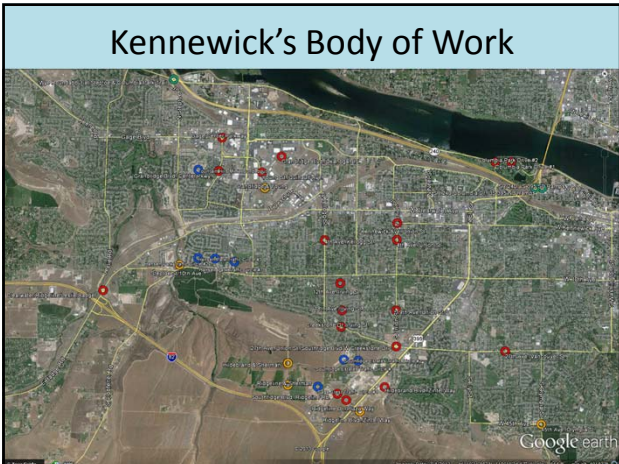
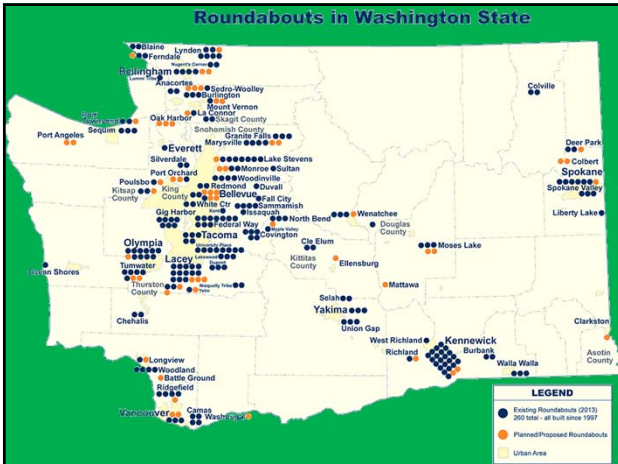




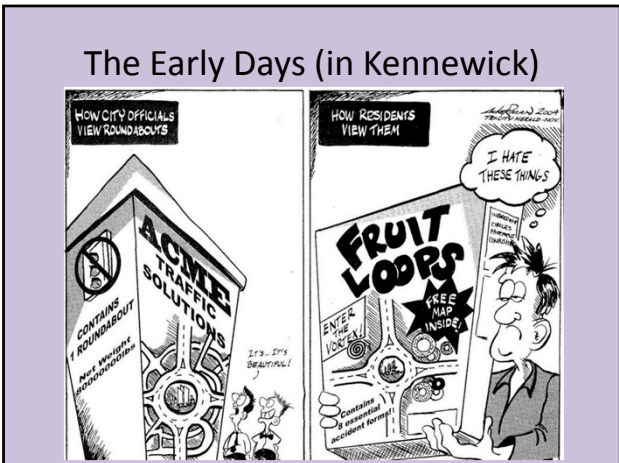
Disclaimer

- This presentation represents my own opinions and observations about:
 - Sign clutter and maintenance needs,
 - Evaluation of MUTCD Optional signs and markings
 - Does Less = More?
- You are the one that has to answer to your boss or the jury.
- Read the MUTCD and make your own interpretation.



The Many Advantages of Roundabouts

- Increased Safety
 - Fewer Conflict Points
 - Fewer Crashes
 - Crashes are less severe
- Environment
 - Air Quality is better
 - Less Noise
 - Less Fuel Cost
- Cost
 - Similar or higher initial cost
 - Maintenance – Landscaping and sign replacement vs. equipment replacement, routine maintenance, detection & communications problems, and signal timing.



Why all the suspicion of Roundabouts



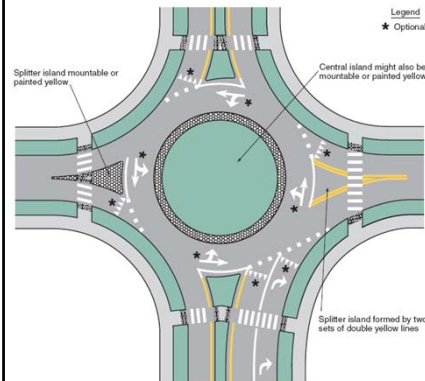
- Traffic by Tom Vanderbilt
- In an article posted on Slate in 2009 Tom asks why Americans are so suspicious of roundabouts
 - Tom likens Traffic Signals to “...binary, on-off traffic control” and,
 - roundabouts to traffic control governed by “fuzzy logic” that requires drivers to make decisions and pay attention

Single Lane Roundabouts - Markings

- Yield Line
- Arrow(s)
- Crosswalks



2009 MUTCD – Single Lane Markings



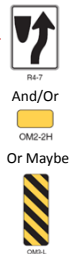
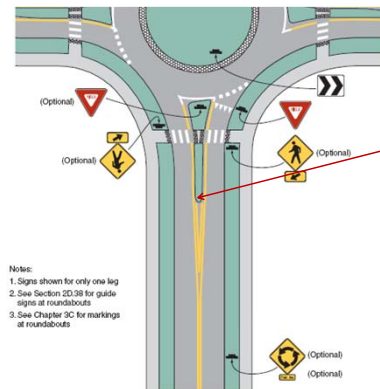
Think through the need for Optional items.

Keeping in mind that they are increased maintenance and may not add significant value.

Single Lane Roundabouts - Signing

- Advance Warning Signs
- Object Markers and Keep Right Signs
- Pedestrian or School Crossing Signs
- Yield Signs
- Chevrons
- Street Name Signs

2009 MUTCD – Signs for Single Lane





Advance Warning Signs

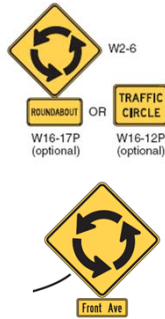


Advance Warning Signs

There wasn't enough room here for an additional standard advance sign



Advance Warning Signs – Other Ideas



Advance Warning Signs – Flashing Beacons

In some instances we have added beacons on long tangent sections. Downhill grade here has been an issue. Consider developing guidelines for placement so it is defensible where they are placed and provides reason for rejecting requests.



Object Markers & Keep Right



Pedestrian or School Crossing Signs


- Different colors & Different Sizes
 - Now using standard yellow for non-school signs
 - Using smaller signs on multilane approaches where signs are doubled up



- No Ped signs at all in many cases now
 - Leave them in commercial areas and schools



Yield Signs



R1-2

Yield To Both Lanes Signs



Challenges with "Yield To Both Lanes" Signs


What do these two signs have in common?

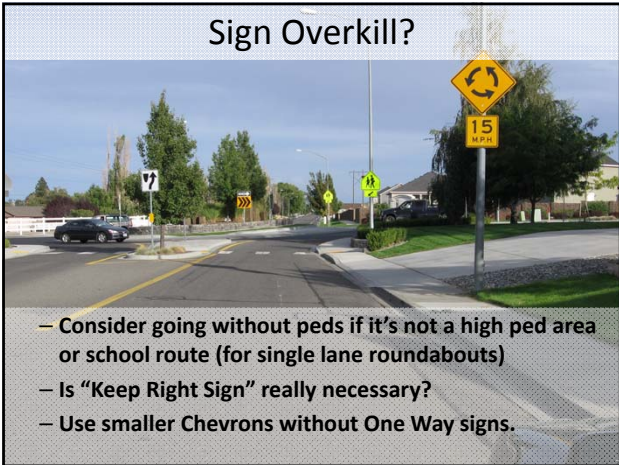
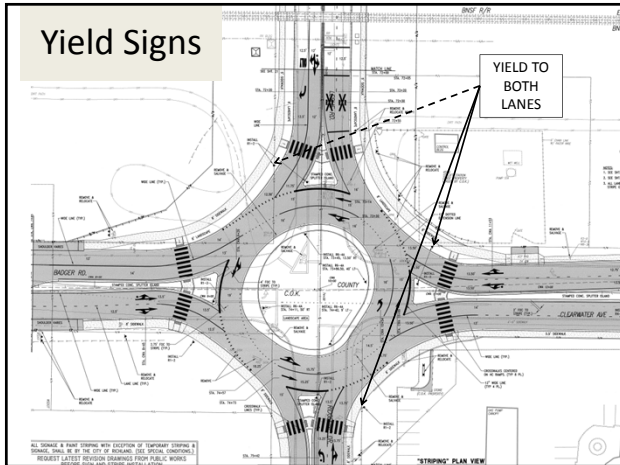


Yield – To Both Lanes

- Consider "Yield to both lanes" sign when there are two exits immediately downstream
- When inside lanes may cut across to exit (spiral)

OR





Does Less = More?



Multi-lane Roundabouts – Taking it to the next level



Guide Signs & Markings

- Lane Control - Fish Hook vs. Standard arrows



- How are these perceived by the driver?
 - Are they perceived correctly?
 - Are they perceived and understood in time to get in the proper lane.
- Is there a single correct choice that works for all drivers?

Fish Hooks vs. Standard

- Fish Hooks are stylized, inconsistent, difficult to make and maintain/replace.
- My opinion is they are difficult for the unfamiliar driver to interpret quickly enough to consistently make a proper lane choice.
- My opinion is that using Standard arrows allows a driver to use a familiar and simple graphic to perceive, respond, and react properly to use the correct lane.

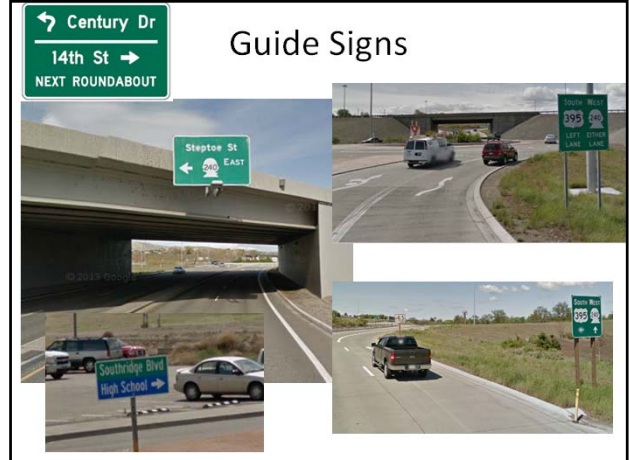
Lane Control Signs – Being “Thrown for a loop”



Lane Control Markings

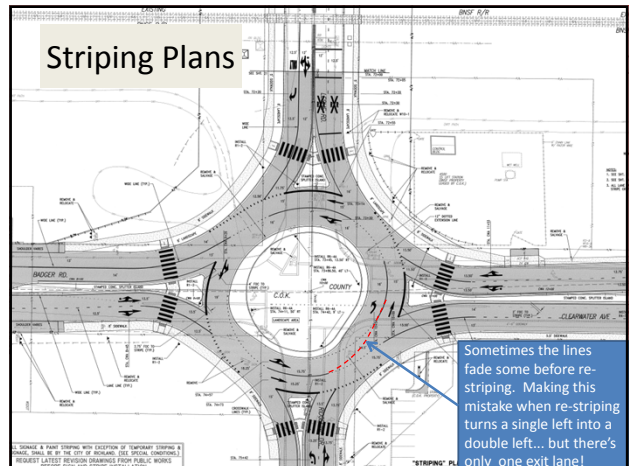


The Challenge of Guide Signs

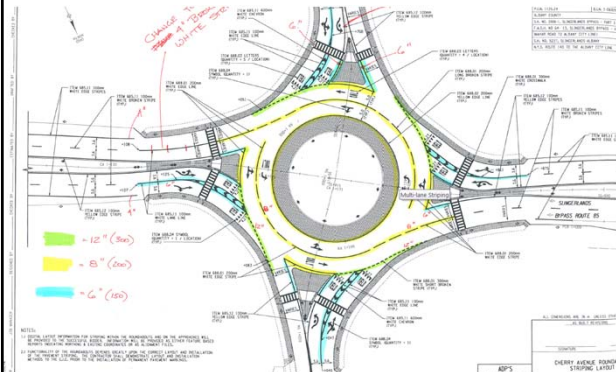


Multi-lane Striping

- Many variations of multi-lane depending on the anticipated traffic needs.
- Special guide striping in the roundabout to help give drivers good direction.
- Take note of the design and make sure to match when freshening it up. WSDOT example on Blue Bridge.



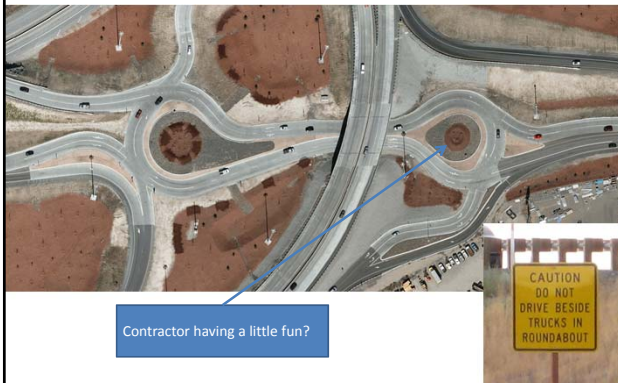
Wide Lines for Clarity – Thermoplastic for Longevity



Concrete & Contrast



Trucks in Multi-Lane Roundabouts



Unfinished Approaches/Exits



Landscaping & Sight Distance Issues

- Placement of trees in relation to signs
- Placement of trees, shrubs, and fences with regards to sight distance
- Watering of the central island and/or splitter islands and who has control of this.
- Artwork vs. Landscaping

Trees & Signage



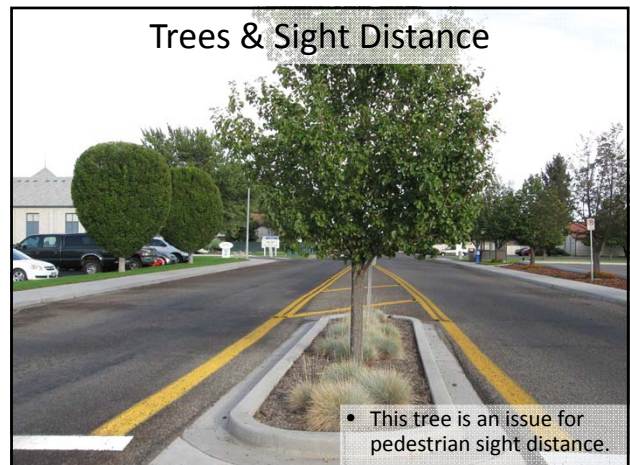
- Yield signs, being typically placed around the corner are very difficult to place without being obscured by trees. Can be an issue for ped signs also.
- Makes a case for placing a 2nd Yield sign on the splitter island even on single lane roundabouts if trees will be present.

Trees & Sight Distance



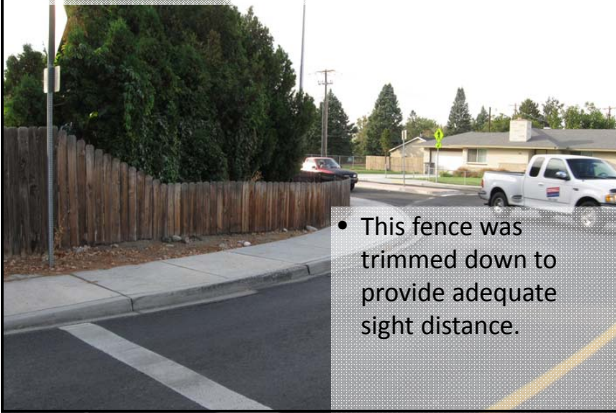
- Homeowner chose to trim these arba vitae up from the bottom rather than remove one or two after a complaint.
- This was a good solution here increasing visibility of pedestrians by drivers.

Trees & Sight Distance



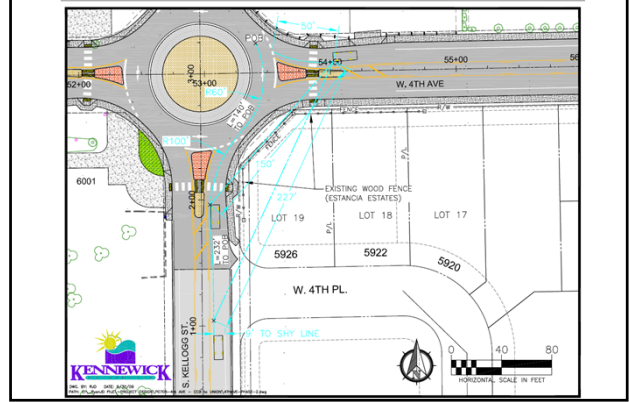
- This tree is an issue for pedestrian sight distance.

Fences & Sight Distance

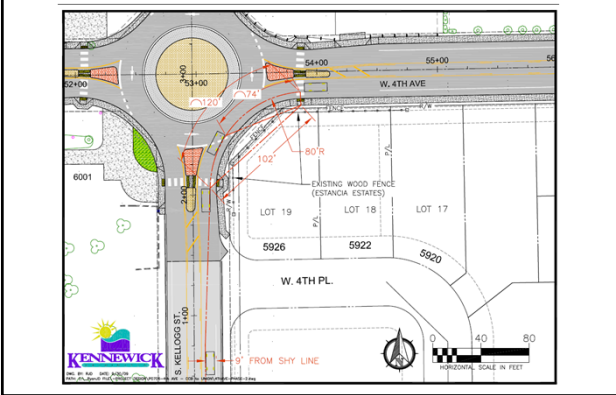


- This fence was trimmed down to provide adequate sight distance.

Vehicle Sight Distance



Pedestrian Sight Distance

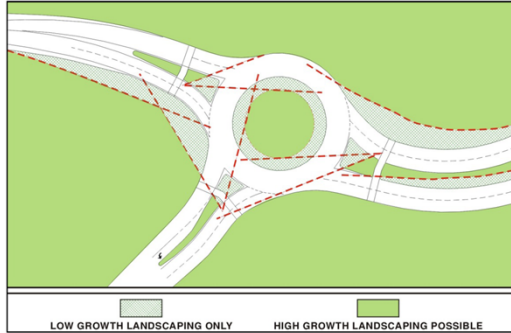


Fences & Sight Distance



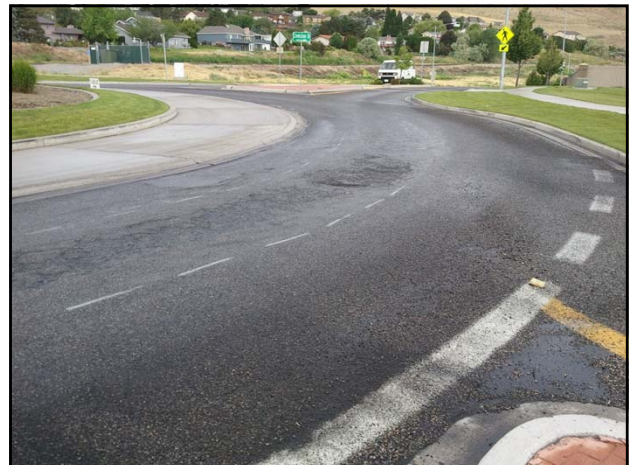
- This fence was placed incorrectly by the developer. They removed and replaced it correctly at great expense.
- After that it appears they planted large bunch grass right in the sight triangle!

Example Sight Distance Diagram



K Kittelson & Associates, Inc.
Transportation Planning/traffic Engineering

TRANSYSTEMS CORPORATION



Landscaping – Private Maintenance



Landscaping – Private Maintenance



Attractive Nuisance



Artwork – Leslie & Clearwater



Artwork – Leslie & Clearwater



Artwork – Flowers



Artwork – Man & Boy Flying Kite



The End



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