Lane Departure and Roadside Collisions

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Lane Departure and Roadside Collisions Fact Sheet

How Significant is the Issue?

On Iowa roadways, there were 5,585 severe injuries that occurred during lane departure crashes (2007 and 2011), which is 53% of all severe injuries during the five year period. This includes 3,507 severe injuries in single vehicle run-off the road crashes, 1,209 severe injuries in across centerline or across median crashes and the remaining 869 severe injuries involved multiple vehicle crashes that were not across centerline or across median. Of these 5,585 severe injuries, 3,467 involved a roadside collision.

What are the Contributing Factors?

The Driver

50% of severe injuries occurred when the driver was between the ages of 25 and 64. Approximately 70% of severe injuries occurred when the driver was male.

Age Group	Percent	Age Group	Percent
14 - 19	18%	25 – 64	50%
20 - 24	19%	≥65	13%

Light and Surface Condition

38% of severe injuries occurred during dark driving conditions. 59% occurred during daylight with the remaining 3% reported during dawn or dusk.

Severe injuries were predominantly reported on dry roads (68%). 9% occurred on wet roads while 16% occurred on a road with snow, ice, slush or frost surface conditions. The surface condition was other/unknown for the remaining 7% of severe injuries.

Road and Area Type

Severe injuries were evenly split between state and local roads, but rural roads account for 77% of the severe injuries.

Jurisdiction	Rural	Urban	Total
State	38%	12%	50%
County	38%	1%	39%
City	-	10%	10%
Other/Unknown	<1%	<1%	1%
Total	77%	23%	100%

County

The top five counties represent 22% of Iowa's severe injuries associated with lane departure crashes.

County	Percent
Polk	8%
Scott	4%
Johnson	4%
Pottawattamie	3%
Linn	3%

Roadside Collisions – Fixed Objects

Most severe injuries involved a roadside collision with a ditch/embankment (25%).

Fixed Collision	Percent
Ditch/Embankment	25%
Tree	6%
Pole	5%

Time

Most severe injuries occurred on the weekends (Fri-Sun, 50%).

Most severe injuries occurred between noon and 7:59 PM (42%) and 8 PM and 3:59 AM (30%).

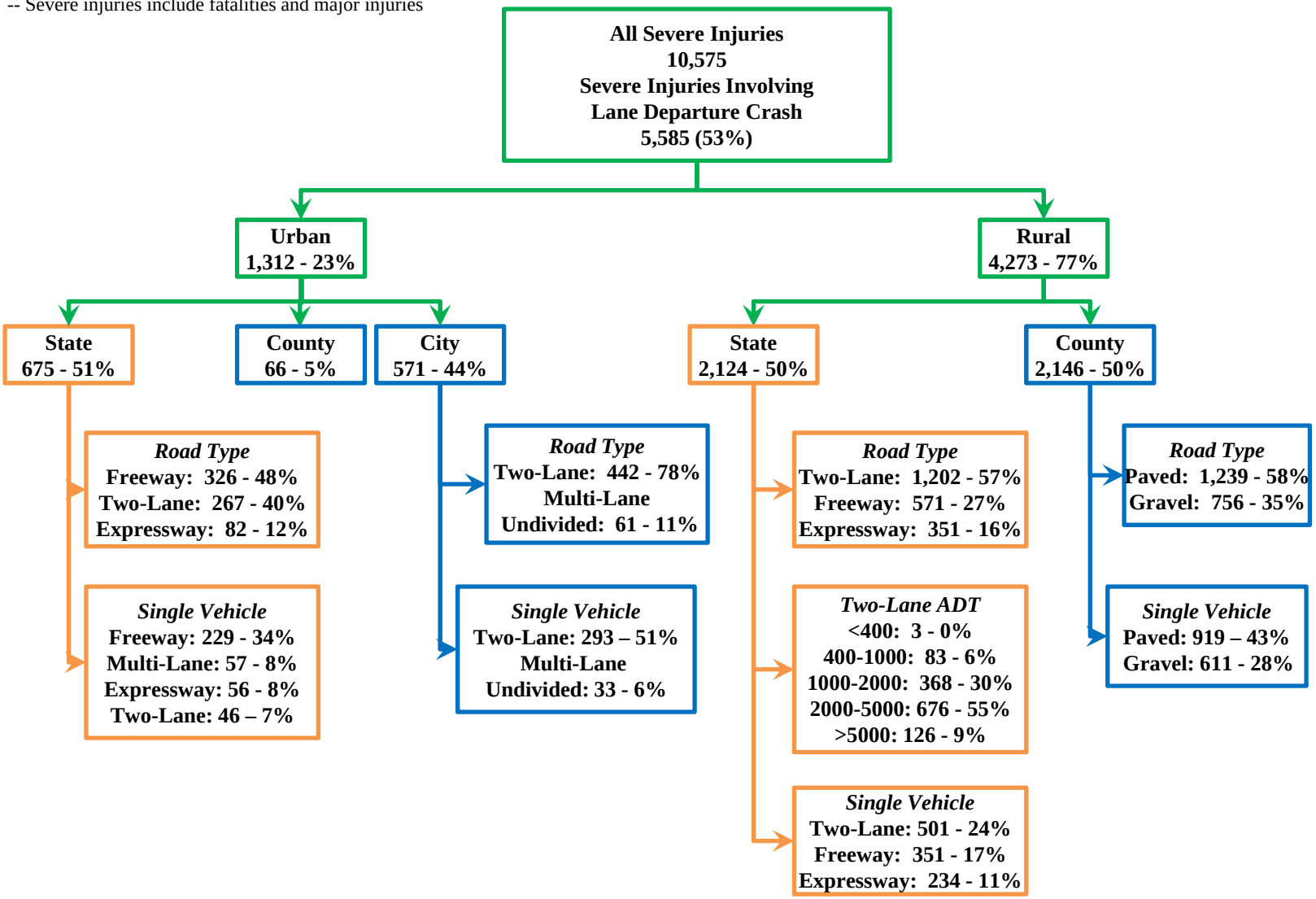
	Percent							
Time of Day	M	Tu	W	Th	F	Sa	Su	Total
Midnight to 3:59 AM	1%	1%	1%	1%	2%	4%	5%	15%
4:00 AM to 7:59 AM	2%	1%	2%	2%	2%	2%	2%	13%
8:00 AM to 11:59 AM	3%	2%	2%	2%	2%	2%	2%	15%
Noon to 3:59 PM	3%	3%	2%	3%	3%	4%	3%	21%
4:00 PM to 7:59 PM	3%	3%	2%	3%	3%	4%	3%	21%
8:00 PM to Midnight	2%	2%	2%	2%	3%	2%	2%	15%
Total	14%	12%	11%	13%	15%	18%	17%	100%

Lane Departure Crash Tree – By System

What the Crash Data Tells Us:

- Over 3/4 of lane departure injuries occur on rural roads.
- Rural lane departure severe injuries are evenly split between State and County roadways.
- 55% of rural State road lane departures severe injuries occur on 2-lane roads with an ADT of 2000-5000 vpd.
- 58% of rural County road lane departure severe injuries occur on paved roads.

Source: Iowa Crash Records System, 2007-2011
-- Severe injuries include fatalities and major injuries

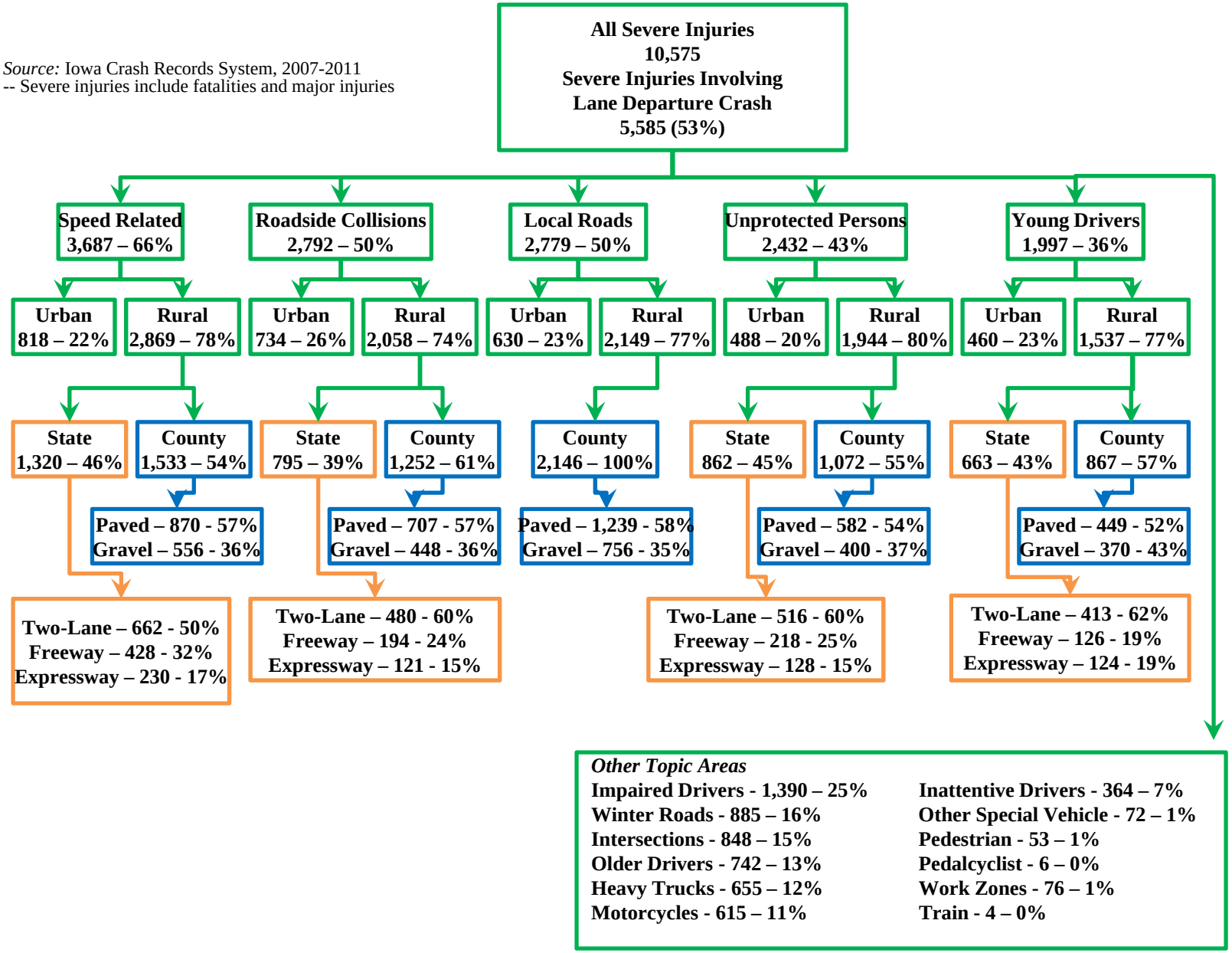


Lane Departure Crash Tree – By Topic

What the Crash Data Tells Us:

- The following areas are related to severe lane departure injuries:
  - –Speed (66%)
  - –Roadside Collision (50%)
  - –County and City Roads (50%)
  - –Unprotected Persons (43%)
  - –Younger Drivers (36%)
- For each of the areas noted above, over 75% occurred on rural roads. County roads are slightly more at risk than state routes.
- For each of the areas noted above, County paved roadways and State 2-lane roadways are most at risk.

Source: Iowa Crash Records System, 2007-2011
-- Severe injuries include fatalities and major injuries

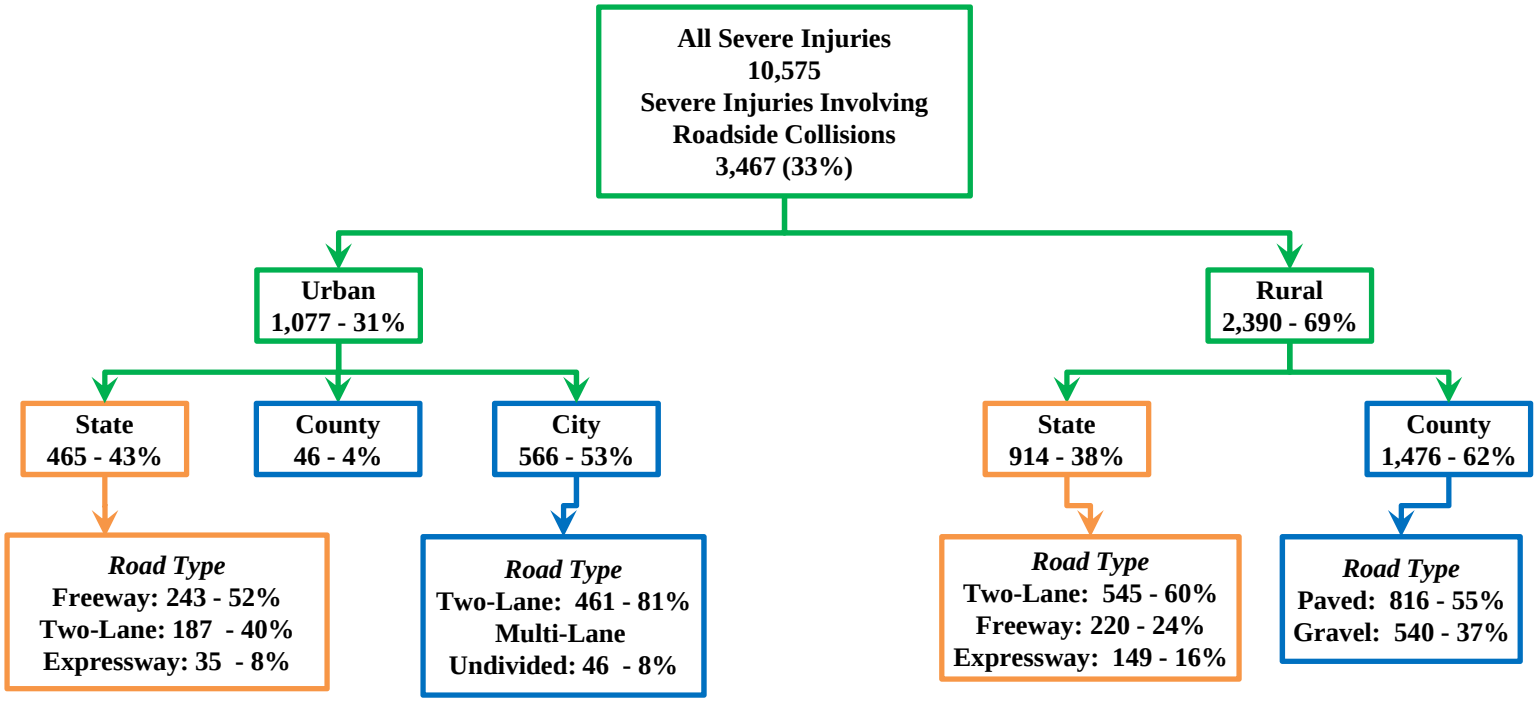


Roadside Collisions Crash Tree – By System

What the Crash Data Tells Us:

- More than 2/3 of severe roadside collision injuries occur on rural roads.
- Over 60% of rural roadside collision severe injuries occur on the county road system.
- Paved roadways on the County system are most at risk. 2-lane roadways are most at risk on the State and City system.

Source: Iowa Crash Records System, 2007-2011
-- Severe injuries include fatalities and major injuries

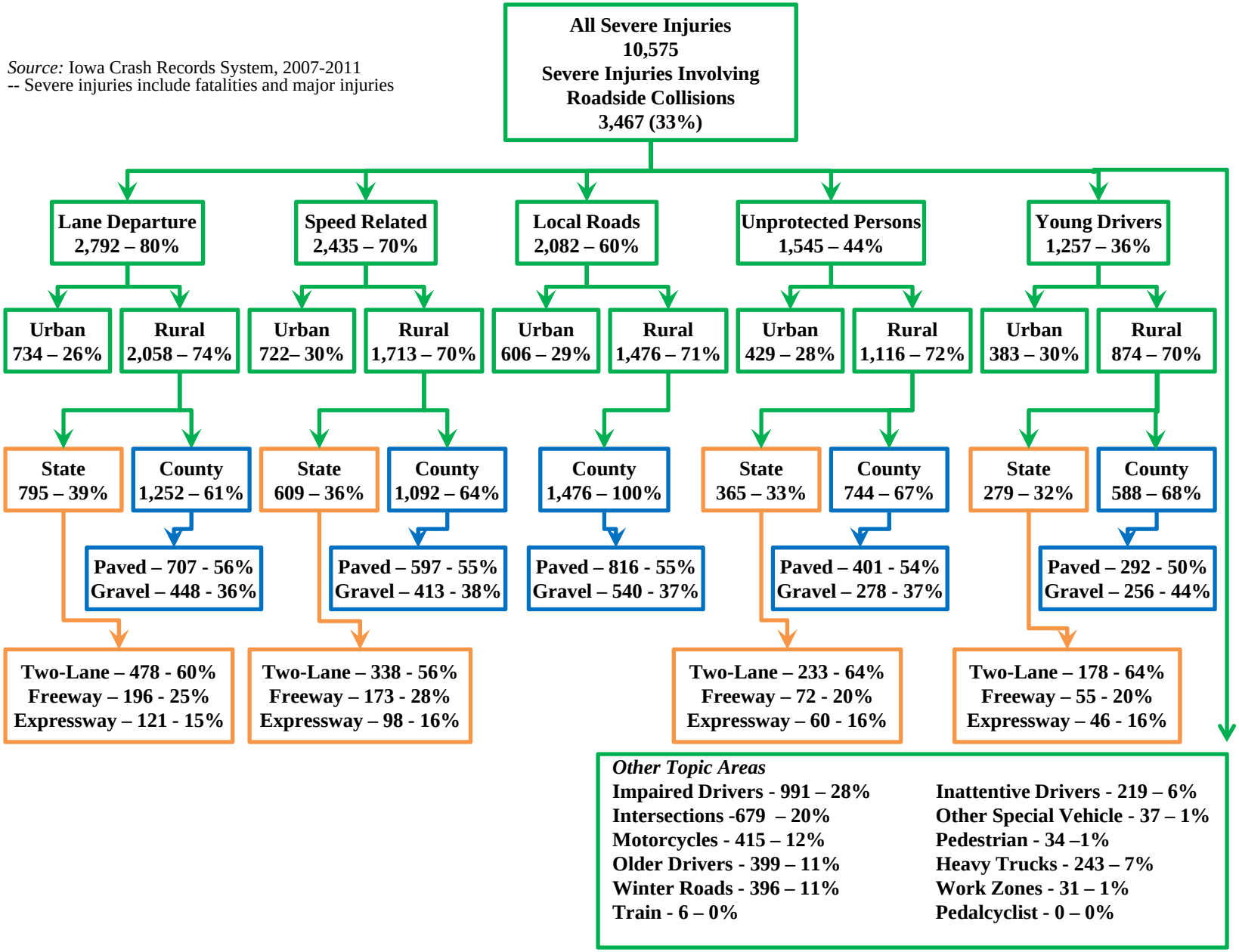


Roadside Collisions Crash Tree – By Topic

What the Crash Data Tells Us:

- The following areas are related to severe roadside collision injuries:
  - –60%-80% involved lane departure, speed, and/or local roads.
  - –1/3 to 1/2 involved unprotected persons and/or younger drivers.
- For all the areas noted above, roughly 2/3 of the roadside collision severe injuries occurred on rural county roads.
- For all the noted above, rural paved county roads and rural 2-lane state roads most at risk.

Source: Iowa Crash Records System, 2007-2011
-- Severe injuries include fatalities and major injuries



Lane Departure and Roadside Collisions – Possible Strategies

Objectives	Strategies	Relative Cost to Implement and Operate	Effectiveness	Typical Timeframe for Implementation
A - Keep vehicles from encroaching on the roadside	A1 - Install **shoulder rumble strips**	Low	Tried	Short
	A2 - Install edge lines "profile marking", **edge line rumble strips** or modified shoulder rumble strips on section with narrow or no paved shoulders	Low	Experimental	Short
	A3 - Provide **enhanced shoulder, lighting, or delineation and marking for sharp curves**	Low	Tried / Proven	Short
	A4 - Provide **improved highway geometry** for horizontal curves	Moderate	Proven	Long
	A5 - Provide **enhanced pavement markings**	Low	Tried	Short
	A6 - Provide **high-friction surface treatment**	Moderate	Proven	Medium
	A7 - Apply shoulder treatments *Eliminate shoulder drop-offs ***Shoulder edge** *Widen and/or **pave shoulders**	Low	Experimental Proven	Medium
B - Minimize the likelihood of crashing into an object or overturning if the vehicle travels off the shoulder	B1 - Design **safer slopes and ditches** to prevent rollovers	Moderate	Proven	Medium
	B2 - **Remove/relocate objects** in hazardous locations	Moderate to High	Proven	Medium
C - Reduce the severity of the crash	C1 - Improve design and application of **barrier and attenuation systems**	Moderate to High	Tried	Medium
D - Reduce the likelihood of a head on vehicles collision	D1 - Install **centerline rumble strips** for two-lane roads	Low	Proven	Short
	D2 - Use **alternating passing lanes** or four-lane sections at key locations	Moderate to High	Tried	Medium
	D3 - Install **cable median barrier** for narrow-width medians and multilane roads	Moderate to High	Proven	Medium

Source: NCHRP 500 Series
Note: Short (<1 year); Medium (1-2 years); Long (>2 years)