Red-Light Running
There are at least 3 million intersections in the United States.

At least 300,000 are signalized.
There were 8,657 intersection fatalities in 2007.
What is Red Light Running?

- **Permissive yellow rule:**
  - Driver can legally enter intersection during entire yellow interval
  - **Violation** occurs if driver enters intersection after onset of red

- **Restrictive yellow rule:**
  - Driver can neither enter nor be in intersection on red
  - **Violation** occurs if driver has not cleared intersection after onset of red
Safety Facts About Red-Light Running

Fatal Red-Light Running Crashes

Safety Facts About Red-Light Running

Red-Light Running Crashes

Source: Establishing a Uniform Definition of Red-Light Running Crashes, ITE Journal, March 2006
Safety Facts About Red-Light Running

- Red-light running crashes are more likely than other crashes to cause injury
- On urban roads, fatal RLR crashes are more likely than other fatal crashes
- Fatal RLR crashes are somewhat more likely to occur during the day

Source: Prevalence and Characteristics of Red Light Running Crashes in the United States, Accident Analysis and Prevention, 1999
Types of Crashes

- Right angle
- Rear end
- Left turn
4% of Americans reported running red lights

- 1% run them “often”
- 3% run them “sometimes”

97% of drivers feel that other drivers running red lights are a major safety threat

1 in 3 people claim they personally know someone injured or killed in a red light running crash
Types of Red-Light Runners

- **Unintentional**
  - Engineering Countermeasures

- **Intentional**
  - Enforcement Countermeasures
## Possible Causes and Countermeasures

<table>
<thead>
<tr>
<th>Possible Cause of RLR</th>
<th>Engineering</th>
<th>Enforcement</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not see signal</td>
<td>●</td>
<td></td>
<td>◊</td>
</tr>
<tr>
<td>Tried to beat yellow</td>
<td>◊</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Reported they had green</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intentional violation</td>
<td>◊</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Unable to stop vehicle</td>
<td>●</td>
<td></td>
<td>◊</td>
</tr>
<tr>
<td>Followed another vehicle</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Confused by signal</td>
<td>●</td>
<td></td>
<td>◊</td>
</tr>
</tbody>
</table>

● = Likely countermeasure
◊ = Possible countermeasure
The first step to addressing red-light running is to conduct a thorough field review.
Intersection Safety Resources

- NCHRP Report 500 Volume 12
- Guide sheets
- Safety Strategies brochure
- Signalized Intersections: Informational Guide
Red-Light Running Resources

- Red Light Camera Systems: Operational Guidelines
- Making Intersections Safer: A Toolbox...
- Field Guide for Inspecting Signalized Intersections...
Engineering Countermeasures

- Improve signal visibility
- Improve line of sight
- Improve signal conspicuity
- Increase likelihood of stopping
- Improve signal timing
- Eliminate the need to stop
Install one signal face per approach lane

Use 12-inch lenses
Install supplemental signal heads
Improve Line of Sight

Use special signal face treatments

Red-Light Running
Improve Signal Conspicuity

Use backplates to increase target value of signal heads
Improve Signal Conspicuity

Install LED indications
Use double-red indications for special cases
Increase Likelihood of Stopping

Use signal ahead signs to warn motorists of upcoming traffic control.
Increase Likelihood of Stopping

Use dynamic warning in special cases
Increase Likelihood of Stopping

Increase pavement friction
Improve Signal Timing

Ensure yellow change intervals are properly timed
\[ Y = t + \frac{1.47 \times V_{85}}{2d + 2Gg} \]

*where*

\( Y \) = yellow duration in seconds
\( t \) = reaction time = 1s
\( V_{85} \) = 85th percentile speed in mi/h
\( d \) = deceleration = 10ft/s\(^2\)
\( G \) = grade in ft/ft
\( g \) = acceleration due to gravity = 32.2 ft/s\(^2\)
Improve Signal Timing

Retime signals to provide improved progression
Eliminate the Need to Stop

Use roundabouts where feasible
Eliminate the Need to Stop

Remove unneeded traffic signals

SIGNAL UNDER STUDY FOR REMOVAL

Red-Light Running
The Next Step

- Follow up countermeasures with observation
- Number of red light runners can be surrogate for improved safety
- If unsuccessful, look towards enforcement countermeasures
Enforcement Countermeasures

- Increased enforcement
- Enforcement assistance lights
- Automated enforcement
After engineering countermeasures have been implemented and if they did not correct the problem.
Enforcement Assistance Lights

Install enforcement lights to assist police
Automated Enforcement

Implement a red light camera safety program
Red Light Cameras

Source: Insurance Institute for Highway Safety web site (www.ilhs.org)
Do you know the law?

1. When you approach a red light, stop before the stop line or crosswalk, whichever is closer to you.
2. Do not "run" into the intersection while violating.
3. When making a right turn on red, you must:
   a. Come to a full stop.
   b. Yield to all pedestrians and traffic with a green light.
4. You must come to a full stop and yield to any vehicle approaching the intersection with a green arrow or "walk" sign.
5. If a traffic signal is unobstructed, treat the intersection like a four-way stop.
6. With 2 intersections for red light running within 1/2 mile, the Department of Highway Safety and Motor Vehicles will order you to attend driver improvement school.

Red-Light Running

Stop Red Light Running Week
Statewide Enforcement Wave
August 4 – 11, 2007
For More Information

- FHWA Office of Safety
  - http://safety.fhwa.dot.gov/
- Insurance Institute for Highway Safety
  - http://www.ihs.org/
- Institute of Transportation Engineers
  - http://www.ite.org/safety/
- American Association of State Highway and Transportation Officials
  - http://safety.transportation.org/
- Red Means Stop Coalition
  - http://www.redmeansstop.org/