NCITE Geometric Design Committee

6/22/2017 Meeting Minutes

8:30 AM – 10:00 AM

Location: **Stantec**

2335 Highway 36 West

St. Paul, MN 55113

Committee Chair:

Kelly Besser, Stonebrooke Engineering

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Committee Co-Chair:

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Meeting Minutes:

I. Introductions

- See attached sign in sheet.

II. Presentation and Roundtable Discussion:

MnDOT Roundabout Steering Committee Design Guidelines Presentation and Roundtable: Part III

- A roundtable discussion topics list was provided at the meeting. See attached for notes on topics discussed.

III. Next Meeting: TBD.

- Topic is TBD.

NCITE Geometric Design Committee Meeting, 6/22/2017

Roundabout Design Roundtable Discussion Topics

➔ Meeting notes provided are from topics discussed at the 4/20/17 meeting.

1. Phi angles – What is the preferred method of determining this measurement? When is it appropriate to use 2(phi) instead? Will this measurement be required on L1 layouts in the future?
    - MnDOT requires a phi angle exhibit on the layout.
    - 25 degrees is optimal.
    - Not a controlling factor, but should be considered to avoid an uncomfortable angle to look backward for entry into the roundabout, and for ease of entry to the right.
    - 2phi/phi is used for "ideal", squared up intersections. Guidelines for how to measure this will be provided in the updated Chapter 12 of RDM.
    - Path overlap is important to check for multilane entries.

2. What is approach leg deflection and effect on reducing speeds entering roundabouts?

    - Some deflection is good, but too much results in large amount of R/W impacts.
    - Splitter island length can be determined by the SSD from approach to entry. MnDOT is backing off this slightly to try to reduce lengths as appropriate.

3. Design speed on approach legs versus design speed approaching/within roundabout – at what point does the design speed no longer apply on approaches/exits?

    - Each situation is different, but the goal is to slow vehicles. Superelevation should be provided up to the splitter island nose, but beyond that any super provided will allow the driver to continue at a higher speed versus slowing them down. Consider supering for a lower speed than the approach leg design speed.

4. What are commonly used inscribed circle diameter ranges and impact on safety, volumes, etc? When would a non-traditional shaped central island be used?

    - 150'-165' are typical for single lane, 180'-200' for multi lane.
    - An ellipse-shaped central island might help with acute entry angles.

5. Tangential exit geometrics can be beneficial for large vehicles exiting roundabouts. Does this impact speed differentials through the roundabout?

    - R2-R3 is usually limited by acceleration and there is no strict adherance to speeds for this value.
    - R1 and R2 differential is the most important relationship.
    - To control R values, keep the outside curbs as close to the ICD as possible.
    - To accommodate larger vehicles, the splitter island end can be pulled away from the alignment, which doesn't affect fast path.
    - Make signs removable on the splitter island ends so they can be removed when OSOW vehicles need to traverse the intersection.

6. ADA/bicycles and roundabouts – discuss design guidance for slip ramps and splitter island cut-throughs. Trail runout into shoulder on departure sides – how has this been working?

    - Slip ramp designs should be simplified as much as possible.
    - Limit the amount of curb used - the curb can end in a rural setting once the slip ramp ties to the roadway.
    - Free rights need to be considered for ped accomodations so they aren't too confusing for users.

7. What are some common "mistakes" you see during your reviews?

    - Overdesign and not having sufficient data to support more than a 1x1 roundabout.
    - Medians too long/large.
    - Unnecessary truck aprons.

8. What are some rules of thumb for different design parameters that MnDOT has or prefers?

    - Left offset approaches.
    - 13'-14' truck aprons.

➔ The 4/20/17 discussion ended after topic 8.

<u>6/22/2017</u>

9. Any suggestions/considerations for designing a single-lane roundabout to allow for conversion to a multi-lane roundabout in the future?

    - MnDOT met with Concrete office and had good conversation
        - Concrete office doesn't like striping on expansion joint
        - Paving industry prefers concentric design with longitudinal joint following-through the exit path for ease of construction
        - 2' radius on splitter island is difficult to construct
    - Traffic forecasting is important
        - Bailey and Radio in Forest Lake may soon be the first roundabout expanded from single- to multi-lane, and would be expanded to the outside
        - There has been success with building the ultimate condition and using delineators, striping, and other methods to create a single-lane configuation

10. Signalized pedestrian crossings.

    - HAWK systems – Best not to signalize
    - River Falls, WI is a good example of effective pedestrian management system
    - MnDOT moving away from signalized crossings

11. Signing – optional vs required from the MUTCD figures (roundabout ahead warning signs).
    - MnDOT has standard signing layout
    - Yield Ahead sign is probably not necessary
    - Ped crossing signs are unnecessary on entrances but on exits are helpful
    - Lane assignment signs on overhead sign trusses are strongly recommended by MnDOT for multi-lane roundabouts, with a Type A lane assignment sign ahead of the OH sign
    - MnDOT Roundabout Task Force is developing figures for overhead lane assignment sign usage
    - PCMS are a useful alternative to "Traffic Control Change Ahead" signs
12. Rigid fast path adherence in all situations (small odd-shaped rdbts and very large roundabouts).
13. Discuss OSOW vehicle accomodations and design vehicles. (Bonus topic 1 - Jamal's ppt slide 21)
    - 95-ft "low-boys" haul Contractor equipment and MnDOT feels this is the most appropriate design vehicle for roundabouts
14. Bonus topic 2 (slide 22)
15. Bonus topic 3 (slide 23)
16. What is the relationship between entry width and circulating width and what are the guidelines MnDOT follows for widths?
17. Discuss geometric design of free flow right turn bypass lanes.
18. Discuss benefits and disadvantages of use of "table-top" entry profiles, and the impacts on stopping sight distance and ADA design.

Other:

- MnDOT feels designers "over-design" roundabouts too much and suggests that a single-lane roundabout should be the base condition that is the default first alternative is a roundabout is being considered, and until designers can show that a multi-lane roundabout is absolutely necessary to solve the existing intersection's problems and that a single lane roundabout can't, the single lane roundabout concept should be used.
- Level of Service means something different for roundabouts than for roadways in general, and shouldn't be used as a design standard. Instead, delay should be the evaluating criteria. Delays are different in different settings.
- Chapter 5 (Intersections) of MnDOT Design Manual might be revised, for example to better accommodate pedestrians
- Roundabouts at MN36 & English St. would have benefitted from this
- MnDOT has never done three-lane roundabouts
- Mini-roundabouts are being shown effective for much less cost

NCITE GEOMETRIC DESIGN COMMITTEE MEETING

Thursday, June 22, 2017, 8:30 AM to 10:00 AM			
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