



**QUAPAW NATION  
OF  
OKLAHOMA**

***TRIBAL TRANSPORTATION SAFETY PLAN***

**FINAL REPORT**

**December 11, 2017**

**PREPARED BY:**



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## **Introduction**

### **Background**

The Quapaw tribal area is unique in that it is well connected with the surrounding roadway networks in Kansas, Oklahoma, and Missouri. Due to that fact, a high percentage of traffic on the major routes travels through the tribal area to arrive at their final destination. This situation presents its own unique challenges when working to improve the transportation safety in this area.

Another unique characteristic is the breakdown of roadway ownership and physical location of the Quapaw roadway system. The roadway system is comprised of 144.5 miles of county roads, 43.1 miles of urban/city streets, 24.2 miles of state highway, and 7.9 miles of tribal roads. Additionally, the breakdown of bridge ownership is similar to the roadways. There are 2773 feet of county bridges, 782 feet of state bridges, and 120 feet of tribal bridges.

The geographical location of some of these roadways presents an unusual challenge as well. Though the vast majority of the Quapaw road network is in Oklahoma, there are six (6) sections of roadway that are in the state of Kansas (totaling 0.9 miles) and one (1) section of roadway that is within the state of Missouri (0.1 mile). Working within three states poses a very unique challenge to the tribe.

In order to help better understand the transportation safety challenges, traffic crash data was evaluated from the Oklahoma Highway Safety Office (OHSO), Kansas Department of Transportation (KDOT), and the Missouri Department of Transportation (MoDOT). All three agencies provided crash data specific to the Quapaw tribal area for the years 2011 to 2016.

MoDOT's Transportation Management System (TMS) was used to identify crash data in the state of Missouri. No injury or fatal crashes were found for the one tenth mile segment of Downstream Boulevard between SE 118<sup>th</sup> Street and the US 400 roundabout in Missouri.

KDOT was contacted to obtain crash data along the six (6) sections of roadway within the state of Kansas. One (1) injury crash and one (1) property damage only crash were found along these sections which include a short stretch of SE 118<sup>th</sup> Street south of Downstream Boulevard, two short sections along Downstream Boulevard between the casino and SE 118<sup>th</sup> Street, and three short sections of internal street network within the parking lot area.

OHSO was contacted to obtain crash data within the Quapaw region of Oklahoma. During this six year timeframe there were 328 total crashes within the combined study area. Of those, there were eight (8) fatal crashes with nine (9) fatalities; there were 130 injury crashes with 135 persons injured; and, there were 190 property damage only crashes. The purpose of this plan is to document known and perceived issues and to take a proactive approach towards transportation safety.

Emphasis areas, based on data analysis, were identified and then prioritized by the stakeholders. Strategies have been developed with desired outcomes for reducing fatalities and serious injuries from vehicle crashes. In order to help focus the collective efforts of the stakeholder group, a Vision, Mission, and Goal were established.



**Vision:** Eliminate all injury and fatal crashes within the Quapaw region.

**Mission:** Implementing cost-effective engineering projects, education campaigns, law enforcement efforts, and EMS strategies to quickly reduce and ultimately eliminate all injury and fatal crashes within the Quapaw region.

**Goal:** Reduce fatalities and injuries by 5% each year over the next five (5) years.

## ***Safety Partners/Stakeholders***

The following agencies were consulted in the development of the Tribal Transportation Safety Plan (TTSP) and are crucial to achieving the planned goals.

- CJW Transportation Consultants, LLC
- Quapaw Tribe Maintenance Director
- Quapaw Tribe Tribal Administrator
- Quapaw Tribe Chief Financial Officer
- Quapaw Tribe EMS Director
- Quapaw Tribe Marshals, Chief
- Quapaw Tribe Grants Manager
- Quapaw Tribe EM Project Manager
- Quapaw Services Authority Health and Safety Manager
- Quapaw Tribe Business Committee – Secretary/Treasurer
- Quapaw Services Authority Project Manager
- Quapaw Tribe Housing Director
- Quapaw Tribe Roads Manager

## ***Methodology***

The stakeholder group met and conducted a charrette style meeting where stakeholders offered input on transportation safety issues within the Quapaw region. Those issues were documented and then categorized into emphasis areas specific to the Quapaw transportation network. From these specific emphasis areas, detailed data analysis was conducted on the traffic crash data to further the safety issues identified by the local stakeholder group.

Crash data was acquired from OHSO. Using this data, ensuring that attention was given to the emphasis areas identified by the stakeholder group, an in-depth analysis was completed. This analysis identified key crash types, locations, and contributing factors for the 2011-2016 timeframe. Additional areas of concern were identified and then prioritized by working with the stakeholders in a group meeting. All modes of transportation were discussed.

From the data analysis and local stakeholder input, as well as review of the Oklahoma Strategic Highway Safety Plan, the emphasis areas were prioritized. The prioritization was done to ensure that the most effective countermeasures would be used to meet the Vision, Mission, and Goal of the transportation safety plan.



Performance measures were also developed for each recommended emphasis area.

Strategies used will be in line with those found in the 2013-2014, Oklahoma Strategic Highway Safety Plan (SHSP).

## ***Data Analysis***

The 2011-2016 OHSO crash data was reviewed and analyzed by severity, crash type, contributing circumstance, and time of day/day of week. National Highway Traffic Safety Administration's (NHTSA) Fatality Analysis Reporting System (FARS) data from 2011-2015 was also reviewed and analyzed to determine if there were additional elements that needed to be considered in this plan.

During the timeframe from 2011-2016, there were nine (9) traffic fatalities in the Quapaw region occurring in eight (8) fatal crashes. There was one (1) fatality in 2011; two (2) fatalities in 2012; three (3) fatalities in 2013; none in 2014; two (2) in 2015; and, one (1) in 2016. Five (5) of the fatal crashes listed alcohol as a contributing factor. Two (2) of the fatal crashes listed both alcohol and drugs as contributing factors.

Native American Traffic Safety Facts (2017), stemming from FARS data (2011-2015), lists one (1) Native American as being killed as a result of a car crash. In 2012, a Native American pedestrian was struck and killed by a motor vehicle. The data shows that the pedestrian was in the roadway when struck by the vehicle.

The stakeholders were provided the data (both tabular and graphic) to review. Additional areas of concern, beyond what the crash data revealed, were identified and discussed. A thorough review of the regional crash data, input from the stakeholders, and the 2013-2014 Oklahoma SHSP was used in this process. From this process, the following thirteen (13) issues were identified.

- Roadway Safety (narrow roads, sight distance, flooding, pavement condition – Engineering & Emergency Response)
- Accessibility (bridge/roadway flooding causing some areas to be cut off, roadway width in areas is problematic – Engineering & Emergency Response)
- Distracted Driving (mostly cell phones, but any type of distraction – Education)
- Drainage Issues (water on roadways, ditches and stream flooding, hydroplaning and issues at intersections – Engineering)
- Roadway Delineation (pavement marking & signing is in poor condition or missing – Engineering)
- Intersection Improvements (sight distance, geometrics, visibility, etc. – Engineering)
- Parking Areas (obstructing view at driveways and intersections – Engineering)
- Speeding (work zones, actual speed limits, might do Safety Zones – Engineering & Enforcement)
- Work Areas (speeding, sight distance, driver issues (specifically the chat pile mitigation area) – Engineering & Enforcement)
- Intersection Lighting (very dark, easy to miss – Enforcement)
- School Zone Issue (loading/unloading can cause congestion, pedestrians crossing main roadway – Engineering, Education, & Enforcement)
- Impaired Driving (high percentage of impaired fatalities in region – Enforcement & Education)
- Seatbelt Usage (low usage – Education)



Engineering, education, enforcement, & emergency medical services are commonly referred to as the “4E’s”. Strategies from all of the 4E’s identified in the SHSP have been utilized to address issues within the identified emphasis areas. From the identified issues and their related emphasis area, four (4) key emphasis areas were chosen. These emphasis areas will allow the tribe to focus and maximize the effectiveness of their efforts.

## ***Emphasis Areas***

The four (4) key emphasis areas identified are: Unsafe Driver Behavior; Intersection Crashes; Crashes Involving Young Drivers; and Lane Departure Crashes. These emphasis areas were selected based on a thorough analysis of the regional crash data, input from the stakeholders, and by reviewing the 2013-2014 Oklahoma SHSP.

To ensure that this plan is specific to the Quapaw region, the objectives and success indicators have been tailored specifically to the Quapaw region’s identified areas of concern (see Appendix A).

## **Background**

The stakeholders applied local knowledge and reviewed the safety data provided by the Oklahoma Highway Safety Office. The safety of all inhabitants, visitors, and passersby in the Quapaw region is vitally important and must be considered. Therefore, a comprehensive approach to this plan was taken.

## **Objective**

The overall objective of this plan is to reduce all fatal and serious injury crashes by 5% each year for 5 years. This will be best accomplished through successful planning and implementation in all four emphasis areas.

## **Performance Measures**

Going forward, crash data acquired from the Oklahoma Highway Safety Office will be used to determine if the actions identified for each emphasis area has been successful. Additionally, media efforts and the number of students that have been reached through specific highway safety educational programs will be tracked to ensure that outreach is being accomplished in the Quapaw region.

## **Strategies**

Individual strategies are listed in the Tribal Safety Plan Matrix for each emphasis area to ensure accountability for all organizations and/or positions listed in the Tribal Safety Plan Matrix. The stakeholders group will meet semi-annually to discuss and review the efforts taken in each emphasis area.

## ***Implementation Process***

The stakeholders will establish milestones to measure the progress of the Transportation Safety Plan and keep a record of successes and challenges. This data will be essential in evaluating the actions/strategies



to determine their effectiveness. The working group will monitor the implementation of these strategies to ensure their success. Furthermore, monitoring will provide accountability, keep stakeholders engaged, and allow for collaboration opportunities to be identified.

The stakeholders will meet with the responsible person/organization for each action/strategy to ensure that they are on track with the agreed upon milestones. This meeting should include updated data (when available) as prescribed in the plan. The timeframe for holding these meetings will depend on the type of strategy and the timeframe needed to update the data as outlined in the Transportation Safety Plan.

## ***Evaluation Process***

Educational and Enforcement strategies can be measured almost immediately. Crash numbers can be reviewed annually. However, to ensure that the strategies have worked with any statistical certainty, follow-up studies will need to take place three to five years after improvements have been made.

A simple Benefit-Cost analysis can be performed to demonstrate the success and cost effectiveness of the Tribal Transportation Safety Plan.

## ***Next Steps***

With the results of the ongoing evaluation of this Tribal Transportation Safety Plan, the stakeholders will make changes or modifications to the plan as necessary. The stakeholders will keep the Plan up-to-date based on the results of its evaluation or any changes in the transportation network within the region. Regularly scheduled updates of the Plan will allow the stakeholders to review what is working well, what needs improvement, and any additional emphasis areas and/or strategies to implement. The stakeholders will establish regularly scheduled evaluations and a regular scheduled update cycle to ensure routine examination of the plan and to ensure the plan's effectiveness.



## **References**

Oklahoma Highway Safety Office, 2013-2014 Strategic Highway Safety Plan:

<http://www.okladot.state.ok.us/oshsp/index.htm>

FHWA, Safe Roads for a Safer Future – A Joint Safety Strategic Plan

<https://safety.fhwa.dot.gov/ssp/ssp.pdf>

FHWA, Proven Safety Countermeasures

<https://safety.fhwa.dot.gov/provencountermeasures/>

FHWA, Developing Safety Plans: A Manual for Local Rural Road Owners:

[https://safety.fhwa.dot.gov/local\\_rural/training/fhwasa12017/](https://safety.fhwa.dot.gov/local_rural/training/fhwasa12017/)

FHWA, Information Tools for Tribal Governments: Developing a Transportation Safety Plan:

[https://www.fhwa.dot.gov/planning/processes/tribal/planning\\_modules/safety/tribalsafetyplan.pdf](https://www.fhwa.dot.gov/planning/processes/tribal/planning_modules/safety/tribalsafetyplan.pdf)

FHWA, Tribal Road Safety Audits: Case Studies:

[https://safety.fhwa.dot.gov/rsa/tribal\\_rsa\\_studies/](https://safety.fhwa.dot.gov/rsa/tribal_rsa_studies/)

NHTSA, Fatality Analysis Reporting System (FARS)

<http://www.nhtsa.gov/FARS>

Tribal Transportation Safety Management System Steering Committee, Tribal Transportation Strategic Safety Plan:

<http://tribalsafety.org/>

Quapaw Tribe Roads Department, Transportation Plan for the Quapaw Indian Tribe of Oklahoma

Indian Reservation Roads Program, Inventory Data Sheet (ver 2), FY 2018 Inventory, 20 Oct 17







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***APPENDIX A – TRIBAL SAFETY PLAN MATRIX***

December 11, 2017

PREPARED BY:

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Tribal Safety Plan Matrix						
EMPHASIS AREA			STRATEGIC LINKAGE			
<b>1 - Unsafe Driver Behavior</b>			Unsafe Driver Behavior was identified in the state-wide Strategic Highway Safety Plan as the first of the four (4) Emphasis Areas for the 2013-2014 Oklahoma SHSP.			
OBJECTIVES			SUCCESS INDICATORS			
Reduce the frequency and severity of driver related crashes within the region.			An increase in awareness, leading to better driver decisions will reduce driver behavior related crashes, which tend to be severe crashes, in the Quapaw Tribal Region.			
			<b>Overall Goal:</b> 20% Reduction Serious Injuries & 30% Reduction Fatalities			
Education	Actions	Target Outputs	Organizations and Persons Responsible	Date of Completion	Performance Measures	Monitoring and Education
	Public service announcements regarding the dangers of speeding, driving distracted, driving impaired and/or being unbelted in a moving vehicle	Increased awareness of the dangers involved in driving while impaired, speeding, distracted, and/or unbelted	Quapaw Services Authority / Project Manager	Dec. 2018 (review/update messages annually)	Number of PSAs, Discussions at Public Meetings, and School Presentations	Informal survey of public response planned each fall at a public meeting
	Meet with Oklahoma Highway Patrol and Ottawa County Sheriff to request Increased enforcement efforts specifically looking for speeding, impaired driving, distracted driving, and/or unbelted occupants	More warnings and citations issued specifically relating to unsafe driver behavior reducing speeding and impaired driving, and increasing seatbelt usage.	Quapaw Services Authority / Project Manager	Dec. 2018 (reviewed annually)	Number of reported crashes listing speeding, impaired driving, distracted driving, and/or unbelted occupants.	Annual crash data obtained from Oklahoma Highway Safety Office
	Look for opportunities to develop a new ambulance facility and purchase additional ambulances or acquire better access to the interstate	Improve response time to incidents (especially on the interstate), thus increasing the likelihood of survival in severe crashes	Quapaw Services Authority / Project Manager	Dec. 2022	Reduction of response time to severe crashes	Annual report by EMS providing notification time, arrival time, and response to scene times for each incident



## APPENDIX A (cont.)

## *Quapaw Nation of Oklahoma Tribal Transportation Safety Plan*

EMPHASIS AREA			STRATEGIC LINKAGE			
<b>2 – Intersection Crashes</b>			Intersection Crashes was identified in the state-wide Strategic Highway Safety Plan as the second of the four (4) Emphasis Areas for the 2013-2014, Oklahoma SHSP.			
OBJECTIVES			SUCCESS INDICATORS			
Reduce the frequency and severity of intersection related crashes within the region.			A decrease in intersection related crashes, which tend to be severe crashes, in the Quapaw Tribal Region.  <b>Overall Goal:</b> 20% Reduction Serious Injuries & 30% Reduction Fatalities			
Engineering	Actions	Target Outputs	Organizations and Persons Responsible	Date of Completion	Performance Measures	Monitoring and Education
	Intersection improvements, including but not limited to, geometric improvements, increased and/or improved signing, improved pavement marking, and lighting	Reduction in serious injury and fatal crashes that are intersection related	Quapaw Services Authority / Project Manager	Dec. 2022	Number of serious injuries and fatalities due to intersection related crashes	Annual crash data obtained from Oklahoma Highway Safety Office
	Meet with Oklahoma Highway Patrol and Ottawa County Sheriff to request increased enforcement for intersection related violations	More warnings and citations issued specifically relating to intersections	Quapaw Services Authority / Project Manager	Dec. 2018 (reviewed annually)	Number of serious injuries and fatalities due to intersection related crashes	Annual crash data obtained from Oklahoma Highway Safety Office
	Look for opportunities to develop a new ambulance facility and purchase additional ambulances or acquire better access to the interstate	Improve response time to incidents (especially on the interstate), thus increasing the likelihood of survival in severe crashes	Quapaw Services Authority / Project Manager	Dec. 2022	Reduction of response time to severe crashes	Annual report by EMS providing notification time, arrival time, and response to scene times for each incident
Enforcement						
Emergency Medical Services						



**APPENDIX A**  
(cont.)

*Quapaw Nation of Oklahoma  
Tribal Transportation Safety Plan*

EMPHASIS AREA			STRATEGIC LINKAGE			
<b>3 – Crashes Involving Young Drivers</b>			Crashes Involving Young Drivers was identified in the state-wide Strategic Highway Safety Plan as the third of the four (4) Emphasis Areas for the 2013-2014, Oklahoma SHSP.			
OBJECTIVES			SUCCESS INDICATORS			
Reduce the frequency and severity of crashes involving young drivers within the region.			A decrease in serious injuries and fatalities involving young driver crashes in the Quapaw Tribal Region.  <b>Overall Goal:</b> 20% Reduction Serious Injuries & 30% Reduction Fatalities			
Education	Actions	Target Outputs	Organizations and Persons Responsible	Date of Completion	Performance Measures	Monitoring and Education
	Participation in the Alive at 25 program, increase driver's education, & establish a Safety City program	Reduction in serious injury and fatal crashes involving your drivers	Quapaw Services Authority / Project Manager	Dec. 2018 (reviewed annually)	Number of serious injuries and fatalities involving young drivers	Annual crash data obtained from Oklahoma Highway Safety Office
	Meet with Oklahoma Highway Patrol and Ottawa County Sheriff to request increased enforcement of Graduated Driver License (GDL) requirements	More warnings and citations issued specifically to young drivers violating graduated license rules	Quapaw Services Authority / Project Manager	Dec. 2018 (reviewed annually)	Number of serious injuries and fatalities involving young drivers	Annual crash data obtained from Oklahoma Highway Safety Office
	Look for opportunities to develop a new ambulance facility and purchase additional ambulances or acquire better access to the interstate	Improve response time to incidents (especially on the interstate), thus increasing the likelihood of survival in severe crashes	Quapaw Services Authority / Project Manager	Dec. 2022	Reduction of response time to severe crashes	Annual report by EMS providing notification time, arrival time, and response to scene times for each incident



## APPENDIX A (cont.)

## Quapaw Nation of Oklahoma Tribal Transportation Safety Plan

EMPHASIS AREA			STRATEGIC LINKAGE			
<b>4 – Lane Departure Crashes</b>			Lane Departure Crashes was identified in the state-wide Strategic Highway Safety Plan as the fourth of the four (4) Emphasis Areas for the 2013-2014, Oklahoma SHSP.			
OBJECTIVES			SUCCESS INDICATORS			
Reduce the frequency and severity of lane departure crashes within the region.			A decrease in serious injuries and fatalities involving Lane Departure Crashes in the Quapaw Tribal Region.  <b>Overall Goal:</b> 20% Reduction Serious Injuries & 30% Reduction Fatalities			
	Actions	Target Outputs	Organizations and Persons Responsible	Date of Completion	Performance Measures	Monitoring and Education
Engineering	Work with Oklahoma DOT and Ottawa County to add centerline and edge line rumble strips, improve/enhance pavement markings, improve curve signing, remove obstacles within the clear zone	Reduction in serious injury and fatal crashes involving lane departures	Quapaw Services Authority / Project Manager	Dec. 2020	Number of serious injuries and fatalities involving lane departures	Annual crash data obtained from Oklahoma Highway Safety Office
Enforcement	Increased enforcement for all traffic violations	More warnings and citations issued	Quapaw Services Authority / Project Manager	Dec. 2022	Number of serious injuries and fatalities involving young drivers	Annual crash data obtained from Oklahoma Highway Safety Office
Emergency Medical Services	Look for opportunities to develop a new ambulance facility and purchase additional ambulances or acquire better access to the interstate	Improve response time to incidents (especially on the interstate), thus increasing the likelihood of survival in severe crashes	Quapaw Services Authority / Project Manager	Dec. 2022	Reduction of response time to severe crashes	Annual report by EMS providing notification time, arrival time, and response to scene times for each incident





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***APPENDIX B – CRASH DATA (2011-2016)***

December 11, 2017

PREPARED BY:

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MOTOR VEHICLE CRASH SUMMARY

Quapaw Region

Ottawa County, OK

Case	Fatal	Hit and Run	Enforcement Agency	Total Number of Vehicles	Total Number Injured	Total Number Killed	Crash Date	Crash Time	County	Crash In or Near City	City	Highway/Street Name	Nearest Intersecting Highway/Street	Workzone	Workzone Type	Location Within Workzone	Workers Present In Workzone	Lighting	Weather	Locality	Location First Harmful Event	First Harmful Event for Entire Crash	Day of Week	Crash Injury Severity	Total Motor Vehicle Occupants in	Total Non-Motorists in Crash	Total Commerical Vehicles in	Alcohol Related	Drug Related	ODOT Highway Class	Latitude	Longitude	
2011-01	N	N	NORTH MIAMI POLICE DEPT	2	2	0	2011-07-04	12.47	OTTAWA	I	NORTH MIAMI			N	0	0	0	1	1	2	8	34	2	3	4	0	0	0	0	0	7	36.9215	-94.8763
2011-02	N	N	NORTH MIAMI POLICE DEPT	2	2	0	2011-07-15	13.44	OTTAWA	I	NORTH MIAMI			N	0	0	0	1	1	2	1	34	6	3	4	0	0	0	0	0	7	36.9226	-94.8752
2011-03	N	N	NORTH MIAMI POLICE DEPT	2	3	0	2011-08-10	17.11	OTTAWA	I	NORTH MIAMI			N	0	0	0	1	3	6	1	34	4	3	4	0	0	0	0	0	7	36.9226	-94.8752
2011-04	Y	N	COMMERCE POLICE DEPT	1	0	1	2011-03-31	06.52	OTTAWA	I	COMMERCE			N	0	0	0	9	1	6	1	10	5	5	1	0	0	1	0	0	7	36.9433	-94.8651
2011-05	N	N	COMMERCE POLICE DEPT	2	0	0	2011-08-25	15.00	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	1	34	5	1	1	0	0	0	0	0	6	36.9378	-94.8697
2011-06	N	N	COMMERCE POLICE DEPT	1	1	0	2011-08-11	16.49	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	2	52	5	2	1	0	0	1	0	0	6	36.9388	-94.8776
2011-07	N	N	COMMERCE POLICE DEPT	2	1	0	2011-08-10	13.26	OTTAWA	I	COMMERCE			N	0	0	0	1	4	5	1	34	4	2	2	0	0	0	0	0	7	36.9283	-94.8678
2011-08	N	Y	COMMERCE POLICE DEPT	2	0	0	2011-08-01	24.00	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	1	34	2	1	4	0	0	0	0	0	6	36.9342	-94.8742
2011-09	N	N	COMMERCE POLICE DEPT	2	1	0	2011-07-29	10.30	OTTAWA	I	COMMERCE			N	0	0	0	1	1	5	1	34	6	2	2	0	0	0	0	0	7	36.9423	-94.8666
2011-10	N	N	COMMERCE POLICE DEPT	1	0	0	2011-07-23	13.00	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	1	17	7	1	1	0	0	0	0	0	6	36.9341	-94.8775
2011-11	N	Y	COMMERCE POLICE DEPT	2	0	0	2011-07-08	06.46	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	99	34	6	1	0	0	0	0	0	0	6	36.9307	-94.8730
2011-12	N	N	COMMERCE POLICE DEPT	1	1	0	2011-05-17	14.50	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	1	19	3	2	2	0	1	0	0	0	7	36.9428	-94.8660
2011-13	N	N	COMMERCE POLICE DEPT	2	1	0	2011-04-26	20.00	OTTAWA	I	COMMERCE			N	0	0	0	1	4	1	1	34	3	2	2	0	0	0	0	0	6	36.9361	-94.8753
2011-14	N	N	COMMERCE POLICE DEPT	1	0	0	2011-05-14	07.50	OTTAWA	I	COMMERCE			N	0	0	0	1	1	2	2	18	7	1	1	0	0	0	0	0	7	36.9276	-94.8683
2011-15	N	Y	COMMERCE POLICE DEPT	2	0	0	2011-05-12	19.25	OTTAWA	I	COMMERCE			N	0	0	0	1	3	1	1	34	5	1	1	0	0	0	0	0	6	36.9352	-94.8742
2011-16	N	N	COMMERCE POLICE DEPT	2	0	0	2011-05-06	16.50	OTTAWA	I	COMMERCE			N	0	0	0	1	1	2	1	34	6	1	4	0	0	0	0	0	7	36.9293	-94.8675
2011-17	N	N	COMMERCE POLICE DEPT	2	0	0	2011-04-26	15.45	OTTAWA	I	COMMERCE			N	0	0	0	1	1	2	1	34	3	1	4	0	0	0	0	0	7	36.9395	-94.8674
2011-18	N	N	COMMERCE POLICE DEPT	2	0	0	2011-04-13	14.22	OTTAWA	I	COMMERCE			N	0	0	0	1	1	5	1	34	4	1	2	0	0	0	0	0	6	36.9436	-94.8670
2011-19	N	N	COMMERCE POLICE DEPT	1	1	0	2011-04-20	19.13	OTTAWA	I	COMMERCE			N	0	0	0	1	1	7	2	17	4	2	1	0	0	1	0	0	7	36.9432	-94.8653
2011-20	N	N	COMMERCE POLICE DEPT	2	2	0	2011-03-13	11.59	OTTAWA	I	COMMERCE			N	0	0	0	1	3	7	1	34	1	2	3	0	0	0	0	0	7	36.9283	-94.8678
2011-21	N	N	COMMERCE POLICE DEPT	2	0	0	2011-03-01	13.15	OTTAWA	I	COMMERCE			N	0	0	0	1	1	6	1	34	3	1	2	0	0	0	0	0	7	36.9301	-94.8674
2011-22	N	N	COMMERCE POLICE DEPT	2	0	0	2011-02-08	09.24	OTTAWA	I	COMMERCE			N	0	0	0	1	5	1	1	34	3	1	2	0	0	0	0	0	6	36.9376	-94.8742
2011-23	N	Y	COMMERCE POLICE DEPT	2	0	0	2011-02-21	16.30	OTTAWA	I	COMMERCE			N	0	0	0	1	1	6	2	34	2	1	1	0	0	0	0	0	6	36.9343	-94.8764
2011-24	N	Y	COMMERCE POLICE DEPT	2	0	0	2011-02-03	13.12	OTTAWA	I	COMMERCE			N	0	0	0	1	5	7	1	34	5	1	1	0	0	0	0	0	6	36.9291	-94.8586
2011-25	N	N	COMMERCE POLICE DEPT	2	0	0	2011-01-24	08.11	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	1	34	2	1	1	0	0	0	0	0	6	36.9348	-94.8685
2011-26	N	N	COMMERCE POLICE DEPT	1	0	0	2011-01-11	08.18	OTTAWA	I	COMMERCE			N	0	0	0	1	10	7	1	46	3	1	1	0	0	0	0	0	6	36.9291	-94.8584
2011-27	N	N	COMMERCE POLICE DEPT	2	0	0	2011-10-24	17.30	OTTAWA	I	COMMERCE			N	0	0	0	1	1	2	1	34	2	1	2	0	0	0	0	0	7	36.9283	-94.8678
2011-28	N	N	COMMERCE POLICE DEPT	2	0	0	2011-10-18	17.00	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	1	34	3	1	2	0	0	0	0	0	6	36.9436	-94.8669
2011-29	N	N	COMMERCE POLICE DEPT	2	0	0	2011-09-30	07.00	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	1	34	6	1	2	0	0	0	0	0	6	36.9300	-94.8651
2011-30	N	N	COMMERCE POLICE DEPT	2	0	0	2011-10-04	08.02	OTTAWA	I	COMMERCE			N	0	0	0	1	1	1	1	34	3	1	1	0	0	0	0	0	6	36.9338	-94.8708
2011-31	N	Y	COMMERCE POLICE DEPT	1	0	0	2011-09-24	00.10	OTTAWA	I	COMMERCE			N	0	0	0	2	1	5	2	17	7	1	1	0	0	0	0	0	6	36.9293	-94.8578
2011-32	N	N	NORTH MIAMI POLICE DEPT	2	0	0	2011-12-01	14.54	OTTAWA	I	NORTH MIAMI			N	0	0	0	1	1	2	1	34	5	1	2	0	0	0	0	0	7	36.9226	-94.8752
2011-33	N	N	NORTH MIAMI POLICE DEPT	2	1	0	2011-12-07	16.46	OTTAWA	I	NORTH MIAMI			N	0	0	0	1	1	2	1	34	4	3	2	0	0	0	0	0	7	36.9226	-94.8752
2011-34	N	N	COMMERCE POLICE DEPT	2	0	0	2011-12-31	19.30	OTTAWA	I	COMMERCE			N	0	0	0	2	1	1	1	35	7	1	2	0	0	0	0	0	6	36.9340	-94.8775
2011-35	N	N	COMMERCE POLICE DEPT	2	0	0	2011-11-08	16.15	OTTAWA	I	COMMERCE			N	0	0	0	1	4	2	1	34	3	1	3	0	0	0	0	0	7	36.9322	-94.8674
2011-36	N	N	COMMERCE POLICE DEPT	1	0	0	2011-12-17	19.00	OTTAWA	I	COMMERCE			N	0	0	0	3	1	1	1	46	7	1	1	0	1	0	0	0	6	36.9333	-94.8653
2011-37	N	N	NORTH MIAMI POLICE DEPT	2	0	0	2011-06-23	17.05	OTTAWA	I	NORTH MIAMI	MAIN STREET		N	0	0	0	1	1	2	1	34	5	1	4	0	0	0	0	0	7	36.9226	-94.8752
2011-38	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2011-01-15	18.51	OTTAWA	N	QUAPAW	COUNTY ROAD 630	COUNTY ROAD 50	N	0	0	0	2	1	5	4	59	7	3	1	0	0	0	0	0	5	36.9422	-94.7522
2011-39	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2011-01-13	23.06	OTTAWA	N	QUAPAW	US HIGHWAY 69 A	COUNTY ROAD SOUTH 600	N	0	0	0	2	1	5	2	34	5	2	5	0	0	0	0	0	1	36.9436	-94.7946
2011-40	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2011-02-03	13.02	OTTAWA	N	QUAPAW	INTERSTATE 44	TPU 324.90	N	0	0	0	1	1	5	1	34	5	1	2	0	1	0	0	0	3	36.9481	-94.6786
2011-41	N	N	OKLAHOMA HIGHWAY PATROL	2	2	0	2011-02-28	05.32	OTTAWA	N	QUAPAW	UNITED STATES HIGHWAY 69A	COUNTY ROAD EAST 10	N	0	0	0	2	4	5	1	30	2	3	1	0	1	0	0	0	1	36.9957	-94.7407
2011-42	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2011-03-03	08.20	OTTAWA	N	QUAPAW	COUNTY ROAD SOUTH 665	COUNTY ROAD EAST 22	N	0	0	0	1	1	5	4	59	5	2	1	0	0	0	0	0	5	36.9857	-94.6886
2011-43	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2011-03-21	13.56	OTTAWA	N	QUAPAW	COUNTY ROAD 137	COUNTY ROAD E93	N	0	0	0	1	3	5	1	10	2	3	2	0	0	0	0	0	5	36.8769	-94.7823
2011-44	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2011-04-15	13.58	OTTAWA	N	QUAPAW	COUNTY ROAD S630	COUNTY ROAD E30	N	0	0	0	1	4	1	4	47	6	1	1	0	0	0	0	0	5	36.9727	-94.7584
2011-45	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2011-05-01	21.12	OTTAWA	N	QUAPAW	COUNTY ROAD S.600	US HWY 69 A	N	0	0	0	2	3	5	4	57	1	3	3	0	0	1	0	0	1	36.9436	-94.7946
2011-46	N	N	OKLAHOMA HIGHWAY PATROL	2	2	0	2011-04-29	19.23	OTTAWA	N	COMMERCE	COUNTY ROAD SOUTH 550	COUNTY ROAD EAST 30	N	0	0	0	1	1	5	1	34	6	2	2	0	0	0	0	0	5	36.9725	-94.8849
2011-47	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2011-05-21	22.01	OTTAWA	N	QUAPAW	COUNTY ROAD SOUTH 590	COUNTY ROAD EAST 66	N	0	0	0	2	1	5	4	57	7	2	3	0	0	1	0	0	5	36.9176	-94.7644
2011-48	N	N	OKLAHOMA HIGHWAY PATROL	2	2	0	2011-05-16	12.18	OTTAWA	N	QUAPAW	COUNTY ROAD SOUTH 630	U.S. HIGHWAY	N	0	0	0	1	1	5	1	34	2	2	3	0	0	0	0	0	5	36.9894	-94.7406
2011-49	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	201																										



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2012-23	N	Y	OKLAHOMA HIGHWAY PATROL	2	0	0	2012-02-11	14.00	OTTAWA	N	QUAPAW	COUNTY ROAD E60	COUNTY ROAD S640	N	0	0	0	1	1	5	1	34	7	1	2	0	0	0	0	5	36.9293	-94.7433	
2012-24	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-02-22	02.05	OTTAWA	N	QUAPAW	STATE HIGHWAY 69 A	COUNTY ROAD 610	N	0	0	0	2	1	5	1	33	4	1	1	0	0	1	0	1	36.9641	-94.7769	
2012-25	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-03-08	19.23	OTTAWA	N	COMMERCE	COUNTY ROAD 40	COUNTY ROAD 530	N	0	0	0	2	3	5	1	33	5	1	4	0	0	0	0	5	36.9579	-94.9301	
2012-26	N	N	OKLAHOMA HIGHWAY PATROL	1	3	0	2012-03-01	16.04	OTTAWA	N	QUAPAW	COUNTY ROAD E60	COUNTY ROAD S650	N	0	0	0	1	1	5	4	10	5	3	3	0	0	0	0	5	36.9264	-94.7217	
2012-27	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2012-03-03	18.27	OTTAWA	N	QUAPAW	COUNTY ROAD E 30	COUNTY ROAD S575	N	0	0	0	5	3	5	4	10	7	3	2	0	0	0	0	5	36.9725	-94.8309	
2012-28	N	Y	OKLAHOMA HIGHWAY PATROL	2	1	0	2012-03-16	23.32	OTTAWA	N	QUAPAW	US HIGHWAY 69	COUNTY ROAD 620	N	0	0	0	2	1	5	1	34	6	2	3	0	0	0	0	1	36.9705	-94.7613	
2012-29	N	N	OKLAHOMA HIGHWAY PATROL	2	3	0	2012-04-08	20.40	OTTAWA	N	COMMERCE	STATE HIGHWAY 69 A	COUNTY ROAD 60	N	0	0	0	2	1	5	1	34	1	3	3	0	0	0	1	0	4	36.9247	-94.8419
2012-30	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2012-04-25	18.47	OTTAWA	N	QUAPAW	US HIGHWAY 69 A	COUNTY ROAD SOUTH 600	N	0	0	0	1	1	5	1	34	4	2	5	0	0	0	0	1	36.9436	-94.8072	
2012-31	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2012-04-27	17.36	OTTAWA	I	PICHER	US HIGHWAY 69	6 TH STREET	N	0	0	0	1	1	5	1	71	6	3	2	0	0	0	0	7	36.9788	-94.8309	
2012-32	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2012-05-27	14.45	OTTAWA	N	QUAPAW	US HIGHWAY 69	COUNTY ROAD EAST 40	N	0	0	0	1	1	5	4	48	1	2	1	0	0	0	0	1	36.9579	-94.8308	
2012-33	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-06-07	21.37	OTTAWA	N	COMMERCE	COUNTY ROAD 30	COUNTY ROAD 530	N	0	0	0	2	3	5	1	33	5	1	2	0	0	0	0	5	36.9724	-94.9228	
2012-34	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2012-06-13	17.20	OTTAWA	N	QUAPAW	COUNTY ROAD 137	COUNTY ROAD 66	N	0	0	0	1	1	5	1	34	4	3	3	0	0	0	0	5	36.9233	-94.7824	
2012-35	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-06-25	08.31	OTTAWA	N	QUAPAW	UNITED STATES HIGHWAY 69A	COUNTY ROAD ( S 600 RD )	N	0	0	0	1	1	5	4	59	2	1	1	0	0	0	0	1	36.9436	-94.8047	
2012-36	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2012-06-21	11.18	OTTAWA	N	QUAPAW	INTERSTATE 44	TPU 324.9	Y	1	3	N	1	3	5	4	41	5	2	1	0	0	0	0	3	36.9508	-94.6752	
2012-37	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2012-07-07	03.27	OTTAWA	N	QUAPAW	COUNTY ROAD (137)	COUNTY ROAD (66)	N	0	0	0	2	1	5	4	35	7	1	1	0	0	0	0	5	36.9103	-94.7824	
2012-38	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-08-04	00.37	OTTAWA	N	QUAPAW	U.S. HIGHWAY 69 A	COUNTY ROAD (S. 614)	N	0	0	0	2	1	5	1	10	7	1	2	0	0	0	0	1	36.9667	-94.7706	
2012-39	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2012-08-07	22.05	OTTAWA	N	QUAPAW	COUNTY ROAD SOUTH 630	COUNTY ROAD EAST 72	N	0	0	0	2	1	5	1	33	3	3	1	0	0	0	0	5	36.9220	-94.7522	
2012-40	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2012-08-14	07.11	OTTAWA	N	QUAPAW	COUNTY ROAD (E. 66)	SH137	N	0	0	0	1	3	5	1	34	3	3	2	0	0	0	0	5	36.9218	-94.7843	
2012-41	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2012-09-01	14.09	OTTAWA	N	COMMERCE	COUNTY ROAD (E. 64)	STATE HIGHWAY 69A	N	0	0	0	1	3	5	4	48	7	2	6	0	0	0	0	4	36.9181	-94.8419	
2012-42	N	N	OKLAHOMA HIGHWAY PATROL	3	1	0	2012-08-29	21.09	OTTAWA	N	QUAPAW	UNITED STATES HIGHWAY 69A	COUNTY ROAD ( S 600 )	N	0	0	0	2	1	5	1	34	4	2	6	0	0	1	0	0	1	36.9436	-94.8090
2012-43	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2012-09-10	17.36	OTTAWA	N	QUAPAW	COUNTY ROAD (E 60)	COUNTY ROAD (S 652)	N	0	0	0	1	1	5	1	14	2	1	5	0	1	0	0	5	36.9292	-94.6947	
2012-44	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2012-09-26	14.37	OTTAWA	N	QUAPAW	US HIGHWAY 69A	COUNTY ROAD (E 10)	N	0	0	0	1	3	5	1	34	4	3	2	0	0	0	0	1	36.9986	-94.7407	
2012-45	Y	N	OKLAHOMA HIGHWAY PATROL	1	1	1	2012-09-03	19.55	OTTAWA	N	QUAPAW	COUNTY ROAD (S 700)	COUNTY ROAD (E 40)	N	0	0	0	5	1	5	4	57	2	5	5	0	0	1	0	5	36.9677	-94.6192	
2012-46	Y	Y	OKLAHOMA HIGHWAY PATROL	1	0	1	2012-09-27	05.36	OTTAWA	N	QUAPAW	U.S. HIGHWAY 69A	COUNTY ROAD (S. 610)	N	0	0	0	2	4	5	1	30	5	5	5	0	0	0	0	1	36.9619	-94.7822	
2012-47	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2012-10-08	18.08	OTTAWA	N	QUAPAW	UNITED STATES HIGHWAY 69A	COUNTY ROAD ( S 600 RD )	N	0	0	0	1	1	5	1	34	2	1	2	0	0	0	0	1	36.9436	-94.7946	
2012-48	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-10-08	18.39	OTTAWA	N	QUAPAW	US HWY 69 A	COUNTY ROAD (S 590)	N	0	0	0	1	1	5	1	68	2	1	1	0	1	0	0	1	36.9436	-94.8090	
2012-49	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2012-10-10	01.20	OTTAWA	N	QUAPAW	US HIGHWAY 69A	COUNTY ROAD SOUTH 614	N	0	0	0	2	3	5	1	33	4	2	1	0	0	0	0	1	36.9679	-94.7677	
2012-50	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2012-10-28	12.09	OTTAWA	N	QUAPAW	UNITED STATES HIGHWAY 69A	COUNTY ROAD ( S 600 RD )	N	0	0	0	1	1	5	4	59	1	3	1	0	0	0	0	1	36.9436	-94.8000	
2012-51	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-11-01	12.02	OTTAWA	N	QUAPAW	COUNTY ROAD (E 60)	COUNTY ROAD (S 642)	N	0	0	0	1	1	5	4	50	5	1	1	0	1	0	0	5	36.9293	-94.7397	
2012-52	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-11-13	09.05	OTTAWA	N	QUAPAW	COUNTY ROAD (E. 66)	COUNTY ROAD (S. 600)	N	0	0	0	1	1	5	4	10	3	1	1	0	0	0	0	5	36.9175	-94.8006	
2012-53	N	N	OKLAHOMA HIGHWAY PATROL	2	2	0	2012-11-12	16.15	OTTAWA	N	QUAPAW	US 69A	COUNTY ROAD (S 620)	N	0	0	0	1	1	5	1	34	2	3	2	0	0	0	0	1	36.9705	-94.7613	
2012-54	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-11-11	09.31	OTTAWA	I	NORTH MIAM	US HWY 69	DELMAR ST.	N	0	0	0	1	4	2	4	59	1	1	1	0	0	0	0	7	36.9179	-94.8775	
2012-55	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2012-08-21	09.26	OTTAWA	N	QUAPAW	U.S. HIGHWAY 69	U.S HIGHWAY 69 A	N	0	0	0	1	1	5	1	34	3	4	2	0	1	1	0	1	36.9435	-94.8306	
2012-56	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2012-12-19	16.03	OTTAWA	I	PICHER	US HIGHWAY 69	1ST STREET	N	0	0	0	1	3	2	1	34	4	1	2	0	0	0	0	7	36.9853	-94.8310	
2012-57	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2012-12-24	17.05	OTTAWA	N	COMMERCE	COUNTY ROAD (E. 60)	COUNTY ROAD (S. 550)	N	0	0	0	5	3	5	4	57	2	1	1	0	0	0	0	5	36.9290	-94.8775	
2013-01	N	N	COMMERCE POLICE DEPT	2	0	0	2013-04-16	15.00	OTTAWA	I	COMMERCE	MICKEY MANTLE BLVD		N	0	0	0	1	1	2	1	34	3	1	2	0	0	0	0	7	36.9284	-94.8678	
2013-02	N	N	COMMERCE POLICE DEPT	2	1	0	2013-04-12	14.54	OTTAWA	I	COMMERCE	HWY 69		N	0	0	0	1	1	5	1	34	6	2	3	0	0	0	0	7	36.9436	-94.8639	
2013-03	N	N	COMMERCE POLICE DEPT	2	0	0	2013-04-08	12.00	OTTAWA	I	COMMERCE	S 580 RD & HWY 69		N	0	0	0	1	1	7	1	34	2	1	2	0	0	0	0	1	36.9436	-94.8408	
2013-04	N	Y	COMMERCE POLICE DEPT	2	0	0	2013-02-26	20.01	OTTAWA	I	COMMERCE	2ND ST		N	0	0	0	3	1	2	1	34	3	1	2	0	0	0	0	7	36.9346	-94.8674	
2013-05	N	N	COMMERCE POLICE DEPT	2	0	0	2013-02-07	12.47	OTTAWA	I	COMMERCE	D ST		N	0	0	0	1	4	1	1	34	5	1	2	0	0	0	0	6	36.9291	-94.8651	
2013-06	N	N	COMMERCE POLICE DEPT	2	0	0	2013-01-17	07.55	OTTAWA	I	COMMERCE	N RIVER		N	0	0	0	1	1	2	1	34	5	1	2	0	0	0	0	6	36.9333	-94.8742	
2013-07	N	N	COMMERCE POLICE DEPT	2	0	0	2013-01-18	08.08	OTTAWA	I	COMMERCE	N MAPLE		N	0	0	0	1	1	1	1	34	6	1	2	0	0	0	0	6	36.9333	-94.8719	
2013-08	N	Y	COMMERCE POLICE DEPT	2	0	0	2013-01-31	06.52	OTTAWA	I	COMMERCE	S MICKEY MANTLE		N	0	0	0	1	1	2	1	34	5	1	2	0	0	0	0	7	36.9284	-94.8678	
2013-09	N	N	COMMERCE POLICE DEPT	2	0	0	2013-01-31	12.47	OTTAWA	I	COMMERCE	5TH ST		N	0	0	0	1	1	1	1	34	5	1	2	0	0	0	0	6	36.9388	-94.8721	
2013-10	N	N	COMMERCE POLICE DEPT	1	0	0	2013-03-09	12.51	OTTAWA	I	COMMERCE	US HWY 69		N	0	0	0	1	3	1	4	17	7	1	1	0	0	0	0	7	36.9258	-94.8704	
2013-11	N	N	COMMERCE POLICE DEPT	2	2	0	2013-01-02	23.07	OTTAWA	I	COMMERCE	MICKEY MANTLE BLVD		N	0	0	0	3	1	6	1	34	4	4	2	0	1	1	0	7	36.9278	-94.8681	
2013-12	N	N	COMMERCE POLICE DEPT	1	1	0	2013-05-18	14.20	OTTAWA	I	COMMERCE	124 N VINE STREET		N	0	0	0	1	1	4	1	31	7	2	1	2	0	0	0	6	36.9344	-94.8763	
2013-13	N	N	COMMERCE POLICE DEPT	2	0	0	2013-06-04	13.15	OTTAWA	I	COMMERCE	403 N MAIN ST		N	0	0	0	1	1	1	1	34	3	1	1	0	0	0	0	6	36.9377	-94.8775	
2013-14	N	N	COMMERCE POLICE DEPT	1	0	0	2013-04-27	05.30	OTTAWA	I	COMMERCE	SH 69		N	0	0	0	3	4	1	1	47	7	1	1	0	0	0	0				



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2013-48	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2013-11-04	18.47	OTTAWA	N	COMMERCE	US69	COUNTY ROAD (S590)	N	0	0	0	2	3	5	1	34	2	1	2	0	0	0	0	1	36.9436	-94.8088
2013-49	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2013-11-21	21.25	OTTAWA	N	QUAPAW	COUNTY ROAD ( E 50)	COUNTY ROAD ( S 629 LANE)	N	0	0	0	2	4	5	4	57	5	1	1	0	0	0	0	5	36.9436	-94.7627
2013-50	N	N	OKLAHOMA HIGHWAY PATROL	1	2	0	2013-12-16	16.46	OTTAWA	N	QUAPAW	COUNTY ROAD ( E 50 RD )	COUNTY ROAD ( S 630 RD )	N	0	0	0	1	1	5	4	10	2	3	2	0	0	0	0	5	36.9161	-94.7697
2013-51	Y	N	OKLAHOMA HIGHWAY PATROL	3	0	1	2013-08-28	10.35	OTTAWA	N	QUAPAW	U.S. HIGHWAY 69A	COUNTY ROAD (EAST 30)	N	0	0	0	1	1	5	1	34	4	5	2	0	1	1	1	1	36.9747	-94.7552
2013-52	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2013-12-31	13.35	OTTAWA	N	QUAPAW	US69A	COUNTY ROAD ( S 600)	Y	1	1	Y	1	1	5	1	34	3	1	5	0	0	0	0	1	36.9436	-94.8036
2013-53	Y	N	OKLAHOMA HIGHWAY PATROL	2	2	1	2013-10-16	16.45	OTTAWA	N	COMMERCE	COUNTY ROAD ( E 30 RD )	COUNTY ROAD ( S 505 RD )	N	0	0	0	1	3	5	1	34	4	5	3	0	0	0	0	5	36.9722	-94.9661
2014-01	N	N	COMMERCE POLICE DEPT	2	0	0	2014-11-08	16.30	OTTAWA	I	COMMERCE	COMMERCE AVE		N	0	0	0	1	1	1	1	99	7	1	1	1	0	0	0	6	36.9332	-94.8740
2014-02	N	N	COMMERCE POLICE DEPT	1	0	0	2014-09-08	13.05	OTTAWA	I	NORTH MIAM	OAK		N	0	0	0	1	1	1	2	46	2	1	1	0	1	0	0	6	36.9200	-94.8787
2014-03	N	N	COMMERCE POLICE DEPT	1	0	0	2014-09-08	13.05	OTTAWA	I	NORTH MIAM	OAK		N	0	0	0	1	1	1	1	18	2	1	1	0	1	0	0	6	36.9200	-94.8787
2014-04	N	N	COMMERCE POLICE DEPT	2	0	0	2014-09-11	14.00	OTTAWA	I	NORTH MIAM	HWY 69 S		N	0	0	0	1	3	6	1	34	5	1	3	0	0	0	0	7	36.9223	-94.8758
2014-05	N	N	COMMERCE POLICE DEPT	2	1	0	2014-10-06	14.54	OTTAWA	I	NORTH MIAM	MAIN ST		N	0	0	0	1	1	2	1	34	2	3	2	0	0	0	0	7	36.9145	-94.8775
2014-06	N	N	COMMERCE POLICE DEPT	2	0	0	2014-10-16	13.50	OTTAWA	I	NORTH MIAM	N MAIN ST		N	0	0	0	1	1	2	1	34	5	1	2	0	0	0	0	7	36.9200	-94.8776
2014-07	N	N	COMMERCE POLICE DEPT	2	0	0	2014-11-11	24.00	OTTAWA	I	COMMERCE	N MAPLE ST		N	0	0	0	1	1	1	1	34	3	1	1	0	0	0	0	6	36.9356	-94.8719
2014-08	N	N	COMMERCE POLICE DEPT	2	0	0	2014-12-02	11.15	OTTAWA	I	COMMERCE	S MICKEY MANTLE		N	0	0	0	1	3	6	1	34	3	1	3	0	0	0	0	7	36.9290	-94.8675
2014-09	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2014-01-24	10.25	OTTAWA	N	QUAPAW	US 69 A	COUNTY ROAD (S.600)	N	0	0	0	1	1	5	1	34	6	1	3	0	0	0	0	1	36.9437	-94.8058
2014-10	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-02-02	11.05	OTTAWA	N	QUAPAW	COUNTY ROAD ( E 50 RD )	COUNTY ROAD ( S 620 RD )	N	0	0	0	1	5	5	4	10	1	1	1	0	0	0	0	5	36.9437	-94.7608
2014-11	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-01-27	18.30	OTTAWA	N	QUAPAW	COUNTY ROAD (S. 650)	COUNTY ROAD (S.655)	N	0	0	0	2	1	5	4	57	2	1	2	0	0	0	0	5	36.9436	-94.7116
2014-12	N	N	OKLAHOMA HIGHWAY PATROL	4	4	0	2014-01-29	12.25	OTTAWA	N	QUAPAW	U.S. HIGHWAY 69A	COUNTY ROAD (S. 600)	N	0	0	0	1	1	5	1	34	4	2	5	0	0	0	0	1	36.9437	-94.8071
2014-13	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2014-02-18	10.51	OTTAWA	N	COMMERCE	UNITED STATES 69A	UNITED STATES 69A	N	0	0	0	1	3	5	1	34	3	1	2	0	0	0	0	1	36.9436	-94.8412
2014-14	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-02-25	12.20	OTTAWA	N	COMMERCE	U.S. HIGHWAY 69A	COUNTY ROAD (E. 60)	N	0	0	0	1	1	5	1	15	3	1	1	0	0	1	0	4	36.9310	-94.8419
2014-15	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2014-03-10	23.09	OTTAWA	N	QUAPAW	COUNTY ROAD (E 66)	COUNTY ROAD ( S 592)	N	0	0	0	2	1	5	4	57	2	3	2	0	0	1	0	5	36.9192	-94.8175
2014-16	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2014-03-12	07.54	OTTAWA	N	QUAPAW	COUNTY ROAD ( 137 RD )	COUNTY ROAD ( E80 RD )	N	0	0	0	1	1	5	1	34	4	1	3	0	0	0	0	5	36.9001	-94.7877
2014-17	N	Y	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-03-20	06.17	OTTAWA	N	QUAPAW	COUNTY ROAD (EAST 90)	STATE HIGHWAY 137	N	0	0	0	2	1	5	4	57	5	1	1	0	0	0	0	4	36.8857	-94.7874
2014-18	N	Y	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-04-14	04.00	OTTAWA	N	QUAPAW	COUNTY ROAD ( S630 RD )	COUNTY ROAD ( E30 RD )	N	0	0	0	2	3	5	4	47	2	1	1	0	0	0	0	5	36.9713	-94.7405
2014-19	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2014-04-22	09.23	OTTAWA	N	COMMERCE	COUNTY ROAD ( S520 RD )	COUNTY ROAD ( E60 RD )	N	0	0	0	1	1	5	4	44	3	2	1	0	0	0	0	5	36.9346	-94.9497
2014-20	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2014-05-09	07.00	OTTAWA	N	QUAPAW	COUNTY ROAD (E. 69)	COUNTY ROAD ( S. 652)	N	0	0	0	1	3	5	1	34	6	1	2	0	0	0	0	5	36.9178	-94.7088
2014-21	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-04-30	16.22	OTTAWA	N	COMMERCE	COUNTY ROAD (S. 560)	COUNTY ROAD (E. 50)	N	0	0	0	1	1	5	4	10	4	1	1	0	1	0	0	5	36.9508	-94.8668
2014-22	N	N	OKLAHOMA HIGHWAY PATROL	2	2	0	2014-05-16	15.05	OTTAWA	N	QUAPAW	COUNTY ROAD (E. 40 RD)	COUNTY ROAD (S. 590 RD)	N	0	0	0	1	3	5	1	34	6	3	2	0	0	0	0	5	36.9581	-94.8062
2014-23	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-05-12	10.45	OTTAWA	I	PICHER	U.S. HIGHWAY 69	COUNTY ROAD (E. 22)	N	0	0	0	1	1	5	2	46	2	1	1	0	1	0	0	7	36.9843	-94.8308
2014-24	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2014-06-06	07.51	OTTAWA	N	COMMERCE	COUNTY ROAD E60	COUNTY ROAD S540	N	0	0	0	1	3	5	4	51	6	2	1	0	0	0	0	5	36.9289	-94.9110
2014-25	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2014-06-11	19.17	OTTAWA	N	QUAPAW	COUNTY ROAD ( E 60 RD )	COUNTY ROAD ( S 652 RD )	N	0	0	0	1	1	5	4	10	4	3	1	0	0	0	0	5	36.9284	-94.7110
2014-26	N	N	OKLAHOMA HIGHWAY PATROL	2	6	0	2014-06-15	16.20	OTTAWA	N	COMMERCE	COUNTY ROAD (S 550)	COUNTY ROAD (E 20)	N	0	0	0	1	3	5	1	34	1	4	6	0	0	0	0	5	36.9869	-94.8848
2014-27	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2014-05-31	21.30	OTTAWA	N	QUAPAW	US HIGHWAY 69A	COUNTY ROAD (S 590)	N	0	0	0	2	1	5	1	34	7	1	5	0	1	0	0	1	36.9436	-94.8099
2014-28	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2014-06-25	03.30	OTTAWA	N	COMMERCE	SH69A	US60	N	0	0	0	2	3	5	4	57	4	3	1	0	0	0	0	4	36.9437	-94.8419
2014-29	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2014-06-28	22.29	OTTAWA	N	COMMERCE	US HIGHWAY 69	US HIGHWAY 69A	N	0	0	0	2	3	5	3	57	7	2	3	0	0	0	0	1	36.9433	-94.8353
2014-30	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-07-14	19.50	OTTAWA	N	QUAPAW	US HIGHWAY-69	COUNTY ROAD ( E. 20)	N	0	0	0	1	1	1	4	48	2	1	1	0	0	0	0	7	36.9871	-94.8311
2014-31	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-08-12	17.30	OTTAWA	N	QUAPAW	COUNTY ROAD (EAST 57)	COUNTY ROAD (SOUTH 642)	N	0	0	0	1	1	5	4	49	3	1	1	0	0	0	0	5	36.9297	-94.7272
2014-32	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-09-23	17.18	OTTAWA	N	QUAPAW	COUNTY ROAD (S 620)	COUNTY ROAD (E 69)	N	0	0	0	1	1	5	4	57	3	1	1	0	0	0	0	5	36.9165	-94.7686
2014-33	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-09-24	06.43	OTTAWA	N	QUAPAW	COUNTY ROAD (E 57)	COUNTY ROAD (S 638)	N	0	0	0	4	1	5	4	57	4	1	2	0	0	0	0	5	36.9329	-94.7337
2014-34	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-10-11	19.36	OTTAWA	N	COMMERCE	STATE HIGHWAY 69A	COUNTY ROAD (E 60)	N	0	0	0	2	3	5	1	33	7	1	2	0	0	0	0	4	36.9340	-94.8418
2014-35	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2014-10-24	20.35	OTTAWA	I	QUAPAW	4TH ST	QUAPAW ST	N	0	0	0	3	1	1	1	31	6	3	1	1	0	0	0	6	36.9544	-94.7901
2014-36	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-12-04	18.02	OTTAWA	N	QUAPAW	COUNTY ROAD ( S 630 RD )	COUNTY ROAD ( E 20 RD )	N	0	0	0	2	2	5	4	49	5	1	1	0	0	0	0	5	36.9885	-94.7406
2014-37	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2014-12-06	03.53	OTTAWA	I	PICHER	UNITED STATES 69	COUNTY ROAD (E 10)	N	0	0	0	2	3	5	2	99	7	2	1	0	0	0	0	7	36.9984	-94.8310
2014-38	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2014-12-05	22.31	OTTAWA	N	COMMERCE	COUNTY ROAD (E 60)	COUNTY ROAD (S 530)	N	0	0	0	2	3	5	1	33	6	1	2	0	0	0	0	5	36.9279	-94.9423
2014-39	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2014-12-16	12.25	OTTAWA	N	QUAPAW	COUNTY ROAD (E30)	COUNTY ROAD (S610)	N	0	0	0	1	3	5	1	32	3	2	1	3	0	0	0	5	36.9725	-94.7783
2014-40	N	N	OKLAHOMA HIGHWAY PATROL	1	2	0	2014-12-14	03.00	OTTAWA	N	COMMERCE	COUNTY ROAD EAST 50 ROAD	COUNTY ROAD SOUTH 550 ROAD	N	0	0	0	2	3	5	4	59	1	3	2	0	0	0	0	5	36.9435	-94.9021
2015-01	N	N	COMMERCE POLICE DEPT	2	0	0	2015-03-02	08.50	OTTAWA	I	COMMERCE	NORTH MAIN		N	0	0	0	1	3	6	1	99	2	1	5	0	0	0	0	7	36.9226	-94.8752
2015-02	N	N	COMMERCE POLICE DEPT	2	0	0	2015-03-05	18.55	OTTAWA	I	COMMERCE	A STREET		N	0	0	0	2	3	4	1	99	5	1	5	0	0	0	0	6	36.9327	-94.8730
2015-03	N	N	COMMERCE POLICE DEPT	2	0	0	2015-02-27	17.00	OTTAWA	N	COMMERCE	HIGHWAY 69		N	0	0	0	1														

Appendix B  
(cont.)

Quapaw Nation of Oklahoma  
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2015-39	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2015-08-04	19.33	OTTAWA	N	NORTH MIAM	COUNTY ROAD (E 65)	COUNTY ROAD (S 530)	N	0	0	0	5	4	5	4	18	3	1	1	0	0	1	0	5	36.9216	-94.8884
2015-40	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2015-08-26	13.30	OTTAWA	N	COMMERCE	COUNTY ROAD (E30)	COUNTY ROAD (S565)	N	0	0	0	1	1	5	4	47	4	1	1	0	0	0	0	5	36.9711	-94.8489
2015-41	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2015-08-24	17.53	OTTAWA	N	COMMERCE	COUNTY ROAD (S 560)	COUNTY ROAD (E 30)	N	0	0	0	1	1	5	4	44	2	1	1	0	0	1	0	5	36.9754	-94.8614
2015-42	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2015-08-31	15.54	OTTAWA	N	PICHER	COUNTY ROAD (E 20)	COUNTY ROAD (S 592)	N	0	0	0	1	1	5	1	34	2	2	2	0	0	1	0	5	36.9871	-94.7946
2015-43	N	N	OKLAHOMA HIGHWAY PATROL	1	2	0	2015-09-22	20.30	OTTAWA	N	COMMERCE	COUNTY ROAD (E. 10)	COUNTY ROAD (S. 490)	N	0	0	0	2	1	5	4	57	3	3	4	0	0	1	0	5	36.9994	-94.9948
2015-44	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2015-10-27	05.57	OTTAWA	N	PICHER	US-69A	US-69A	N	0	0	0	2	4	5	1	34	3	2	2	0	0	0	0	1	36.9435	-94.8306
2015-45	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2015-10-22	17.46	OTTAWA	N	QUAPAW	US-69A	COUNTY ROAD (E 16)	N	0	0	0	1	3	5	1	34	5	2	5	0	0	0	0	1	36.9936	-94.7407
2015-46	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2015-11-03	19.00	OTTAWA	I	QUAPAW	UNITED STATES HIGHWAY 69A	COUNTY ROAD ( E 50 RD )	N	0	0	0	2	3	5	1	34	3	2	3	0	0	0	0	1	36.9465	-94.7897
2015-47	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2015-10-30	13.56	OTTAWA	N	COMMERCE	COUNTY ROAD ( S 565 RD )	COUNTY ROAD ( E 30 RD )	N	0	0	0	1	4	5	1	10	6	2	3	0	0	0	0	5	36.9711	-94.8579
2015-48	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2015-11-21	05.38	OTTAWA	N	QUAPAW	COUNTY ROAD ( S 630 RD )	COUNTY ROAD ( E 30 RD )	N	0	0	0	2	4	5	4	47	7	1	1	0	0	0	0	5	36.9713	-94.7404
2015-49	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2015-11-20	18.58	OTTAWA	N	QUAPAW	COUNTY ROAD (E50)	STATE HIGHWAY 137	N	0	0	0	2	1	5	1	10	6	4	1	0	0	1	0	5	36.9436	-94.7986
2015-50	N	N	OKLAHOMA HIGHWAY PATROL	1	0	0	2015-11-27	09.42	OTTAWA	N	QUAPAW	I-44 (WILL ROGERS TURNPIKE)	TPO 328.8	N	0	0	0	1	4	5	3	41	6	1	1	0	0	0	0	3	36.9938	-94.6221
2015-51	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2015-11-23	07.48	OTTAWA	N	QUAPAW	US-69A	COUNTY ROAD (S 600)	N	0	0	0	1	1	5	1	34	2	1	2	0	0	0	0	1	36.9436	-94.8072
2015-52	N	N	OKLAHOMA HIGHWAY PATROL	2	0	0	2015-12-04	14.22	OTTAWA	N	QUAPAW	COUNTY ROAD (S 630)	COUNTY ROAD (E 20)	N	0	0	0	1	1	5	1	34	6	1	2	0	0	0	0	5	36.9883	-94.7227
2015-53	N	Y	OKLAHOMA HIGHWAY PATROL	2	1	0	2015-12-11	05.51	OTTAWA	N	QUAPAW	INTERSTATE 44 (WRTP)	MM 327 EB	N	0	0	0	2	2	5	1	34	6	2	2	0	1	0	0	3	36.9718	-94.6481
2015-54	N	N	OKLAHOMA HIGHWAY PATROL	3	1	0	2015-12-11	12.34	OTTAWA	N	QUAPAW	US-69A	COUNTY ROAD (S 600)	N	0	0	0	1	1	5	1	34	6	4	6	0	0	0	0	1	36.9436	-94.8072
2015-55	N	Y	OKLAHOMA HIGHWAY PATROL	1	0	0	2015-12-20	22.09	OTTAWA	N	COMMERCE	COUNTY ROAD (E 30)	COUNTY ROAD (S 565)	N	0	0	0	2	3	5	4	47	1	1	1	0	0	0	0	5	36.9740	-94.8489
2015-56	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2015-12-28	20.15	OTTAWA	N	QUAPAW	COUNTY ROAD (E.57)	COUNTY ROAD (S. 630)	N	0	0	0	2	3	5	1	49	2	2	1	0	0	0	0	10	36.9346	-94.7451
2015-57	Y	N	OKLAHOMA HIGHWAY PATROL	2	2	2	2015-11-30	10.48	OTTAWA	N	QUAPAW	SH-137	COUNTY ROAD (E 80)	N	0	0	0	1	4	5	1	34	2	5	4	0	0	0	0	5	36.8987	-94.7769
2016-01	Y	N	COMMERCE POLICE DEPT	1	1	1	2016-07-02	22.45	OTTAWA	I	COMMERCE	SOUTH 560 ROAD		N	0	0	0	3	1	6	1	99	7	5	2	0	0	1	1	#NULL!	36.9436	-94.8671
2016-02	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2016-02-21	13.45	OTTAWA	N	QUAPAW	COUNTY ROAD (S. 137)	STATE HIGHWAY 10	N	0	0	0	1	1	5	4	51	1	4	1	0	0	0	0	5	36.8717	-94.7877
2016-03	N	N	OKLAHOMA HIGHWAY PATROL	1	2	0	2016-06-04	15.43	OTTAWA	N	QUAPAW	COUNTY ROAD (E 40)	COUNTY ROAD (S 590)	N	0	0	0	1	1	5	1	73	7	4	4	0	0	0	0	5	36.9580	-94.8064
2016-04	N	N	OKLAHOMA HIGHWAY PATROL	2	3	0	2016-10-18	11.09	OTTAWA	N	QUAPAW	US-69A	COUNTY ROAD (E 16)	N	0	0	0	1	1	5	1	34	3	4	3	0	0	0	0	1	36.9943	-94.7407
2016-05	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2016-01-22	15.51	OTTAWA	N	QUAPAW	COUNTY ROAD (E 40)	COUNTY ROAD (S 620)	N	0	0	0	1	3	5	1	34	6	3	2	0	0	0	0	5	36.9581	-94.7585
2016-06	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2016-02-14	00.25	OTTAWA	N	PICHER	US-69	COUNTY ROAD (E 30)	N	0	0	0	2	1	5	4	59	1	3	1	0	0	1	0	7	36.9756	-94.8309
2016-07	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2016-02-16	21.47	OTTAWA	N	COMMERCE	US-69	SH-69A	N	0	0	0	2	1	5	1	34	3	3	2	0	0	1	0	1	36.9436	-94.8408
2016-08	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2016-05-05	13.35	OTTAWA	N	QUAPAW	UNITED STATES HIGHWAY 69A	COUNTY ROAD ( E 30 RD )	N	0	0	0	1	1	5	4	10	5	3	1	0	0	0	0	1	36.9779	-94.7524
2016-09	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2016-05-10	08.06	OTTAWA	N	COMMERCE	COUNTY ROAD (E 60)	SH-69A	N	0	0	0	1	1	5	4	44	3	3	1	0	0	1	0	4	36.9290	-94.8419
2016-10	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2016-05-08	13.35	OTTAWA	N	QUAPAW	UNITED STATES HIGHWAY 69A	COUNTY ROAD ( E 15 RD )	N	0	0	0	1	3	5	1	34	1	3	4	0	0	0	0	1	36.9914	-94.7410
2016-11	N	N	OKLAHOMA HIGHWAY PATROL	1	2	0	2016-05-11	20.19	OTTAWA	N	COMMERCE	COUNTY ROAD ( S 540 RD )	COUNTY ROAD ( E 50 RD )	N	0	0	0	1	3	5	4	57	4	3	4	0	0	1	0	5	36.9435	-94.9135
2016-12	N	N	OKLAHOMA HIGHWAY PATROL	1	2	0	2016-06-25	17.44	OTTAWA	N	QUAPAW	COUNTY ROAD (E. 40 RD)	COUNTY ROAD (S. 590 RD)	N	0	0	0	1	3	5	4	57	7	3	3	0	0	0	0	5	36.9581	-94.8031
2016-13	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2016-06-27	15.12	OTTAWA	N	QUAPAW	I-44 (WRTP)	TPO 328.26	N	0	0	0	1	4	5	2	41	2	3	4	0	0	0	0	3	36.9773	-94.6411
2016-14	N	N	OKLAHOMA HIGHWAY PATROL	2	2	0	2016-08-05	15.58	OTTAWA	N	QUAPAW	COUNTY ROAD (E 57)	COUNTY ROAD (S 630)	N	0	0	0	1	1	5	1	34	6	3	4	0	0	0	0	5	36.9344	-94.7469
2016-15	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2016-08-18	18.30	OTTAWA	I	PICHER	US-69	F STREET	N	0	0	0	1	1	5	4	47	5	3	1	0	1	0	0	7	36.9931	-94.8310
2016-16	N	Y	OKLAHOMA HIGHWAY PATROL	2	1	0	2016-12-24	20.52	OTTAWA	N	QUAPAW	COUNTY ROAD (S 610)	COUNTY ROAD (E 20)	N	0	0	0	2	3	5	1	34	7	3	1	0	0	0	0	5	36.9872	-94.7763
2016-17	N	N	COMMERCE POLICE DEPT	3	1	0	2016-01-14	08.40	OTTAWA	I	COMMERCE	S MICKEY MANTLE		N	0	0	0	1	1	6	10	17	5	2	1	0	0	0	0	7	36.9300	-94.8674
2016-18	N	N	COMMERCE POLICE DEPT	1	1	0	2016-09-07	15.00	OTTAWA	I	COMMERCE	US HIGHWAY 69A		N	0	0	0	1	1	7	1	99	4	2	1	0	0	0	0	4	36.9363	-94.8418
2016-19	N	N	COMMERCE POLICE DEPT	2	1	0	2016-10-26	08.50	OTTAWA	I	NORTH MIAM	HWY 69		N	0	0	0	1	4	6	1	34	4	2	3	0	0	0	0	#NULL!	36.9200	-94.8776
2016-20	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2016-01-16	12.34	OTTAWA	N	QUAPAW	COUNTY ROAD (S. 610)	COUNTY ROAD (E. 80)	N	0	0	0	1	1	5	1	34	7	2	3	0	0	0	0	5	36.9001	-94.7879
2016-21	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2016-01-20	07.45	OTTAWA	N	COMMERCE	COUNTY ROAD (E/W 30)	COUNTY ROAD (N/S 310)	N	0	0	0	1	3	5	4	57	4	2	1	0	0	0	0	5	36.9723	-94.9518
2016-22	N	N	OKLAHOMA HIGHWAY PATROL	2	1	0	2016-01-16	22.29	OTTAWA	N	QUAPAW	I-44 (WILL ROGERS TURNPIKE)	TPU 328.36	N	0	0	0	2	1	5	1	34	7	2	3	0	0	0	0	3	36.9843	-94.6332
2016-23	N	N	OKLAHOMA HIGHWAY PATROL	2	3	0	2016-02-13	23.10	OTTAWA	N	QUAPAW	COUNTY ROAD (S. 630)	COUNTY ROAD (E. 50)	N	0	0	0	2	1	5	1	35	7	2	6	0	0	0	0	5	36.9456	-94.7404
2016-24	N	N	OKLAHOMA HIGHWAY PATROL	1	1	0	2016-02-18	23.08	OTTAWA	N	COMMERCE	COUNTY ROAD ( S565 RD )	COUNTY ROAD ( 40 RD )	N	0	0	0	2	1	5	4	47	5	2	1	0	0	0	0	5	36.9580	-94.8639
2016-25	N	Y	OKLAHOMA HIGHWAY PATROL	2	1	0	2016-06-25	20.25	OTTAWA	N	QUAPAW	COUNTY ROAD E. 50	COUNTY ROAD S. 629	N	0	0	0	1	3	5	1	34	7	2	1	0	0	0	0	5	36.9367	-94.7521
2016-26	N	N	COMMERCE POLICE DEPT	3	0	0	2016-01-19	24.00	OTTAWA	I	COMMERCE	HWY 69		N	0	0	0	3	6	2	1	34	3	1	3	0	0	0	0	7	36.9328	-94.8674
2016-27	N	N	COMMERCE POLICE DEPT	3	0	0	2016-01-05	14.00	OTTAWA	I	COMMERCE	N HWY 69		N	0	0	0	1	1	2	1	34	3	1	3	0	0	0	1	1	36.9436	-94.8426
2016-28	N	N	COMMERCE POLICE DEPT	2	0	0	2016-02-19	09.38	OTTAWA	I	COMMERCE	HWY 69		N	0	0	0	1	1	7	1	34	6	1	2	0	0	0	0	1	36.9436	-94.8408
2016-29	N	N	COMMERCE POLICE DEPT	2	0	0	2016-02-18	10.43	OTTAWA	I	COMMERCE	N ELM		N	0	0	0	1	1	1	1	34	5	1	1	0	0	0	0	6	36.9344	-94.8685
2016-30	N	N	COMMERCE POLICE DEPT	2	0	0	2016-04-05	24.00	OTTAWA	I	COMMERCE	QUINCY STREET																				

**MOTOR VEHICLE CRASH SUMMARY**

*Downstream Casino Resort Area  
Cherokee County, KS*

Year	CRASHES				PEOPLE	
	Total	Fatal	Injury	PDO	Deaths	Injuries
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	2	0	1	1	0	2
<b>Total</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>

\*PDO – Property Damage Only

NOTE: Kansas crash data provided by Kansas DOT.



**MOTOR VEHICLE CRASH SUMMARY**

*Downstream Casino Resort Area*  
*Newton County, MO*

Year	CRASHES				PEOPLE	
	Total	Fatal	Injury	PDO	Deaths	Injuries
2011	0	0	0	0	0	0
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0
2016	02	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\*PDO – Property Damage Only

NOTE: Missouri crash data identified through MoDOT's Transportation Management System (TMS) accident summary application.





***QUAPAW NATION  
OF  
OKLAHOMA***

***TRIBAL TRANSPORTATION SAFETY PLAN***

***APPENDIX C – CRASH CODE DEFINITIONS***

December 11, 2017

PREPARED BY:

CJW 

## Appendix C

## Quapaw Nation of Oklahoma Tribal Transportation Safety Plan

### Oklahoma Crash Codes

Variable	Description	Value	Label
CASE	Unique case number for crash		
ENV_FATAL	Fatality Code	0	Not Stated
		9	Unknown
		N	No
		Y	Yes
ENV_HIT	Hit & Run Code	0	Not Stated
		9	Unknown
		N	No
		Y	Yes
ENV_VEH	Total Number of Vehicles		
ENV_INJ	Total Number Injured		
ENV_KILL	Total Number Killed		
ENV_DATE	Crash Date		
ENV_TIME	Crash Time		
ENV_COUNTYNAME	County		
ENV_IN_NEAR_CITY	Crash In or Near City	I	In City
		N	Near City
env_city	City		
ENV_STREET_HWY	Highway/Street Name		
ENV_INTERSECT_ROAD	Nearest Intersecting Highway/Street		
ENV_WORKZONE	Workzone	N	No
		Y	Yes
ENV_WORKZONE_TYPE	Workzone Type	1	Lane Closure
		2	Lane Shift/Crossover
		3	Work on Shoulder/Median
		4	Intermittent or Moving Work
		9	Unknown
		20	Not Stated
ENV_WORKZONE_LOCATION	Location of Collision within the Workzone	1	Before the First Work
		2	Advance Warning Area
		3	Transition Area
		4	Activity Area
		5	Termination Area
		9	Unknown
		20	Not Stated
ENV_WORKZONE_WORKER	Worker Present in Workzone	0	Not Stated
		9	Unknown
		N	No
		Y	Yes
ENV_LIGHT	Lighting	1	Daylight
		2	Dark-Not Lighted
		3	Dark-Lighted
		4	Dawn
		5	Dusk
		6	Dark-Unknown Lighting
		7	Other
		9	Unknown
		20	Not Stated



## Appendix C (cont.)

## *Quapaw Nation of Oklahoma Tribal Transportation Safety Plan*

### Oklahoma Crash Codes

ENV_WEATHER	Weather	1	Clear
		2	Fog/Smog/Smoke
		3	Cloudy
		4	Rain
		5	Snow
		6	Sleet/Hail (Freezing Rain/Drizzle)
		7	Severe Crosswind
		8	Blowing Snow
		9	Blowing Sand, Soil, Dirt
		10	Other
		98	Not Stated
ENV_LOCALITY	Locality	99	Unknown
		1	Residential
		2	Business
		3	Industrial
		4	School
		5	Not Built-up
		6	Mixed Use
		7	Other
		9	Unknown
		20	Not Stated
ENV_HARM_EVENT_LOCATION	Location of First Harmful Event	1	On Roadway
		2	Shoulder
		3	Median
		4	Roadside
		5	Gore
		6	Separator
		7	Parking Lane/Zone
		8	Off Roadway, Location Unknown
		9	Outside Right-of-Way
		10	Other
ENV_FIRST_HARM_EVENT	First Harmful Event for Entire Crash	98	Not Stated
		0	Not Applicable
		10	Overturn/Rollover
		11	Fire/Explosion
		12	Immersion
		13	Jackknife
		14	Cargo/Equipment Loss/Shift
		15	Equipment Failure
		16	Separation of Units
		17	Departed Road Right
		18	Departed Road Left
		19	Cross Median/Centerline
		20	Downhill Runaway
		21	Fell/Jumped from Motor Vehicle
		22	Thrown or Falling Object
		23	Other Non-Collision
		30	Pedestrian
		31	Pedal Cycle
		32	Railway Vehicle
		33	Animal



## Appendix C (cont.)

## Quapaw Nation of Oklahoma Tribal Transportation Safety Plan

### Oklahoma Crash Codes

ENV_FIRST_HARM_EVENT	First Harmful Event for Entire Crash	34	Motor Vehicle in Transport
		35	Parked Motor Vehicle
		36	Struck by Falling/Shifting Cargo
		37	Work Zone/Maintenance Equipment
		38	Other Non-Fixed Object
		40	Barrier (Cable)
		41	Barrier (Concrete)
		42	Barrier (Other)
		43	Fence Pole
		44	Fence
		45	Traffic Signal Support
		46	Traffic Sign Support
		47	Utility Pole/Light Support
		48	Other Post/Pole/Support
		49	Guardrain/Guardrail Fence
		50	Guardrain End
		51	Culvert
		52	Curb
		53	Island
		54	Sand Barrels
		55	Impact Attenuator
		56	Pavement Drop-Off
		57	Ditch
		58	Embankment
		59	Tree (Standing)
		60	Dividing Strip
		61	Retaining Wall
		62	Bridge Abutment
		63	Bridge Pier/Support
		64	Bridge Rail
		65	Bridge Post
		66	Bridge Curb
		67	Bridge Super Structure (Beams)
		68	Bridge Overhead Structure
		69	Delineator
		70	Mailbox
		71	Other Fixed Object
		72	Other Highway Structure
		73	Ground
		98	Not Stated
		99	Unknown
ENV_DAY	Day of Week	1	Sunday
		2	Monday
		3	Tuesday
		4	Wednesday
		5	Thursday
		6	Friday
		7	Saturday





## Appendix C (cont.)

## *Quapaw Nation of Oklahoma Tribal Transportation Safety Plan*

### Oklahoma Crash Codes

ENV_KABCO	Crash Injury Severity	0	Not Applicable
		1	None
		2	Possible
		3	Non-Incapacitating
		4	Incapacitating
		5	Fatal
		9	Unknown
ENV_TOT_OCCUPANTS	Total Motor Vehicle Occupants in Crash		
ENV_TOT_NONMOTORISTS	Total Non-Motorists in Crash		
ENV_TOT_COMM_VEH	Total Commerical Vehicles in Crash		
env_alcohol_related	Alcohol Related	0	No
		1	Yes
env_drug_related	Drug Related	0	No
		1	Yes
odot_hc	ODOT Highway Class	1	Rural US Highway
		2	Interstate Highway
		3	Interstate Turnpike
		4	Rural State Highway
		5	County Road
		6	City Street
		7	Urban US Highway
		8	Urban State Highway
		9	Non-Interstate Turnpike
		10	Unknown
LATITUDE	Latitude		
LONGITUDE	Longitude		





***QUAPAW NATION  
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***TRIBAL TRANSPORTATION SAFETY PLAN***

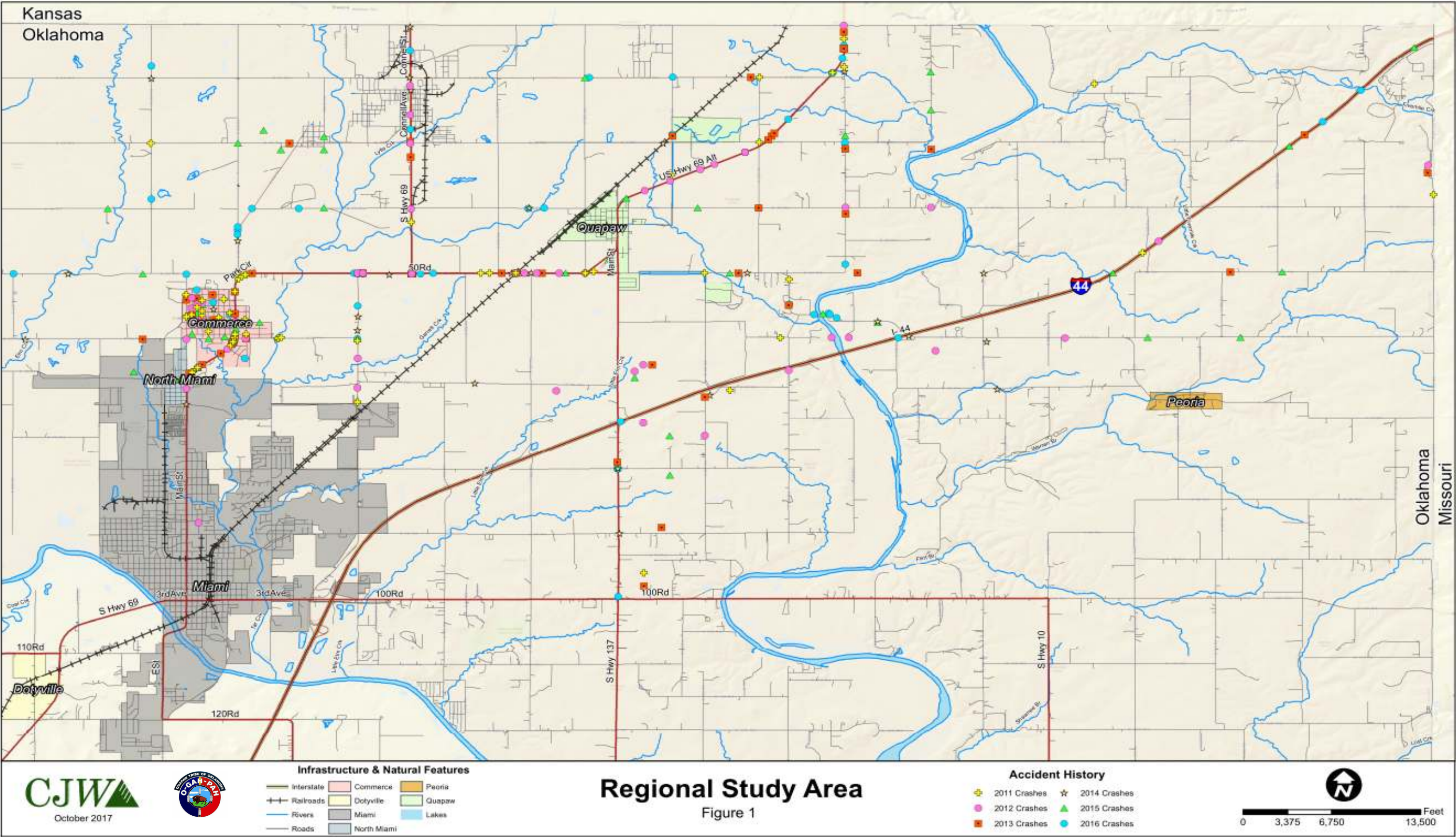
***APPENDIX D – GIS CRASH MAPS***

December 11, 2017

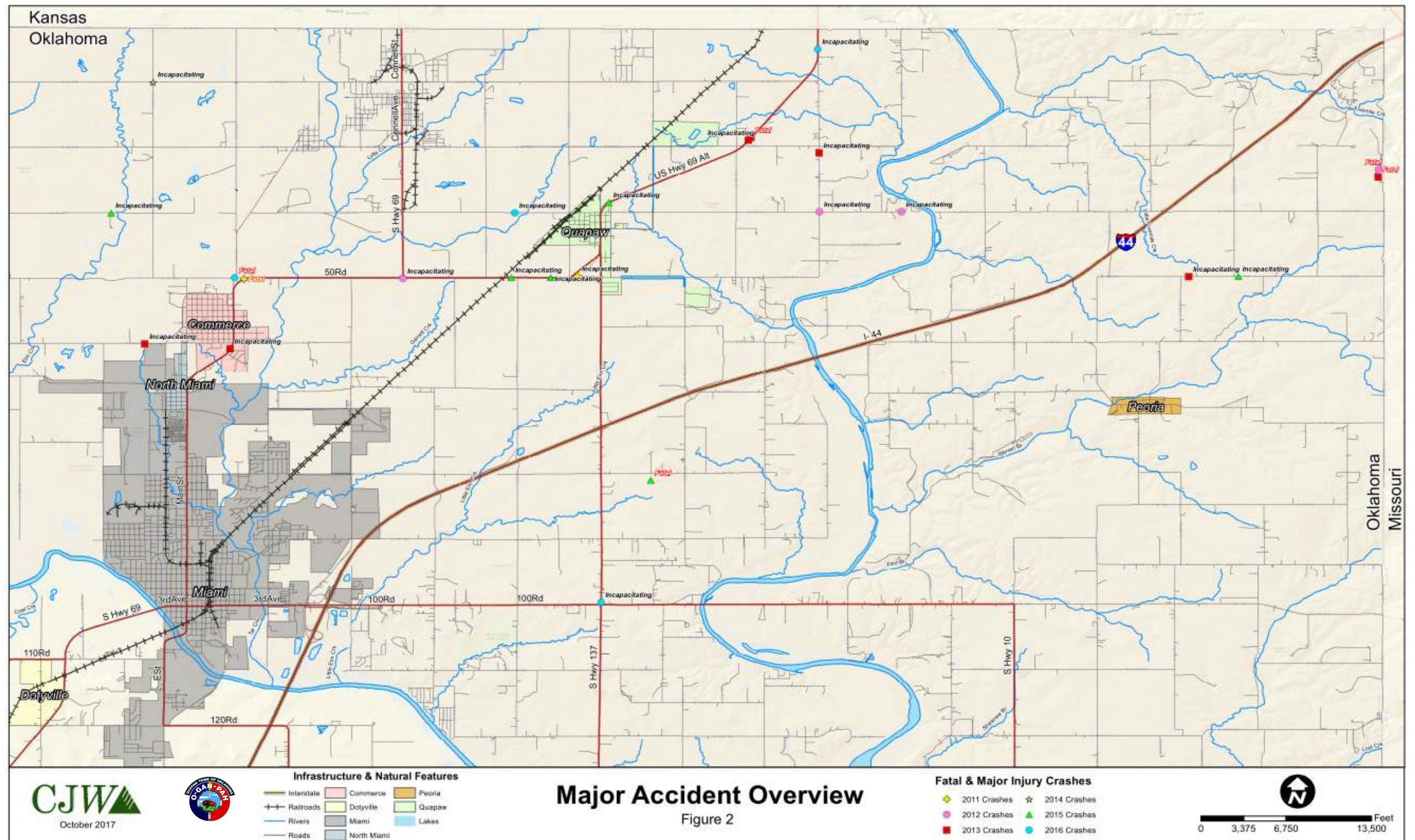
PREPARED BY:

CJW 

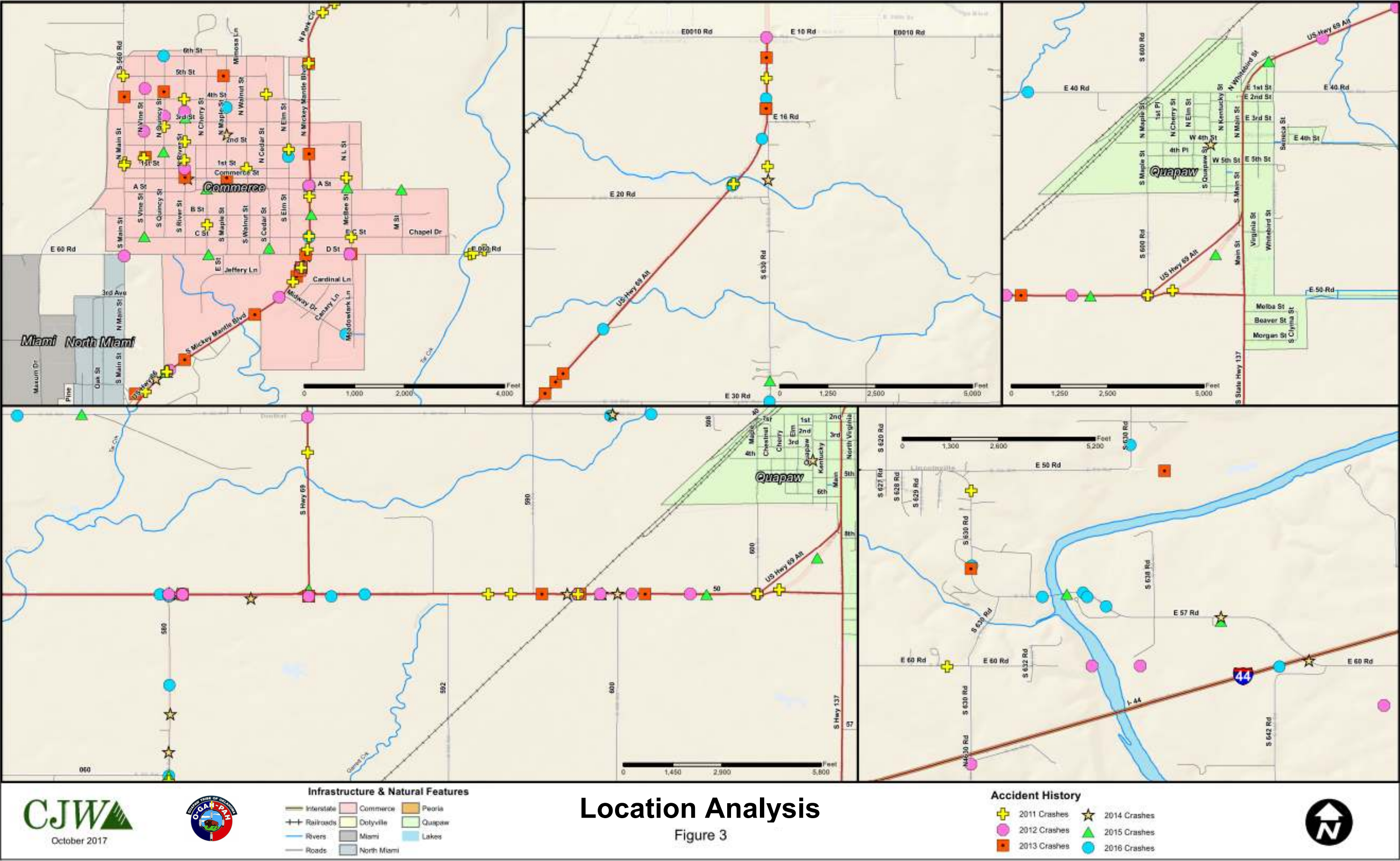














***QUAPAW NATION  
OF  
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***TRIBAL TRANSPORTATION SAFETY PLAN***

***APPENDIX E – 2007 TRAFFIC VOLUMES***

December 11, 2017

PREPARED BY:

CJW 

# Appendix E

## Quapaw Nation of Oklahoma Tribal Transportation Safety Plan

April 2007

### Quapaw Tribe of Oklahoma Traffic Counts

Site #	Route Number	Location	Month Counted	Day of Week	Volume Counted	Conversion Factors	Current ADT**	Projected ADT***	% Heavy Trucks^
						Day*			
1	IRR Route 0139	S630 Rd. South of E50 Rd.	April	Friday	1387	0.859	1191	1789	8.80%
	Section 070								
2	IRR Route 0103	E57 Rd. West of S638 Rd.	April	Friday	1071	0.859	920	1386	22.30%
	Section 050								
3	IRR Route 0139	S630 Rd. South of E60 Rd.	April	Friday	152	0.859	131	194	4.60%
	Section 030								
4	IRR Route 0196	S630 Rd. North of E40 Rd.	April	Friday	286	0.859	246	365	5.50%
	Section 030								
6	IRR Route 0183	E40 Rd. West of S630 Rd.	April	Friday	311	0.859	267	397	8.30%
	Section 010								
6	IRR Route 0190	S580 Rd. North of E66 Rd.	April	Friday	6743	0.859	5792	8601	9.40%
	Section 010								
7	IRR Route 0187	E60 Rd. West of S580 Rd.	April	Friday	1852	0.859	1591	2362	6.20%
	Section 030								
8	IRR Route 0190	South 580 Rd. South of U.S. 69	April	Friday	5094	0.859	4376	6498	12.10%
	Section 030								
9	IRR Route 0185	E50 Rd. West of County Road 137	April	Friday	1641	0.859	1410	2093	10.30%
	Section 010								
10	IRR Route 0000	County Road 137 South of U.S. 69A	April	Friday	2010	0.859	1727	2564	13.40%
	Section 000								
11	IRR Route 0169	P Street South of E60 Rd.	April	Saturday	300	1.035	300	446	2.30%
	Section 010								
12	IRR Route 0129	E60 Rd. West of South Main St.	April	Saturday	842	1.035	871	1294	3.60%
	Section 030								
13	IRR Route 0130	E50 Rd. West of U.S. Hwy. 69	April	Saturday	415	1.035	430	638	11.60%
	Section 030								
14	IRR Route 0000	S560 Rd. North of E50 Rd.	April	Saturday	1322	1.035	1368	2032	3.90%
	Section 000								
15	IRR Route 0182	E40 Rd. West of U.S. Hwy. 69	April	Saturday	95	1.035	98	146	5.30%
	Section 040								
16	IRR Route 0182	E40 Rd. East of U.S. Hwy. 69	April	Saturday	367	1.035	380	564	4.90%
	Section 050								
17	IRR Route 0193	S600 Rd. North of E40 Rd.	April	Saturday	62	1.035	64	95	20.90%
	Section 010								
18	IRR Route 0182	E40 Rd. West of S600 Rd.	April	Monday	825	0.972	802	1191	7.40%
	Section 050								
19	IRR Route 0103	S670 Rd. North of E69 Rd.	April	Tuesday	478	0.975	466	692	9.30%
	Section 070								
20	IRR Route 0104	E60 Rd. West of S670 Rd.	April	Tuesday	366	0.975	357	530	11.40%
	Section 005								





# Appendix E (cont.)

## Quapaw Nation of Oklahoma Tribal Transportation Safety Plan

April 2007

### Quapaw Tribe of Oklahoma Traffic Counts

Site #	Route Number	Location	Month Counting	Day of Week	Volume Counted	Conversion Factors	Current ADT**	Projected ADT***	% Heavy Trucks^
						Day*			
21	IRR Route 0188	E60 Rd. East of S670 Rd.	April	Tuesday	91	0.975	89	132	17.60%
	Section 010								
22	IRR Route 0156	S652 Rd. South of E60 Rd.	April	Tuesday	181	0.975	176	262	10.50%
	Section 010								
23	IRR Route 0174	S620 Rd. South of E50 Rd.	April	Tuesday	103	0.975	100	149	13.50%
	Section 020								
24	IRR Route 0123	E57 Rd. East of County Road 137	April	Tuesday	178	0.975	174	258	29.70%
	Section 010								
25	IRR Route 0191	S590 Rd. North of U.S. Hwy. 69A	April	Tuesday	103	0.975	100	149	86.40%
	Section 010								
26	IRR Route 0000	E30 Rd. East of U.S. Hwy. 69	April	Tuesday	410	0.975	400	594	11.60%
	Section 000								
27	IRR Route 0000	E30 Rd. West of U.S. Hwy. 69	April	Tuesday	322	0.975	314	466	8.90%
	Section 000								
28	IRR Route 0000	E20 Rd. East of U.S. Hwy. 69	April	Tuesday	635	0.975	619	919	4.10%
	Section 000								
29	IRR Route 0000	E20 Rd. West of U.S. Hwy. 69	April	Tuesday	539	0.975	528	780	6.90%
	Section 000								
30	IRR Route 0000	E28 Rd. West of U.S. Hwy. 69	April	Tuesday	619	0.975	604	896	24.80%
	Section 000								
31	IRR Route 0178	E20 Rd. West of S604 Rd.	April	Tuesday	632	0.975	616	915	5.20%
	Section 030								
32	IRR Route 0196	S630 Rd. South of E20 Rd.	April	Tuesday	332	0.975	324	481	10.80%
	Section 050								
33	IRR Route 0139	E30 Rd. East of U.S. Hwy. 69A	April	Tuesday	200	0.975	195	290	11.00%
	Section 092								
34	IRR Route 0104	S660 Rd. South of E22 Rd.	April	Tuesday	219	0.975	214	317	10.10%
	Section 060								
35	IRR Route 0197	S665 Rd. South of E10 Rd.	April	Tuesday	302	0.975	294	437	7.70%
	Section 010								

#### ABBREVIATIONS KEY

\*Conversion Factors: ODOT adjustment factors used to mitigate the impact of seasonal, daily, or other generally predictable fluctuations in traffic volume.

\*\*Current ADT: Current Average Daily Traffic (Volume Counted with applied Conversion Factors)

\*\*\*Projected ADT: Current ADT Projected twenty years.

^Heavy Vehicles, i.e., trucks (vehicles having more than 4 wheels) and buses.

^^Information from the Data Base of ODOT.





**April 2007**

*Quapaw Nation of Oklahoma  
Tribal Transportation Safety Plan*

Quapaw Tribe of Oklahoma  
Traffic Counts from Oklahoma Department of Transportation

[illegible]

### ABBREVIATIONS KEY

\*Conversion Factors: ODOT adjustment factors used to mitigate the impact of seasonal, daily, or other generally predictable fluctuations.

\*\*Current ADT: Current Average Daily Traffic (Volume Counted with applied Conversion Factors)

\*\*\*Projected ADT: Current ADT Projected twenty years.

<sup>a</sup>Heavy Vehicles, i.e., trucks (vehicles having more than 4 wheels) and buses.

<sup>AA</sup>Information from the Data Base of ODOT.

<sup>AAA</sup> Information from the Data base of Oklahoma Turnpike Authority





***QUAPAW NATION  
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OKLAHOMA***

***TRIBAL TRANSPORTATION SAFETY PLAN***

***APPENDIX F – PROVEN SAFETY COUNTERMEASURES***

December 11, 2017

PREPARED BY:

CJW 



U.S. Department of Transportation  
Federal Highway Administration

## PROVEN SAFETY COUNTERMEASURES



### USLIMITS2

USLIMITS2 helps practitioners assess and establish safe, reasonable, and consistent speed limits



USLIMITS2 helps support speed limit decisions.

Source: Richard Retting

*"USLIMITS2 acts as an external, impartial, second set of eyes."*

Georgia DOT Traffic Engineer

USLIMITS2<sup>1</sup> is a free, web-based tool designed to help practitioners assess and establish safe, reasonable, and consistent speed limits for specific segments of roadway. It is applicable to all types of facilities, from rural and local roads and residential streets to urban freeways.

USLIMITS2 supports customary engineering studies<sup>2</sup> used to determine appropriate speed limits. These studies typically include evaluating criteria such as 85th percentile speed, traffic volumes, roadway type, roadway setting, number of access points, crash history, pedestrian/bicyclist activity, etc. Similarly, USLIMITS2 produces an unbiased and objective suggested speed limit value based on 50th and 85th percentile speeds, traffic volume, roadway characteristics, and crash data.

Traffic engineers often communicate with the public, community leaders, and government officials to explain the methodology behind setting speed limits. USLIMITS2 provides an objective second opinion and helps support these speed limit decisions. USLIMITS2 augments the credibility of engineering speed studies, helping to address concerns from local government officials and private citizens when speed limits are adjusted.

To begin using USLIMITS2, users create a new project or upload an existing project file for revisions or updates through the online tool. The website contains the user guide, information on the tool's decision logic and related research, and frequently asked questions.



USLIMITS2 is applicable to all types of roadways.

Source: Missouri DOT



Users can save their USLIMITS2 project files for future analysis or reviews.

<sup>1</sup> USLIMITS2 is available free online at <https://safety.fhwa.dot.gov/uslimits2/>.

<sup>2</sup> For more information on setting speed limits based on engineering studies, refer to the Manual on Uniform Traffic Control Devices.

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

FHWA-SA-17-070

**Safe Roads for a Safer Future**  
Investment in roadway safety saves lives  
<https://safety.fhwa.dot.gov>





U.S. Department of Transportation  
Federal Highway Administration

## PROVEN SAFETY COUNTERMEASURES



### Enhanced Delineation and Friction for Horizontal Curves

SAFETY BENEFITS:

#### CHEVRON SIGNS

**25%**

Reduction in nighttime crashes

**16%**

Reduction in non-intersection  
fatal and injury crashes

Source: CMF Clearinghouse, CMFIDs 2438 and 2439

#### HIGH FRICTION SURFACE TREATMENTS

**52%**

Reduction in wet road crashes

**24%**

Reduction in curve crashes

Source: CMF Clearinghouse, CMFIDs 7900 and 7901

This proven safety countermeasure for reducing crashes at curves includes a variety of potential strategies that can be implemented in combination or individually. These strategies fall into two categories: enhanced delineation and increased pavement friction.



Source: Thinkstock

#### Enhanced Delineation

Enhanced delineation treatments can alert drivers in advance of the curve and vary by the severity of the curvature and operating speed. Price ranges for these strategies are low to moderate. Treatments include the following:

- Pavement markings.
- Post-mounted delineation.
- Larger signs and signs with enhanced retroreflectivity.
- Dynamic advance curve warning signs and sequential curve signs.

#### Increased Pavement Friction

High friction surface treatment (HFST) is another highly cost-effective countermeasure. HFST compensates for the high friction demand at curves where the available pavement friction is not adequate to support operating speeds due to one or more of the following situations:

- Sharp curves.
- Inadequate cross-slope design.
- Wet conditions.
- Polished roadway surfaces.
- Driving speeds in excess of the curve advisory speed.

To implement these proven safety countermeasures, agencies can take the following steps:

1. Develop a process for identifying and treating problem curves.
2. Use the appropriate application for the identified problem(s), consider the full range of enhanced delineation and friction treatments.
3. Improve consistency in application of horizontal curve guidance provided in the *Manual on Uniform Traffic Control Devices* for new and existing devices.
4. Review signing practices and policies to ensure they comply with the intent of the new guidance.

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

FHWA-SA-17-058

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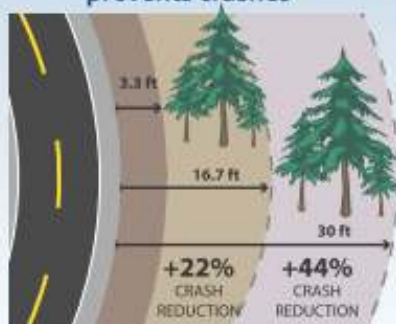
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## PROVEN SAFETY COUNTERMEASURES



### Roadside Design Improvements at Curves

Increasing the Clear Zone  
prevents crashes



Source: Leidos. Data Source: CMF Clearinghouse (CMF IDs 35 and 36)

**27%**  
of all fatal crashes  
occur at curves

**80%**  
of all fatal crashes at  
curves are roadway  
departure crashes

Source: Fatality Analysis Reporting System (FARS)

Roadside design improvement at curves is a strategy encompassing several treatments that target the high-risk roadside environment along the outside of horizontal curves. These treatments prevent roadway departure fatalities by giving vehicles the opportunity to recover safely and by reducing crash severity.

Roadside design improvements can be implemented alone or in combination and are particularly recommended at horizontal curves—where data indicates a higher-risk for roadway departure fatalities—and where cost effectiveness can be maximized.

#### Roadside Design Improvements to Provide for a Safe Recovery

In cases where a vehicle leaves the roadway, strategic roadside design elements, including clear zone addition or widening, slope flattening, and shoulder addition or widening, can provide drivers with an opportunity to regain control and re-enter the roadway.

- A **clear zone** is an unobstructed, traversable area beyond the edge of the through traveled way for the recovery of errant vehicles. Clear zones are free of rigid fixed objects such as trees and utility cabinets or poles. AASHTO's *Roadside Design Guide* details the clear zone width adjustment factors to be applied at horizontal curves.
- **Slope flattening** reduces the steepness of the sideslope to increase drivers' ability to keep the vehicle stable, regain control of the vehicle, and avoid obstacles.
- **Adding or widening shoulders** gives drivers more recovery area to regain control in the event of a roadway departure.

#### Roadside Design Improvements to Reduce Crash Severity

Since not all roadside hazards can be removed at curves, installing roadside barriers to shield unmovable objects or embankments may be an appropriate treatment. Roadside barriers come in three forms:

- **Cable barrier** is a flexible barrier made from wire rope supported between frangible posts.
- **Guardrail** is a semi-rigid barrier, usually either a steel box beam or W-beam. These deflect less than flexible barriers, so they can be located closer to objects where space is limited.
- **Concrete barrier** is a rigid barrier that does not deflect. These are typically reserved for use on divided roadways.



Source: Alaska DOT

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

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## PROVEN SAFETY COUNTERMEASURES



### Local Road Safety Plans

Local roads experience  
**3x the fatality rate**  
of the  
**Interstate Highway System.**

Source: FARS and FHWA Highway Statistics Series (2014)



Safety improvements on local roads can be determined through the LRSP process.  
Source: Delaware Valley Regional Planning Commission

A local road safety plan (LRSP) provides a framework for identifying, analyzing, and prioritizing roadway safety improvements on local roads. The LRSP development process and content are tailored to local issues and needs. The process results in a prioritized list of issues, risks, actions, and improvements that can be used to reduce fatalities and serious injuries on the local road network.

While local roads are less traveled than State highways, they have a much higher rate of fatal and serious injury crashes. Developing an LRSP is an effective strategy to improve local road safety for all road users and support the goals of a State's overall strategic highway safety plan.

Although the development process and resulting plan can vary depending on the local agency's needs, available resources, and targeted crash types, aspects common to LRSPs include:

- Stakeholder engagement representing the 4E's – engineering, enforcement, education, and emergency medical services, as appropriate.
- Collaboration among municipal, county, Tribal, State and/or Federal entities to leverage expertise and resources.
- Identification of target crash types and crash risk with corresponding recommended proven safety countermeasures.
- Timeline and goals for implementation and evaluation.

Local road agencies should consider developing an LRSP to be used as a tool for reducing roadway fatalities, injuries, and crashes.<sup>1</sup> The plan should be viewed as a living document that can be updated to reflect changing local needs and priorities.

<sup>1</sup> Developing Safety Plans: A Manual for Local Rural Road Owners, FHWA-SA-12-017, provides guidance on developing an LRSP.

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

FHWA-SA-17-069



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## PROVEN SAFETY COUNTERMEASURES



### Longitudinal Rumble Strips and Stripes

SAFETY BENEFITS:



**CENTER LINE RUMBLE STRIPS**

**44-64%**

Head-on, opposite-direction, and sideswipe fatal and injury crashes

**SHOULDER RUMBLE STRIPS**

**13-51%**

Single vehicle, run-off-road fatal and injury crashes



Source: NCHRP Report 641, Guidance for the Design and Application of Shoulder and Centerline Rumble Strips.



Shoulder rumble strips and center line rumble strips are installed on this roadway. Source: FHWA

**Longitudinal rumble strips** are milled or raised elements on the pavement intended to alert drivers through vibration and sound that their vehicles have left the travel lane. They can be installed on the shoulder, edge line of the travel lane, or at or near center line of an undivided roadway.

With roadway departure crashes accounting for more than half of the fatal roadway crashes annually in the United States, rumble strips and stripes are designed to address these crashes caused by distracted, drowsy, or otherwise inattentive drivers who drift from their lane. They are most effective when deployed in a systemic application since driver error may occur on all roads.

Transportation agencies should consider milled center line rumble strips (including in passing zone areas) and milled edge line or shoulder rumble strips with bicycle gaps for systemic safety projects, location-specific corridor safety improvements, as well as reconstruction or resurfacing projects.

**Rumble stripes** are edge line or center line rumble strips where the pavement marking is placed over the rumble strip, which can result in an increased visibility of the pavement marking during wet, nighttime conditions.



Example of an edge line rumble stripe. Source: Missouri DOT

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

FHWA-SA-17-059



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## PROVEN SAFETY COUNTERMEASURES



### Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections



Example of countermeasures on the stop approach.

Source: South Carolina DOT

#### SAFETY BENEFITS:

**10%**  
Reduction in injury and  
fatal crashes

**15%**  
Reduction in  
nighttime crashes

This systemic approach to intersection safety involves deploying a group of multiple low-cost countermeasures, such as enhanced signing and pavement markings, at a large number of stop-controlled intersections within a jurisdiction. It is designed to increase driver awareness and recognition of the intersections and potential conflicts.

The systemic approach to safety has three components:

- (1) analyze systemwide data to identify a problem,
- (2) look for similar risk factors present in severe crashes, and
- (3) deploy on a large scale low-cost countermeasures that address the risk factors contributing to crashes.

The low-cost countermeasures for stop-controlled intersections generally consist of the following treatments:

#### On the Through Approach

- Doubled up (left and right), oversized advance intersection warning signs, with street name sign plaques.
- Enhanced pavement markings that delineate through lane edge lines.

#### On the Stop Approach

- Doubled up (left and right), oversized advance "Stop Ahead" intersection warning signs.
- Doubled up (left and right), oversized Stop signs.
- Retroreflective sheeting on sign posts.
- Properly placed stop bar.
- Removal of any vegetation, parking, or obstruction that limits sight distance.
- Double arrow warning sign at stem of T-intersections.



Example of countermeasures on the through approach.

Source: South Carolina DOT

#### Average Benefit-Cost Ratio

**12:1**

Source: T. Le et al, "Safety Effects of Low-Cost Systemic Safety Improvements at Signalized and Stop-Controlled Intersections," 96th Annual Meeting of the Transportation Research Board, Paper Number 17-05379, January 2017.

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

FHWA-SA-17-056



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## PROVEN SAFETY COUNTERMEASURES



### Road Safety Audits

A road safety audit is a proactive, formal safety performance examination of an existing or future road or intersection by an independent and multi-disciplinary team.

SAFETY BENEFIT:

**10-60%**

Reduction in total crashes

Source: Road Safety Audits: An Evaluation of RSA Programs and Projects, FHWA-SA-12-037; and FHWA Road Safety Audit Guidelines, FHWA-SA-06-06.

While most transportation agencies have established traditional safety review procedures, a road safety audit (RSA) is unique. RSAs are performed by a multi-disciplinary team independent of the project. RSAs consider all road users, account for human factors and road user capabilities, are documented in a formal report, and require a formal response from the road owner. (See the eight steps for conducting an RSA below.)

RSAs provide the following benefits:

- Reduced number and severity of crashes due to safer designs.
- Reduced costs resulting from early identification and mitigation of safety issues before projects are built.
- Improved awareness of safe design practices.
- Increased opportunities to integrate multimodal safety strategies and proven safety countermeasures.
- Expanded ability to consider human factors in all facets of design.

RSAs can be performed in any phase of project development, from planning through construction. RSAs can also be conducted on any size project, from minor intersection and roadway retrofits to large-scale construction projects. Agencies are encouraged to conduct an RSA at the earliest stage possible, as all roadway design options and alternatives are being explored.



Multi-disciplinary team performs field review during an RSA.

Source: FHWA

### CONDUCTING AN RSA



→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

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## PROVEN SAFETY COUNTERMEASURES



### Reduced Left-Turn Conflict Intersections



Example of MUT intersection.

Source: FHWA

#### SAFETY BENEFITS:

RCUT

**54%**

Reduction in injury and fatal crashes<sup>1</sup>

MUT

**30%**

Reduction in intersection-related injury crash rate<sup>2</sup>

Reduced left-turn conflict intersections are geometric designs that alter how left-turn movements occur in order to simplify decisions and minimize the potential for related crashes. Two highly effective designs that rely on U-turns to complete certain left-turn movements are known as the restricted crossing U-turn (RCUT) and the median U-turn (MUT).



Example of RCUT intersection.

Source: FHWA

#### Restricted Crossing U-turn (RCUT) Median U-turn (MUT)

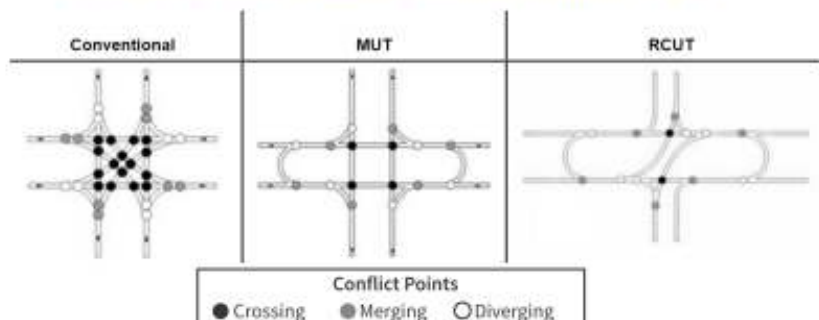
The RCUT intersection modifies the direct left-turn and through movements from cross-street approaches. Minor road traffic makes a right turn followed by a U-turn at a designated location – either signalized or unsignalized – to continue in the desired direction.

The RCUT is suitable for a variety of circumstances, including along rural, high-speed, four-lane, divided highways or signalized routes. It also can be used as an alternative to signalization or constructing an interchange. RCUTs work well when consistently used along a corridor, but also can be used effectively at individual intersections.

The MUT intersection modifies direct left turns from the major approaches. Vehicles proceed through the main intersection, make a U-turn a short distance downstream, followed by a right turn at the main intersection. The U-turns can also be used for modifying the cross-street left turns.

The MUT is an excellent choice for heavily traveled intersections with moderate left-turn volumes. When implemented at multiple intersections along a corridor, the efficient two-phase signal operation of the MUT can reduce delay, improve travel times, and create more crossing opportunities for pedestrians and bicyclists.

#### MUT and RCUT Can Reduce Conflict Points by 50%



Source: FHWA

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

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## PROVEN SAFETY COUNTERMEASURES



### Roundabouts

#### TWO-WAY STOP-CONTROLLED INTERSECTION TO A ROUNDABOUT



**82%**

Reduction in severe crashes

#### SIGNALIZED INTERSECTION TO A ROUNDABOUT



**78%**

Reduction in severe crashes

Source: Highway Safety Manual

The modern roundabout is a type of circular intersection configuration that safely and efficiently moves traffic through an intersection. Roundabouts feature channelized approaches and a center island that results in lower speeds and fewer conflict points. At roundabouts, entering traffic yields to vehicles already circulating, leading to improved operational performance.

Roundabouts provide substantial safety and operational benefits compared to other intersection types, most notably a reduction in severe crashes.

Roundabouts can be implemented in both urban and rural areas under a wide range of traffic conditions. They can replace signals, two-way stop controls, and all-way stop controls. Roundabouts are an effective option for managing speed and transitioning traffic from high-speed to low-speed environments, such as freeway interchange ramp terminals, and rural intersections along high-speed roads.



Example of a single-lane roundabout.

Source: FHWA



Example of a multi-lane roundabout.

Source: FHWA

FHWA encourages agencies to consider roundabouts during new construction and reconstruction projects as well as for existing intersections that have been identified as needing safety or operational improvements.

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

FHWA-SA-17-055

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## PROVEN SAFETY COUNTERMEASURES



**SafetyEdge<sub>SM</sub>**



Example of SafetyEdge<sub>SM</sub> after backfill material settles or erodes.

Source: FHWA

SAFETY BENEFIT:

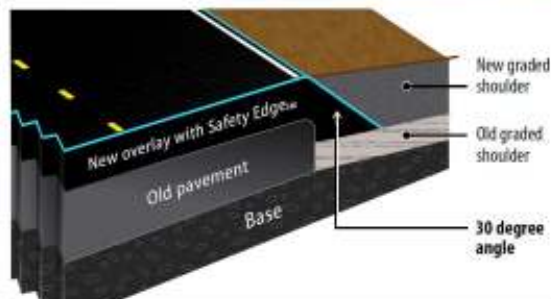
**11 %**

Reduction in fatal and injury crashes



Source: Safety Effects of the SafetyEdge<sub>SM</sub>, FHWA-SA-17-044.

SafetyEdge<sub>SM</sub> technology shapes the edge of the pavement at approximately 30 degrees from the pavement cross slope during the paving process. This systemic safety treatment eliminates the vertical drop-off at the pavement edge, allowing drifting vehicles to return to the pavement safely. It has minimal effect on asphalt pavement project cost with the potential to improve pavement life.



Cross-section view of an overlay with SafetyEdge<sub>SM</sub>.

Source: FHWA-SA-17-044

Vehicles may leave the roadway for various reasons, ranging from distracted driver errors to low visibility, or to the presence of an animal on the road. Exposed vertical pavement edges can cause vehicles to be unstable and prevent their safe return to the roadway. SafetyEdge<sub>SM</sub> gives drivers the opportunity to return to the roadway while maintaining control of their vehicles.

For both SafetyEdge<sub>SM</sub> and traditional edge, agencies should bring the adjacent shoulder or slope flush with the top of the pavement. Since over time the edge may become exposed due to settling, erosion, and tire wear, the gentle slope provided by SafetyEdge<sub>SM</sub> is preferred versus the traditional vertical pavement edge.

Transportation agencies should develop standards for implementing SafetyEdge<sub>SM</sub> on all new asphalt paving and resurfacing projects where curbs are not present, while encouraging standard application for concrete pavements.

SafetyEdge<sub>SM</sub> adds nominal cost to repaving a road.

Rural road crashes involving edge drop-offs are

Calculated benefit-cost ratios typically range between

**500-1400**



**2 to 4 times**

more likely to include a fatality than other crashes on similar roads.

Source: Safety Effects of the SafetyEdge<sub>SM</sub>, FHWA-SA-17-044.

Source: S.L. Hallmark, et al., Safety Impacts of Pavement Edge Drop-offs, (Washington, DC: AAA Foundation for Traffic Safety: 2006), p.93.

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.


FHWA-SA-17-062



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## PROVEN SAFETY COUNTERMEASURES



**Left and Right Turn Lanes at Two-Way Stop-Controlled Intersections**

SAFETY BENEFITS:

**LEFT-TURN LANES**


**28-48%**

Reduction in total crashes

**RIGHT-TURN LANES**


**14-26%**

Reduction in total crashes



Source: Highway Safety Manual


Auxiliary turn lanes—either for left turns or right turns—provide physical separation between turning traffic that is slowing or stopped and adjacent through traffic at approaches to intersections. Turn lanes can be designed to provide for deceleration prior to a turn, as well as for storage of vehicles that are stopped and waiting for the opportunity to complete a turn.



Source: FHWA

While turn lanes provide measurable safety and operational benefits at many types of intersections, they are particularly helpful at two-way stop-controlled intersections. Crashes occurring at these intersections are often related to turning maneuvers. Since the major route traffic is free flowing and typically travels at higher speeds, crashes that do occur are often severe. The main crash types include collisions of vehicles turning left across opposing through traffic and rear-end collisions of vehicles turning left or right with other vehicles following closely behind. Turn lanes reduce the potential for these types of crashes.


Installing left-turn lanes and/or right-turn lanes should be considered for the major road approaches for improving safety at both three- and four-leg intersections with two-way stop control on the minor road, where significant turning volumes exist, or where there is a history of turn-related crashes. Pedestrian and bicyclist safety and convenience should also be considered when adding turn lanes at an intersection.



Source: FHWA

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit <https://safety.fhwa.dot.gov/provencountermeasures>.

FHWA-SA-17-053



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