



U.S. Department of Transportation  
Federal Highway Administration



**Safe Roads for a Safer Future**  
*Investment in roadway safety saves lives*

# Safety at Signalized Intersections



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Traffic Gurus Annual Meeting  
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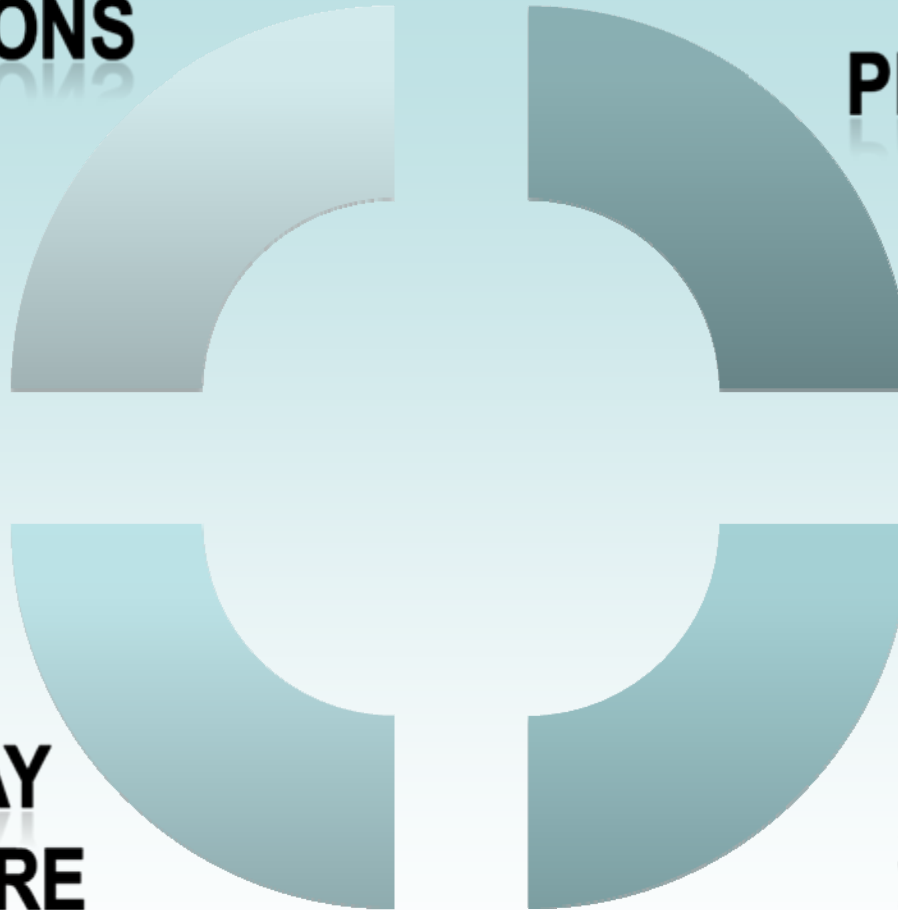
# FHWA Safety Focus Areas

**INTERSECTIONS**

**PEDESTRIANS**

**ROADWAY  
DEPARTMENT**

**SPEEDING**

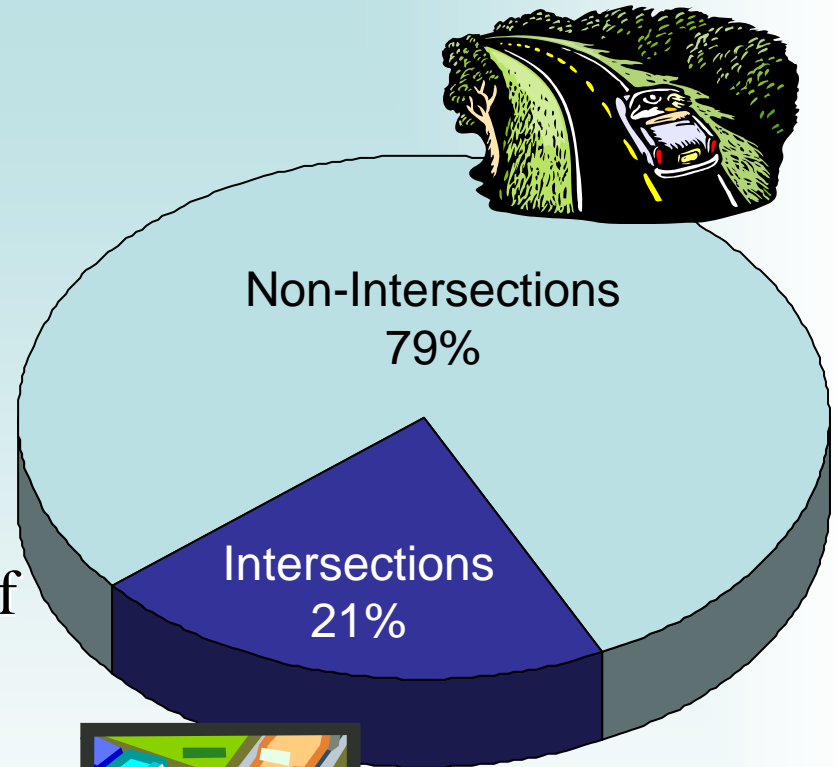


# Nationwide Fatalities

There were 41,059 highway fatalities in 2007.

Where did they occur?

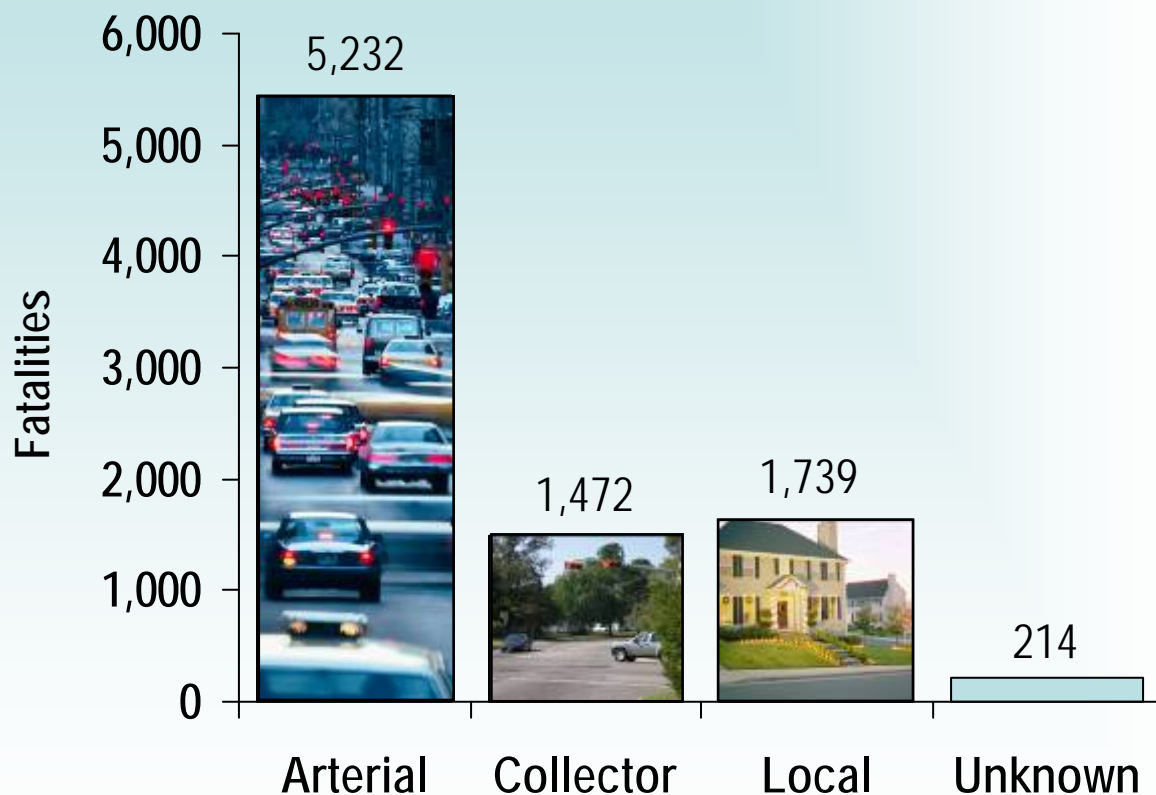
About half of all crashes and half of all injury crashes occur at intersections.



# Intersection Fatalities

There were 8,657 intersection fatalities in 2007.

Where did they occur?



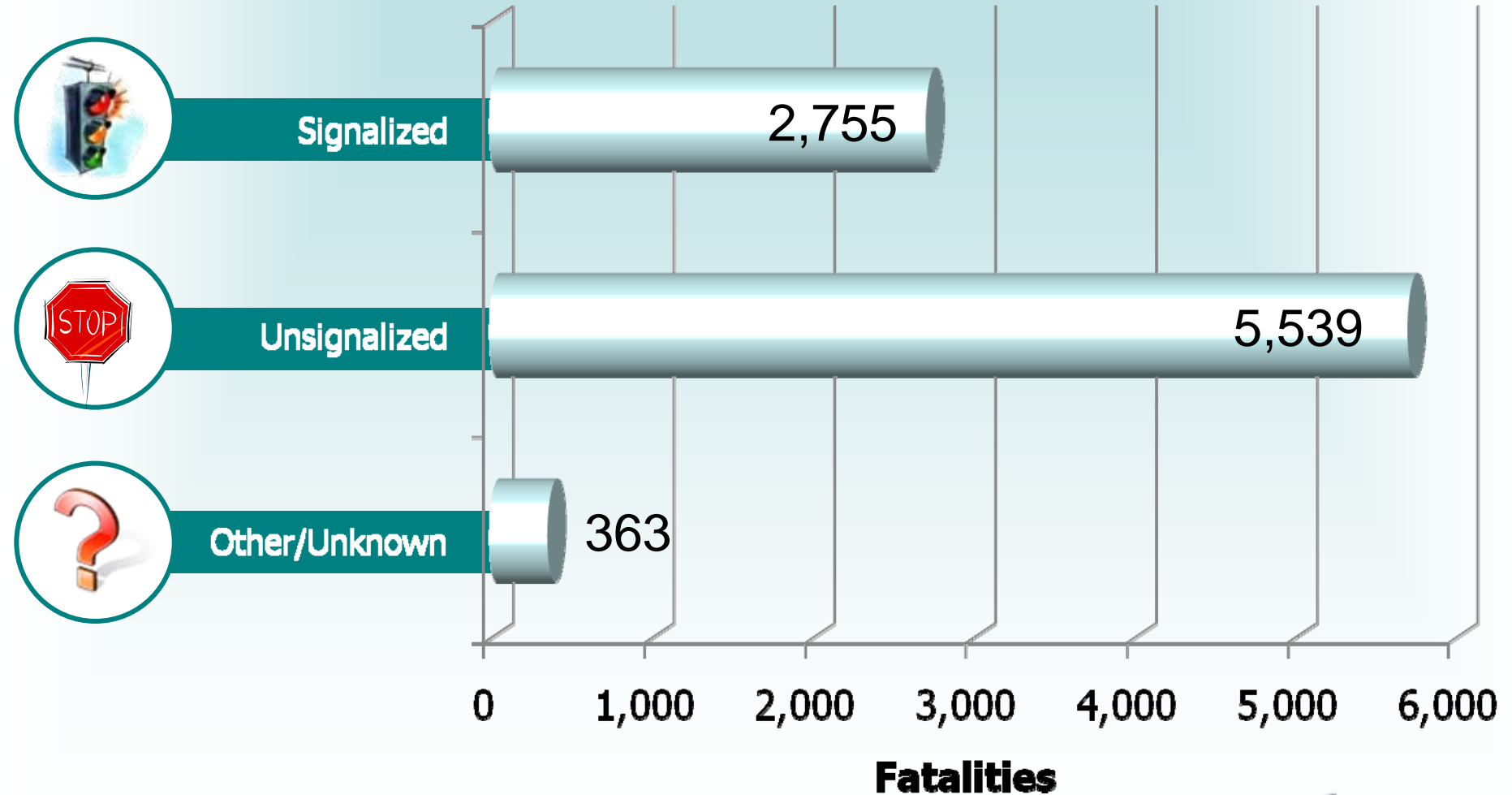
# Traffic Signals

**There are at least 3 million intersections in the United States.**

**At least 300,000 are signalized.**



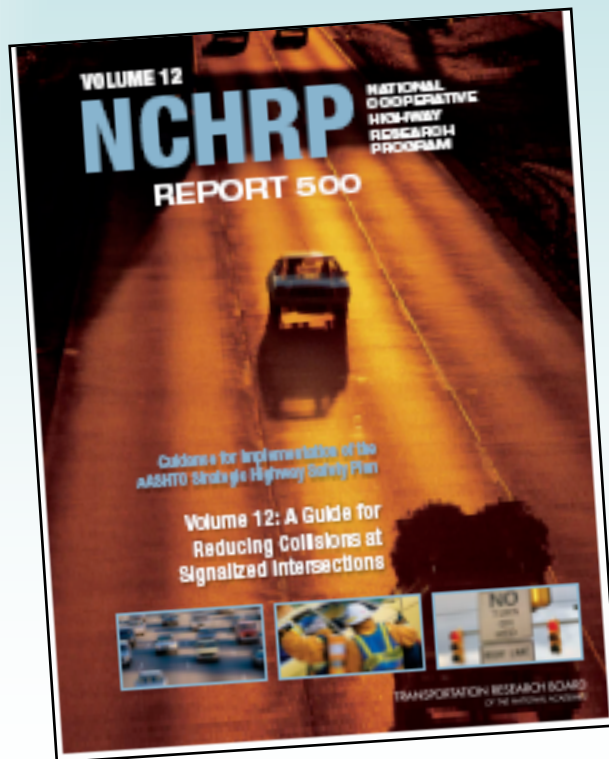
# Intersection Fatalities





# Intersection Safety Guidance

- NCHRP Report 500 Volume 12
- Guide sheets
- Safety Strategies brochure



# Typical Signalized Intersection Crash Types

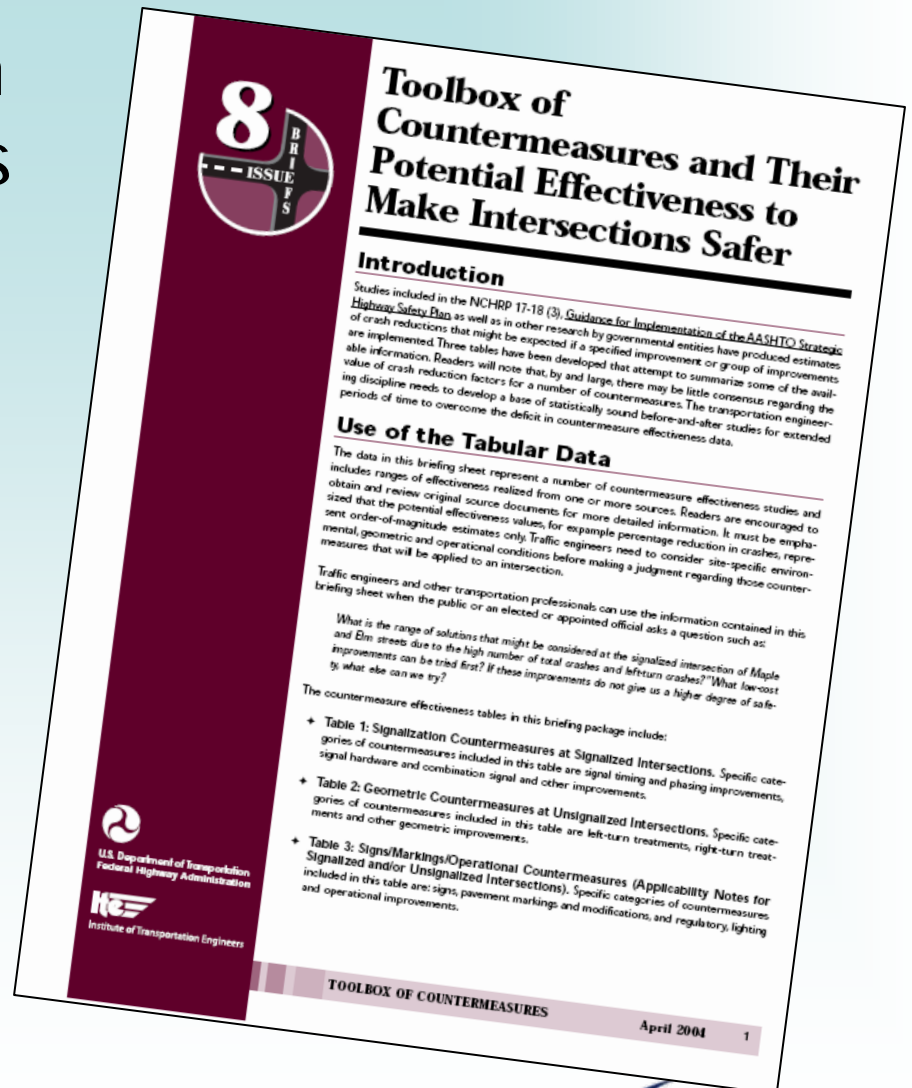
- Right angle
- Rear end
- Left turn
- Sideswipe
- Pedestrian/bicycle



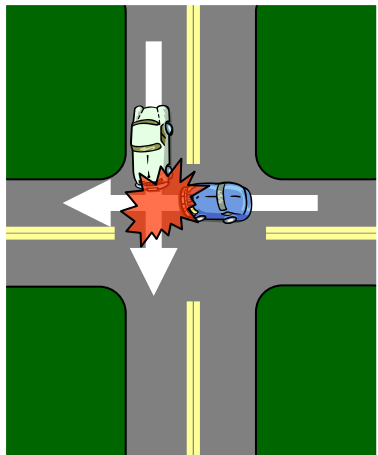


# Crash Reduction Factors

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



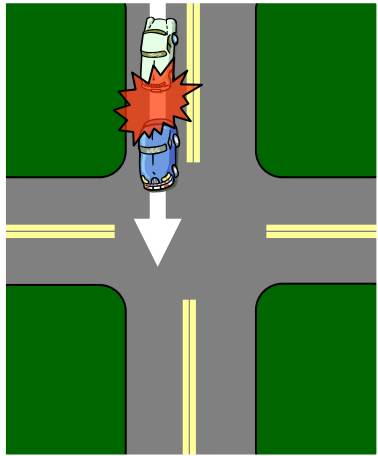
# Angle Crashes



- 42% of fatal crashes at signalized intersections
- Potential countermeasures:
  - Optimize change intervals
  - Improve sight distance
  - Restrict access
  - Provide targeted enforcement
  - Restrict parking
  - Construct roundabouts



# Rear End Crashes

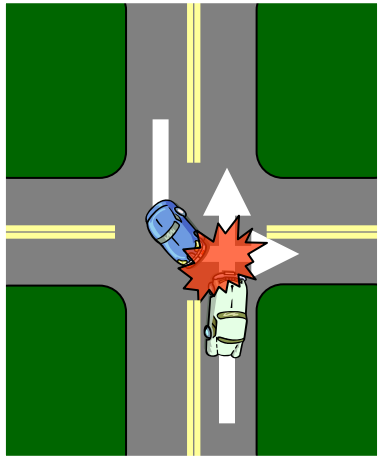


- 8% of fatal crashes at signalized intersections
- Potential countermeasures:
  - Increase visibility of intersection and/or traffic signals
  - Increase awareness
  - Improve signal coordination
  - Install turn lanes
  - Control approach speeds
  - Optimize change intervals



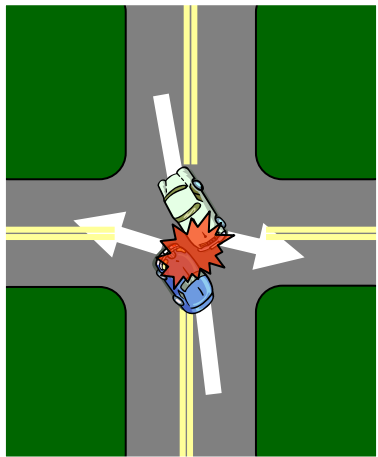
# Left Turn Crashes

- 21% of fatal crashes at signalized intersections
- Potential countermeasures:
  - Employ protected left turn phasing
  - Implement turn restrictions
  - Improve turning lane design
  - Reconstruct approaches
  - Improve sight distance
  - Improve signal coordination





# Sideswipe Crashes

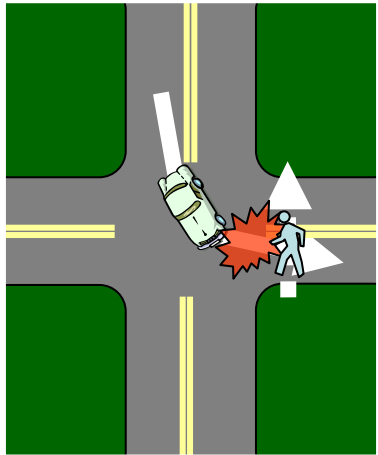


- 13% of fatal crashes at signalized intersections
- Potential countermeasures:
  - Install pavement markings
  - Provide protected left turn phasing





# Pedestrian/Bicycle Crashes



- 25% of fatal crashes at signalized intersections
- Potential countermeasures:
  - Improve signal hardware
  - Improve pedestrian/bicycle facilities
  - Provide information and education



## For More Information

- NCHRP Report 500 Series Volume 12
  - <http://safety.transportation.org/>
- Manual on Uniform Traffic Control Devices
  - <http://mutcd.fhwa.dot.gov/>
- Signalized Intersections: Informational Guide
  - <http://www.tfhrc.gov/safety/pubs/04091/index.htm>
- FHWA Office of Safety
  - <http://safety.fhwa.dot.gov/>

