

ALUMNI

Građevinskog fakulteta Sveučilišta u Mostaru



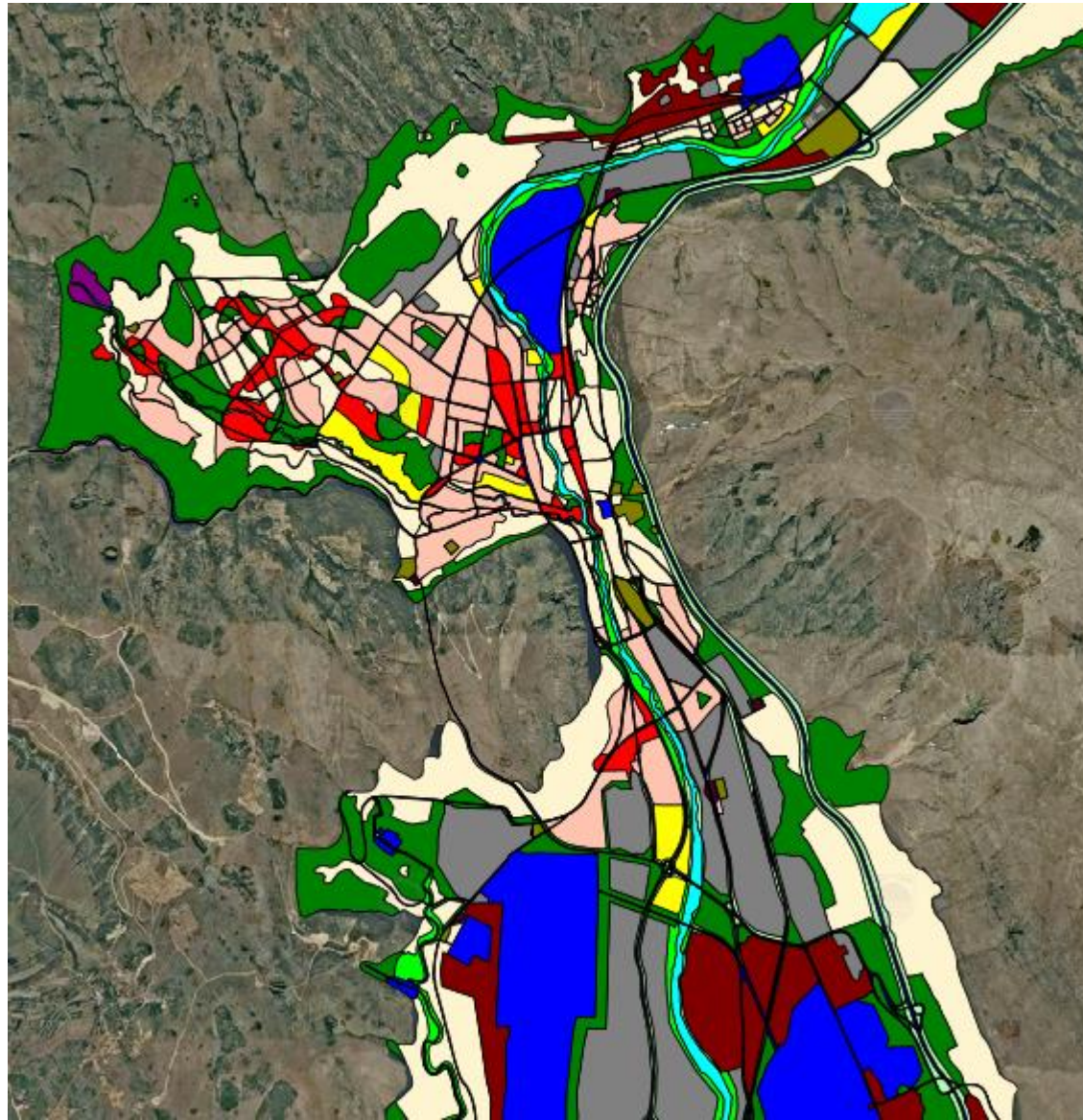
Matice hrvatske bb, 88000 Mostar, Bosna i Hercegovina

MOSTAR KAO PROMETNO SREDIŠTE

I NEKE ZANIMLJIVOSTI S JUGA I SJEVERA HERCEGOVINE

Mostar, 01. srpnja 2021. godine

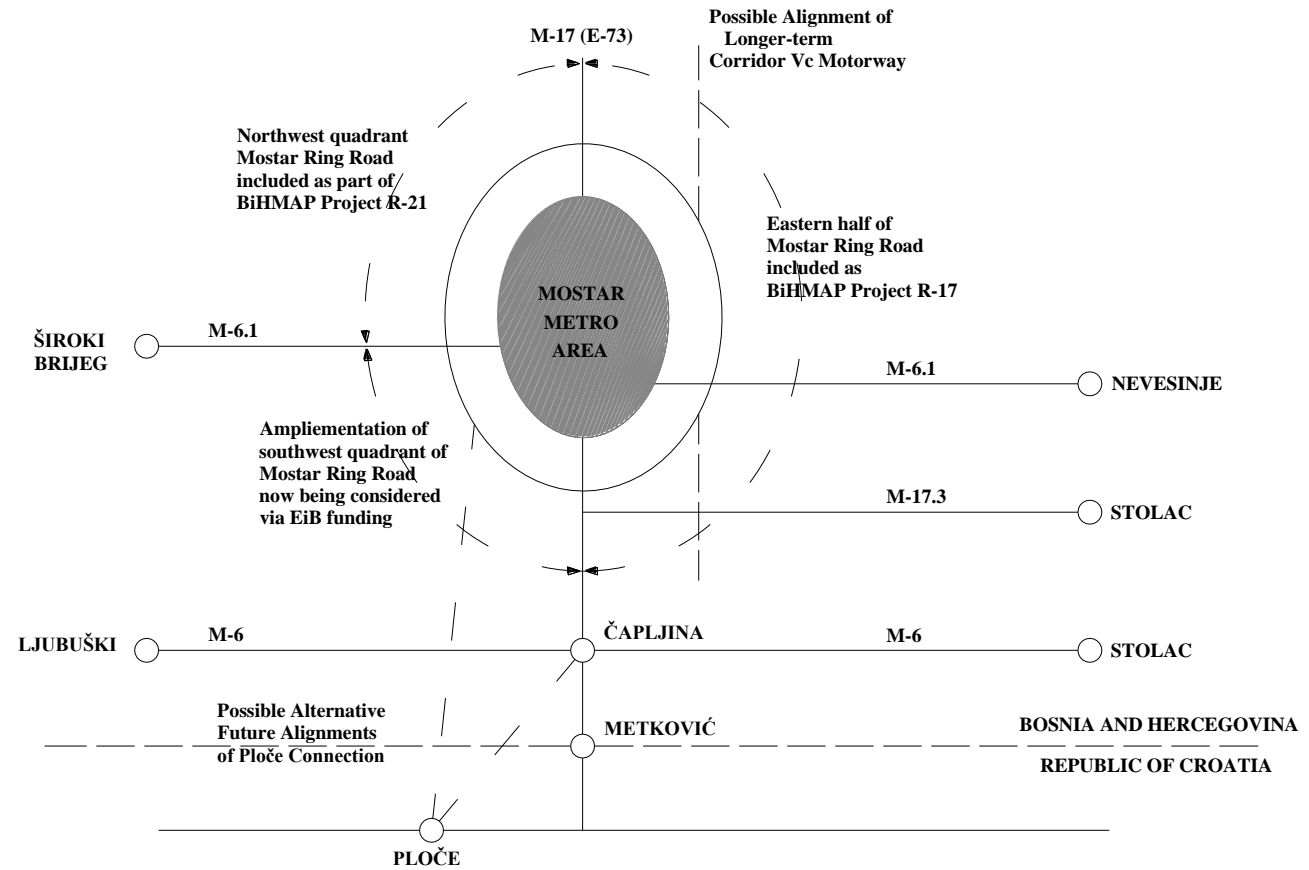
PROSTORNI PLAN 1990.



Izvor: Zavod za prostorno uređenje grada Mostara

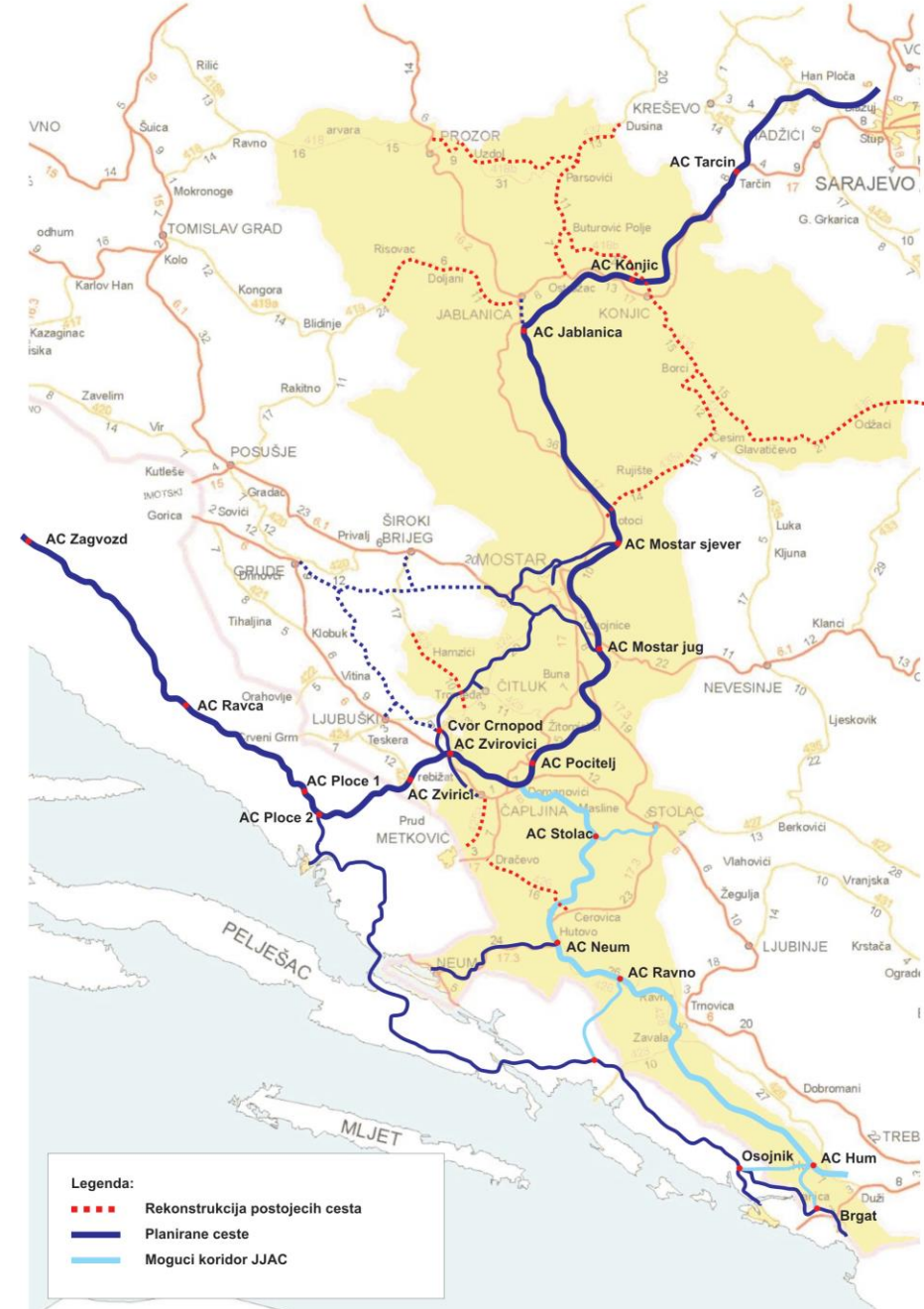
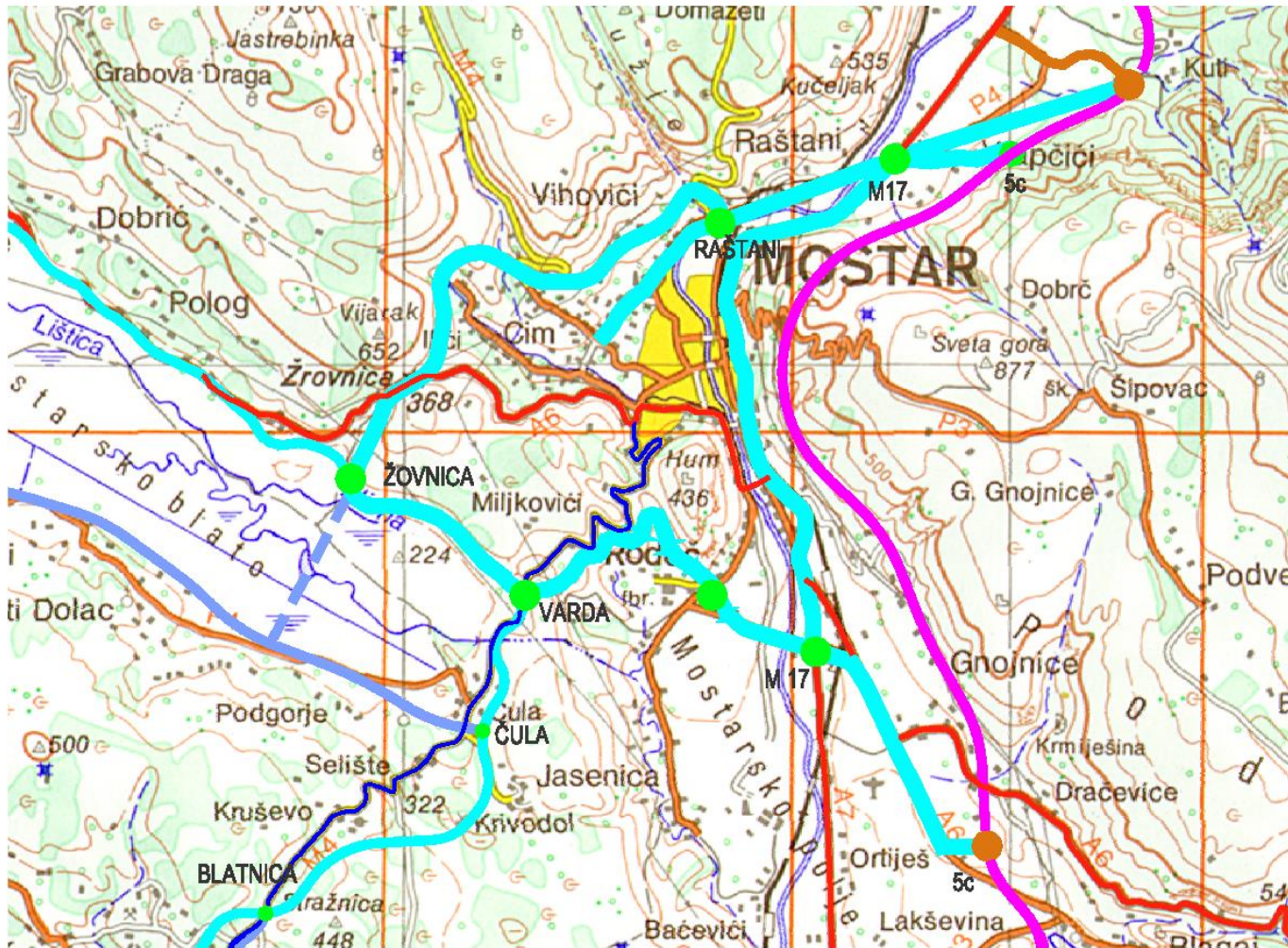
Mostarski prsten

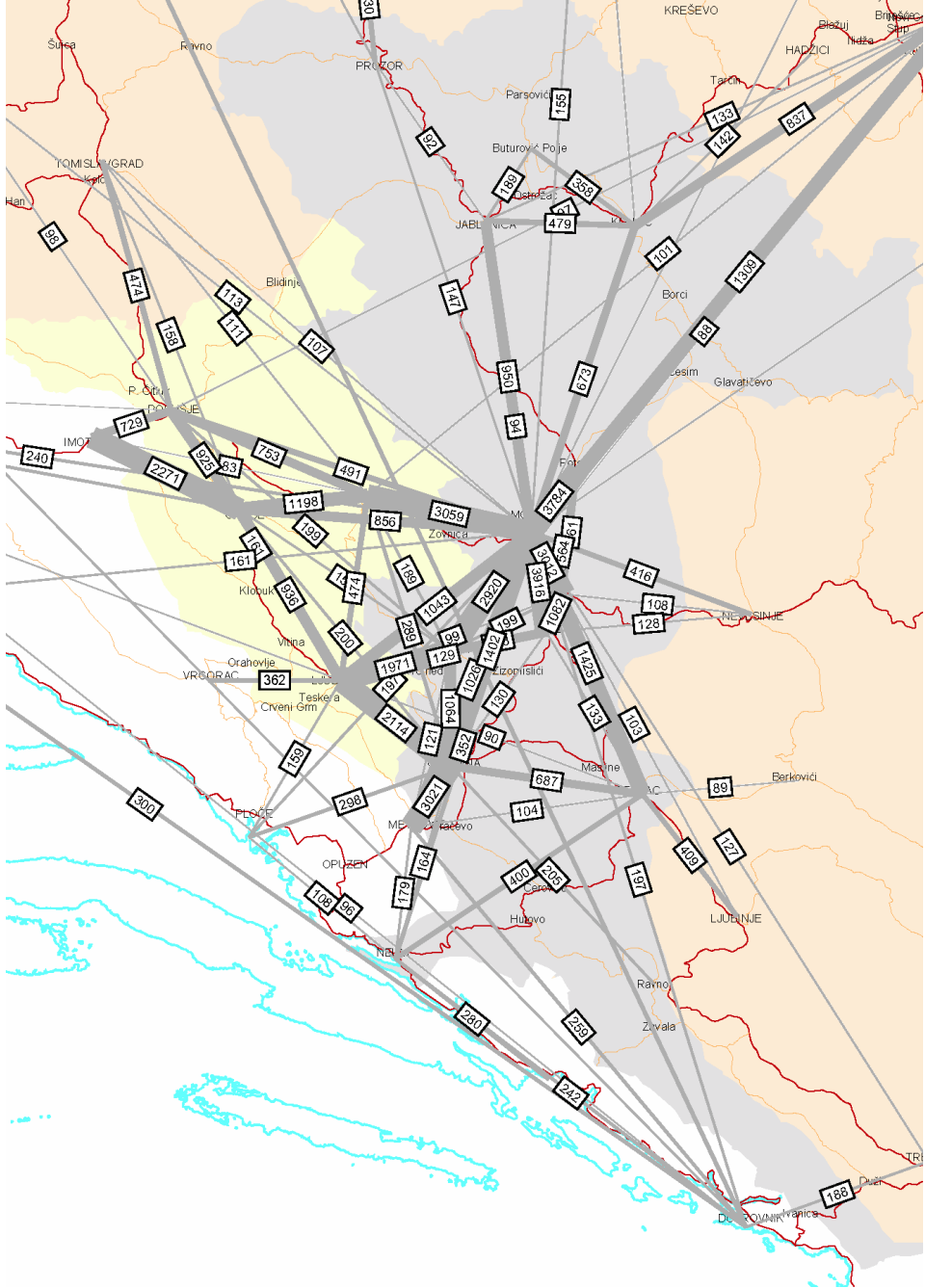
Transportni master plan (TMP) 2000.



Potencijalne teme Studije regionalnog transporta Mostara

2005./6. Mostarski prsten u studijama

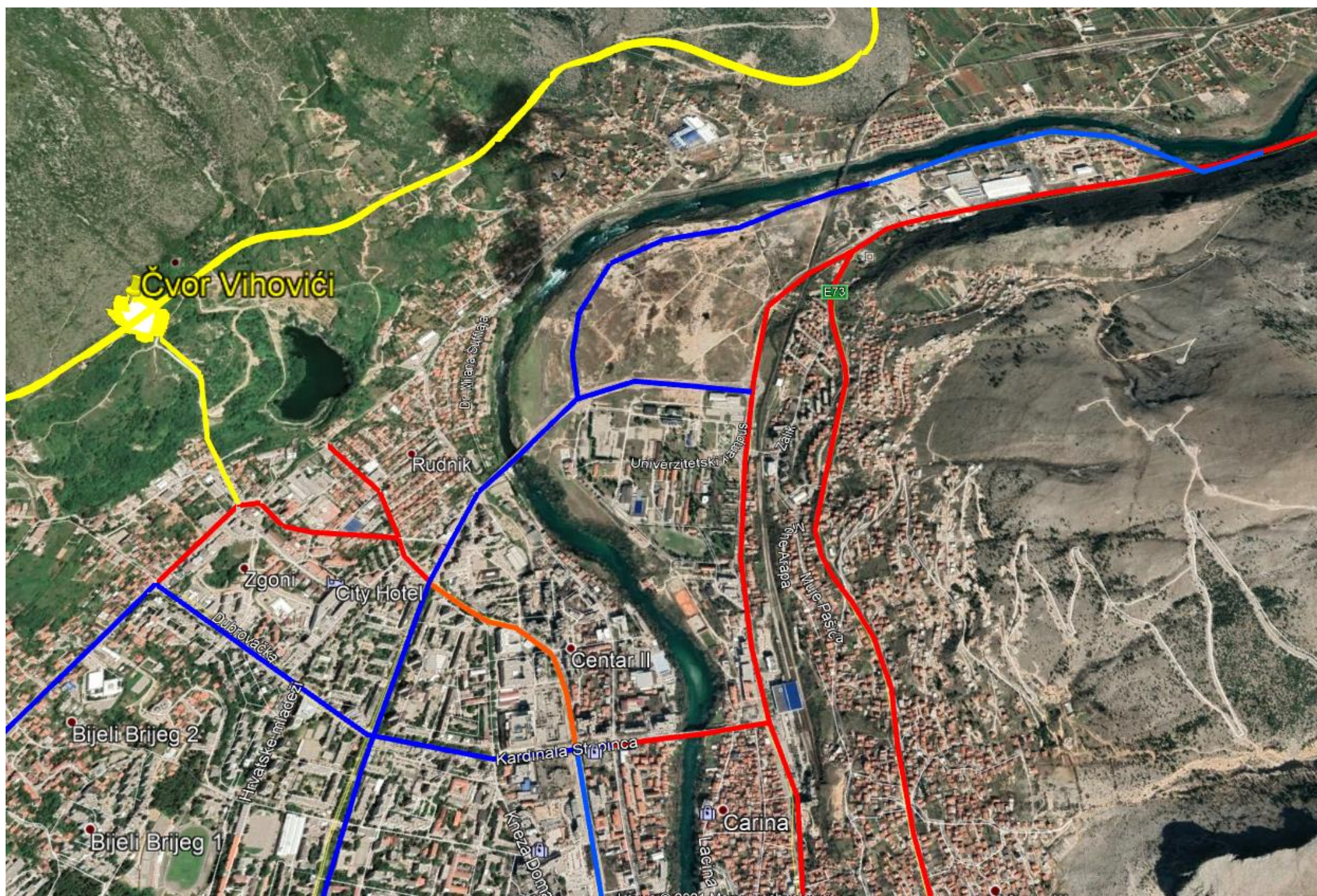


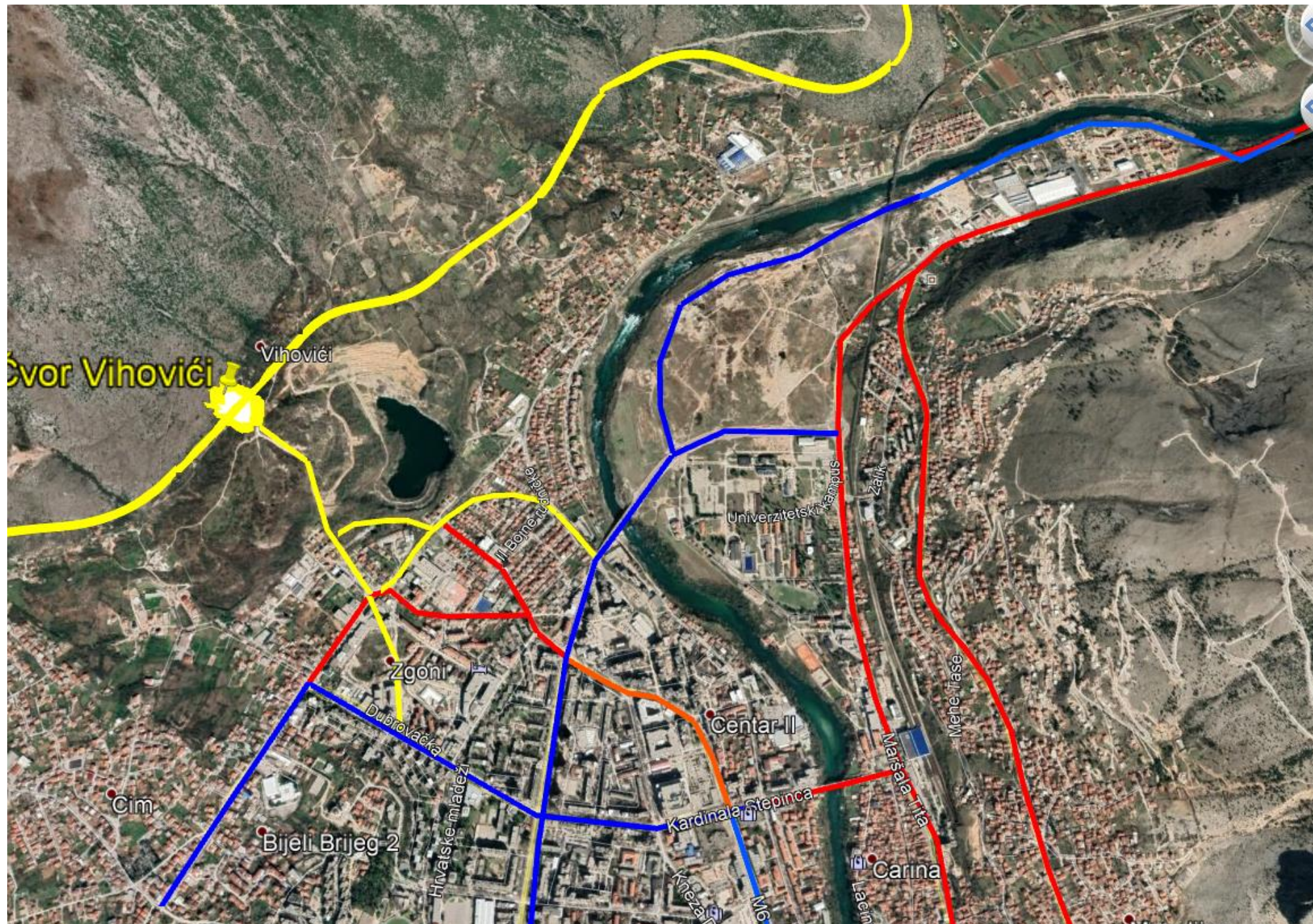


ALUMNI GFSVEMO - Razvoj cestovne mreže Hercegovine i Mostara kao prometnog središta – Mostar, 1. srpnja 2021



ALUMNI GFSVEMO - Razvoj cestovne mreže Hercegovine i Mostara kao prometnog središta – Mostar, 1. srpnja 2021.

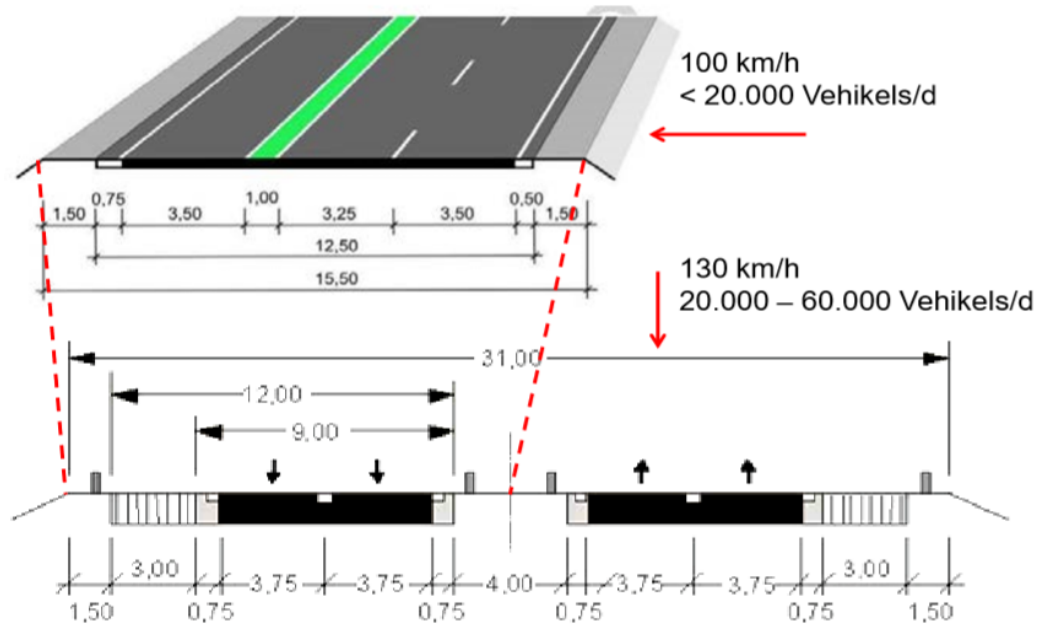




Tema s juga Hercegovine

Hans-Joachim Vollpracht, Torsten Bergh

Develop the motorways stepwise from the 2+1



German guidelines for rural roads - RAL 2013 and for motorways - RAA 2008

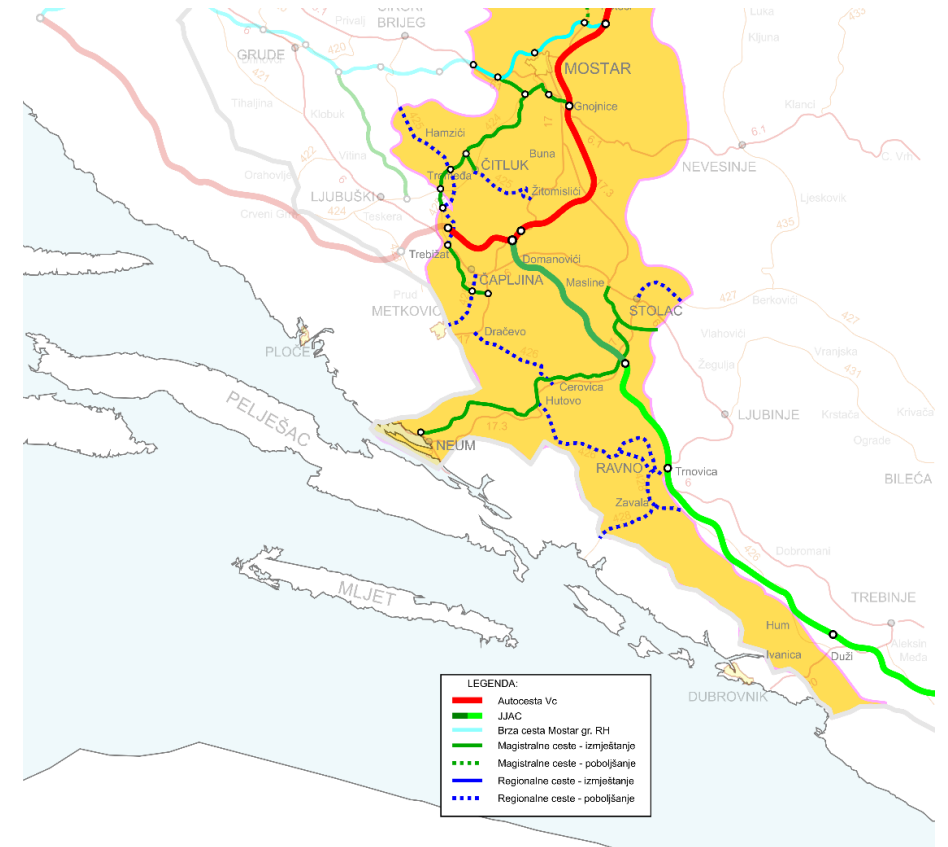
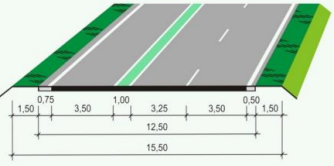
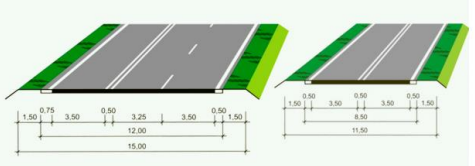


Figure 12: The stepwise development of the motorway system by the 2+1 cross section

Design Class 1

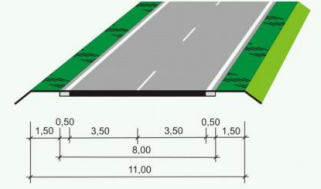


Design Class 2

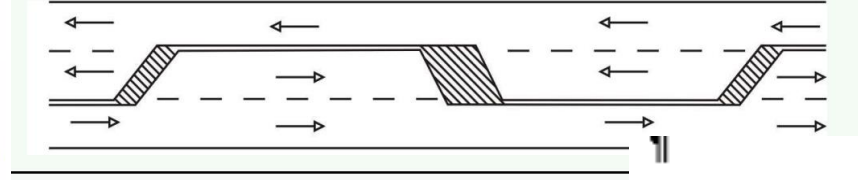
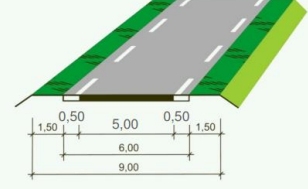


road marking as the unique identifier! → every time visible

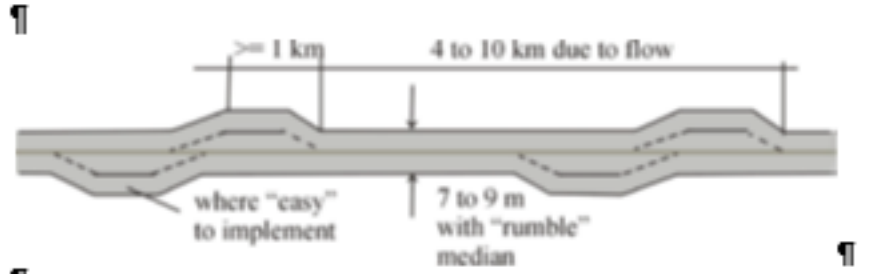
Design Class 3



Design Class 4



1a) "Continuous 12-13-m wide 2+1 design"



1b) "9-m wide 1+1 with overtaking lanes design"

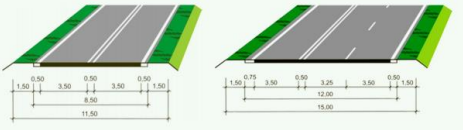
Slika 1-a) i 1b): Swedish 2+1 continuous and overtaking lane designs [1]



by Prof. Weise, TU Dresden

2+1 in coming German design guide

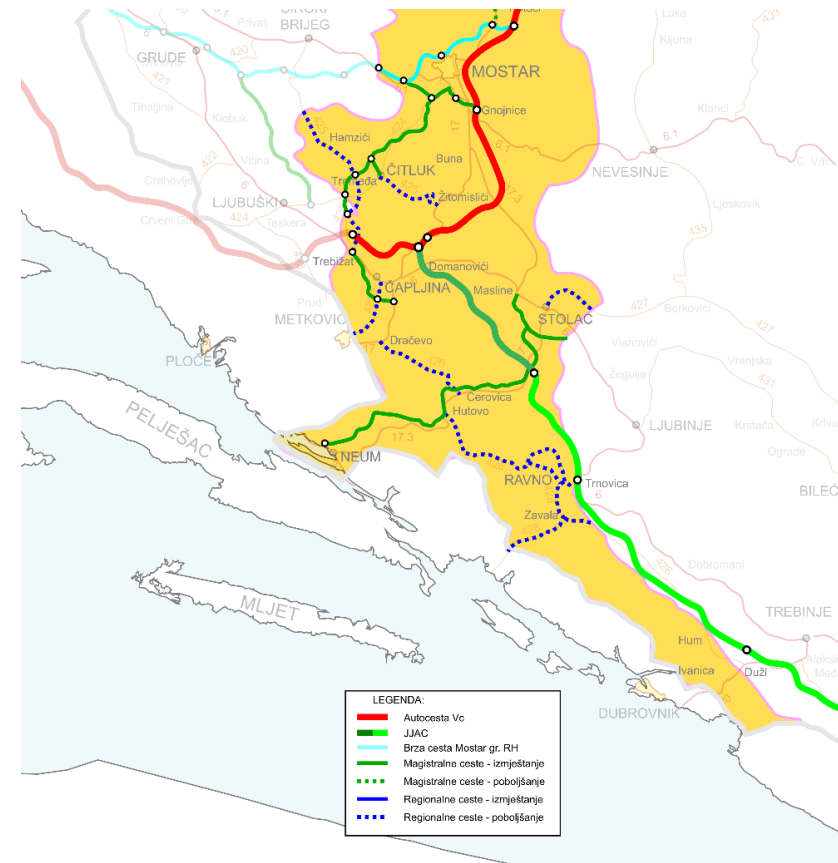
Design Class 2



Rezultati

| Obrazac L3-1: Razina usluge i srednja brzina vožnje putničkih automobila na jedno-, dvo- tj. trotračnoj dionici | | | | | | | | | | |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------|------|------|------|------|------|------|------|------|
| Kategorija prometnice po RIN (2008) | | EKL1 | | | | | | | | |
| Prečni presjek po RAL (2012) | | 2+1 KONTINUIRANI, 43,8% dvotračnih dijelova | | | | | | | | |
| Planirani stupanj kvalitete QSV - Razina usluge RU | | Jadransko-jonska autocesta - fazna gradnja | | | | | | | | |
| Naziv dionice i duljina | | IR čvor Počitelj - do 1. tunela, L = 14400 m | | | | | | | | |
| Promatrani smjer | | Počitelj - Neum/Stolac | | | | | | | | |
| 1 | Mjerodavna jačina prometa q_d [vozila/h] (poglavlje L2) | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 |
| 2 | Mjerodavno relevantan udio teškog prometa [%] (poglavlje L2) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 3 | Dužina L_i [m] | 1700 | 1700 | 1650 | 1300 | 1700 | 1200 | 1550 | 1100 | 1500 |
| 3A | broj trakova | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 |
| 4 | Klasa nagiba (tablica L3-2) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| 5 | Klasa zakrivljenosti (tablica L3-3) | | | | | | | | | |
| 6 | Srednja brzina vožnje putničkih automobila $V_{F,i}$ [km/h] (slika L3-1 do slika L3-6 tj. slika L3-9) | 85 | 97 | 85 | 97 | 85 | 97 | 85 | 90 | 74 |
| 7 | Korekcija na osnovu dužine dijela dionice (slika L3-7) [km/h] | -1,8 | 2,3 | -1,6 | 0,5 | -1,8 | -1,3 | -0,6 | -1,1 | -1,2 |
| 8 | Korigirana srednja brzina vožnje putničkih automobila $V_{F,i}$ [km/h] | 83,2 | 99,3 | 83,4 | 97,5 | 83,2 | 97 | 83,7 | 89,4 | 72,9 |
| 9 | Gustoća prometa kFS _i (jednadžba (L3-1)) [vozila/km/traku] | 8,41 | 3,52 | 8,39 | 3,59 | 8,41 | 3,61 | 8,36 | 3,91 | 9,60 |
| 10 | RU odnosno QSV _i (tablica L3-1) | C | B | C | B | C | B | C | B | C |
| 11 | Srednja gustoća prometa dionice kFS (jednadžba (L3-5)) [vozila/km/traku] | 6,46 | | | | | | | | |
| 12 | RU odnosno QSV dionice (tablica L3-1) | C | | | | | | | | |
| 13 | Srednja brzina vožnje putničkih automobila $V_{F,i}$ (redak 8 tj. Vz. ul po točki L3.5) [km/h] | 83,2 | 99,3 | 83,4 | 97,5 | 83,2 | 97 | 83,7 | 89,4 | 72,9 |
| 14 | Srednja brzina vožnje putničkih automobila dionice V_F (jednadžba 3.7) [km/h] | 86,68 | | | | | | | | |

| Obrazac L3-1: Kvaliteta prometa i srednja brzina vožnje osobnih motornih vozila na jedno-, dvo- tj. trotračnoj dionici | | | | | | | | | | | |
|------------------------------------------------------------------------------------------------------------------------|----|-------------------------------------------------------------------------------------------------------|-------|------|------|------|------|------|------|------|--|
| Kategorija prometnice po RIN (2008) | | EKL1 | | | | | | | | | |
| Poprečni presjek po RAL (2012) | | 2+1 KONTINUIRANI, 43,8% dvotračnih dijelova | | | | | | | | | |
| Željeni stupanj kvalitete QSV - Razina usluge RU | | Jadransko-jonska autocesta - fazna gradnja | | | | | | | | | |
| Dionica i duljina | | IR čvor Počitelj - do 1. tunela, L = 14400 m | | | | | | | | | |
| Promatrani smjer | | Počitelj - Neum/Stolac | | | | | | | | | |
| Osnove | 1 | Mjerodavna jačina prometa q_d [vozila/h] (poglavlje L2) | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | |
| | 2 | Mjerodavno relevantan udio teškog prometa [%] (poglavlje L2) | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | |
| | 3 | Dužina L_i [m] | 1700 | 1700 | 1650 | 1300 | 1700 | 1200 | 1550 | 1100 | |
| | 3A | broj trakova | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| | 4 | Klasa nagiba (tablica L3-2) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | |
| Razina usluge RU | 6 | Srednja brzina vožnje putničkih automobila $V_{F,i}$ [km/h] (slika L3-1 do slika L3-6 tj. slika L3-9) | 79 | 94,5 | 79 | 94,5 | 79 | 94,5 | 79 | 86 | |
| | 7 | Korekcija na osnovu dužine dijela dionice (slika L3-7) [km/h] | -1,8 | 2,3 | -1,6 | 0,5 | -1,8 | -1,3 | -0,6 | -1,1 | |
| | 8 | Korigirana srednja brzina vožnje putničkih automobila $V_{F,i}$ [km/h] | 77,2 | 96,8 | 77,4 | 95 | 77,2 | 94,5 | 77,7 | 85,4 | |
| | 9 | Gustoća prometa kFS _i (jednadžba (L3-1)) [vozila/km/traku] | 13 | 5,17 | 12,9 | 5,26 | 13 | 5,29 | 12,9 | 5,85 | |
| | 10 | RU odnosno QSV _i (tablica L3-1) | D | B | D | B | D | B | D | B | |
| | 11 | Srednja gustoća prometa dionice kFS (jednadžba (L3-5)) [vozila/km/traku] | 9,88 | | | | | | | | |
| Brzina vožnje | 13 | Srednja brzina vožnje putničkih automobila $V_{F,i}$ (redak 8 tj. Vz. ul po točki L3.5) [km/h] | 77,2 | 96,8 | 77,4 | 95 | 77,2 | 94,5 | 77,7 | 85,4 | |
| | 14 | Srednja brzina vožnje putničkih automobila dionice V_F (jednadžba 3.7) [km/h] | 81,58 | | | | | | | | |



| | | HBS | | | |
|-----------------------------------|--|--------------|--------------|---------------|--------------|
| | | 700 voz/h/sm | | 1000 voz/h/sm | |
| | | k [voz/km] | V_F [km/h] | k [voz/km] | V_F [km/h] |
| | | RU | | RU | |
| (i) autocesta | | A | | A (x = 0.29) | |
| (i) 2+1 EKL1 | | 6,46 | 86,68 | 9,88 | 81,58 |
| 43,75% dvotračnih dijelova | | C/B | | C/D | |

$q_d = 700$ voz/h/smj. odgovara cca PGDP = 11500 voz/dan za FNS = 10 % i raspodjelu po smjerovima 60/40 i $q_d = 1000$ voz/h/smj. odgovara cca PGDP = 16500 voz/dan uz prethodno navedene parametre. Postotak teških vozila je 10%.

COMPARATIVE EXPLANATION OF EUROPEAN EXPERIENCES IN THE „2 + 1” ROAD APPLICATION

(Izvor: THE SAFETY BENEFITS OF THE 2+1 CROSS SECTION FOR INTERURBAN MAIN ROADS AND THE DECENTRALIZED COUNTRY DEVELOPMENT

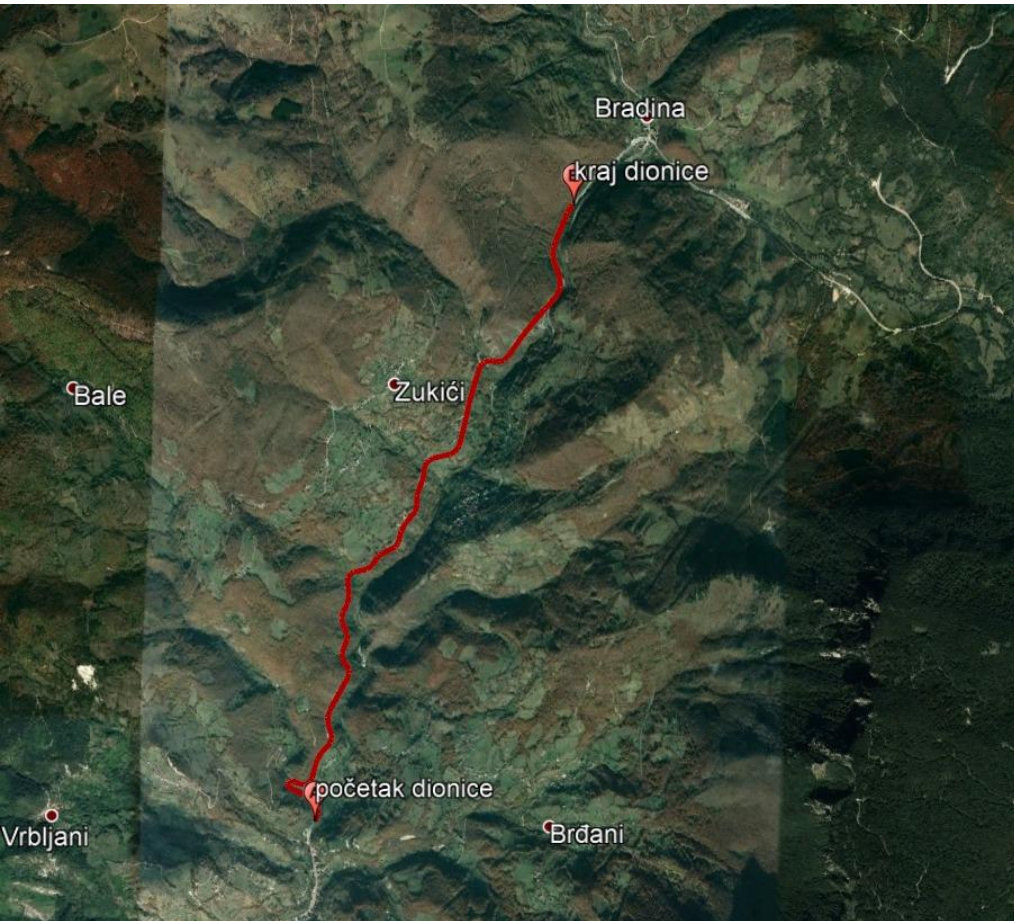
Hans-Joachim Vollpracht, Torsten Bergh ... ANALIZA EVROPSKIH ISKUSTAVA PRIMENE DVOTRAČNOG PROFILA PUTA “2+1” SA ASPEKTA

BEZBEDNOSTI SAOBRAĆAJA, Vladan Tubić, Krsto Lipovac, Nemanja Dobrota)

| COUNTRY | AADT | LENGTH OF PASSING LANE (m) | WIDTH OF PASSING LANE (a,b,c) | LENGTH OF CRITICAL TRANSITION ZONE(m) | TYPE OF DIRECTIONS SEPARATION | FATALITIES REDUCTION | MOTIV (OBJECTIVE) OF IMPLEMENTATION |
|----------------|-------------------------|----------------------------|------------------------------------------------|---------------------------------------|-------------------------------|----------------------|-------------------------------------|
| SWEDEN | 4 000 - 20 000 | 1 000 – 2 000 | 3.5; <u>3.25</u> ; 3.25 | 300 | CABLE BARRIERS | 76% | SAFETY |
| GERMANY | 5 000 -25 000 | min1 000 | 3.75; <u>3.25</u> ; 3.5 | 180 | PAVEMENT MARKINGS | 36% | SAFETY + EFFICIENCY |
| DENMARK | 7 000 - 15 300 | 350 -1 550 | 3.5; <u>3.25</u> ; 3.25 | 300 | - | NO CHANGE | EFFICIENCY |
| FINLAND | 14 000 -25000 (WEEKEND) | 1 050 – 1 700 | 3.75; <u>3.5</u> ; 3.25 | 500 | - | 22 - 46% | EFFICIENCY |
| UNITED KINGDOM | <25000 | 800 - 1 300 | 3.4; <u>3.2</u> ; 3.4 3.5; <u>3.5</u> ; 3.5 | 300 | PAVEMENT MARKINGS | NO CHANGE | SAFETY + EFFICIENCY |
| IRELAND | 11 600-14 000 | 1 000 - 2 000 | 3.5; <u>3.25</u> ; 3.5 | 300 | CABLE BARRIERS | 50 - 60% | SAFETY |
| POLAND | 7 500 -18 000 | 550 - 1 000 | 3.5; <u>3.0</u> ; 3.5 | - | PAVEMENT MARKINGS | 47% | SAFETY + EFFICIENCY |
| Opseg | 4 000 -25 000 | 350 - 2 000 | 3.5 - 3.75 <u>3.0 - 3.5</u> 3.25 - 3.5 | 180 - 500 | | 22 - 76% | / |

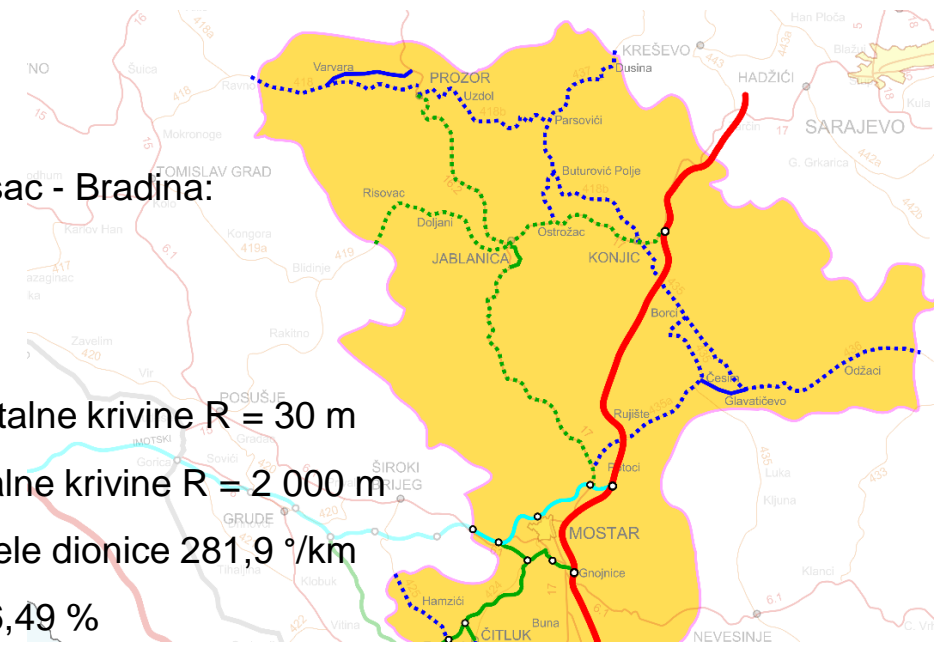
EFFICIENCY =TRAFFIC OPERATIONAL PERFORMANCE

Tema sa sjevera Hercegovine

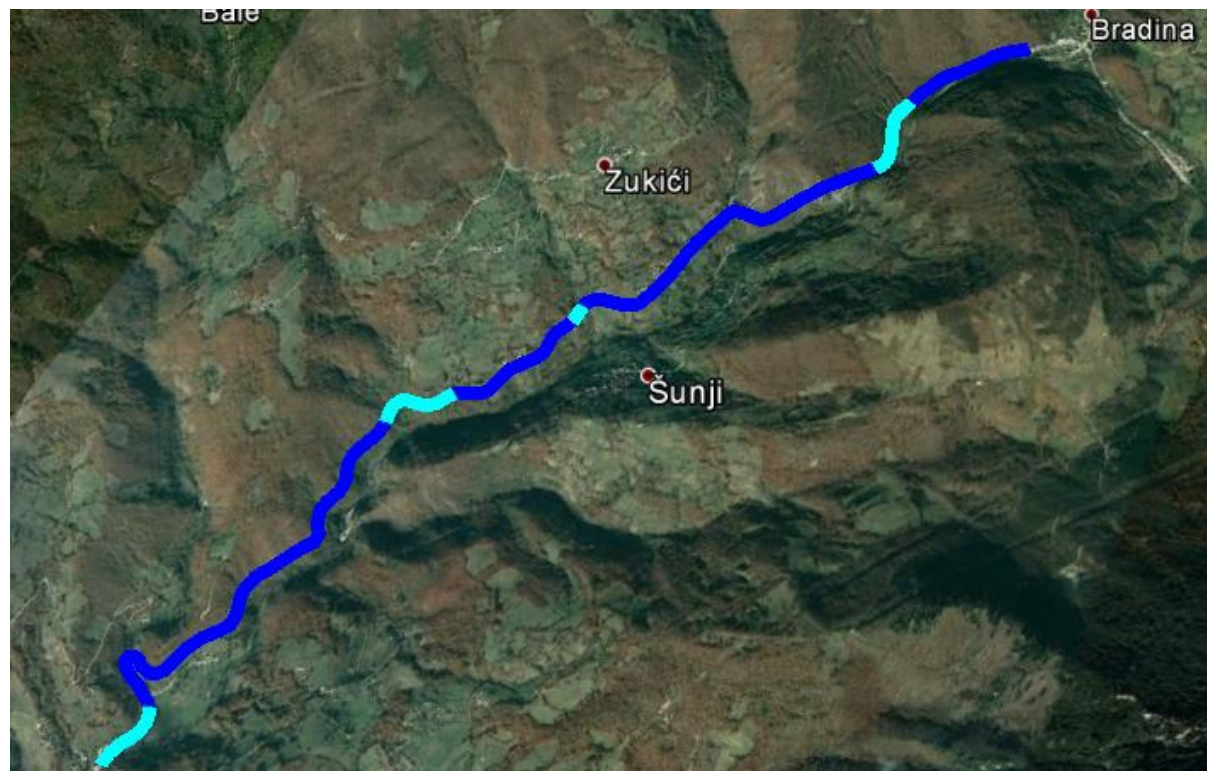
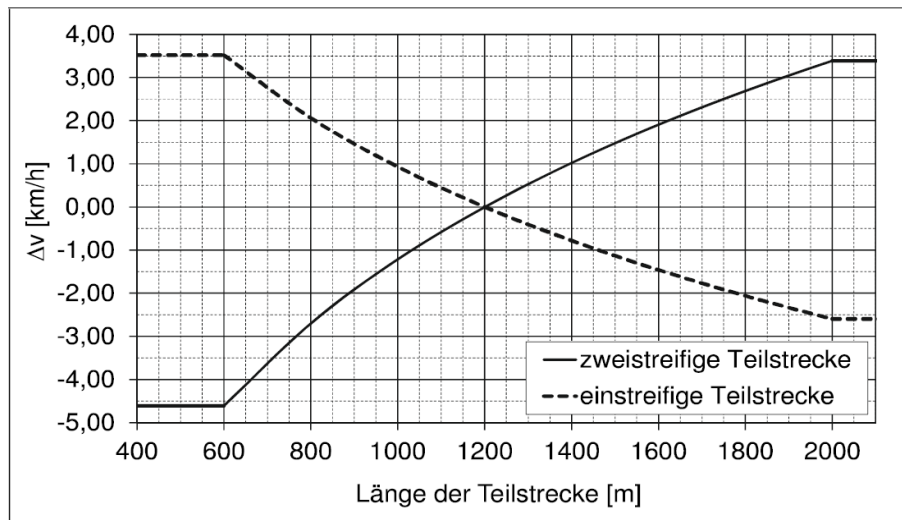
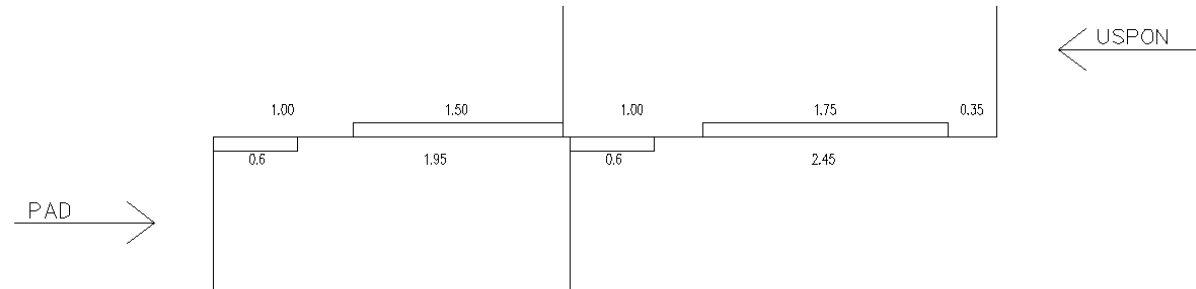
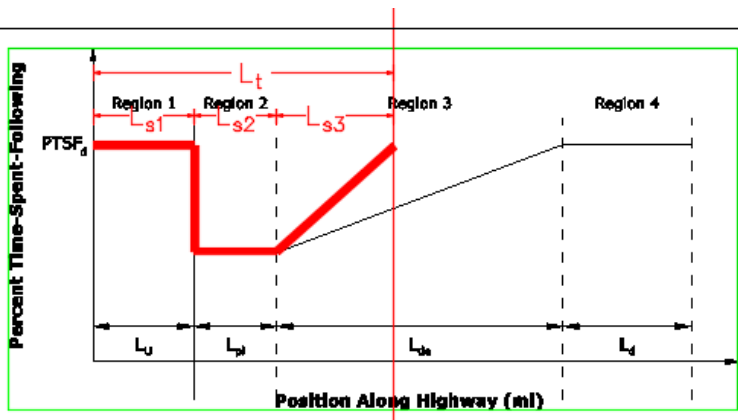


Karakteristike dionice Podorašac - Bradina:

- duljina 5 648 m
- 33 horizontalne krivine
- najmanji polumjer horizontalne krivine $R = 30 \text{ m}$
- najveći polumjer horizontalne krivine $R = 2\,000 \text{ m}$
- krivinska karakteristika cijele dionice $281,9 \text{ ‰/km}$
- prosječan uzdužni nagib $6,49 \text{ ‰}$



| PRETJECAJNA PREGLEDNOST U PADU | | |
|--------------------------------|---------|---------------|
| Pretjecajna preglednost | Duljina | Stacionaža |
| PP1 | 160 m | 1+700 → 1+860 |
| PP2 | 140 m | 3+560 → 3+700 |
| PP3 | 210 m | 4+150 → 4+350 |
| FNPZ = 91% | | |



Rezultati

| Rezultati PTSF-a za trenutno stanje PGDP=10 748 | | | | |
|--------------------------------------------------------------|--------------|--------------|--------------|--------------|
| Postojeće stanje prometnice | | | | |
| | USPON | | PAD | |
| PTSF _{cl} | 20,2 | | 98,5 | |
| Razina usluge | A | | E | |
| Nakon rekonstrukcije | | | | |
| | USPON | | PAD | |
| DIONICA | 1.poddionica | 2.poddionica | 1.poddionica | 2.poddionica |
| PTSF _{cl} | 39,6 | 34,3 | 50,3 | 51,6 |
| | 37,23 | | 51 | |
| RAZINA | B | A | C | C |
| USLUGE | B | | C | |
| Rezultati PTSF-a za planirano projektno razdoblje PGDP=6 000 | | | | |
| Postojeće stanje prometnice | | | | |
| | USPON | | PAD | |
| PTSF _{cl} | 16,7 | | 94,9 | |
| Razina usluge | A | | E | |
| Nakon rekonstrukcije | | | | |
| | USPON | | PAD | |
| DIONICA | 1.poddionica | 2.poddionica | 1.poddionica | 2.poddionica |
| PTSF _{cl} | 34,7 | 29,7 | 50,23 | 49,8 |
| | 32,5 | | 50 | |
| RAZINA | A | A | C | B |
| USLUGE | A | | B | |

| LOS | Class I Highways | |
|-----|------------------|----------|
| | ATS (mi/h) | PTSF (%) |
| A | [REDACTED] | ≤35 |
| B | | >35–50 |
| C | | >50–65 |
| D | | >65–80 |
| E | | >80 |



UNIVERSITY OF ENNA KORE

5th International Summer School
URBAN MOBILITY – Palermo 2018

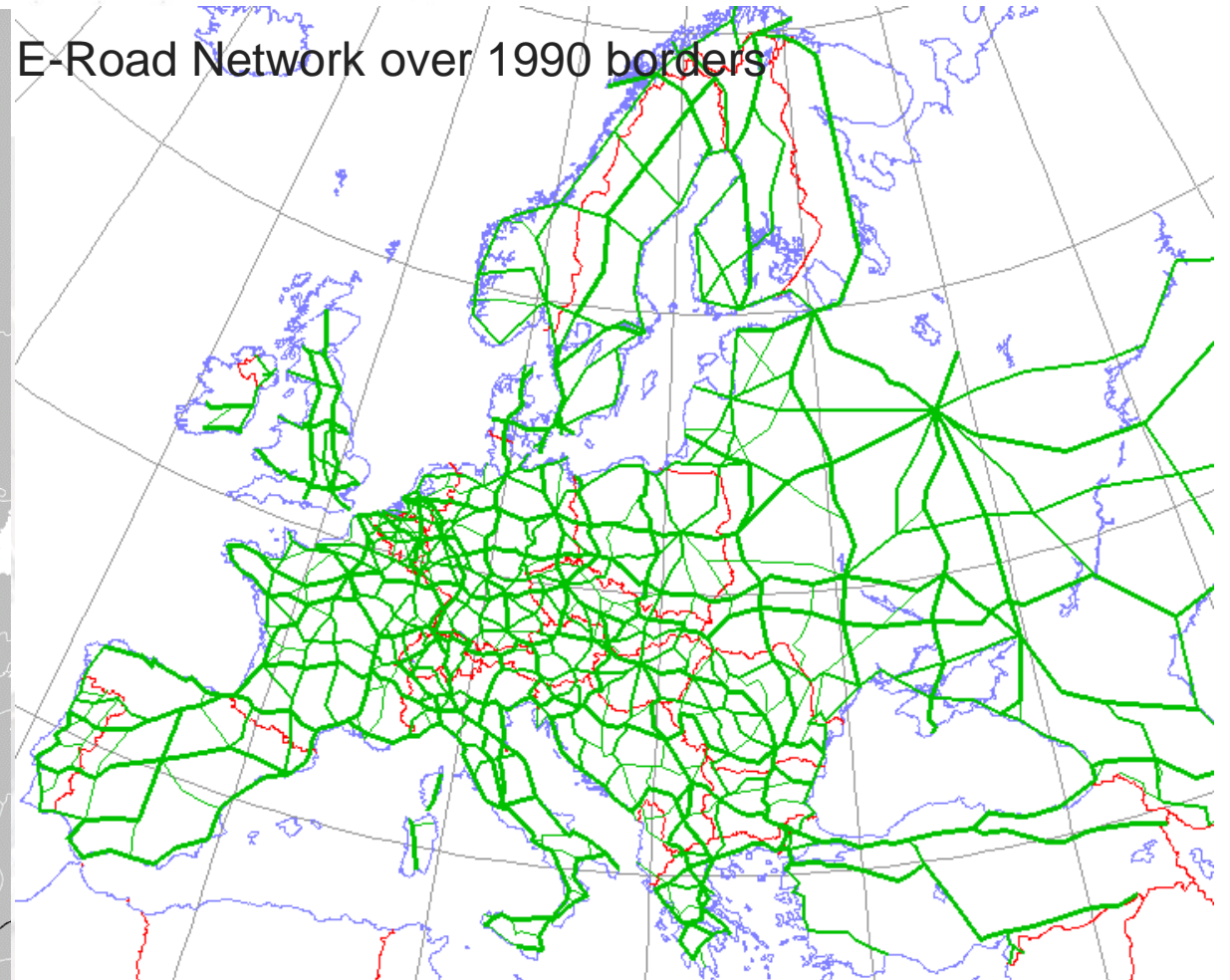


PALERMO
2018
CAPITALE ITALIANA
DELLA CULTURA

Approximate extent of completed
motorway network in Europe 2014



E-Road Network over 1990 borders



Manchester
Metropolitan
University



Univerza v Mariboru
Fakulteta za gradbeništvo,
prometno inženirstvo in arhitekturo



GXL
1978-2018
FACULTY OF CIVIL ENGINEERING



Newcastle
University



UNIVERSITY OF JYVÄSKYLÄ



UNIVERSITY OF TAMPERE



UPC



Hochschule RheinMain
University of Applied Sciences
Wiesbaden / Rüsselsheim



UNIVERSITÀ
degli STUDI
di CATANIA



UNIVERSITÀ
DEGLI STUDI
DI PALERMO

HVALA NA PAŽNJI!