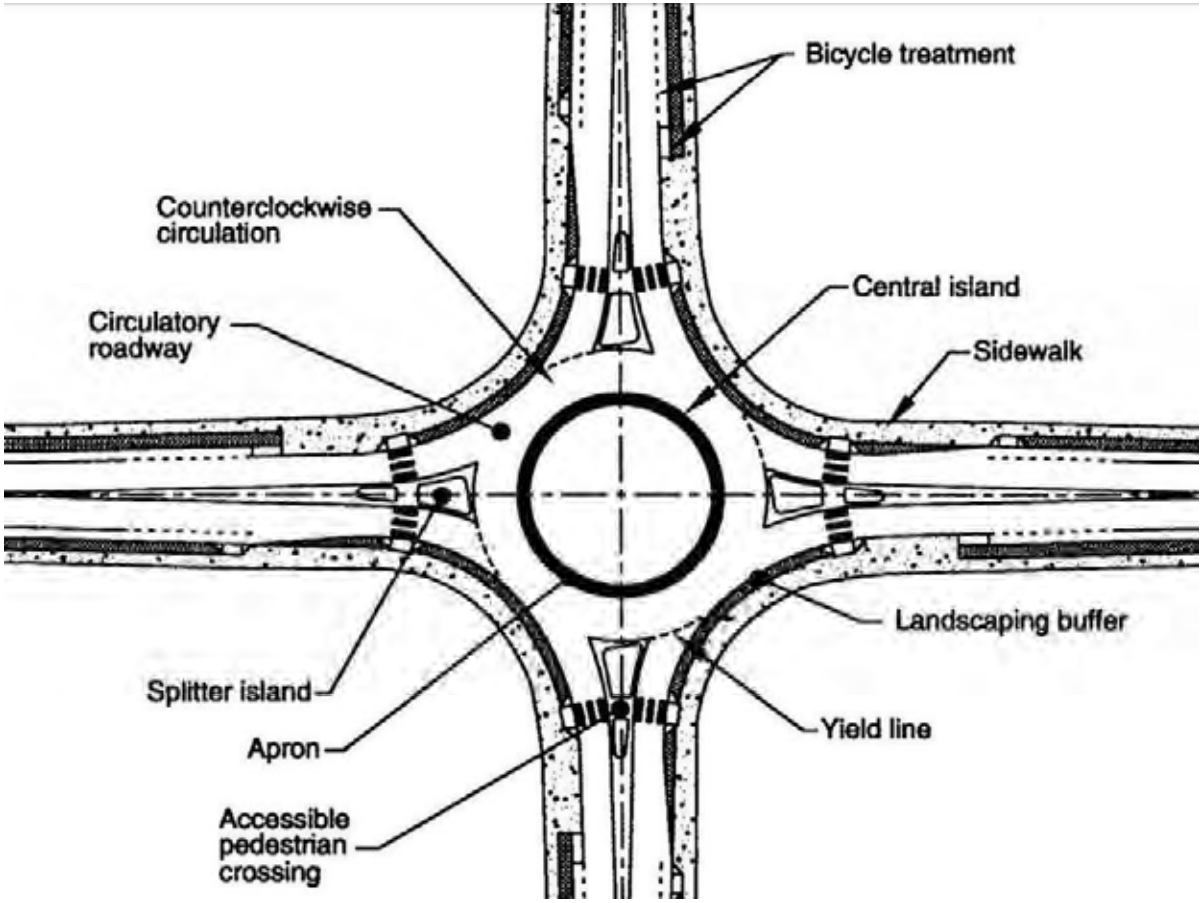
Modern Roundabouts: State of the Practice

TexITE 2010 Summer Meeting

Gary W. Schatz, P.E., PTOE
Austin Transportation Department

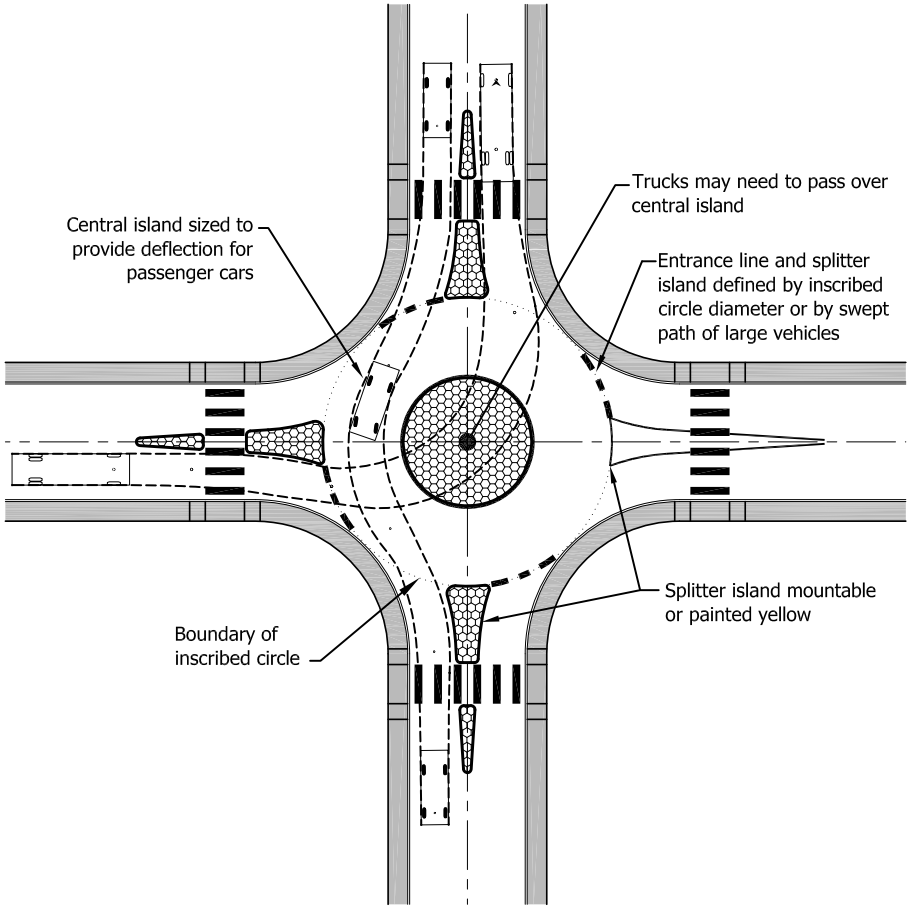
June 18, 2010

Modern Roundabout



From *Roundabouts: An Informational Guide*, Federal Highway Administration, 2000

Mini Roundabout

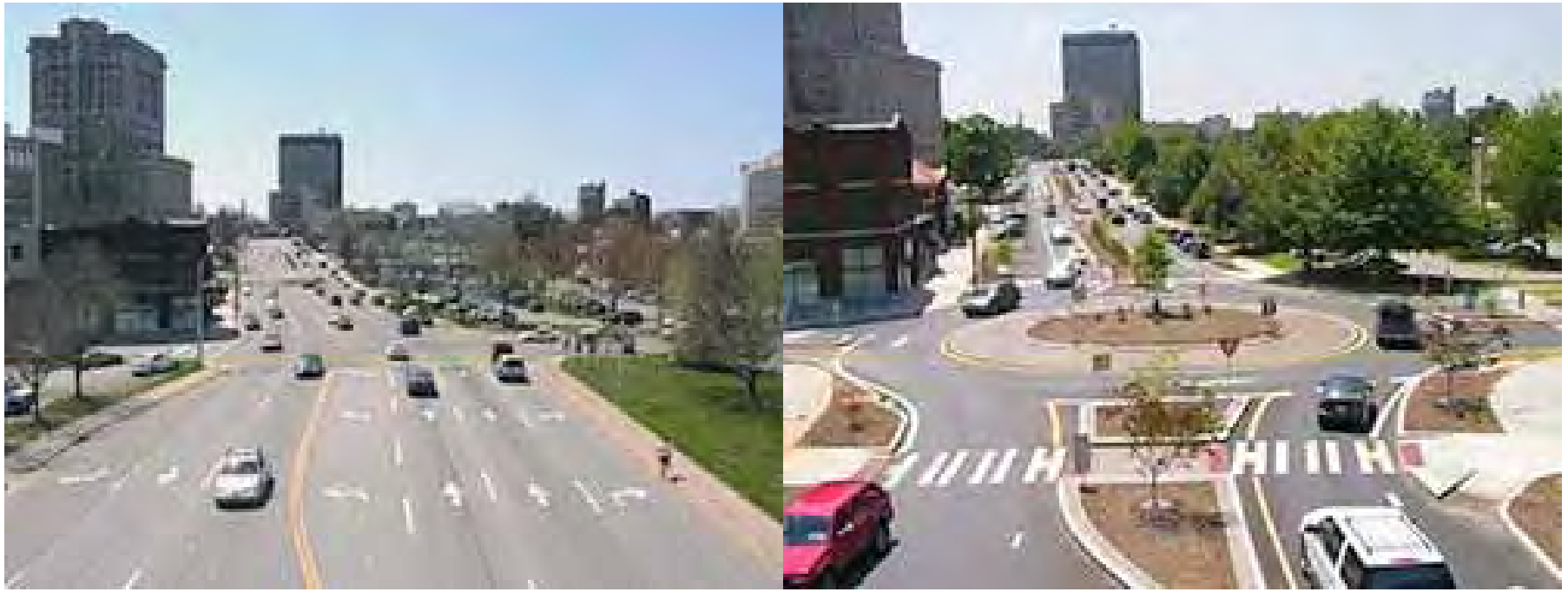


From *Mini-Roundabouts Technical Summary*, Federal Highway Administration, 2010

Advantages of Modern Roundabouts

- Safer than traditional intersections
- Efficient (high capacity/low delay)
- Serves all roadway users
- Geometric flexibility
- Gateways or focal points

Modern Roundabouts in Service



College Street – Asheville, North Carolina
(Images from www.iihs.org)

Modern Roundabouts in Service

Dunning Street (SR 9) – Malta, New York
(Image from Google Earth)

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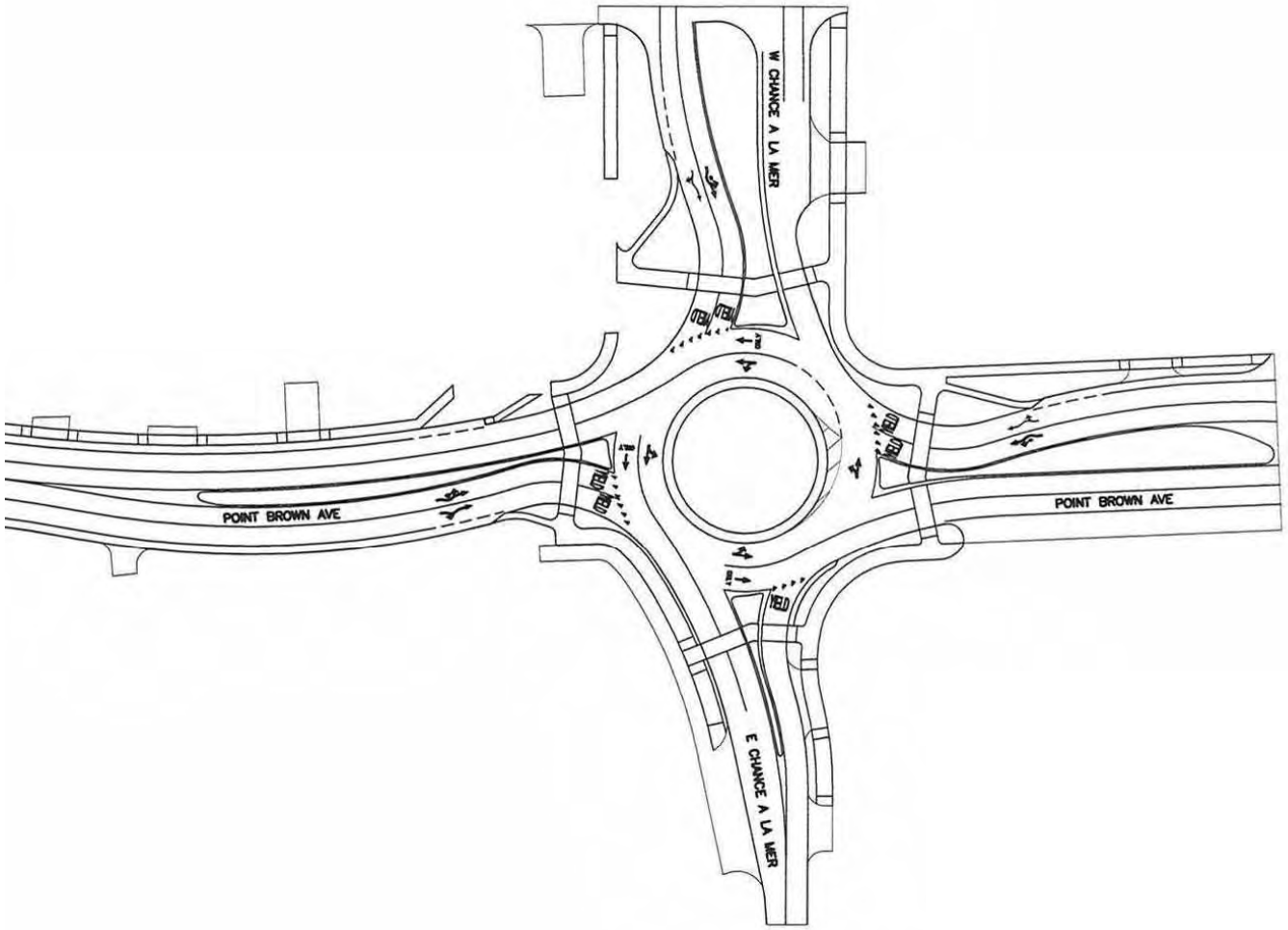
Modern Roundabouts in Service

Tester Road Roundabout – Monroe, Washington (Before)
(Image courtesy of Reid Middleton)

Modern Roundabouts in Service

Tester Road Roundabout – Monroe, Washington (After)
(Image courtesy of Reid Middleton)

Modern Roundabouts in Service

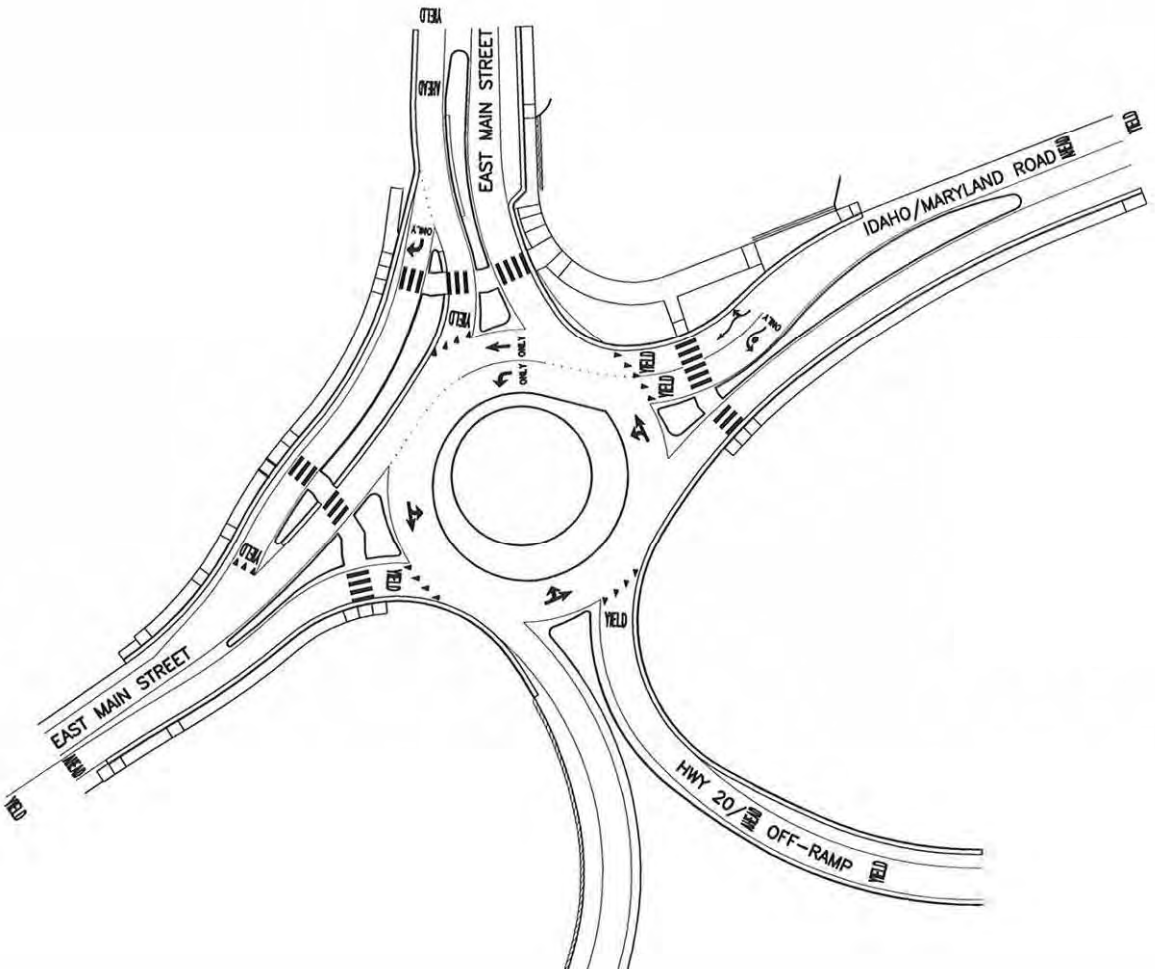


Point Brown @ Chance a la Mer Roundabout – Ocean Shores, Washington
(Image courtesy of Reid Middleton)

Modern Roundabouts in Service

Point Brown @ Chance a la Mer Roundabout – Ocean Shores, Washington
(Image courtesy of Reid Middleton)

Modern Roundabouts in Service



East Main/Idaho/Maryland Road/SH 20 Ramps Roundabout – Grass Valley, California
(Image courtesy of Reid Middleton)

Modern Roundabouts in Service

East Main/Idaho/Maryland Road/SH 20 Ramps Roundabout – Grass Valley, California
(Image courtesy of Reid Middleton)

Modern Roundabouts in Service

Cordata Parkway & Westerly Roundabout – Bellingham, Washington
(Image courtesy of Reid Middleton)

Modern Roundabouts in Service

Jefferson/Webb/Coffey Roundabout – Daingerfield, Texas (Before)
(Image courtesy of Brown & Gay, Inc.)

Modern Roundabouts in Service

Jefferson/Webb/Coffey Roundabout – Daingerfield, Texas (After)
(Image courtesy of Brown & Gay, Inc.)

Modern Roundabouts in Service

US 2 & US 302 Roundabout – Montpelier, Vermont
(Image courtesy of City of Montpelier, Vermont)

Modern Roundabouts in Service

SH 110 & US 302 Roundabout – East Barre, Vermont

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Modern Roundabouts in Service

Roundabout at Cotton Elementary School – San Antonio, Texas
(Image from Google Earth)

Modern Roundabouts in Service

Roundabout at Cotton Elementary School – San Antonio, Texas

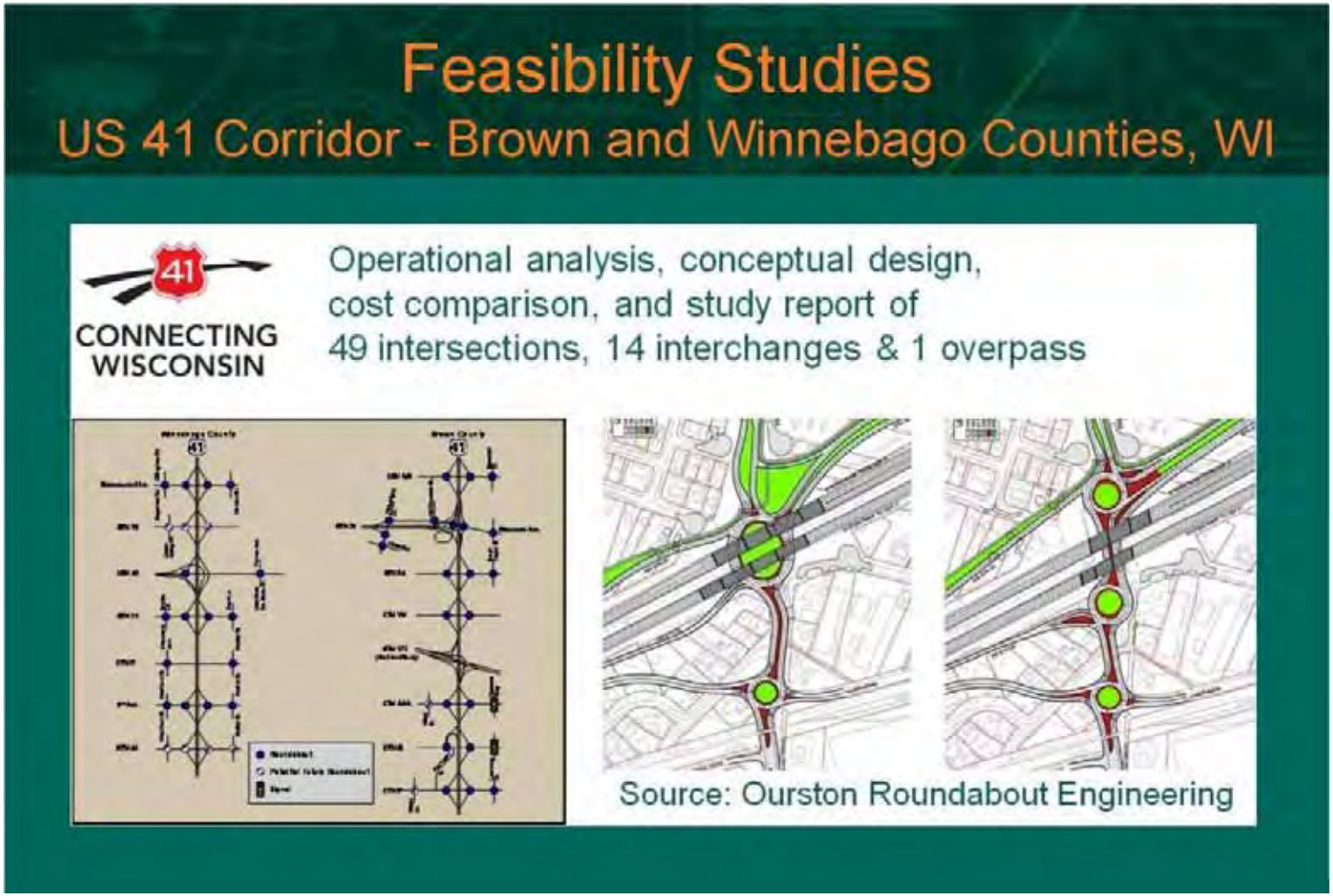
Modern Roundabouts in Service

SH 10 Roundabout – Hanover, New Hampshire

Modern Roundabouts in Service

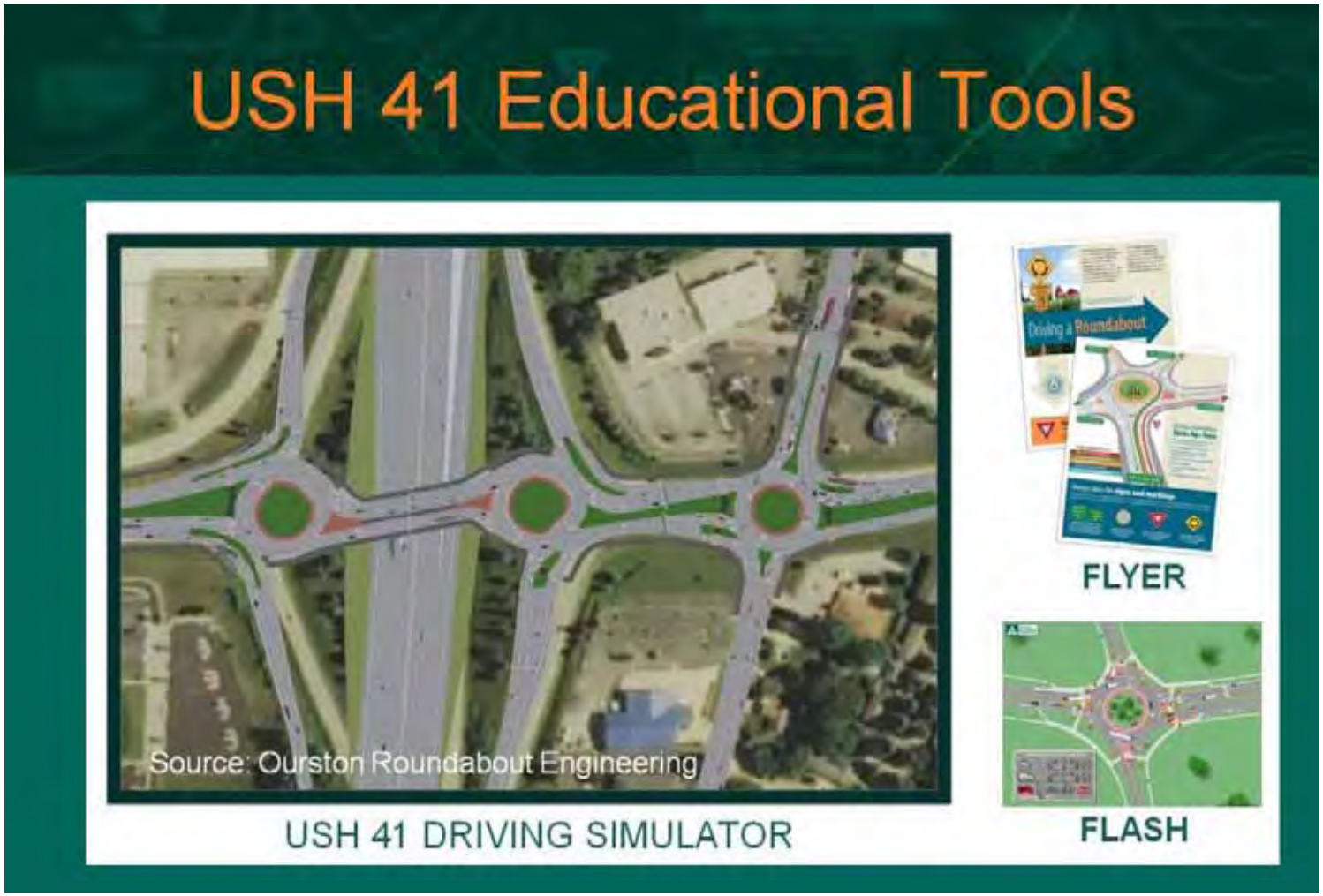
Roundabout at Griffiss AFB - Rome, New York
(Image from the New London Show presentation, NE Roundabouts)

Modern Roundabouts in Design



(Image courtesy of Ourston Roundabout Engineering, Inc.)

Modern Roundabouts in Design

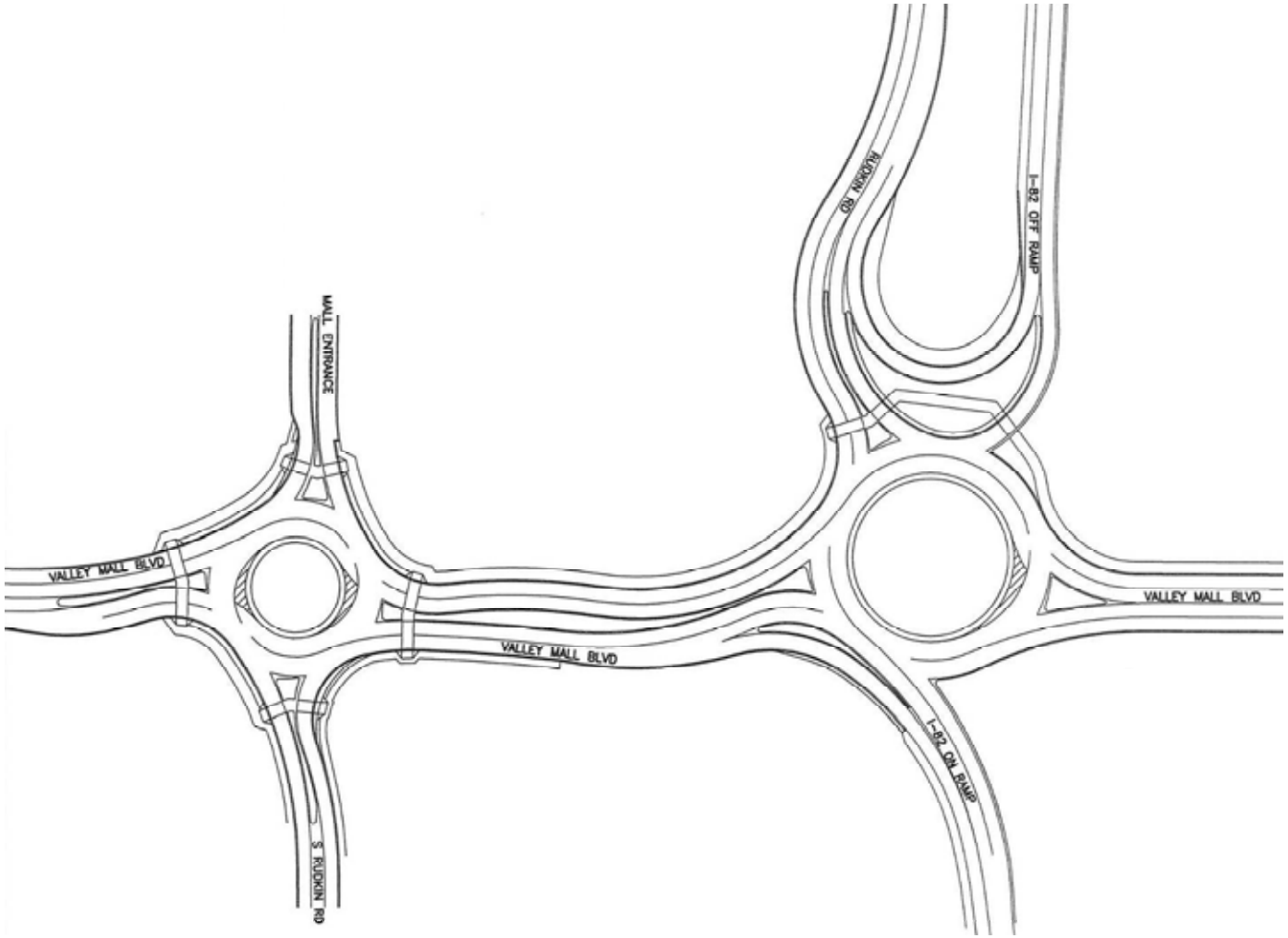


(Image courtesy of Ourston Roundabout Engineering, Inc.)

Modern Roundabouts in Design

I-82 & Valley Mall Boulevard Roundabouts – Union Gap, Washington
(Image from Google Earth)

Modern Roundabouts in Design



I-82 & Valley Mall Boulevard Roundabouts – Union Gap, Washington
(Image courtesy of Reid Middleton)

Roundabout Policies

Roundabouts are the preferred safety alternative for a wide range of intersections. Although they may not be appropriate in all circumstances, they should be considered as an alternative for all proposed new intersections on Federally-funded highway projects…. Roundabouts should also be considered for all existing intersections that have been identified as needing major safety or operational improvements. This would include freeway interchange ramp terminals and rural intersections.

Federal Highway Administration
Consideration and Implementation of Proven Safety Countermeasures, July 2008

Roundabout Policies

Roundabouts are frequently able to address [intersection design] objectives better than other intersection types in both urban and rural environments and on high- and low-speed highways. Thus, when a project includes reconstructing or constructing new intersections, a roundabout alternative is to be analyzed…. When the analysis shows that a roundabout is a feasible alternative, it should be considered the Department's preferred alternative due to the proven substantial safety benefits and other operational benefits.

New York State Department of Transportation
Highway Design Manual, August 2006

Roundabout Policies

Roundabout design is not a specific science, but more of an art form within the context of State and Federal guidelines. …We encourage municipalities and state Departments of Transportation to have their roundabout designs (especially multilane roundabouts) reviewed by someone who has years of roundabout design experience and who is knowledgeable in all aspects of modern roundabout planning, design, construction and operation.

Kansas Department of Transportation
Preamble to *Kansas Roundabout Guide*

Roundabout Policies

Due to modern roundabouts' … inherent complexity of their geometric and operational aspects, WisDOT … requires that a qualified designer … be involved with each stage of the process. …A qualified designer must meet the skills, knowledge and experience level determined appropriate by the Wisconsin Department of Transportation for roundabout design.

Wisconsin Department of Transportation
Facilities Development Manual, December 2008

Design Issues of Roundabouts

Software Challenges

- HCM/Synchro/SIM Traffic
  - Single lane roundabouts analysis only
  - Will “cartoon” two lane roundabout – no analysis
  - Gap acceptance basis
  - Geometry not considered

- Rodel/Arcady
  - Empirical algorithm
  - Considers geometry
  - Effective design tool
  - Limited expertise in US

Design Issues of Roundabouts

Software Challenges

- SIDRA
  - Gap acceptance basis
  - Considers some geometry
  - Calibration to US drivers
  - Limited expertise in US
- VISSIM
  - Visual modeling tool
  - “Does what it’s told”
  - Needs calibration to proven model

Design Issues of Roundabouts

Software Challenges

- Upcoming US Model
  - Gap acceptance basis
  - Does not consider geometry
  - Limited site data

- Roundabout Design Platforms (e.g. TORUS)
  - Interdependency of design elements
  - Can yield deficient designs
  - Not a substitute for design experience

Ongoing Efforts

US Access Board

Public Rights of Way Accessibility Guidelines (PROWAG)

- NPRM anticipated for Fall 2010
- Joint DOJ/DOT rulemaking

Accessible Public Rights-of-Way: Planning and Designing for Alterations

- Published August 2007
- Considered “Best Practice”

Ongoing Efforts

FHWA

Technical Summaries
- Modern Roundabouts and Mini-Roundabouts

Outreach Materials – Under development

Roundabouts: An Informational Guide
- Updated document to be published Fall 2010

2009 MUTCD – Expanded Signing & Markings Info

Roundabouts Peer-to-Peer – Planning in progress

Ongoing Efforts

TRB

NCHRP 3-78A: Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities - Final report recommends more study

NCHRP 3-100: Roundabout Corridors Performance and Efficiency – FY 2011

Ongoing Efforts

Local Research in Progress

Center for Transportation Research

- *Development of Guidelines for Implementation of Roundabouts in Texas*

Texas Transportation Institute:

- *Reducing Older Driver Injuries at Intersections*

Ongoing Efforts

ITE Roundabout Task Force

- Two Years Old!
- Moving to Committee Format
- Publishing Toolbox Topics
- *ITE Journal* – Roundabouts Issue July 2010

Ongoing Efforts

2011 National Roundabout Conference

Carmel, Indiana, May 11-13, 2011

- 46 roundabouts fielded; 8 under construction; 4 in design
- Roundabouts outnumber traffic signals

"I foresee a Carmel without traffic lights."

Mayor James Brainard
Sarasota Observer
May 28, 2009

Questions?