The Case for Roundabouts

TRB National Roundabout Conference

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INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

Delays at red lights getting longer

Wall Street Journal, June 13, 2000

Stopped at a Light? Why Not Read This, You May Have Time

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As Red Signals Grow Longer, Northern Virginia Tries An Experimental Speedup

By Anna Wilde Mathews
Staff Reporter of The Wall Street Journal

FAIRFAX COUNTY, Va.—At the corner of Fairfax County Parkway and Fair Lakes Parkway, drivers see red.

Major intersection problems

- Traffic congestion and delays
- Vehicle emissions

Major intersection problems

- Wide streets
- Long crossing distances

Major intersection problems

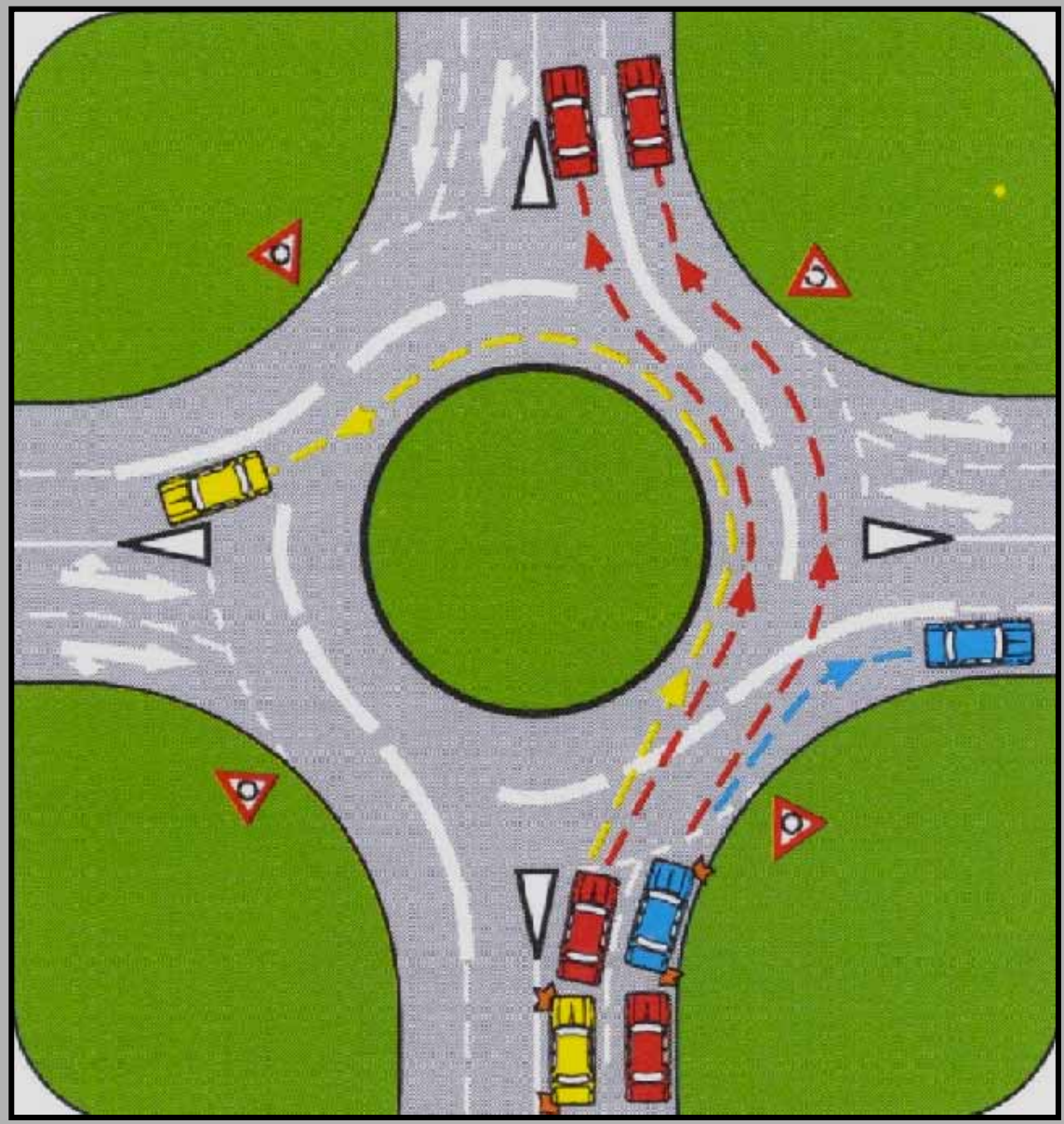
- Crashes and injuries
- Traffic signals encourage speeding

Intersection crashes

U.S. 2003

- More than 2.5 million crashes occurred at intersections
- 8,659 fatal crashes
- These represent 41 percent of all crashes, 46 percent of all injury crashes, and 23 percent of all fatal crashes

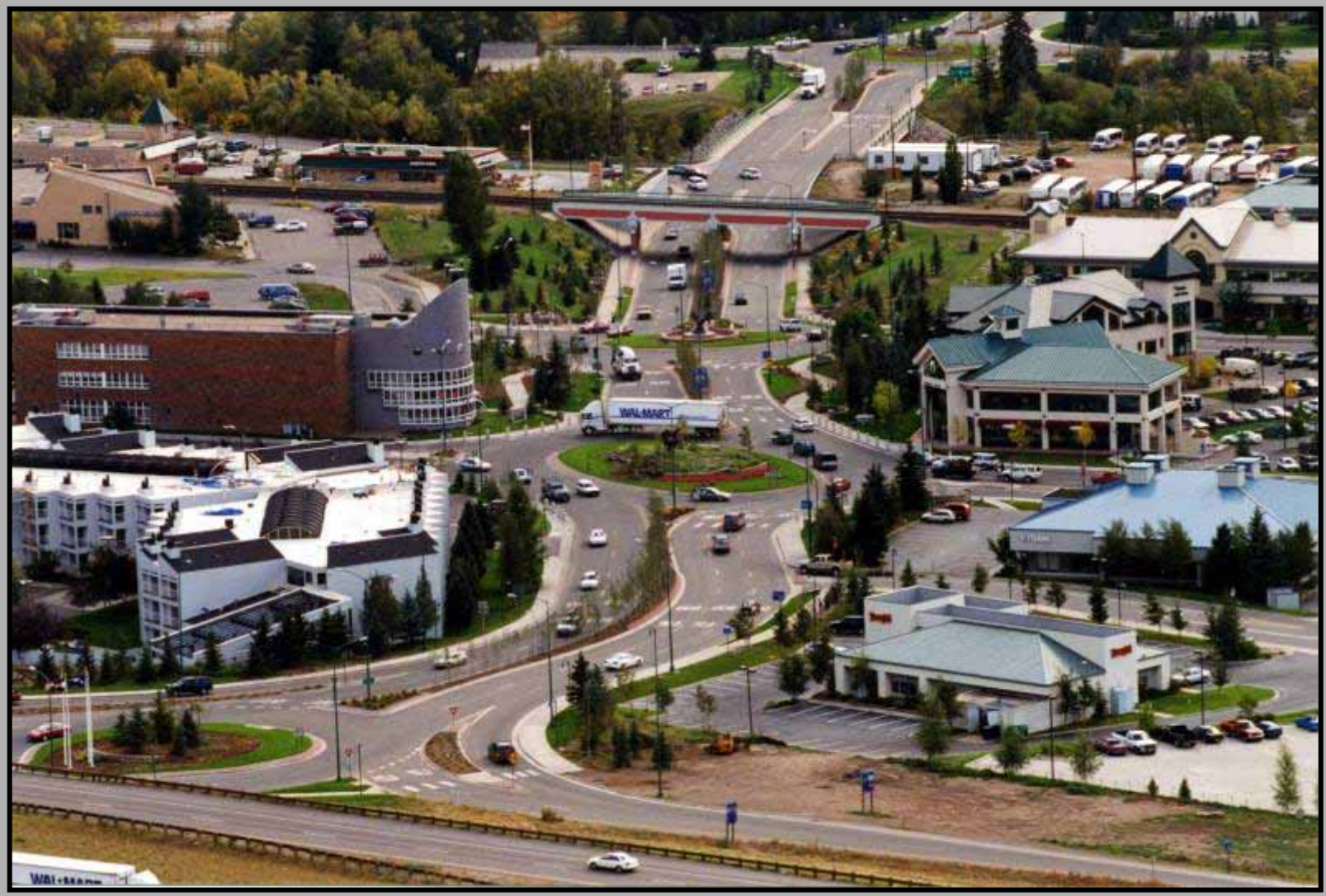
Roundabouts can help address these problems



Rural

Suburban

Urban



Simple

Complex

Benefits of modern roundabouts

- Traffic flow: reduce delay, decrease fuel consumption and air pollution
- Safety: significantly reduce injury crashes
- Maintenance: eliminate maintenance and electricity costs associated with traffic signals (approximately $3,000 per year)
- Aesthetics: central island provides opportunity for landscaping

Pedestrians and roundabouts

- Available research suggests that roundabouts can provide a relatively high degree of safety for pedestrians compared with stop sign and traffic signal control

Pedestrians and roundabouts

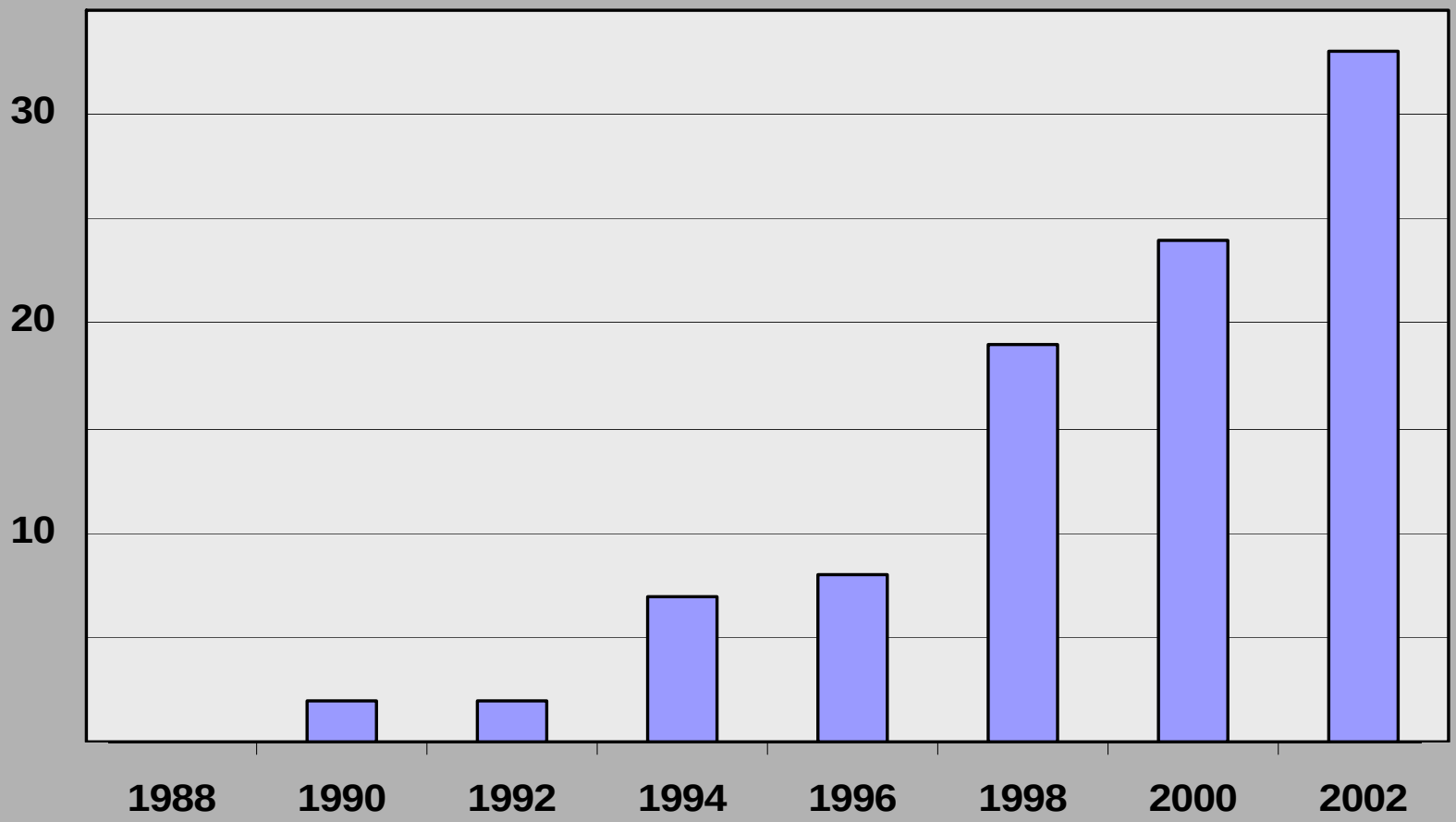
- For single-lane roundabouts, the number of pedestrian crashes is about 3-4 times less than for comparable signalized intersections
- For multi-lane roundabouts, the number of pedestrian crashes is about the same as for comparable signalized intersections
- The severity of pedestrian crashes is lower for roundabouts than for other forms of traffic control

Advantages for pedestrians

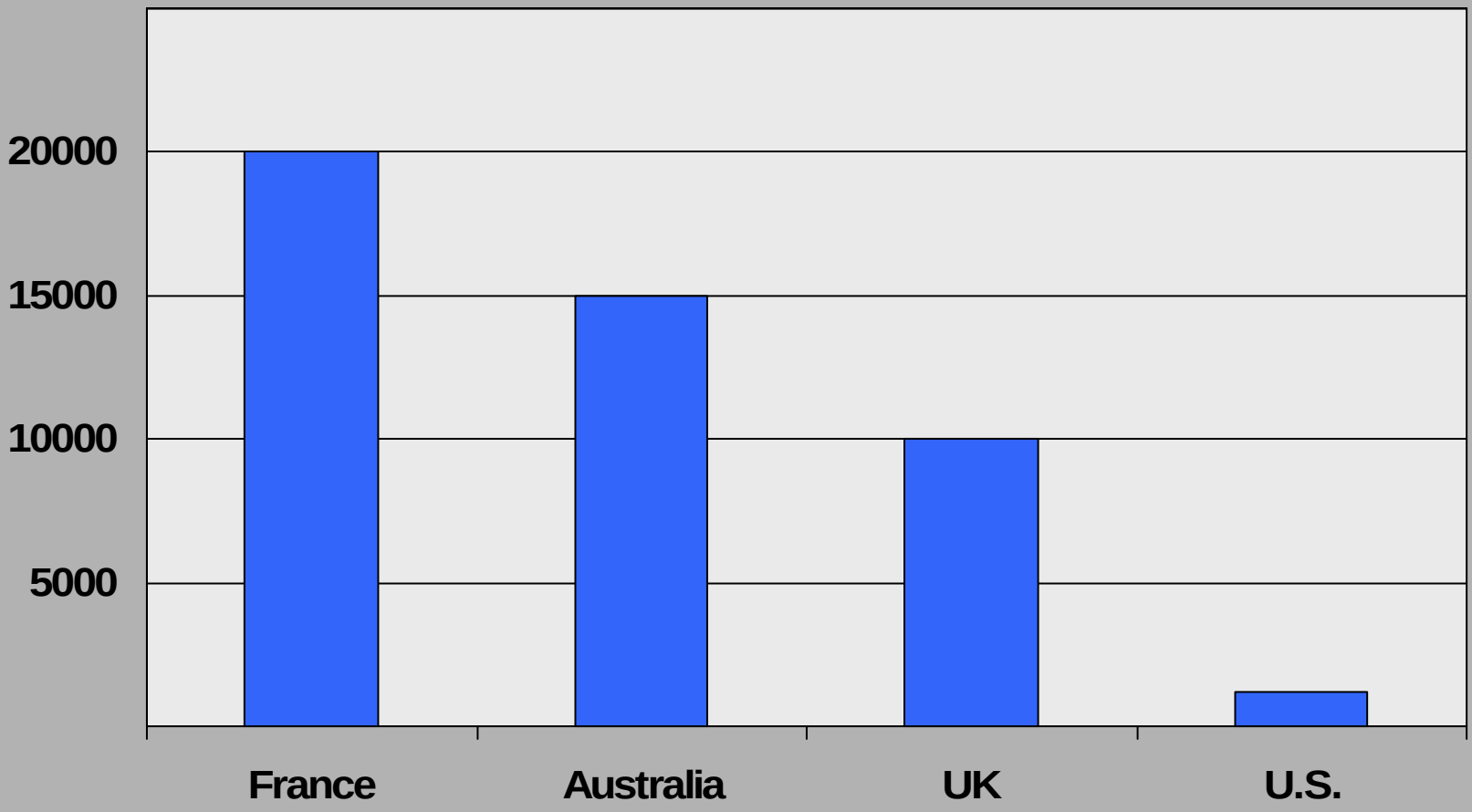
- Traffic speeds within roundabouts are very low – typically 15-20 MPH
- Refuge islands provide for short crossing distances
- Roundabouts are simple intersections, which eliminate left-turns, right-turns, and associated conflicts common at conventional intersections

Number of roundabouts constructed by transportation departments in 9 states

CA, CO, FL, KS, MD, NV, NY, OR, WA



Estimated number of roundabouts



Impediments to construction of roundabouts

- Relatively new in the United States, so there has been some reluctance to apply them
- Questions about relevance of international research and design practices to U.S. experience

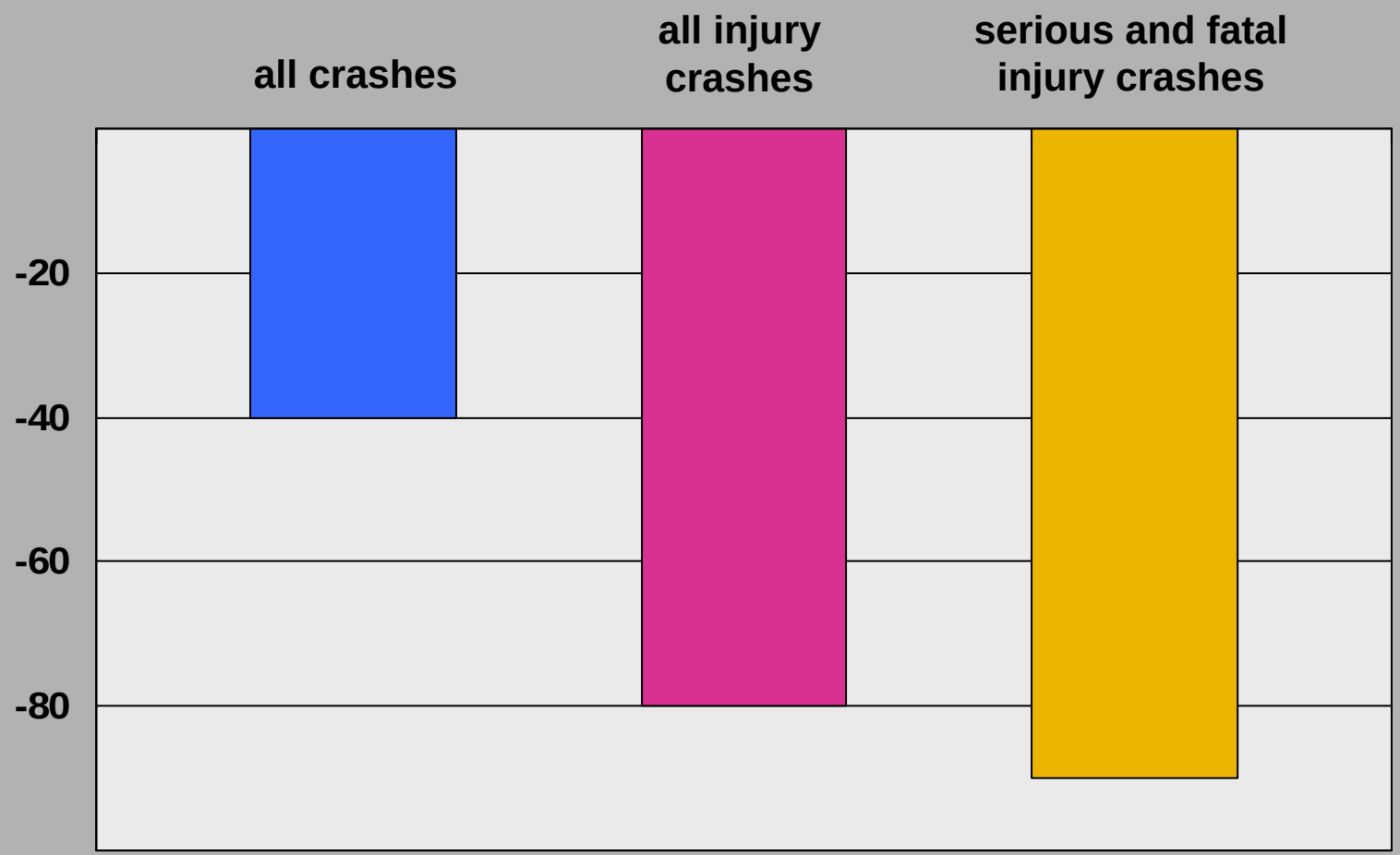
- Opposition among some local residents and elected officials

Purposes of IIHS roundabout research

- Estimate crash reductions associated with roundabouts compared to stop signs and traffic signals
- Evaluate impact of roundabout conversions on traffic flow and public opinion

Percent reductions in crashes associated with roundabouts at 23 U.S. intersections

2001



IIHS

Initial evaluation of public opinion and traffic flow

2002

- 3 intersections converted from stop signs to roundabouts in Kansas, Maryland, and Nevada
- Phone surveys and field observations before and after roundabout construction
- Roundabouts reduced traffic congestion, vehicle delays, and proportion of vehicles that stopped
- Significant increase in public support for roundabouts after construction

Follow-up evaluation of public opinion and traffic flow

2004

- 3 intersections converted to roundabouts from traffic signals and stop signs
- Study sites in New Hampshire, New York, and Washington
- Roundabouts completed in 2004

Intersection with stop sign converted to roundabout

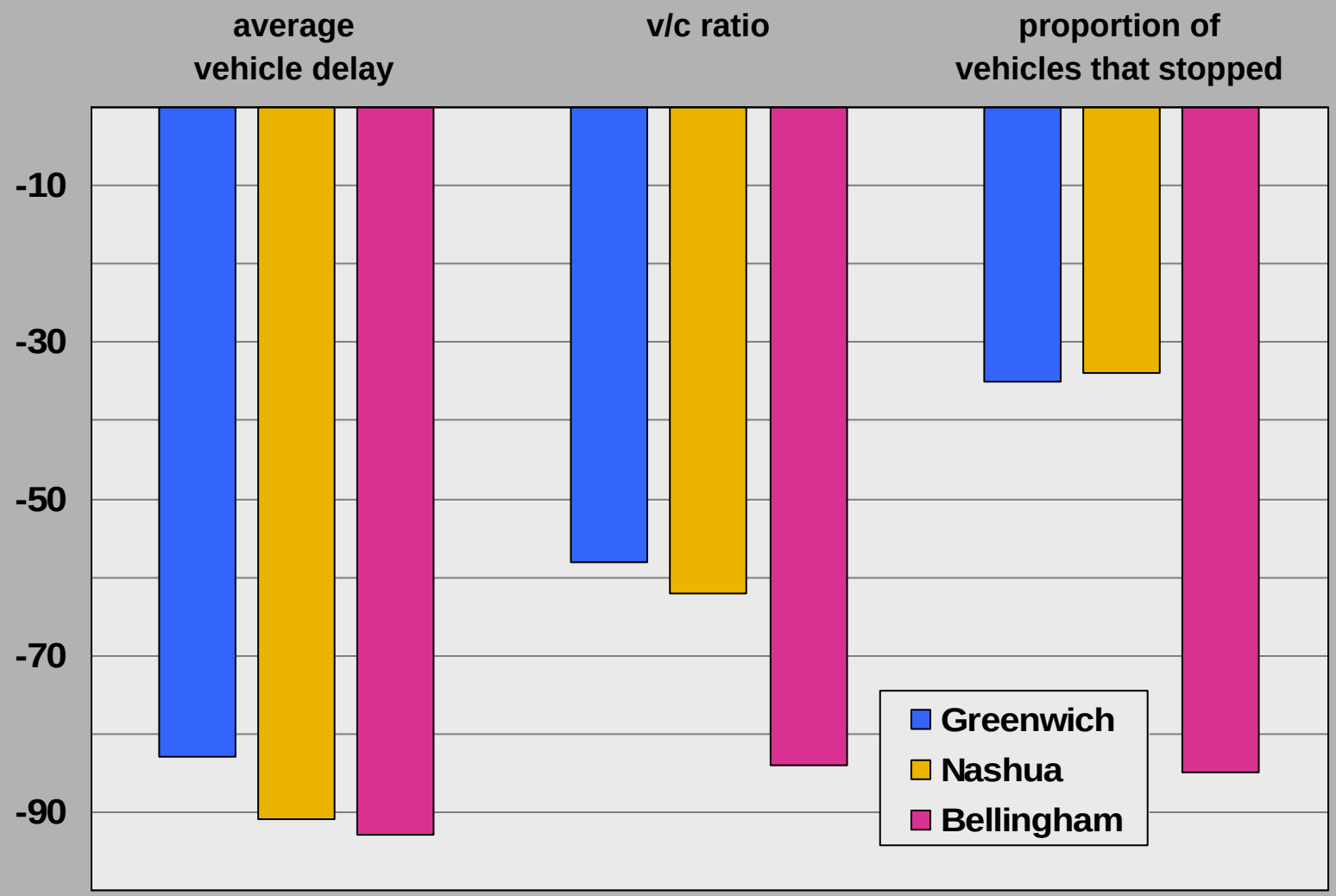
Nashua, NH

Intersection with traffic signal converted to roundabout

Greenwich, NY

Intersection with
4-way stop sign
converted to roundabout
Bellingham, WA

Percent reductions in delay



IIHS study to identify benefits of roundabouts

- Identified 10 intersections in Northern Virginia where
  - new traffic signals were installed within past 5 years or
  - intersections with traffic signals were substantially modified by widening or other changes

Recently modified intersection

Route 123 at Lee Chapel Road in Fairfax Station, Virginia

New traffic signal

Roberts Road at New Guinea Road in Burke, Virginia

Expected effects of roundabouts on traffic flow compared with signal lights

Northern Virginia

- Average 62% to 74% reduction in vehicle delays
- Vehicle delays reduced by about 325,000 hours annually
- Fuel consumption and emissions reduced by about 235,000 gallons annually

Expected effects of roundabouts on crashes and injuries compared with signal lights

Northern Virginia

- Could have prevented an estimated 62 crashes, including 41 injury crashes, between 1999 and 2003 at 5 intersections
- Estimates based on N.Y. Department of Transportation study (2004) that found 37% fewer crashes and 75% fewer injury crashes from conversion to roundabouts

How can we accelerate construction of roundabouts?

Land development

Critical opportunity to construct roundabouts

Advantages of constructing roundabouts as part of land development

- Developer pays construction cost
- Cost of roundabout is less than traffic signal
- Landscaping opportunities
- Avoids expense and controversy of conversion to roundabouts later, after conventional intersections have been built

Roundabout constructed as part of land development

Nokesville, Virginia

Roundabout constructed as part of land development

Reno, Nevada

Continued involvement of TRB

- Regional conferences
- Domestic scanning tours
- Technical publications and special reports
- Visibility on Annual Meeting program

Increased involvement of professional organizations

- AASHTO
- ITE
- ASCE
- NACE
- APA

Increased Federal role

- Instructional courses in roundabout design
- Financial incentives for building roundabouts
- Encourage use of CMAQ and highway safety funds for roundabouts
- FHWA regional and state offices should actively promote roundabouts

Engage environmental advocates

- Air quality
- Fuel conservation
- Fewer traffic lanes, less road widening = more trees
- Landscaping opportunities
- Less electricity consumed by traffic signals

For more information:

www.iihs.org

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