



# Intersections

- Fact Sheet
- Crash Trees
- Possible Safety Strategy



## Intersections Fact Sheet

### How Significant is the Issue?

On Iowa's roadways, there were 3,200 serious injuries associated with intersection crashes between 2007 and 2011. This includes 814 severe injuries at signalized intersections and 1,352 severe injuries at STOP controlled intersections. This is an average of 640 serious injuries per year and involved nearly 30% of all severe crashes during the five year period.

### What are the Contributing Factors?

#### The Driver

42% of severe injuries occurred when the driver was between the age of 14 and 24. Just over 60% of severe injuries occurred when the driver was male.

Age Group	Percent	Age Group	Percent
14 - 19	22%	25 - 64	35%
20 - 24	20%	≥65	23%

#### Light and Surface Condition

37% of severe injuries occurred during dark driving conditions. Another 3% were reported during dawn or dusk and 60% occurred during the day.

Severe injuries were predominantly reported on dry roads (75%). 10% occurred on wet roads while 9% occurred on a road with snow, ice, slush or frost surface conditions. The surface condition was other/unknown for the remaining 6% of severe injuries.

#### Road and Area Type

Severe injuries were primarily in urban areas (60%).

Combining rural and urban roadways, local roads had the greatest number of severe injuries (54%).

Jurisdiction	Rural	Urban	Total
State	20%	25%	45%
County	19%	1%	20%
City	-	34%	34%
Other/Unknown	1%	0%	1%
Total	40%	60%	100%

#### Manner of Crash Collision Impact

Over half of severe injuries (56%) occurred when the reported crash type was non-collision.

Crash Type	Percent	Crash Type	Percent
Non-collision	56%	Broadside	12%
Rear-end	20%	Sideswipe	4%

#### Traffic Control

41% of urban intersection severe injuries occurred at signalized intersections.

57% of rural intersection severe injuries occurred at STOP controlled intersections. These are split between state and county roads.

#### County

The top five counties represent 43% of severe injuries in Iowa.

Top Counties	Percent
Polk	20%
Scott	8%
Pottawattamie	6%
Linn	5%
Woodbury	4%

#### Time

Most severe injuries occurred on Saturdays (20%). Most severe injuries occurred between noon and 8 PM (44%).

Time of Day	Percent							Total
	M	Tu	W	Th	F	Sa	Su	
Midnight to 3:59 AM	1%	1%	1%	1%	2%	5%	4%	15%
4:00 AM to 7:59 AM	1%	1%	1%	2%	2%	2%	1%	10%
8:00 AM to 11:59 AM	3%	2%	1%	3%	2%	3%	1%	15%
Noon to 3:59 PM	4%	3%	3%	3%	3%	4%	2%	22%
4:00 PM to 7:59 PM	4%	2%	2%	4%	3%	3%	4%	22%
8:00 PM to Midnight	2%	2%	2%	2%	3%	3%	2%	16%
Total	15%	11%	10%	15%	15%	20%	14%	100%

# Iowa's Strategic Highway Safety Plan

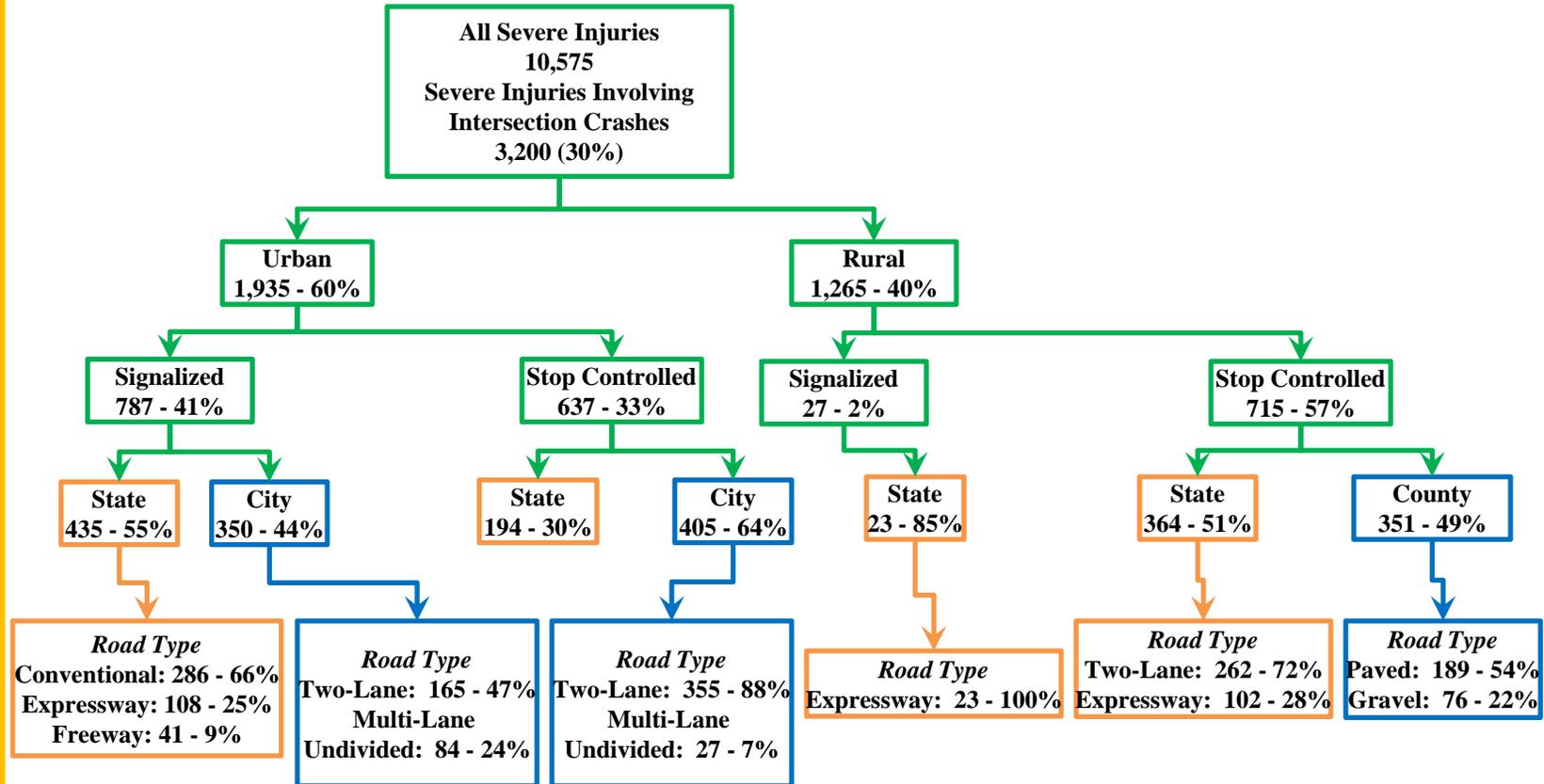
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## Intersections – By System

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

What the crash Data Tells Us:

- 60% of intersection related severe injuries occurred in urban areas.
- Severe injuries at urban intersections occurred at both signalized (41%) and stop controlled (33%) intersections and on both state and city roads.
- Severe injuries at rural intersections were primarily stop controlled with equal split between State and County roads.
- Severe intersection crashes and injuries are most likely on 2-lane paved road intersections.



# Iowa's Strategic Highway Safety Plan

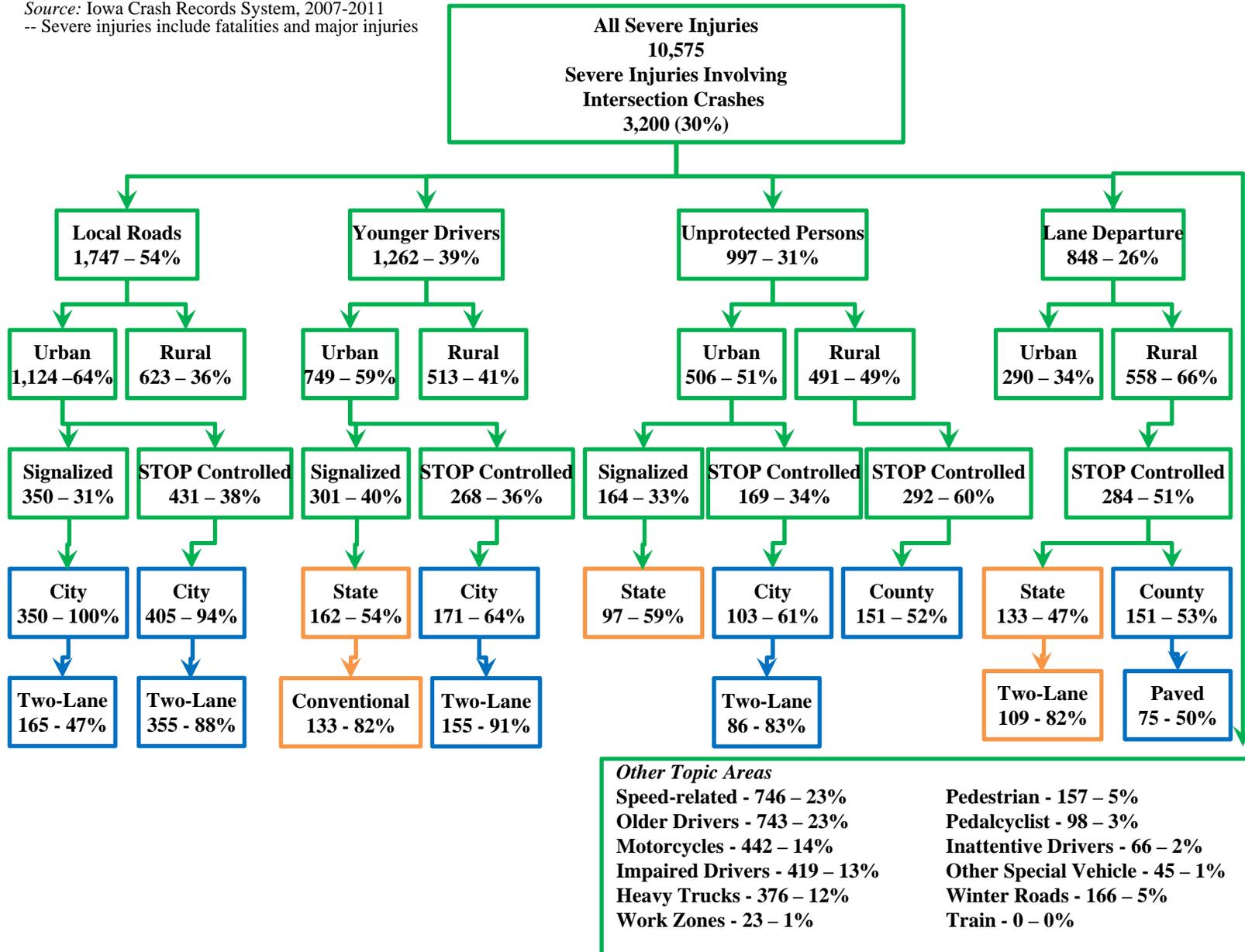
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## Intersections – By Topic

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

What the Crash Data Tells Us:

- The following areas are related to severe intersection crash injuries:
  - Local Roads (54%) with 2/3 on urban roads
  - Younger Drivers (39%)
  - Unprotected Persons (31%)
- Local Road and Younger Drivers are equally represented between signalized and unsignalized intersections severe injuries.
- Unprotected drivers are most at risk at rural stop controlled intersections.
- 2-lane paved roadways are most at risk for severe intersection crashes.



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## Intersections – Possible Strategies

Objectives	Strategies	Relative Cost to Implement and Operate	Effectiveness	Typical Timeframe for Implementation
A - Reduce frequency and severity of intersection conflicts through traffic control and operational improvements	A1 - Employ <b>multiphase signal</b> operation	Low	Tried / Proven	Short
	A2 - Optimize <b>clearance intervals</b>	Low	Proven	Short
	A3 - <b>Restrict or eliminate turning maneuvers</b> (including right turns on red)	Low	Tried	Short
	A4 - Employ <b>signal coordination</b> along a corridor or route	Moderate	Proven	Medium
	A5 - Employ <b>emergency vehicle preemption</b>	Moderate	Proven	Medium
	A6 - Improve <b>operation of pedestrian and bicycle facilities</b> at signalized intersections	Low	Tried / Proven	Short
	A7 - <b>Remove unwarranted signal</b>	Low	Proven	Short
B - Reduce frequency and severity of intersection conflicts through geometric improvements	B1 - Provide/improve <b>left-turn channelization</b>	Moderate	Proven	Medium
	B2 - Provide/improve <b>right-turn channelization</b>	Moderate	Proven	Medium
	B3 - Improve <b>geometry of pedestrian and bicycle facilities</b>	Low	Tried / Proven	Short
C - Improve driver awareness of intersections and signal control	C1 - Improve <b>visibility of signals</b> (overhead indications, 12" lenses, background shields, LED's) <b>and signs</b> (mast arm mounted street names) at intersections	Low	Tried	Short
D - Improve driver compliance with traffic control devices	D1 - Supplement conventional enforcement of red-light running with <b>confirmation lights</b>	Low	Tried	Short
E - Improve access management near signalized intersections	E1 - <b>Restrict access to properties</b> using driveway closures or turn restrictions	Low	Tried	Short
	E2 - <b>Restrict cross-median access</b> near intersections	Low	Tried	Short
F - Improve safety through other infrastructure treatments	F1 - <b>Restrict or eliminate parking</b> on intersection approaches	Low	Proven	Short

Source: NCHRP 500 Series

Note: Short (<1 year); Medium (1-2 years); Long (>2 years)

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## Intersections – Possible Strategies

Objectives	Strategies	Relative Cost to Implement and Operate	Effectiveness	Typical Timeframe for Implementation
A - Reduce the frequency and severity of intersection conflicts through geometric design improvements	A1 - Provide <b>left-turn lanes</b> at intersections	Moderate	Proven	Medium
	A2 - Provide <b>offset left-turn lanes</b> at intersections	Moderate to High	Tried	Medium
	A3 - Provide <b>right-turn lanes</b> at intersections	Moderate	Proven	Medium
	A4 - <b>Restrict or eliminate turning maneuvers</b> by providing <b>channelization or closing median openings</b>	Low	Tried	Short
	A5 - <b>Close or relocate "high-risk" intersections</b>	High	Tried	Long
	A6 - Realign intersection approaches to <b>reduce or eliminate intersection skew</b>	High	Proven	Medium
	A7 - Use <b>indirect left-turn treatments</b> to minimize conflicts at divided highway intersections	Moderate	Tried	Medium
B - Improve sight distance at unsignalized intersections	B1 - <b>Clear sight triangle on stop- or yield-controlled approaches</b> to intersections, including snow removal	Low	Tried	Short
	B2 - <b>Clear sight triangles in the medians</b> of divided highways near intersections, including snow removal	Low	Tried	Short
	B3 - <b>Change horizontal and/or vertical alignment</b> of approaches to <b>provide more sight distance</b>	High	Tried	Long
C - Improve driver awareness of intersections as viewed from the intersection approach	C1 - Improve visibility of intersections by providing <b>enhanced signing and delineation</b>	Low	Tried	Short
	C2 - Improve visibility of intersections by <b>providing lighting</b>	Moderate to High	Proven	Medium
	C3 - Install <b>splitter islands</b> on the minor-road approach to an intersection	Moderate	Tried	Medium
	C4 - Provide a <b>stop bar</b> (or provide a wider stop bar) on minor-road approaches	Low	Tried	Short
	C5 - Install <b>larger regulatory and warning signs</b> at intersections, including the use of dynamic warning signs at appropriate intersections	Low	Tried	Short
	C6 - Provide <b>pavement markings with supplementary messages</b> , such as STOP AHEAD	Low	Tried	Short
D - Choose appropriate intersection traffic control to minimize crash frequency and severity	D1 - <b>Avoid signaling through roads</b>	High	Tried	Long
	D2 - Provide <b>all-way stop control</b> at appropriate intersections	Low	Proven	Short
	D3 - Provide <b>roundabouts</b> at appropriate locations	High	Proven	Long

Source: NCHRP 500 Series

Note: Short (<1 year); Medium (1-2 years); Long (>2 years)