

How to improve the public transport system in the city - example of the city of Šibenik (Croatia)

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Why did the city of Šibenik decide to reorganize its municipal transport?

The service was not regulated by the PSO contract in accordance with Regulation 1370/2007. The city had difficulties in regulating and sanctioning the low level of transport service.

- Insufficient number of departures

- Obsolete fleet

- Delays and unreliable timetable

- „Unofficial stops”

- Unclear and poor quality lines

- Inadequately arranged stops/turning points

- Unattractive service

- Lack of visual identity

- Bad information system

- Inadequate ticketing system



Inefficient municipal public transport results in a small number of passengers, financial costs, insufficient impact on the mobility of citizens and a reduction in the quality of life.

About the Study

Guidelines for medium and short-term activities - plan for the construction of new bus stops, organization of driver shifts, development of the passenger information system, etc.



Long-term measures and forecast of communal bus service development for a period of 25 years

Basis for the creation of PSO contracts - creation of a transport plan, tariff provisions, quality standards, calculation of net financial effect

Study in numbers

700 + pages

15,4 GB working materials

1.500 + georeferenced demand generators

50 + hours of work meetings/presentations/calls

2000 + recorded passengers

650 + analyzed parking places

80 + positions with measured demand

60 + line route variants

113 georeferenced and analyzed stops

10 + analyzed cities with good practice

3 scenarios for the development of city lines

3 price variants

4 variants of tariff zones

3 (4) scenarios for the development of suburban lines

3 forecasted scenarios

9 combinations of profit and loss account analyses

...

Project activities

1.



Current state analysis

2.



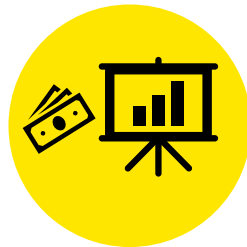
Defining a new public transport system

3.



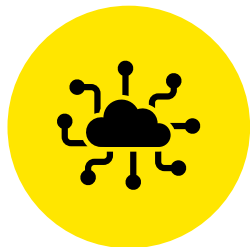
Defining operational indicators of the new PT system

4.



Defining financial indicators of the new PT system

5.



Defining a model of managing the new PT system

6.



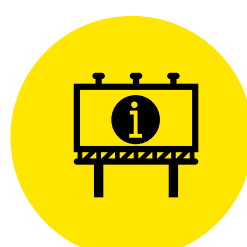
Defining a new tariff system

7.



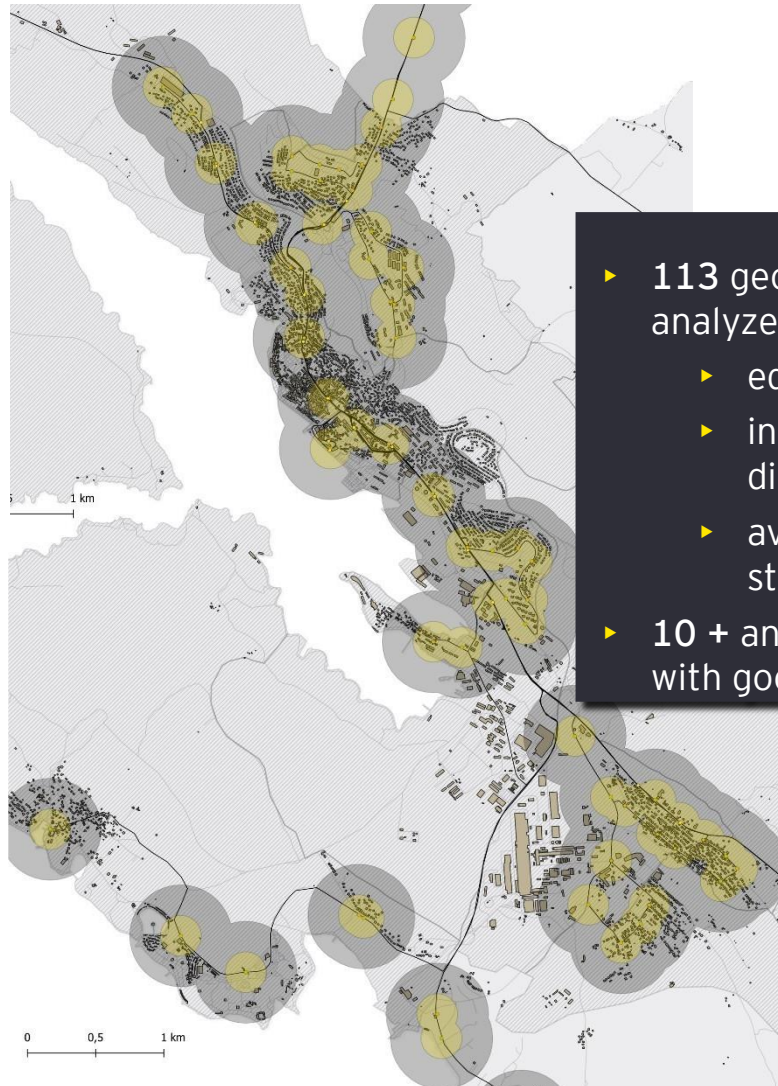
Defining a new payment system

8.



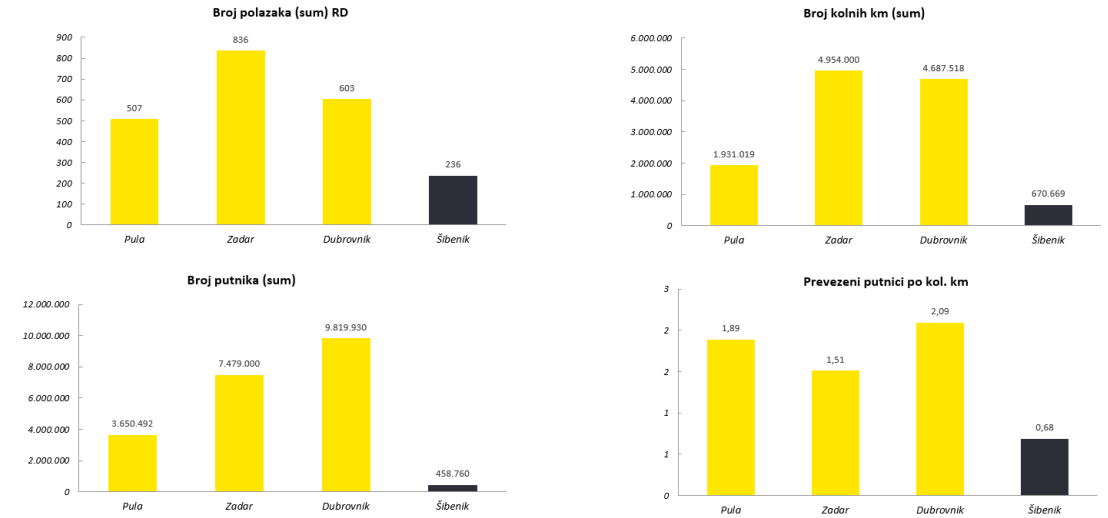
Defining a new user information system

Current state of the bus passenger transport system analysis

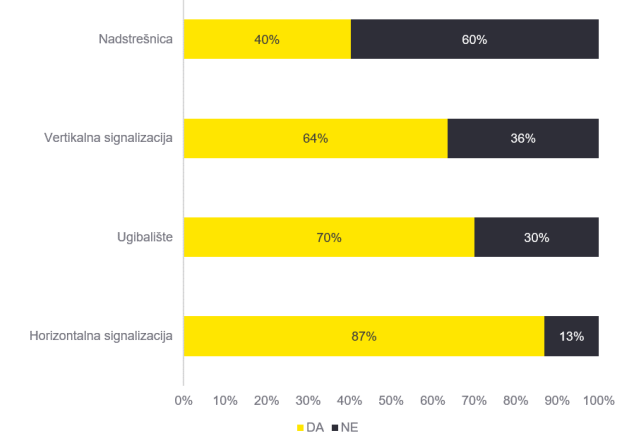


- ▶ 113 georeferenced and analyzed stops
 - ▶ equipment
 - ▶ inter-stop distances
 - ▶ availability of stops
- ▶ 10 + analyzed cities with good practice

Usporedba s ostalim sličnim gradovima u RH

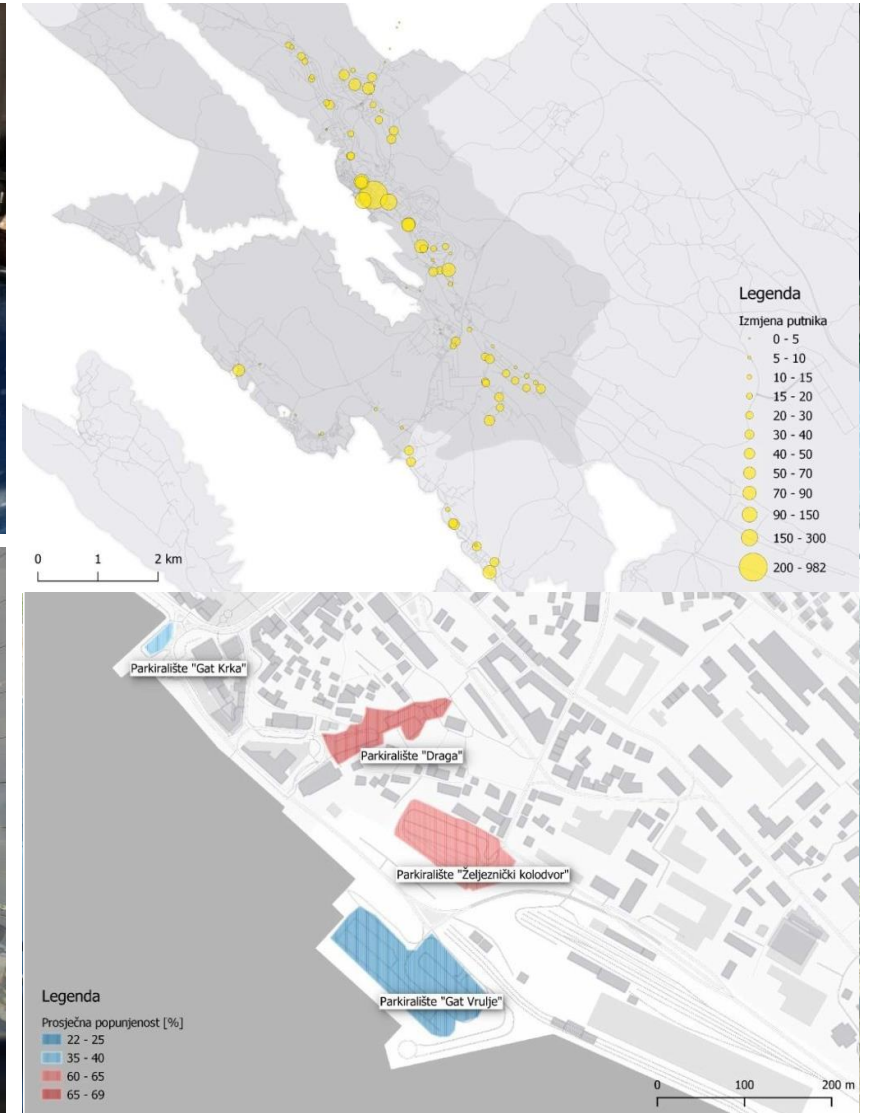


Stanje opremljenosti autobusnih stajališta na području grada Šibenika

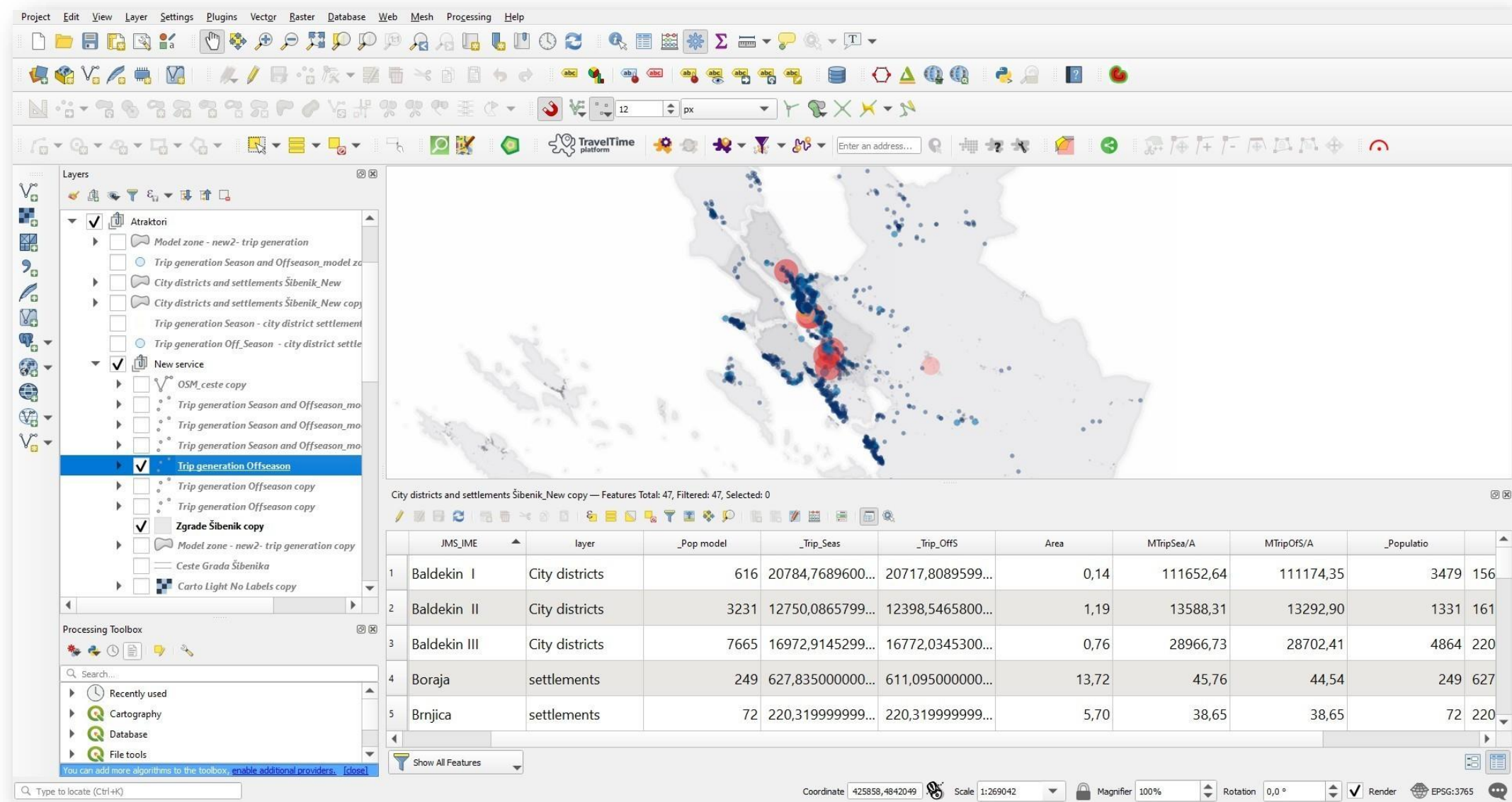


Current state of the bus passenger transport system analysis

- ✓ Documented bus stops in more than 200 photos
- ✓ 2000 + recorded passengers
- ✓ 650 + analyzed parking places
- ✓ 80 + stops with calculated demand



Spatial analysis



Spatial analysis

File

Home

Insert

Page Layout

Formulas

Data

Review

View

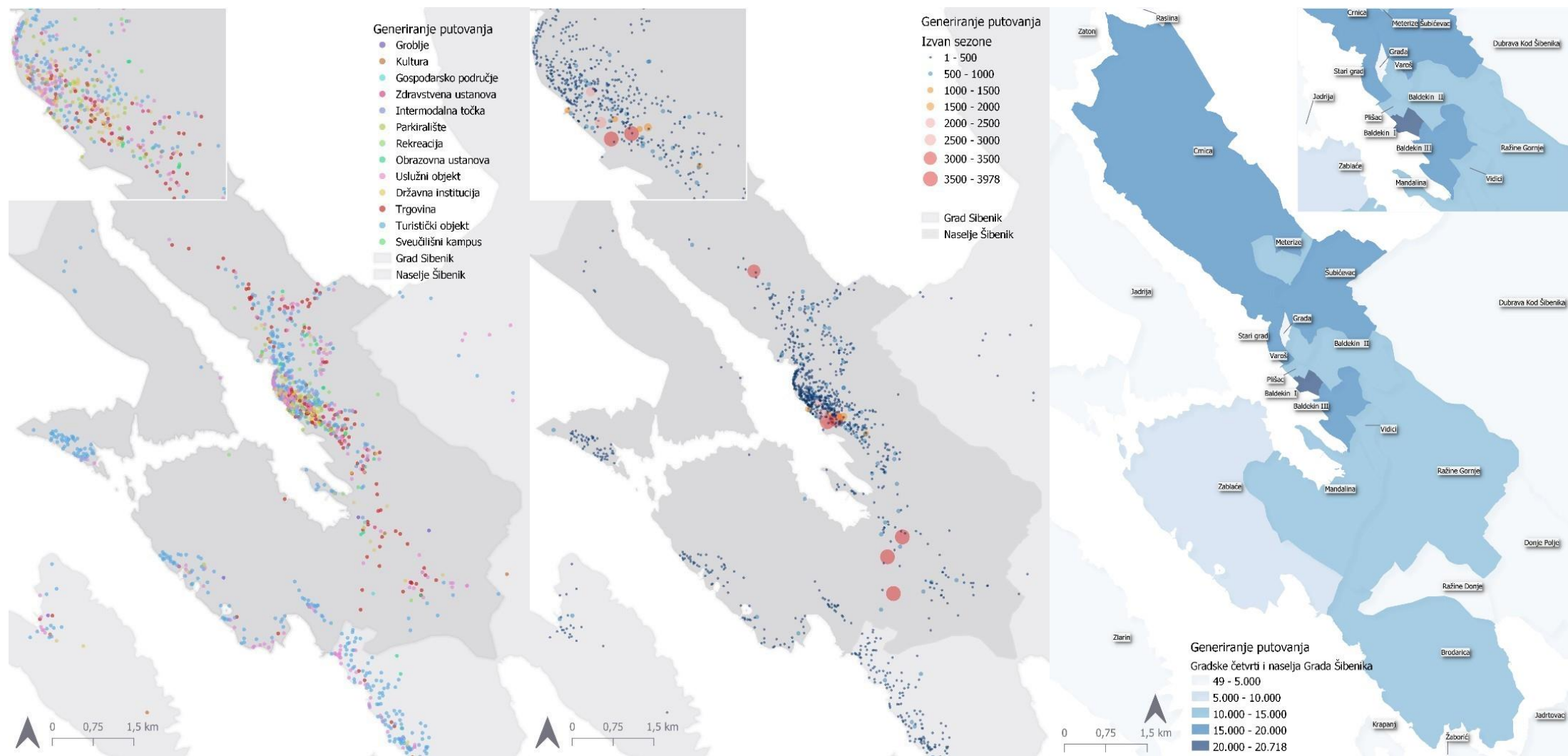
EY Support

Help

PDF-XChange

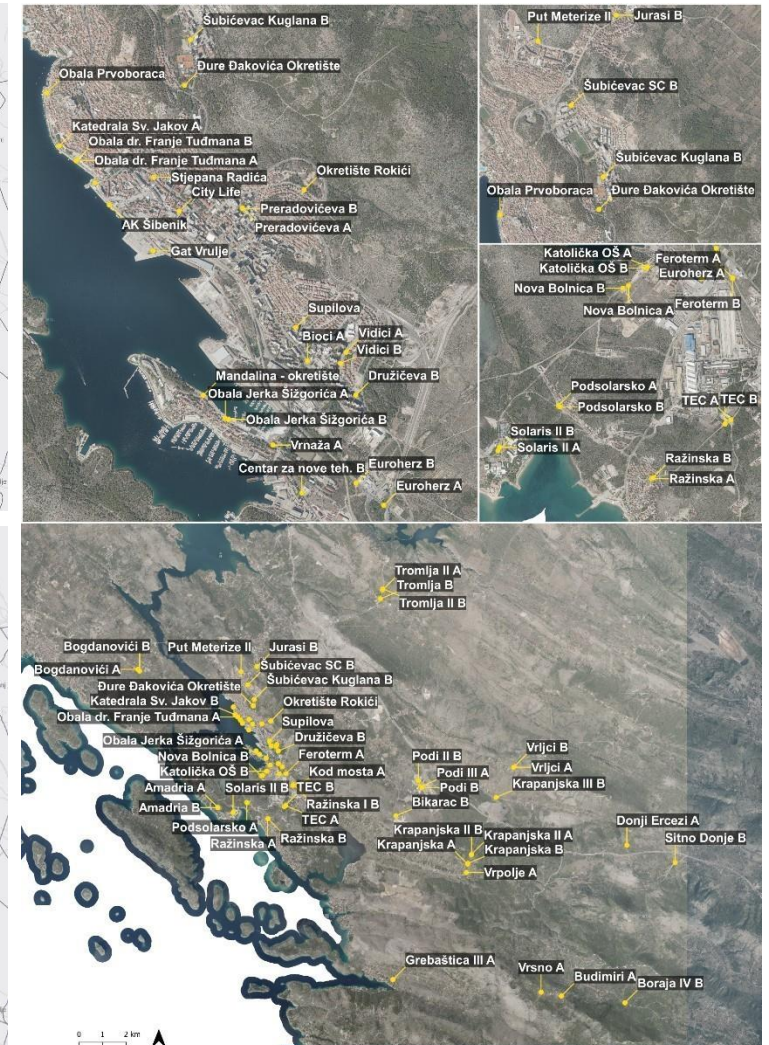
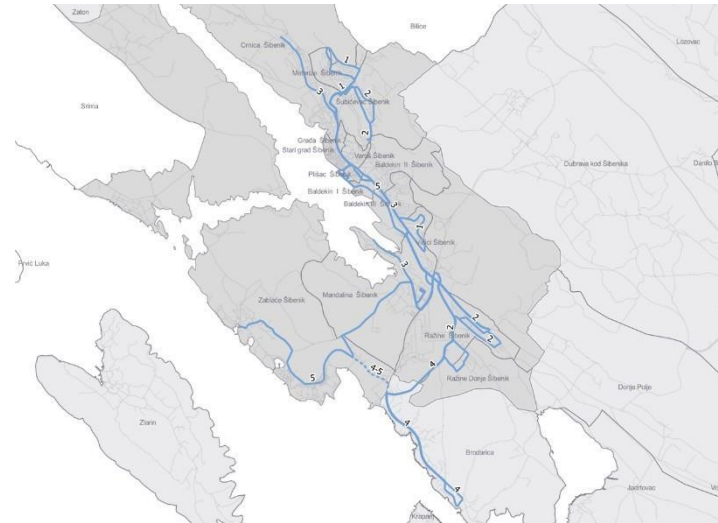
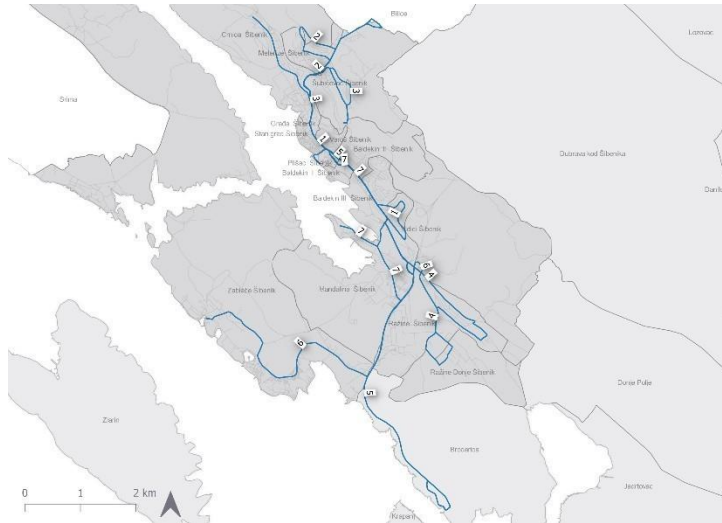
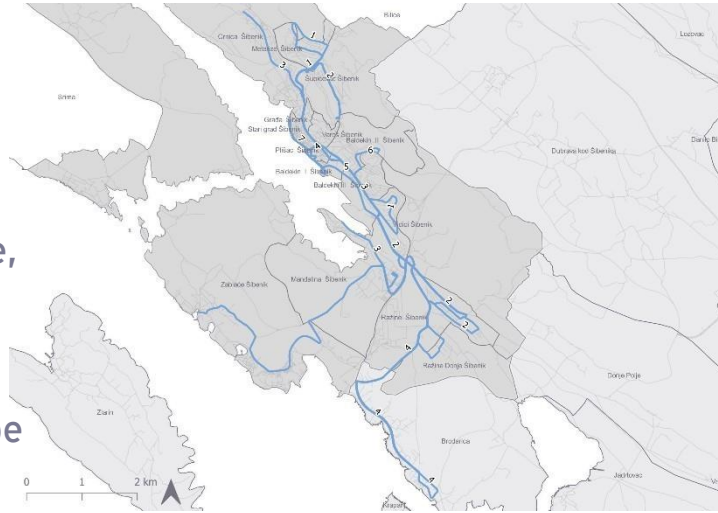
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Spatial analysis



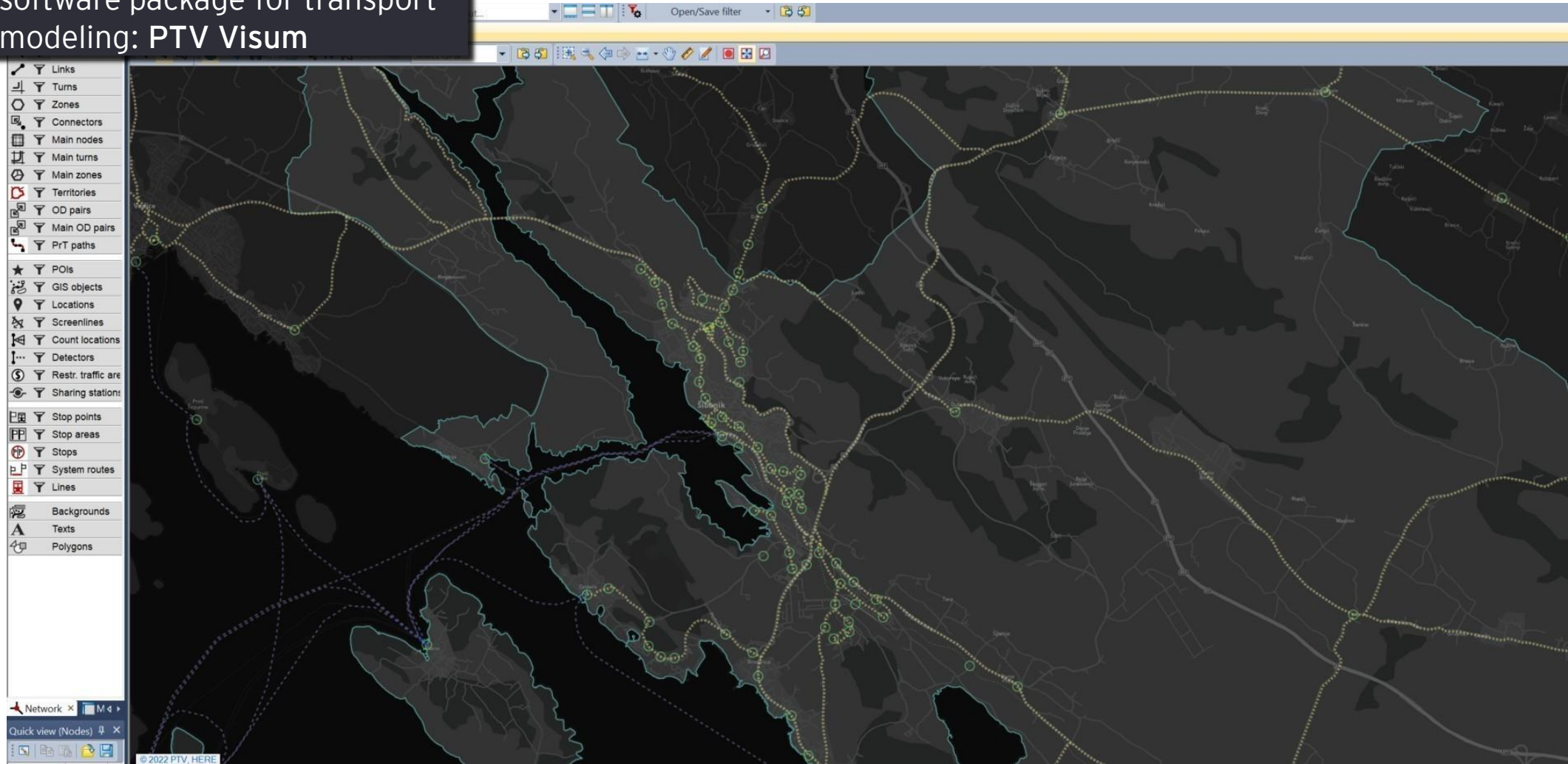
Planning of public transport lines

- 60 + variants
- Plan for new public transport stops
- Conditions for line planning:
 - density of attractors and demand generators,
 - directness and passability of the route,
 - optimal connection according to network theory
 - adequate use of the route - the corridors of the line routes must not be undercapacity.



System modeling

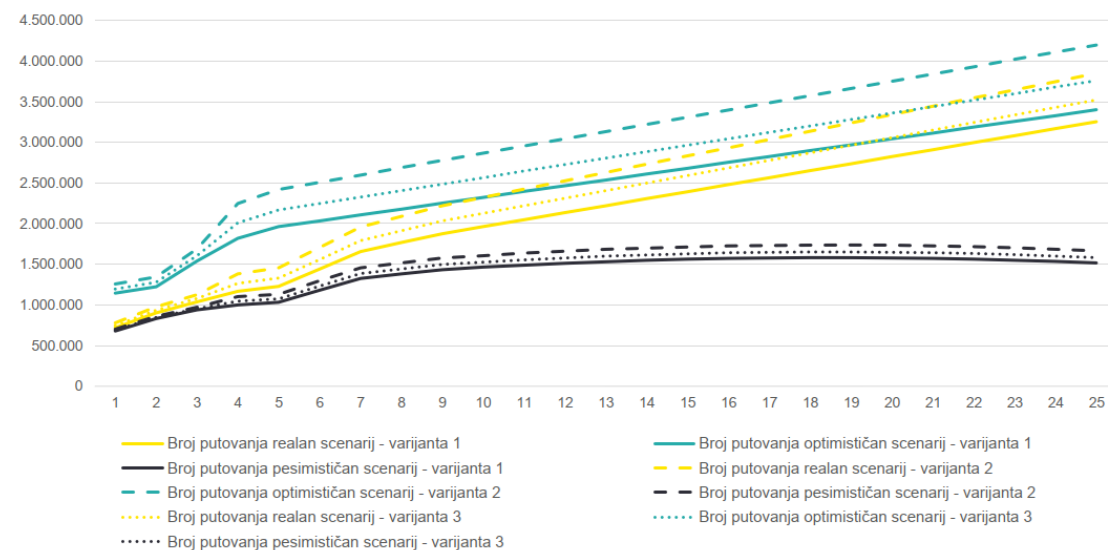
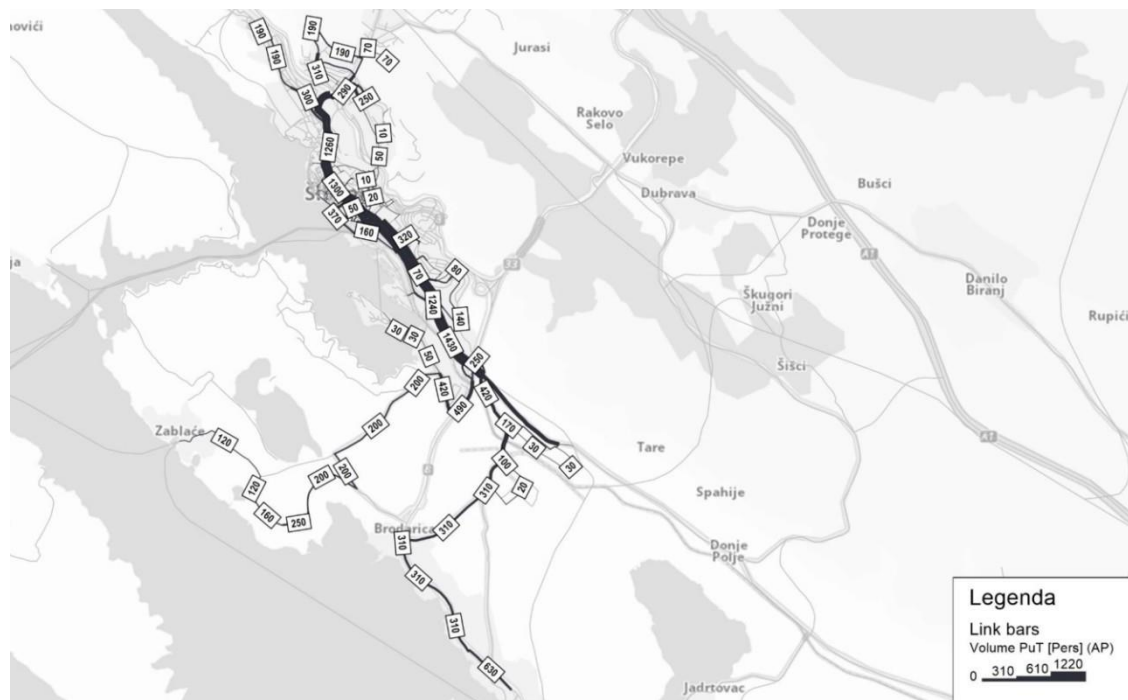
- software package for transport modeling: **PTV Visum**



Demand forecast

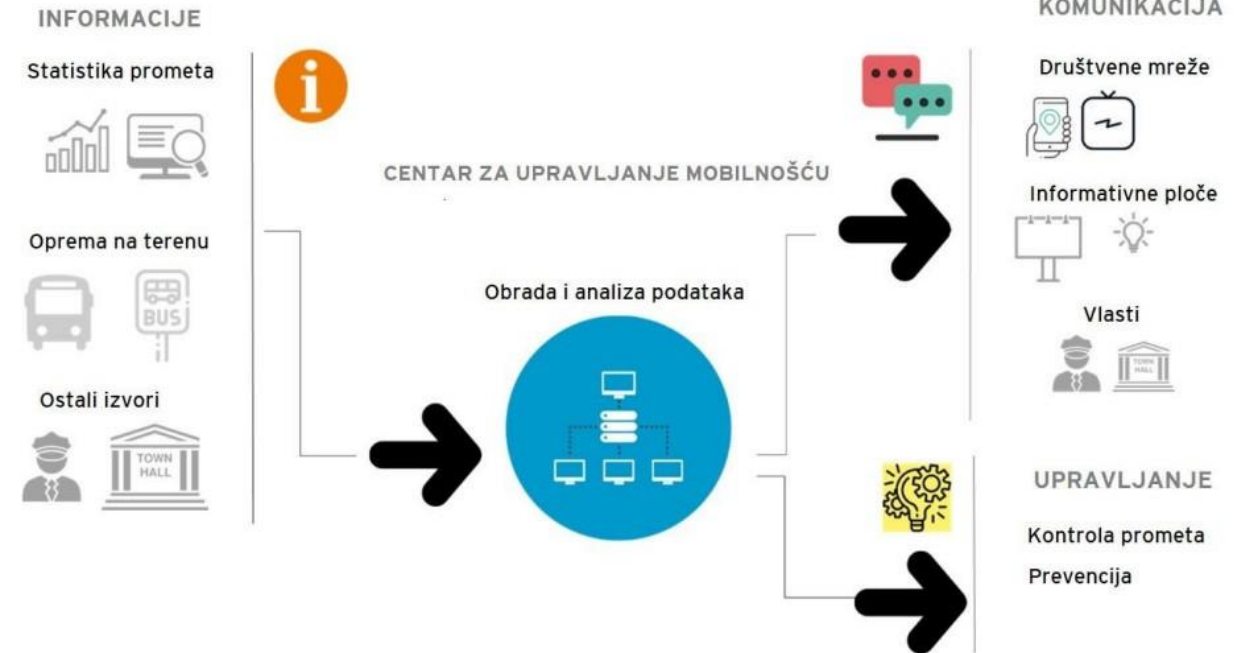
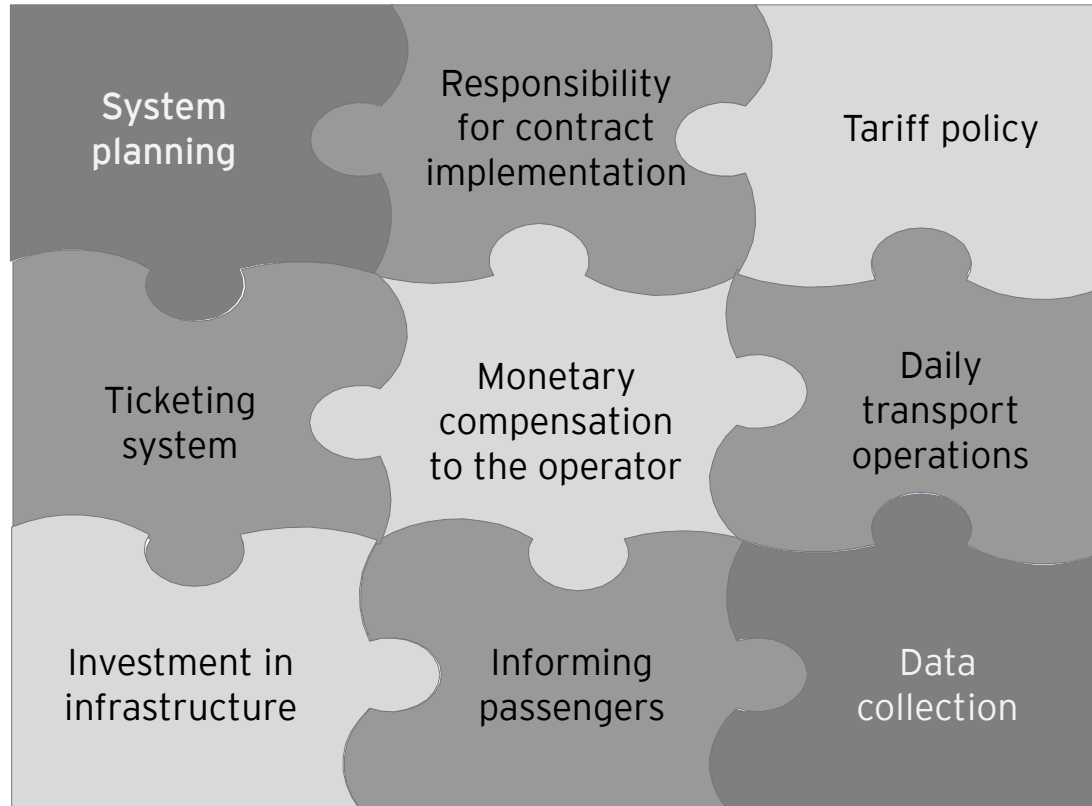


Ponderi	1G	2G	2.1G	2.2G
Uvođenje novih autobusa	5 %	5 %	5 %	5 %
Novi sustav informiranja	4 %	23 %	13 %	4 %
Integrirana karta u sustavu javnog prijevoza	0 %	3 %	0 %	0 %
Reorganizacija linija	0 %	16 %	16 %	16 %
Pojednostavljenje linija	0 %	26 %	26 %	26 %
Ukupno	9 %	73 %	60 %	51 %



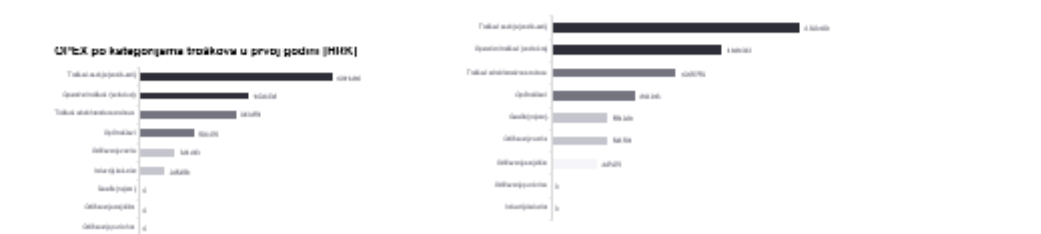
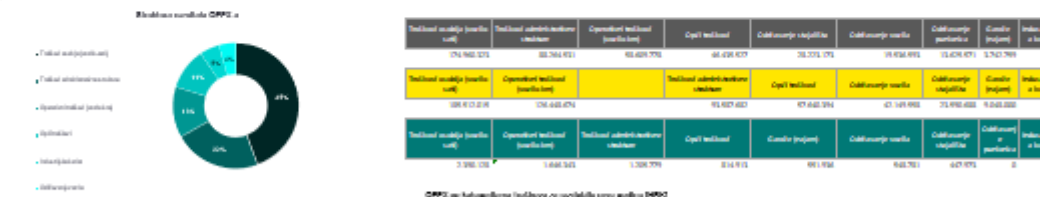
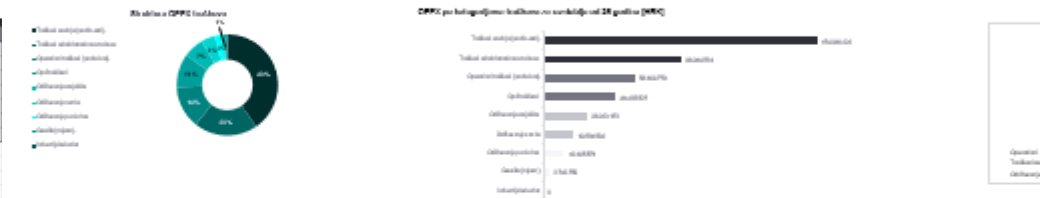
Operational management

Description of activities and responsibilities for:

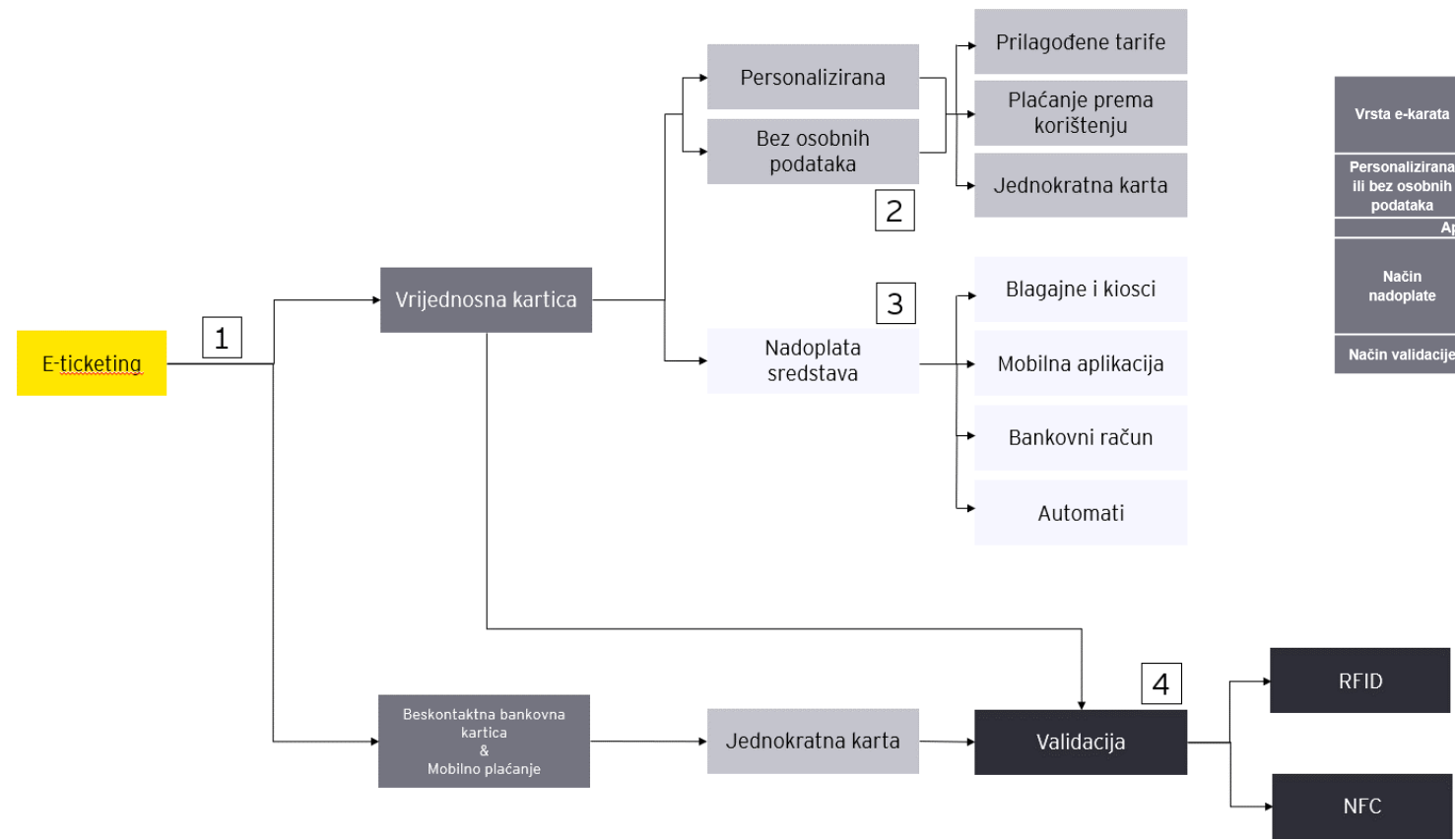


Costs of the new transportation system

JEDINIČNI TRKOVI		MIHAEL PETRIJAKI		OVO JE CIJENA IZ ČLANKA, 21MI I KN ZA 11 autobusa	
				https://biblioteka.skladnadmaterijala.hr/biblioteka/vijesti/banku/podjoko-se-glasna-nov-banku-vazni-park-11-risikopodnih-autobusa-na-ulicu-naseng-gradu-stano-d-ista-117519	
CAPEX					
Kupnja vozila		Cost in Kunas		Cost in Euros	
	Euro VI	1.909.090	kn/vozilo	253.195	€/vozilo
	Hibridno (sa izgaranjem + električni)	3.393.000	kn/vozilo	450.000	€/vozilo
	Električni	5.655.000	kn/vozilo	750.000	€/vozilo
Akumulatori za električna vozila					
	Zamjena akumulatora	1.131.000	kn/vozilo	150.000	€/vozilo
	Zivotni vijek	7	godina		
	Ulaganje u infrastrukturu za električna vozila	474.334	kn/godini vozilo	62.909	€/bilo koji
Oprema u autobusu					
	diranja karata, ITS, CCTV, sustav podrške za vozača	150.800	kn/vozilo	20.000	€/vozilo
Infrastruktura autobusnih stajališta					
	Trošak izvedbe stajališta (ut.)	59.118.000	kn/stajalištu	7.84	€/stajalište
Ostali troškovi					
	Informativna kampanja	377.000	kn	50.000	€
	Obuke	75.400	kn	10.000	€
OPEX					
Operativni troškovi					
	Potrošnja goriva i maziva (dizel)	3,56	kn/vozilo-km	0,472	€/veh-km
	Potrošnja goriva i maziva (električni)	1,03	kn/vozilo-km		
	Naknada vozačima (radna snaga)	68,0	kn/vozilo-god		
	Održavanje vozila (dizel)	1,2	kn/vozilo-km		
	Održavanje vozila (električni)	0,34	kn/vozilo-km		
	Održavanje stajališta i punionica	10%	% od CAPEX		
	Održavanje opreme vozila	10%	% od CAPEX		
Troškovi strukture poduzeća					
	Upravni odbor	15%	% resp. The drivers costs		
	Tehničko osoblje	30%	% resp. The drivers costs		
	Služba za korisnike	2%	% resp. The drivers costs		
	Čišćenje	4%	% resp. The drivers costs		
Ostali troškovi					
	Garaza (najam)	49.000,00	kn/year po vozilu	5.760	€/veh/year
	Izgradnja garaže	30.000.000,00	kn		
Industrijska korist					
	Javno poduzeće	0			
	Privatno poduzeće	6%			
Opći troškovi					
	Opći troškovi	12%	% od ukupnog OPEX-a		
Inflacija					
	Rast BDP-a (% yoy)	3%			
	% inflacije prethodnog BDP-a	0,80			
PRIHOD_GRADSKI					
Operativni troškovi					
	Prosječna vrijednost karte (BAZA)	6,75	kn/pax	0,895	€/veh-km
	Porez na javni prijevoz (dodatni trošak za korisnika)	10%			
	Prosječna vrijednost karte	6,13	kn/pax	0,813	€/veh-km
	Ostalo (komercijalno)	3%	extra income		
	Prosječna godišnje povećanje cijene karte	0%	extra income		
	Prosječna vrijednost karte u 15. godini	6,13	kn/pax		
OSTALO					
	Težak	7,54	kn/€		
Mogući odgovorni					
	Transport Operator				
	Public Administration				

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Ticketing system

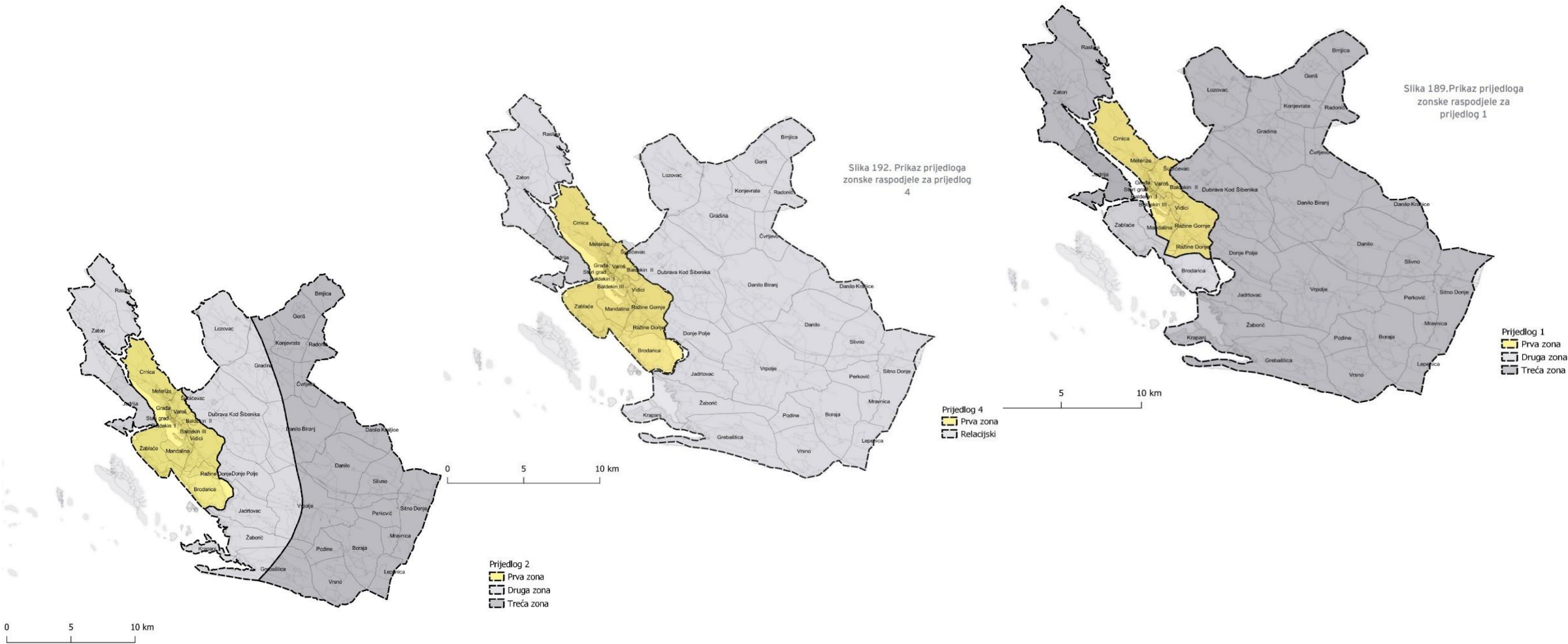


		Šibenik	London	Porto	Kopenh agen	Gijón	Barcelona	Singapur	Zagreb
Vrsta e-karta	Vrijednosna kartica	x	x		x	x	x	x	x
	Bankovna kartica ili mobilno plaćanje	x*	x	x			x		
Personalizirana ili bez osobnih podataka	Personalizirana				x	x	x	x	x
	Bez osobnih podataka	x	x						
Applikacija		x	x				x	x	
Način nadoplate	Automat		x		x	x	x	x	x
	Applikacija	x	x			x	x	x	
	Bankovni račun	x	x		x		x	x	
	Blagajne i ostala prodajna mjesta	x	x	x	x	x	x	x	x
Način validacije	RFID	x	x	x			x		
	NFC		x	x			x		

Grad	Cijena kartice	
	Lokalna valuta	Kuna (kn)
London (Oyster kartica)	5 £	43,39
Kopenhagen (Rejsekort)	35 kr	35,39
Gijón (Citizen kartica)	0 €	0
Barcelona (T-mobility)	4,5 €	33,85
Singapur (EZ-Link kartica)	10 S\$	51,61
Zagreb (Vrijednosna karta)	10 kn	10

Development of technical specifications for the ticketing system

Development of a new tariff system

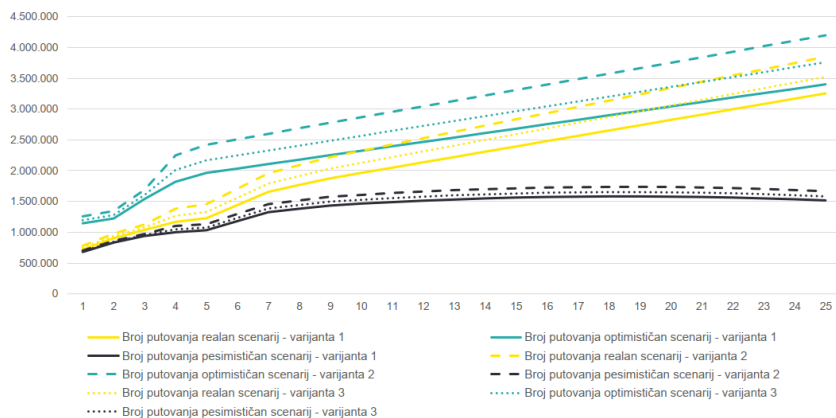




Passenger and revenue forecast

- Using multiple price and demand elasticity scenarios

short run	-0,25	-0,3	-0,1
long run	-0,6	-0,8	-0,3
utjecaj na potražnju			
short run (prve 3 godine)	Realan 9%	Optimističan 11%	Pesimističan 4%
long run (nakon 3 godine)	22%	29%	11%

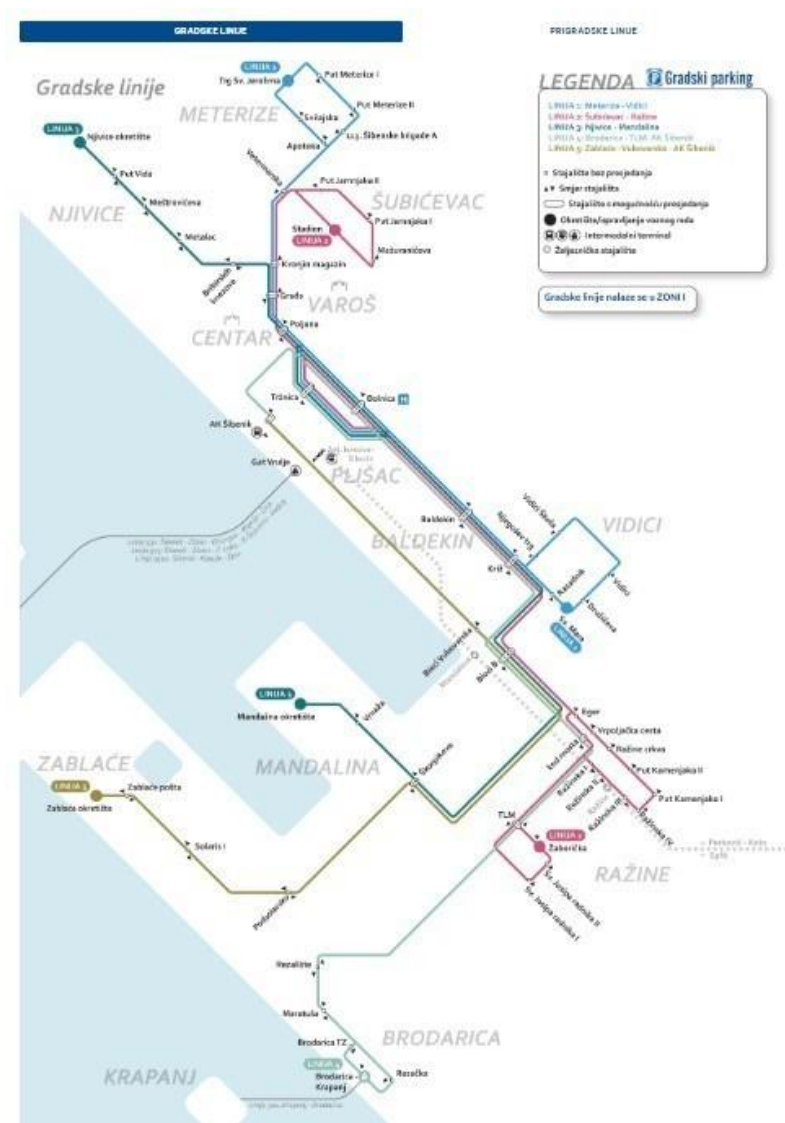


REZULTATI ZA PRIJEVOZNIKA_GRADSKI

Pozitivne vrijednosti označavaju prihod

Godina	Realan scenarij				Optimističan scenarij				Pesimističan scenarij			
	Potražnja nakon elasticiteta	Prihod od karata	Ostali prihod	UKUPNI PRIHOD	Potražnja nakon elasticiteta	Prihod od karata	Ostali prihod	UKUPNI PRIHOD	Potražnja nakon elasticiteta	Prihod od karata	Ostali prihod	UKUPNI PRIHOD
1	731.955	2.959.737 HRK	147.987 HRK	3.107.723 HRK	1.168.063	4.723.185 HRK	236.159 HRK	4.959.344 HRK	684.155	2.766.453 HRK	138.323 HRK	2.904.775 HRK
2	915.750	3.702.931 HRK	185.147 HRK	3.888.078 HRK	1.248.246	5.047.414 HRK	252.371 HRK	5.299.785 HRK	838.479	3.390.479 HRK	169.524 HRK	3.560.003 HRK
3	1.056.500	4.272.068 HRK	213.603 HRK	4.485.671 HRK	1.569.921	6.348.139 HRK	317.407 HRK	6.665.546 HRK	947.199	3.830.100 HRK	191.505 HRK	4.021.605 HRK
4	1.094.031	4.423.830 HRK	221.192 HRK	4.645.022 HRK	1.906.964	7.711.010 HRK	385.551 HRK	8.096.561 HRK	1.022.019	4.132.640 HRK	206.632 HRK	4.339.272 HRK
5	1.274.421	5.153.253 HRK	257.663 HRK	5.410.916 HRK	2.055.167	8.310.284 HRK	415.514 HRK	8.725.798 HRK	1.051.256	4.250.866 HRK	212.543 HRK	4.463.410 HRK
6	1.495.741	6.048.186 HRK	302.409 HRK	6.350.595 HRK	2.130.497	8.614.889 HRK	430.744 HRK	9.045.633 HRK	1.206.403	4.878.218 HRK	243.911 HRK	5.122.129 HRK
7	1.717.061	6.943.118 HRK	347.156 HRK	7.290.274 HRK	2.205.827	8.919.493 HRK	445.975 HRK	9.365.468 HRK	1.353.436	5.472.761 HRK	273.638 HRK	5.746.399 HRK
8	1.831.956	7.407.705 HRK	370.385 HRK	7.778.090 HRK	2.281.157	9.224.098 HRK	461.205 HRK	9.685.303 HRK	1.410.417	5.703.171 HRK	285.159 HRK	5.988.330 HRK
9	1.946.850	7.872.292 HRK	393.615 HRK	8.265.906 HRK	2.356.487	9.528.702 HRK	476.435 HRK	10.005.138 HRK	1.463.187	5.916.549 HRK	295.827 HRK	6.212.376 HRK
10	2.036.049	8.232.980 HRK	411.649 HRK	8.644.629 HRK	2.431.817	9.833.307 HRK	491.665 HRK	10.324.972 HRK	1.492.903	6.036.712 HRK	301.836 HRK	6.338.548 HRK
11	2.125.249	8.593.668 HRK	429.683 HRK	9.023.351 HRK	2.507.147	10.137.912 HRK	506.896 HRK	10.644.807 HRK	1.519.350	6.143.652 HRK	307.183 HRK	6.450.834 HRK
12	2.214.449	8.954.356 HRK	447.718 HRK	9.402.074 HRK	2.582.477	10.442.516 HRK	522.126 HRK	10.964.642 HRK	1.542.526	6.237.368 HRK	311.868 HRK	6.549.237 HRK
13	2.303.648	9.315.044 HRK	465.752 HRK	9.780.796 HRK	2.657.807	10.747.121 HRK	537.356 HRK	11.284.477 HRK	1.562.433	6.317.861 HRK	315.893 HRK	6.633.754 HRK
14	2.392.848	9.675.732 HRK	483.787 HRK	10.159.519 HRK	2.733.137	11.051.726 HRK	552.586 HRK	11.604.312 HRK	1.579.069	6.385.130 HRK	319.257 HRK	6.704.387 HRK
15	2.482.048	10.036.420 HRK	501.821 HRK	10.538.241 HRK	2.808.467	11.356.330 HRK	567.817 HRK	11.924.147 HRK	1.592.434	6.439.176 HRK	321.959 HRK	6.761.135 HRK
16	2.571.247	10.397.109 HRK	519.855 HRK	10.916.964 HRK	2.883.797	11.660.935 HRK	583.047 HRK	12.243.982 HRK	1.602.530	6.479.999 HRK	324.000 HRK	6.803.999 HRK
17	2.660.447	10.757.797 HRK	537.890 HRK	11.295.687 HRK	2.959.127	11.965.539 HRK	598.277 HRK	12.563.816 HRK	1.609.355	6.507.598 HRK	325.380 HRK	6.832.977 HRK
18	2.749.646	11.118.485 HRK	555.924 HRK	11.674.409 HRK	3.034.456	12.270.144 HRK	613.507 HRK	12.883.651 HRK	1.612.910	6.521.973 HRK	326.099 HRK	6.848.072 HRK
19	2.838.846	11.479.173 HRK	573.959 HRK	12.053.132 HRK	3.109.786	12.574.749 HRK	628.737 HRK	13.203.486 HRK	1.613.195	6.523.125 HRK	326.156 HRK	6.849.281 HRK
20	2.928.046	11.839.861 HRK	591.993 HRK	12.431.854 HRK	3.185.116	12.879.353 HRK	643.968 HRK	13.523.321 HRK	1.610.210	6.511.054 HRK	325.553 HRK	6.836.606 HRK
21	3.017.245	12.200.549 HRK	610.027 HRK	12.810.577 HRK	3.260.446	13.183.958 HRK	659.198 HRK	13.843.156 HRK	1.603.955	6.485.759 HRK	324.288 HRK	6.810.047 HRK
22	3.106.445	12.561.237 HRK	628.062 HRK	13.189.299 HRK	3.335.776	13.488.563 HRK	674.428 HRK	14.162.991 HRK	1.594.429	6.447.240 HRK	322.362 HRK	6.769.603 HRK
23	3.195.645	12.921.925 HRK	646.096 HRK	13.568.022 HRK	3.411.106	13.793.167 HRK	689.658 HRK	14.482.826 HRK	1.581.633	6.395.499 HRK	319.775 HRK	6.715.274 HRK
24	3.284.844	13.282.614 HRK	664.131 HRK	13.946.744 HRK	3.486.436	14.097.772 HRK	704.889 HRK	14.802.661 HRK	1.565.567	6.330.533 HRK	316.527 HRK	6.647.060 HRK
25	3.374.044	13.643.302 HRK	682.165 HRK	14.325.467 HRK	3.561.766	14.402.377 HRK	720.119 HRK	15.122.495 HRK	1.546.230	6.252.345 HRK	312.617 HRK	6.564.962 HRK
avg	2.213.800	8.951.735 HRK	447.587	9.399.322 HRK	2.594.840	10.492.507 HRK	524.625	11.017.133 HRK	1.408.211	5.694.250 HRK	284.713	5.978.963 HRK

New passenger information system



Gradski parking

SHOP

O nama Projekti Servisi i usluge Informacije Prigovori i reklamacije Aktualnosti Kontakt

HR

30.08.2022, 15:30h

Od prvog rujna s probnim radom kreće novi sustav javnog gradskog prijevoza

U četvrtak, 1. rujna u Šibeniku s radom započinje novi sustav javnog gradskog prijevoza. Tijekom probnog razdoblja koje će trajati mjesec dana, vožnja će za građane biti besplatna.

Saznajte više

JAVNI GRADSKI PRIJEVOZ

Planiranje putovanja

Unesite početnu lokaciju

Unesite željeno odredište

PREDLOŽI OPĆUE

JAVNA PARKIRALIŠTA

Autobusni kolodvor Šibenik

Prijevoz robe u gradskoj jezgri

Brodska linija 501 Brodarica-Krapanj

New passenger information system



RED VOŽNJE GRADSKIH LINIJA

LINIJAR BR. 1 NJIVICE - TRŽNICA - VIDICI - NJIVICE

Njivice - Tržnica - Vidici	6:15	7:15	8:15	10:15	12:15	13:15	14:15	15:15	16:15	18:15	20:15	21:15
Tržnica - Vidici	6:25	7:25	8:25	10:25	12:25	13:25	14:25	15:25	16:25	18:25	20:25	21:25
Vidici - Kazalište - Njivice	6:35	7:35	8:35	10:35	12:35	13:35	14:35	15:35	16:35	18:35	20:35	21:35
Kazalište - Njivice	6:45	7:45	8:45	10:45	12:45	13:45	14:45	15:45	16:45	18:45	20:45	21:45
Njivice - Tržnica - Vidici	6:05	7:05	10:05	12:05	13:05	15:05	17:05	19:05	21:05			
Tržnica - Vidici	6:15	7:15	10:15	12:15	13:15	15:15	17:15	19:15	21:15			
Vidici - Kazalište - Njivice	6:40	7:40	10:40	12:40	13:40	15:40	17:40	19:40	21:40			
Kazalište - Njivice	6:50	7:50	10:50	12:50	13:50	15:50	17:50	19:50	21:50			
Njivice - Tržnica - Vidici	7:20	11:20	14:20	17:20	21:20							
Tržnica - Vidici	7:30	11:30	14:30	17:30	21:30							
Vidici - Kazalište - Njivice	7:55	11:55	14:55	17:55	21:55							
Kazalište - Njivice	8:05	12:05	15:05	18:05	22:05							

LINIJAR BR. 2 METERIZE - TRŽNICA - METERIZE

Tržnica - Meterize		7:15	9:15	10:30	11:30	13:15	14:15	15:15	16:15	18:15	19:15	20:15	21:15
Meterize - Tržnica	6:30	7:30	9:30	10:45	11:45	13:30	14:30	15:30	16:30	18:30	19:30	20:30	21:30
Tržnica - Meterize		7:15	9:15	11:15	13:15	15:15	18:15	20:15	21:15				
Meterize - Tržnica	6:30	7:30	9:30	11:30	13:30	15:30	18:30	20:30	21:30				
Tržnica - Meterize	7:00	11:00	14:00	17:00	21:00								
Meterize - Tržnica	7:15	11:15	14:15	17:15	21:15								

Vrijedi od 28. lipnja 2021.



LINIJAR 1: METERIZE - VIDICI

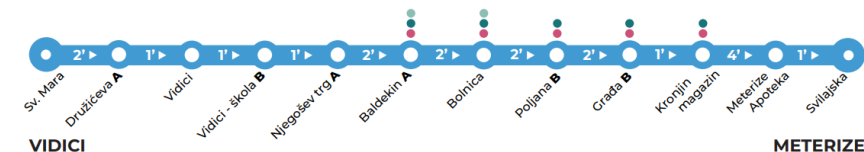


METERIZE Svilaška

PONEDJELJAK - SUBOTA	6:20	7:20	8:20	9:20	10:20	11:20	12:20	13:20	14:20	15:20	16:20	17:20	18:20	19:20	20:20	21:20
NEDJELJOM	6:30	7:30	8:30	9:30	10:30	11:30	12:30	13:30	14:30	15:30	16:30	17:30	18:30	19:30	20:30	

VIDICI Sv. Mara

PONEDJELJAK - PETAK	5:50	6:50	7:50	8:50	9:50	10:50	11:50	12:50	13:50	14:50	15:50	16:50	17:50	18:50	19:50	20:50	21:50
SUBOTOM	5:50	6:50	7:50	8:50	9:50	10:50	11:50	12:50	13:50	14:50	15:50	16:50	17:50	18:50	19:50	20:50	
NEDJELJOM	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00		



LINIJAR 3: NJIVICE - MANDALINA

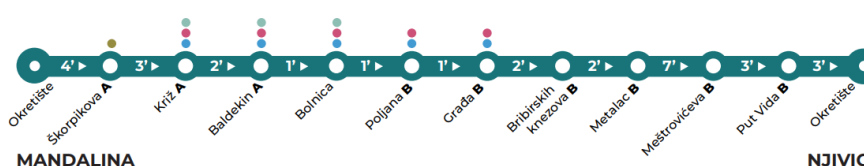


NJIVICE Okretišće

PONEDJELJAK - SUBOTA	6:30	7:30	8:30	9:30	10:30	11:30	12:30	13:30	14:30	15:30	16:30	17:30	18:30	19:30	20:30	21:30
NEDJELJOM	7:30	8:30	9:30	10:30	11:30	12:30	13:30	14:30	15:30	16:30	17:30	18:30	19:30	20:30	21:30	

MANDALINA Okretišće

PONEDJELJAK - SUBOTA	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00
NEDJELJOM	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	

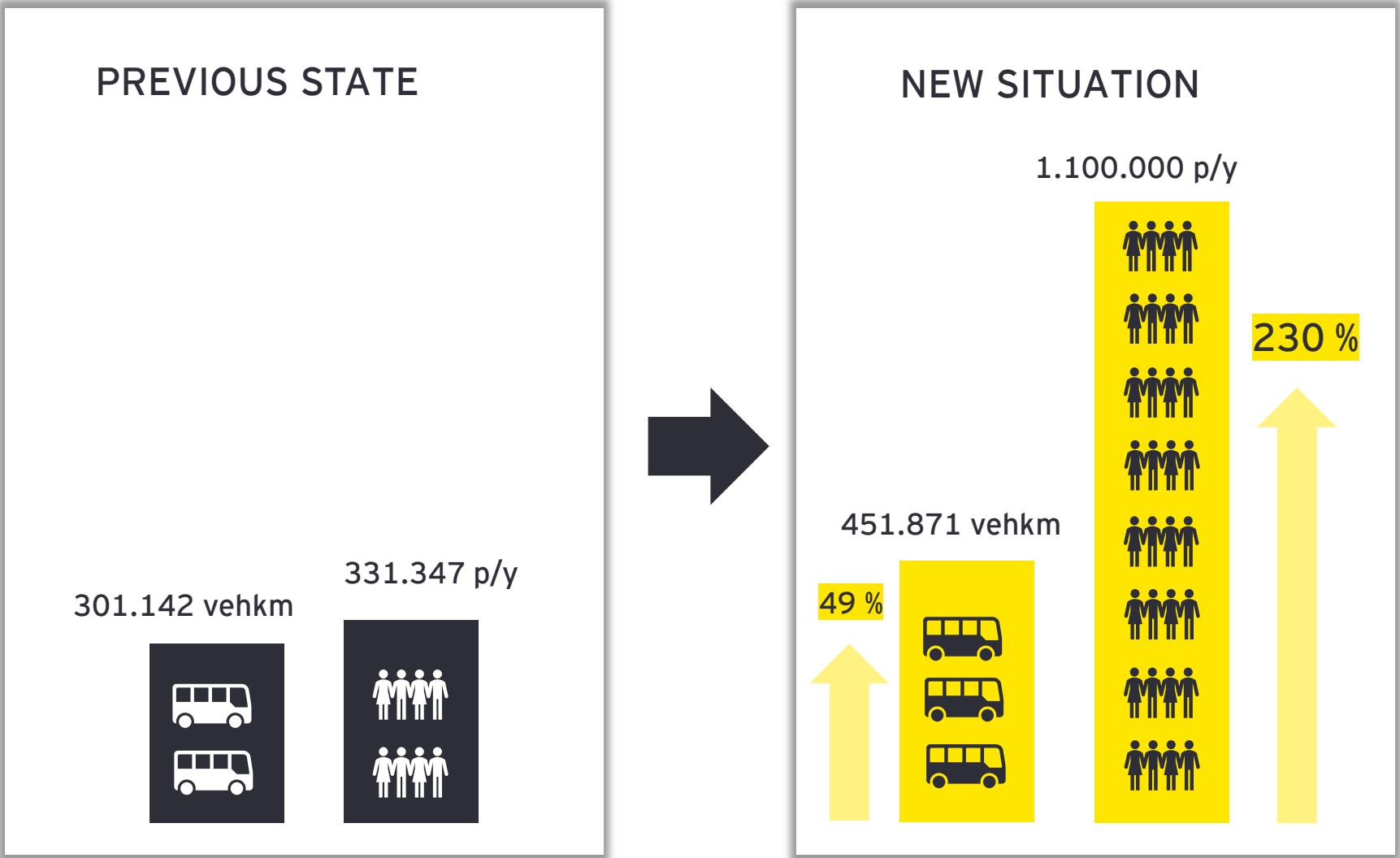


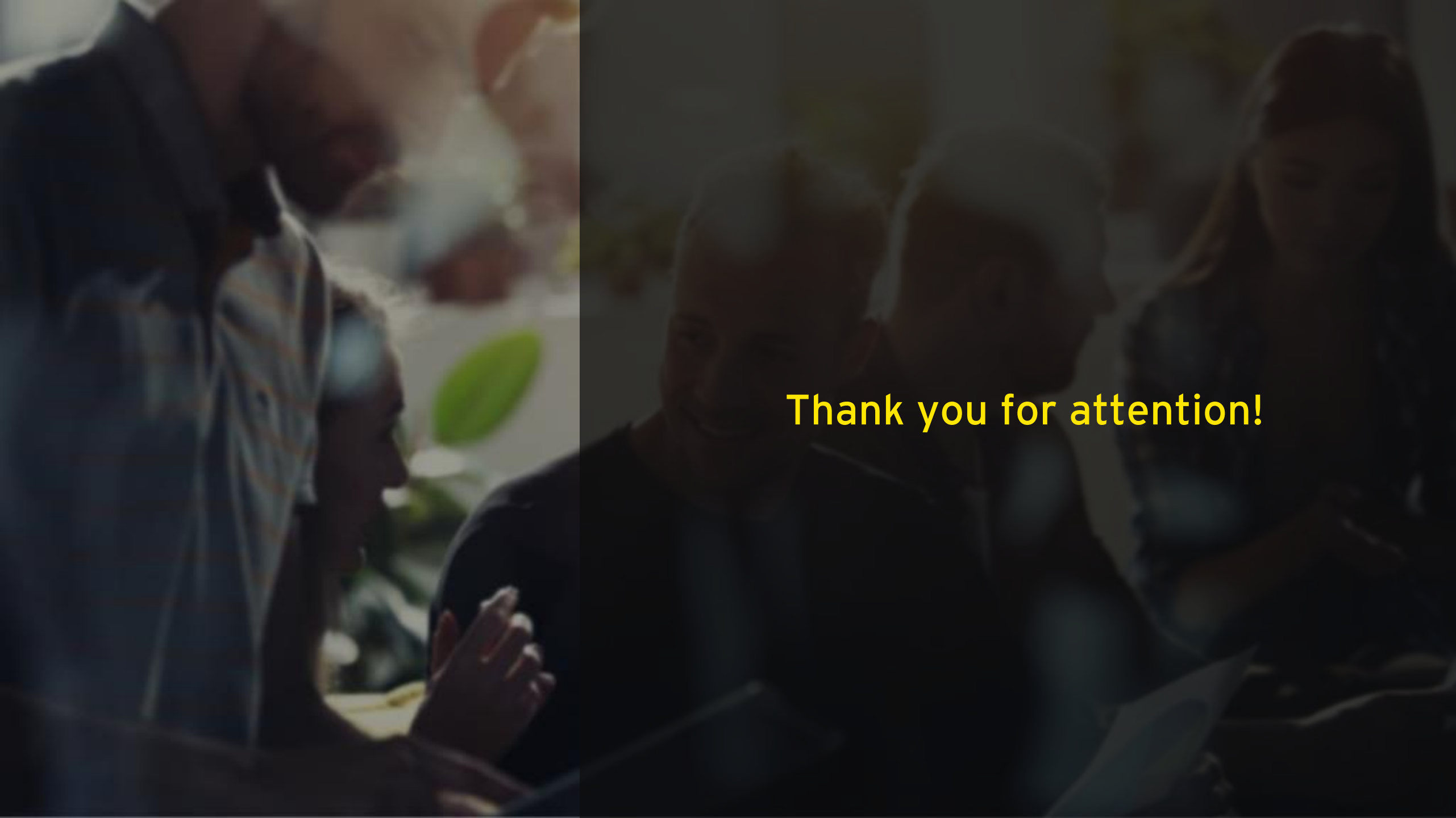
New passenger information system

- Creation of GTFS data ready for uploading to the Google Maps service and for connecting to new info screens



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