



City of
Ljubljana



CIVITAS FORUM 2015

CIVITAS ANNUAL CONFERENCE | 7-9 OCTOBER 2015 | LJUBLJANA

CIVITAS Forum Conference

8.10.2015

Ljubljana, Slovenia

SAFE INFRASTRUCTURE IN SLOVENIA

Andraž Murkovič, Slovenian Traffic Safety Agency

Marko Renčelj, PhD, B.Sc.CE, University of Maribor, Faculty of Civil Engineering



THE CIVITAS INITIATIVE IS CO-FINANCED BY
THE EUROPEAN UNION



Slovenian Traffic Safety Agency:

Central governmental institution for road safety,
established in September 2010



City of
Ljubljana

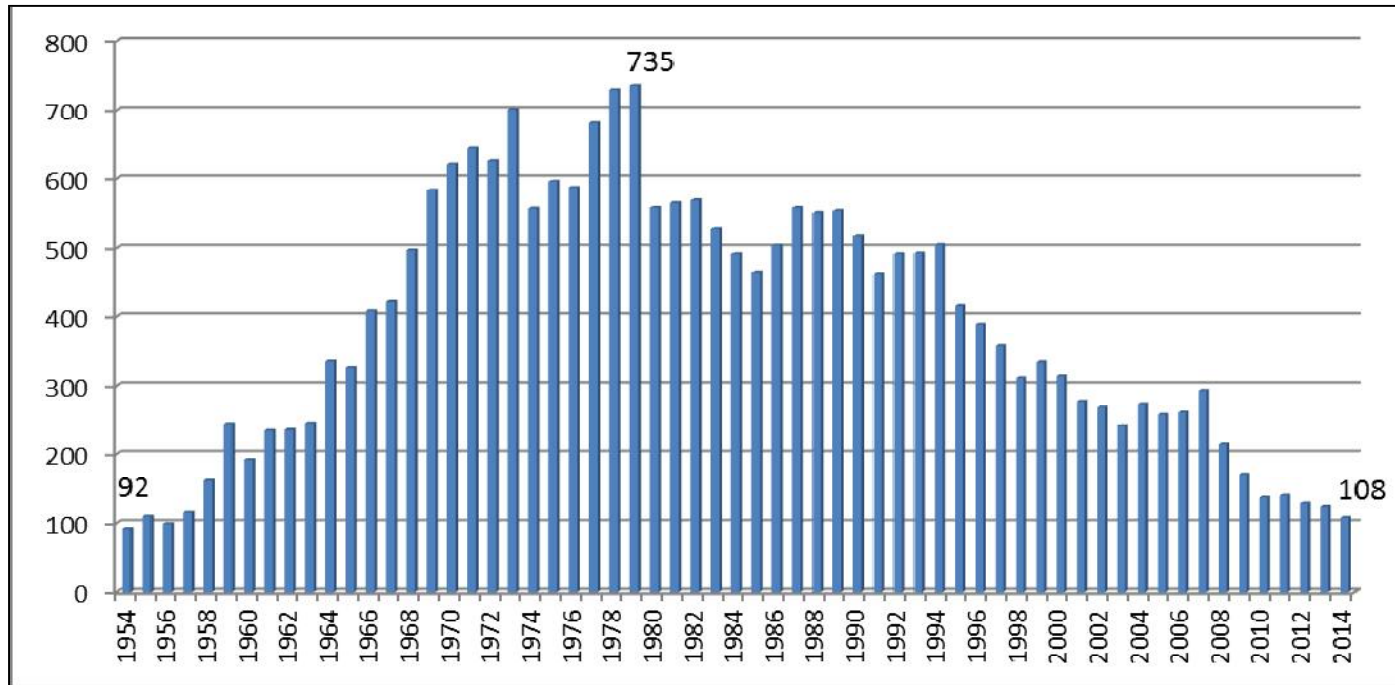
CiViTAS FORUM 2015
CIVITAS ANNUAL CONFERENCE | 7-9 OCTOBER 2015 | LJUBLJANA

Main tasks:

1. Prevention and education in road traffic
2. Road Safety Audit
3. New National Road Safety Program 2013-2022



Number of Fatalities in Road Accidents in Slovenia since 1954:



SLOVENIA – Winner of the 2015 Road Safety Performance Index PIN Award

- 22 %

Reduction of road deaths in Slovenia between 2010
and 2014 (-18% EU average)

- 61 %

Reduction of road deaths in Slovenia between 2001
and 2014 (-53% EU average)



ROAD SAFETY AUDIT IN ACCORDANCE WITH DIRECTIVE 2008/96/EC AND IMPLEMENTATION IN PUBLIC ROADS ACT

- **RELATING TO ALL PHASES OF ROAD PLANNING, CONSTRUCTING AND MAINTAINING;**
- **APPLY TO ROADS OF THE TRANS-EUROPEAN ROAD NETWORK** (Implemented in Roads Act in 2010 – Slovenian Government may prescribe the provisions of this Directive to other public roads);
- **SLOVENIAN TRAFFIC SAFETY AGENCY** – responsible for:
 - training of safety personnel and audit reports – 1st auditor course in September 2011;
 - for further periodic training of auditors – 1st auditor periodic course in September 2014.
 - for keeping register of appointed auditors

IN 2012 MINISTRY OF INFRASTRUCTURE DEVELOPED DIRECTIONS FOR ROAD SAFETY AUDIT

- Road safety impact assessment (RSIA)
- Road safety audit (RSA)
- Road safety network management control – road safety network management (NSM)
- Road safety inspection (RSI)

AUDITOR'S ROLE

- estimate safety effect in road traffic,
- control traffic road safety,
- control road safety network management,
- supervise safety check for roads in use

AUDITOR'S COURSE

First in September 2011

- 7 days course
- 7 different modules (RSIA, RSA, RSI, human factor etc.)

AUDITOR'S PERIODIC COURSE

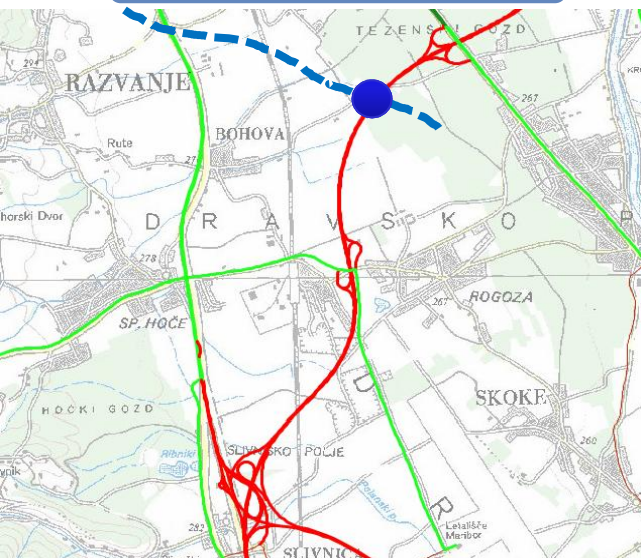
- First in September 2014
- 2 days course
- novelties on the field of RSIA, RSA and RSI, software for auditors etc.

THERE ARE 22 ROAD SAFETY AUDITORS IN SLOVENIA – UNTIL NOW 138 KM OF MOTORWAYS HAS BEEN CHECKED. 160 KM OF MOTORWAYS ARE IN BIDDING PHASE

- Definition: *"The strategic comparative analysis of the impact of different planning alternatives for a new road or a substantial modification to the existing network on the safety performance of the road network "*
- Scope: *"The primary purpose of a Road Safety Impact Assessment (RSIA) is to demonstrate, on a strategic level, the implications on road safety of different planning alternatives of an infrastructure project."*
- Stage of Impact Assessment: *"Road Safety Impact Assessment shall be carried out at the initial planning stage of a project and shall be continually reviewed through the design phases until scheme approval."*

RSIA: Connection of Maribor West by-pass road to Motorway A1

CURRENT SITUATION



4 different variant solutions:

Variant 1: new motorway access point

Variant 2: new motorway access point with continuation of by pass road (Miklavž)

Variant 3: reconstruction of existing access point (Rogoza) and new connection roads between access points

Variant 4: reconstruction of existing access point (Rogoza) and new connection roads between access points with continuation of by-pass road (Miklavž)



Main problem from traffic safety point of view (and also construction / traffic signalization) - to short distances between (existing / planned) motorway access points!

RSIA: Connection of Maribor West by-pass road to Motorway A1 - RESULTS



City of
Ljubljana

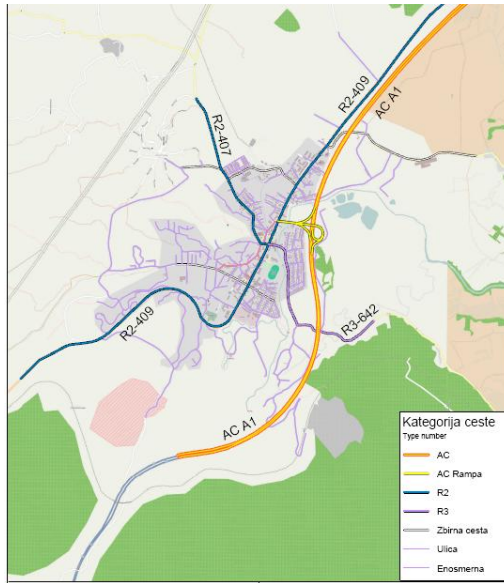
CIVITAS FORUM 2015
CIVITAS ANNUAL CONFERENCE | 7-9 OCTOBER 2015 | LJUBLJANA

- **As is apparent from the final calculations we can conclude that the variant 3 and 4 (with or without bypass Miklavž) was slightly better - as regards the assessment of the expected level of traffic safety - rather than variant 1 or 2.**
- **The difference is (approximately) 25 % to 29 % respectively (approximately € 60,000 per year).**
- **However, it is particularly necessary to emphasize that:**
 - we analyse a relatively small area;
 - certain risk factors are just assumed;
 - lack of reference calculations of risk factors complicates the accurate calculation;
 - calculation does not take into account the intersections (types of intersections, traffic regime, etc.).
- **We also proposed some modifications in project documentation**
 - roundabouts on the western bypass connection to the AC build out as turbo roundabouts;
 - In case of choosing the variant 1 (or 2) we suggest that - due to the short distance between access points - "linked" accelerator and brake bands;
 - we propose that in subsequent stages of project documentation for planning the use of (recent) German guideline *Richtlinien für die Anlage von Autobahn (RAA)*, FGSV 202, 2008.



RSIA: New connection of Vrhnika to Motorway A1

CURRENT SITUATION



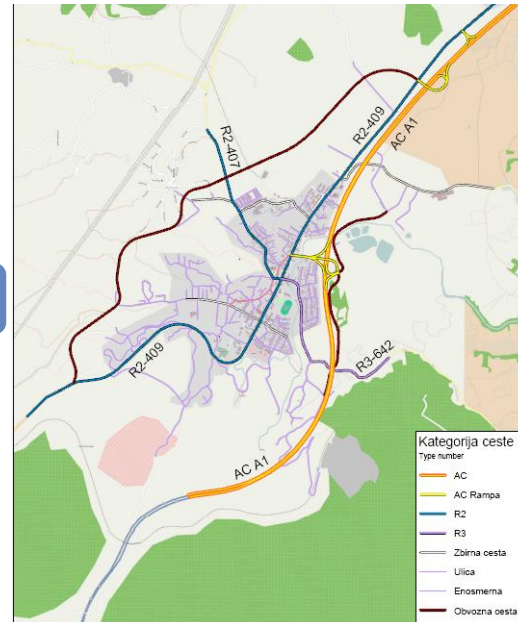
2 different variant solutions:

Variant 1: new motorway access point with new north and south by-pass road

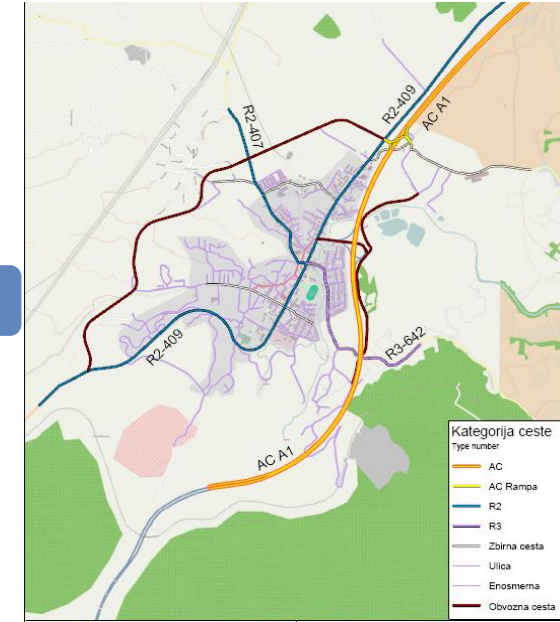
Variant 2: new motorway access point with new north and south by-pass road (different alignment)

Main problem from traffic safety point of view (and also construction) - to short distances between (existing / planned) motorway access points!

VARIANT 1



VARIANT 2



RSIA: New connection of Vrhnika to Motorway A1 - RESULTS



City of
Ljubljana

CIVITAS FORUM 2015
CIVITAS ANNUAL CONFERENCE | 7-9 OCTOBER 2015 | LJUBLJANA

- **As is apparent from the final calculations we can conclude that the variant 2 was slightly better - as regards the assessment of the expected level of traffic safety - rather than the variant 1 or existing network.**
- **The difference amounts to (about) 20 to 40%.**
- **However, it is particularly necessary to emphasize the following:**
 - to analyse selected a relatively small area - only roads under the jurisdiction of DARS;
 - certain risk factors (risk factors) are the default / assumed;
 - a significant impact on the calculation of the length of the network (a very different length and AC connections - ramps) and the value of the traffic load (relatively small load AC connector in version 2);
 - The analysis does not cover the issue - both existing and planned - AC terminals (mainly very small distance to the first intersection);
 - Lack of reference calculations of risk factors (risk factors) complicates the accurate calculation;
 - calculation does not take into account the intersections (types of intersections, traffic regime, etc.).



Thank you!

Andraž Murkovič

Contact Details

Slovenian Traffic Safety Agency

Kotnikova 19a, 1000 Ljubljana

andraz.murkovic@avp-rs.si

<http://www.avp-rs.si>

<http://www.civitas.eu>

Marko Renčelj

Contact Details

University of Maribor

Faculty of Civil Engineering

marko.rencelj@um.si

<http://www.fg.um.si>



City of
Ljubljana

CIVITAS FORUM 2015

CIVITAS ANNUAL CONFERENCE | 7-9 OCTOBER 2015 | LJUBLJANA



SLOVENIAN
TRAFFIC SAFETY
AGENCY



THE CIVITAS INITIATIVE
IS CO-FINANCED BY THE
EUROPEAN UNION