INTERSECTION TRAFFIC CONTROL COMMITTEE

Meeting Minutes
December 2nd, 2015

ATTENDEES

<table>
<thead>
<tr>
<th>Name</th>
<th>Agency</th>
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<tbody>
<tr>
<td>Dean Chamberlain (Chair)</td>
<td>Toole Design Group</td>
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<tr>
<td>Mark Wagner (Co-Chair)</td>
<td>SEH</td>
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<tr>
<td>Roger Plum</td>
<td>SEH</td>
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<tr>
<td>Ken Levin</td>
<td>Hennepin County</td>
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<td>Jerry Kotzenmacher</td>
<td>MnDOT</td>
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<td>Nik Costello</td>
<td>Washington County</td>
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<td>Luke James</td>
<td>SRF</td>
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<td>Bob Byers</td>
<td>Hennepin County</td>
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<td>Paul Jung</td>
<td>MnDOT</td>
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<td>Ashley Roup</td>
<td>MnDOT</td>
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<tr>
<td>Chad Braun</td>
<td>Carver County</td>
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<tr>
<td>Ben Hawkins</td>
<td>Saint Paul Public Works</td>
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<td>Tyler Krage</td>
<td>Alliant Engineering</td>
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MEETING LOCATION: MnDOT Water’s Edge

I. Remaining meeting times/locations for 2015
Final meeting of 2015.

II. Presentation – Pedestrian Crossing Facilitation – Melissa Barnes (MnDOT Office of Traffic, Safety, and Technology)
The following is a summary of Melissa’s presentation. The full presentation is attached at the end of these minutes.

1. Overview
2. Background – Crosswalk Law
3. Where do the curb ramps go?
4. Pedestrian Generator
5. Where do we prohibit crossing?
6. Pedestrian Rights at a Green Signal
7. Where do the Crosswalks go?
8. Installation Criteria
9. Additional Treatments
10. Unmarked Ped Xing Facilitation
11. Questions
a. Comment – The LRRB and Boulder studies are a good resource for information on RRFBs and other pedestrian treatments.
b. Q – Does MnDOT prefer solid-state or APS push-buttons on RRFB systems? A – APS push buttons are standard.

III. Round Robin
1. Ken Levin noted that he has heard complaints from pedestrians that drivers are not yielding to them when the flashing yellow arrow is on. Jerry K. noted that he has received this complaint as well.
2. Jerry K. noted that a fatality in Dakota County has been partially attributed to the driver’s unfamiliarity with flashing yellow arrows.
3. Jerry K. announced some upcoming MnDOT training courses:
   a. Signals 101
   b. Signal & Lighting Certification
4. Jerry K. had the following comments from the Signal TEO Committee Meeting:
   a. PA90 and PA100 foundations have been spinning under certain circumstances. New foundation designs may be forthcoming.
   b. MnDOT has had issues at pedestrian stations related to the reliability of epoxy placed on anchor rods at temperatures at or below 41°
   c. A major rewrite of MnDOT’s cost participation policy is upcoming.
   d. A new state statute now requires signals to be retimed at 3 year intervals.
5. Nik Costello commented on how agencies typically bring a signal out of ‘red-flash’ and asked what might be the safest way to do so.
6. Mark Wagner noted that the next meeting will be hosted by SEH.

NEXT MEETING:

Date: Wednesday, January 6th, 2016 (8:00-10:00am)

Location: SEH – Vadnais Heights office
SEH – Vadnais Center Drive
St. Paul, MN 55110

Topics: Brainstorming session for 2016 meeting topics and locations.

Presenting: ---

Minutes Submitted By: Mark Wagner
www.nc-ite.org
Pedestrian Crossing Facilitation

NCITE Intersection Traffic Control Committee

December 2, 2015

Melissa Barnes, PE, PTOE
Statewide Pedestrian and Bicycle Safety Engineer
MnDOT Office of Traffic, Safety, and Technology

melissa.barnes@state.mn.us
651-234-7376
Overview

- Where to install curb ramps
- Where to prohibit crossings
- Where to paint crosswalks
- Improving crossings beyond crosswalks
Background - Crosswalk Law

Where traffic-control signals are not in place or in operation, the driver of a vehicle shall stop to yield the right-of-way to a pedestrian crossing the roadway within a marked crosswalk or at an intersection with no marked crosswalk. The driver must remain stopped until the pedestrian has passed the lane in which the vehicle is stopped. No pedestrian shall suddenly leave a curb or other place of safety and walk or run into the path of a vehicle which is so close that it is impossible for the driver to yield. This provision shall not apply under the conditions as otherwise provided in this subdivision.

169.21
Where do the curb ramps go?

- Wherever there are sidewalks/trails at an intersection
  - **UNLESS:**
    - Measurable safety concerns
    - Phasing at a signal is impossible or prohibited (more on this later)

- Goat paths
  - Try and install a sidewalk/trail

- At the ends of sidewalk systems
- Perpendicular to sidewalks on one side of the street
Where do the curb ramps go?

- Pedestrian generators will create pedestrian traffic regardless of the size of the road, the speed of traffic, the ADT, crossing facilitation or presence/absence of sidewalks
- Connect destinations
  - Housing (special attention paid to vulnerable users)
  - Restaurants
  - Shopping
  - Hotels
  - Schools
  - Places of worship
  - Transit
  - Parks
  - Museums
  - Etc.
Pedestrian Generator
Where do the curb ramps go?
Where do the curb ramps go?

**No Perpendicular Sidewalks**

Pick a side of the street to cross. Cross at a minimum every 660’ or at every pedestrian generator.

**One Perpendicular Sidewalk**

Must cross on corner with perpendicular sidewalk.
Where do the curb ramps go?

- T-intersection with No Perpendicular Sidewalks
  - Pick a side of the street to cross.

- One-Way Perpendicular Sidewalk Extensions
  - Cross wherever a sidewalk is approaching perpendicular to a parallel system.

- End of Sidewalk System
  - Ramps shall be placed for entrance/exit to the sidewalk system at the end of a sidewalk.
Where do the curb ramps go?

- Perpendicular to sidewalks on one side of the street

Ramps shall be placed for entrance/exit at the end of a sidewalk.

Pick a side of the street to cross. Cross at a minimum every 660’ or at every pedestrian generator.
Where do the curb ramps go?

- **T-intersection with No Perpendicular Sidewalks**: Line ramp up with shoulder. Pick a side of the street.
- **Two Sidewalks Perpendicular to the Through Sidewalk**: Connect all through sidewalks.
Where do the curb ramps go?
Where do the curb ramps go?

- On the side of the street without a sidewalk when there is no shoulder
Where do the curb ramps go?

- Signalized intersections:
  - If you cross 3 legs, cross the 4th unless there’s a safety, operational, or geometric issue.
Where do we prohibit crossing?

- Severely impacts motor vehicle traffic operations
- Inner legs of ramp interchanges
- Safety issues
  - Sight distance
  - Crash history
- Never strand a pedestrian in a quadrant – what if your car broke down?
- Still cross at-grade with ped bridges
Pedestrian Rights at Green a Signal

- **Vehicular traffic facing a circular green signal** may proceed straight through or turn right or left unless a sign prohibits either turn. But vehicular traffic, including vehicles turning right or left, shall yield the right-of-way to other vehicles and to pedestrians lawfully within the intersection or adjacent crosswalk at the time this signal is exhibited. Vehicular traffic turning left or making a U-turn to the left shall yield the right-of-way to other vehicles approaching from the opposite direction so closely as to constitute an immediate hazard.

- **Vehicular traffic facing a green arrow signal**, shown alone or in combination with another indication, may cautiously enter the intersection only to make the movement indicated by the arrow, or other movement as permitted by other indications shown at the same time. Vehicular traffic shall yield the right-of-way to pedestrians lawfully within an adjacent crosswalk and to other traffic lawfully using the intersection.

- Unless otherwise directed by a pedestrian-control signal as provided in subdivision 6, pedestrians facing any green signal, except when the sole green signal is a turn arrow, may proceed across the roadway within any marked or unmarked crosswalk. Every driver of a vehicle shall yield the right-of-way to such pedestrian, except that the pedestrian shall yield the right-of-way to vehicles lawfully within the intersection at the time that the green signal indication is first shown.
Where do the Crosswalks go?

Marking crosswalks alone does not improve safety, but does delineate an approved path to alert pedestrians, bicyclists, and motorists of potential pedestrian movements across a roadway. No research states that marking crosswalks creates a false sense of security. In fact, research is unclear about why marking crosswalks sometimes appears to decrease safety because it has shown that pedestrians actually scan the street more at marked crosswalks and after installing marked crosswalks motor vehicle speeds tend to decrease. The most reasonable explanation has been that more vulnerable users (elderly, children) tend to use marked crosswalks.
Notes
1. Urban, suburban, and rural locations may vary in this classification. Urban may want to use locations that have higher volumes than the surrounding crossings. Rural locations may want to mark locations that have regular pedestrian crossings but may never meet the 20 pedestrians/hour minimum.
2. A reasonable walking distance is 660’ in some suburban/rural applications, urban marked crossings should never be closer than 150’.
3. See the “Additional Treatment Considerations” section for more information.
## Installation Criteria

<table>
<thead>
<tr>
<th>Roadway Configuration</th>
<th>Vehicle ADT ≤ 9,000</th>
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<th></th>
<th>Vehicle ADT &gt; 9,000 - 12,000</th>
<th></th>
<th></th>
<th></th>
<th>Vehicle ADT &gt; 12,000 - 15,000</th>
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<tr>
<td></td>
<td>≤ 30 mph</td>
<td>35 mph</td>
<td>40 mph</td>
<td>≥ 45 mph</td>
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<td>35 mph</td>
<td>40 mph</td>
<td>≥ 45 mph</td>
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<td>35 mph</td>
<td>40 mph</td>
<td>≥ 45 mph</td>
<td>≤ 30 mph</td>
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<td>2 lanes (with or without a raised median)</td>
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<td>A</td>
<td>B</td>
<td>D</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>D</td>
<td>A</td>
<td>A</td>
<td>C</td>
<td>D</td>
<td>A</td>
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<td>3 lanes with raised median</td>
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<td>A</td>
<td>C</td>
<td>D</td>
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<td>C</td>
<td>D</td>
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<td>C</td>
<td>C</td>
<td>D</td>
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</tr>
<tr>
<td>3 lanes without raised median</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
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<td>B</td>
<td>C</td>
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<td>B</td>
<td>B</td>
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<tr>
<td>Multilane (4 or more lanes) with raised median</td>
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<td>C</td>
<td>D</td>
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<td>Multilane (4 or more lanes) without raised median</td>
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### Treatment Descriptions:

A. Consider marked crosswalk and signs

Guidance: Consider installing marked crosswalk with advance warning signs (W11-2); use S1-1 signs for school crossings. Consider in-roadway (R1-6) or overhead (R1-9b) signs.

B. Consider marked crosswalk with enhanced signs (R1-5 or R1-9b) and/or geometric improvements

Guidance: Consider installing treatment options from Type A treatments. Add curb extensions or median refuge islands.

C. Consider marked crosswalk with signs, geometric improvements, and pedestrian activated warning devices

Guidance: Consider installing a raised median refuge island if one is not present. Consider installing marked crosswalk and appropriate crossing signs along with a pedestrian activated warning device (i.e., RRFB). Consider adding curb extensions if possible.

D. Do not install marked crosswalk.

Guidance: Consider pedestrian hybrid beacon, pedestrian traffic signal, or grade separated crossing.

### Specific Notes:

1. Advanced stop lines and signing (R1-5b or c) should be used whenever possible if a multiple threat crash issue is present. Overhead signing, RRFBs or other overhead treatments should be used to mitigate multiple threat crash risks.

2. Do not install a marked crosswalk where there are 3 or more through lanes per direction. Consider a pedestrian hybrid beacon, pedestrian traffic signal, or grade separated crossing.

3. Traffic calming measures should be considered to reduce speed.

4. If a median cannot be or is not currently installed go to Treatment Type D.

5. Minimum acceptable median width to provide a refuge is 6 feet.

### General Notes:

1. Adding crosswalks alone will not make crossings safer, result in more vehicles stopping for pedestrians, nor will they necessarily create a false sense of security.

2. Crosswalks have not been proven to create a false sense of security - research shows that pedestrians scan the road more at marked crosswalks.

3. Whether a crosswalk is marked or not, additional crossing enhancements should be considered. See the "Additional Treatment Considerations" section.

4. See MUTCD Section 38.18 for additional guidance on using this table.

5. Lanes are total cross section.
Installation Criteria

- Requires curb ramps
- Parking prohibited
- No stop control
- School crossings
- Not at channelized right turns
Additional Treatments

- Warning signs
- Medians
- Curb extensions
- Reduced Radii
- Advanced stop lines
- Raised Crosswalk
- Lighting
- RRFB
- PHB
Unmarked Ped Xing Facilitation

- Calm traffic
- Increase visibility
- Install medians
- Move bus stops downstream
- Prohibit parking near crossing
Questions?

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