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University of Zagreb, Faculty of Transport and Traffic Sciences

LEVEL CROSSING SAFETY CAMPAIGN IN CROATIA

Madrid, 10 October 2018
LCs ON THE CROATIAN RAILWAYS

RAILWAYS NETWORK:
- 2,605 km of railway tracks
- 1,519 LCs: 37% Active, 63% Passive
- 59 Pedestrian crossings

DAILY RAIL TRAFFIC:
- 649 passenger rails
- 192 cargo rails
- 160 km/h max speed
NATIONAL ROAD TRAFFIC SAFETY PROGRAMME OF REPUBLIC OF CROATIA 2011 - 2020

Coordinator: University of Zagreb, Faculty of Transport and Traffic Sciences
Partner: HŽ Infrastrukture (Croatian Railways), preventive-educational action „Train is always faster”
"Safety begins with you"

"Your opinion is important"

"Book Month"

„Traveling exhibition - Safety and design"

„Conscientious driver"

"Social Networks"

"Media"

„LC-locator”
SURVEYS
RAILWAY STATIONS IN VINKOVCI AND SLAVONSKI BROD
SAFETY EDUCATION IN SCHOOLS
TRAVELING EXHIBITION – „Safety and design"
COMPETITION – WRITE A SAFETY STORY OR A POEM!

http://www.fpz.unizg.hr/projekt-sigurnost-na-zcp/index.php/novosti/
WRITE A SAFETY STORY OR A POEM! – AWARDS!
SAFETY TIPS - video

https://www.youtube.com/channel/UC_8WyiVQmWEX7NLHpadRj6A
VIDEO – „Railway tracks are not a playground!”

This video was made by high school students.

https://www.youtube.com/watch?v=Mf_n8f0y85w
VIDEO – „Safe with Andrew on the way to School!”

https://www.youtube.com/watch?v=C2ZplhRYGko
ILCAD – 7 June 2018 – Zagreb, CROATIA - „Safety Village“
ILCAD – 7 June 2018 – Zagreb, CROATIA - „Technical visit“
Watch the video summarizing the Conference and side events on 6-7-8 June 2018:

Introduction video: [https://www.youtube.com/watch?v=MDzyqYMRh5c](https://www.youtube.com/watch?v=MDzyqYMRh5c)

Conference: [https://www.youtube.com/watch?v=ORTLQJ7bqDg](https://www.youtube.com/watch?v=ORTLQJ7bqDg)

Conference Summary, 6 - 8 of June 2018: [https://www.youtube.com/watch?v=q3e8J6D8j0M](https://www.youtube.com/watch?v=q3e8J6D8j0M)
LC LOCATIONS IN ZAGREB URBAN AREA

METHODOLOGY FOR COLLECTING DATA

<table>
<thead>
<tr>
<th>Day</th>
<th>Camera</th>
<th>Reporter</th>
<th>Police officer visible</th>
<th>Survey</th>
<th>Educational poster</th>
<th>HQ gate keeper visible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Tuesday</td>
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<tr>
<td>Wednesday</td>
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<tr>
<td>Thursday</td>
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<td>Friday</td>
<td>✓</td>
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</tbody>
</table>
METHODOLOGY

Analysis of the current condition of LC
(characteristics of the current traffic network, collection of real data about the size and distribution of the current traffic load, traffic count, survey of LC users, determining the drivers’ habits, and their traffic culture, etc.);

Development of simulation of the existing condition in the software tool PTV VISSIM;

Proposal of new variants of reconstruction;

Evaluation of the variants using MCDM and AHP method with the application of the software tools Expert Choice

Development of simulation of the optimal variant in software tools PTV VISSIM.
• 200 respondents – 55% F i 45% M
• the highest number of respondents belonged to the group of 26-60 years of age (61%)
• 84% of respondents use the LC Trnava every day
• 61% live within 500 m of the LC
• 73% of respondents do not know how much is the fine for illegal crossing
• 33% of respondents indicate that the reason for illegal crossing is because they are in a hurry
• 93% of respondents think that it is necessary to build an underpass (for pedestrians and for vehicles)

Reasons for legal and illegal crossing of the LC:
- 33% of respondents stated that they are in a hurry
- 13% of respondents think it is safe to pass because they do not see any train arriving
- 12% of respondents think that the barrier stays lowered for too long
- 9% say that they are tired of waiting
- 6% estimate that it is safe
- Only 29% of respondents cross the LC in a proper and legal way
<table>
<thead>
<tr>
<th>Location</th>
<th>Queue Length</th>
<th>Average Waiting Time</th>
<th>Average Vehicle Delays</th>
<th>Highest Emission of Harmful CO Gases</th>
<th>Fuel Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC Trnava</td>
<td>240 m</td>
<td>19.8 s</td>
<td>26.06 s</td>
<td>932 PPM</td>
<td>13 L</td>
</tr>
<tr>
<td>LC Osječka - Trnava I</td>
<td>143 m</td>
<td>69.7 s</td>
<td>80.44 s</td>
<td>1182 PPM</td>
<td>17 L</td>
</tr>
</tbody>
</table>
AHP MODEL

- hierarchical structure of AHP model (goal, alternatives/variants, criteria, sub-criteria)
- ranking of criteria and sub-criteria (pairwise comparison)
- evaluation of variants
- selection of the optimal variant
- sensitivity analysis