

WHY ROUNDABOUTS? WHY NOT SIGNALS, 2 WAY, OR 4 WAY STOPS?



WHY ROUNDABOUTS?

- **Safest At-Grade Intersection Possible**
- High Capacity / Low Delay
- Good for All Modes of Traffic
- Geometric Flexibility
- Aesthetics



Crash Reduction - Roundabouts

- Real world – variability (NYSDOT SPR C-01-47)

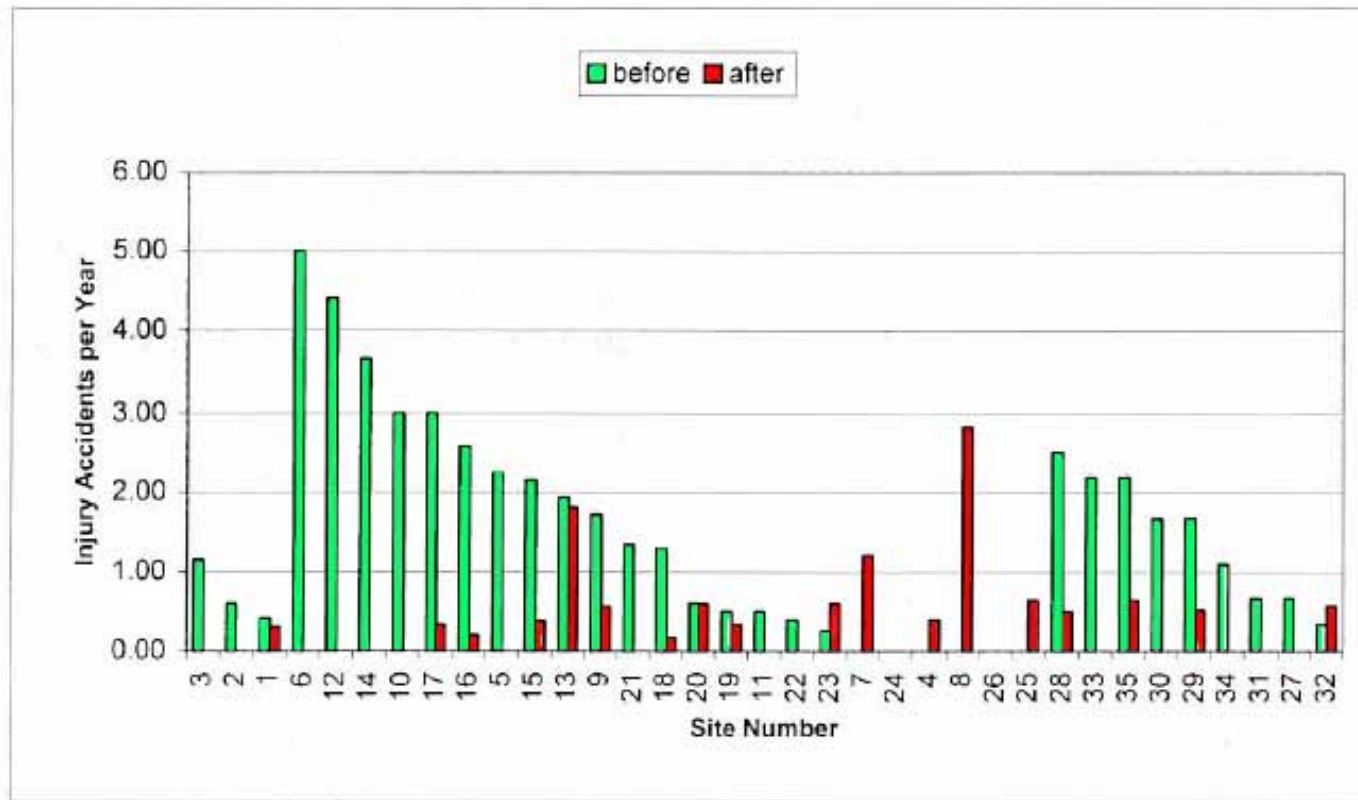


Figure 5-3. Before-After comparison of injury accidents per year

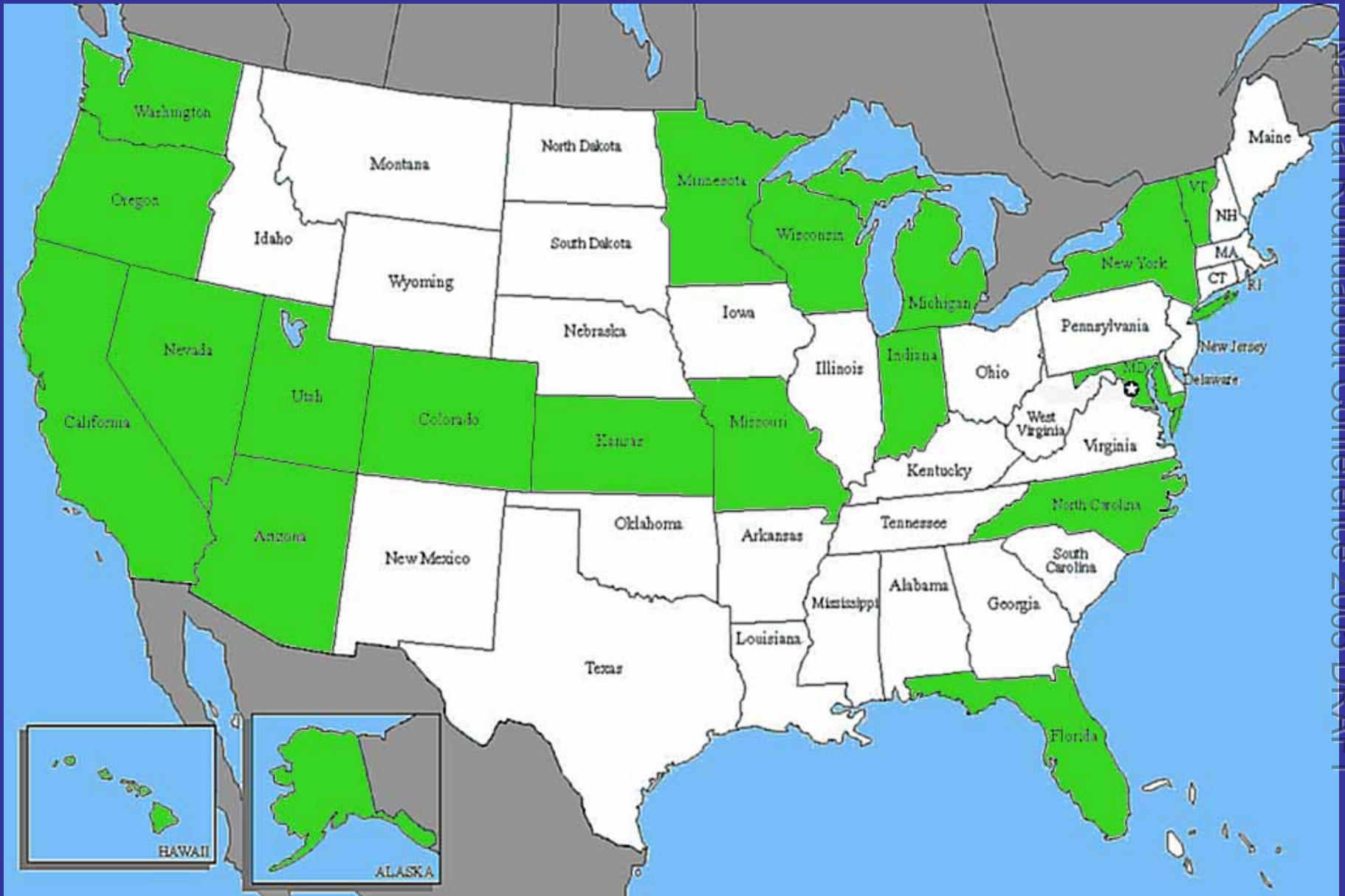
Safety Impacts of Modern Roundabouts

<u>Type of Roundabout</u>	<u>Converted from</u>	<u># of Conversions</u>	<u>Percent Reduction of all Crashes</u>	<u>Percent Reduction of Injury Crashes</u>
Single Lane, Urban	Stop Controlled	12	69%	80%
Single Lane, Rural	Stop Controlled	9	65%	68%
Multi-lane, Urban	Stop Controlled	7	8%	73%
Urban	Signalized	5	37%	75%
All		33	47%	72%

Top Ten Crash Fatality States

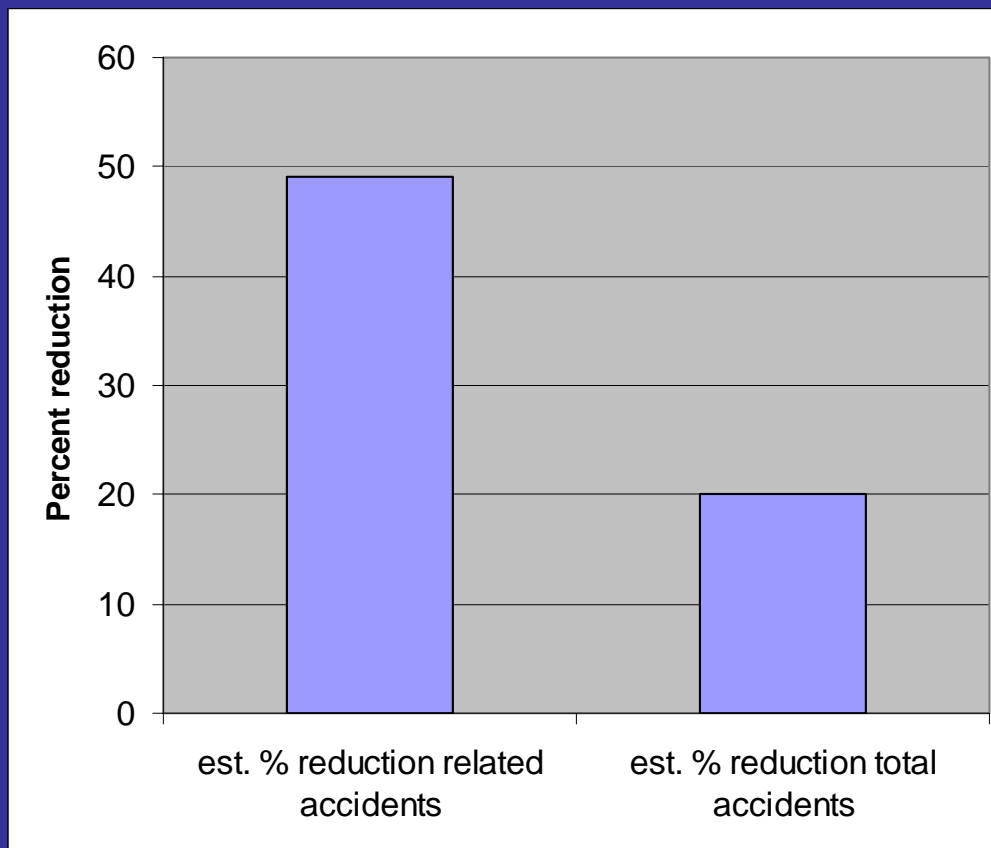


States Actively Progressing Roundabouts



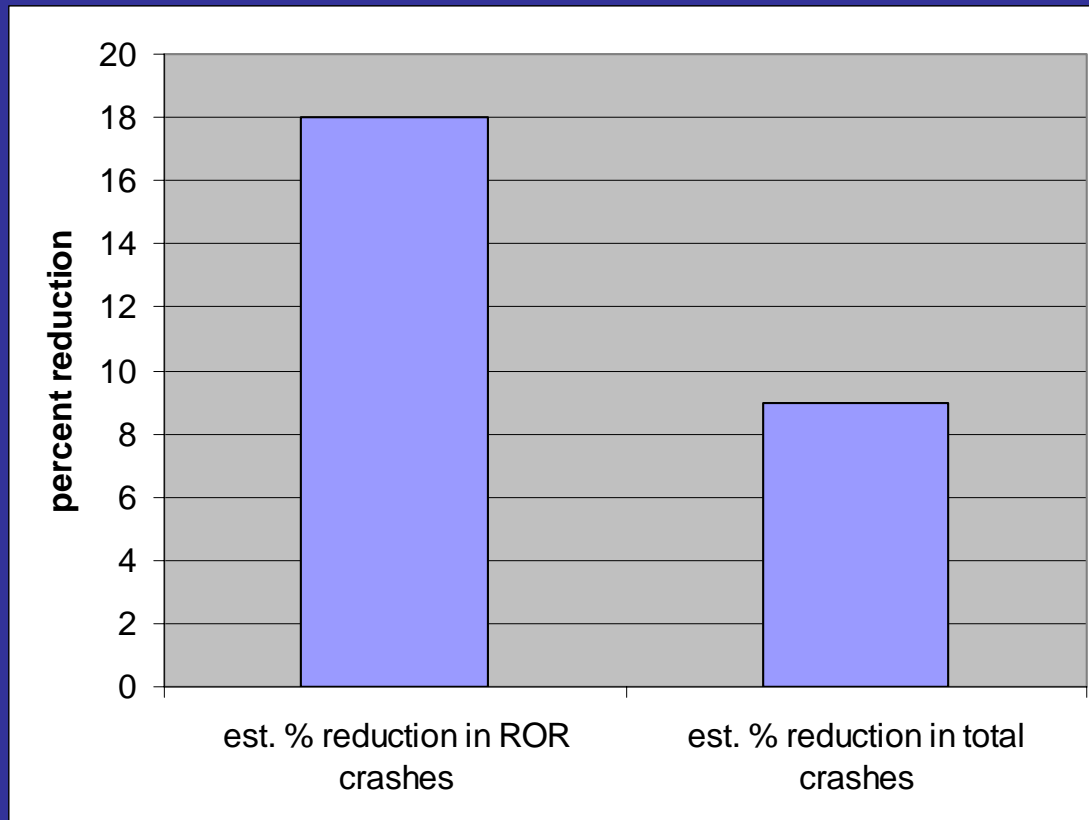
Crash Reduction – Shoulder Widening

- Widen shoulder from 0-8 ft (FHWA-RD-91-046)



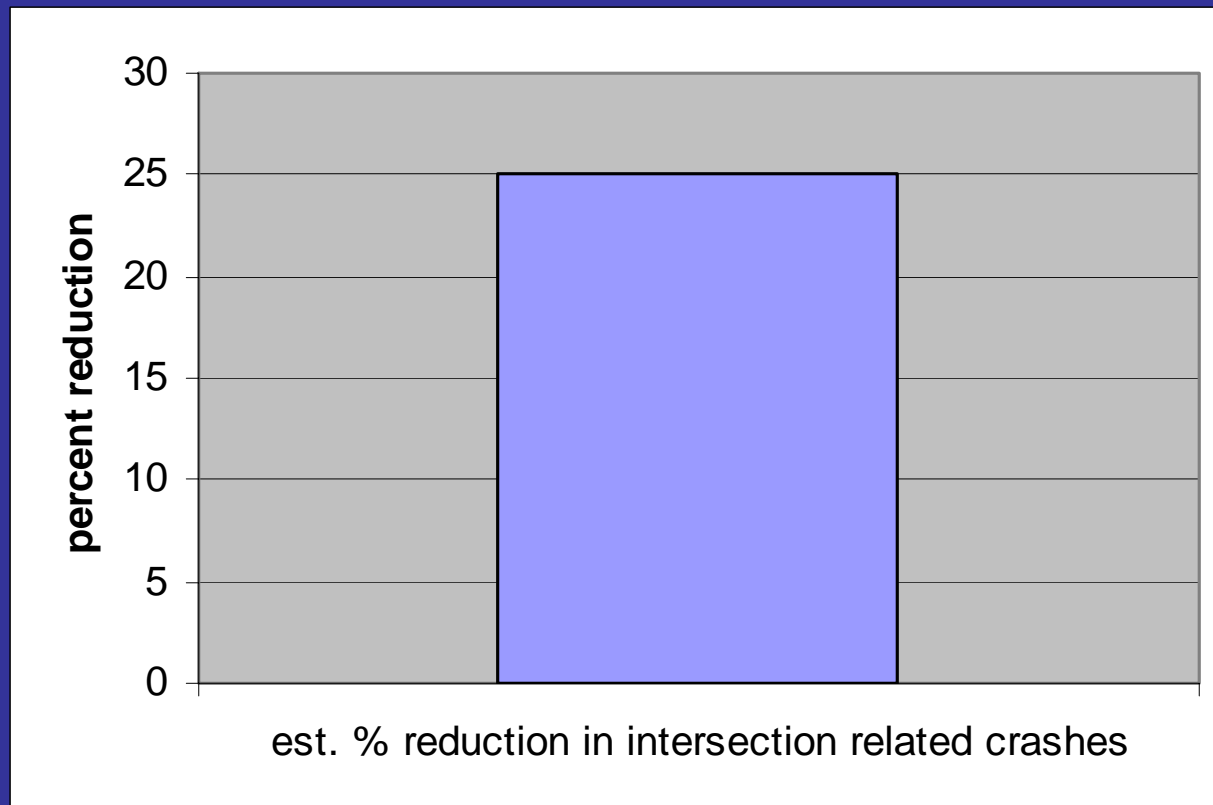
Crash Reduction – Rumble Strips

- Rumble strip crash reduction (FHWA-RD-00-032)



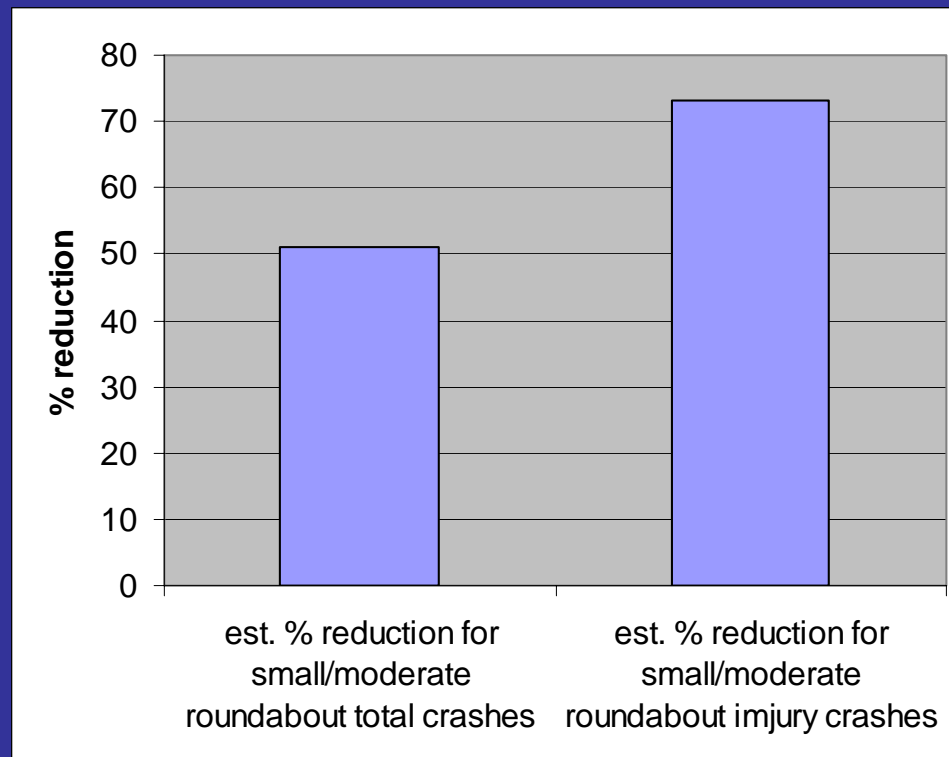
Crash Reduction – Turn Lanes

- Add major road right turn and left turn lanes at 4-legged urban signalized intersection (FHWA-RD-02-103)



Crash Reduction - Roundabout

- Conversion of existing intersection to small/moderate sized roundabout (FHWA-RD-00-067)



RED LIGHT RUNNING CAMERA



40 MPH T-BONE CRASH



INSURANCE INSTITUTE FOR HIGHWAY SAFETY

CRASH REDUCTIONS FOLLOWING INSTALLATION OF ROUNDABOUTS IN THE UNITED STATES -MARCH 2000

- **Reduction of Total Crashes by 39%**
- **Reduction of Injury Crashes by 76%**
- **Reduction of Fatal and Incapacitating Crashes by 89%**

On the web at: www.highwaysafety.org

MARYLAND ROUNDABOUT SAFETY EXPERIENCE

STATISTICS FROM 8 SINGLE LANE ROUNDABOUTS
WITH AT LEAST 2 YEARS OF BEFORE/AFTER DATA

- **Reduction of Total Crashes by 63%**
- **Reduction of Injury Crashes by 83%**

ALSO REPORTED MIXED RESULTS
REGARDING 2 LANE ROUNDABOUTS

South Golden Road - Golden, CO - Before





Ulysses Roundabout

Commercial Access

Commercial Access

Johnson Road Roundabout

South Golden Road - Accident History

Before and After Roundabouts

	3 Years Prior	28 Months After	% Change
Total accidents	158	84	
Accidents Per month	4.39	3	-31.66%
Accidents Per Million Miles	9.1	3.6	-60.44%
Injuries total	31	1	
Injuries Per month	0.86	0.04	-95.85%
Injuries Per Million Miles	1.6	0.09	-94.38%

Montpelier, VT Roundabout

300' from elementary school

560 children per day

800 pedestrians per day

13,000 vehicles per day

No crashes in 8 years
(Previous crash rate was about 5 per year)

THERE ARE NOW
MORE THAN 40
ROUNDAOBOUTS
NEAR SCHOOLS



HOWARD, WISCONSIN

THE FOLLOWING ARE TAKEN FROM :

http://www.co.brown.wi.us/Planning/forms/lineville_roundabout_study.pdf

- **Bicycling has been made safer, and students are now allowed to bike to school. The president of the Bicycle Federation of Wisconsin also believes the roundabouts are safe and convenient for bicyclists and supports their construction throughout the state.**
- **Reportable vehicle crashes have virtually disappeared from the two intersections and injuries have been eliminated. This occurred in spite of the introduction of hundreds of inexperienced drivers to Lineville Road's existing traffic load after the new high school opened in August of 2000.**
- **The director of the Brown County Sheriff's Department's Patrol Division and the principal of Bay View Middle School both believe that traffic congestion and speeding have been significantly reduced along Lineville Road. The patrol director and principal also believe that safety has been greatly enhanced by the roundabouts.**
- **Semi-trailer trucks, school buses, fire trucks, and other large vehicles can easily pass through the roundabouts. The manager of the school bus company that serves the Howard-Suamico School District even stated that he would recommend roundabouts in other school districts.**

WASHINGTON STATE ROUNDABOUT



National Roundabout Conference 2005 DRAFT

WASHINGTON SAFETY RECORD

Safety in a Roundabout Way

Port Orchard Roundabout Safety Improvement

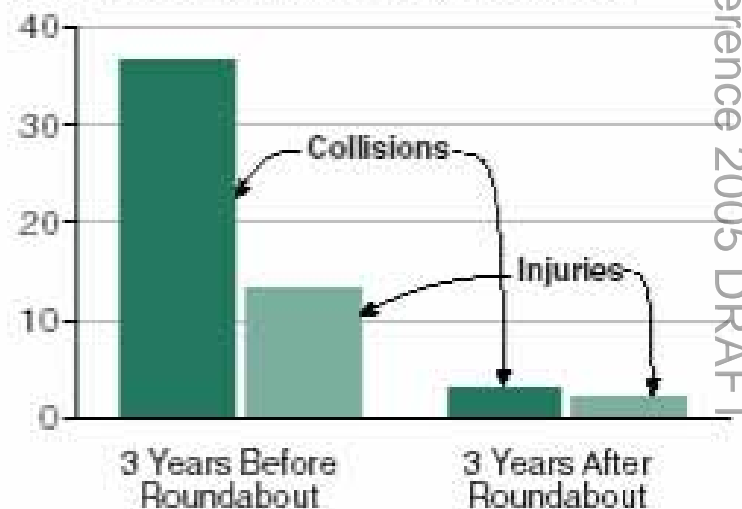
During the late 1980s and early 1990s, traffic growth in the city of Port Orchard in southern Kitsap County overwhelmed the intersection of Bethel Avenue and Mile Hill Drive (SR 166), eventually generating enough injury and property collisions to classify the intersection as a High Accident Location (HAL). Vehicle speeds exceeding the posted speed limit and the intersection configuration contributed to the collision problem. In the mid-1990s, after approval of the design by WSDOT, the City of Port Orchard built a "modern" roundabout, the first of its kind on the state highway system and the second to be built in Washington.

After the construction of the single-lane roundabout, crash data supports how well a roundabout can work when applied to a site-specific intersection safety problem. There are now 48 roundabouts in Washington.



Port Orchard -
Bethel Ave. and
Mile Hill Drive
Intersection

Number of Collisions and Injuries
Before and After Roundabout: Comparison



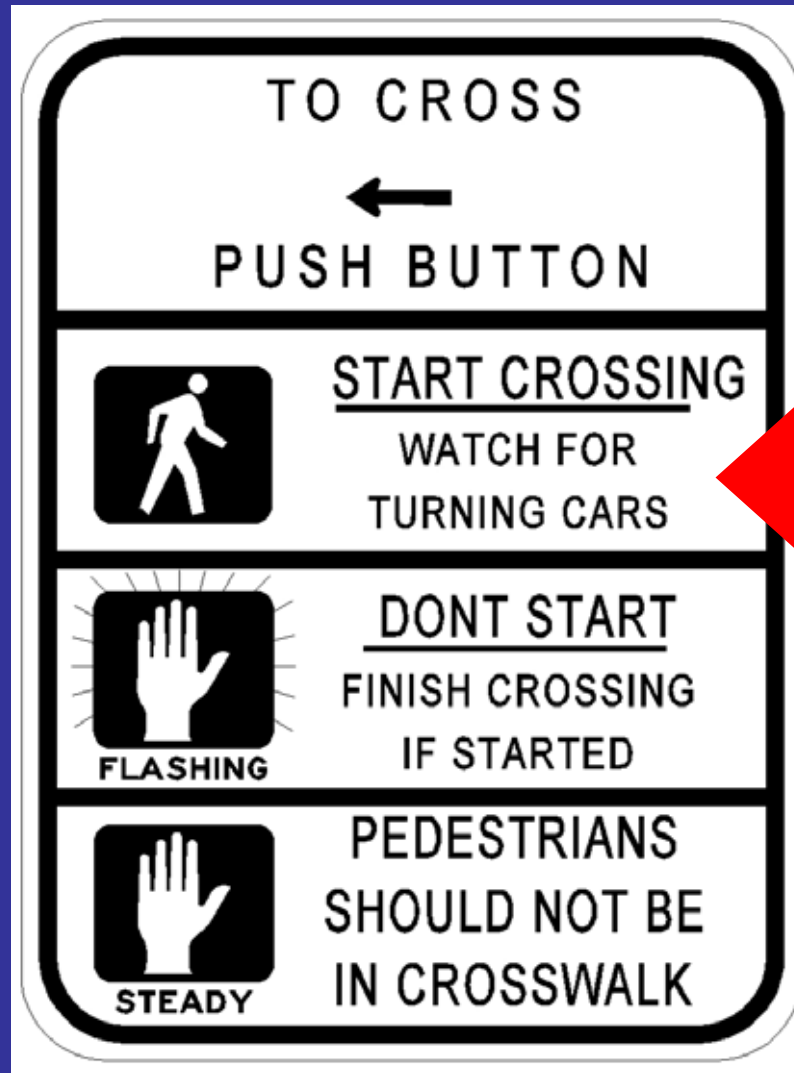
Source: WSDOT Engineering and Regional Operations Division.

Measures, Markers and Mileposts - December 31, 2003

Pedestrian Consideration

- Benefits:
 - Easy to determine gaps
 - Cars only coming from one direction
 - Fewer lanes to cross
 - Splitter Island provides refuge
- Trade Offs:
 - Must assess gaps – This is the most difficult issue
 - NCHRP 3-78 will be addressing this topic
 - No protected phase???

Unless “All Red” Signals Provide No “Protected” Pedestrian Phase



“Queens Tot Tragedy”

The collision occurred at about 9 a.m. as a baby sitter pushed 2-year-old Daniel Campos-Vasquez north on Greenpoint Avenue in Sunnyside, and tried to make her way through a crosswalk at a busy service road feeding the Long Island Expressway.

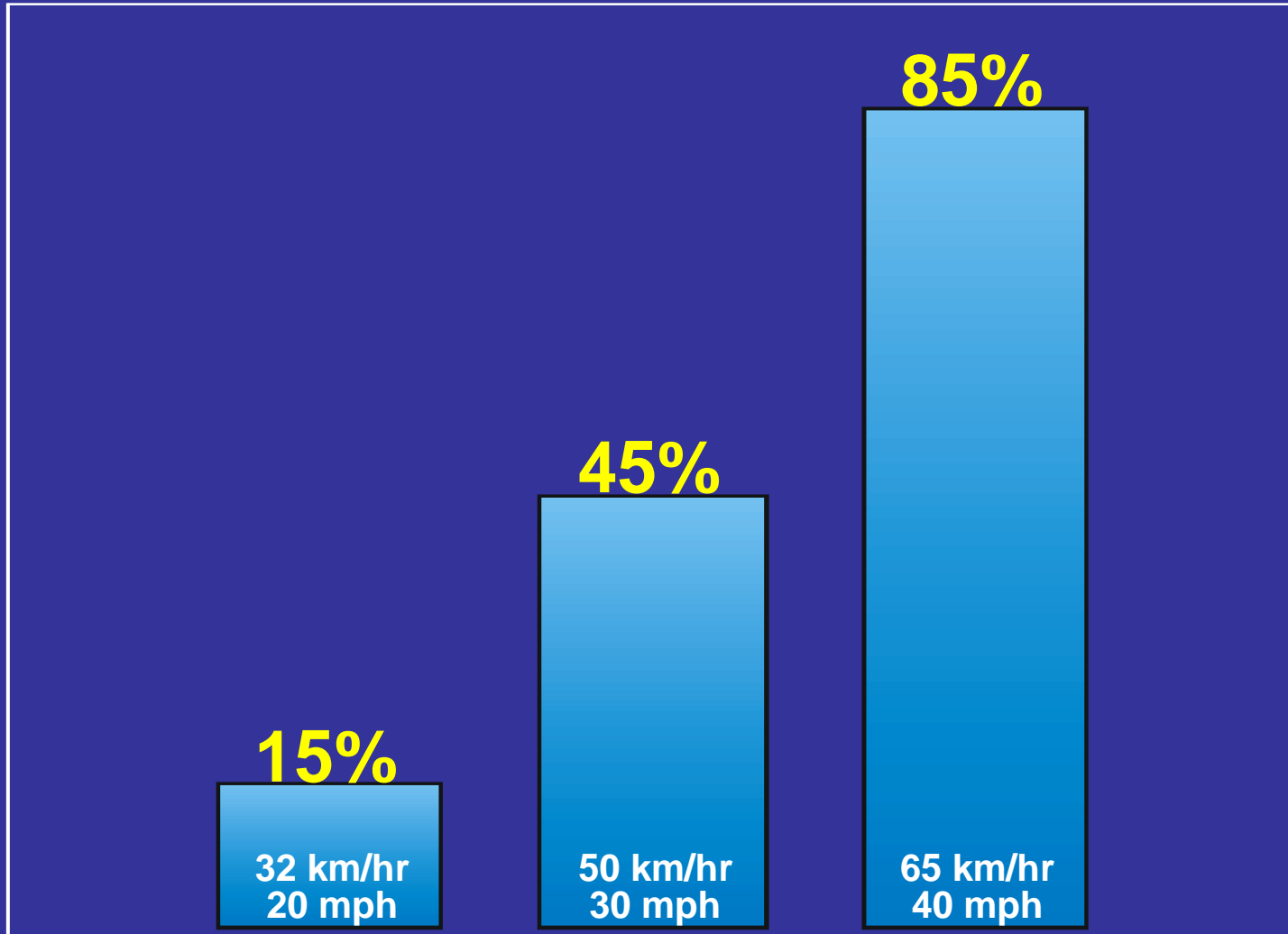
He said he never saw the woman and baby, who were legally in the crosswalk at the moment of impact. The child — a shy but happy tot — slammed into the pavement hard and was pronounced dead a short time later at Elmhurst Hospital, said police.

At the same time, construction worker Harold Basil, 51, was making a left turn onto the service road in his white van, cops said.

“They came from behind me and I made the turn and they hit the back wheel,” the anguished motorist said before retreating behind police lines to an emergency vehicle, where he leaned his head and cried.

Why Roundabouts Reduce Pedestrian Fatalities

Pedestrian's Probability of Death if Hit by Cars



Improving Traffic Safety

Reducing Deaths and Injuries through Safer Streets

Despite the gains that have been made in traffic safety programs in the U.S. over the last several decades through a crackdown on drunk driving, increased seatbelt usage, and the more widespread use of airbags, traffic crashes are still the leading cause of death for Americans between the ages of 4 and 33. In 2001, 42,116 Americans were killed in traffic collisions, up slightly from the 41,945 killed in 2000. Of those killed in 2001, 4,955 were pedestrians and 728 were bicyclists. These tragic deaths occurred even as states failed to spend nearly \$1 billion in federal funds specifically allocated for improving traffic safety. The reauthorization of the nation's surface transportation funding bill, TEA-21 offers a significant new opportunity to improve traffic safety and save lives.

In 2001, 42,116 Americans were killed and 3 million injured in traffic collisions.

States which are relatively safe for car drivers and passengers, may still be unsafe for the most vulnerable users of the transportation system – bicyclists and pedestrians. The state of Florida, for example, falls just about in the middle in its ranking for total traffic fatalities per 100,000 residents. But when pedestrians and bicyclists are broken out of those total numbers, Florida emerges as the most dangerous state in the country, with 3.73 bicyclists and pedestrians killed per 100,000 residents on an annual basis. This statistic is especially alarming given the 29 percent decline in bicycling and walking in that state over the last ten years.

Speed Kills

The National Highway Traffic Safety

A roundabout installed in Bradenton Beach, Florida, offers strong evidence of traffic calming's effectiveness. Where there had previously been one pedestrian fatality per year at the site, in the nine years following installation of the roundabout there have been no reported crashes, let alone fatalities or injuries of motorists, pedestrians, or bicyclists.

Pedestrian Injuries in UK

(Injury Rates per 100 Million Pedestrians)

Mini-Roundabouts	31
Small Roundabouts	33
Conventional (2 lane)	45
Large (2+ lane)	72
Traffic Signals	67

Pedestrian & Bike Safety of Modern Roundabouts

IIHS March 2000 Study

Before: 3 Pedestrian Injuries, 4 Bike Injuries

After: 1 Pedestrian Crash (minimal injury), 3 Bike Injuries

Not Statistically Meaningful

US Roundabouts with High Pedestrian Volumes

- Clearwater Beach Entry FL: Before 1.6 ped injuries per year
Built in 1999 2 bike injuries per year
After 0 ped injuries
0 bike injuries
- Towson, MD: Before 0.4 ped injuries per year
Built in 1998 **After 0.2 ped injuries per year**

Pedestrians @ Great Neck – Long Island



One of NYSDOT Newest Signals

April 22, 2005 / Page # _____

Times Union NY Times Newsday Post Daily News Daily Gazette
by Leader Herald

Man killed 2 weeks after stop light goes up

By JUSTIN MASON The Leader-Herald

BROADALBIN - A 93-year-old man was killed in a crash at a Route 29 intersection Thursday two weeks after the state installed a traffic light at the location.

Police said the man failed to stop for the traffic light.

The fatality comes in wake of a rash of accidents for years at the intersection. The accidents prompted local residents to lobby for changes at the intersection. Earlier this month, the state Department of Transportation installed a three-signal traffic light at the intersection, which was praised by village residents.

Given the speed of vehicles along Route 29, the DOT made many temporary and permanent warnings of the impending traffic signal, said Mike Sadekoski, a regional project engineer, who helped plan the changes at the intersection.

New NYSDOT Intersection Design Policy

Refer to Section 5.9.7 of this chapter for requirements to analyze roundabout alternatives when installing or modifying a signalized intersection. Guidance and requirements on the design of roundabouts is covered in the roundabout pages on the Department's Internet and IntraDOT sites. Roundabout design requires considerable experience and also incorporates many site-specific variables for optimal design.

The Roundabout Unit in the Main Office Design Services Bureau should be consulted during project scoping to ensure the latest layout, design, and construction techniques are utilized. Additionally, the Roundabout Unit should be consulted for guidance and assistance during development of the preliminary and advance detail plans.

Before deciding to build a new signalized intersection or make major improvements to an existing signalized intersection (e.g., reconfigure the intersection, major widening on more than one approach), the alternative of using a roundabout intersection is to be analyzed except where the location:

- Is within a well working coordinated signal system with acceptable accident histories.
- Is where signals will be installed solely for emergency vehicle preemption.
- Has steep terrain that makes providing an area, graded at 5% or less for the circulating roadways, infeasible.
- Has been deemed unsuitable for a roundabout by the Roundabout Design Unit.

When the analysis shows that a roundabout is feasible, it should be considered the Department's preferred alternative due to the proven substantial safety benefits and other operational benefits. When the analysis shows that a roundabout alternative is not feasible, a summary of the analysis should be sent to the Roundabout Design Unit if they have not been consulted in accordance with Section 5.9.1.4 of this chapter.

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