Bicycle/Bus Conflict Area Study

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DVRPC and the regional context

- Philadelphia’s MPO, created in 1965
- 2 States, 9 Counties, 353 Municipalities
Philadelphia project context

- Growing “green” modes, but narrow streets
  - Bike share study
  - New bike/ped master plan
  - Transit First

- **Question:** how can we reduce conflicts between buses and bicyclists on city streets?

- DVRPC received a PennDOT research grant to explore the issue and potential solutions
Nature of the problem

- **Core problem:** Conflicts particularly occur when SEPTA buses cross bike lanes to curb at bus stops
  - Cyclists can be “squeezed”/sideswiped, or make unsafe movements into travel lanes
- **The law:** “Rules of the Road” - Neither vehicle has universal priority; vehicle being overtaken has the ROW
  - Buses should not accelerate around a bicyclist and then cut them off while curbing
  - Bicyclists should not overtake a bus as it approaches an intersection and expect the bus to yield
- **In short** – this is a unique conflict where both parties can be confused: special treatment may be necessary
Key Tasks

- Collect data to document and identify the nature of the problem
  - PennDOT crash data (2003-2007)
  - Study area videologging to discern nature of conflicts

- Explore national/international “best practices” for similar conflicts:
  - Current practice in Philadelphia
  - Literature review of best practices

- Recommend local solutions
Select reported Bus & Bike-Involved Crashes, 2003-2007

PennDOT reported crash data for 2003-2007:

• 1,757 total bus-involved crashes
• 2,515 total bike-involved crashes
• 46 crashes involving both bikes and buses
  (10 on streets with bike lanes)
### Bike/bus crash type summary

<table>
<thead>
<tr>
<th>Collision Type</th>
<th>Crashes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sideswipe (same direction)</td>
<td>21</td>
<td>45.7%</td>
</tr>
<tr>
<td>Angle</td>
<td>15</td>
<td>32.6%</td>
</tr>
<tr>
<td>Hit pedestrian</td>
<td>5</td>
<td>10.9%</td>
</tr>
<tr>
<td>Rear-end</td>
<td>2</td>
<td>4.3%</td>
</tr>
<tr>
<td>Head-on</td>
<td>2</td>
<td>4.3%</td>
</tr>
<tr>
<td>Sideswipe (opposite direction)</td>
<td>1</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

- Crash data alone did not shed light on the problem
- Raw incident volumes were not high, but anecdotal sense of the problem was much higher
- Complex problem: needed observational data
Videologs

- Used to document degree of conflict between SEPTA and bicycles
  - 3 locations along Walnut St (bike/bus traffic + bike lane + bus zone)
  - AM Peak (7 – 10 AM) Midday (11 – 2 PM) conducted mid-week, March 2009
  - 1,000 cyclists / 130 buses
    - 47 ‘incidents’ (whenever modes met)

- Unexpected conclusion: the most problematic conflicts were between bicyclists and boarding/alighting bus passengers
Peer city review seeking “best practice” solutions

- Reviewed related strategies elsewhere
  - Soft improvements (painting/striping/signage, $$-)  
  - Hard improvements (construction, $$+)

Strategies considered:

Strategy 1: Colored bike lanes in conflict hotspots, including transit stop areas

Strategy 2: Discontinue bike lanes at transit stops

Strategy 3: Physical re-routing of bike lane around stop location

Strategy 4: Left-side bicycle lanes

Strategy 5: Unique pavement markings and/or signage
Peer city scan: left-side bike lanes

- Examples of left side bicycle lanes from Minneapolis (left) and New York (right)

- Philadelphia uses left-side bicycle lanes along stretches of 11th and 12th Streets in North Philadelphia to prevent conflicts with trolley tracks
Peer city scan: left-side bike lanes

- Should be considered in certain situations:
  - One-way streets with frequent bus/trolley stops
  - Locations with high numbers of right-turning motor vehicles
  - Locations where there are a high number of left-turning bicyclists
  - High parking turnover (New York City)
  - Continuity of street

- **Key positive:** separates the modes, avoiding conflict
Peer city scan: left-side bike lanes

Potential issues with left-side bicycle lanes:

- Unfamiliarity on the part of drivers and cyclists
- Accommodations must be made in situations where cyclists must switch from the left to the right side
Conclusions/Recommendations

- Stripe/restripe left-side bicycle lanes on one-way streets where transit conflicts exist.

- Where this is impossible, or for two-way streets, do not locate bike facilities along transit routes (pursue complete corridors vs. complete streets).

- Pursue a citywide “yield pyramid” to clarify roles and responsibilities.

- One “responsibilities” proposal: ‘Do not pass bus/trolley on the right’ sign on rear of vehicle.
Next Steps

- The City’s updated Bike/Ped Master Plan (Summer 2010) will include the left-side lane concept.

- Recommendations were adopted as official SEPTA policy for bike-related street design along transit routes.

For more info:

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