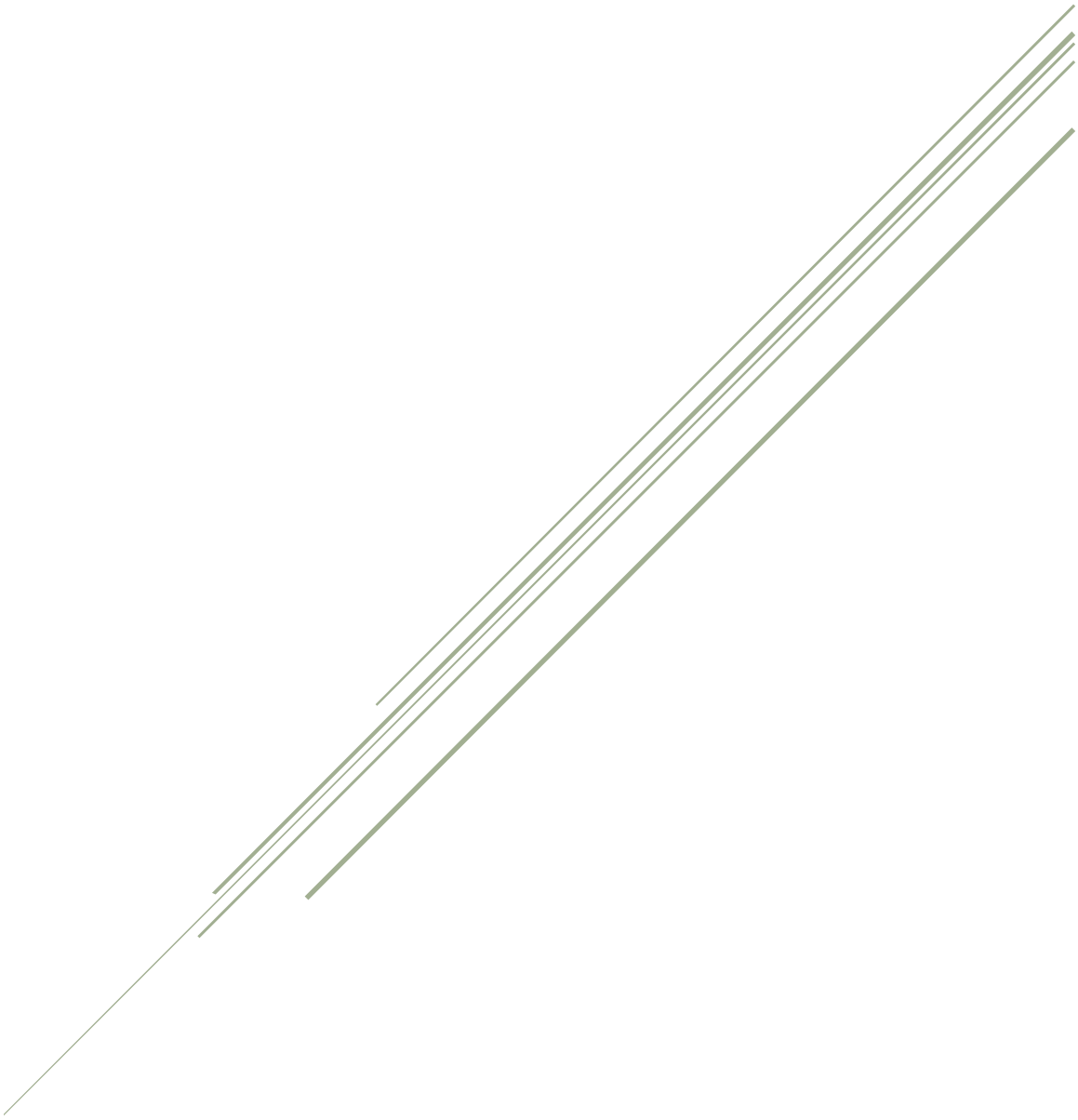
KAW NATION

Transportation Safety Update

April 2020



Developed by Cross Timbers Consulting, LLC

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ACRONYMS

BIA	Bureau of Indian Affairs
CDC	Center for Disease Control
DOT	Department of Transportation
DUI	Driving Under the Influence
EMS	Emergency Medical Services
F-O	Fixed-Object
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
Four (4) Es	Engineering, Enforcement, Education, Emergency Services
HFST	High Friction Surface Treatment
MUTCD	Manual on Uniform Traffic Control Devices
NHTSA	National Highway Traffic Safety Administration
NTTFI	National Tribal Transportation Facility Inventory
ODOT	Oklahoma Department of Transportation
OHP	Oklahoma Highway Patrol
OHSO	Oklahoma Highway Safety Office
OTSA	Oklahoma Tribal Statistical Area
PDO	Property Damage Only
R/O	Rollover
RSA	Road Safety Audit
RwD	Roadway Departure
SAFE-T	Statewide Analysis for Engineering & Technology
STSP	Strategic Transportation Safety Plan
TTAM	Tribal Transportation Allocation Methodology
TTP	Tribal Transportation Program
TTPSF	Tribal Transportation Program Safety Funds

Introduction

Tribal Transportation Program Safety Funds

The Tribal Transportation Program (TTP) is the largest program in the Office of Federal Lands Highway. The purpose of the TTP is to address the transportation needs of Tribal governments throughout the United States. The program received $465 million in fiscal year 2016 and with increases of $10 million per year to $505 million in fiscal year 2020, as established in Public Law 114-94, Fixing America's Surface Transportation Act (FAST Act). Funds are allocated among Tribes using a statutory formula based on tribal population, road mileage, and average tribal shares of the former Tribal Transportation Allocation Methodology (TTAM) formula.

Native American and Alaska Native populations experience higher rates of transportation related fatal injuries. To identify causes and develop countermeasures, Tribal Transportation Program Safety Funds (TTPSF) have been made available to federally recognized Indian Tribes through a competitive, discretionary program. Each year under the FAST Act, 2% of the available TTP funds are set aside for Tribal transportation safety. Eligible projects for the TTPSF under the FAST Act include 1) the development and update of transportation safety plans; 2) crash data assessment, improvement, and analysis; and, 3) infrastructure improvements and other eligible activities listed in 23 U.S.C. 148(a)(4).

The development of a Strategic Transportation Safety Plan (STSP) has been encouraged as a means to address transportation safety issues in tribal communities through the four Es: Engineering, Enforcement, Education, and Emergency Medical Services. Using TTP safety funds, the Kaw Nation developed its own STSP in 2015 to serve as a foundation and justification for safety improvements projects. The goal of the safety plan is to identify data-driven needs regardless of resources or specific funding. After three years, a Tribe may apply for funding to update the transportation safety plan. Updates may assess safety data improvement opportunities, consider priority areas from the STSP, and reevaluate available safety data and priorities.

Kaw Nation

The Kanza (Kansa) or the Wind People are collectively known as the Kaw Nation. The tribal enrollment is currently over 3,500. The Kaw people were the predominant Tribe in the area now recognized as northern and eastern Kansas, but their hunting territory extended to the west. Westward expansion to the agricultural lands produced by the Missouri and Kansas Rivers disrupted Kaw territory. The Kaw Allotment Act of 1902 stripped the Tribe of any kind of legal status until Indian Reorganization in 1959. In the fall of 1871, the northeast portion of the former Osage holdings was selected, and the Tribe was moved from Council Grove, Kansas, to the 100,000 acres purchased from the Osage Nation for the Kaw Reservation in northern Indian Territory (Kay County, Oklahoma). In the 1960s, the U.S. Army Corps of Engineers dammed the Arkansas River and built Kaw Lake over most of the designated Kaw Reservation. Many tribal members were displaced, and the original settlements inundated. Prior to flooding, the Kaw Council House was relocated, and the tribal cemetery was moved north of Newkirk. The main tribal complex is found in Kaw City, on the peninsula extending into Kaw Lake.

In the state of Oklahoma, Tribes have designated jurisdictional area. The Kaw Nation tribal jurisdictional area is found in the eastern portion of Kay County, but the transportation network covers much of the area to the west. For Tribes in Oklahoma, the U.S. Census Bureau, through the American Community

Survey (ACS), identifies and delineates federally recognized Tribes that formerly had a reservation in Oklahoma Territory as an Oklahoma Tribal Statistical Area (OTSA). The boundary of an OTSA is the former reservation in Oklahoma, except where modified agreements with neighboring Tribes for statistical data presentation purposes. The Kaw Nation transportation network covers the U.S. Census designated OTSAs and will be the geographic region of study for this transportation safety plan update (Figure 1).

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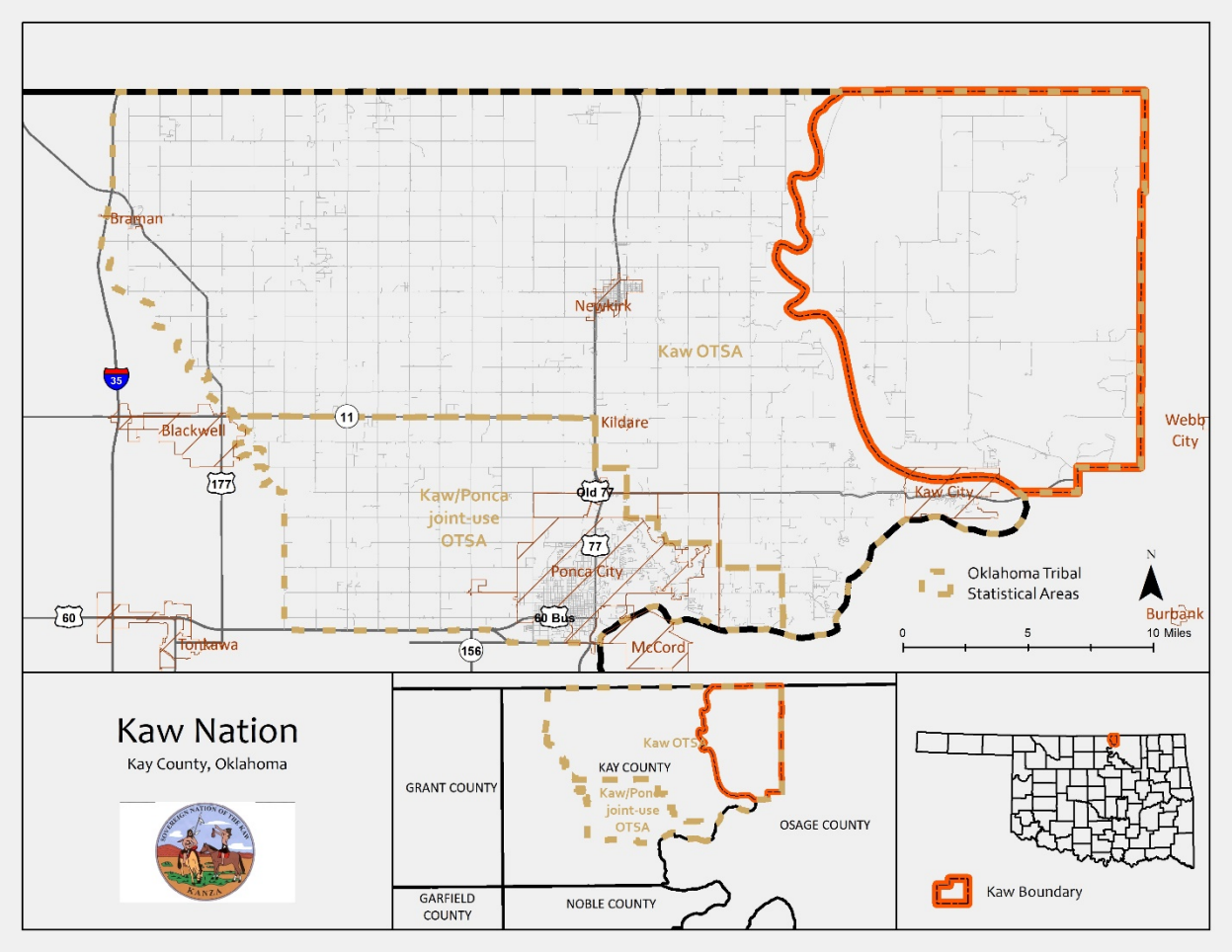


FIGURE 1. KAW NATION TRANSPORTATION NETWORK

Kaw Nation Transportation Safety Plan Update

The purpose of this document is to provide an update of the transportation safety plan that was developed in 2015 for the Kaw Nation.

The process for this update will follow the initial transportation safety plan: 1) Identification of concerns; 2) Development of solution strategies; and 3) Site specific implementation.

In August 2017, the Tribal Transportation Strategic Safety Plan for the county was presented to the U.S. Congress. The national plan was intended to identify and discuss common transportation safety issues

for Tribes across the country. The plan justifies the need and funding for Tribal areas by recognizing that solid data collection methods are lacking that would allow Tribes to better understand, identify, and share tribal transportation safety issues.

Five emphasis topics were identified at the national level to improve safety on Tribal lands:

- Occupant Protection Devices
- Roadway Departure
- Impaired Driving
- Pedestrians
- Availability of Public Safety Services

Emerging topics of interest to Tribes were speed, driver distraction, intersections, young drivers, older drivers, animal-vehicle crashes, and off-road transportation.

Due to COVID-19 outbreak at the time of developing this document, a public meeting was not possible. Therefore, public outreach was conducted via online questionnaire. The results of this questionnaire have been used to identify the emphasis areas for the Kaw Nation.

Kaw Nation Public Outreach

Tribal Transportation Survey

A tribal transportation safety questionnaire was posted on the Kaw Nation website and on the Tribe's Facebook page. The survey was active for over two weeks and advertised by the Transportation Director. The questionnaire asked for comments about the five main emphasis areas identified at the national level. The questionnaire then asked if the following transportation concerns were relevant to the Kaw Nation:

- Speed
- Driver Distraction
- Intersections
- Young Drivers
- Older Drivers
- Off-Road Transportation
- Animal Vehicle Crashes

Respondents were given the option to share any further tribal transportation concerns. Six complete responses and one partial response were received. A full summary of the survey and responses can be found in Appendix A.

Main Emphasis Areas

The table below summarizes the comments provided for the main emphasis areas. These comments are taken directly from survey responses.

TABLE 1. MAIN EMPHASIS AREAS RESPONSES

1. OCCUPANT PROTECTION DEVICES (seat belts, child safety seats, etc.)	
	Should be used ever time in any vehicle
	n/a

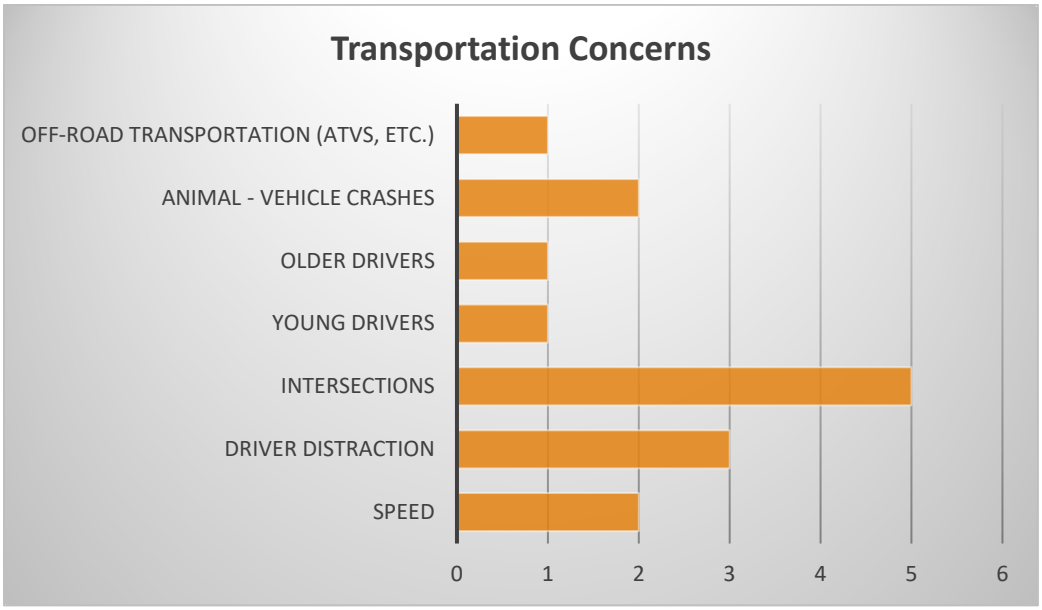
	Every occupant in a vehicle should wear a seatbelt at all times. Children should be in safety seats according to their age and weight. Very relevant to Kaw Nation
	seat belts do save people child seats are a must
	Important for infants and children. If not followed violation of law.
	It is important for all people to wear seat belts and use child safety seats. Not only are these laws but also is protection in case of accidents which could save lives.
	we need to keep our people safe it is very important.
2. ROADWAY DEPARTURES (a crash which occurs after a vehicle crosses an edge line or center line)	
	Kay County has had a few deaths due to roadway departures over the years
	counties would like to continue our maintenance agreements to help stripe roads for clearer markings and signage.
	Most crashes that involve a vehicle crossing end in fatality or serious injury. Edge lines and centerlines need to be marked on Kaw Nation rural roads as well as curve markings
	most of the roads in the country have no center line or edge lines
	Not sure about this question. Kaw City highway is very dangerous.
	Our roads are not always up to standards. Some roads are hazardous with pot holes and the shoulders of the roads could be damaged. Hitting these could cause your car to swerve into oncoming traffic or losing control completely. Very important to keep roads in good shape.
3. IMPAIRED DRIVING (most commonly driving under the influence)	
	I think Kay County has a high impaired driving rate
	n/a
	many people drive on back roads when impaired. This affects Kaw Nation as many of our roads are "in the country". Statistics in this area show many people continue to drive while impaired.
	I do not know how to keep impaired drivers off of roads
	Substance abuse is a problem.
	Employees drive cars that are leased or owned by Kaw Nation. Driving records are checked and vehicles are used for business only not pleasure. Getting a DUI or DWI could affect your ability to drive for the Nation which could be detrimental to your job.
4. PEDESTRIANS (people walking and/or biking)	
	Not a lot of pedestrian traffic
	a walking trail/bike path from Newkirk to the tribal headquarters along river road may be a need.
	Not that relevant as our roads are not in a community except for Kaw Nation housing
	N/A
	Highway 11 goes through Kaw City. Should be marked if crossing highway or riding a bike.
	Roads need to be clearly marked for bikers and pedestrians. We have a lot of them in our area.
5. AVAILABILITY OF PUBLIC SAFETY SERVICES (emergency response)	
	It takes longer in some of the more remote areas of Kay County
	continue the cross agreements with the county and other municipalities
	Emergency services are adequate
	This is a place I think we should try to improve
	Newkirk has service from Newkirk. Not sure if Kaw City has an ambulance or if they rely on Shidler, which is approximately 20 miles away. Would be good to have this service.
	Especially with the pandemic we are experiencing we need to have an emergency response system and policies in place. We need to know what we need to do in case of an emergent situation. Tornadoes are also prevalent in our area. We need to be ready to assist our members and community
6. Please provide any specific details about driver behavior or geographic locations.	
	speed is a major problem everywhere as well as driver distraction. There are many animal/vehicle crashes.

	with country driving you can always be distracted by whats around you
	Intersection at LA Cann and River Road is dangerous, especially after bingo is over. Would help if blacktop was repainted along with side roads.
7. Lastly, please discuss any other transportation safety concerns for the Kaw Nation.	
	Guardrails Widen shoulders Shoulder drop offs Improve some dirt and gravel roads Improve older bridges in the area Update older signs in the area Start a Kaw Nation Public Transportation Hub Maintain all paved roads in the service area Improve Kaw Nation parking facilities Expand Kaw Nation parking at gas stations and casinos to boost economic growth
	would like to maintain our working relationship to better provide safe roads and bridges to our public. Thanks for all you have done
	Safety concerns are road markings, guard rails, rough roads that may cause disruption in driving. There is also the problem of farm equipment on the roads.
	We can always use improvements to roads and bridges as they get older
	LA Cann road now has high truck traffic now because of construction of wind farms and new rock quarry.
	I feel I have discussed these in the first questions.

Other Transportation Concerns

Although not selected as national priority topics, these transportation concerns are experienced across the nation by a number of tribes. Figure 2 shows the result of the transportation concerns survey. Intersections and driver distraction were considered to be the most critical safety issues. Intersections may be the result of road geometry deficiencies. Driver distraction is the result of human behavior.

FIGURE 2. KAW NATION TRANSPORTATION CONCERNS



Crash Data Analysis

Kaw Nation Collisions (2015-2019)

The Oklahoma Department of Transportation (ODOT) allows access to collision data throughout the state through their SAFE-T (Statewide Analysis for Engineering and Technology) database. Collisions data can be accessed for counties, municipalities, and other geographic regions. Data can also be examined by specific streets or ranges of streets. The geographic region studied is the area covered by the NTTFI Routes, mostly represented by the Oklahoma Tribal Statistical Areas for the Kaw Nation. Collisions counted in this analysis are those that intersect the Kaw Nation NTTFI routes, that fall within the Kaw OTSA, and those along SH 11. The map below shows the collisions included for the purposes of this study (Figure 3). The total count is 461 collisions. Contributing factors and other conditions were analyzed over the most recent five year period (2015-2019).

Collisions are ranked on a severity scale of 1 to 5:

- 1 – Property Damage Only (PDO)
- 2 – Possible Injury
- 3 – Non-incapacitating Injury
- 4 – Incapacitating injury
- 5 – Fatality

Collisions with a severity class of 3, 4, or 5 will collectively be referred to as “severe collisions.”

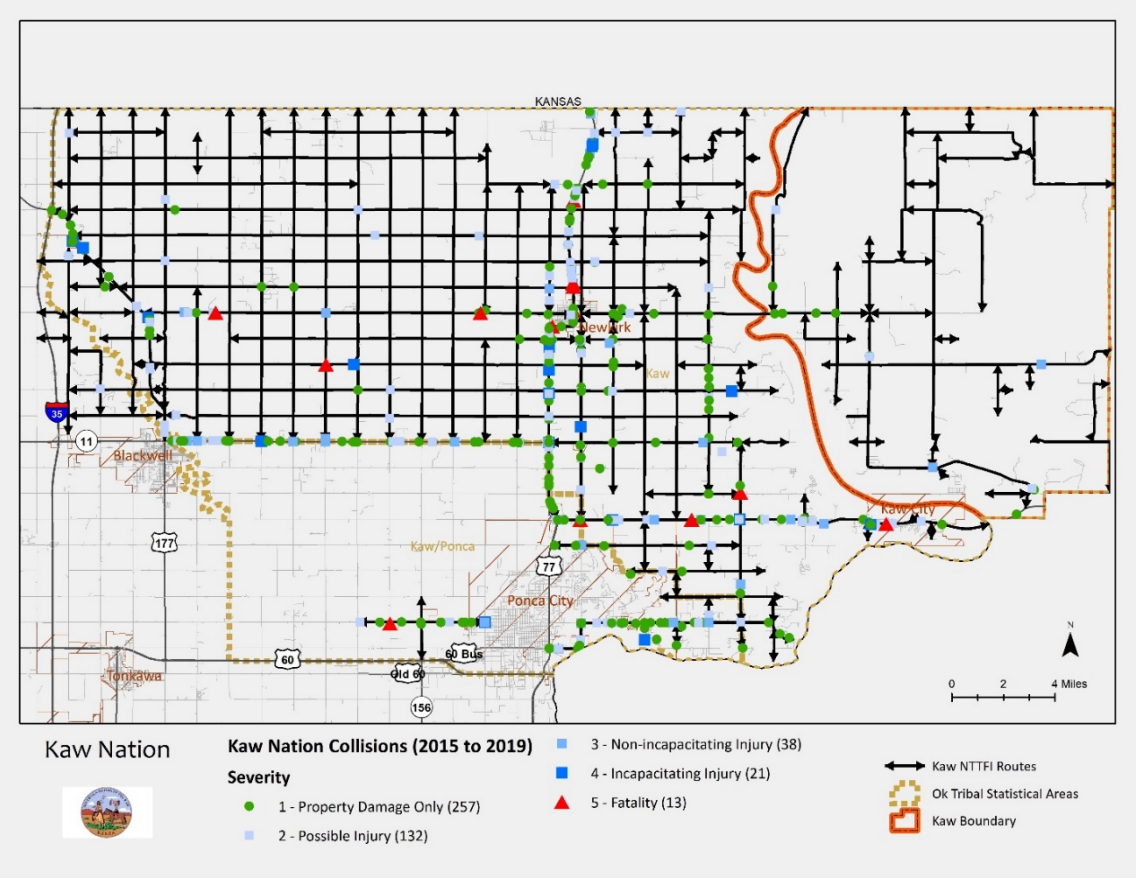


FIGURE 3. KAW NATION COLLISIONS (2015-2019)

Road geometry design and human behavior are the critical components for roadway safety. Collision data reveal troublesome locations, roadway deficiencies, and primary contributing factors. An examination of the contributing factors looks at the overall types of collisions, whether drugs and alcohols were involved, and the weather and lighting conditions.

The following table shows the number of known collisions where drugs and alcohol were involved. As expected, DUIs account for a higher percentage of severe collisions.

TABLE 2. KAW NATION COLLISIONS – DUIS

All Collisions	DUI - All (%)	Severe Collisions	DUI - Severe (%)
461	63 (13.7%)	72	13 (18.1%)

Figures 4 and 5 show the lighting and weather conditions for the Kaw Nation collisions. Most of the collisions occurred during Daylight and with Clear conditions.

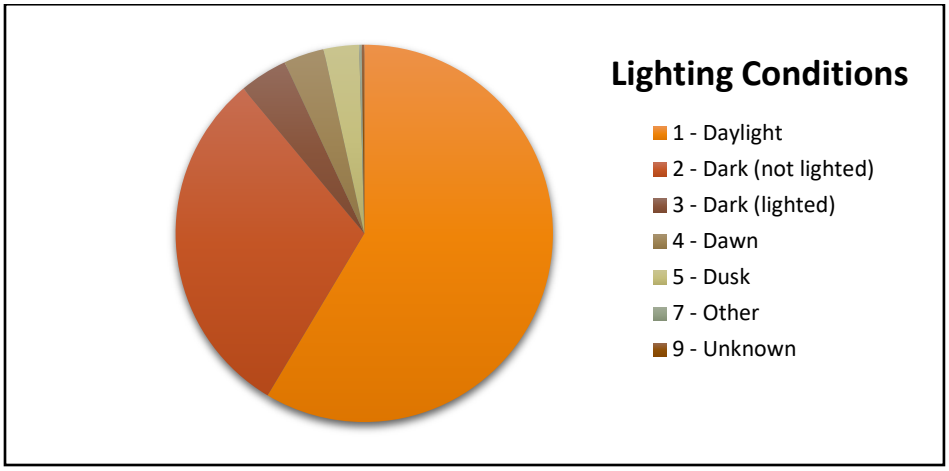


FIGURE 4. KAW NATION COLLISIONS - LIGHTING CONDITIONS

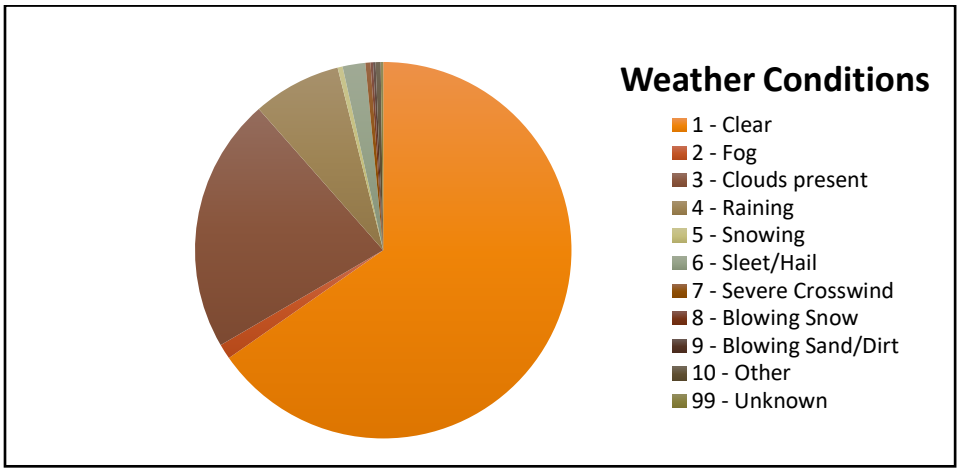


FIGURE 5. KAW NATION COLLISIONS - WEATHER CONDITIONS

The table below shows the counts of the types of collisions reported and their severity. The collisions types are based on criteria by ODOT reporting in the SAFE-T database. F-O stands for "Fixed-Object."

TABLE 3. TYPES OF COLLISIONS

Types of Collisions	Severity					Total
	1 – PDO	2 – Poss. Injury	3 – Non-Inc. Injury	4 – Inc. Injury	5 – Fatality	
ANGLE-OTHER			1			1
ANGLE-TURNING	28	16	4	3	1	52
ANIMAL	36	9			1	46
F-O BARR-CABLE	2					2
F-O BR-BEAMS	1					1
F-O BR-CURB	1					1
F-O BR-OVERHEAD	1					1
F-O BR-PIER	2		1			3
F-O BR-RAIL	4		1			5
F-O CULVERT	10	4	3			17
F-O DITCH	12	10	2	2		26
F-O EMBANKMENT		1	1			2
F-O FENCE	12	3		2		17
F-O FENCE-POLE	1			1		2
F-O GROUND		2	1			3
F-O GUARDRL-END	2					2
F-O GUARDRL-FACE	9	5	1			15
F-O MAILBOX	2					2
F-O OTHER	2					2
F-O POLE-OTHER	1					1
F-O TRAFF-SIGN	6	4				10
F-O TREE	7	6	5		1	19
F-O UTIL-POLE	10	8				18
HEAD-ON	2	2	1		1	6
OTH-BACKING	2					2
OTHER	11	4	1		1	17
OTH-SINGLE-VEH	3	1				4
PEDAL-CYCLE		1				1
PEDESTRIAN		1	2	1	1	5
REAR-END	32	16	4	1		53
RIGHT-ANGLE	32	24	6	6	5	73
ROLLOVER	10	13	4	4		31
SIDESWIPE-OPP	8	2			2	12
SIDESWIPE-SAME	8			1		9
Total	**257**	**132**	**38**	**21**	**13**	**461**

Roadway Departure (RwD) Crashes

Roadway departure (RwD) crashes are defined as when a vehicle leaves the traveled way and results in a crash. Roadway alignment is considered an important contributing factor. The national transportation safety plan states that 35% of roadway departure fatalities in Tribal areas occurred in a horizontal curve, in keeping with crash statistics across the country.

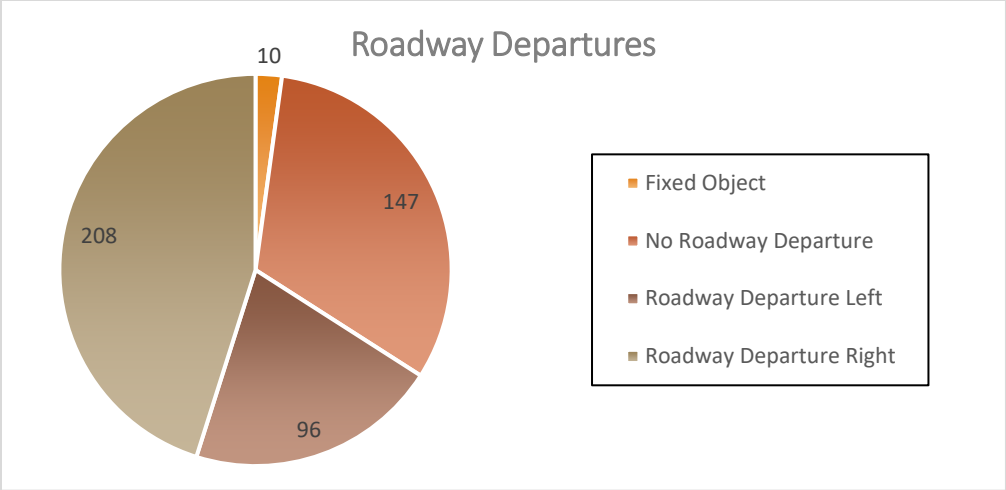


FIGURE 6. KAW NATION ROADWAY DEPARTURES

Emphasis Areas

Occupant Protection Devices

According to the Center for Disease Control (CDC), motor vehicle crashes are a leading cause of unintentional injury death for Native American adults and children. The death rate for Native Americans is more than twice of non-Hispanic whites or blacks; among all racial/ethnic groups, Native American children experience the highest fatal and nonfatal injury rates. The major risk factors are low seat belt use and child safety restraint use in Indian Country.

The State of Oklahoma has a primary seatbelt law which means that a driver can be pulled over for not being buckled. Children under 2 years must be in a rear-facing car seat and car seats are required until 4 years of age. Booster seats are required until 8 years of age and children riding in the backseat must be buckled up until 13 years of age.

The Kaw Nation established an Injury Prevention Program in 2000 that focused on child passenger safety and offered car seats and installation. However, funding for this grant program expired and the services no longer exist.

Strategies

Education

- Establish installation and inspection programs for child safety seats.
- Educate drivers and youth.
    - Use car seats, booster seats, passenger restraints (seat belts) on every trip.

Enforcement

- Conduct short-term, highly visible child passenger safety seats and seat belts.
- Combine seat belt and impairment enforcement efforts.
- Collaborate with other law enforcement groups.

Roadway Departure (RwD)

Reducing rural roadway departure (RwD) is a priority concern the FHWA. The FHWA's efforts to reduce RwDs are guided by the Strategic Approach and Plan which targets keeping vehicles on the roadway, providing for safe recovery, and reducing crash severity. RwDs are a major problem on rural, locally-owned roads. In Tribal area, RwD is involved in 63% of fatal crashes. Reducing Rural Roadway Departures is one of the Every Day Counts (EDC) 5 initiatives. The Counter-measures and approaches proven to reduce deaths focus on reducing rural roadway departures (FoRRRwD).

RwD crashes on rural roads are random and the locations where they occur often changes from year to year, creating a challenge to determine where to install proven countermeasures. Although the locations change, there is consistency in the risk factors which lead to the crash (e.g. narrow shoulders, roadway alignment, light conditions, driver behavior). Analysis tools can help identify locations that are at highest risk of future roadway departure crashes. Knowing which locations and corridors are high risk of RwDs allows for countermeasures to be implemented systemically. Figure 7 is a map of the collisions classified as Roadway Departures. A larger version of this map can be found in Appendix B.

Resources for RwDs:
https://safety.fhwa.dot.gov/roadway_dept/
https://safety.fhwa.dot.gov/roadway_dept/strat_approach/
https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/roadway_departures.cfm

Rollover Crashes

Rollover crashes, also referred to as Overturn crashes, are a subset of RwD, and account for most of the highway fatalities across the nation. According to the FHWA, Rollover/Overturn (R/O) account for 30% of all fatal RwD crashes. The risk factors for these crashes are rural areas, speed limits greater than 30 mph, and curves. Strategies for treating R/O crashes include curve delineation, friction treatments in curves, edge lines and shoulder rumble strips, safety edges, clear zones, traversable roadside slopes, and barriers to shield fixed object and slopes.

Thirty-one Rollover crashes were recorded over the Kaw Nation road network. A quarter of these resulted in severe collisions but no fatalities. Figure 8 is a map of the R/O crashes. About half of the R/O crashes took place on US Hwy 177 or US Hwy 77. The other crashes are scattered about the road network. These locations can be studied to determine appropriate countermeasures.

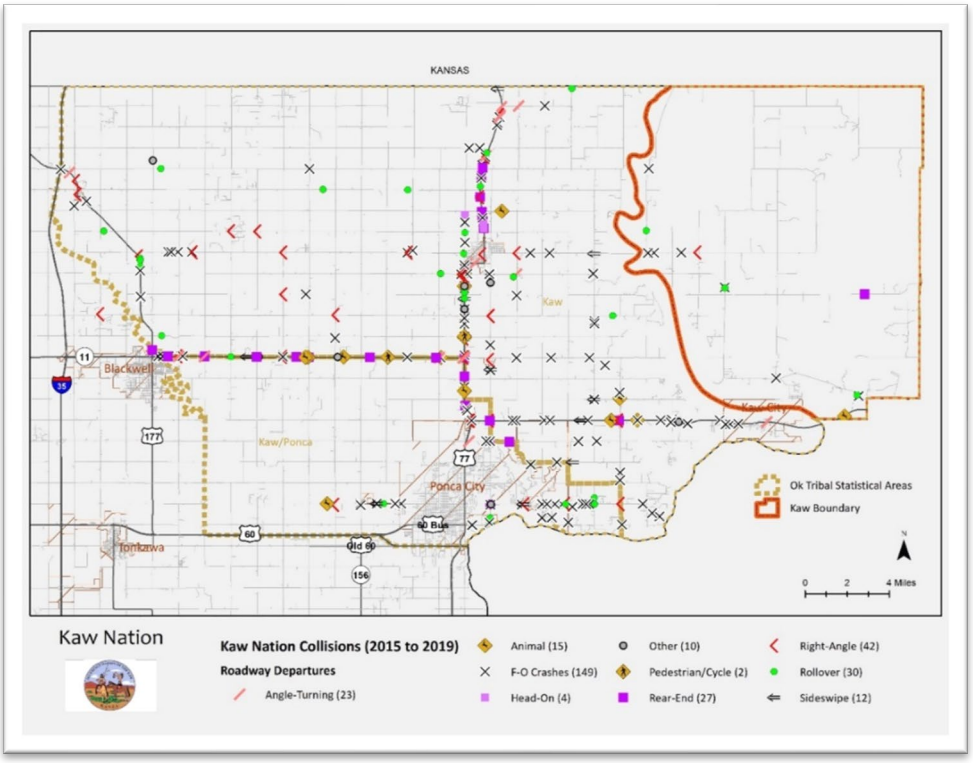


FIGURE 7. KAW NATION ROADWAY DEPARTURE CRASHES

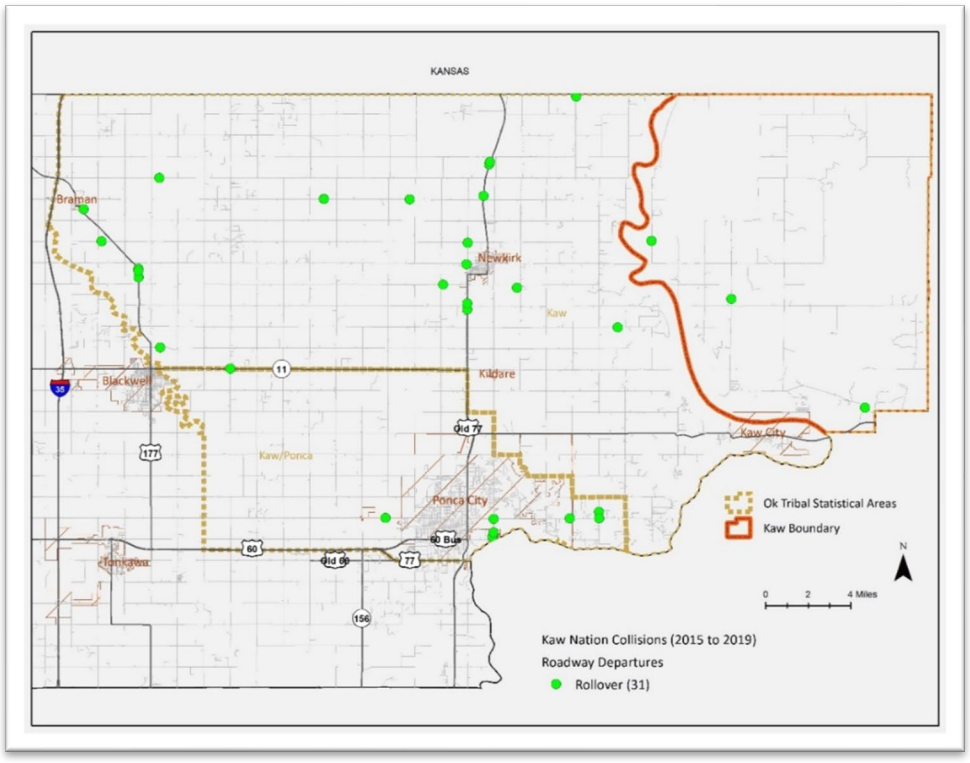


FIGURE 8. KAW NATION R/O CRASHES

Fixed-Object (F-O) Crashes

Nationally, around 20% of motor vehicle crash deaths result from a vehicle leaving the roadway and hitting a fixed-object (F-O). Across the Nation, nearly half of these deaths occur at night and nearly half involved a tree (F-O Tree). Figure 9 shows where the Kaw Nation F-O collisions occur.

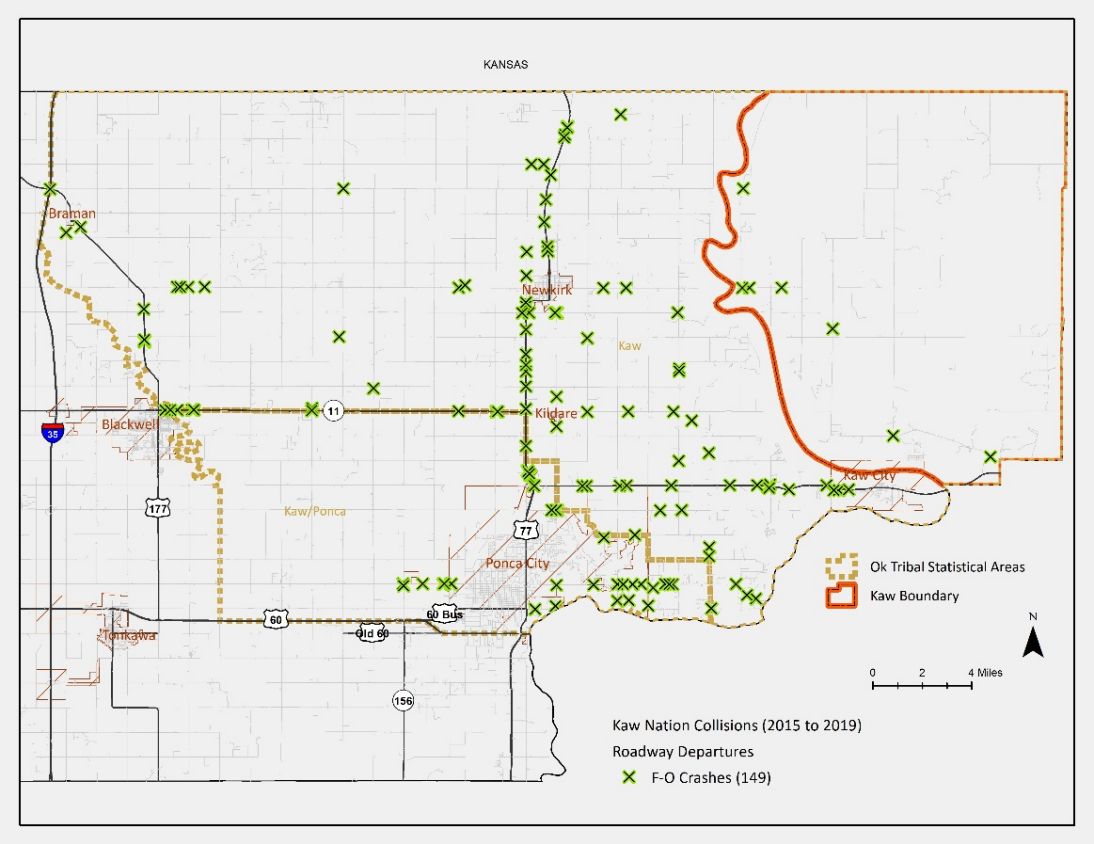


FIGURE 9. KAW NATION F-O CRASHES

Table 4 below shows the breakdown of Fixed-Object Collisions. The top five F-O collisions involved Ditches, Trees, Utility Poles, Culverts and Fences.

TABLE 4. KAW NATION F-O COLLISIONS

Type of F-O Collisions	Count
F-O BARR-CABLE	2
F-O BR-BEAMS	1
F-O BR-CURB	1
F-O BR-OVERHEAD	1
F-O BR-PIER	3
F-O BR-RAIL	5
F-O CULVERT	17
F-O DITCH	26
F-O EMBANKMENT	2
F-O FENCE	17
F-O FENCE-POLE	2
F-O GROUND	3
F-O GUARDRL-END	2
F-O GUARDRL-FACE	15
F-O MAILBOX	2
F-O OTHER	2
F-O POLE-OTHER	1
F-O TRAFF-SIGN	10
F-O TREE	19
F-O UTIL-POLE	18
Grand Total	**149**

Appendix B provides maps that examine different types of roadway departures crashes throughout the Kaw Nation transportation network.

Strategies

Engineering

- Identify locations where greater incidences of RwDs occur.
    - Identify RwD subset locations (e.g. F-O, Rollover, etc.).
- Conduct a study of roadway deficiencies that are known to contribute to RwDs.
- Conduct a study of driver conditions to determine the influence of driver behavior in RwDs.
- Develop a Roadway Departure Strategic Plan.
    - https://safety.fhwa.dot.gov/roadway_dept/docs/rwd_strategic_plan_version2013.pdf
- Implement known effective RwD countermeasures.
    - https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/roadway_departures.cfm
- Correct roadway deficiencies shown to be linked to RwDs.
- Improve signage at critical locations.
- Apply high-friction surface treatments (HFST) at critical locations.
    - https://safety.fhwa.dot.gov/roadway_dept/pavement_friction/high_friction/

Impaired & Distracted Driving

Native Americans experience a disproportionately high percentage of alcohol-involved crashes and have the highest alcohol-related motor vehicle death rate of all racial groups. Drugs and alcohol often go hand-in-hand, and typically drugs will not be tested if alcohol is involved (drugs are metabolized differently and require their own special tests). Most fatalities in Tribal areas involve alcohol as a contributing factor.

The State of Oklahoma is home to thirty-eight federally recognized Tribes with trust lands parceled out within the Tribal Jurisdictional Areas. Impaired driving among Native Americans is not a measurable statistic due to the lack of formal reservations in Oklahoma. Alcohol-related crash data for Native Americans is only available in the event of a fatality.

As discussed in the Crash Data Analysis section, DUIs accounted for 18.1% of the severe crashes within the Kaw Nation transportation network.

Oklahoma's ENDUI program focuses on prevention, enforcement, adjudication, and media efforts to reduce impaired driving-related crashes. Traffic fatalities have been declining over the last five years in the state of Oklahoma. https://enduiok.com/.

While the Injury Prevention Program was operational, the Kaw Nation endorsed the statewide initiative to end DUIs. In 2015, the program partnered with the Southern Plains Tribal Technical Assistance Program (now defunct) in hosting an ENDUI event, educating youth about the dangers of impaired driving or riding with an impaired driver.

Distracted Driving is an unsafe driving behavior that has grown with advancements in technology and reliance upon smart phones. According to the National Highway Traffic Safety Administration (NHTSA), distracted driving claimed over 2,800 lives in 2018. In 2015, Oklahoma became the 46th state to ban

texting while driving. However, law enforcement officials have stated that this ban is difficult to enforce given privacy laws and the ability of law enforcement to indisputably observe the behavior.

Strategies

Education

- Incorporate existing resources into education programs and community outreach.
    - Parents are the Key: https://www.cdc.gov/parentsarethekey/
    - Alive at 25: https://www.oksafety.org/aliveat25
    - NHTSA: https://www.nhtsa.gov/risky-driving
- Continue to develop and improve programs to discourage DUI and distracted driving for the tribal and surrounding communities.

Enforcement

- Develop a tribal road safety program using the guidelines as outlined in the Roadway to Safety Tribal Communities Toolkit.
    - https://www.cdc.gov/motorvehiclesafety/native/toolkit.html
- Collaborate with county, state, and other local law enforcement officials.

Pedestrians

Across the country, pedestrian safety is common to all Tribes, regardless of population or land holdings. Native Americans have the highest pedestrian fatality risk of any racial group. As expected, most Tribal pedestrian fatalities occur in rural areas and after dark. The lack of pedestrian infrastructure contributes to the risk.

The survey responses were mixed regarding pedestrian safety. The Kaw Nation does not experience a lot of pedestrian traffic but where there are pedestrians, those areas need to be marked clearly. The Kaw Nation transportation network experienced six pedestrian collisions during the study period, four of which were severe (including one fatality). Two of these involved alcohol or drugs on the part of the pedestrian.

A study Oklahoma Highway Safety Office (OHSO) Interactive Crash Map dashboard revealed many more instances of pedestrian crashes within Newkirk and Ponca City. The City of Newkirk lies within the Kaw Nation transportation safety study area. Four ped/bike collisions occurred within Newkirk, two of which involved children 12 years or younger. One of the children sustained incapacitating injuries.

The OHSO interactive crash maps and data portal can be found here: http://ohso.ok.gov/crash-data2.

Strategies

Engineering

- Future road improvements should account for pedestrian/bicycle use and safety.
- Identify locations were pedestrian crossings are needed.
- Research various pedestrian crossings and implement the best options into design plans.
    - FHWA Pedestrian and Bicycle Program: https://www.fhwa.dot.gov/planning/processes/pedestrian_bicycle/

Education

- Integrate pedestrian and bicycle safety into existing community programs.
- Develop tribal programs focused on pedestrian / bicycle safety for both drivers and non-drivers.
- Develop public outreach / education based on anticipated recreational use.

Availability of Public Safety Services

Emergency response times are a major concern for most Tribes give the rurality of Indian county and remote locations of tribal complexes in Oklahoma. To improve response times, Tribes are seeking to update 911 systems, expand communication capabilities, and coordinate with local emergency response systems. Communications between law enforcement and emergency medical services (EMS) are essential to the safety and security of communities. Enabling advanced communication technologies will allow law enforcement officials to be more mobile, respond more rapidly, and access all areas of a region. Road conditions and weather conditions often hamper response times and disasters, natural and man-made, forcing responders to find alternative routes.

The survey responses seemed to indicate that current public safety services are adequate. Improvements can always be made to decrease response times especially within the rural areas. Overall, the Kaw Nation should continue and maintain coverage agreements and collaboration with the county, municipalities, and other service providers throughout Kay County.

Engineering

- Implement GIS resources.
    - Mapped transportation network.

Enforcement

- Coordination with other emergency management organizations.
- Purchase or acquire necessary hardware and software to improve communication capabilities.

Intersections

Intersections are listed within the national tribal transportation safety plan as a topic of interest of some Tribes. Within a road system, intersections are planned points of conflict, where paths cross, separate, or join. Intersection safety is priority at the national, state, and local levels. Uncontrolled intersections are problematic in rural intersections. Excessive speeds and the lack of signage to indicate right-of-way can make rural county roads intersections prone to collisions.

In the Kaw Nation safety survey, intersections were listed as the foremost concern. The crash data revealed that intersections are indeed a transportation safety concern for the Kaw Nation. From the available ODOT information, 174 of the 461 Kaw Nation collisions were intersection related, that is 37.7%.

ODOT has the following intersection classifications:

- 0 = not intersection related
- 1 = intersection-related
- 5 = north of intersection city street
- 6 = east of intersection city street
- 7 = south of intersection city street
- 8 = west of intersection city street.

These intersection crashes were queried from the Kaw Nation dataset for further examination. The map below (Figure 10) shows the location and the types of collisions that have occurred at intersections.

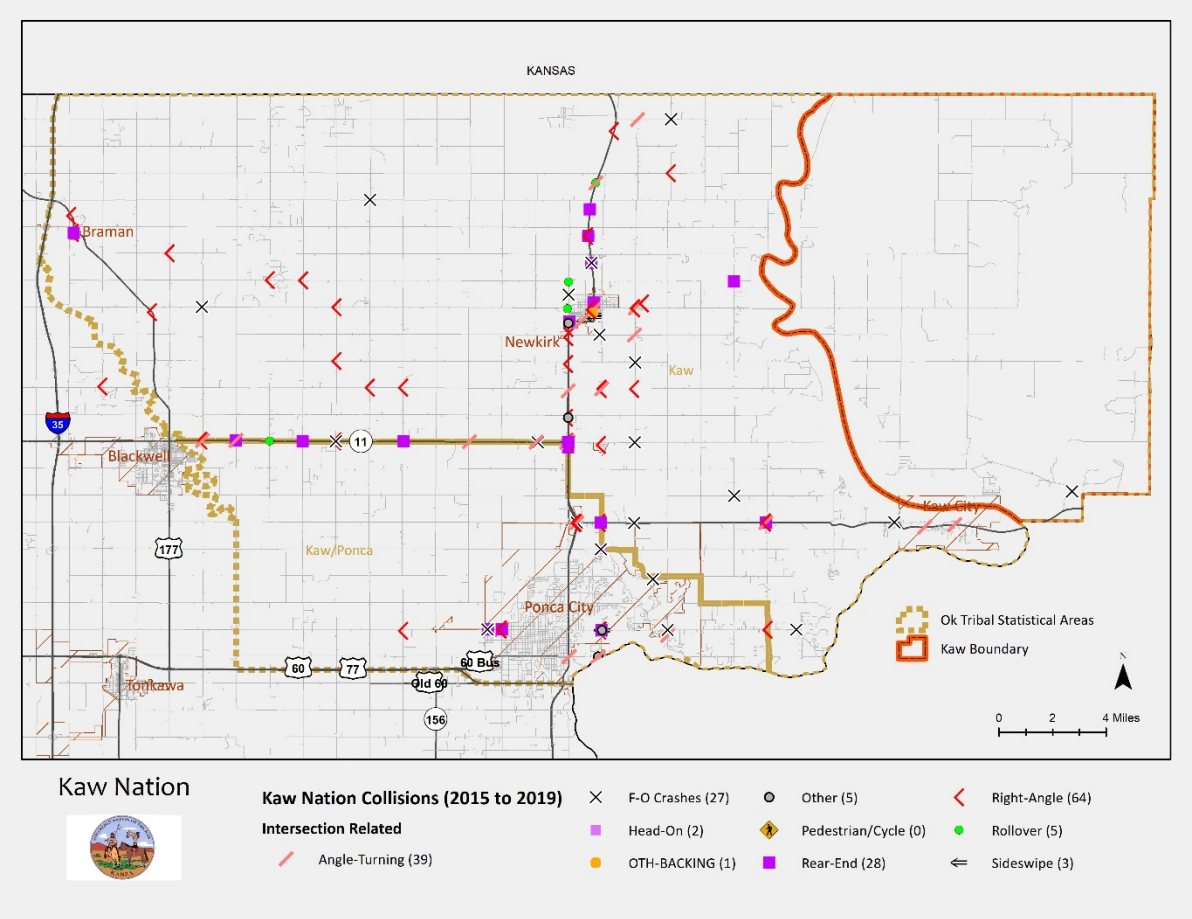


FIGURE 10. KAW NATION INTERSECTION RELATED CRASHES

Right-angle collisions made up 36.8% of all the intersection-related collisions. Right-angle collisions occur when two cars traveling at right angles to each other collide. The right-angle collisions appear to be spread throughout the Kaw Nation transportation network. A safety review of these locations would determine if a systemic countermeasure approach should be considered.

Along SH 11 and US 77, multiple collision types take place along the roadways stretching through the Kaw Nation transportation network. US 77 is part of the Kaw Nation NTTFI; yet, SH 11 is currently not on the Kaw Nation's NTTFI nor is it listed on any Tribe's inventory. Nevertheless, the roadways leading to the north are on the Kaw Nation NTTFI, and the roadways leading to the south are on the Ponca Tribe's inventory. A map of the intersection related collisions with the NTTFI routes can be found in Appendix B.

The FHWA provides resources and effective countermeasures for intersection related crashes, including innovative intersection solutions.

https://safety.fhwa.dot.gov/intersection/

Strategies

Engineering

- Identify locations where greater incidences of intersection related collisions occur.
    - Identify intersection-related subset locations (e.g. right-angle, angle turning, etc.)
- Conduct a study of roadway deficiencies at intersection-related collisions to determine best countermeasure.
- Improve signage at critical locations.
- Correct roadway deficiencies at high-incident intersections.
- Correct roadway deficiencies at right-angle collision locations.
- Develop a Roadway Departure Strategic Plan.
    - https://safety.fhwa.dot.gov/roadway_dept/docs/rwd_strategic_plan_version2013.pdf

Site Specific Implementation

The Roadway Departure crashes, the Fixed-Object crashes, and the Intersection Related crashes were re-examined for their severity to identify critical site-specific locations (Appendix C). One stretch of roadway presented itself as high-risk based on the crash data and importance to the Kaw Nation: State Highway 11 from US77 to Kaw City (Figure 11).

State Highway 11 into Kaw City

This 13.82-mile stretch of highway is designated as Control Section 28 in Kay County. This section of roadway leads from US77 into Kaw City where the tribal complex is located (Figure 11).

Over the five year study period, fifty-nine collisions occurred along this stretch of highway, including three fatalities and six injuries. On the sliding-scale analysis map, the majority of the length of the roadway is evaluated as severe. A sliding-scale analysis identifies roadway segments with a high crash occurrence. The full crash data report for this control section, including the sliding-scale analysis, is included within Appendix C.

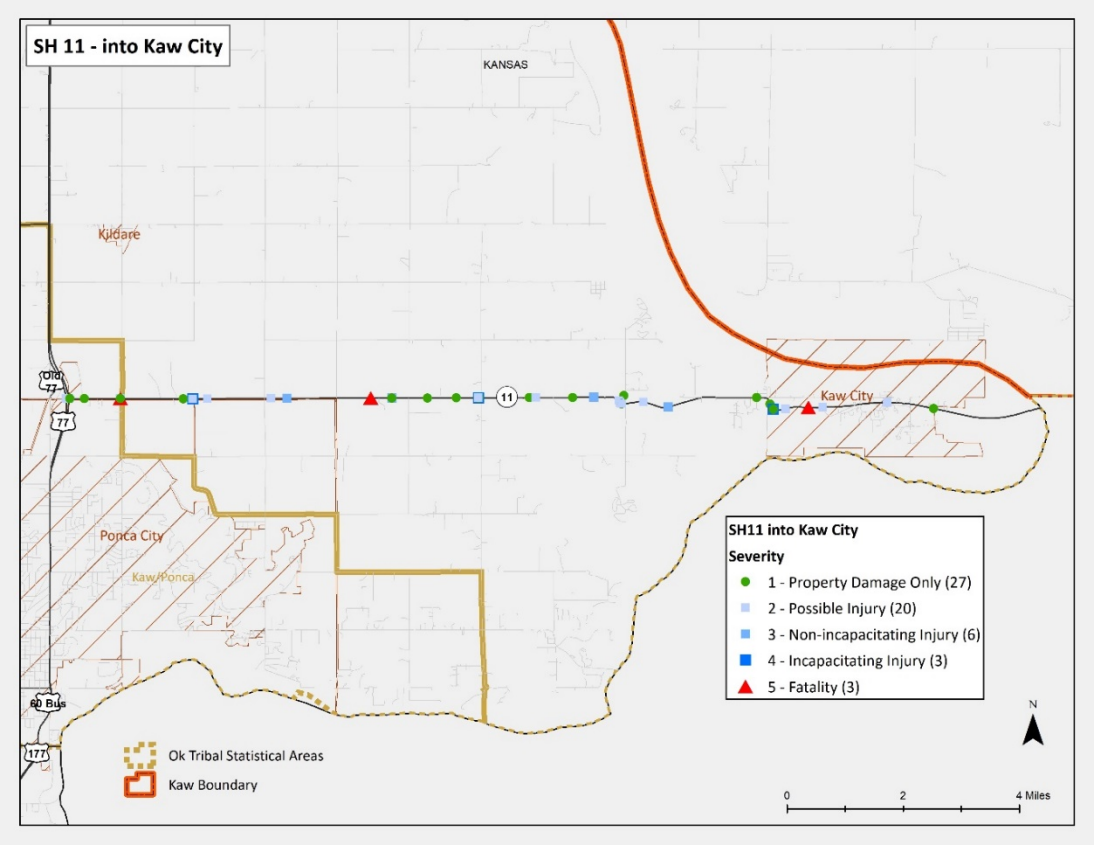


FIGURE 11. SH11 CONTROL SECTION INTO KAW CITY

Strategies

Engineering

- Conduct a Road Safety Audit (RSA) of this control section
- Coordinate and collaborate with ODOT for potential safety improvement projects
    - Correct roadway deficiencies
    - Implement known effective countermeasures

Conclusion

Per the FHWA, transportation safety plans are a tool to be used by Tribes to identify and address transportation risk factors. The goal of transportation safety is to eliminate the potential for severe collisions, those that result in injury or fatality. Transportation safety plans outline available resources and possible efforts to reduce risk, either through roadway improvements or impacting human behavior.

This transportation plan is meant to be a dynamic document that will be adapted as needs change due to roadway improvements, legislation changes, and technological advances.

Sources and Guidance

Federal Highway Administration. Tribal Transportation Safety Plans. U.S. Department of Transportation. https://flh.fhwa.dot.gov/programs/ttp/safety/plans.htm

Federal Highway Administration. Office of Safety. U.S Department of Transportation. http://safety.fhwa.dot.gov

Oklahoma Department of Transportation. Statewide Analysis for Engineering & Technology (SAFE-T). http://www.oksafe-t.org

Tribal Transportation Safety. http://www.tribalsafety.org/