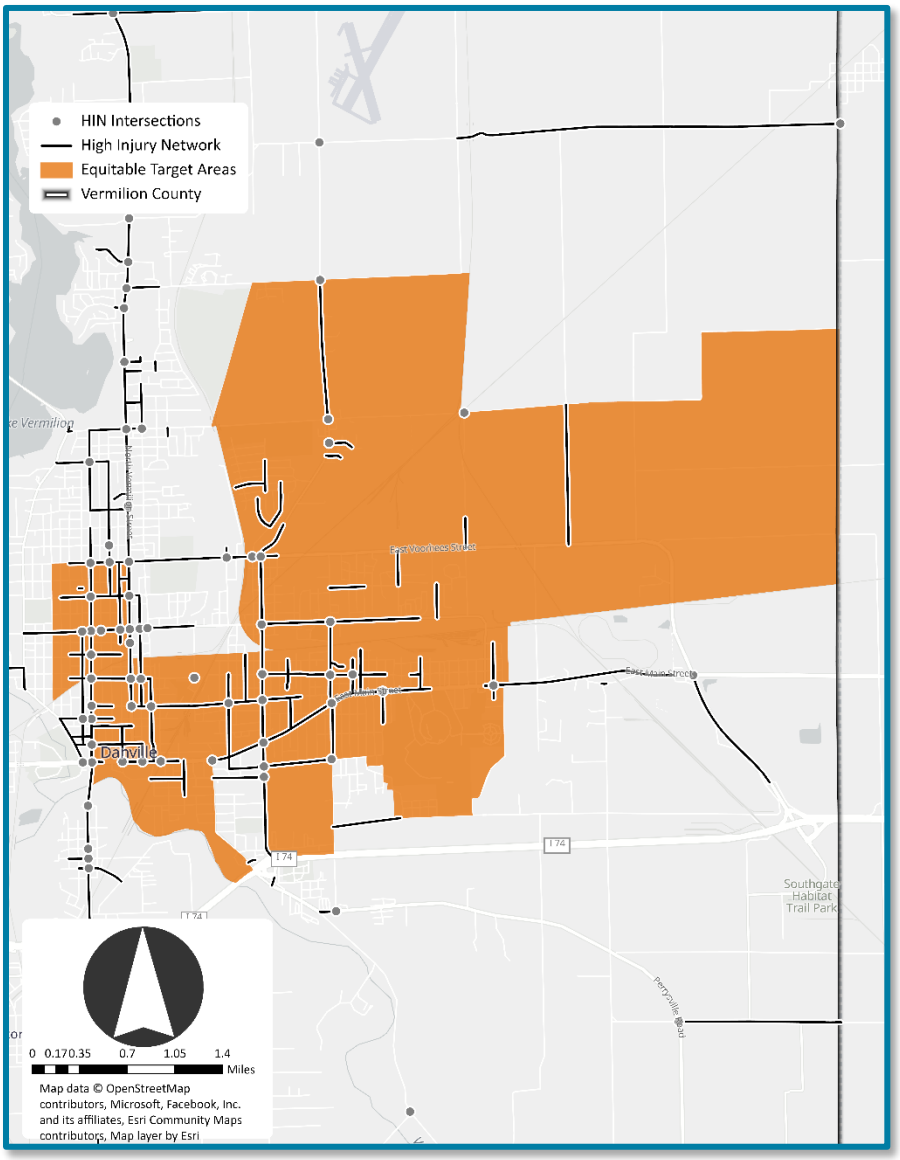
FIGURE 8 - EQUITABLE TARGET AREAS



ETA and the High Injury Network

Given the connection between disadvantaged communities and the disproportionate roadway safety outcomes, it is not surprising that there is substantial overlay between the high injury network and the ETA. Approximately 31 miles of the HIN (26%) is within the ETA. Notable portions of the HIN within the ETA include North Bowman Avenue, Williams Street, East Fairchild Street, and South/North Griffith Street. These streets, among others within the ETA, should be prioritized for future safety improvements. The ETA and HIN are shown in Figure 9.

FIGURE 9 - HIGH INJURY NETWORK AND EQUITABLE TARGET AREAS



Appendix B

Proven Safety Countermeasures

MEMO

To: Vermilion County Safety Action Plan Steering Committee

From: Lochmueller Group

Date: March 31, 2023

Subject: Vermilion County Safety Action Plan Technical Memo 2 – Countermeasure Matrix

Introduction

The Vermilion County Safety Action Plan (VCSAP) will establish an implementation strategy and recommendations to eliminate roadway deaths and serious injuries. The VCSAP relies on a comprehensive understanding of crashes observed throughout the County to best inform effective strategies to improve safety. This technical memorandum summarizes the Countermeasure Matrix of proven solutions identified to improve safety based in accordance with the trends identified in Technical Memorandum 1 – Crash Analysis and High Injury Network.

The Countermeasure Matrix lists context sensitive countermeasures that address predominant crash characteristics, roadway or intersection configurations, and other relevant trends observed in the county. It provides information for each countermeasure, including a cost/complexity rating, the crash modification factor (CMF) value, applicable crash types, and CMF Clearinghouse rating.

Crash conditions and contextual circumstances drive the suitability of each countermeasure for a specific situation. The Countermeasure Matrix offers decisionmakers the ability to select from multiple appropriate countermeasures and identify those that most align with available resources and public preferences in order to address a problem.

Based on the County's identified crash trends, four implementation sub-groups were developed to help identify which safety improvement(s) may be the most appropriate:

- Intersections
- Arterials
- Rural highways
- Pedestrians and bicycle facilities

Intersections

Crashes occur at intersections due to the high exposure of vehicles, pedestrians, and bicyclists at conflict points. Though urban areas in Vermilion County experienced higher proportions of angle crashes and turning crashes than in the rural areas, these types of crashes also occur in suburban and rural settings. Accordingly, intersections was chosen as an implementation sub-group in the Countermeasure Matrix. The countermeasures in this section can apply to urban or rural roadways, but many are more fitting for an urban setting. For projects in this sub-group the exact safety countermeasure(s) would be selected in response to the crash history experienced at the specific intersection and be implemented as intersection improvement projects.

Low-cost, low-complexity intersection improvements do not require right-of-way acquisition and can be implemented without an engineering study to address relevant crashes. These countermeasures could serve as interim solutions while procurement for a more costly or complex solution is secured or while planning and design activities are underway. The following low-cost, low-complexity countermeasures are effective against applicable crash types and can be implemented quickly:

- Provide “stop ahead” pavement markings
- Install advanced yield or stop markings and signs
- Install a conflict warning system
- Install reflective signal head backplates
- Add three-inch yellow retroreflective sheeting to signal backplates
- Replace standard stop sign with flashing LED stop sign

Changing intersection traffic control is another potential countermeasure that would require an engineering study at minimum, as these countermeasures depend on traffic volumes. The following countermeasures are appropriate for intersections with relevant crash history and appropriate traffic volumes:

- Convert a two-way stop control intersection to an all-way stop control
- Install a traffic signal

Countermeasures in this section apply to intersections that are currently controlled by a traffic signal. They require engineering effort and analysis of traffic operations. The countermeasures vary in complexity and may be implemented along with geometric improvements. Signalized intersections in urban areas serve pedestrians and bicyclists. The following countermeasures may be applied to intersections with existing traffic signals:

- Install left turn flashing yellow arrow signals
- Install pedestrian signals
- Convert permissive left turns to protected only
- Implement a leading pedestrian interval
- Prohibit right-turn-on-red
- Implement a dilemma zone protection system
- Install dynamic signal warning flashers

The scope of the geometric improvements identified in this section require significant engineering effort, require traffic analysis, and may have right-of-way impacts. The complexity varies and can range from lane reconfigurations to alternative intersection designs. The following geometric countermeasures are identified to reduce relevant crashes:

- Reduce channelized right turn angle
- Change intersection skew angle
- Convert signalized intersection to a roundabout
- Convert intersection to median U-turn intersection

Arterials

Vermilion County's main arterials are Illinois Route 1 and US 150. These facilities and other arterials carry traffic through and between Danville and neighboring communities. As a result, arterials were chosen as an implementation sub-group in the Countermeasure Matrix.

Roadways categorized as arterials are facilities of regional significance and carry "through" traffic between major destinations. These facilities are dual purpose and often accommodate both local trips and regional traffic. Access management is an important tool in maintaining safe and efficient traffic operations on such facilities. The following countermeasures related to access management are identified:

- Install a two-way left-turn lane (TWLTL)
- Install any type of median barrier
- Modify access point density

Some of the countermeasures identified in the intersection section are potentially more effective when applied to a series of intersections as a corridor project. In addition to the intersection improvement project countermeasures, the following are identified for urban/suburban arterials:

- Install flashing yellow arrow signals
- Convert permissive left turns to protected only
- Install a dilemma zone protection system

Rural Highways

There are numerous rural highways in Vermilion County under jurisdiction of either the State or the County, and rural highways are good candidates for systemic safety improvements. A systemic approach acknowledges that crash experience alone may not be sufficient to determine implementation priorities across a network. . This is particularly true for many rural roadways with low volumes where crash densities tend to be extremely low with few high crash locations[1].

The identified rural highway safety improvements focus on crashes where vehicles depart from the travel lane, including run-off-the-road crashes and head-on crashes caused by a vehicle crossing the centerline. These identified countermeasures provide auditory and/or tactile feedback to the driver should they stray from the travel lane, delineate curves, and provide recovery area by widening the roadway. While the focus of this implementation sub-group is rural highways, the countermeasures can be applied to lower functional class facilities in a rural setting.

[1] Why the Systemic Approach. FHWA.
https://highways.dot.gov/safety/data-analysis-tools/systemic/why-systemic-approach

The following countermeasures for rural highways are low cost, low complexity and focus on pavement markings and signing:

- Install new fluorescent curve signs (or upgrade existing curve signs)
- Install wider edgelines
- Install in-lane curve warning pavement markings
- Install centerline rumble strips
- Install edgeline or shoulder rumble strips

The following identified rural highway countermeasures are higher cost or could have right-of-way impacts:

- Install dynamic speed feedback system
- Install high-friction surface treatment (HFST) on curves (intended for systemic application)
- Widen shoulders
- Flatten cross slopes

Pedestrian and Bicyclist Facilities

Pedestrian- and bicyclist-involved crashes are five times more likely to result in an injury or fatality when compared to motor vehicle only crashes. Accordingly, pedestrians and bicyclists are considered Vulnerable Roadway Users (VRU). Providing pedestrian and bicyclist accommodations or facilities can be a key element of an intersection or corridor project. For example, a “road diet” can be used to repurpose existing travel lanes for bicycle lanes. The following countermeasures to provide facilities for pedestrians and bicyclists.

- Install sidewalks
- Install bicycle lanes
- Install a two-way left turn lane

Pedestrian accommodations to cross the street at intersections or midblock crossings include the following:

- Implement a leading phase interval
- Prohibit right turn on red
- Install pedestrian signal heads
- Install a pedestrian hybrid beacon (PHB or HAWK)
- Install a rectangular rapid flashing beacon (RRFB)

These countermeasures can be implemented by individual intersection or crossing, or with a more systemic approach. For example, in a downtown/village setting right turn on red may be prohibited at all intersections to keep vehicles out of the crosswalk. A series of midblock pedestrian crossings along a corridor can be enhanced with a pedestrian hybrid beacon or a rectangular rapid flashing beacon as a systemic corridor improvement.

Countermeasure Matrix

The Countermeasure Matrix beginning on page 6 lists the countermeasures described in this memo. The following information is provided for each countermeasure:

- Cost/complexity rating – Countermeasure cost/complexity rating is based on typical application. Ratings are low, low-medium, medium, and medium-high.
- CMF value - The CMF value is a multiplicative factor representing the proportion of crashes expected after implementing a countermeasure. CMFs with a value less than 1.0 indicate an expected decrease in crashes. Some CMFs are equation based. Due to the complexity of the equations, they were not included in the Countermeasure Matrix.
- Applicable crash severity – The KABCO scale corresponds to the severity of the injuries obtained from the crash: K (fatal), A (incapacitating injury), B (non-incapacitating injury), C (reported/non-evident), and O (no indication of injury).
- Applicable crash types – Many of the countermeasures apply to all crash types, but some only apply to angle crashes.
- CMF Clearinghouse rating – The CMFs not included in the Highway Safety Manual (HSM) are rated in quality. Ratings are based on the study sample size, study design and statistical methodology, etc. The highest rank is 5 stars. CMFs in the Countermeasure Matrix are rated 3 out of 5 stars or better.

TABLE 1. VERMILION COUNTY COUNTERMEASURE MATRIX

Countermeasure	IMPLEMENTATION SUB-GROUP				COST/ COMPLEXITY	CMF ID	CMF	AREA TYPE	CRASH SEVERITY	CRASH TYPE	RATING
	INTERSECTIONS	ARTERIALS	RURAL HIGHWAYS	PEDESTRIAN AND BICYCLIST FACILITIES							
Retroreflective Signal Head Backplates	X				LOW	7792	0.76	Rural	ABC	All	3
Add 3-Inch Yellow Retroreflective Sheeting t Signal Backplates	X				LOW	1410	0.85	Urban	KABCO	All	4
Modify Signal Phasing (Implement a Leading Phase Interval)	X			X	LOW	9901	0.9	Urban, Rural	KABCO	All	5
Prohibit Right Turn on Red	X			X	LOW	5194	Equation	Urban, Rural	KABCO	All	HSM
Install Intersection Conflict Warning Systems (ICWS) for Four-Lane at Four-Lane Intersections	X				LOW	8453	0.83	Rural	KABCO	All	5
Install Intersection Conflict Warning Systems (ICWS) for Two-Lane at Two-Lane Intersections	X				LOW	8438	0.73	Rural	KABCO	All	5
Provide "Stop Ahead" Pavement Markings	X				LOW	397	0.69	Rural	KABCO	All	4
Convert Two-Way (With Flashing Beacons) to All-Way Stop Control (With Flashing Beacons)	X				LOW	3133	0.198	Urban, Rural	KABCO	All	3
Convert Two-Way (Without Flashing Beacons) to All-Way Stop Control (With Flashing Beacons)	X				LOW	3136	0.183	Urban, Rural	KABCO	All	3
Convert Two-Way (Without Flashing Beacons) To All-Way Stop Control (Without Flashing Beacons)	X				LOW	3130	0.393	Urban, Rural	KABCO	All	3
Replace Standard Stop Sign with Flashing LED Stop Sign (Angle Crashes)	X				LOW	6602	0.585	Urban, Rural	KABCO	Angle	4
Install Advanced Yield or Stop Markings And Signs	X				LOW	9018	0.886	Urban, Rural	KABCO	All	3
Install Dynamic Signal Warning Flashers	X				LOW	4198	0.814	Urban, Rural	KABCO	All	4
Install a Traffic Signal (Rural)	X				LOW-MED	325	0.56	Rural	KABCO	All	5
Install a Traffic Signal (Urban/Suburban)	X				MED-HIGH	9144	0.84	Urban, Suburban	KABCO	All	4
Dilemma Zone Protection System	X	X			LOW-MED	4854	0.564	Urban, Rural	KABCO	Angle	3
Convert Intersection to Median U-Turn (MUT) Intersection	X				MED	10851	0.633	Urban	KABCO	All	5
Improve Angle of Channelized Right Turn Lane	X				MED	8428	0.558	Urban, Rural	KABCO	All	4
Install Pedestrian Signals	X			X	MED	8480	Equation	Urban, Rural	KABCO	All	4
Install Left Turn Flashing Yellow Arrow Signals and Supplemental Traffic Signs	X	X			MED	7730	0.857	Urban	KABCO	All	3
Convert From Permissive to Protected	X	X			MED	4653	0.94	Urban, Rural	KABCO	All	HSM
Convert Intersection With Minor-Road Stop Control to Modern Roundabout	X				MED-HIGH	227	0.56	Urban, Rural	KABCO	All	3
Convert Signalized Intersection to Modern Roundabout	X				MED-HIGH	225	0.52	Urban, Rural	KABCO	All	3
Change Intersection Skew Angle	X				MED-HIGH	5188	Equation	Rural	KABCO	All	HSM
Install a Traffic Signal (Urban)	X				MED-HIGH	319	0.77	Urban	KABCO	All	4

Countermeasure	IMPLEMENTATION SUB-GROUP				COST/ COMPLEXITY	CMF ID	CMF	AREA TYPE	CRASH SEVERITY	CRASH TYPE	RATING
	INTERSECTIONS	ARTERIALS	RURAL HIGHWAYS	PEDESTRIAN AND BICYCLIST FACILITIES							
Install TWLTL (Two-Way Left Turn Lane) On Two Lane Road		X			LOW-MED	2337	0.775	Urban, Rural	KABCO	All	4
Install TWLTL (Two-Way Left Turn Lane) On Four Lane Road		X			LOW-MED	10375	0.701	Urban	KABCO	All	4
Install Any Type Of Median Barrier		X			LOW-MED	43	0.7	Rural	ABC	All	3
Install Any Type Of Median Barrier		X			LOW-MED	42	0.57	Rural	K	All	3
Modify Access Point Density		X			MED	5185	Equation	Rural	KABCO	All	HSM
Provide Highway Lighting		X			MED	5160	0.8	Urban, Rural	KABCO	All	HSM
Install Sidewalk		X		X	MED	11246	0.598	Urban, Rural	KABCO	All	4
Install Bicycle Lanes		X		X	MED	10737 - 10743	varies	Urban	KABCO	All	4
Install a Pedestrian Hybrid Beacon (PHB or HAWK)		X		X	LOW-MED	10585	0.883	Urban	KABCO	All	5
Install Rectangular Rapid Flashing Beacon (RRFB)		X		X	MED	11158	0.31	Urban, Rural	KABCO	All	4
Install Wider Edgelines (4 in To 5 in)			X		LOW	4750	0.699	Rural	KABCO	All	3
Install Wider Edgelines (4 in To 6 in)			X		LOW	4736	0.825	Rural	KABCO	All	4
Install Dynamic Speed Feedback System			X		LOW	6885	0.95	Rural	KABCO	All	4
Install In-Lane Curve Warning Pavement Markings			X		LOW	10312	0.652	Rural	KABCO	All	5
Roadway Lighting			X		LOW-MED	7793	0.75	Rural	KABCO	All	3
Provide Intersection Illumination			X		MED	2376	0.67	Rural	KABCO	Angle	4
Change Shoulder Width From X To Y (Meters)			X		MED	10178	Equation	Rural	KABCO	All	3
Flatten Side Slopes (2-Lane Median)			X		MED	7175	0.861	Rural	KABCO	All	4
Flatten Side Slopes (4-Lane Median)			X		MED	6912	0.976	Rural	KABCO	All	4
Install New Fluorescent Curve Signs or Upgrade Existing Curve Signs to Fluorescent Sheeting			X		LOW	2431	0.82	Rural	KABCO	All	5
Implement Systemic Signing And Visibility Improvements At Signalized Intersections			X		LOW	8922	0.955	Urban, Rural	KABCO	All	4
Edgeline Rumble Stripes			X		LOW	4112	0.901	Urban	KABCO	All	5
Install Centerline Rumble Strips			X		LOW	124	0.86	Rural	KABCO	All	4
Install Centerline Rumble Strips			X		MED	3342	0.89	Rural	KABCO	All	4
Install Edgeline or Shoulder Rumble Strips			X		MED	9763	0.839	Rural	KABCO	All	4
Install High-Friction Surface Treatment (HFST) (Curves)			X		MED	10318	0.529	Urban, Rural	KABCO	All	5

Appendix C

Benefit Cost Analysis

MEMO

To: Vermilion County Safety Action Plan Steering Committee

From: Lochmueller Group

Date: June 27, 2023

Subject: Vermilion County Safety Action Plan Technical Memo 3 – Benefit-Cost Analysis

Introduction

The Vermilion County Safety Action Plan (VCSAP) will establish an implementation strategy and recommendations to eliminate roadway deaths and serious injuries. The VCSAP relies on a comprehensive understanding of crashes observed throughout the County to best inform effective strategies to improve safety. This technical memorandum summarizes the benefit-cost analysis for projects identified in the City of Danville and rural areas in Vermillion County.

Methodology

Safety benefits are generated by implementing countermeasures within the study area. Vehicle crash data was obtained from the Illinois Department of Transportation (IDOT). Data was obtained for a five-year period beginning in 2017 and ending in 2021. The benefits were monetized based on guidance in the US Department of Transportation Benefit-Cost Analysis Guidance for Discretionary Grant Programs[1]. The parameters and values used in the analysis are summarized in **Table 1** and **Table 2**. Costs and benefits in the analysis are reported in year 2025 US dollars.

TABLE 1 GENERAL PARAMETERS

Parameter	Values
Discount Rate	7%
Construction Year Complete	2025
Analysis Period (Years)	20
End of Project Life	2045

[1] US Department of Transportation Benefit-Cost Analysis Guidance for Discretionary Grant Programs. https://www.transportation.gov/sites/dot.gov/files/2023-01/Benefit%20Cost%20Analysis%20Guidance%202023%20Update.pdf

TABLE 2 USDOT BCA GUIDANCE MONETIZED VALUES BY CRASH SEVERITY

KABCO Level	Monetized Value Per Event
O – No Injury	$4,000
C – Possible Injury	$78,500
B – Non-incapacitating	$153,700
A – Incapacitating	$564,300
K – Killed	$11,800,000

Crash modification factors (CMFs) are used to calculate the anticipated reduction in crashes. Each CMF only applies to certain types of crashes, crash severities, and area types. All CMFs used for these projects come from the US Department of Transportation FHWA Crash Modification Factors Clearinghouse[2]. CMFs for the proposed safety improvement projects were identified and included in **Table 3.**

TABLE 3. CRASH MODIFICATION FACTORS

Name	CMF ID	CMF Value	Crash Reduction	Notes
Road Diet	874	0.63	37%	Applies to all crashes
Decrease Lane Width from 12 to 11 ft	IDOT	0.86	14%	Applies to all crashes
Install a Bike Lane	10741	0.734	27%	Applies to bicycle/vehicle crashes only
Install a Sidewalk (Or Shared Use Path)	11246	0.598	40%	Applies to pedestrian/vehicle crashes only
Center and Edge Line Rumble Strips	6850	0.8	20%	Applies to all crashes

[2] U.S. Department of Transportation Federal Highway Administration Crash Modification Factors Clearinghouse. https://www.cmfclearinghouse.org/index.php

Pedestrian/Bicyclist Improvements

There are 10 potential projects identified within the City of Danville with a focus on pedestrians and bicyclists. The project scopes include road diets or narrowing of travel lanes, installing bike lanes, reconstructing to shared use paths or sidewalks, and/or installing ADA-compliant curb ramps. These projects are detailed in **Attachment A**.

The crash benefits are calculated based on the instance of vehicle/pedestrian, vehicle/bicyclist, or vehicle/vehicle crashes for which a potential reduction applies. Many of the project locations did not have any reported pedestrian or bicycle crashes and therefore have B-C Ratios that only include applicable benefits from reductions in vehicle/vehicle crashes. However, pedestrian and bicycle crashes have a high level of discordance, or incidents that go unreported. Because of this, the results of applying the crash modification factors (CMFs) to only the reported crashes shows a smaller reduction than if all crashes, reported and unreported, had CMFs applied. A summary of the crash history, benefits, and cost is included in **Table 4**. The locations are depicted in **Figure 1.**

According to an article from the University of Illinois[3], the number of unreported crashes involving pedestrians is approximately 60%, with the majority of these being crashes that do not require hospital visits or fatalities.

Several reasons for pedestrian crashes going unreported exist and include lack of serious injuries, impairment due to drugs or alcohol, distrust of the police, and victims not having the means to pay for medical treatment, such as an ambulance ride to the hospital.

Findings from the article state that areas that have higher rates of poverty and/or a large percentage of households that do not own an automobile have the highest number of unreported crashes. According to the US Census Bureau, Danville has a poverty rate of 28.5%[4] while 16.7%[5] of households do not own an automobile. Both are higher than average for the State of Illinois which has a poverty rate of 12.1% while 10.7% of households do not own an automobile.

Based on these findings, it would be reasonable to assume that Danville has a high number of pedestrian and/or bicycle crashes that go unreported. Between years 2017 and 2021 there were 7 pedestrian crashes on the corridors analyzed, which is an average of 1.4 pedestrian crashes per year. If 60% were unreported, the average would be 2.3 crashes per year higher. The cost associated with these unreported crashes could be as high as $4.8 M, assuming that the severity was non-incapacitating injury.

---

[3] Mickey Edwards & Manuel Gutierrez (2023) The Incidence Burden of Unreported Pedestrian Crashes in Illinois, Traffic Injury Prevention. https://pubmed.ncbi.nlm.nih.gov/36374231/

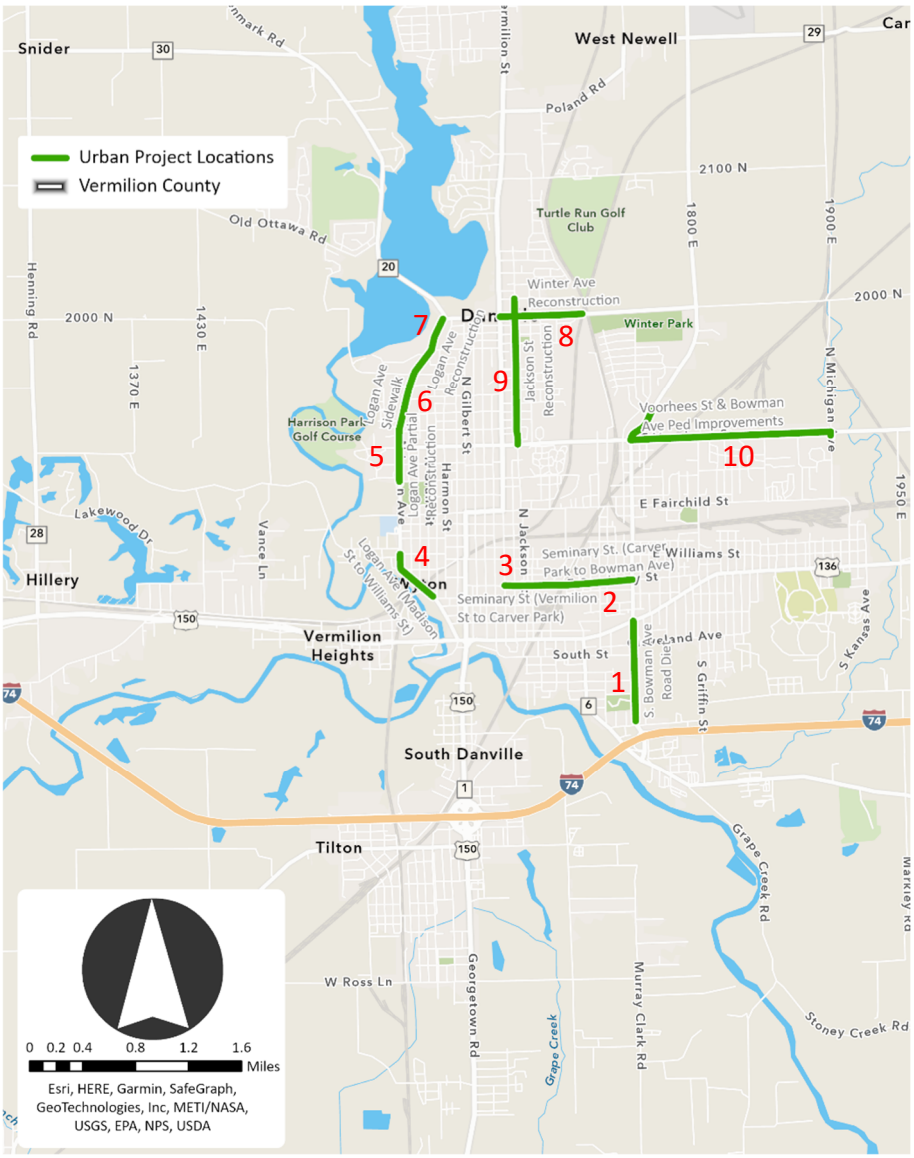
[4] Poverty Status in the Past 12 Months. American Community Survey US Census Bureau. https://data.census.gov/

[5] Selected Housing Characteristics. American Community Survey. US Census Bureau. https://data.census.gov/

TABLE 4 PEDESTRIAN/BICYCLIST IMPROVEMENTS SUMMARY

Project	All Crashes (2017-2021)	Vehicle/ Pedestrian Crashes (2017-2021)	Vehicle/ Bicyclist Crashes (2017-2021)	Proposed Improvements	Safety Benefits	Prelim. Project Cost	Benefit-Cost Ratio
1 – Bowman Ave Road Diet	100	2	1	Road Diet and Bike Lane	$6.0 M	$1.2 M	5.02
2 – Seminary St (Junction St to Bowman Ave)	27	2	2	Narrow Lane Width/SUP	$3.3 M	$5.4 M	.61
3 – Seminary St (Vermilion St to Junction St)	29	-	-	Narrow Lane Width/SUP	$470,000	$2.0 M	.24
4 – Logan Ave (English St to Voorhees St) Partial Reconstruction	3	-	-	Narrow Lane Width/Shared Use Path/Sidewalk	$103,000	$1.0 M	.1
5 – Logan Ave Sidewalk (Voorhees St to Swisher Ave)	6	-	-	Narrow Lane Width/Sidewalk	$43,000	$1.5 M	.03
6 – Logan Ave Reconstruction (Swisher Ave to Winter Ave)	6	-	-	Narrow Lane Width/SUP	$376,000	$3.0 M	.13
7 – Logan Ave (Madison St to Williams St)	9	1	-	Narrow Lane Width/SUP	$360,000	$1.0 M	0.36
8 – Winter Ave Reconstruction	59	1	-	Narrow Lane Width/SUP	$1.8 M	$3.3 M	.55
9 – Jackson St Reconstruction	36	-	-	Narrow Lane Width/SUP	$760,000	$6.0 M	.13
10 – Voorhees St & Bowman Ave Ped Improvements	61	1	-	Narrow Lane Width/SUP/ Change to Protected Left	$9.3 M	$3.0 M	3.11
Total	336	7	3	-	$22.6 M	$27.5 M	.82

FIGURE 1 DANVILLE (URBAN) PROJECT LOCATIONS



Rural Roadway Improvements

There is a potential project to install centerline and edge line rumble strips at 8 locations in Vermilion County outside of the city limits. The following potential project locations were identified based on locations in the high-injury network (HIN) outside of the Danville Urban Area limits that had a significant number of ran-off-road (ROR) type crashes.

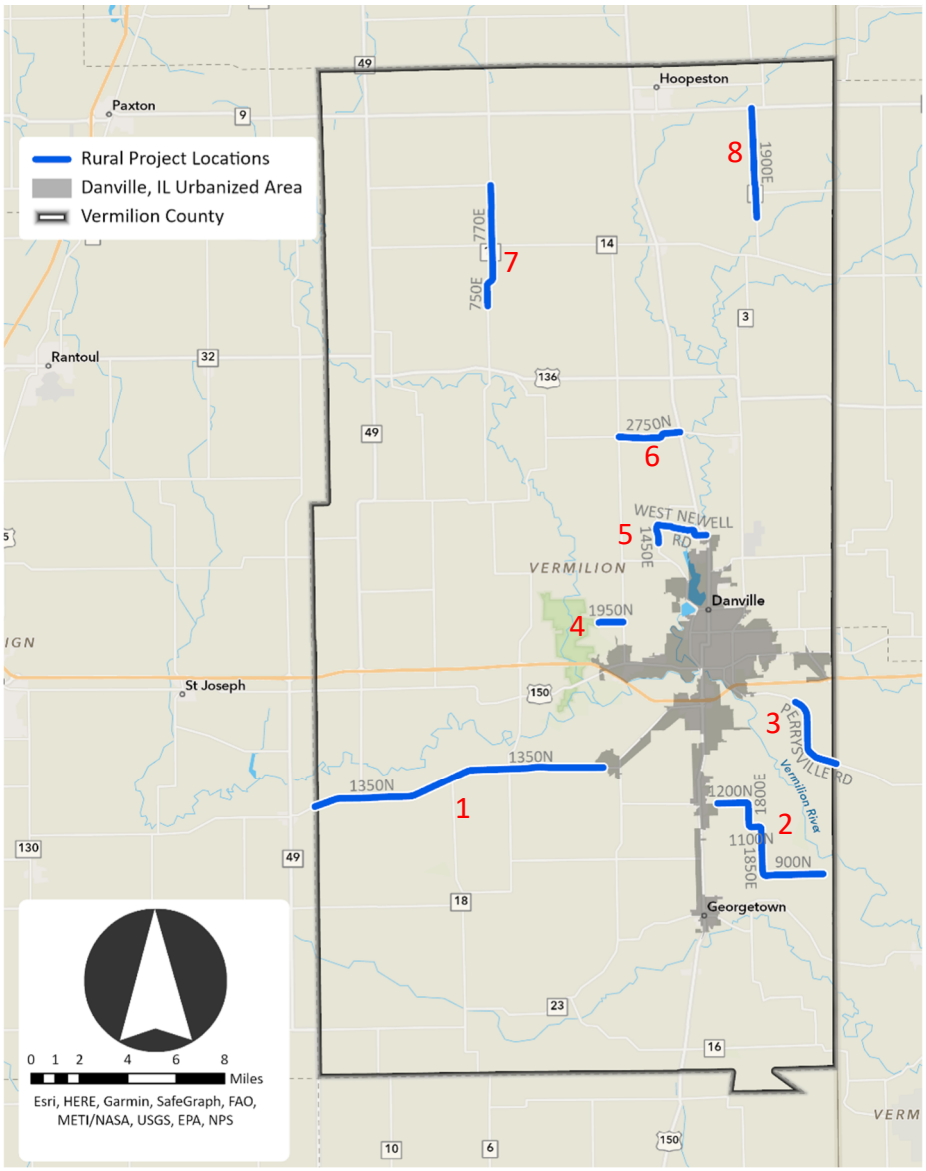
The edge line and centerline rumble strips are CMF ID 6850 and apply to all crash types. The cost to install the rumble strips ranged from $0.10 per linear foot to $1.20 per linear foot and vary based on the quantity and location where they are installed[6]. The benefit-cost analysis uses the cost of $1.00 per linear foot of rumble strip, which equates to $15,840 per mile for center and edge line rumble strips. The results of the benefit-cost analysis for the rural county project locations are located in **Table 6**. The locations are depicted in **Figure 2**.

TABLE 6. COUNTY BENEFIT COST RATIOS

Project	Crashes (2017-2020)	Safety Benefits	Project Cost	Benefit-Cost Ratio
1 – Catlin-Homer Rd	23	$1.2 M	$193,900	6.12
2 – Westville Rd / Forest Glen Rd	18	$1.9 M	$112,700	17.07
3 – Perrysville Rd	12	$8.8 M	$55,900	156.71
4 – Kickapoo Park Rd	4	$481,900	$16,100	29.93
5 – Denmark Rd / Newark Rd	42	$2,927,200	$12,300	237.98
6 – CR 2750	10	$928,000	$41,600	22.31
7 – CR 750 / CR 770	4	$1.4 M	$80,600	17.89
8 – Antioch Rd (CR 1900)	3	$7.6 M	$71,600	105.77
Total	116	$25.2 M	$584,700	43.14

[6] FHWA Safety. Rumble Strips and Rumble Stripes FAQs. Retrieved May 2023. https://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/faqs.cfm#

FIGURE 2 COUNTY (RURAL) PROJECT LOCATIONS



1. South Bowman Ave Road Diet		
Extents: Bart St to US 136		**Segment Length:** 0.76 miles
Project Description Overlay the existing roadway and convert the 4-lane section into a 3-lane section with 1 lane in each direction with a TWLTL and a bike lane.		
Improvement Type		Comments:
Install Shared Use Path	☐	
Install ADA Ramps	☒	Provide ramp improvements at selected side streets
Pavement Overlay	☒	10% Patching
Roadway Reconstruction	☐	
Install/Replace Sidewalks	☐	
Install Bike Lane	☒	5-foot wide (7-foot with gutter on each side)
Install/Replace Curb	☐	
Prelim. Opinion of Probable Cost		Comments:
PE 1	☒	
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$1.2M	
Notes This will integrate with future roundabout (IDOT project) at Texas/Bowman and ped improvements over I-74. It will also integrate with planned bike lanes on South St.		

2. Seminary St Shared Use Path		
Extents: Junction St to Bowman Ave		**Segment Length:** 0.62 miles
Project Description Work consists of patching and overlaying the existing roadway and restriping to include a bike lane.		
Improvement Type		Comments:
Install Shared Use Path	☒	
Install ADA Ramps	☒	
Pavement Overlay	☒	Including patching
Roadway Reconstruction	☐	
Install/Replace Sidewalks	☐	
Install Bike Lane	☒	Use sharrows where roadway narrows under railroad bridge
Install/Replace Curb	☐	
Prelim. Opinion of Probable Cost		Comments:
PE 1	☒	
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$5.4M	

Notes

- Lanes will be reduced in width to 11 feet
- B6.18 curb and gutter
- An 8-foot shared use path on South side
- North sidewalk to remain; five ft wide
- Signal timing to be modified as needed at Bowman signal

3. Seminary St Shared Use Path		
Extents: Vermilion St to Junction St		**Segment Length:** 0.35 miles
Project Description Reconstruct the existing roadway to add a sidewalk and curb ramps.		
Improvement Type		Comments:
Install Shared Use Path	☒	On South side, if feasible
Install ADA Ramps	☒	
Pavement Overlay	☐	
Roadway Reconstruction	☒	
Install/Replace Sidewalks	☒	North side
Install Bike Lane	☐	
Install/Replace Curb	☒	
Prelim. Opinion of Probable Cost		Comments:
PE 1	☒	
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$2.0M	
Notes • Lanes will be reduced in width to 11 feet • B6.18 curb and gutter • Shared use path to be 8 feet wide • Sidewalk on North side is 5 feet wide		

4. Logan Ave Partial Reconstruction		
Extents: English Ave to Voorhees St		**Segment Length:** 0.26 miles
Project Description Work consists of reconstructing east side of the existing roadway and installing a shared use path on the east side of the road.		
Improvement Type		Comments:
Install Shared Use Path	☒	
Install ADA Ramps	☒	
Pavement Overlay	☒	
Roadway Reconstruction	☒	East side
Install/Replace Sidewalks	☐	
Install Bike Lane	☐	
Install/Replace Curb	☒	Replace existing curb on East side
Prelim. Opinion of Probable Cost		Comments:
PE 1	☐	PE 1 funded with STU/STBG Funds
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$1.0M	
Notes Shared use path connects to the existing bike path at Lincoln Park. • On street parking to be eliminated on East side • Lane width will be reduced • B6.18 curb and gutter, to match west side • Shared use path will be on East side, 8 feet wide		

5. Logan Ave Sidewalk		
Extents: Voorhees Ave to Swisher Ave		**Segment Length:** 0.80 miles
Project Description Work consists of installing an 8' shared use path on the east side of the roadway from the intersection with Voorhees St to the intersection with Roselawn St and then on the west side of the roadway from the intersection with Roselawn St to the intersection with Swisher Ave. Where adequate right of way isn't available to install the shared use path, sidewalk will be installed in its place.		
Improvement Type		Comments:
Install Shared Use Path	☒	Where feasible on west side
Install ADA Ramps	☐	
Pavement Overlay	☐	
Roadway Reconstruction	☐	
Install/Replace Sidewalks	☒	East side of roadway from Vorhees to Roselawn, West side of roadway from Roselawn to Swisher
Install Bike Lane	☐	
Install/Replace Curb	☐	
Prelim. Opinion of Probable Cost		Comments:
PE 1	☐	PE 1 funded with STU/STBG Funds
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$1.0M	
Notes		

6. Logan Ave Reconstruction		
Extents: Winter Ave to Swisher Ave		**Segment Length:** 0.25 miles
Project Description Work consists of reconstructing the existing roadway and installing sidewalk on the west side of the road that connects to the existing sidewalk at the intersection with Winter Ave.		
Improvement Type		Comments:
Install Shared Use Path	☐	
Install ADA Ramps	☒	
Pavement Overlay	☐	
Roadway Reconstruction	☒	
Install/Replace Sidewalks	☒	West side of roadway
Install Bike Lane	☐	
Install/Replace Curb	☒	Part of roadway reconstruction
Prelim. Opinion of Probable Cost		Comments:
PE 1	☐	PE 1 funded with STU/STBG Fund
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$1.5M	
Notes		

7. Logan Ave Reconstruction (South)		
Extents: Madison Ave to W Williams St		**Segment Length:** 0.43 miles
Project Description Work consists of reconstructing the existing roadway and installing a shared use path of the west side of the road.		
Improvement Type		Comments:
Install Shared Use Path	☒	West side of roadway
Install ADA Ramps	☒	
Pavement Overlay	☐	
Roadway Reconstruction	☒	
Install/Replace Sidewalks	☐	
Install Bike Lane	☐	
Install/Replace Curb	☐	
Prelim. Opinion of Probable Cost		Comments:
PE 1	☐	PE 1 locally funded
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$3.0M	Estimated range $2.0M to $3.0M
Notes Connects Carle at the Riverfront SUP & medical campus, hospital, downtown area, Ellsworth Park, Lincoln Park bike path, W. Williams realignment/ped improvements. and is part of Madison Neighborhood plan. Will eliminate bike lanes on roadway. • Lane width will be reduced to 11or 12 ft • B6.18 curb and gutter • Shared use path to be 8 feet wide • 5 foot sidewalk on Northeast/East side of roadway		

8. E Winter Ave Reconstruction		
Extents: US 136 to East of Monterey St		**Segment Length:** 0.62 miles
Project Description Work consists of reconstructing the existing roadway and installing a shared use path on the south side of the road that connects to the existing shared use path east of Monterey St.		
Improvement Type		Comments:
Install Shared Use Path	☒	South side of roadway
Install ADA Ramps	☒	
Pavement Overlay	☐	
Roadway Reconstruction	☒	
Install/Replace Sidewalks	☒	As needed on North side, may widen South side sidewalk
Install Bike Lane	☐	
Install/Replace Curb	☒	
Prelim. Opinion of Probable Cost		Comments:
PE 1	☐	PE 1 funded with STU/STBG Funds
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$3.3	
Notes		

9. N Jackson St Reconstruction		
Extents: Voorhees St to Chester Ave		**Segment Length:** 1.11 miles
Project Description Work consists of reconstructing the existing roadway and adding a shared-use path off of the roadway.		
Improvement Type		Comments:
Install Shared Use Path	☐	
Install ADA Ramps	☒	
Pavement Overlay	☐	
Roadway Reconstruction	☒	
Install/Replace Sidewalks	☒	
Install Bike Lane	☒	
Install/Replace Curb	☒	
Prelim. Opinion of Probable Cost		Comments:
PE 1	☐	PE 1 funded with STU/STBG Funds
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$6.0M	
Notes Need to reconstruct to create bike friendly and ADA compliant corridor. Connects 2 schools with Voorhees St sidewalk, DHS Shared use path, Lincoln Park bike bath, YMCA, etc.		

10. Voorhees St and Bowman Ave Pedestrian Improvements		
Extents: Voorhees St (to Michigan Ave) and Bowman Ave (to Crestview Dr)		**Segment Length:** 1.83 miles

Project Description

Work on this consists of installing a shared use path where the right of way allows. Sidewalks will be installed where there isn't adequate right of way for a shared used path. Driveways being crossed by the path or sidewalk will be repaved. The path or sidewalk will be installed at the following locations:

- west side of the roadway along Bowman Ave
- the north side along Voorhees St from Bowman Ave to Griffin St
- south side of Vorhees St from Griffin St to Michigan Ave.

Crosswalks will be installed along the north leg of the Bowman Ave & Voorhees St intersection and at the east leg of the Griffin St & Voorhees St intersection. The signal at the Bowman Ave & Voorhees St intersection will be upgraded to account for the new pedestrian crossings. Install ADA compliant curb ramps as necessary and replace the existing curb along Voorhees St from Griffin St to Michigan Ave.

Improvement Type		Comments:
Install Shared Use Path	☒	Where feasible given right of way constraints
Install ADA Ramps	☒	
Pavement Overlay	☐	
Roadway Reconstruction	☐	
Install/Replace Sidewalks	☒	
Install Bike Lane	☐	
Install/Replace Curb	☒	
Prelim. Opinion of Probable Cost		Comments:
PE 1	☐	PE 1 funded with STU/STBG Funds for Bowman Ave and TIF funds for Voorhees St
PE 2	☒	
PE 3	☒	
Construction	☒	
Total	$3.0M	

Notes

32% - 45% of households along this corridor depend on walking or biking as their means of travel.

Appendix D

Community Engagement Plan

Public Survey Results

Stakeholder Interviews

Letters of Support

MEMO

To: VCSAP Steering Committee

From: Kate Swinford, PE, PTOE – Lochmueller Group

Date: February 13, 2023

Subject: **Community Engagement Plan**

Plan Purpose

The Community Engagement Plan (CEP) will serve as the authoritative guide and organizing framework for community engagement efforts throughout the Vermilion County Safety Action Plan (VCSAP) process. The VCSAP is a data driven plan that will prioritize resources for implementation and recommendations to eliminate roadway deaths and serious injuries. Community engagement is a critical component to a successful planning process and aims to increase transparency, build trust, and promote collaboration between the community and decision-makers. The result is a well informed and representative plan that meets the needs of all stakeholders in the county. The CEP details the collection of activities to engage a wide range of stakeholders and how the community's input will be considered and integrated into the final decision-making process.

Steering Committee

The purpose of the steering committee is to guide decision making during the project and oversee the development of the VCSAP. The steering committee's role is to provide critical input and ensure that the plan is created using a data-driven approach, to prioritize the list of projects for implementation with the goal of eliminating severe injury and fatal crashes, and to serve as a conduit between the project team and the community, sharing information and building support among various constituent groups within the county. The steering committee will consist of local county/city staff, related agencies, and other community representatives with a vested interest and/or responsibility for public health and safety.

Lochmueller Group will work with DATS, County, and City staff to host monthly meetings with the steering committee to develop a plan that represents the needs, values, and aspirations of the communities within the county. The following state, regional, and local agency representatives make up the VCSAP steering committee:

Huntington Tower, 201 W Springfield Avenue, Suite 1012
Champaign, Illinois 61820
PHONE: 217.673.7633

TABLE 1 - STEERING COMMITTEE MEMBERS

Name	Agency	Contact
Sam Cole	City of Danville	scole@cityofdanville.org
Adrian Greenwell	Vermilion County	agreenwell@vchighway.org
Janet Payonk	Vermilion County	payonk@vchighway.org
Lisa Beith	Danville Mass Transit	lbeith@cityofdanville.org
Nicole Dowling	CRIS Rural Mass Transit	nicoled@ruraltransits.org
Avoree Gore	IDOT	avoree.gore@illinois.gov
Thomas Caldwell	IDOT	thomas.caldwell@illinois.gov
Mark Moreschi	IDOT	mark.moreschi@illinois.gov
Brian Trygg	IDOT	brian.trygg@illinois.gov
Scott Neihart	IDOT	scott.neihart@illinois.gov
Betsy Tracy	FHWA	betsy.tracy@dot.gov

Online Survey

An online survey will be created to solicit community feedback and will be focused on roadway and transportation related safety concerns. The purpose of this survey is to gather information to identify behaviors and attitudes that impact roadway safety, identify barriers to traveling throughout the community, and develop community supported improvements to increase roadway safety for all users.

The survey will be developed using Survey Monkey and shared with the steering committee. The steering committee and Lochmueller Group will then distribute the online survey to the public, advertising via social media, email lists, newsletters, etc. Lochmueller Groups will create a flyer with the online survey link. The flyer will be shared with the steering committee for distribution in high traffic locations such as city halls, libraries, transit stops, etc. The list of questions for the online survey is shown below.

TABLE 2 - ONLINE SURVEY QUESTIONS

Number	Question
1	Which travel modes do you use often or regularly?
2	How safe do you feel traveling on or along the roadways in your community?
3	What would make you feel safer?
4	How safe is it traveling on the roadway within you community for the following people? (drivers, bicyclists, walkers, motorcyclists, elderly/disabled persons, transit users)
5	Which statement best describes current attitudes, or general feelings, of most people in your community?
6	Do you consider speeding a safety issue in your community?
7	What barriers keep you from walking or biking more, or at all?
8	Which type of safety improvements would you most support?
9	What are your top transportation related safety concerns in the county?
10	Who is filling out this survey?

Stakeholder Interviews

Stakeholder interviews provide a means of gathering valuable information, opinions, and perspectives that are relevant to the project. This information will be used to inform decision making and improve outcomes. Stakeholder interviews will provide a deeper understanding of the issues and concerns of different groups, and how these can be addressed in the planning and decision-making process. Stakeholder interviews will be conducted with the following individuals/groups:

TABLE 3 - STAKEHOLDER INTERVIEW PARTICIPANTS

Name	Agency	Email	Phone
Chris Yates	Danville Police Department	cyates@danvillepd.org	217.431.2234
Jane McFadden	Vermilion County Coroner	jmcfadden@vercounty.org	217.554.6030
Aaron Marcott	Danville Fire Department	amarcott@cityofdanville.org	217.444.3776
Lloyd Smith	Rossville Fire Department	firechief.lloydsmith@gmail.com	217.304.2295
Josh Linton	Kickapoo Fire Department	--	217.442.2214
Butch Fields	Tilton Ambulance Service	--	217.304.3406

Community Open House

A community open house will be held to outline the planning process, showcase how public input shaped the plan, demonstrate the region's commitment to roadway safety, and illustrate the findings and recommendations of the VCSAP. Lochmueller Group will create up to 8 presentation boards/displays and supporting materials to share information. The steering committee will assist the project team in finding an appropriate location and advertising for the community open house.

Community Engagement Schedule

- **Community Engagement Plan (CEP) –** February 23 (living document, will change/update throughout the planning process)
- **Online Survey –** February 15 (open for approximately 30 days)
- **Stakeholder Interviews –** February 15 – March 15
- **Community Open House –** week of May 15
- **Community Engagement Summary Memorandum –** May 26
- **VCSAP DRAFT –** June 15
- **VCSAP Final –** July 20

Key Terms

The VCSAP requires a shared understanding of key ideas and concepts to move forward the recommendations of the plan. The key terms listed here are those items that elicit confusing or unclear interpretations. By defining key terms, the project team and steering committee can provide consistent and clear messaging to the public while obtaining valuable and informed feedback.

- **Accessibility** – Accessibility is the concept that refers to one's ability to reach a desired destination. Accessibility is the potential for interaction.
- **Americans with Disabilities Act (ADA)** – ADA is a civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life including transportation.
- **Barriers** – Barriers are conditions, policies, or attitudes that prevent, or make difficult, the use and enjoyment of services, amenities, practices, products, and information, as well as those personal and social hurdles that many peoples must surmount in day-to-day life.
- **Complete Streets** – Complete streets are streets for everyone. Complete Streets is an approach to planning, designing, building, operating, and maintaining streets that enables safe access for all people who need to use them, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.
- **Mobility** – Mobility is the concept that refers to the efficient or quick movements of people, goods, or services. Mobility is the potential for movement.
- **Safe Systems Approach** – The safe systems approach is a holistic and human centered approach to roadway safety. The principles of the safe systems approach are:
    - *Death and serious injuries are unacceptable.* The safe systems approach is an ethical principle that no one should suffer death or serious injury while using the transportation system.
    - *Humans make mistakes.* People will inevitably make mistakes but the transportation system can be designed to mitigate human mistakes to avoid death and serious injury.
    - *Humans are vulnerable.* Human bodies have physical limits for tolerating trauma, therefore it is critical to design a transportation systems that accommodates physical human vulnerabilities.
    - *Responsibility is shared.* All stakeholders—including government at all levels, industry, non-profit/advocacy, researchers, and the general public—are vital to preventing fatalities and serious injuries on our roadways.
    - *Safety is proactive*. Proactive tools should be used to identify and address safety issues in the transportation system, rather than waiting for crashes to occur and reacting afterwards.
    - *Redundancy is crucial*. Reducing risks requires that all parts of the transportation system be strengthened, so that if one part fails, the other parts still protect people.
- **Safety Countermeasure** – Safety countermeasures are strategies or treatments that are effective at reducing fatal and serious injury crashes.
- **Transportation Equity** – Transportation Equity is fairness with respect to the distribution of access, mobility, connectivity, opportunity, benefits, and impacts of circumstances affecting the provision of a safe, reliable, and affordable transportation system and services. Transportation equity can be classified into three types:

  - *Procedural equity.* Procedural equity is focused on the degree of involvement of diverse public stakeholders in the processes by which transportation decisions are made.
  - *Geographic equity*. Geographic equity focuses on the distribution of impacts across geography and space.
  - *Social equity.* Social equity is focused on the distribution across population groups that can be equal or differ by income, social class, and mobility ability.
- **Underserved Communities** – Underserved communities are populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list in the definition of equity.
- **Vision Zero** – Vision Zero is the global movement to end traffic-related fatalities and serious injuries by incorporating the safe systems approach to roadway safety.

MEMO

To: Vermilion County Safety Action Plan Steering Committee

From: Lochmueller Group

Date: April 11, 2023

Subject: Vermilion County Safety Action Plan Public Survey responses

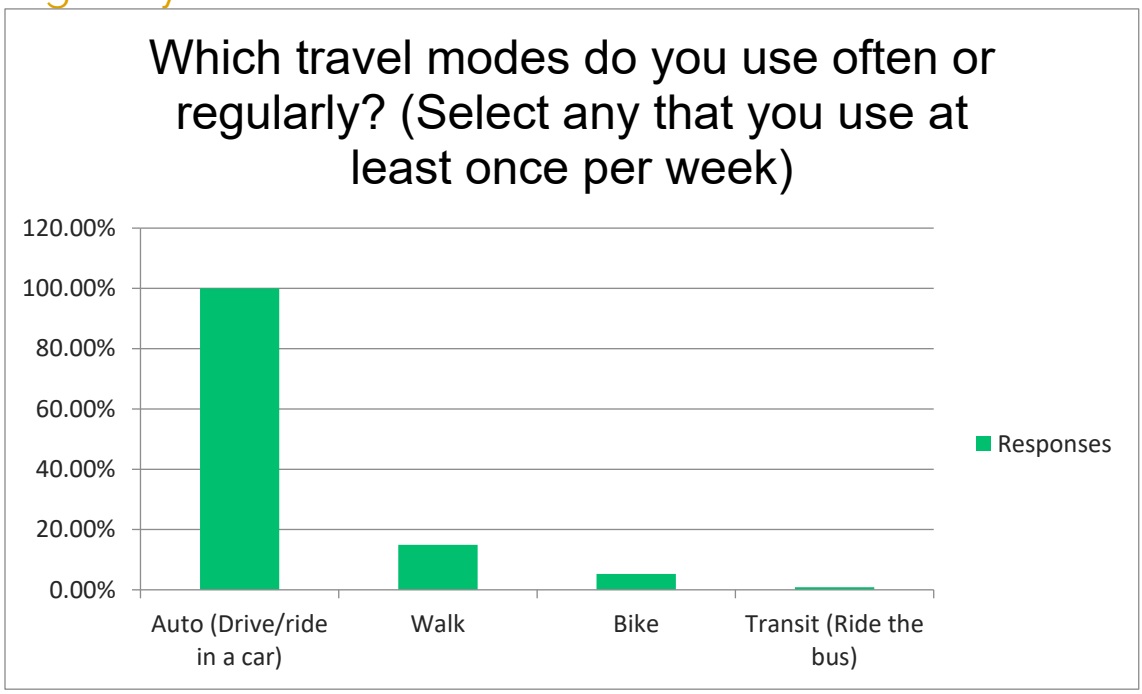
Community Survey

A community survey took place between February 15, 2023, and March 31, 2023. The online survey was widely advertised by various members of the DATS Technical Committee with the goal of gathering information regarding attitudes and opinions of Vermilion County residents regarding safety for drivers, pedestrians, cyclists, and transit users.

The survey included 10 questions related to safety in the county and safety measures. The results, 114 survey submissions, will help shape the public engagement component of the Vermilion County Safety Action Plan and serve as a tool to identify potential areas of concern and potential solutions.

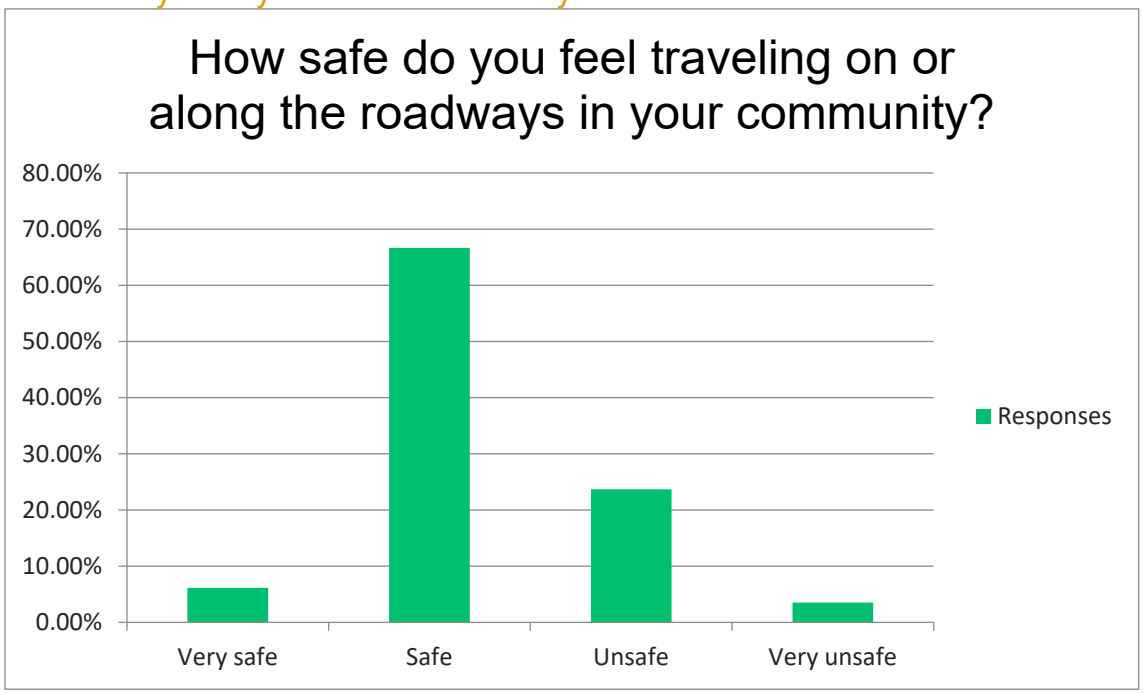
Huntington Tower, 201 W Springfield Avenue, Suite 1012
Champaign, Illinois 61820
PHONE: 217.673.7633

Question 1: Which travel modes do you use often or regularly?



Question 1 was asked to understand how Vermilion County residents travel around the county and the modes of transportation which are the most prominent in the community. 100% of survey respondents report driving a vehicle at least one time a week. Just under 15% of respondents reported walking at least once a week, Just over 5% of respondents reported biking at least once a week and less than 1% of respondents reported using public transportation at least once a week.

Question 2: How safe do you feel traveling on or along the roadways in your community?



Question 2 was asked to identify the feelings surrounding safety when traveling around Vermilion County. A majority of respondents, 66.7% reported feeling safe using the roadways. 23.7% of respondents reported feeling unsafe, 6% reported feeling very safe and only 3.5% of respondents reported feeling very unsafe. When looking at responses of sentiments of safety on roadways, it is important to note that the vast majority of respondents travel solely using a private vehicle.

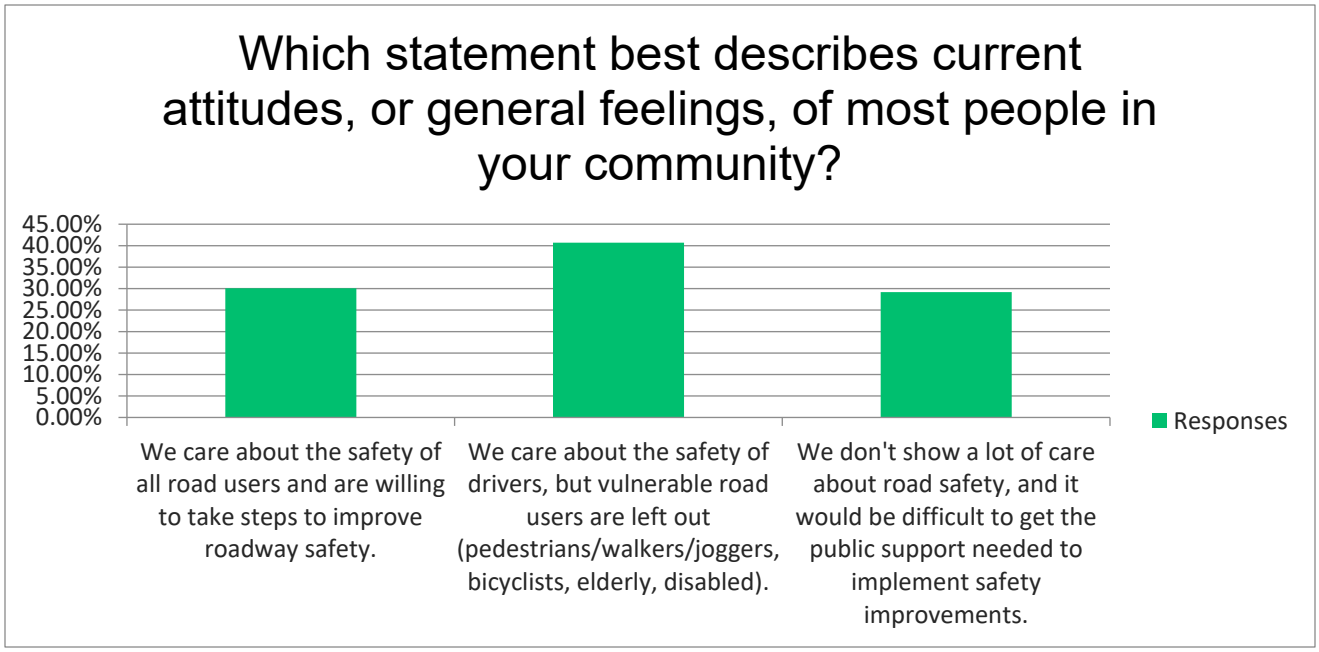
Question 3: What would make you feel safer?

Question 3, an open ended question, was asked to gather public opinion on what residents feel would make them safer while traveling through the county. Of the 114 survey respondents, 100 answered this question while 14 opted to skip. The answers given varied from respondent to respondent, with some being broader comments and others being more location specific. Many respondents commented on the conditions of the roads, speeding, lack of traffic signals, and poor pedestrian infrastructure.

Question 4: How safe is it traveling on the roadways within your community for the following people?

Question 4 was asked to gather opinions from residents regarding the perceived safety of other road users. The majority of respondents, almost 67%, reported that travelling on roadways in Vermilion County is safe for drivers. The majority of respondents, 61%, reported that traveling on roadways is unsafe for bicyclists. Similarly, 59% of respondents reported that traveling on roadways is unsafe for walkers. 52% of respondents reported that traveling on roadways is safe for motorcyclists. 49% of respondents reported that traveling on roadways is unsafe for elderly/disabled persons. 67.6% of respondents reported that traveling on roadways is safe for transit users.

Question 5: Which statement best describes current attitudes, or general feelings, of most people in your community?

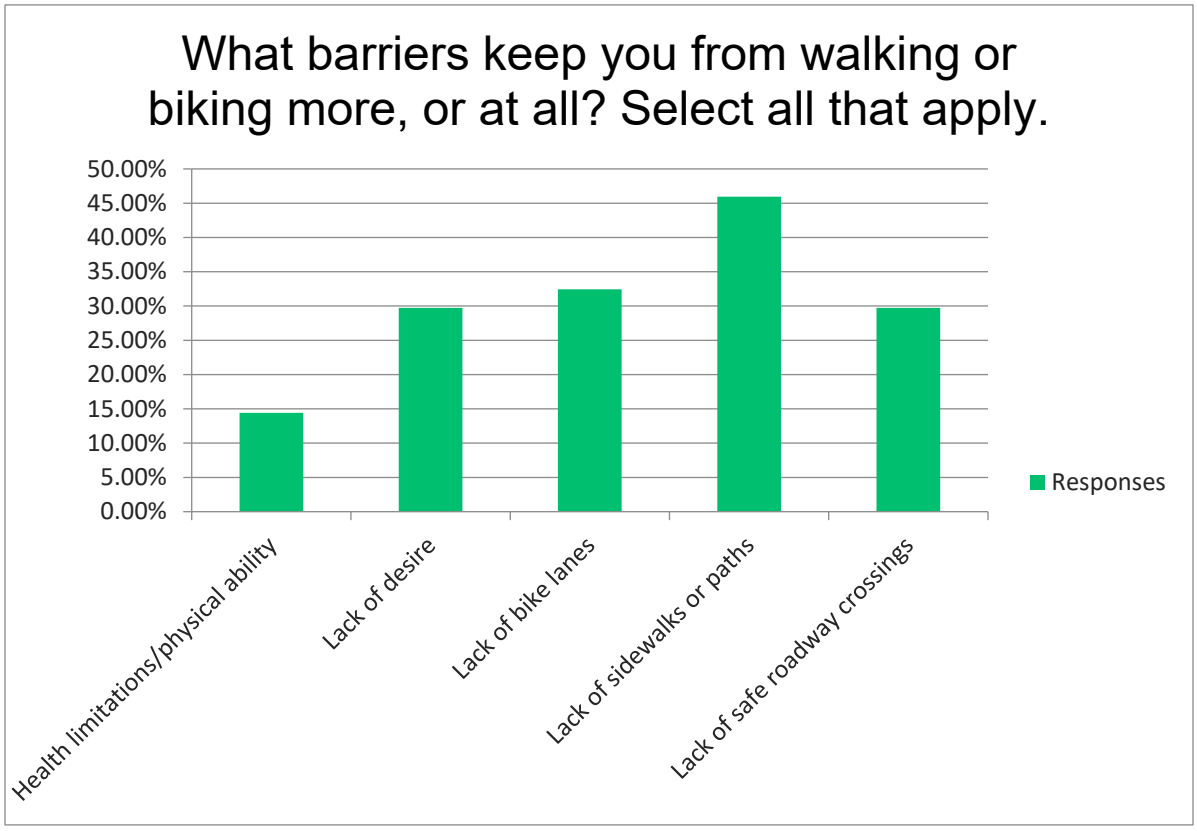


Question 5 was asked to gauge public perception of the community's feeling towards safety. The options for this question included "We care about the safety of all road users and are willing to take steps to improve roadway safety.", "We care about the safety of drivers, but vulnerable road users are left out (pedestrians/walkers/joggers, bicyclists, elderly, disabled).", and "We don't show a lot of care about road safety, and it would be difficult to get the public support needed to implement safety improvements.". The majority of respondents, 40.7%, reported that the community cares about the safety of drivers but other road users are left out. 30% reported that the community cares about the safety of all road users and 29% reported that the community doesn't show much care for road safety.

Question 6: Do you consider speeding a safety issue in your community?

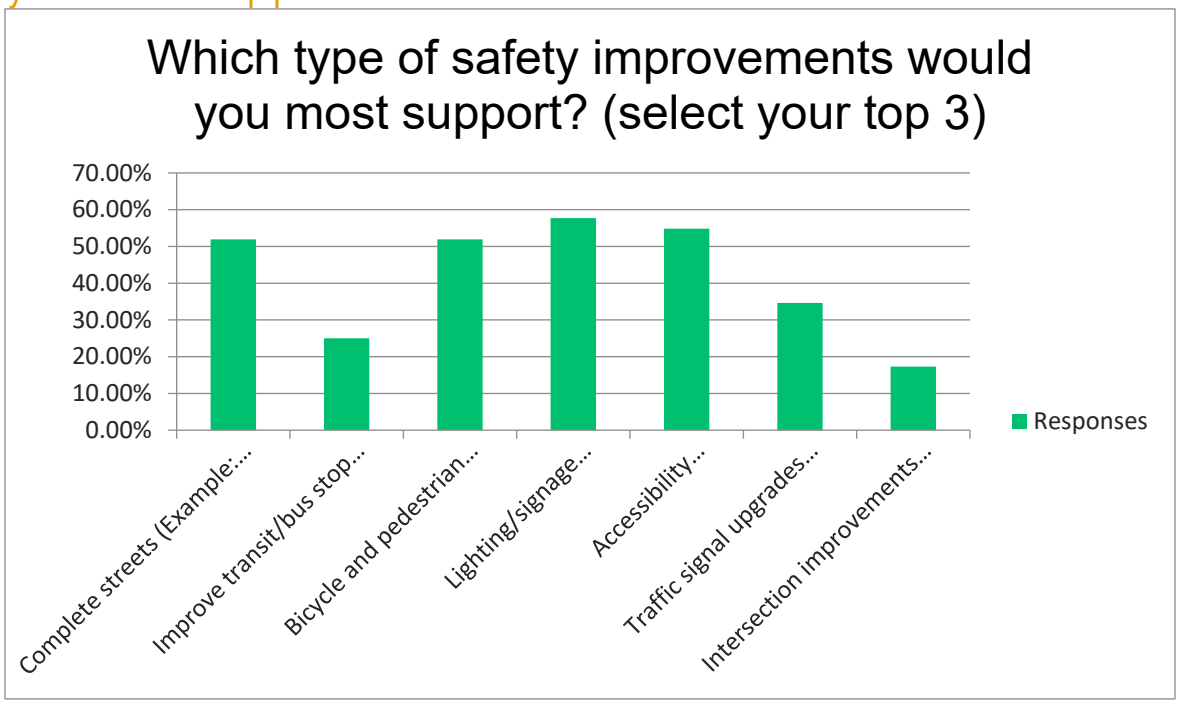
Question 6 was asked to gather opinions on speeding as a safety issue. Most respondents, 66%, reported they felt speeding was an issue in their community.

Question 7: What barriers keep you from walking or biking more, or at all?



Question 7 was asked to understand what keeps residents from walking or biking. The majority of respondents, nearly 46%, reported that a lack of sidewalks or paths it the barrier. 32% reported that a lack of bike lanes is the issue. 29.7% of respondents reported that they have no desire and 29.7% reported a lack of safe roadway crossing as the issue. 14% reported that health limitation kept them from walking or biking. 97 respondents answered this question while 17 skipped. There were 34 written responses.

Question 8: Which type of safety improvements would you most support?



Question 8 was asked to understand which forms of safety improvements are most popular among residents. Lighting concerns were the most popular among respondents with 57.7% selecting this safety improvement. This is followed by accessibility concerns, with 54.8% selecting this safety improvement. The third most popular safety improvement is a tie between complete streets and bicycle/pedestrian separation, both were selected by 52% of respondents. 34.6% selected traffic signal upgrades, 25% selected public transit infrastructure improvements and 17% selected intersection improvements.

Question 9: What are your top transportation related safety concerns in the county?

Question 9, an open ended question asking for a list of 3 safety concerns, was asked to find out what safety concerns are most prominent within the community. 96 respondents answered this question and 18 respondents skipped. For first concerns, many responses were related to question 3. There were many comments concerning speeding, road conditions, and lighting. Several responses also commented on the lack of public transportation to vital areas in Danville and around Vermilion County. The responses for the second concern consisted more of issues related to cyclists and pedestrians with comments about lack of sidewalks and bike lanes. The third concern box was filled out by fewer respondents but consisted of many similar concerns as the first two.

Question 10: Who is filling out this survey?

Question 10 was asked to gather demographic data on survey respondents, including name, company/agency, whether or not respondent is a resident of Vermilion County, and city/town/neighborhood. The majority of respondents are residents of Vermilion County.

VCSAP Stakeholder Phone Interviews

Pitch Script:

Hello, I'm calling on behalf of the Danville Metropolitan Planning Organization, which is a group of local County agency leaders. We are conducting a study of existing roadway safety needs throughout Vermilion County. Your department was identified as an agency that could help us identify barriers to traveling throughout the community. I'd like to speak with you about how roadway safety impacts your organization. If you could, please call me back. My number is 217.673.7636. Thank you for your time.

Questions:

- How safe are the roadways in Vermilion County for your agency/service/customers?
- What would make the roadways safer?
- What do you think the current attitudes of the community are towards safety?
- Is speeding a safety issue for your service (customers or employees)?
- What safety improvements would you support in the County?
- Are there specific intersection or roadway segments that in your opinion, are not safe to travel?

Chief Chris Yates – Danville Police Chief, 217-431-2234

- How safe are the roadways in Vermilion County for your agency/service/customers?
    - Danville City and PW department have done an excellent job in resurfacing and making the City streets as good as he's seen in a long time. Most concern are roadways controlled by IDOT. Route 1. Biggest concern about Rte. 1 Up north by Meijer largest concern. Lots of commercial developments, one intersection that's traffic signal, one that isn't. Believes there are more crashes than there should be in this area. Lots of people have reached out asking for the unsignalized intersection to be signalized.
    - More attention could be given to Rte 1. Surface is poor.
    - Single most concern – some type of traffic control device at that southern entrance to Meijer. No median present. Does not believe a median would help. Concentration of traffic at the existing signal would increase and not help as much as a traffic signal at the intersection.
- What would make the roadways safer?
- What do you think the current attitudes of the community are towards safety?
    - Yes, community would prefer safety over convenience.
- Is speeding a safety issue for your service (customers or employees)?
    - Rte 1 speed is way too fast. Most of their traffic detail is set up on Rte. 1. Posted speed limit is 45 mph. No traffic control lights for a long distance, can get going pretty fast.
- What safety improvements would you support in the County?
- Are there specific intersection or roadway segments that in your opinion, are not safe to travel?
    - Last fatality at Village Mall entrance – ran red light.
    - Meijer entrance is lots of accidents and also severe crashes.

Jane McFadden – Vermilion County Coroner, 217-554-6030

- How safe are the roadways in Vermilion County for your agency/service/customers?
    - Doesn't think they are horrible. Not optimal.
    - A few hotspots. Route 1 north of Danville to Rossville. Route 49 has had a few fatalities in the past few years. I-74 between Fithian and the state line. Route 49 close to Potomac. 150 doesn't seem to be an issue with lots of fatalities. Red Top Road, near cemetery, between Danville and Rossville – several crashes, thinks it is due to passing and speeding.
- What would make the roadways safer?
    - Stop signs set too far back from the intersection in rural areas, especially when the corn is high. Corn too close to the road.
    - Speed a major factor. Impaired driving. Behavioral issues. Enforcement needed to stop speeders.
    - Need campaign on safe driving – inattentive drivers a big issue.
- What do you think the current attitudes of the community are towards safety?
    - General public would be supportive, even if it caused inconvenience.
- Is speeding a safety issue for your service (customers or employees)?
    - Speed and inattentive drivers are the number one cause of fatalities in her opinion.
- What safety improvements would you support in the County?
- Are there specific intersection or roadway segments that in your opinion, are not safe to travel?

Chief Aaron Marcott – Danville Fire Department, 217-444-3776

- How safe are the roadways in Vermilion County for your agency/service/customers?
- What would make the roadways safer?
    - South gilbert street – traffic control.
    - Education on distracted driving.
    - Narrow roads - parking an issue for the engines. On State streets where the roads are tighter. Illinois/Indiana given as examples.
- What do you think the current attitudes of the community are towards safety?
    - People would be willing to accept minor inconvenience in the name of safety,
- Is speeding a safety issue for your service (customers or employees)?
    - Not so much speeding, but distracted driving. Speeding an issue for patients, but not so much firefighters.
- What safety improvements would you support in the County?
- Are there specific intersection or roadway segments that in your opinion, are not safe to travel?
    - Rear end collisions at Winter/Vermilion, right by the fire station when the engines pull out.
    - Curve on Vorhees out by 1200 Int'l Place. Lynch Road – area where there are a lot of crashes.

Kickapoo Fire Protection District, 217-442-2214

- How safe are the roadways in Vermilion County for your agency/service/customers?
- What would make the roadways safer?

- What do you think the current attitudes of the community are towards safety?
- Is speeding a safety issue for your service (customers or employees)?
- What safety improvements would you support in the County?
- Are there specific intersection or roadway segments that in your opinion, are not safe to travel?
    - Pretty flat. No rail crossing, bridge, or viaduct concerns. Speaking to First Lt. Josh Linton.
    - Largest concern is more than half the district is not water accessible (hydrants).
    - Roadway crashes vary. One main intersection - Rte 150 and Henning Rd. Human behavior main culprit. A bunch of country road that could use guardrail.
    - Fairly decent drivers in their district.

Rossville Fire Protection District, Chief Lloyd Smith 217-304-2295

- How safe are the roadways in Vermilion County for your agency/service/customers?
- What would make the roadways safer?
- What do you think the current attitudes of the community are towards safety?
- Is speeding a safety issue for your service (customers or employees)?
- What safety improvements would you support in the County?
- Are there specific intersection or roadway segments that in your opinion, are not safe to travel?
    - Been low on crashes in the last few years. No significant intersection issues.
    - Speed between Rossville and Hoopeston is an issue. Rte 1 is a drag strip both north and south of town.
    - Roads need resurfacing. Going to start becoming an issue before long, but not yet. Potholes will start to cause issues.
        - Bowman Ave one of the worst.
        - Alvin to Bismarck into Danville area
        - Rossville Rd. 3550 – was supposed to be widened and resurfaced?? Ran out of money.
            - It is a major east/west
            - Currently very narrow
    - Mainly black top roads within their area
    - Safety attitude – not supportive of closures or inconveniences, even in the name of safety.
    - Bowman Ave and Attica Rd. only options north. No other roads to detour. Public not happy with driving 3+ miles on detour.
    - North of town, border with Hoopeston. Guardrail on bridge wiped out 7 years ago. Patched but never replaced. Tractor hit it when a tow truck hit the tractor from behind. Roughly 3900 N on Rte. 1.

Tilton Ambulance, Butch Fields 217-304-3406

- How safe are the roadways in Vermilion County for your agency/service/customers?
    - Some are and some are not.
        - Interstate 74, State of IL decreased lighting along the interstate. Interchanges specifically are not very clearly lit. Not all the guide signs are reflective anymore during the nighttime.
    - County Roads are very dark at night time.

        - Hard to see addresses on houses in the dark. Can't follow GPS. Constantly slowing down to see road numbers. Also can't see county road markers due to poor lighting. Can't really see the county road signs. Can they be bigger, easier to be seen during night? They are reflective, but they are too small. Sign is one color – lettering is another color. Both reflect but two colors blur together.
- What would make the roadways safer?
    - would be easier/safer for emergency responders if all signals had pre-emption. Red light running is prevalent, people don't stop and aren't paying attention, even if the ambulance has the green light, it is still hazardous.
- What do you think the current attitudes of the community are towards safety?
    - Would people be OK with an inconvenience if it meant a safer road conditions? No, in Tilton, people would not be supportive. Thinks this would be true for the entire County, no matter which town or rural.
- Is speeding a safety issue for your service (customers or employees)?
    - Yes absolutely. Speeding is everywhere. Not as much in town. Once they are outside of a town, the speed increases. No law enforcement patrol, no
- What safety improvements would you support in the County?
    - Roadways need to be reconstructed. Travel to Sidell a lot. Have to go a certain way to avoid potholes – through Indianola. Between Indianola and Sidell roads are poor condition. Smaller roads to smaller communities are what don't get enough attention.
- Are there specific intersection or roadway segments that in your opinion, are not safe to travel?
    - Tilton covers a lot of area, not just Tilton. They respond to Oakwood and Georgetown ambulance, Lynch fire protection back-up. No specific intersection/roadway coming to mind.

Larry Baughn, Chairman
County Board
Vermilion County, Illinois

Joseph G. Cannon Building
201 N. Vermilion Danville, IL 61832
Phone: (217) 554-6000 Fax: (217) 554-6010 e-mail: lbaughn@vercounty.org

Friday, May 12, 2023

Sam Cole, DATS Director
Danville Area Transportation Study
111155 East Voorhees Street, Suite A
Danville, Illinois 61832

Dear Director Cole:

I am writing to support the Vermilion County Safety Action Plan because your Vision Zero plan establishes a framework that focuses on improving traffic safety throughout the County.
As a member agency of the Danville Area Transportation Study (DATS), we support the four implementation sub-groups identified to improve safety:

- Intersections
- Arterial Routes
- Rural Highways
- Pedestrian and bicycle facilities

The development of the action plan will prove to be a key factor in Vermilion County, the City of Danville and other partners improving safety, and eliminating fatal and serious injury accidents. We support the goal of reaching zero fatalities on our roadways by 2050, and we look forward to the implementation of the Vermilion County Safety Action Plan and Vision Zero!

Sincerely,

Larry Baughn Jr,
Vermilion County Board Chairman

Rickey Williams, Jr., Mayor

June 9, 2023

Sam Cole, DATS Director
Danville Area Transportation Study
1155 East Voorhees Street, Suite A
Danville, IL 61832

Dear Director Cole,

I am writing in support of the Vermilion County Safety Action Plan because this Vision Zero plan establishes a framework that focuses on improving traffic safety throughout Vermilion County. As Mayor of Danville, I support the four implementation sub-groups identified to improve safety:

- Intersections
- Arterial Routes
- Rural Highways
- Pedestrian and bicycle facilities

I believe that having a safe and equitable transportation that serves all individuals regardless of the location or mode of transportation is key to restoring the health and vitality of our neighborhoods and ensuring that all individuals have the opportunity to live out their purpose. The development of the action plan will prove to be a key factor for Vermilion County, the City of Danville and other partners by providing a guide to improving safety and eliminating fatal and serious injury accidents. I support the goal of reaching zero fatalities on our roadways by 2050 and look forward to the implementation of the Vermilion County Safety Action Plan and Vision Zero!

Sincerely,

Rickey Williams Jr.

Mayor, City of Danville

DMT
Danville Mass Transit

June 9, 2023

Sam Cole, Director
Danville Area Transportation Study
1155 E. Voorhees St.
Danville, IL 61832

Sam:

It has been an incredible pleasure having been a part of the formation of the Vermilion County Safety Action Plan. This Vision Zero plan creates a goal for Vermilion County, and a method for achieving that goal of lessening the probability of fatal accidents. As a transportation provider in the county, we will experience the positive impact of the identified plan components daily.

We feel that the goal of zero fatalities by the year 2050 is an attainable goal and the implementation of this plan will prove beneficial in reducing serious injuries, as well. Danville Mass Transit is in full support of the plan and we look forward to traveling on roadways that are safer in Vermilion County.

With appreciation,

Lisa Beith

Lisa Beith, Director

101 north jackson street *danville, illinois 61832* *217 431 0653* *fax 217 431 8647*

JANE McFADDEN, CORONER
201 N. VERMILION ST., SUITE 325,
DANVILLE, IL 61832
PHONE 24 HRS. 217-554-6030 FAX 217-302-5200

May 23, 2023

Sam Cole, DATS Director
Danville Area Transportation Study
1155 East Voorhees Street, Suite A
Danville, IL 61832

Dear Director Cole,

I am writing in support of the Vermilion County Safety Action Plan because your Vision Zero plan establishes a framework that focuses on improving traffic safety throughout Vermilion County. The Vermilion County Coroner's Office supports the four implementation sub-groups identified to improve safety:

- Intersections
- Arterial Routes
- Rural Highways
- Pedestrian and bicycle facilities

My office sees the devastating effects of fatal traffic accidents in Vermilion County each and every year. I am grateful to be able to participate in efforts to address the causes of traffic crash fatalities. The development of the action plan will prove to be a key factor in Vermilion County, the City of Danville and other partners by improving safety and thus eliminating fatal and serious injury accidents. We support the goal of reaching zero fatalities on our roadways by 2050 and we look forward to the implementation of the Vermilion County Safety Action Plan and Vision Zero!

Respectfully,

Jane McFadden
Vermilion County Coroner