APPENDIX A: **CRASH DATA ANALYSIS**

This appendix to the Salina Comprehensive Safety Action Plan provides a more detailed look at the crash data analysis performed for the Comprehensive Safety Action plan's development. This data informed plan recommendations, future prioritization of safety treatments and countermeasures, and selection of corridor profiles available in Appendix E.

This analysis is separated into three distinct sections to reflect the three types of analysis that were performed:

- Descriptive Safety Analysis (DSA)
- High Injury Networks (HIN)
- High Risk Networks (HRN)

Descriptive Safety Analysis

This analysis examines the City of Salina's overall crash trends and contributing factors over the past five years (2019-2023). Its purpose is to identify what crash types and factors tend to produce a high number of fatal and serious injury crashes. Data was sourced from the KDOT KORA Open Data Site and City of Salina, KS. This memo describes high level crash trends by various crash and roadway attributes and identifies areas of concern and opportunity to reduce fatal and injury-causing crashes through proven, innovative, and comprehensive crash reduction strategies.

Summary of Key Findings

- While Salina crash numbers do not appear to be increasing, no improvement is evident in the trend either.
- Of the 4,222 crashes in Salina between 2019 and 2023, 1,117 resulted in an injury and 11 were fatal, including one pedestrian and one bicyclist death.
- The frequency of pedestrian crashes along roadway segments rather than at intersections where pedestrians are expected to interact with traffic may indicate a need for additional safe mid-block crossings to improve pedestrian safety.

Descriptive Crash Analysis Methodology

The descriptive crash analysis methodology consists of data collection, consolidation, processing, and contextualization based on available crash and roadway attribute data. A series of high-level descriptive summary tables and charts capture relationships between region-wide crash data, infrastructure data, and contextual variables. These statistics explore overall crash trends and patterns that can be used to guide the selection of variables warranting deeper analysis, new roadway behavior programs, policy changes, or the selection of safety countermeasures for project development. The data does not distinguish between serious and minor injuries.[1]

Crash Data

Sources

For this time period, police Officers in Kansas complete Form 850A, the Kansas Motor Vehicle Crash Report[2], using codes found in Form 855 [3], the Crash Code Sheet based on instruction from the Law Enforcement Crash Report Coding Manual.[4] KDOT's Crash Data Unit then collects and aggregates these reports into requestable crash datasets.[5]

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1 There is some doubt about the accuracy of distinction in crash reports between injury severity as accurately assessing this factor in the field can be challenging.

2 https://www.ksdot.gov/Assets/wwwksdotorg/bureaus/burTransPlan/prodinfo/lawinfo/SamplePaperForm.pdf

3 https://www.ksdot.gov/Assets/wwwksdotorg/bureaus/burTransPlan/prodinfo/lawinfo/CrashCodingSheet.pdf

4 https://www.ksdot.gov/Assets/wwwksdotorg/bureaus/burTransPlan/prodinfo/lawinfo/2024KansasCrashReportCodingManual.pdf

5 https://www.ksdot.gov/bureaus/offchiefcoun/openrecords.asp

Limitations

The consultant team studied crashes that occurred during a period of five years, from 2019 through 2023. The available roadway data reflects the current state of the roadway. We assume that some changes in roadway design and operation have occurred in previous years for which the data cannot account. For example, if a crash occurred in 2020 and the posted speed limit changed in 2021 from 35 mph to 30, the analysis would link the 2020 crash to the present day 30 mph speed limit. As crash data is viewed in aggregate and only the past 5 years of crash data is used, the effect of this limitation is expected to be minimal.

The analyses reported here do not adjust for exposure rates based on volumes by modes. Therefore, results show crash density but not frequency of crashes normalized by level of traffic or pedestrian and bicycle volumes, which is also called exposure. For example, in many communities, pedestrian crashes are more common during daylight conditions than dark conditions. This does not mean that daylight conditions are more dangerous than dark conditions. Rather, it reflects the fact that people are more likely to travel, and especially more likely to travel by walking, in light conditions than in dark conditions. Some proxies for exposure are noted in this analysis, such as land use, transit facilities, and functional classification.

Finally, bicycle and pedestrian involved crashes are considered a "crash type" and as a result are not assigned a "collision first harmful event" the way that collisions with other motor vehicles are. This limits this study's ability to understand dynamics around crashes with these vulnerable road users. Data about the nature of a crash with a vulnerable road user would be useful, for example, to understand whether pedestrians are being struck by cars making "right on red" turns or cyclists being side swiped along road segments or right or left hooked at intersections.

Descriptive Crash Analysis

Figure 1 shows crashes going back to 2014 as the longer time frame allows a better sense of the overall trend. As shown by the dotted lines, the trend is mostly flat over the ten-year period.

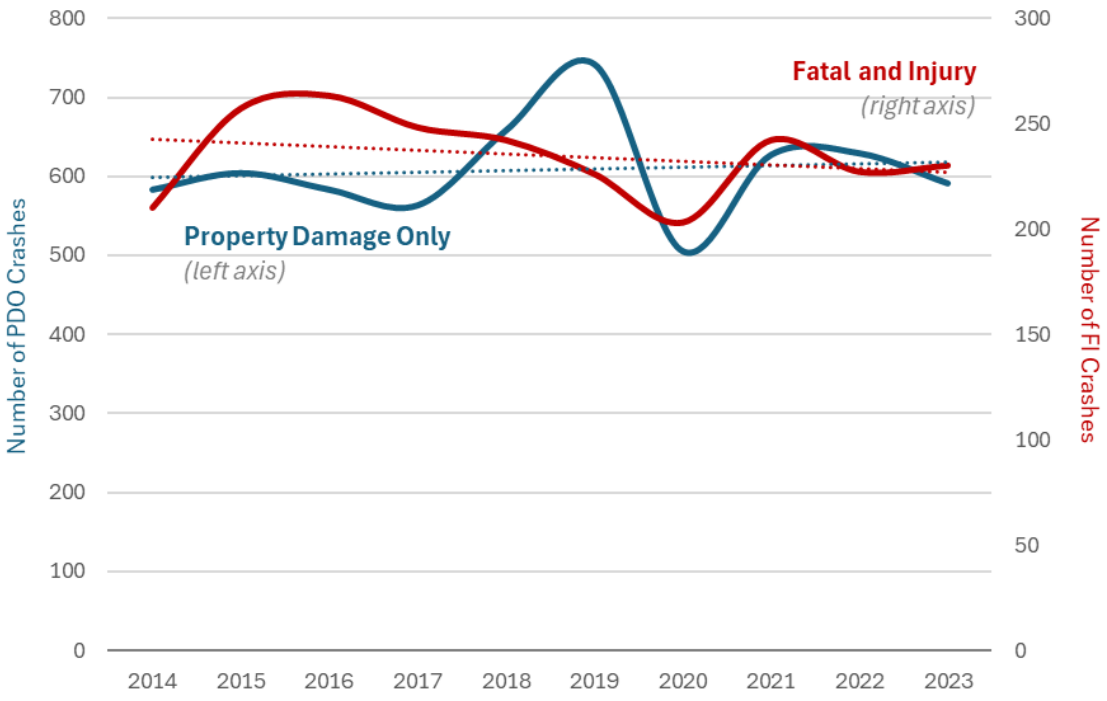


FIGURE 1 *Crash Trends, 2014-2023*

Crashes by Mode

Of the 4,222 crashes recorded in Salina over the five-year study period, 11 were fatal including one pedestrian and one bicycle crash (Figure 1). The lack of Bicycle and Pedestrian crashes resulting in property damage only is notable. This is generally driven by the high likelihood of an injury when a vulnerable road user is involved in a crash, and the fact that crashes that do not involve an injury are unlikely to be reported. In addition, many of these crashes may not meet reporting standards since pedestrians and bicyclists are unlikely to meet thresholds for property damage crash reporting as described in the state crash reporting manual linked above. Throughout this analysis, pedestrian and bike crash statistics will include property damage crashes to assess the largest dataset available for patterns.

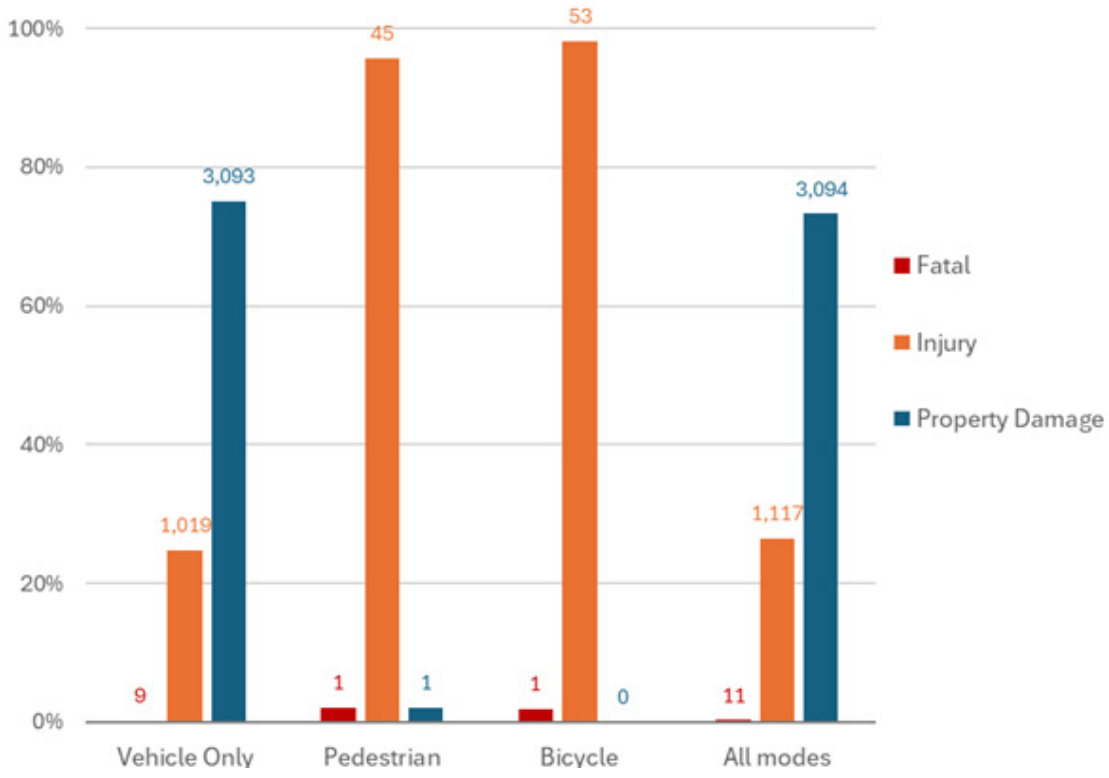


FIGURE 2 *Crashes by mode, 2019-2023*

Day of Week and Time of Day

Table 1 shows crash totals for times of day throughout the week. The primary pattern in this data summary shows that higher driving volumes during the daytime hours yield higher crash volumes, both for all crashes and for fatality and injury crashes. Consistent with this pattern, crash counts are also lower on the weekend compared to weekdays. *Table 2*, comparing counts for all crashes with counts of fatal and injury crashes shows that the percentage of crashes resulting in a fatality or injury is higher on Thursday and Saturday nights, but not notably higher on Friday nights. Crashes early on Saturday morning are also more likely to result in a fatality or injury but the total count for this period is low enough that this is not necessarily a reliable pattern.

TABLE 1 *Day of Week and Time of Day, 2019-2023*[6]

	All Crashes								Fatal and Injury Crashes							
	Su	M	T	W	Th	F	S	Total	Su	M	T	W	Th	F	S	Total
2-6 AM	34	20	17	13	16	17	30	147	9	2	4	4	2	3	9	33
6-10 AM	35	102	97	108	78	113	44	577	9	30	28	26	28	32	7	160
10 AM - 2 PM	96	180	147	174	149	174	120	1,040	28	48	40	53	40	49	33	291
2-6 PM	129	226	241	231	246	264	142	1,479	28	64	63	59	55	72	29	370
6-10 PM	79	77	84	103	97	114	107	661	21	31	24	26	29	31	41	203
10 PM - 2 AM	57	29	36	36	45	58	57	318	15	9	7	11	7	9	13	71
Total	430	634	622	665	631	740	500	4,222	110	184	166	179	161	196	132	1,128

TABLE 2 *Percentage of Crashes Involving a Fatality or Injury by Time, 2019-2023*

	Su	M	T	W	Th	F	S	Total
2-6 AM	26.5%	10.0%	23.5%	30.8%	12.5%	17.6%	30.0%	22.4%
6-10 AM	25.7%	29.4%	28.9%	24.1%	35.9%	28.3%	15.9%	27.7%
10 AM - 2 PM	29.2%	26.7%	27.2%	30.5%	26.8%	28.2%	27.5%	28.0%
2-6 PM	21.7%	28.3%	26.1%	25.5%	22.4%	27.3%	20.4%	25.0%
6-10 PM	26.6%	40.3%	28.6%	25.2%	29.9%	27.2%	38.3%	30.7%
10 PM - 2 AM	26.3%	31.0%	19.4%	30.6%	15.6%	15.5%	22.8%	22.3%

6 Table 3 and Table 4 time ranges rely on the hour value. For example, the 2-6 range includes crashes with time stamps from 02:00 AM through 05:59 AM. A crash at time 06:00 would fall in the 6-10 time bin.

Crash Types

The analysis of crash types in Table 3 shows that collisions between motor vehicles are by far the most common crash type. It also shows that crashes between traveling motor vehicles are also slightly more likely to result in a fatality or injury. While pedestrian and bicycle involved crashes are less common, they are more likely than other crash types to result in an injury or fatality, which is consistent with state and national crash trends.

TABLE 3 *Collision Type, 2019-2023*

Collision with...	All Crashes	Fatal and Injury Crashes
Other Motor Vehicle	69.8%	75.5%
Parked Motor Vehicle	14.9%	3.5%
Fixed Object	10.6%	9.6%
Bicycle	1.1%	4.1%
Pedestrian	1.0%	3.6%
Not a Collision	0.9%	1.4%
Other Object	0.7%	0.5%
Overturned Vehicle	0.5%	1.8%
Animal	0.5%	-

Figure 3 shows the distribution of crash locations. Most crashes are simply identified as being “Not Intersection Related”, “Intersection” or “Intersection Related”[7]. Intersection crashes are substantially more likely to be a fatal or injury (FI) crash compared to other crash types. The opposite is seen in crashes along the roadway and crashes related to parking lots or driveways. Both of those categories have a lower percentage of FI crashes than they do of all crashes.

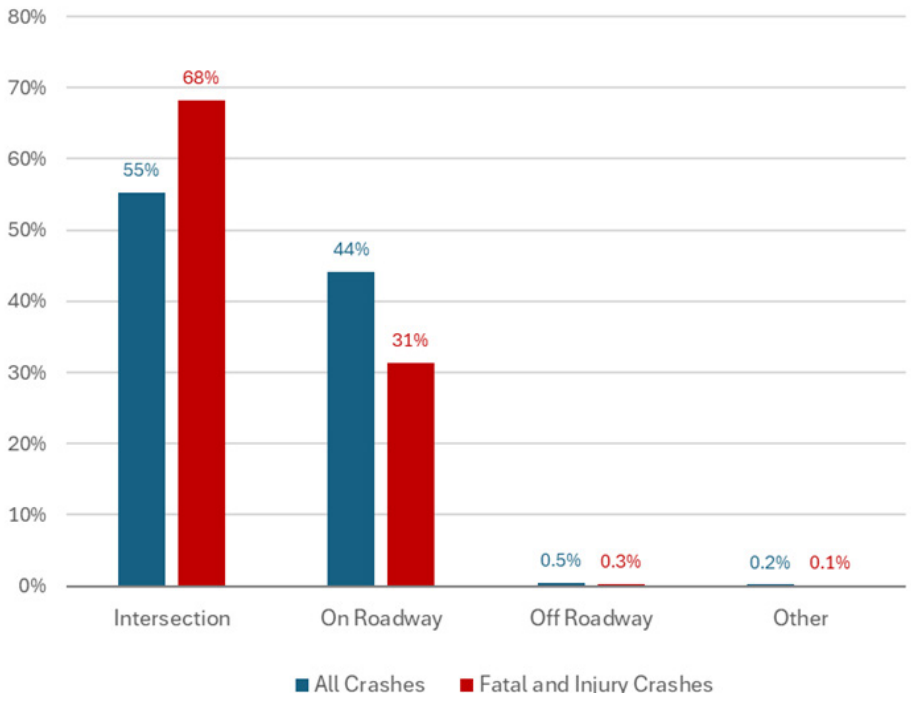


FIGURE 3 *Collision Location, 2019-2023*

7 From the KDOT Law Enforcement Crash Report Coding Manual, 2019: “Intersection-Related requires a judgment call about the effects of intersections and their traffic controls upon traffic and crash causation.”

Looking at pedestrian and bicycle categories in Table 4, bike crashes are slightly more likely to occur at intersections while slightly more than half of pedestrian crashes occur at non-intersection locations. Usually, pedestrian crashes are more likely to be intersection related, as these are the main locations that pedestrians enter the roadway. Given the bias towards non-intersection locations, it may be the case that safe pedestrian crossings are relatively sparse along major roads, resulting in pedestrians attempting to cross midblock without an indicated crossing. These may also be locations where sidewalk infrastructure does not exist or is in a poor condition.

TABLE 4 *Collision Location by mode, 2019-2023*

	Pedestrian Crashes	Bicycle Crashes
Intersection	19	30
On Roadway	23	16

Figure 4 shows a breakdown of crashes identified as collisions with other motor vehicles as listed in Table 3. Angle crashes and rear end crashes are most common, Angle crashes are the most common crash type resulting in fatality or injury and are more likely to result in a fatality or injury than other crash types, along with Head On crashes. Unfortunately, because pedestrian and bicycle crashes are considered a crash type, further categorization of those crashes was not available in the data as it was for crash location for pedestrian and bicycle crashes.

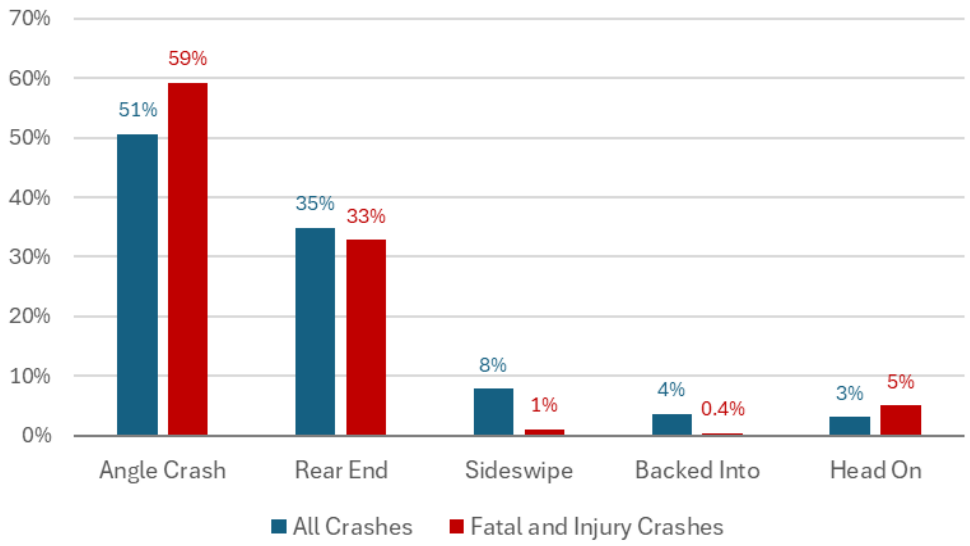


FIGURE 4 *Collision Type, 2019-2023*

Table 5 shows the types of objects struck in Fixed Object crashes. Curbs are the most common object and are more likely to result in a fatality or injury than most other crash types. Striking a tree is more likely to result in a fatality or injury compared to striking a signpost. This may be due to the difference in solidity of these objects but may also be influenced by driving speeds or other behavior in areas where signs or trees are more common.

TABLE 5 *Fixed Object Type, 2019-2023*

Fixed Object	All Crashes	Fatal and Injury Crashes
Curb	37.4%	49.1%
Utility Device	15.9%	13.0%
Sign Post	9.8%	3.7%
Tree	7.4%	13.9%
Other Post	6.9%	3.7%
Mailbox	6.0%	2.8%
Hydrant	3.1%	-
Fence / Gate	2.9%	2.8%
Median Barrier	2.5%	3.7%
Other	2.5%	1.9%
Building	1.6%	1.9%
Ditch	0.9%	0.9%
Barricade	0.7%	-
Culvert	0.7%	0.9%
Guardrail	0.7%	0.9%
Wall	0.4%	0.9%
Bridge Rail	0.4%	-
Overhead Sign Support	0.2%	-

Table 6 shows the distribution of crashes by posted speed limit. Most streets are 30 miles per hour or less, but streets with posted speed limits of **35 mph or greater are disproportionately represented in all crashes. Streets posted at 35 mph account for 21% of crashes despite making up only 4% of streets by mileage. Disproportionality is also apparent on 40 mph streets, which make up 27% of crashes but only 8% of street mileage.** 45 mph hour streets are represented in the crash data roughly equal to their percentage of street milage. Further, crashes on these streets are more likely to involve an injury or fatality than crashes on streets with slower speed limits. This dynamic is less apparent for 35 mph streets, 24% of FI crashes compared to 21% of all crashes and more significant for 40 mph streets, 33% of FI crashes compared to 27% of all crashes. 45 mph streets are approximately equally represented in All and FI crashes. A map of streets with 35, 40 and 45 mph limits can be found in Figure 6.

TABLE 6 *Crashes by Posted Speed Limit, 2019-2023*

	All Crashes			Fatal and Injury Crashes			Road Mileage	
Speed Limit	*Count*	*%*	*Per Mile*	*Count*	*%*	*Per Mile*	*Total*	*%*
15	7	0.2%	12.2	1	0.1%	1.7	0.6	2.0%
20	33	0.8%	689.3	7	0.6%	146.2	0.0	0.2%
30	2,101	49.8%	86.5	461	40.9%	19.0	24.3	84.0%
35	889	21.1%	728.4	272	**24.1%**	222.8	1.2	**4.2%**
40	1,140	27.0%	506.2	368	**32.6%**	163.4	2.3	**7.8%**
45	50	1.2%	96.6	19	1.7%	36.7	0.5	1.8%

A similar trend is seen in Table 10 showing crash statistics by functional classification. The functional class of a street in Salina is often consistent with the speed limit (see Figure 7 and Figure 8). A comparison of the Functional Class mileage to the Speed mileage shows that many higher functional class roads are still limited to 30 mph. While higher volumes on Arterial Streets may be an important factor for the drastically higher rate of crashes on those streets, the substantial increase in representation of those streets in FI crashes compared to all crashes shows that crashes on those streets are more dangerous than other streets as well as more common. This is consistent with the idea that the design of those streets could be improved to slow speeds, reduce conflicts and possibly reduce crash rates and severity.

TABLE 7 *Functional Class, 2019-2023*

	All Crashes			Fatal and Injury Crashes			Road Mileage	
Functional Class	*Count*	*%*	*Per Mile*	*Count*	*%*	*Per Mile*	*Total*	*%*
Arterial Streets	2,192	51.9%	663.7	700	**62.1%**	212.0	3.3	**11.5%**
Minor Arterial Streets	418	9.9%	267.0	118	**10.5%**	75.4	1.6	**5.5%**
Collector Streets	358	8.5%	132.5	81	7.2%	30.0	2.7	9.4%
Local Streets	1,218	28.8%	63.5	223	19.8%	11.6	19.2	67.0%
Park Road	15	0.4%	21.1	5	0.4%	7.0	0.7	2.5%
Private Streets	19	0.5%	16.1	1	0.1%	0.8	1.2	4.1%

Table 8 summarizes crashes by lane count. Streets with higher numbers of lanes are consistently linked to higher rates of crashes and higher severity of crashes. A map of lane count across Salina roads can be found in Figure 8.

TABLE 8 *Lane Count, 2019-2023*

	All Crashes			Fatal and Injury Crashes			Road Mileage	
Lanes	*Count*	*%*	*Per Mile*	*Count*	*%*	*Per Mile*	*Total*	*%*
2	2,351	51.1%	88.5	531	43.3%	20.0	26.6	90.9%
3	32	0.7%	270.0	11	0.9%	92.8	0.1	0.4%
4	1,841	40.0%	824.6	564	**46.0%**	252.6	2.2	**7.6%**
5	379	8.2%	1,253.2	119	9.7%	393.5	0.3	1.0%

Both Table 9 and Figure 5 examine weather and lighting conditions. Neither offer much direct information about crash causation as they both demonstrate that most driving happens during normal weather and daylight conditions. Importantly though, normal weather conditions may affect a driver's perception of driving risk and encourage them to drive more aggressively than they would in less-than-optimal weather, as crashes during normal weather conditions are more severe on average than crashes during adverse conditions. While this is also seen in lighting conditions, i.e., daylight crashes are more likely to involve a fatality or injury, crashes in the dark on lighted streets, and crashes at dusk are also more likely to be severe compared to all crashes.

While there is little opportunity to mitigate weather and lighting factors in crash frequency and severity, looking at this data is illustrative of the importance of driver perception of risk in their behavior and may justify modifications that use this perception-based trend to reduce speeds or other driving decisions that are influenced by the environment, whether natural or built.

TABLE 9 *Weather Conditinos, 2019-2023*

Weather Condition	All Crashes	Fatal and Injury Crashes
No adverse condition	89.93%	93.62%
Rain, Mist, Drizzle	5.85%	4.43%
Snow	2.01%	1.06%
Unknown	0.81%	0.09%
Strong Wind	0.47%	0.35%
Freezing Rain	0.28%	0.09%
Sleet	0.17%	0.09%
Snow and Wind	0.14%	0.09%
Fog	0.12%	-
Rain and Wind	0.09%	0.09%
Rain and Fog	0.07%	-
Dust storm	0.02%	0.09%
Smoke	0.02%	-

FIGURE 5 *Lighting Conditions, 2019-2023*

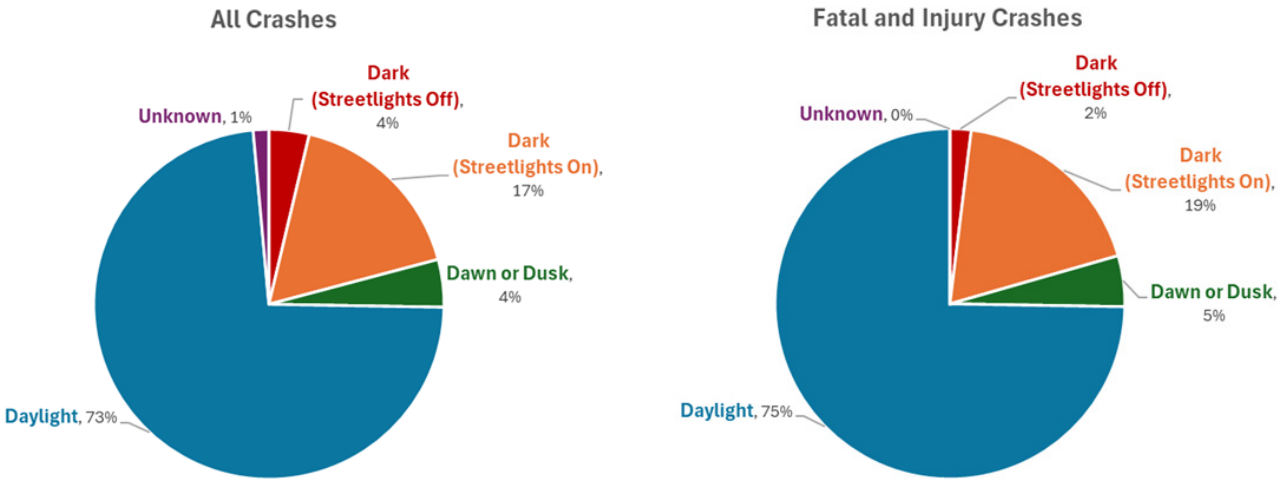


FIGURE 6 *Posted Speed Limit*

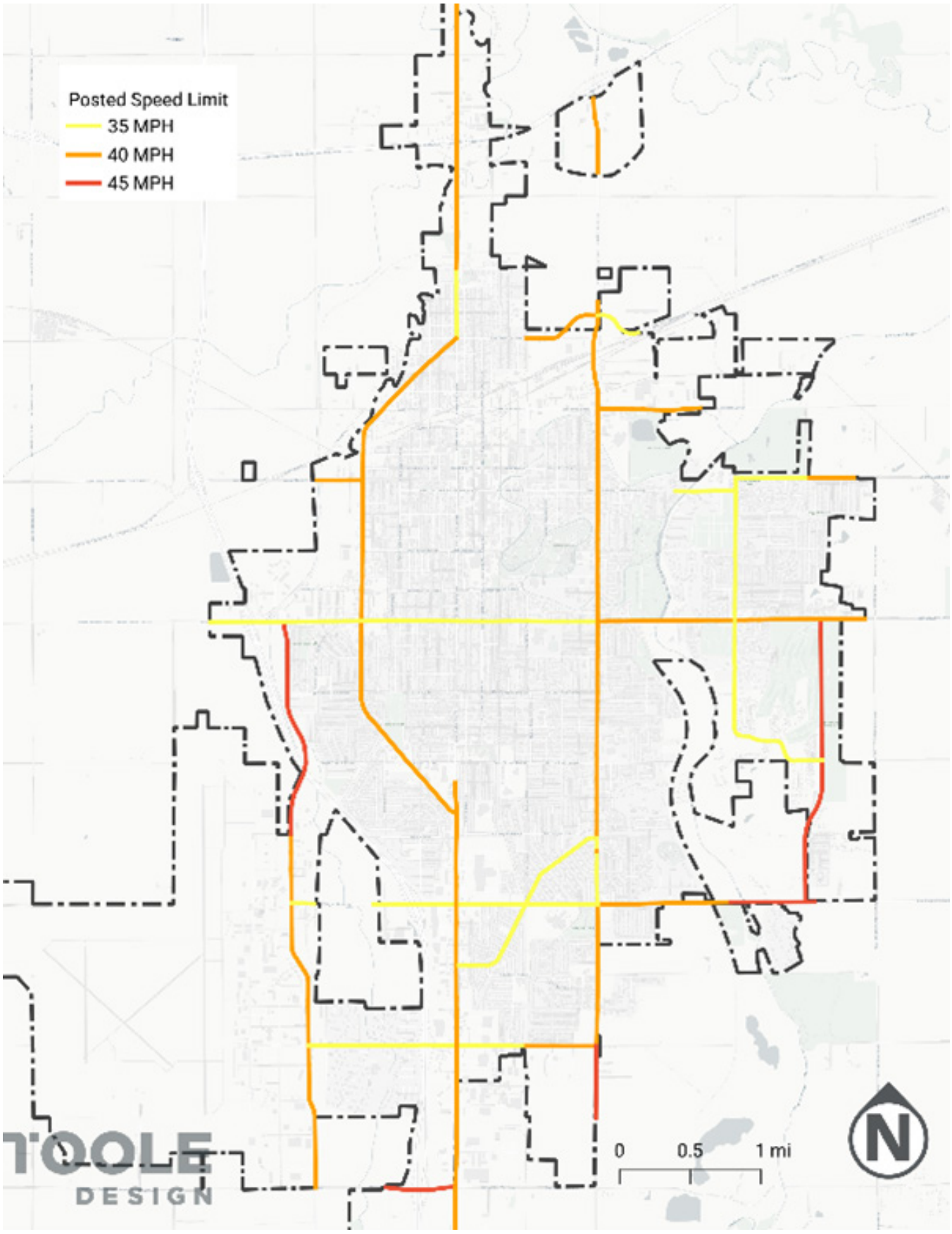


FIGURE 7 *Functional Class*

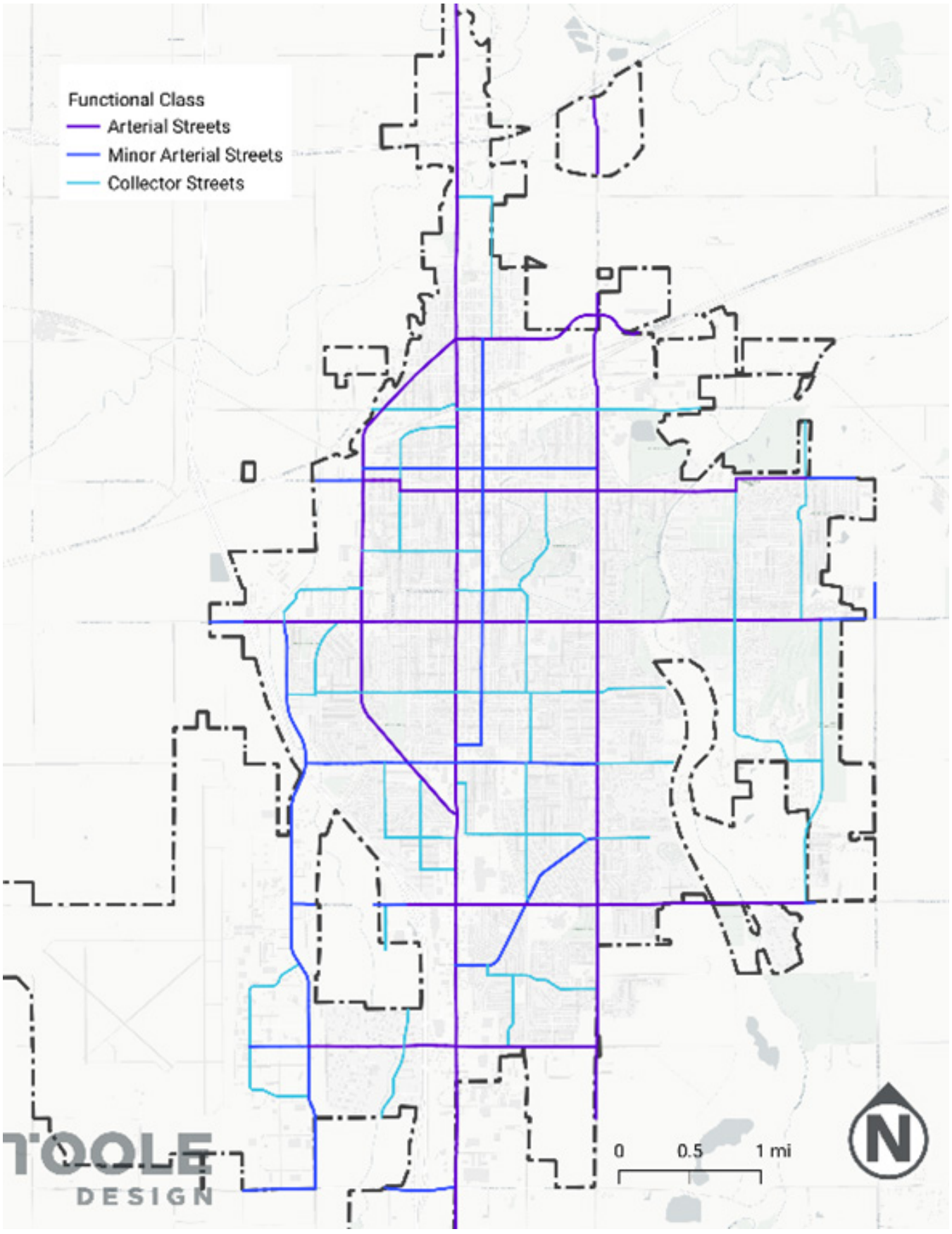
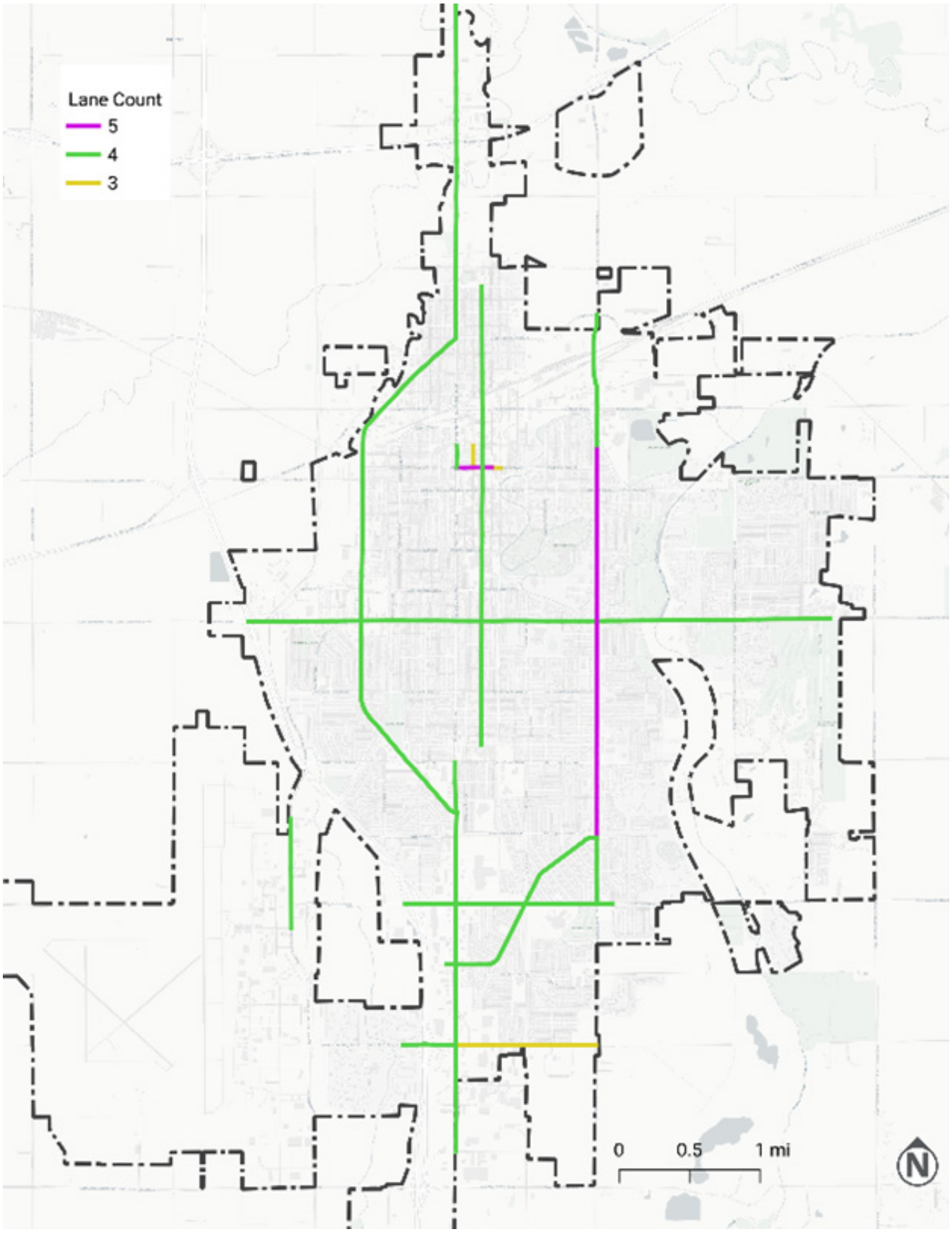


FIGURE 8 *Lane Count*



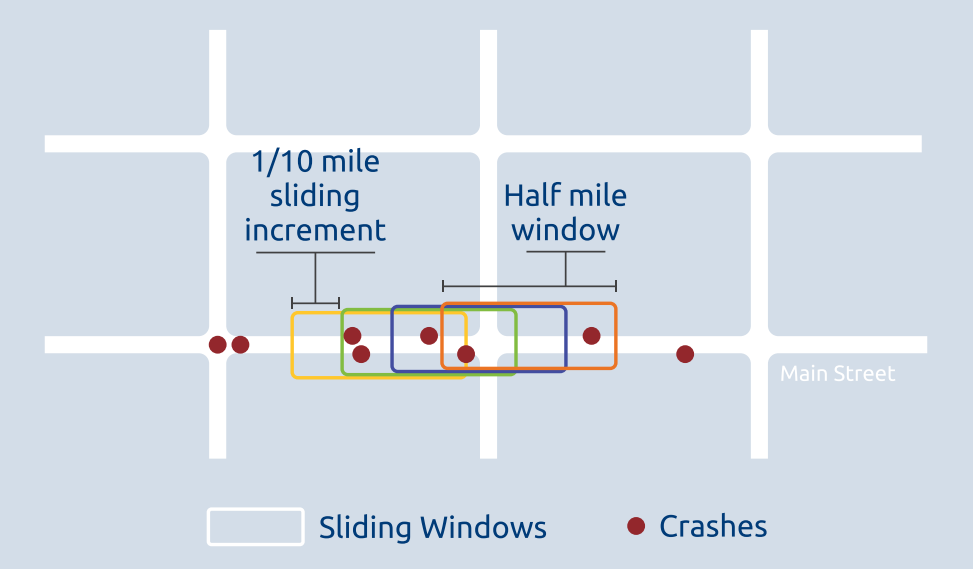
High Injury Network

The following section describes the consultant team's methodologies and thresholds for developing High Injury Networks (HIN). Salina's HINs focus on fatal and injury crashes between 2019-2023 and utilize crash data from the Kansas Department of Transportation (KDOT).

Sliding Window Analysis Methodology

A sliding window analysis helps us understand crashes throughout a transportation network and identify segments with the highest crash density, weighted by crash severity. For Salina, the analysis is done by determining the number and severity of crashes in a half-mile window on a roadway and shifting that virtual "window" along the roadway 1/10 of a mile at a time, counting the number of crashes by severity and road user that occurred within each successive half-mile segment. An example of a sliding window analysis is shown in Figure 9.

FIGURE 9 *Example of the Sliding Window Analysis. Source: Toole Design Group*



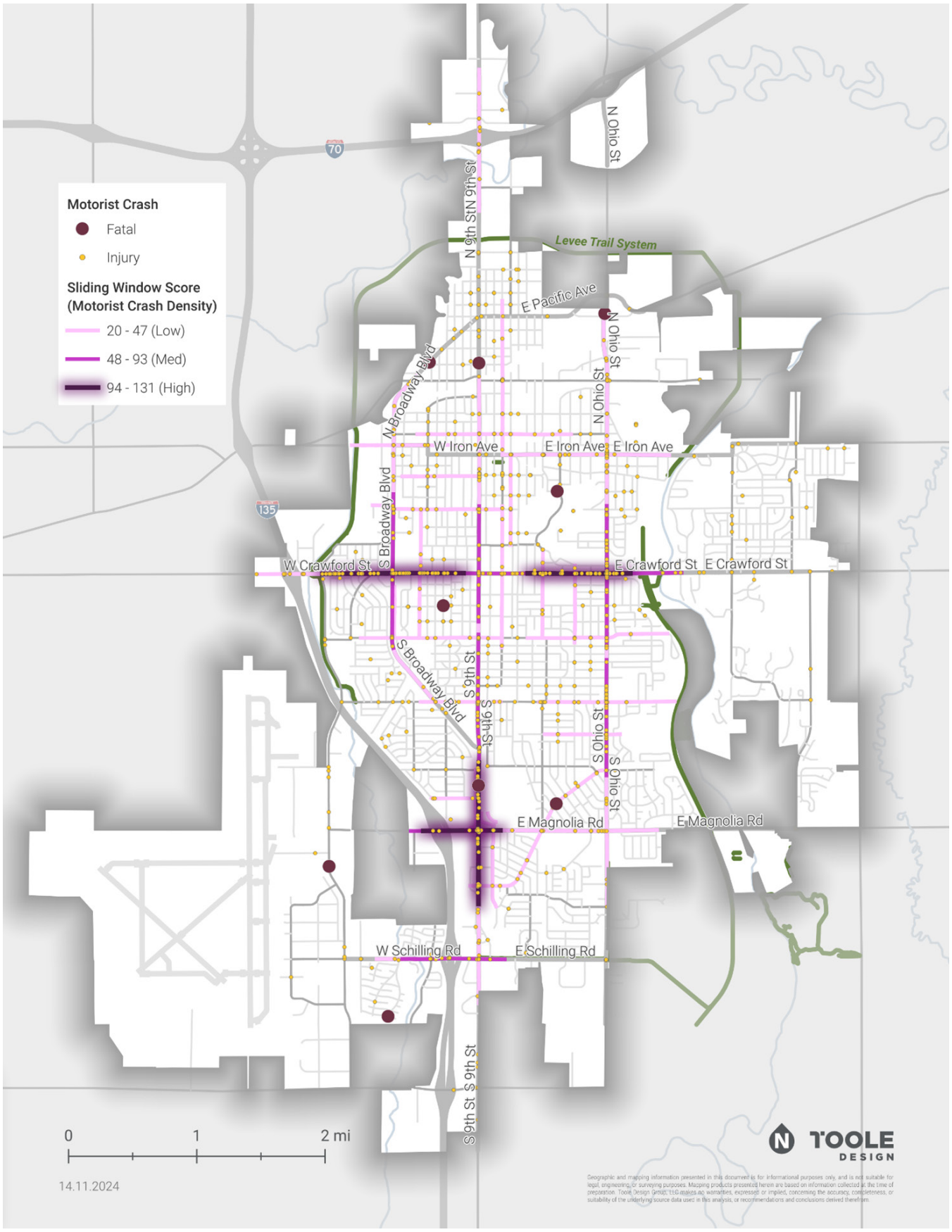
The sliding window scores weigh the most severe crashes more heavily than lower severity crashes. The sliding window score is calculated by multiplying the number of Fatal crashes by 3, multiplying the number of Injury crashes by 1, and Property Damage Only crashes by 0. This ratio allows for the inclusion of less severe crashes in the analysis while still focusing on corridors with more severe crashes. For instance, with Fatal crashes weighted at three times injury crashes, a corridor with two fatal crashes will have the same weighted total as a corridor with six injury crashes. Injury crashes were included in this analysis to augment the relatively small dataset of fatal crashes and in response to research (performed by the consultant) that has found a significant percentage of pedestrian and bicyclist injuries to be underreported and/or misclassified.

Once the weights are established and applied to the crashes, the total number of crashes are aggregated along a corridor while incorporating the crash severity weighting. Each segment is scored and those scored results are found in the following sliding window maps for pedestrian, bicyclists, and motorists accordingly.

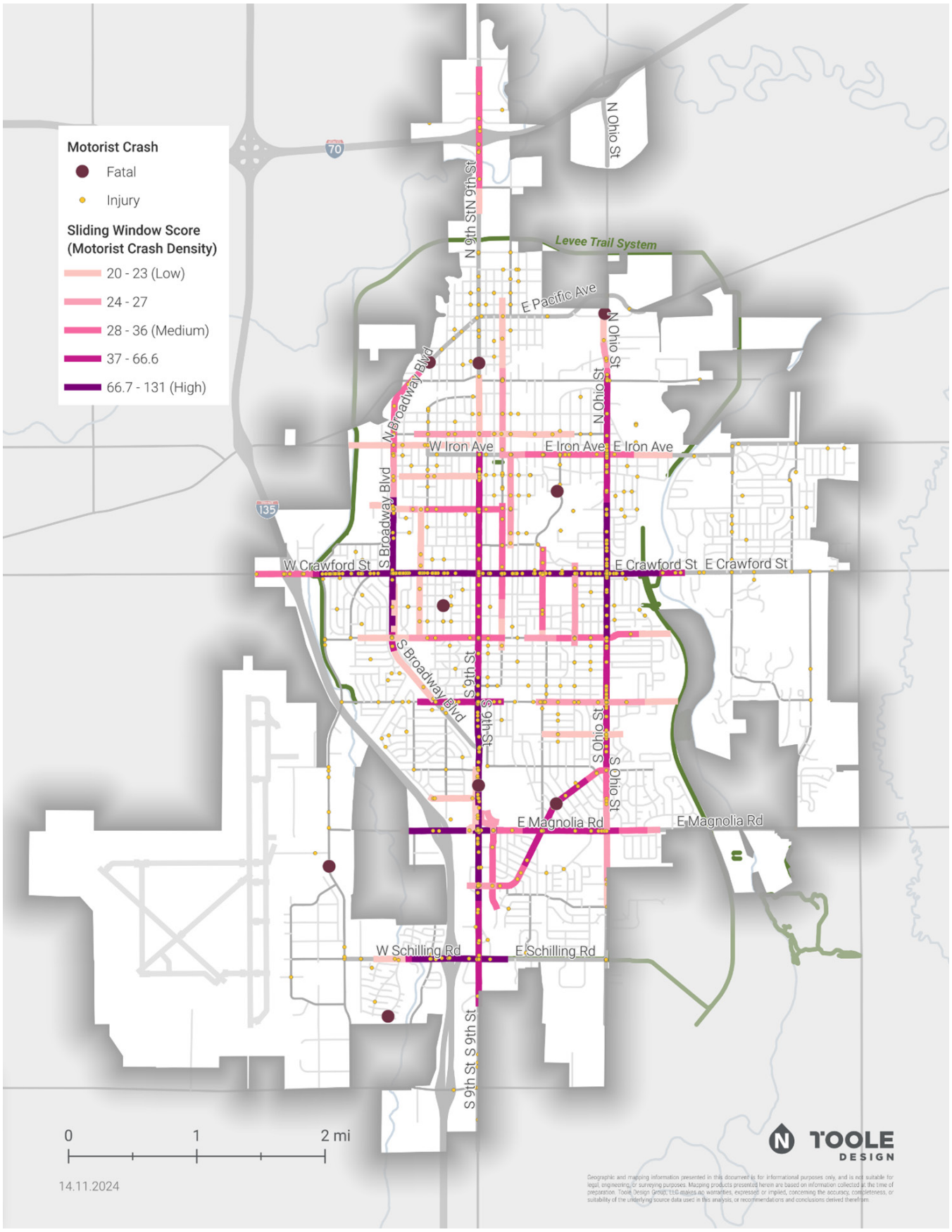
Crash Density Maps

The project team produced crash density maps (Map 1 to Map 4) using the sliding window analysis. These crash density maps set the foundation for the HIN based on the methodologies outlined in the **Development of High Injury Network** section.

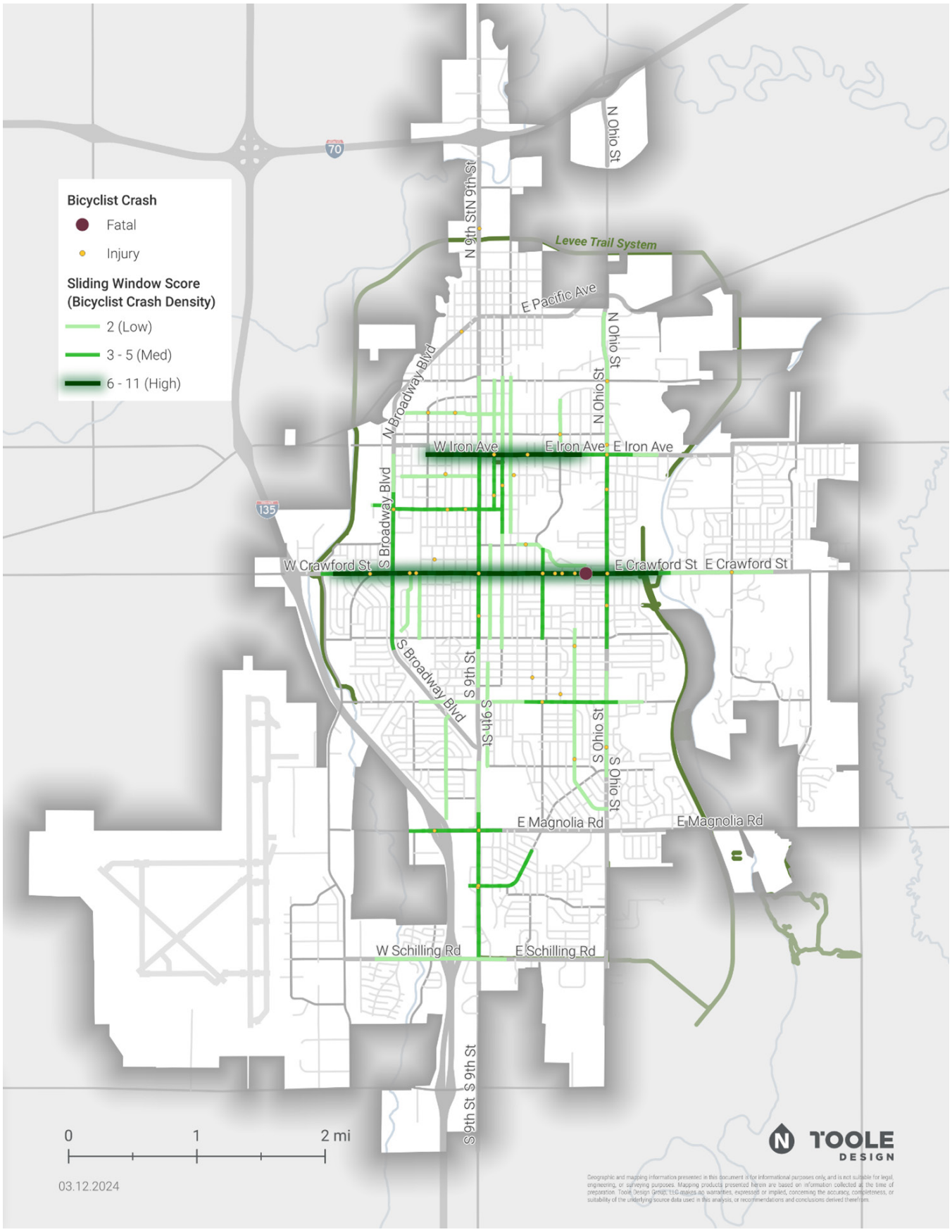
MAP 1 *Motorist Sliding Window Analysis*



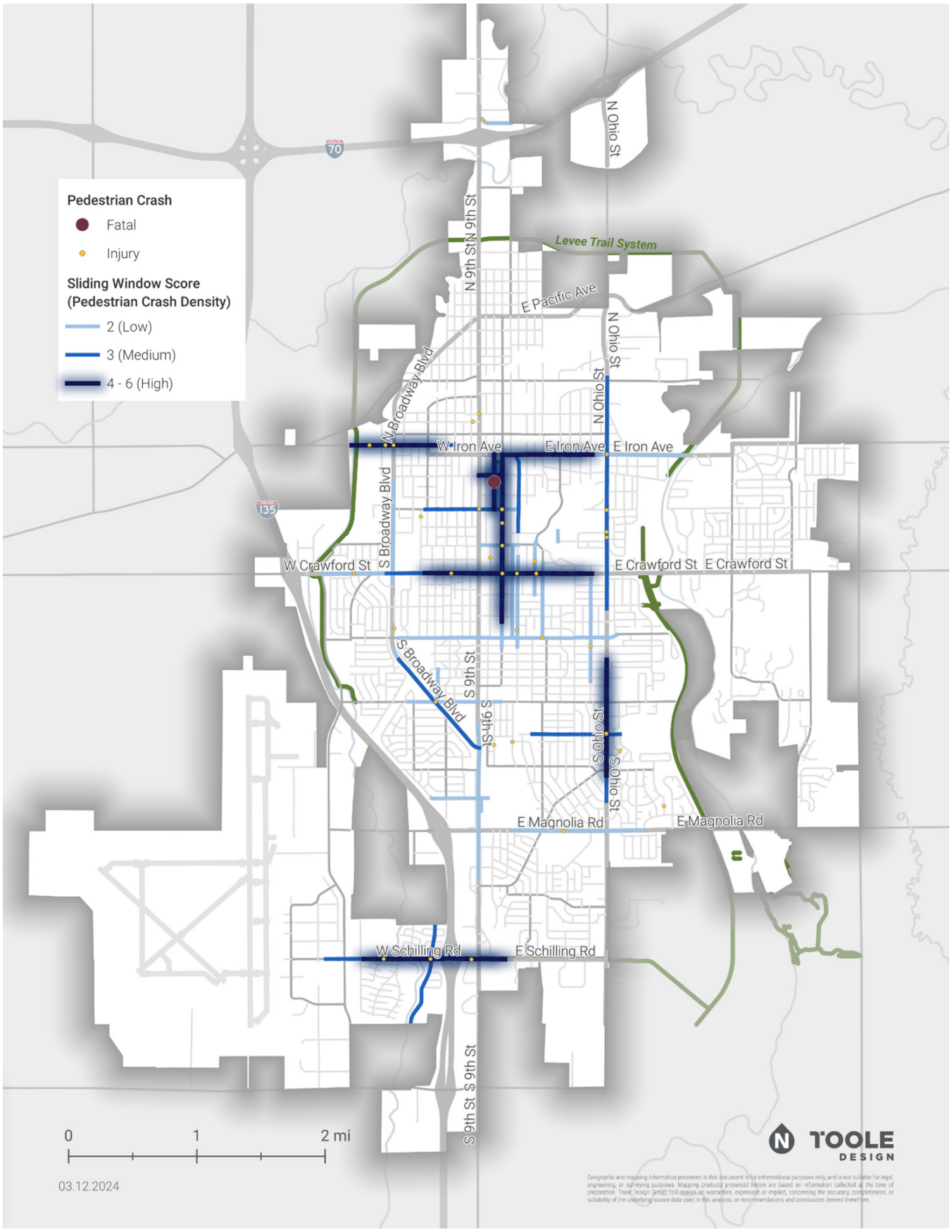
MAP 2 *Granular detail of Motorist Sliding Window Analysis*



MAP 3 *Bicyclist Sliding Window Analysis*



MAP 4 *Pedestrian Sliding Window Analysis*



Development of the High Injury Network

The HIN is developed based on the results of the crash density maps from the sliding window analysis. Both intersection and segment crashes were included in this evaluation as the focus is on overall corridor conditions. The HIN aims to help identify corridors that may warrant special attention. Identification of these corridors can help a city prioritize investment in the areas where crash history demonstrates the most serious problems and easily communicate those priorities to the community.

Developing an HIN is an iterative process. The HIN development process relies on historical crash data, which is imperfect and incomplete because not every crash is reported to the police. As such, this process requires engineering judgment as well as local knowledge. The following process was used to develop the mode-specific HINs and the overall HIN:

1. Map the sliding window analysis results for each road user type (pedestrian, bicyclist, and motorist) individually. (See Maps 1 to 3 for sliding window analysis results.)
2. For each mode, determine the threshold of the sliding window score required to be included in the HIN. This step eliminates streets that have a lower crash density and prioritizes streets that have higher crash severities and frequencies.
3. Review and manually adjust (with feedback from Salina public works) for false-positive segments that have a high crash score due to a single intersection crash but do not have any other crashes along the corridor.

High Injury Network Thresholds

The goal of the minimum HIN threshold setting process is to settle on a minimum sliding window score for each road user independently that will create a network that covers a selective set of the city streets but a relatively large share of crashes with an emphasis on fatal crashes. These scores may differ by transportation mode. For example, a score of 5 may be appropriate for the bicyclist HIN, but relatively low for a motorist HIN since there are generally more motorist crashes than bicycle crashes.

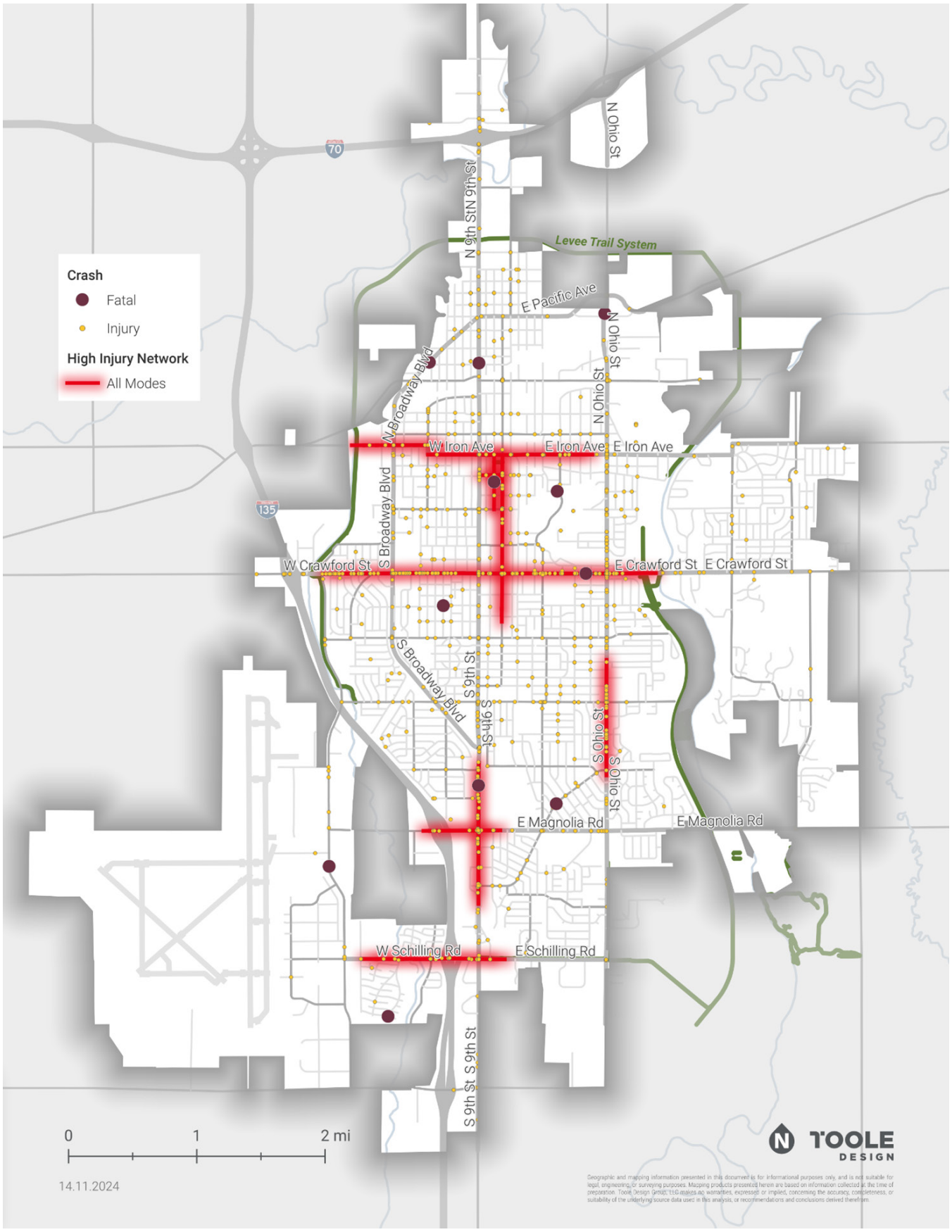
Thresholds for each road user included in the HIN are listed in Table 10. A segment that meets or exceeds the weighted crash score threshold noted below for each road user was included in each road user-specific HIN and the overall HIN. The weighted crash score thresholds for areas included in the HIN do not exactly follow the weighted crash score ranges from the sliding windows, as the HIN is a compilation of the highest weighted crash scores.

TABLE 10 *Thresholds for Minimum Sliding Window Score by Road User*

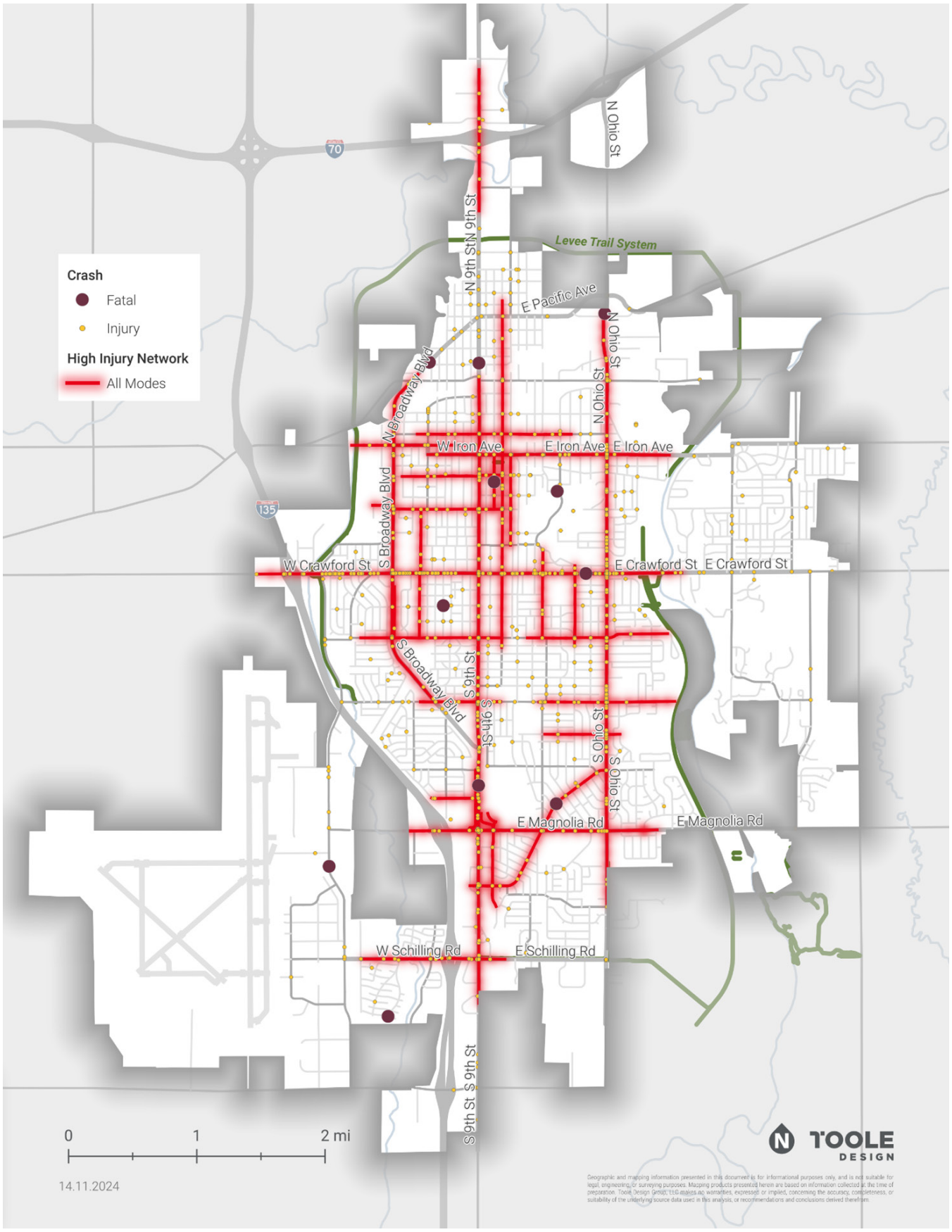
Road User	Version 1	Version 2
Pedestrian	4	4
Bicyclist	6	6
Motorist	94	20

Map 5 shows the resulting HIN based on the sliding window analysis conducted for each road user. It brings together segments where crash densities were shown as “high” on the preceding crash density maps. A number of fatal motorist crashes were not on segments categorized as “high” crash density. A more granular map that displays more score ranges is provided in Map 2. To capture more fatal motorist crashes, a second version of the HIN was developed with a dramatically lower motorist threshold (Map 6).

MAP 5 *All Road User High Injury Network, Version 1 (high motorist threshold)*



MAP 6 *All Road User High Injury Network, Version 2 (lower motorist threshold)*



Summary Statistics

Table 11 provides some summary statistics for the all-modes HIN. The first version of the all-modes HIN is approximately 3% of the whole roadway network in Salina, but approximately 43% of fatal and injury crashes occurred on these roadways. The second version of the all-modes HIN covers 14% of the roadway network, though it only captures two more fatal crashes, while approximately doubling the number of injury crashes it covers.

TABLE 11 *Summary Statistics*

	Miles		Fatal Crashes		Injury Crashes		**Fatal and Injury Crashes**	
HIN version 1 (Map 5)	10	3%	*3*	*27%*	*481*	*43.1%*	**484**	**42.9%**
HIN version 2 (Map 6)	40	**14%**	*5*	*45%*	*848*	*75.9%*	**853**	**75.6%**

Fatal Crashes

Several vehicle fatal crashes are not on roads included in the vehicle high injury network. While a fatal crash can be an important signal that a road is dangerous, this is not always the case. Fatal crashes are statistically rare compared to injury and property damage only crashes. As a result, a fatal crash is not as strong an indication of a dangerous roadway as a high number of injury crashes. In some cases fatal crash locations are not good candidates for roadway improvements and redesign work.

In order to investigate this Toole Design obtained from KDOT Crash Data Unit the crash reports for all fatal crashes in Salina over the 5-year period being studied. Six fatal crashes are beyond the extent of the high injury network. These included:

- **South Centennial Road:** Report indicated alcohol, speed and no seatbelt as contributing factors to the fatality.
- **Glenshire Avenue:** Report indicated alcohol and no motorcycle license as contributing factors to the fatality.
- **Franklin St:** Report indicated alcohol as a contributing factor to this motorcycle fatality.
- **South Oakdale Avenue:** Report indicated driver medical event leading to the vehicle fatally striking a bystander
- **North Broadway Boulevard:** Report indicated no behavioral factors. Lack of other injury crashes at this intersection point to driver error being more likely than roadway design. The crash was listed as during daylight but 4:30 in the afternoon during December and the orientation of the vehicles may indicate that the sun made it difficult for the driver to see the other vehicle.
- **North 9th Street:** Report indicated road departure at a high rate of speed. Report mentions state of mind a possible contributing factor.

Overall, only the crash on N. Broadway Blvd. is consistent with the possibility of a roadway design issue. In this case, the sliding windows density analysis leads one to conclude that other locations are higher priority candidates for modifications or redesign.

Finally, speed, motorcycles, and alcohol use while driving are factors in several of these crashes. Non-Infrastructure policy changes may be productive interventions but are outside the scope of this appendix.

High Risk Network

The purpose of this section is to document the process of developing a High-Risk Network for the Salina Comprehensive Safety Action Plan. This systemic analysis helps identify roadway facilities with the greatest potential for safety improvements by identifying combinations of roadway attributes associated with higher frequencies of fatal and injury crashes. This analysis is proactive and identifies roadways where fatal and injury crashes are likely to occur in the future. This complements the High Injury Network which is reactive and identifies the locations where these crashes occurred over the past five years.

Systemic Screening Factors

The systemic safety analysis process identifies key roadway facility attributes that correlate with high crash frequencies. Such attributes are referred to as systemic screening factors in this analysis. During the process, systemic screening factors are grouped into roadway facility profiles each with differing levels of crash frequencies. It is important to note that this analysis does not necessarily reveal a causal relationship, nor that these individual screening factors should necessarily be the target of treatments.

Systemic screening factors and roadway facility profiles should be studied from a practical and policy-driven perspective to determine what components may be reasonable targets of safety improvements and which should be viewed primarily as non-causal correlations.

Table 12 lists and defines the roadway segment attributes that were analyzed to develop facility profiles of the roadway network in Salina. Factors considered in the analysis were limited by data quality and availability.

TABLE 12 *Factors screened for systemic safety analysis to develop the High Risk Network*

Systemic Screening Factor	Description
Number of Lanes	0, 2, 3, 4, 5
Speed Limit	0 mph, 15 mph, 20 mph, 30 mph, 35 mph, 40 mph, 45 mph
Functional Class	Arterial Streets, Minor Arterial Streets, Collector Streets, Local Streets, Park Road, Private Streets

Methodology

The study used the same dataset and time period for the systemic screening analysis consistent with the descriptive safety analysis and the High Injury Network. The target study roadway facilities included all city-owned roadways in Salina. Consolidated roadway data was analyzed to retain all relevant roadway cross-sectional and contextual attributes.

The systemic analysis screening process is based on a decision tree machine learning algorithm where each factor is screened individually to determine whether the factor distinguishes between locations with relatively high or low average crash densities per mile. For categorical screening factors like functional classification, posted speed limit, and number of lanes, the algorithm considers each unique classification individually. The algorithm screens all factors recursively to identify the most correlated factors and continues until a set of factors is identified as a systemic safety network tier. Figure 10 illustrates the decision tree algorithm where three correlated factors define a systemic safety network tier (facility profile).

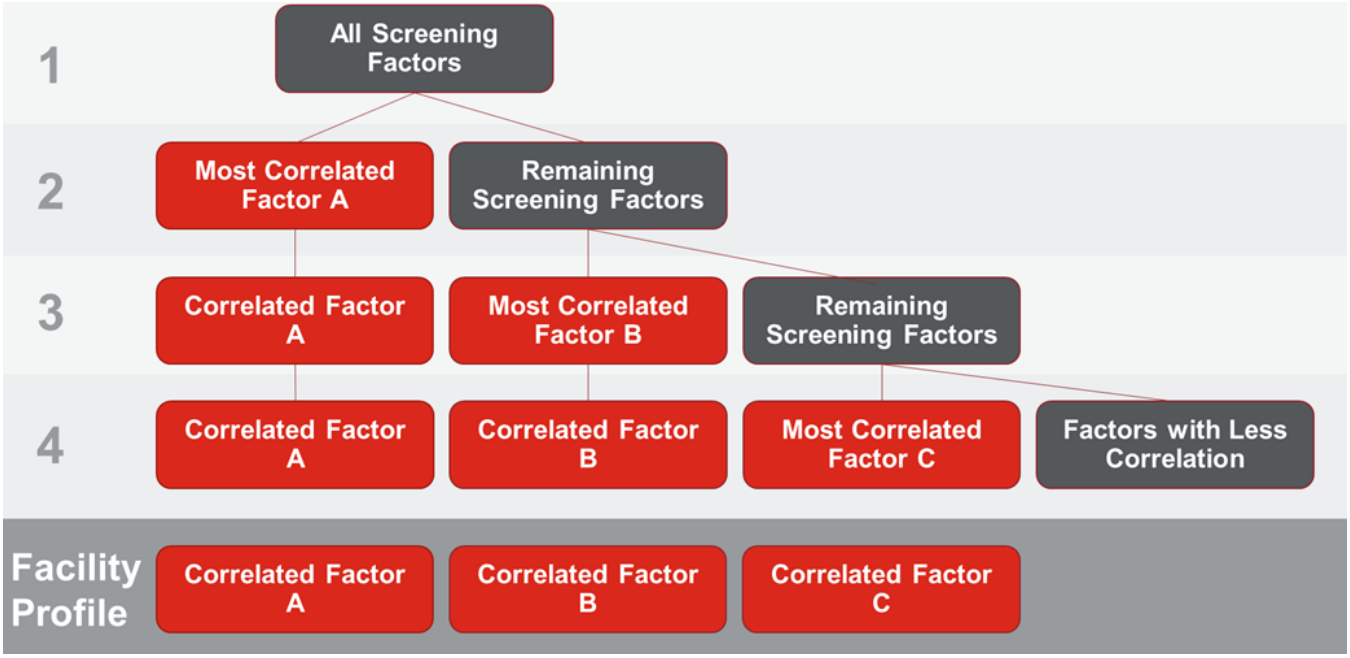


FIGURE 10 *Illustration of decision tree screening process*

Data Limitations

The consultant team studied crashes that occurred during a period of five years from 2019 through 2023. The available roadway data reflects the most recently available state of the roadway. The project team assumed that some changes in roadway design and operation have occurred in previous years for which the data cannot account. For example, if a crash occurred in 2020 and the posted speed limit changed in 2021 from 35 mph to 30, the analysis would link the 2020 crash to the present day 30 mph speed limit. As crash data is viewed in aggregate and only the past 5 years of crash data is used, the effect of this limitation is expected to be minimal.

The analyses reported here do not adjust for exposure rates based on volumes by modes. Therefore, results show crash density but not frequency of crashes normalized by level of traffic or pedestrian and bicycle volumes, which is also called exposure. For example, in many communities, pedestrian crashes are more common during daylight conditions than dark conditions. This does not mean that daylight conditions are more dangerous than dark conditions. Rather, it reflects the fact that people are more likely to travel, and especially more likely to travel by walking, in light conditions than in dark conditions. Some proxies for exposure are noted in this analysis, such as land use, transit facilities, and functional classification.

Analysis Results

The systemic safety analysis assesses each roadway segment for the presence of screening factors that are correlated with severe crashes. Roadway segments are then assigned one of five tiers: Critical, High, Medium, Low, or Minimal. Each tier represents a group of attributes that are correlated with differing frequencies of fatal and injury crashes. Segments in the Critical, High, and Medium tiers are considered to be part of the Systemic Safety Network.

The analysis provides the following output:

- A map of the High-Risk Network
- A table listing out the screening factors that are significantly correlated with each tier
- A table of descriptive statistics for the High-Risk Network

High Risk Network

This section discusses results of the analysis for fatal and injury crashes involving all modes (motor vehicle, pedestrian, and bicycle) within the full study area. The corridors identified as 'Critical', 'High', and 'Medium' in the systemic safety analysis of all modes are shown in Map 7.

Table 13 displays the screening factors most effective at indicating elevated frequency of fatal and injury crashes (facilities in Critical, High, and Medium tiers). Roads that have 3 or more lanes and a speed limit of 35 mph have the highest frequency of fatal and injury crashes.

TABLE 13 *Facility profiles and corresponding screening factors*

	Systemic Screening Factors		
Facility Profile Tier	*Functional Class*	*Number of Lanes*	*Speed Limit*
Critical		3 or more	35 mph
High		3 or more	40 mph or more; AND 30 mph or less
Medium	Arterial Streets	2 lanes	
Low	Collector Streets, Minor Arterial Streets, Park Roads	2 lanes	
Minimal	Local Streets, Private Streets	2 lanes	

The associated average fatal and injury crash frequency per mile as well as the relative mileage of each tier are summarized in Table 14 and illustrated in Figure 11: Share of crashes compared to share of roadway network, by tier. About 66% of fatal and injury crashes in the study area are on Critical, High, and Medium tier facilities. Yet, these facilities only represent 13.7% of the total roadway miles in the study area. This discrepancy is especially true for the Critical tier facilities: 2.5% of the total roadway miles in the study area are Critical tier facilities, but 21.1% of fatal and injury crashes occurred on those facilities.

TABLE 14 *Summary metrics of the High Risk Network for all modes*

	Facility Profile Metrics				
Facility Profile Tier	*Avg. Fatal and Injury Crashes per Mile*	*Miles*	*Fatal and Injury Crashes*	*Miles Share*	*Fatal and Injury Crashes Share*
Critical	72.87	7.1	516.0	2.5%	21.1%
High	41.68	19.7	822.0	6.9%	33.6%
Medium	21.71	12.6	273.0	4.4%	11.2%
Low	7.16	44.3	317.0	15.4%	13.0%
Minimal	2.55	202.8	517.0	70.9%	21.1%

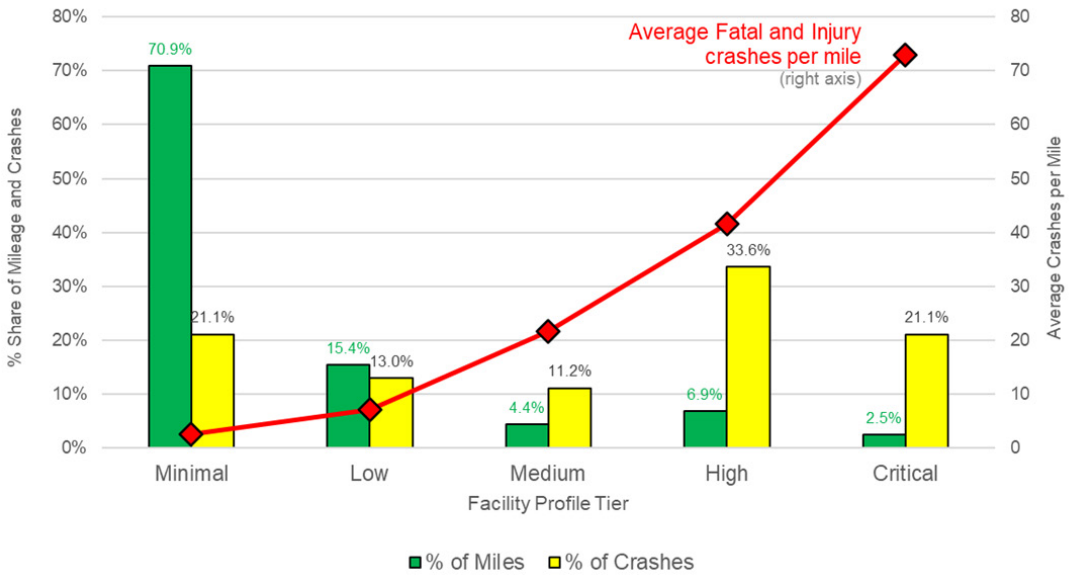
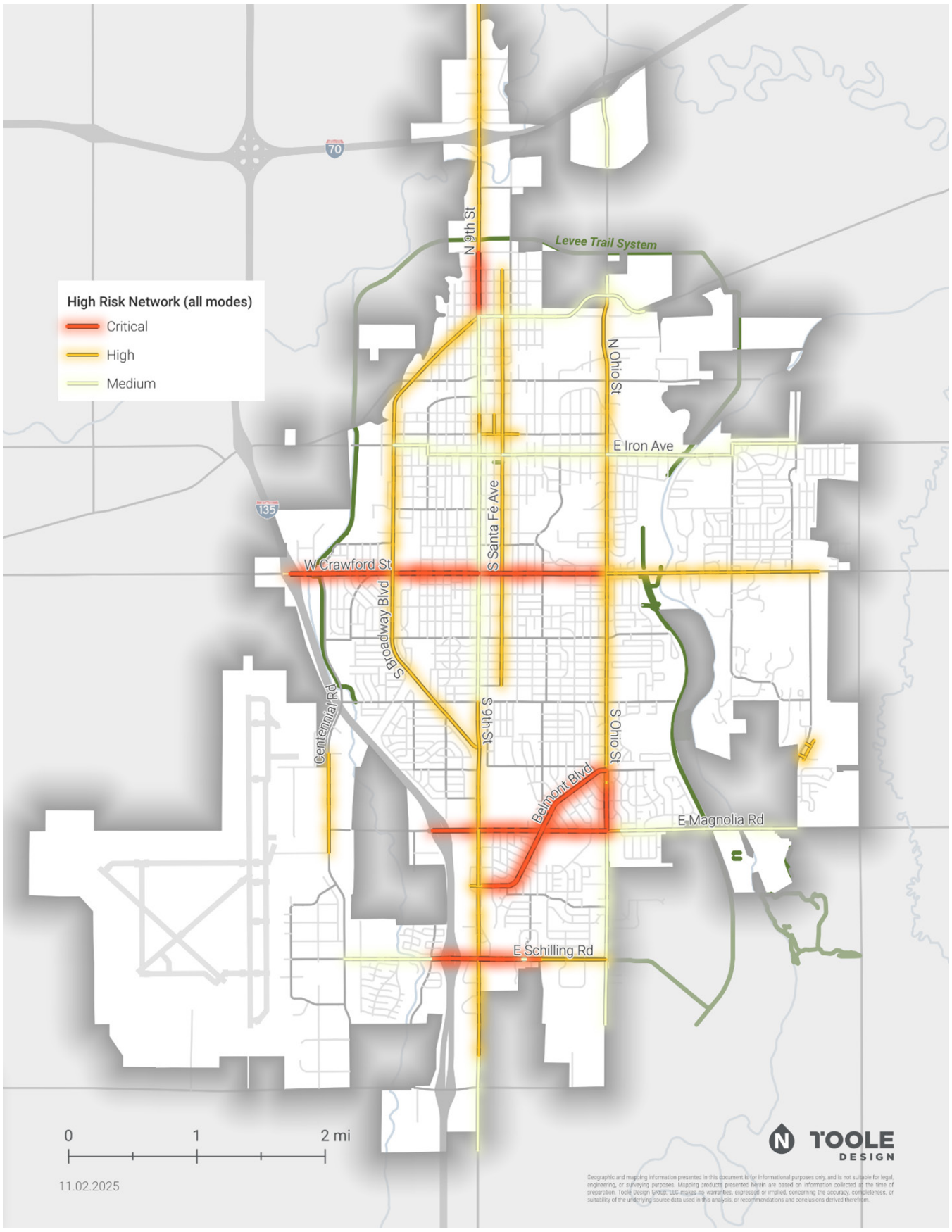


FIGURE 11 *Share of crashes compared to share of roadway network, by tier*

MAP 7 *High Risk Network (2019-2023 crash data)*



APPENDIX B:
OUTREACH AND ENGAGMENT REVIEW

Below is a summary of key safety concerns and comments received from stakeholders and the public as part of the extensive outreach and engagement completed as part of Salina's Comprehensive Safety Action Plan development. It is vital to plan success that the public be involved and informed and that local stakeholders are given the opportunity to steer plan development and lead implementation after the plan has been finalized.

Public Survey and Webmap

In total, 415 people completed the plan's survey. There was also a webmap that was included as part of this effort where over 600 points of safety concern, points of interest, and destinations, and desired walking and biking routes were identified. The survey and webmap were open from October 2024 to February 2025.

Survey

The survey asked participants questions including demographics, safety priorities, and travel methods. The results of the survey are summarized below.

The survey asked respondents four questions related to how important transportation safety is to the community. The results overwhelmingly favored creating safer streets for all transportation modes.

- 89% agree Salina should prioritize eliminating transportation related deaths and injuries
- 78% agree Salina should prioritize providing safe spaces for walking, biking, and rolling.
- 86% agree that reducing risk of serious & fatal injuries is more important than minimizing travel time
- 87% are willing to change behavior to help reduce serious crashes
- 50% indicated that they would be more willing to walk, bike, or roll if streets were safer and more comfortable

Respondents indicated a preference for driving in Salina, but nearly 20% indicated that they walk for some trips as well and 12% sometimes bike.

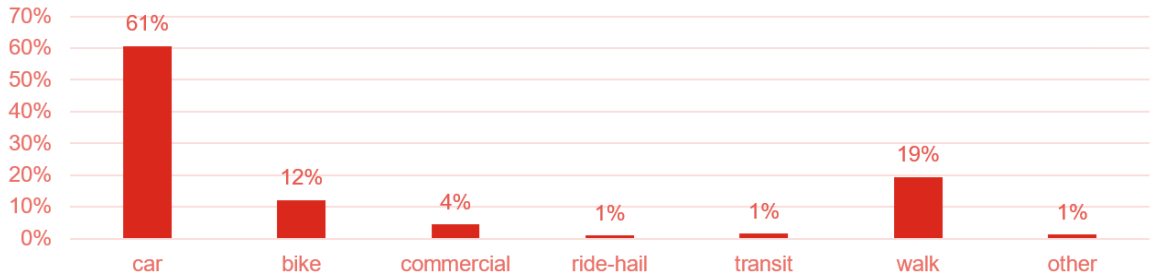


FIGURE 1 *Travel Mode Survey Results*[1]

Demographics questions from the survey indicated an overrepresentation of some groups in the responses when compared to census demographics. Since these groups (white (92%), primarily 45 or older (65%), and women (57%)) were overrepresented, subsequent pop-up events in March then targeted younger and diverse demographics to help ensure everyone's voice was heard. Approximately 14% of respondents noted a disability or physical limitation of some kind [2].

1 Respondents were asked to pick their top two preferred travel modes.

2 Options included being deaf, blind, physical walking challenge, or other.

Webmap

The webmap allowed respondents to provide feedback on locations where they do not feel safe walking, biking, or driving, or where they have had a near miss or crash. Respondents could indicate more than one location. The Magnolia Road and 9th Street intersection received the most points, which parallels that intersection's presence on the HIN and HRN (described in more detail in Appendix A). Other top locations are shown in Table 1.

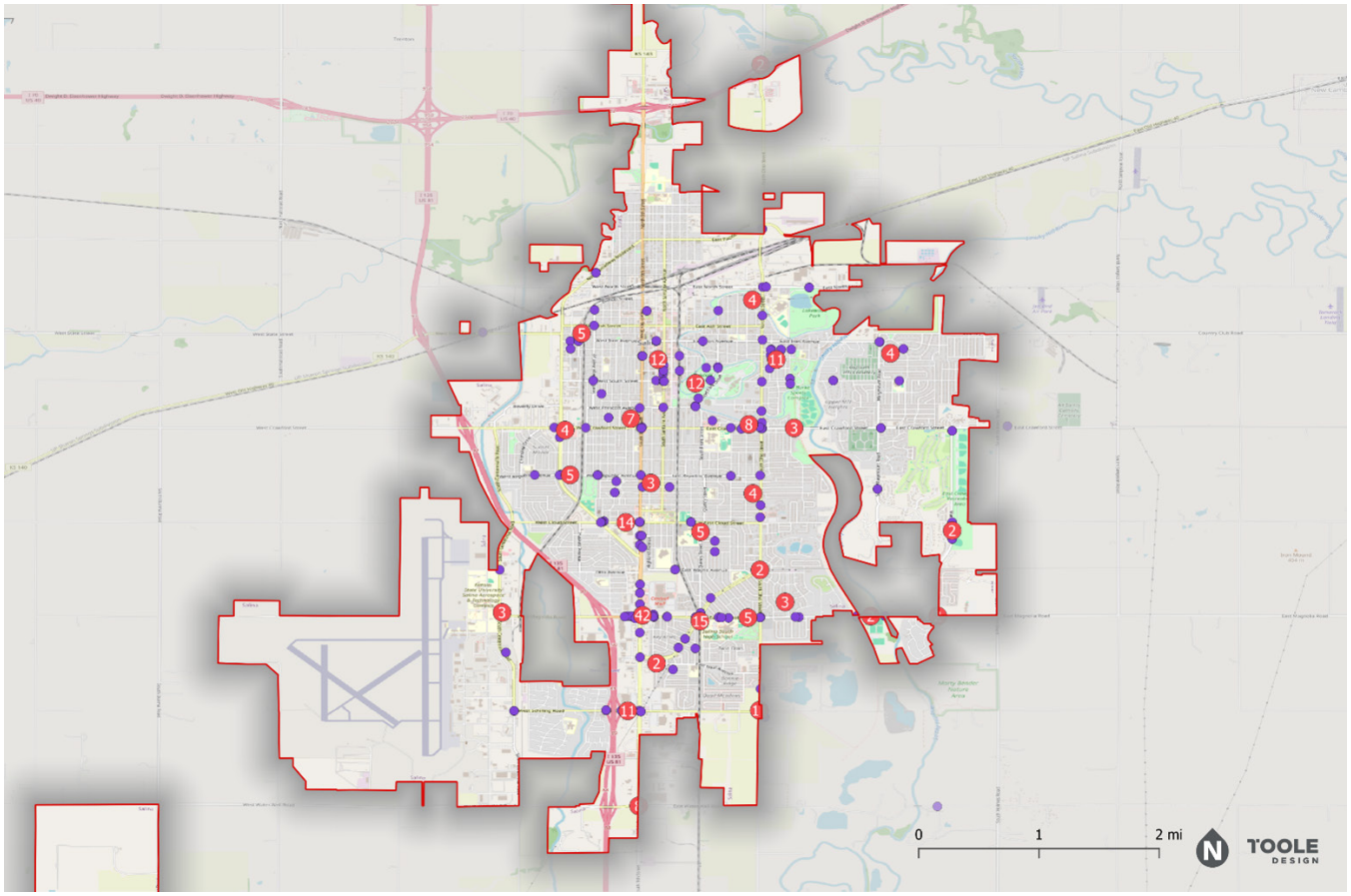


FIGURE 2 *Safety Concerns Identified in Public Survey Online Map*

TABLE 1 *Thresholds for Minimum Sliding Window Score by Road User*

No.	Location	Count
1	S Old Hwy 81 & W Magnolia Rd	40
2	W Magnolia Rd & Belmont Blvd	13
3	S Sante Fe Ave & W Mulberry St	11
4	E Schilling Rd & S Ohio St	11
5	Gypsum Ave & S Conneticut	10
6	S Old Hwy 81 & Charlotte Ave	8
7	S Old Hwy 81 & W Water Well Rd	8
8	W Schilling Rd & S Old Hwy 81	7
9	E Crawford St & S Ohio St	7
10	S Oakdale Ave & Oakdale Dr	7

Respondents were also asked to identify places they commonly like to go by placing a mark on the webmap. These locations are shown in Figure 3 and Table 2.

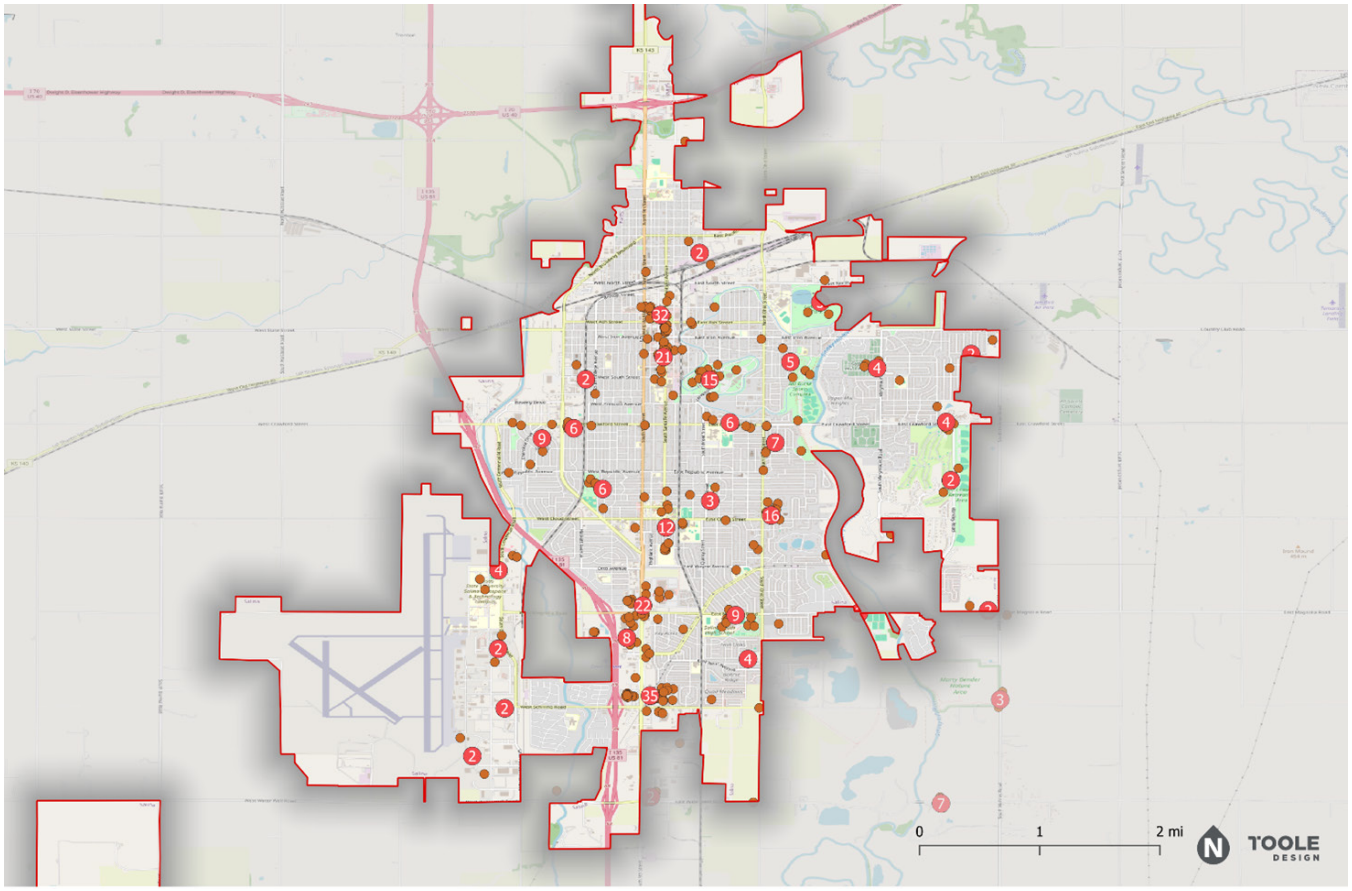


FIGURE 3 *Destinations*

TABLE 2 *Top Destination from Webmap Identified in Public Survey Online Map*

No.	Location	Count	Destination Summary
1	S Old Hwy 81 & E Schilling Rd	35	Sam's Club, Sam's Club Gas Station, Target, Smartstyle, and more.
2	W Ash St & N Santa Fe	32	Saline County of Health Department, USPS, Salina Area Chamber of Commerce, Saline County District Court, and more.
3	S Old Hwy 81& W Magnolia Rd	22	Center Mall, Chic-fil-A, Dillons, Marshalls, Aldi, and more.
4	W Walnut & Santa Fe	21	Stiefel Theatre, Salina Art Center Cinema, Salvatio Army, Salina Art Center
5	E Cloud St & S Ohio St	16	Dillons, Dillon's Fuel Center, Jimmy John's, South Gate Shopping Center, and more.
6	Oakdale Park	15	Recreation areas, tennis courts, walking paths, Eric Stein Stage, Kenwood Cove Aquatic Park, and more.
7	E Cloud St & Larson St	12	Kansas Wesleyan University, Graves Family Sports Complex, St. Mary's Catholic Church, Sacred Heart Senior High School, and more.
8	W Magnolia Rd & Kensington Rd	11	Jerry Ivey Memorial Park, Salina South High School, Redeemer Lutheran Church, and more.
9	S Broadway & W Crawford St	9	Dillons, Walgreens, Kansasland Tire, Dollar Tree, McDonald's Cave Diver's Liquor, and more.
10	S Old Hwy 81 & Belmont Blvd	8	Buffalo Wild Wings, Sonic Drive-in, Spangles, McAlister's Deli, and more.

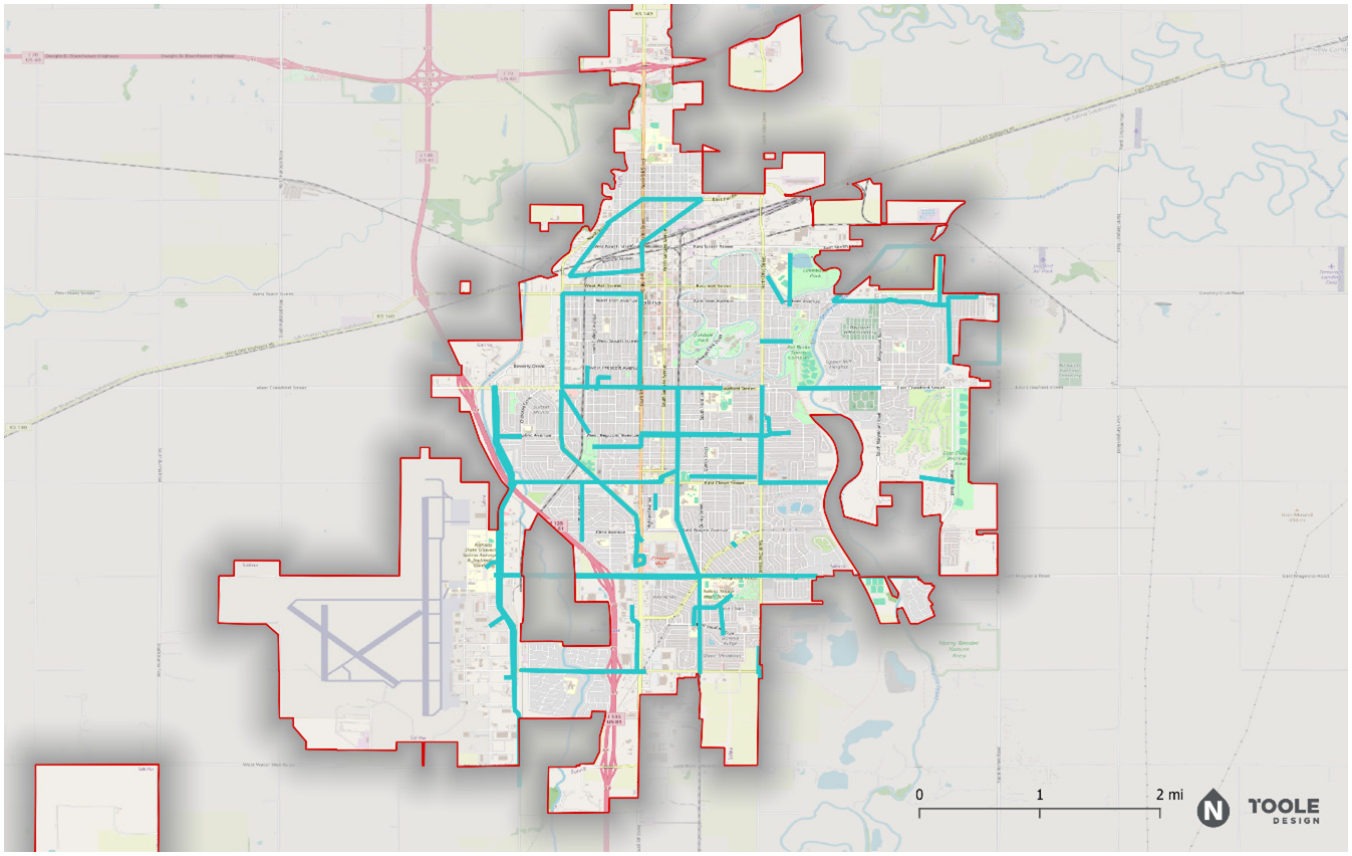


FIGURE 4 *Desired Walking Routes Identified in Public Survey Online Map*

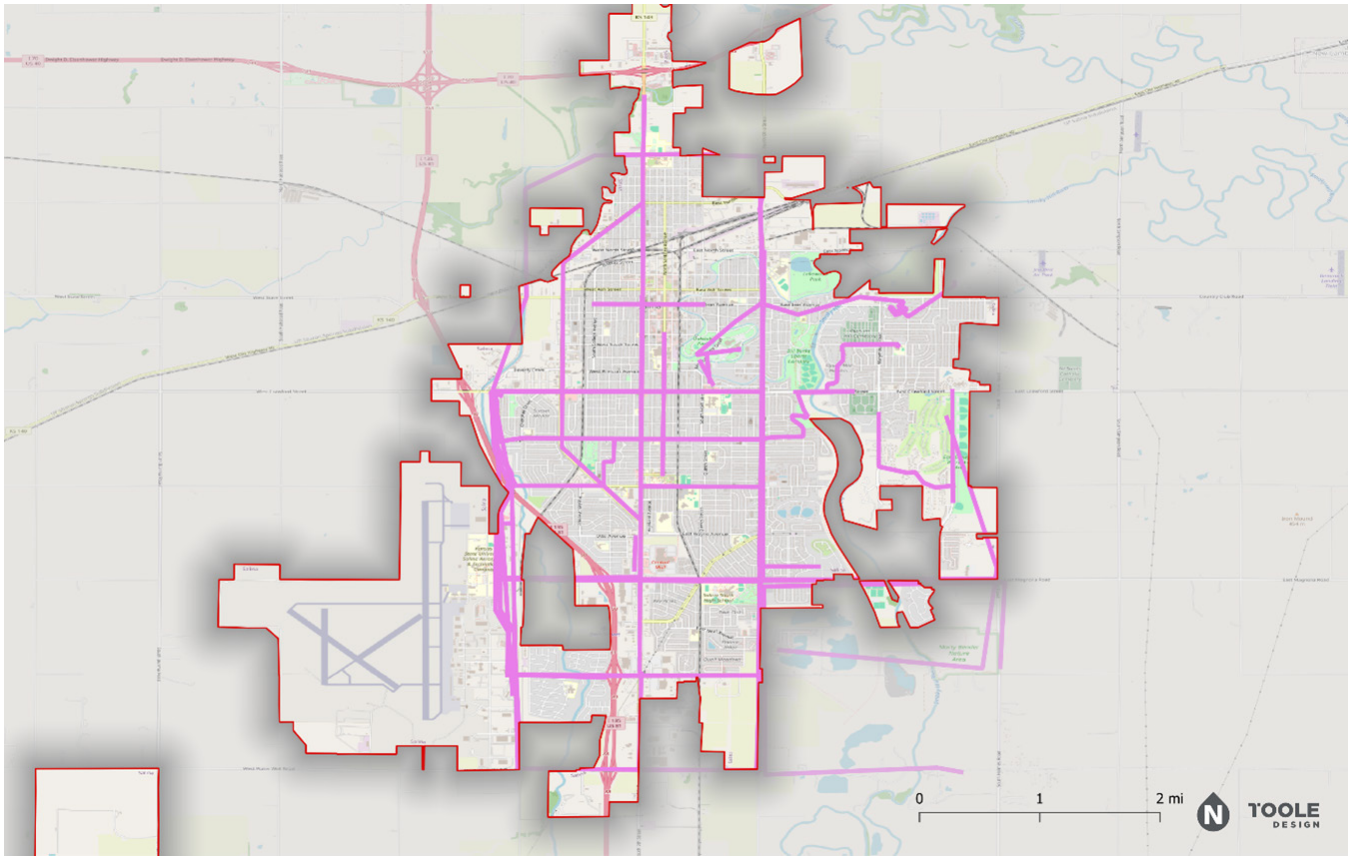


FIGURE 5 *Desired Biking Routes Identified in Public Survey Online Map*

Pop-up Events

A total of four outreach events were held during plan development

- Salina Fieldhouse Truck or Treat – October 28th, 2024
- Ad Astra Coffee Shop – March 13, 2025
- YMCA – March 14, 2025
- The Alley – March 14, 2025

These events engaged more than 600 Salina residents in some capacity, with approximately 75 people providing in depth comments and conversations with plan development staff.

Stakeholder Listening Sessions

The plan team hosted three listening sessions (two in-person, one online) to gather information from area planners, engineers, community advocates, and business leaders. These open-ended discussions allowed stakeholders to talk through concerns about transportation safety and related issues. It also gave the plan team additional background on community concerns, priorities, and history.

Key Safety Concerns

From this combined outreach and engagement, residents and stakeholders indicated a need for safer, more connected streets for all transportation modes (driving, walking, biking, and transit), but challenges include auto-dominated culture, infrastructure gaps, a limited budget, and other community challenges. **Speeding, unsafe crossings, and lack of safe routes for children are top priorities.** Below is a summary of the comments and concerns voiced by residents and stakeholders.

- **Unsafe or Uncomfortable Corridors:** Ohio Street, Centennial Road, Belmont Boulevard, Magnolia Street, Crawford Street, and 9th Street were frequently cited as unsafe due to speeding, driver distraction, poor signal timing, and lack of pedestrian/bike accommodations.
- **Pedestrian Issues:** residents talked about a lack of safe crossings along roads with infrequent crosswalks, a lack of continuous and well-maintained sidewalks (especially north Salina and near schools), and poor ADA compliance in some places which creates unsafe conditions.
- **Bicycle Safety:** Residents cited gaps in the trail network, ineffective sharrows, and lack of safe bike facilities all of which tend to discourage cycling. Drivers are not very accommodating of bicycles on the roads themselves and there are some roads that bicyclists will avoid entirely like Crawford Street and Ohio Street. Centennial Road and the area surrounding the airport are especially disconnected. Separated bike lanes are desired to connect to downtown Salina.
- **School Zones & Youth Safety:** Schools have heavy vehicle traffic at drop-off/pick-up and there is a need for better walking and biking infrastructure near schools. There are concerns with kids walking/biking in the dark as well.
- **Driver Behavior:** Speeding, driver impatience, distracted driving, failure to yield to pedestrians, and disregard for RRFBs (rectangular rapid flashing beacons) are recurring issues.

Community Values & Barriers

- Residents indicated a strong desire to protect families, children, and older adults.
- Residents indicated a community resistance to investing in bike/pedestrian infrastructure due to perceptions of low usage and concerns about taking away vehicle parking.
- Sidewalk maintenance falls on property owners, leading to uneven coverage and compliance gaps.
- North Salina (largely Spanish-speaking) lacks sidewalks and may be underrepresented in outreach.

Ongoing Engagement After the Plan is Adopted

- Continue to partner with schools, childcare providers, OCCK, LiveWell, United Way, Greater North Salina Community, and Salina Area Young Professionals to broaden outreach and education on transportation safety.
- Use pop-up events, walk audits, and paper surveys to continue outreach efforts. Salina Grace, food banks, shelters can be used to reach economically disadvantaged groups.

Wins & Opportunities

- The downtown road diet on Santa Fe greatly improved walkability and spurred redevelopment in the area.
- RRFBs and multi-use paths (e.g., south on Schilling) are seen as effective but may need public education to improve compliance.
- School mobility and transit partnerships (USD 305, OCCK Mobility Working Group, LiveWell Saline, United Way) offer strong engagement avenues.
- The public is interested in proactive safety improvements (not just reactive to crashes).

APPENDIX C:
PLAN AND POLICY REVIEW AND RECOMMENDATIONS

As part of the planning process for the City of Salina Comprehensive Safety Action Plan (CSAP), the Planning Team reviewed the City of Salina's existing plans, policies, and other documents related to transportation safety. This process identified themes and actions that were used throughout the planning process and informed final recommendations within the Comprehensive Safety Action Plan.

Plans and Policies Reviewed

To ensure a comprehensive and actionable approach to enhancing safety in Salina, a thorough review of existing plans and policies was conducted. This analysis identified potential gaps, inconsistencies, and opportunities within current planning frameworks while evaluating alignment with best practices in transportation safety and planning. The review encompassed local, regional, and state-level policies and documents, but focused on local efforts. Our review included the following documents:

1. Saline County Local Road Safety Plan, September 2022
2. City of Salina Traffic Studies Technical Memo, October 2023
3. City of Salina Bicycle Master Plan Map, April 2016
4. Salina Kansas Comprehensive Plan, September 2010
5. Five-Way Corner Road Safety Assessment, April 2024
6. Claflin Ave and S Santa Fe Ave Closure, Kansas Wesleyan University Traffic Impact Study (Draft), December 2023
7. Kansas Vulnerable Road User Priority Corridors Map, November 2024
8. Engineering City Commission Information Memorandum, September 2024
9. Sidewalk Gaps Funding Decision Matrix, December 2023
10. SS4A Vulnerable Road User Priority 1 Corridors PPT Presentation, October 2024
11. W Magnolia Road Project Fact Sheet: Project Overview, October 2023

Framework for Plan and Policy Review

For each document reviewed, we have provided a summary of the following:

- A brief description of the document and its purpose.
    - Key elements related to the CSAP such as Safety Vision, Goals, and Policies; Safety Data and Analysis; and Recommended Countermeasures;
- Gaps or Barriers to reaching zero serious injuries and fatalities;
- Opportunities to address gaps and implement safety best practices.

Summary of Elements within Reviewed Documents

Document	Year	Safety Vision or Goals	Safety Data Analysis	Equity/ Public Input / Workshop	Roadway Design / Safety Countermeasures	Projects / Priority Corridors or Segments	Funding / Implementation
Saline County Local Road Safety Plan	2022				X		
City of Salina Traffic Studies Technical Memo	2023		X	X	X	X	
City of Salina Bicycle Master Plan Map	2016						
Salina Kansas Comprehensive Plan	2010				X	X	X
Five-Way Corner Road Safety Assessment	2024			X			
Kansas Wesleyan University Traffic Impact Study	2023		X				
Kansas Vulnerable Road User Priority Corridors Map	2024					X	
Engineering City Commission Information Memorandum	2024					X	X
Sidewalk Gap Funding Decision Matrix	2023		X				
SS4A Vulnerable Road User Priority 1 Corridors	2024	X			X	X	
W Magnolia Road Project Fact Sheet: Project Overview	2023				X		

Plan and Policy Summary

Document	Description	Elements for CSAP	Responsible
Saline County Local Road Safety Plan (2022)	Provides a framework for identifying, analyzing, and prioritizing roadway safety improvements on local rural roads. Includes a prioritized list of issues, risks, actions, and improvements that can be used to reduce fatalities and serious injuries on the local road network.	▪ The LRSP has a goal of reducing fatalities and serious injuries by 50% by 2029. ▪ Identifies crash risk factors, lists potential safety countermeasures based on those risk factors, and prioritizes projects for Saline County. ▪ Seeks to educate the public on restraint use, distracted driving, and driver impairment (pg. 122). ▪ Engaged county stakeholders in the LRSP process and gathered feedback on potential safety countermeasures (pg. 5). (Elected officials, insurance providers, parents, etc.). ▪ Includes countermeasures to reduce or manage speeding (speed advisory plaques, on-pavement markings for speed control, speed activated flashers, etc.) (pg. 93-99, 180-182). Also includes probable costs for these treatments (pg. 202-212).	Saline County, KS
City of Salina Traffic Studies Technical Memo (2023)	This document summarizes a traffic study of Magnolia Road, recommending phased improvements to enhance safety, service, and development, with the goal of creating a five-lane corridor with a two-way left turn lane.	▪ Considers roundabouts and other traffic calming strategies as possible safety improvements (pg. 1). ▪ Expresses a commitment to safe left-hand turns (pg. 7, 9). ▪ Seeks to discourage speeding vehicles (pg.70). ▪ Consideration given to an increase in law enforcement to discourage speeding and to help drivers notice and comply with stop requirements at intersections (pg. 70).	City of Salina, KS
City of Salina Bicycle Lanes Master Plan Map (2016)	Outlines the vision and framework for developing and improving bicycle infrastructure in Salina, focusing on creating a safe and connected cycling network. Assesses existing facilities, identifies gaps, proposes new bike lanes and paths to promote cycling as a viable mode of transportation.	▪ Supports Vision Zero by enhancing cycling safety and promoting active transportation options throughout the city. ▪ Recommends building bike lanes and trails to provide connectivity and enhanced safety for cyclists. ▪ Helps improve roadways for vulnerable and disadvantaged users by highlighting areas with high cyclist traffic, identifying gaps in infrastructure. Targets improvements that enhance accessibility and safety.	City of Salina, KS

Plan and Policy Summary

Document	Description	Elements for CSAP	Responsible
Salina Kansas Comprehensive Plan (2010)	Serves as the core planning document for the community as it charts a course for the future. Future planning efforts and guiding documents should be rooted in the vision, policies, and strategies identified in this document.	▪ A Community Attitude and Interest Survey showed that two-thirds of participants were in support of a balanced transportation system (i.e., bicycle network) and linear parks for enhanced mobility options ▪ The plan includes a robust section on complete streets and their integration into the transportation network (pg. 65). ▪ Includes an implementation section with actions and strategies. Several elements of the roadway network are discussed including connectivity, street standards, improvements to intersections, completing the pedestrian network, etc. (pg. 123).	Saline County, KS
Five-Way Corner Road Safety Assessment (2024)	This report summarizes the findings of an April 2024 Road Safety Assessment Workshop for the Five Way corner in North Salina.	▪ Encourages reducing speed limits on various arterials and collectors including Broadway (pg. 5). ▪ Recommends improved markings for wide turning lanes (pg. 5). ▪ Provides recommendations for bulb-outs, curb extensions, crosswalks, and roundabouts (pg. 4). ▪ Discusses enforcement and how agencies can help deter reckless driving and other dangerous behavior on the road, which can prevent fatal or injury crashes and save lives (pg. 6). ▪ Multimodal safety focused education enables drivers, pedestrians, and bicyclists of all ages and abilities to build skills, understand traffic laws, and recognize how their behavior impacts the safety of all road users, including vulnerable pedestrians and cyclists (pg. 6). ▪ Notes that the absence of crosswalk striping and overhead lighting causing limited visibility.	KDOT

Plan and Policy Summary

Document	Description	Elements for CSAP	Responsible
Kansas Wesleyan University Traffic Impact Study (2023)	Analyzes the potential impacts and feasibility of the proposed closure of W. Claflin from Highland Ave through the Kansas Wesleyan University campus to west of the railroad tracks, and the closure of S. Sante Fe Avenue from E. Kirwin Avenue to W. Claflin.	▪ Contains a comprehensive, 3-page crash analysis with maps, tables, and diagrams expounding on recorded crashes. ▪ Highlights the need to identify alternative routes for effective emergency response.	Kansas Wesleyan University
Kansas Vulnerable Road User Priority Corridors Map (2024)	Highlights the high-risk areas for pedestrians, cyclists, and individuals with disabilities, guiding infrastructure improvements and promoting multi-modal transportation	▪ Identifies high-risk areas for vulnerable users, enabling targeted safety improvements and interventions to reduce traffic-related fatalities and injuries. ▪ The map aids data-driven decision-making by highlighting high-risk areas, enabling planners to prioritize safety interventions and allocate resources effectively.	Kansas Department of Transportation
Engineering City Commission Information Memorandum (2024)	An administrative brief from Jim Teutsch, Director of Public Works, detailing proposed roadway, trail, and rail crossing projects throughout Salina and their associated sources of funding.	▪ Calls for the construction of several projects with safety benefits including a roundabout and a mixed use path on Magnolia Rd. Such projects will enhance safety by providing important linkages in the City of Salina. The City has received grants to support design and construction of these projects.	City of Salina, KS
Sidewalk Gap Funding Decision Matrix (2023)	A matrix containing a rating, score, or qualitative assessment of walkability and roadway improvements in Salina.	▪ Proximity of diverse land uses and recreational features such as parks and trails to residents and businesses makes for a more safe, bikeable, and livable community. ▪ This document uses a data-driven approach to ensure that investments are targeted to areas where they will have the greatest impact on reducing pedestrian injuries and fatalities.	City of Salina, KS

Plan and Policy Summary

Document	Description	Elements for CSAP	Responsible
W Magnolia Road Project Fact Sheet: Project Overview (2023)	Presents planned enhancements to improve connectivity, highlights W Magnolia's designation as an "Impact Roadway" deserving additional aesthetic and functional improvements, proposes phased implementation, and provides construction cost estimates. Includes site plan.	▪ Outlines improvements to crosswalks on W Magnolia, which align with the city's designated Impact Streets standards and vision outlined in the General Plan. Focuses on enhancing notable arterials and thoroughfares due to their significance to the broader community.	City of Salina, KS

Gaps and Opportunities Assessment

Document	Gap/Barrier	Opportunity/Recommendation
Saline County Local Road Safety Plan (2022)	▪ The plan does not mention the Vision Zero approach or the Safe System approach. ▪ The plan needs more robust public outreach and engagement and an equity analysis element to be competitive for SS4A or potentially other federal grant requirements.	▪ Incorporate the Safe System approach into plan development and recommendations ▪ Actively involve diverse communities in the planning process to better understand the diverse needs of the community are understood and addressed. ▪ Recommend more countermeasures that facilitated walking, biking, and transit, and those that work to naturally calm traffic in areas where more than one travel mode is expected.
City of Salina Traffic Studies Technical Memo	▪ The study outlines engineering alternatives for several locations, but prioritizes LOS calculations instead of safety considerations for all modes. ▪ The study recommends new and upgraded pavement markings but does not include signage or more advanced traffic calming measures for enhanced safety in many instances.	▪ Use systemic and targeted crash analysis to better understand safety risks and recommendations along the studied corridors. ▪ Incorporate the countermeasures toolbox and decision matrix to help identify appropriate safety treatments and countermeasures. ▪ Create a prioritization framework to help determine which projects will have the biggest safety impact and improve traffic conditions
City of Salina Bicycle Lanes Master Plan Map (2016)	▪ The plan and map should be updated now that they are about 10 years old. ▪ Does not provide additional information regarding the development process used for this map and community input. ▪ Does not incorporate bicycle crash data into the Bicycle Lanes Master Plan. ▪ Does not provide details on bikeway elements or provide design guidance.	▪ Update the Bicycle Lanes Master Plan and consider a complete streets and/or active transportation plan ▪ If only updating this map, provide additional information on how the map was created, what data was used, and what considerations were given. ▪ Include crash data and a level of traffic stress analysis into any plan update. ▪ Consult the AASHTO Guide for the Development of Bicycle Facilities or similar national guidance for best practices in bike facility design, implementation, and maintenance. Incorporate those best practices into any plan update.
Salina Kansas Comprehensive Plan (2010)	▪ The plan is now 15 years old ▪ The plan does not have a clear safety goal ▪ The plan does not detail transportation safety prioritization and integration into the city's planning and programming processes.	▪ Salina has plans to update the comprehensive plan already. ▪ Incorporate the discussed Vision Zero goal into the plan and other recommendations from the CSAP. ▪ Integrate comprehensive safety, complete streets principles, and Vision Zero elements into a future comprehensive plan and into how the city selects and implements transportation engineering projects.

Gaps and Opportunities Assessment

Document	Gap/Barrier	Opportunity/Recommendation
Five-Way Corner Road Safety Assessment (2024)	▪ Lacks implementation steps and plan to evaluate countermeasures over time.	▪ Provide an implementation section with clear steps and timelines, ensuring that safety initiatives are systematically carried out.
Kansas Wesleyan University Traffic Impact Study (2023)	▪ Does not detail a connection with high crash locations, which would provided valuable insights to inform its findings and recommendations.	▪ A updated traffic study can leverage data from the CSAP's High-Injury Network (HIN) and High Risk Network maps to identify areas with high crash rates and focus on implementing safety improvements where they are most needed.
Kansas Vulnerable Road User Priority Corridors Map (2024)	▪ State-level analysis is not as detailed as local analysis providing in this CSAP	▪ Indicate opportunities for safety interventions such as traffic calming, crosswalks enhancements, pedestrian refuge islands, etc. ▪ The HIN and HRN analysis completed as part of the Salina CSAP were created specifically for Salina and were calibrated to local conditions. These should be prioritized over statewide analysis.
Engineering City Commission Information Memorandum (2024)	▪ It is not clear how the projects identified in this memo were prioritized and selected for grant applications and construction.	▪ Make sure project prioritization is part of a comprehensive scoring process that emphasizes transportation safety for all modes of travel and selects projects in disadvantaged areas of the city.
Sidewalk Gap Funding Decision Matrix (2023)	▪ The matrix does not provide metrics for crash risk or a breakdown in the number of FSI crashes by mode. ▪ It is unclear why safety points may not be awarded for Safe Routes to School or public safety risk, but not both.	▪ Utilize FSI crash data along with the pedestrian high injury network along with the high risk network to score the public safety risk criterion, in addition to high speeds and traffic volume which are already part of the scoring process. ▪ The presence of narrow lanes should not be included as a safety risk as narrow lanes tend to slow traffic, which improves safety. ▪ Consider restructuring the safe routes to school and public safety risk categories so they work together.
W Magnolia Road Project Fact Sheet: Project Overview (2023)	▪ Should include a crash analysis to understand crash history and future risk. ▪ The plan could be enhanced by incorporating stakeholder engagement. This enhancement should include engagement with stakeholders such as Kansas State University, Salina Regional Airport, and local businesses along W Magnolia.	▪ The findings from a crash analysis inform the overall redesign strategy, ensuring that improvements prioritize safety for all users. ▪ Involving local stakeholders fosters a sense of ownership and investment in the project, making residents and businesses more likely to support and advocate for the plan. This buy-in can result in a smoother implementation process and greater overall community satisfaction.

APPENDIX D: **COMMUNITY NEEDS ANALYSIS**

This appendix is foundational for the Salina Comprehensive Safety Action Plan (CSAP) because it provides a better understanding of the social and economic context in Salina that influences travel patterns and user safety. Community and equity issues are directly related to transportation safety. Connections between the two will be highlighted throughout this appendix and will cover analysis methodology, review historical context, identify community focus areas, and set the foundation to create a more equitable Salina as an overarching recommendation of the CSAP.

The conclusion will include the results of a spatial demographic analysis and recommendations/key takeaways to inform the planning process.

Framework

Definitions and Principles

In transportation planning, equity is often defined as the fair distribution of investments and benefits of system infrastructure and outputs. Achieving equity is defined by the following principles:

- Compensating for inequities between groups in society.
- Providing greater benefit to those with greater need.
- Recognizing current and past inequities.
- Considering the local demand for resources.
- Fairly distributing cost and benefit between those with differing abilities and needs.
- Ensuring everyone has transportation access and options that allow them to participate fully in city life.
- Determining who has been and is being harmed by transportation policies and practices and how to reduce harm through future actions.

Importance of an Equitable Transportation Safety System

For any CSAP, it is critical to recognize the populations that do not drive for whatever reason (ability, income, age, or just a preference for other modes). Though this population may be small for communities across Kansas, it is still important to understand where these communities are located and prioritize access by means other than a vehicle when possible. Owning a vehicle and traveling by car can be burdensome for many people; access to walking, biking and transit ensures people have mobility, independence, and access to opportunities. Recent trends have shown that younger and active older people look increasingly for communities where they can reach their destinations without driving. Whether or not it is by choice, many people in Salina travel without a personal vehicle.

Historically marginalized groups are more likely to shoulder the burdens of a transportation system or have the system's benefits withheld because of past policies and investment patterns. These policies and patterns are examined throughout this analysis. Equitable investments throughout the community have potential to benefit the lives of everyone in Salina. Understanding where these investments should be prioritized ensures the city will reduce harm and create a more safe and sustainable community.

Community Needs Analysis Approach

The analysis examines the different ways communities are impacted by future transportation investments. There are three steps to the process: information gathering to understand the historical context and inform future engagement, a demographic analysis that identifies key populations and descriptive statistics, and finally integration with the greater CSAP by providing strategies to advance equity in Salina. The findings from this analysis can be used in the Salina CSAP as a component of how projects will be prioritized and to inform how we monitor, reduce, and, ideally, eliminate disparities.

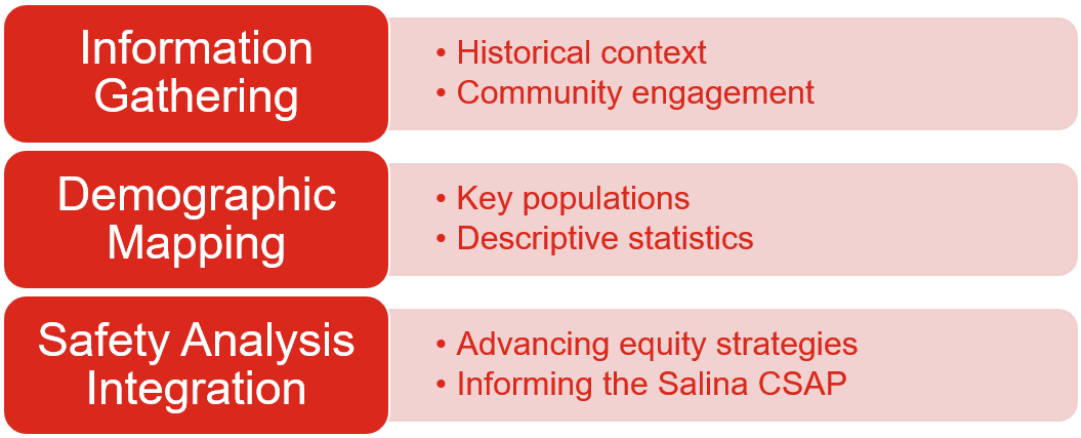


FIGURE 1 *Equity Analysis Approach*

Historical Context

This analysis reviews the history and present context of Salina to gain an understanding of important developments that shape the community today. The historical context also considers the national and statewide context that Salina is within to better understand policies and practices.

Throughout the country's history, transportation policy and practices specifically have created inequitable access and unsafe systems for marginalized people. Marginalized communities face issues such as higher exposure to pollution, public health, and climate impacts, higher concentrations of traffic crashes, service gaps, inadequate infrastructure, and divisive roadway construction.

This section will explain situations where infrastructure, housing policies, land use planning, law enforcement practices, and climate injustice can act as barriers to an equitable transportation system.

Infrastructure

The Plan aims to provide a safer multimodal transportation system in Salina. Existing infrastructure has a great impact on equity throughout the community. One way this can manifest is for small and mid-size communities is in facing funding challenges because their local governments lack staff capacity to manage large projects or to build specialization for things like bicycle and pedestrian planning and engineering. This can result in unintended inequitable outcomes not out of malice, but in limited resources and funding. This section examines different elements of Salina's existing transportation infrastructure and their possible impacts on equity.

Highways

Highways often result in transportation barriers, increased serious crashes, and lead to higher concentrations of pollution. There are two interstate highways that provide access to Salina, I-70 and I-135. I-70 runs just north of Salina and brings in a lot of stop-by visitors traveling across the state. There is truck infrastructure along both I-70 and I-135. This truck traffic could create dangerous situations for vulnerable road users in these areas.

I-135 runs north-south on the west side of Salina. There are multiple major employers and educational facilities west of the highway while most residential development is on the east side. Listening Session participants informed the project team that this area is a major growth area for logistics/warehousing. I-135 can be a barrier for people trying to get to work at these major employers on foot, by bicycle, or by transit. Centennial Road, Magnolia Road, and Schilling Road act as major connection points from this area and central Salina. In outreach, the plan survey, and in listening sessions these roadways were listed as corridors where improved pedestrian and bicycle connections should be made.

Railway

A major railyard cuts through the center of the city bisecting north and south Salina. The railroad cuts through some of the most urbanized areas of the community. The Union Pacific Freight Depot first opened in 1920 and served the Union Pacific and downtown Salina until the 1970s when it was closed.[1] This railroad provided the critical connection between Salina and Kansas City.

Railyards can have similar harmful impacts to communities as highways. Truck emissions, noise pollution from locomotives, and railyard equipment all create an environment that have negative impacts on the nearby communities' health and quality of life.[2] These communities are also more likely to experience high levels of violence, homelessness, and unemployment.[3]

Salina's 2010 Comprehensive Plan mentions the possibility of realigning the railyard to be west of the airport to remove it from the heart of the community and reduce conflicts with other travel modes.

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1 **https://www.up.com/aboutup/train_town/salina_ks/index.htm**

2 **Tracking Harm: Health and Environmental Impacts of Railyards (2012).** Trade, Health and Environment Impact Project.

3 Spencer-Hwang R, Montgomery S, Dougherty M, Valladares J, Rangel S, Gleason P, Soret S. Experiences of a rail yard community: life is hard. J Environ Health. 2014 Sep;77(2):8-17. PMID: 25226779; PMCID: PMC4486117

Transit

Transit is one tool that can be used to greatly advance transportation equity for a community. Fast and convenient transit increases access to healthcare, healthy food, jobs, and education. Salina is currently serviced by CityGo General Public Transportation, which is provided through a partnership between City of Salina, OCCK, and KDOT. CityGo services about 80% of the city with 5 routes and 6 transfer points. CityGo also provides "Wave and Ride" routes, requiring passengers to wave to a passing bus indicating that they want to board.

- Fare is $1 per trip, $2 for a day pass, and $35 for a month pass. Passes are available for purchase online and through several locations throughout Salina.
- Service hours are 6 AM to 9 PM Monday – Friday and 9 AM to 5 PM on Saturday. No service is available on Sunday.

Infrequent service is an accessibility factor of transit and, consequently, transportation equity. Infrequent or unpredictable transit service does not effectively connect people to the destinations they need to access. The existing transit service in Salina seems to be consistent in connecting people across the city and outside of the city. However, in the listening sessions the project team learned that many people cannot easily cross streets near transit stops, and there can be gaps in the sidewalk network near stops. Though transit coverage in Salina is comprehensive, the first-and-last mile infrastructure connecting to transit is lacking.

Active Transportation

Sidewalks

Throughout the City there are many gaps in the sidewalk network and generally a lack of connected sidewalk networks. There are several places where people who walk are forced to do so in the street or in the curb, especially near transit stops. According to crash data, a large percentage of pedestrians have been struck by cars mid-block. This suggests that pedestrians often do not have a safe place to cross the street. It could also indicate that pedestrians lack access to sidewalk infrastructure and are forced to walk in the street.

The 2010 Comprehensive Plan states that developing a complete sidewalk network is a priority, and that all new development should be considering sidewalk implementation. The city currently has about 30 miles of sidewalk gaps that they plan to fill in the future. Sidewalk implementation is ranked based on criteria such as safe routes to school, public safety, worn path/documented users, and bus stop/route proximity.

Sidewalk maintenance is just as important as implementation. Sidewalk maintenance is an equity issue because in many older neighborhoods with concentrations of low-income communities the sidewalks have fallen into disrepair. In Salina, sidewalk maintenance is typically the responsibility of the property owner, and in some cases the property owner may not be able to afford sidewalk maintenance. The 2010 Comprehensive Plan mentions the importance of inspecting and maintaining sidewalks, especially in the downtown area.

In recent years, the city has been considering a cost sharing system where the city will help fund repairs of missing or poor condition sidewalks. If feasible, this system should advance transportation equity by investing in sidewalk repairs in areas that have the greatest need.

Bicycle Infrastructure

The Salina bikeway network is comprised of linear parks, multi-use paths, and shared roadways. The 2010 Comprehensive Plan has guided the development of the citywide bikeway network. It is noteworthy that bike share is available in Salina through KANcycle. KANcycle is administered through OCCK. Bike share stations are located at:

- 9th & Hamilton
- 7th & Walnut
- Sunset Plaza
- Bill Burke Park
- Kansas Wesleyan University

KANcycle passes can be bought on a pay-as-you-go basis, at $1.50 per 30 minutes. Annual memberships can also be purchased for $30. Discounted memberships are also provided to some riders. Access to bike share along with transit makes it feasible to live in Salina without a car.

Traffic Crashes and Fatalities

Data has proven that crashes and fatalities are not shared equally across races in the United States. Nationwide, crash analyses have found that American Indian and Alaska Native (AIAN), Black, and Latinx Americans face higher rates of traffic injuries and fatalities.[4] Across the United States, the number of people killed while walking has continued to increase in 2023, with an estimated 7,318 pedestrians struck and killed, up 14 percent since 2019. [5] People of Color, particularly Indigenous and Black Americans, are substantially more likely to die while walking than any other race or ethnic group.[6]

The Descriptive Crash Analysis found that there were 4,222 crashes in Salina between 2019 and 2023, 1,117 resulted in an injury and 11 were fatal, including one pedestrian and one bicyclist death. The High Injury Network analysis for this Plan found that crashes are concentrated along major roadways in Salina such as Broadway Blvd., Iron Ave., Crawford St., 9th St., and Ohio St. It is difficult to draw conclusions related to race in the crash trends in Salina. Further, pedestrian and bicycle crashes are largely underreported to police for various reasons.

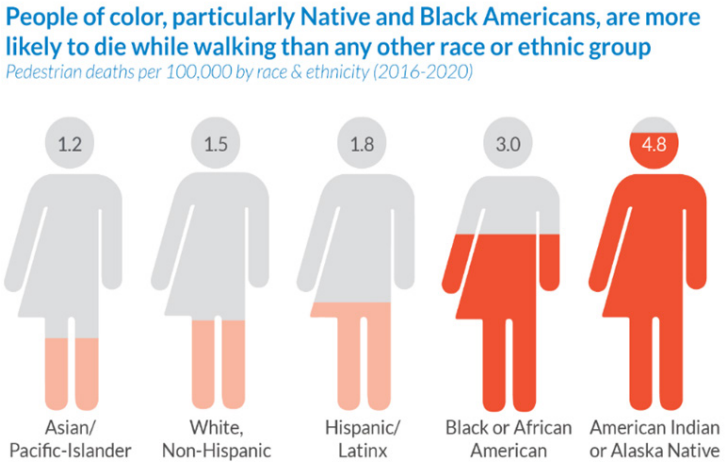

FIGURE 2 *Pedestrian Deaths in the United States by Race and Ethnicity (Fatality Analysis Reporting System (FARS) data, 2016-2020)*

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4 Nauman, Rebecca B. and Laurie F. (2013). **Motor Vehicle Traffic-Related Pedestrian Deaths — United States, 2001–2010**. MMWR Morbidity and Mortality Weekly Report, 62(15):277-282.

5 Governors Highway Safety Association. (2023) **Pedestrian Traffic Fatalities by State**

6 Smart Growth America & National Complete Streets Coalition. (2022). **Dangerous by Design**.

Housing and Land Use

Affordable housing is pertinent to transportation equity discussions because neighborhoods provide different transportation access and transportation investments influence property values and vice versa. Wealthier neighborhoods often see more investment in their transportation infrastructure. Housing affordability also has a direct impact on being able to afford a vehicle. Many households across the country are both burdened by housing and transportation costs.

Affordable Housing

Housing affordability may not be a major concern in Salina, 68% of the Salina housing is occupied by the owner, 60% of whom have a mortgage. The median household income of white families in Salina is $58,750, compared to the $48,950 for Black households. Poverty rates ($27,750 or less for a family of 4) show that 13% of Black, 58% of American Indian, and 10% of white residents have an income below the poverty line.

Often, affordable housing areas are further from goods and services with less safe and accessible transportation options to assist with additional distances. The demographic analysis and mapping in the following pages details the communities of concentrated poverty in Salina.

Homelessness

- On a single night in 2023, roughly 653,100 people – or about 1 in every 500 people in the United States — were experiencing homelessness.[7]
- People experiencing homelessness have an increased risk of being killed or seriously injured in traffic crashes
- Lack of access to affordable and reliable transportation may be a factor that could lead an individual to experience homelessness.[8]
- Shelters in Salina said a number of the people who use their services do not have access to a car and are reliant on transit, walking, or biking. They face challenges in several locations and specifically cited crossings on arterial roads as a problem area for the city to address.

Law Enforcement

Law Enforcement is an important aspect of transportation equity because enforcement is conventionally viewed as a key component of achieving transportation safety and compliance. Unfortunately, transportation enforcement has a discriminatory history throughout the U.S., impacting the level of safety on public streets and in public spaces for specific members of the community. Nationwide, BIPOC, especially Black residents, are more likely than white residents to be pulled over, have their car searched, be pulled over on a bicycle, be stopped by a cop while walking, and be ticketed on transit.[9]

Some cities have implemented anti-harassment programs, hired unarmed personnel for transportation enforcement, and increased engagement between the community and law enforcement members. Salina PD has implemented a proactive alerting system (S.A.ID)[10] for identifying residents with special needs who may require specialized assistance to provide for increased safety for the individual and first responders. This is one aspect of ensuring that enforcement can be administered equitably and safely for Salina residents regardless of their mental or physical ability.

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7 FHWA **Promising Practices for Transportation Agencies to Address Road Safety among People Experiencing Homelessness**

8 Roark Murphy, "**Transportation and Homelessness**."

9 Barajas, Jesus. (2021). Biking Where Black: Connecting Transportation Planning and Infrastructure to Disproportionate Policing. **https://www.sciencedirect.com/science/article/pii/S1361920921003254**

10 **https://www.salina-ks.gov/s-a-id-special-needs-alerts-and-identification-program**

Climate Resilience

Climate and transportation equity are closely tied in a variety of ways. Climate change impacts disproportionately impact low-income, BIPOC, and other marginalized groups. The transportation sector is a large contributing industry to greenhouse gas emissions, which degrade both air and water quality. By investing in a multimodal transportation system, more people may choose to walk or bicycle for short trips rather than driving. This mode shift can greatly reduce the emissions released from driving for every trip.

The Kansas Wesleyan University hosts a community resilience hub, which works to establish resources and provide support leading Salina to a more stable, secure, and equitable ecosystem. The Hub is in its first phase, focusing on education, action, and advocacy for regenerative agriculture. Current projects include:

- **Central Kansas Food Corridor:** supporting local communities with fresh produce
- **Quail Creek Family Farm:** 600 acres of land for research and hands-on learning at a regenerative organic farm in Salina, Kansas.
- **The Rodale Institute:** provide regional farmer training and support, as well as programming for students that includes research, educational opportunities, and farm practices unique to the Central Plains.

Equitable implementation of climate solutions, such as green infrastructure, shelters, and street trees, will reduce threats of climate related displacement. Street trees are a particularly advantageous investment, not only providing environmental benefits, but also act as traffic calming and create a more comfortable walking environment. Transportation investments and decisions can have either negative or positive impacts to the climate. Climate change effects will disproportionately impact those who rely on walking, biking, and transit to get around.

Community Engagement

One purpose of this equity analysis is to inform engagement efforts for this planning process. Community engagement efforts for transportation projects historically attract people who have the time and resources to participate in engagement activities. This results in those who may have the greatest need for a multimodal transportation system, or those who live nearest to dangerous roadways, not being represented in engagement takeaways.

More inclusive and equitable engagement can help ensure that the transportation network in Salina is built for the needs of all residents. Intentional outreach, such as selecting strategies to reach diverse groups, using hands-on activities, and creating comfortable environments that empower people, will result in more representative and fruitful engagement efforts.

More information on engagement efforts can be found in Appendix B.

Demographic Analysis and Mapping

Several demographic maps were developed for this analysis to better understand the spatial equity context of Salina. These maps identify areas where concentrations of disadvantaged communities might be located. The series of maps in this section helps identify demographic patterns which can then be spatially compared to various transportation outcomes. Disparities outlined in the previous section can be further examined using demographic maps to identify geographic distribution of key populations.

In the demographic mapping step, populations are distinguished based on demographic factors that reflect communities who have been systemically oppressed and marginalized on a national scale. Using available Census and American Community Survey (ACS) data and tools provided by the USDOT, we can categorize and map these populations. Key takeaways will be used later in the planning process to compare outcomes in areas experiencing greatest disadvantage and to develop equitable recommendations for this CSAP.

Key Populations

To create a clear understanding of disadvantaged communities, a list of key populations was developed. These populations have often been at a disadvantage on a national scale because of historic practices and policies. The key populations for Salina's Comprehensive Safety Action Plan equity analysis are:

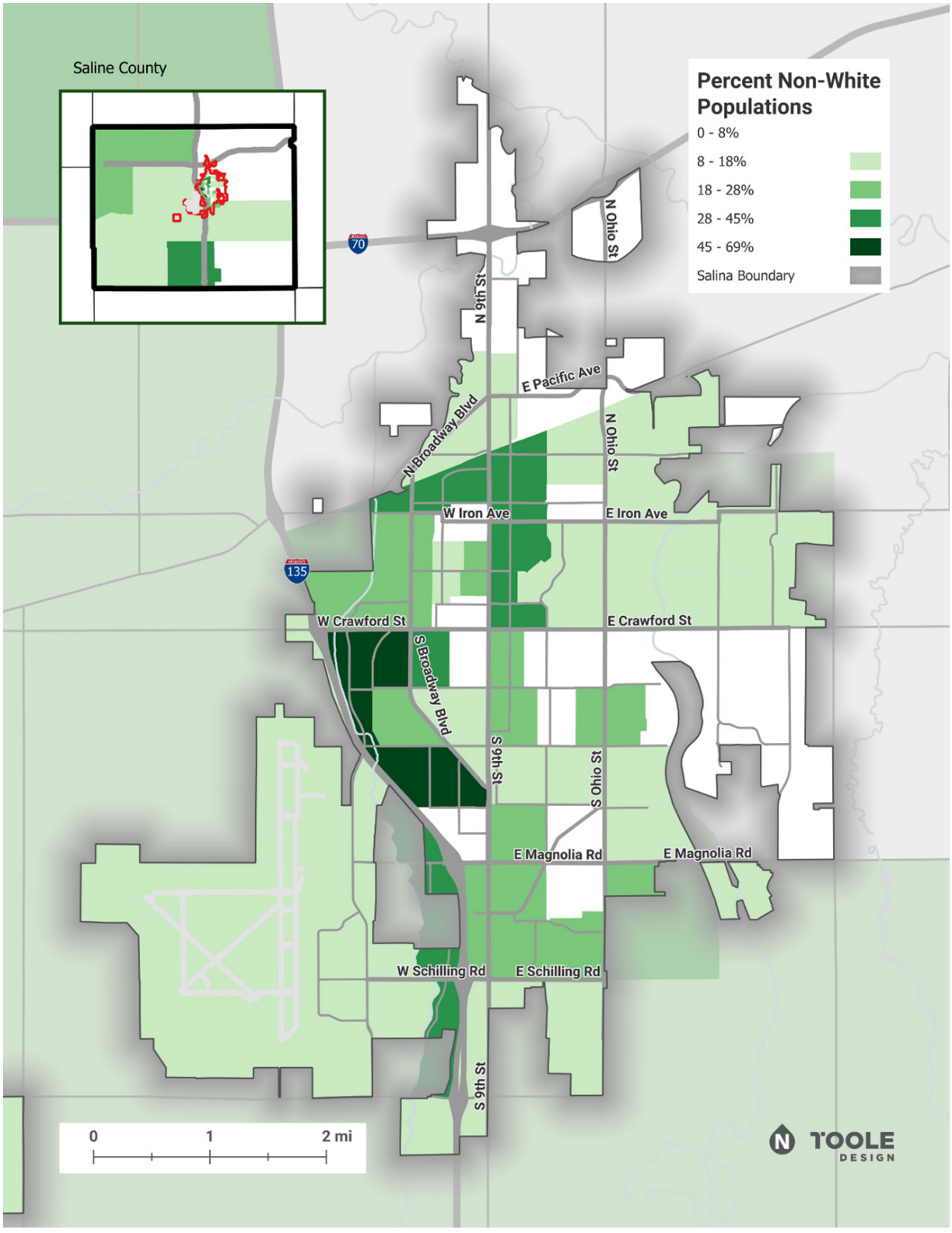
- People of Color, including Hispanic or Latinx people
- Households in poverty
- Cost-burdened households
- Unemployed population
- Limited English Proficiency (LEP)
- Older adults 65+ years of age
- Youth under 18 years of age
- Carless households
- Households with disabilities
- People without a high school diploma

Patterns and key takeaways about each of these key population groups create an understanding of where and who are the communities of highest need in Salina. These key population groups can be overlayed with findings from the greater safety analysis to identify overlaps where there are concentrations of disadvantaged people and unsafe infrastructure for vulnerable road users.

People of Color

The map below combines all non-white race categories from the census to map the minority populations in Salina. The areas with the highest concentration of non-white population include central Salina, just south of the railroad tracks, and in the southwest area of the city along I-135.

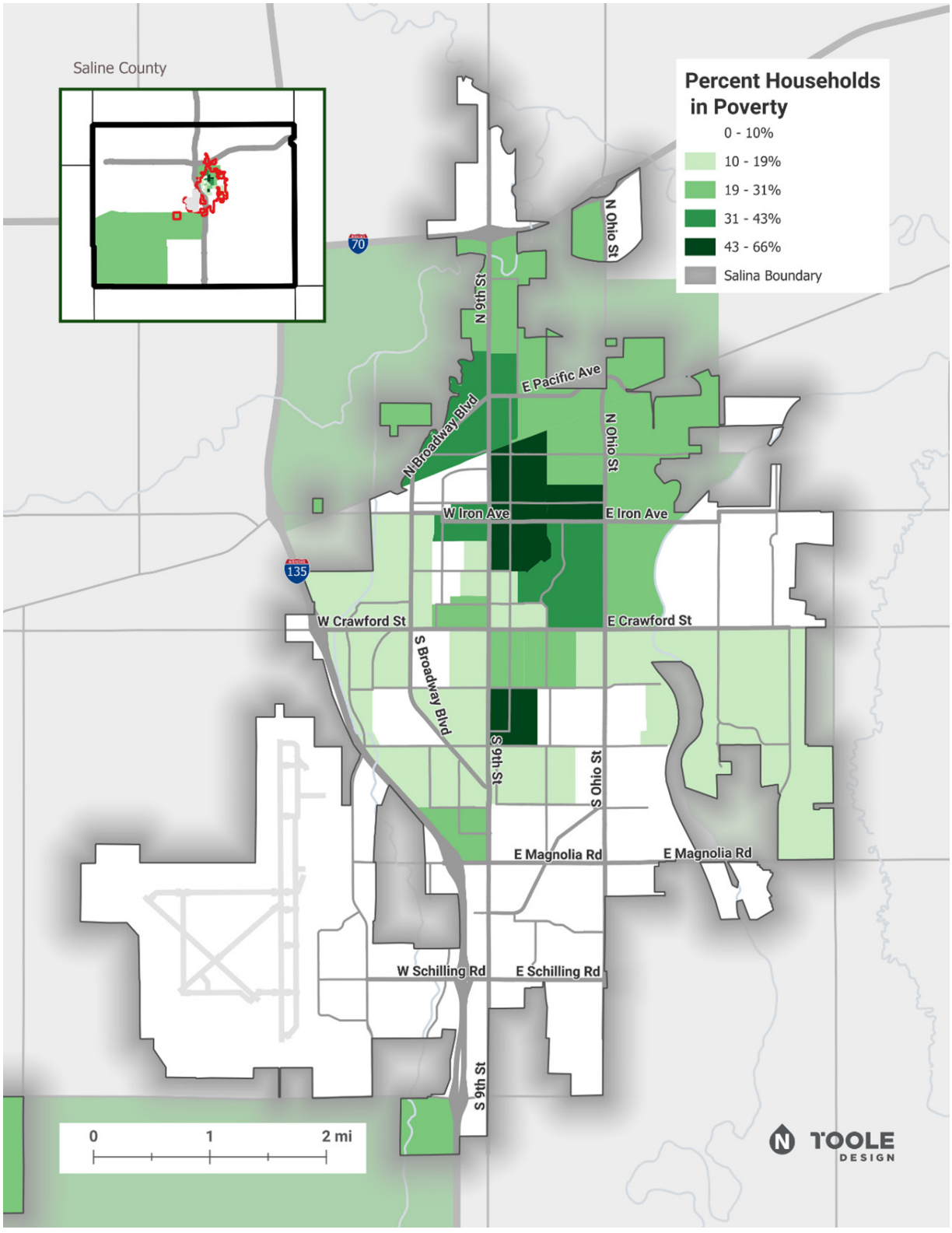
MAP 1 *Percent Non-White Population Map*



Households in Poverty

To be considered a household in poverty, a family of four must make $27,750 or less annually. Households in this category are largely concentrated north and south of the railroad tracks. There is also a pocket of households in poverty located east of 9th Street and south of Cloud Street just south of the Kansas Wesleyan University campus.

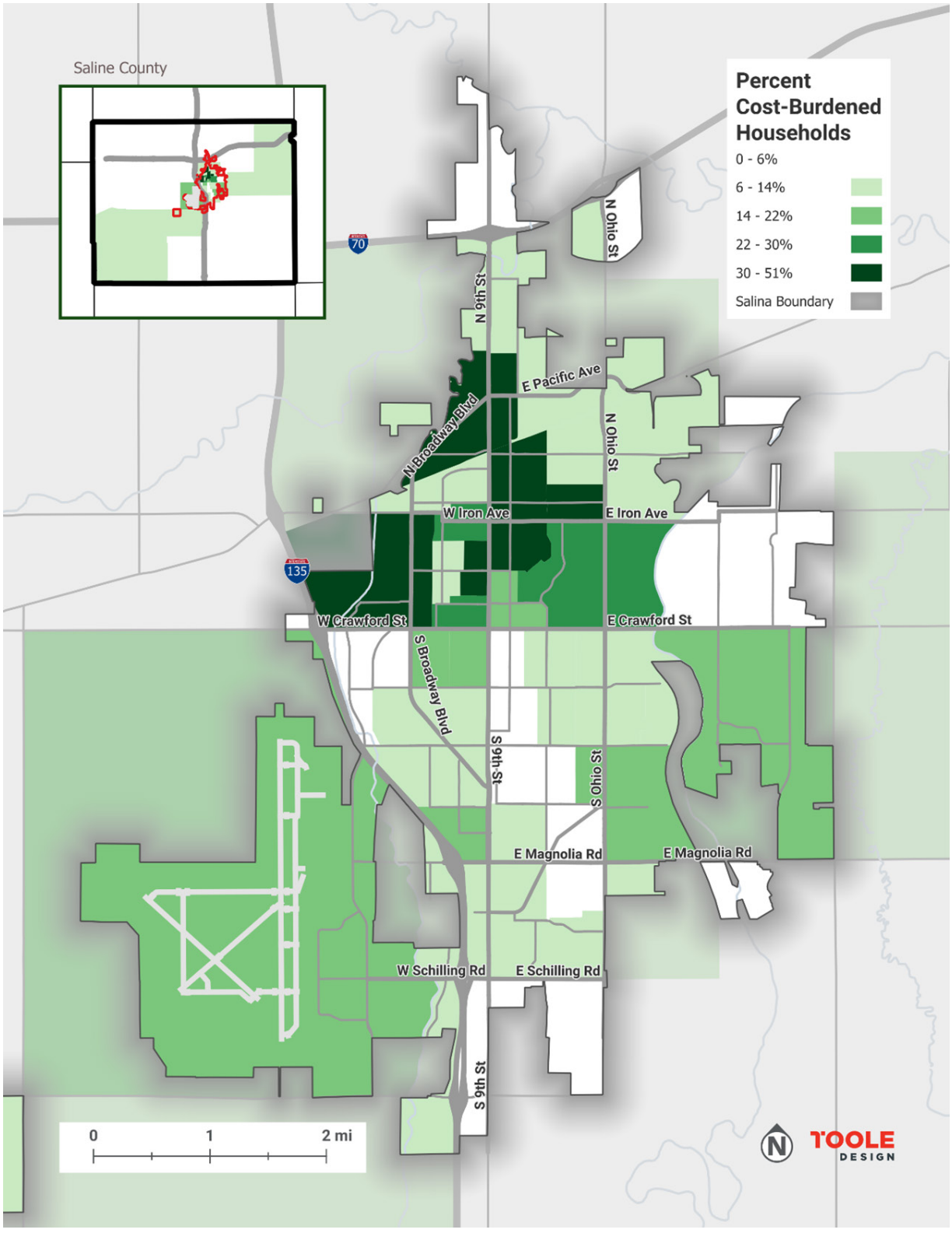
MAP 2 *Percent Households in Poverty Map*



Cost-Burdened Households

To be considered cost burdened, a household must spend more than 30% of their income on housing. Families in this situation are often one incident away from not being able to pay for what they need. There are concentrations of these households in north central Salina. Most of these areas are near the railroad or the highway.

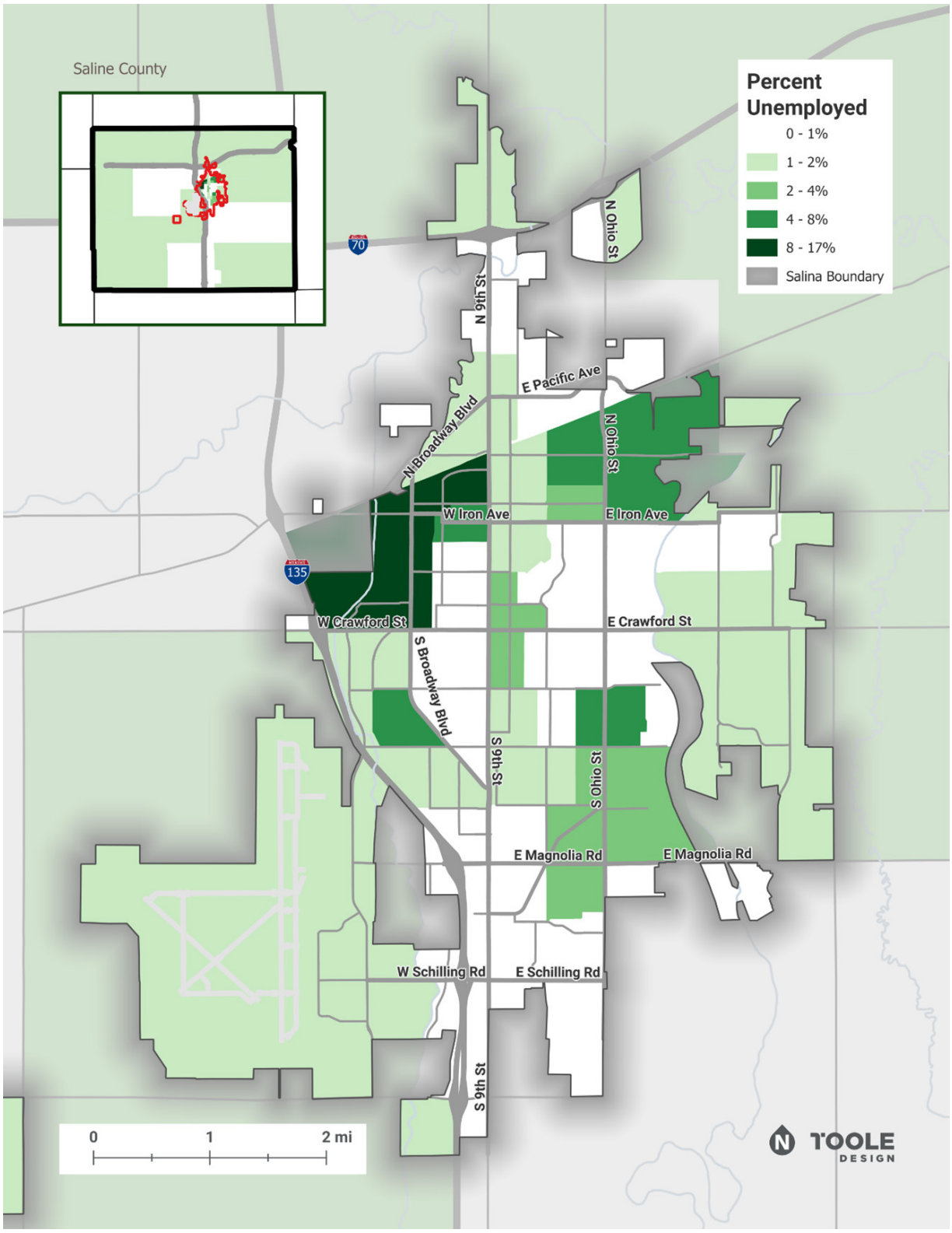
MAP 3 *Percent Cost Burdened Households Map*



Unemployed Population

Unemployed populations are largely spread out across the community. There is one area with a higher concentration of unemployed populations south of the railroad with the highest concentration on the west side of 9th Street.

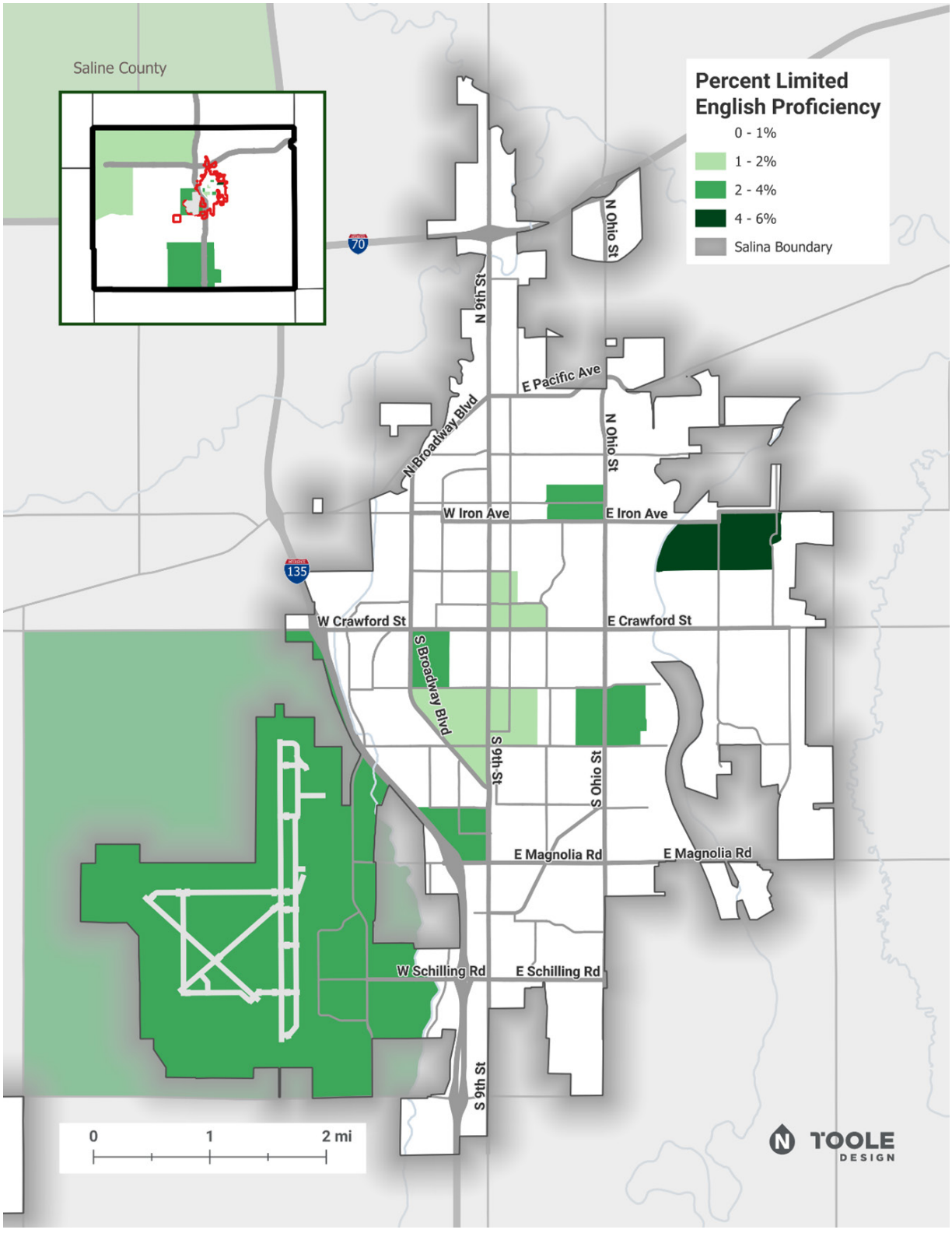
MAP 4 *Percent of Unemployed Population Map*



Limited English Proficiency

The limited English proficiency population is relatively small in Salina with the highest percentage in any one census tract being 6% of the population. The highest concentration of limited English population is located near the Indian Rock Park in eastern Salina.

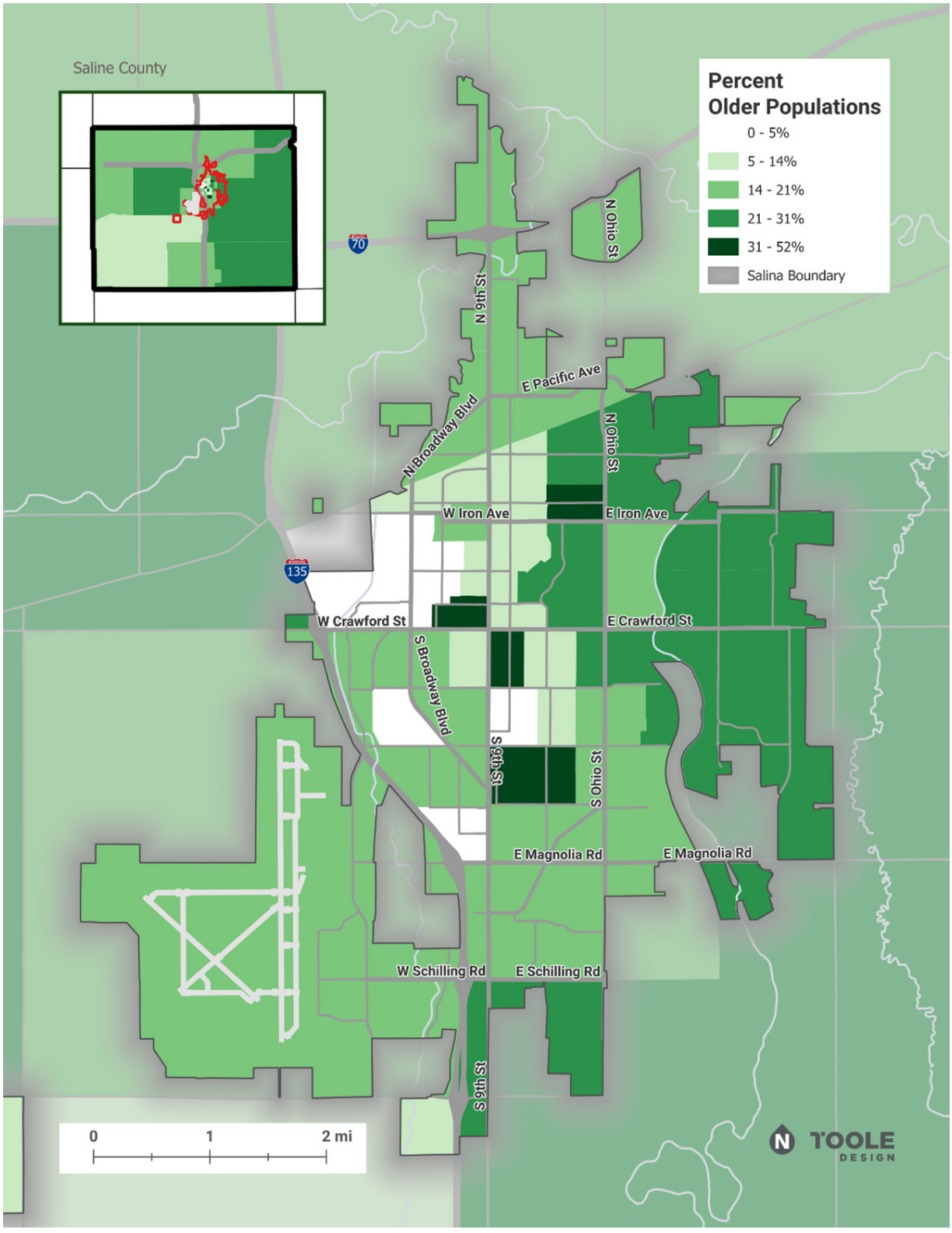
MAP 5 *Percent Limited English Proficiency Map*



Older Adults

The older adult population (65+) is generally spread across the city. There are concentrations of this population along 9th Street. It is noteworthy that most of the city's census tracts have at least 5% older population. This indicates a population that is aging in place and will need certain accommodations to travel across the community safely and reliably.

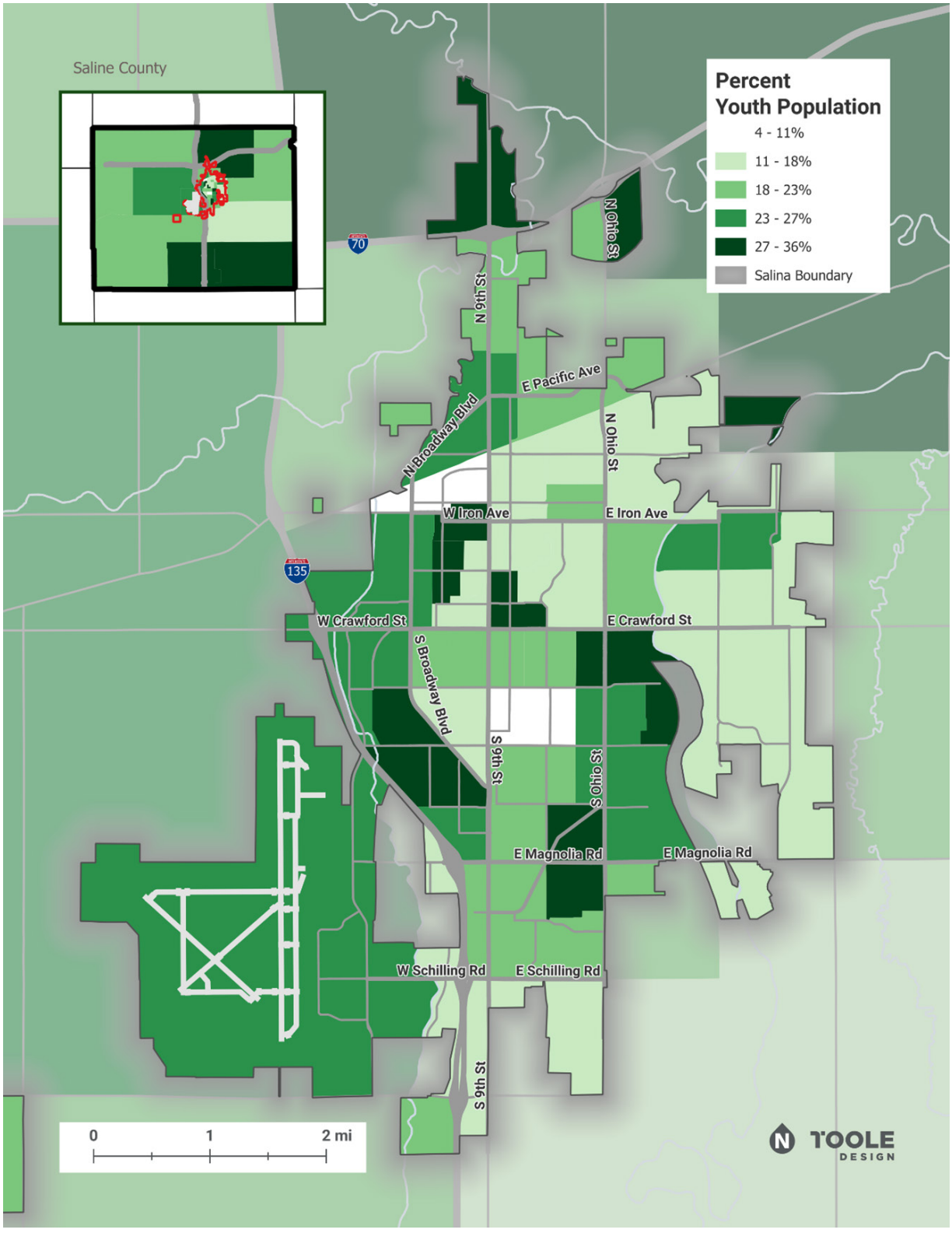
MAP 6 *Percent Population 65+ Map*



Youth

As seen with the older population in Salina, the youth population is also generally evenly distributed throughout the community. There are many youth populations outside of the city limits, which may create situations where children must rely on older family members more to get where they need to go.

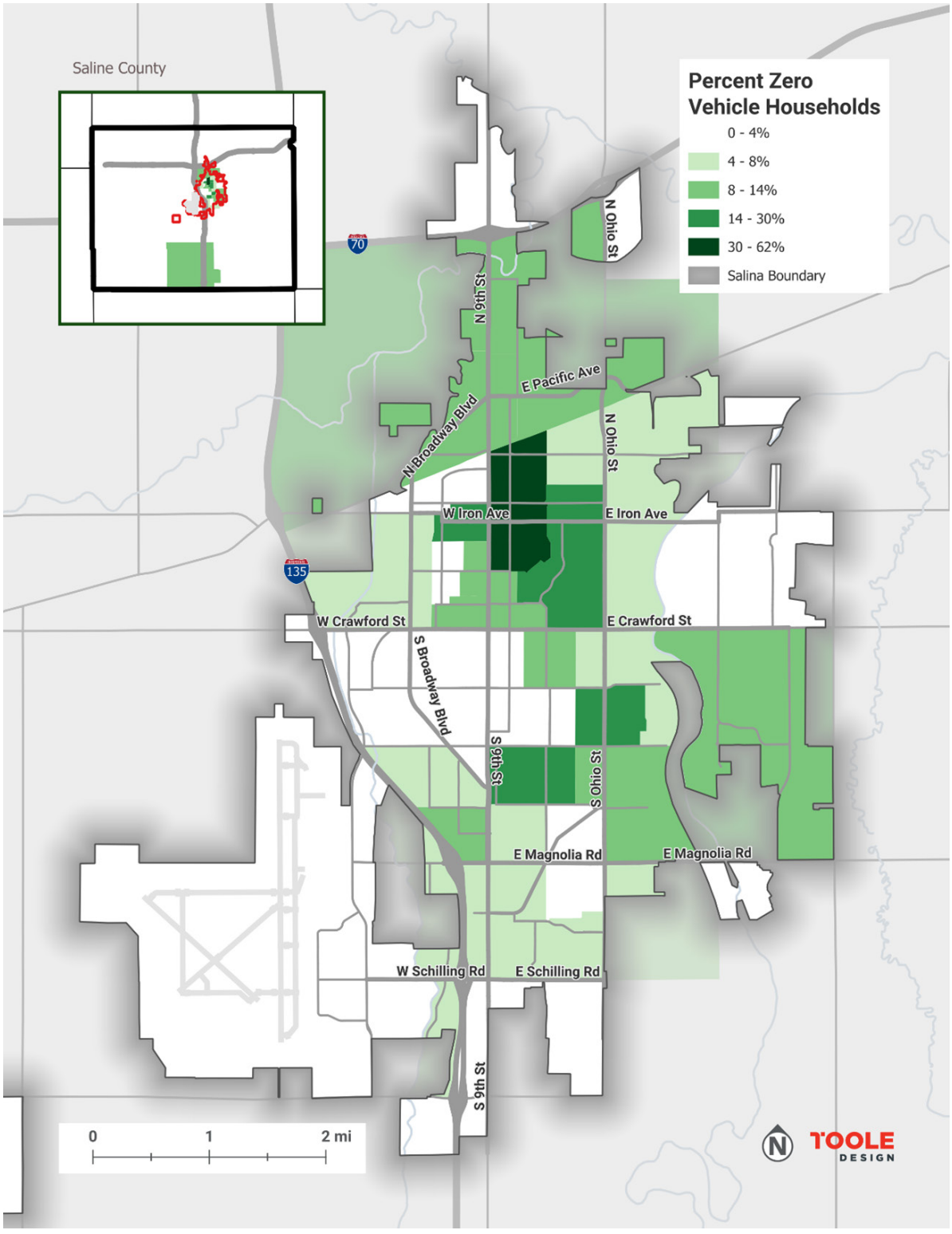
MAP 7 *Percent Youth (<18 years) Population Map*



Carless Households

Considering the state average percent households with no vehicles is 5%, the percentages for Salina are higher (7.6%). It is noteworthy that the census tracts in central Salina just south of the railroad have as much as 62% of households with no access to a vehicle. This map shows that there is a considerable population in Salina that must traverse the city to access daily needs without a personal automobile.

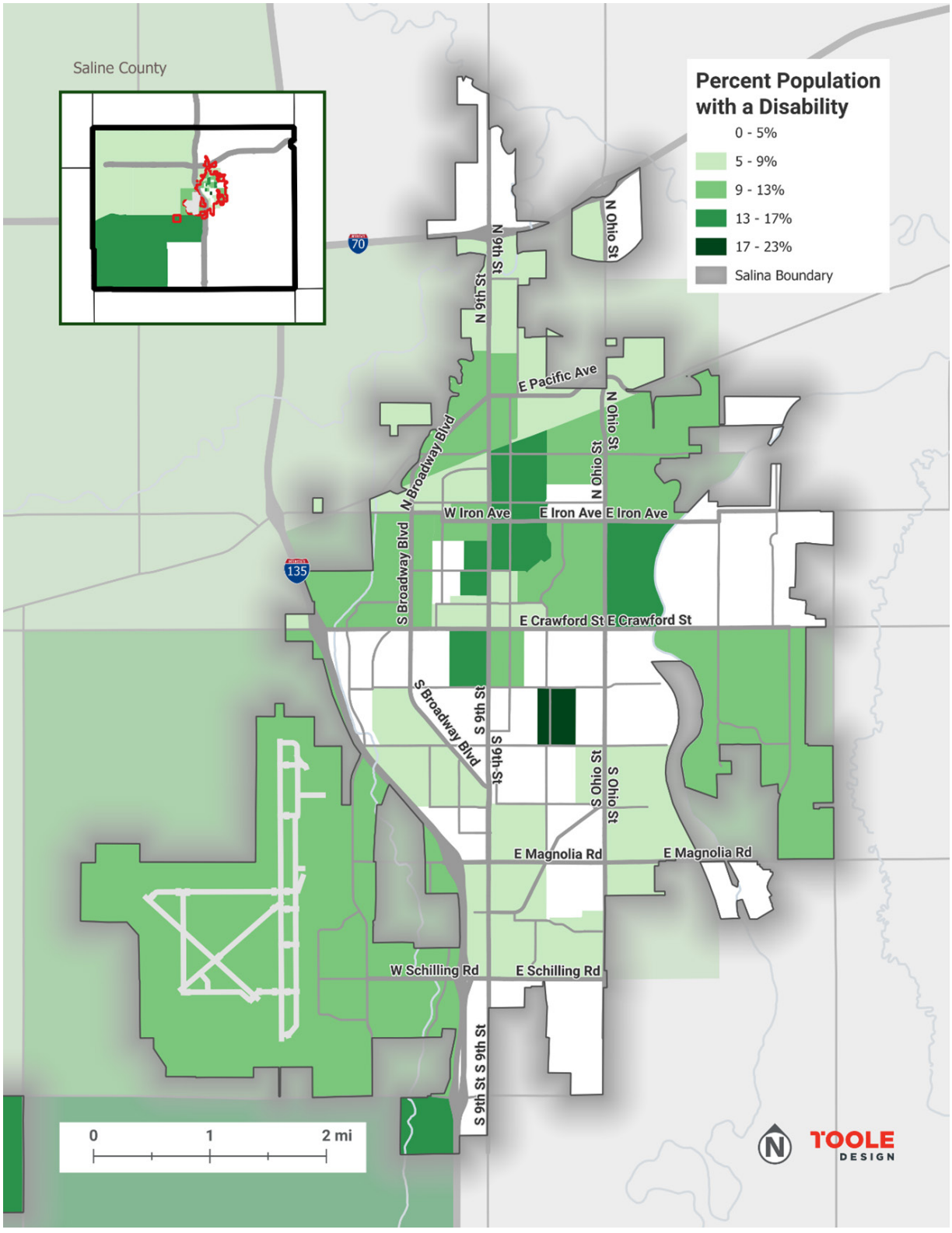
MAP 8 *Percent Zero Vehicle Households Map*



Households with Disabilities

The population with a disability in Salina is generally spread throughout the community. There are concentrations of this population in central Salina around the airport, and a noteworthy pocket of the highest concentration along Roach Street between Cloud Street and Republic Avenue.

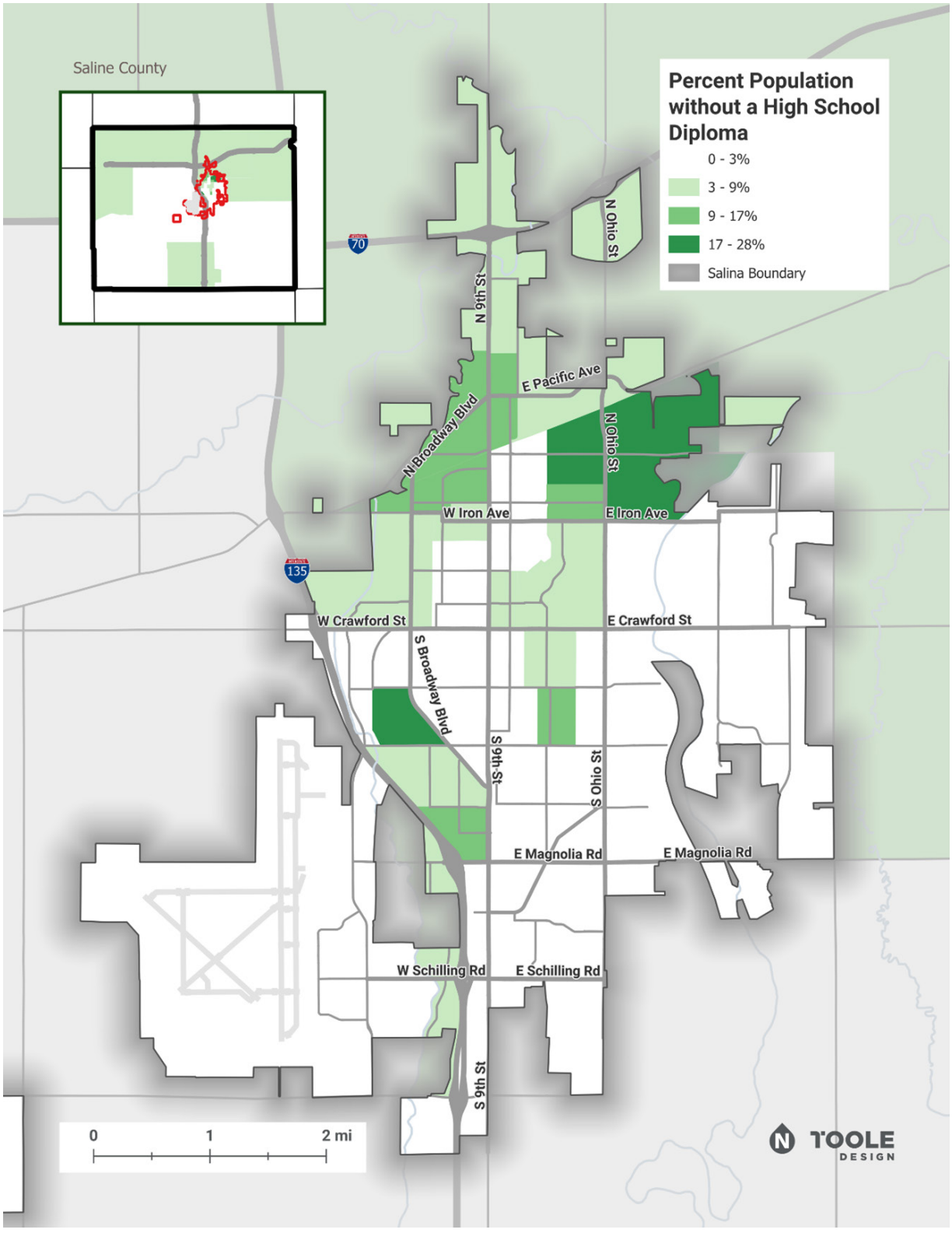
MAP 9 *Percent Population with a Disability Map*



People without a High School Diploma

Generally, this population is relatively small within Salina. The highest concentration of those without a high school diploma is located just south of the railroad in the eastern portion of the city. There is also a small concentration of this population south of Broadway Boulevard.

MAP 10 *Percent Population without a High School Diploma Map*

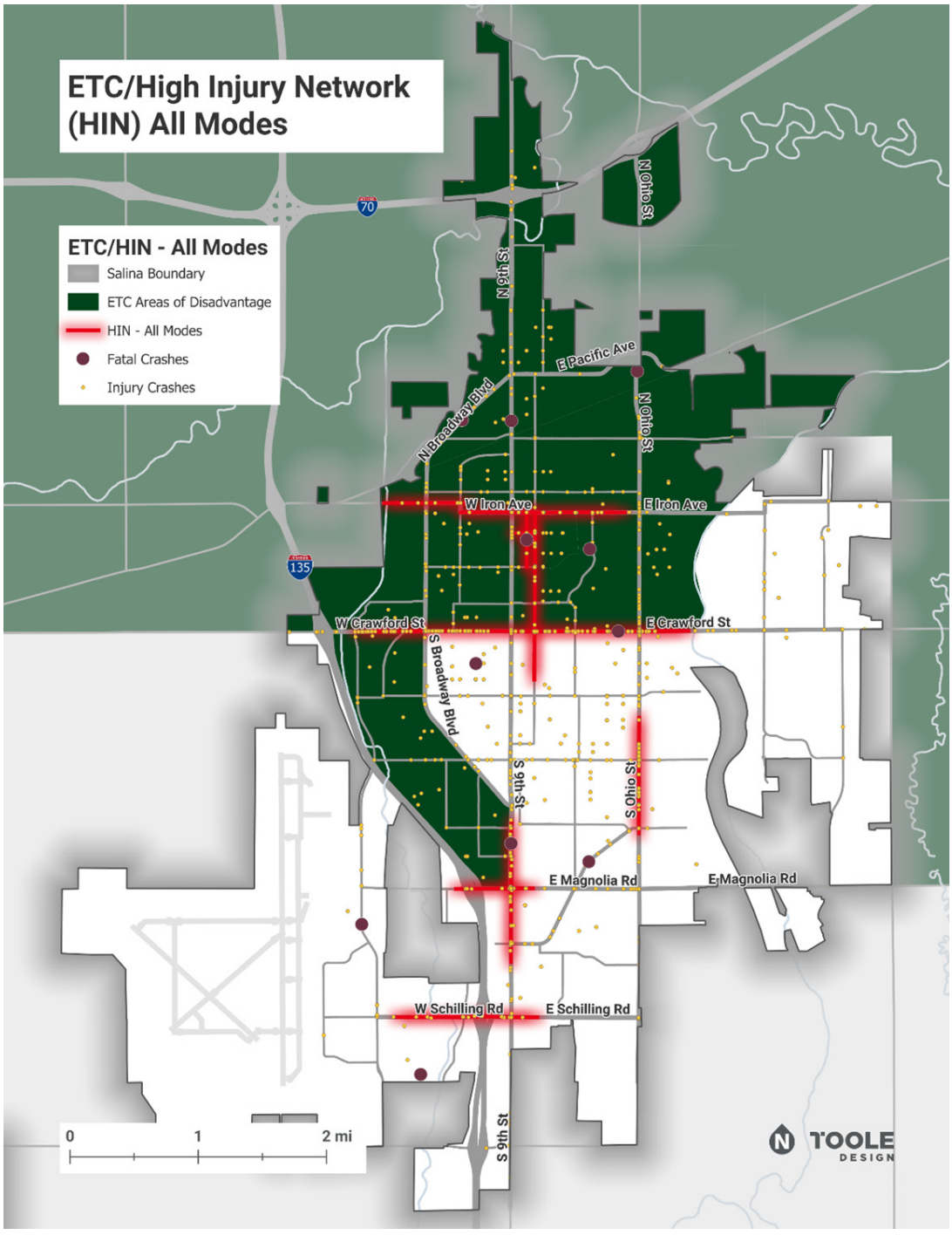


Equitable Transportation Community (ETC) Areas

The USDOT's former ETC tool uses 2020 census data to understand the intersectional burden communities might experience because of underinvestment in transportation infrastructure. The ETC score is a composite of five categories: transportation insecurity, climate and disaster risk burden, environmental burden, health vulnerability, and social vulnerability. The areas highlighted on the map below were found to be above average for all of these categories. These same areas are highlighted in several of the previous maps as having the highest concentrations of the key populations previously identified.

Overlaid on this data are the highest scoring HIN roadway segments. All but two HIN segments are within or border ETC areas.

MAP 11 *USDOT Equitable Transportation Communities Map*



Advancing Equity Through the Comprehensive Safety Action Plan

This section describes potential strategies to advance equity in Salina informed by the findings from this equity analysis. The following strategies can and should impact the planning and implementation of transportation safety projects in Salina.

Continued Assessment

The equity analysis reveals populations and areas that should remain in the forefront when deciding how to address planning issues such as transportation safety. Investments can be prioritized to address performance while prioritizing disproportionate impacts and underinvestment among historically marginalized communities.

Data Types

The safety analysis in this plan provides only part of the puzzle in the form of **quantitative** data through equity mapping and the high injury network (HIN). **Qualitative** data will also be important to collect through engagement with the communities identified in this analysis. This equity analysis includes historical context, but the best data to understand people's lived experiences comes from community engagement.

Expanding Analysis

Use the equity analysis as a tool to develop targeted engagement and modify engagement strategies as needed. This analysis lays the foundation for a more systemic framework that uses equity to make outreach and investment decisions regarding future planning projects.

Prioritization

Use this analysis and the broader Comprehensive Safety Action Plan to help prioritize project locations and ensure that all residents of Salina are considered in project scoping, design, and maintenance.