Oregon Department of Transportation

US20@Barclay Drive Roundabout Project
Informational Open House
April 14, 2015

Oregon Department of Transportation

US20@Barclay Drive Roundabout Project

Informational Open House

Agenda

6:00pm	Doors Open
6:15 pm	Welcome/Introductions
6:20 pm	History and Need of the Project
6:30 pm	Roundabout Purpose, Proposed Design, Results of Roundabout Testing
7:00 pm	One-On-One Questions and Comments
7:30 pm	Wrap Up/Continued Opportunity for Questions
8:00 pm	End

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US20@Barclay Drive Roundabout Project

Need and Purpose

Need - Safety

"…***long delays for pedestrians, bicyclists and motorists wishing to cross the highway or for vehicles wanting to turn left onto or off of the highway.*** *"* TSP Jan 2010

Purpose – Improve Safety

Reduce the number and severity of motor vehicle crashes at this intersection. Maintain access to residential communities, schools, lodging, commercial and industrial developments and the alternate truck route for all users of the facility (Hwy US20)

History/Process

TSP – Jan 2010

Feasibility Analysis/Workshop – Nov 2011

City Requests Funding thru STIP for Roundabout

Funding/STIP/Public Stakeholder Process – 2011 to Present

Freight Concurrence on Sizing – Apr 2015

City/ODOT Agreement on Design Concept

Construction Summer 2016

Design Concepts

Design Refinement

Oregon Department of Transportation

US20@Barclay Drive Roundabout Project

Roundabout Purpose, Proposed Design, Results of Roundabout Testing

Scott Beaird, PE

Kittelson & Associates, Inc.

US20/BARCLAY DRIVE ROUNDABOUT

Informational Open House

April 14, 2015

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Oregon Department of Transportation

CITY OF SISTERS INCORPORATED 1946

System Context

What is a roundabout?

What is not a modern roundabout?

Rotary

Photo: City of Fort Worth, TX

Traffic Circle

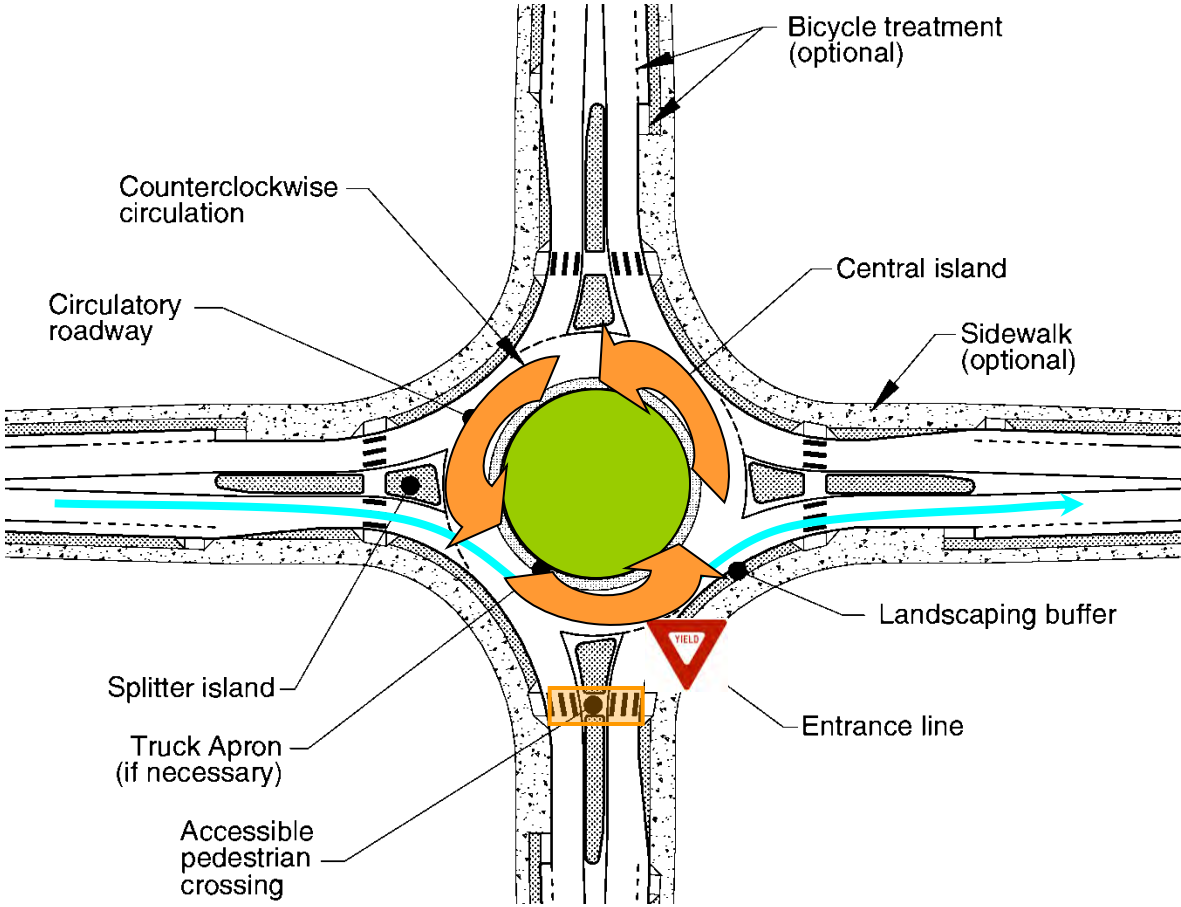
Photo: Google Maps

Neighborhood Traffic Circle

Photo: Lee Rodegerdts

What is a modern roundabout?

- **YIELD control on entry**
  - Priority to circulating vehicles
- **Slow, consistent speeds**
- **Landscaping**
- **Pedestrian access & crossing**
- **No Parking**
- **Direction of circulation**
  - Channelization



Conversion of Rotary to Roundabout: Kingston, NY

Photo: New York State DOT

Why a roundabout?

Rationale for Considering Roundabouts

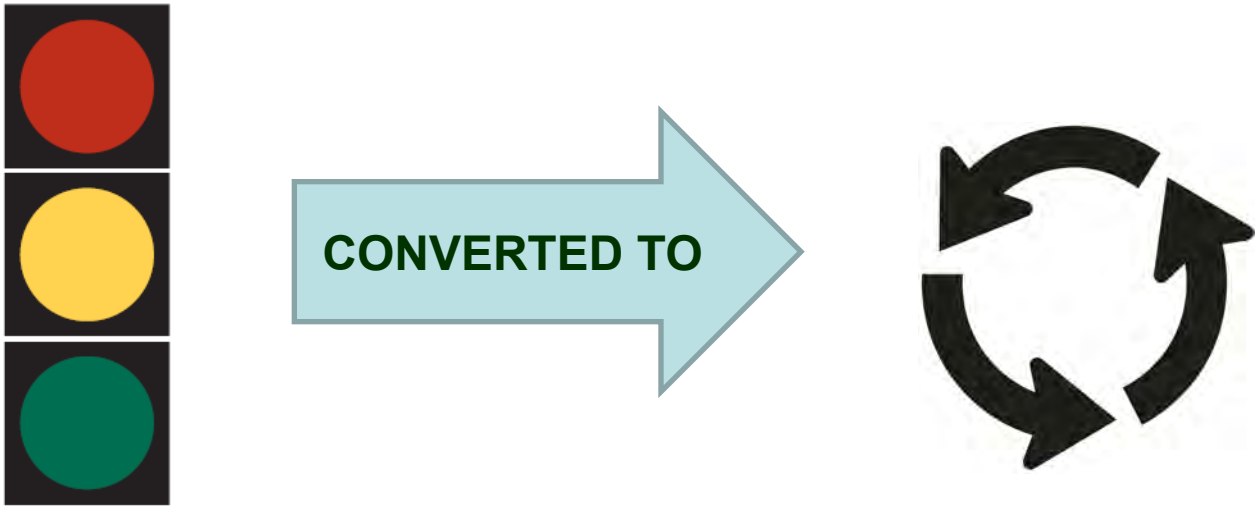
- **Safety**
  - Reduce number of crashes
  - Reduce severity of crashes
- **Operations**
  - Reduce congestion
  - Reduce emissions
- **Gateway Aesthetics**

Safety Performance (NCHRP Report 572)

- Over 90% reduction in fatalities
- 76% reduction in injuries
- 35% reduction in total crashes
- Very little reported pedestrian and bicycle crash experience

Photo: Lee Rodegerdts

Safety Performance (NCHRP Report 572)



- **78% reduction in injuries**
- **48% reduction in total crashes**

Pedestrian Safety

- Netherlands (181 Intersections converted to roundabouts)
  - 73% reduction in pedestrian crashes
  - 89% reduction in pedestrian injury crashes
- Norway (4 years of data)
  - 59 roundabouts = 1 pedestrian injury crash out of 33 injury crashes (3%)
  - 124 signals = 57 pedestrian injury crashes out of 287 injury crashes (20%)
- NCHRP Report 572
  - 769 observed pedestrian events
    - No crashes
    - Four conflicts (0.5%)

Cyclist Safety

- NCHRP Report 572
  - 690 observed bicyclist events
    - No crashes
    - Four conflicts (0.6%)

Rationale: Safety

- Roundabouts have a proven safety record for reducing motor vehicle crashes, particularly injury and fatal crashes

- Experience is due to basic contributing factors:
  - Reduced conflict points
  - Reduced conflict severity (crash types)
  - Reduced vehicle speeds
  - Reduced driver decisions

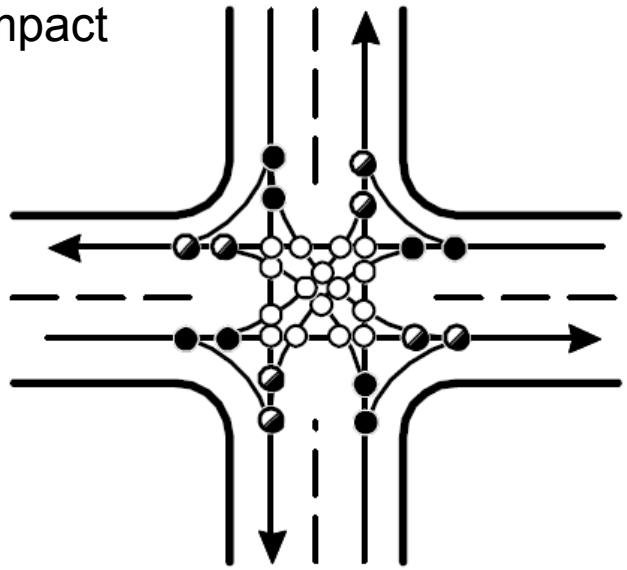
Vehicle Conflict Points: REDUCED

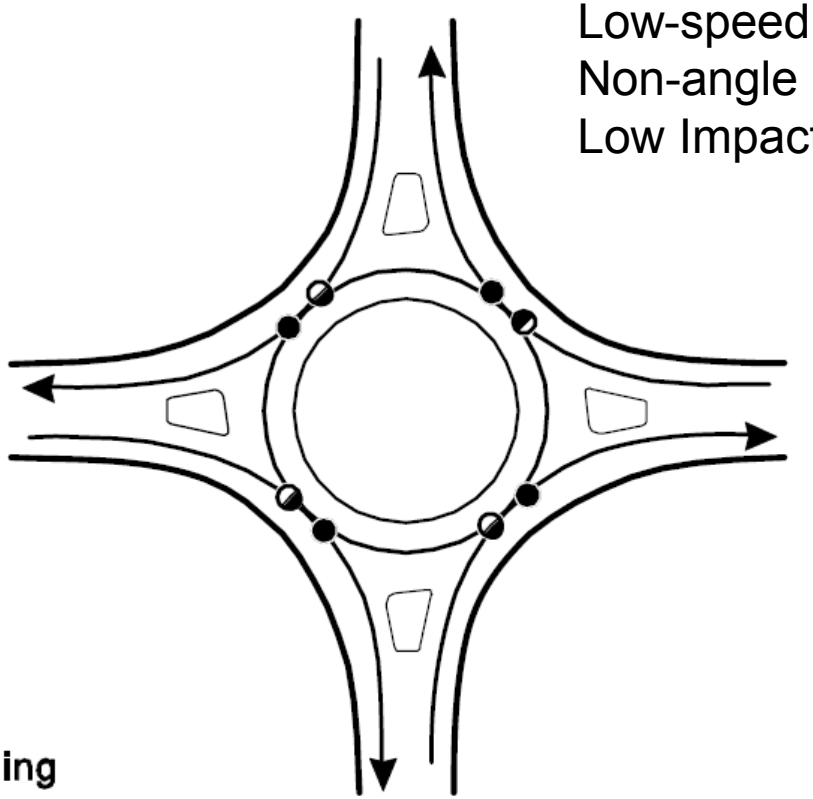
32 conflict points

- High-speed
- Angle Crashes
- High Impact

8 conflict points

- Low-speed
- Non-angle Crashes
- Low Impact





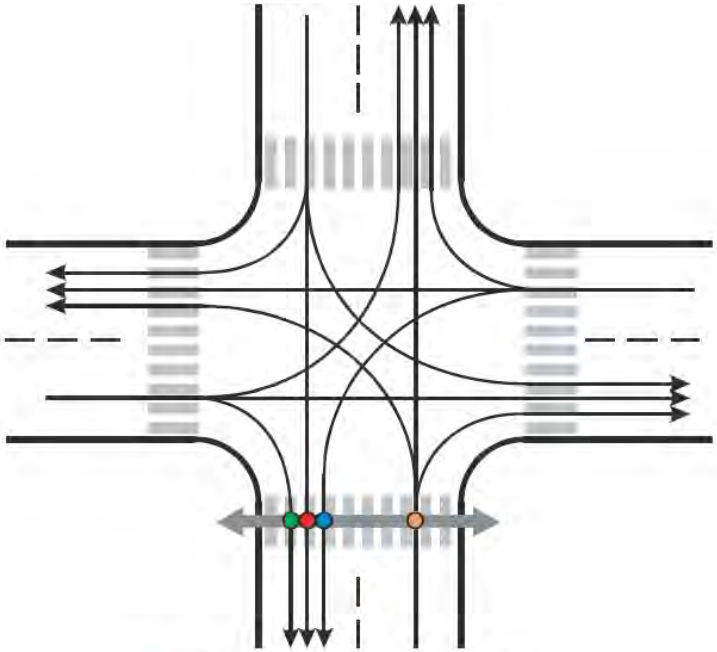
● Diverging

◪ Merging

○ Crossing

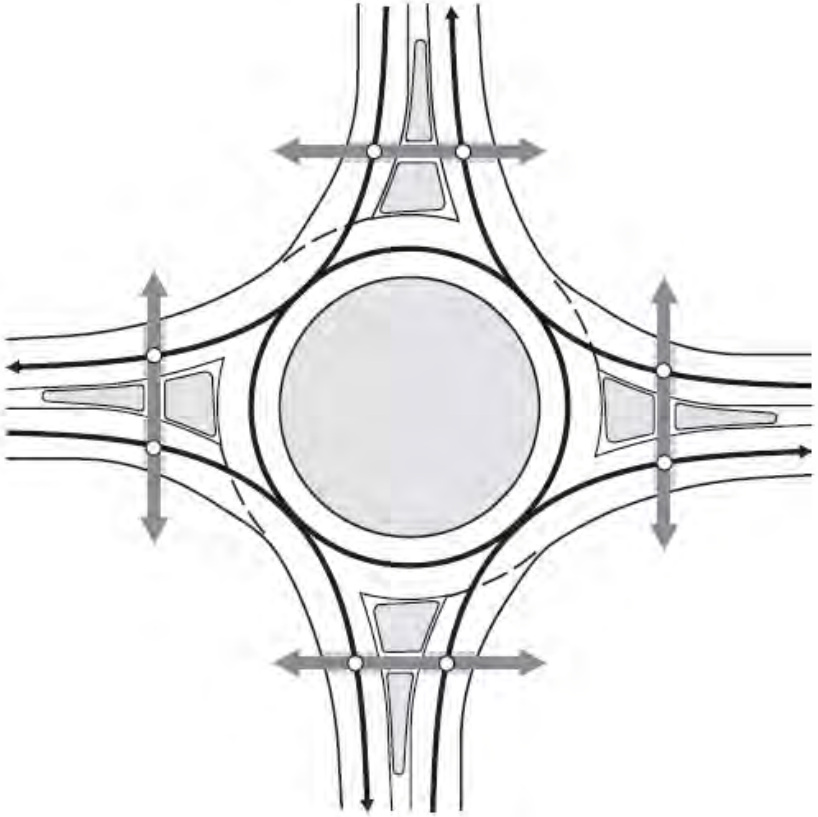
Pedestrian Conflict Points: REDUCED

16 conflict points



- Right turn on green conflict
- Red light running conflict
- Left turn on green conflict
- Red light running or right turn on red conflict

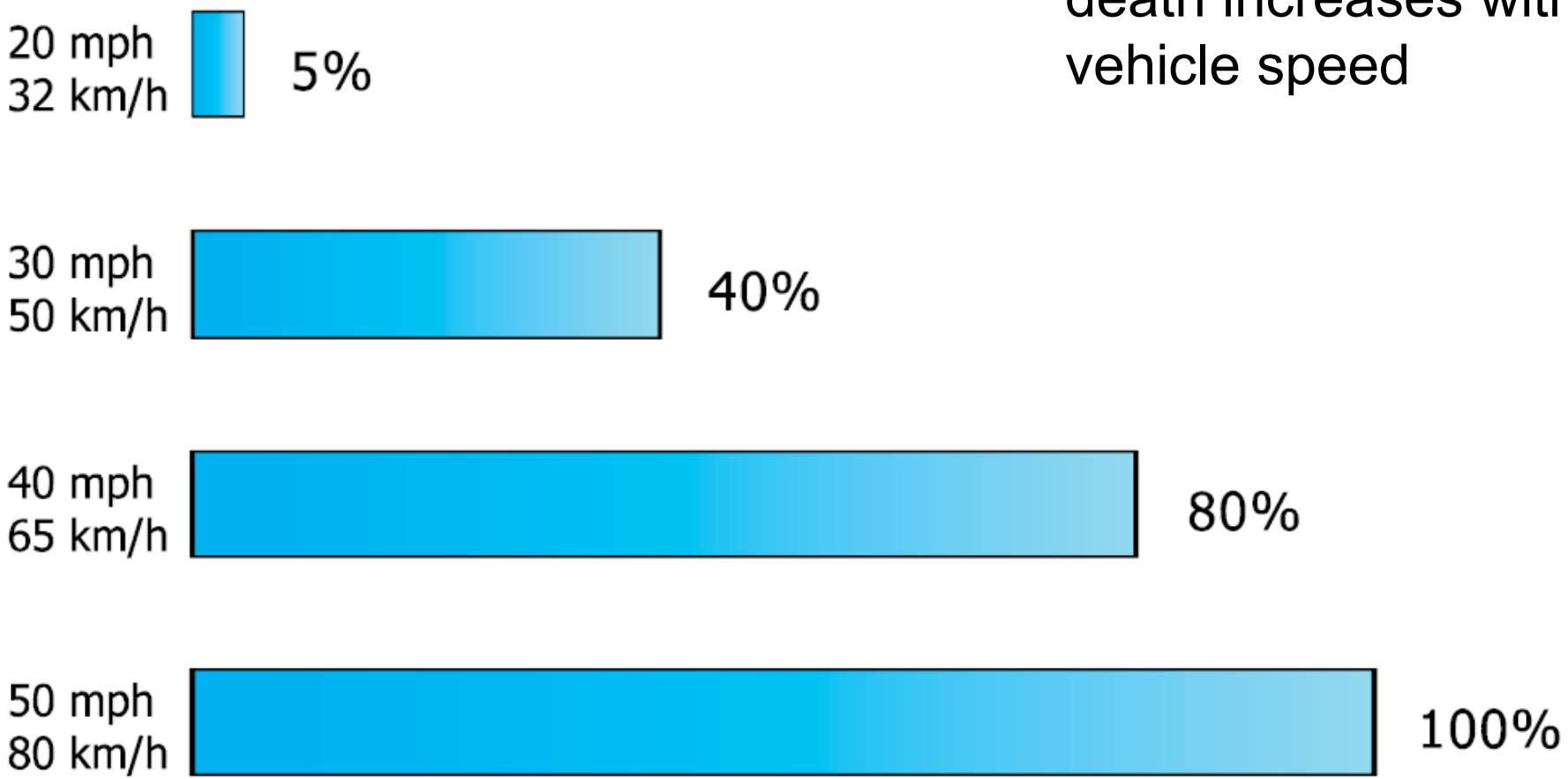
8 conflict points



○ Vehicle/Pedestrian Conflicts

Lower speed is safer for pedestrians

Chance of pedestrian death increases with vehicle speed



Roundabouts and Bicyclists

- Roundabouts slow vehicles to speeds compatible with bicycles
- Bicyclists have wide range of skills and comfort levels in mixed traffic
  - Experienced cyclists (e.g., commuter or utility cyclists)
  - Inexperienced cyclists (e.g., children or occasional recreation cyclists)
- Give bicyclists option of either being vehicle or pedestrian

Expected Crashes over 5 Years

5.0 Crashes
1.8 Fatal/Injury

5.0 Crashes
1.7 Fatal/Injury

2.8 Crashes 44% reduction
0.3 Fatal/Injury 82% reduction

Vehicular Delay - Signal vs. Roundabout

US20/Barclay
Year of Opening (2016) Average Delay/Vehicle

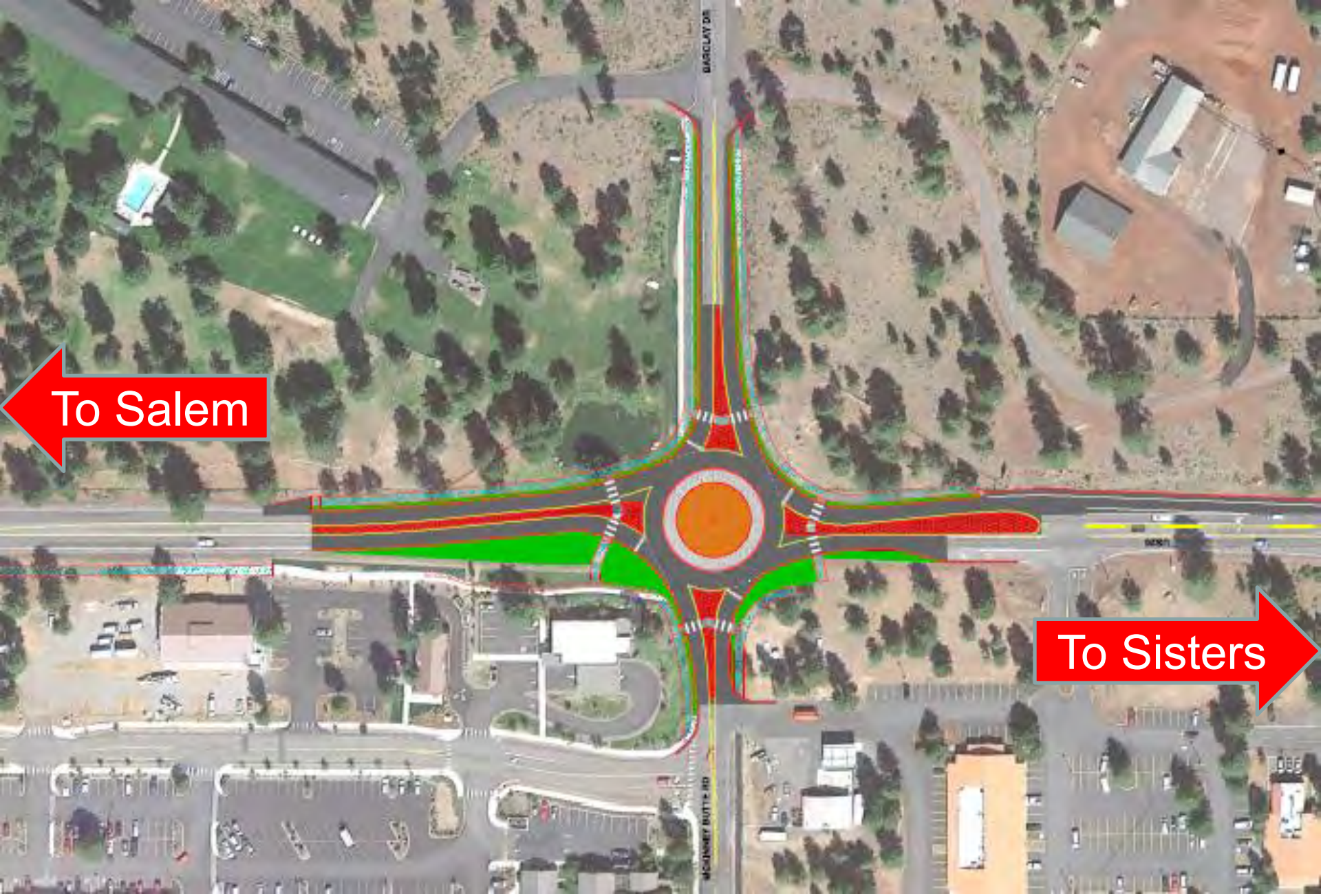
15.2s

13.9s

Roundabouts Save Fuel & Reduce Emissions

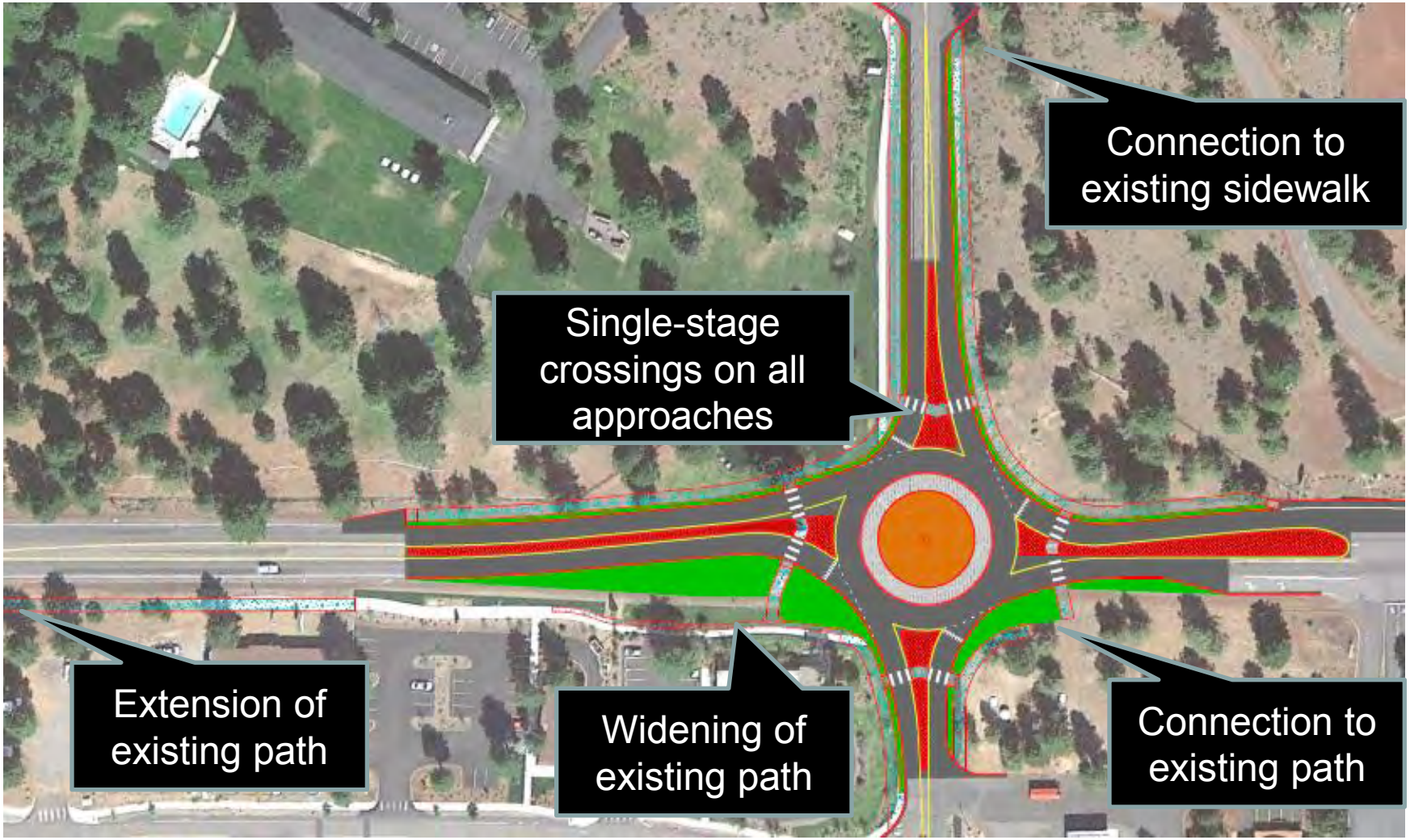
- At least two studies have noted that roundabouts can reduce fuel consumption by about 30%.
- In one study, replacing a signal with a roundabout reduced CO emissions by 29% and Nitrous Oxide emissions by 21%
- Another study noted reductions of 34% NO, 32% CO, 37% CO2 & 42% in hydrocarbons by replacing traffic signals and stop signs

What will the roundabout look like?


To Salem
To Sisters
BARCLAY DR
MCKENZIE BUTTE RD

Bicycle Accommodation

Pedestrian Accommodation



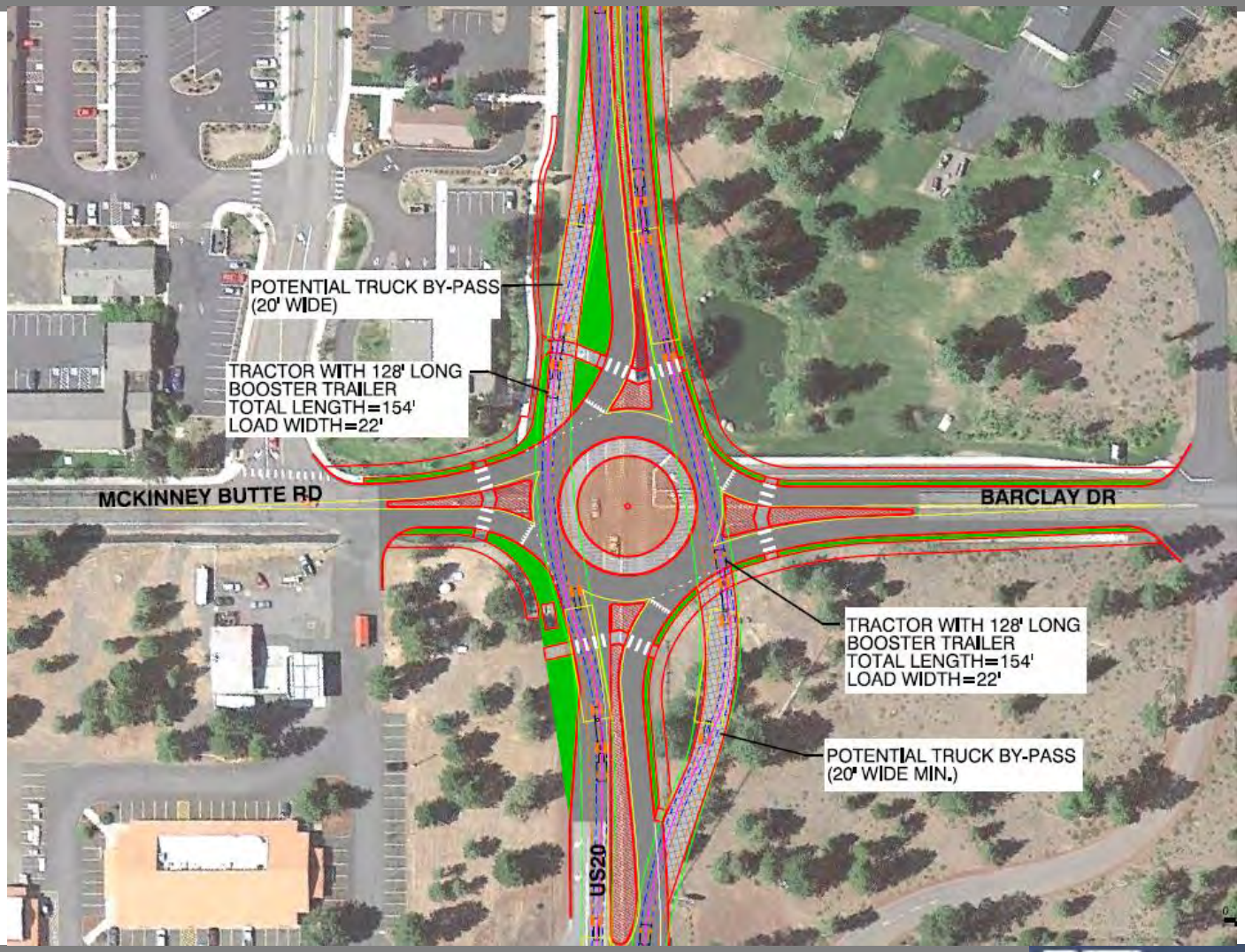
Pedestrians – One-Stage Crossings

Designing for Freight

- Full-scale test in two locations
- Tested 18 truck/trailer combinations
  - Up to 130’ in length
- All test vehicles made it through the roundabout

Koneta
Koneta

Bypass for Overdimensional Loads



Summary

- **Why roundabouts?**
  - Safer for all users
  - Lower peak hour and off-peak delay
  - Community gateway opportunities
- **Roundabout will be designed for…**
  - Passenger vehicles
  - Pedestrians
  - Bicyclists
  - Freight

Questions?