Garden City Road Safety Audit

Kansas Avenue: Taylor Avenue/U.S. 83B to Jennie Barker Road

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March 2025

NOT FOR CONSTRUCTION—The Recommendations in this document are intended ONLY for the local agency to use in determining possible future changes at the RSA location.

Subject to United States Code Use Restricted 23 USC 407.

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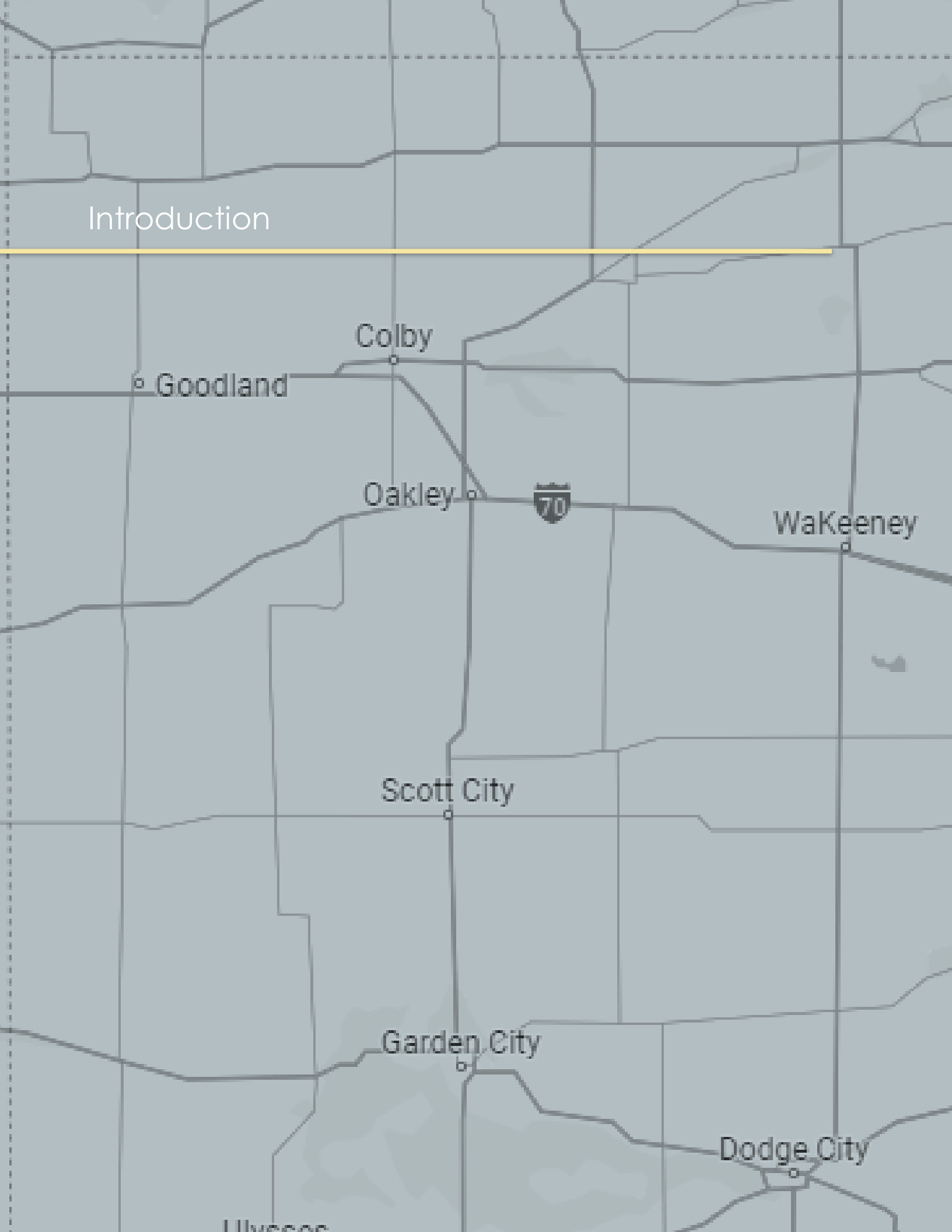


Introduction

Garden City, Kansas, is part of the Multi-jurisdictional Safe Streets for All (SS4A) Safety Action Plan, a collaboration between twelve jurisdictions to improve roadway safety. Partner communities and counties include Garden City, Holcomb, Liberal, Scott City, Oakley, Oberlin, Finney County, Seward County, Haskell County, Scott County, Logan County, and Decatur County. The U.S. 83 Communities Roadway Safety Plan and Road Safety Audits (RSA) are important initiatives for improving road safety and are a critical component of the plan.

RSAs are formal examinations of selected roadway facilities from a safety performance viewpoint. An independent multidisciplinary team made up of engineers, traffic specialists, and planners performs all RSAs. The end result of an RSA are qualitative estimates and reports on potential road safety issues and identified opportunities for safety improvements that will benefit all road users. By leveraging data, community input, and expert analysis, the city can implement targeted interventions to reduce traffic crashes and improve overall road safety. The RSA team reviews local agency crash data and conducts field observations during different times of day, such as peak/non-peak hours. The Kansas Avenue field visits took place from April 1st to April 3rd, 2024.

Kansas Avenue, also known as K-156, is one of the busiest corridors in Garden City, providing connections to commercial activity, job centers, community assets like the Talley Trail, and two highways. Recently, Kansas Avenue has become a priority corridor for Garden City and identified as being a gateway street for the city. The recent comprehensive plan reinforces this in several ways. Among other recommendations, Kansas Avenue is identified as a prime candidate for a multimodal street conversion that would include improvements to better serve all modes and users.

Figure 1 shows the study area. The study area includes 3.25 miles of Kansas Avenue between Taylor Avenue/U.S. 83B and Jennie Barker Road in Garden City. Within the corridor, there are 12 signalized and 25 non-signalized intersections. The RSA addresses eleven of the twelve signalized intersections: Taylor Ave/U.S. 83B, 8th St, Main St, 3rd St, Center St, Fleming St, Campus Dr, Target Access, U.S. 83 Southbound Ramps, U.S. 83 Northbound Ramps, and Leslie Rd. The Kansas Ave/Jennie Barker Rd-Mary St intersection is covered within the Mary Street RSA.

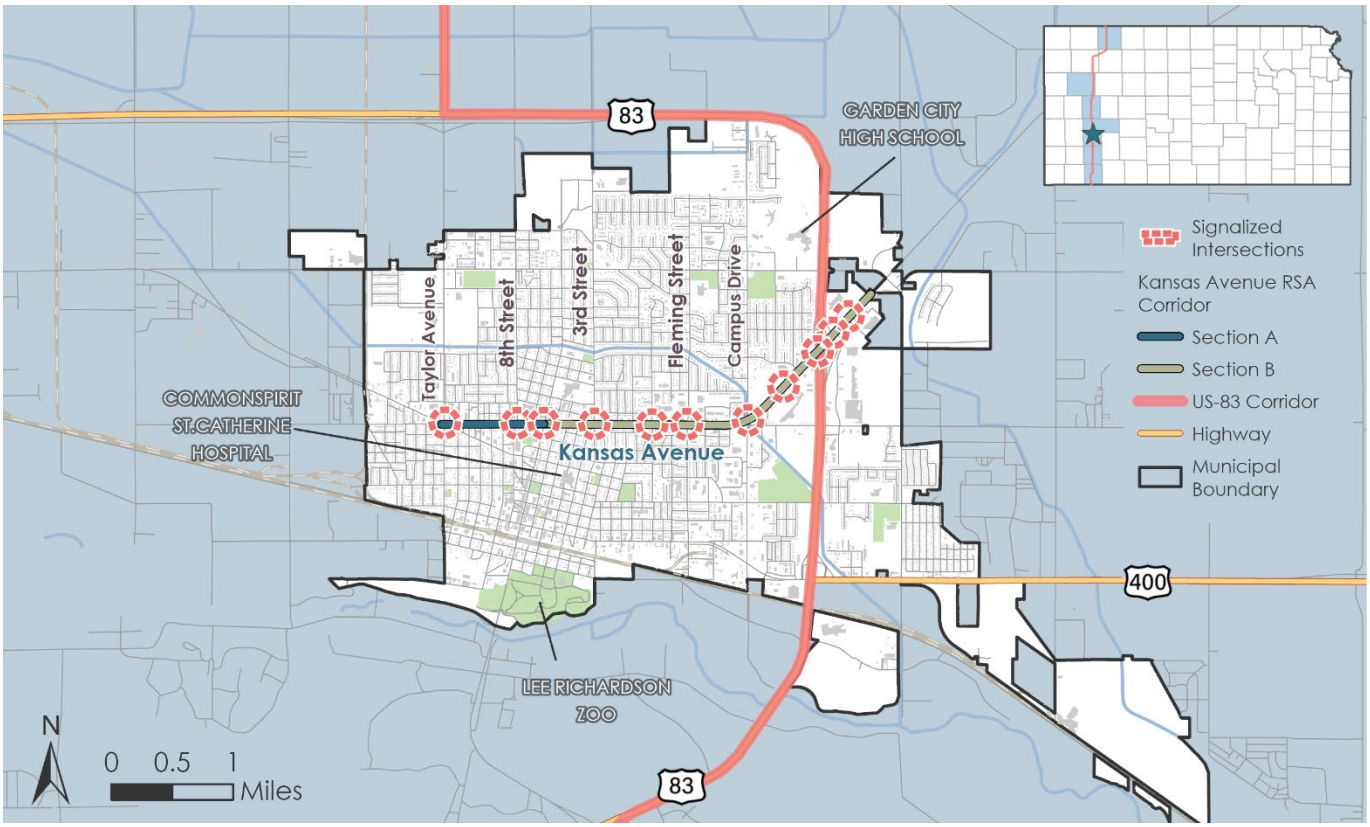


Figure 1 – Project Location Map

Report Overview

The following sections provide an overview, crash review, comments from the public, and observations from the field review.

Observation Process

To gain a better understanding of the corridor's patterns, challenges, and needs, the team performed extended observations on three different occasions. Each time, different elements were analyzed and documented by members of the project team. Some of these trips involved walking reviews, others included driving the coridor, and others included a combination of walking and driving. Prior to performing the field review, team members met virtually in March 2024 to discuss the overview, RSA schedule, and plan for the field review. In Table 1 are summaries of each trip and the variables that were observed.

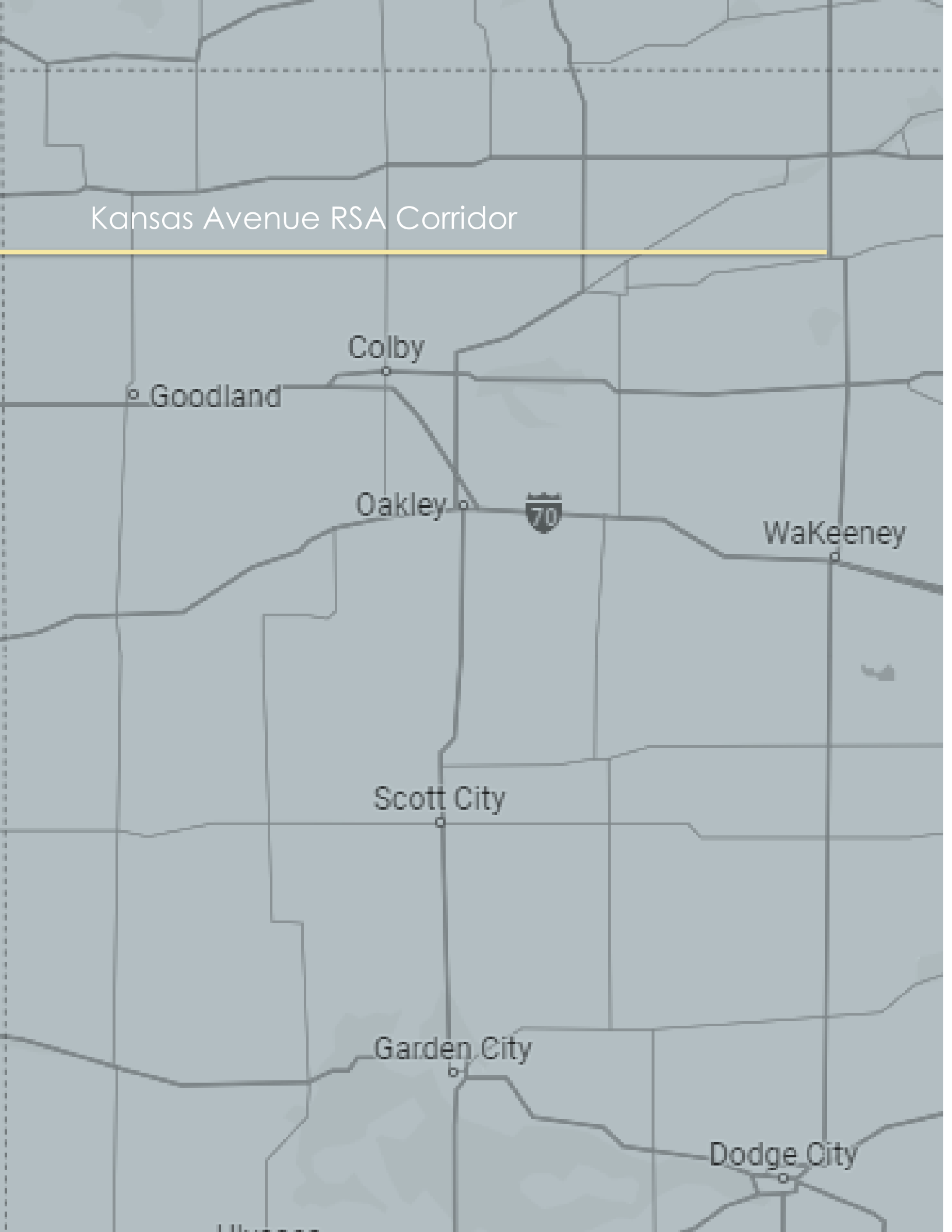
In the end, corridor-wide notes were created based on general observations made by the team during the visits. Observations included road user behavior, traffic signal operations, Americans with Disabilities Act (ADA) facility conditions, including ramps and sidewalks, sign visibility, obstruction, design deficiencies, bicycle infrastructure, and spot speed measurements.

Table 1 - Observation Process Overview

Date and Time	Observation Action
April 2, 2024 **1:00 PM to 6:00 PM**	Driving the Kansas Avenue corridor
April 3, 2024 **7:00 AM to Noon**	Evaluation of every signalized intersection in the corridor and observation of the general conditions of each roadway connection along the corridor.
April 4, 2024	Team members traveled the Kansas Avenue corridor in both directions in its entirety.

Recommendation Process

The recommendations in this plan are the result of extensive data analysis, field work and observations, community input, and reflects the education, training, and experience of our team members. Improving the safety and mobility of all road users was the team's primary objective and guided the process from the beginning. The recommendations have been organized by their projected timeframes, ranging from tasks to accomplish quickly, to others that will require additional planning or analysis.


Kansas Avenue RSA Corridor
Colby
Goodland
Oakley
70
WaKeeney
Scott City
Garden City
Dodge City

Kansas Avenue Corridor

The following section provides an overview, observations, and recommendations for the Kansas Avenue corridor, including intersection geometry, user behavior, signal control, and multi-modal infrastructure.

Kansas Avenue, highlighted in Figure 2, is an urban arterial street that runs east-west through Garden City. Kansas Avenue is also designated as Kansas Highway 156 (K-156) east of Taylor Avenue, and U.S. Route 83 Business (US-83B) between Taylor Avenue and Main Street. Figure 3 and Figure 4 show a typical roadway section of the two different roadway layouts along Kansas Avenue in between intersections. Section A runs from Taylor Avenue/U.S. 83B to Main Street/US-83B. It is a four-lane road with two travel lanes in each direction. Section B runs from Main Street to Jennie Barker Road. It is a four-lane road with a center two way left turning lane and two travel lanes in each direction. There are generally attached sidewalks throughout most of the corridor and no bike lanes.

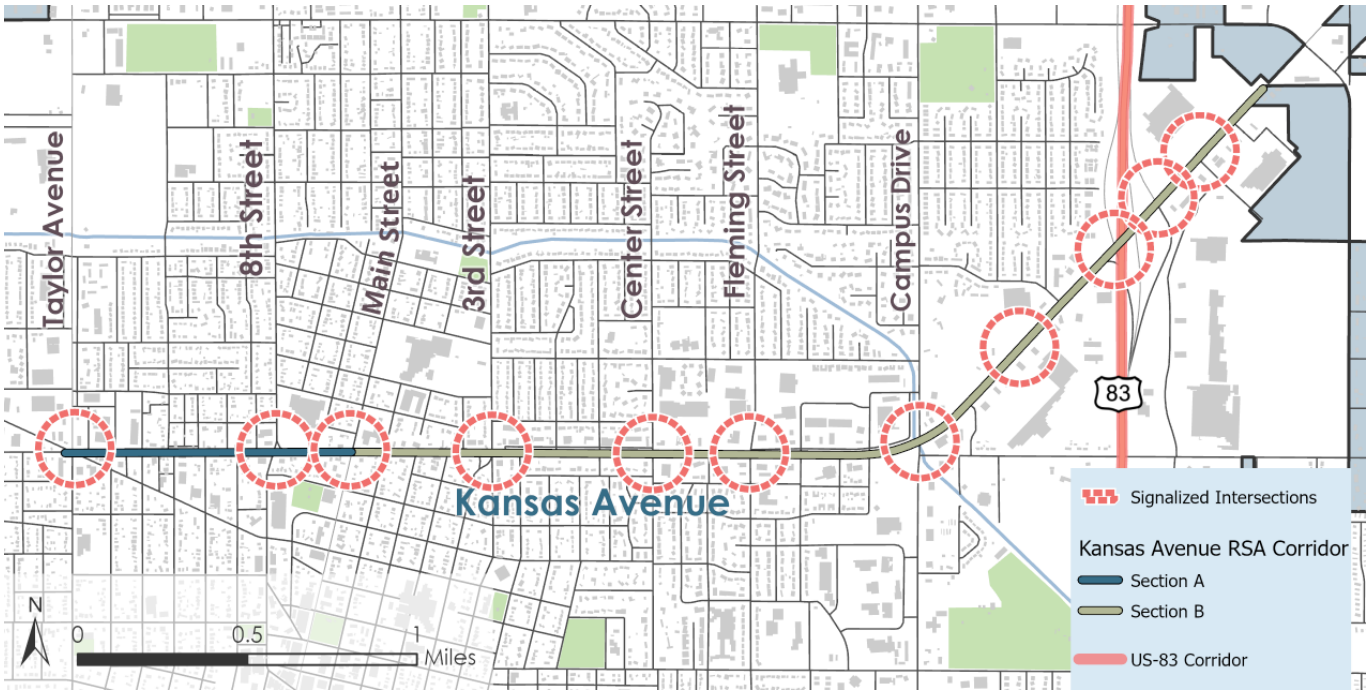


Figure 2 - Project Area

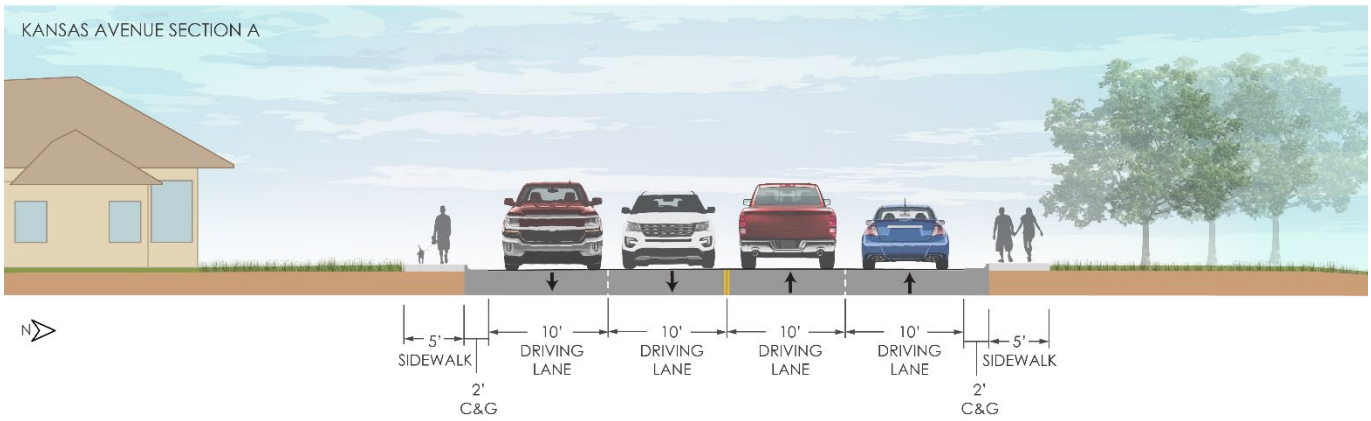


Figure 3 - Kansas Avenue Section A - Typical Roadway Section

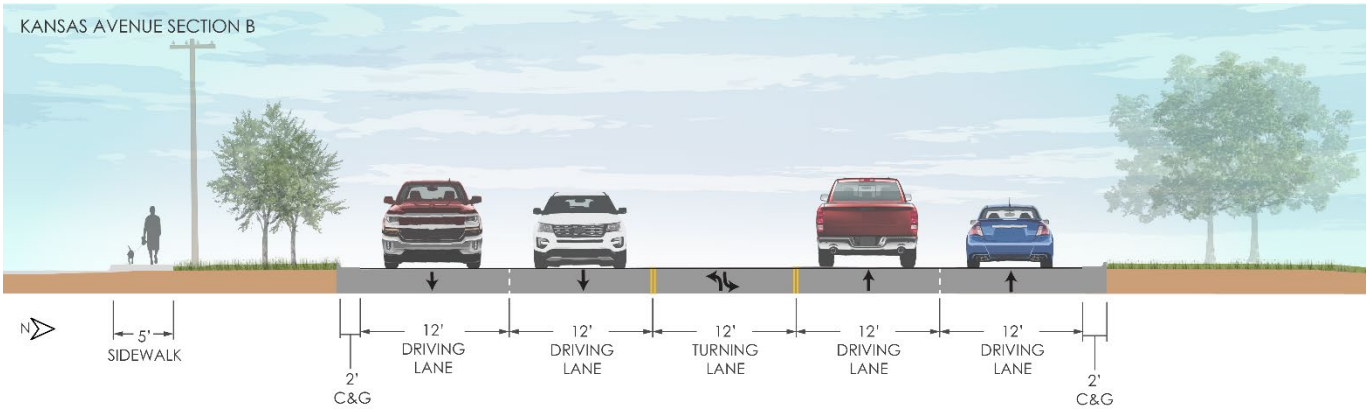
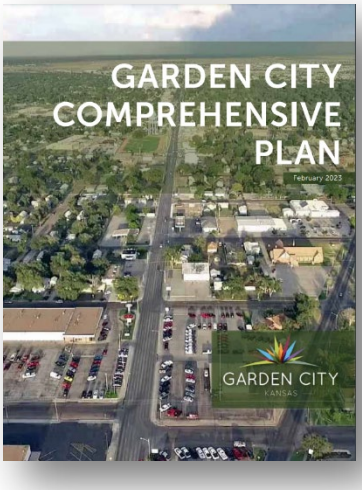


Figure 4 - Kansas Avenue Corridor Section B - Typical Roadway Section

Plan Review

In the most recent Garden City Comprehensive Plan, Kansas Avenue is identified as being a candidate for a variety of improvements that would transform the corridor into more of a complete street. Garden City envisions a reimagined and revitalized Kansas Avenue where a variety of trips can be accomplished by walking, biking, or public transportation in a more attractive environment that better contributes to the economic strength of surrounding neighborhoods and businesses.



Notable improvements include, but are not limited to:

- Completion of facilities, including bike lanes, sharrows, bike storage, bike signage, and bike stations, along or crossing Complete Streets corridors.
- Construction of sidewalks, promenades, plazas, crosswalks and other facilities to encourage walking and make the experience of walking enjoyable.
- Construction of transit stops and facilities as needed along corridors.
- Installation of crosswalks, pedestrian signals, bulbouts or other streetscape and traffic calming methods to slow traffic and increase safety for people walking and biking.
- Improved landscaping and street trees.
- Improved street lighting (for vehicular traffic) and lighting along sidewalks and walking areas (for people walking).
- Public art installations.
- Signage, monumentation and improved gateways.
- Installation of public seating areas and related street furnishings.
- Redevelopment along corridors geared to create walkable, bikeable, and more active corridors that promote community interaction and vitality similar to traditional Main Streets and related types of districts.

Other notable recommendations from the Comprehensive Plan include:

- Filling gaps in the sidewalk network
- Complete corridor plans, detailing improvements for all modes of traffic, for the Complete Streets corridors of **Kansas**, Taylor, Fulton, Main, Campus and Mary.
- Update the city's roadway and construction standards in keeping with Complete Streets policies and principles.
- Draft and adopt a Complete Streets policy, guiding the design of local and collector streets in the city, going forward.
- The city will encourage integration and connections between different neighborhoods and between different shopping or civic spaces around Garden City.

Adjacent Land Use

The Kansas Avenue corridor serves as a major commercial thoroughfare for Garden City. The area is predominantly commercial, with several pockets of mixed-density housing, ranging from single-family homes to small apartment buildings. At the western end of the corridor, car-oriented businesses dominate, including auto parts stores, gas stations, and auto dealerships. Moving east, the area features a mix of locally owned businesses and residential pockets of single-family homes bewteen 12th Street and 3rd Street. Abe Hubert Elementary School is located just north of Kansas Avenue at the intersection of Kansas Avenue and 8th Street. Single-family housing directly backs up to the south side of Kansas Avenue between 3rd Street and Center Street. Commerical activity picks back up between Center Street and U.S. 83, with larger retail establishments such as Dillon's, Target, and the Garden City Plaza shopping mall. East of U.S. 83 is a commercial power center with retail, hotel, and drive-thru restaurants. Horace J. Good Middle School, Trinity Luthern Pre-school, and Garden City Community College are all located within a few blocks of Kansas Avenue. Small office uses are sporadically located throughout the corridor along with a few places of worship.

The Garden City Comprehensive Plan outlines the preferred future land uses along the Kansas Avenue corridor but does not represent a major departure from the current pattern. Currently the majority of the corridor is zoned for commercial use surrounded by a variety of housing types. The preferred future land use shows upgrading the entire corridor between Taylor Avenue and U.S. 83 to mixed use, combing commercial and residential uses. The recommended future land use classifications are shown in Figure 5. In addition to land use recommendations, the Comprehensive Plan provides guidance and goals for neighborhood development and community design that would complement the safety improvements recommended for the Kansas Avenue corridor.

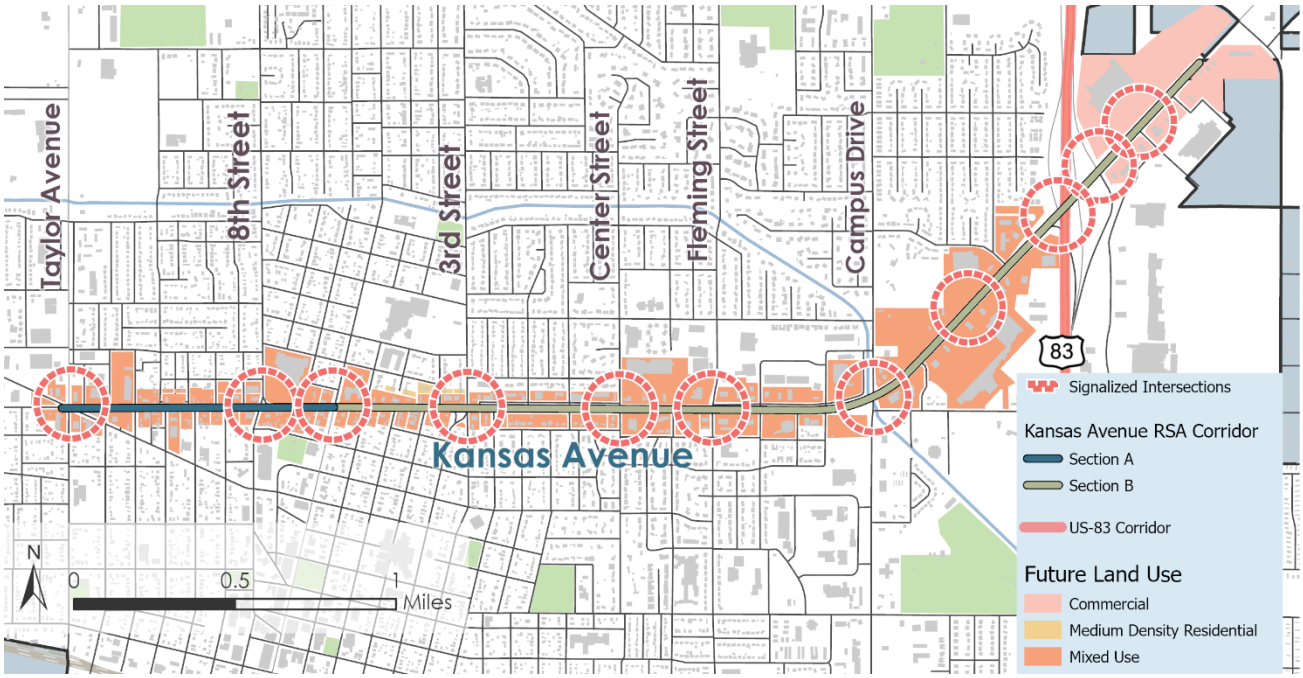


Figure 5 – Future Land Use along Kansas Avenue. Source: City of Garden City, Kansas

Traffic Volumes

Traffic volumes were collected along the corridor on Wednesday, April 24 and Thursday, April 25, 2024, which consisted of turning-movement counts at all eleven signalized intersections for 13 hours (6:00 a.m. – 7:00 p.m) and full-day counts at four roadway segments. The AM and PM peak hour traffic volumes are shown in Figure 6, as well as the 24-hour traffic counts. The segment of Kansas Avenue between Main Street and 3rd Street saw the highest 24-hour traffic volume with 19,078 vehicles. The segment between Leslie Road and Jennie Barker Road had the lowest volume compared to the rest of the corridor but is also in one of the fastest developing areas of Garden City.

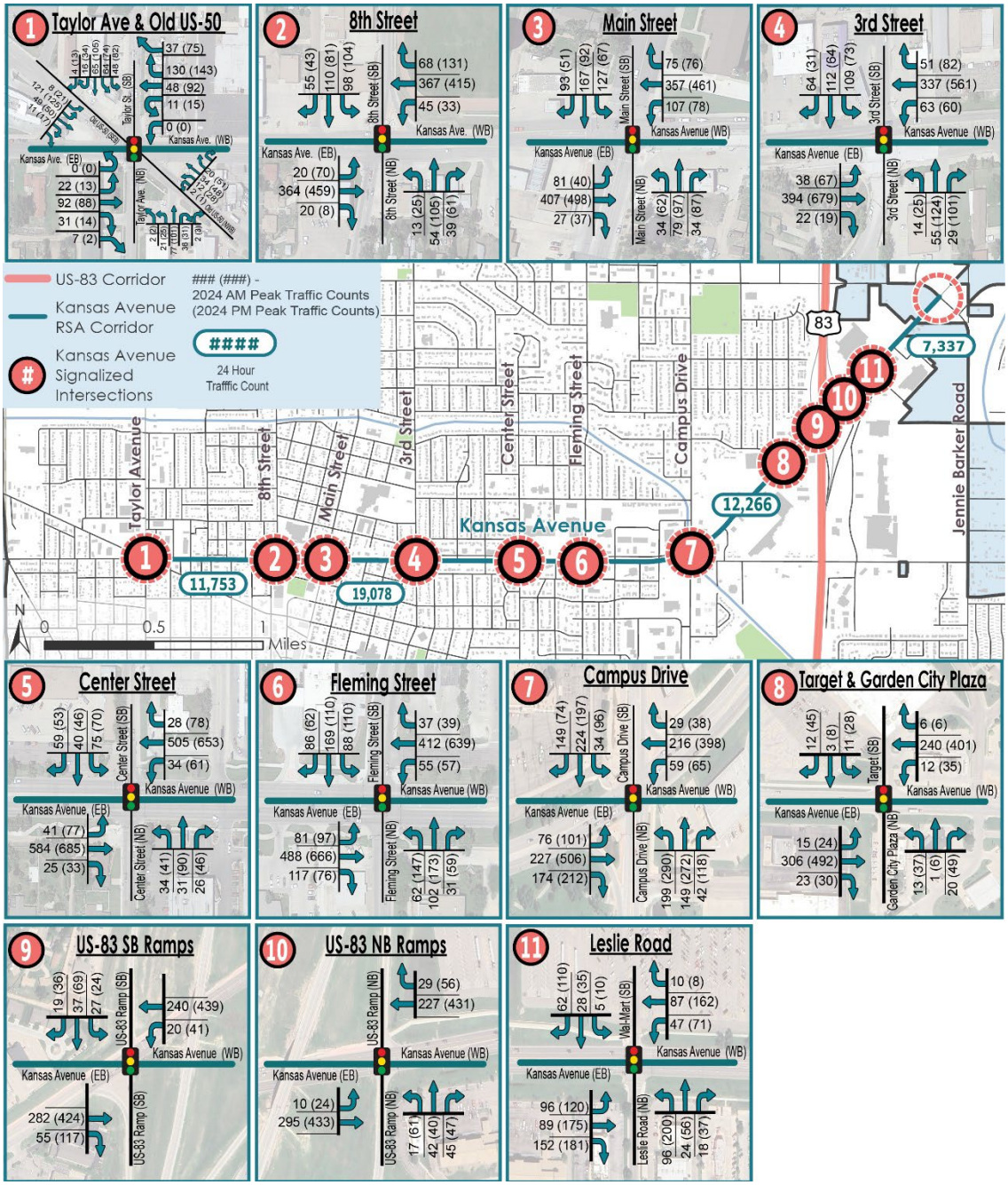


Figure 6 - Project Area Turning Movement Counts

Traffic Operations Analysis

Intersection operations for Kansas Avenue were analyzed in Synchro software to provide an overview of current intersection level traffic operations. Operational conditions were graded in accordance with the criteria established in the Highway Capacity Manual (HCM) published by the Transportation Research Board. The HCM measures the operations of an intersection or movement based on the average delay experienced by drivers and assigns a level of service (LOS) using a letter grade scale. LOS A represents very little delay for drivers while LOS F represents significant congestion and delays. LOS D typically represents the operational capacity of an intersection or movement and was used as the lowest acceptable operations level for this analysis. Table 2 summarizes the LOS thresholds for signalized intersections.

Table 2 - HCM Delay LOS Criteria for Signalized Intersections

Level of Service (LOS)	Average Control Delay (sec)
LOS A	≤10
LOS B	>10-20
LOS C	>20-35
LOS D	>35-55
LOS E	>55-80
LOS F	>80

Signal timings were received from Garden City for each of the project corridor's signalized intersections. These signal timings are key in understanding the green time allocated to each signal phase, which affects the calculation of vehicle delay. The signal cycle makes up the total green, yellow, and red phases for all vehicle movements, as well as the pedestrian phases. All of the signalized intersections are actuated or semi-actuated, meaning that Kansas Avenue is prioritized over the cross streets using vehicle detectors. The signals along Kansas Avenue are not coordinated with each other.

The results of the traffic operations analysis on Kansas Avenue during the AM and PM peak hours are displayed in Figure 7. All of the intersection movements on Kansas Avenue are operating at, or better than, LOS D. The only signalized intersection that experiences LOS D level delay is the intersection of Taylor Avenue and Kansas Avenue, which experiences higher vehicle delay due to it having six approach legs.

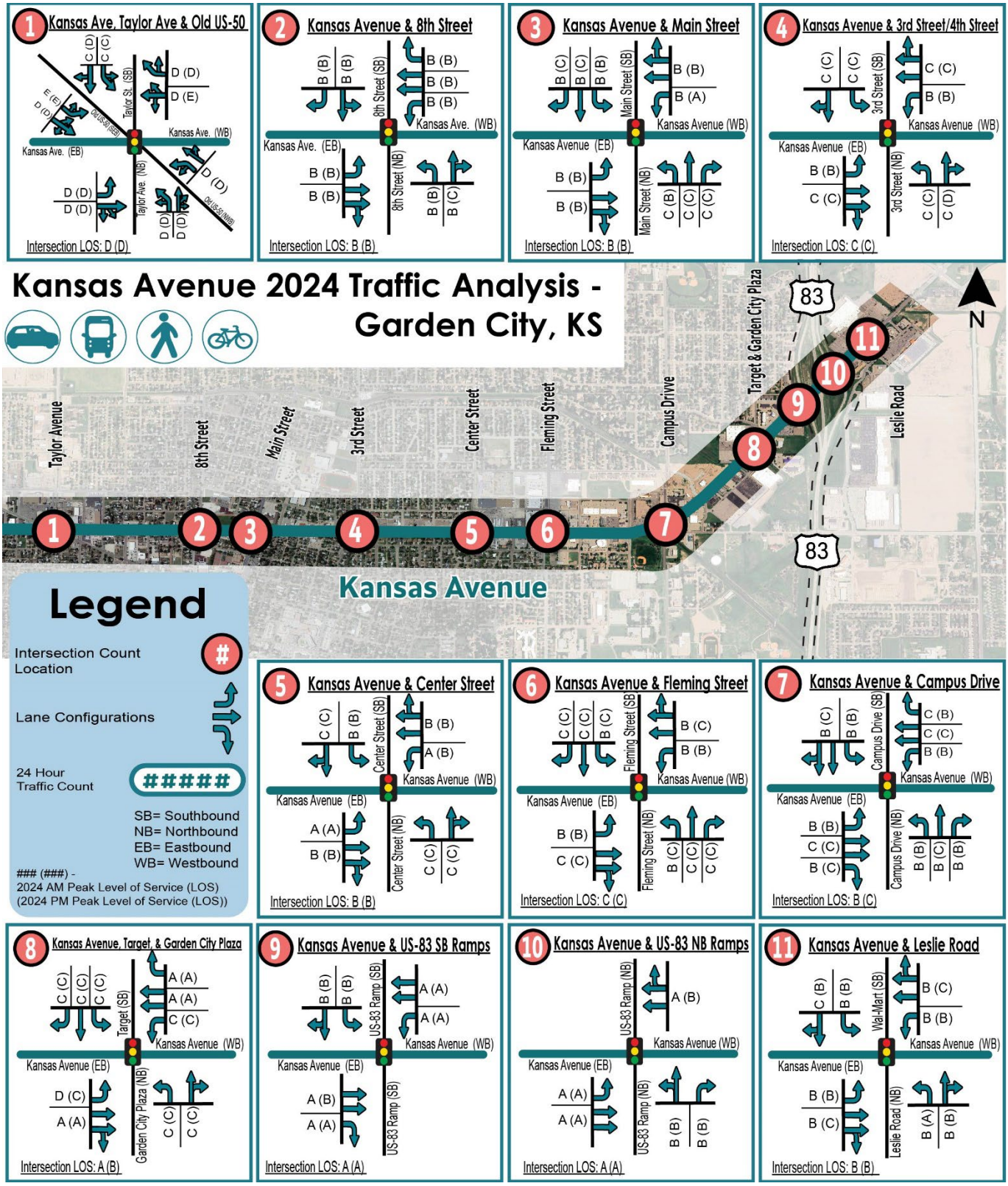


Figure 7 - Existing Peak Hour Traffic Operations on Kansas Ave

StreetLight data was also used to develop a picture of the delay and congestion experienced by drivers traveling along Kansas Avenue.

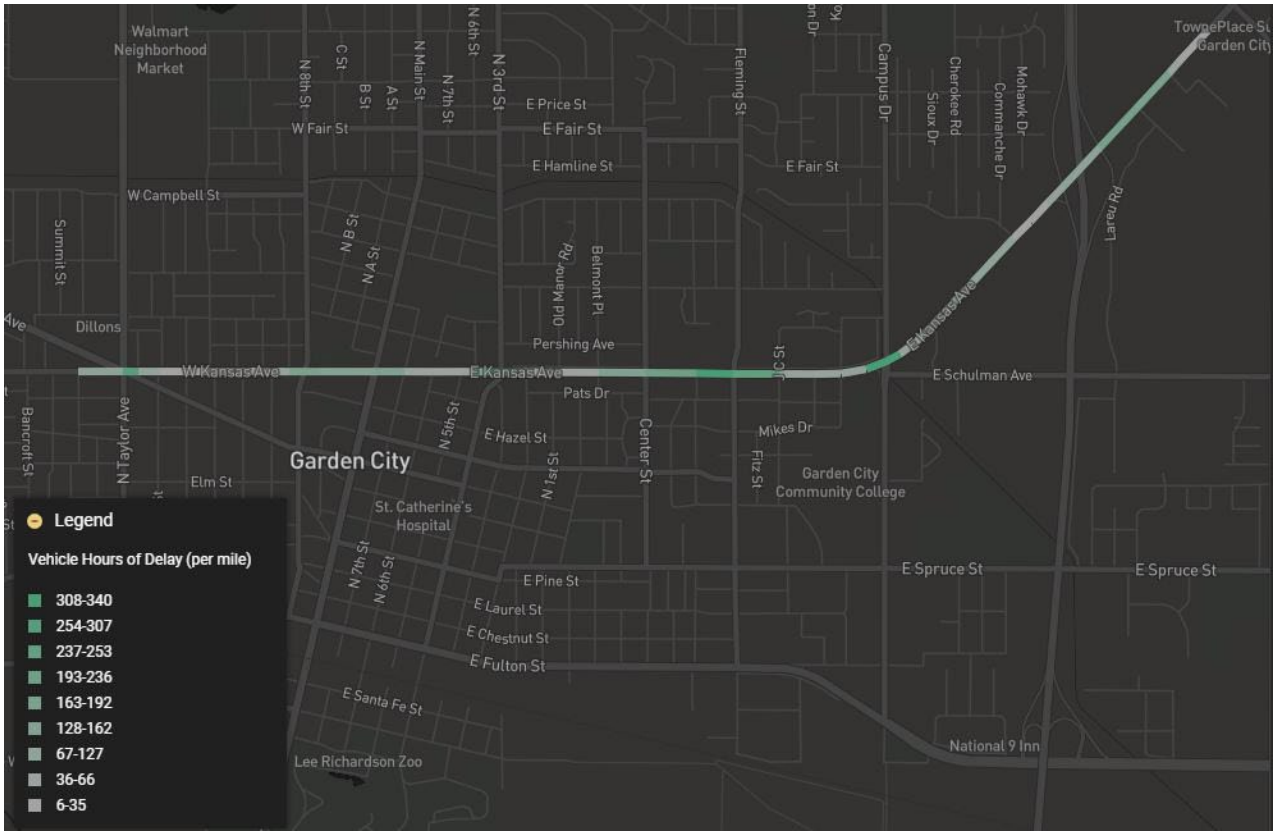


Figure 8 illustrates vehicle delay along the corridor, which indicates delay is greatest around the Fleming Street and Campus Drive intersections.

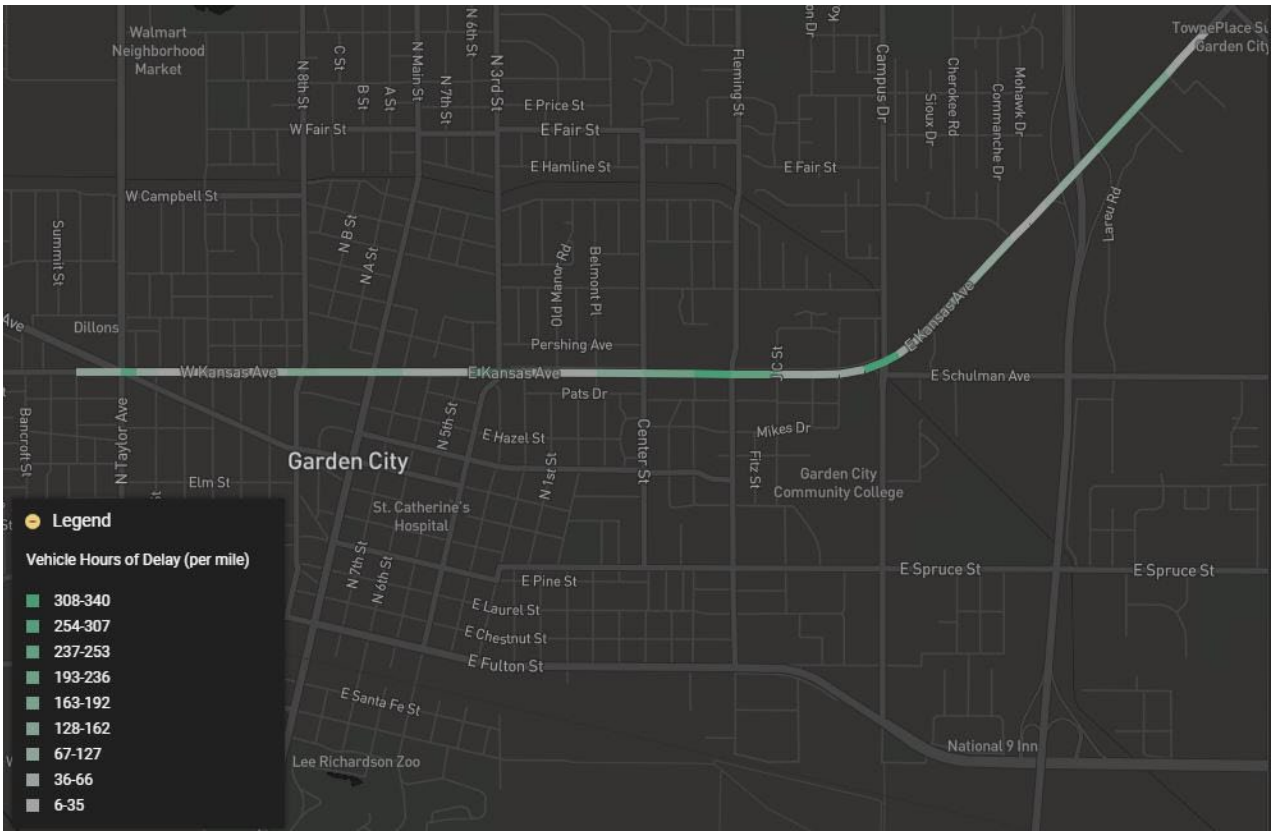


Figure 8 - Vehicle Delay along Kansas Avenue (StreetLight)

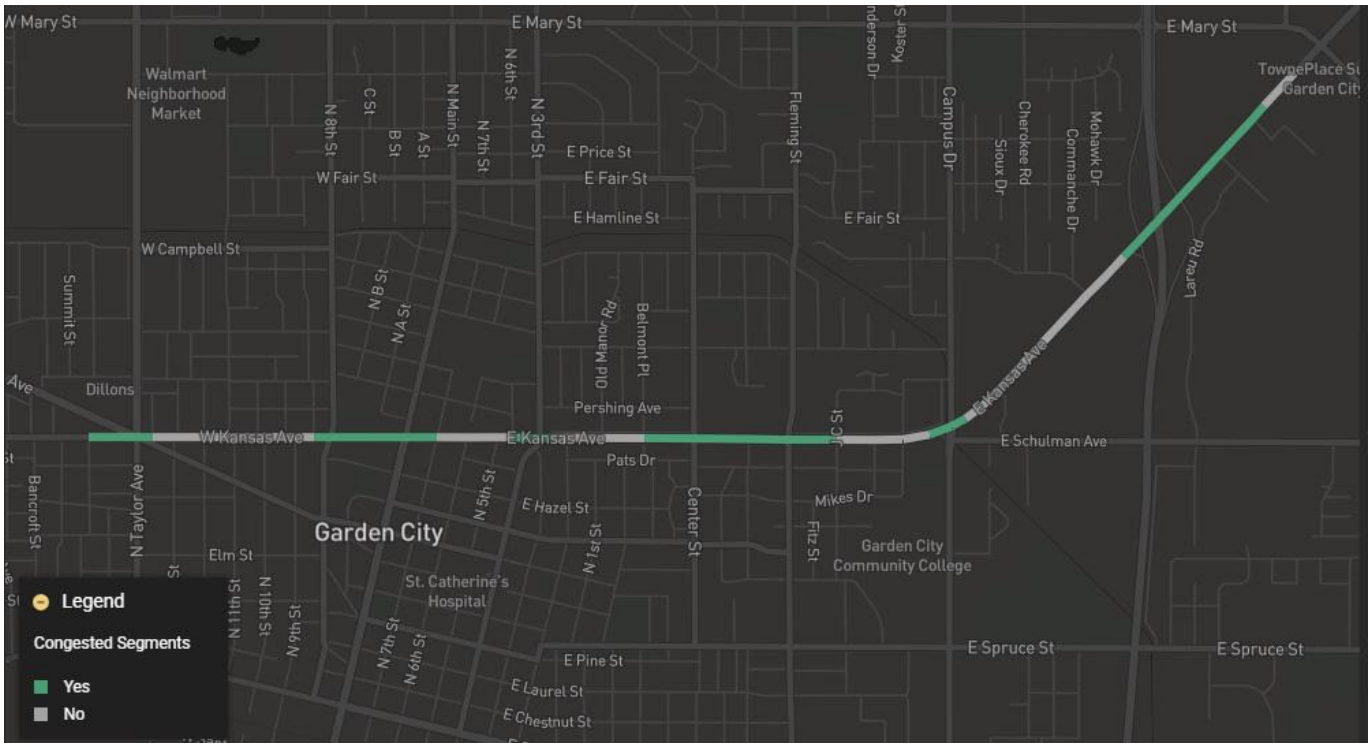


Figure 9 illustrates the segments of Kansas Avenue that are considered congested during the PM peak hour based on StreetLight analytics. As shown in the figure, nearly all segments approaching a traffic signal are considered congested. During the weekday PM peak, the StreetLight Congestion Factor for Kansas Avenue is 41%, which is the percentage of vehicle miles traveled on the corridor that are in heavy congestion, where vehicles are traveling at or below 80% of the free-flow speed.

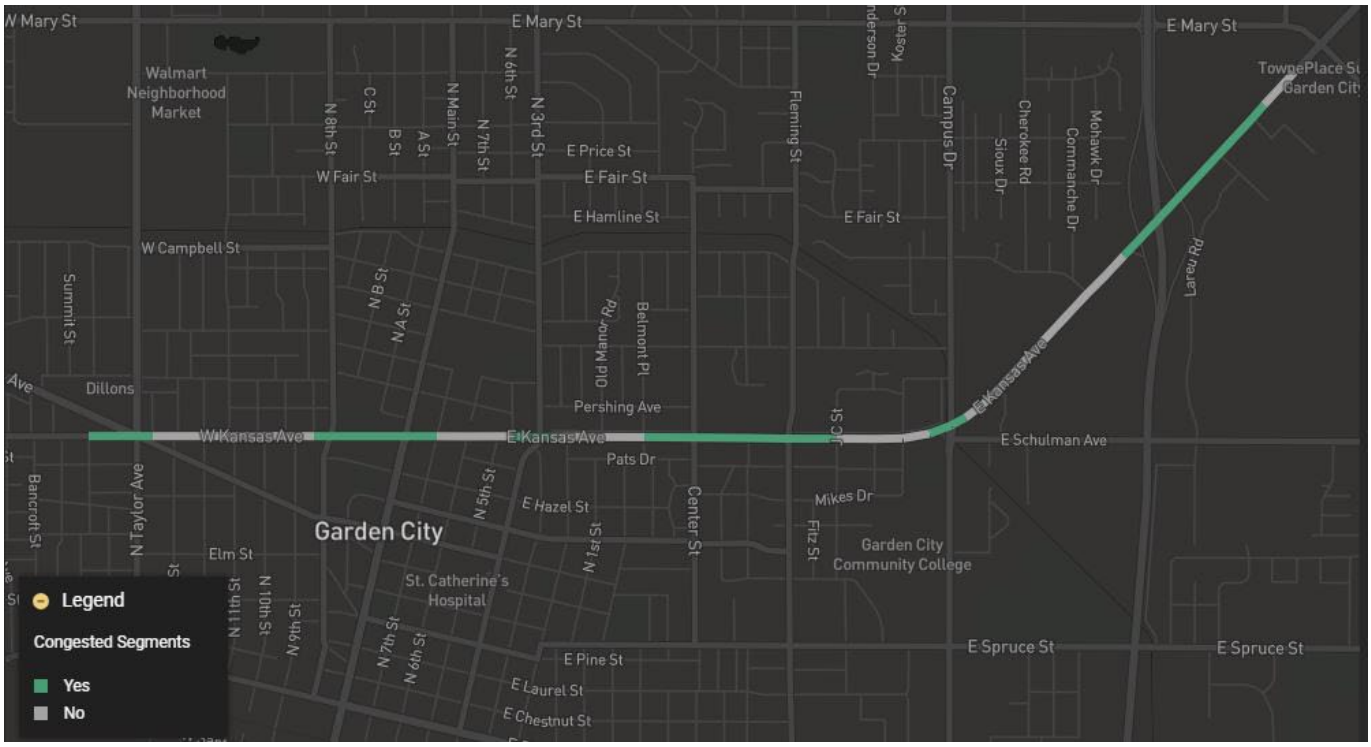


Figure 9 - Congested Segments of Kansas Avenue – PM peak (StreetLight)

Speed Limits and Analysis

The posted speed limit along Kansas Avenue varies from 30 to 45 mph across the study corridor. Vehicle speed data was collected at four locations, summarized in Figure 10 using the 85th percentile speed in both the westbound and eastbound directions on Kansas Avenue. The 85th percentile vehicle speeds exceeded 7+ mph over the posted speed limits at four of the eight collection locations. The 85th percentile vehicle speeds were lower at the remaining four collection locations, but still exceeded the posted speed limits by 1 to 5 mph at every location. The average 85th percentile speed across the corridor is approximately 43 mph.

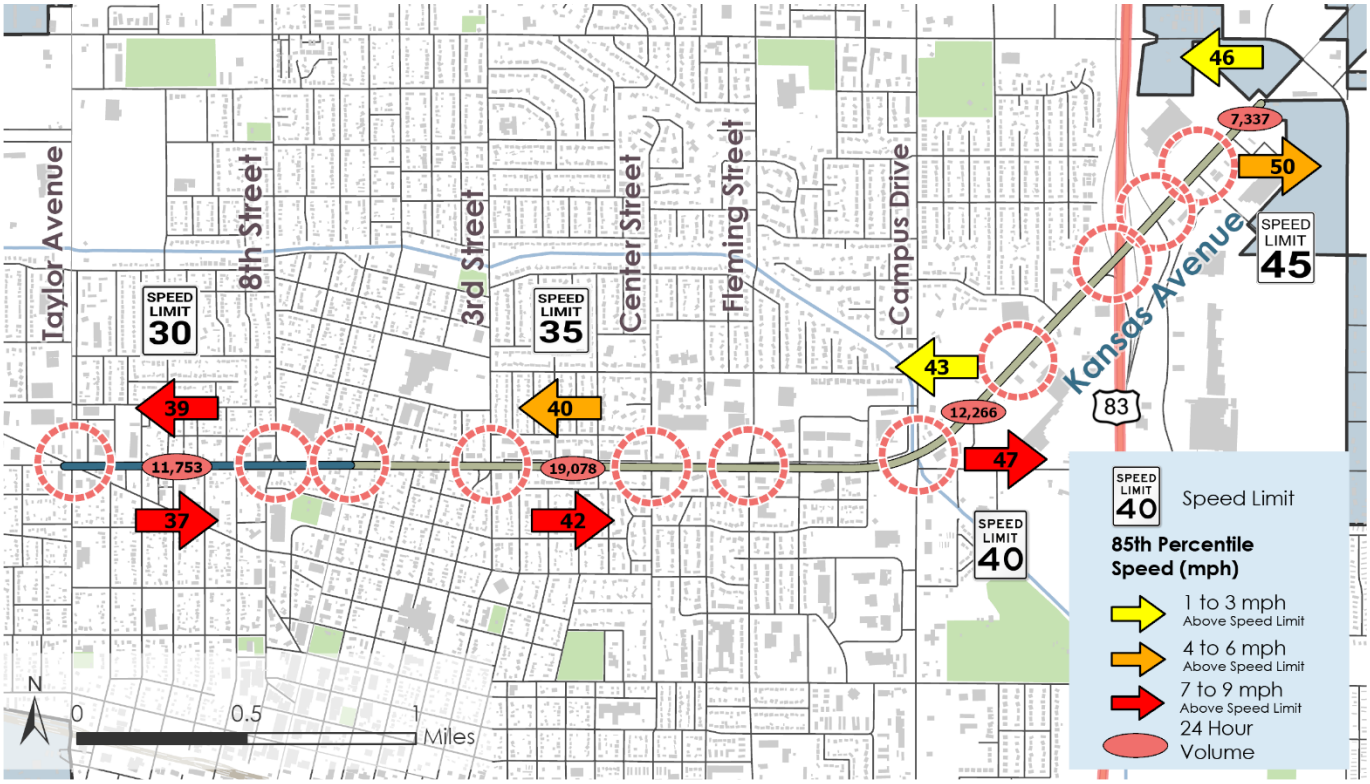


Figure 10 – Kansas Avenue Speed Limits and Vehicle Speeds Summary

Bicycle and Pedestrian Connectivity

Data on existing and missing sidewalks, signalized and unsignalized crosswalks, and pedestrian signal phasing were conducted using both desktop review and field observations. Pedestrian infrastructure such as crosswalks and sidewalk gaps along Kansas Avenue are identified in Figure 11. Pedestrian signal phasing exists at all of the signalized intersections along Kansas Avenue. Despite all signalized intersections having pedestrian phasing, there are no countdown timers for pedestrians at Taylor Avenue, 8th Street, 3rd Street, Fleming Street, and Campus Drive.

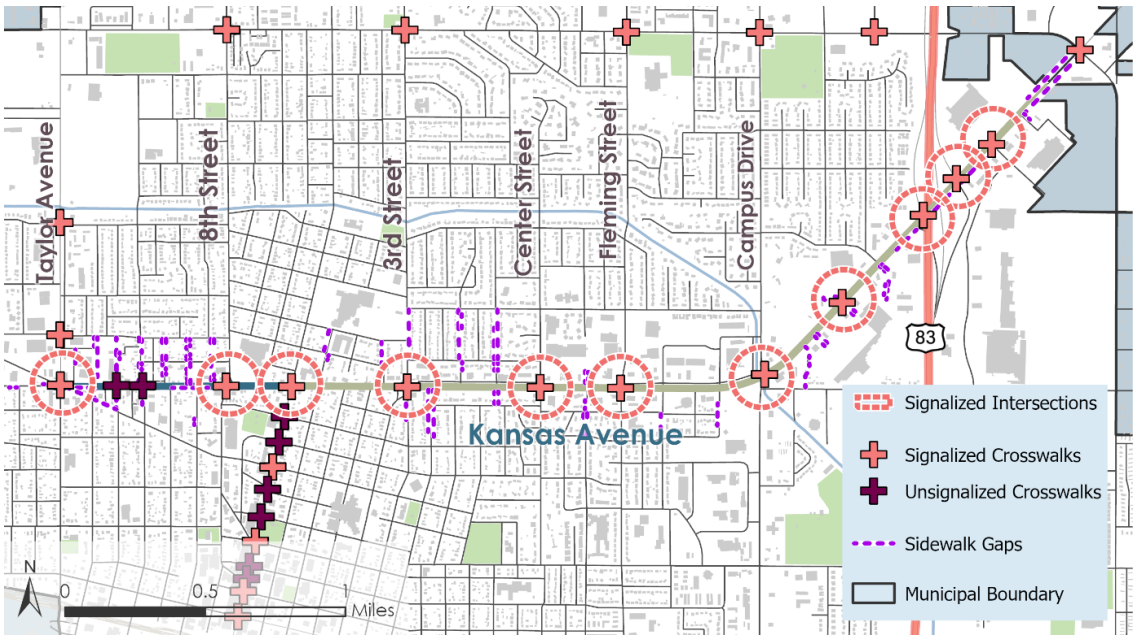


Figure 11 – Pedestrian Infrastructure along Kansas Avenue

The existing sidewalks along Kansas Avenue are a mix of attached and detached, with widths ranging from approximately 3 to 5 feet, similar to the appearance shown in Figure 12. The sidewalk along the north side of Kansas Avenue between 3rd Street and Center Street, and between Fleming Street and Campus Drive is located along the north edge of the frontage road (Kansas Plaza), which is separated from the main roadway by a median (Figure 13).

Figure 12 - Photos showing examples of attached (left) and detached (right) sidewalks along Kansas Avenue

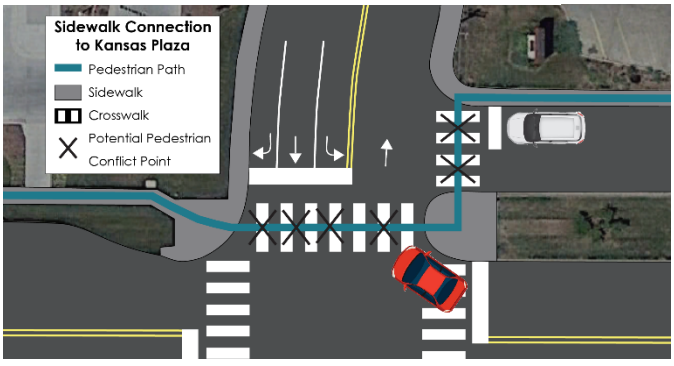


Figure 13 - Sidewalk Connection to Kansas Plaza along the north side of Kansas Avenue

There are several sidewalk gaps along Kansas Avenue, including by Taylor Avenue, 8th Street, the U.S. 83 ramps, and approaching Jennie Barker Road. Each signalized intersection, except for U.S. 83 Northbound has marked crosswalks that include standard,

continental, or brick markings. Additional crosswalks across Kansas Avenue exist at 11th and 12th Streets (brick style) but are unsignalized.

Figure 14 shows trail and bicycle infrastructure that was sourced from the Garden City Comprehensive Plan (2021). Currently, there is one marked bike lane touching Kansas Ave – on 2nd Street south of Kansas Avenue, shown in Figure 15. The comprehensive plan calls for the installation of a similar bike lane on Main Street heading north of Kansas Avenue.

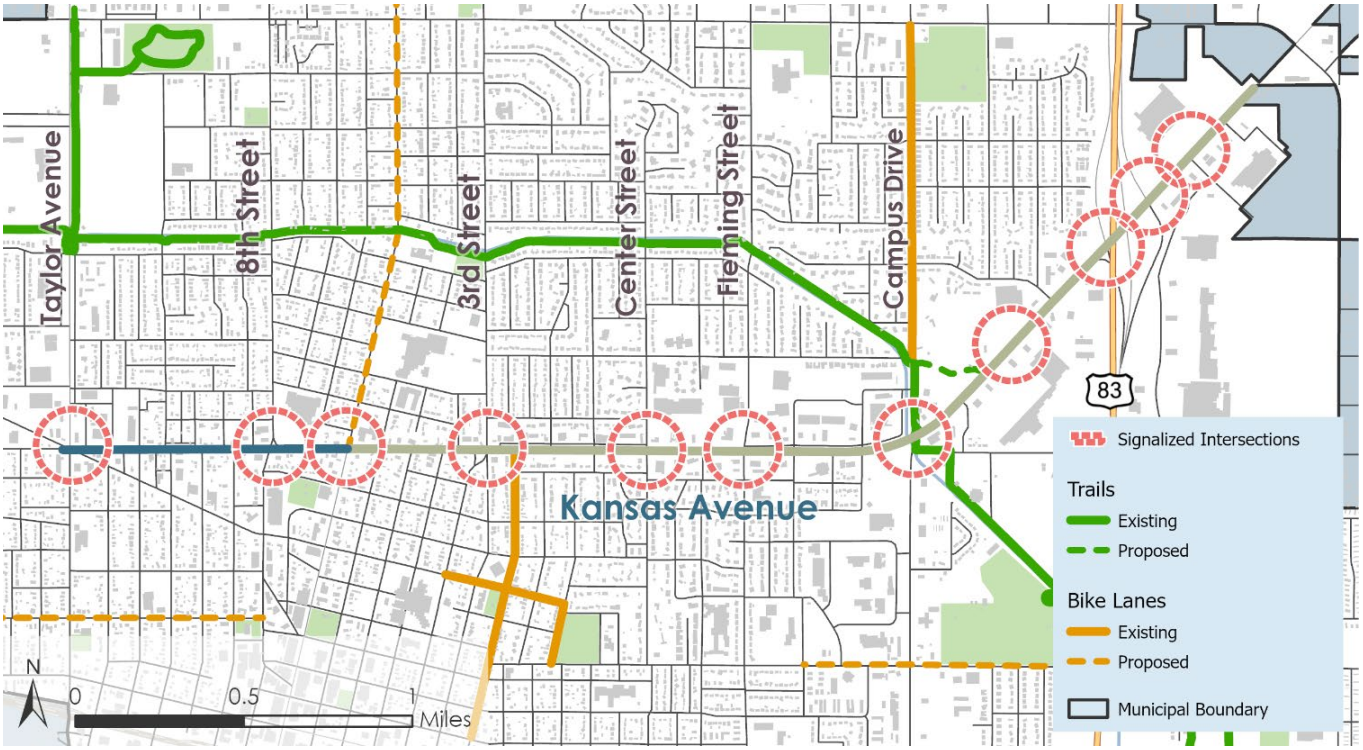


Figure 14 - Trail and Bike Lane Infrastructure near Kansas Avenue

The Talley Trail connects to Kansas Avenue at Campus Drive and a future extension of the trail is proposed along Harding Avenue to connect at the intersection of Harding Avenue/McCoy Drive and Kansas Avenue.

Figure 15 - Photo of bike lane on 2nd Street

Pedestrian and cyclist count data were collected at the eleven signalized intersections over a 13-hour period (6:00am to 7:00pm) during the same time the turning movement counts were captured, shown in Figure 16. The Kansas Avenue and Fleming Street intersection saw the most pedestrian activity with 48 pedestrian crossings over the 13-hour period. There were few observed cyclist movements at any of the intersections, Center Street saw the most with 12. Cyclists may be using alternative paths to get east-west across Garden City, or the study period may not have captured their movements

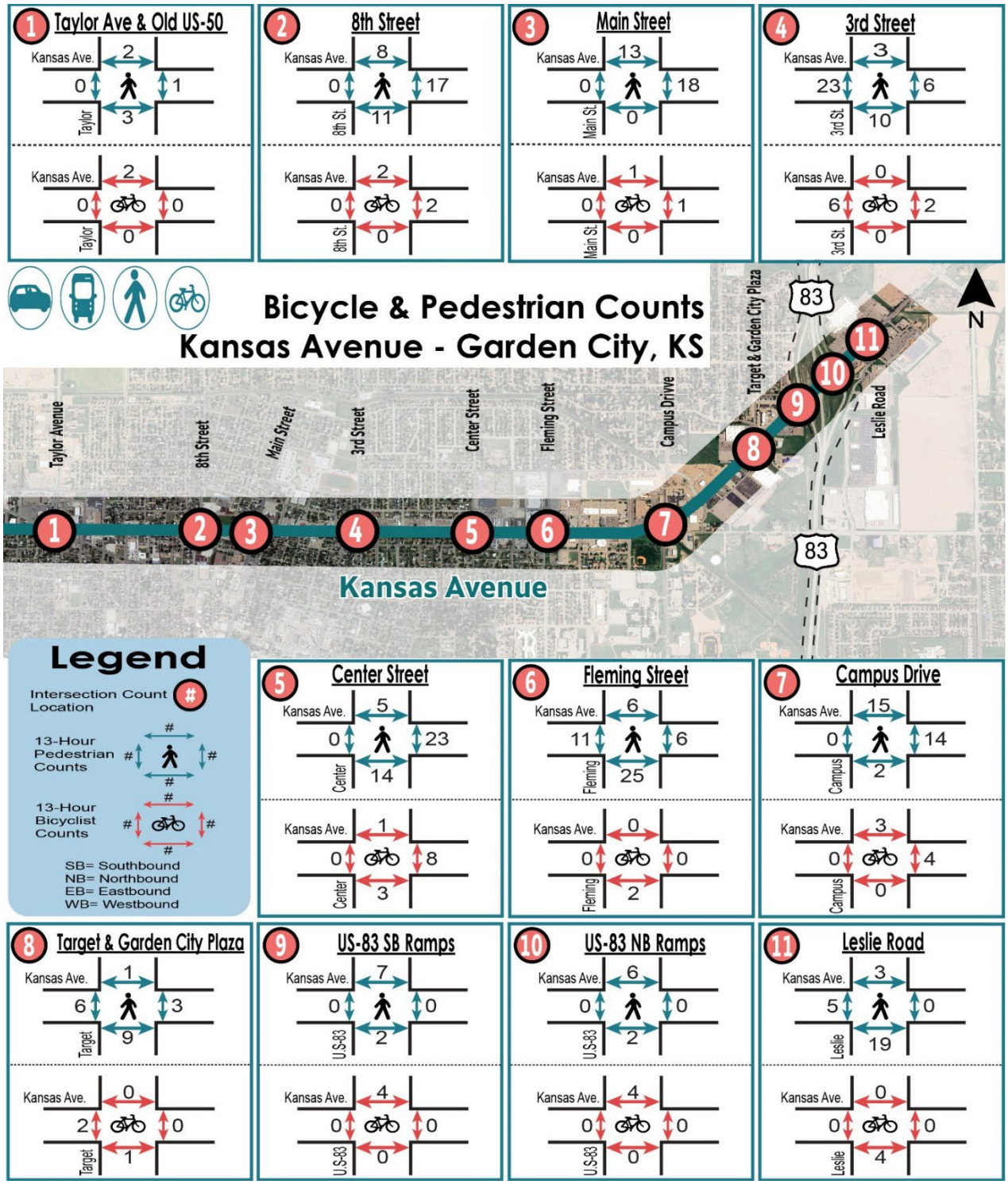


Figure 16 - 13-hour Bicycle and Pedestrian Counts on Kansas Avenue Corridor

Transit Connections

Garden City provides public transportation services, Finney County – City Link, to over 35,000+ people. Their services include four fixed route bus service with 65 stops throughout the city, as well as paratransit services via their mini-bus program. Figure 17 displays the bus routes and stops nearest to the Kansas Avenue corridor. There are about 10 stops within a block of Kansas Avenue. All four of the fixed route loops that serve Garden City touch Kansas Avenue. These fixed routes make connections to important points of interest in the area like the Walmart Supercenter, Dillons West, Dillons East, and Garden City Plaza.

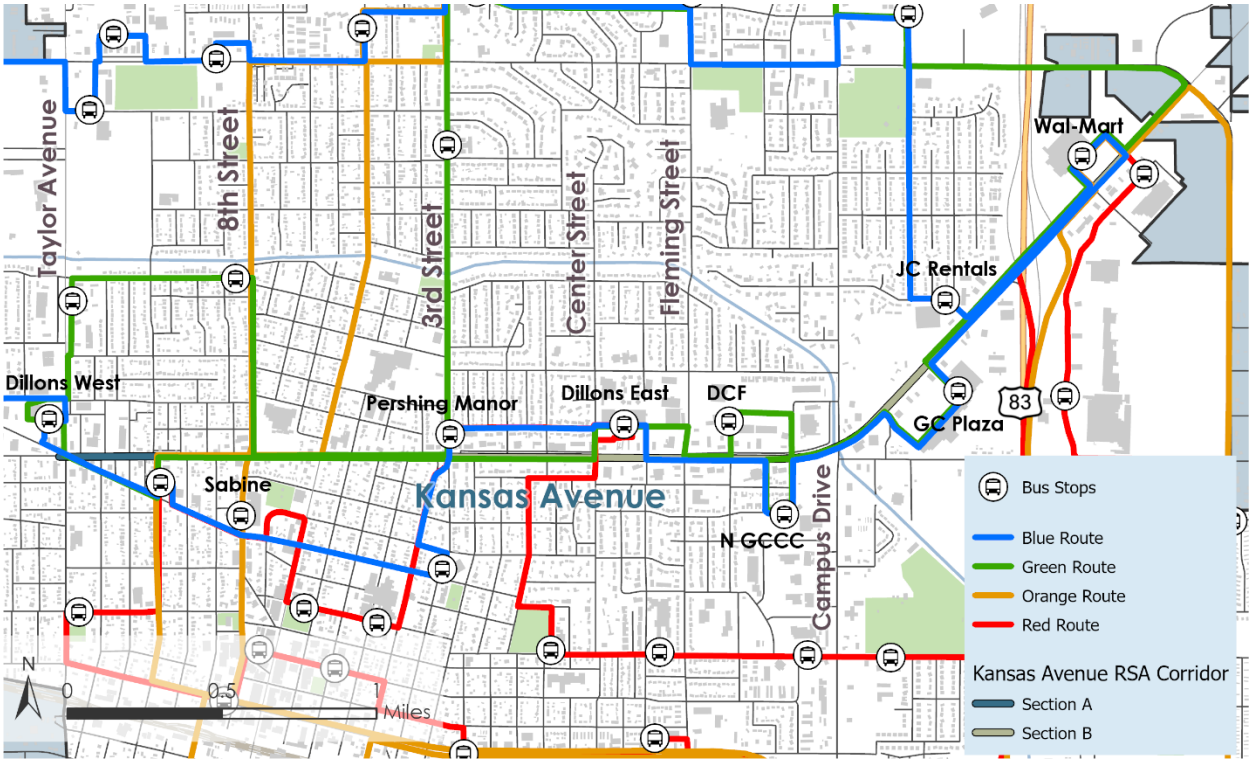


Figure 17 - Finney County City Link - transit stops and fixed routes around the Kansas Avenue corridor area

Figure 18 - Image of City Link bus stop at DCF off Kansas Avenue

Crash Analysis

Between 2018 and 2022, 383 crashes occurred along Kansas Avenue within the RSA project limits. There were 7 Suspected Serious Injury (SSI), 68 Injury, and 308 Property Damage Only crashes. Figure 19 summarizes the crash density on the corridor by 500 feet and show that most of the crashes are clustering at signalized and unsignalized intersections.

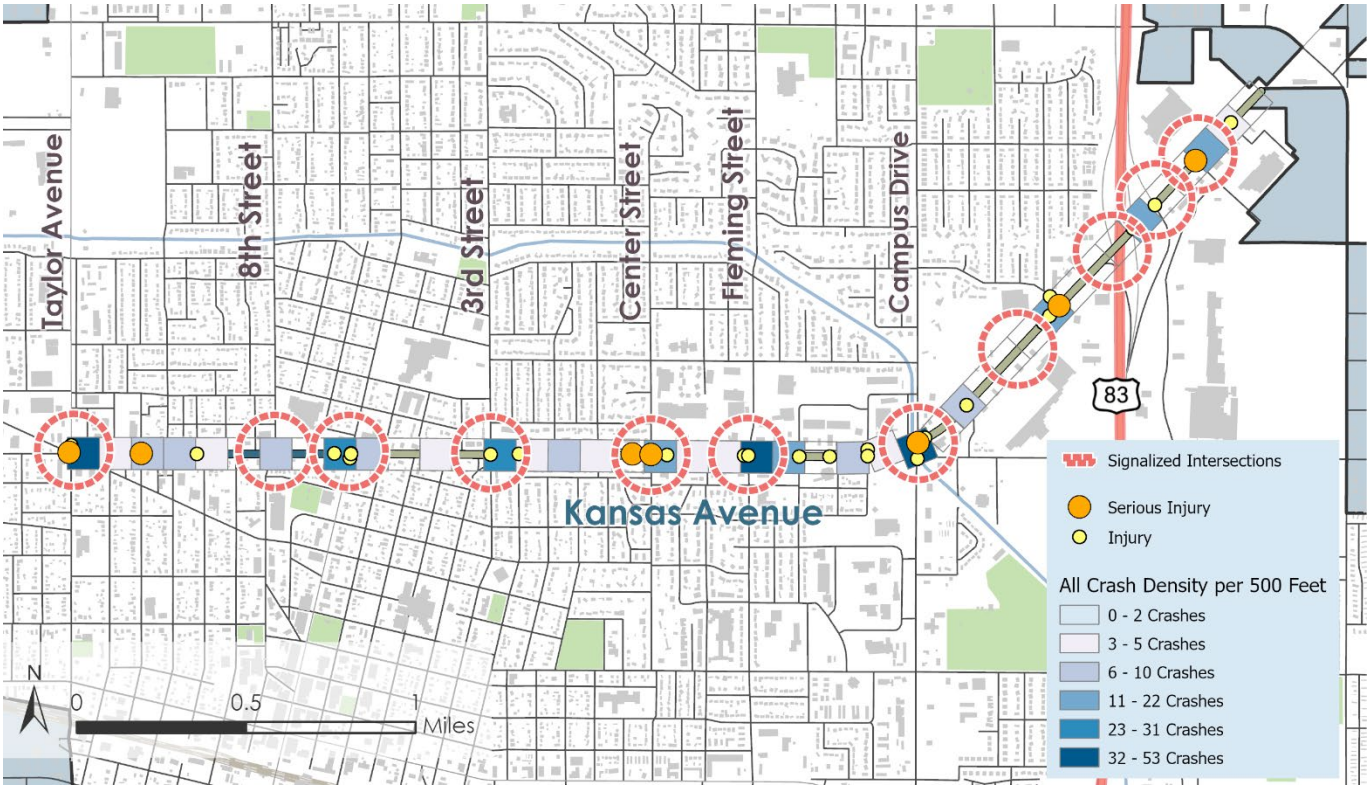


Figure 19 - Corridor crash map overview

Table 3 summarizes the crashes on Kansas Avenue by year and crash severity. Crashes resulting in serious and other injuries accounted for about 20 percent of all crashes on Kansas Avenue, this rate is just above the 19 percent for Garden City overall.

Table 3 – Kansas Avenue Corridor Wide Crash Summary

Corridor-wide Crash Summary				
Crash Year	**Serious Injury**	**Injury**	**PDO**	**Total**
2018	1	8	68	77
2019	1	23	97	121
2020	2	11	37	50
2021	2	15	51	68
2022	1	11	55	67
TOTAL	**7**	**68**	**308**	**383**
PERCENTAGE	**1.83%**	**17.8%**	**80.42%**	**100%**

Most of the crashes, as shown in Figure 20, were the result of angle or rear end crashes. The most common vehicle maneuvers leading up to an angle crash were straight/following road (68.2%) and a left turn (15.6%). Half of all serious injury and injury crashes were angle crashes (50.6%) – most of which were straight/following road maneuvers.

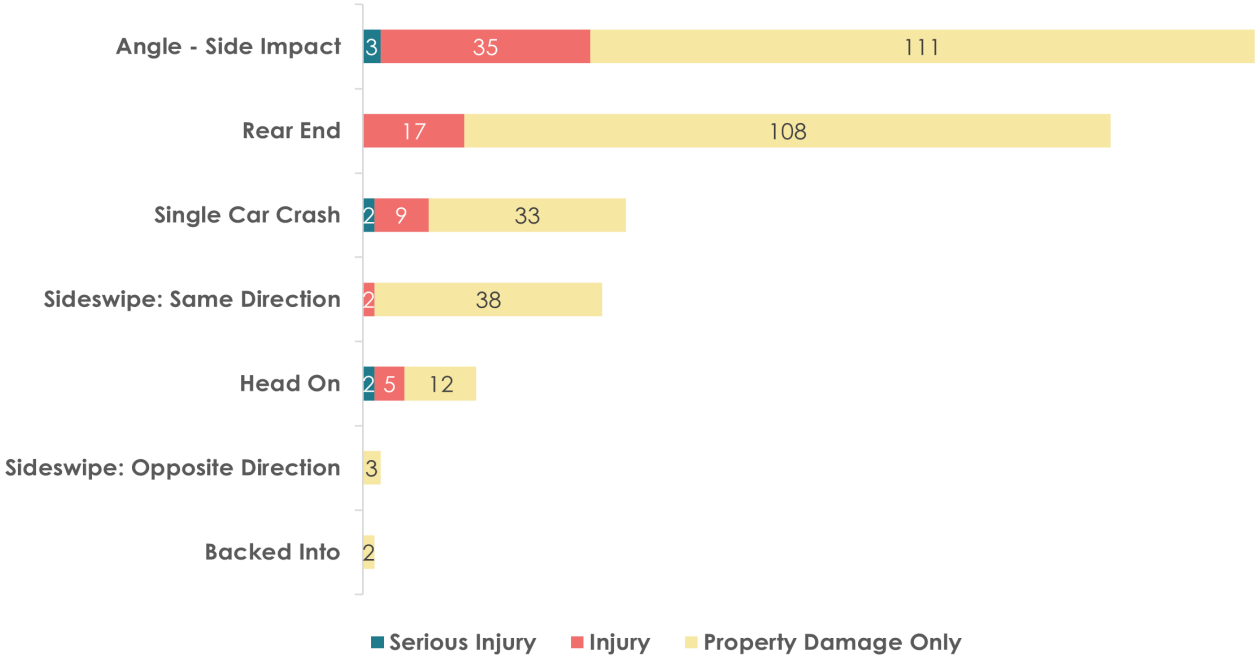


Figure 20 – Kansas Avenue Crash Summary (2018 to 2022)

Figure 21 breaks down the type of single car crashes that occurred – accounting for two of the seven serious injury crashes. Fixed object crashes made up the majority of single car crashes (66%) about a third of which resulted in an injury or a serious injury.

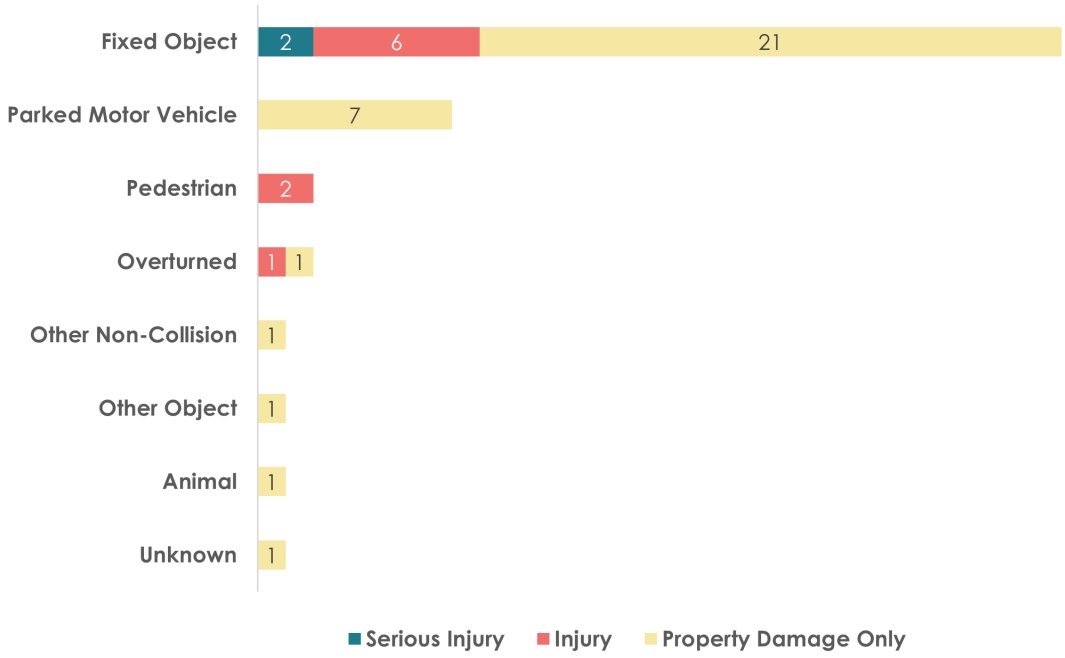


Figure 21 - Crash Classification Summary for Single Car Crashes

Figure 22 summarizes the location of crashes on Kansas Avenue with most of the crashes occurring at an intersection – a slight majority of which occurred at signalized intersections (53%). Intersections typically have a higher risk for crashes with a higher number of conflict points and more turning vehicles. This is higher than the total crashes occurring at an intersection for Garden City (57%) in the same period.

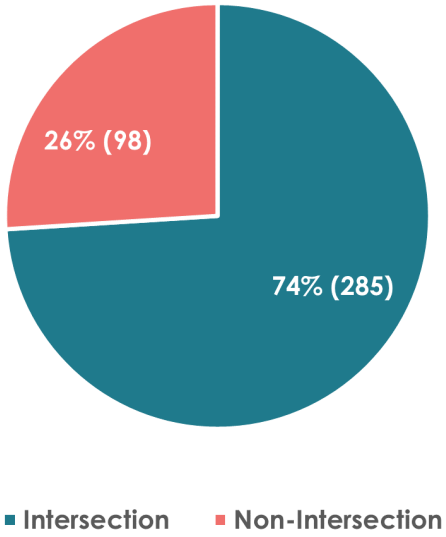


Figure 22 - Crashes by Location

Figure 23 summarizes the crashes on Kansas Avenue by hour of the day and compares it to the average hourly traffic volumes on Kansas Avenue. The number of hourly crashes generally follows the peaks of hourly traffic volumes, with the AM peak traffic hour (7am to 8am) matching the peak in hourly crashes in the morning. However, the peak for hourly crashes in the afternoon occurs from 3pm to 4pm while the hourly traffic peaks both at 3pm and 5pm. These crashes occurred from 2018 to 2022 during which traffic volumes fluctuated due to the COVID-19 pandemic and a portion of the population staying home. The traffic volume shown on the graph was collected in Spring 2024 and does not reflect the average volumes at the time of the crashes.

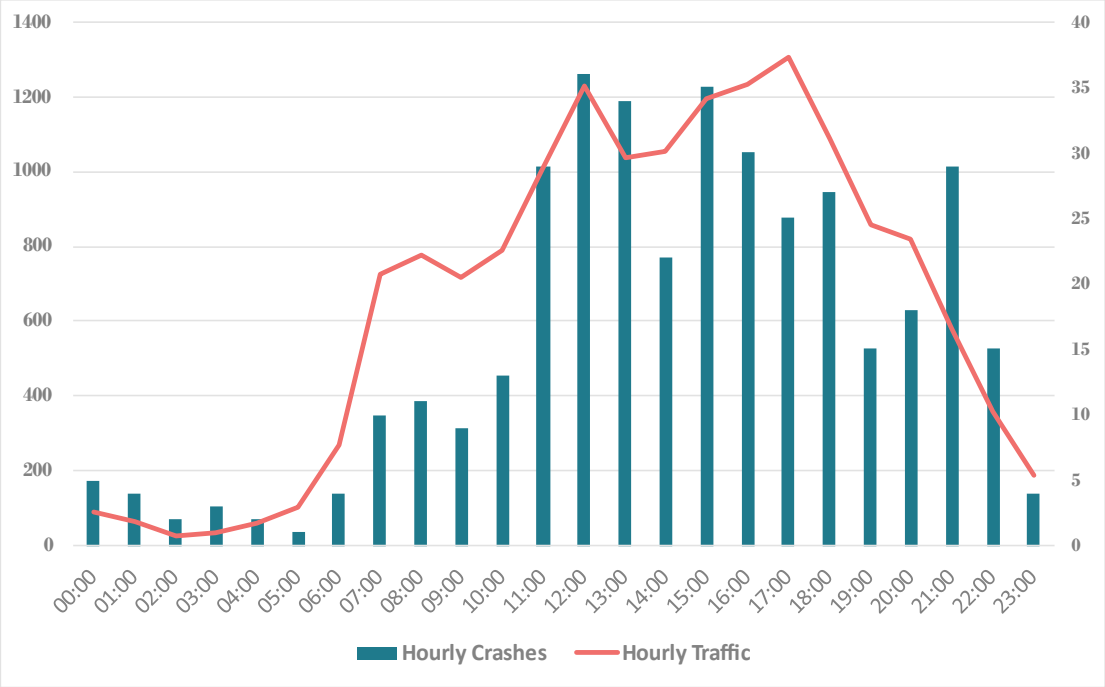


Figure 23 - Traffic Volumes and Crashes by Hour on Kansas Avenue

Table 4 summarizes the number of crashes at each of the signalized intersections along Kansas Avenue and gives the crash rate per 1 million entering vehicles at each of the intersections, as well as the critical crash ratio. A value above 1 indicates a higher-than-expected crash rate in comparison to similar intersections in Kansas, which warrants further investigation. Four of the signalized intersections exceeded the critical crash rate: Taylor Avenue (6-point intersection), 3rd Street, Fleming Street,and Campus Drive. The Kansas Avenue intersection with Taylor Avenue and Buffalo Jones Avenue has almost double the crash rate of the next highest intersection which is due to the lower entering volume, the higher number of crashes, and the higher number of conflict points due to the intersection having six separate legs.

Table 4 - Signalized Intersection Crash Summary on Kansas Avenue

Signalized Intersection Crash Summary							
Intersection	**Entering Volume (vpd)**	**Serious Injury**	**Injury**	**PDO**	**Total**	**Crash Rate[1]**	**Critical Crash Ratio[2]**
Taylor	10900	1	5	32	38	1.91	***2.92***
8th	17600	0	0	6	6	0.19	0.29
Main	19600	0	2	21	23	0.64	0.98
3rd	23400	0	2	27	29	0.68	***1.04***
Center	22900	2	4	16	22	0.53	0.81
Fleming	26600	0	15	34	49	1.01	***1.55***
Campus	26500	1	12	32	45	0.93	***1.42***
Target Access	13400	0	0	1	1	0.04	0.06

U.S. 83 SB	13400	0	4	6	10	0.41	0.63
U.S. 83 NB	12900	0	1	5	6	0.25	0.39
Leslie	13500	1	2	12	15	0.61	0.93

[1]Crashes/1 million entering vehicles

[2]The critical crash ratio compares the actual crash rate to the critical crash for similar intersections in Kansas. A value above 1 suggests a higher-than-expected crash rate.

Table 5 breaks down the types of crashes that occurred at each signalized intersection. The two most common crash types at signalized intersections were rear-end (37.3%) and angle (36.1%) crashes. Rear end crashes were most common at the intersections with Fleming, Campus, and 3rd which are also the intersections with the highest entering volume of vehicles per day. Fleming, Campus, and Taylor had the most angle crashes. The Taylor Avenue intersection saw the most sideswipe crashes at a signalized intersection, accounting for almost a third of all sideswipes at signalized intersections.

Table 5 - Signalized Intersection Crash Types Summary

Signalized Intersection Crash Types					
Intersection	**Angle**	**Rear End**	**Sideswipe**	**Head On**	**Other**
Taylor	13	10	10	2	3
8th	1	2	2	0	1
Main	9	8	3	0	3
3rd	8	16	1	2	2
Center	8	8	3	1	2
Fleming	19	22	1	5	2
Campus	17	16	8	2	2
Target Access	0	1	0	0	0
U.S. 83 SB	7	3	0	0	0
U.S. 83 NB	2	2	0	0	2
Leslie	4	3	3	1	4
TOTAL	**88**	**91**	**31**	**13**	**21**
PERCENTAGE	**36.1%**	**37.3%**	**12.7%**	**5.3%**	**8.6%**

Table 6 summarizes the crashes on each segment between each of the signalized intersections analyzed and includes the crash rate per 1 million vehicle miles traveled, which is based on the segment length and traffic volume. The roadway segment crashes occurred at both non-intersection and unsignalized intersection locations.

The average crash rate for the segments along Kansas Avenue is **1.56.** Three of the segments were above the average crash rate for the corridor, Taylor to Main, Campus to U.S. 83, and U.S. 83 to Mary Street.

Table 6 - Roadway Segment Crash Summary

Roadway Segment Crash Summary							
Segments	**Length (mi)**	**Volume (vpd)**	**Serious Injury**	**Injury**	**PDO**	**Total**	**Crash Rate**
Taylor to Main	0.65	11,700	1	4	31	36	***2.59***
Main to 3rd	0.33	19,100	0	0	11	11	0.96
3rd to Center	0.37	19,200	0	1	10	11	0.85
Center to Campus	0.63	19,900	0	4	28	32	1.40
Campus to U.S. 83	0.71	12,300	1	10	20	31	***1.95***
U.S. 83 to Mary Street	0.56	7,300	0	2	10	12	***1.61***
*Crashes/1 million vehicle-miles traveled							

Table 7 summarizes the crash types that occurred on each segment of Kansas Avenue. The most common crash types on the segments included angle (44.4%), rear end (24.1%), and fixed object (9%). The angle crashes mostly occurred after straight/following the road (58%), left turn (22%), and right turn (13%) vehicle maneuvers.

The only pedestrian involved crash occurred on the segment in between Taylor and Main when a pedestrian was hit while crossing Kansas Avenue at 12th Street.

Table 7 - Roadway Segment Crash Types Summary

Roadway Segment Crash Types						
Segments	**Angle**	**Rear End**	**Sideswipe**	**Head On**	**Fixed Object**	**Other**
Taylor to Main	9	11	2	3	5	6
Main to 3rd	4	1	1	1	1	3
3rd to Center	1	7	0	0	1	2
Center to Campus	19	6	4	0	2	1
Campus to U.S. 83	19	5	4	1	2	0
U.S. 83 to Mary	7	2	0	1	1	1
Total	**59**	**32**	**11**	**6**	**12**	**13**
Percentage	**44.4%**	**24.1%**	**8.3%**	**4.5%**	**9.0%**	**9.8%**

The safety issues at each intersection and along each segment will be analyzed later in the report.

Public Feedback

The Task Force and additional stakeholders met to provide input and perspectives about roadway safety concerns and issues for the overall U.S. 83 Communities Roadway Safety Paln study area. A moderator led participants through a visioning exercise.

At a pop-up at the Garden City Fall Fest, the public provided comments on Kansas Avenue, which included:

- Intersection concerns at Campus Drive and Schulman Avenue
- Intersection concerns at 5-points (Kansas Ave & Taylor Ave & Buffalo Jones Ave)

Participants believed the Safety Action Plan could lead to improved safety, enhanced traffic flow, and better planning for the future. The top concerns were as follows.

- Safety
- Truck traffic
- Bike/Pedestrian accommodations
- Improved traffic flow
- Better Signage

Previous improvements to Kansas Avenue to improve conditions have been considered and discussed by the City in public City Commission meetings and in the City's public Capital Improvement Planning (CIP) process. These include:

- Widening Kansas Avenue to five lanes (2 through lanes in each direction and a TWLTL) from 3rd Street to Belmont Place
- Concrete panel repair at intersection of Kansas Avenue and Campus Drive

Corridor-Wide Observations

The following section summarizes general observations that apply to the project corridor.

Figure 26 - General Observations on Kansas Avenue

Observations and Issues

Pedestrian Infrastructure

- Several curb ramps along Kansas Avenue are missing truncated domes (Figure 26).
- Several locations had non- ADA-compliant curb ramp grades and landing areas.
- The use of pedestrian countdown signals was inconsistent at intersections along the corridor.
- Several segments of sidewalk along Kansas Avenue are blocked by objects such as power poles and street signs (Figure 26).

Figure 25 – Curb ramp missing truncated domes and sidewalk obstruction

Signing and Striping

- There are several locations where crosswalk striping is missing or needs to be repainted (Figure 27).

Figure 27 – Example of faded crosswalk that needs to be repainted

- Most unsignalized intersections do not have stop lines at Mary Street.
    - The 11th edition of the *Manual on Uniform Traffic Control Devices* (MUTCD) states: "*Stop lines may be used to indicate the point behind which vehicles are required to stop in compliance with a STOP (R1-1) sign,… or some other traffic control device that requires vehicles to stop , except YIELD signs that are not associated with passive grade crossings" (page 573)*. The guidance provided indicates: *"Stop lines should be used to indicate the point behind which vehicles are required to stop in compliance with a traffic control signal (see Section 4D.08)." While stop lines are not required at stop-controlled intersections, they may be added to improve compliance with stop signs where yielding to them is a concern.*

Corridor-Wide Recommendations

The recommendations in Table 8 are based on the collaborative effort of the RSA multidisciplinary team and stakeholder interviews, as well as on the team's experience driving and walking the corridor.

The time frame for each recommendation is broken down by into three categories:

- Short-term: 0 to 3 years
- Medium-term: 3 to 5 years
- Long-term: 5 to 10 years

The cost estimates for each recommendation is given at a high level 10% planning phase and may fluctuate based on the final design. The total cost estimates are broken down into three categories:

- Low cost: Less than $50,000
- Medium cost: Between $50,000 and $200,000
- High cost: Greater than $200,000

Table 8 – Kansas Avenue Corridor Wide Recommendations

ID	Corridor-Wide Recommendations	Time Frame	Cost Estimate[1]
1	Install flashing yellow arrows on signal heads	Short	Medium
2	Implement traffic signal coordination along Kansas Avenue Street	Short	Low
3	Install signal head backplates with retroreflective borders	Short	Low
4	Implement durable pavement markings along corridor when re-striping.	Short	Low
5	ADA Improvements	Long	Medium

[1] Cost estimate shows high level costs at 10% planning phase. Cost may fluctuate based on design. For example, road diet implementation cost may be higher if signals are rebuilt as a part of the project or lower if done in conjunction with scheduled roadway re-striping.

Install flashing yellow arrows on signal heads

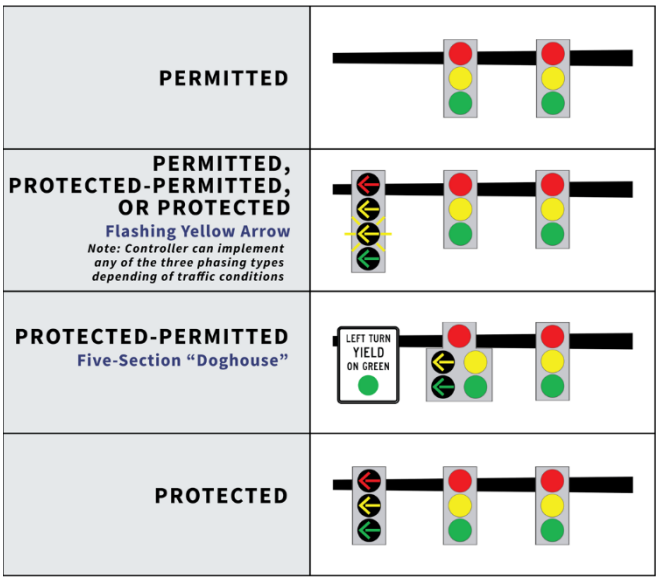


Figure 28 - Left-turn operations

The corridor has a mixture of permitted (perm), protected/permissive (prot/perm), and protected-only (prot) left turn operations. Protected left turns give the right-of-way to left turning vehicles, allowing them to turn unimpeded. Permissive left turns allow left turning vehicles to turn, but while yielding to opposing traffic and pedestrians. Protected/permissive phasing utilizes both protected and permissive modes at different times in the signal cycle. Figure 28 shows the signal displays associated with left turn operations. Failure to yield right-of-way crashes resulting from left turns is common at some locations on the corridor. A flashing yellow arrow (FYA) for permissive left-turn movements at signalized intersections helps drivers turning left avoid confusion. Confusion may arise from left-turning drivers who see a permissive circular green signal and mistakenly believe that the left turn has the right-of-way over opposing traffic. Furthermore, four-section FYA heads allow for the left turns to be operated differently by time of day (such as protected-only during peak periods and protected/permissive off peak), as well as permitting the safe operation of "lagging" left turns (the left-turn movement receives a green arrow following the green indication for the opposing through movement) by avoiding the "yellow trap" (when left-turning drivers receive a yellow indication and erroneously believe that the opposing traffic has also received a yellow indication, when in fact, the opposing direction still has a green indication).

Recommendation: Consideration should be given to replacing the existing five-section protected/permissive left-turn signal heads with FYA signal heads where separate left-turn lanes are provided (such as what already exists at the Mary Street/Kansas Avenue intersection). Based on the *Safety Evaluation of Flashing Yellow Arrow at Signalized Intersections* published by FHWA in August 2020, reductions in left-turn crashes of 25% at intersections where FYA is implemented on one road (Table 38 of FHWA report) and of 38% at intersections where FYA is implemented on both roads (Table 39 of FHWA report) could be expected with such a replacement of signal heads.

Implement traffic signal coordination along Kansas Avenue

With system coordination, instead of operating independently, the traffic signals along a roadway corridor operate as a group, thereby synchronizing movements and allowing for better progression in a manner that minimizes the number of stops drivers must make. The decision to use coordination should be influenced by a variety of factors, such as the operating environment, roadway users, and community priorities. While coordination can reduce travel time, stops, delay, and queues for the coordinated movements, there may be consequences for the uncoordinated movements. In addition to the enhancements to traffic operations, traffic signal coordination has also been shown to have the potential to improve safety. Findings have suggested that coordination can decrease total crashes along a corridor by 21 percent (CMF ID 9868).

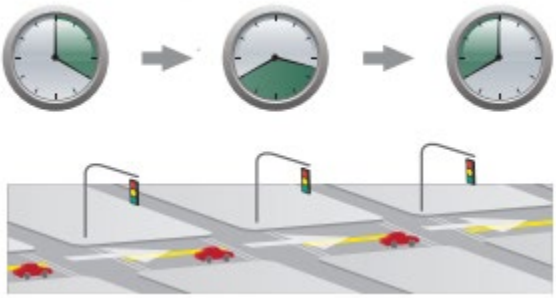


Figure 29 - Traffic Signal Coordination Graphic (Source: UDOT)

Recommendation: Consider implementing traffic signal coordination along Kansas Avenue.

Install signal head backplates with retroreflective borders

Backplates added to a traffic signal head improve the visibility of the illuminated face of the signal by introducing a controlled-contrast background. The improved visibility of a signal head with a backplate is made even more conspicuous by framing it with a 1- to 3-inch yellow retroreflective border. Signal heads that have backplates equipped with retroreflective borders are more visible and conspicuous in both daytime and nighttime conditions. A reduction in total crashes of 15% can be expected at intersections where backplates with retroreflective borders are implemented.

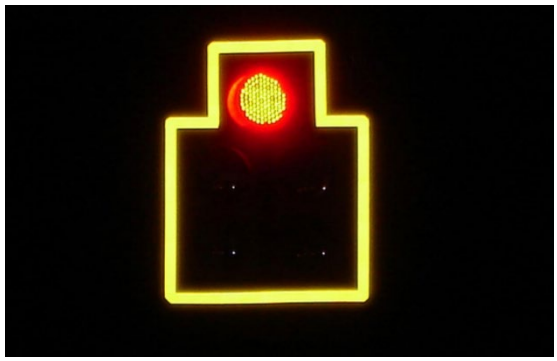


Figure 30 - Retroreflective borders on signal head backplates. (Source: South Carolina DOT)

Recommendation: Consideration should be given to replacing the signal head backplates with retro-reflective backplates (such as what already exists at the Mary Street/Kansas Avenue intersection).

Implement more durable pavement markings along corridor when re-striping.

While a pavement condition analysis was not performed, the concrete portions of Mary Street are generally in "Good" or better condition as defined by the Pavement Surface Evaluation Rating (PASER) scale. However, the corridor's markings for crosswalks and stop lines has faded or is no longer visible. Refer to the City's 2024 Street Inventory/Condition & Maintenance Plan for additional information on pavement conditions.

Recommendations: Evaluate existing pavement markings and as needed, restripe the corridor, including crosswalks and stop lines at signalized intersections. Use high durability pavement markings that last several years rather than traffic paint requiring annual application.

ADA Improvements

To be ADA-compliant, the Public Right-of-Way Accessibility Guidelines, published by the U.S. Access Board, has specific requirements sidewalks must meet. Requirements that include width, slope, surface texture, and maintenance.

The RSA team observed several factors related to ADA improvements, including curb ramps and landings, cracked or uneven sidewalks, obstructions along the sidewalks (utility or signal poles, mailboxes, etc.), as well as the condition of curbs, gutters, and signal equipment. The RSA team did not complete an ADA audit, and other ADA compliance issues may exist.

Recommendation: While installation of curb ramps at all locations along the corridor currently lacking and fixing non-compliant ramps and sidewalk infrastructure would be ideal, we recognize such a recommendation could be made for most any street corridor in the City. Therefore, we recommend installing or upgrading ramps with alterations of the street, curb, or sidewalk as already required by ADA regulations, as well as when identified as barriers by the public and as prioritized in a Transition Plan.

The City's ADA Transition Plan, currently in development at the time of this analysis, will provide more in-depth data on the status of curb ramps on the corridor and will prioritize curb ramp installations and repairs city-wide. Future phases of the Transition Plan should also focus on the remainder of the pedestrian environment. The RSA team recommends completing rehabilitation maintenance by upgrading existing sidewalks and adding sidewalks along with development to create consistency along the corridor. Expand the narrow sidewalk sections to a width of 5 feet for improved accessibility and safety. Expand connectivity under US-83 to connect with Kansas Avenue and Jennie Barker trail systems, and any upcoming development in the area. It is recommended that all new sidewalks be offset from the curb or be at least 6 feet wide at back of curb.

Intersection Specific Analysis

Intersection Specific Analysis

Intersection 1: Kansas Avenue & Taylor Avenue & Buffalo Jones Avenue/Old U.S. 50

Overview

Figure 31 - Aerial Image of Taylor Avenue Intersection

The Kansas Avenue and Taylor Avenue intersection is signalized with six approaches and represents the western boundary of the project study area, shown in Figure 31. Refer to Figure 32 to see the direction of travel for each lane approaching and leaving the intersection. Both approaches of Taylor Avenue have protected/permissive left-turn phasing, both approaches of Kansas Avenue have permissive-only left-turn phasing, and the Buffalo Jones (southeast-bound/northwest-bound) approaches are split phased (they "take turns" and do not run concurrently).

A mix of attached and detached sidewalks are present on each leg of the intersection, except for at the tip of the medians between Kansas Avenue and Buffalo Jones Ave/Old U.S. 50, where there is no direct connection to the crosswalks. Brick crosswalks exist on all four sides of the intersection, each equipped with pedestrian signals, through none feature countdown timers.

Daily traffic at the intersection is approximately 3,000 VPD on the west leg, 7,600 VPD on the east leg, 6,700 VPD on the north leg, 3,400 VPD on the south leg, 3,500 VPD on the southeast leg, and 5,300 VPD on the northwest leg. The Taylor Ave and Buffalo Jones Ave/Old U.S. 50 intersection saw 6 pedestrians and 2 bicyclists crossing the intersection over a 13-hour period. Figure 32 illustrates all 155 potential conflict points that exist at this intersection – locations where road users' paths could intersect, representing areas of potential crashes. The high number of conflict points (155) indicates a significant risk of crashes at this intersection. Figure 33 highlights the 54 potential pedestrian conflict points, underscoring the dangers pedestrians face when crossing this intersection.

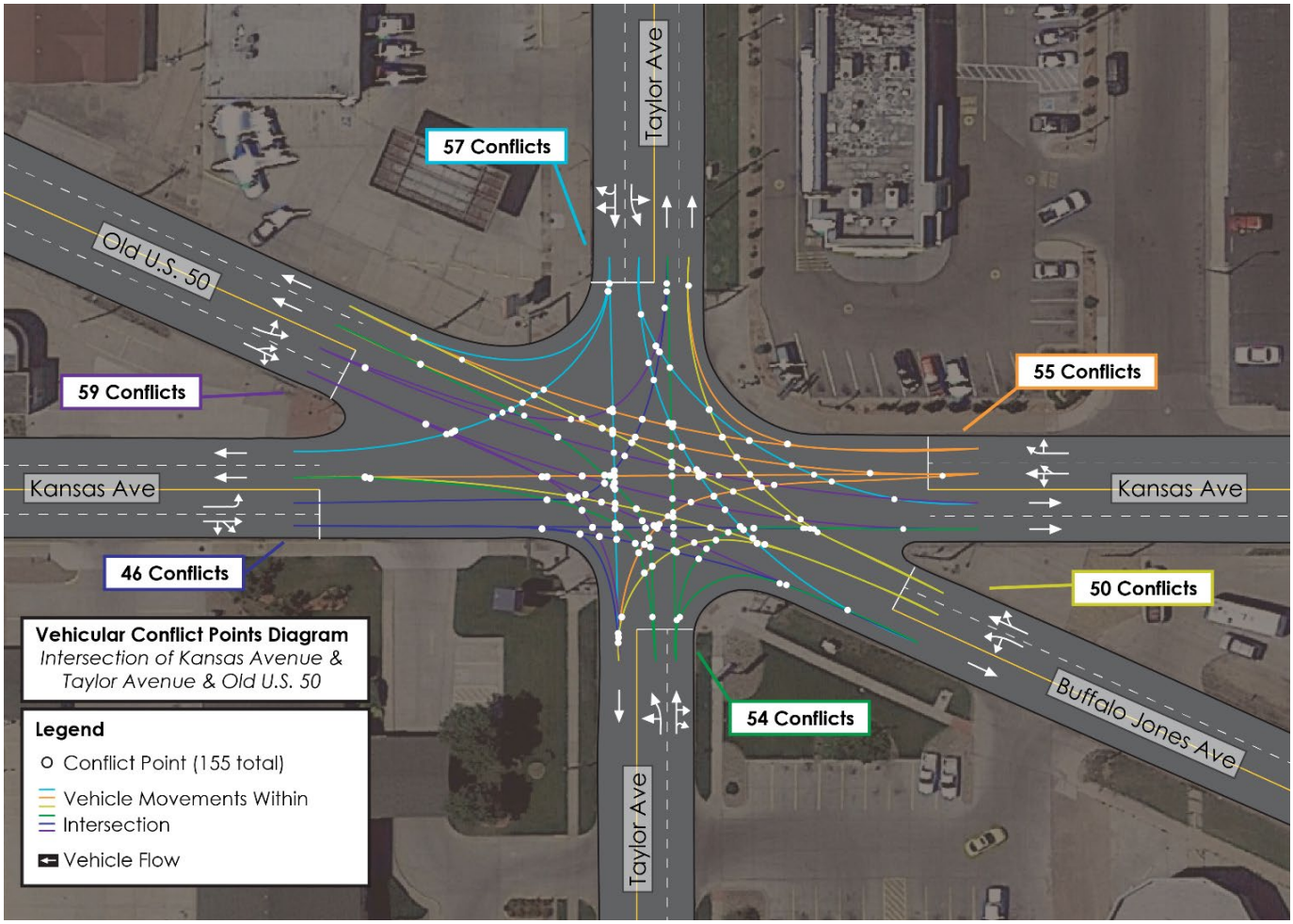


Figure 32 - Conflict Point Diagram of Kansas Ave & Taylor Ave &Buffalo Jones Ave/Old U.S. 50 Intersection

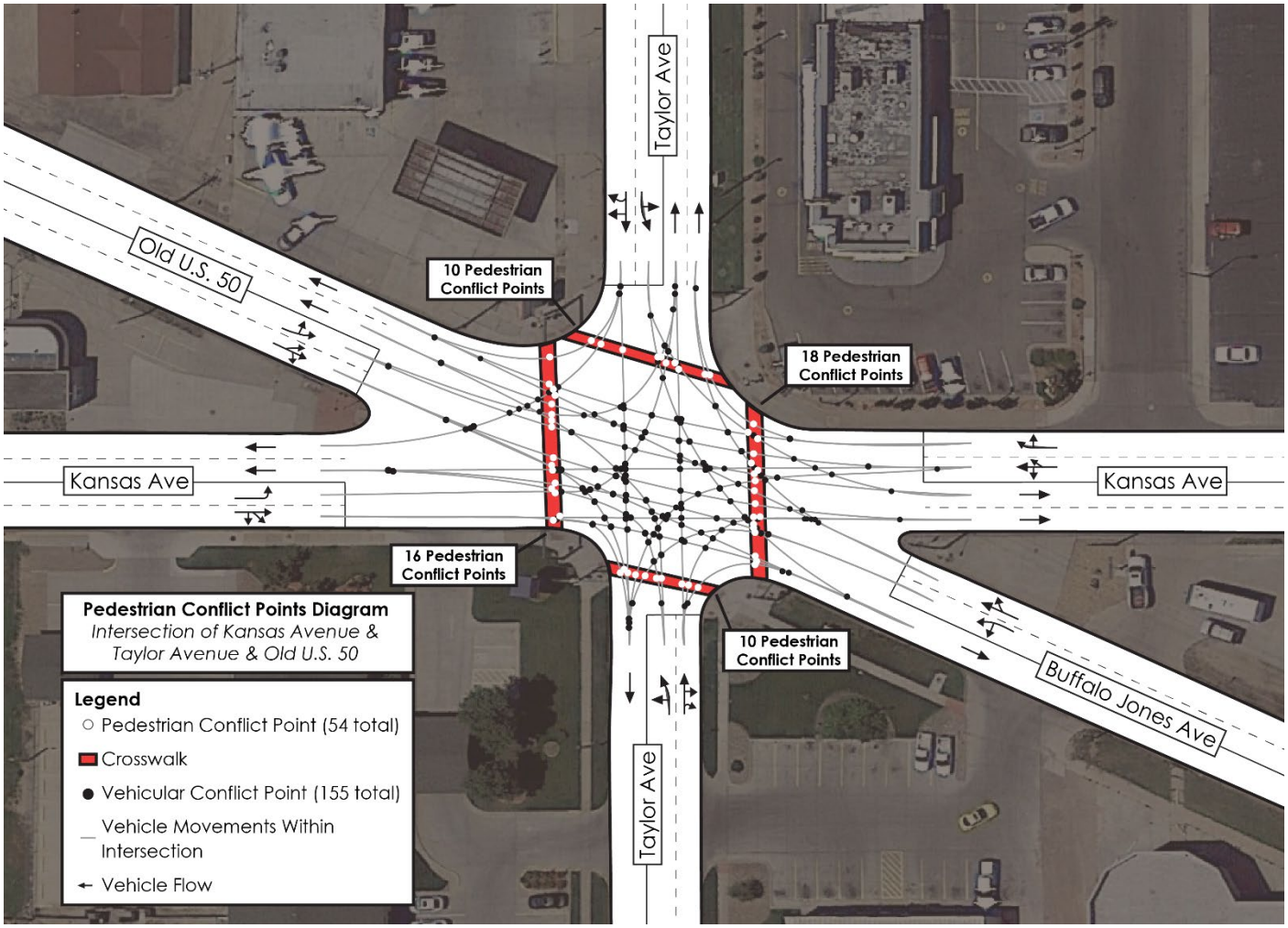


Figure 33 - Pedestrian Conflict Point Diagram of Kansas Ave & Taylor Ave & Buffalo Jones/Old U.S. 50 Intersection

Crash Review

Table 9 summarizes the crashes that occurred at the Kansas Avenue intersection with Taylor Avenue.

Total Crashes: 38 crashes (1 serious injury crash)

Significant Crash Pattern: Rear end, sideswipe, and angle – left turn

Table 9 – Kansas Avenue & Taylor Avenue Intersection Crash Summary

Kansas Avenue & Taylor Avenue Intersection	Serious Injury		Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%	Crashes	%
Angle - Left Turn	0	0%	4	10%	7	18%	11	29%
Angle - Straight/following road	0	0%	1	3%	3	8%	4	10%
Rear End	0	0%	0	0	10	26%	10	26%
Head On	0	0%	0	0	1	3%	1	3%

Sideswipe	0	0%	0	0	10	26%	10	26%
Fixed Object	1	3%	0	0	1	3%	2	5%
Grand Total	**1**	**3%**	**5**	**13%**	**32**	**84.2%**	**38**	**100%**
Note: Due to rounding for simplicity, percentages may not sum to 100%								

Rear end Crash Analysis: There were 10 rear end crashes (0 injury crashes). Rear ends were most common while vehicles were heading southbound on Taylor Avenue (6). Half of the rear end crashes occurred in the afternoon around 3:30pm to 5:30pm.

Sideswipe Crash Analysis: There were 10 sideswipe crashes (0 injury crashes). The westbound approach on Kansas Avenue saw the most sideswipe crashes (4) out of all the approaches.

Angle – Left turn Crash Analysis: There were 11 angle – left turn crashes (4 injury crashes). The most common approaches where the first vehicle was originating in the left turn crash were Buffalo Jones southeastbound (4), Taylor Avenue southbound (3), and Kansas Avenue eastbound (3).

Fixed Object Crash Analysis: There were 2 fixed object crashes (1 serious injury crash). The serious injury crash occurred when a vehicle was stopped at the signal heading westbound on Kansas Avenue and once the signal turned green the driver accelerated directly west into the building at 1210 Buffalo Jones Avenue. The vehicle was estimated to be traveling at 20mph when it impacted the building. No contributing circumstance was provided in the report.

Comments Provided by City Staff and Stakeholders

The intersection was mentioned by members of the public at the engagement event. No near misses were communicated, just general uneasiness due to the complexity of the intersection.

Observations

Traffic analysis indicates the intersection is operating at LOS D in both the morning and afternoon peak hours. The approach volumes at this intersection are relatively lower compared to other signalized intersections on the corridor, but the six separate approaches contribute to the increased delay.

The RSA team made the following intersection observations during the field reviews:

- The stop lines are faded/missing on all six legs of the intersection (Figure 35).

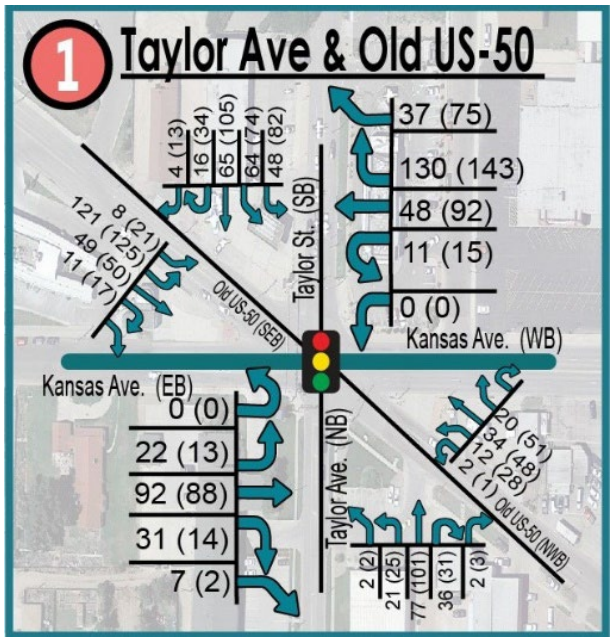


Figure 34 - Turning Movement Counts at Kansas Avenue and Taylor Avenue

- Pedestrian signals exist but no countdown timers are present.

Figure 35 - Photo at Kansas Ave. & Taylor Ave intersection showing faded stop line

Recommendations

Specific recommendations at the Kansas Avenue, Buffalo Jones Avenue & Taylor Avenue Intersection include:

- Review pedestrian phase clearance intervals and ensure they are calculated consistently for each crossing.
- Consider installing a separate traffic signal mast arm for the southeast-bound approach to allow for greater separation of the signal heads for the southeast-bound and eastbound approaches.
- Consider removing the Garden City Inn driveway onto West Kansas Avenue, as it is located within the intersection.
- Consider using high-visibility crosswalk markings.

Additionally, various options were considered to improve the safety and operation of the intersection, two of which are discussed below:

Conversion of Buffalo Jones Avenue to One-Way

By converting Buffalo Jones Avenue to one-way in the southeast-bound direction, the number of approaches to the intersection would be reduced from six to five. This change would improve traffic operations by removing one of the exclusive signal phases. The intersection was analyzed for the PM peak hour with projected 2044 traffic volumes assuming an annual growth rate of 0.5% (about 10% increase in existing traffic). Table 10 shows the potential improvement from LOS D to LOS C with this change, which represents a reduction in overall average vehicle delay of 34%. Additionally, this change would improve traffic safety by reducing the number of vehicle-to-vehicle conflict points from 155 to 105 and vehicle-to-pedestrian conflict points from 54 to 46.

The one-way conversion could potentially be done for just one block, between Taylor Avenue and 13th Street. However, consideration should be given to the potential for an increase in traffic turning left onto Kansas Avenue from stop sign-controlled streets (9th through 13th Streets).

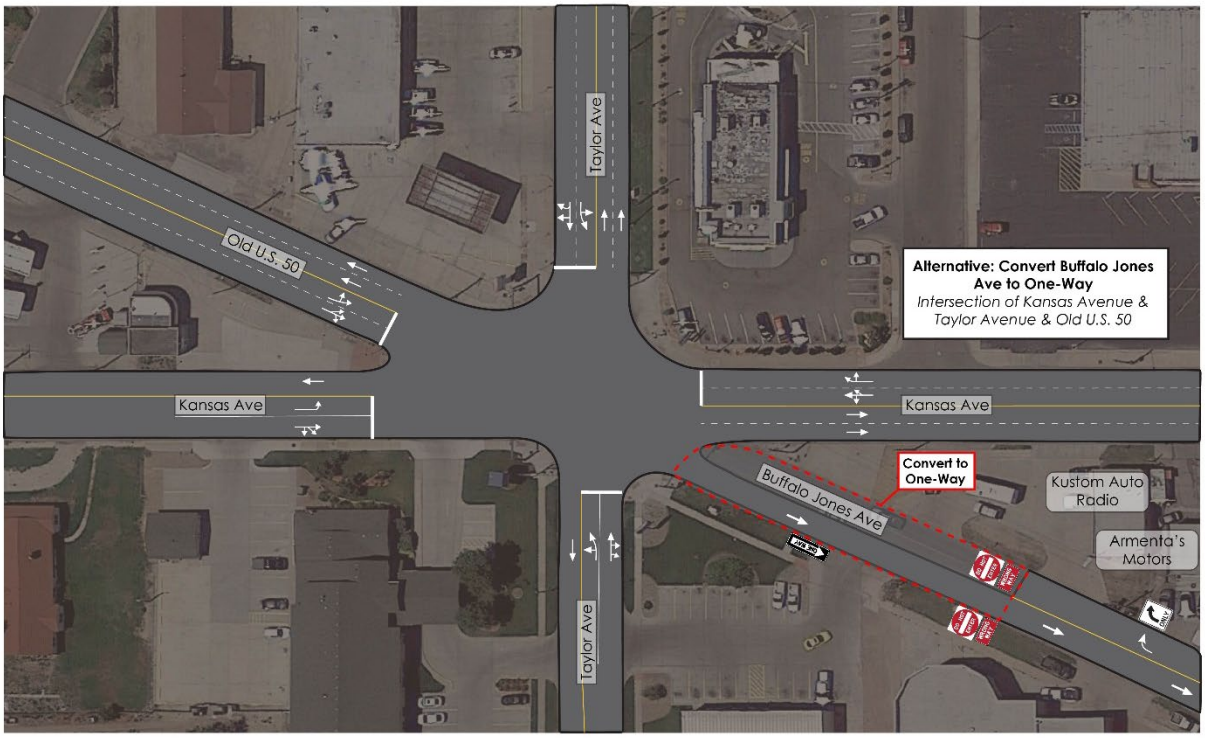


Figure 36 - Conceptual design of the intersection alternative converting Buffalo Jones Avenue to a one-way street

Replacing Traffic Signal with Roundabout

Removing the traffic signal and reconstructing the Kansas Ave/Taylor Ave intersection as a single-lane roundabout would significantly improve both traffic operations and safety. The intersection was analyzed for the PM peak hour with projected 2044 traffic volumes assuming an annual growth rate of 0.5% (about 10% increase in existing traffic). Table 10 shows the potential improvement from LOS D to LOS A with this change, which represents a reduction in overall average vehicle delay of 88%. Additionally, this change would improve traffic safety not only by reducing the number of conflict points, but also through reduced vehicle speeds. Converting a signalized intersection to a roundabout has been shown to reduce fatal and injury crashes by 78%. The feasibility of implementing this option would need to be evaluated, as there would likely be impacts to existing properties and access points.

Table 10 - Table summarizing traffic operations in 2044 PM Peak Hour for each Kansas Ave/Taylor Ave intersection alternative

Kansas Ave/Taylor Ave Intersection Alternative Traffic Analysis						
2044 PM Peak Hour Level of Service/Delay						
	Existing Configuration		**Buffalo Jones One-Way**		**Roundabout**	
Approach	**LOS**	**Delay (sec)**	**LOS**	**Delay (sec)**	**LOS**	**Delay (sec)**
Eastbound	D	46.7	C	30.6	A	6.5
Westbound	E	59.4	D	40.0	A	4.4

Northbound	D	51.3	D	35.2	A	6.2
Southbound	D	36.3	C	23.6	A	7.5
SE-bound	E	62.0	D	40.8	A	8.6
NW-bound	E	61.3	---	---	A	6.4
TOTAL	**D**	**52.1**	**C**	**34.5**	**A**	**6.5**

This study only investigated the operational feasibility of a roundabout at this location; however, due to the six legs and limited right-of-way, the geometric feasibility is undetermined at this time. While the operational benefits are abundant, additional conceptual engineering is needed to determine the physical feasibility of this potential improvement.

Intersection 2: Kansas Avenue & 8th Street

Overview

Figure 37 - Aerial Image of 8th Street Intersection

Kansas Avenue and 8th Street is a signalized intersection (Figure 38). The east leg of Kansas Avenue consists of two through lanes in each direction, a dedicated left-turn lane, and a channelized right-turn lane. The west leg of Kansas Avenue consists of two through lanes in each direction and a dedicated northbound left-turn lane. The north and south legs of 8th Street consist of a single through lane in each direction and a dedicated left-turn lane. Right-turns must be made from the right shared through lane on each approach except for the east leg of Kansas Avenue. There is protected/permissive left-turn phasing for every approach.

Attached sidewalks are present on every leg approaching the intersection. There are no bike lanes on Kansas Avenue or 8th Street. Daily traffic at the intersection is approximately 11,700 VPD on the west leg, 13,900 on the east leg, 5,500 VPD on the north leg, and 4,000 on the south leg. Ladder crosswalks are present on the north, south, and east sides of the intersection, each equipped with pedestrian signals, though none feature countdown timers. The 8th Street intersection saw 36 pedestrians and 4 bicyclists crossing the intersection over a 13-hour period. The east leg of the intersection saw the most bicycle and pedestrian crossings with 19 and there were no crossings on the west leg since it has no pedestrian signal phase.

Abe Hubert elementary school is just to the north and east of the intersection as well as neighborhoods to the north and south. Bicycle and pedestrian activity at the intersection may originate at the school.

Crash Review

Table 11 summarizes the crashes that occurred at the Kansas Avenue intersection with 8th Street. With only 6 crashes, there is a relatively low number of crashes at a signalized intersection.

Total Crashes: 6 crashes (0 injury)

Significant Crash Pattern: None.

Table 11 – Kansas Avenue & 8th Street Intersection Crash Summary

Kansas Avenue & 8th Street Intersection	PDO		Total	
	Crashes	%	Crashes	%

Angle - Straight/following road	1	16.7%	1	16.7%
Rear End	2	33.3%	2	33.3%
Sideswipe	2	33.3%	2	33.3%
Fixed Object	1	16.7%	1	16.7%
Grand Total	**6**	**100%**	**6**	**100%**

Comments Provided by City Staff and Stakeholders

Observations

Traffic is operating at LOS B in both the morning and afternoon peak hours.

The RSA team made the following intersection observations during the field reviews:

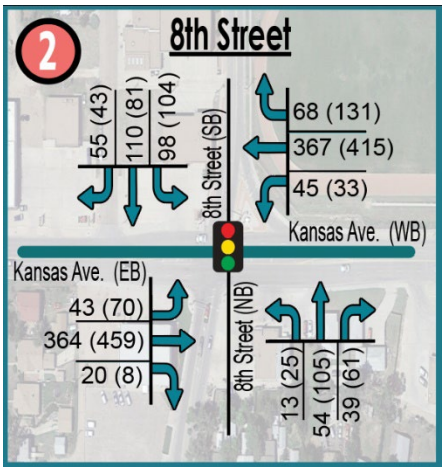


Figure 38 - Turning Movement Counts at Kansas Avenue and 8th Street

- The existing crosswalks on the north, east, and south legs of intersection were faded, but have since been refreshed (Figure 40).
- There is no marked crosswalk or pedestrian signal phase for the west leg of the intersection
- Pedestrian signals exist on the north, east, and south legs of the intersection but no countdown timers are present.
- In the channelized right turn lane, there is a stop line before the crosswalk marking and a yield sign past the crosswalk marking.

Figure 39 - Photo at Kansas Ave & 8th St showing faded crosswalk

Recommendations

Specific recommendations at the Kansas Avenue & 8th Street intersection include:

- Use durable pavement markings for the crosswalks.
- Install pedestrian countdown timers.
- Remove the stop line pavement marking in the channelized WB-to-NB right-turn lane.
- Consider a raised crosswalk within the channelized WB-to-NB right-turn lane.

Intersection 3: Kansas Avenue & Main Street

Overview

Figure 40 - Aerial Image of Main Street Intersection

Kansas Avenue and Main Street is a signalized intersection (Figure 41). The east and west legs of Kansas Avenue consist of two through lanes in each direction and a dedicated left-turn lane. Right-turns must be made onto Main Street from the right shared through lane. The north and south legs of Main Street consist of a single through lane in each direction and dedicated left- and right-turn lanes onto Kansas Avenue. There is protected/permissive left-turn phasing for every approach.

Attached sidewalks are present on every leg approaching the intersection. There are no existing bike lanes on Kansas Avenue or Main Street. A bike lane is proposed along Main Street north of Kansas Avenue. Daily traffic at the intersection is approximately 14,100 VPD on the west leg, 15,600 on the east leg, 4,400 VPD on the north leg, and 5,000 on the south leg. Continental crosswalks are present on all four sides of the intersection, each equipped with pedestrian signals and countdown timers. The Main Street intersection saw 31 pedestrians and 2 bicyclists crossing the intersection over a 13-hour period.

Crash Review

Table 12 summarizes the crashes that occurred at the Kansas Avenue intersection with Main Street.

Total Crashes: 23 crashes (2 injury crashes)

Significant Crash Pattern: Rear end and angle – straight/following road

Table 12 – Kansas Avenue & Main Street Intersection Crash Summary

Kansas Avenue & Main Street Intersection	Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%
Angle – Changing Lanes	0	0%	1	4.3%	1	4.3%
Angle - Right Turn	0	0%	1	4.3%	1	4.3%
Angle - Straight/following road	1	4.3%	4	17.4%	5	21.7%
Angle – Stopped in Traffic	0	0%	1	4.3%	1	4.3%

Rear End	0	0%	8	34.8%	8	34.8%
Sideswipe	0	0%	3	14.3%	3	14.3%
Fixed Object	1	4.3%	1	4.3%	2	8.7%
Non-collision	0	0%	1	4.3%	1	4.3%
Grand Total	**2**	**8.7%**	**21**	**91.3%**	**23**	**100%**

Rear end Crash Analysis: There were eight rear end crashes (0 injury crashes). All of the rear end crashes occurred on Kansas Avenue in the eastbound (3) and westbound (5) directions. Only two of the rear end crashes occurred under adverse weather conditions, both rainy conditions.

Angle – Straight/following road Crash Analysis: There were five angle crashes where the vehicle maneuver was straight/following the road (1 injury crash). Vehicle one was heading either eastbound (1), westbound (3), or southbound (1) when it was struck by vehicle 2.

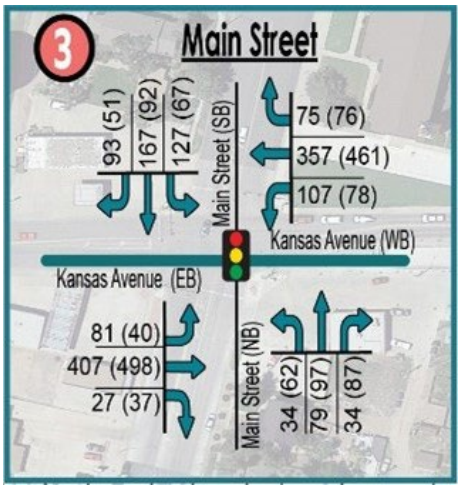


Figure 41 - Turning Movement Counts at Kansas Avenue and Main Street

Comments Provided by City Staff and Stakeholders

Observations

Traffic is operating at LOS B in both the morning and afternoon peak hours.

The RSA team made the following intersection observations during the field reviews:

- All four curb ramps do not have truncated domes.

Recommendations

Specific recommendations for the Kansas Avenue & Main Street intersection include:

- Consider moving or closing the driveway access on Main Street for Papa Johns and Muffler Shop further away from the intersection.

Intersection 4: Kansas Avenue & 3rd Street

Overview

Kansas Avenue and 3rd Street is a signalized intersection (Figure 43). The east and west legs of Kansas Avenue consist of two through lanes in each direction and a dedicated left-turn lane. The north and south legs of 3rd Street consist of a single through lane in each direction and a dedicated left-turn lane. Right-turns must be made from the right shared through lane for every approach. There is protected/permissive left-turn phasing for every approach.

Figure 42 - Aerial Image of 3rd Street Intersection

A mix of attached and detached sidewalks are present on every leg approaching the intersection. There are no existing bike lanes on Kansas Avenue or 3rd Street. Daily traffic at the intersection is approximately 16,400 VPD on the west leg, 18,900 on the east leg, 6,200 VPD on the north leg, and 5,200 on the south leg. A mix of continental and ladder crosswalks are present on all four sides of the intersection, each equipped with pedestrian signals, though none feature countdown timers. The 3rd Street intersection saw 42 pedestrians and 8 bicyclists crossing the intersection over a 13-hour period.

Crash Review

Table 13 summarizes the crashes that occurred at the Kansas Avenue intersection with 3rd Street.

Total Crashes: 29 crashes (2 injury crashes)

Significant Crash Pattern: Rear end and angle – straight/following road

Table 13 – Kansas Avenue & 3rd Street Intersection Crash Summary

Kansas Avenue & 3rd Street Intersection	Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%
Angle - Left Turn	0	0%	2	6.9%	2	6.9%
Angle - Straight/following road	1	3.4%	5	17.2%	6	20.7%
Rear End	1	3.4%	15	51.7%	16	55.2%
Head On	0	0%	2	6.9%	2	6.9%
Sideswipe	0	0%	1	3.4%	1	3.4%

Fixed Object	0	0%	2	6.9%	2	6.9%
Grand Total	**2**	**6.9%**	**27**	**%**	**29**	**100%**

Rear end Crash Analysis: There were 16 rear end crashes (1 injury crash). Rear end crashes occurred in all four approaches eastbound (6), westbound (7), southbound (1), and northbound (2).

Angle – Straight/following road Crash Analysis: There were six angle crashes where the vehicle maneuver before the crash was straight/following the road (1 injury crash).

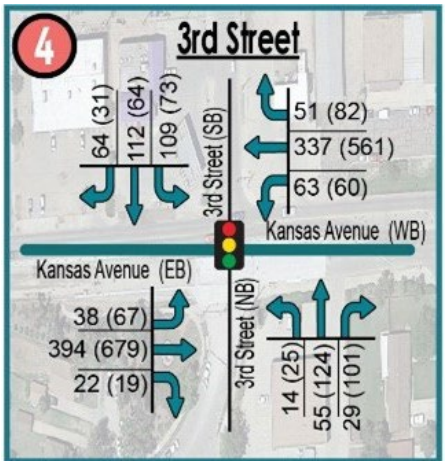


Figure 43 - Turning Movement Counts at Kansas Avenue and 3rd Street

Comments Provided by City Staff and Stakeholders

Observations

Traffic is operating at LOS B in the morning peak hour and LOS C in the afternoon peak hour.

The RSA team made the following intersection observations during the field reviews:

- The painted crosswalks and stop lines were faded on all four legs of the intersection (Figure 45).
- Three of the four curb ramps (NE, SE, and SW corners) do not have truncated domes.
- Landscaping on the southwest corner of intersection may be blocking the sight distance for northbound right turn vehicles.
- There are pedestrian signal heads at this intersection, but they do not have countdown timers.

Figure 44 - Photo at Kansas Ave & 3rd St showing faded crosswalk and stop line

- 4th Street curves up as it approaches Kansas Avenue so that it can align with 3rd Street at Kansas Avenue. The curve of the road may be blocking the view of southbound left turning vehicles yielding to oncoming northbound vehicles and northbound vehicles may have decreased perception when approaching the intersection. This may have contributed to some of the northbound rear end, fixed object, and angle crashes at this intersection due to reduced sight distance.

Recommendations

Kansas Avenue & 3rd Street

Specific recommendations at the Kansas Avenue & 3rd Street intersection include:

- Install pedestrian countdown timers.
- Use durable pavement markings for the crosswalks and stop lines.

Intersection 5: Kansas Avenue & Center Street

Overview

Kansas Avenue and Center Street is a signalized intersection (Figure 46). The east and west legs of Kansas Avenue consist of two through lanes in each direction and a dedicated left-turn lane. The north and south legs of Center Street consist of a single through lane in each direction and dedicated left-turn lane. Right-turns must be made from the right shared through lane for every approach. There is protected/permissive left-turn phasing for every approach.

Figure 45 - Aerial Image of Center Street Intersection

A mix of a attached and detached sidewalks are present on every leg approaching the intersection except for along the west side of the north leg of Center Street. There are no existing bike lanes on Kansas Avenue or Center Street. Daily traffic at the intersection is approximately 19,400 VPD on the west leg, 19,600 on the east leg, 4,100 VPD on the north leg, and 2,300 on the south leg. Brick and standard crosswalks are present on the east and south sides of the intersection, both equipped with pedestrian signals and countdown timers. The Center Street intersection saw 42 pedestrians and 12 bicyclists crossing the intersection over a 13-hour period.

Crash Review

Table 14 summarizes the crashes that occurred at the Kansas Avenue intersection with Center Street.

Total Crashes: 22 crashes (2 serious injury crashes)

Significant Crash Pattern: Rear end, angle – straight/following road

Table 14 – Kansas Avenue & Center Street Intersection Crash Summary

Kansas Avenue & Center Street Intersection	Serious Injury		Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%	Crashes	%
Angle - Merging	0	0%	0	0%	1	4.5%	1	4.5%
Angle - Right Turn	0	0%	0	0%	1	4.5%	1	4.5%
Angle - Straight/following road	1	4.5%	0	0%	5	22.7%	6	27.3%
Rear End	0	0%	4	18.2%	4	18.2%	8	36.4%
Head On	0	0%	0	0%	1	4.5%	1	4.5%

Sideswipe	0	0%	0	0%	3	13.6%	3	13.6%
Fixed Object	1	4.5%	0	0%	1	4.5%	2	9.1%
Grand Total	**2**	**9.1%**	**4**	**18.2%**	**16**	**72.7%**	**22**	**100%**

Rear end Crash Analysis: There were eight rear end crashes (4 injury crashes). All of the rear end crashes occurred on Kansas Avenue and was evenly split between the eastbound and westbound approaches. Most of the rear end crashes occurred in the afternoon between the hours of 2pm and 5pm (5) which includes the peak hour for traffic in the afternoon.

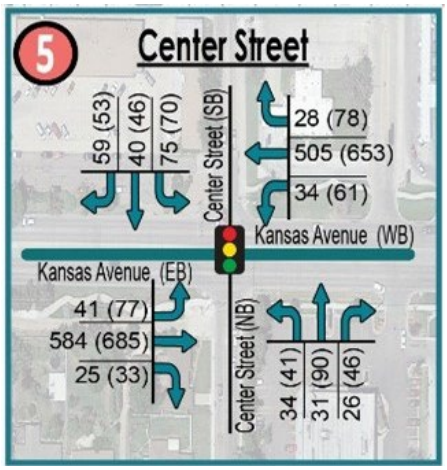


Figure 46 - Turning Movement Counts at Kansas Avenue and Center Street

Angle – Straight/following road Crash Analysis: There were six angle crashes where the vehicle maneuver before the crash was straight/following the road (1 serious injury crash). Angle crashes were recorded across all four approaches, with the first vehicle traveling eastbound (3), westbound (1), southbound (1), and northbound (1). The serious injury crash occurred when a vehicle traveling eastbound on Kansas Avenue turned left onto Center Street, failed to yield, and collided with a westbound vehicle. The driver of the vehicle turning left onto Center Street was 86 years old at the time of the crash, indicating that age may have played a factor in the crash and injury.

Fixed Object Crash Analysis: There were two fixed object crashes, one of which resulted in a serious injury. The serious injury crash occurred when a vehicle traveling eastbound on Kansas Avenue veered left across Kansas Avenue and struck a tree just before the Center Street intersection. At the time of the crash, the roadway surface was wet, it was dark out with street lights on as it was around 10pm, and the driver was 75 years old, all of which may have contributed to the crash and the injury severity.

Comments Provided by City Staff and Stakeholders

Observations

Traffic is operating at LOS B in the morning peak hour and LOS C in the afternoon peak hour.

Figure 47 - Photo of Kansas Ave and Center St intersection showing faded stop line

The RSA team made the following intersection observations during the field reviews:

- The curb ramp on the northwest corner of the intersection is missing truncated domes.

- The north leg of the intersection is missing a stop line (Figure 48).
- The stop lines on the north and south leg of the intersection were faded.
- The west and north legs of the intersection lack marked crosswalks and pedestrian signals.

Recommendations

Specific recommendations for the Kansas Avenue and Center Street intersection include:

- Review pedestrian phase clearance intervals and ensure they are calculated consistently for each crossing.
- Add a marked crosswalk and pedestrian signal phasing on the north leg to fill a gap in the pedestrian connectivity along the north side of Kansas Avenue. It appears that a curb ramp was relatively recently constructed on the northwest corner to cross Center Street. The traffic counts indicate that there are pedestrians crossing the north leg of the intersection.
- Consider also adding a marked crosswalk and pedestrian signal phasing on the west leg of the intersection.

Intersection 6: Kansas Avenue & Fleming Street

Overview

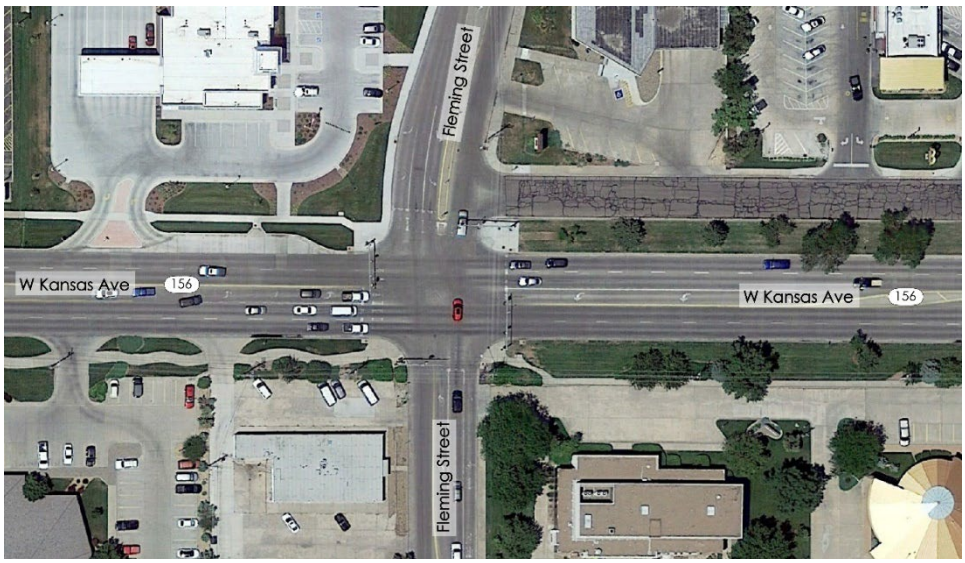


Figure 48 - Aerial Image of Fleming Street Intersection

Kansas Avenue and Fleming Street is a signalized intersection (Figure 49). The east and west legs of Kansas Avenue consist of two through lanes in each direction and a dedicated left-turn lane. Right turns onto Fleming Street must be made from the right shared through lane onto Fleming Street. The north and south legs of Fleming Street consist of a single through lane in each direction and dedicated left- and right-turn lanes onto Kansas Avenue. There is protected/permissive left-turn phasing for every approach.

A mix of attaached and detached sidewalks are present on every leg approaching the intersection. There are no existing bike lanes on Kansas Avenue or Fleming Street. Daily traffic at the intersection is approximately 20,300 VPD on the west leg, 18,800 on the east leg, 7,300 VPD on the north leg, and 6,800 on the south leg. Continental crosswalks are present on all four sides of the intersection, each equipped with pedestrian signals, though none feature countdown timers. The Fleming Street intersection saw the most pedetsrian activity at a signalized intersection on Kansas Avenue, with 48 pedestrians crossing the intersection over a 13-hour period. There were 2 bicyclist crossings during the same 13-hour period.

Crash Review

Table 15 summarizes the crashes that occurred at the Kansas Avenue intersection with Fleming Street.

Total Crashes: 49 crashes (15 injury crashes)

Significant Crash Pattern: Rear end, angle – straight/following road, and head on.

Table 15 – Kansas Avenue & Fleming Street Intersection Crash Summary

Kansas Avenue & Fleming Street Intersection	Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%
Angle – Left Turn	0	0%	1	2%	1	2%
Angle - Right Turn	0	0%	1	2%	1	2%
Angle - Straight/following road	7	14.3%	10	20.4%	17	34.7%

Rear End	4	8.2%	18	36.7%	22	44.9%
Head On	3	6.1%	2	4.1%	5	10.2%
Sideswipe	0	0%	1	2%	1	2%
Fixed Object	0	0%	1	2%	1	2%
Pedestrian	1	2%	0	0%	1	2%
Grand Total	**15**	**30.6%**	**34**	**69.4%**	**49**	**100%**

Rear end Crash Analysis: There were 22 rear end crashes (4 injury crashes). All of the rear end crashes occurred on Kansas Avenue in the eastbound (10) and westbound (12) directions. Some of these crashes may be attributable to congestion as the eastbound and westbound through approaches are operating at LOS C for both the morning and afternoon peak hours. All of the rear end crashes occurred in a seven hour period from 12pm to 7pm, with half of them occurring from 2pm to 6pm.

Angle – Straight/following road Crash Analysis: There were 17 angle crashes where the vehicle maneuver before the crash was straight/following the road (7 injury crashes). More than half of these angle crashes occurred when the first vehicle was driving northbound through the intersection and struck a vehicle heading either eastbound or westbound on Kansas Avenue (9, 3 injuries). Eastbound vehicles accounted for the second-highest number of angle crashes (5).

Head on Crash Analysis: There were five crashes that resulted from a head on collision (3 injury crashes). Head on crashes occurred in every approach direction eastbound (2), westbound (1), northbound (1), and southbound (1).

Pedestrian Crash Analysis: There was one pedestrian involved crash that resulted in an injury. A vehicle was traveling westbound on Kansas Avenue, turned left onto Fleming Street, then failed to yield the right of way to two pedestrians crossing Fleming Street and collided with them. The crash occurred around 5pm on a Thursday in daylight conditions.

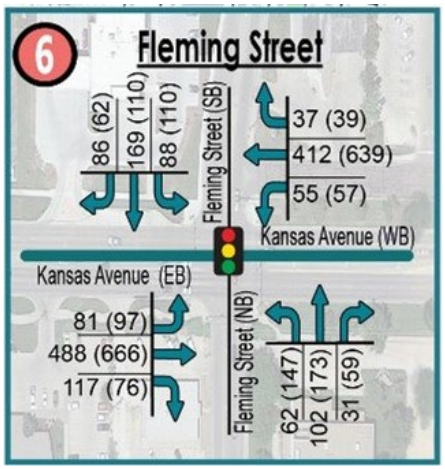


Figure 49 - Turning Movement Counts at Kansas Avenue and Fleming Street

Comments Provided by City Staff and Stakeholders

Observations

Traffic is operating at LOS C in both the morning and afternoon peak hour.

The RSA team made the following intersection observations during the field reviews:

- The crosswalk across the frontage road to reach the intersection was faded.
- The crosswalks and stop lines on all four legs of the intersection were faded (Figure 51**Error! Reference source not found.**).
- All four curb ramps at the intersection are missing truncated domes (Figure 51).
- Pedestrian signals exist but no countdown timers are present.

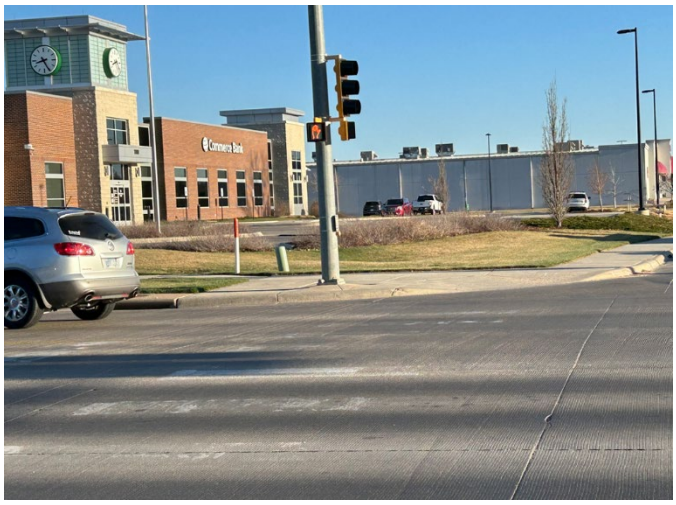


Figure 50 - Photo at Kansas Ave & Fleming St showing faded crosswalk and missing truncated domes

Recommendations

Specific recommendations for the Kansas Avenue and Fleming Street intersection include:

- Install pedestrian countdown timers.
- Use durable pavement markings for the crosswalks and stop lines.
- Consider removing the driveway access to the southeast of the intersection or converting it to right in/right out.

Intersection 7: Kansas Avenue, Campus Drive, & Schulman Avenue

Overview

Figure 51 - Aerial Image of Campus Drive Intersection

Kansas Avenue and Campus Drive is a signalized intersection. Schulman Avenue intersects Campus Drive just 180 feet south of Kansas Avenue (centerline-to-centerline spacing), with only right turns allowed to and from Schulman Avenue (Figure 52). The east and west legs of Kansas Avenue consist of two through lanes in each direction, a dedicated left-turn lane, and a channelized right-turn lane onto Campus Drive. The north leg of Campus Drive consists of two through lanes in each direction and a dedicated left-turn lane. Right-turns from the north leg of Campus Drive onto Kansas Avenue must be made from the right shared through lane. The south leg of Campus Drive consists of a single northbound through lane with dedicated left- and right-turn lanes and two southbound receiving lanes separated by a median. There is protected/permissive left-turn phasing for every approach. Schulman Avenue consists of a single through lane in each direction with right-in, right-out only access from/onto Campus Drive.

A mix of attached and detached sidewalks are present on every leg approaching the intersection. Despite the presence of sidewalks that lead to the northwest and southwest corners of the intersection, there are no marked/signalized crosswalks across any of the legs adjacent to these corners, effectively stranding pedestrians at these locations. Sidewalks exist along both sides of Schulman Avenue. There are no existing bike lanes on Kansas Avenue, Campus Drive, or Schulman Avenue near this intersection. The Talley Trail runs along Campus Drive and crosses Kansas Avenue at this intersection before continuing along Campus Drive and connecting to Schulman Avenue. Daily traffic at the intersection is approximately 18,800 VPD on the west leg, 14,100 on the east leg, 9,200 VPD on the north leg, and 11,900 on the south leg. Only one crosswalk exists along the east side of this intersection, serving as the crossing point for the Talley Trail. It is a continental crosswalk with pedestrian signals, however it lacks countdown timers. Schulman Avenue also has a continental crosswalk but it is unsignalized. The Campus Drive intersection saw 31 pedestrians and 7 bicyclists crossing the north, south, and east legs of the intersection over a 13-hour period, despite the fact that only the east leg has a marked/signalized crosswalk.

Crash Review

Table 16 summarizes the crashes that occurred at the Kansas Avenue intersection with Campus Drive.

Total Crashes: 45 crashes (1 serious injury crash)

Significant Crash Pattern: Rear end, angle – staight/following road, and sideswipe

Table 16 – Kansas Avenue & Campus Drive Intersection Crash Summary

Kansas Avenue & Campus Drive Intersection	Serious Injury		Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%	Crashes	%
Angle – Left Turn	0	0%	1	2.2%	1	2.2%	2	4.4%
Angle – Right Turn	0	0%	0	0%	1	2.2%	1	2.2%
Angle – Stopped in Traffic	0	0%	1	2.2%	0	0%	1	2.2%
Angle - Straight/following road	1	2.2%	5	11.1%	7	15.6%	13	28.9%
Rear End	0	0%	3	6.7%	13	28.9%	16	35.6%
Head On	0	0%	0	0%	2	4.4%	2	4.4%
Sideswipe	0	0%	1	2.2%	7	15.6%	8	17.8%
Fixed Object	0	0%	1	2.2%	1	2.2%	2	4.4%
Grand Total	**1**	**2.2%**	**12**	**26.7%**	**32**	**71.1%**	**45**	**100%**

Rear end Crash Analysis: There were 16 rear end crashes (3 injury crashes). Rear end crashes occurred in the eastbound (6), westbound (1), southbound (7), and northbound (4) directions. They were distributed throughout the afternoon hours with only one occurring around 9am and half of them occurring from 12pm to 4pm. Traffic is operating at an LOS C in the afternoon for all approaches heading through the intersection.

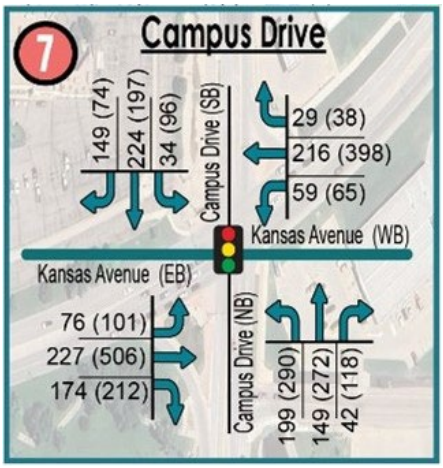


Figure 52 - Turning Movement Counts at Kansas Avenue and Campus Drive

Angle – Straight/following road Crash Analysis: There were 13 angle crashes where the vehicle maneuver before the crash was straight/following the road (1 serious injury crash, 5 injury crashes). Angle – straight/following the road crashes occurred in the eastbound (6), northbound (2), and southbound (5) directions.

In September 2022, a serious injury crash occurred when a vehicle traveling northbound through the intersection struck a vehicle traveling westbound and pushed it into the guardrail on the northwest side of the intersection. Further contributing circumstance information was not provided in the crash report however the westbound vehicle driver was driving without a license.

Sideswipe Crash Analysis: There were 8 sideswipe crashes (1 injury crash). Sideswipe crashes occurrred in the eastbound (4), westbound (2), northbound (2), and southbound (1). The most common maneuver prior to the crash was changing lanes, which occurred 4 times.

There were 5 crashes that occurred at the intersection of Campus Drive and Schulman Avenue,

none of which resulted in an injury. Two of these crashes were angle – straight/following the road crashes where a vehicle traveling northbound on Campus Drive collided with a vehicle turning onto Campus Drive from Schulman Avenue

Comments Provided by City Staff and Stakeholders

Observations

Traffic is operating at LOS B in the morning peak hour and LOS C in the afternoon peak hour.

The RSA team made the following intersection observations during the field reviews:

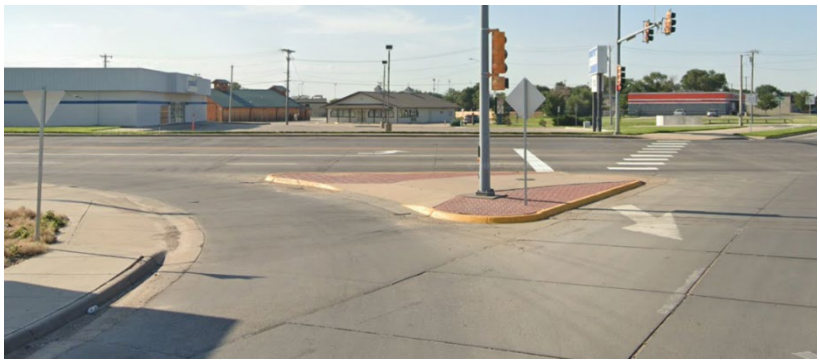


Figure 53 – Photo of Kansas Ave & Campus Dr showing missing pedestrian connection across channelized turning lane

- There is no marked crosswalk across the channelized turn lane to connect to the existing crosswalk on the east leg of the intersection (Figure 54).
- All curb ramps at the intersection are missing truncated domes.
- Pedestrian signals exist only on the east leg, but no countdown timers are present.
- There are no yield lines at the yield sign for either of the channelized turn lanes.
- There are obstructions on the Talley Trail to the north of the intersection.
- The north leg of the intersection has two receiving lanes and the outside lane merges into the inside lane
- Vehicle queues on the northbound approach can extend beyond the Schulman Avenue intersection.

Recommendations

Specific recommendations for the Kansas Avenue and Campus Drive intersection include:

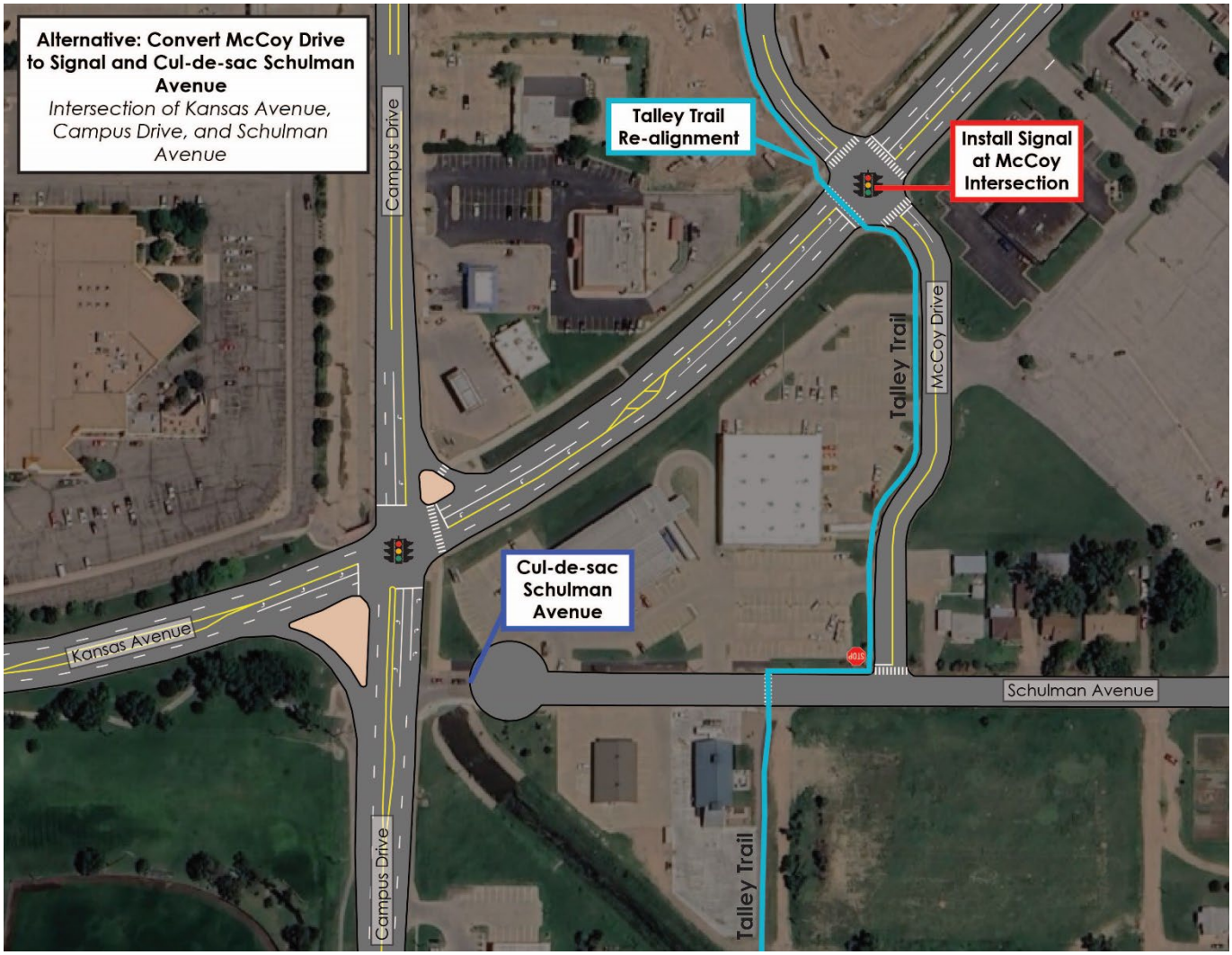
- Consider raised crosswalks within the channelized right-turn lanes.
- Add pedestrian crossings across all legs of the intersection. The curbline may need to be pushed out on the northwest corner, to make room for curb ramps, by eliminating the outside lane on the southbound approach.
- Consider removing the merge lane on the north leg of the intersection.

Additionally, various options were considered to improve the safety and operation of the Campus Dr/Schulman Ave intersection, two of which are discussed below:

Cul-de-sac Schulman Avenue and Install Signal at Kansas Ave/McCoy Dr

By cul-de-saccing Schulman Avenue, its intersection with Campus Drive would be eliminated along with the traffic safety and operational issues associated with the closely spaced intersections of Campus Dr/Kansas Ave and Campus Dr/Schulman Ave. Signalizing the intersection of Kansas Ave/McCoy Dr would facilitate the safe re-routing of traffic from WB Schulman Ave to WB Kansas Ave. Furthermore, with a signal at Kansas Ave/McCoy Dr, the Talley Trail could be re-routed from Campus Drive to McCoy Drive.

Although the Kansas Ave/McCoy Dr intersection is only 760 feet and 900 feet from the existing traffic signals to the west and east, respecitvely, a traffic signal progression analysis shows that traffic flow along Kansas Avenue would not be significantly impacted by an additional signal at McCoy Drive, if the traffic signals along the corridor are also coordinated in conjunction with the signal installation.



Realign Schulman Avenue to Provide Full Access at Campus Drive

Another option was considered that would not only maintain the Schulman Avenue access to/from Campus Drive, but upgrade it from right-turn-only to full-movement access. A conceptual layout of this option is shown in Figure 55.

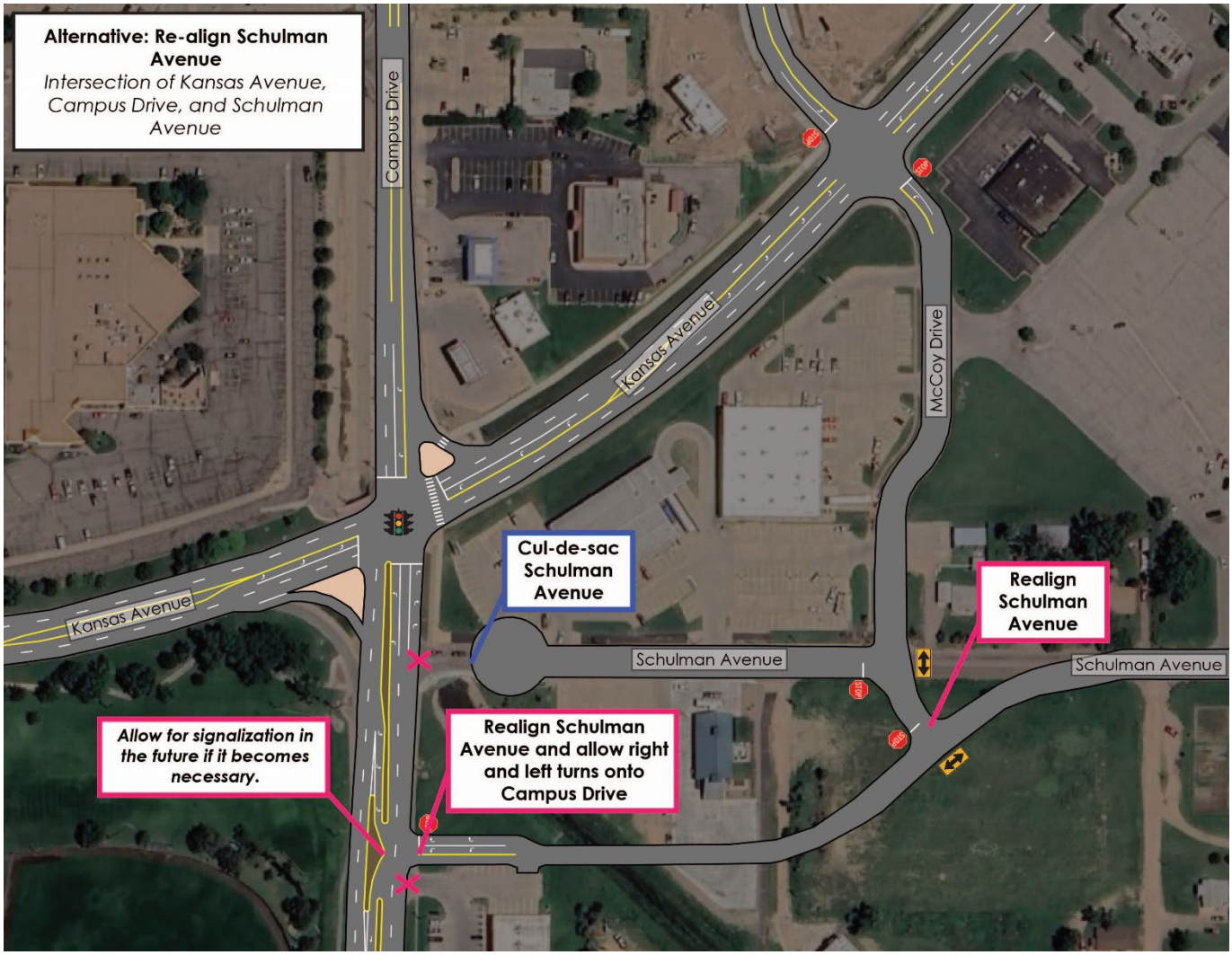


Figure 54 - Conceptual design for Schulman Ave/Campus Drive alternative

With this concept, the western end of Schulman Avenue would be re-aligned to swing to the south, with its intersection at Campus Drive shifted approximately 225 feet to the south. To provide acceptable levels of service and safer operations, the intersection would be constructed as a Channelized-T, in which left-turning drivers from Schulman Avenue would yield to NB traffic and SB left-turning traffic on Campus Drive, and then merge into SB traffic.

Table 17 shows the expected intersection LOS at Kansas Ave/Campus Dr and Campus Dr/Schulman Ave for both the existing configuration and with the proposed realignment of Schulman Avenue. The LOS analysis was completed using projected 2044 PM peak-hour volumes, which were developed by factoring the existing traffic volumes by an annual growth rate of 0.5-1.0%/year, as well as assuming the magnitude of traffic that would re-route from McCoy Drive and U.S. 83 to use the newly-afforded left-turn movements at the Campus Dr/Schulman Ave intersection.

Table 17 - Traffic Operations analysis for Kansas Ave/Campus Drive alternatives in the 2044 PM Peak Hour

2044 PM Peak Hour Level of Service		
Intersection	Existing Configuration	Schulman Realignment
Kansas Ave/Campus Dr	C (23.6 sec) – overall intersection	C (22.9 sec) – overall intersection
Campus Dr/Schulman Ave	B (12.9 sec) – WB RT	C (24.4 sec) – WB LT

As shown in the table, as a full-movement unsignalized channelized-T intersection, the Campus Dr/Schulman Ave intersection is expected to operate at LOS C for the westbound left-turn movement. Although the analysis of this concept shows that it can be expected to operate with a very favorable level of service as a stop sign-controlled intersection, it is recommended that it be designed such that it could easily be convereted to a signalized intersection should the need arise.

Refer to the Talley Trail RSA report for recommendations directly related to the Talley Trail.

Intersection 8: Kansas Avenue & Target/GC Plaza Access

Overview

Figure 55 - Aerial Image of Target/GC Plaza Access Intersection

Kansas Avenue and the Target/Garden City Plaza Access points is a signalized intersection (Figure 56). The east leg of Kansas Avenue consists of two through lanes in each direction, a dedicated left-turn lane, and a channelized right-turn lane into Target. The west leg of Kansas Avenue consists of two through lanes in both directions and a dedicated left-turn lane. The north leg accessing Target consists of a single through lane in each direction and dedicated left- and right-turn lanes. The south leg accessing Garden City Plaza consists of a single through lane in each direction and a dedicated left-turn lane. Right-turns must be made from the right shared through lane on the west and south legs of the intersection. There is protected-only left-turn phasing for the east and west appraoches and protected/permissive left-turn phasing for the north and south approaches.

Sidewalks are present along both sides of Kansas Avenue approaching the intersection and on the north side of Kansas Avenue the sidewalks are 10 feet wide. There are no sidewalks along the access drives for Target or Garden City Plaza. There are no existing bike lanes on Kansas Avenue or the access drives for Target and Garden City Plaza. Daily traffic at the intersection is approximately 12,100 VPD on the west leg, 11,900 on the east leg, 1,700 VPD on the north leg, and 1,100 on the south leg. Standard crosswalks with pedestrian signals and countdown timers are present on the north, south, and west legs of the intersection. The Target/Garden City Plaza intersection saw 19 pedestrians and 3 bicyclists crossing the intersection over a 13-hour period, which included some crossings of the east leg despite its lack of a marked/signalized crosswalk.

Crash Review

Table 18 summarizes the crashes that occurred at the Kansas Avenue intersection with the Target/Garden City Plaza Access points.

Total Crashes: 1 crash

Significant Crash Pattern: None.

Table 18 – Kansas Avenue & Target Access Intersection Crash Summary

Kansas Avenue & Target Access Intersection	PDO		Total	
	Crashes	%	Crashes	%

Rear End	1	100%	1	100%
Grand Total	**1**	**100%**	**1**	**100%**

Comments Provided by City Staff and Stakeholders

Observations

Traffic is operating at LOS A in the morning peak hour and LOS B in the afternoon peak hour.

The RSA team made the following intersection observations during the field reviews:

- The stop lines on all four legs of the intersection were faded.
- The crosswalks on the north, south, and west legs of the intersection were faded (Figure 58).

Figure 56 - Turning Movement Counts at Kansas Avenue and Target/GC Plaza Access

Recommendations

Specific recommendations for the Kansas Avenue and Target/Garden City Plaza entrance intersection include:

- Use durable pavement markings for the crosswalks and stop lines.
- Consider adding a marked/signalized crosswalk on the east leg.

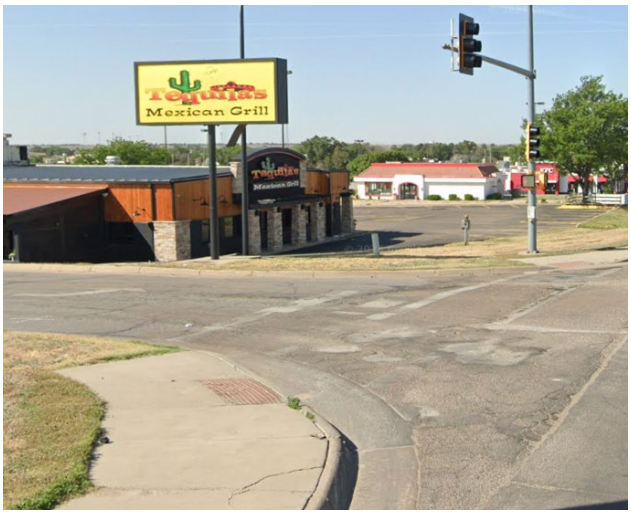


Figure 57 - Photo at Kansas Ave & Garden City Plaza access drive showing poor crosswalk conditions

Intersection 9: Kansas Avenue & U.S. 83 Southbound

Overview

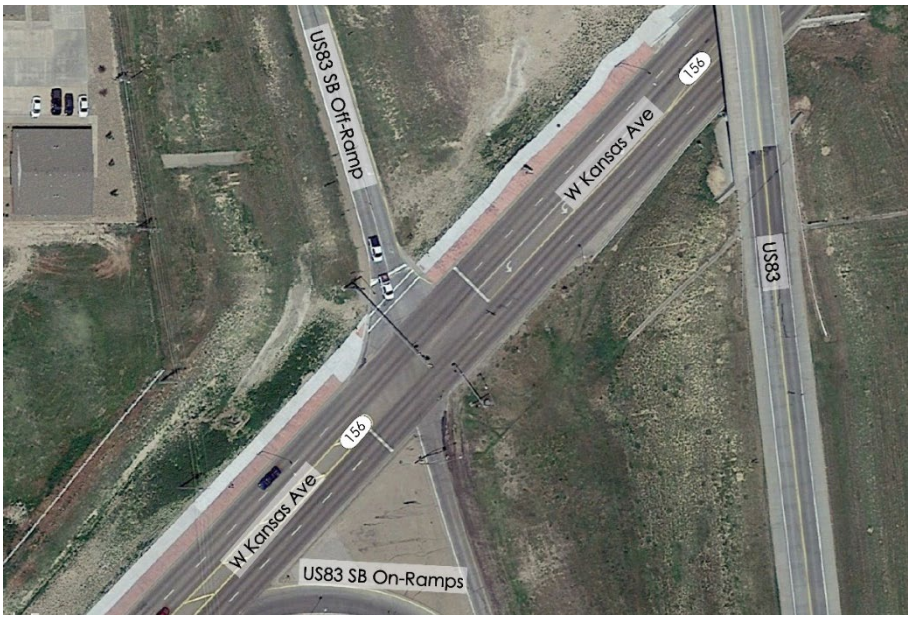


Figure 58 - Aerial Image of U.S. 83 Southbound On/Off-Ramps Intersection

Kansas Avenue runs underneath U.S. 83, resulting in a grade separation that requires on- and off-ramps for access. The intersection of Kansas Avenue and the southbound on- and off-ramps of U.S. 83 is a signalized intersection (Figure 59). The east leg of Kansas Avenue consists of two through lanes in each direction and a dedicated left-turn lane onto the U.S. 83 Southbound on-ramp. The west leg of Kansas Avenue consists of two through lanes in each direction separated by a flush median marking with a channelized right-turn lane onto the the U.S. 83 Southbound on-ramp. The north leg of the intersection consists of the U.S. 83 Southbound off-ramp which has dedicated left- and right-turn lanes. The south leg of the intersection consists of the U.S. 83 Southbound on-ramp which has a single lane. All turning movements at this intersection occur via dedicated turning lanes. The eastern appraoch has protected/permissive left-turn phasing and the northern leg has permitted turning movements.

Attached sidewalks are present along the north side Kansas Avenue approaching the intersection but are absent along the south side. There are no sidewalks along the U.S. 83 on- and off-ramps. There are no existing bike lanes on Kansas Avenue or the U.S. 83 ramps. Daily traffic at the intersection is approximately 11,700 VPD on the west leg, 11,000 on the east leg, 1,600 VPD on the north leg, and 2,500 on the south leg. A standard crosswalk with pedestrian signals and countdown timers is present on the north leg of the intersection. The U.S. 83 Southbound ramps intersection saw 9 pedestrians and 4 bicyclists crossing the intersection over a 13-hour period. Despite the lack of pedestrian infrastructure, two pedestrians were counted crossing the south leg of the intersection.

Crash Review

Table 19 summarzies the crashes that occurred at the Kansas Avenue intersection with the U.S. 83 Southbound On- and Off-Ramps.

Total Crashes: 10 crashes (4 injury crashes)

Significant Crash Pattern: Angle – straight/following road

Table 19 – Kansas Avenue & U.S. 83 SB Ramps Intersection Crash Summary

Kansas Avenue & U.S. 83 SB	Injury	PDO	Total

Ramps Intersection	Crashes	%	Crashes	%	Crashes	%
Angle - Straight/following road	2	20%	5	50%	7	70%
Rear End	2	20%	1	10%	3	30%
Grand Total	**4**	**40%**	**6**	**60%**	**10**	**100%**

Angle – Straight/following road Crash Analysis: There were seven angle crashes where the vehicle maneuver before the crash was straight/following the road (2 injury crashes). Most of these crashes occurred in the afternoon from 2pm to 6pm (6). In all of the crashes, a vehicle was traveling southbound through the intersection and collided with a vehicle heading westbound or eastbound on Kansas Avenue. One of the vehicles failed to yield to a red light in either the eastbound (3), westbound (1), and southbound (3) approaches.

Comments Provided by City Staff and Stakeholders

Observations

Traffic is operating at LOS A for both the morning and afternoon peak hour.

The RSA team made the following intersection observations during the field reviews:

- The stop line on the off-ramp (north leg) was starting to fade.
- There are no sidewalks on the south side of Kansas Avenue here and subsequently no pedestrian signal heads for the east, west, and south legs of the intersection.

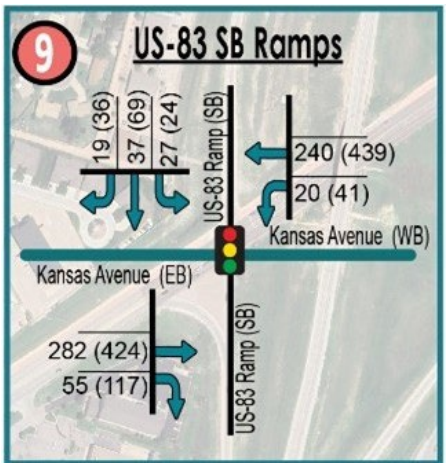


Figure 59 - Turning Movement Counts at Kansas Avenue and U.S. 83 SB

Recommendations

Specific recommendations for the Kansas Avenue and U.S. 83 Southbound ramp intersection include:

- Consider adding additional pedestrian infrastructure at the intersection, particularly across the south leg, in conjunction with an extension of the sidewalk along the south side of Kansas Avenue that currently terminates at the driveway for Staples and Comfort Inn 650 feet to the west.

Intersection 10: Kansas Avenue & U.S. 83 Northbound

Overview

Figure 60 - Aerial Image of U.S. 83 Northbound On/Off-Ramps Intersection

Kansas Avenue runs underneath U.S. 83, resulting in a grade separation that requires on- and off-ramps for access. The intersection of Kansas Avenue and the northbound on- and off-ramps of U.S. 83 is a signalized intersection (Figure 61). The east leg of Kansas Avenue consists of two through lanes in each direction separated by a flush median marking. Right-turns onto the U.S. 83 Northbound on-ramp must be made from the right shared through lane. The west leg of Kansas Avenue consists of two through lanes in each direction with a dedicated left-turn lane onto the the U.S. 83 Northbound on-ramp. The north leg of the intersection consists of the U.S. 83 Northbound on-ramp which consists of a single lane The south leg of the intersection consists of the U.S. 83 Northbound off-ramp which consists of a dedicated right-turn lane and a straight or left-turn lane. The westerm appraoch has protected/permissive left-turn phasing and the southern leg has permitted turning movements.

Attached and detached sidewalks are present along the north side Kansas Avenue approaching the intersection but are absent along the south side. There are no sidewalks along the U.S. 83 on- and off-ramps. There are no existing bike lanes on Kansas Avenue or the U.S. 83 ramps. Daily traffic at the intersection is approximately 11,100 VPD on the west leg, 11,300 on the east leg, 1,600 VPD on the north leg, and 1,800 on the south leg. Pedestrian signals with countdown timers exist on the north leg of the intersection but no pavement markings are present. The U.S. 83 Northbound ramps intersection saw 8 pedestrians and 4 bicyclists crossing the intersection over a 13-hour period. Despite the lack of pedestrian infrastructure, two pedestrians were counted crossing the south leg of the intersection.

Crash Review

Table 20 summarizes the crashes that occurred at the Kansas Avenue intersection with the U.S. 83 Northbound On- and Off-Ramps.

Total Crashes: 6 crashes (1 injury crash)

Significant Crash Pattern: Angle – None.

Table 20 – Kansas Avenue & U.S. 83 NB Ramps Intersection Crash Summary

Kansas Avenue & U.S. 83 NB	Injury	PDO	Total

Ramps Intersection	Crashes	%	Crashes	%	Crashes	%
Angle - Straight/following road	0	0%	2	33.3%	2	33.3%
Rear End	0	0%	2	33.3%	2	33.3%
Fixed Object	1	16.7%	1	16.7%	2	33.3%
Grand Total	**1**	**16.7%**	**5**	**83.3%**	**6**	**100%**

Comments Provided by City Staff and Stakeholders

Observations

Traffic is operating at LOS A in both the morning and afternoon peak hour.

The RSA team made the following intersection observations during the field reviews:

- The crosswalk on the north leg had faded away.
- The stop line on the off-ramp (south leg) was starting to fade.
- There are no sidewalks on the south side of Kansas Avenue here and subsequently no pedestrian signal heads for the east, west, and south legs of the intersection.

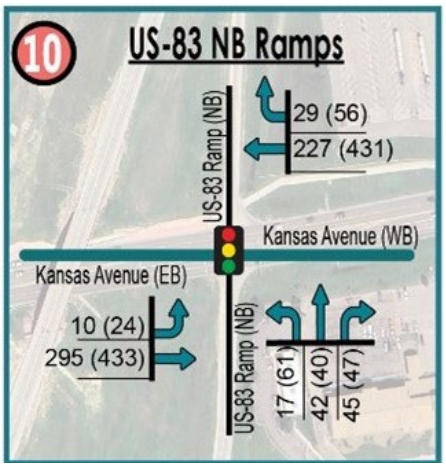


Figure 61 - Turning Movement Counts at Kansas Avenue and U.S. 83 NB

Recommendations

Specific recommendations for the Kansas Avenue and U.S. 83 Northbound ramp intersection include:

- Consider adding additional pedestrian infrastructure at the intersection, particularly across the south leg, in conjunction with an extension of the sidewalk along the south side of Kansas Avenue that currently terminates at the driveway for Staples and Comfort Inn 1,400 feet to the west.

Intersection 11: Kansas Avenue & Leslie Road

Overview

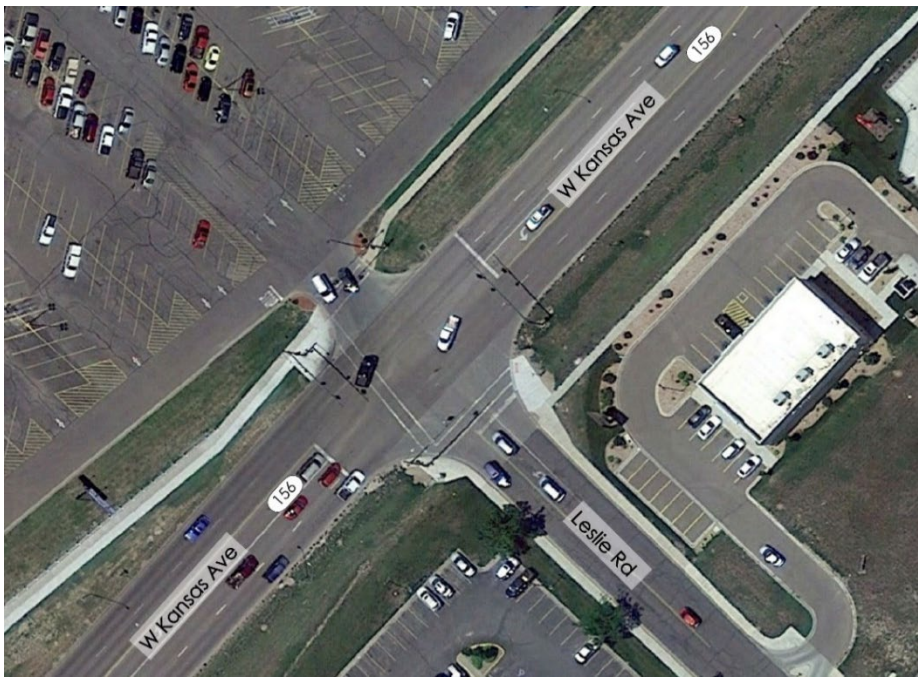


Figure 62 - Aerial Image of Leslie Road Intersection

Kansas Avenue and Leslie Road is a signalized intersection (Figure 63). The east and west legs of Kansas Avenue consist of two through lanes in each direction and a dedicated left-turn lane. The north leg of Leslie Road feeds into the Walmart parking lot and consists of a single through lane in each direction and a dedicated left-turn lane. The south leg of the Leslie Road consists of a single thorugh lane in each direction and a dedicated left-turn lane. Right-turns must be made from the right shared through lane for every approach. There is protected/permissive left-turn phasing for every approach.

A mix of a attached and detached sidewalks are present on the east, south, and west legs of the itnersection. There are no existing bike lanes on Kansas Avenue or Leslie Road. Daily traffic at the intersection is approximately 11,200 VPD on the west leg, 5,100 on the east leg, 4,200 VPD on the north leg, and 6,600 on the south leg. A mix of standard and ladder crosswalks are present on the north, south, and west sides of the intersection, all equipped with pedestrian signals and countdown timers. The Leslie Road intersection saw 27 pedestrians and 4 bicyclists crossing the intersection over a 13-hour period.

Crash Review

Table 21 summarizes the crashes that occurred at the Kansas Avenue intersection with Leslie Road.

Total Crashes: 15 crashes (1 serious injury crash)

Significant Crash Pattern: None.

Table 21 – Kansas Avenue & Leslie Road Intersection Crash Summary

Kansas Avenue & Leslie Road Intersection	Serious Injury		Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%	Crashes	%
Angle – Left Turn	0	0%	1	6.7%	0	0%	1	6.7%
Angle – Slowing or Stopping	0	0%	0	0%	1	6.7%	1	6.7%

Angle – Stopped awaiting turn	0	0%	0	0%	1	6.7%	1	6.7%
Angle – Straight/following road	0	0%	0	0%	1	6.7%	1	6.7%
Backed Into	0	0%	0	0%	2	13.3%	2	13.3%
Rear End	0	0%	0	0%	3	20%	3	20%
Head On	1	6.7%	0	0%	0	0%	1	6.7%
Sideswipe	0	0%	0	0%	3	20%	3	20%
Fixed Object	0	0%	1	6.7%	1	6.7%	2	13.3%
Grand Total	**1**	**6.7%**	**2**	**13.3%**	**12**	**80%**	**15**	**100%**

Head On Crash Analysis: There was one head on crash that resulted in a serious injury. The crash occurred when a vehicle heading westbound on Kansas Avenue attempted to turn left onto Leslie Road, failed to yield to oncoming traffic, and collided with a vehicle traveling eastbound on Kansas Avenue. At the time of the crash both vehicles had a green light but the left turning vehicle had to yield on green but admitted to believing they could make the turn before the eastbound vehicle approached the intersection. The crash occurred around 9pm on a Sunday.

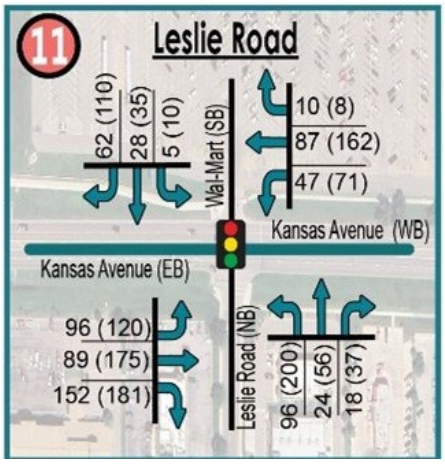


Figure 63 - Turning Movement Counts at Kansas Avenue and Leslie Road

Comments Provided by City Staff and Stakeholders

A marked/signalized crosswalk is planned to be added on the east leg of this intersection.

Observations

Traffic is operating at LOS B in both the morning and afternoon peak hours.

The RSA team made the following intersection observations during the field reviews:

- The curb ramp on the southwest corner of the intersection is missing truncated domes (Figure 65).
- There is no pedestrian signal head, curb ramp or marked crosswalk for the east leg of the intersection.

- The stop lines on the north and south legs of the intersection were faded.
- The crosswalks on the north, south, and west legs of the intersection were faded (Figure 65).

,

Recommendations

There are no specific recommendations for this intersection. Refer to corridor-wide recommendations and already planned improvements.

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Figure 64 - Photo at Kansas Ave & Leslie Rd showing faded crosswalks and missing truncated domes

Specific Intersection Recommendations

The recommendations in Table 22 are based on the collaborative effort of the RSA multidisciplinary team and stakeholder interviews, as well as on the team's experience driving and walking the corridor. Each signalized intersection received a number of recommendations and are numbered the same as in the previous analysis from west to east:

1. Kansas Avenue & Taylor Avenue
2. Kansas Avenue & 8th Street
3. Kansas Avenue & Main Street
4. Kansas Avenue & 3rd Street
5. Kansas Avenue & Center Street
6. Kansas Avenue & Fleming Street
7. Kansas Avenue & Campus Drive
8. Kansas Avenue & Target Access
9. Kansas Avenue & U.S. 83 SB
10. Kansas Avenue & U.S. 83 NB
11. Kansas Avenue & Leslie Road

The time frame for each recommendation is broken down by into three categories:

- Short-term: 0 to 3 years
- Medium-term: 3 to 5 years
- Long-term: 5 to 10 years

The cost estimates for each recommendation is given at a high level 10% planning phase and may fluctuate based on the final design. The total cost estimates are broken down into three categories:

- Low cost: Less than $50,000
- Medium cost: Between $50,000 and $200,000
- High cost: Greater than $200,000

Recommendations	Time Frame	Cost	Taylor Ave	8th St	Main St	3rd St	Center St	Fleming St	Campus Dr	Target Access	U.S. 83 SB	U.S. 83 NB	Leslie Rd
Repaint faded or missing stop lines	Short	Low	-	-	-	X	X	X	-	X	-	-	-
Add/repaint crosswalk markings	Short	Low		X		X	X	X	X	X	X	X	-
Check/adjust pedestrian crossing phase length	Short	Low	X	-	-	-	X	-	-	-	-	-	-
Add sidewalks where applicable	Long	Medium	-	-	-	-	X	-	-	-	-	-	-
Install pedestrian countdown timers on pedestrian phase signal heads	Medium	Medium	-	X	-	X	-	X	-	-	X	-	-
Add yield lines in channelized turn lanes	Short	Low	-	X	-	-	-	-	X	-	-	-	-
Remove nearby driveway access	Medium	Medium to High	X	-	-	-	X	-	-	-	-	-	-

Table 22 - Specific Recommendations for Each Signalized Intersection

Segment Specific Analysis

Segment Specific Analysis

Segment 1: Taylor Avenue/U.S. 83B to Main Street

Overview

Figure 65 - Aerial View of Kansas Ave between Taylor Avenue/U.S. 83B & Main Street

The Kansas Avenue segment from Taylor Avenue/U.S. 83B to Main Street is a four-lane road with no dedicated turning lanes (Figure 66) and is 0.65 miles long. The area directly adjacent to Kansas Avenue comprises commercial land uses with a few residential lots mixed in. The commercial activity along this segment varies including auto parts stores, car dealerships, gas stations, and a variety of locally-owned businesses. Abe Hubert Elementary School is located on the north side of Kansas Avenue at the intersection with 8th Street. Residential land uses are present to both the north and south beyond the commercial land uses that are directly adjacent to Kansas Avenue.

There are 5-foot attached sidewalks on the north side of the street and between 13th St to10th St and 8th St to Main St on the south side of the street. The south side of the street is missing sidewalks between Taylor Avenue/U.S. 83B to 13th St and between 10th St and 8th St. There are some obstructions in the sidewalks on both sides of the street including power/street light poles, street signs, etc. There are two unsignalized crosswalks in this segment across Kansas Ave at 11th and 12th Streets. There are no bike lanes or paths along Kansas Avenue. The daily traffic volume for this section of Kansas Avenue is approximately 11,700 VPD.

Crash Review

Table 23 summarizes the crashes that occurred on Kansas Avenue from Taylor Avenue to Main Street. Over half of the crashes (58%) occurred at unsignalized intersections, while 33 percent occurred in-between intersections and three crashes (8%) occurred at driveways (Figure 67).

Total Crashes: 36 (1 serious injury crash, 4 injury crashes)

Significant Crash Pattern: Rear end and angle – straight following the road

Table 23 - Taylor Avenue to Main Street Segment Crash Summary

Kansas - Taylor Avenue to Main Street	Serious Injury		Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%	Crashes	%
Angle - Left Turn	0	0%	0	0%	1	2.8%	1	2.8%

Angle - Straight/following road	0	0%	1	2.8%	7	19.4%	8	22.2%
Head On	1	2.8%	1	2.8%	1	2.8%	3	8.3%
Rear End	0	0%	1	2.8%	10	27.8%	11	30.6%
Sideswipe	0	0%	0	0%	2	5.6%	2	5.6%
Unknown	0	0%	0	0%	1	2.8%	1	2.8%
Parked Motor Vehicle	0	0%	0	0%	2	5.6%	2	5.6%
Fixed Object	0	0%	0	0%	5	13.9%	5	13.9%
Pedestrian	0	0%	1	2.8%	0	0%	1	2.8%
Unknown	0	0%	0	0%	2	5.6%	2	5.6%
Grand Total	**1**	**2.8%**	**4**	**11.1%**	**31**	**86.1%**	**36**	**100%**

Rear end Crash Analysis: There were 11 rear end crashes (1 injury crash). Rear end crashes occurred mostly in the eastbound direction (7).

Angle – Straight/following road Crash Analysis: There were eight angle crashes where the vehicle maneuver before the crash was straight/following the road (1 injury crash). These crashes occurred at five separate unsignalized intersections across the corridor, 10th Street (1), 11th Street (1), 12th Street (2), 13th Street (2), and Mildred Street (2).

Head on Crash Analysis: There were three head on crashes (1 serious injury crash, 1 injury crash). A serious injury crash occurred when a vehicle was driving westbound on Kansas Avenue, attempted to turn north onto 12th Street, but their vehicle turned south and collided with a vehicle traveling eastbound on Kansas Avenue. The driver of the westbound vehicle was 18 years old, which may have contributed to the crash. The driver of the eastbound vehicle experienced serious injuries as a result of the crash.

Pedestrian Crash Analysis: A pedestrian was struck while crossing Kansas Avenue north near 12th Street, by a vehicle heading westbound. The vehicle drove off after the crash. The crash occurred around noon and resulted in an injury to the pedestrian. The crossing is marked with a brick material and there are truncated domes on both sides of the crossing.

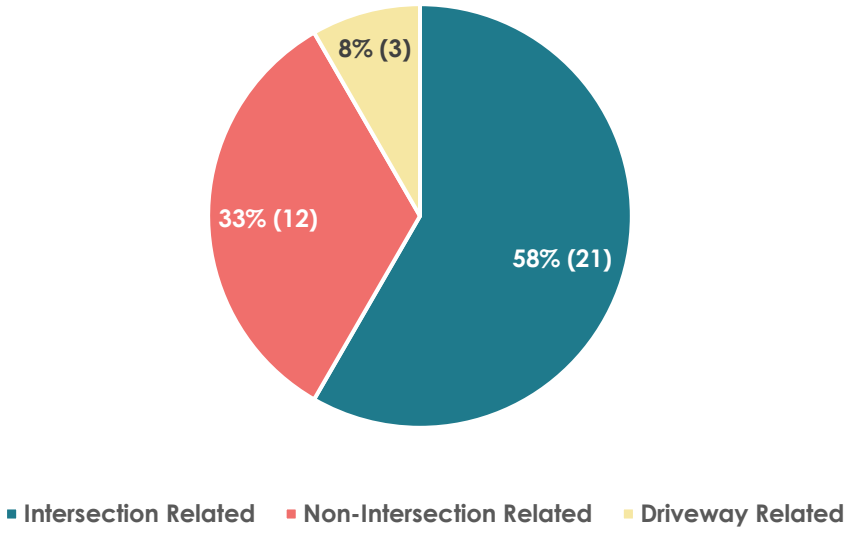


Figure 66 – Kansas Avenue - Taylor Avenue to Main Street Crash Location

Figure 68 summarizes the crashes at unsignalized intersections between Taylor Avenue and Main Street. The 12th Street intersection had the most crashes in this segment (7) and included a serious injury crash. 12th Street is about 800 feet east of the Taylor Avenue intersection. The Mildred Street intersection saw the second most crashes and is about 180 feet east of the Taylor Avenue intersection.

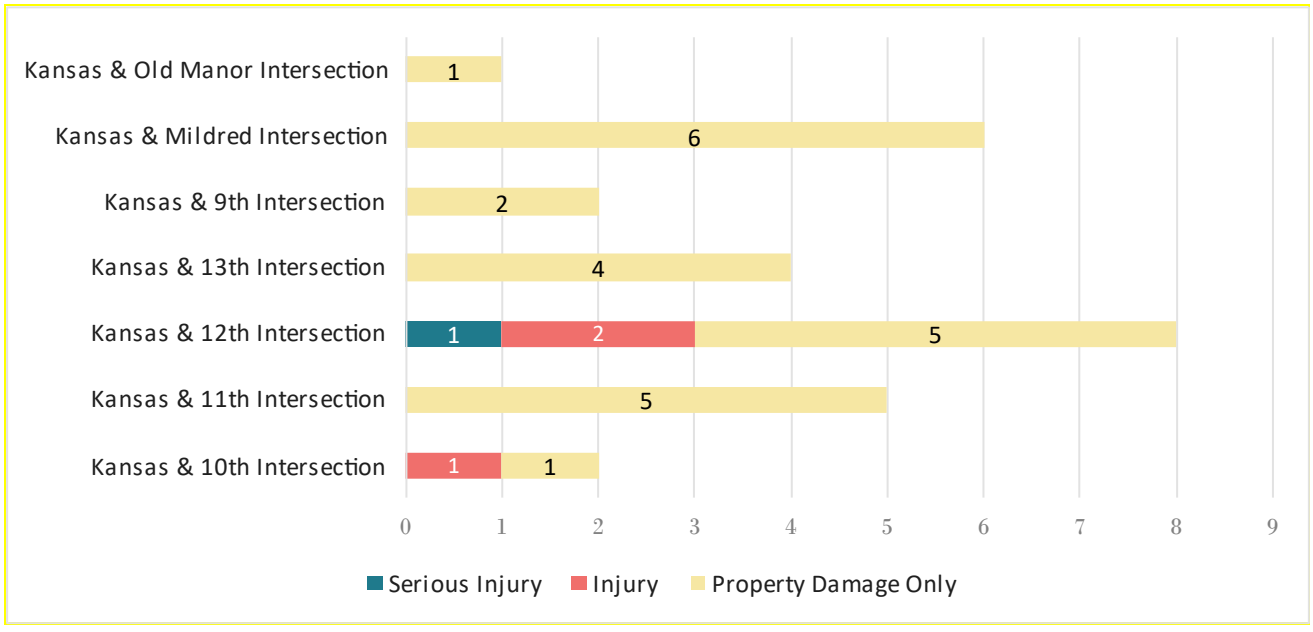


Figure 67 - Crashes at unsignalized intersections between Taylor Avenue and Main Street

Comments Provided by City Staff and Stakeholders

Observations

There are 37 driveways connecting to Kansas Avenue on this segment with a driveway density of

5.39 per 500 feet. This is well above average in comparison to the other corridor segments and the driveways connect to mostly commercial uses, with some connecting to residential. There are also 10 unsignalized intersection locations on this segment with a density of about 1.46 driveways per 500 feet. This is the highest intersection density compared to other segments on the Kansas Avenue corridor.

The RSA team made the following intersection observations during the field reviews:

- There are several curb ramps along the segment that are missing truncated domes (Figure 69).
- The crosswalk across Kansas Avenue at 12th Street has colored pavers, but no warning signage or RRFB
- The northeast corner of 10th St is missing a curb ramp.
- There are sidewalk gaps along the south side of Kansas Avenue between Taylor Ave/U.S. 83B and 13th St and between 10th St and 8th St.
- There are no stop lines at side street intersections.
- There are several signs obstructing the sidewalk along Kansas Avenue (Figure 70).
- There is no two-way left-turn lane in this segment which could contribute to some of the crashes.

Figure 68 - Photo of Kansas Avenue showing missing truncated domes at Hattie St

Figure 69 - Photo showing signs obstructing the sidewalk along Kansas Avenue

Recommendations

Specific recommendations for the segment of Kansas Avenue from Taylor Avenue to Main Street include:

- Conduct a thorough study of pedestrian improvements. Identify where marked pedestrian crossings should be installed and where existing ones should be removed. Utilize proven safety countermeasures such as RRFBs and HAWK signals.
- Add sidewalks on the south side of Kansas Avenue.
- Consider adding a two-way left turn lane through either a road diet or widening the road.

Segment 2: Main Street to 3rd Street

Overview

Figure 70 - Aerial View of Kansas Ave between Main Street and 3rd Street

The Kansas Avenue segment from Main Street to 3rd Street is a four lane road with a two-way left turning lane (TWLTL) throughout (Figure 71) and is 0.33 miles long. The area immediately adjacent to this segment of Kansas Avenue is composed of commercial land uses including the First United Methodist Church, several food establishements, gas stations, and locally owned businesses. Despite being commercial zoned, the majority of the land uses on the south side of the segment are residential.

There is a mix of 3-foot attached and detached sidewalks on both sides of the street, with street light poles running along the outside edge of the sidewalks on the south side of the street. There are three marked crosswalks across stop sign-controlled side streets along this section of Kansas Avenue: one on the south leg of 6th St, one on the south leg of 5th St, and one on the north leg of 5th St. There are no bike lanes or paths along Kansas Avenue. The daily traffic volume for this section of Kansas Avenue is approximately 19,100 VPD.

Crash Review

Table 24 summarizes the crashes that occurred on Kansas Avenue from Main Street to 3rd Street. Just over half (55%) of the crashes on this segment occur at non-signalized intersections with the rest occurring at non-intersection locations (Figure 72).

Total Crashes: 11

Significant Crash Pattern: None.

Table 24 –Main Street to 3rd Streeet Segment Crash Summary

Kansas – Main Street to 3rd Street	PDO		Total	
	Crashes	%	Crashes	%
Angle - Left Turn	1	9.1%	1	9.1%
Angle - Right Turn	1	9.1%	1	9.1%
Angle – Straight/following road	2	18.2%	2	18.2%

Head On	1	9.1%	1	9.1%
Rear End	1	9.1%	1	9.1%
Sideswipe	1	9.1%	1	9.1%
Fixed Object	1	9.1%	1	9.1%
Overturned	1	9.1%	1	9.1%
Parked Motor Vehicle	2	18.2%	2	18.2%
Grand Total	**11**	**100%**	**11**	**100%**

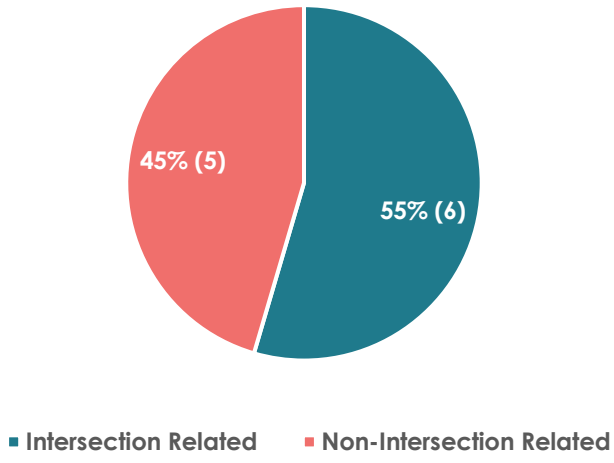


Figure 71 – Kansas Avenue – Main Street to 3rd Street Crash Location

Figure 73 summarizes the crashes at unsignalized intersections between Main Street and 3rd Street. The 5th Street intersection saw the most crashes on this segment (3) and is about 300 feet west of the 3rd Street intersection.

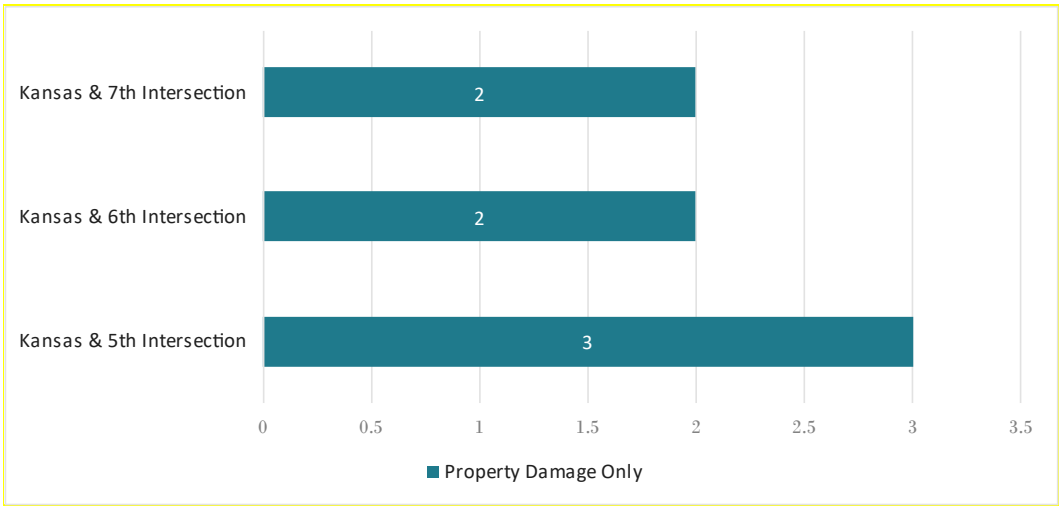


Figure 72 - Crashes at unsignalized intersections between Main Street and 3rd Street

Comments Provided by City Staff and Stakeholders

Observations

There are 19 driveways connecting to Kansas Avenue on this segment with a driveway density of 5.45 driveways per 500 feet, the highest driveway density compared to the other segments on the corridor. All of the driveways connect to commercial uses. There are also 4 unsignalized intersection locations on this segment, with a density of about 1.15 intersections per 500 feet.

The RSA team made the following intersection observations during the field reviews:

- The curb ramps on the northwest corner of 7th St are missing truncated domes.
- 7th Street is about 60 feet wide as it approaches Kansas Avenue on the north side.
- The crosswalks across 5th and 6th Streets were faded (Figure 74).
- There are no stop lines at some side street intersections.

Figure 73 – Photo at the intersection of Kansas Ave & 6th St showing faded crosswalk paint

Recommendations

Specific recommendations for the segment of Kansas Avenue from Main Street to 3rd Street include:

- Consider adding a stop line and painted crosswalk on the southbound 7th Street approach to Kansas Avenue and decrease the width of 7th Street with bump-outs at Kansas Avenue.

Segment 3: 3rd Street to Center Street

Overview

Figure 74 - Aerial View of Kansas Ave between 3rd Street and Center Street

The Kansas Avenue segment from 3rd Street to Center Street is a four lane road with a two-way left turn lane (TWLTL) throughout (Figure 75) and is 0.37 miles long. The north side of this segment of Kansas Avenue is zoned for Neighborhood Shopping District and is comprised of mostly of locally-owned businesses. The south side of this segment is zoned for Single Family Residential and is comprised of single-family homes.

There is a mix of 5-foot attached and detached sidewalks on the south side of the street. The sidewalks on the north side of Kansas Avenue are located along the north side of the frontage road (Kansas Plaza), which is separated from the main roadway by a median. There are no bike lanes or paths along Kansas Avenue, but there are marked bike lanes on 2nd Street that ends at Kansas Avenue. The daily traffic volume for this section of Kansas Avenue is approximately 19,200 VPD.

Crash Review

Table 26 summarizes the crashes that occurred on Kansas Avenue from 3rd Street to Center Street. Just over half (55%) of the crashes on this segment occurred at non-signalized intersections with the rest occurring at non-intersection locations (Figure 76).

Total Crashes: 11

Significant Crash Pattern: Rear end.

Table 25 – 3rd Street and Center Street Segment Crash Summary

Kansas – 3rd Street to Center Street	Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%
Angle - Left Turn	0	0%	1	9.1%	1	9.1%
Rear End	1	9.1%	6	54.5%	7	60.6%
Fixed Object	0	0%	1	9.1%	1	9.1%
Parked Motor Vehicle	0	0%	2	18.2%	2	18.2%
Grand Total	**1**	**9.1%**	**10**	**90.9%**	**11**	**100%**

Rear end Crash Analysis: There were 7 rear end crashes on this segment (1 injury crash). Most of these crashes occurred at the Old Manor Road intersection, which does not have two-way left turn lanes.

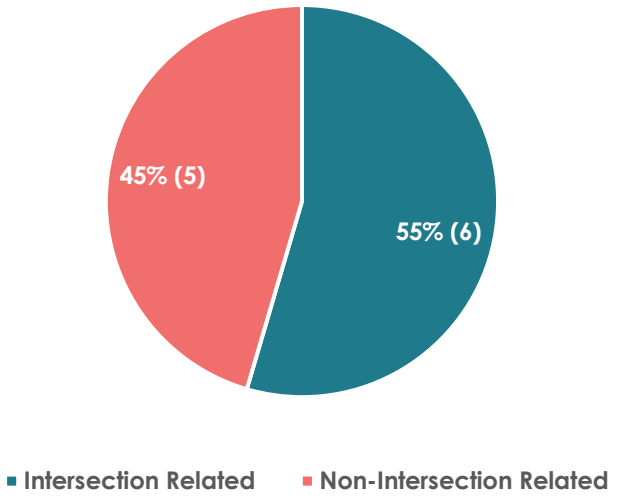
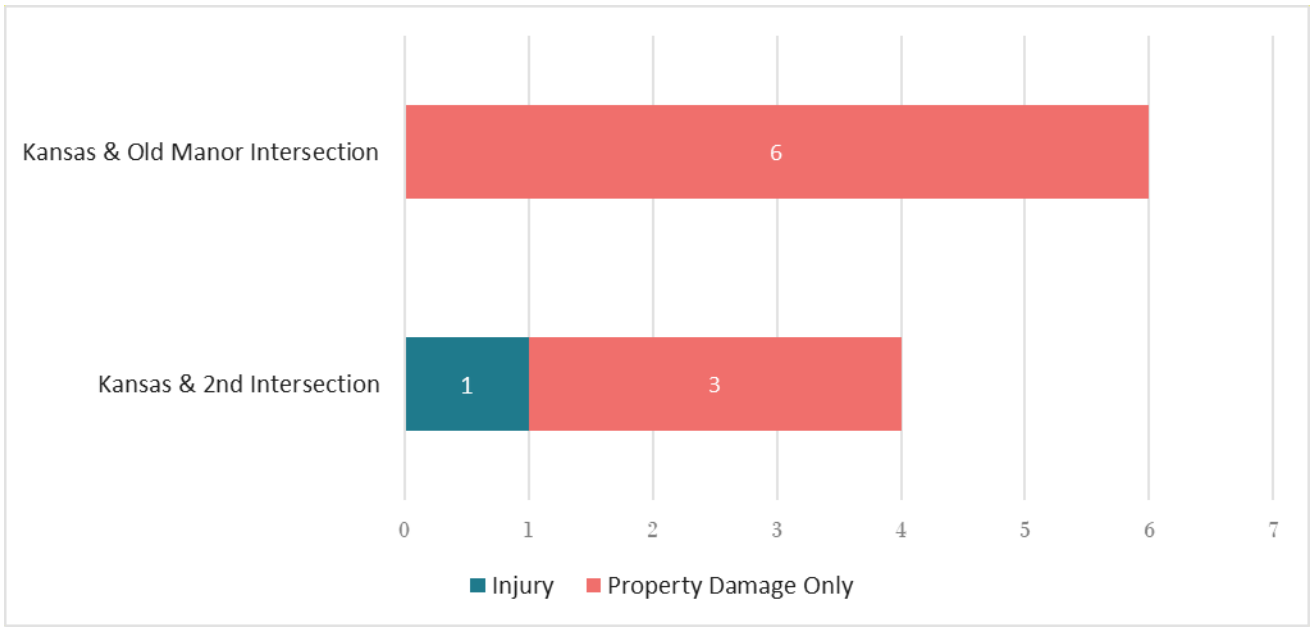


Figure 75 – Kansas Avenue – 3rd Street to Center Street Crash Location



Comments Provided by City Staff and Stakeholders

Observations

There is 1 driveway connecting to Kansas Avenue on this segment, with a density of 0.26 driveways per 500 feet. Kansas Plaza is the location where most of the driveways connect to instead of Kansas Avenue. There are also 4 unsignalized intersections on this segment with a density of about 1.02 intersections per 500 feet – above average for the Kansas Avenue corridor.

The RSA team made the following intersection observations during the field reviews:

- There are several curb ramps along this segment that are missing truncated domes (Figure 77).
- There are no stop lines at side street intersections.
- 2nd Street is about 60 feet wide as it approaches Kansas Avenue.

Figure 76 - Photo along Kansas Ave at 2nd St showing curb ramps missing truncated domes

Recommendations

Specific recommendations for the segment of Kansas Avenue from 3rd Street to Center Street include:

- Consider a marked crosswalk or bump-outs across 2nd Street.

Segment 4: Center Street to Campus Drive

Overview

Figure 77 - Aerial View of Kansas Ave between Center Street and Campus Drive

The Kansas Avenue segement from Center Street to Campus Drive is a four lane road with a two-way left turn lane (TWLTL) throughout (Figure 78) and is 0.63 miles long. This segment of Kansas Avenue is comprised of commerial land uses including Walgreens, Dillon's, fast food establishments, banks, a Tommy's Car Wash, an urgent care, and other similar uses. Garden City Community College is located just to the south of this segment along Campus Drive.

There are 5-foot detached sidewalks on both sides of the street between Center and Fleming, with power poles running along the outside edge of the sidewalks. Between Fleming St and Campus Dr, there are 5-foot detached sidewalks on the south side of the street. The sidewalks on the north side of Kansas Avenue between Fleming and Campus are located along the north side of the frontage road (Kansas Plaza), which is separated from the main roadway by a median. There is one marked crosswalk across a stop sign-controlled site street, on the south leg of the JC St and Kansas Avenue intersection. There are no bike lanes or paths along Kansas Aveue. The Talley Trail crosses Kansas Avenue at the intersection of Kansas Avenue and Campus Drive The daily traffic volume for this section of Kansas Avenue is approximately 19,900 VPD.

Crash Review

Table 26 summarizes the crashes that occurred on Kansas Avenue from Center Street to Campus Drive. The majority of crashes (72%) on this segment occurred at unsignalized intersections, while 25 percent occurred in-between intersections and one crash (3%) occurred at a driveway (Figure 79).

Total Crashes: 28 (4 injury crashes)

Significant Crash Pattern: Angle – straight/following road.

Table 26 – Center Street to Campus Drive Segment Crash Summary

Kansas – Center Street to Campus Drive	Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%
Angle – Avoidance Maneuver	0	0%	1	3.6%	1	3.6%

Angle – Left Turn	0	0%	2	7.1%	2	7.1%
Angle - Right Turn	0	0%	3	10.7%	3	10.7%
Angle – Straight/following road	2	7.1%	9	32.1%	11	39.3%
Rear End	0	0%	6	21.4%	6	21.4%
Sideswipe	1	3.6%	1	3.6%	2	7.1%
Fixed Object	1	3.6%	1	3.6%	2	7.1%
Parked Motor Vehicle	0	0%	1	3.6%	1	3.6%
Grand Total	**4**	**12.5%**	**24**	**87.5%**	**28**	**100%**

Angle – straight/following road Crash Analysis: There were 11 angle – straight/following road crashes (2 injury crashes). These crashes occurred at 3 intersections in the segment: the JC Street intersection (5), the College Street intersection (5), and the Anderson Street intersection (1). There are left turn lanes at each of these intersections and throughout the segment. In all the crashes, a vehicle approaching Kansas Avenue failed to yield to the right of way of a vehicle driving on Kansas Avenue, entered the roadway, and collided with the vehicle. At JC Street on the southbound approach, there is a sign beneath the stop sign prohibiting straight through and left turn maneuvers from 7am to 7pm and all the crashes at this intersection occurred from 3pm to 7pm and 5 of the 9 angle – side impact crashes involved a vehicle traveling Southbound through the intersection.

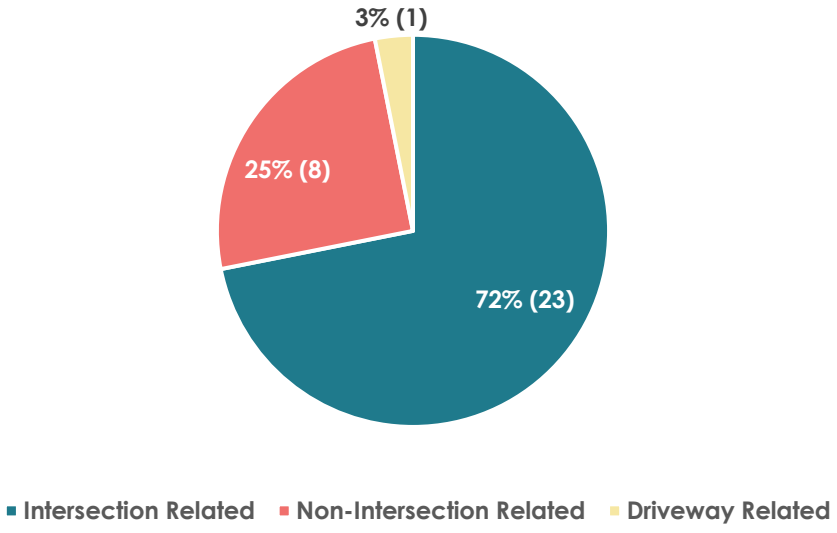


Figure 78 – Kansas Avenue – Center Street to Campus Drive Crash Location

Figure 80 summarizes the crashes at unsignalized intersections between Center Street and

Campus Drive. The JC Street intersection saw the most crashes in this segment (11) and most of these crashes occurred in the afternoon from 2pm to 7pm (7).

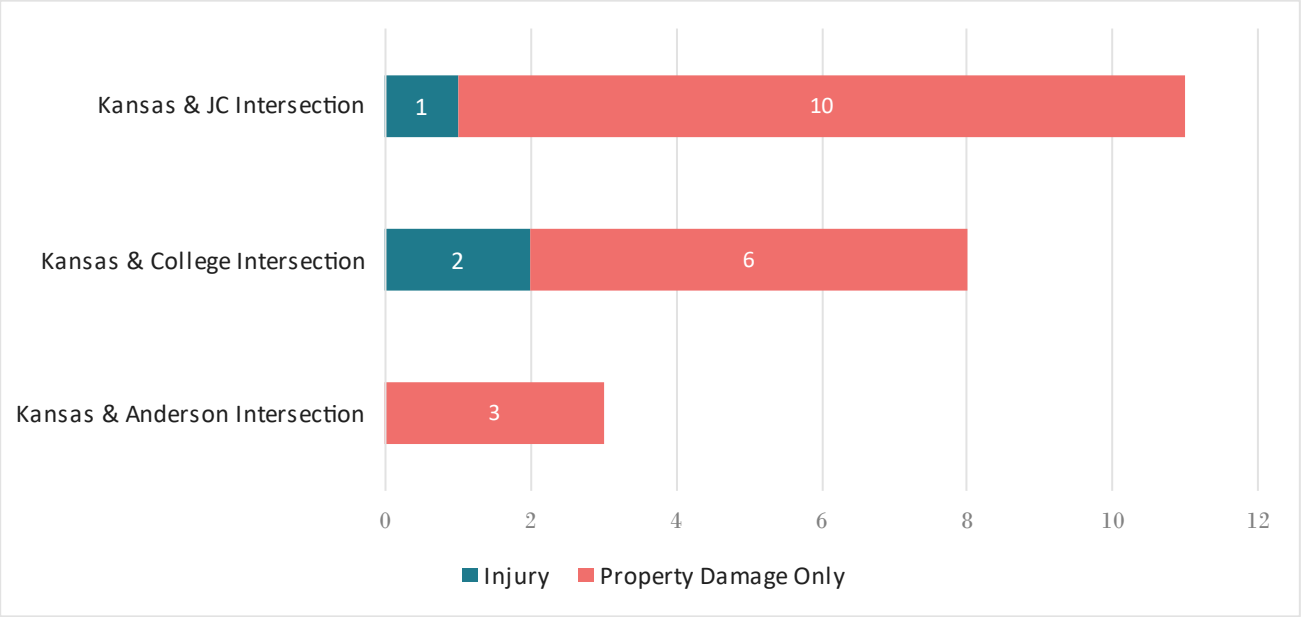


Figure 79 - Crashes at unsignalized intersections between Center Street and Campus Drive

Comments Provided by City Staff and Stakeholders

Observations

There are 14 driveways connecting to Kansas Avenue on this segment with a driveway density of 2.10, which is above average compared to the other segments on the corridor. All of the driveways here connect to commercial uses including the Dillons grocery store to the north. Kansas Plaza runs east to west just to the north of Kansas Avenue, and connects to all of the businesses for half of the segment. There are 4 unsignalized intersections on this segment with a density of about 0.60 intersections per mile, which is close to average when compared to the rest of the corridor.

The RSA team made the following intersection observations during the field reviews:

- There are several curb ramps along this segment that are missing truncated domes.
- The crosswalks across the south legs of Nelson St and JC St were faded (Figure 81).
- Some stop sign-controlled side streets lack stop lines and others had stop lines, but they were faded.

Figure 80 - Photo along Kansas Ave at Nelson St showing faded crosswalk and missing truncated domes

- At JC Street on the southbound approach, there is a sign beneath the stop sign approaching Kansas Avenue prohibiting straight through and left-turn maneuvers from 7am to 7pm.

Recommendations

Specific recommendations for the segment of Kansas Avenue from Center Street to Campus Drive include:

- Consider ¾ left turn access in segment between Center Street and Fleming Street due to the number of driveways.
- Consider ¾ left turn access at JC Street.

Segment 5: Campus Drive to U.S. 83

Overview

Figure 81 - Aerial View of Kansas Ave between Campus Drive and U.S. 83

The Kansas Avenue segment from Campus Drive to U.S. 83 is a four lane road with a two-way left turn lane (TWLTL) throughout (Figure 82) and is 0.71 miles long. This segment of Kansas Avenue is composed of commerial land uses and a Planned Unit Development. Commerial uses on this segment include larger uses such as a Harbor Freight, sit-down restaurants, Target, Staples, and a couple hotels. The Planned Unit Development is for Garden City Plaza, a shopping mall with several larger department stores.

There are 5-foot attached sidewalks on the south side of the street between Campus Drive and the Staples access drive with street light poles running along the outside edge of the sidewalks. There are no sidewalks along the south side of the road from the Staples access to U.S. 83. Detached sidewalks exist on on the north side of the road with street light poles running along the inside edge of the sidewalks. There is one unsignalized continental crosswalk on the north leg of the McCoy St and Kansas Avenue intersection. There are no bike lanes or paths along Kansas Avenue. The daily traffic volume for this section of Kansas Avenue is approximately 12,300 VPD.

Crash Review

Table 27 summarizes the crashes that occurred on Kansas Avenue from Campus Drive to U.S. 83. Just over half of crashes (55%) on this segment occurred at unsignalized intersections, while 26 percent occurred in between intersections and 19 percent occurred at driveways (Figure 83).

Total Crashes: 31 (1 serious injury crash, 10 injury crashes)

Significant Crash Pattern: Angle – straight/following road and angle – left turn

Table 27 – Campus Drive to U.S. 83 Segment Crash Summary

Kansas – Campus Drive to U.S. 83	Serious Injury		Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%	Crashes	%
Angle – Avoidance Maneuver	0	0%	1	3.2%	0	0%	1	3.2%
Angle – Left Turn	1	3.2%	1	3.2%	5	16.1%	7	22.6%

Angle – Right Turn	0	0%	1	3.2%	1	3.2%	2	6.5%
Angle - Straight/following road	0	0%	4	12.9%	5	16.1%	9	29%
Head On	0	0%	1	3.2%	0	0%	1	3.2%
Rear End	0	0%	1	3.2%	4	12.9%	5	16.1%
Sideswipe	0	0%	0	0%	4	12.9%	4	12.9%
Fixed Object	0	0%	1	3.2%	1	3.2%	2	6.5%
Grand Total	**1**	**3.2%**	**10**	**32.3%**	**20**	**64.5%**	**31**	**100%**

Angle – Straight/following road Crash Analysis: There were 9 angle – straight/following road crashes (4 injury). The crashes occurred at the Crestway intersection (4), the McCoy intersection (1), and the driveways to the Target and Taco Bell (4).

Angle – Left turn Crash Analysis: There were 7 angle – left turn crashes (1 serious injury, 1 injury). These crashes occurred at the McCoy Street intersection (4) and at driveways (3).

A serious injury crash occurred when a vehicle exited the private driveway at Taco Bell, attempted to turn left, failed to yield to oncoming traffic, and struck a motorcycle that was heading eastbound on Kansas Avenue. The crash occurred just before 10:00 p.m. in dark, lighted conditions. The driver of the motorcycle sustained serious injuries. When looking west from the driveway, Kansas Avenue slopes gradually uphill toward a crest near the Target signalized intersection about 500 feet away, which may obstruct the sight distance for drivers turning onto Kansas Avenue. The speed of the motorcycle at the time of the crash is unknown.

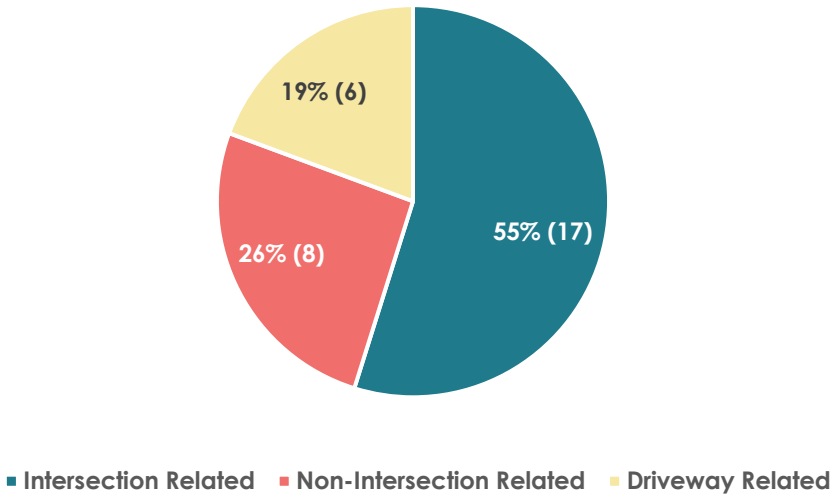


Figure 82 – Kansas Avenue – Campus Drive to U.S. 83 Crash Location

Figure 84 summarizes crashes at unsignalized intersection locations in the segment from Campus Drive to U.S. 83. Each of the two unsignalized intersections, at McCoy Street and Crestway Drive had 11 crashes, angle type crashes were the most common crashes at both of the intersections.

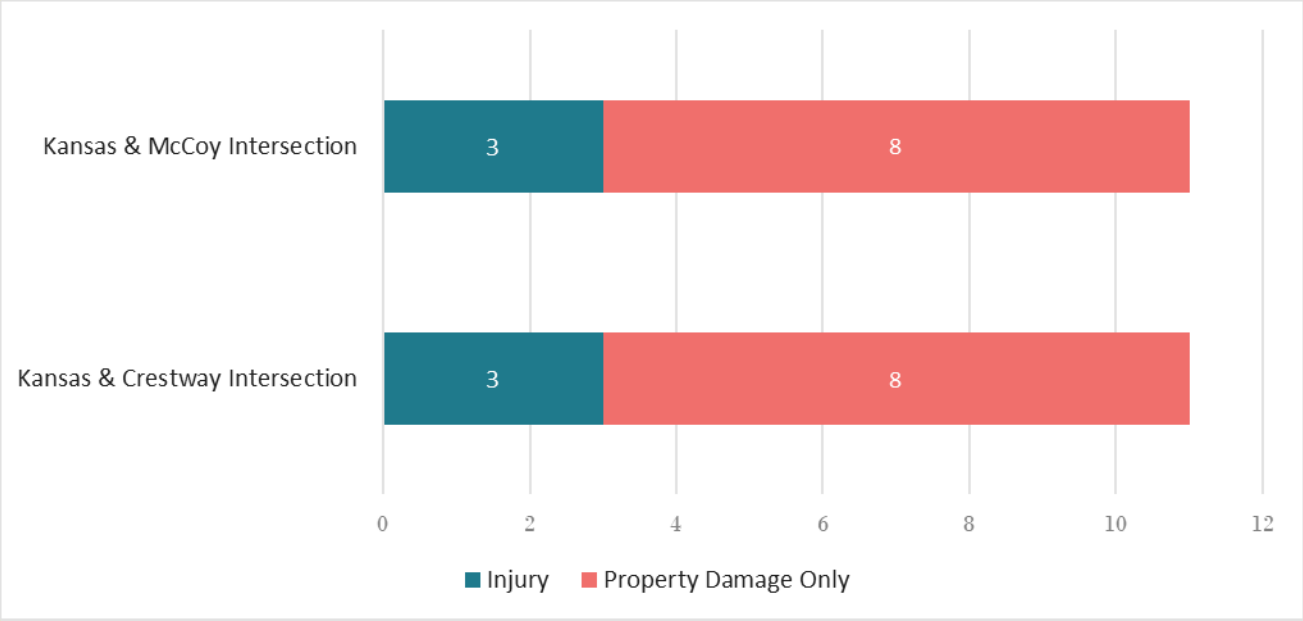


Figure 83 - Crashes at unsignalized intersections between Campus Drive and U.S. 83

Comments Provided by City Staff and Stakeholders

Observations

There are 4 driveways connecting to Kansas Avenue on this segment with a density of about 0.53 driveways per 500 feet. This is a low amount compared to other segments on the corridor. There are also 2 unsignalized intersection locations on this segment with a density of about 0.27 intersections per 500 feet, another low amount.

The RSA team made the following intersection observations during the field reviews:

- There are missing or faded stop lines at side street intersections.
- There are existing crosswalks at side streets that are faded (Figure 85).
- The crosswalk on the north leg of the Crestway Drive intersection is set back about 50 feet from Kansas Avenue, with two separate stop lines for SB drivers, one at the crosswalk and one at Kansas Avenue.

Figure 84 - Photo of Kansas Ave at Crestway Dr showing faded crosswalk and stop line

Recommendations

Specific recommendations for the segment of Kansas Avenue from Campus Drive to U.S. 83 include:

- Consider rebuilding the crosswalk further south to align with the trail/sidewalk.
- Consider developing an Access Management Plan for the segment of Kansas Avenue between Campus Drive and U.S. 83. Such a plan could potentially allow for full-movement signalized (when warranted) intersections at McCoy Drive and Crestway Drive, while all other unsignalized access points are restricted to right-in/right-out or ¾ movement through the installation of a raised center median.

Segment 6: U.S. 83 to Jennie Barker Road

Overview

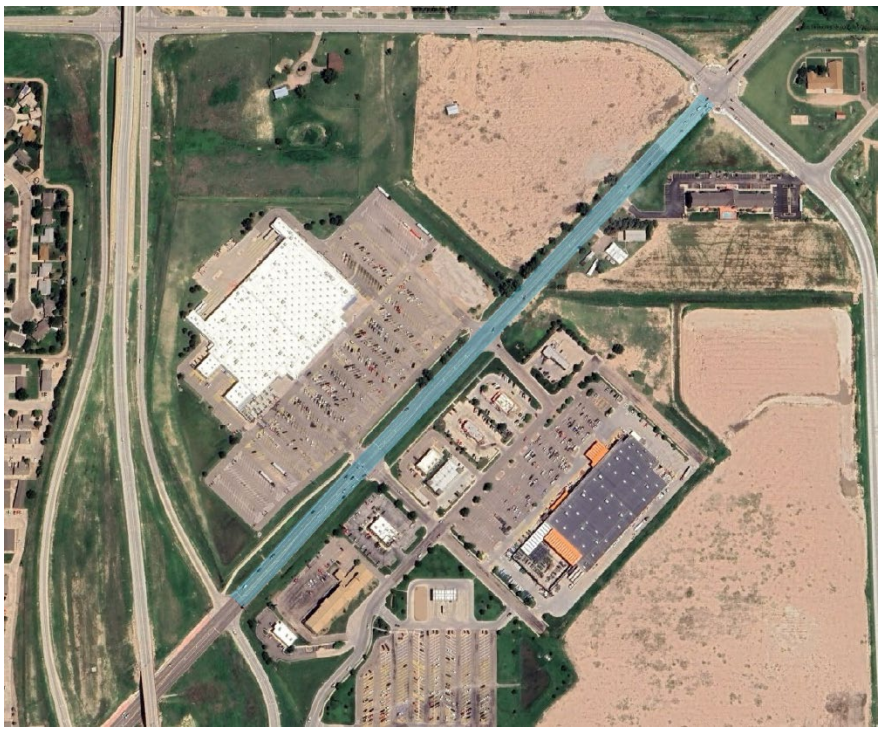


Figure 85 - Aerial View of Kansas Ave between U.S. 83 and Jennie Barker Road

The Kansas Avenue segment from U.S. 83 to Jennie Barker Road is a four lane road with a two-way left turn lane (TWLTL) throughout (Figure 86) and is 0.56 miles long. This segment of Kansas Avenue is composed of large commercial uses including Walmart, Home Depot, Sam's Club, drive-thru restaurants, and hotels. One residential lot is located along the south side of this segment.

Along the north side of this segment of Kansas Avenue from U.S. 83 to to Roman Road, there are detached sidewalks with street light poles running along the inside edge. There are no sidewalks along the south side of Kansas Avenue from U.S. 83 to Leslie Road. There are 5-foot detached sidewalks on the south side of Kansas Avenue between Leslie Road and Roman Road. There are no sidewalks on either side of the street approaching Jennie Barker Road. There is an unsignalized ladder crosswalk on the north leg of the Roman Road and Kansas Avenue intersection. There are no bike lanes or paths along Kansas Avenue. The daily traffic volume for this section of Kansas Avenue is approximately 7,300 VPD.

Crash Review

Table 28 summarizes the crashes that occurred on Kansas Avenue from U.S. 83 to Jennie Barker Road. The majority of crashes (83%) on this segment occurred at non-signalized intersections with the rest occurring at non-intersection locations (Figure 87).

Total Crashes: 12 (2 injury crashes)

Significant Crash Pattern: None.

Table 28 – U.S. 83 to Jennie Barker Road Segment Crash Summary

Kansas – U.S. 83 to Jennie Barker Road	Injury		PDO		Total	
	Crashes	%	Crashes	%	Crashes	%
Angle - Merging	0	0%	1	8.3%	1	8.3%
Angle - Right Turn	0	0%	2	16.7%	2	16.7%

Angle – Straight/following road	2	16.7%	2	16.7%	4	33.3%
Head On	0	0%	1	8.3%	1	8.3%
Rear End	0	0%	2	16.7%	2	16.7%
Animal	0	0%	1	8.3%	1	8.3%
Fixed Object	0	0%	1	8.3%	1	8.3%
Grand Total	**2**	**16.7%**	**10**	**83.3%**	**12**	**100%**

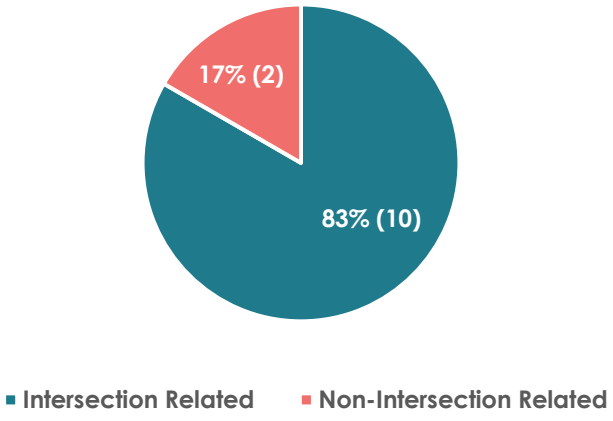


Figure 86 – Kansas Avenue – U.S. 83 to Jennie Barker Road Crash Location

Figure 88 summarizes the crashes at unsignalized intersections on Kansas Avenue from U.S. 83 to Jennie Barker Road of which there was only one unsignalized intersection at Roman Road (5). The most common crash types at Roman Road were related to angle – side impact where vehicles were merging, making a right turn, and driving straight/following road.

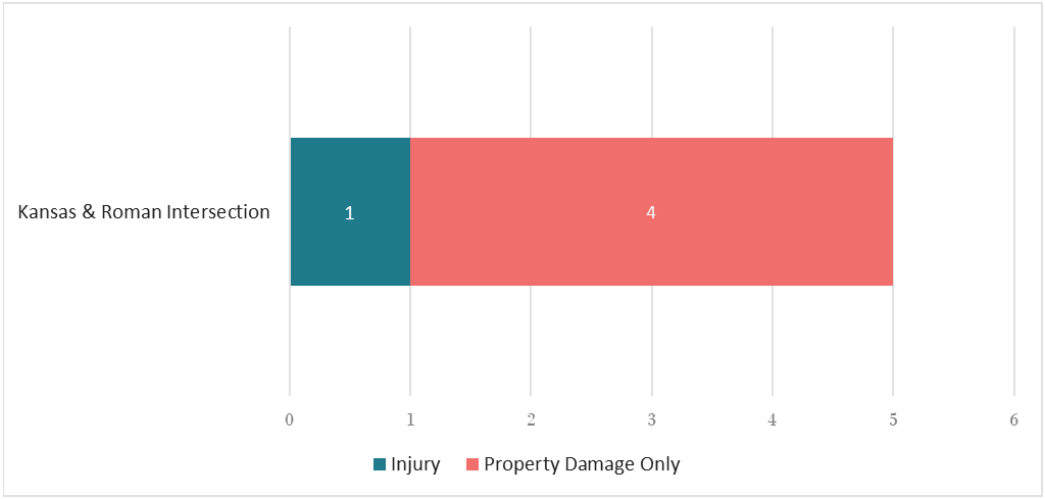


Figure 87 - Crashes at unsignalized intersections along Segment 6 from U.S. 83 to Jennie Barker Road

Comments Provided by City Staff and Stakeholders

Observations

There are 2 driveways in this segment and 1 unsignalized intersection, both of which are low compared to other segments on the corridor.

The RSA team made the following intersection observations during the field reviews:

Figure 88 - Photo of Kansas Ave at Roman Rd

- Several stop lines and crosswalks were faded.
- There were faded stop lines at some side street intersections (Figure 89).
- There are no sidewalks approaching Jennie Barker Road.

Recommendations

Specific recommendations for the segment of Kansas Avenue from U.S. 83 to Jennie Barker Road include:

- Add sidewalks up to the Jennie Barker Road/Mary Street intersection.

Specific Segment Recommendations

The recommendations in Table 29 are based on the collaborative effort of the RSA multidisciplinary team and stakeholder interviews, as well as on the team's experience driving and walking the corridor. Each segment received a number of recommendations and are numbered the same as in the previous analysis from west to east:

4. Taylor Avenue to Main Street
5. Main Street to 3rd Street
6. 3rd Street to Center Street
1. Center Street to Campus Drive
2. Campus Drive to U.S. 83
3. U.S. 83 to Jennie Barker Road

The time frame for each recommendation is broken down by into three categories:

- Short-term: 0 to 3 years
- Medium-term: 3 to 5 years
- Long-term: 5 to 10 years

The cost estimates for each recommendation is given at a high level 10% planning phase and may fluctuate based on the final design. The total cost estimates are broken down into three categories:

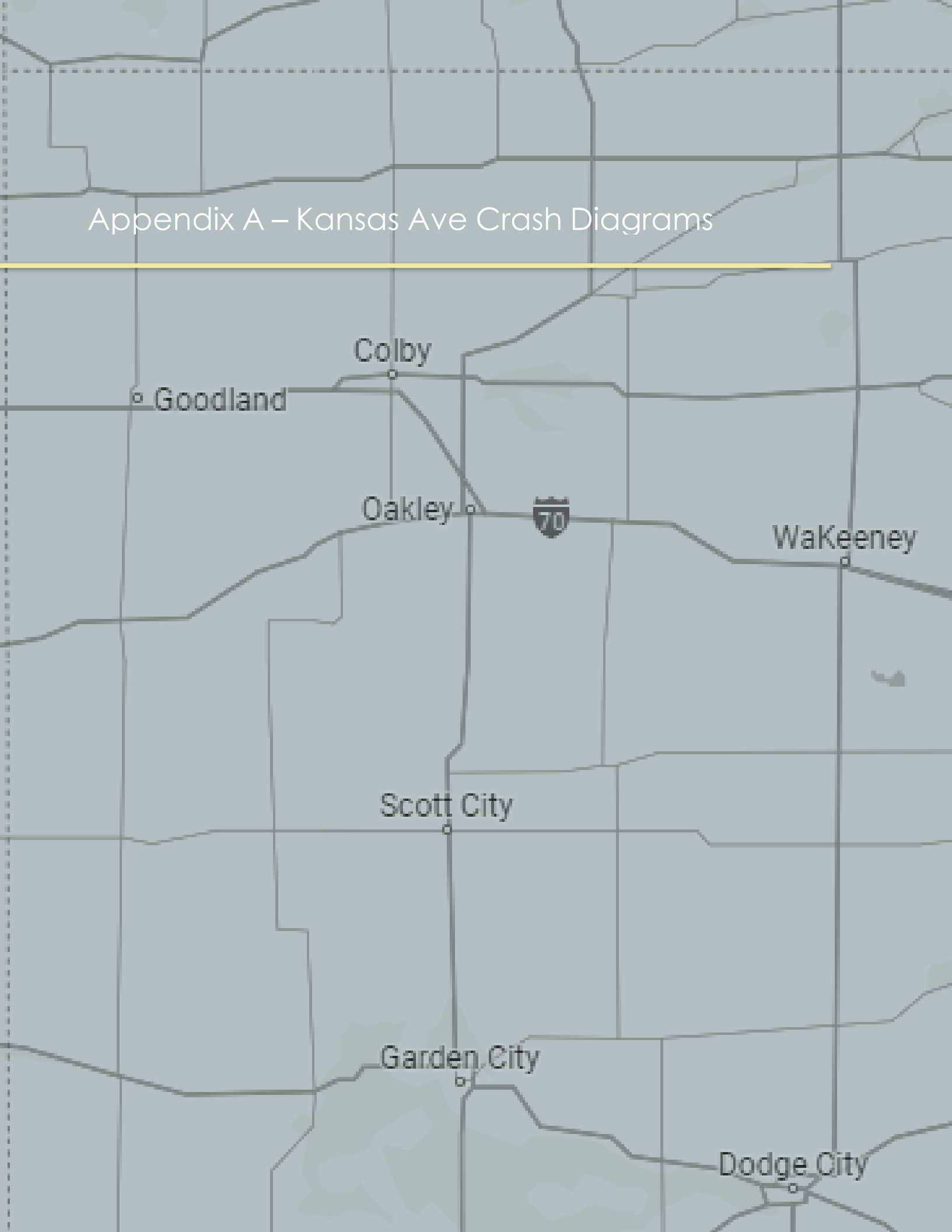
- Low cost: Less than $50,000
- Medium cost: Between $50,000 and $200,000
- High cost: Greater than $200,000

Table 29 - Specific Recommendations for Each Segment

Recommendations	Time Frame	Cost	Taylor Ave to Main St	Main St to 3rd St	3rd St to Center St	Center St to Campus Dr	Campus Dr to U.S. 83	U.S. 83 to Jennie Barker Rd
Add sidewalks where applicable	Medium	Medium to High	X	-	-	-	-	X
Add/repaint crosswalk across side streets at Kansas Avenue	Short	Low	-	X	X	X	X	-
Add pedestrian crossing or RRFB across Kansas Avenue	Medium	Low to Medium	X	X	-	-	-	-
Add ¾ left turn access with medians at unsignalized intersections/driveways	Long	High	-	-	-	X	X	-
Widen Kansas Avenue to add left turn lanes on east and west bound approaches of	Long	High	X	-	-	-	-	-

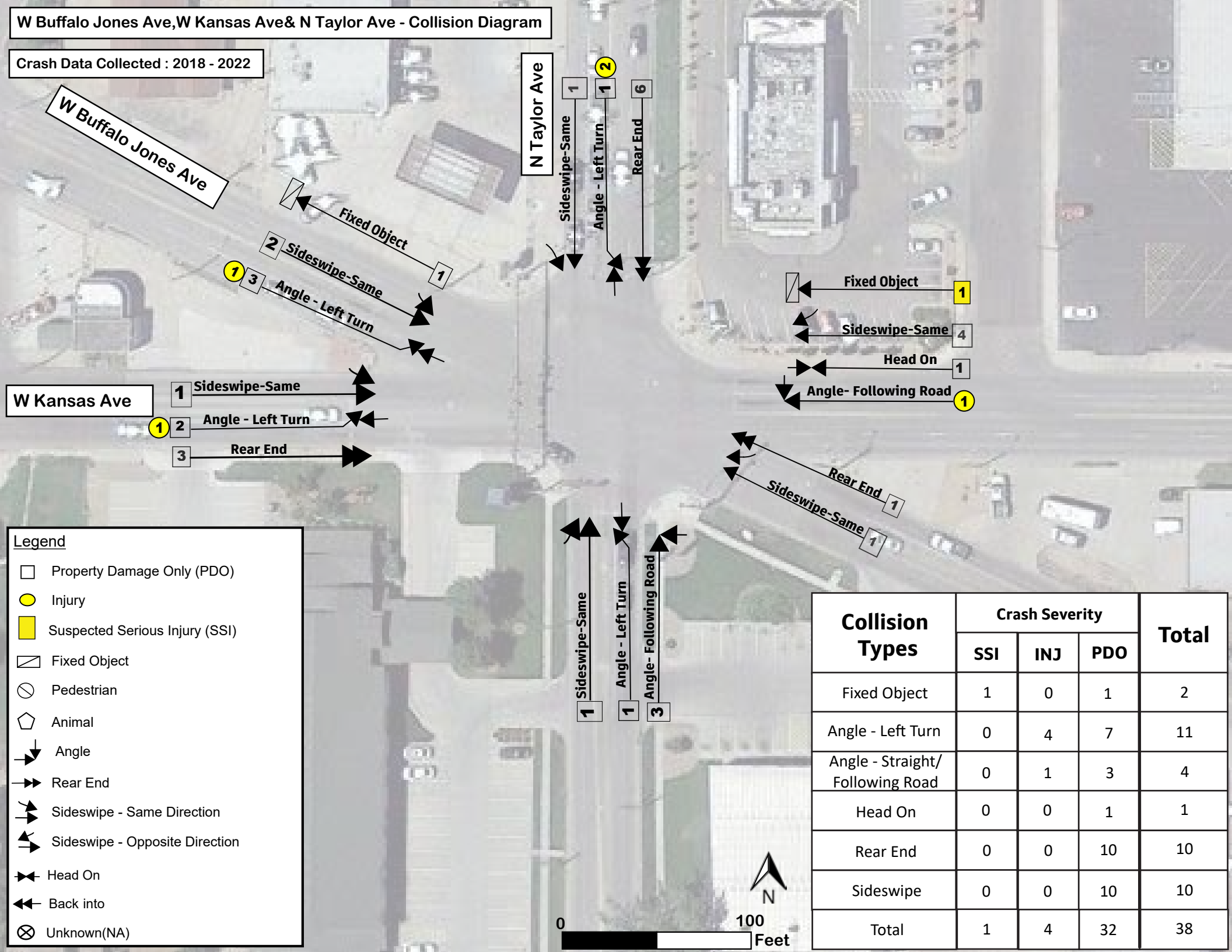
unsignalized intersections or reconfigure the roadway to a 3-lane section								
Conduct a pedestrian crossing study to identify ideal crossing locations	Short	Short	**X**	-	-	-	-	-

Appendix A – Kansas Ave Crash Diagrams



W Buffalo Jones Ave,W Kansas Ave& N Taylor Ave - Collision Diagram

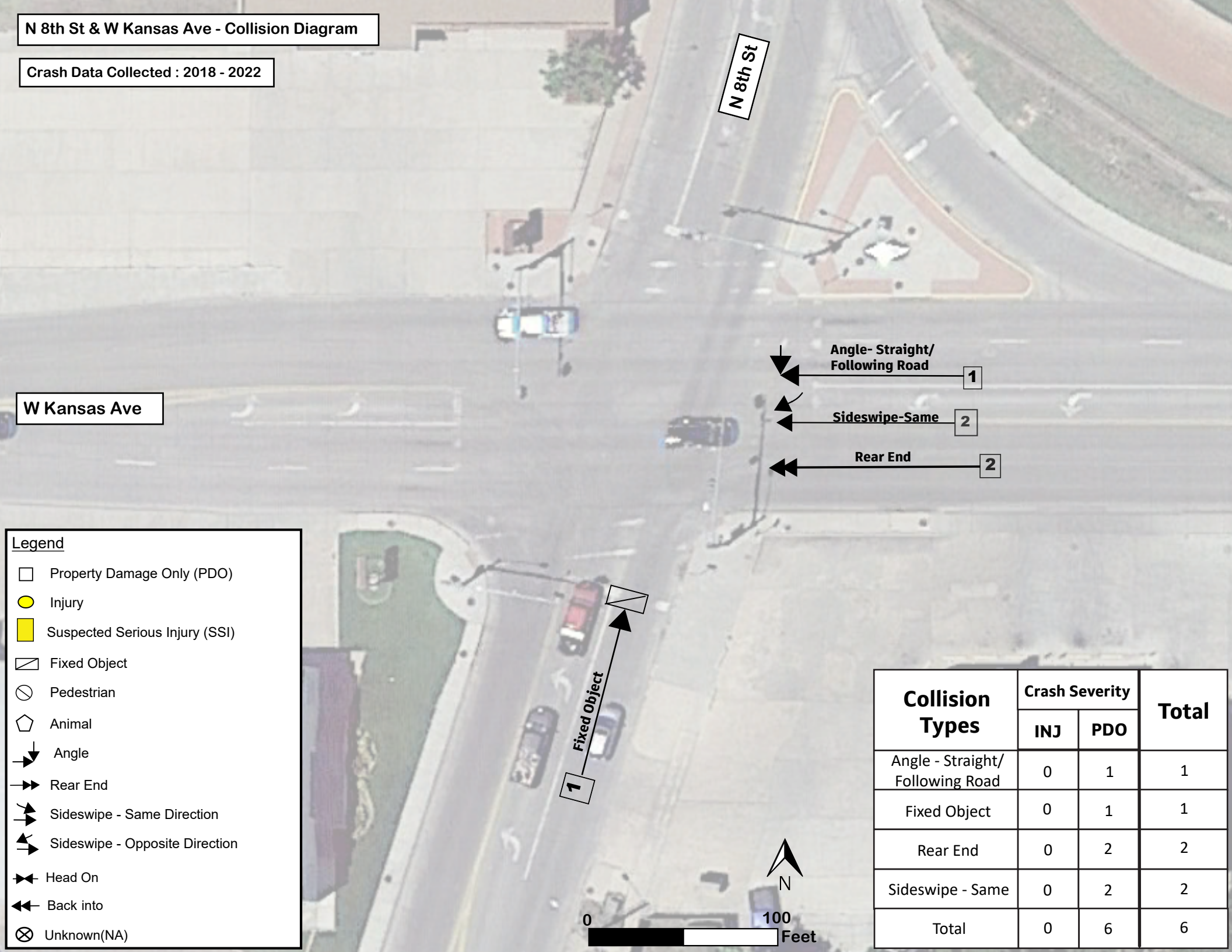
Crash Data Collected : 2018 - 2022



Collision Types	Crash Severity			Total
	SSI	INJ	PDO	
Fixed Object	1	0	1	2
Angle - Left Turn	0	4	7	11
Angle - Straight/ Following Road	0	1	3	4
Head On	0	0	1	1
Rear End	0	0	10	10
Sideswipe	0	0	10	10
Total	1	4	32	38

N 8th St & W Kansas Ave - Collision Diagram

Crash Data Collected : 2018 - 2022

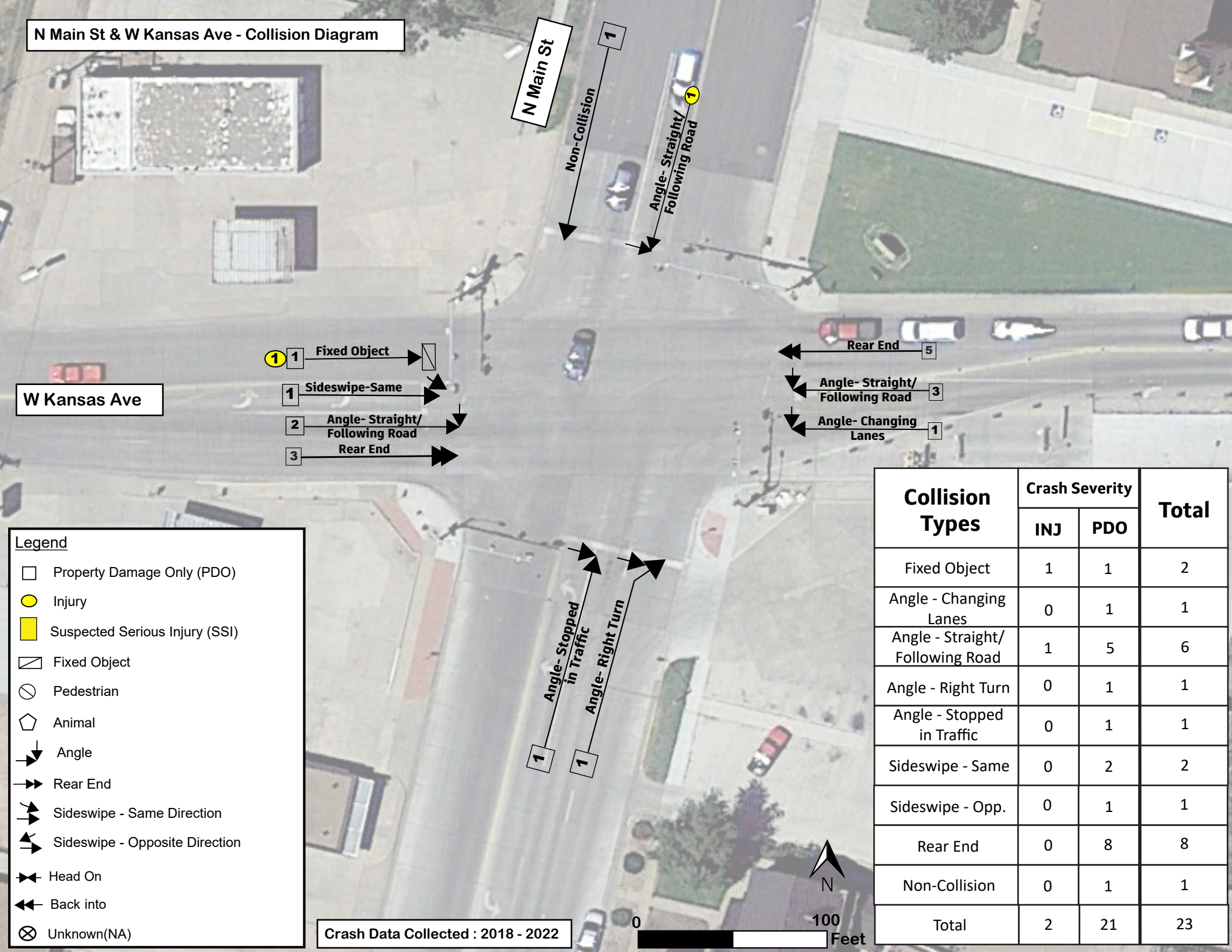


Legend

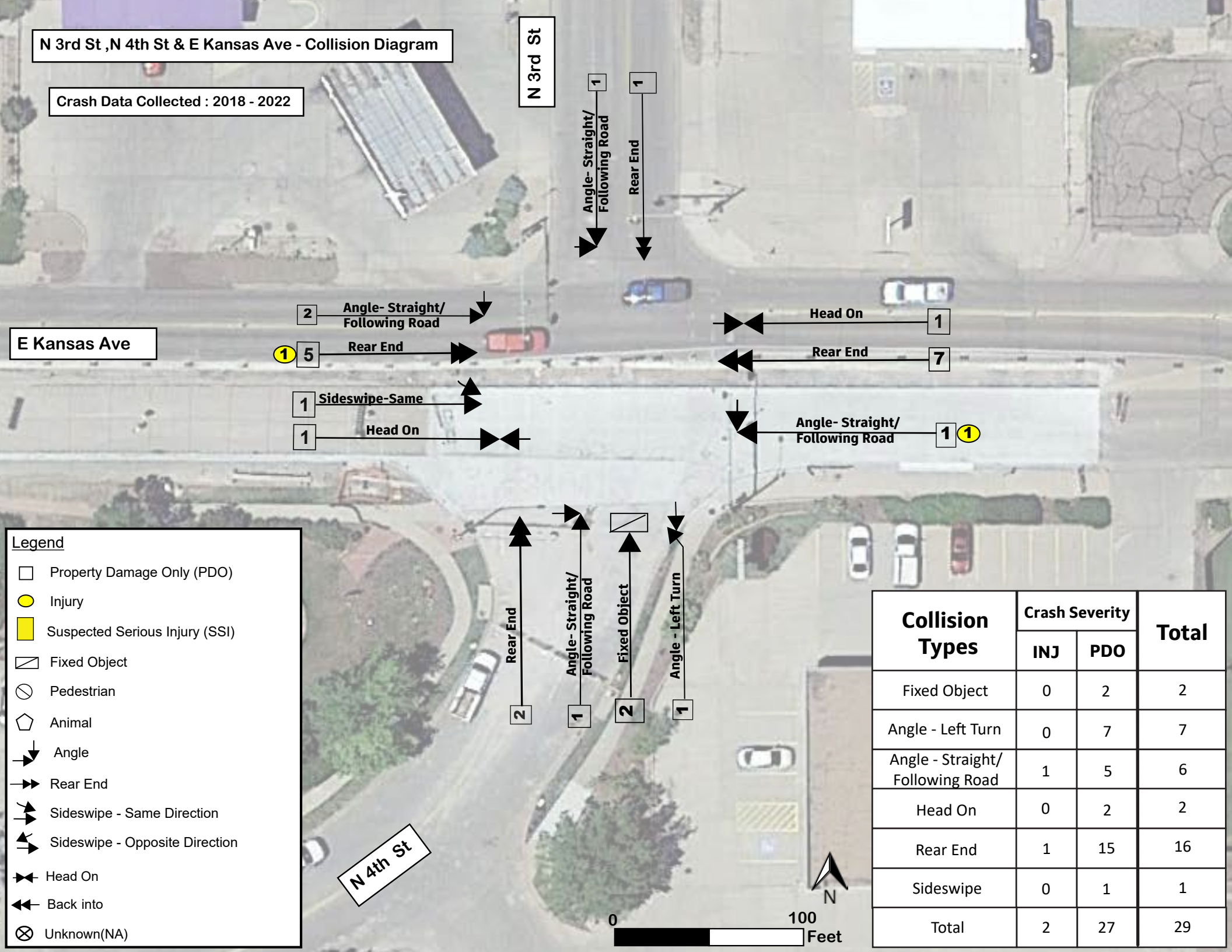
- Property Damage Only (PDO)
- Injury
- Suspected Serious Injury (SSI)
- Fixed Object
- Pedestrian
- Animal
- Angle
- Rear End
- Sideswipe - Same Direction
- Sideswipe - Opposite Direction
- Head On
- Back into
- Unknown(NA)

Collision Types	Crash Severity		Total
	INJ	PDO	
Angle - Straight/ Following Road	0	1	1
Fixed Object	0	1	1
Rear End	0	2	2
Sideswipe - Same	0	2	2
Total	0	6	6

N Main St & W Kansas Ave - Collision Diagram



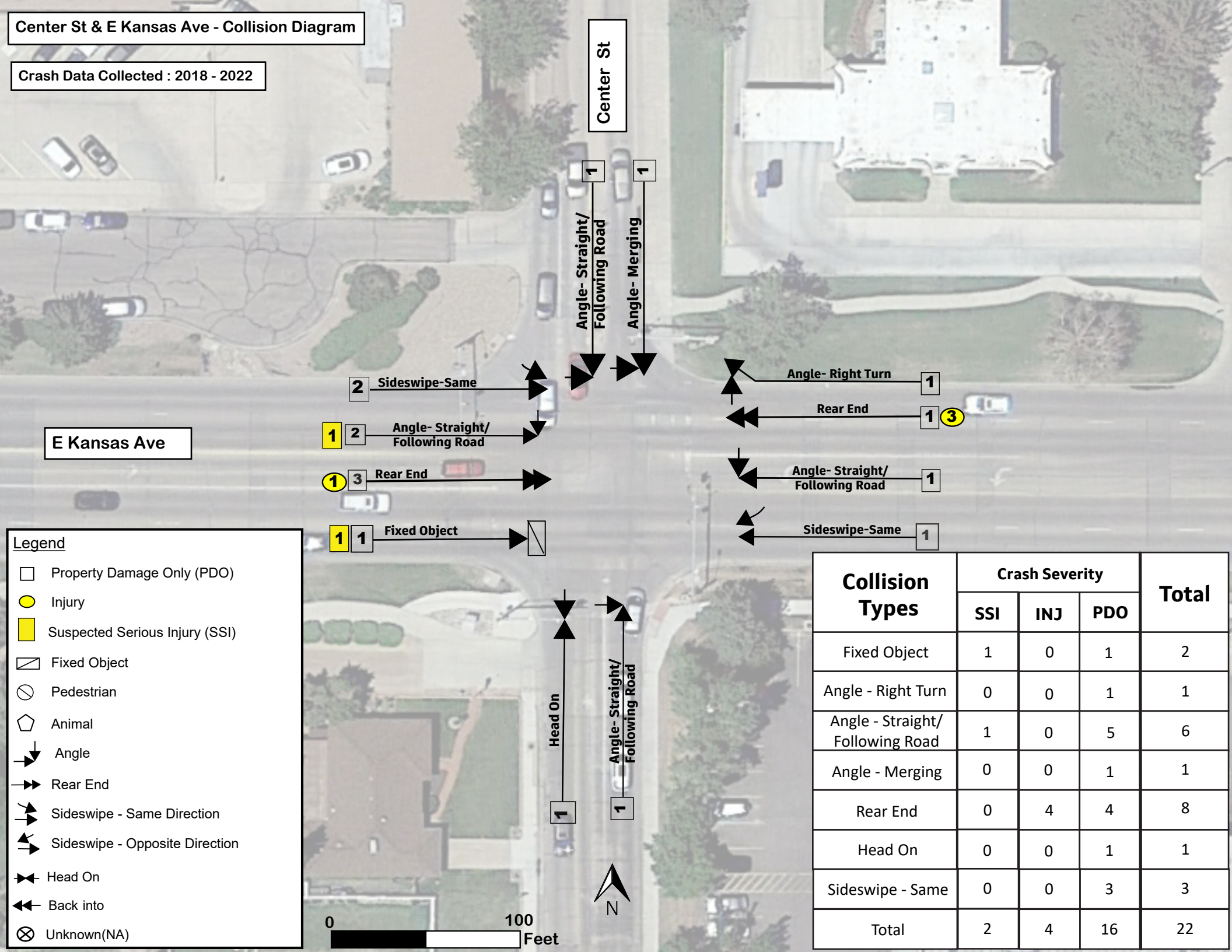
Collision Types	Crash Severity		Total
	INJ	PDO	
Fixed Object	1	1	2
Angle - Changing Lanes	0	1	1
Angle - Straight/ Following Road	1	5	6
Angle - Right Turn	0	1	1
Angle - Stopped in Traffic	0	1	1
Sideswipe - Same	0	2	2
Sideswipe - Opp.	0	1	1
Rear End	0	8	8
Non-Collision	0	1	1
Total	2	21	23



Collision Types	Crash Severity		Total
	INJ	PDO	
Fixed Object	0	2	2
Angle - Left Turn	0	7	7
Angle - Straight/ Following Road	1	5	6
Head On	0	2	2
Rear End	1	15	16
Sideswipe	0	1	1
Total	2	27	29

Center St & E Kansas Ave - Collision Diagram

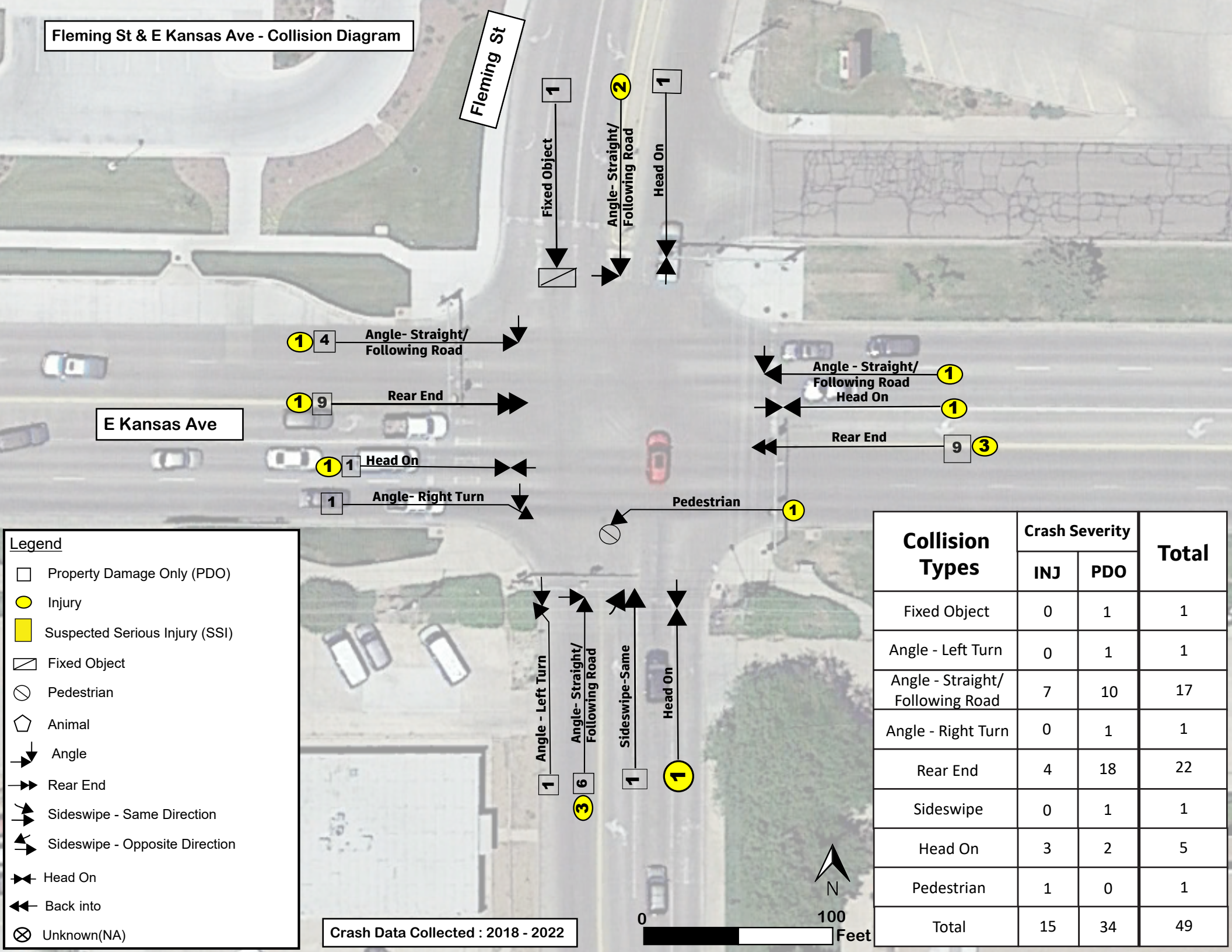
Crash Data Collected : 2018 - 2022



Legend

- Property Damage Only (PDO)
- Injury
- Suspected Serious Injury (SSI)
- Fixed Object
- Pedestrian
- Animal
- Angle
- Rear End
- Sideswipe - Same Direction
- Sideswipe - Opposite Direction
- Head On
- Back into
- Unknown(NA)

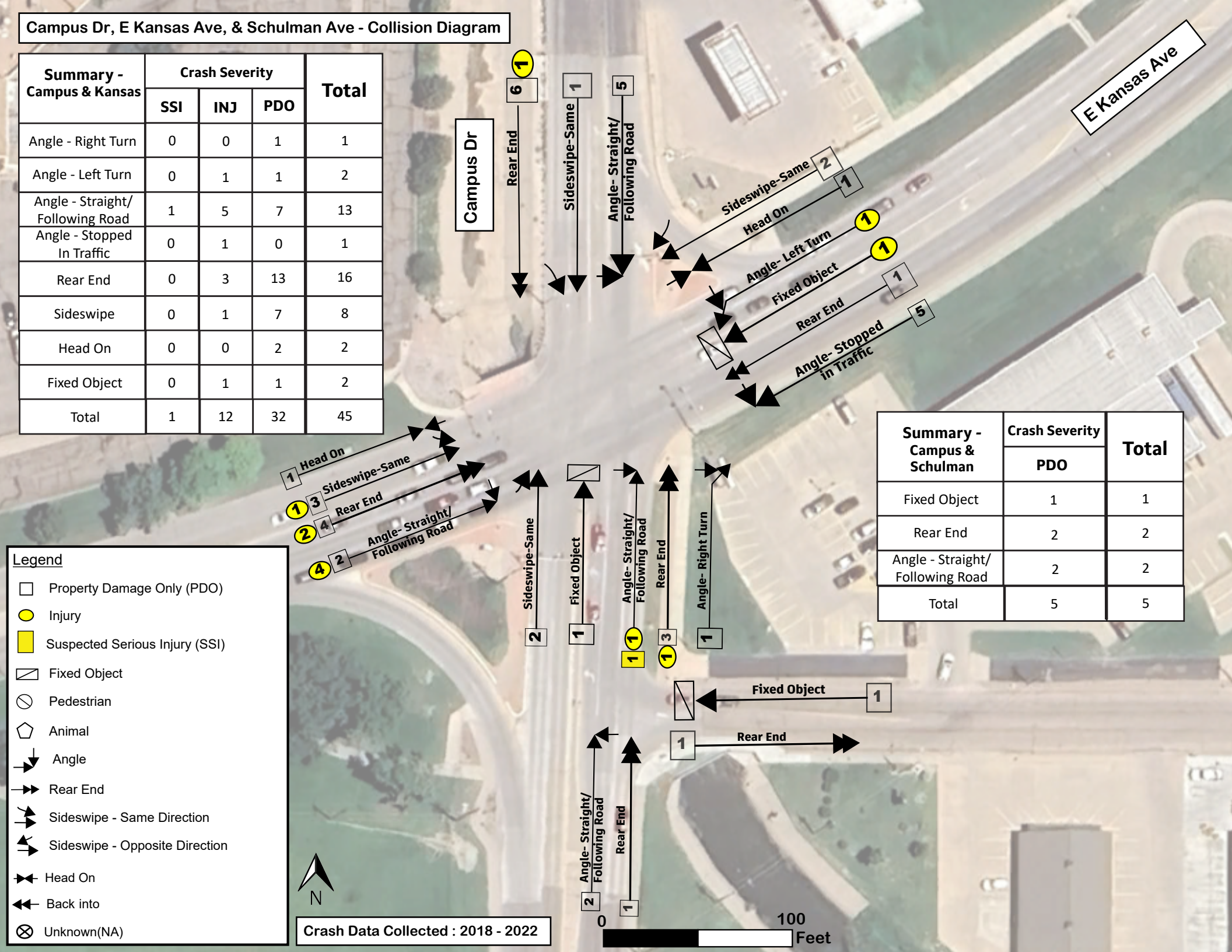
Collision Types	Crash Severity			Total
	SSI	INJ	PDO	
Fixed Object	1	0	1	2
Angle - Right Turn	0	0	1	1
Angle - Straight/ Following Road	1	0	5	6
Angle - Merging	0	0	1	1
Rear End	0	4	4	8
Head On	0	0	1	1
Sideswipe - Same	0	0	3	3
Total	2	4	16	22



Collision Types	Crash Severity		Total
	INJ	PDO	
Fixed Object	0	1	1
Angle - Left Turn	0	1	1
Angle - Straight/ Following Road	7	10	17
Angle - Right Turn	0	1	1
Rear End	4	18	22
Sideswipe	0	1	1
Head On	3	2	5
Pedestrian	1	0	1
Total	15	34	49

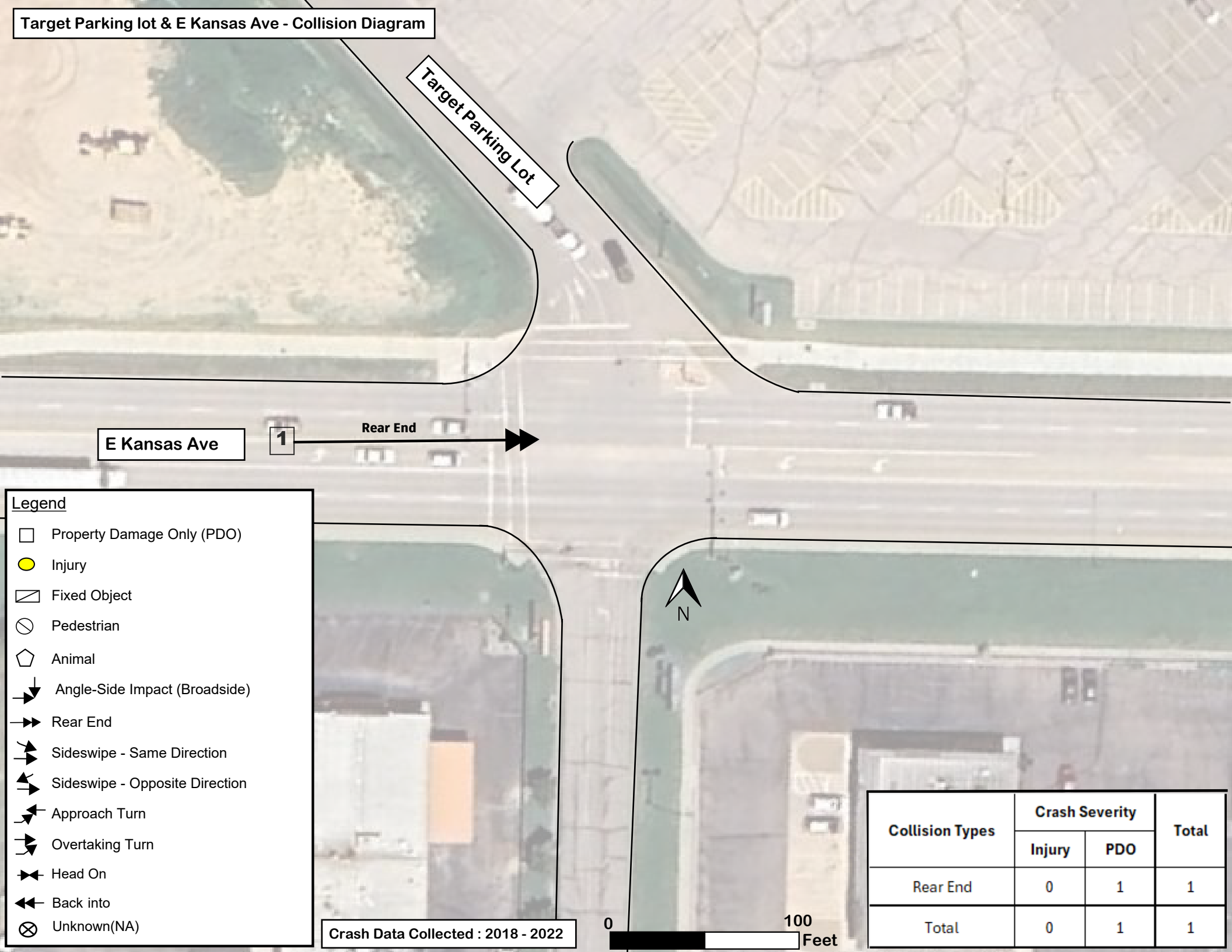
Campus Dr, E Kansas Ave, & Schulman Ave - Collision Diagram

Summary - Campus & Kansas	Crash Severity			Total
	SSI	INJ	PDO	
Angle - Right Turn	0	0	1	1
Angle - Left Turn	0	1	1	2
Angle - Straight/ Following Road	1	5	7	13
Angle - Stopped In Traffic	0	1	0	1
Rear End	0	3	13	16
Sideswipe	0	1	7	8
Head On	0	0	2	2
Fixed Object	0	1	1	2
Total	1	12	32	45

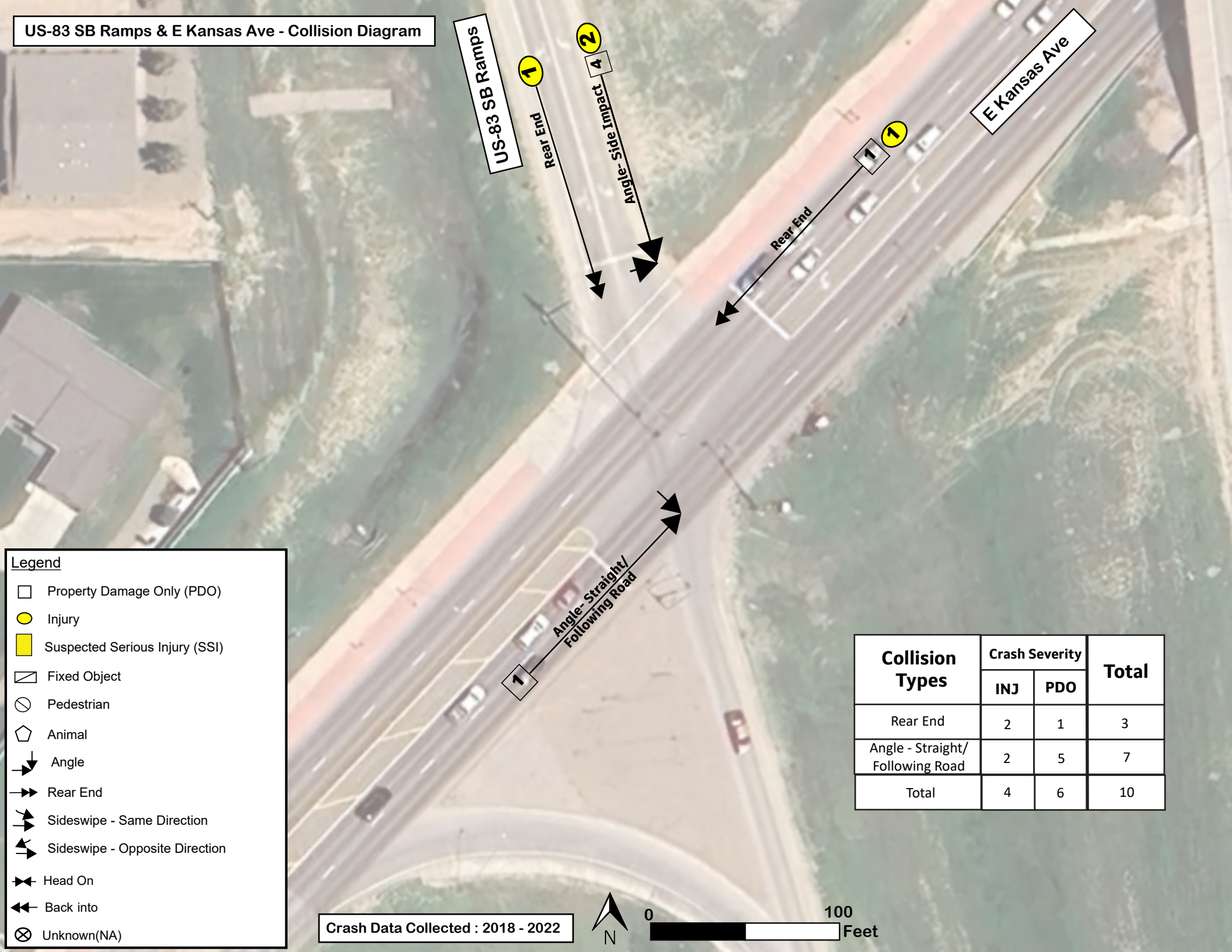


Summary - Campus & Schulman	Crash Severity	Total
	PDO	
Fixed Object	1	1
Rear End	2	2
Angle - Straight/ Following Road	2	2
Total	5	5

Crash Data Collected : 2018 - 2022



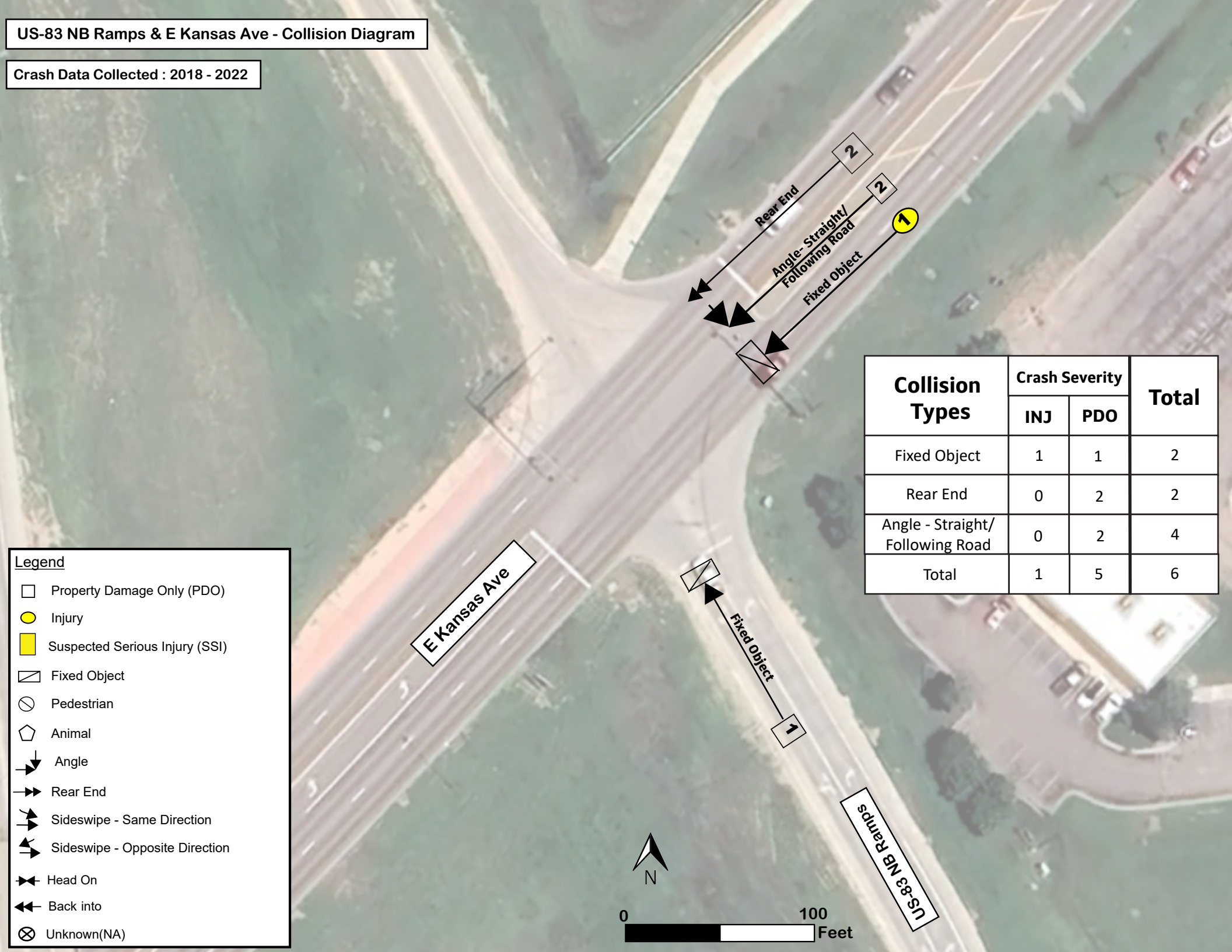
Collision Types	Crash Severity		Total
	Injury	PDO	
Rear End	0	1	1
Total	0	1	1



Collision Types	Crash Severity		Total
	INJ	PDO	
Rear End	2	1	3
Angle - Straight/ Following Road	2	5	7
Total	4	6	10

US-83 NB Ramps & E Kansas Ave - Collision Diagram

Crash Data Collected : 2018 - 2022

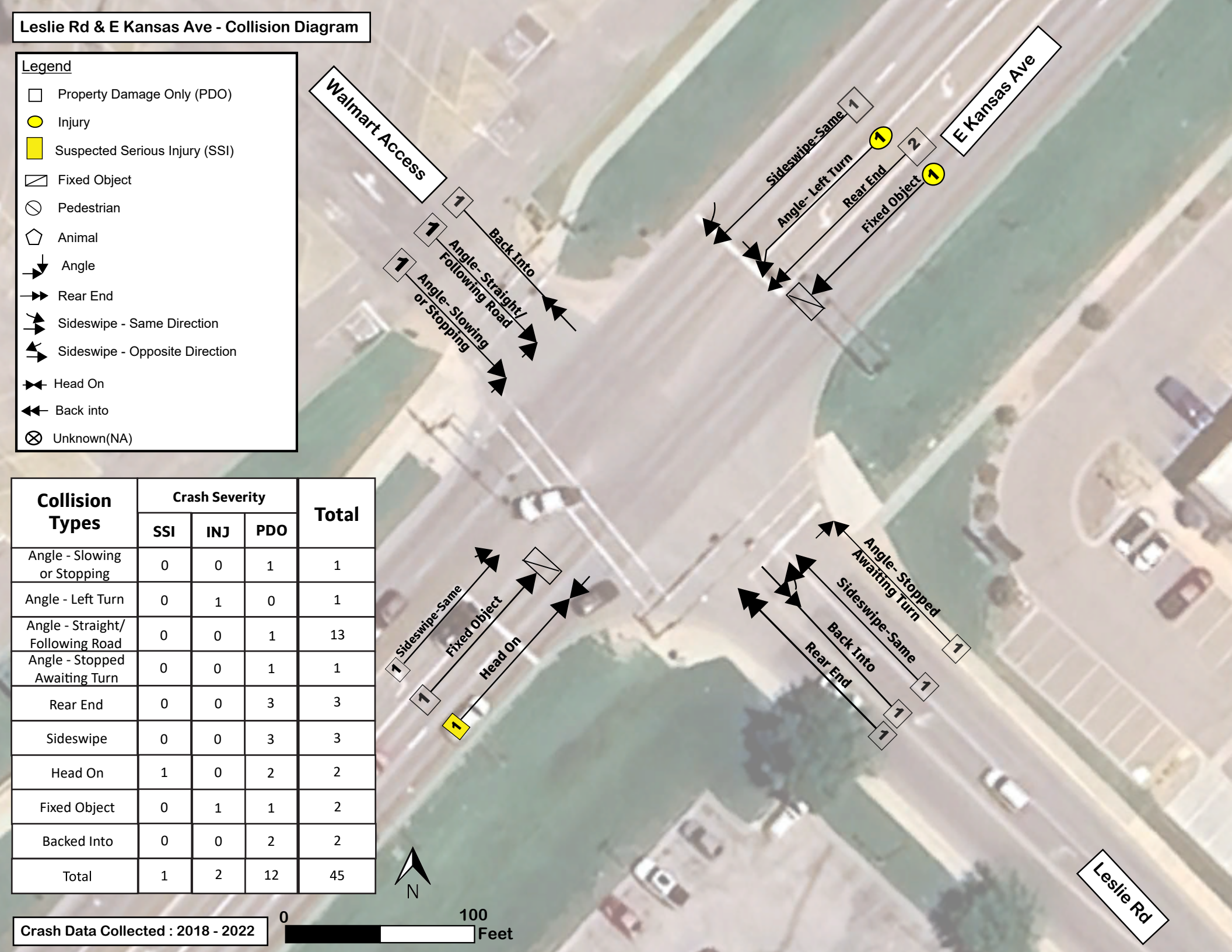


Collision Types	Crash Severity		Total
	INJ	PDO	
Fixed Object	1	1	2
Rear End	0	2	2
Angle - Straight/ Following Road	0	2	4
Total	1	5	6

Legend

- Property Damage Only (PDO)
- Injury
- Suspected Serious Injury (SSI)
- Fixed Object
- Pedestrian
- Animal
- Angle
- Rear End
- Sideswipe - Same Direction
- Sideswipe - Opposite Direction
- Head On
- Back into
- Unknown(NA)

Leslie Rd & E Kansas Ave - Collision Diagram



Collision Types	Crash Severity			Total
	SSI	INJ	PDO	
Angle - Slowing or Stopping	0	0	1	1
Angle - Left Turn	0	1	0	1
Angle - Straight/ Following Road	0	0	1	13
Angle - Stopped Awaiting Turn	0	0	1	1
Rear End	0	0	3	3
Sideswipe	0	0	3	3
Head On	1	0	2	2
Fixed Object	0	1	1	2
Backed Into	0	0	2	2
Total	1	2	12	45

Crash Data Collected : 2018 - 2022