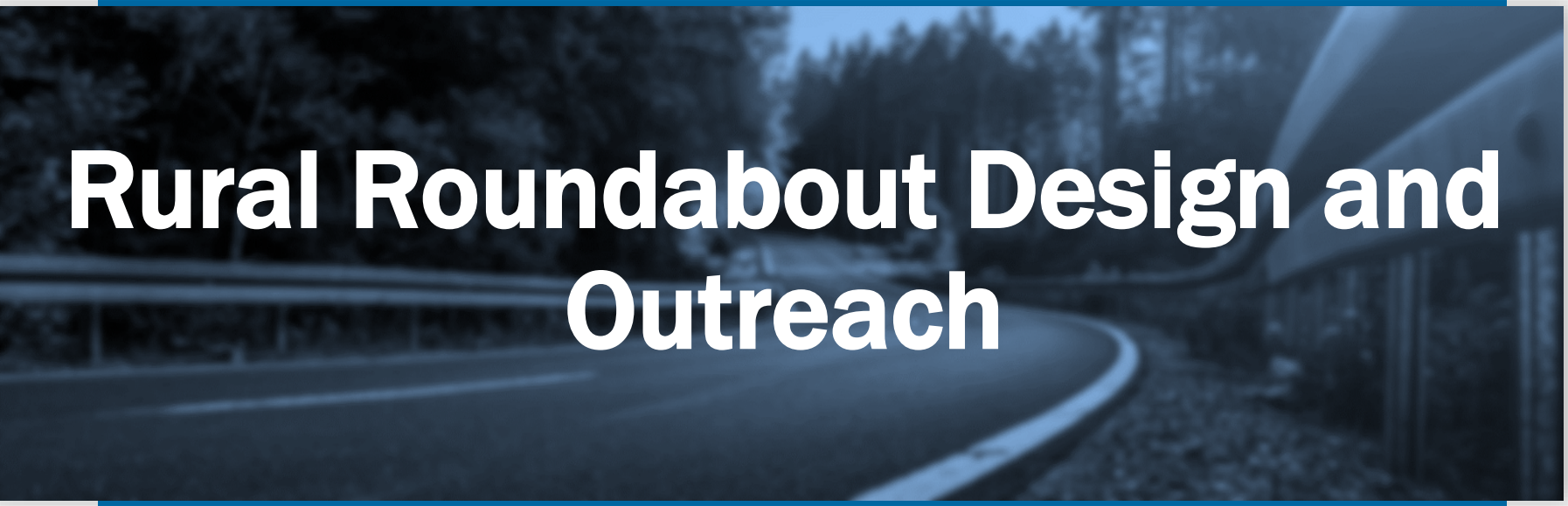
National Center for Rural Road Safety

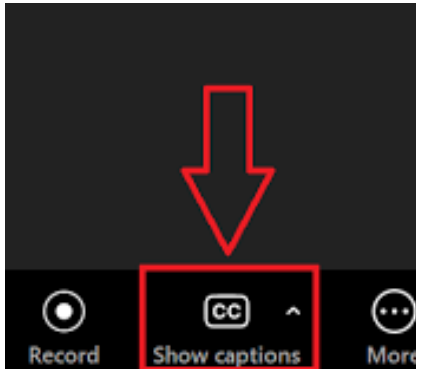
A Federal Highway Administration Center for Excellence



Rural Roundabout Design and Outreach

September 24, 2025 Webinar

Webinar Logistics



- Duration is 1.5 hours
- To activate closed captioning for the webinar:
  - Click on the “Show Captions” button at the bottom of your screen.
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- Recording webinar for website archival
  - https://ruralsafetycenter.org/webinar-archive/
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- Certificates of Completion/Application for CEUs will be provided
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NEW Home Safely Podcast: Episode 3

- Amanda Austin
  - Roundabout and Alternative Intersection Design (RAID) Lead for Texas Department of Transportation (TxDOT)
- In this conversation:
  - TxDOT's roundabout initiative
  - Why roundabouts are crucial to saving lives on rural roadways
- Listen and subscribe!

HOME SAFELY PODCAST

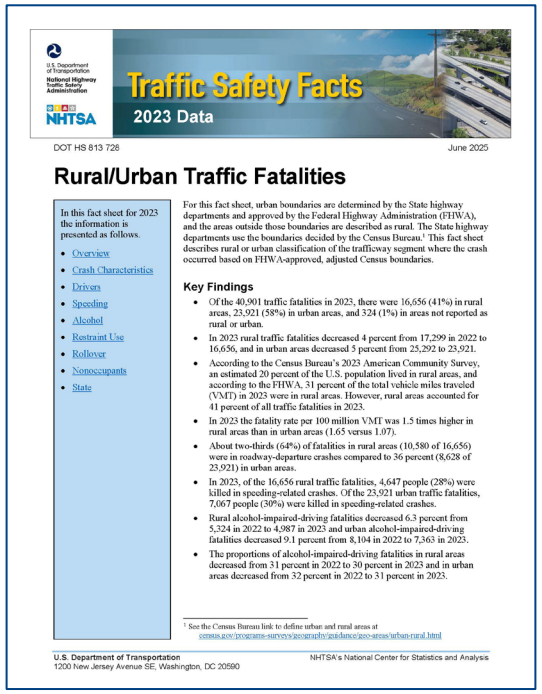
Road Safety Champion Program

- Safety 101 program
- Core Module 7: Safety Analysis Process (Sept. 30th)
- Maintenance & Construction Pathway Modules and Planning & Engineering Pathway Modules
  - Tuesdays 2-4 pm ET October, November, and December
- *NEW* First Responder and Public Health Module Pilots
  - Wednesdays 2-4 pm ET October, November, and December
  - Except PH4 and PH6 which will be 1-3 pm ET

Learn More!

Register Now!

NEW NHTSA Resource



U.S. Department of Transportation
National Highway Traffic Safety Administration
NHTSA

Traffic Safety Facts
2023 Data

DOT HS 813 728 June 2025

Rural/Urban Traffic Fatalities

In this fact sheet for 2023 the information is presented as follows.

- Overview
- Crash Characteristics
- Drivers
- Speeding
- Alcohol
- Restraint Use
- Rollover
- Nonoccupants
- State

For this fact sheet, urban boundaries are determined by the State highway departments and approved by the Federal Highway Administration (FHWA), and the areas outside those boundaries are described as rural. The State highway departments use the boundaries decided by the Census Bureau.[1] This fact sheet describes rural or urban classification of the trafficway segment where the crash occurred based on FHWA-approved, adjusted Census boundaries.

Key Findings

- Of the 40,901 traffic fatalities in 2023, there were 16,656 (41%) in rural areas, 23,921 (58%) in urban areas, and 324 (1%) in areas not reported as rural or urban.
- In 2023 rural traffic fatalities decreased 4 percent from 17,299 in 2022 to 16,656, and in urban areas decreased 5 percent from 25,292 to 23,921.
- According to the Census Bureau's 2023 American Community Survey, an estimated 20 percent of the U.S. population lived in rural areas, and according to the FHWA, 31 percent of the total vehicle miles traveled (VMT) in 2023 were in rural areas. However, rural areas accounted for 41 percent of all traffic fatalities in 2023.
- In 2023 the fatality rate per 100 million VMT was 1.5 times higher in rural areas than in urban areas (1.65 versus 1.07).
- About two-thirds (64%) of fatalities in rural areas (10,580 of 16,656) were in roadway-departure crashes compared to 36 percent (8,628 of 23,921) in urban areas.
- In 2023, of the 16,656 rural traffic fatalities, 4,647 people (28%) were killed in speeding-related crashes. Of the 23,921 urban traffic fatalities, 7,067 people (30%) were killed in speeding-related crashes.
- Rural alcohol-impaired-driving fatalities decreased 6.3 percent from 5,324 in 2022 to 4,987 in 2023 and urban alcohol-impaired-driving fatalities decreased 9.1 percent from 8,104 in 2022 to 7,363 in 2023.
- The proportions of alcohol-impaired-driving fatalities in rural areas decreased from 31 percent in 2022 to 30 percent in 2023 and in urban areas decreased from 32 percent in 2022 to 31 percent in 2023.

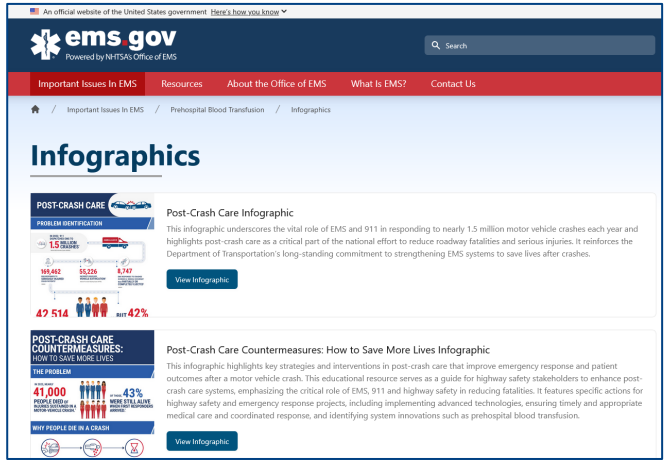
[1] See the Census Bureau link to define urban and rural areas at census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html

U.S. Department of Transportation
1200 New Jersey Avenue SE, Washington, DC 20590

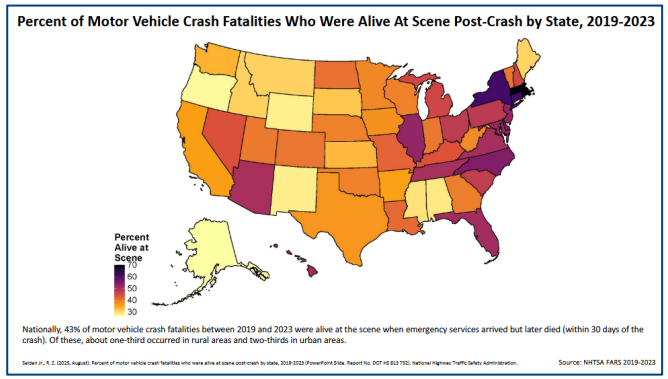
NHTSA's National Center for Statistics and Analysis

Rural/Urban Traffic Fatalities: Traffic Safety Facts 2023 Data

NEW Post-crash Care Resources



Infographics including pre-hospital blood



Map by state of fatalities alive when first responders arrived at the scene

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Federal Advisory Committee Opportunities

- Accepting nominations on/before October 20, 2025
  - Motorcyclist Advisory Council
  - National Emergency Medical Services Advisory Council

#RoundaboutsWeek

- **National Roundabouts Week Media Kit**
  - NRW Media Kit Information
  - NRW Fact Sheet
  - NRW Customizable Press Release
  - NRW Social Media Graphics
  - NRW Generic b-roll Video Footage (2 minutes)
  - NRW Public Service Announcement (30 seconds)

Today's Presenters

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Questions

Please Reach Out!

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- www.ruralsafetycenter.org



@ruralroadsafety

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National Center for Rural Road Safety
Roundabouts Week: Rural Roundabout Design and Outreach.
September 24, 2025

How to use NCHRP Research Report 1043: Guide for Roundabouts

Brian L. Ray, PE
Sunrise Transportation Strategies, LLC.

Sunrise
Transportation Strategies, LLC.

National Center for Rural Road Safety

Did you know the earliest USA roundabout applications were in rural areas?

- 1990s Maryland State Highway Administration (SHA) wanted to address fatal and severe crashes on rural highways
- Heard positively about European safety performance and wanted to try it in Lisbon
- Used outreach to share this “new” solution; agreed to remove the roundabout if it was ineffective
- The roundabout was a success in all ways!

Photo: Maryland SHA

Lisbon, MD

It hasn’t change much in nearly 30 years

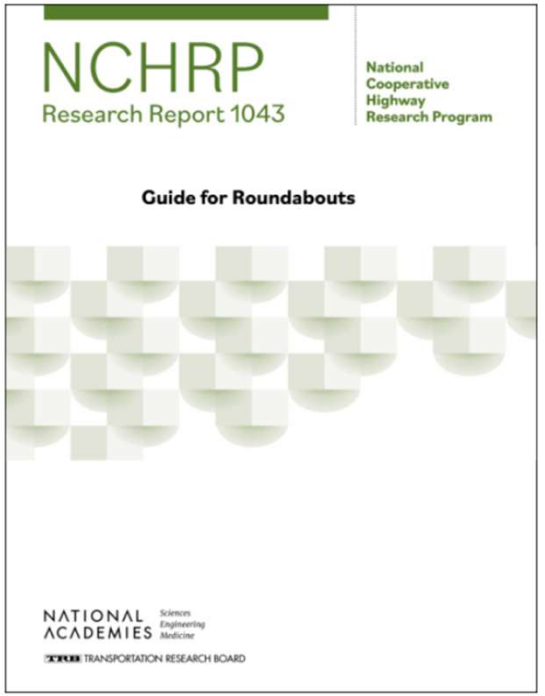
Lisbon, MD

Agenda

- **Research Report Overview**
- Research and Syntheses—What's new?
- Roundabout Design Process
- Guide Organization

NCHRP Research Project 03-130 Work Activities

NCHRP Research Report 1043
Guide for Roundabouts



- *You can get NCHRP Documents for free in .pdf !*
- *Just search the report title!*

Guide for Roundabouts | Blurbs New | Blurbs | Publications (trb.org)

NCHRP Research Report 1043 – Guide for Roundabouts

- This new Roundabout Guide:
  - Has parts and chapters reflecting project development stages
  - Emphasizes planning and design in context:
    - Project Type
    - Built and natural environment
    - Context Classification
    - User-focused
  - Supports a design continuum versus roundabout “types”

Performance driven to support roundabout implementation!

NCHRP Research Report 1043 – Guide for Roundabouts

- The Guide includes research and synthesis findings conducted as part of NCHRP Research Project 03-130
  - Designing for Trucks
  - Designing for Bicycles
  - Synthesized information on roundabout design and implementation
  - Intersection Control Evaluation practices

…also integrating lessons from practice since NCHRP Report 672 was published in 2010…

NCHRP Research Report 1043 – Guide for Roundabouts

- The Guide also integrates findings and guidance from:
  - *Highway Safety Manual* and *Highway Capacity Manual* updates
  - NCHRP Research Report 834: *Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities: A Guidebook*
  - NCHRP Research Report 888: *Development of Roundabout Crash Prediction Models and Methods*
  - NCHRP Research Report 948: *Guide for Pedestrian and Bicyclist Safety at Alternative and Other Intersections and Interchanges*
  - *GB8 Vision and Road Map* (NCHRP Project 20-07 Task 423)
  - Part IV of GB8 Draft Chapters (NCHRP Web Document 320)
  - FHWA Pooled Fund Study: *Reasons for Drivers Failing To Yield at Multi-Lane Roundabout Exits*
  - Contemporary ICE guidance and approaches

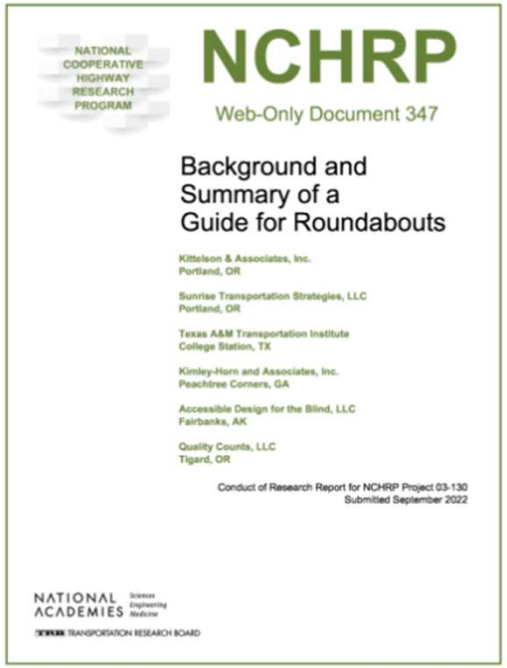
Agenda

- Research Report Overview
- **Research and Syntheses—What's new?**
- Roundabout Design Process
- Guide Organization

NCHRP Research Project 03-130 Research

- Designing for Trucks
  - State of Practice Review
  - Truck Industry Outreach
  - Driver Behavior Data Collection
- Designing for Bicycles
  - State of Practice Review
  - Virtual Field Reviews
  - Bicycle Treatment Concepts

…reflecting the evolution of roundabout practice…



NCHRP Web-Only Document 347

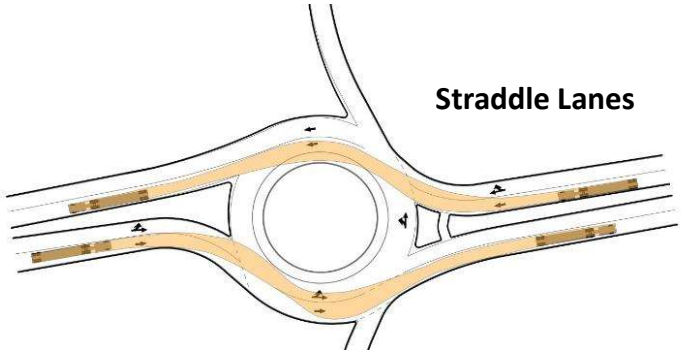
Designing for Trucks

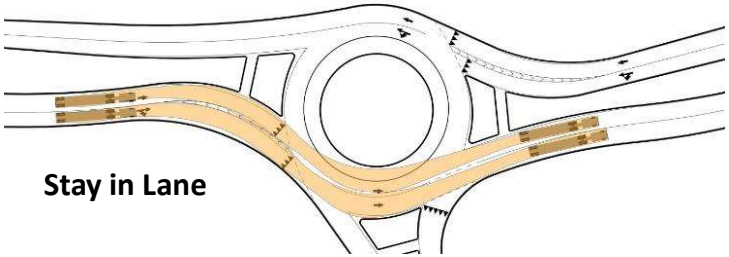
- A lack of understanding and compliance with techniques to keep trucks in lanes partially (Case 2) or completely (Case 3) compared to straddle lanes (Case 1).
  - Many truck drivers operate Case 2 and Case 3 roundabouts as if they were Case 1 (i.e., straddling lane lines).
- Case 2 and Case 3 increase roundabout dimensions
  - Potentially faster passenger car speeds, longer pedestrian crossings, increased construction cost, and larger right-of-way impacts.

…a good lesson to be sure users know what our intent really is…

Designing for Trucks

- Guide Recommendations
  - Simplified to two cases for multilane design for trucks:
    - Straddling lanes
    - Staying in a lane
  - Straddle-lane design is recommended as the default based on how truck drivers use roundabouts in practice and to simplify traffic control devices.
  - Turbo roundabout features can be used with stay-in-lane designs.





…implementing a roundabout is more important than achieving a Case 2 or 3 configuration…

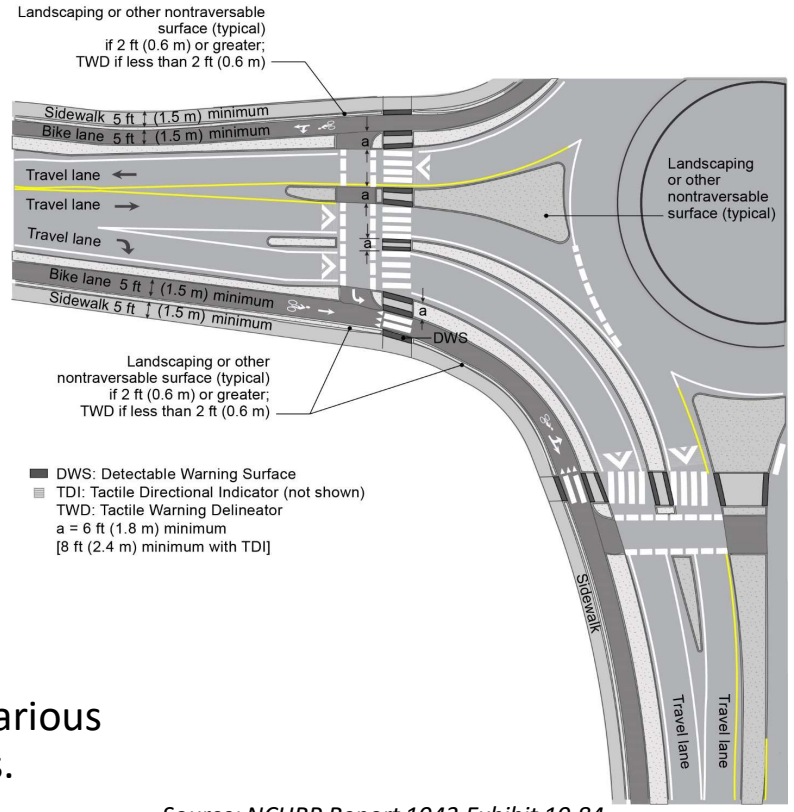
Designing for Bicycles

- Bicycle design principles and techniques have evolved since the 2010 NCHRP Report 672.
- There is an emerging standard typology of bicyclists based on levels of comfort.
  - "interested but concerned" category emerging as the design bicyclist
- Bicycle treatment concepts developed to illustrate a range of treatments for a variety of roundabout configurations.

…emphasize principles to allow flexible decision making…

Designing for Bicycles (Peds too!)

- Guide Recommendations
  - Emphasize principles:
    - Reduce speeds at conflict points;
    - Separate modes;
    - Clearly communicate right-of-way priority;
    - Provide predictable, simple, direct alignments; and
    - Provide comfortable spaces for waiting and decision making.
  - New Guide information and exhibits:
    - Material on tactile walking surface indicators for pedestrians who are blind or have low vision.
    - Exhibits on pedestrian and bicycle treatments, including various combinations of on-street, separated, and shared facilities.

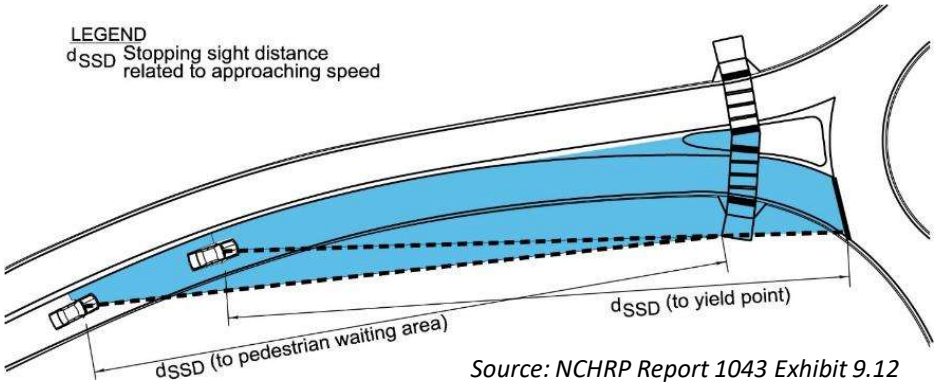


Source: NCHRP Report 1043 Exhibit 10.84

Designing for Bicycles (Peds, too!)

- Refined/expanded performance checks
  - Updated stopping sight distance and intersection sight distance
  - Added bicyclist and pedestrian design flags from NCHRP Research Report 948
  - Added pedestrian wayfinding and crossing assessments

…concepts applicable to other intersection forms



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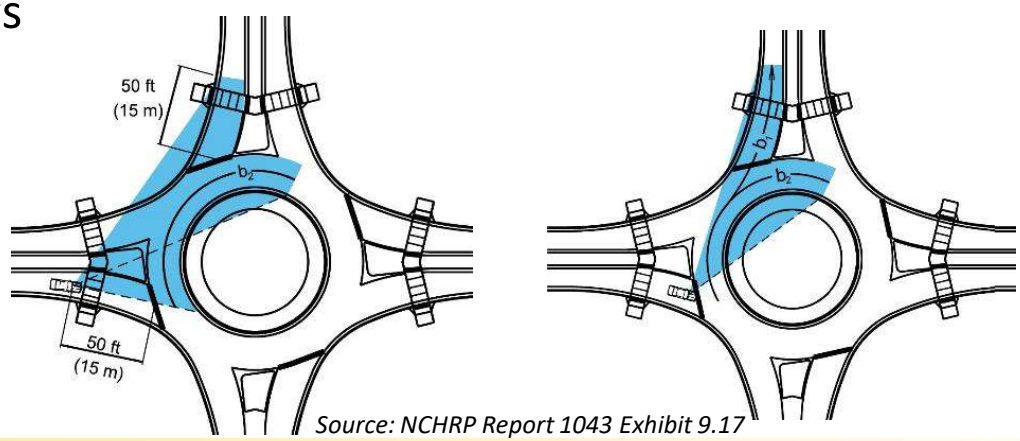

Source: NCHRP Report 1043 Exhibit 9.17

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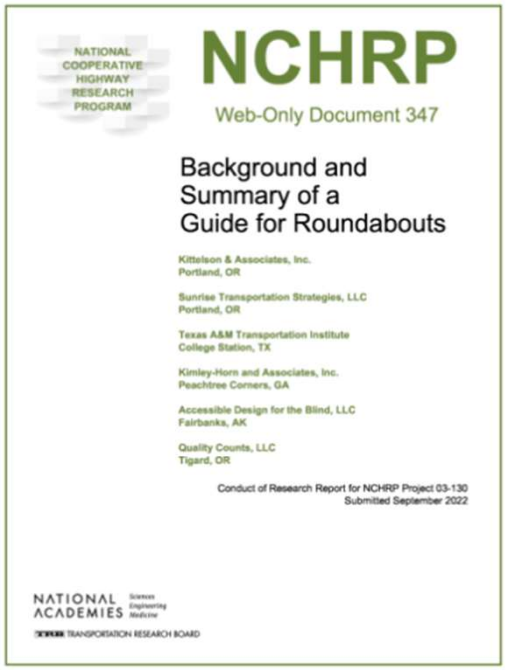
NCHRP Research Project 03-130 Syntheses

- Synthesis Plans
  - Designing for Oversize/Overweight Trucks
  - In-service assessment and retrofit
  - Mini-roundabouts
  - Economic Impact of Roundabouts
  - Traffic Control Devices -- Metering
  - Traffic Control Devices – Pedestrian crossings
  - Traffic Control Devices – Railroad crossings
  - Illumination



NCHRP Web-Only Document 347

…understanding practices in various topic areas…

Synthesis Topics—Findings Highlights

- Oversize/Overweight (OSOW)Trucks
  - State practices for OSOW trucks are typically performed on a case-by-case basis.
- **In-Service Assessment and Retrofit**
  - Providing real-world examples in the Guide can help illustrate applications of design principles
- **Mini-Roundabouts and Compact Roundabouts**
  - De-emphasize the “name.” A traversable central island has defining implications for many aspects of the Guide
- Economic Impacts
  - There are no quantitative data that provides a means of measuring the economic impacts of roundabouts.

Synthesis Topics—Findings Highlights

- Traffic Control Device (TCD): Metering
  - Metering has been successful but is still limited – typically a single approach to mitigate queuing on a downstream entry.
- TCD: Railroad Crossings
  - Railroads and highway agencies' experiences vary widely with roundabouts at or near at-grade rail crossings. Many considerations are documented.
- TCD: Pedestrian Crossings
  - Current research identified treatments that show effectiveness for improving accessibility.
- **Illumination**
  - Practice varies widely, and the Guide includes updated national lighting guidelines and include design flexibility.

In-Service Assessment and Retrofit

- Guide Recommendations
  - Emphasize principles:
    - Retrofitting existing roundabouts or circular intersections is often more difficult than new construction.
    - Follow performance checks to identify contributing issues; and
    - Design choices should be based on benefit gained over existing condition.
  - New Guide information and exhibits:
    - Example performance check and typical modifications.
    - Pedestrian wayfinding assessments.
    - Pedestrian crossing assessment.

Source: NCHRP Report 1043 Exhibit 9.31

Performance Check	Contributing Factors to Undesirable Performance	Possible Modifications to Address Issue
Geometric speed	• Skew • Inadequate deflection (combination of size, placement, or approach alignment) • Wide lanes • Excessively large entry curb radii	• Add raised crosswalks to enhance entry and exit speed control. • Modify the entry horizontal geometry to increase deflection. • Alter the approach alignment to the left to lengthen entry arcs and increase deflection. • Reduce the number of lanes. • Reduce lane widths. • Include or increase raised features, such as splitter islands and truck aprons.

Source: NCHRP Report 1043 Exhibit 9.31

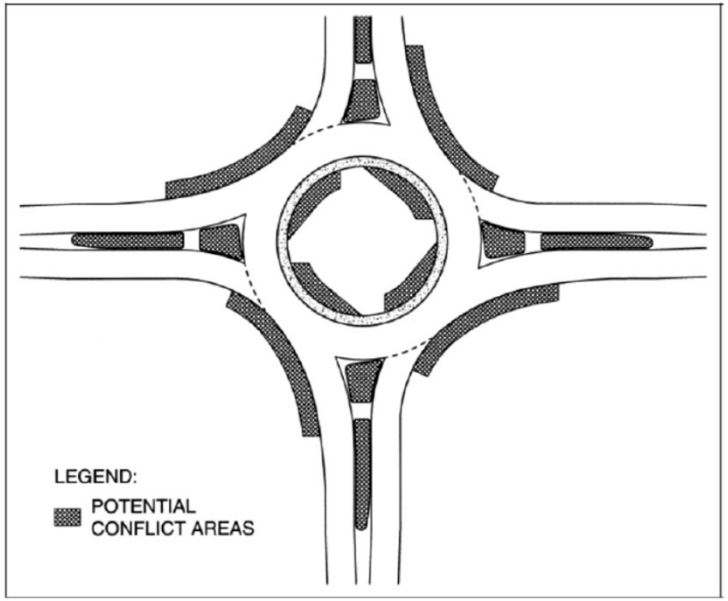
Mini-Roundabouts and Compact Roundabouts

- Guide Recommendations
  - Emphasize principles:
    - Consider performance needs and not the roundabout name;
    - Traversable elements support design and implementation; and
    - A fully traversable central island influences signing decisions.
  - New Guide information and exhibits:
    - Flexibility in terminology.
    - Promotes a wide range of applications.
    - Recognizes value in constrained locations

Source: NCHRP Report 1043 Exhibit 10.4

Illumination

- Guide Recommendations
  - Emphasize principles:
    - Illumination based on roundabout-specific characteristics versus traditional intersection forms;
    - Delineation helps drivers recognize roundabouts and mimic design features;
    - Roundabout-specific lighting policy allows flexibility; and
    - Applying Dark Sky principles can guide lighting decisions.
  - New Guide information and exhibits:
    - Illuminance criteria for streets with continuous lighting based on asphalt or portland cement concrete.
    - Illumination criteria for isolated roundabouts.
    - Guidance for crosswalks and transition lighting.



Source: NCHRP Report 1043 Exhibit 14.7

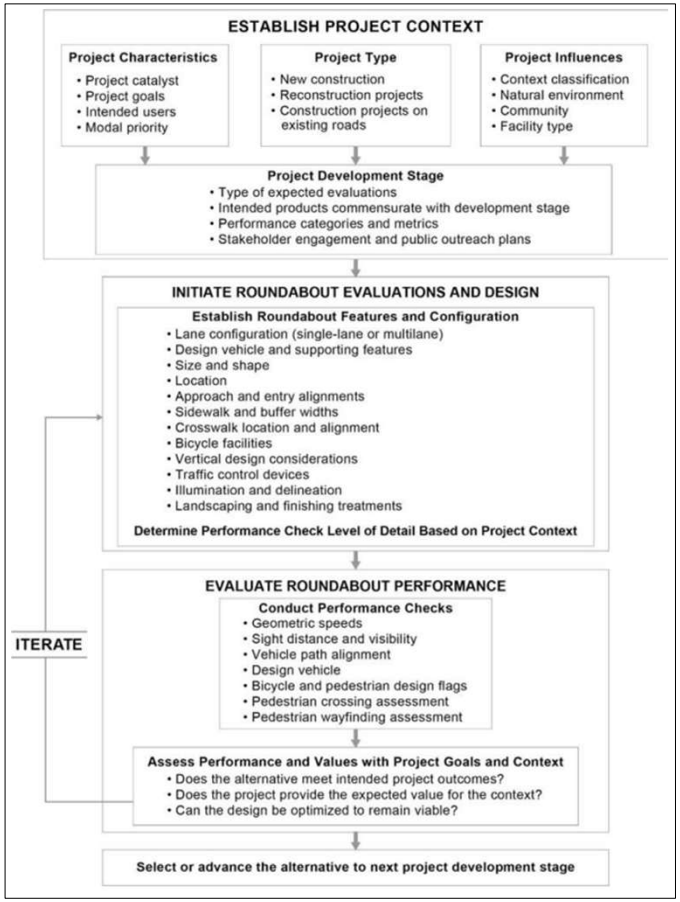
Agenda

- Research Report Overview
- Research and Syntheses—What's new?
- **Roundabout Design Process**
- Guide Organization

Roundabout Design Process

- Performance-based approach to get to an "optimal" design
- Process works at early concepts through final design decisions
- Integrates concepts from AASHTO Green Book 7th Edition and looks toward future Green Book 8th Edition
- Evaluates "performance" for the roundabout and other broader project goals

…emphasizing design flexibility in a project's context…



Source: NCHRP Report 1043 Exhibit 9.1

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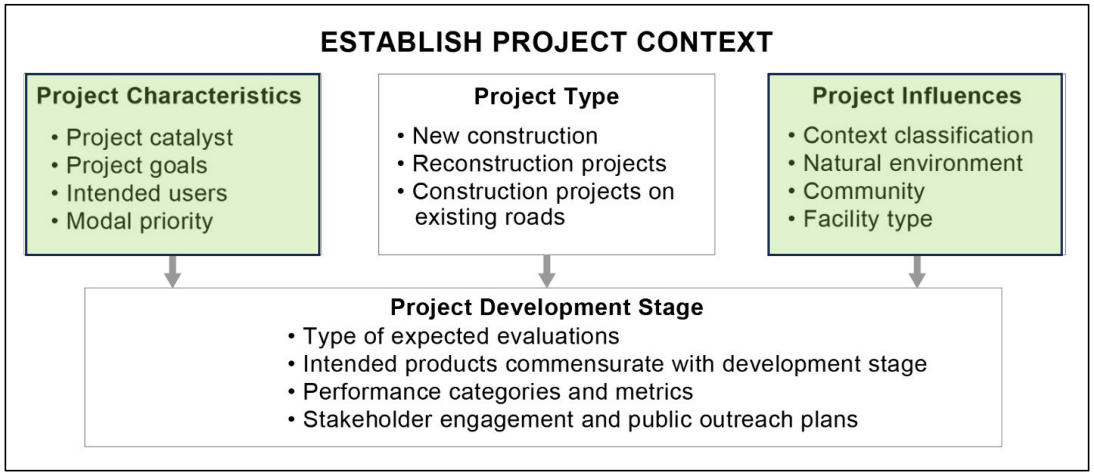
Design Process--Context

- Scalable to project development stage
- Encourages flexible and adaptable design
- Outcomes beyond just roundabout design
- Allows community, culture, and equity elements



…project context is the foundation to adaptable implementation…

Source: NCHRP Report 1043 Exhibit 9.1

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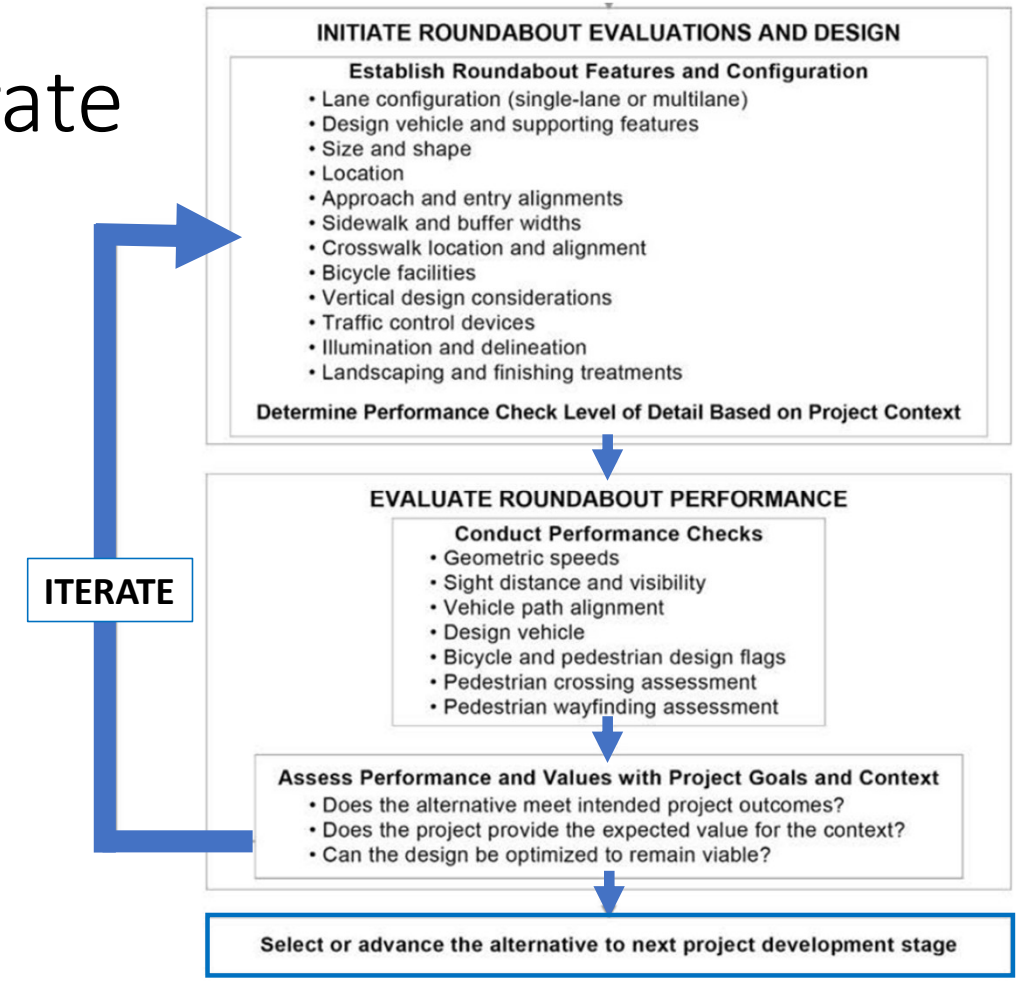
Design Process--Iterate

- Modify design and elements to best meet target performance
- Iterate as needed to optimize. Sometimes repeatedly
- Assess if roundabout remains viable
- Always consider context and intended outcomes



Source: NCHRP Report 1043 Exhibit 9.1

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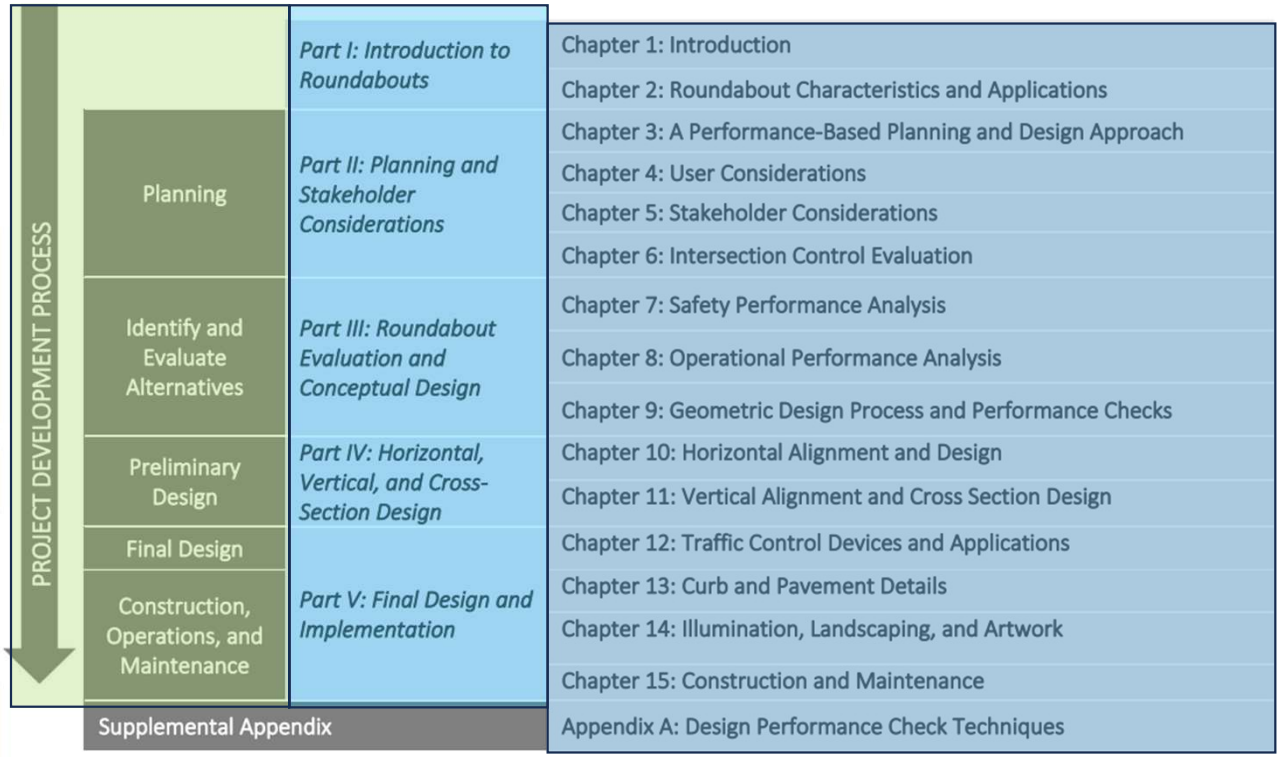
Agenda

- Research Report Overview
- Research and Syntheses—What's new
- Roundabout Design Process
- **Guide Organization**

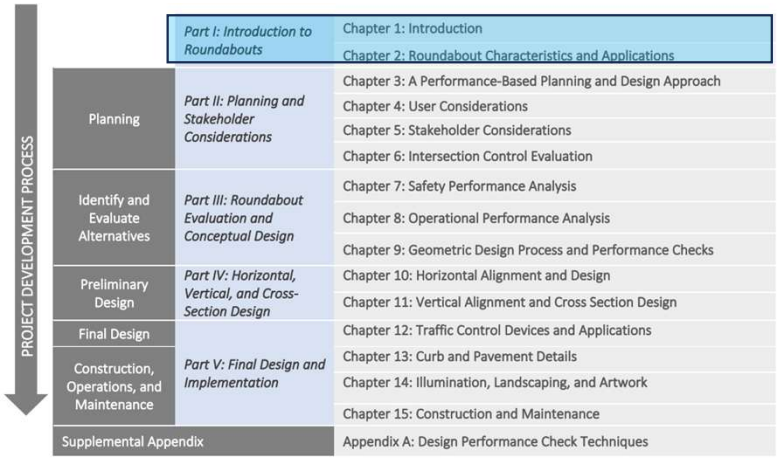
Guide Organization



- Organized by Project Development process
- Five Parts
  - Chapter groupings to support each part
- 15 chapters supporting project development
- Appendix supporting performance checks techniques

Part I Introduction to Roundabouts

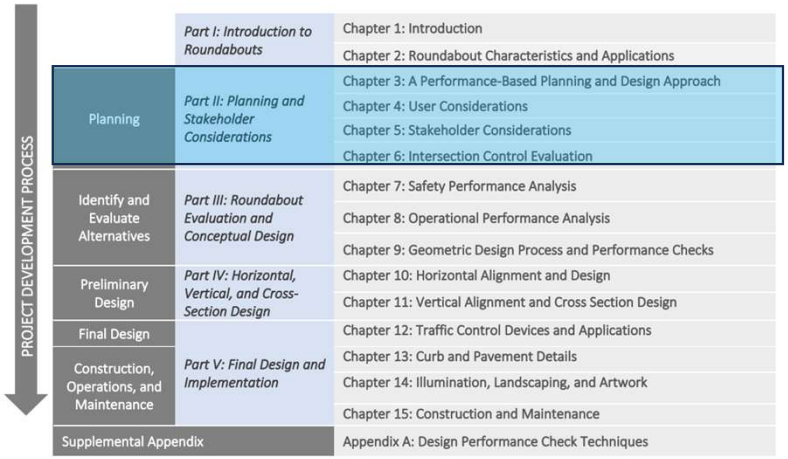
- Overview:
  - Updated roundabout history and practice within the United States
  - Program-level policy and practice considerations
    - Such as: Vision Zero, Safe System, Roundabouts First Policies, Intersection Control Evaluation
  - Roundabout types versus categories
  - Notes innovative contexts



…advancing <u>good</u> roundabouts versus perfect roundabouts that don't get advanced….

Part II Planning and Stakeholder Considerations

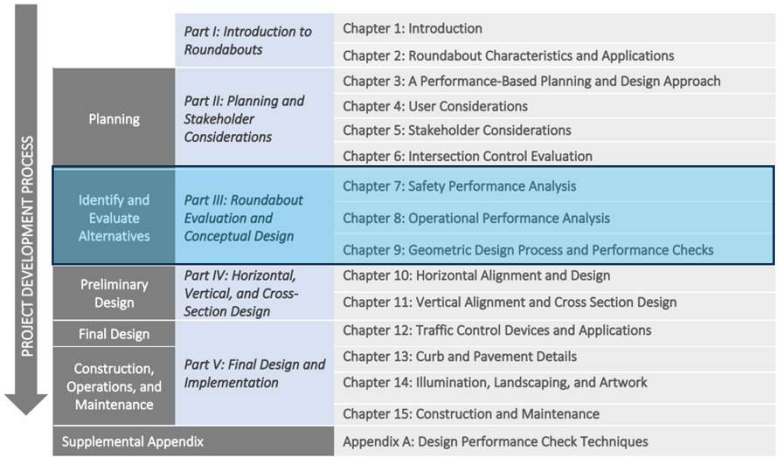
- Overview:
  - Considerations for planning and designing roundabouts.
    - Applying a performance-based planning and design framework.
    - Emphasizing goals and desired outcomes.
    - Considering project types.
    - Detailing roundabout user characteristics and considerations.
    - Public and stakeholder considerations and techniques
    - Overviews intersection control evaluation (ICE) activities



…context is the foundation for design decisions…

Part III Roundabout Evaluation and Conceptual Design

- Overview:
  - Supports roundabout concept and preliminary design activities
  - Supporting ICE and other objective evaluations
  - Includes project-level principles for conducting safety and operational performance analysis
  - Details geometric design process and performance checks supported by *Appendix A Design Performance Check Techniques*



…establishing the performance evaluation elements…

Part III Roundabout Evaluation and Conceptual Design

- Part III Highlights
  - Updated conflict point presentation for multilane design approaches.
  - Safety analysis reflects:
    - *Highway Safety Manual 1st Edition*,
    - NCHRP Research Report 888: *Development of Roundabout Crash Prediction Models and Methods*, and other research.
  - Operational analysis reflects the *Highway Capacity Manual 7th Edition*.
  - Defines design vehicle design
    - "Designing for" (common design vehicle)
    - "Accommodating" (check vehicle)

…input guided by research findings…

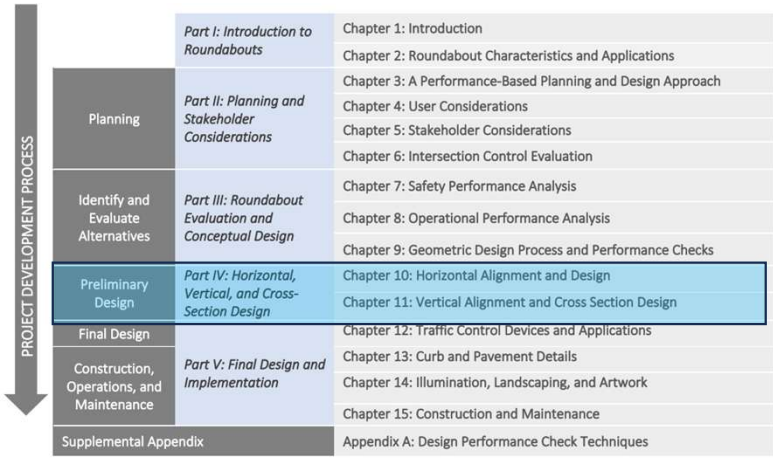
Part III Roundabout Evaluation and Conceptual Design

- Part III: Highlights
  - Revises sight distance measurement:
    - Stopping Sight Distance:
      - Where pedestrians are waiting (versus crossing).
    - Intersection Sight Distance: Two distinct conditions:
      - Upstream position while in motion
      - Stopped position at the entrance.
  - Added bicycle and pedestrian design flags method
    - Adapted from NCHRP Report 948: *Guide for Pedestrian and Bicyclist Safety at Alternative and Other Intersections and Interchanges*.

…positive advances from NCHRP Report 672…

Part IV Horizontal, Vertical, and Cross-Section Design

- Overview
  - Presents how to establish horizontal, vertical, and cross-section geometric design features to integrate each roundabout user
  - Supports performance-based geometric design concepts from conceptual design to preliminary
    - Preliminary design often supports environmental clearance and project approval to advance to final design.
  - Content for horizontal, vertical, and cross-section geometric design elements also apply to final design.



…three-dimensional roundabout design…

Part IV Horizontal, Vertical, and Cross-Section Design

- Part IV Highlights
  - Introductory sections on design process, principles, and performance influences.
  - Material on tactile walking surface indicators for pedestrians who are blind or have low vision.
  - Exhibits on pedestrian and bicycle treatments, including various combinations of on-street, separated, and shared facilities.
  - Discussion and techniques for transition design from high-speed environments.

…the Guide advances pedestrian considerations applicable to any intersection form…

Part IV Horizontal, Vertical, and Cross-Section Design

- Part IV Highlights (continued)
  - Two cases for multilane design for trucks: straddling lanes and staying in lane.
    - The straddle-lane design is recommended as the default.
  - Expanded material on oversized and/or overweight vehicles.
  - Expanded material on mini-roundabouts and compact roundabouts.
  - Content on turbo roundabouts treatments and features
  - Expanded material on bypass lanes.
  - Examples of vertical profile and cross section design.

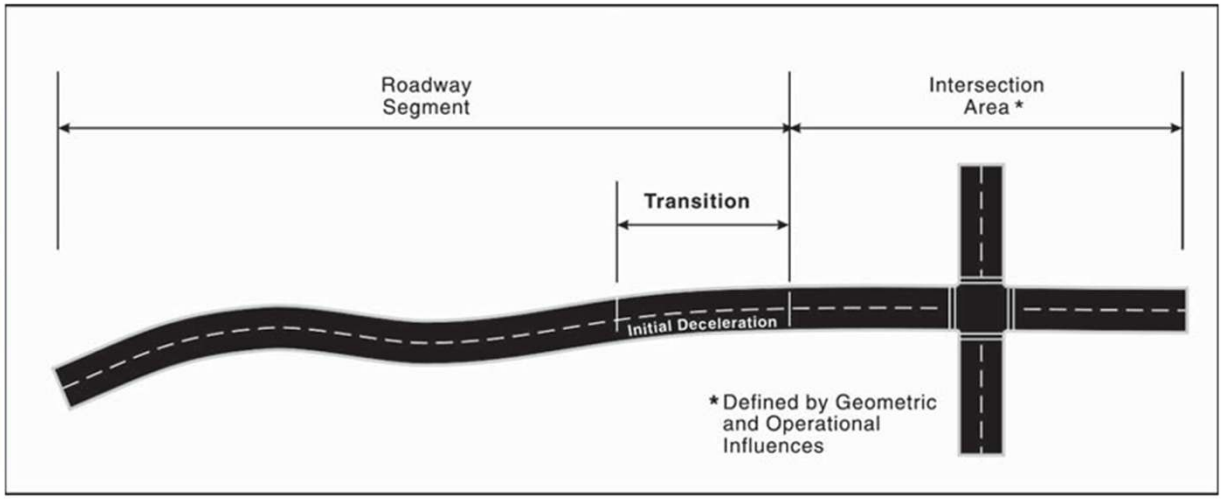
…more details in all areas to support planning and design decision making…

High-speed (45 mph and higher) Approaches—Rural Environments

- Historical safety of rural roundabouts:
  - Overall reduction in crashes
  - Reduced crash frequency and severity
  - Increase in single vehicle crashes
- Specific design guidance:
  - Maximize visibility of the central island
  - Add changes in cross section or alignment to alert drivers on approaches
- Maryland State Highway Administration initiated its roundabout program in the mid-1990s to address rural safety needs.
  - Roundabouts were so successful SHA integrated them in all environments

High-speed approaches —Principles from NCHRP Report 613

- Guidelines for Selecting Speed Reduction Treatments at High-speed Intersections
  - Provide sufficient transition between the segment operations and the intersection operations
  - Visually to support human factors needs
  - Comfortable deceleration



Source: NCHRP Report 613

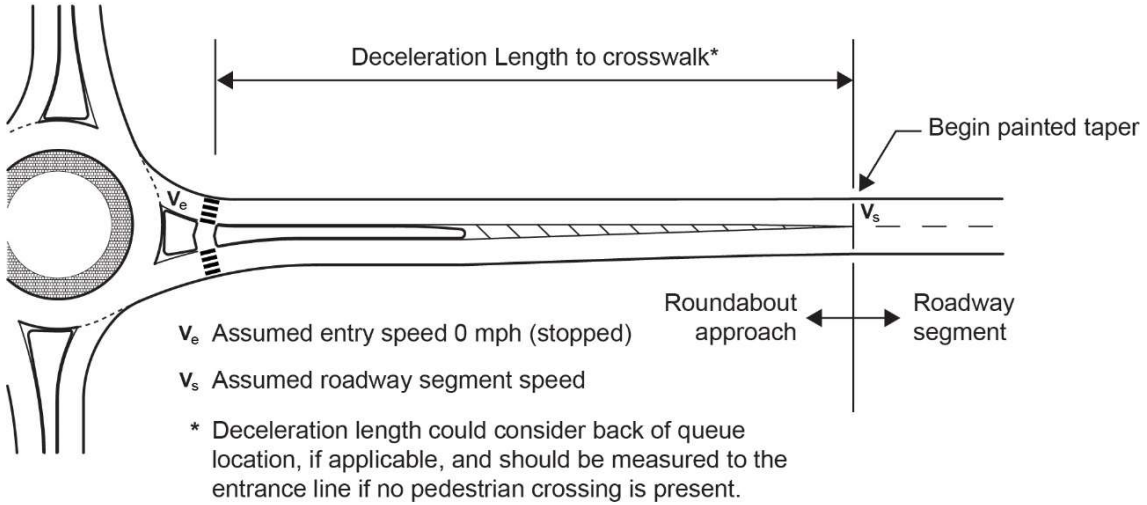
High-speed approaches

- Transition from segment to roundabout influence area
  - Painted gore area
  - Raised splitter island and outside curbs
  - Large landscaped central island

Photo: W&H Pacific, Inc.

High-speed approaches– Freeway Exit Ramp Deceleration Model

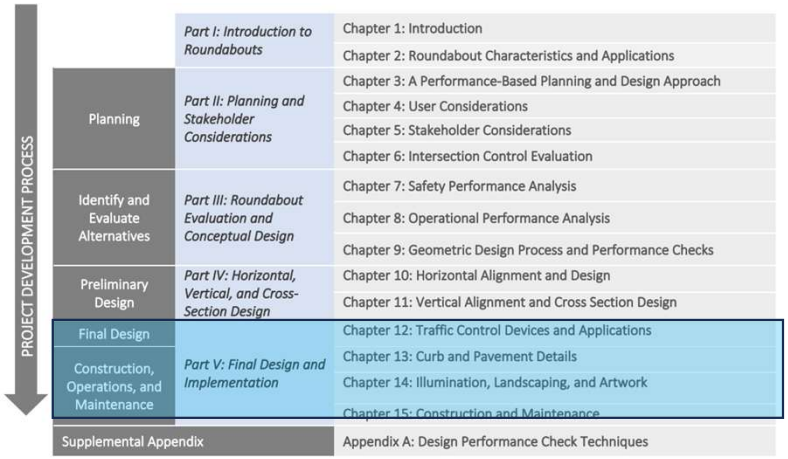
- From NCHRP Research Report 1043: Exhibit 10.108
  - Design speed = 65 mph
  - Target speed = Stop at crosswalk
  - Desired deceleration length = 570’



Source: NCHRP Research Report 1043

Part V Final Design and Implementation

- Overview
  - Provides roundabout details necessary to advance from preliminary design final design
  - Outlines roundabout construction and maintenance elements
  - Addresses topics that also influence roundabout concept and preliminary design decisions
    - Traffic control devices and applications
    - Curb and pavement details
    - Illumination, landscaping, and artwork



...design does not begin in design…these topics can influence planning decisions…

Part V Final Design and Implementation

- Part V Highlights
  - Reorganized the presentation of traffic control devices
    - By area of the roundabout, rather than by type of device
    - Photos of traffic control devices at roundabouts.
  - Expanded discussion of signals and beacons at roundabouts, including metering applications and pedestrian crossings.
  - Expanded discussion of roundabouts at or near at-grade rail crossings.
  - Refinements to Illuminating Engineering Society (IES) illumination method to increase design flexibility.
  - Examples of construction staging sequences.

Appendix: Design Performance Check Techniques

- Details a variety of design performance check techniques that can facilitate the check process
  - Complements and a companion to Chapter 9: Geometric Design Process and Performance Checks.
  - New multimodal checks: Bicycle and pedestrian design flags, and pedestrian crossing and wayfinding assessments.
- Techniques are representative but not exhaustive of all possible techniques.
  - Practitioners must sometimes modify performance check techniques to meet a specific configuration.

Closing

- Roundabout design continues to evolve for the better
- NCHRP Research Report 1043 *Guide for Roundabouts* builds and expands on the solid base of NCHRP Report 672

- Rural conditions are wonderful opportunities to apply roundabouts to reduce crash frequency and severity
- NCHRP Report 1043 provides principles and design flexibility to support rural roundabout planning, design, and implementation

Questions we can’t cover today? Contact me!

Brian L. Ray, PE
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Jacobs

Challenging today.
Reinventing tomorrow.

Community Outreach:
Building Trust to Build Roundabouts

Shannon Lambert, PE*

September 24, 2025

*WA, TX

Introduction

Shannon Lambert, PE

- Roundabout SME, Community Outreach Specialist
- 20+ years experience
- 75+ roundabout projects
- Yakima, WA office

Agenda

- What is outreach?
- Why does outreach matter?
- How do I develop an outreach strategy?
- Lessons learned
- Key takeaways

What is outreach and why does it matter?

What is outreach?

- **Community outreach is a strategic effort by agencies to inform, involve, and build trust with affected communities**

  - Community Outreach, Public Involvement, Community Engagement often used interchangeably
  - Outreach should be tailored to each community
    - Not “one-size-fits-all”

Source:
Walla Walla Union Bulletin (all)

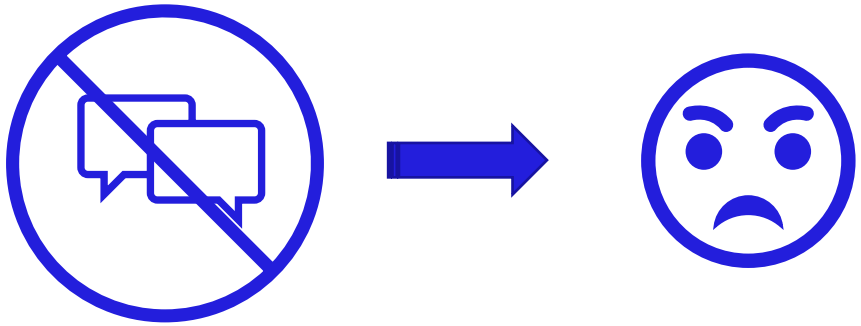
Why does outreach matter?

- Public is often skeptical about rural roundabouts:
  - Safety and operations
  - Discomfort

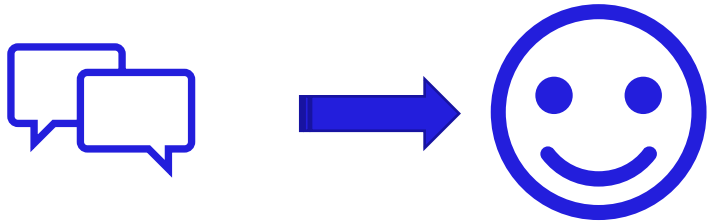
- “I drove through a bad roundabout, that means all roundabouts are bad”

Why does outreach matter?

- Historic impacts of limited outreach
  - Mistrust and feeling “steam rolled”
  - Projects misaligned with community needs and priorities
  - Tribal voices excluded from decisions

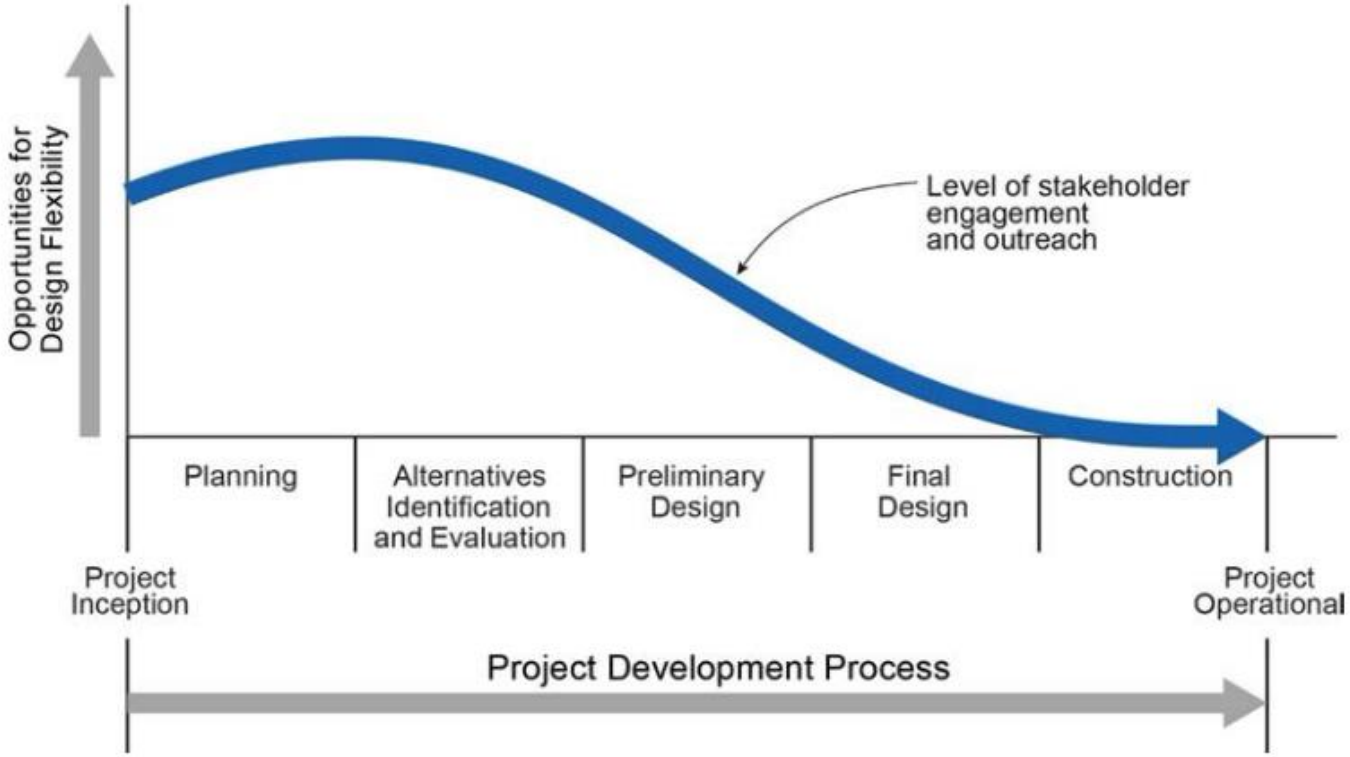


- Proactive outreach benefits
  - Builds community trust
  - Aligns project with community needs and priorities
  - Encourages collaboration



Why does outreach matter?

- Project team hears about concerns early on
- Team will have different information to share at different project stages
- **Improves project outcomes**



Source:
NCHRP Report 1043, Exhibit 5.5

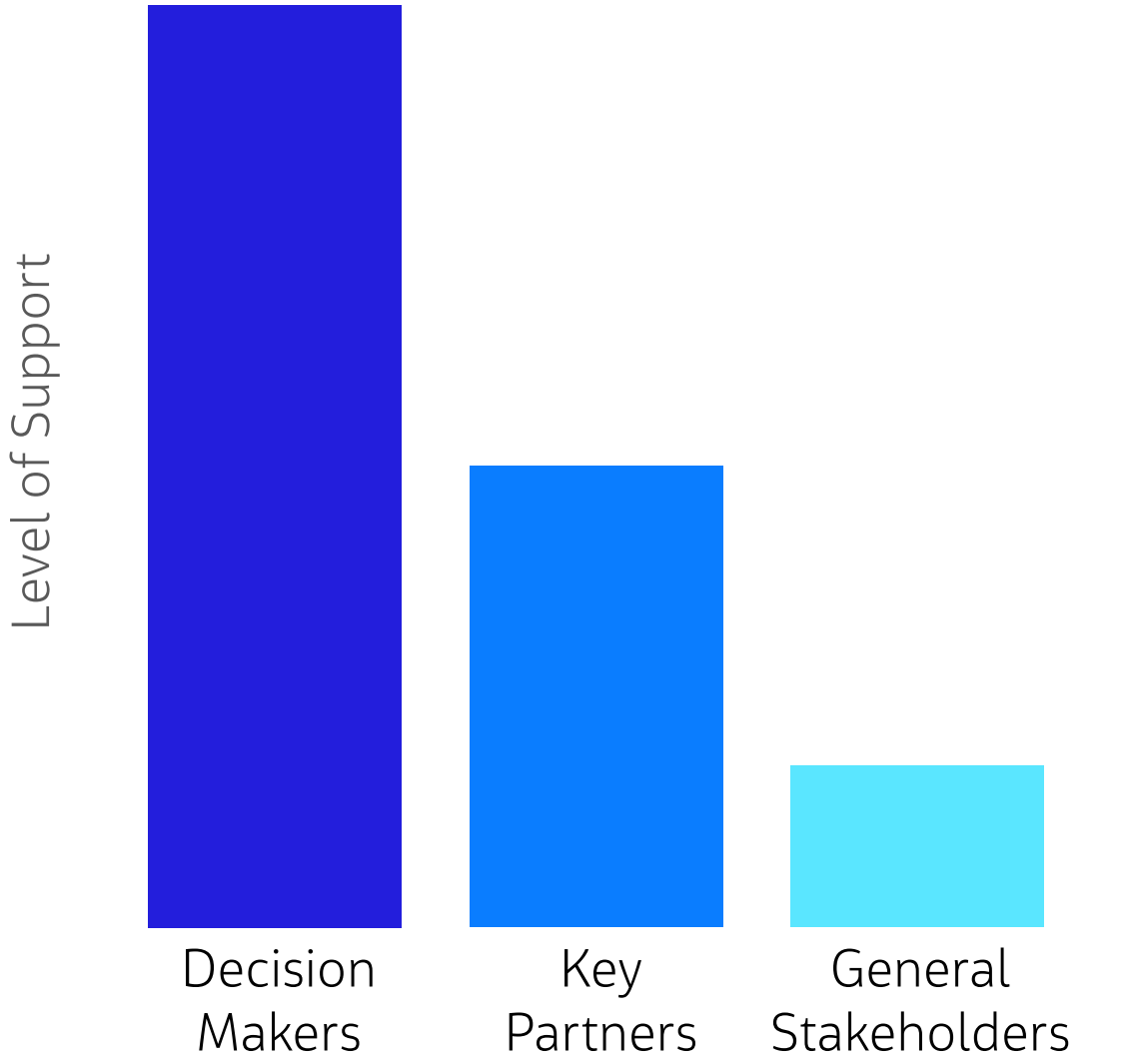
Developing an outreach strategy

How do I develop an outreach strategy?

1) Define goals
   - Understand community needs
   - Determine what meaningful participation looks like for this project
   - Strengthen project relationships
   - Gain project support
   - Build momentum for success

How do I develop an outreach strategy?

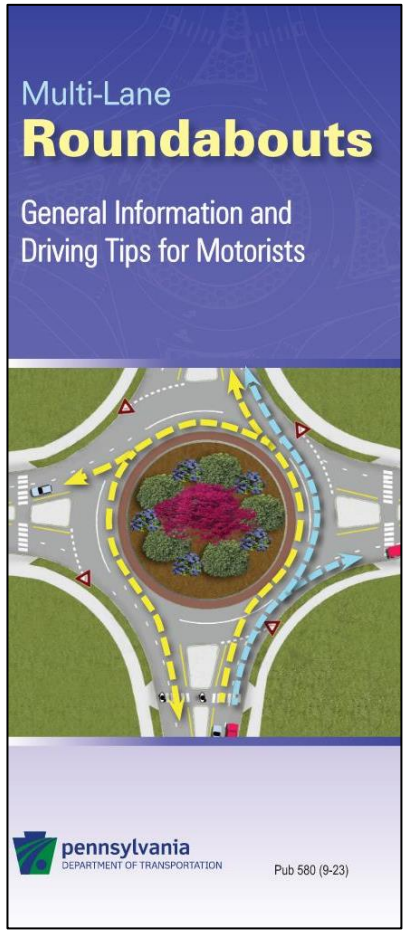
2) Identify project partners break into distinct audiences
   - Decision makers (internal & external)
   - Key partners and stakeholders
   - General partners and stakeholders
- Scale level of outreach to each influence group based on group needs

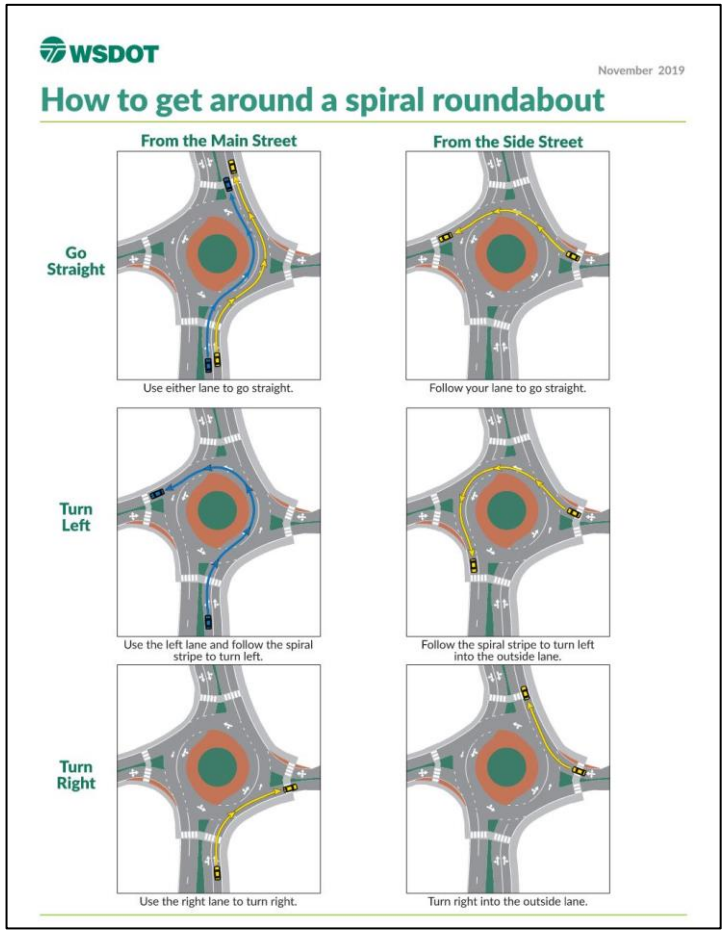


How do I develop an outreach strategy?

3) Consider which communication methods and tools are available

- Brochures
- Fliers



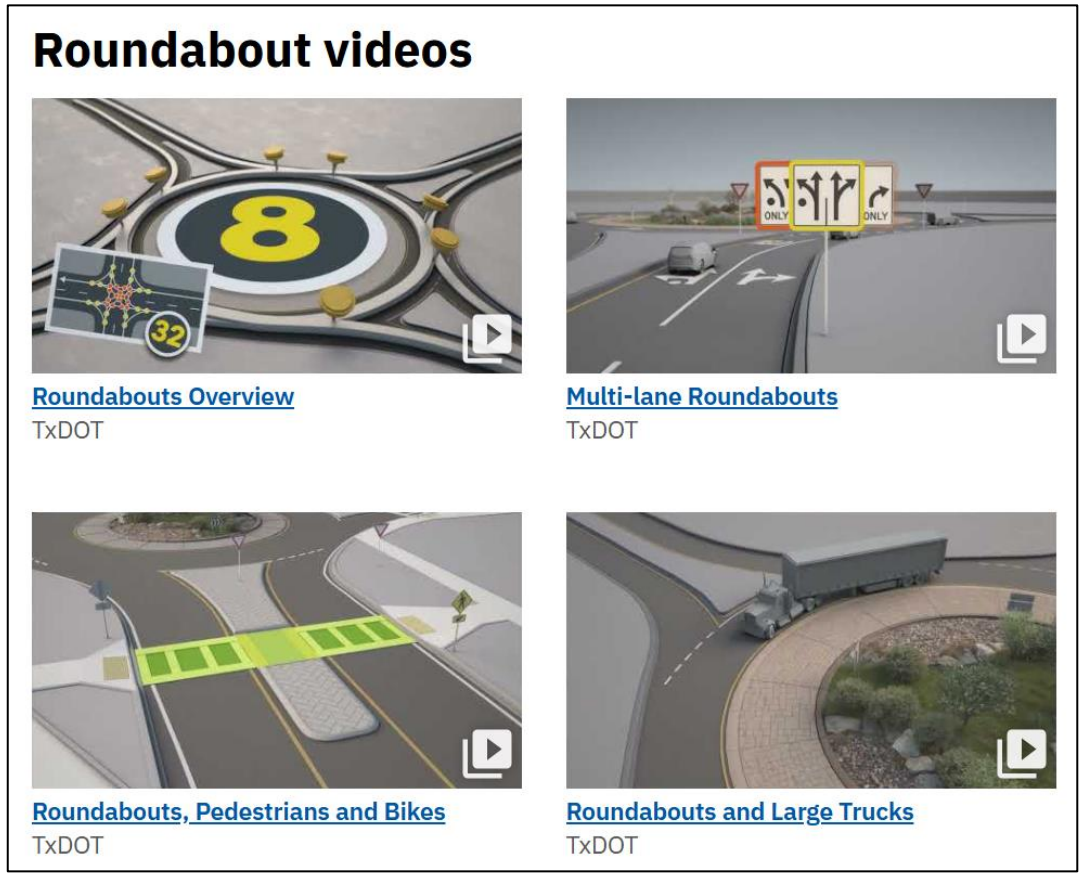


Source: PennDOT, Multi-Lane Roundabouts, pa.gov (left), City of Denton, Pedestrians and Bicyclists, cityofdenton.com (center), WSDOT, How to drive a Spiral Roundabout, wsdot.gov (right)

How do I develop an outreach strategy?

3) Consider which communication methods and tools are available

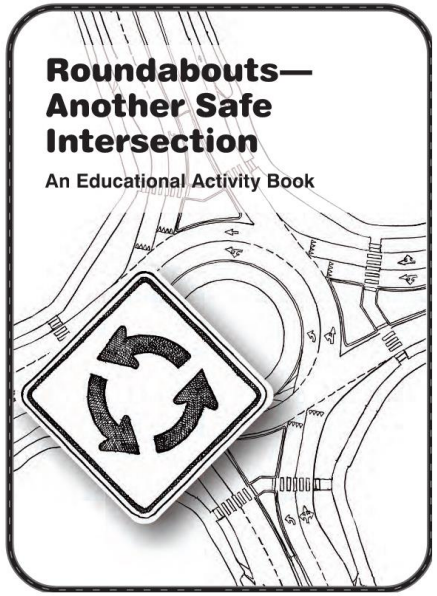
- Videos
- Scale models



Source:
TxDOT, Roundabout videos, txdot.gov/roundabouts (left), WSDOT (right)

How do I develop an outreach strategy?

3) Consider which communication methods and tools are available
   - Roundabout rodeos
   - Children's activities



Source: City of Bend, OR, Roundabouts – Another Safe Intersection (left), WSDOT (center), Photo by Lee Rodegerdts, via NCHRP Report 1043 (right)

How do I develop an outreach strategy?

4) Make an outreach plan for each group
   - Determine what information each group needs
   - Decide on communication methods for each group
   - Schedule multiple opportunities to engage
   - Consider who you need to reach out to first

5) Execute outreach plan for each influence group

Let’s take a look at a sample outreach plan

How do I develop an outreach strategy?

If you've worked with one tribe, you've worked with one tribe.

Audiences	Level of Support	Information to be Provided	Method of Communication	Opportunities to Engage
County Commissioners	Concurrence	• Roundabout benefits • Project benefits • Concerns?	• Info packets • Conversations • Project website	• Council meetings • 1:1 meetings

How do I develop an outreach strategy?

Audiences	Level of Support	Information to be Provided	Method of Communication	Opportunities to Engage
County Commissioners	Concurrence	• Roundabout benefits • Project benefits • Concerns?	• Info packets • Conversations • Project website	• Council meetings • 1:1 meetings
Tribal Nation Engineering	Concurrence	• Roundabout benefits • Project benefits • Concerns?	• Info packets • Conversations • Project website	• 1:1 meetings

How do I develop an outreach strategy?

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Tribal Nation Engineering	Concurrence	• Roundabout benefits • Project benefits • Concerns?	• Info packets • Conversations • Project website	• 1:1 meetings
Tribal Nation Leadership	Concurrence	• Roundabout benefits • Project benefits • Concerns?	• Info packets • Conversations	• Leadership meetings (by invitation)

How do I develop an outreach strategy?

Audiences	Level of Support	Information to be Provided	Method of Communication	Opportunities to Engage
County Commissioners	Concurrence	• Roundabout benefits • Project benefits • Concerns?	• Info packets • Conversations • Project website	• Council meetings • 1:1 meetings
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Tribal Nation Leadership	Concurrence	• Roundabout benefits • Project benefits • Concerns?	• Info packets • Conversations	• Leadership meetings (by invite only)
Public	Lack of Opposition	• Roundabout benefits • Roundabout education	• Project flier • Conversations • Project website • Scale model	• Open house • Community events

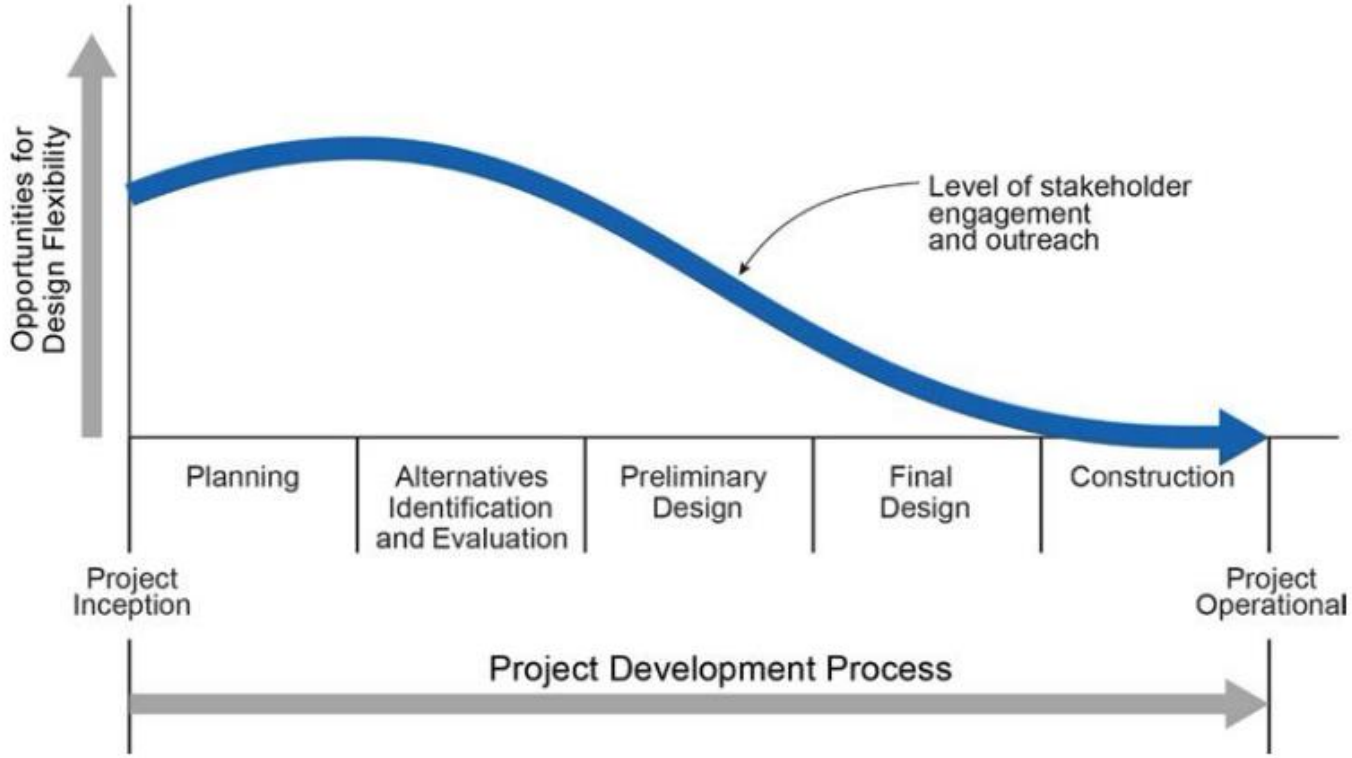
How do I develop an outreach strategy?

6) Debrief at end of project
   - Did we achieve our goals?
   - Was our messaging understood?
   - What worked well that we can build on for future success?
   - What should we do differently next time?

Lessons learned & Key takeaways

Lessons learned

- Begin outreach early, especially with decision makers
- Addressing concerns becomes more difficult as the project progresses



Source:
NCHRP Report 1043, Exhibit 5.5

Lessons learned

- In-person open house messages reach a narrow slice of communities
- Virtual open houses reach a different audience
- Attending local events helps reach more people
  - Community Days and Parades
  - School STEM Night
  - National Night Out

Source: Walla Walla Union Bulletin (left)
WSDOT, Yakama Nation Backpack Giveaway (right)

Lessons learned

- Projects cannot move forward if decision makers don't trust design team
- Teaming with a trusted local partner can open doors, but we must still earn community trust

Source:
Yakama Nation

Key takeaways

- Effective outreach improves project outcomes
- Every project is different
- Every county and town is different
- Every Tribal Nation is different

Building trust builds roundabouts!

Source: WSDOT

Thank you for joining us!

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Approaching Rural Roundabouts:
Designing to Enhance Visibility

Katie Handel, PE*

September 24, 2025

*WA, TX

Introduction

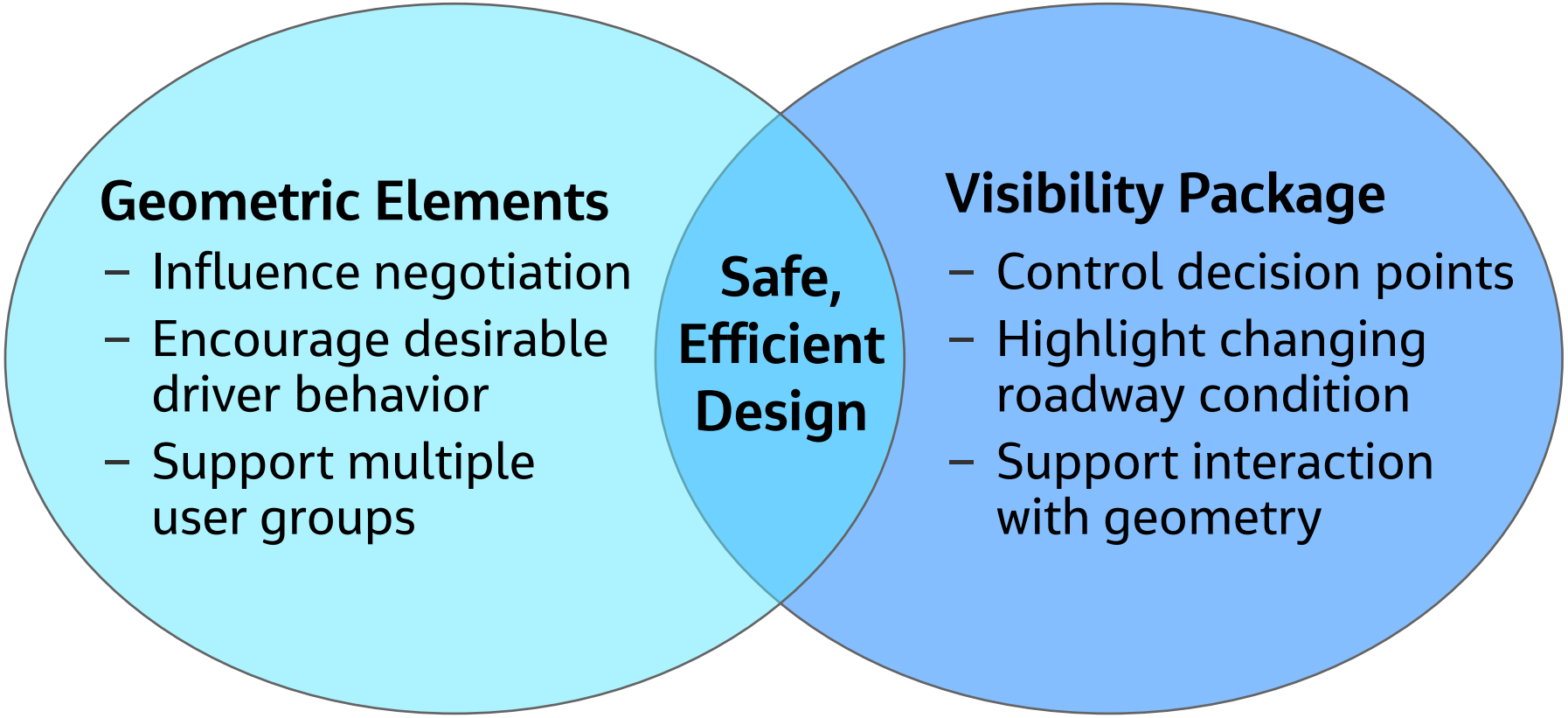
Katie Handel, PE

- Roundabout SME, Geometric Specialist
- 12+ years experience
- 125+ roundabouts projects
- Bellevue, WA
- Member, TRB AKL12 (Roundabout Committee)

Agenda

- Understand roundabout features
- Conduct performance checks
- Enhance visibility

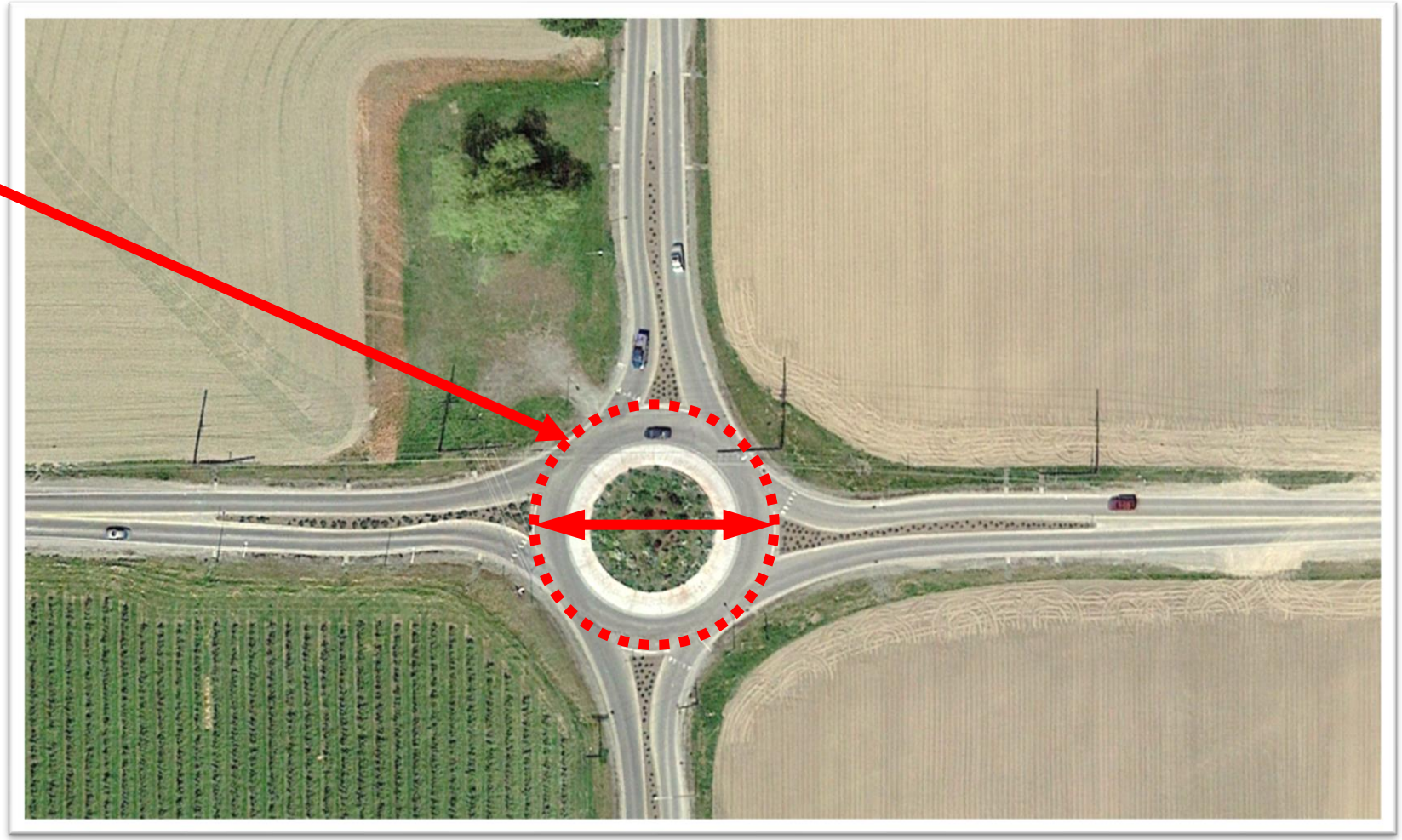
Goals for rural roundabout design



Harmonize geometric and supporting elements to promote a safe and efficient intersection

Roundabout features

- Inscribed Circle Diameter (ICD)
- Circulatory roadway
- Truck apron
- Center island
- Splitter islands
- Chicane



Source:
Google Earth Pro

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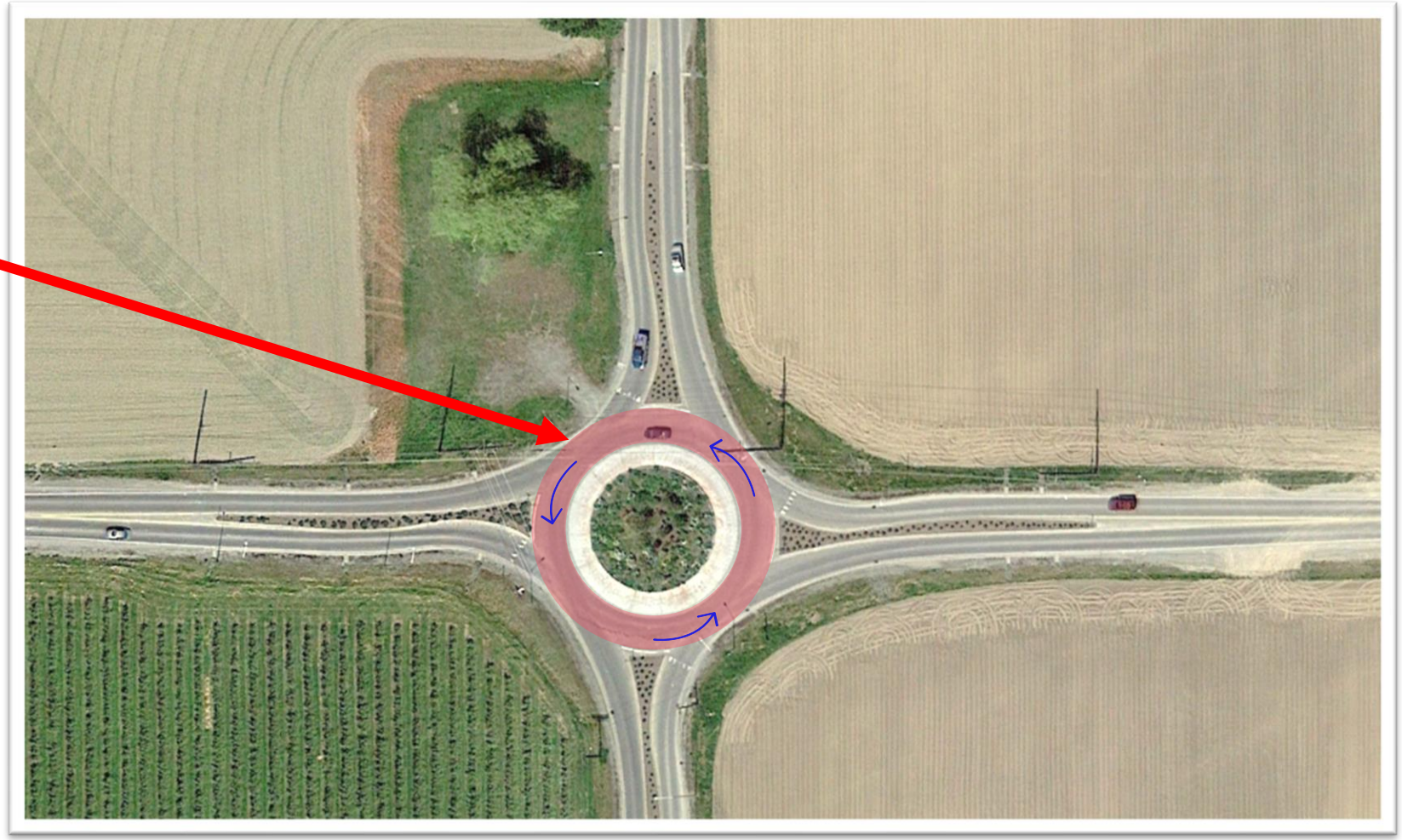

Source:
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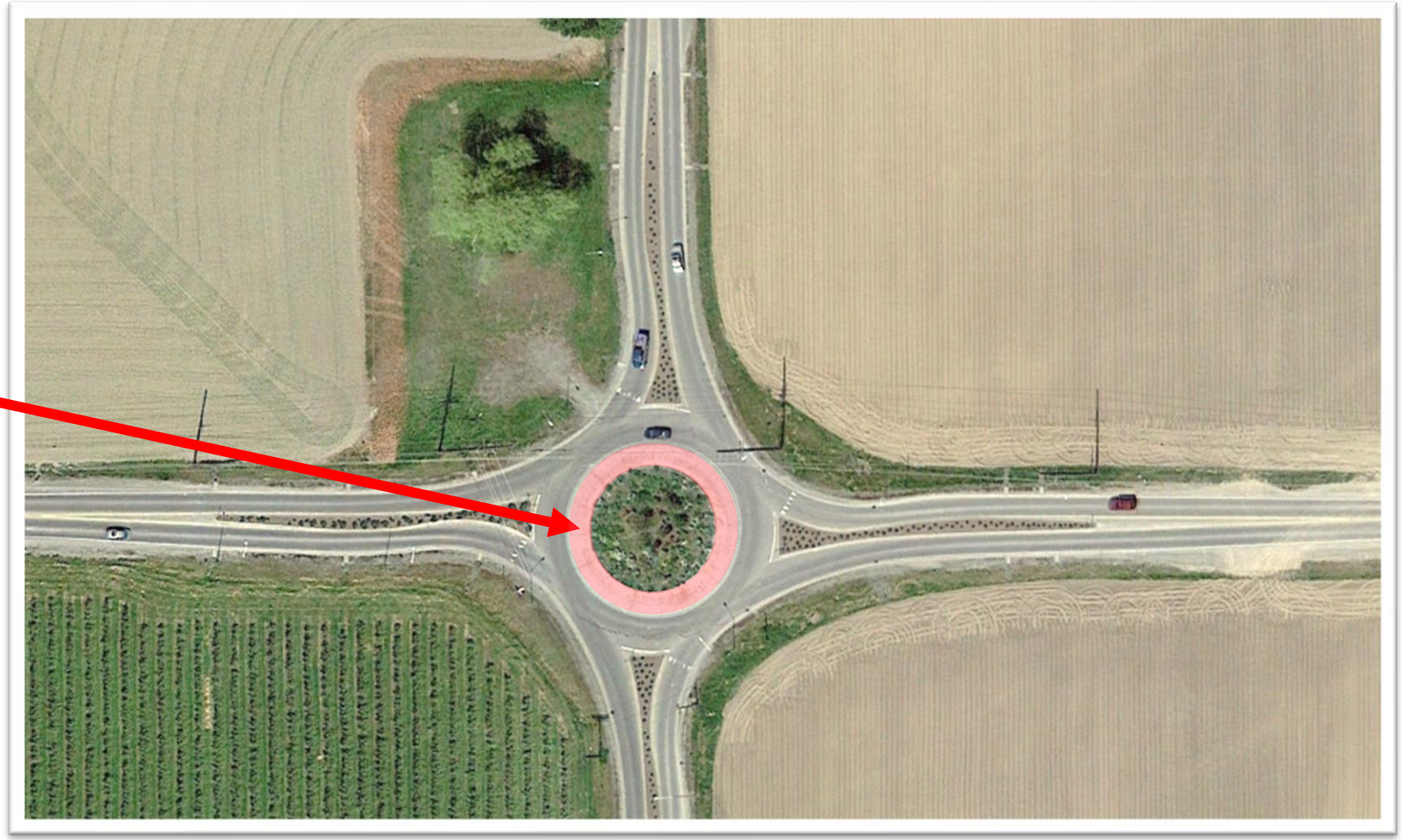

Source:
Google Earth Pro

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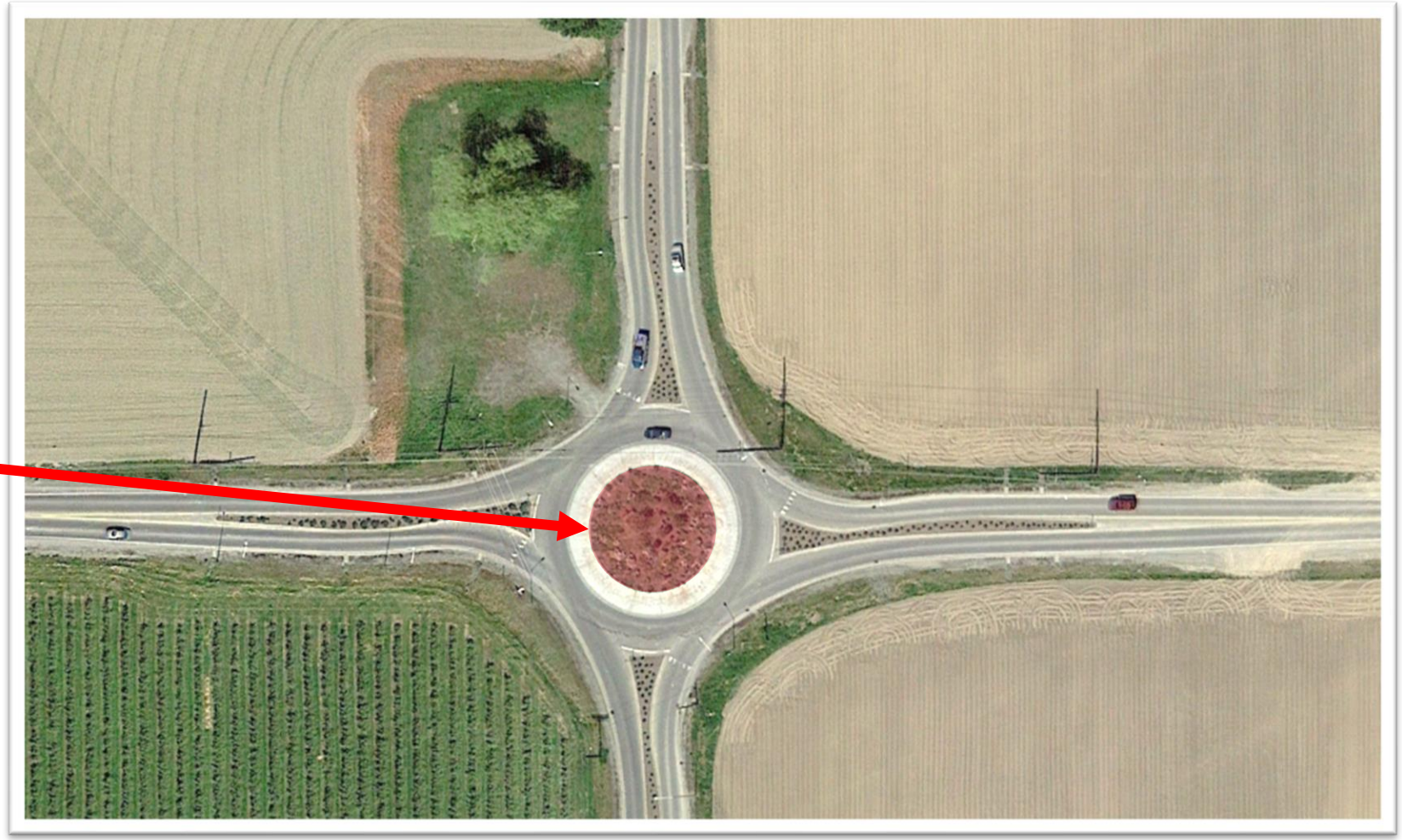

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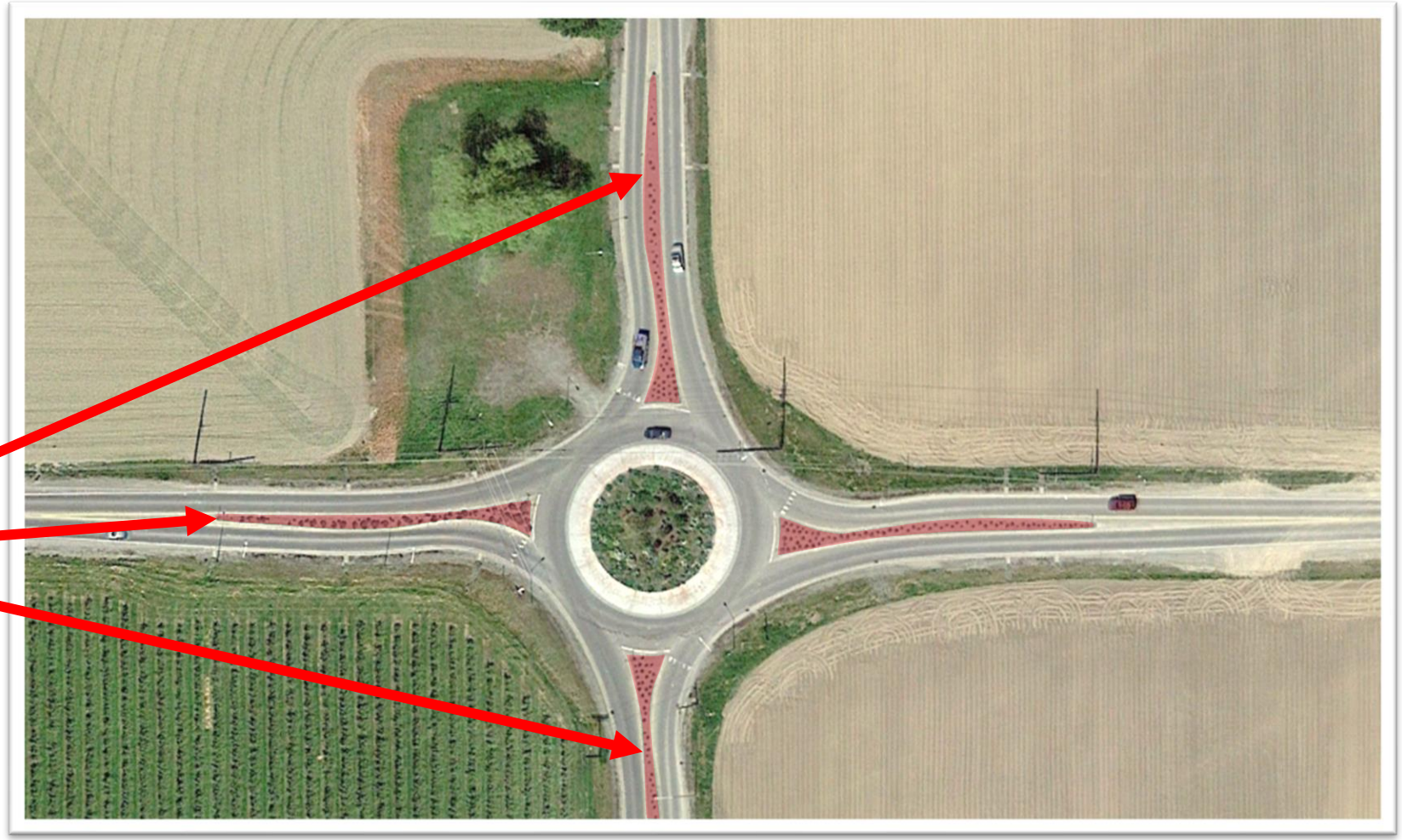

Source:
Google Earth Pro

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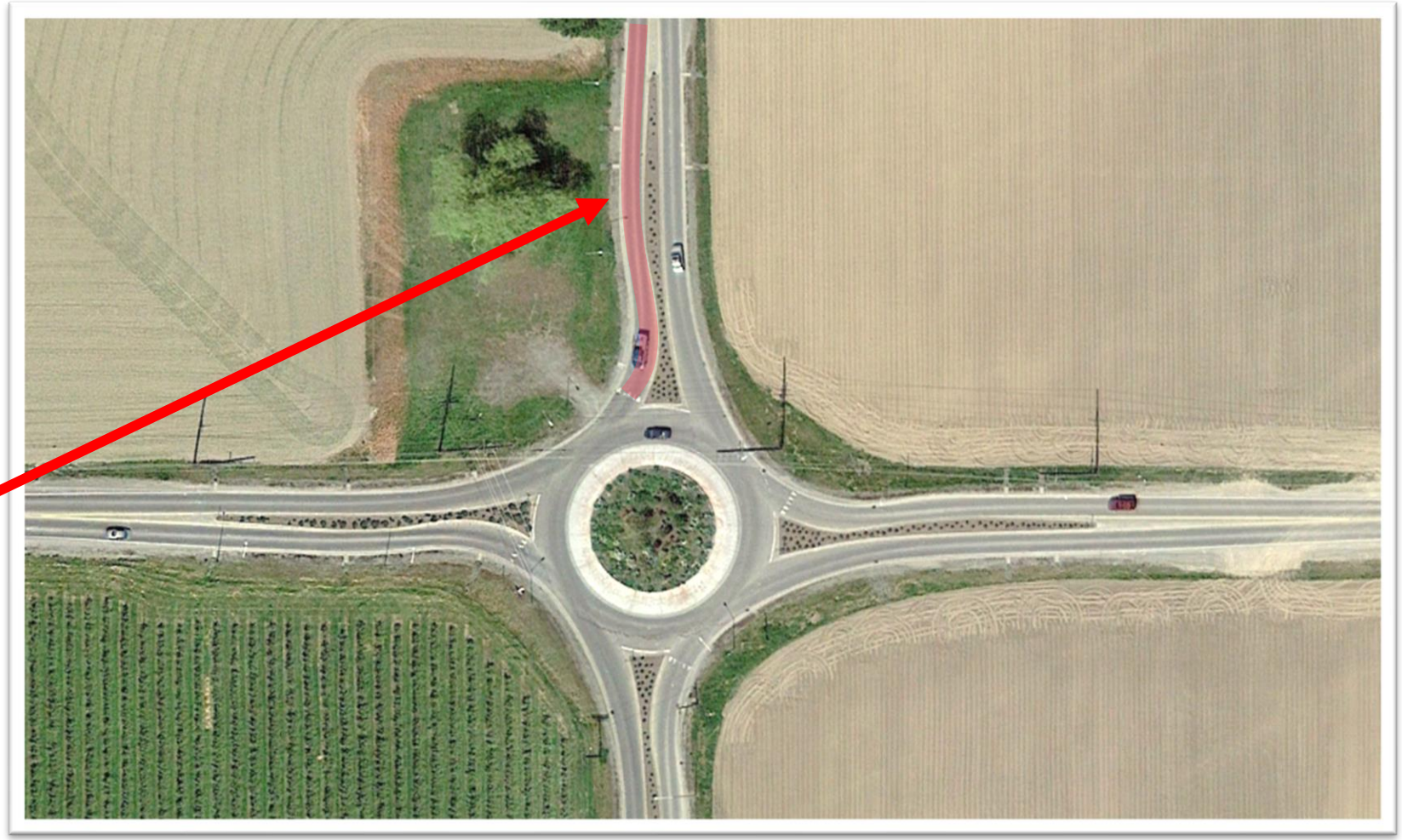


Source:
Google Earth Pro

Key design principles

- Proper deflection
- Appropriate speed control
- Fluid drive path

Source: Skagit County

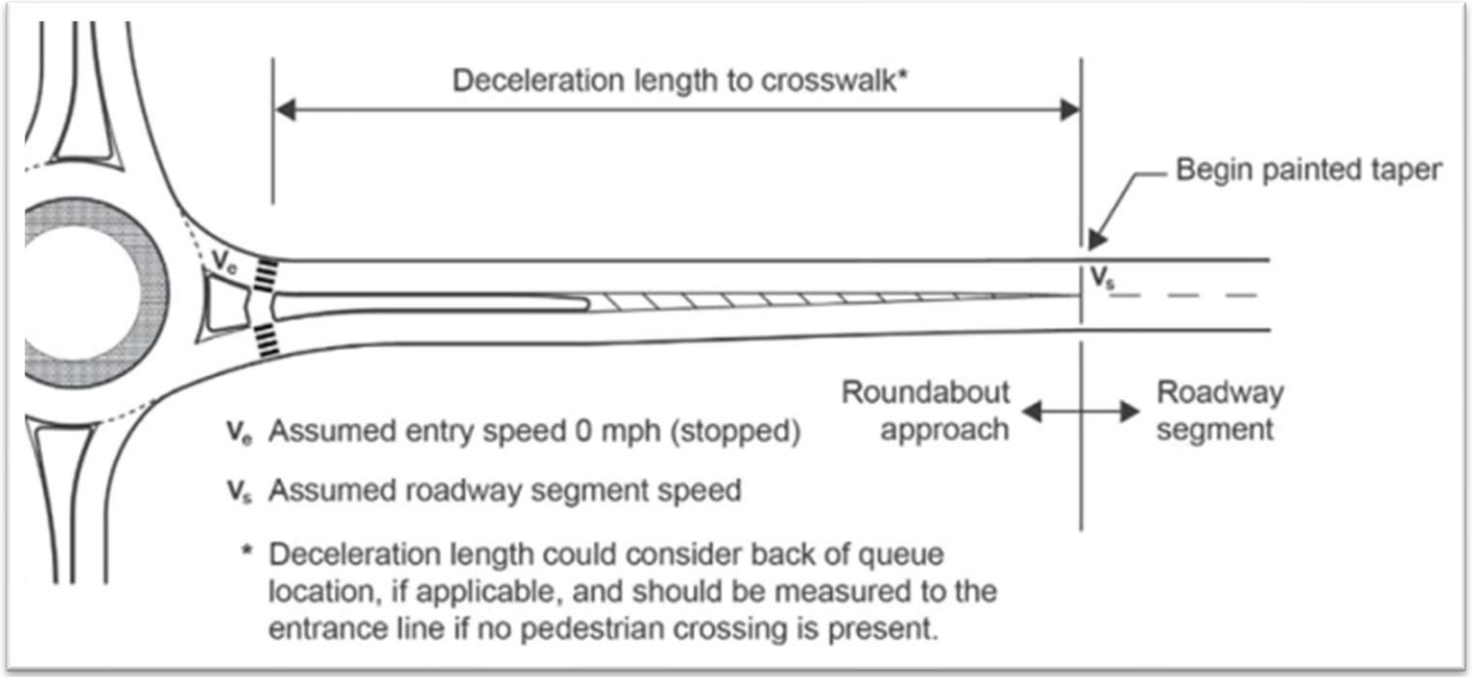
Speed control

- Approach geometry induces natural slowing
  - Introduce curvature approaching the intersection
  - Successively smaller radii
- Benefit:
  - Efficient operation
  - Low speed differentials
  - Reduced severity of collisions

Source :
Google Earth Pro

Deceleration length

- Cue drivers to changing condition
- Follow operation and design principles for freeway exit ramps
  - Deceleration distance based on assumed stop location
  - Account for grade
- Consider superelevation for chicane radii



Source:
NCHRP 1043, Exhibit 10.107

Splitter islands

- Select characteristics by approach
  - Context classification
  - Approach speed
  - Turning movements
  - Active transportation needs
  - Visibility challenges
- Raised & non-traversable preferred
- Color contrast matters

Higher approach speed = longer splitter island

Source: Katie Handel

Exterior curbing

- Introducing exterior curbs on approach is recommended
  - Mountable curbing advised
- Closed drainage system not required

Source (left & middle): Katie Handel

Source (right): NCHRP 1043, Exhibit 10.111 (Lee Rodegerdts)

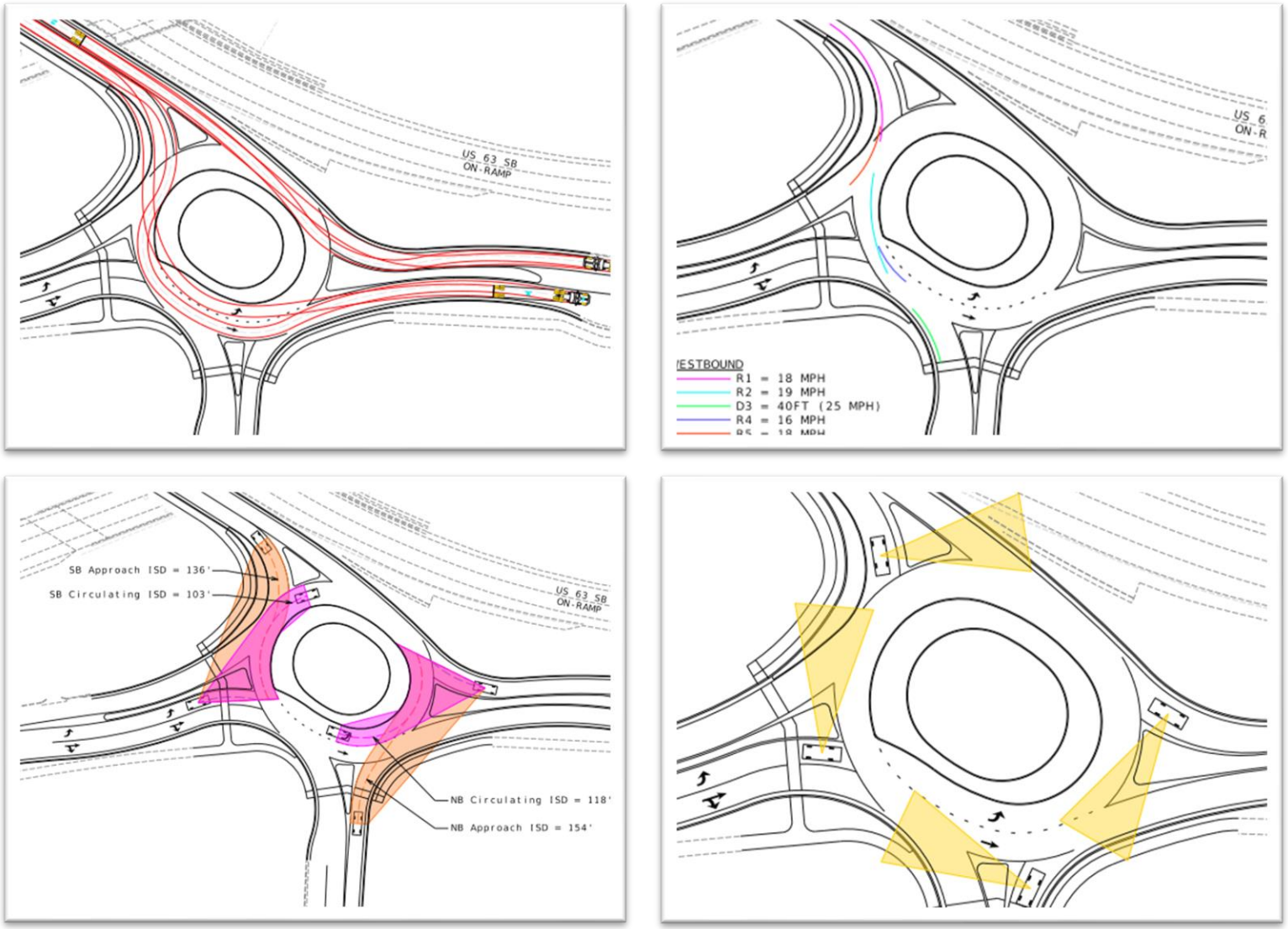
Active transportation

- Rural environment ≠ no active transportation
- Not everyone drives
- Rural examples
  - Raised & at-grade shoulders
  - Plan for splitter island cut-throughs
  - Grading for the future
  - Include shared-use path

Source:
WSDOT DM Ch. 1320.04(3)(a)

Performance checks

- Validates geometrics for unique needs of the intersection
  - Turning movements
  - Geometric speed (fastest paths)
  - Sight distance
  - View angle



Source: Jacobs

Performance checks

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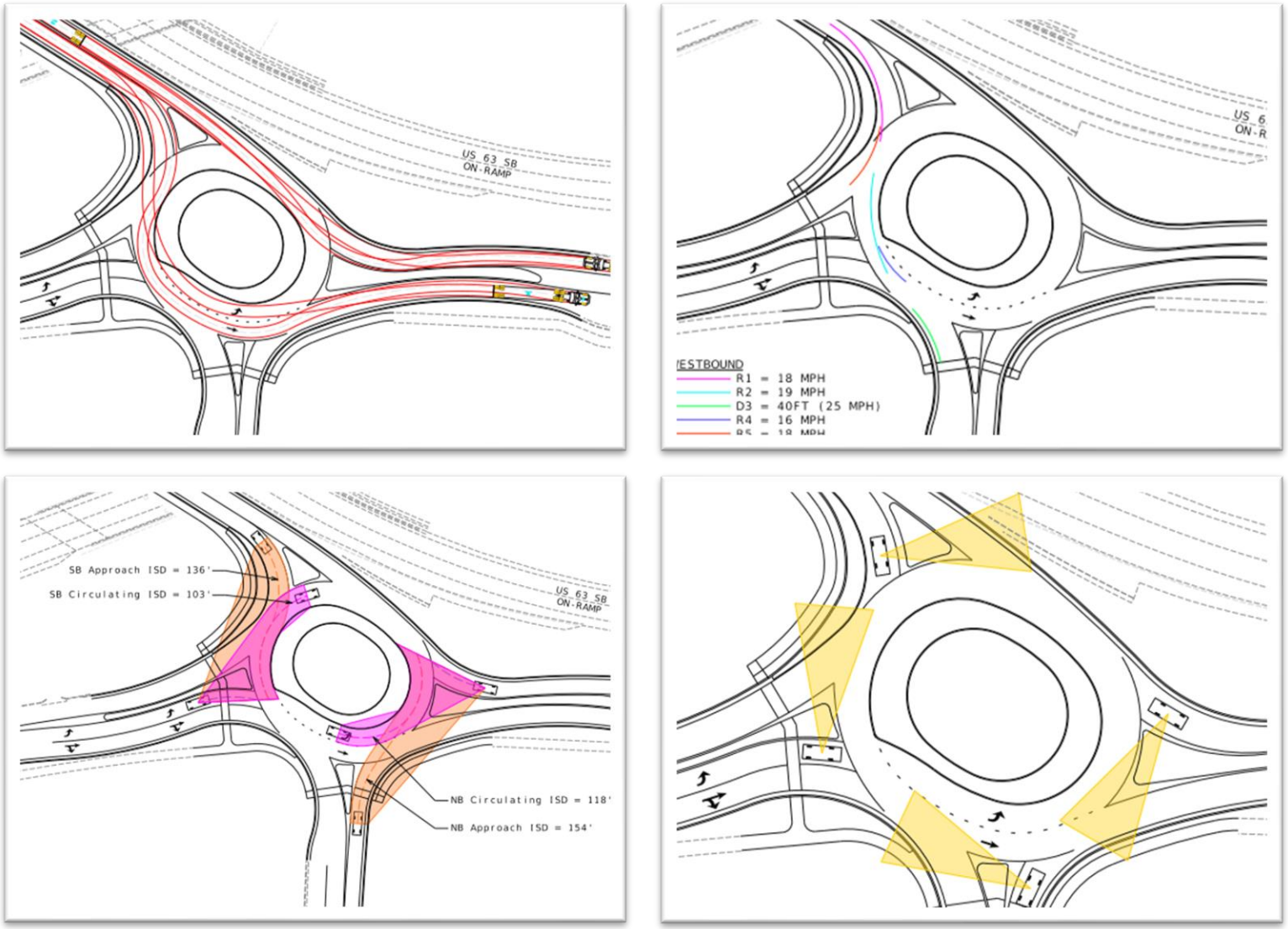


Source: Jacobs

Vehicle selection

- Selecting correct vehicle(s) is imperative to the roundabout's success
  - May be different for each leg/ turning movement
  - Reduces risk of under or over-design
  - Investment protection for curbs, signs, illumination
  - Happy freight community

Source (top): Katie Handel

Source (bottom): Reid Middleton

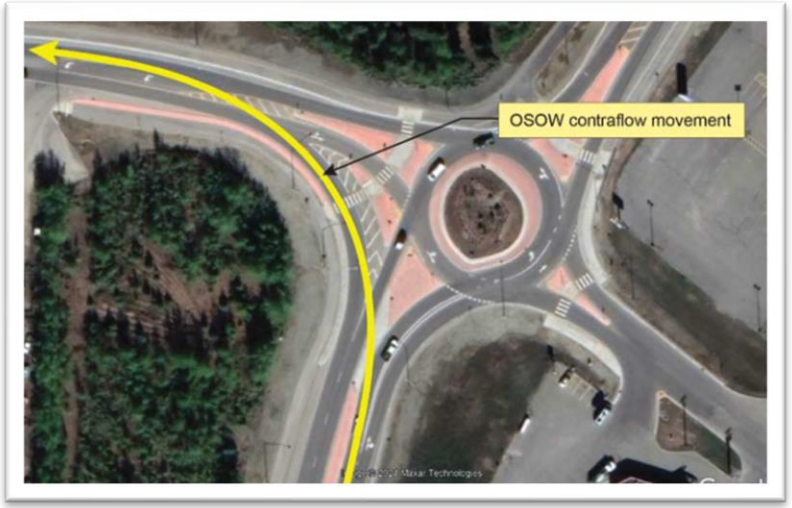
Vehicle selection

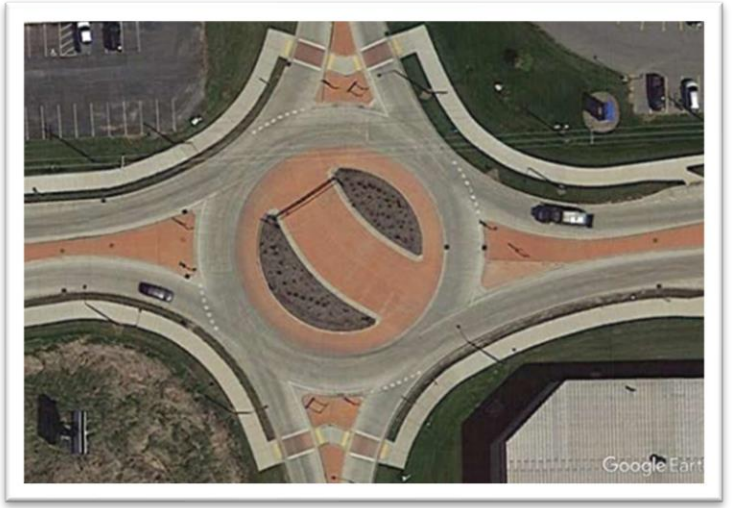
- "Design" vehicle
  - Frequent user
  - Truck cabs traverse within travel lane
  - Trailer may offtrack on aprons or shoulders
- Common examples:
  - Urban: Bus or single unit truck
  - Rural: WB-62
  - Highways: WB-67

Source: Katie Handel

Vehicle selection

- "Accommodated" or "Control" vehicle
  - Infrequent large vehicle
  - Makes specific movement(s)
  - Cab & trailer may mount aprons
- Oversize or overweight (OSOW)
  - Length
  - Load overhang
  - Vertical clearance





Source (top): Reid Middleton

Source (bottom left): NCHRP 1043, Exhibit 10.41

Source (bottom right): NCHRP 1043, Exhibit 10.43

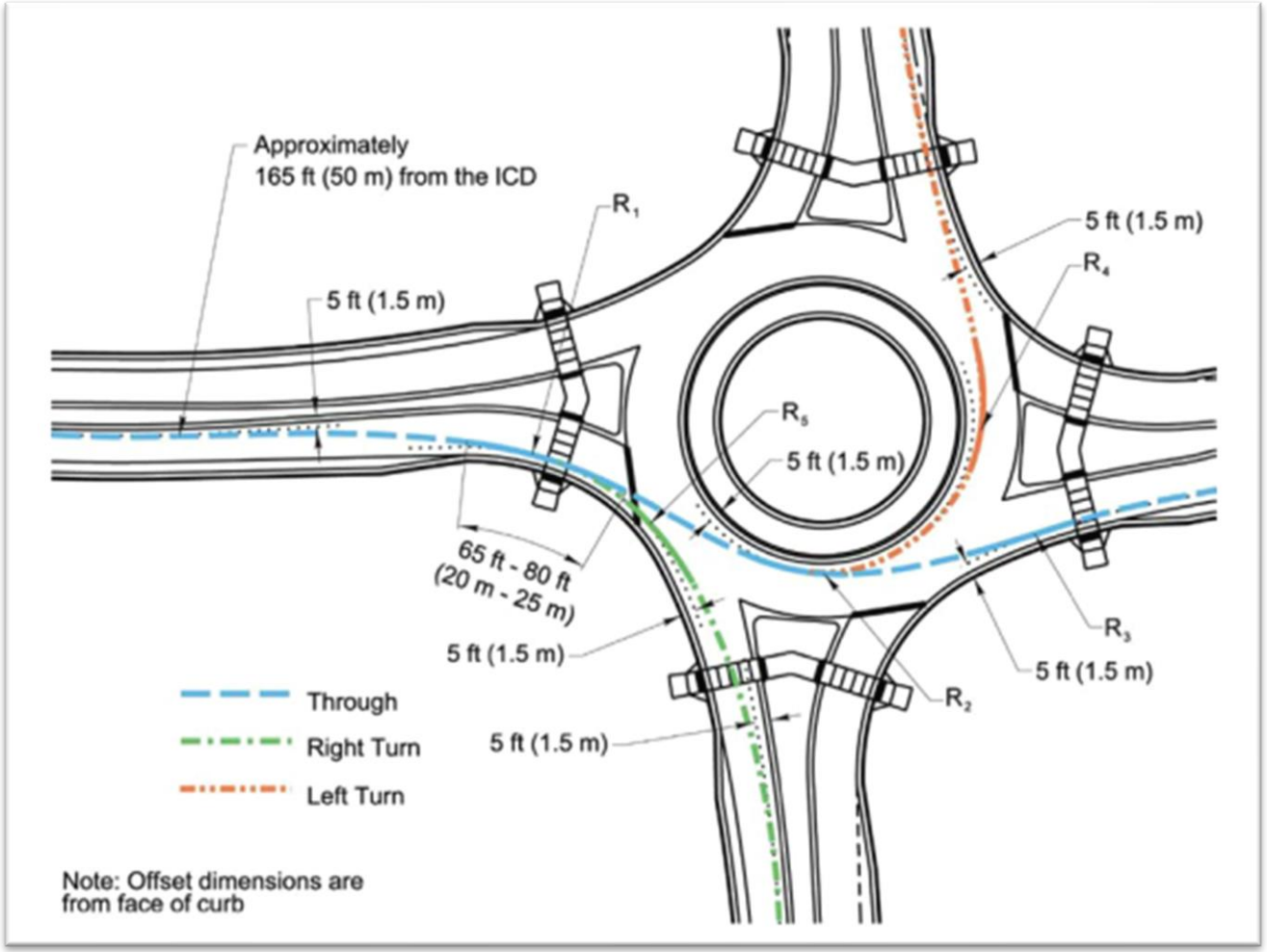
Turning movements

- Use natural, fluid paths for simulations
- Low negotiation speed for trucks
  - 3-5 mph typical
- Provide 1′ min. clearance to vertical curbs
  - Tires off gutter pans
- Interior truck apron
  - Design vehicle trailers can offtrack
  - 3-15 ft width typical
- Exterior truck aprons
  - Generally reserved for control vehicles

Source:
Katie Handel

Geometric speed (Fastest path)

- Quantitative eval. of speed control
  - NCHRP 1043, Chapter 9.4
- Estimates path of vehicle centerline
  - Radii are correlated to speed
- Speed differential
  - 10-15 mph max between successive movements
  - Lower speed differential = reduced crash severity
- Calculation instruction
  - NCHRP 1043, Appendix A



Source:
NCHRP 1043, Exhibit A.3

Supporting elements enhance visibility

- Common supporting elements include:
  - Signing
  - Marking
  - Lighting
  - Landscaping
- Supporting elements improve visibility and operations
- Not a substitute for sound geometric design
- Draw on FHWA Proven Safety Countermeasures

Source (photo): Katie Handel

Source (icons): FHWA Proven Safety Countermeasures

Signing

- Advance guide signs are recommended for 40+ mph approaches
  - Provides supplemental warning of upcoming roundabout
  - Consider gated configuration
- Incorporation of LED elements can increase driver awareness
  - LED flashing borders
  - Beacons
  - Radar feedback signs (RSDS)

Source:
NCHRP 1043, Exhibit 12.1 (Lee Rodegerdts)

Marking

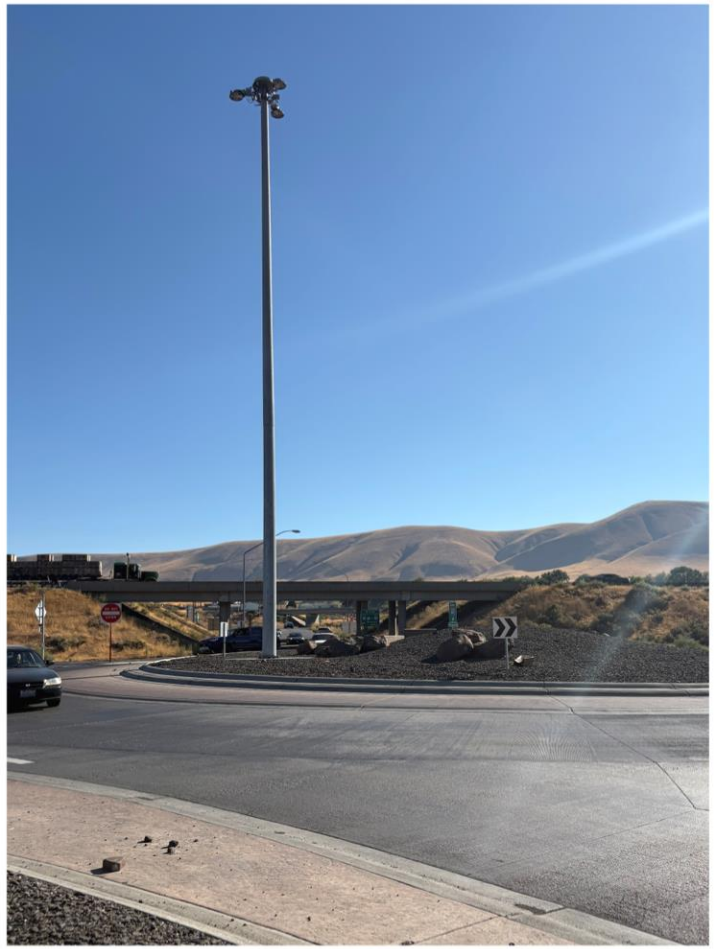
- Use markings to supplement and reinforce geometry
- Consider applying proven safety countermeasures
  - Wide edge lines
  - Optical speed bars
  - Rumble stripes/strips

Source (top): Texas Technical Institute

Source (bottom): FHWA

Lighting

- Improves visibility & safety
- Policy level decision
  - Recommended illuminance levels vary
- Research indicates partial lighting is still beneficial
  - NCHRP Synthesis of Highway Practice 575
- Consider transition zones



Source:
Katie Handel

Landscaping

- Creates target value for approaching vehicles, enhancing visibility
  - Controls sight distance
  - Promotes lower speeds
  - Reduces headlight glare
- Supports transition between roadway contexts
  - Placemaking opportunity
- Low-maintenance options are available

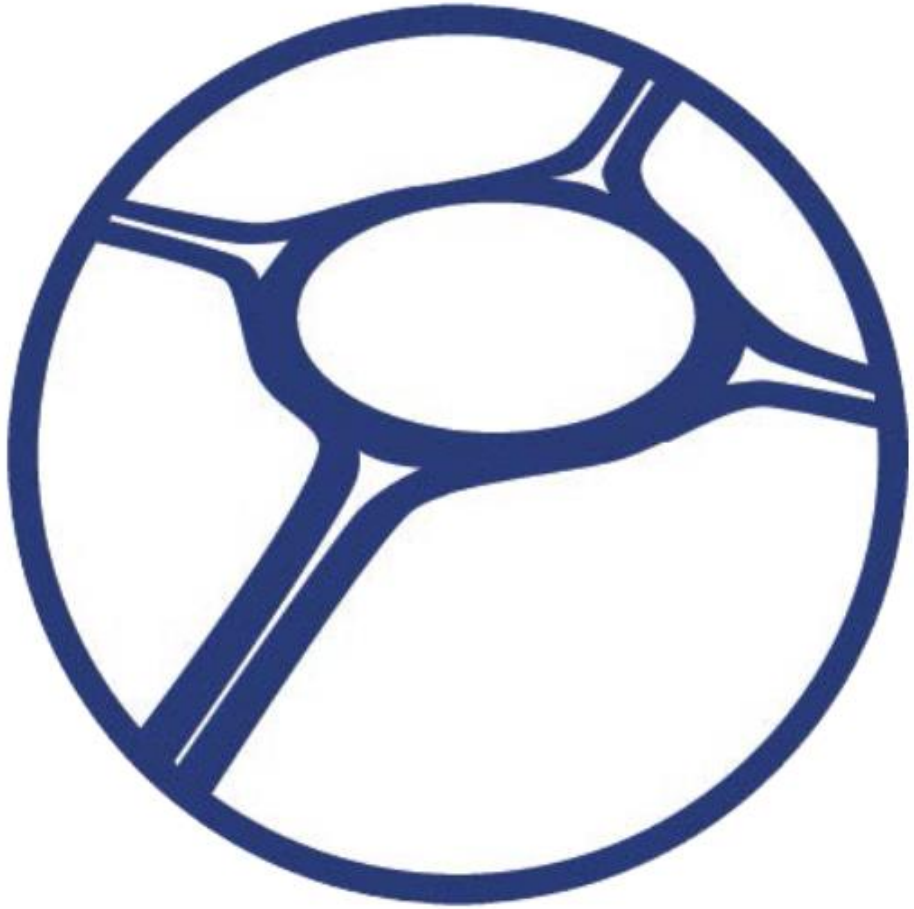
Source: Katie Handel

Key takeaways

- Geometrics are critical for roundabouts with high-speed approaches
- Right-size the roundabout for the user mix
- Use supporting elements to strategically enhance visibility

Challenge

- Can a roundabout solve a safety problem in your area?



Source:
FHWA Proven Safety Countermeasures

Thank you for joining us!

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Important