Non-motorized Sidepath Safety Analysis and Design Guidelines

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Project background

- A sidepath is a type of shared use path located parallel to a roadway
- Usually bi-directional
- Usually separated from the road with a buffer
Project background

• In suburban conditions, sidepaths offer a great compromise
• Bicyclists find them comfortable, but engineers worry about safety

Project background

• Research and best practices related to sidepaths are limited
• None yet in Michigan
Key research efforts / outline

- Crash analysis
- Resident survey
- Design guide development
- Educational materials

Crash analysis methodology

- Three components of crash analysis:
  1. Statewide analysis
  2. Case-control for eight counties
  3. In-depth examination of two high-crash counties

- Sidepath vs sidewalk in the data
- Exposure

Crash analysis work led by Wayne State University
Crash analysis methodology

- 11,305 statewide crashes 2010-2015
- Data collection efforts included using state crash records, police crash reports and GPS locations to examine road geometry
- Each crash assigned a three-digit code described by Pedestrian and Bicycle Crash Analysis Tool (PBCAT)

Case control: the best of intentions

- Research team initially attempted a case-control of 110 pairs, at 220 sidepath sites around the state
- After running bivariate and multivariate analyses, no statistically significant results
Oakland and Kent counties

- Primarily urban/suburban counties
- Large number of sidepaths in a variety of conditions
- Southeast and Western Michigan
- Total of 2,253 bicyclist involved crashes from 2010-2015

Crash analysis findings – injury severity

**Injuries for Sidewalk/Sidepath Bicycle Crashes**
- No Injury: 18%
- Possible Injury: 35%
- Evident Injury: 25%
- Disabling Injury: 15%
- Fatel: 1%

**Injuries for Roadway Bicycle Crashes**
- No Injury: 35%
- Possible Injury: 35%
- Evident Injury: 11%
- Disabling Injury: 37%
- Fatel: 1%
Crash Analysis Findings – PBCAT Categories

- #1 and #2 Motorist Drive Out Sign (#1) and Signal (#2) Controlled
- #3 Motorist Left Turn Opposite Direction

Crash analysis findings – bicycle travel direction

Crashes on sidepaths/sidewalks
Bicycle traveling with traffic

31%
Crash analysis findings – bicycle travel direction

Crashes on sidepaths/sidewalks
Bicycle traveling against traffic

65%

Crash analysis findings – bicycle travel direction

Sidepath warning sign for motorists (CDOT)

Watch for turning vehicles sign for bicyclists (VDOT)
Resident survey methodology

- Random sample of about 5,000 Michigan residents
- Letters explaining survey printed in English and Spanish
- 351 responses, for a 7% response rate
- Only one respondent per household who was 18 years or older
- $5 ‘gourmet coffee gift cards’ were privately-donated and acted as an incentive

Images were used on survey as visual aid to help participants identify facility preference
Participants asked about near-misses they experienced as drivers and bicyclists
### Resident survey findings

- **I like bicycling.***
- **Getting regular exercise is very important to me.***
- **I like the idea of sometimes walking or biking instead of taking the car.***
- **I would like to see more people bicycling in my city.***

#### Percentage of respondents who agree/strongly agree

- **Frequent cyclist (n=116)**
- **Occasional cyclist (n=83)**
- **Rare cyclist (n=93)**
- **Never cyclist (n=54)**

### Resident survey findings – what would encourage you

- **75%**
  - Separated bike facilities* (n=264)
- **50%**
  - More bike facilities/a complete bike network (n=175)
- **33%**
  - Law enforcement of motorist behavior (n=115)
- **28%**
  - Law enforcement of cyclist behavior (n=99)
- **13%**
  - Lower speed limits on roads w/ bike facilities (n=46)
- **7%**
  - Lower speed limits on roads w/out bike facilities (n=26)
- **7%**
  - Easy access to bike safety education (n=24)
Facility selection tool: the best of intentions

• Initial intent: develop a guide to help practitioners know when it was safe to install a sidepath, based on roadway characteristics
• Findings were related to intersections, vehicle turns, and bicyclist direction of travel
• Design guide focusing on intersection treatments developed

Sidepath Intersection and Crossing Treatment Guide

• Process and guidance for integrating high-quality bikeways into a proposed roadway project or as a stand-alone project.
• Has guidance on the following topics:
  • Bikeway selection
  • Safety considerations for sidepaths
  • Intersection treatment selection process
Intersection treatment recommendations

Worksheet

- Fillable form to walk through steps
- Encourages documentation
Data collection will be critical to addressing exposure issues and enhance understanding of crash trends.

Public strongly prefers separated bicycle facilities, especially when bicycling with children.

Building more separated bicycle facilities and a more connected bicycle network would help encourage people to bicycle more.

Contraflow bicycling increases crash risk along sidepaths.

The guide provides recommendations for treatments to reduce crashes along sidepaths, especially at intersections.