What Are We Walking Into?
Prioritizing Pedestrian and Bicycle Projects

Derek Leuer, PE | Traffic Safety Engineer
October 23rd, 2018
Toward Zero Deaths

Agenda

Topics
- Defining the Problem
- Metro Risk Assessment
- Statewide Risk Assessment
- Questions and Discussion
What is the Problem

- Every year 1,600 to 2,000 Pedestrians and Bicyclists are involved with Motor Vehicle Crashes
- Average is around 50 fatalities/year
- Average about 150 serious injuries/year

Minnesota Traffic Fatalities

Peak Year was 1968 with 1,060 Fatalities
- 1944 was 356 fatalities
- 1943 was 274 fatalities
- 2017 was 358 fatalities
What is the Problem

Ped and Bike Fatalities compared to Total Fatalities

Ped and Bike Fatalities compared to the Total Fatalities (%)

Historical Average of 10%

2016 = 17.1%
Past Solutions

• Most agencies were auto-centric
• Ped/Bike was an after thought
• Discourage Biking and Walking
• Cities built for cars, not people
• Discrimination?

Unintended Consequences

• People don’t walk/bike
• Discourage Biking and Walking
• Obesity Epidemic
• Asthma, heart conditions, etc.

57 percent of American children will grow up to be obese
Encourage Walking and Biking

!!Colliding of the Worlds!!

- How do we mesh the two?
- How do we fund ped/bike?
- Changing a culture
Metro Risk Assessment

Derek Leuer

What is the Problem

• Every year ~ 1,200 Pedestrians and Bicyclists are involved with Motor Vehicle Crashes


• Average is around 22 fatalities/year

• Average about 100 serious injuries/year
Metro District Safety Plan

• This is a data driven analysis

• Goal: To identify at-risk intersections and suggest countermeasures to reduce pedestrian and bicycle related fatal and serious injury crashes

• Metro Planners knew about previous risk analysis

• Set-Aside money starting in 2017

• Fluctuates, but $2-3 Million / Year

Metro District Safety Plan

• Fund safety directly (vs system continuity)

• Lots of requests (unknown if risk was real)

• Metro wanted to lead, not react

• Expand; Preserve and Enhance

• Maximize Investment

• Mix Stand-Alone Projects and Project Enhancements
  • Pavement Program
Data Summary

• Total Intersection = 5421
• 750 were evaluated
• 650 used in the final analysis
• Out of the 5421 intersections there was 2850 total crashes and 269 K+A crashes

Risk Factors

Signalized Risk Factors
• Bus Stop
• Major Median
• Major Speed Limit (35-50 mph)
• Near School
• Major Left Turn Signal (Protected)
• Approach Volume (25,001-35,000)
• Location Type (Suburban)
• Approach Volume (35,001-45,000)
• No on Street Parking

Un-Signalized Risk Factors
• No on Street Parking
• Location Type (Suburban)
• Speed Limit (30 or Less mph)
• Major Through Lanes (4)
• Major Median
• Near School
• Bus Stop
• Approach Volume (35,001-45,000)
• Location Type (Urban)
• Major Speed Limit (35-50 mph)
• Street Lighting (NONE)
• Number Legs (4)
Example of 5 Star Intersection

TH 5 (7th St. W) and St. Paul Ave

Signalized Risk Factors
★ • Bus Stop
★ • Major Median
★ • Major Speed Limit (35-50 mph)
★ • Near School
★ • Major Left Turn Signal (Protected)
★ • Approach Volume (25,001-35,000)
★ • Location Type (Suburban)
★ • Approach Volume (35,001-45,000)
★ • No on Street Parking

Countermeasures

Signalized Counter measures:
1. Confirmation Lights

Signalized Bus Stop Countermeasure:
1. Reduce Signal Cycle Length
2. Pedestrian Priority
3. Put Pedestrian Phase on Recall
4. Move Bus Stops to Far Side
5. Countdown Timers

Signalized Major Median and Approach Volume Countermeasure:
1. Increase pedestrian Phase Length
2. Reduce Signal Cycle Length
3. Pedestrian Priority
4. Put Pedestrian Phase on Recall

Un-signalized Countermeasure:
1. Raised Crossing
2. In Street Pedestrian Signs
3. Median Refuge Island
4. RRFB (Rectangular Rapid Flash Beacon)
5. HAWK
6. Curb Extension
### 2016 District Safety Plans Update

#### Metro Signalized Intersection Risk Factors

- Bus Stop
- Major Median
- Major Speed Limit (35-50 mph)
- Near School
- Major Left Turn Signal (Protected)
- Approach Volume (25,001-35,000)
- Location Type (Suburban)
- Approach Volume (35,001-45,000)
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#### Urban Segments

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#### Urban Intersections - Right Angle

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2016 District Safety Plans Update

US 53 and 13th Street, Virginia, MN

Risk Factors Present

★ Cross Product
  - Major = 14,900
  - Minor = 2,600
  - Cross Product = 39 Million

★ Traffic Control Device (Signal)
★ Major Corridor Speed (45 MPH)
★ Skew (15 degrees)
★ On/Near Horizontal Curve (Yes)
★ Primary Land Use Type (Retail/Suburban)
★ Severe Crash Density
  - (1 severe ped/bike crash 2009-2013)

2016 District Safety Plans Update

DSP Intersection Risk Rating
2014-2015 Fatal and Serious Injury Crashes

Intersections
Bike-Ped K+A Crashes

45% of severe crashes
26% of locations

26% of the intersections had 45% of the crashes!
Over 300 intersections had some type of project selected and assigned!

Submitted Projects

- 20 Intersections
- Pedestrian Countdown Timers
- All 4 stars and above
- $240,000 in HSIP
A Selection of Treatments

- Warning signs
- Medians
- Curb Extensions
- Road Diets
- Reducing Corner Radii
- Advanced Stop Lines
- Raised Crosswalks
- In-Roadway Lights
- Pedestrian Hybrid Beacons
- Pedestrian Signals
- Grade Separation
- Striped Channelized Right Turns
- Blank-Out No Right Turn on Red Signs
- Lighting
- Gateway Treatment

Crosswalk Marking Placement

- Our Flowchart (See MnDOT TEM)
Crosswalk Marking Placement

- Our table**** (See MnDOT TEM)
  - Developed based on Zegeer study and other national studies for additional treatments (Virginia, Colorado, Washington, etc.).

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<th>Table 13.1 Pedestrian Facility Treatments</th>
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What Else?

- Emergency vehicles – blink across in a row. How about up the pole?
- What else catches your eye?
- Balance between attention and distraction
The End!

Questions? Discussions?

Derek Leuer