Evaluation Of Sustained Enforcement, Education, and Engineering Measures on Pedestrian Crossings

Nichole L. Morris, Ph.D.
Curtis M. Craig, Ph.D.
HumanFIRST Laboratory
University of Minnesota
Ron Van Houten, Ph.D
Western Michigan University
Pedestrian deaths are at a 30 year high nationally.

Nearly 14% of Minnesota 2019 traffic deaths were pedestrians.
Can High-Visibility Enforcement Improve Pedestrian Safety?
Measuring Driver Compliance

• Staged crossings (Fall 2017)
  – 16 unsignalized marked crosswalks
  – At or near sites where pedestrian crashes had occurred
  – Selected crosswalks with sufficient traffic volume, location and spread, potential for enforcement
  – Measure baseline performance
**General Protocol for Coders**

- Coding was done in teams of two.
- Staged pedestrian and Recorder/coder.
- Monday-Friday, 9am-4pm.
- Clear weather conditions, during daylight hours.
- Mark yielding based on dilemma zone (ITE Signal Timing).
- Mark yielding distances: <10 ft, 10-40 ft, & >40 ft.

<table>
<thead>
<tr>
<th>Location:</th>
<th>Describe condition:</th>
<th>Coder #1</th>
<th>Coder #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>Start Time:</td>
<td>Stop Time:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Staged Crossings</th>
<th>Cars Not Yielding</th>
<th>Distance Cars yielded from crosswalk</th>
<th>Multiple Threat Conflict</th>
<th>Evasive Action</th>
<th>Failure in Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Less than 10 ft</td>
<td>Between 10 ft - 40 ft</td>
<td>More than 40 ft</td>
<td>Pass</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Baseline Results

1581 CROSSINGS
51.7% <40FT BACK
3.6% <10FT BACK
33.9% AVERAGE YIELDING
11% OF CROSSING WITH MULTIPLE THREAT PASSING
Multiple Threat Passing & Crashes

- Multiple-threat crash
  - First coined by Snyder and Knoblauch (1971)
  - Describe a pedestrian being struck after walking out in front of a stopped vehicle by a second driver in the same direction of travel.
  - The occurrence is, in part, due the stopped vehicle obstructing the passing driver’s view of the pedestrian in the crosswalk.
Baseline Multiple Threat Passing by Number of Lanes

Sites by Number of Lanes

Percent of MT-Passing per Crossing

- 2 lanes
- 3 lanes
- 4 lanes
- 5 lanes
- All Sites
Planning Intervention

• Focus on Passing Violations
  – *Multiple Vehicle Threats deemed critical component of study*
  – Must reduce behavior through enforcement and awareness
  – Increase penalty

• “Check Box” on endangering life or public property
Education & Outreach

Critical to gain community support

1. Announce loud and clear WHERE & WHEN the high visibility enforcement will be happening
2. Begin enforcement with a warning only wave
3. Announce and re-announce each new wave
4. Capitalize on community partners
Passing Education/Outreach
Education & Outreach

• Announcing upcoming enforcement is CRITICAL to community buy-in
YOU JUST FAILED TO
YIELD TO A PEDESTRIAN
IN A CROSSWALK

Save a Life
Always Look for Pedestrians!

In Saint Paul, 835 pedestrians were struck by motor vehicles in the past 5 years - more than 3 crashes every week!

- 17 died and 747 were injured
- 87 were children 10 and under
- 100 were youth ages 11-17

Minnesota law is clear

✓ Drivers must come to a complete stop for people at or in crosswalks, allowing them to safely cross the street.

✓ Drivers must not overtake and pass a vehicle stopped for a person at or in a crosswalk. There may be people crossing you can’t see!

✓ Watch your speed. You are less likely to see people crossing the street when you are going too fast.

The City of Saint Paul is working to make our streets safer for everyone.

Spread the word about pedestrian safety and be a good role model!

An important traffic safety message from the Saint Paul Police Department

NOTICE

Saint Paul Police Department will begin ticketing drivers who do not stop for people in crosswalks starting this coming week.

In Saint Paul, 835 pedestrians were struck by motor vehicles in the past 5 years – more than 3 crashes every week!

- 17 died and 747 were injured
- 87 were children 10 and under
- 100 were youth ages 11-17

Minnesota law is clear

✓ Drivers must stop for people crossing in crosswalks. This means coming to a complete stop to allow them to cross.

✓ Drivers must not overtake and pass a vehicle stopped at a crosswalk. There may be people crossing you can’t see!

✓ Watch your speed. You are less likely to see people crossing the street when you are going too fast.

The City of Saint Paul is working to make our streets safer for everyone.

Be a good model, stop for pedestrians, avoid a ticket, and help keep our pedestrians safe!

An important traffic safety message from the Saint Paul Police Department and the City of Saint Paul

Saint Paul Public Schools is not sponsoring, endorsing, or recommending the activities announced in this flyer.
STOP FOR ME
ST. PAUL
Safety is a Shared Responsibility

IN THE PAST 5 YEARS,

835 Pedestrians were struck by motor vehicles in St. Paul.
87 WERE KIDS 10 & UNDER
100 WERE KIDS 11 – 17

BE A GOOD ROLE MODEL, STOP FOR PEDESTRIANS & KEEP OUR CITY SAFE

Drivers must not overtake and pass a vehicle stopped at a crosswalk. There may be people crossing that you can’t see.

Stop for people in crosswalks and come to a complete stop to allow them to cross.

Watch your speed. You are less likely to see people crossing the street when you are going too fast.

Stop well back from crosswalks (3 car lengths) to help other vehicles see the pedestrian so they can stop too.

MINNESOTA LAW IS CLEAR
St. Paul police officers will be ticketing drivers who do not stop for pedestrians.

5 SIMPLE STEPS FOR PEDESTRIAN SAFETY
In the past 5 years, 835 pedestrians were struck by motor vehicles in St. Paul. Here are some tips to help you stay safe!

1. MAKE YOUR INTENTION TO CROSS CLEAR
Wave to drivers, make eye contact, and place one foot off curb, but out of the way of traffic.

2. DON’T ASSUME DRIVERS WILL STOP
Make sure a vehicle is clearly coming to a stop before stepping out into traffic.

3. CHECK EVERY LANE AS YOU CROSS
Stop and look before stepping out from in front of a vehicle that has stopped for you. Always act as if the next vehicle may not stop for you.

4. ALWAYS WALK
Walk, never run, across a crosswalk. It’s more important that you make sure drivers have time to see you than it is to hurry.

5. OBEY TRAFFIC SIGNALS
When there are traffic signals present, be sure to follow their instructions.

SPREAD THE WORD!
Pedestrian safety is a shared responsibility.

An important traffic safety message from the St. Paul Police Department and the City of St. Paul.
SPPD Wave #1 & #2

• **First enforcement wave**
  – Warning phase
  – *April 30-May 4*
  – Earned media
  – Outreach
  – 1,112 warnings issues

• **Second enforcement wave**
  – Tickets issued
  – June 18-29
  – 633 citations & 34 warnings

• **Feedback signs begin**
  – Social norming
  – Implied surveillance
SPPD Wave #3 & #4: In-Street Signs

- **Third enforcement wave**
  - Tickets issued
  - Aug 6-17
  - 386 citations & 74 warnings

- **In-street signs begin**
  - R1-6 signs
  - Centerline placed

- **Fourth enforcement wave**
  - Tickets issued
  - Oct 1-12
  - 248 citations & 34 warnings

- **Gateway Treatments**
  - R1-6 signs split gateway
  - Site-by-site configuration
Predicting Yielding

- Number of factors were predictive for driver yielding
  - Number of lanes
  - 85th percentile speeds
  - Enforcement
  - Temperature
  - Advanced Stop Lines
  - Presence of bus stop
Passing Declines Over Time

Drivers Passing by Site Type and Week

Percent of Crossings

Study Week

Baseline 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

-4 -3 -2 -1 1 2 Wave #1 Wave #2 Wave #3 Wave #4

Generalization  Treatment
Research Take Aways

• Study intervention increased driver yielding while also *decreasing multiple threat passing*
  – Low-cost engineering paired with enforcement and education can be a powerful tool
  – Advance stop lines should be employed more often

• Ultimately, we must reduce speeds and lanes to achieve our pedestrian safety goals
Thank you!

Special thanks to:
• Minnesota Department of Transportation
• Saint Paul Police Department
• Saint Paul Public Works
• HumanFIRST research team
• Twin Cities media partners

Contact Information
Nichole L. Morris, Ph.D.
nlmorris@umn.edu