



Palacký University
Olomouc

Three Crossings Study

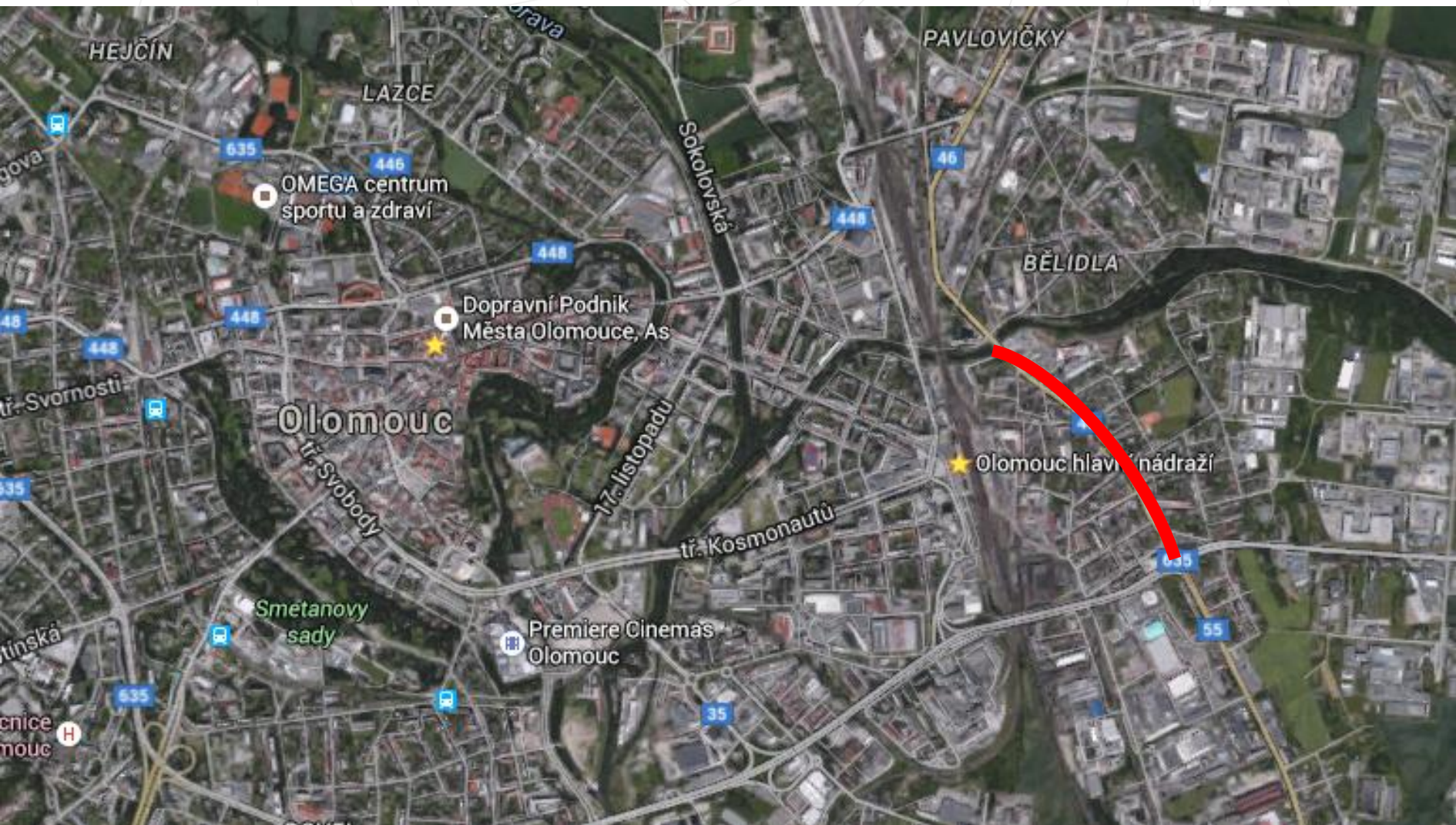


1. Background & story

- In August 2015 the owner (state administration) of the road removed (at the request of the Police) all pedestrian crossings from Hodolanska street in the Czech city of Olomouc.
- All together 5 marked unsignalised pedestrian crossings (the street is approx. 1 km long).
- The reason was that these crossings were not in line with the applicable safety guidelines, i.e. not safe (...and the local municipal authority did not provide funds to renovate them).
- It was a sudden decision, with no previous (or subsequent) information campaigns.
- Two weeks later, one signalised (provisional) crossing was set up.



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1. Background & story



Hodolanska street, non-standardised pedestrian crossing before removal



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1. Background & story



Hodolanska street, after the pedestrian crossing has been removed



1. Background & story

Facts about Hodolanska street:

- 1 km long, a suburban area
- high volume of motor traffic
- Trams & heavy vehicles
- 2 crashes with pedestrians, 01/2010 - 09/2013, no fatalities, one case involving injury and damage

Car densities per hour (one direction), day	908
Car densities 24h (one direction)	16,344
Trams per hour (one direction)	4



2. Problem & questions

Authorities:

When considering that it is not possible to renovate non-standardised crossings within a year or so, is it safer to keep the current non-standardised crossings or remove them?

We were not able to answer this.

So, we reformulated the question:

1. What are the needs and preferences of pedestrians in this area?
2. How will this change affect their behaviour?



3. Theory

- Theory of human needs & *maximum gain* (e.g. Freud, Maslow, McClelland)
- *Theory of habits and its influence on behaviour and behaviour change* (e. g. Lally et al., 2010)
- *Pedestrians' needs and preferences – safety (subjective), comfort, easiness (flow), aesthetics, social environment* (Hakamies-Blomqvist & Jutila, 1997)
- *Pedestrians prefer the shortest way* (e.g. Broach, 2015)
- *Perception of safety – subjective safety vs. objective safety* (e.g. Vlakveld, 2008)
- *Risk homeostasis theory & awareness* (e.g. Wilde, 2000)
- *Driver's yielding behaviour & waiting times & pedestrians comfort* (e.g. Schroeder & Roupail, 2011)



4. Data collection, analysis & sample

Time: one month after the change, 7.00-9.00, 13.00-14.00, 16.00-18.00, 3 days (Tue, Wed, Thu), together 15 hours

Place: the former crossing and its surroundings ($\approx 50\text{m}$ in both directions), the new signalised crossing 200m away, tram stop

Methods: Rapid on-site interviews (needs, motives, perceived safety), video recording analysis – manual/human (behaviour & scene: where crossed, gap/ yielding, waiting time, no. of cars passed, disturbances – running, braking, etc).

Sample: Interviews $N=325$ (all peds willing to answer during observation time and space $\approx 1/3$ of all), video analysis $N=829$ (all peds captured during observation times)



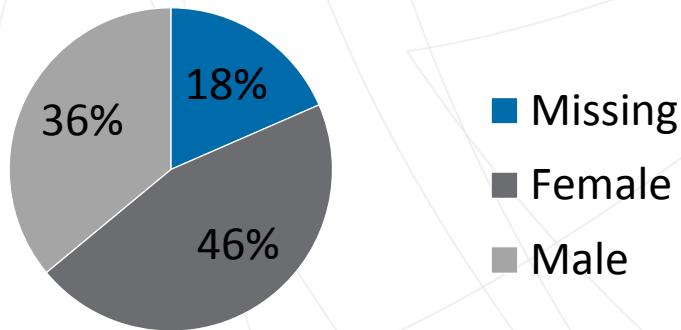
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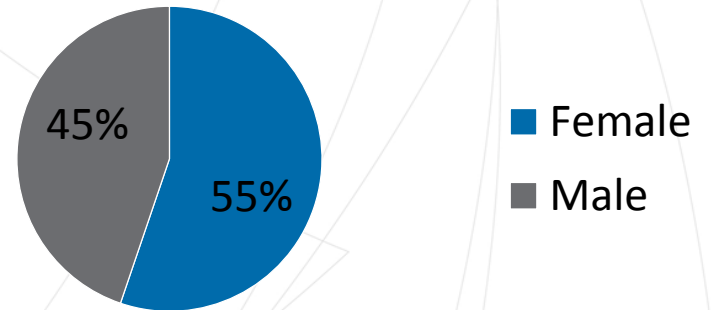


4. Sample description

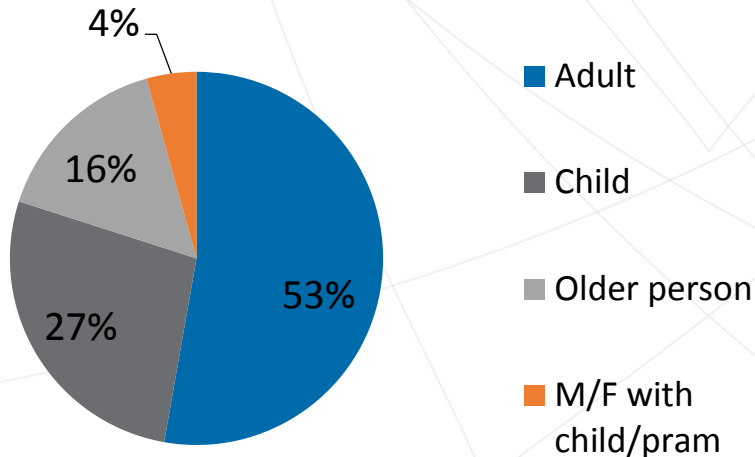
Gender - interviews



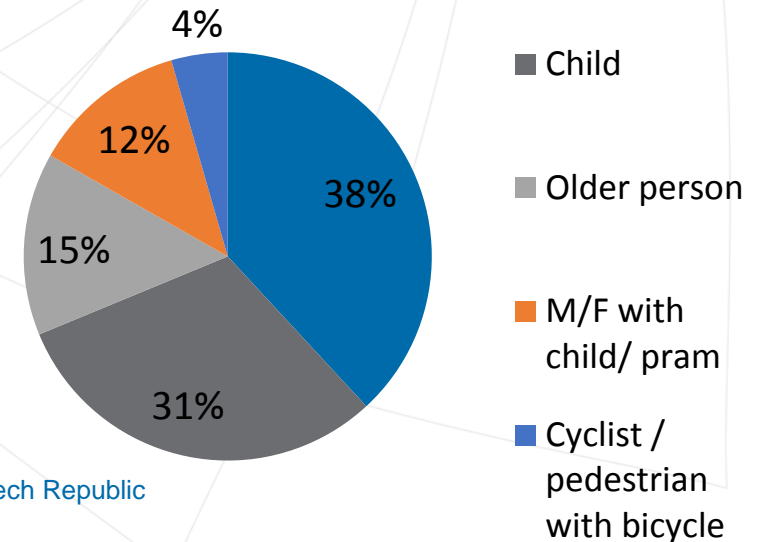
Gender - video



VRUs - interviews



VRUs - video





5. Results - Scene

Where are you going?	%
Work	26.19%
School	42.46%
Leisure/ walk	6.75%
Other	24.21%

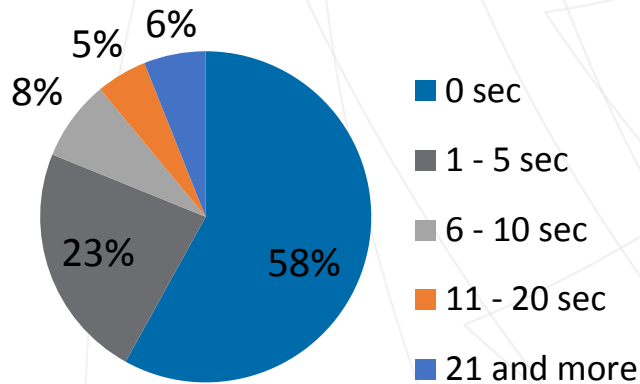
Do you cross here regularly (more than once a week)?	%
Yes	87.96%
No	11.42%

Speed	
Mean speed (km/h)	<u>28.09</u>
STD	8.65
Max. speed	76
Min. speed	8
N	10,114

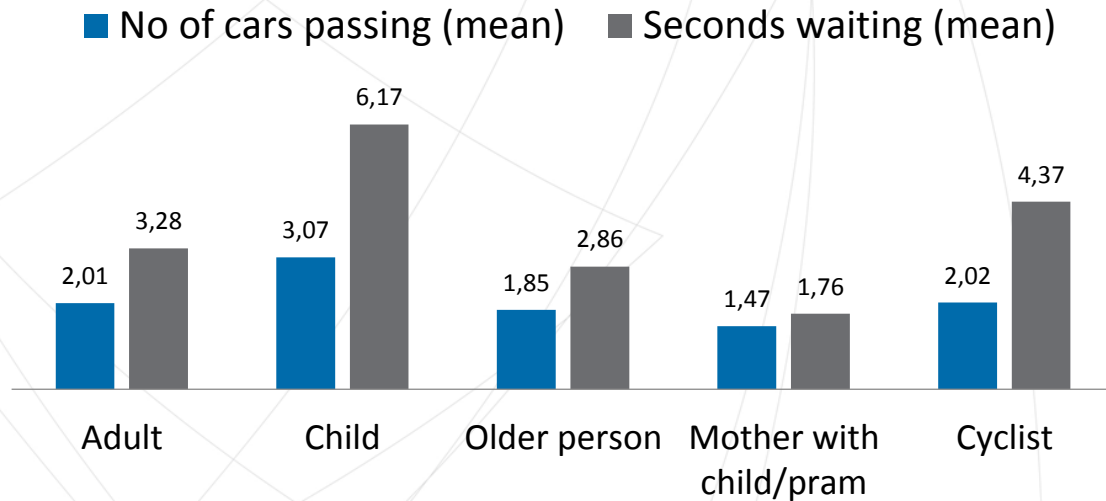


5. Results – Waiting time

Waiting time (seconds), video



Waiting time/ cars passing

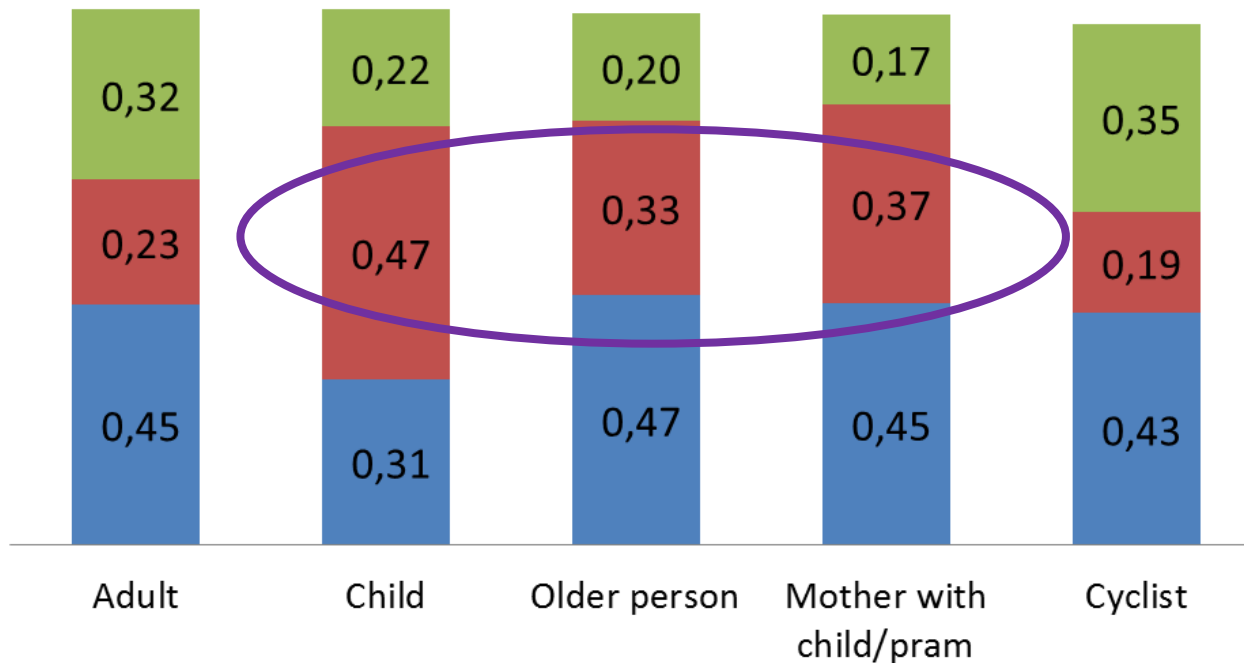


	No of cars passing		Seconds waiting		N
	(mean)	SD	(mean)	SD	
Adult	2.01	2.25	3.28	8.86	316
Child	3.07	2.91	6.17	8.94	252
Older person	<u>1.85</u>	2.24	<u>2.86</u>	9.32	120
Mother with a child/pram	<u>1.47</u>	1.09	<u>1.76</u>	3.83	102
Cyclist	2.02	2.7	4.37	12.49	37



5. Results – Crossing behaviour

- Waiting for the safe gap
- Waiting for priority (yielding of the vehicle - stop or slow down)
- Not waiting (no car approaching)

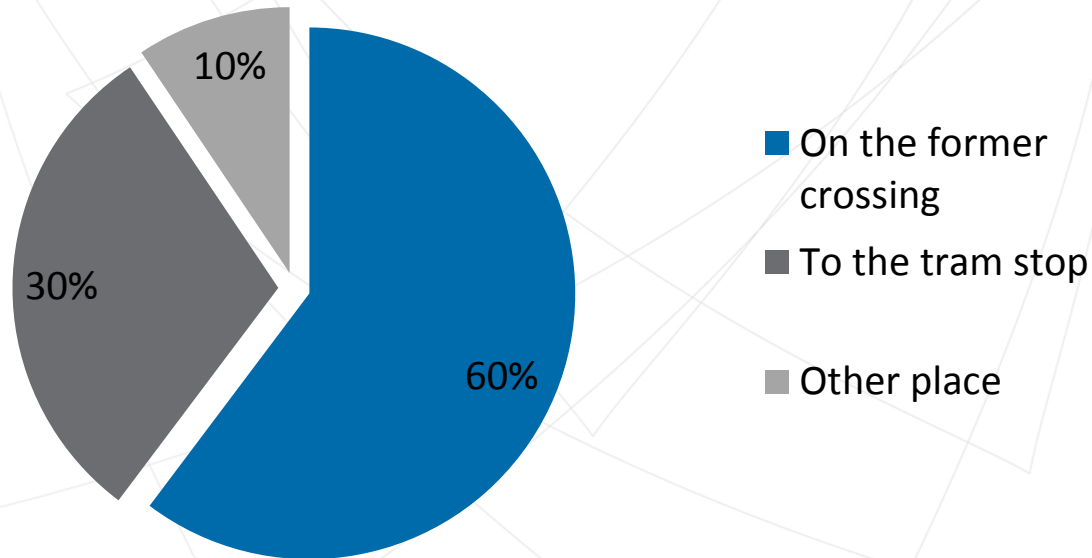


	N
Adult	316
Child	252
Older person	120
Mother with a child/pram	102
Cyclist	37



5. Results - Behaviour

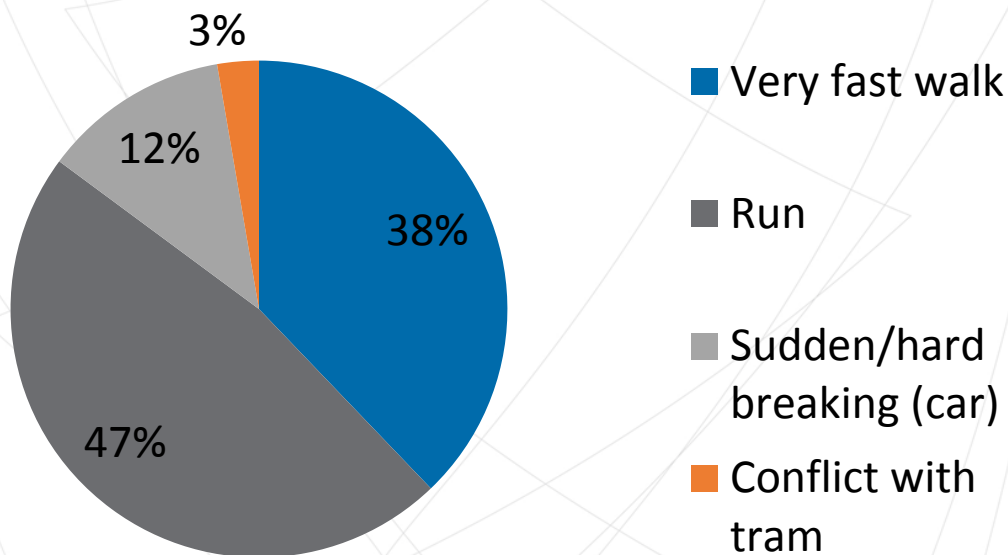
Place of crossing (video)





5. Potential conflict situations

Type of conflict situation



	Potential conflict situations	%
No conflict	774	93.70%
Potential conflict	52	6.30%
Total	826	100.00%



5. Results – Needs and preferences

Do you feel safe when crossing here?	Frequencies	%
Yes	18	5.54%
No	303	93.23%

Why not?

- Too many cars...
- Cars not respecting/ giving priority to pedestrians
.... *"I feel as an ant to be smashed by a car" ...*
- I feel afraid here (e.g. of being hit by a car, being killed)
... *"People don't like to cross here, they fear for their lives" ...*
- Absence of the crossing
- Afraid for others (their children; elementary school nearby)
... *"I'm afraid for my children who walk here on their way to school"*
- Dangerous for mothers with prams and disabled persons
.... *"I walk with crutches and drivers won't let me cross"*
- Too wide a road/ long time to get to the other side..



5. Results – Needs and preferences

Was it a good idea to remove the crossings? Was it better then or now?

Almost all (320 out of 324) the respondents thought it had been safer and more comfortable before the crossings had been removed.

..... *"It was a stupid thing to remove the crossings."*

"It was better with the crossings, I wish to have them back."

"I'm really afraid here, moreover, a lot of children walk here."

"People were used to them."

"I really don't understand the reason for removing them."

"Too many cars, drivers don't yield."

"I used to let children go to school here, now I walk them to school."

"I don't care, probably it had to be done - as those crossings were not safe."

.....



5. Results – Needs and preferences

Do you still cross here (the former crossing)? Did this affect your crossing patterns?

More or less **half** of the respondents did not change their ways of crossing the road - they cross the road at the former crossing, and state that:

- *they are used to crossing here and won't change it,*
- *they feel less safe,*
- *wait longer,*
- *pay more attention (check carefully for approaching cars, walk quicker.....),*
- *and hope that cars will yield.*

The others **changed their patterns** and use mostly the **signalised crossing** (new one) which is not far away (200m). Some of them use **tram stop islands** to cross (segmenting their crossing manoeuvre into several stages). Some stress that they are able to cross even without the crossings, although admitting that it must be complicated for **children and older and disabled persons.**



5. Results – Needs and preferences

What do you think that the municipal authority should do about this?

The great majority of the respondents just answered that the municipal authority **should restore the crossings where they were without any changes** (no complaints about safety issues when crossings were at their original locations).

Some of them suggest setting up **signalised crossings (with traffic lights)** or renovating the **crossings so that they comply with the norms** ("*...the municipality should find money to do that...*"), or "*...add humps, add additional signs - especially those alerting drivers about the presence of children ...*"

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6. Conclusions and recommendations

Conclusions:

- The removal of the crossings **decreased pedestrians' perceived safety and comfort**. On the other hand, **their awareness has been raised**.
- The residents tend **to stick to their old patterns** and cross on the site of the former crossing, eventually finding an “innovative” solution (tram stop islands) instead of using a new signalised crossing (too far).
- The pedestrians **don't perceive the non-standardised crossings (former) as unsafe**.
- The greatest impact (negative) is on children, the elderly, and disabled persons **(VRUs)**.

Recommendations:

- If it is not possible to renovate a crossing, **keep non-standardised crossings** in place (until the renovation is possible), **unless there is clear evidence of danger** (conflicts, complaints, ...).
- **Enforce LOW SPEED in the location**.
- Implement low-cost measures to **enforce yielding (drivers) and raise awareness** (drivers and pedestrians).
- **Pay special attention to the VRUs, consider their needs and abilities as a standard**.



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