Safety at Unsignalized Intersections
There were 41,059 highway fatalities in 2007. Where did they occur?

About half of all crashes and half of all injury crashes occur at intersections.
There were 8,657 intersection fatalities in 2007.

Where did they occur?

- 39% in rural areas
- 61% in urban areas

![Bar chart showing intersection fatalities by type and location]
Intersection Fatalities

- Unsignalized: 3,091 (Urban), 3,099 (Rural)
- Signalized: 1,991 (Urban), 329 (Rural)
- Other: 78 / 78
Intersection Safety Guidance

- NCHRP Report 500 Volume 5
- Guide sheets
- Safety Strategies brochure
Typical Intersection Crash Types

- Right angle
- Rear end
- Left turn
- Sideswipe
- Pedestrian/bicycle
Crash Reduction Factors

- Quantitative results from research or other studies
- Expected reduction in crashes from implementation of a specific countermeasure
Angle Crashes

- Account for 53% of fatal crashes at unsignalized intersections

- Potential countermeasures:
  - Clear sight triangles
  - Improve awareness of intersection
  - Apply access management
  - Improve turn lane design
  - Construct roundabouts
  - Construct acceleration lanes
  - Close/relocate intersections
  - Reduce/eliminate skew
  - Post appropriate speed limits
  - Targeted enforcement
Improve Awareness of Intersection

Double Warning Signs

Oversize Signs

Unsignalized Intersections

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Unsignalized Intersections

Improve Awareness of Intersection

1. Splitter Island

2. Supplemental Beacons
Improve Awareness of Intersection

Provide Lighting

Install Rumble Strips
Apply Access Management

Unsignalized Intersections

Right-in/Right-Out

Channelization
Improve Turn Lane Design

Offset Right Turn Lane
Construct Roundabouts

Unsignalized Intersections
Construct Left-Turn Acceleration Lanes

- Acceleration Lane
- Through Lanes
Close / Relocate Intersection

Unsignalized Intersections
Post Appropriate Speed Limits on Approaches
Targeted Enforcement

Unsignalized Intersections

Speed violations

Stop violations
• Account for 6% of fatal crashes at unsignalized intersections

• Potential countermeasures:
  - Install turn lanes
  - Supplemental overhead signing
  - Provide shoulder bypass lanes
  - Provide pavement markings
  - Provide right-turn acceleration lanes
  - Construct roundabouts*
  - Provide left-turn acceleration lanes*
  - Provide lighting*
  - Post appropriate speed limits*
  - Improve intersection awareness*

* Discussed previously
Install Turn Lanes

Left turn lanes

Right turn lanes

Unsignalized Intersections
Supplemental Overhead Signing
Provide Shoulder Bypass Lanes
Provide Pavement Markings

Unsignalized Intersections

- Stop
- Merge

[Images of road markings and signage]
Provide Right-Turn Acceleration Lanes
Left Turn Crashes

- Account for 8% of fatal crashes at unsignalized intersections

- Potential countermeasures:
  - Improve turn lane design
  - Implement turn restrictions
  - Use indirect left turn treatments
  - Provide lighting*
  - Clear sight triangles*
  - Provide left turn acceleration lanes*
  - Construct roundabouts*
  - Close/relocate high-risk intersections*

* Discussed previously
Improve Turn Lane Design
Improve Turn Lane Design

Unsignalized Intersections
Use Indirect Left Turn Treatments

Unsignalized Intersections
Sideswipe Crashes

- Account for 2% of fatal crashes at unsignalized intersections
- Potential countermeasures:
  - Install pavement markings
  - Provide lane assignment signing or marking
  - Provide right-turn acceleration lanes*

* Discussed previously
Provide Striping in Median Area
Pedestrian/Bicycle Crashes

- Account for 14% of fatal crashes at unsignalized intersection crashes

- Potential countermeasures:
  - Improve pedestrian/bicycle facilities
  - Provide traffic calming
  - Information and education
Improve Pedestrian/Bicycle Facilities

- Advance crossing warning
- Continuous/Setback Sidewalks
- Unsignalized Intersections
Provide Traffic Calming

- Neighborhood circles
- Pedestrian bulb-outs

Unsignalized Intersections

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Information and Education

- Web sites
- In school programs
- Printed material
- Radio and TV
- Community outreach
- Speed trailers

Unsignalized Intersections

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For More Information

- AASHTO Report 500 Series Volume 5
  - [http://safety.transportation.org/](http://safety.transportation.org/)
- Manual on Uniform Traffic Control Devices
- Toolbox on Intersection Safety and Design
  - [http://www.ite.org/](http://www.ite.org/)
- FHWA Office of Safety