



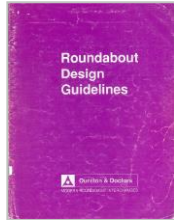
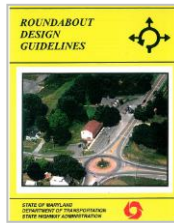
## Roundabouts: An Intersection Alternative Overview

# 607397 - ROUTE 6 AT MAIN STREET IN WELLFLEET

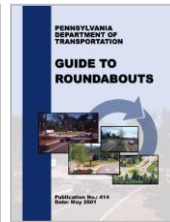
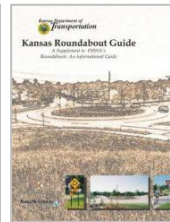
# RECENT U.S. HISTORY HAS BEEN ACTIVE...

NCHRP  
Report 672,  
MUTCD,  
HSM, HCM

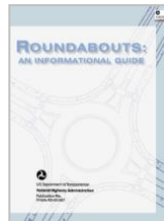
First Modern  
Use in U.S.



Maryland  
& Florida  
O&D Guides



Explosion of State  
Guides & Manuals



FHWA  
Roundabout  
Guide



NCHRP  
Report 572

1990

1993

1995

2000

2001

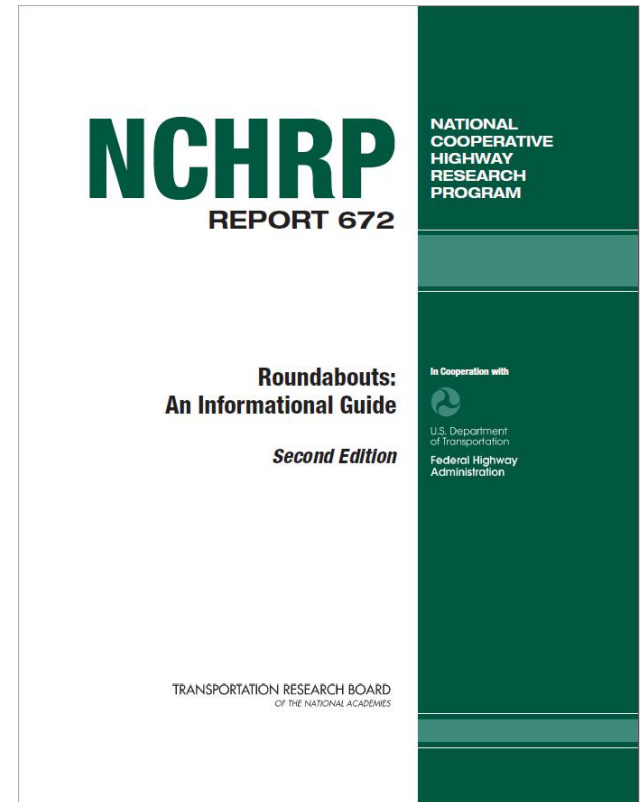
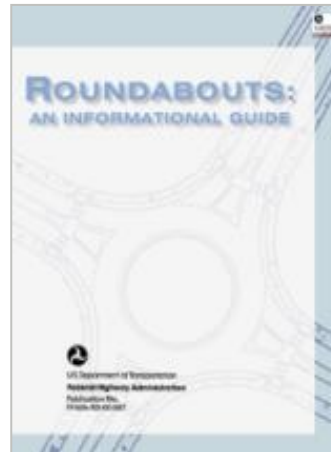
2007

2009

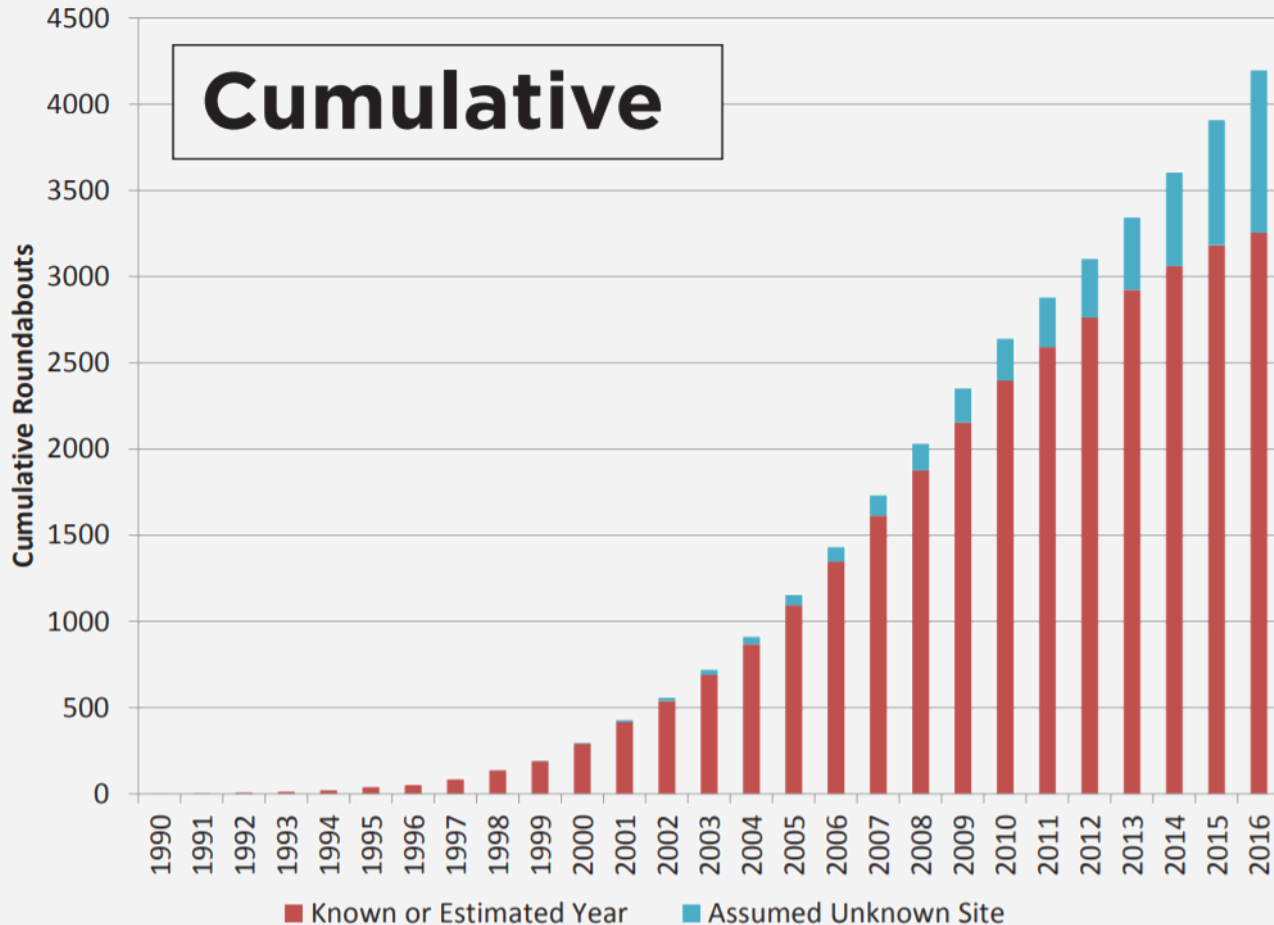
2010

# NCHRP REPORT 672: ROUNDBABOUTS: AN INFORMATIONAL GUIDE, 2ND EDITION

- Current “Roundabout Guide”
- Work conducted under NCHRP Project 3-65A
- Co-branded by FHWA
- Adopted by FHWA as update to 2000 edition by memorandum dated January 20, 2011

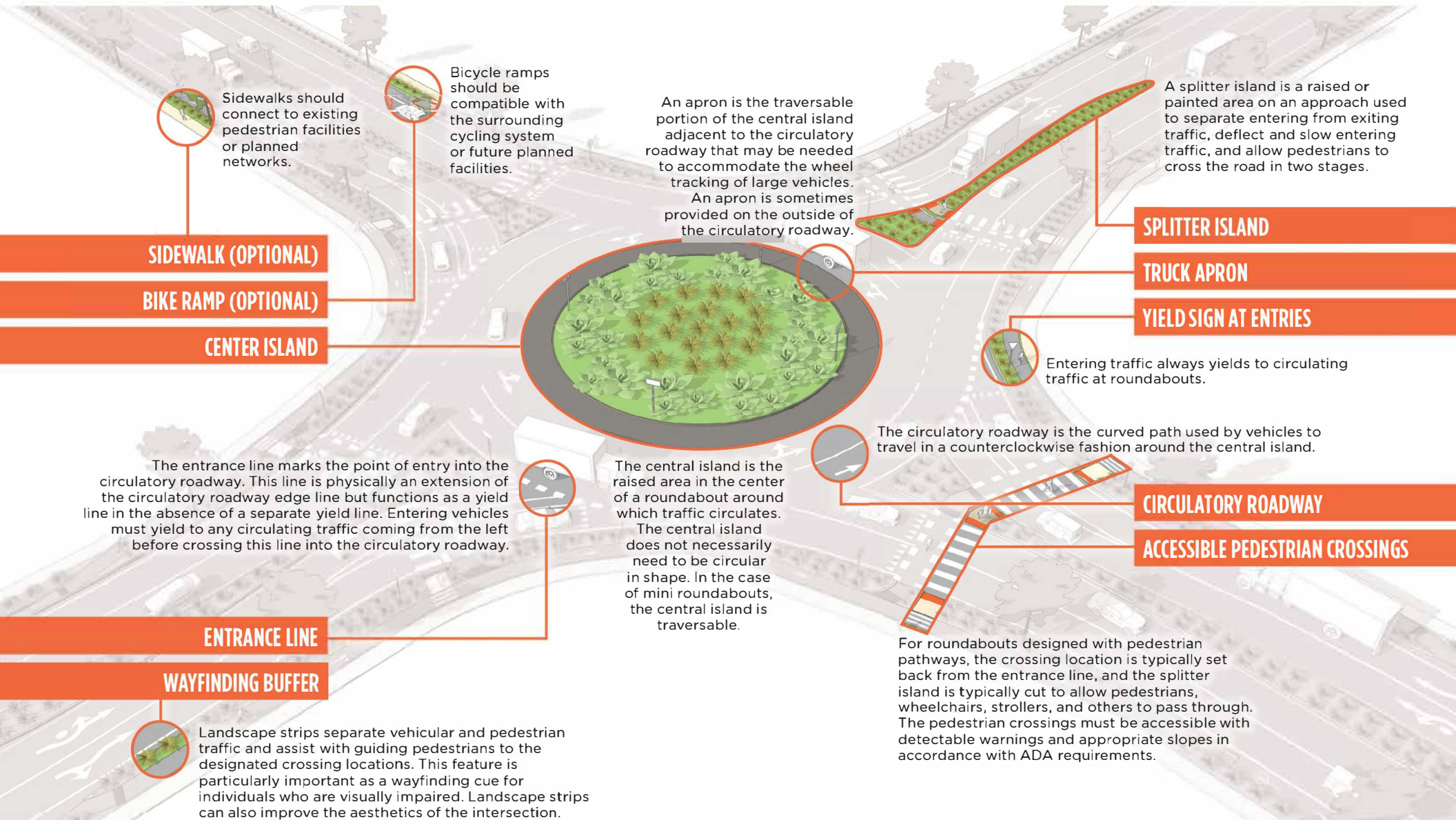


# NUMBER BUILT EACH YEAR IS GOING UP...

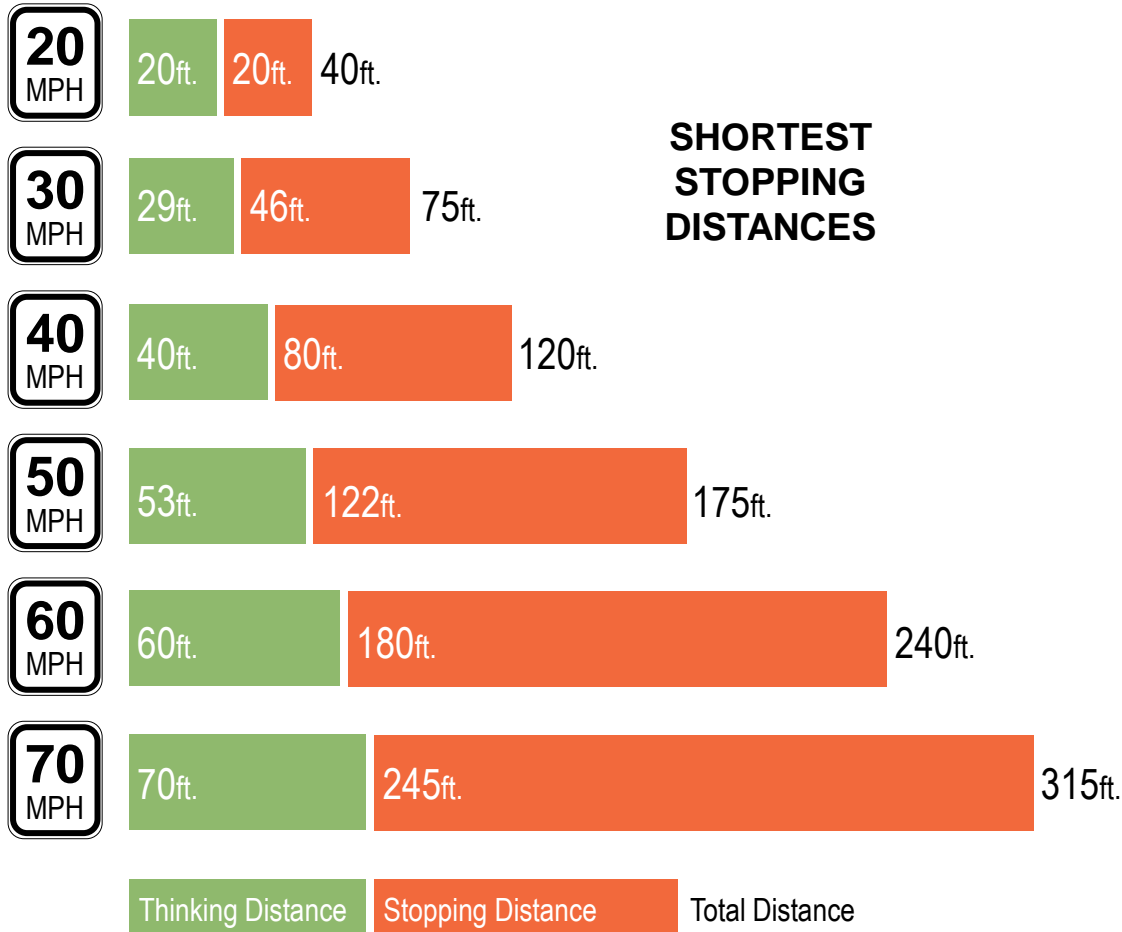


Based on database at [roundabouts.kittelson.com](http://roundabouts.kittelson.com)

# KEY ROUNDABOUT CHARACTERISTICS



# BENEFITS OF A ROUNDABOUT



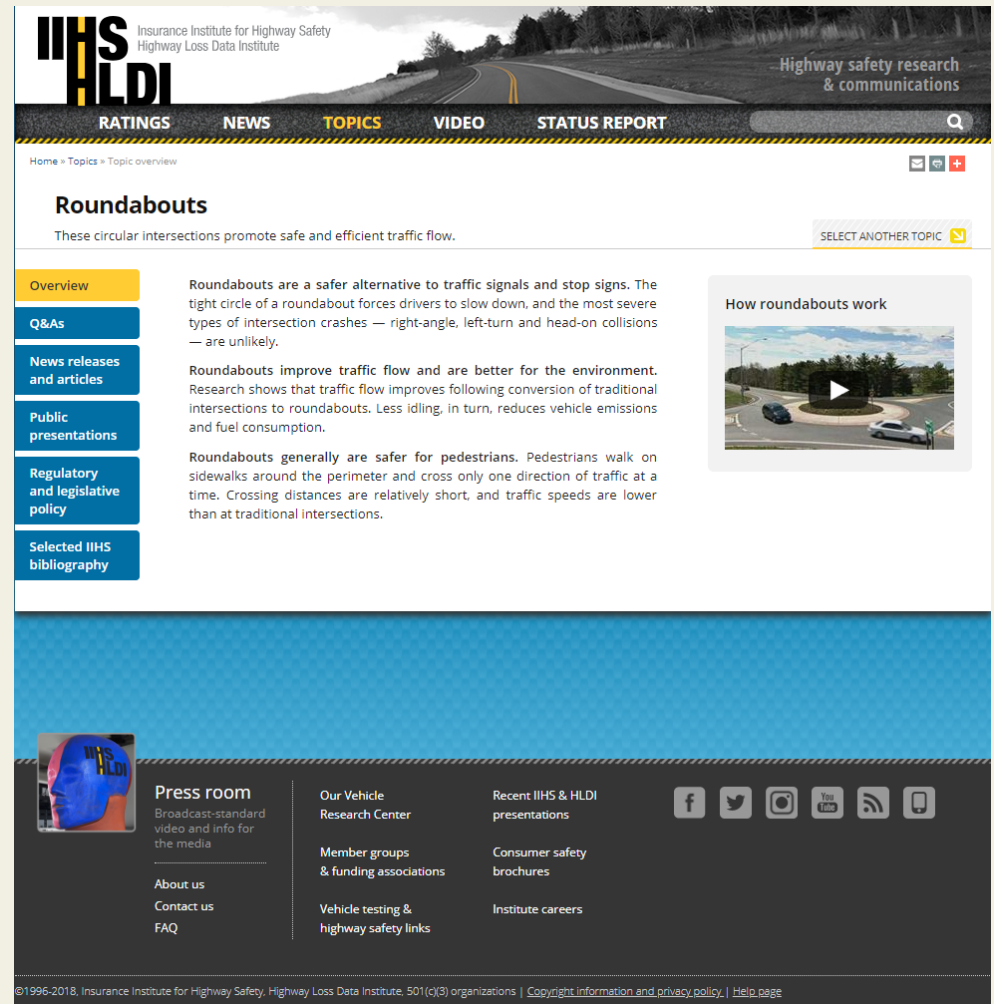
Source: Killing Speed Saving Lives

## Slower Vehicle Speeds (under 25 mph)

- Drivers have more time to judge and react to other cars or pedestrians
- Advantageous to older and novice drivers
- Reduces the severity of crashes
- Keeps pedestrians safer

# INSURANCE INSTITUTE FOR HIGHWAY SAFETY

*Roundabouts are a safer alternative to traffic signals and stop signs. The tight circle of a roundabout forces drivers to slow down, and the most severe types of intersection crashes — right-angle, left-turn and head-on collisions — are unlikely.*



The screenshot shows the IIHS website page for Roundabouts. The page features a navigation menu with options: RATINGS, NEWS, TOPICS, VIDEO, and STATUS REPORT. The main content area is titled "Roundabouts" and includes a sub-header "These circular intersections promote safe and efficient traffic flow." Below this, there is a sidebar with a list of categories: Overview, Q&As, News releases and articles, Public presentations, Regulatory and legislative policy, and Selected IIHS bibliography. The main text area contains three paragraphs: "Roundabouts are a safer alternative to traffic signals and stop signs. The tight circle of a roundabout forces drivers to slow down, and the most severe types of intersection crashes — right-angle, left-turn and head-on collisions — are unlikely." "Roundabouts improve traffic flow and are better for the environment. Research shows that traffic flow improves following conversion of traditional intersections to roundabouts. Less idling, in turn, reduces vehicle emissions and fuel consumption." "Roundabouts generally are safer for pedestrians. Pedestrians walk on sidewalks around the perimeter and cross only one direction of traffic at a time. Crossing distances are relatively short, and traffic speeds are lower than at traditional intersections." To the right of the text is a video player titled "How roundabouts work" with a play button icon. The footer of the page includes a "Press room" section with a video thumbnail, "Our Vehicle Research Center", "Member groups & funding associations", "Vehicle testing & highway safety links", "Recent IIHS & HLDI presentations", "Consumer safety brochures", and "Institute careers". Social media icons for Facebook, Twitter, Instagram, YouTube, RSS, and a mobile app icon are also present. The footer text reads: "©1996-2018, Insurance Institute for Highway Safety, Highway Loss Data Institute, 501(c)(3) organizations | Copyright information and privacy policy | Help page"

# BICYCLISTS AND PEDESTRIANS

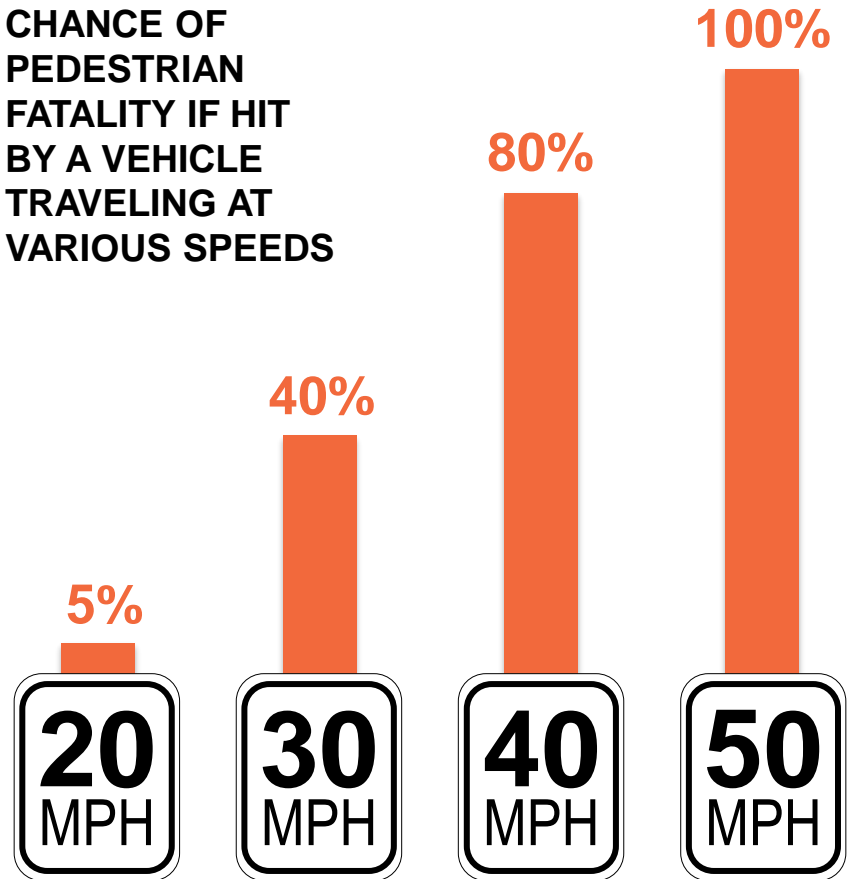
## FEATURES FOR ALL USERS

- Adding certain treatments at roundabouts can enhance the experience for both pedestrians and bicycles.

## LESS CONFLICT

- Roundabouts have fewer conflict points. A single lane roundabout has 50% fewer pedestrian-vehicle conflict points than a comparable stop or signal controlled intersection. Conflicts between bicycles and vehicles are reduced as well.

## CHANCE OF PEDESTRIAN FATALITY IF HIT BY A VEHICLE TRAVELING AT VARIOUS SPEEDS



Source: Leaf, W. A. and D. F. Preusser. Literature Review on Vehicle Travel Speeds and Pedestrian Injuries. Final Report DOT HS 809 021. National Highway Traffic Safety Administration, Department of Transportation, Washington, D.C., October 1999



# BENEFITS OF A ROUNDABOUT

## FEWER CONFLICT POINTS THAN SIGNALIZED INTERSECTIONS

**75%** fewer vehicle-to-vehicle conflict points

**67%** fewer vehicle-to-pedestrian conflict points

## LIVES SAVED

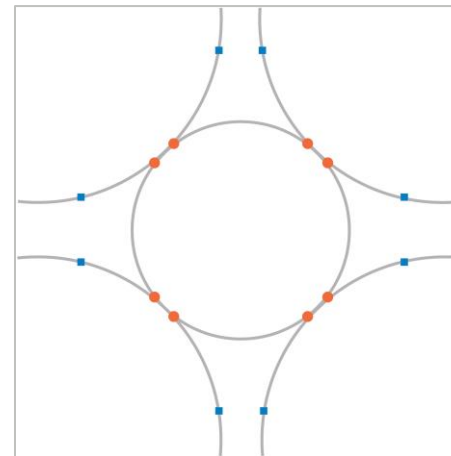
Up to **90%** reduction in fatalities

**76%** reduction in injury crashes

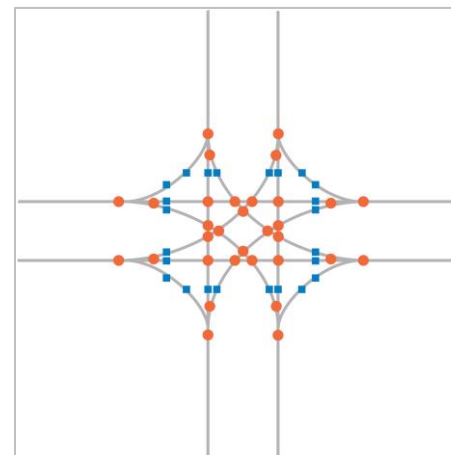
**30-40%** reduction in pedestrian crashes

**10%** reduction in bicycle crashes

## POSSIBLE CONFLICTS POINTS: ROUNDABOUT VS. 4-WAY INTERSECTION



- 8 Vehicle to Vehicle Conflicts
- 8 Vehicle to Pedestrian Conflicts

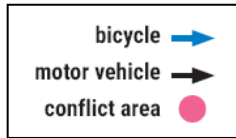


- 32 Vehicle to Vehicle Conflicts
- 24 Vehicle to Pedestrian Conflicts

This comparison assumes both intersections have single through lanes crossing the intersection.

# BICYCLES AT ROUNDABOUTS

## CHAPTER 4: INTERSECTIONS, EXHIBIT 4A



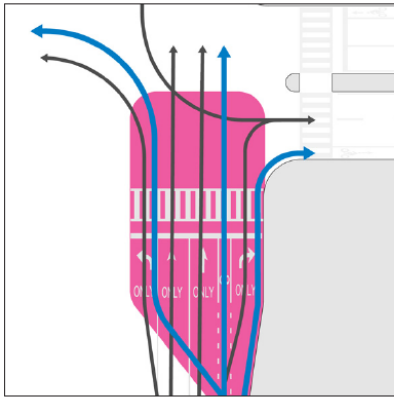
### MASSDOT SEPARATED BIKE LANE GUIDE



### COMPARISON OF BICYCLIST EXPOSURE AT INTERSECTIONS

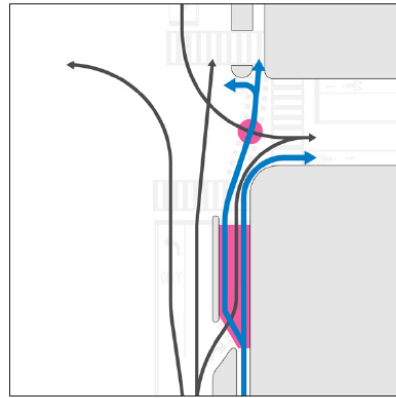
The diagrams on this page provide a comparison of the levels of exposure associated with various types of intersection designs.

Exposure Level:  
High



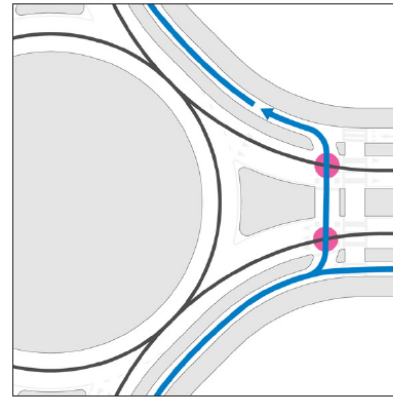
CONVENTIONAL BIKE LANES  
AND SHARED LANES

Exposure Level:  
High to Medium



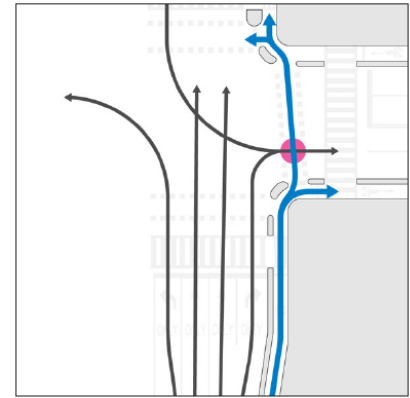
SEPARATED BIKE LANES WITH  
MIXING ZONES

Exposure Level:  
Medium to Low



SEPARATED BIKE LANES  
THROUGH ROUNDABOUTS

Exposure Level:  
Low



PROTECTED INTERSECTIONS

# BICYCLES AT ROUNDBABOUTS

Slower vehicle operating speeds make roundabouts safer and more comfortable for bicyclists



Bicyclists can either use the roundabout as a vehicle or use dedicated ramps to access the crosswalks



# BICYCLISTS AND PEDESTRIANS

## LOWER SPEED

Lower speed is associated with better yielding rates, reduced vehicle stopping distance, and lower risk of collision injury or fatality.

Also, the speed of traffic through a roundabout is more consistent with comfortable bicycle riding speed.



## SHORTER, SETBACK CROSSINGS

Pedestrians cross a shorter distance of only one direction of traffic at a time since the entering and exiting flows are separated. Drivers focus on pedestrians apart from entering, circulating and exiting maneuvers.



# OLDER DRIVERS AT ROUNDABOUTS

## AARP fact sheet supports roundabouts as safer for older drivers

- Require slower vehicle speeds
- Reduce collision severity
- Eliminate the need to make left turns in front of oncoming traffic

### Modern Roundabouts | A LIVABILITY FACT SHEET

Every day in the U.S. more than 20 people are killed at traffic intersections, and many more are seriously injured.<sup>1</sup>

Roundabouts — circular intersections that move traffic counterclockwise around a central island — can help reduce these deaths and injuries. Modern roundabouts are calmer and safer than conventional intersections and have been deemed a “proven safety counter-measure” by the U.S. Department of Transportation.<sup>2</sup>

Roughly the size of a baseball field, modern roundabouts differ from rotaries or traffic circles, which can be as big as the stadium itself. Roundabouts feature lower, safer vehicle speeds. They can be 80 feet across with single lanes carrying 25,000 vehicles a day or larger at 200 feet, with double lanes and 45,000 vehicles a day.<sup>3</sup>

Personal injuries and fatalities plummet as much as 90 percent in modern roundabouts when compared to conventional intersections.<sup>4</sup> Roundabouts cause drivers to slow down, ideally to less than 20 mph, which reduces the risks to both pedestrians and drivers.

Because roundabouts can handle 30 to 50 percent more traffic than conventional intersections, they reduce travel delays.<sup>5</sup> Since roundabouts can be designed to be aesthetically pleasing, they help create a sense of place.

By January 2014, roundabouts graced more than 2,000 intersections in the U.S., with more planned.<sup>6</sup> Given their safety and placemaking benefits, roundabouts should be considered for many more of the three million intersections in the U.S.

**Modern roundabouts are calmer and safer than conventional intersections and have been deemed a “proven safety counter-measure” by the U.S. Department of Transportation.**



Vehicle speeds on Grandview Drive in University Place, Wash., often reached or exceeded 50 mph. After the installation of modern roundabouts, vehicle crashes dropped from one every nine months to zero in 14 years.

# EMERGENCY VEHICLES IN ROUNDABOUTS

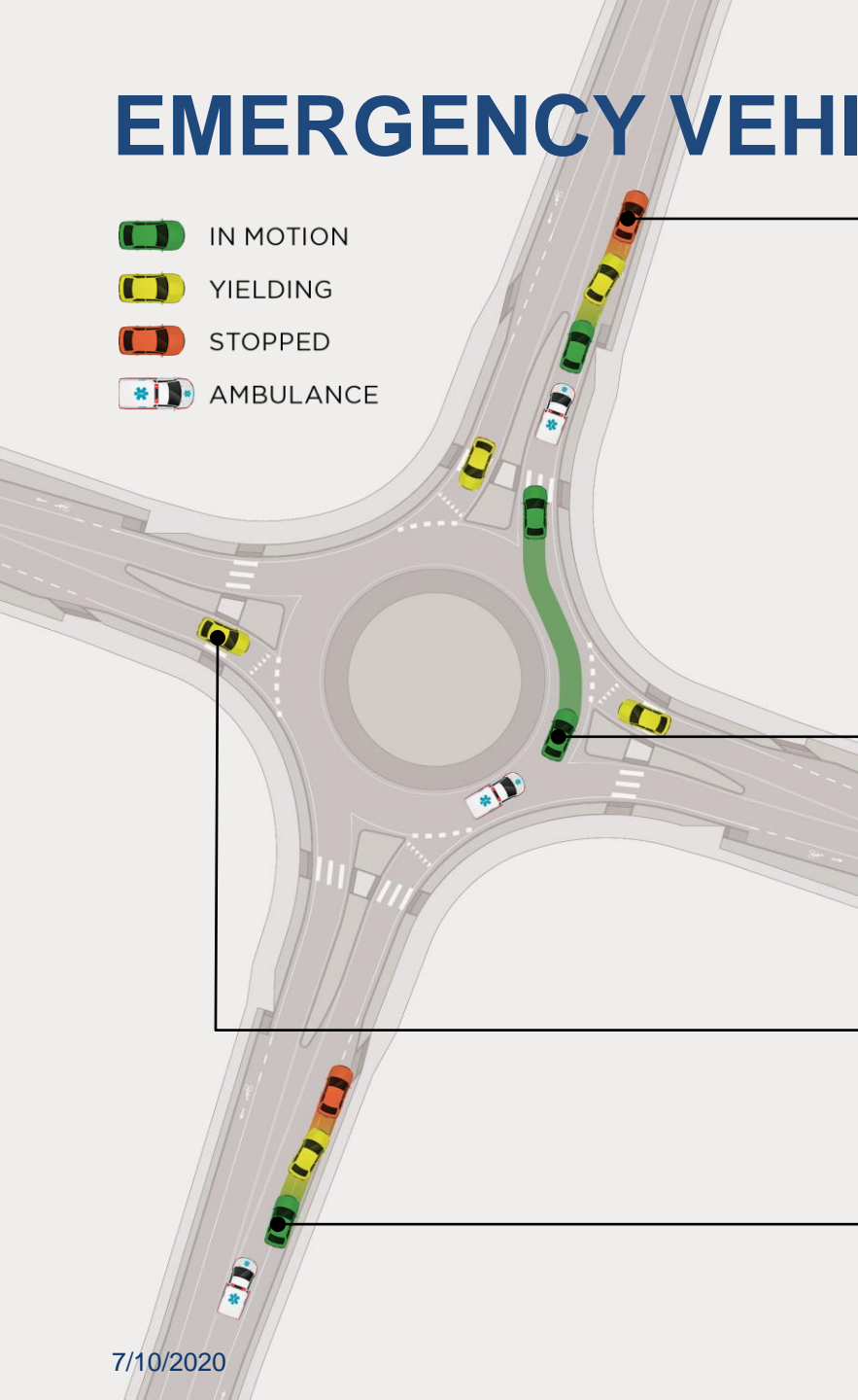
Benefit of lower vehicle speeds and never having to run through a red traffic signal

Truck apron can be used by larger vehicles or to bypass a disabled vehicle



# EMERGENCY VEHICLES

-  IN MOTION
-  YIELDING
-  STOPPED
-  AMBULANCE



After you exit the roundabout, drive past the median island, pull over to the right, and stop so the emergency vehicle can safely pass.

If you are already in the roundabout, do not stop, continue to the nearest exit, drive past the median island and pull over to the right.

Do not enter a roundabout when an emergency vehicle is approaching from another direction.

Prior to reaching the roundabout median island, pull over to the right so the emergency vehicle can pass.

# EMERGENCY RESPONSE

FHWA Roundabout Video (8 min)

<http://safety.fhwa.dot.gov/intersection/roundabouts/>

Fire trucks using roundabouts (21 sec)

<https://youtu.be/e-XBEaV6CSw>

Fire Chief for Clearwater Florida demos emergency use of roundabouts (23 sec)

[https://youtu.be/N4AY\\_R\\_6bZl](https://youtu.be/N4AY_R_6bZl)

Fire truck roundabout - directly through intersection (28 sec)

<https://youtu.be/P47DQwGsnGk>



# FIRST RESPONDERS



## EMERGENCY RESPONSE TIMES

At any intersection, traffic conditions vary throughout the day. Roundabouts can improve travel times by eliminating unnecessary stops and delays during the course of a day.

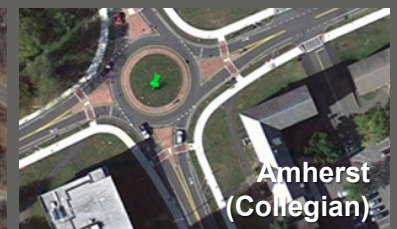
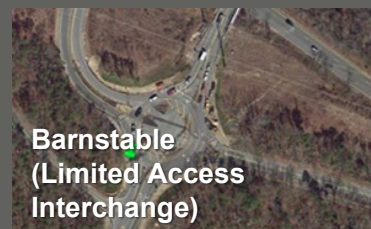
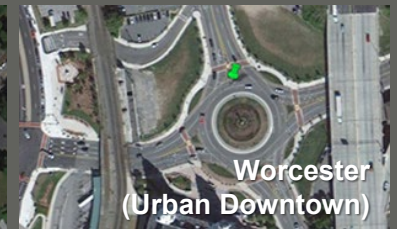
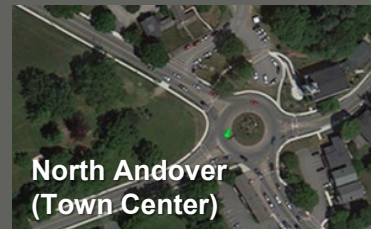
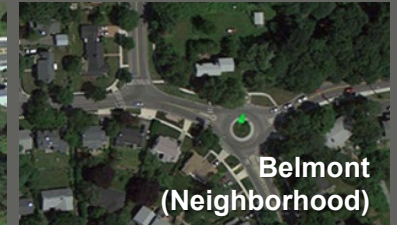
# ROUNDAABOUTS IN MASSACHUSETTS

**147 CIRCULAR INTERSECTIONS**

**113**  
Rotaries

**34**  
Roundabouts

## ROUNDAABOUTS LOCATED IN MANY DIFFERENT CONTEXTS



# ROUNDBABOUTS IN CLOSE PROXIMITY TO A FIRE STATION

Nantucket



# ROUNDBABOUTS IN TOURIST / SEASONAL DESTINATIONS

## Oak Bluffs



# CONVERTING TRAFFIC SIGNALS TO ROUNDABOUTS

Amherst, MA - 2011



# CONVERTING TRAFFIC SIGNALS TO ROUNDABOUTS

Hudson, MA - 2013



# ROUNDBABOUTS VS. ROTARIES

- ROTARY
- ROUNDABOUT

No lane changes are needed within the roundabout

Maximum speed



# ROTARY TO ROUNDABOUT CONVERSION

