Proposed Realignment & Design Study of Intersection at Lien Rd /Zeier Rd / N. Thompson Dr

Public Information Meeting
March 1, 2007
City of Madison, WI

Presentation Outline

1. Project Objectives
2. Project Background
3. Design Alternatives
4. Summary & Recommendation

Project Objectives: Find a Preferred Solution – Intersection Treatment

a. Improve Traffic Flow -- reduce existing and future traffic congestion

b. Improve Safety – reduce crashes

c. Improve Pedestrian and Bicycle conditions – connectivity, more facilities

Project Objectives: Cont'd

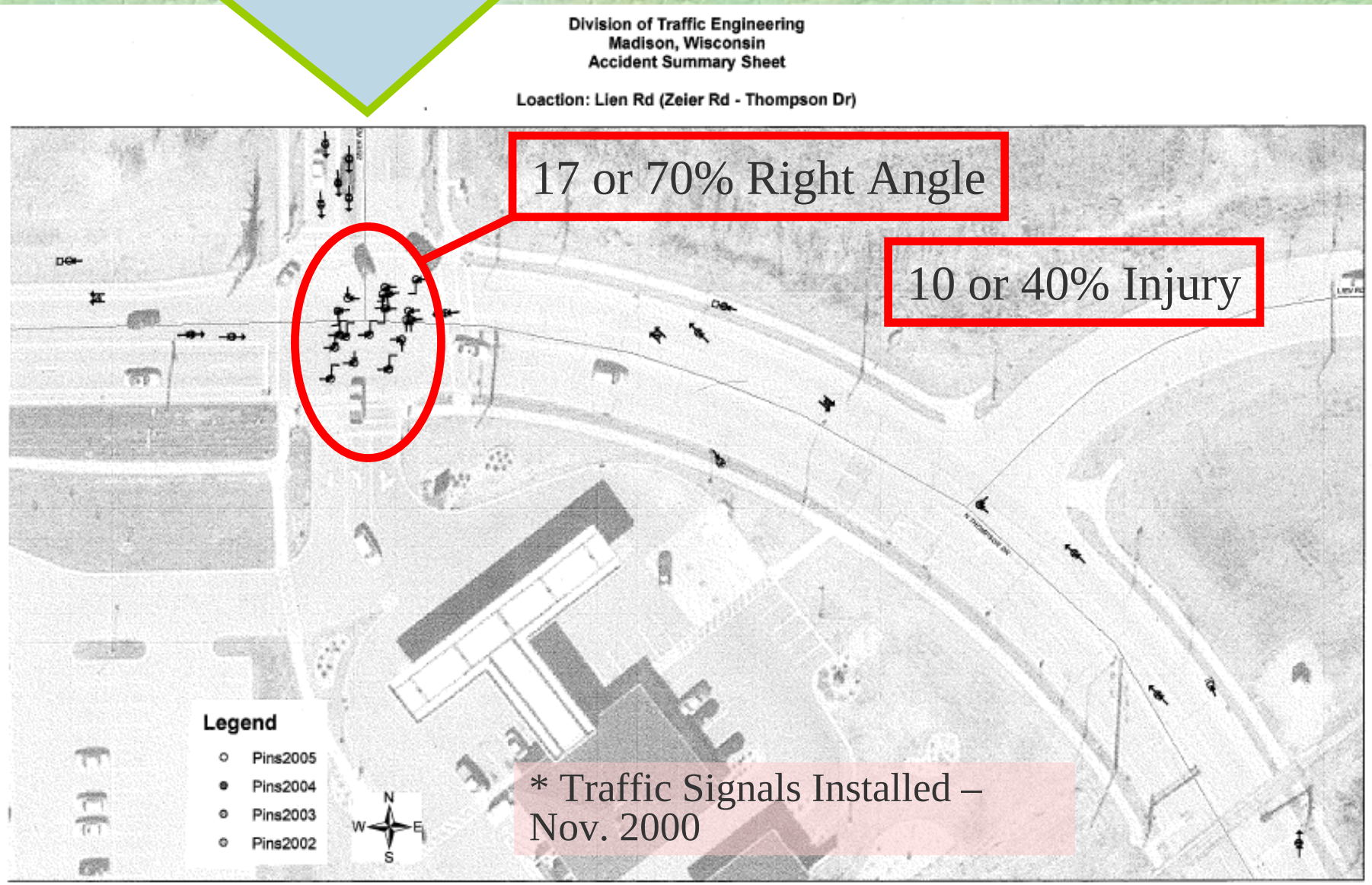
d. Protect and Improve Livability of Neighborhood

e. Support Businesses and New Development

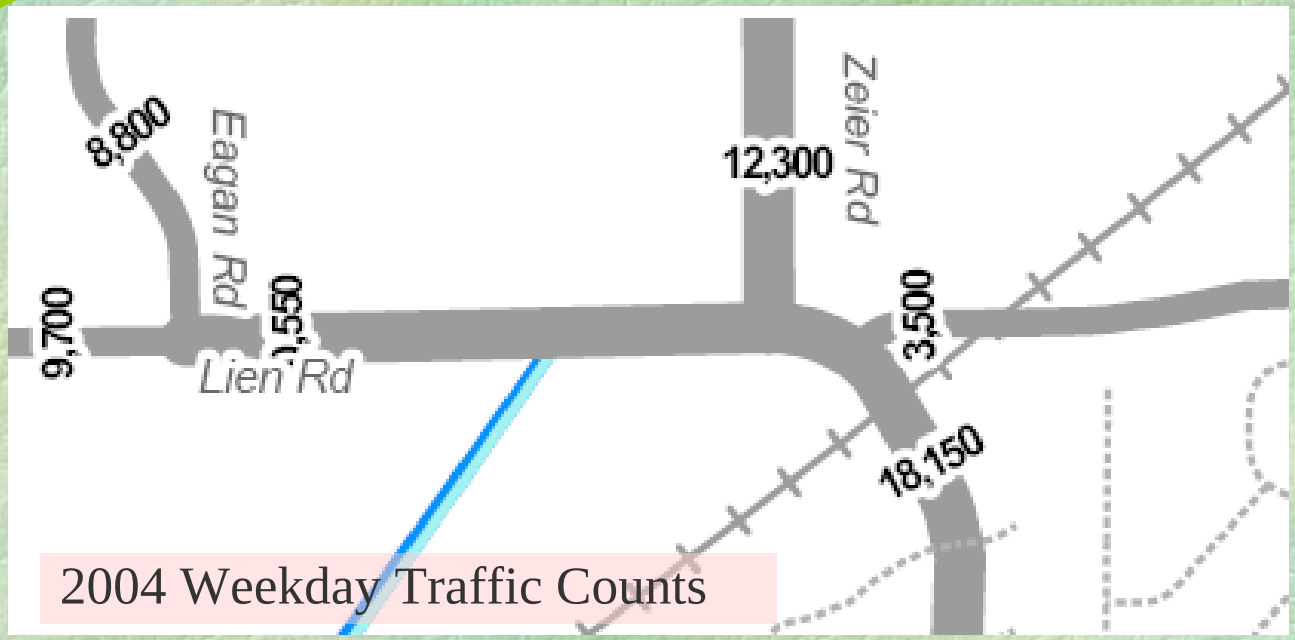
f. Improve Environment – reduce vehicle delay, fuel consumption, emissions

Project Background

Crashes 2002-2005 (with traffic signal)



Existing Conditions
Peak Hour Congestion and Delay



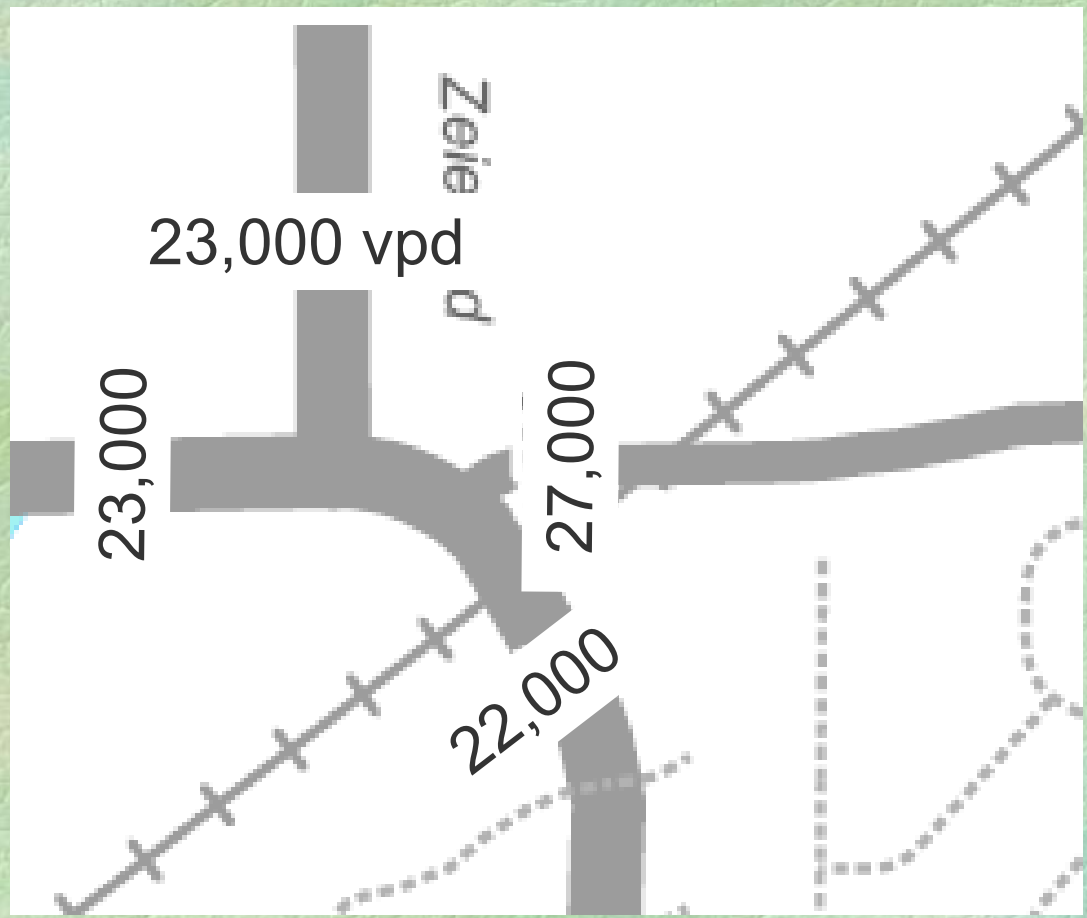
a. Weekdays and Weekends

b. Level of Service (LOS) 'D'

c. Backups to Gander Mtn, East Springs Dr

Projected Future Traffic Volumes--Yr 2030

Source: Madison Area MPO "East Side Arterials / Collectors Study"



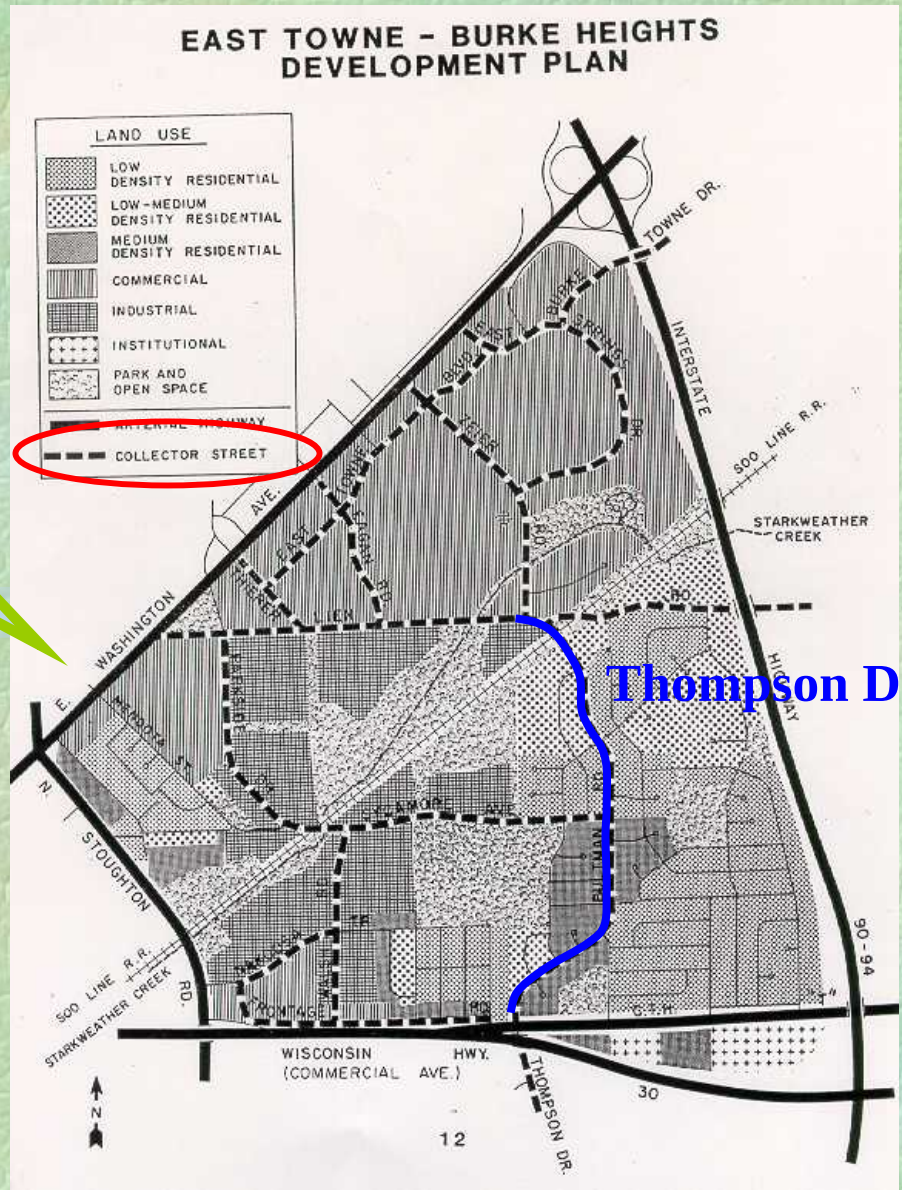
Existing Conditions -- Intersection Re-Alignment

a. Curve on a hill
b. Two intersections close together

c. With more development & traffic—

different approach needed

Ridgewood Neighborhood & Street Functional Class

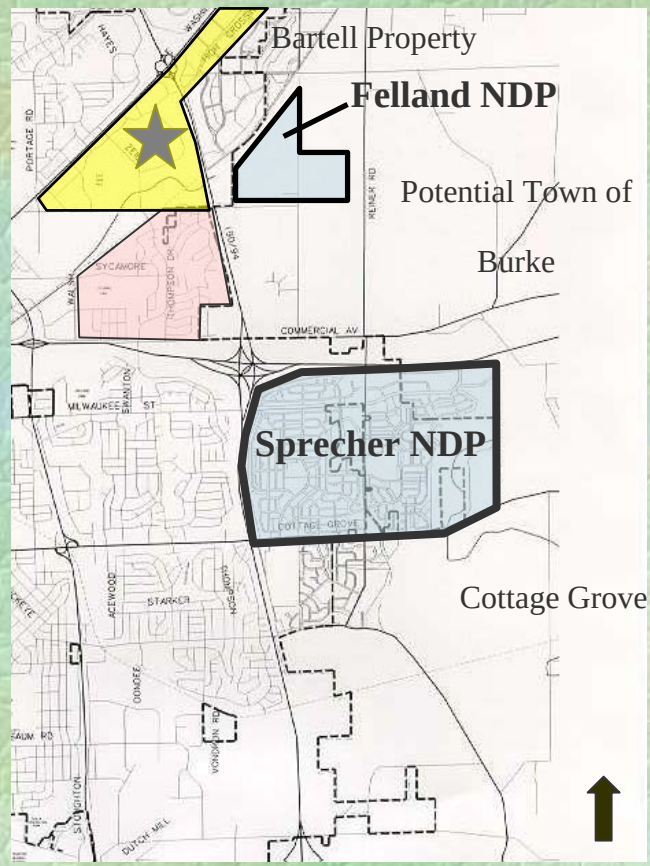


Thompson Dr.

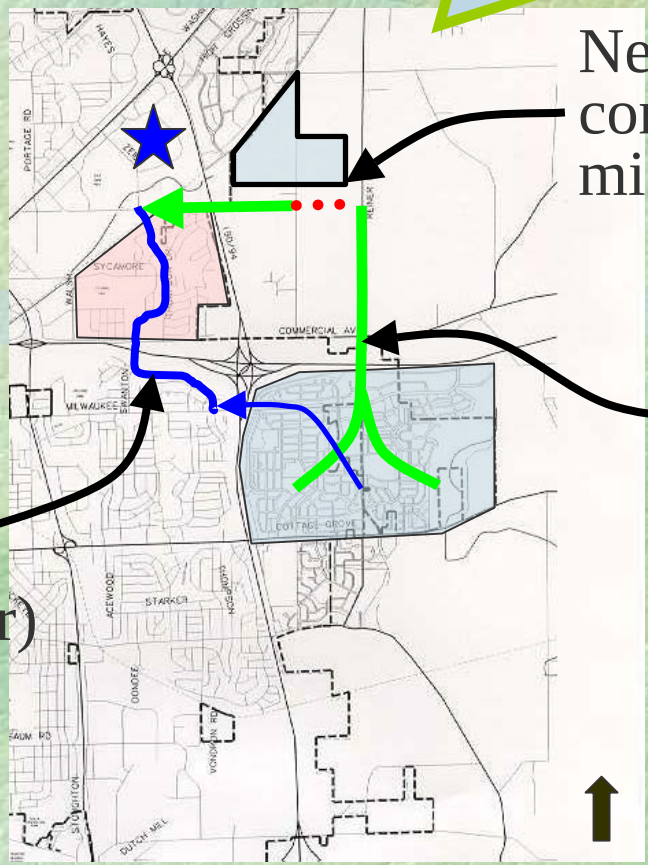
Future Development

Current Development

Planned Development



Additional Connections and Traffic Redirection needed to help Ridgewood Neighborhood & support additional development

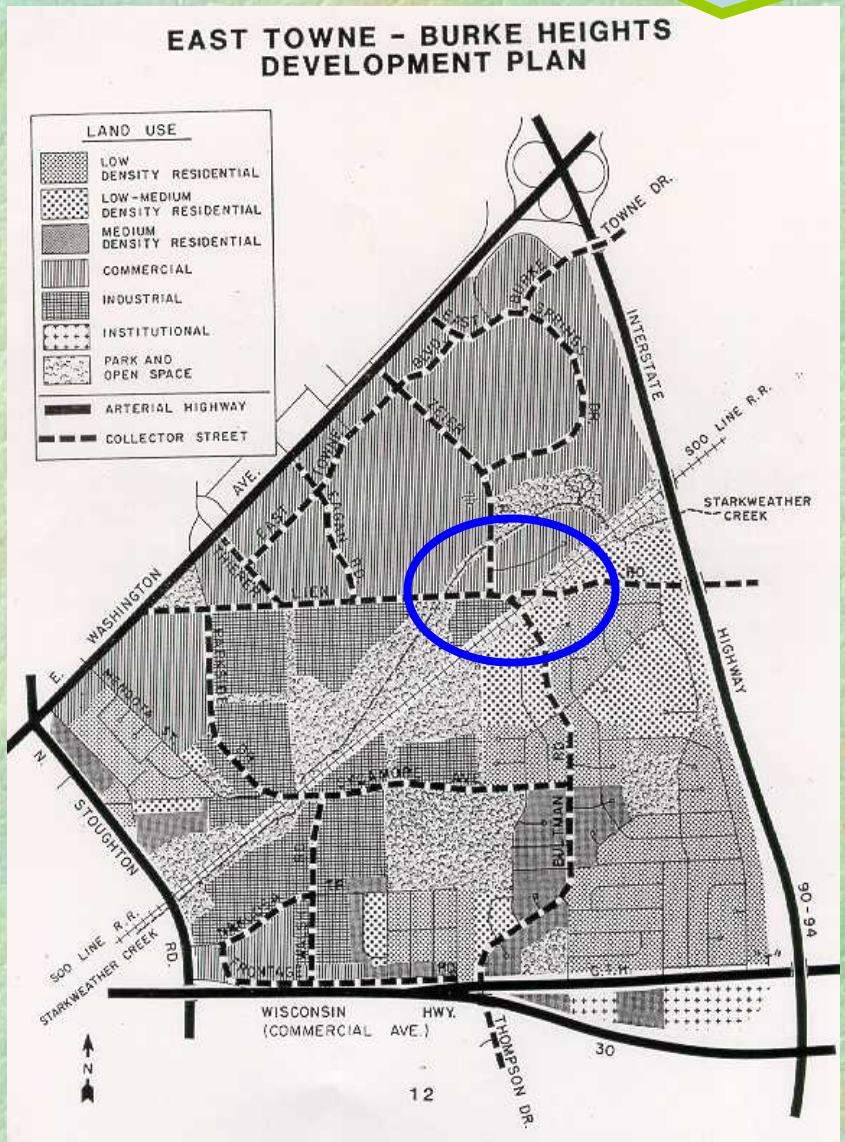


Need to complete this missing link (Lien Rd)

Encourage This Route (Sprecher Rd)

Not This Route (Thompson Dr)

City Desire: Support Neighborhood & System Goal of Emphasizing Lien Rd over Thompson Dr.



Intersection Re-Alignment Planned with Lien Rd. Reconstruction -- Phase 1 of 2

Intersection Re-Alignment Project Phase 2 of 2

Lien Road Plans -- 2003

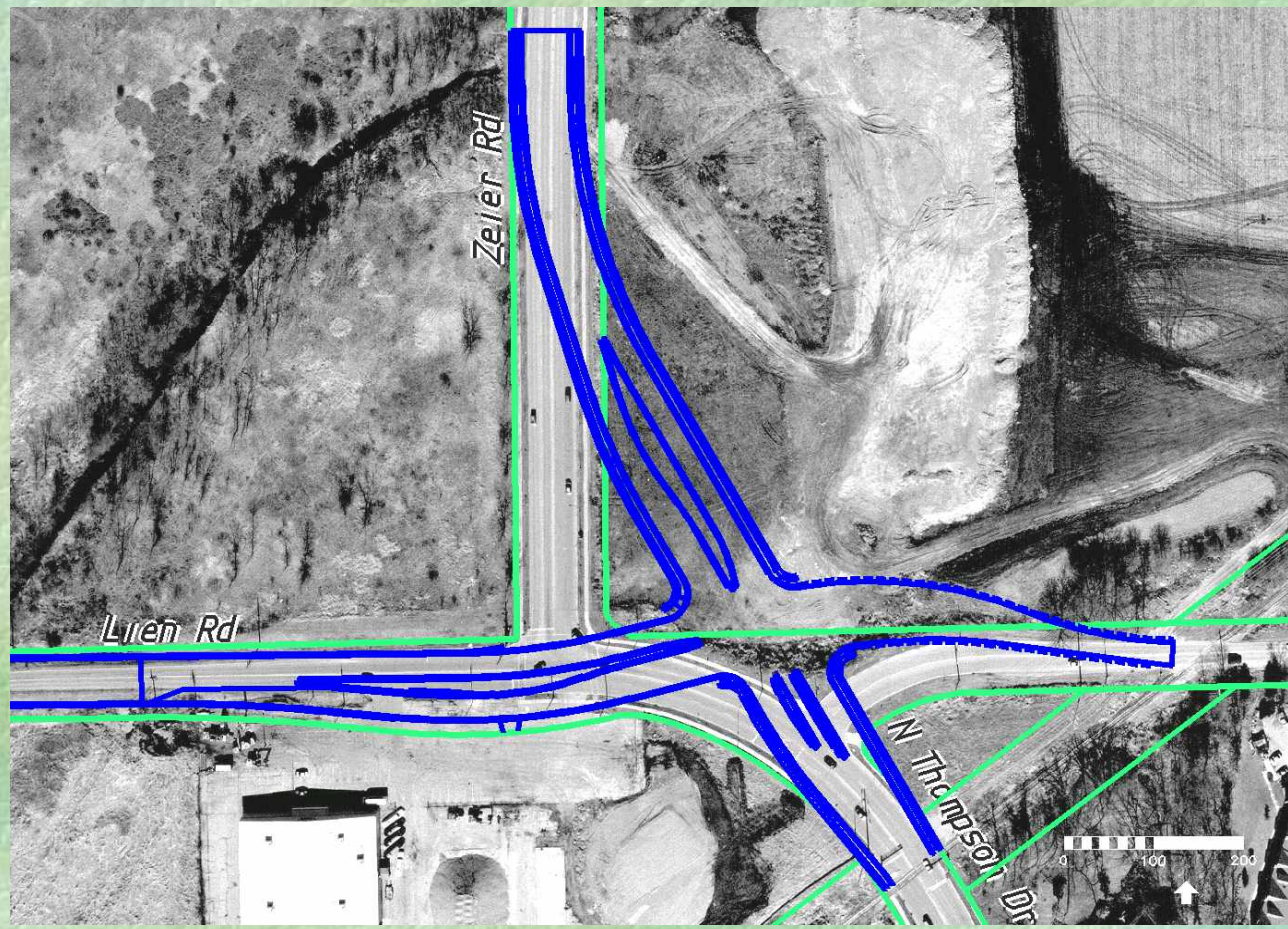
Design Alternatives

1. Intersection Re-Alignment

a. Simplifies two intersections into one

b. Removes curve from N. Thompson Dr.

c. Supports Neighborhood & System Goals of emphasizing Lien Rd.



2. Intersection Treatment? Traffic Signals or Roundabout

- No Set Answer, Case by Case Review
- Need to Evaluate Alternatives
  - -- Traffic Operations
  - -- Safety, crash performance
  - -- Costs—life cycle costs and benefits
  - -- Impacts (property, access, right of way)
  - -- Ped and Bike Mobility
  - -- Other Considerations (context, aesthetics, situation, signal progression, emissions)

The Case for Traffic Signals

5 ISSUE BRIEFS

U.S. Department of Transportation
Federal Highway Administration

Institute of Transportation Engineers

Traffic Signals

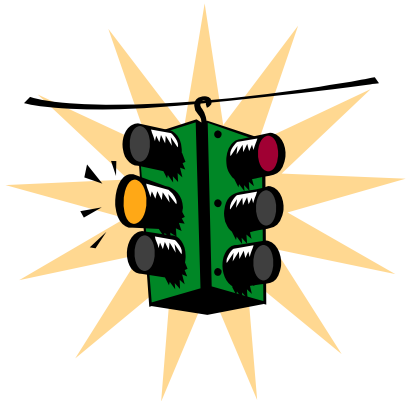
Purpose of Traffic Signals

Traffic signals are used to assign vehicular and pedestrian right-of-way. They are used to promote the orderly movement of vehicular and pedestrian traffic and to prevent excessive delay to waiting traffic.

Traffic signals should not be installed unless one of the warrants specified by the *Manual on Uniform Traffic Control Devices* (MUTCD) has been satisfied. The satisfaction of a warrant is not in itself justification for a signal. A traffic engineering study must be conducted to determine if the traffic signal should be installed.

Advantages of Traffic Signals

Warranted traffic signals properly located and operated, usually have one or more of the following advantages:



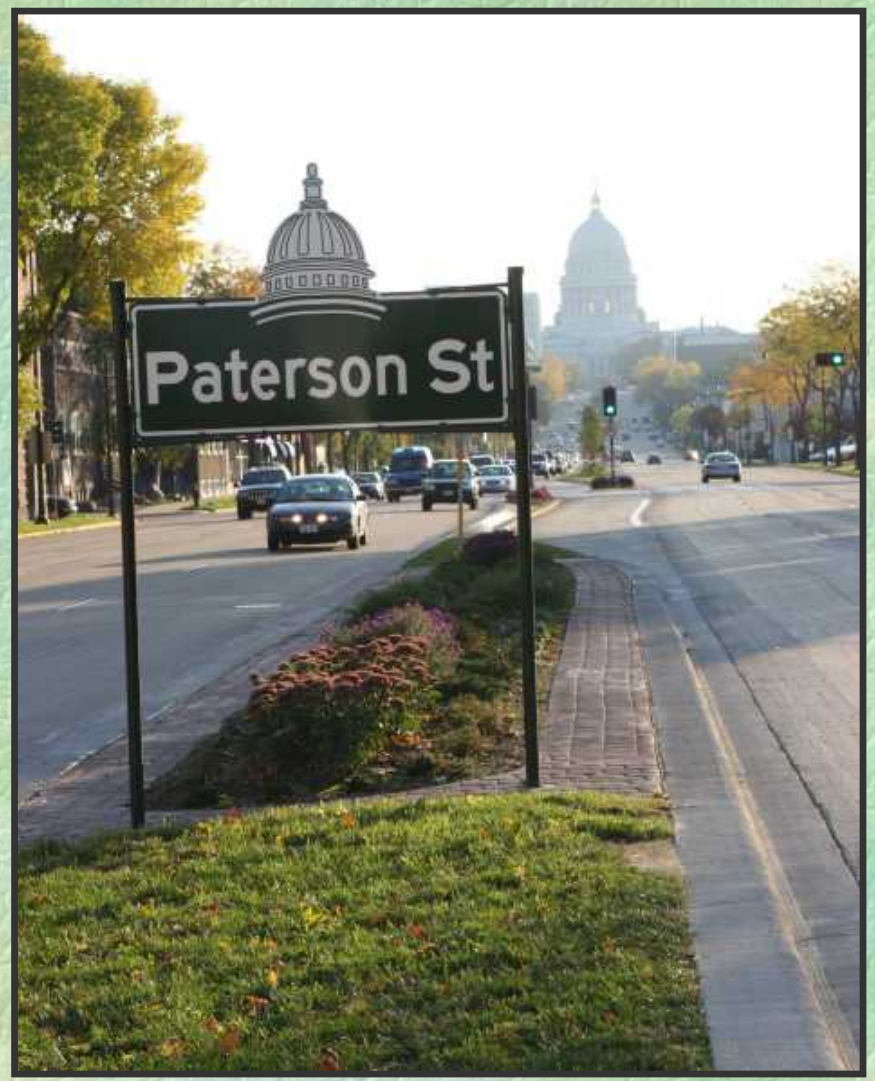
- Provide for orderly movement of traffic;
- Increase traffic capacity of the intersection;
- Reduce the frequency of certain types of crashes, (e.g. right-angle crashes);
- Provide for continuous or nearly continuous movement of traffic along a given route; and
- Interrupt heavy traffic to permit other traffic, vehicular or pedestrian, to cross.

Advantages of Traffic Signals

- Easily understood, recognized
- Provide gaps in traffic flow upstream (300-1,200 feet) for other intersections and driveways
- Can be equipped with audible signals for visually impaired

Accessible Pedestrian Signals

Traffic Signals can lead to attractive projects



Traffic Signals can lead to attractive projects

Traffic Signals can yield new products for pedestrians and bicyclists

Ped Countdown Timers

Advanced Stop Lines, Bike Boxes

The Case for Roundabouts

TRB National Roundabout Conference

May 23, 2005

Brian O'Neill

INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

IIHS

Major intersection problems

- Crashes and injuries
- Traffic signals encourage speeding

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Major intersection problems

- Traffic congestion and delays
- Vehicle emissions

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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

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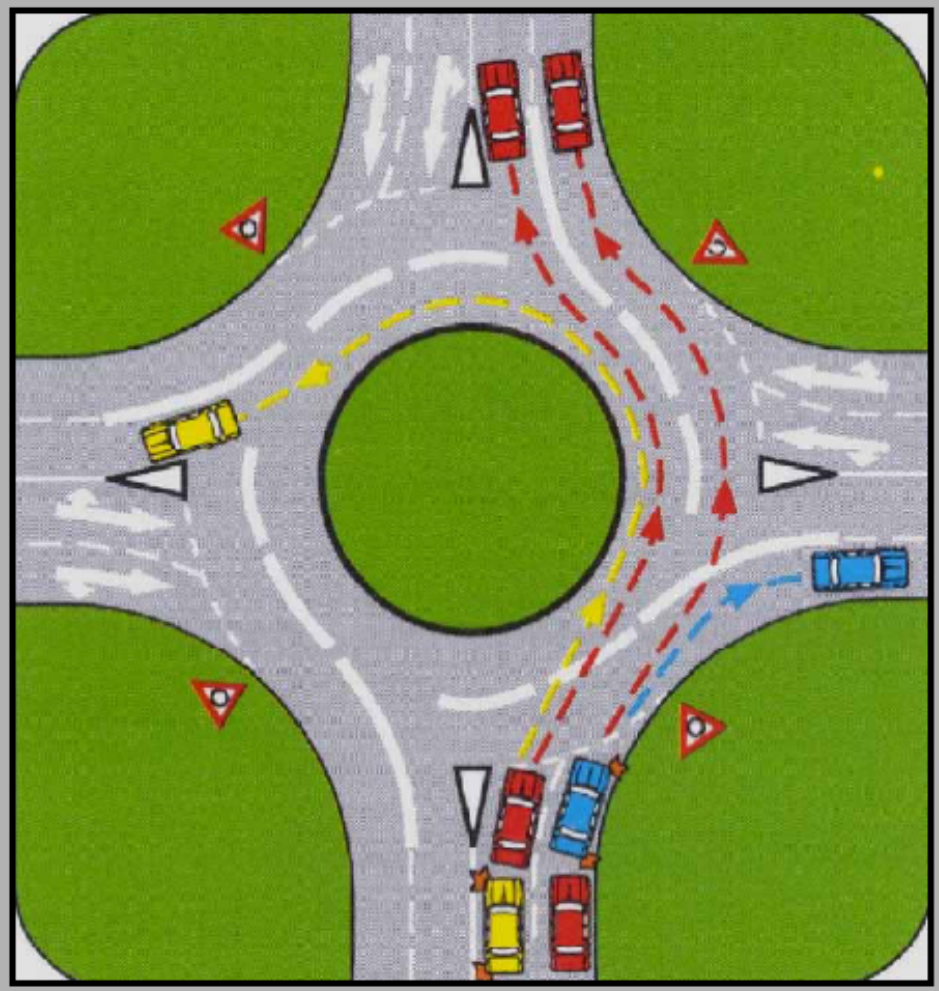
Roundabouts can help address these problems



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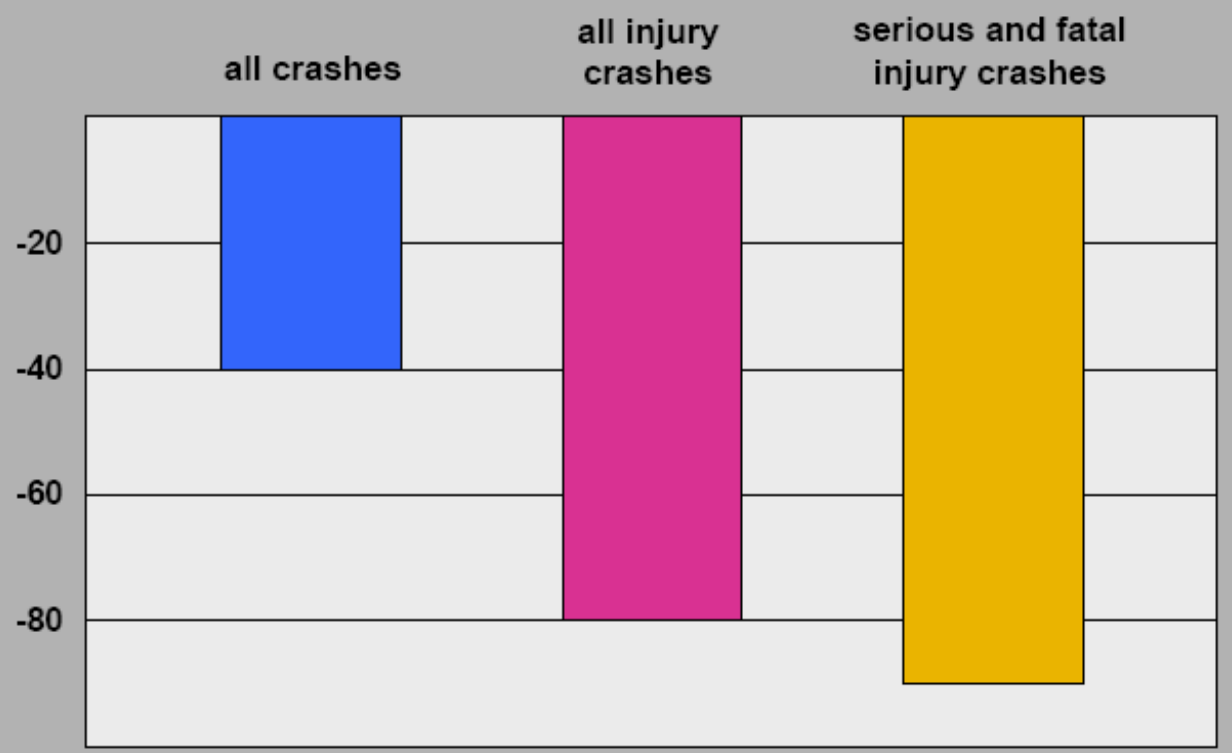
Benefits of modern roundabouts

- 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

IIHS

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

2001



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Rural

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Suburban

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Urban

IIHS

Simple

IIHS

Complex

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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

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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

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Intersection with stop sign converted to roundabout

Nashua, NH

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Intersection with traffic signal converted to roundabout

Greenwich, NY

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

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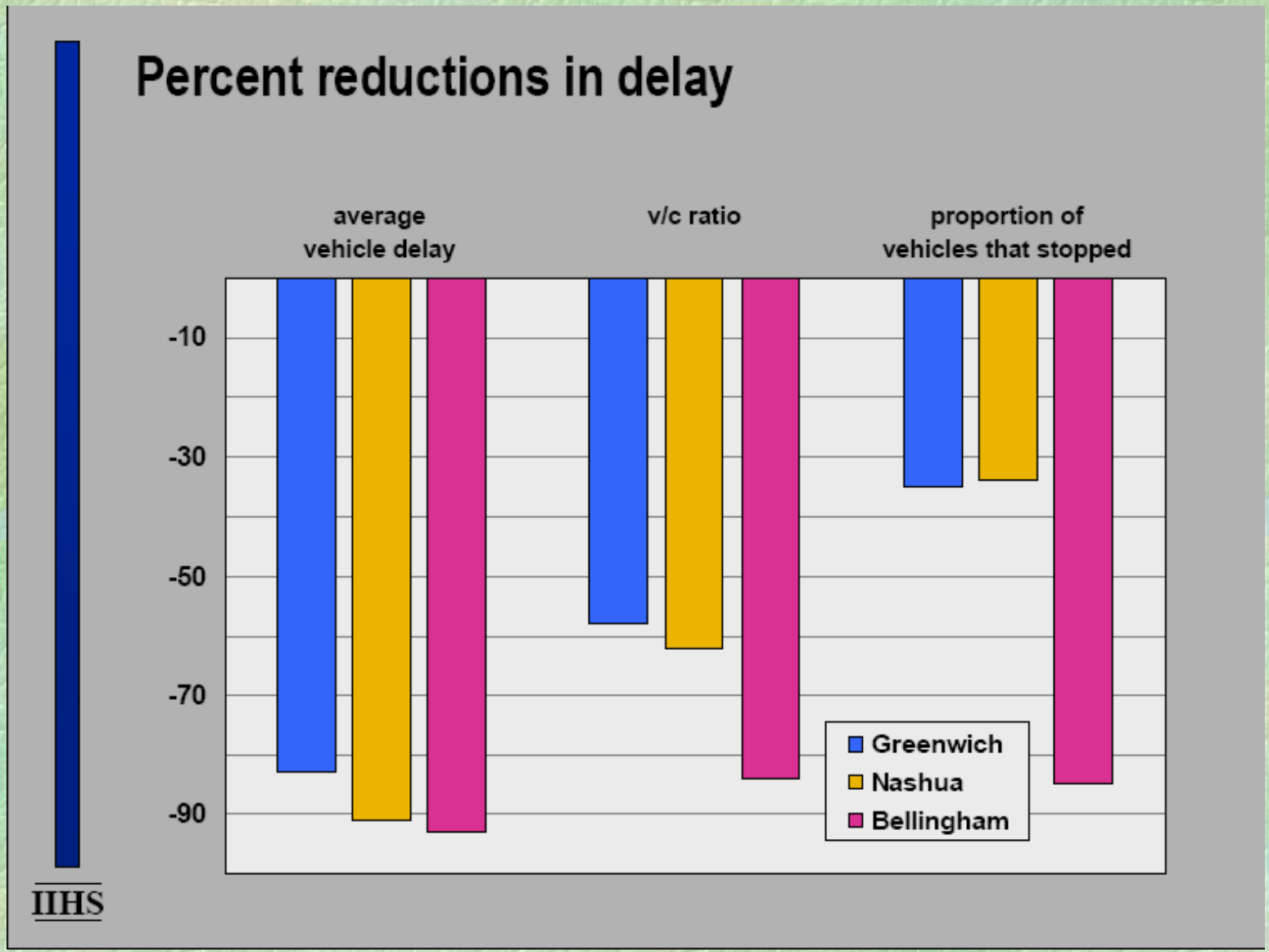
Percent reductions in delay
average vehicle delay
v/c ratio
proportion of vehicles that stopped
-10
-30
-50
-70
-90
Greenwich
Nashua
Bellingham
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How can we accelerate construction of roundabouts?

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Land development

Critical opportunity to construct roundabouts

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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

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Roundabout constructed as part of land development

Nokesville, Virginia

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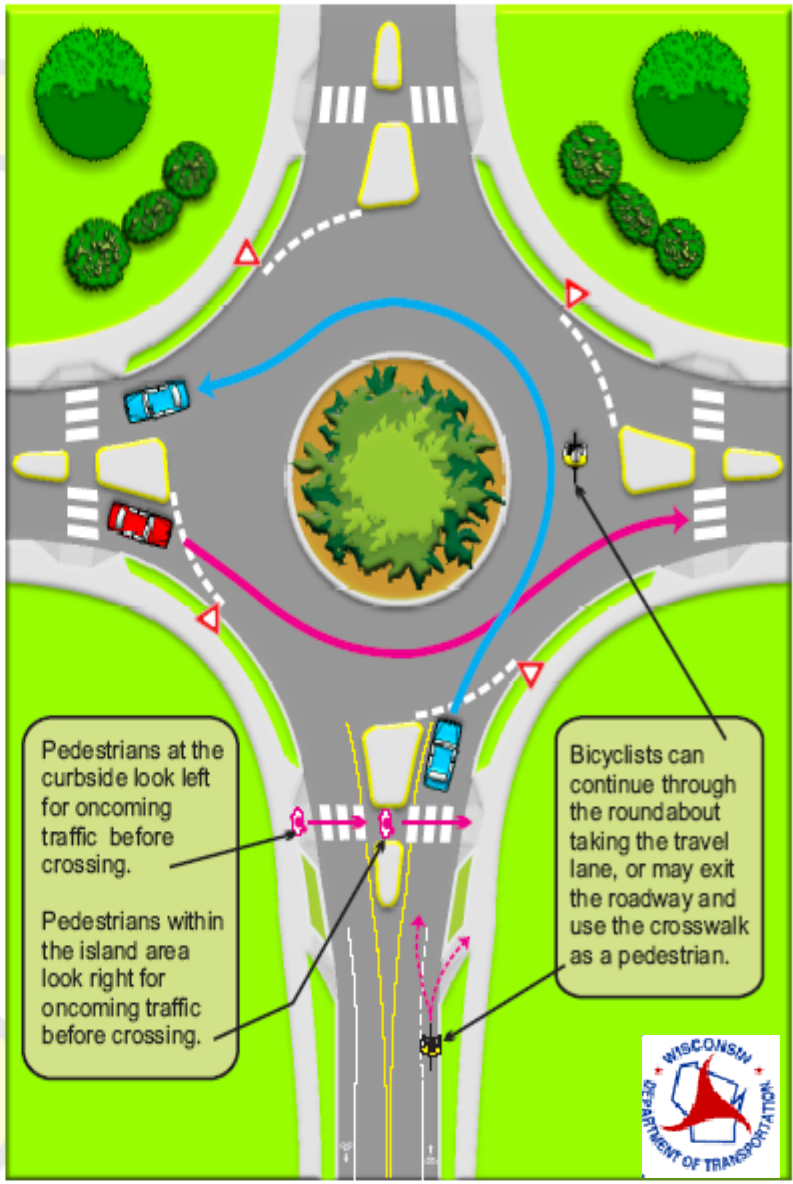
What are exactly Roundabouts?

Roundabouts are an intersection alternative with certain principles

a. Yield at Entry

b. Deflection

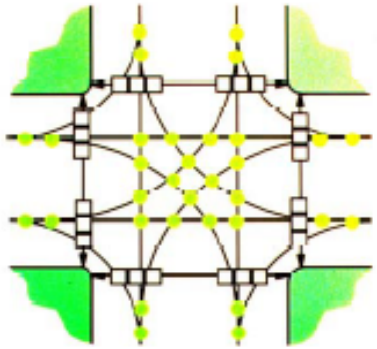
c. Fastest Path



Intersection Conflict Points

Exhibit 5-2. Vehicle conflict point comparison for intersections with single-lane approaches.

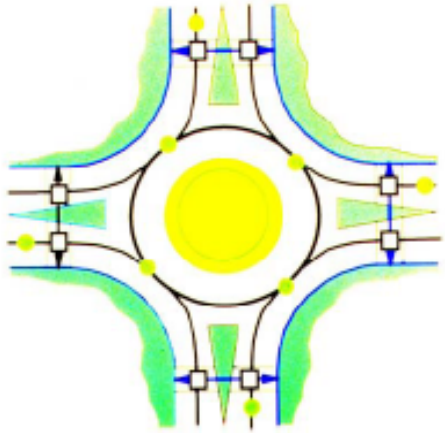
Conflicts at a Signalized or Signed Intersection



24 Vehicle/Pedestrian Conflict Points

32 Vehicle/Vehicle Conflict Points

Conflicts at a Single Lane Roundabout



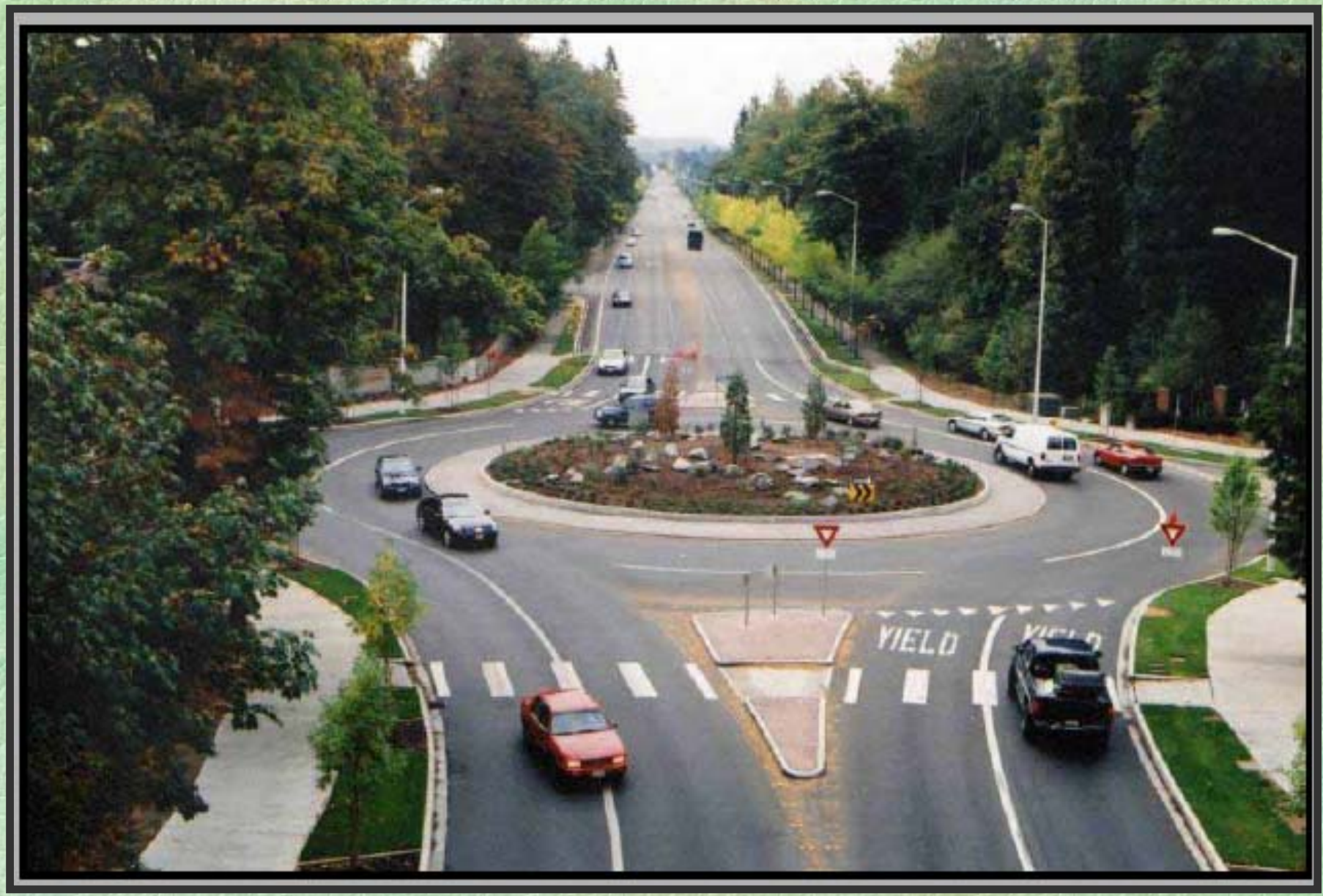
8 Vehicle/Pedestrian Conflict Points

8 Vehicle/Vehicle Conflict Points

A four-leg single-lane roundabout has 75% fewer vehicle conflict points—compared to a conventional intersection.

Source: Roundabouts: An Informational Guide, FHWA-RD-00-67, June 2000

Roundabout principles in action

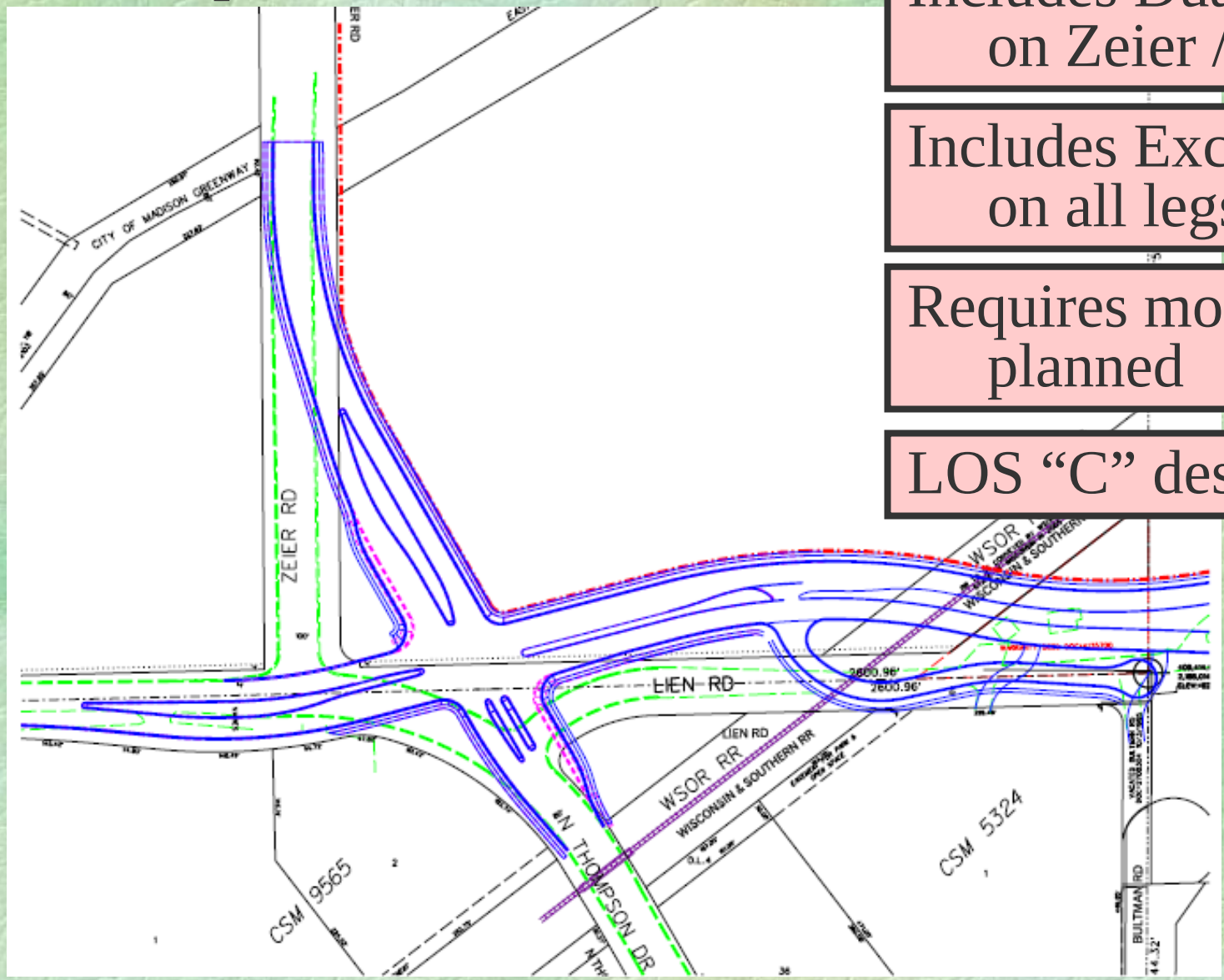


Source: IIHS, Brian O'Neill

Alternatives Analysis

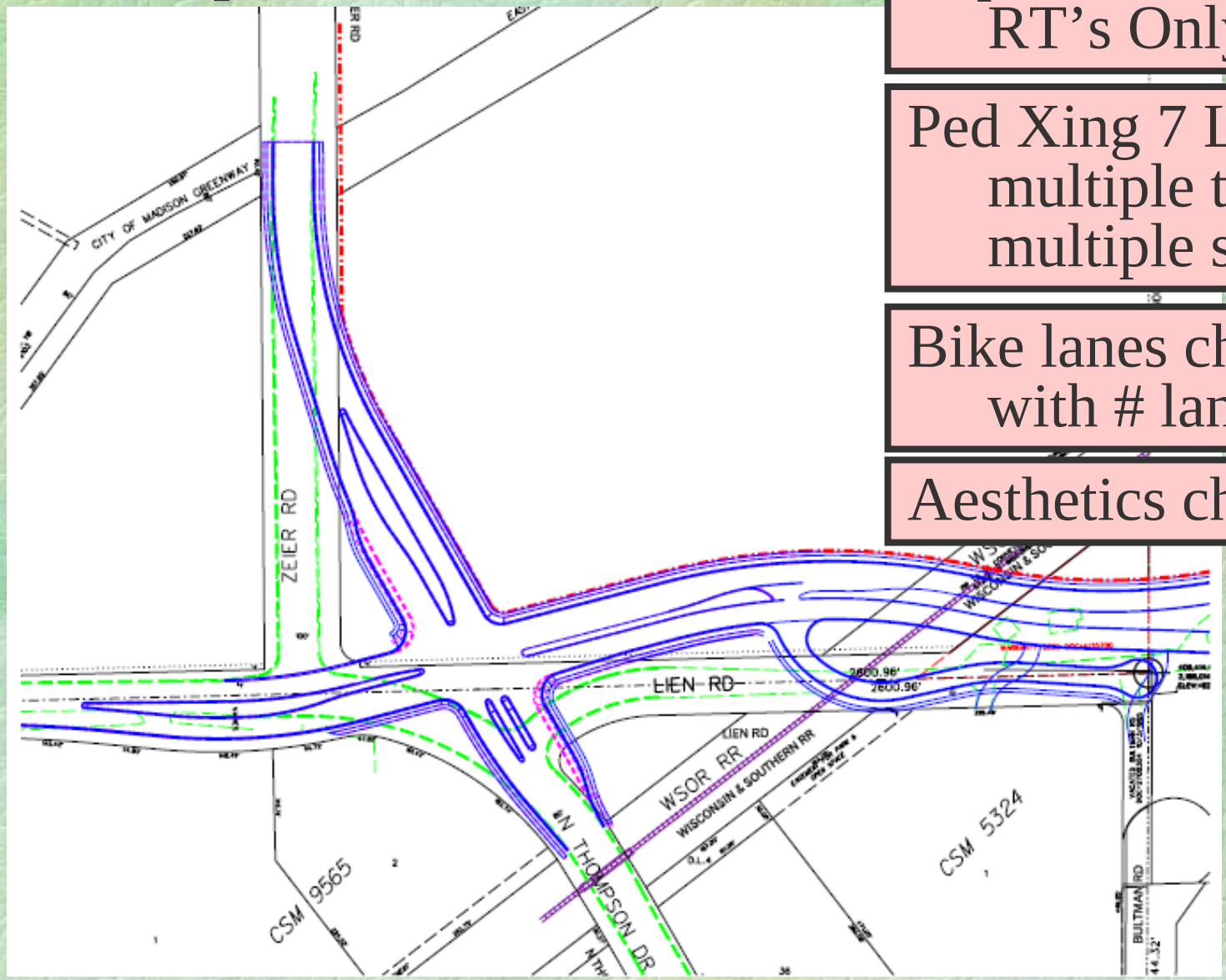
1. “Optimum Performance” Signalized Intersection
2. “Minimum Impact” Signalized Intersection
3. “Modern Roundabout” Intersection

1. Signal Alternative "Optimum Performance"



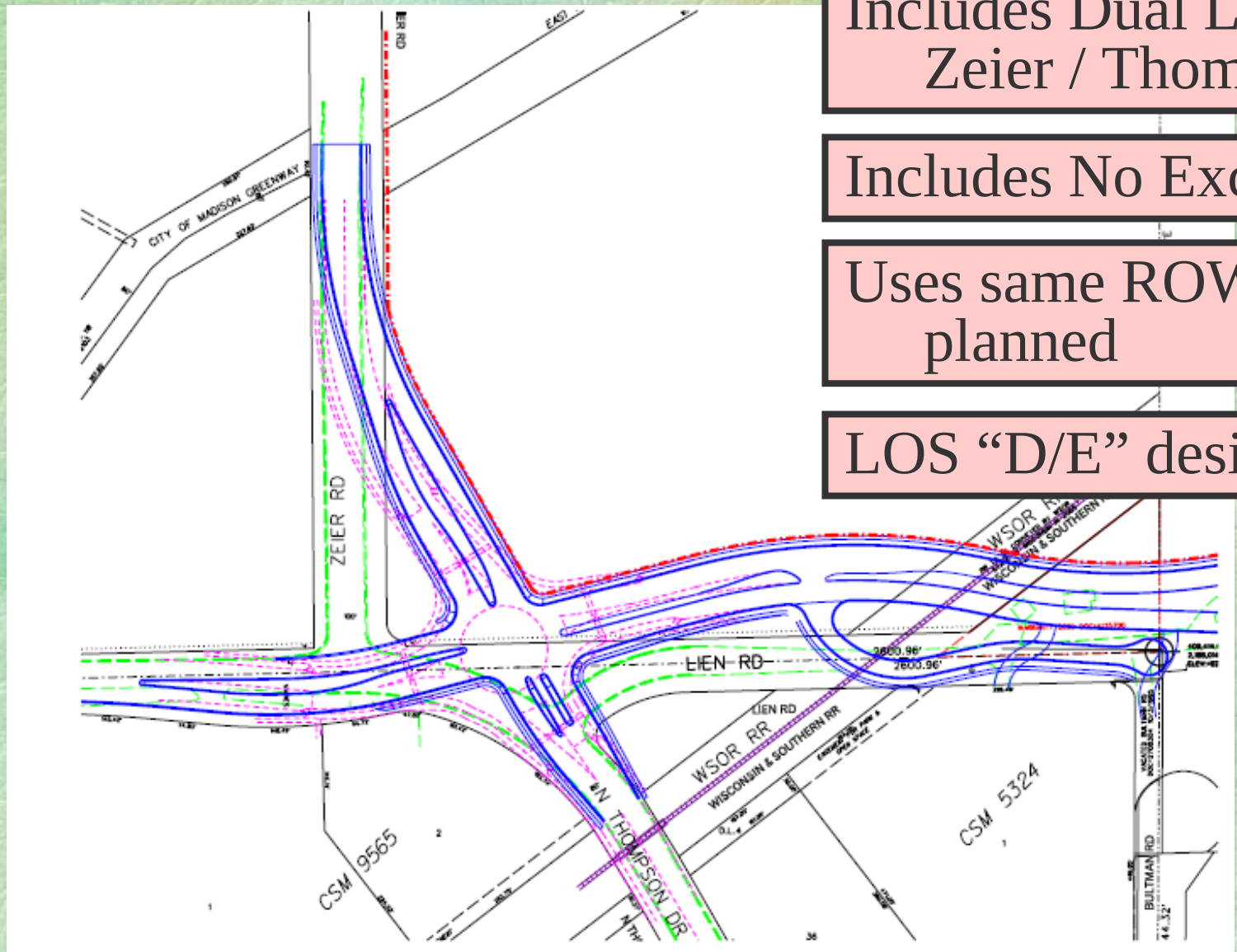
- Requires 7 Lanes
- Includes Dual LT Lanes on Zeier / Thompson
- Includes Excl. RT Lanes on all legs
- Requires more ROW than planned
- LOS "C" design year

1. Signal Alternative "Optimum Performance"



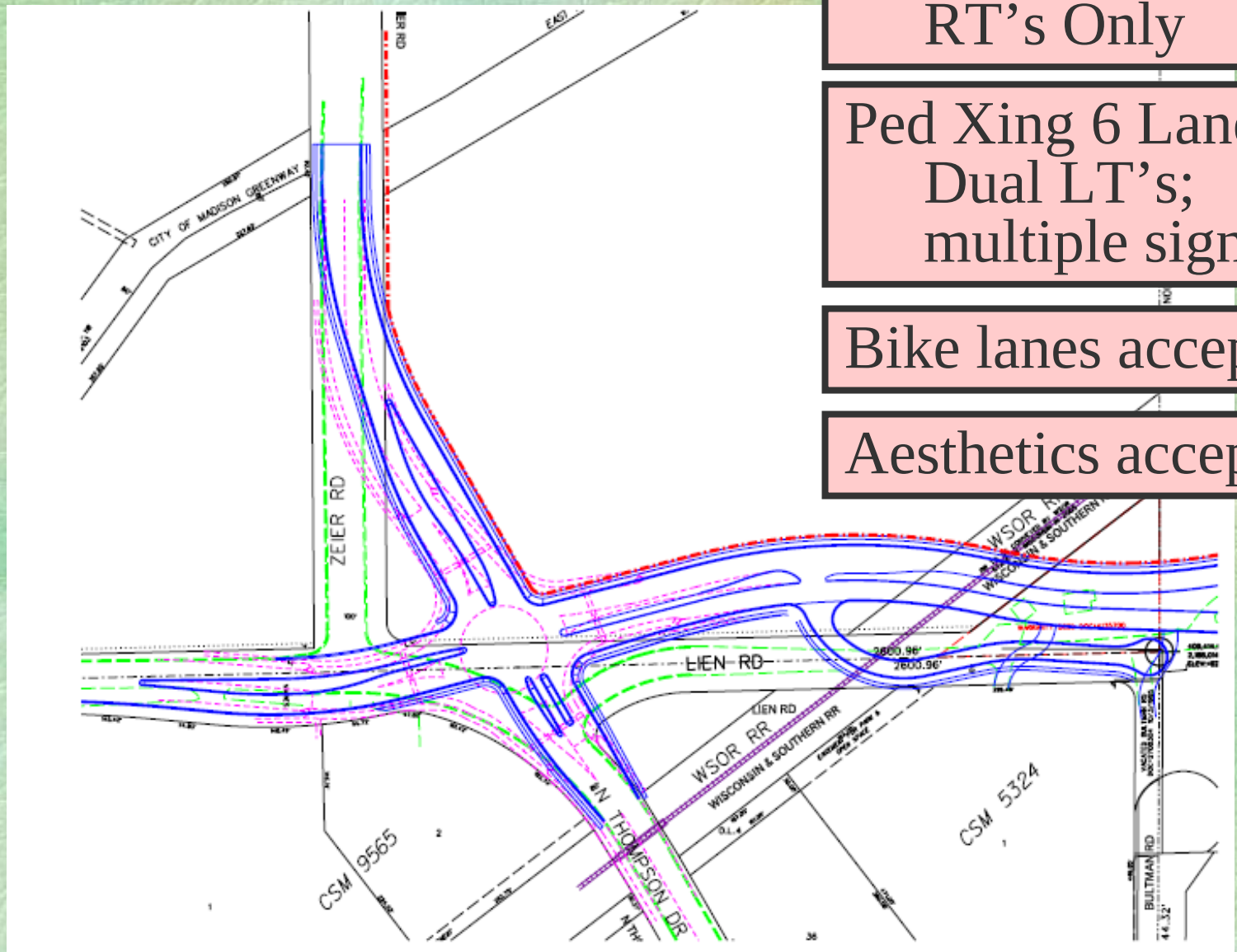
- Improves some crashes
- Impacts PDQ access -- RT's Only
- Ped Xing 7 Lanes; multiple turn lanes; multiple signal phases
- Bike lanes challenging with # lanes
- Aesthetics challenging

2. Signal Alternative "Minimum Impact"



- Requires 6 lane cross-section at intersection
- Includes Dual Lt Lanes on Zeier / Thompson
- Includes No Excl RT Lanes
- Uses same ROW as planned
- LOS "D/E" design year

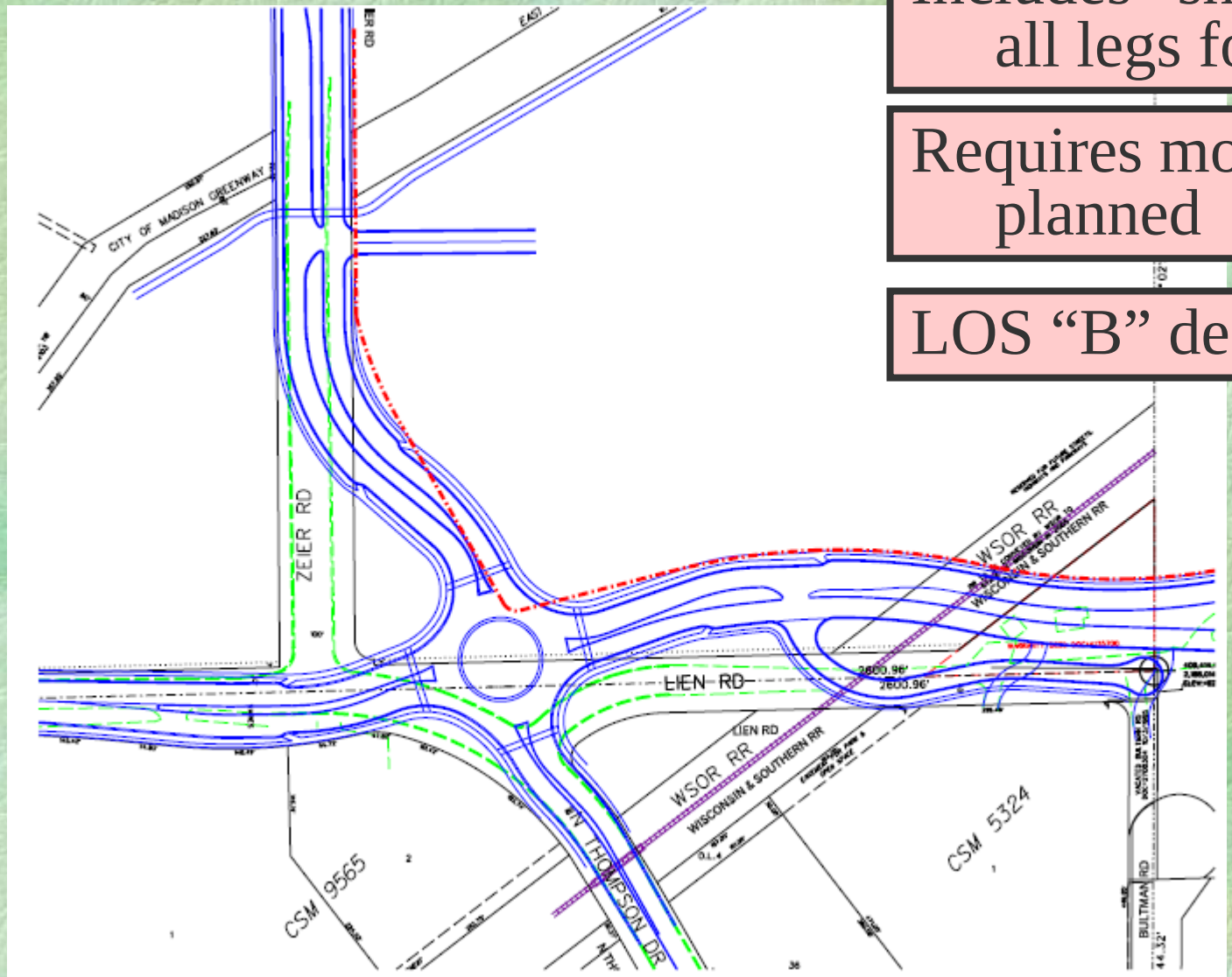
2. Signal Alternative "Minimum Impact"



- Improves some crashes
- Impacts PDQ access -- RT's Only
- Ped Xing 6 Lanes; Dual LT's; multiple signal phases
- Bike lanes acceptable
- Aesthetics acceptable

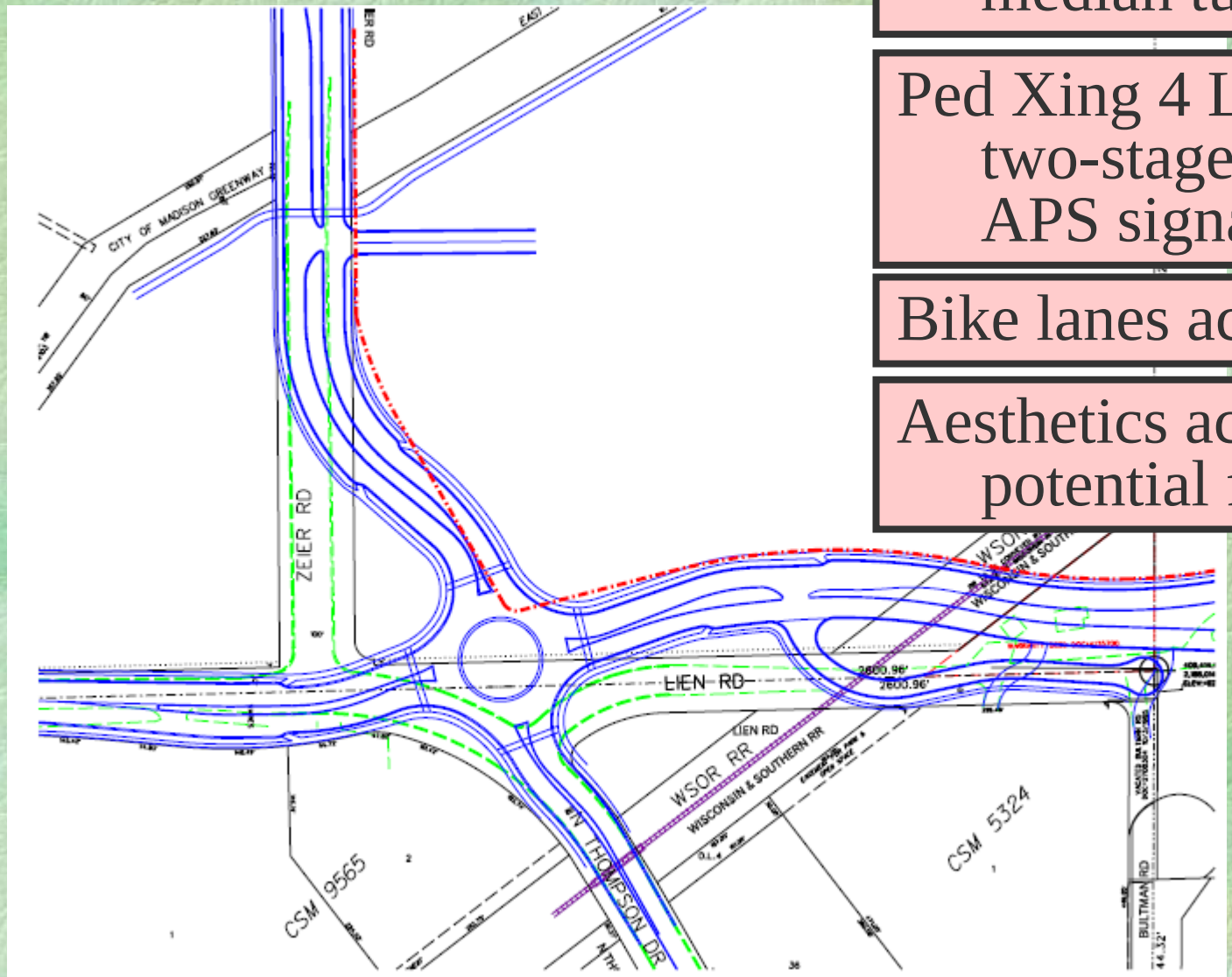
3. Roundabout Alternative (2-Lane)

- Requires 4 lane cross-section at intersection
- Includes “shared” lanes on all legs for turns
- Requires more ROW than planned
- LOS “B” design year



3. Roundabout Alternative (2-Lane)

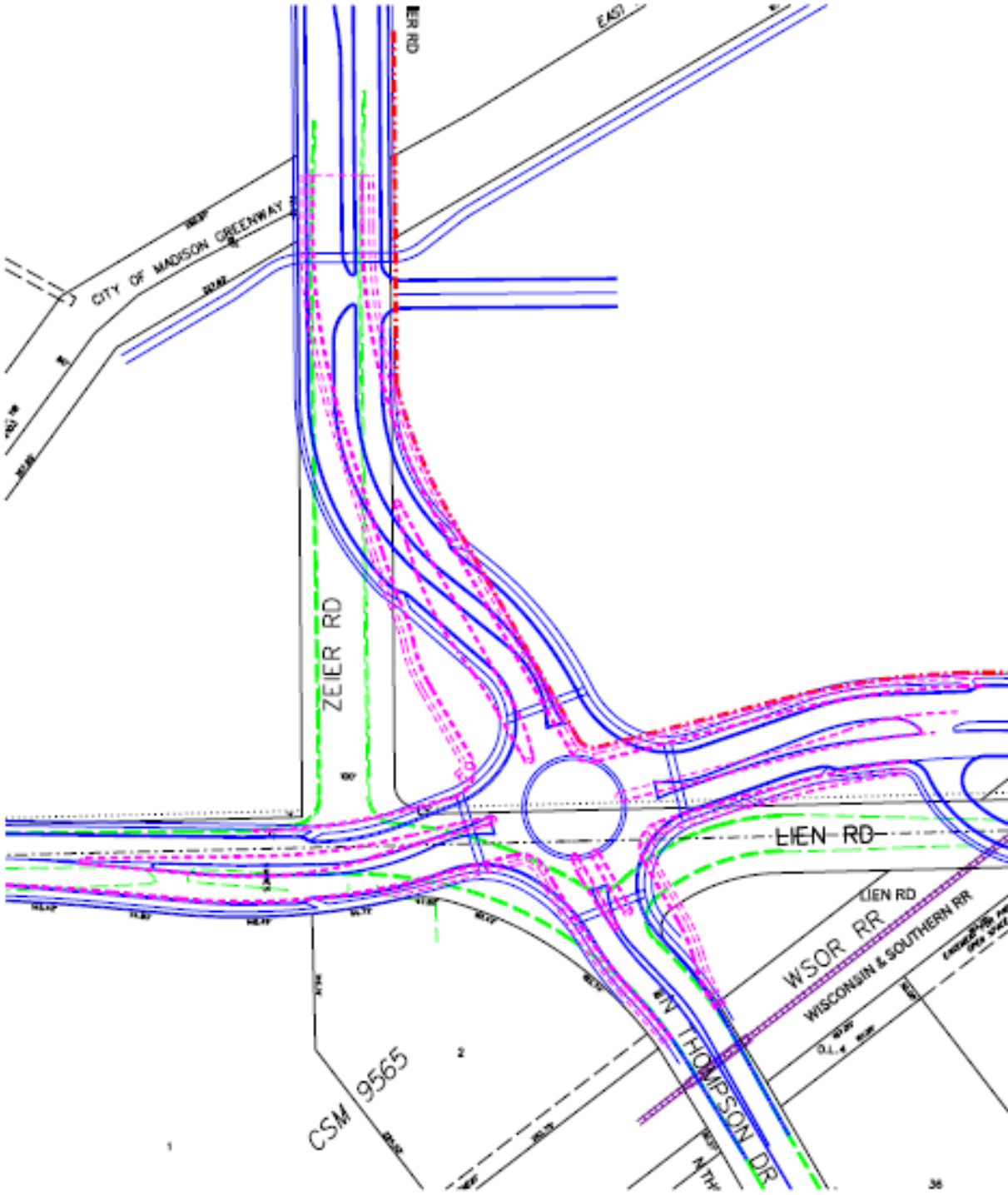
- Improves most crashes
- Maintains PDQ access via median turn lane
- Ped Xing 4 Lanes; two-stage xing; APS signal needed
- Bike lanes acceptable
- Aesthetics acceptable; potential for gateway



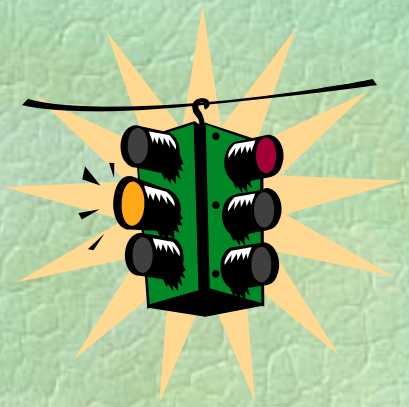
Right of Way Comparison:

Roundabout vs.

Signal
"Optimal
Performance"



Analysis Summary
Traffic Signals



- ✓ "Acceptable Long-Term Solution
- ✓ "Acceptable" Safety Improvement
- ✓ Both Signal options require 6-7 lanes, turn lanes
- ✓ Access to PDQ is impacted
- ✓ Ped-Bike Conditions acceptable to challenging

Analysis Summary
Roundabout

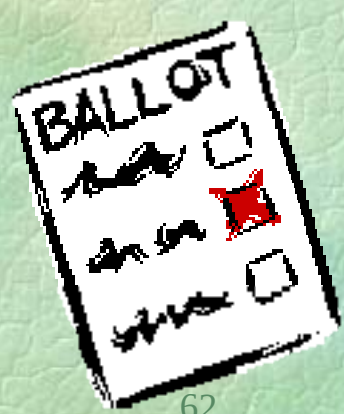
- ✓ "Good" Long-Term Solution
- ✓ "Excellent" Safety Improvement
- ✓ Street width kept to a minimum (4-lanes), but still some ROW Impacts for design/deflection
- ✓ Access to properties not impacted
- ✓ Ped-Bike Conditions acceptable to good

Comparison of Alternatives

Criteria	Signal (Optimum Performance)	Signal (Minimum Impact)	Roundabout
Traffic Operations	***	**	****
Safety	***	***	****
ROW Impacts	***	****	**
Access Impacts	**	**	****
Ped, Bike Features, Crossings, Conflicts	**	***	***
Aesthetics	**	**	****
Community Acceptance, familiarity	***	***	**
Costs (annual maint.; life cycle)	**	**	***
TOTAL * = Poor; ** = Fair * = Good; **** = Excellent**	**20**	**21**	**26**

Decision Making Summary

- Public Feedback—Businesses, Property Owners, Neighborhood
- Local Agencies
- Elected Officials
- Costs / Funding
- Right of Way
- Construction Schedule



Questions?

City Traffic Engineering Division: 266-4761

http://www.cityofmadison.com/transp/ntmpfaq.html

The **IIHS** is an independent, nonprofit, scientific and educational organization dedicated to finding what works and doesn't work to prevent motor vehicle crashes and reduce injuries in the crashes that still occur.

IIHS research focuses on countermeasures aimed at all three factors in motor vehicle crashes (human, vehicular, and environmental) and on interventions that can occur before, during, and after crashes to reduce losses.