

# Enhancing Collision Data Analysis and Road Safety Audits Using GIS

Terry Holman
Transportation Program Manager
The Chickasaw Nation Roads Program

#### Discussion Topics

- GIS in transportation
- Data analysis
- Safety audits
- Prioritization
- Resources



#### GIS in Transportation

- Asset management
- Transportation planning
- Project development
- Construction management
- Traffic management
- Safety planning



#### Safety Planning - Data Analysis

- Traffic load analysis
- Collision mapping
- Behavioral trends
- Demand projection
- Environmental impacts



#### Collision Data Analysis

- 1. Acquire collision data
- 2. Limit data to specific routes
- 3. Analyze data based on pre-determined criteria (injuries, roadway departures, etc.)
- 4. Isolate routes
- 5. Perform on-site safety audits
- 6. Assign safety priority based on audit findings
- 7. Add priority list to long-range and safety plans



#### Collision Data

- 1. Data source (SAFE-T)
- 2. Area of impact (13 counties)
- 3. Timeframe (2010 2017)
- 4. Collision filters (all collisions)
- 5. Data fields
- 6. Shapefiles

SAFE-T (oksafe-t.org)

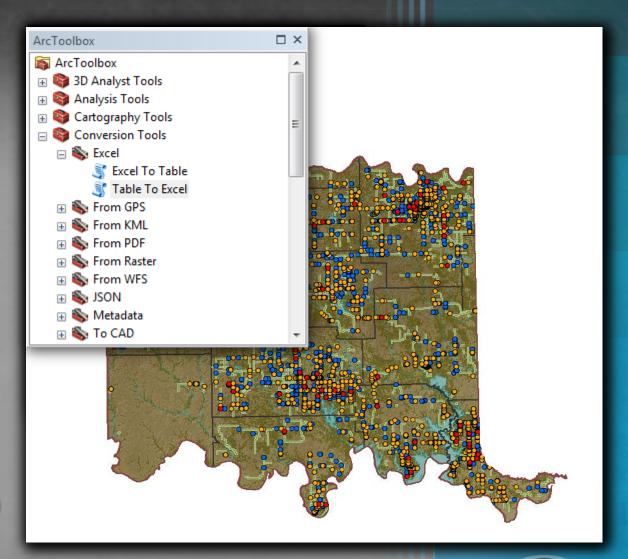
Oklahoma Department of Transportation

☑ Select All in Section					
☑ County #	☑ City #	✓ Control #		✓ Int ID #	
✓ Milepoint	☑ Hwy Name	✓ Hwy Class		✓ Special Feature 1	
✓ Special Feature 2	✓ Int. Rel.	<b>✓</b> #Vis. Injure	ed	<b>✓</b> # Killed	
☑ Type of Collision (Derived)	✓ Severity	<b>☑</b> Date		✓ Latitude (Derived)	
☑ Longitude (Derived)					
Select All in Section					
☐ Reporting Agency	☐# Vehicles	# Commerc	cial Vehicles	☐ First Harmful Event	
☐ Collision Time	Collision Troop	☐ Work Zone	:	Railroad Crossing	
☐Alcohol Involved	☐ Drugs Involved	☐ Unit Count	:	☐ Person Count	
☐ Street 1	☐ Street 2	☐ Collision II	D	☐ Intersection Design	
□Quadrant	☐ Diagram Collision Code				
	Environment Fi	elds [			
Primary Vehicle Fields					
	Vehicle/Person S	Sums			
	Derived Field	ls [			
	Unit Fields (All)				
	Persons Fields (All)				
	Highway Inventory Fields				
	Additional Highway Inv	entory Fields			



#### Collision Data

- 1. Import collision data
- 2. Add inventory layer
- 3. Limit collisions (intersect)
- 4. Collision and route layers
- 5. Convert data table to Excel spreadsheet for in-depth collision analysis (optional)





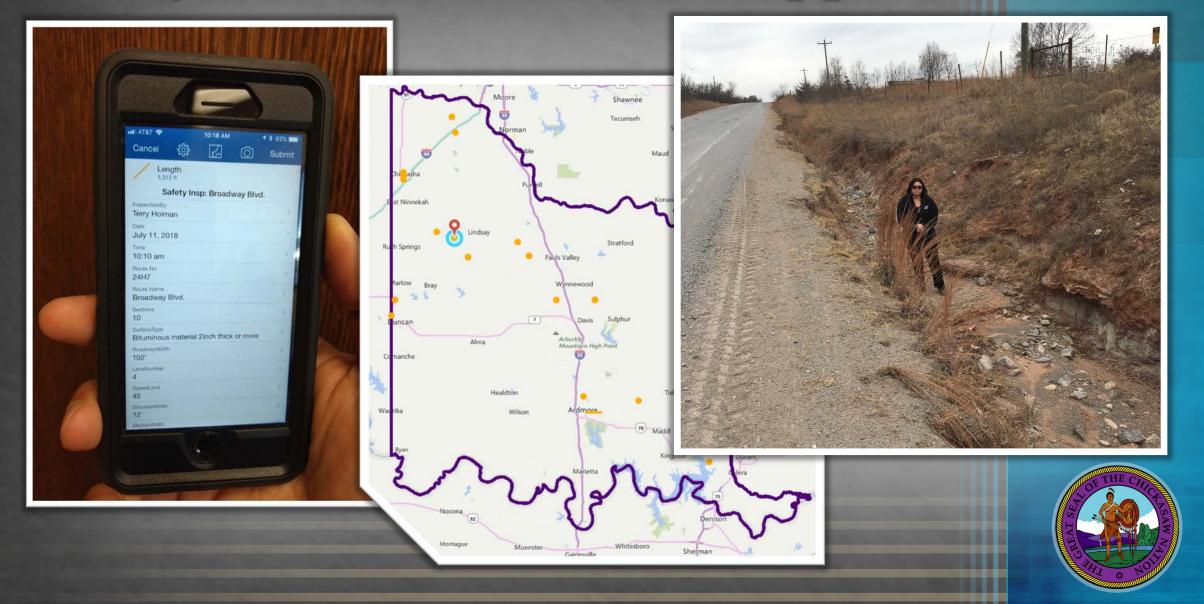
# Safety Audits

9	na Spickasaw Sation	ROADS PROGRAM  TRIBAL TRANSPORTATION FACILITY ON-SITE SAFETY INSPECTION CHECKLIST			
SPECTION BY:		DATE	TIME		
DUTE NO. RO	DUTE NAME		SECTION(S)		
IRFACE TYPE	ROADWAY WIDTH	NO. LANES	SPEED LIMIT		
IOULDER WIDTH M	EDIAN WIDTH CURB DESIGN	CURB WIDTH	CURB HEIGHT		
I I	CONDUCTOR		CONDITION		
	FEATURE CONDITION	REPAIR REQUIREME	NTS & STA		
	ent	rate	Major SZ Recommended New/Reconstruct See Notes		
	N/A Poor Fair Good	None Minor Moderate	Major Recomme New/Reco		
ROADWAY					
Roadway Width					
Alignment					
Surface Quality					
Curb / Gutter					
Striping					
BRIDGE					
Bridge Width					
Deck					
Structure					
Surface Quality		一一一一			
Approach					
SITE CONDITION					
Drainage					
Grade / Slope		HHH	H HHH		
Sight Distance		HHH	H HHH		
on Distance		-			

SAFETY FEATURES Guardrails		
Lighting		
Shoulder		
Signage		
Signalization		
PEDESTRIAN SAFETY		
ADA Features (Ramps, Etc.)		
Crosswalks		
Sidewalks		
Signage		
Signalization		
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### Safety Audits – Collector App



## Safety Audits - Prioritization

			Safety Improvement Priority List				
		Priority Number	Route Number	Section	Route Name	Priority Score	
TO THE COURT	the	1	3342	30	Reck Road	8.36	
4	lliChusu Vation	2	3414	830	Duncan Bypass / Elk Road	5.32	
	vation	3	2743, 2446	10, 20	Homer Francis Rd / Lazy Acres / State Hwy 1	3.07	
PECTION BY: Willey Williams		4	21A3	840	Wallace Williams (CR 1520)	2.13	
UTE NO. RO	UTE NAME	5	2383	40	N CR 3000	1.63	
PIA3 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Wallace Williams (CR 1520 ROADWAY	6	2344	10	Old Antioch Road	1.50	
Situminous < 2" DULDER WIDTH ME	DIAN WIDTH CL	7	3210	30	Sunshine Road	1.37	
N/A	N/A	8	2334	60	Katie East (CR 1680)	1.17	
SAFETY PRIORITY	FEATURE C	9	3808	30	Leavenworth Trail / Scissor Tail Road	1.08	
0 - None 10 - Highest <b>2.1</b>		10	3616	40	Eastman Road	1.04	
	0 - N/A 4 - Poor	11	3320	10	Mt. Washington Road	0.99	,
ROADWAY Roadway Width		12	2178	810	9th Street & Choctaw Ave.	0.05	
Alignment	X	13	3340	10	Tribble Road	0.66	
Surface Quality		14	2176	856		0.66	_
Curb / Gutter	$\square$ $\square$ $\square$	15	3809		W Iowa Ave / 9th Street		
Striping BRIDGE	X			20	Streetman Road	0.64	
Bridge Width	$\square$	16	3313	30	Springdale Road	0.55	
Deck	$\mathbf{x} \square \mathbf{c}$	17	3157	40	Earl Road	0.55	
Structure	$X \square \square$	18	2176	850	Missouri Ave / 9th Street	0.55	
Surface Quality  Approach		19	3801	30	Silo Road	0.43	
SITE CONDITION		20	3414	850	Duncan Bypass / Gatlin Road	0.40	
Drainage		21	2347	20	Maysville Loop	0.33	
Grade / Slope		22	2198	810	Chitwood Expressway (CR 2920)	0.16	
Sight Distance Vegetation	X	23	3343	40	Cheek Road	1.03	
0-1011011		24	2145	810	CR 2970 / CR 1250	0.53	
		25	2137	810	Tecumseh Road / State Highway 4	0.00	
		26	2178	830	9th Street / Illinois Ave	0.00	
		27	2175	830	9th Street / W Grand Ave	0.00	
	The same of	28	3808	50	Leavenworth Trail	0.00	



#### Resources – GIS Data

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USDA Geospatial Data Gateway
(datagateway.nrcs.usda.gov)
U.S. Census Bureau
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(www.census.gov/geo/maps-data)

NHTSA ~ Fatality Analysis Reporting System

FARS Encyclopedia ~ (www-fars.nhtsa.dot.gov)

OK Geographic Information Council

(okmaps.onenet.net/digital\_data.htm)

Oklahoma Department of Transportation

Open Data Portal ~ (gis-okdot.opendata.arcgis.com)

SAFE-T (oksafe-t.org) ~ Matt Warren (mwarren@odot.org)



### Resources - Safety Audits

National Transportation Safety Board

(www.ntsb.gov)

**Tribal Transportation Safety** 

(www.tribalsafety.org)



# Thank You! Questions/Comments?

