University of Maribor
Faculty of Civil Engineering, Transportation Engineering and Architecture

TRAFFIC SAFETY ANALYSIS IN INTERSECTION OF ZAGREBŠKA CESTA AND POLJSKA ULICA

Project presentation

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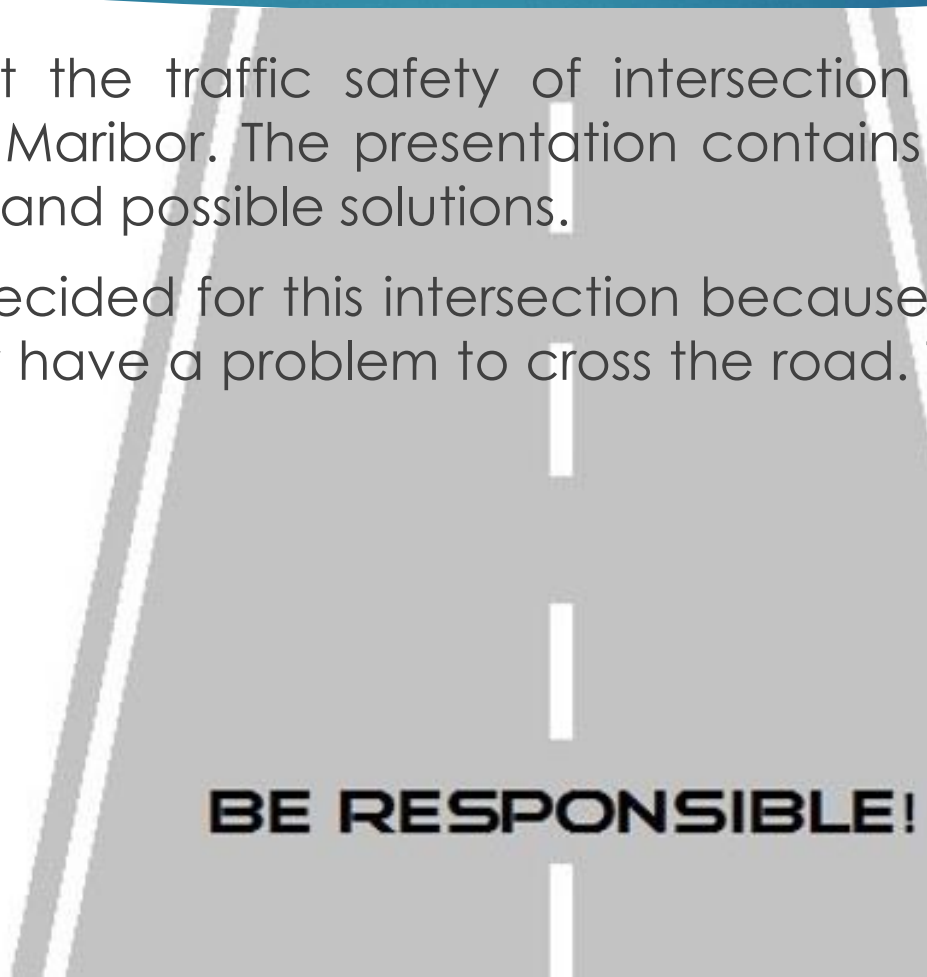
ETSC
European Transport Safety Council

3YEARS
YOUNG ROAD USERS

Content

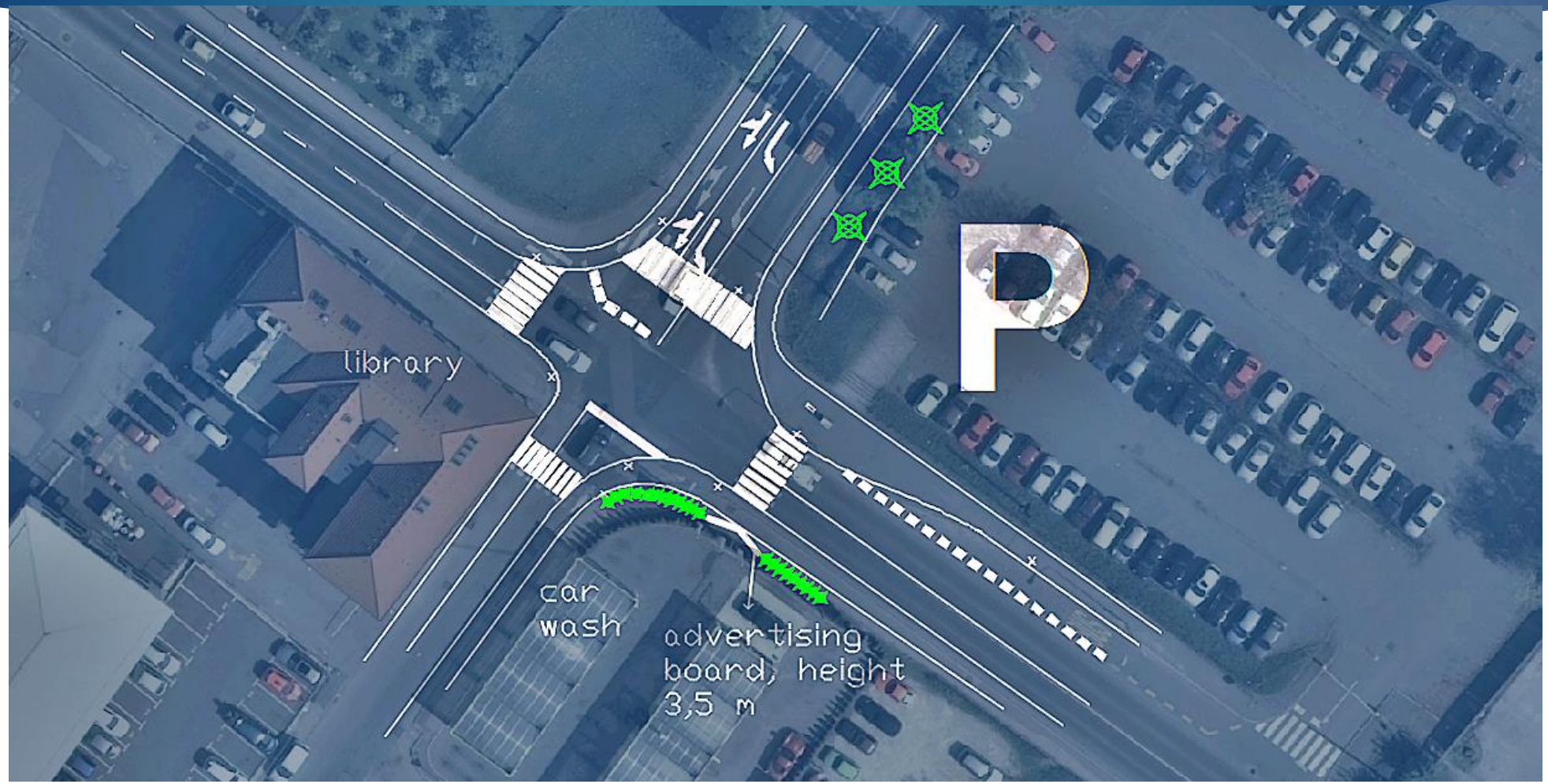
- We will present the traffic safety of intersection Zagrebška cesta and Poljska ulica in Maribor. The presentation contains the complete analysis of traffic safety and possible solutions.
- Problem: We decided for this intersection because there is a lot of heavy traffic and they have a problem to cross the road. There is also a problem with visibility.



Current situation

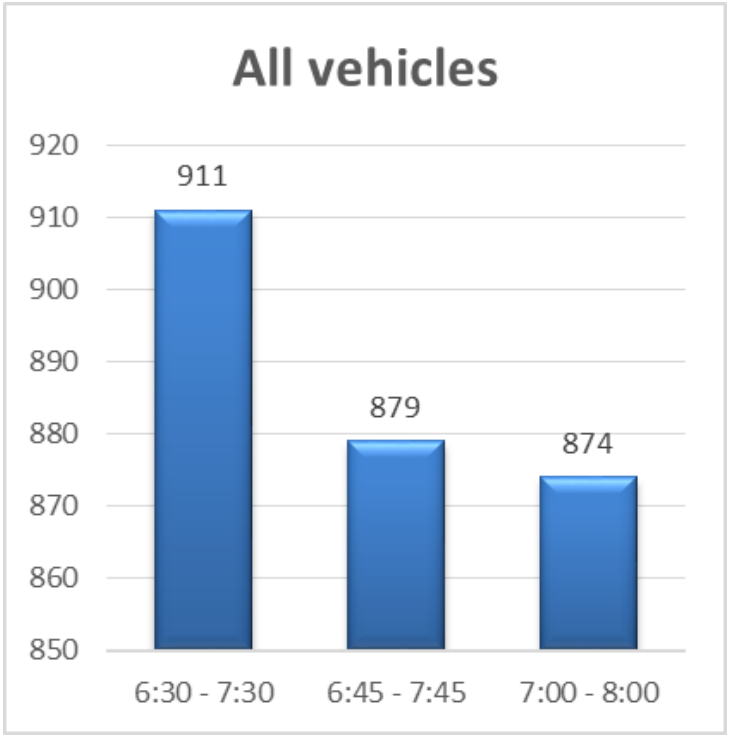
- Intersection has horizontal traffic signs management and vertical traffic signs management.
- Four way intersection with no traffic lights.
- The main traffic direction is Zagrebška cesta.
- Secondary traffic directions are Poljska ulica and Zagrebška cesta.

Current situation



Traffic density and traffic count

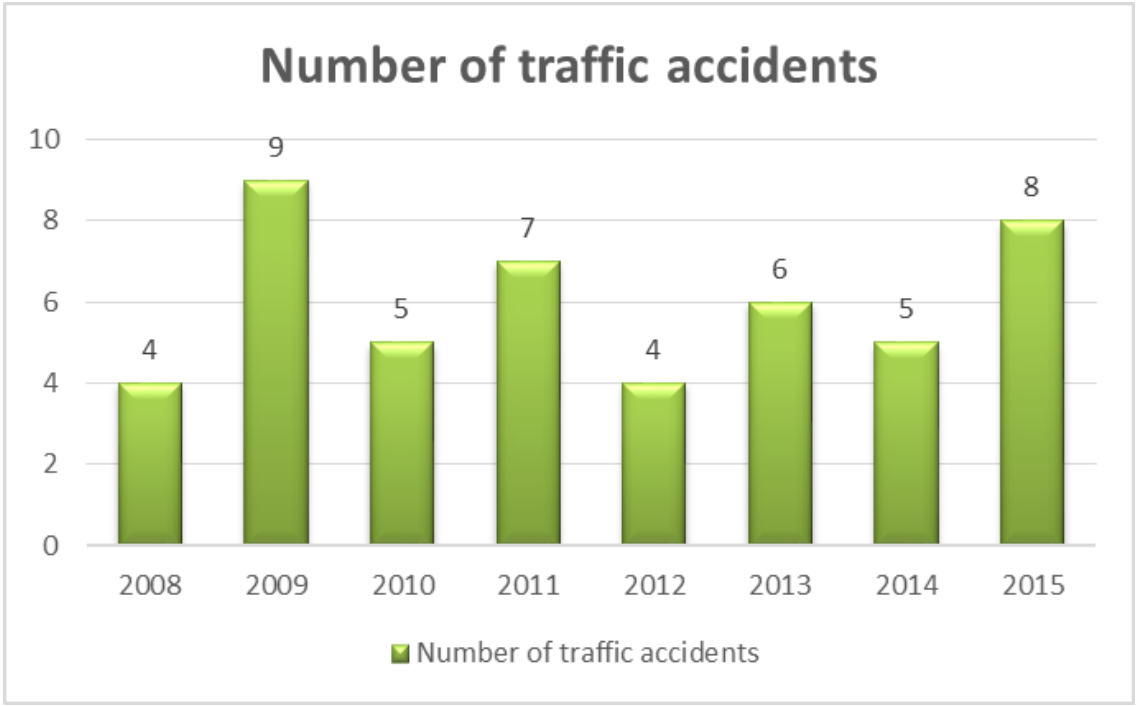
- Traffic count has been carried out on 22. March 2016.
- Weather: sunny
- Peak hour: 6.30 – 7.30



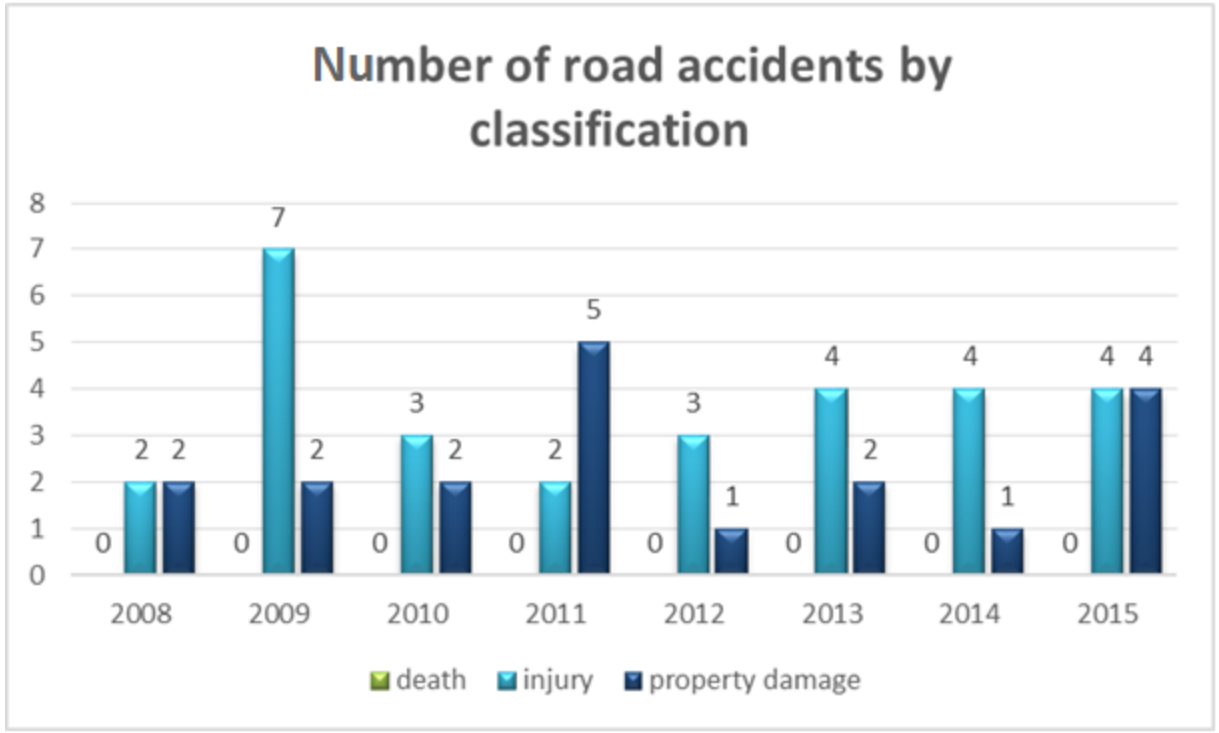
TRAFFIC SAFETY

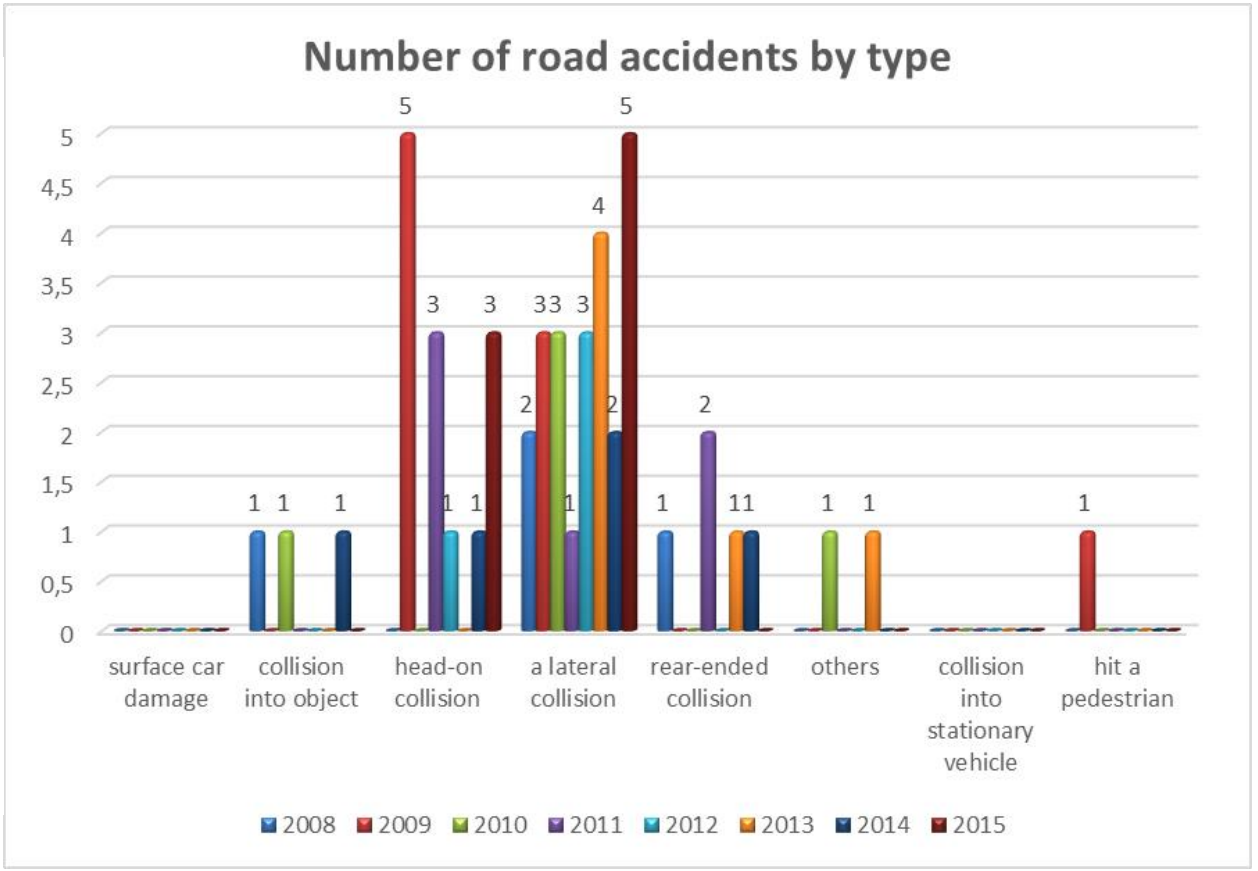
- Definition of traffic collision:

Vehicle collision occurs when a vehicle collides with another vehicle, pedestrian, animal, road debris, or other stationary obstacle, such as a tree. Traffic collisions may result in injury, death and property damage.



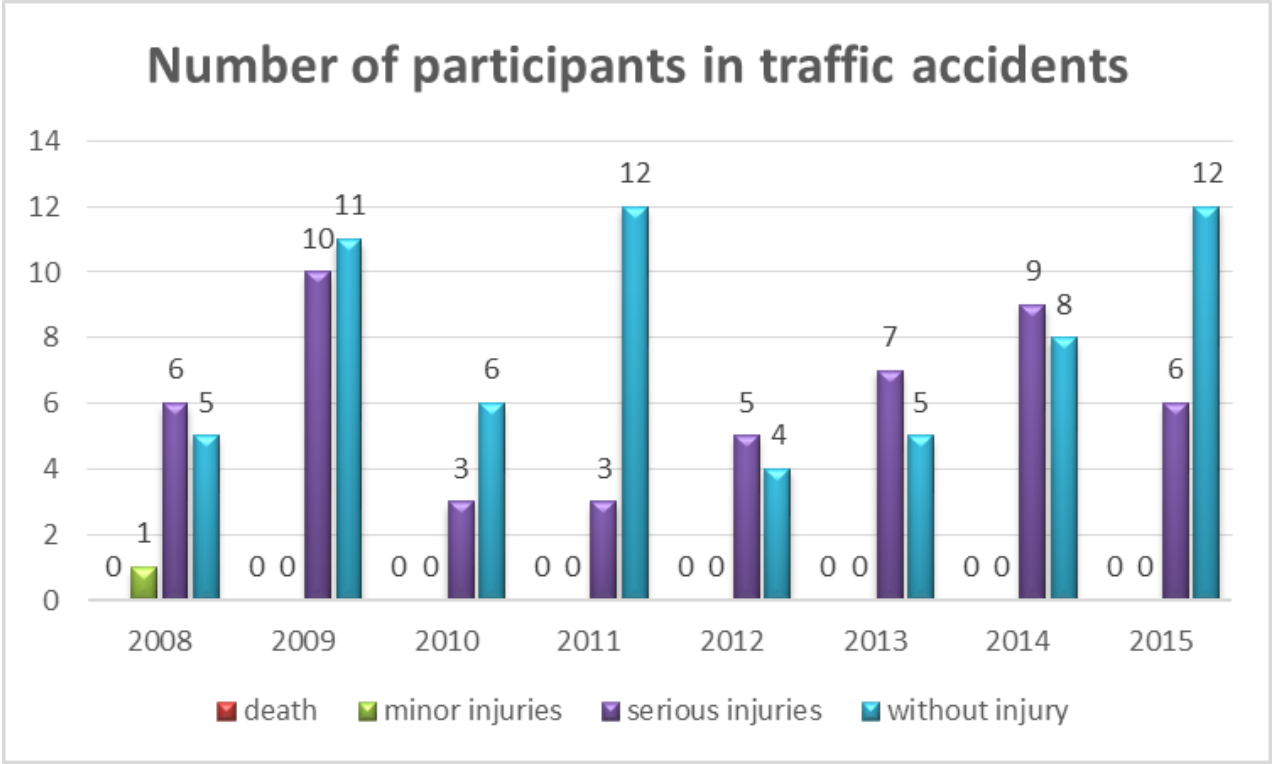
Traffic accidents by classification and type





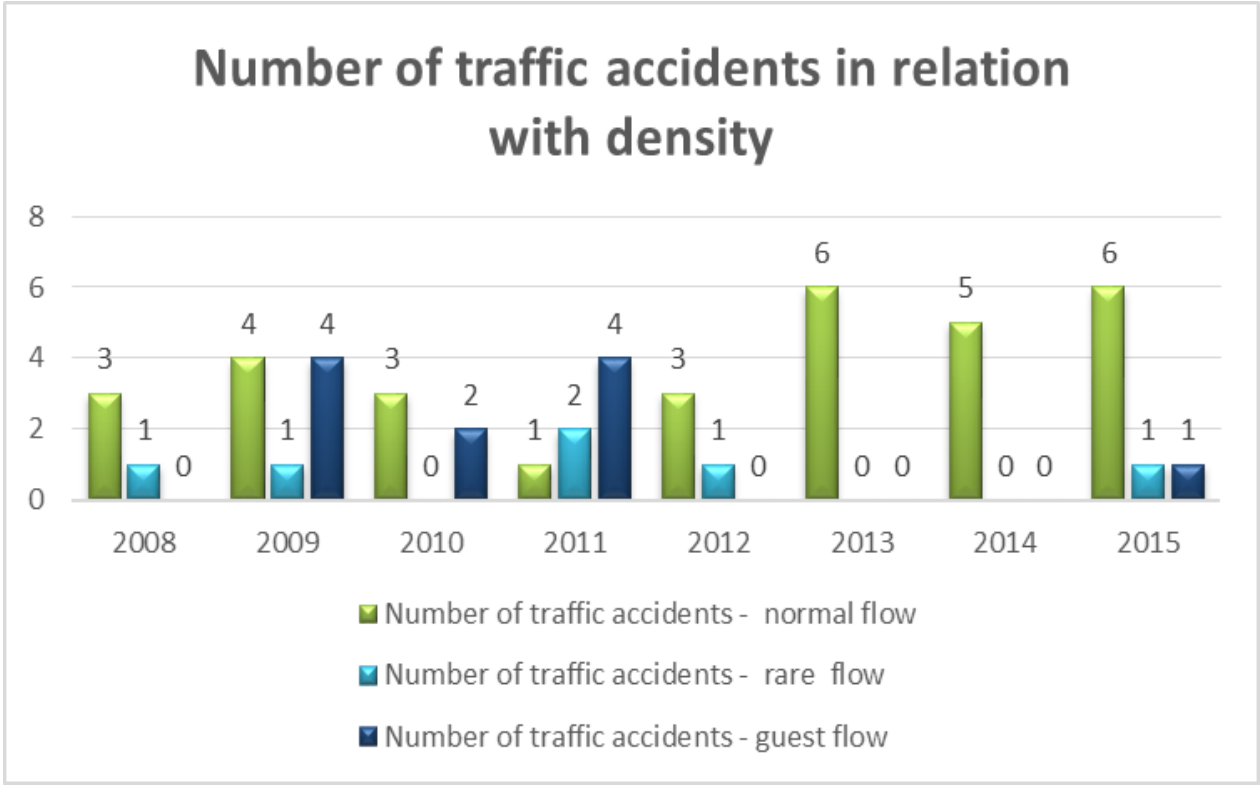
Participants in a traffic accidents

Total number of participants in accidents is 114.



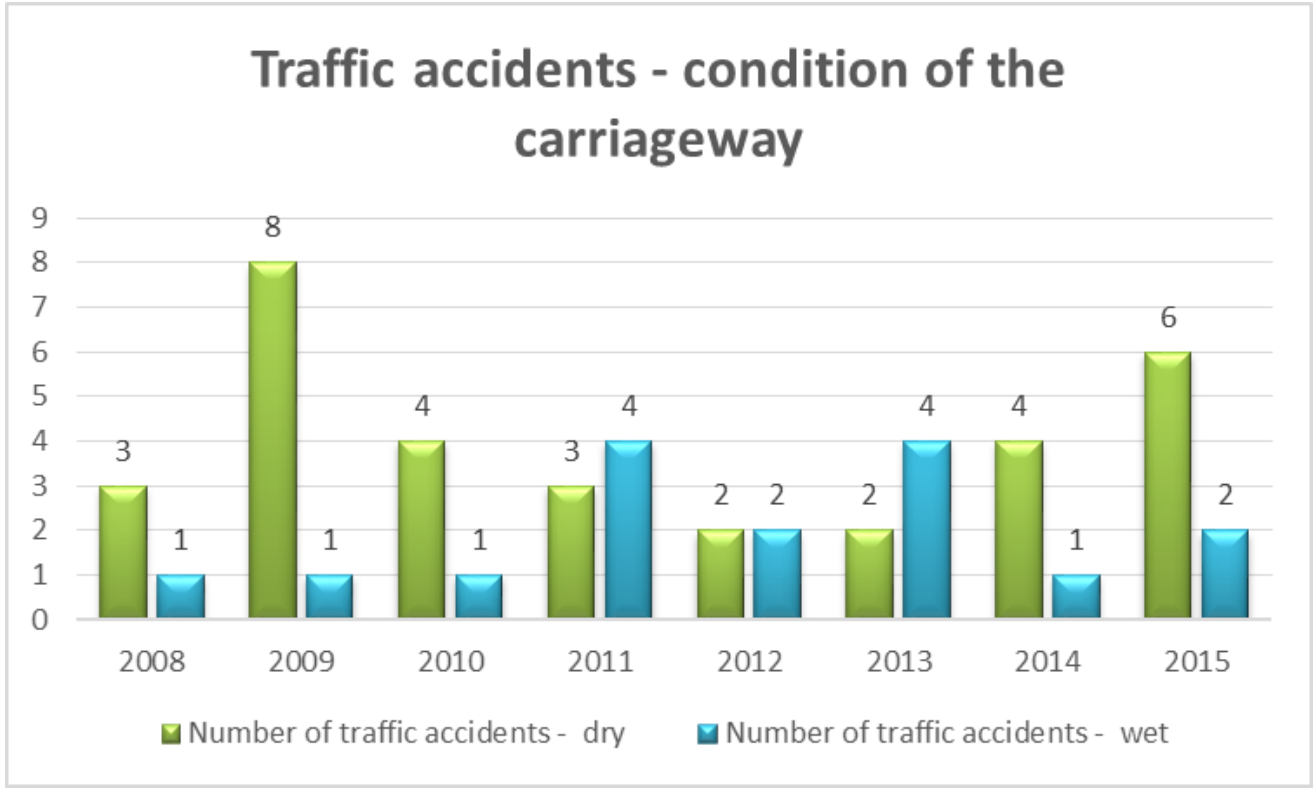
Traffic accidents in relation with traffic density

- 65% of traffic accidents happened ot normal traffic flow.
- 22% of traffic accidents happened in guest flow
- 13% of traffic accidents happened ot rare traffic flow.



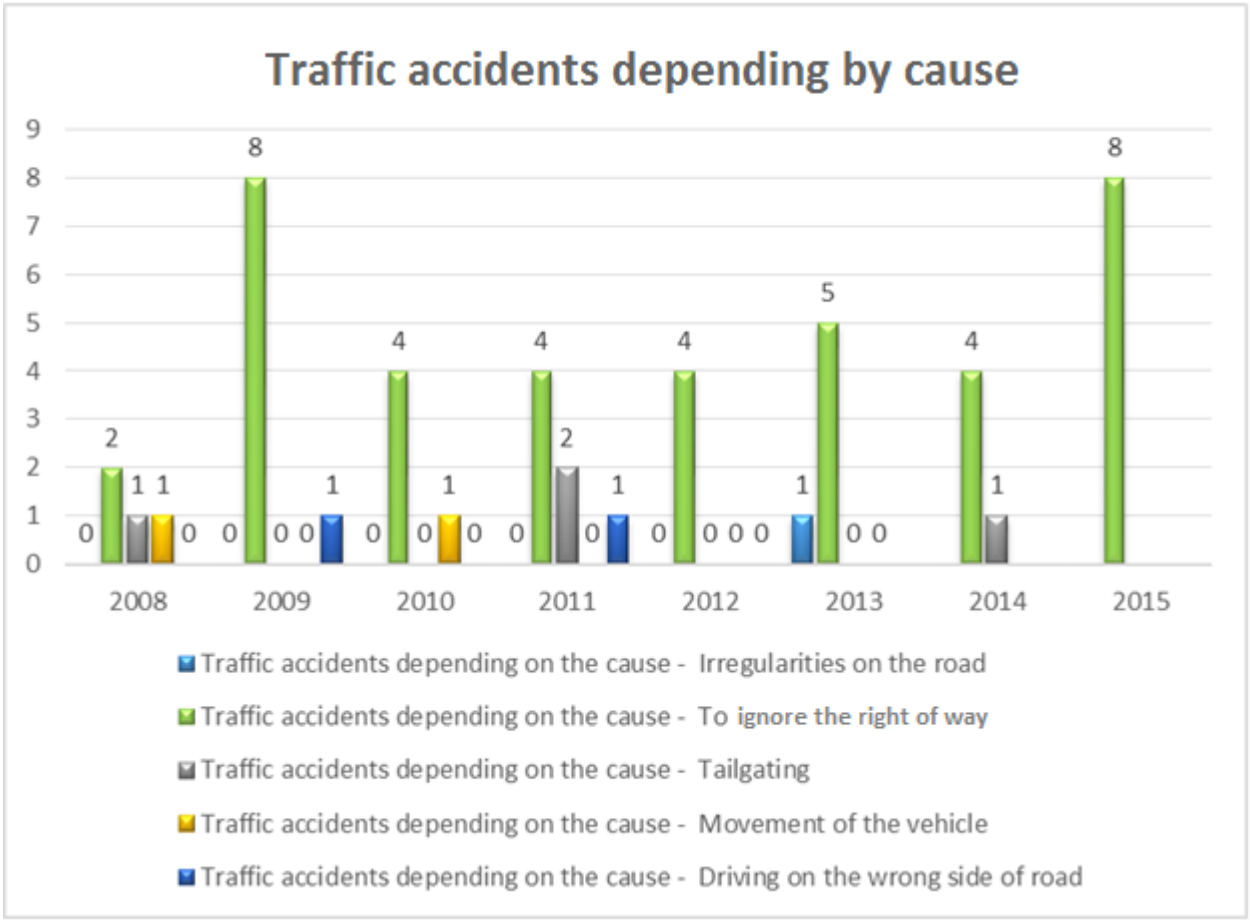
Traffic accidents in relation with the state of carriageway

- 66% of traffic accidents happened on the wet carriageway
- 34% of traffic accidents happened on dry carriageway

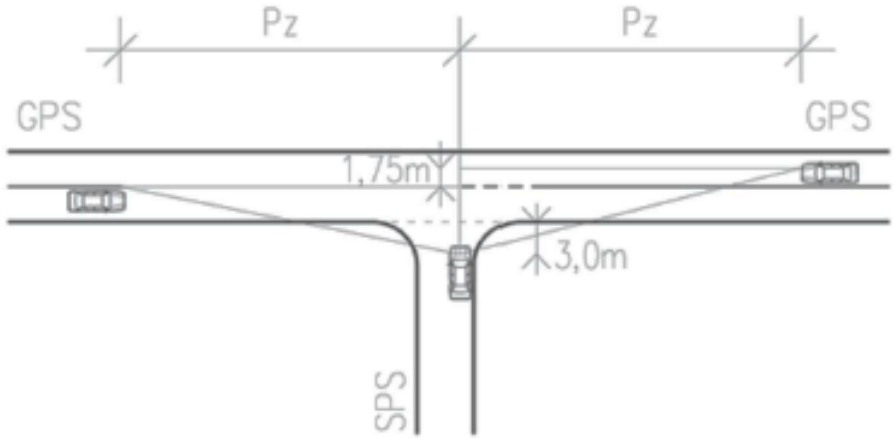


Traffic accidents depending by cause

- 81% of all traffic accidents happened because ignoring the right of way
- 4 traffic accidents happened because of tailigating



Visibility on intersection



Visibility on intersection

Condition of the road

Cross sections of the road

Cross section of Poljska ulica

Lookout point:
middle of intersection

Cross sections of the road

Cross section of Zagrebška cesta – direction Ploj

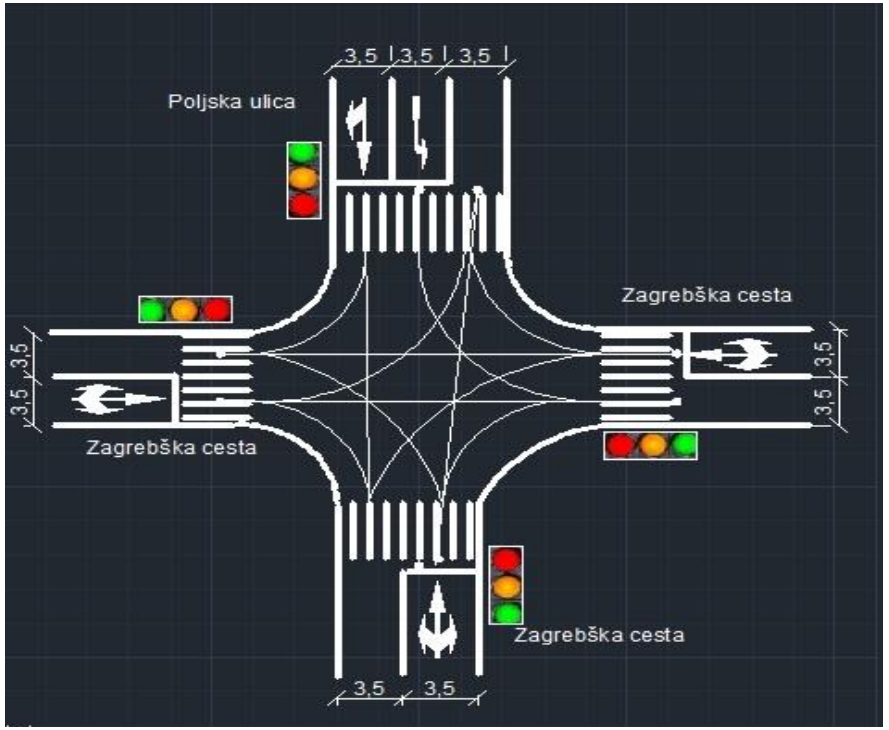
Zagrebška cesta – Kavčičeva ulica (south east)
Zagrebška cesta – Nasipna ulica (northwest)

Lookout point:
middle of intersection

Measures for improving traffic safety

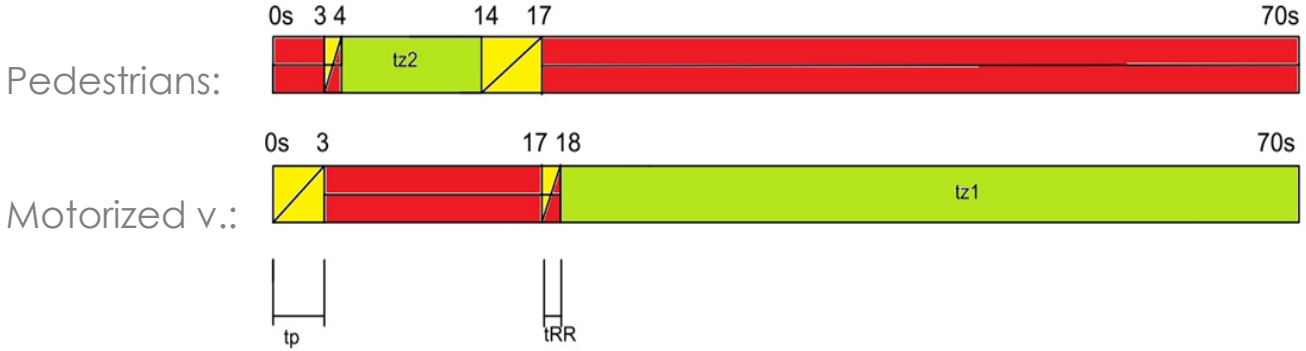
First proposed solution: Reconstruction of intersection into intersection with traffic lights

Sketch for the implementation of intersection with traffic lights



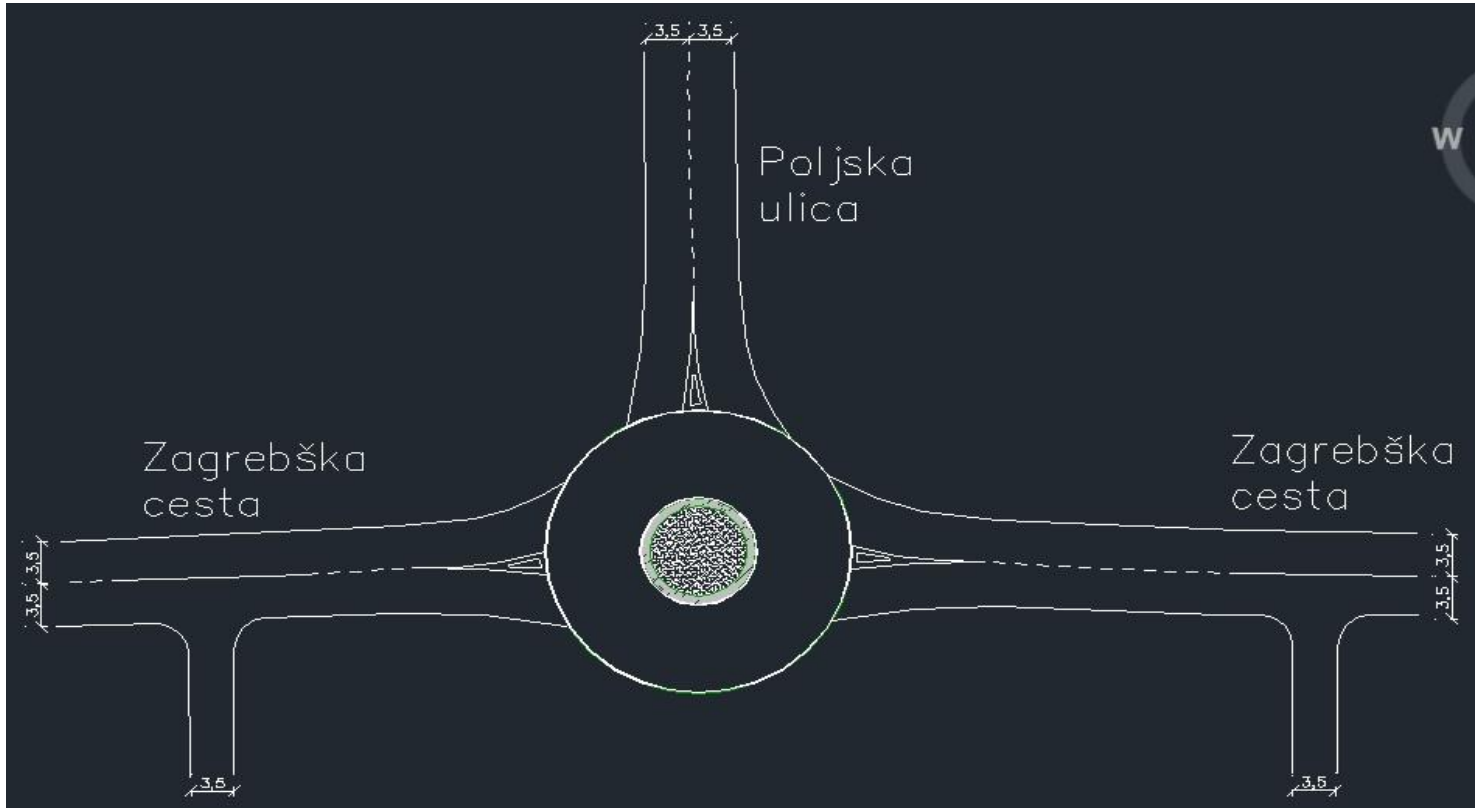
The costs for implement this solution are approximate 90,000€ + 20,000€ = 110,000€ (resurfacing costs are 20,000€)

Steering system for the traffic lights of motorized vehicles and pedestrian:



Second proposed solution: Reconstruction of the intersection into roundabout

- The selected intersection would be the most appropriate as single band roundabout.
- The costs for implement this solution are approximately 260,000€ (with purchase of plots are costs: 260,000 + 42,000€ = 302.000€)



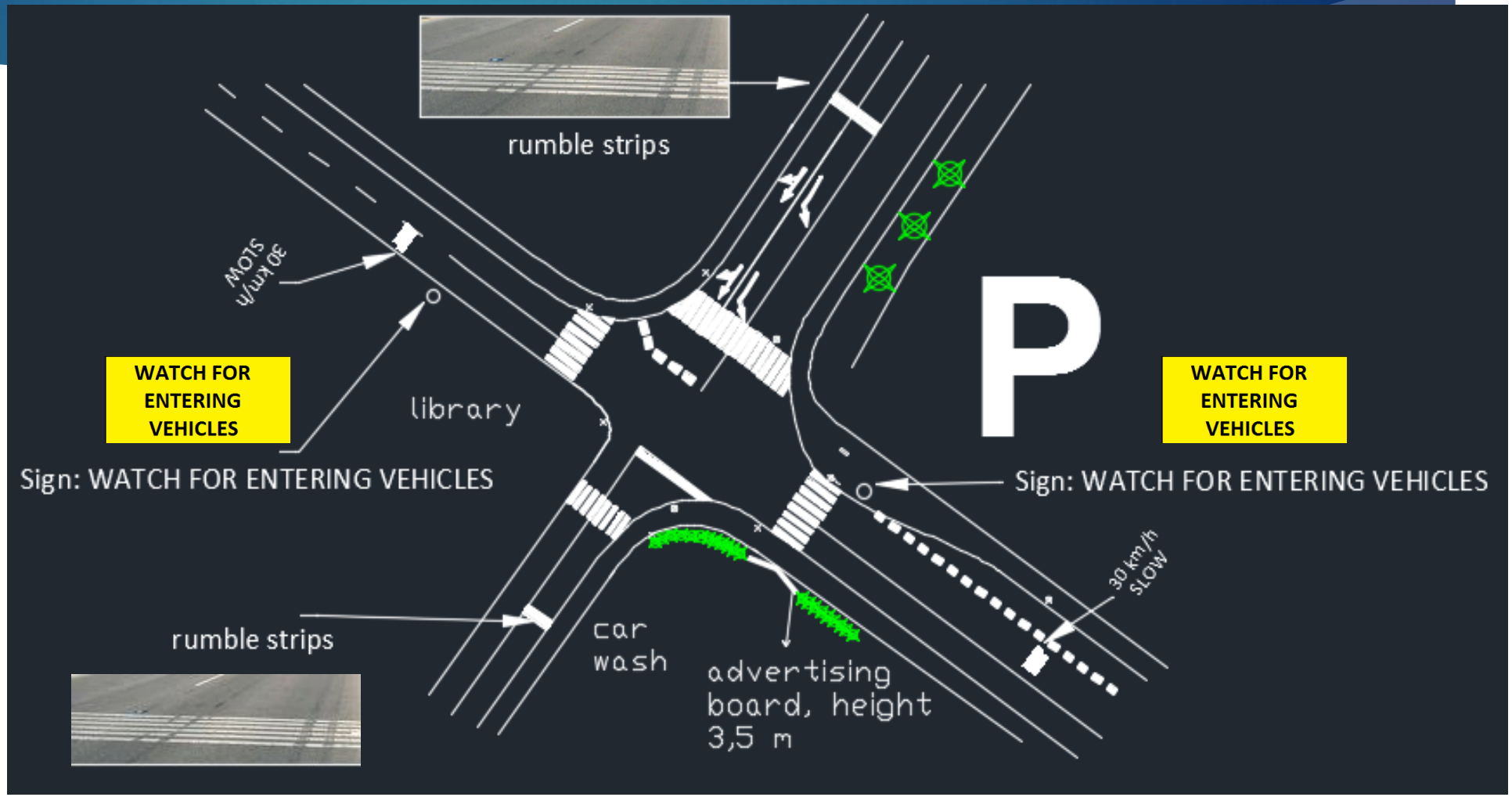
Purchase of lands for the construction of the roundabout

Third proposed solution: Preserve the existing situation of intersection but add a few new soft measures

- The most important measure would be to resurface the rough road.
- Reducing the speed to 30 km / h.
- To improve road safety in the selected intersection, we need to improve road visibility.

Third proposed solution: Preserve the existing situation of intersection but add a few new soft measures

The costs for implement this solution are approximately 21,000€. (costs for 600 meters of resurfacing are 20,000€)



Multi-criteria analysis

Presentations of goals and indicators:

Targets	Weights	Indicator (I)	Weights
Traffic effects	0,6	Traffic safety	0,25
		Traffic load	0,05
		Cyclists and pedestrians	0,15
		Traffic usefulness of intersection	0,15
Economic impact	0,15	Costs of implementation	0,15
Environmental effects	0,25	Noise	0,05
		Emissions	0,1
		The use of space	0,1
Sum	1	Sum	1

Standardization of indicators:

I	Weights	Solution 1		Solution 2		Solution 3	
		Standardized values	The contribution indicator	Standardized values	The contribution indicator	Standardized values	The contribution indicator
I1	0,25	0,8	0,2	1	0,25	0,2	0,05
I2	0,05	0,6	0,03	0,8	0,04	1	0,05
I3	0,15	1	0,15	0,6	0,09	0,4	0,06
I4	0,15	0,9	0,135	0,4	0,06	1	0,15
I5	0,15	0,5	0,075	0,2	0,03	1	0,15
I6	0,05	0,8	0,04	0,1	0,005	1	0,05
I7	0,1	0,8	0,08	0,4	0,04	1	0,1
I8	0,1	1	0,1	0,2	0,02	0,8	0,08
Σ	**1**		**0,81**		0,535		0,69

Strategy and timeline

- Talk with proffesors/university and get in touch with Municipality .
- Get in touch with possible partners and with Slovenian Traffic Safety Agency
- Ask for support from local community.
- Get newest information from police department.

Timeline	Nov	Dec	Jan	Feb	Mar
Proffesors:					
Municipality:					
Partners:					
Traffic Safety Agency:					
Local community:					
Police department:					

Evaluation

- Measure speed (before, 3 months after implementation)
- Analysis of the data before and after the measures (police data,...)
- Visibility check (visibility berm)

Dificulties

- Get in touch with municipality
- Low municipal budget
- For second solution could be difficult to purchase plots.
- To get in touch with possible partners.

Conclusion

- To conclude, three different solutions were presented in this project presentation.
- With multi-criteria analysis, it was found that the preferred solution is the intersection with traffic lights. Traffic lights are suitable in terms of space and cost.
- If the municipality decided to build a roundabout, they would have to purchase the surrounding land, which would make the investment more expensive.
- Compared to solution 3, where the existing situation is arranged with soft measures, the intersection with traffic lights would be a long-lasting solution.

WE ARE GRATEFUL FOR YOUR ATTENTION!