



Navajo Nation



Presented by:

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**2018 Strategic Highway
Safety Plan**

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- Who is Responsible for Highway Safety?
 - What is a Strategic Highway Safety Plan?
 - Initial Crash Data Review
 - State Emphasis Areas: Arizona, Utah, New Mexico
 - High Crash Areas within Navajo Nation
 - Conclusion & Next Steps



Who is Responsible for Highway Safety?




All of us...!




4E's of Highway Safety

- **ENGINEERING** – What can be done *physically* to make the road safer?
- **EDUCATION** – What can be *taught* to encourage good driving behavior?
- **ENFORCEMENT** – What laws can *enforce* poor driving behavior?
- **EMERGENCY MEDICAL SERVICES** – What can be done to *improve* emergency response times and connections to hospitals?



NDOT's Department of Highway Safety

- Crash Data Compilation.
 - Safety Programs.
 - Coordination with other Agencies.
 - Coordination with internal Divisions/Departments.
 - Seek funding for Safety Improvements.
- 



What is a Strategic Highway Safety Plan?

- ❑ Provides an Understanding of Highway Safety Within a Defined Area.
- ❑ Evaluates Existing Trends and Processes.
- ❑ Facilitates a way for Practitioners to Become Informed and Involved.
- ❑ Defines a Vision/Goals/Objectives to Improve Highway Safety.
- ❑ Identifies Opportunities for Highway Safety Improvement.
- ❑ Outlines Strategies to Address Opportunities.
- ❑ Defines Roles and Responsibilities to Address Strategies.

Crash Data

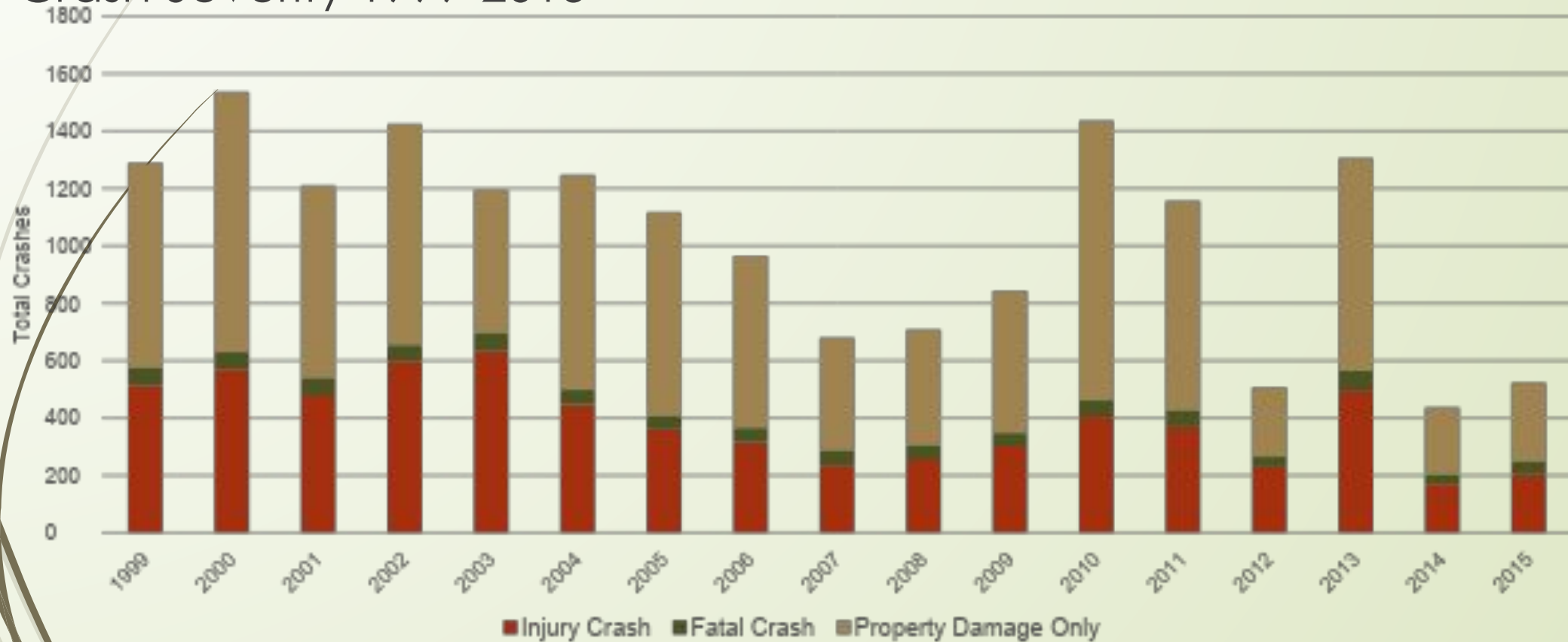


1999-2015

- **17,583** Recorded Crashes within Navajo Nation
- **7,480 (43%)** are Fatal and Serious Injury Crashes
- Of the Fatal and Serious Injury Crashes:
 - **43% (3,185)** are within 7 areas; and
 - **57% (4,295)** are located outside those areas.

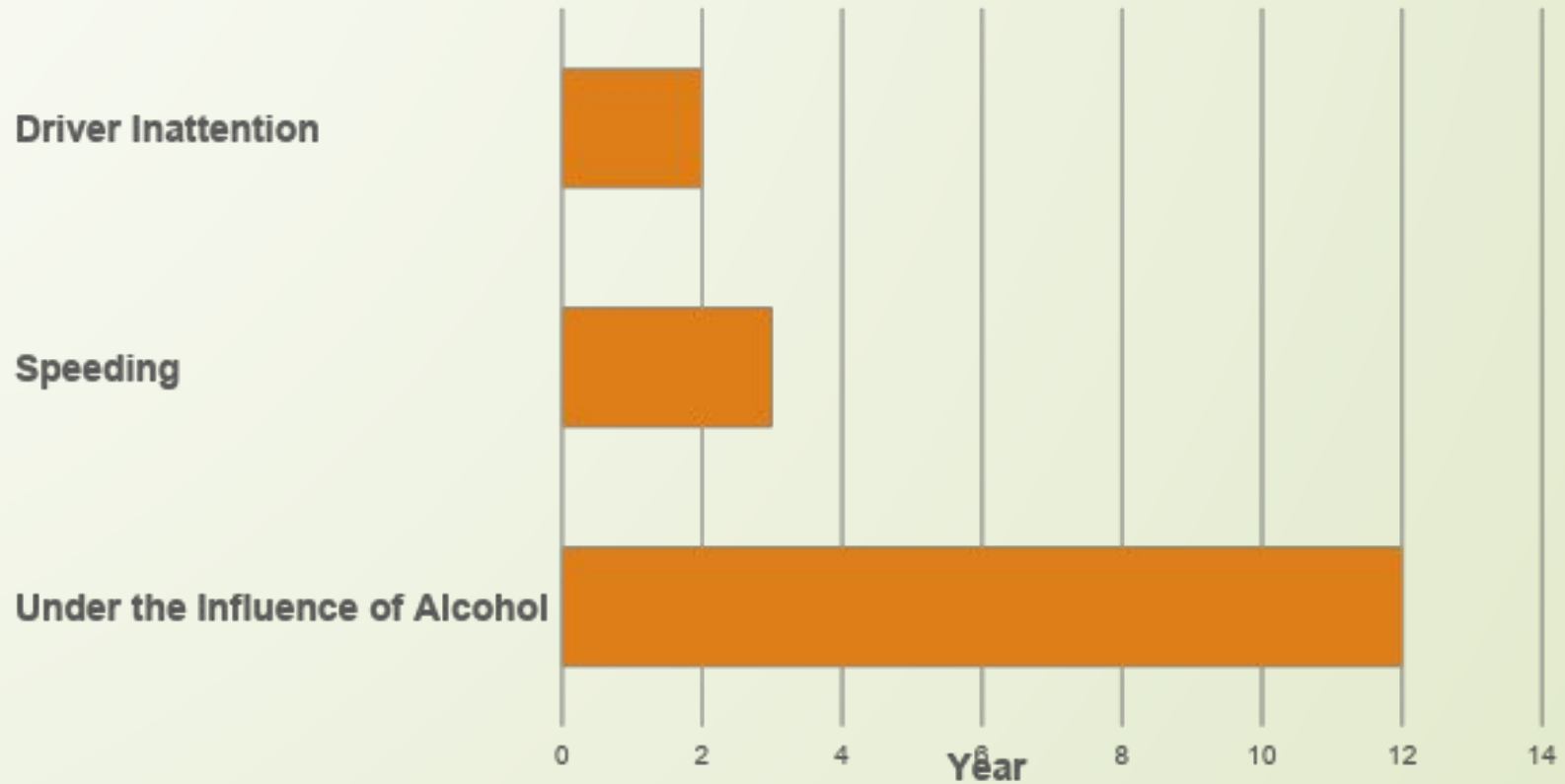
Crash Data

Crash Severity 1999-2015



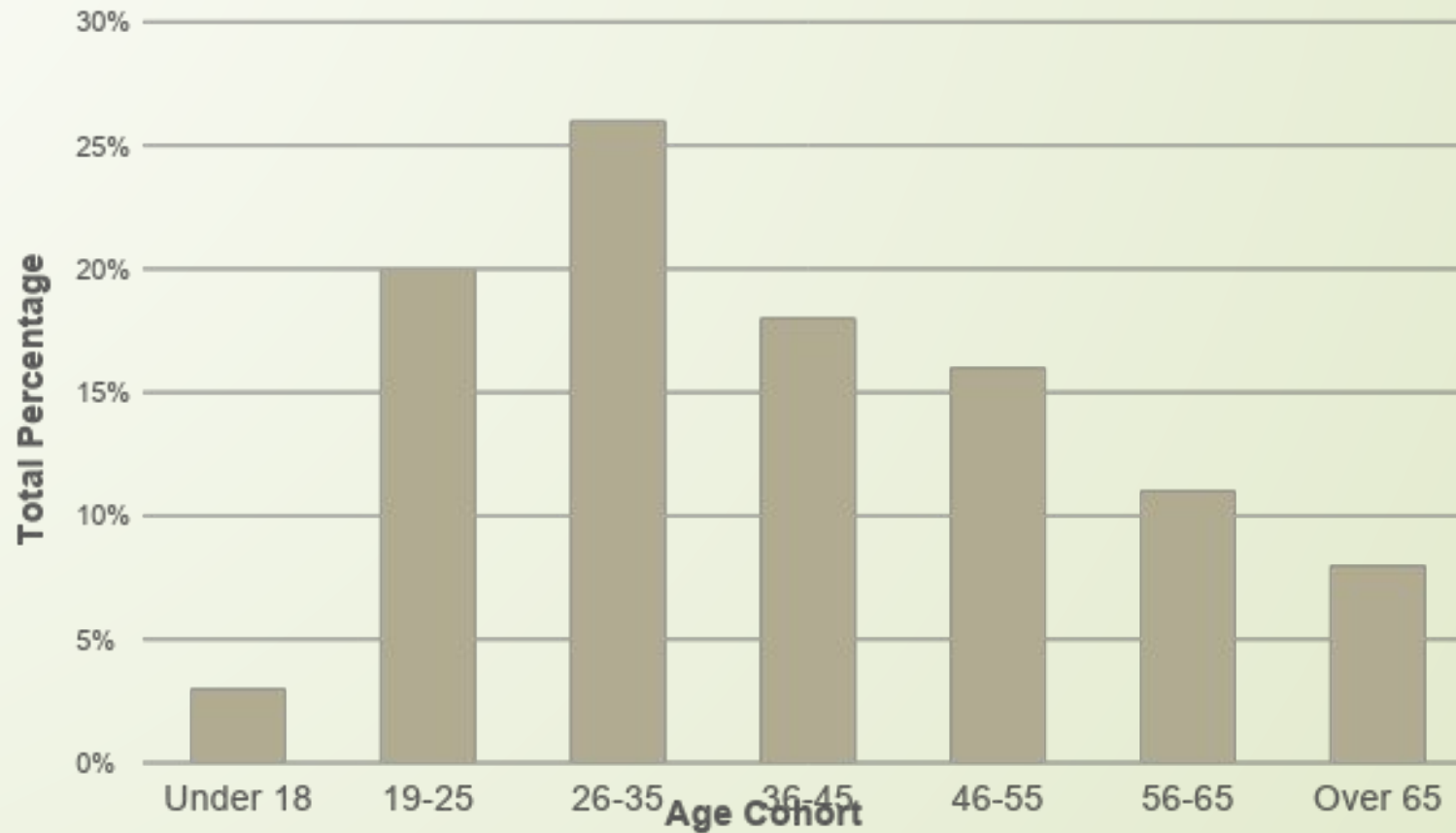
Crash Data – over 17 years...

Most Common Crash Cause Factor by Number of Years



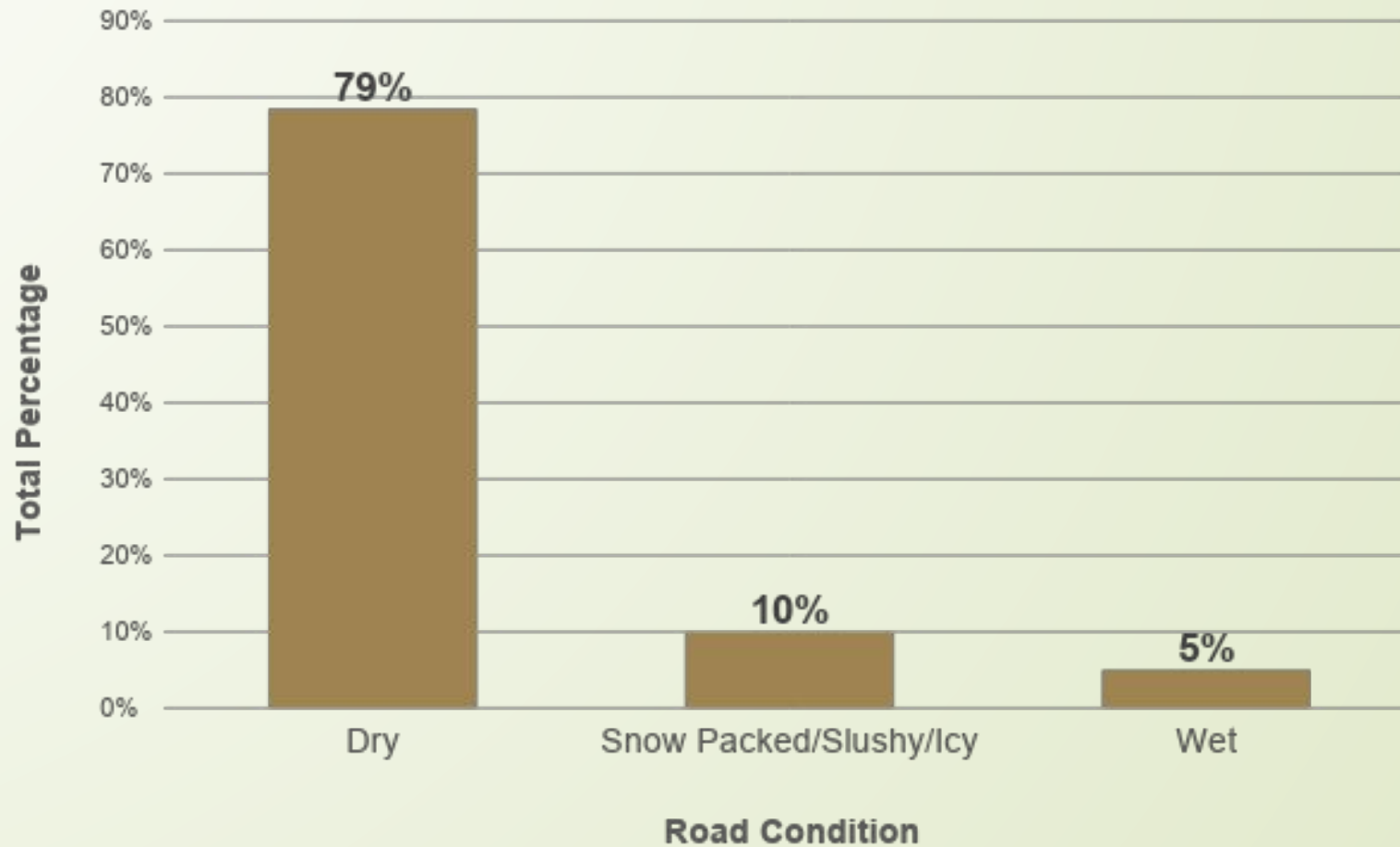
Crash Data – over 17 years...

Most Common Crash Age by Age Cohort



Crash Data – over 17 years...

Top 3 Crash Road Condition



Crashes

The Economic Cost

The economy is significantly impacted by the total cost of motor vehicle injuries. The 2015 estimated national average cost per incident:

- Fatality = \$1,542,240
- Incapacitating Injury = \$90,270
- Non-Incapacitating Injury = \$26,112
- Possible Injury = \$21,420
- Property Damage Only = \$11,526

From 1999-2015, the total estimated economic cost of crashes in Navajo Nation was **\$1,537,421,008!**



Arizona **\$921,325,068**

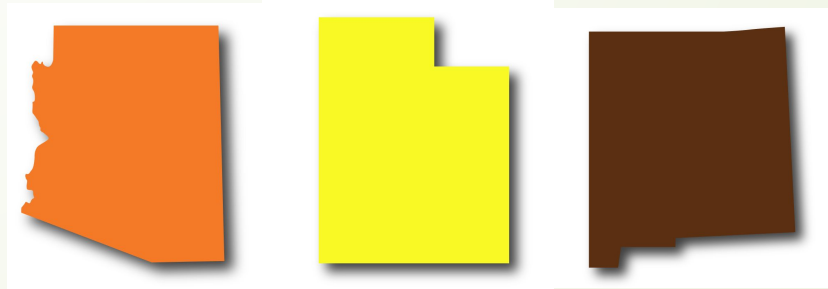


New Mexico **\$584,181,648**



Utah **\$31,914,292**

State Emphasis Areas

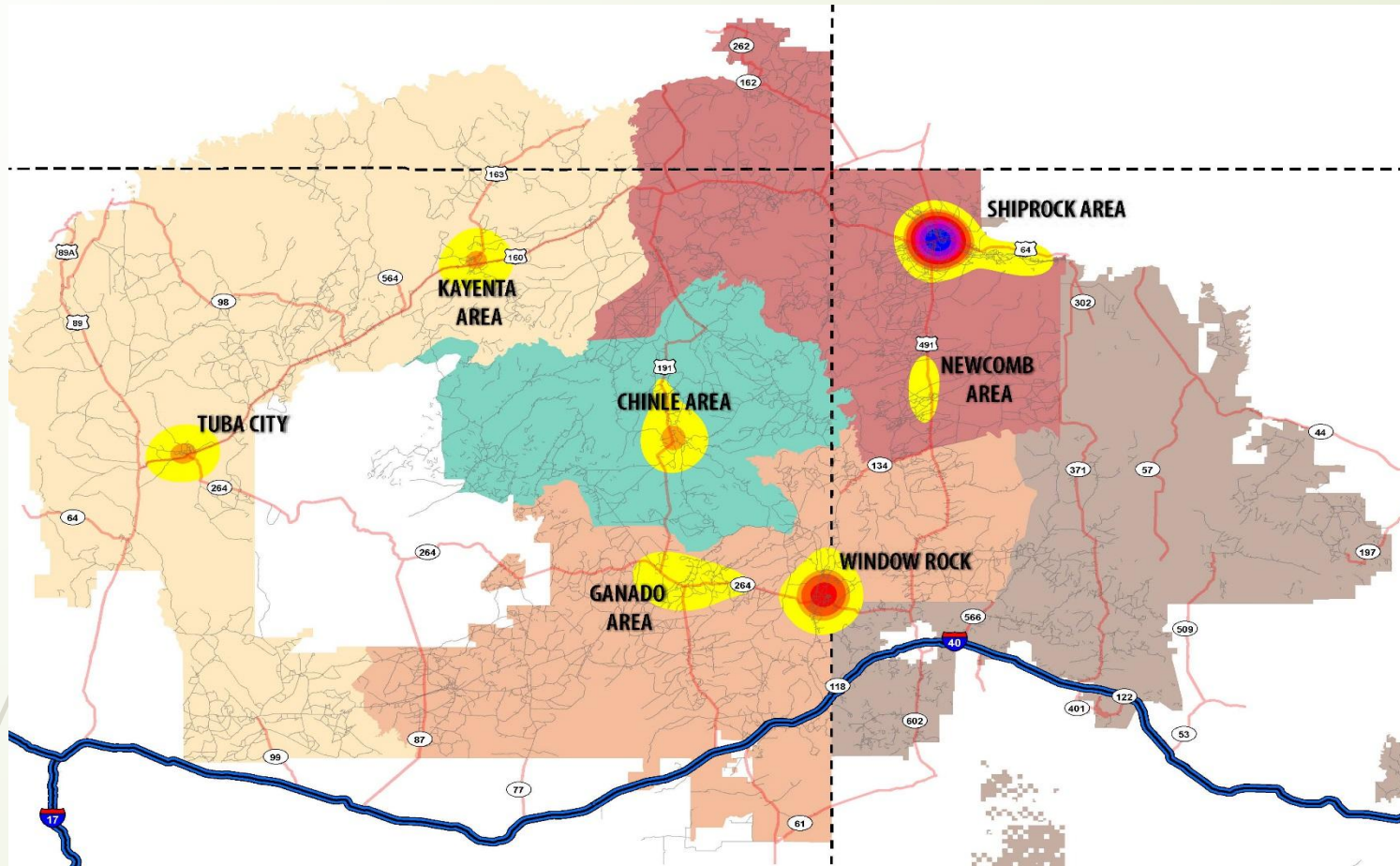


Emphasis Areas common to all Three States include:

- *Speeding/Aggressive Driving*
- *Impaired Driving*
- *Distracted Driving*
- *Occupant Protection*
- *Age Related*

Arizona, New Mexico, & Utah State Emphasis Areas			
	Arizona	New Mexico	Utah
Speeding/Aggressive Driving	X	X	X
Impaired Driving	X	X	X
Distracted Driving	X	X	X
Intersection Crashes		X	X
Motorcycles	X		X
Lane Departure Crashes		X	X
Occupant Protection (Restraints)	X	X	X
Nonmotorized Users (Bike/Pedestrian)	X		X
Public Info/Education		X	X
Age Related	X	X	X
Traffic Records/ Data Improvements	X	X	
Policy Initiatives	X		
Drowsy Driving			X
Emergency Services Response		X	
Infrastructure and Operations	X		
Native Americans		X	
Heavy Vehicles/Transit	X		
Natural Risks	X		
Special Users		X	
Traffic Incident Management	X		
Interjurisdictional	X		

**Navajo Nation
Crash Data Analysis
Injury and Fatal Crashes Only
(1999-2015)**



Agency

- Chinle
- Eastern
- Fort Defiance
- Northern
- Western

- BIA/Tribal Route
- Interstate
- US/State Highway

Kernel Density Analysis of Fatal and Injury Crashes

Value

- High : 7
- Low : 1

Navajo Nation Highest Crash Areas

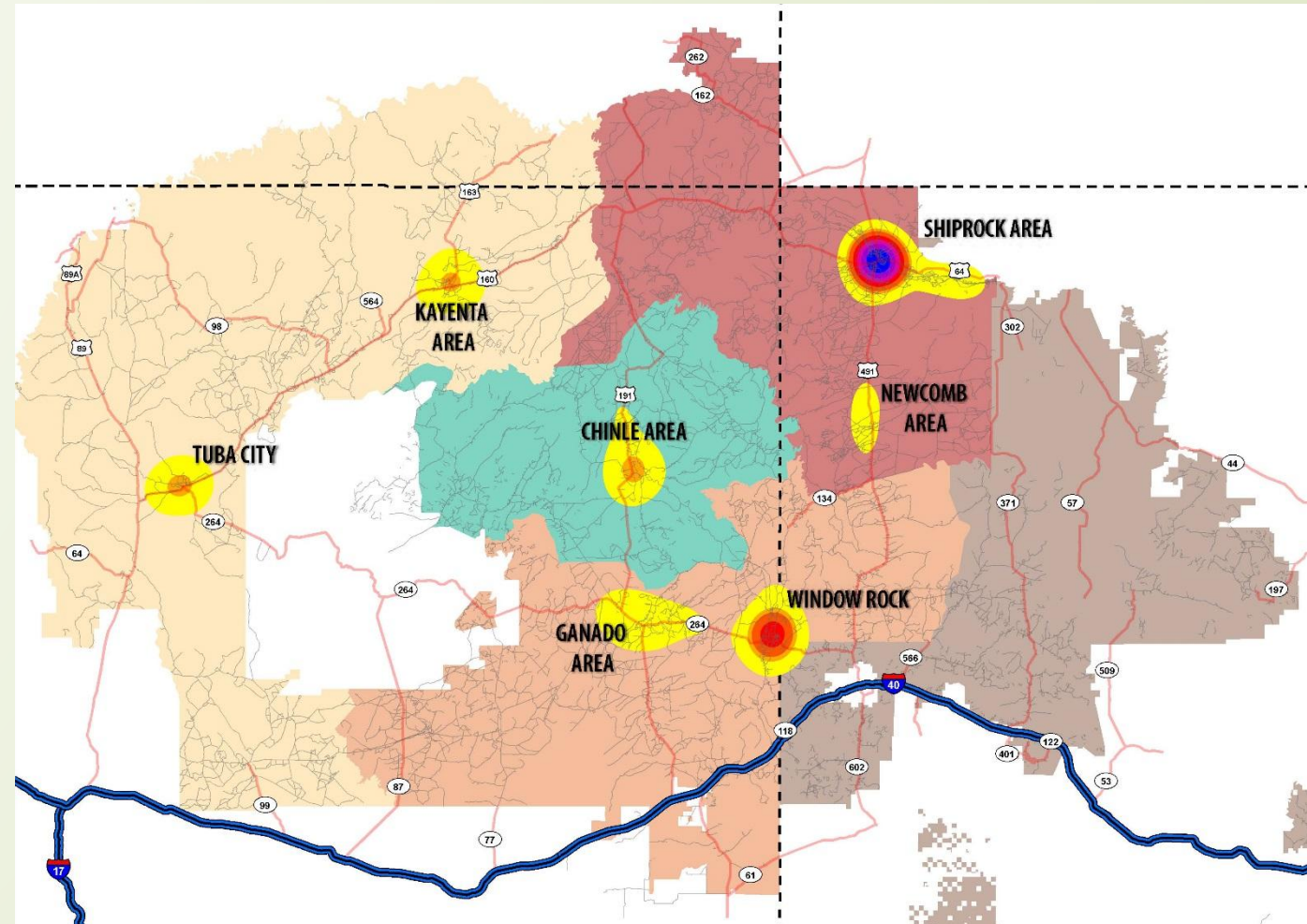
1. Shiprock Area
2. Window Rock
3. Tuba City
4. Kayenta Area
5. Chinle Area
6. Ganado Area
7. Newcomb Area

High Crash Areas

The 7 highest crash areas comprise:

- **41%** of all Fatal/Injury Crashes
- **52%** of all Pedestrian Involved Crashes
- **60%** of all Intersection Related Crashes

But only make up 4.1% of road mileage.



Shiprock Area

9% of all Fatal/Injury
Crashes

Highest Crash Factors:

- Under the Influence of Alcohol
- Driver Inattention
- Failed to Yield to ROW

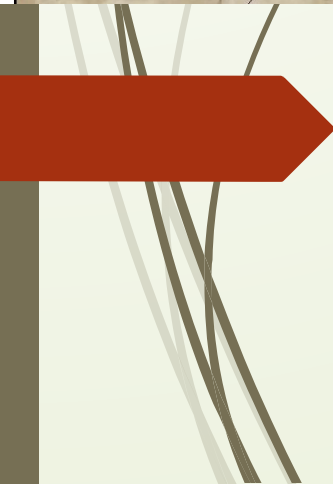
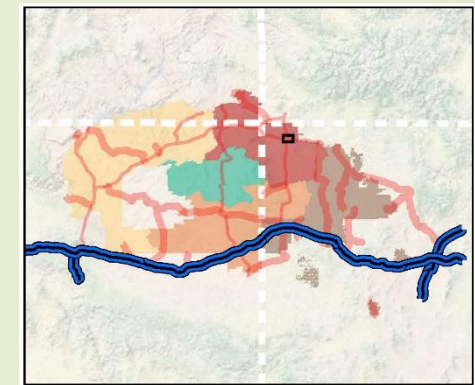
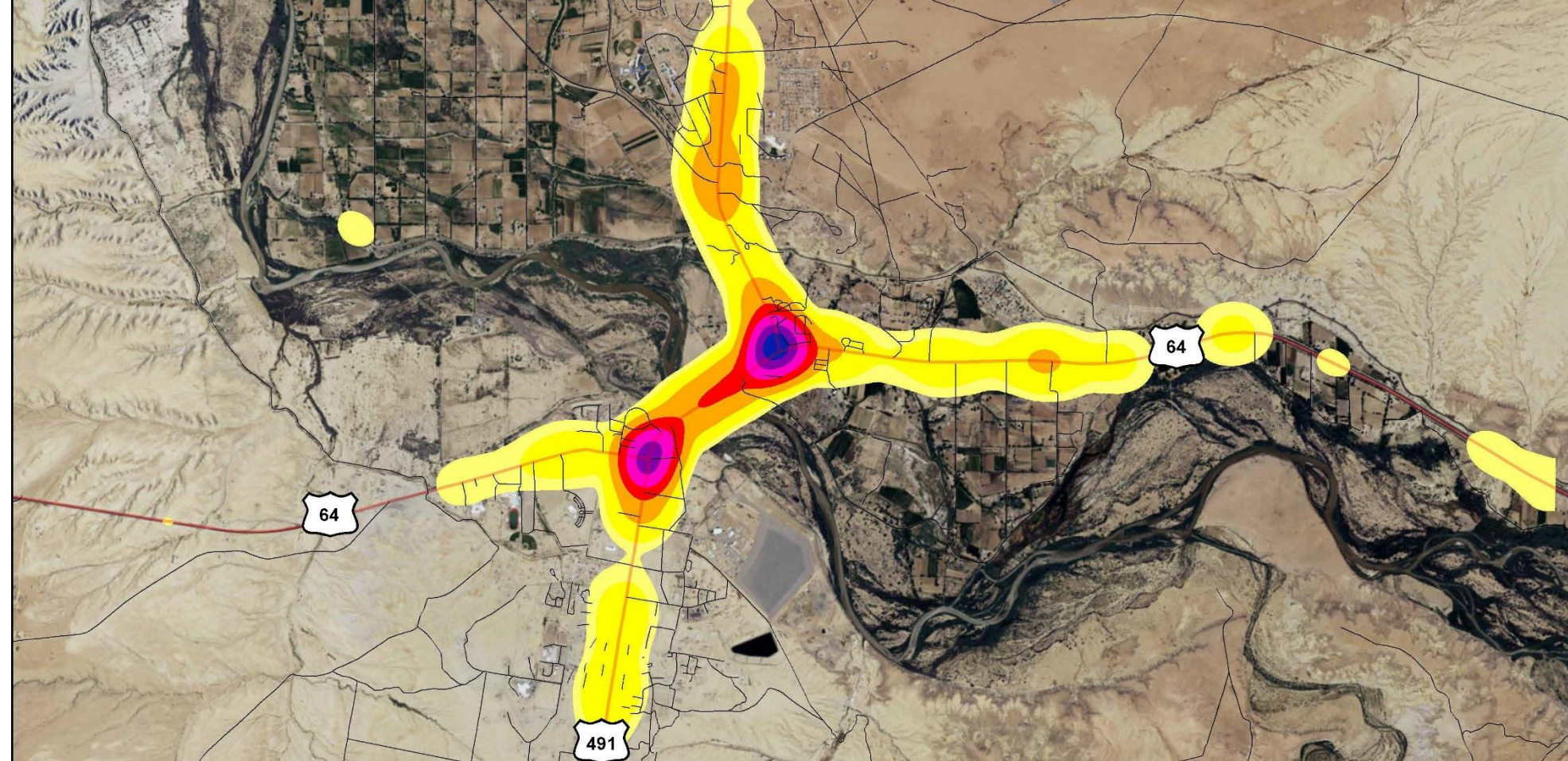
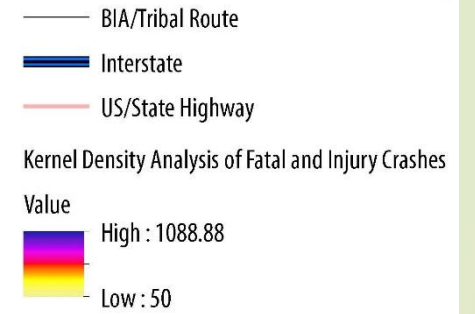
648 Severe Crashes:

- 93% Crashes with Injuries
- 7% Crashes with Fatalities

Common Collision Types:

- Rear Ended
- Other Vehicle
- Sideswipe

Navajo Nation Crash Data Analysis (Injury and Fatal Crashes Only) (1999-2015)



Shiprock Area

Fatal/Injury Crash Density

Window Rock Area

9% of all Fatal/Injury
Crashes

Highest Crash Factors:

- Under the Influence of Alcohol
- Failed to Yield to ROW
- Driver Inattention

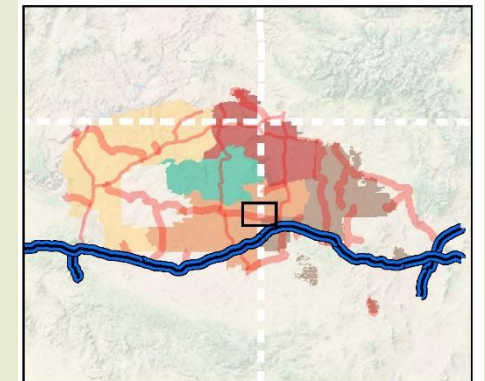
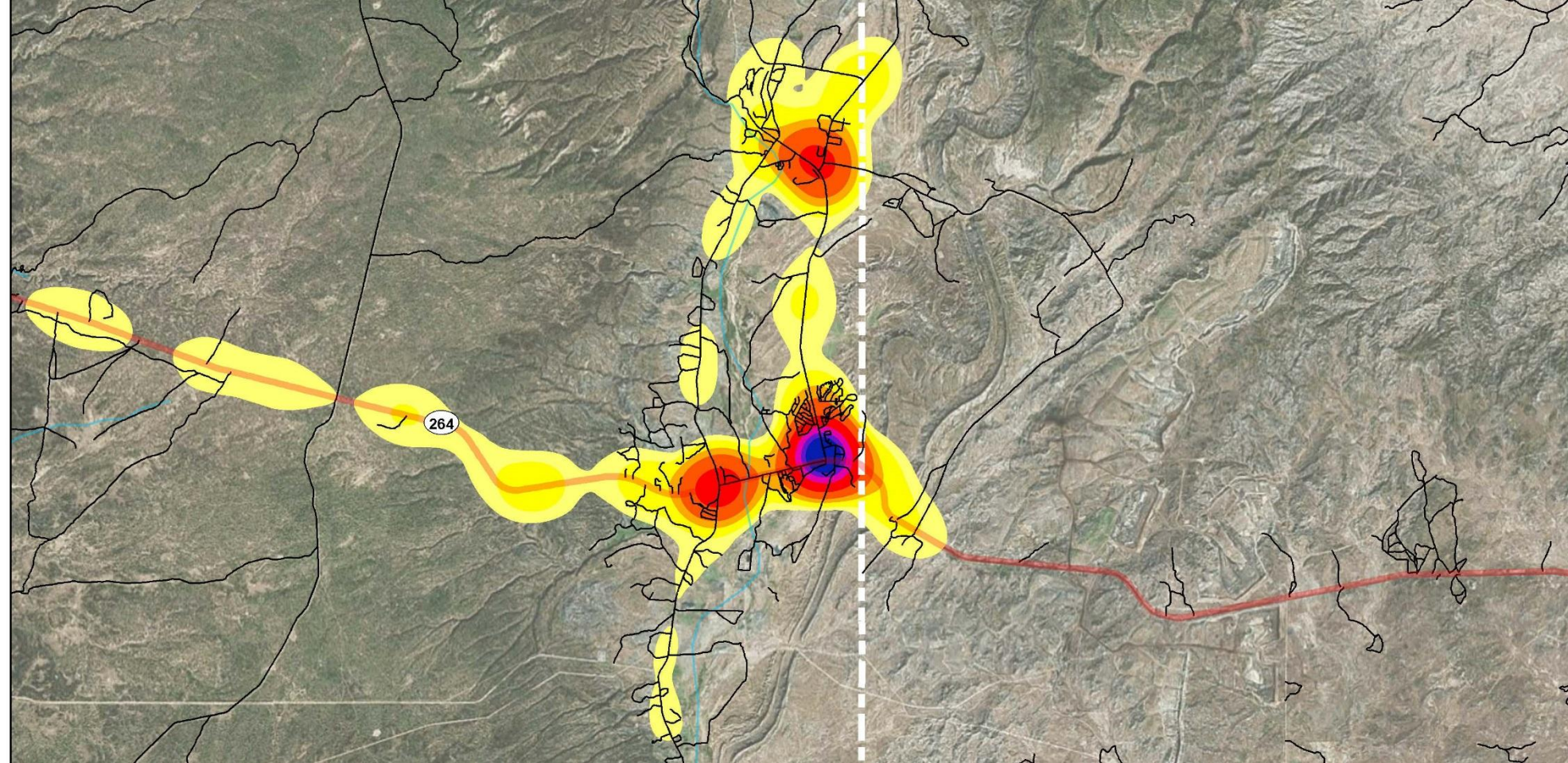
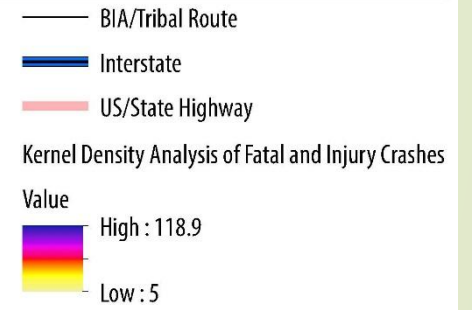
645 Severe Crashes

- 90% Crashes with Injuries
- 10% Crashes with Fatalities

Common Collision Types:

- Rear Ended
- Overturn/Rollover
- Hit Side of Vehicle
- Hit Animal

Navajo Nation Crash Data Analysis (Injury and Fatal Crashes Only) (1999-2015)



Window Rock

Fatal/Injury Crash Density



Chinle Area

6% of all Fatal/Injury
Crashes

Highest Crash Factors:

- Driver Inattention
- Under Influence of Alcohol
- Speeding

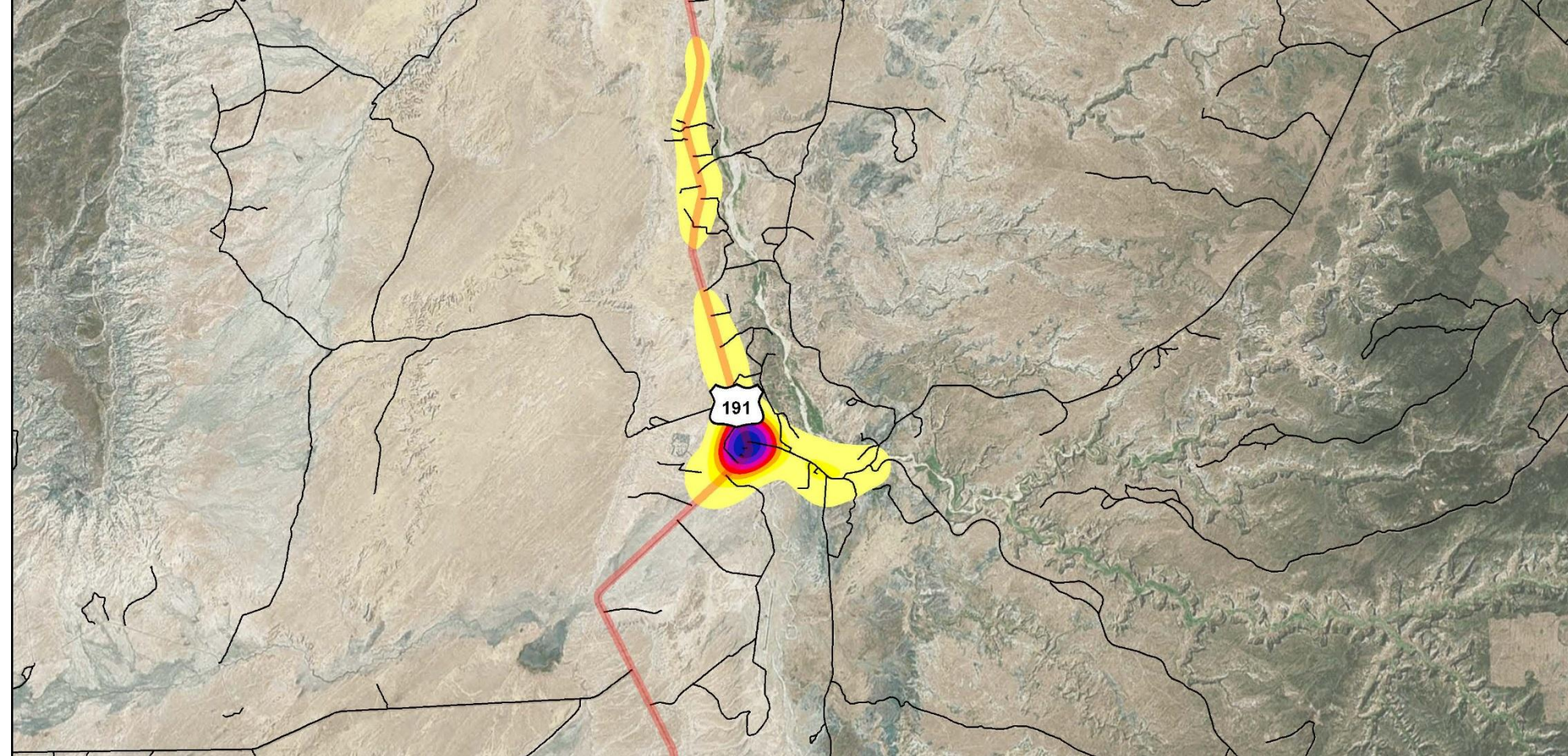
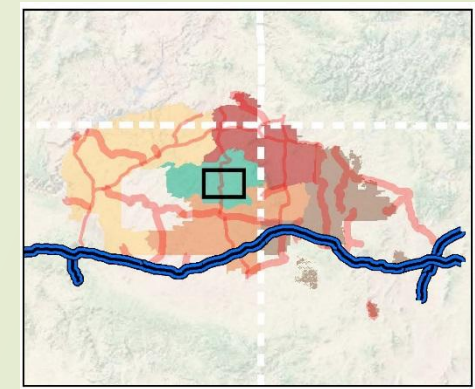
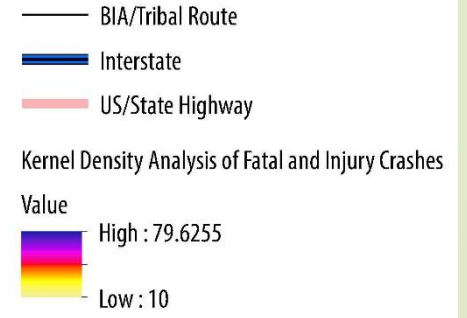
476 Severe crashes:

- 91% Crashes with Injuries
- 9% Crashes with Fatalities

Common Collision Types:

- Rear Ended
- Single Crash
- Overturn/Rollover

Navajo Nation Crash Data Analysis (Injury and Fatal Crashes Only) (1999-2015)



Chinle Area

Fatal/Injury Crash Density

Ganado Area

6% of all Fatal/Injury Crashes

Highest Crash Factors:

- Under the Influence of Alcohol
- Animal on Road
- Driver Inattention

442 Severe Crashes:

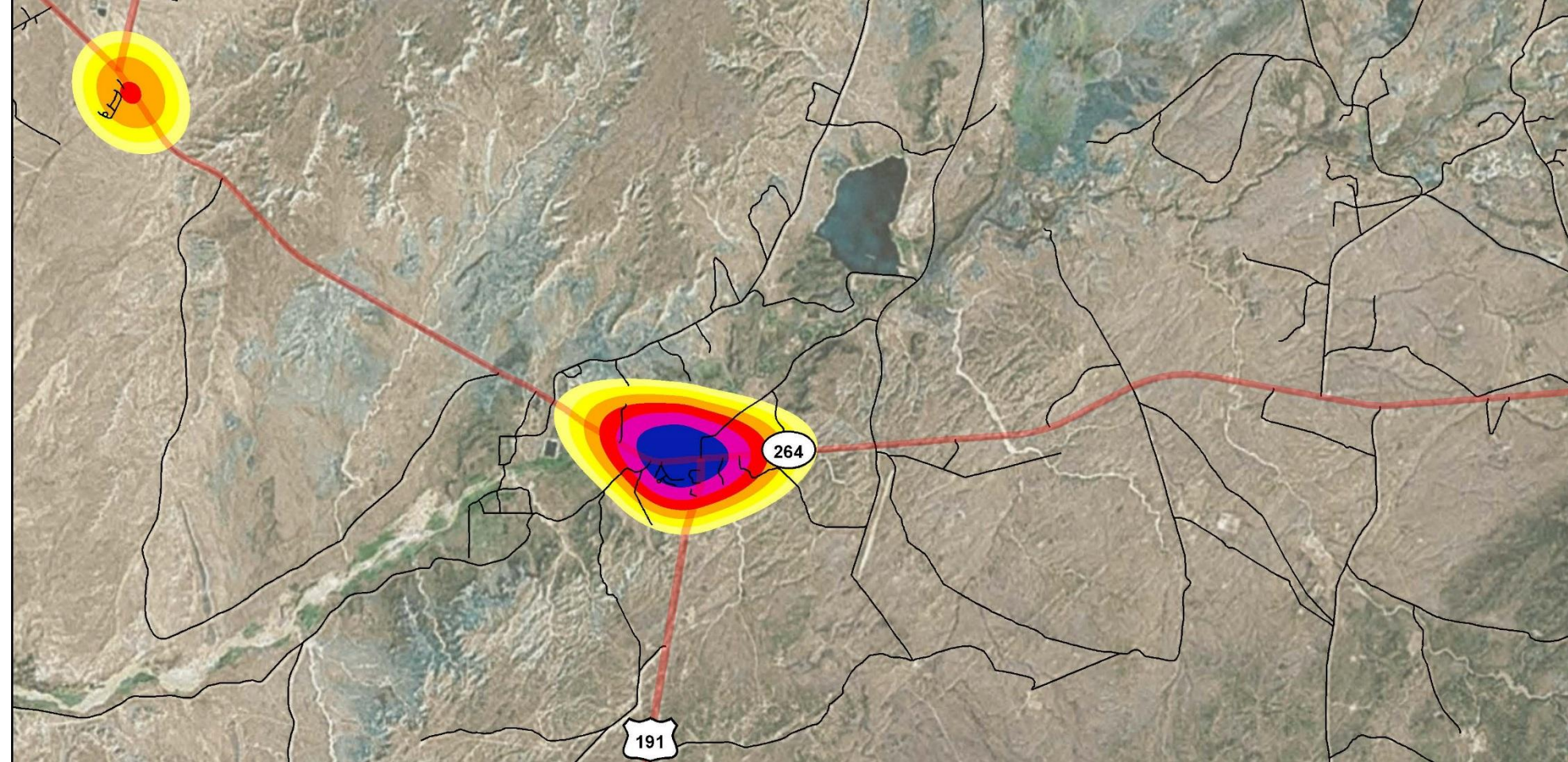
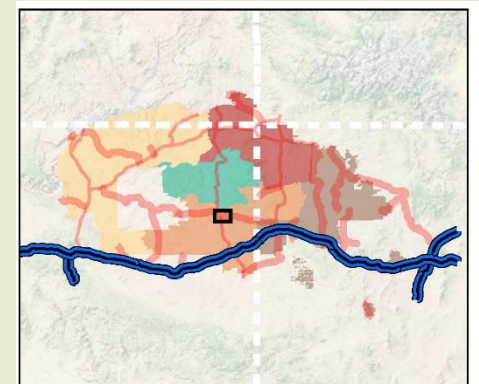
- 89% Crashes with Injuries
- 11% Crashes with Fatalities

Common Collision Types:

- Overturn/Rollover
- Hit Animal
- Rear Ended

Navajo Nation Crash Data Analysis (Injury and Fatal Crashes Only) (1999-2015)

- BIA/Tribal Route
 - Interstate
 - US/State Highway
- Kernel Density of Fatal and Injury Crashes
- Value
- High : 21.1428
 - Low : 15



Ganado Area

Fatal/Injury Crash Density

Tuba City

6% of all Fatal/Injury Crashes

Highest Crash Factors:

- Under the Influence of Alcohol
- Driver Inattention
- Speeding

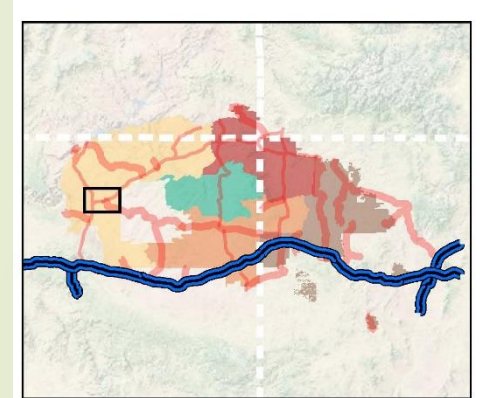
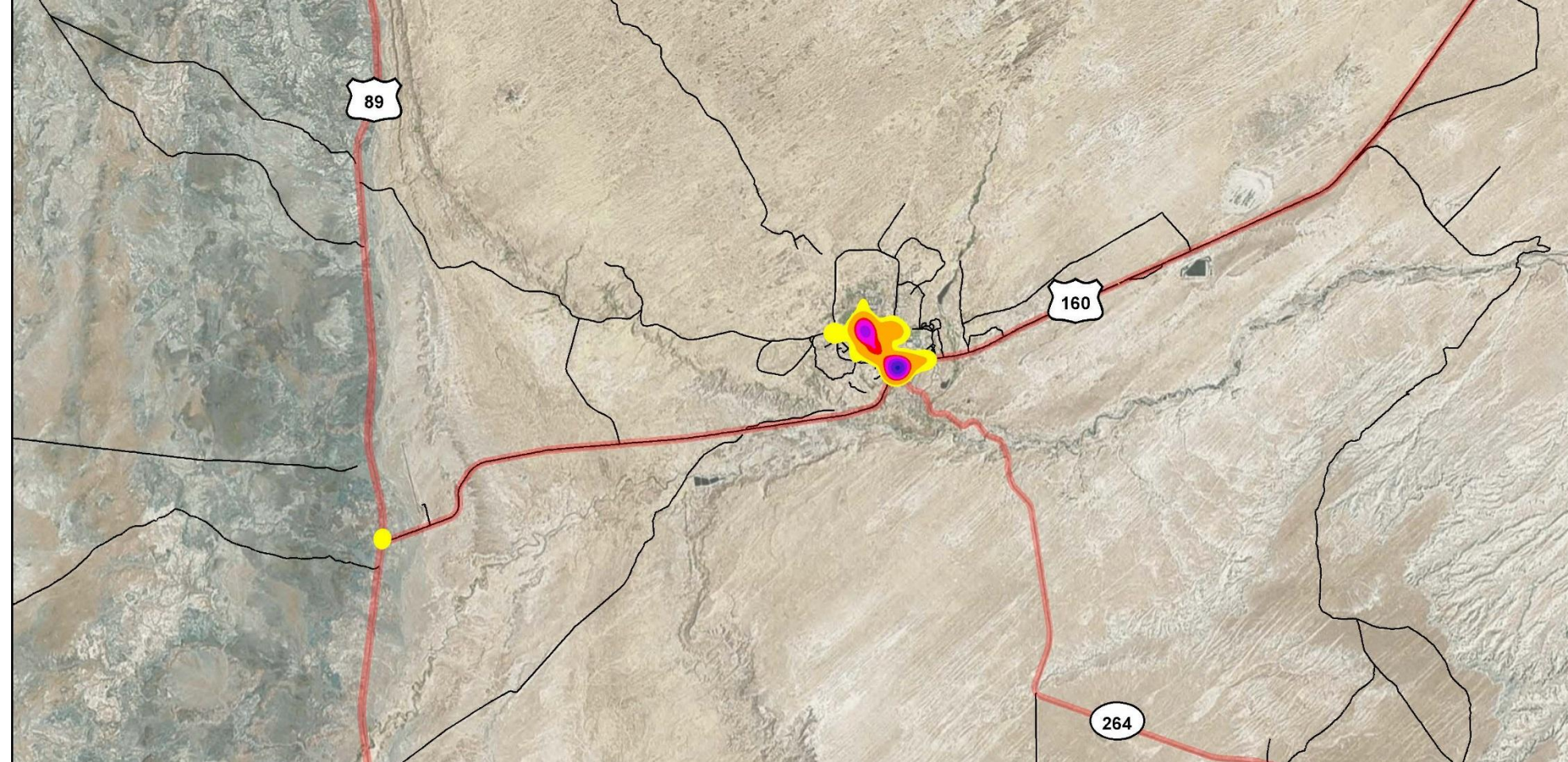
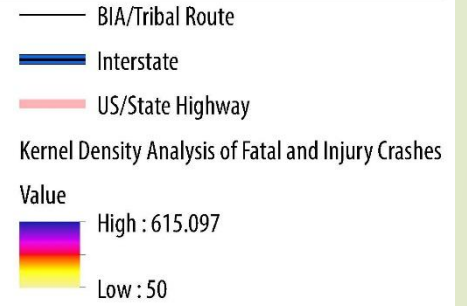
427 Severe Crashes:

- 90% Crashes with Injuries
- 10% Crashes with Fatalities

Common Collision Types:

- Overturn/Rollover
- Rear Ended
- Sideswipe

Navajo Nation Crash Data Analysis (Injury and Fatal Crashes Only) (1999-2015)



Tuba City

Fatal/Injury Crash Density

Kayenta Area

5% of all Fatal/Injury Crashes

Highest Crash Factors:

- Failed to Yield to ROW
- Under the Influence of Alcohol
- Driver Inattention

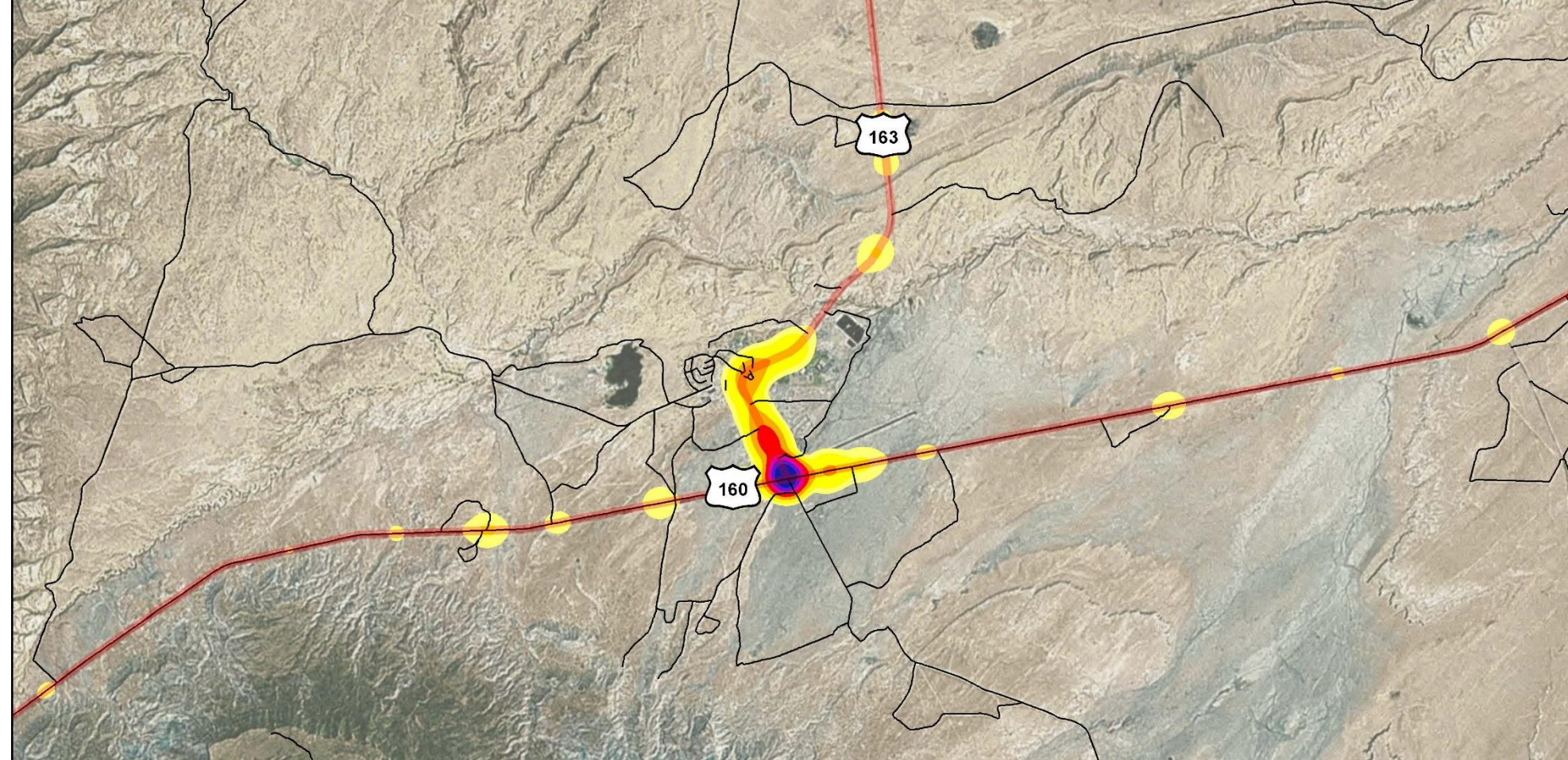
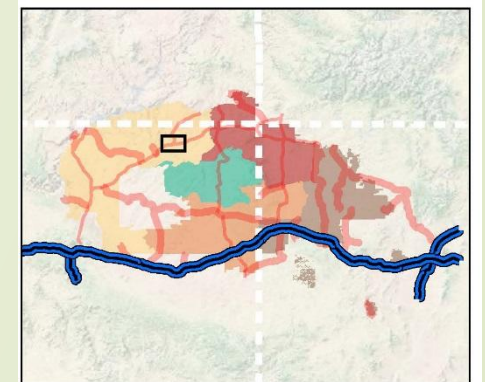
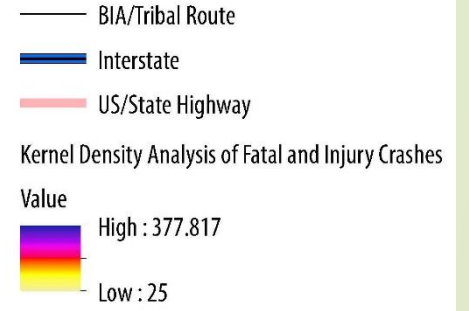
337 Severe Crashes:

- 92% Crashes with Injuries
- 8% Crashes with Fatalities

Common Collision Types:

- Single Crash/Non-Collision
- Overturn/Rollover
- Sideswipe
- Other Vehicle

Navajo Nation Crash Data Analysis (Injury and Fatal Crashes Only) (1999-2015)



Kayenta Area

Fatal/Injury Crash Density

Newcomb Area

3% of all Fatal/Injury Crashes

Highest Crash Factors:

- Under the Influence of Alcohol
- Animal on Road
- Driver Inattention

210 Severe Crashes:

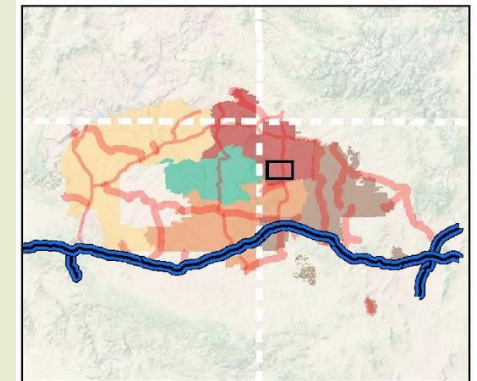
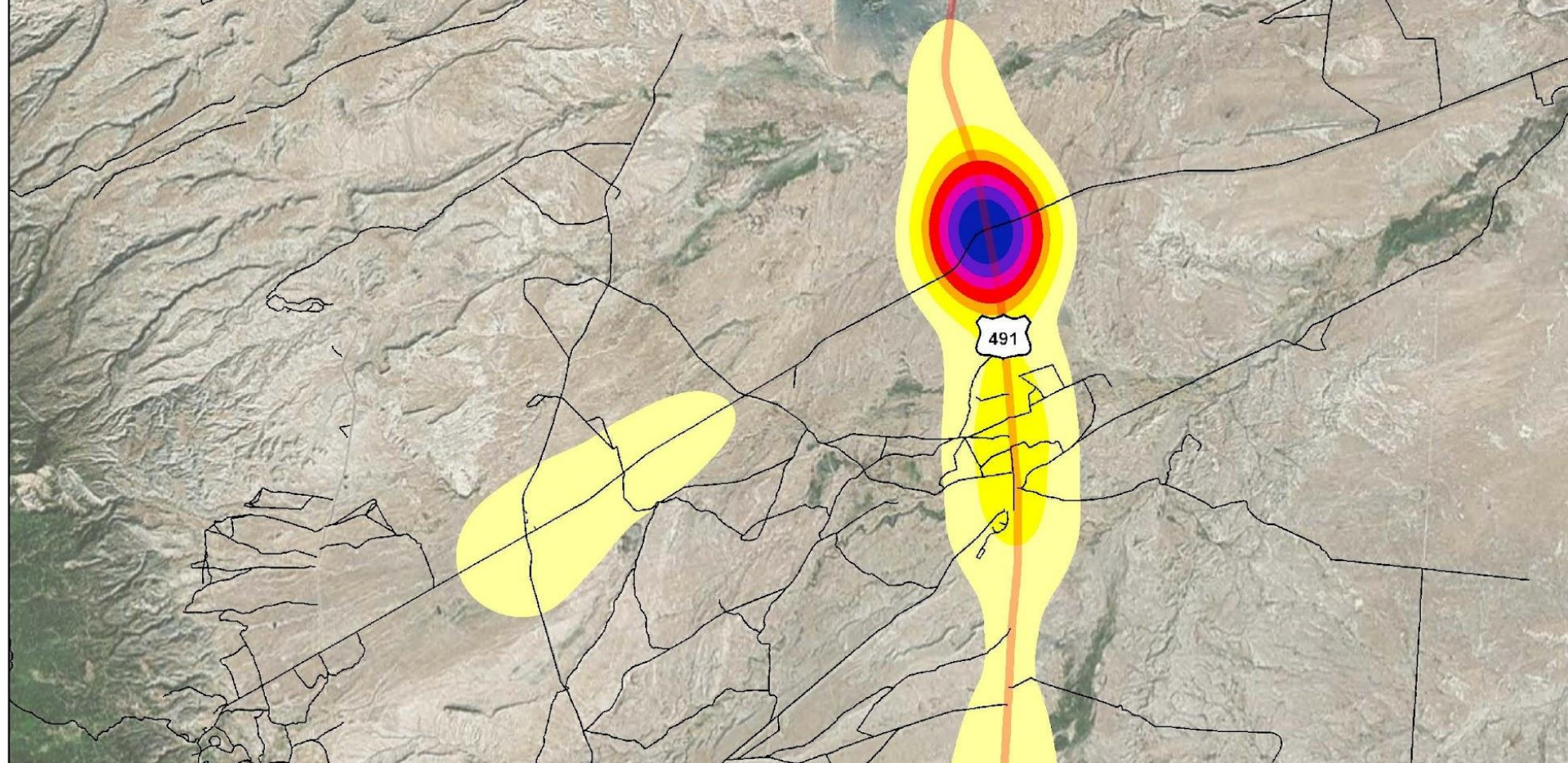
- **84%** Crashes with Injuries
- **16%** Crashes with Fatalities

Common Collision Types:

- Overturn/Rollover
- Hit Animal
- Skidded/Sliding

**Navajo Nation
Crash Data Analysis
(Injury and Fatal Crashes Only)
(1999-2015)**

- BIA/Tribal Route
 - Interstate
 - US/State Highway
- Kernel Density Analysis of Crashes
- Value
- High : 31.4046
 - Low : 5



Newcomb Area

Fatal/Injury Crash Density



Severe Crashes In these Seven Areas account for...:

63% of all **INTERSECTION** Related Crashes

70% of all **PEDESTRIAN** Involved Crashes

79% of **Behavior** Crash Types in these areas were **RIGHT-OF-WAY/YIELD** Related Crashes

37% of **Environmental** Crash Types in these areas were **WILDLIFE/ANIMAL** Involved Crashes



Common Severe Crashes In other rural Areas include...:

28% of all are **DRIVER INATTENTION** Related Crashes

20% of all are **ALCOHOL** Related Crashes

16% of all are **SPEEDING** Related Crashes

9% of all are **ANIMAL** Involved Crashes

6% of all are **ASLEEP at WHEEL** Involved Crashes



How Did We Understand the Issues...?

- Crash Data Compilation...!
 - Paper to electronic database.
 - GIS geolocating the crash.



Tracs – a great tool!

- Arizona and New Mexico use TraCS
- Navajo Nation is working with ADOT and NMDOT for TraCS.

- One database for all crashes.
- Improved quality control.
- GPS of all crash locations.