Pedestrian Crossings Near Schools

Matus Sucha

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1. Background

My presentation is about **layout of the traffic infrastructure** in the vicinity of pedestrian crossings near schools, and its influence on:

- drivers’ and pedestrians’ behaviour
- and
- pedestrians’ feeling of safety and comfort.

*Work in progress.*

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2. Study design

Involving pre-/post-testing, the study is divided into several stages.

1. **Phase 1**: involves data collection prior to adjustments to the infrastructure (summer/autumn 2016).

2. **Phase 2**: approx. 2 months after temporary adjustments (less costly, less complex ones: adjustments referred to in this presentation), winter 2016/spring 2017.

3. **Phase 3**: will be conducted after the completion of more extensive infrastructure adjustments (expected to take place in 2018).

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3. Site description

- Road section in the city center of Prague running past a school (attended by children aged 6-15).
- The key spot is a pedestrian crossing outside the school. The section under study covers ca. 150 metres before the crossing (to the west) and ca. 50 metres after the crossing (to the east).
- The road descends at a gradient of ca. 10% from the west to the east.
- There is a tram and bus service in the section.
- The speed limit is 40 km/h in both directions.
3. Study design

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3. Study design

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4. Site description

- Infrastructure adjustments (temporary)
  - Zúžení vozovky, jízda po tramvajových kolejích - rozšíření prostorek kolem přechodu (viditelnost)
  - Zkrácení délky přechodu - omezení rychlosti (30 km/h resp. 40 km/h, proměnlivé dle harmonogramu školy)
  - Úsekové měření rychlosti a zpětná vazba řidičů
  - Nové uspořádání parkování (zahrazovací sloupky)
  - Varovná světelná informační linie u přechodu přes tramvajovou trať
3. Site description

During the morning rush hour, the traffic police assist in controlling the traffic around the main crossing outside the school to ensure that pedestrians have the immediate right of way.

But in the afternoon, on the way home, the children have to manage on their own.
Temporary infrastructure adjustments

- narrowing the carriageway, cars driving on tram tracks
- widening the area around the crossing (visibility)
- reducing the length of the crossing
- variable speed limit (30 or 40 km/h, depending on the school timetable)
- section speed measurement and feedback for drivers
4. Research questions

1. Will the comfort of pedestrians (especially children) who are crossing increase?
   (shorter waiting time, lower traffic density, better subjective feeling of safety, crossing the road using the marked crossing)

2. Will pedestrians’ safety increase?
   (lower speed of passing cars, more drivers giving way to pedestrians, lower rate of conflict situations)

3. Will the preferred modes of transport change?
   (children walking or using a bicycle or scooter to go to school on their own without being accompanied/driven in a car)

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5. Methods

The following methods were used to collect and assess data:

1. Interviews and questionnaires administered to children (during school hours)
2. Direct on site observation of drivers’ and pedestrians’ behaviour
3. On-site interviews with pedestrians (adults) and drivers (driving children to the school)
4. Speed measurement
6. Sample

- Observation and measurement took place on two days (Thursday and Friday), in the morning, from 07:00 to 08:15, and in the afternoon, from 12:00 to 15:00.

- Only the **afternoon observation data** can be used for analysis (considering the effect of the police in the morning), i.e. a total of **six hours of observation**.

- The total number of situations observed (afternoon): \( N = 370 \)

- One observation = one pedestrian or group of pedestrians crossing the street at the study site, in both directions.
6. **Sample** (only afternoon, 2 day, 6 hours)

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-10 years</td>
<td>59</td>
</tr>
<tr>
<td>11-18 years</td>
<td>24</td>
</tr>
<tr>
<td>19-65 years</td>
<td>269</td>
</tr>
<tr>
<td>66+ years</td>
<td>18</td>
</tr>
<tr>
<td>N</td>
<td>370</td>
</tr>
</tbody>
</table>

**Gender**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>173</td>
</tr>
<tr>
<td>Male</td>
<td>197</td>
</tr>
<tr>
<td>N</td>
<td>370</td>
</tr>
</tbody>
</table>

83 children
7. 1. Results: questionnaires administered to children in schools

Questionnaires distributed/returned: **321/214**, 67% response rate *(not all questions answered in all questionnaires)*

List of “dangerous” locations in the vicinity of the Táborská school

1. **Crossing outside the school – area – 96x (our spot)**
2. Sezimova/Táborská crossing – 68x
3. Crossing in the Petr Rezek street area – 34x
8. 1. Results: questionnaires administered to children in schools (N = 214)

Crossing outside the school (our spot) was marked (N=96) as the most dangerous place near school.

The majority of the children find their route to school rather safe (2/3 of the children), while 1/3 rate it as unsafe.

Nevertheless, 70% of the children provided negative responses to the question about whether they were happy with the traffic infrastructure near the school.

Most common reasons for being not happy:
- Not safe to go to or from school
- Not a good pavement for a scooter or bike
- Cars parking outside designated areas
How do children get to school and what would their preferred mode of transport be if they had a choice?

The majority of the children are happy with the way in which they get to school: the school is not far away from their homes and they can just walk.

A number of the kids use public transport to travel to school. Only a small number of the students ride a scooter or bicycle to school, even though for many more children it would be a preferred mode of transport.

Other preferred ways of getting to school included going by car with their parents (or their schoolmates).
How do you travel to school?

- Walk alone: 45
- Walk with parents: 40
- Bike or scooter: 5
- By car with parents: 15
- Public transport and walk: 50

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Why not "wished for" mode

- Not safe: 40
- Not suitable infrastructure for riding bike or scooter: 25
- Not possible to store bike or scooter at school: 10
- Other reason: 30
7. 2. Results: direct on site observation

Car and pedestrian densities (per hour):

<table>
<thead>
<tr>
<th>Time</th>
<th>Cars, both directions</th>
<th>Pedestrians, both directions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning – 07:30-08:30</td>
<td>667</td>
<td>109</td>
</tr>
<tr>
<td>Afternoon – 13:00-14:00</td>
<td>638</td>
<td>125</td>
</tr>
</tbody>
</table>

Pedestrians crossing on the crossing or outside the crossing (only afternoon, 6 hours of observation):

<table>
<thead>
<tr>
<th>Crossing pattern</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>On the crossing</td>
<td>340 total/261 adults/79 children</td>
</tr>
<tr>
<td>Outside the crossing</td>
<td>30 total/27 adults/3 children</td>
</tr>
<tr>
<td>N</td>
<td>370</td>
</tr>
</tbody>
</table>
7. 2. Results: direct on site observation

**Speed** (limit 40 km/h)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morning</strong></td>
<td>1079</td>
<td><strong>28.36</strong></td>
<td>8</td>
<td>57</td>
<td>8.15</td>
</tr>
<tr>
<td><strong>Afternoon</strong></td>
<td>2599</td>
<td><strong>20.92</strong></td>
<td>8</td>
<td>50</td>
<td>5.22</td>
</tr>
</tbody>
</table>

Speed measured 2 metres before the edge of the crossing.
7. 2. Results: direct on site observation

Parents driving their children to school

<table>
<thead>
<tr>
<th>Time</th>
<th>No. of cars driving children to/from school</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning – 07:30-08:30</td>
<td>15 cars</td>
</tr>
<tr>
<td>Afternoon – 12:00-15:00</td>
<td>5 cars</td>
</tr>
</tbody>
</table>

Total number of children attending the school: 610 kids
7. 3. Results: pedestrians’ comfort and subjective safety (observation and interview)

### Waiting time

<table>
<thead>
<tr>
<th>Waiting time (data for 12.00-15.00 times only)</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>No waiting (no car approaching)</td>
<td>161</td>
</tr>
<tr>
<td>Less than 5 seconds</td>
<td>184</td>
</tr>
<tr>
<td>5 to 20 seconds</td>
<td>25</td>
</tr>
<tr>
<td>More than 20 seconds</td>
<td>0</td>
</tr>
<tr>
<td>N</td>
<td>370</td>
</tr>
</tbody>
</table>
Drivers yielding to pedestrians

<table>
<thead>
<tr>
<th>Yielding</th>
<th>Frequencies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yielding</td>
<td>202</td>
<td>84.5%</td>
</tr>
<tr>
<td>Not yielding</td>
<td>37*</td>
<td>15.5%</td>
</tr>
</tbody>
</table>

* in five cases (2%) not yielding to the child

<table>
<thead>
<tr>
<th>Drivers yielding</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, slow down</td>
<td>113</td>
</tr>
<tr>
<td>Yes, stand still</td>
<td>89</td>
</tr>
<tr>
<td>No</td>
<td>37</td>
</tr>
<tr>
<td>No car approaching situation</td>
<td>131</td>
</tr>
<tr>
<td>N</td>
<td>370</td>
</tr>
</tbody>
</table>
9. Summary

- Approximately 1/3 of the children who were interviewed do not feel safe when going to or from the school.
- More or less 2/3 of the children are not happy with the traffic infrastructure near the school. Main reasons: pavement not good for scooters or bikes or cars parking outside the designated areas.
- The majority of the children walk to school or use public transport. If possible, they would prefer to use a scooter or bicycle to get to the school, or go in their parents’ car.
- The speed of the cars before the crossing tends to be rather low; about 85% of the drivers yield to pedestrians. In most cases waiting time to cross the road is up to 5 seconds.
- Within a one-hour observation period in the morning before the school starts, 15 parents brought their children to school by car.
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