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Network of Spatial Research and Planning
in Central, Eastern and South Eastern Europe

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GREEN INFRASTRUCTURE IN CENTRAL, EASTERN AND SOUTH EASTERN EUROPE:
A UNIVERSAL SOLUTION TO CURRENT ENVIRONMENTAL AND SPATIAL CHALLENGES?

SPATIAL FACTORS AS OPPORTUNITY OR RISK FOR LIFE QUALITY OF URBAN INHABITANTS

Lestan Katarina Ana, Ph.D. researcher

Prof. dr. Mojca Golobič, supervisor, University of Lj., Biotechnical Faculty, Department of Landscape Architecture

Prof. dr. prim. Ivan Eržen, MD, co-supervisor, National institute for public health, Slovenia



Introduction



Introduction



SPATIAL FACTORS AS OPPORTUNITY OR RISK FOR LIFE QUALITY OF URBAN INHABITANTS

Katarina Ana Lestan
Mojca Golobič
Ivan Erzen



Introduction

Slovenia in Europe



Ljubljana: the capital city

Source: Google Maps



Introduction

Ljubljana: small city



nature and urban tissue are interwoven.



Theoretic background

- Issue: children and the elderly - directly dependent of the proximity of green open areas



- Vulnerable users: local green areas cannot be substituted by green areas in other parts of the city



Theoretic background

- Modern way of life
- indoor air: chemicals, nano-particles, microorganisms, electro smog, etc.



- Spending time indoors / time spent outside



Research question & Methodology

PLANNING & PUBLIC HEALTH SCIENCE

- Post transition collective residential developments have poor open/green space.
- Lack of open/green space has an impact on its use and consequently on the health related life-style of inhabitants.

Empirical study of a set of residential areas (pre- vs. post transition)

1. Analysis and evaluation of residential areas
2. Behavioural observations and mapping
3. Opinion survey of residents - Questionnaire



Selection of residential areas



eight residential areas in Ljubljana;

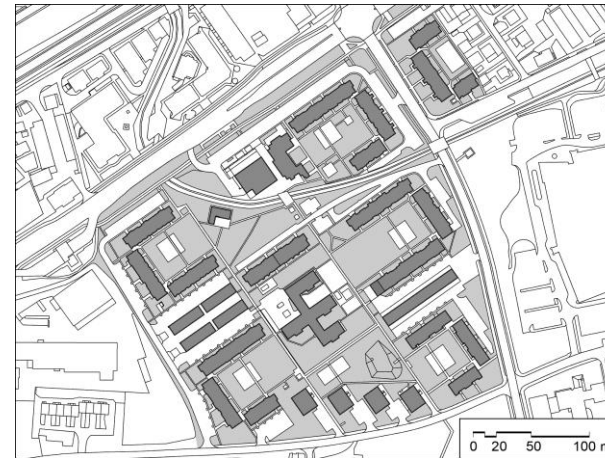
4 post transition (Nova Grbina, Viška Sončava, Celovški Dvori and Mesarska),

4 pre transition „residential estates“ (VS4 – Bonifacija, BS3 v Bežigradu, ŠS6 v Šiški and Trnovska Soseska VS1).



1. Analysis and evaluation of residential areas

- Based on maps, layouts and field visits;
- residential areas spatial layouts/selected parameters/ were evaluated in reference to urban standards and guidelines (if existing) and compared between the areas



Legend:
■ buildings
□ green areas
□ other open areas

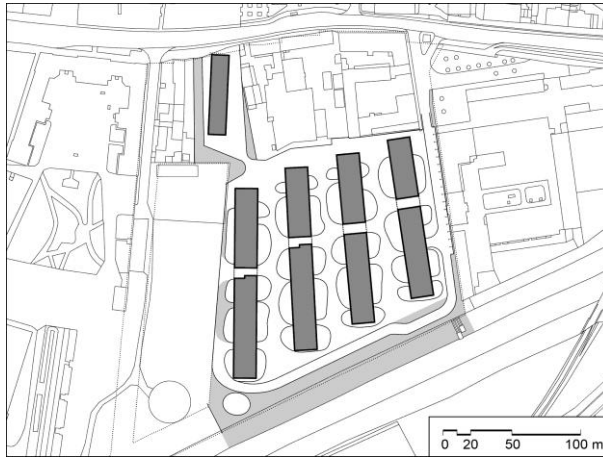
5 areas (4 + 1) were selected for further analysis



Bonifacija – VS4



1. Analysis and evaluation of residential areas



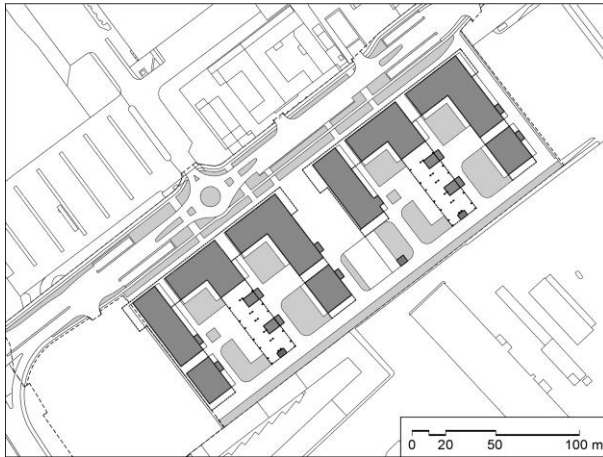
- Legend:
- buildings
 - green areas
 - other open areas



Mesarska



1. Analysis and evaluation of residential areas



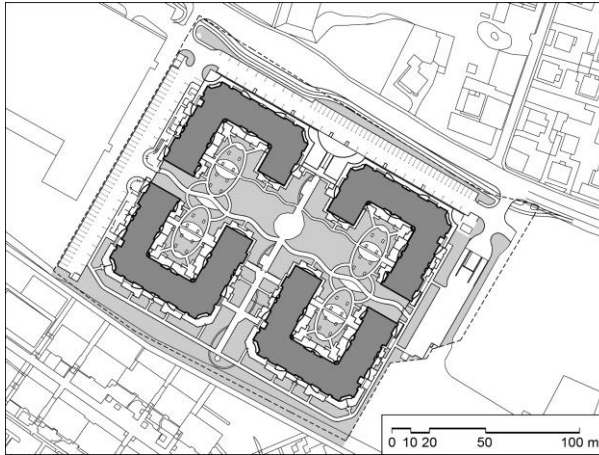
Legend:
■ buildings
■ green areas
□ other open areas



Celovški dvori



1. Analysis and evaluation of residential areas

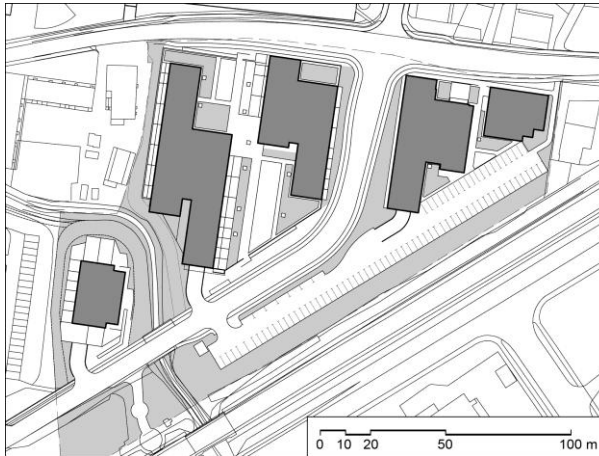


Legend:

- buildings
- green areas
- other open areas



1. Analysis and evaluation of residential areas



- Legend:
- buildings
 - green areas
 - other open areas



1. Results: evaluation of residential areas

MEASURE	INDICATOR	TYPE OF MEASUREMENT	NOVA GRBINA	VIŠKA SONČAVA	CELOVŠKI DVORI	MESARSKA	VS4 BONIFACIJA	REFERENCE VALUE	
			VALUE						
RESIDENTIAL AREA	surface area	m ²	30.700,1	20.443,54	24.364,42	30.299,44	83.744,53	comparison	
	number of all residential units	number	316	248	833	688	904	comparison	
	number of occupied apartments	number	241	132	190	396	759	comparison	
	number of residents	number	543	342	526	799	1613	comparison	
	building height	gross ground floor + floors (mansard)	from 3 to 10 floors	from 3 to 10 floors	from 3 to 10 floors	from 3 to 10 floors	from 3 to 10 floors	comparison	
	FSI - floor space index	gross floor surface area / site surface area		1,14	1,17	2,79	1,8	0,68	depending on the number of floors
	site coverage	gross ground floor surface area / site surface area		0,33	0,41	0,27	0,3	0,20	comparison
EQUIPMENT	grocery shop	shop / number of residents	0	0	0	2	1	average	
		m	257,0	415,0	360,0	across the street	0	average	
		m ²	1226,8	515,2	350	556	1867		
	children's playgrounds	m ² / number of residents	2,3	1,51	0,67	0,7	1,16	2,4 m ² / resident or 0,023 m ²	
		m ²			393		658	m ² / resident	
sports facilities	m ² / number of residents	0	0	0,75	0	0,41	2,88 m ² / resident		
car park areas	number of parking places / apartment	1,8	1,5	2	2	0,9	1,5 parking spaces / apartment		
OPEN AND GREEN AREAS	all open areas	m ²	20.669,51	12115,06	14284,42	20959,14	66946,51	comparison	
	functional areas (excluding private ground floor atrium gardens, roads and external car park areas)	m ² / number of residents	8.438,6	6829,84	12976,17	14849,14	47557,51	comparison	
		m ² / residential unit	15,54	19,97	24,67	18,58	29,48	5 m ² - 15 m ² / resident, minimum 15 m ² / residential unit	
	passive areas (atriums, private use)	m ² / number of residents	2.426,09	1182,38	1308,25	6110	5190	comparison	
	larger green areas	distance in	Rožnik hill: 693	Rožnik hill: 85	Rožnik hill: 204 m	Golovec hill: 70	Rožnik hill: 277	comparison	

NUMBERS DO NOT SAY EVERYTHING!

SPATIAL FACTORS AS OPPORTUNITY OR RISK FOR LIFE QUALITY OF URBAN INHABITANTS

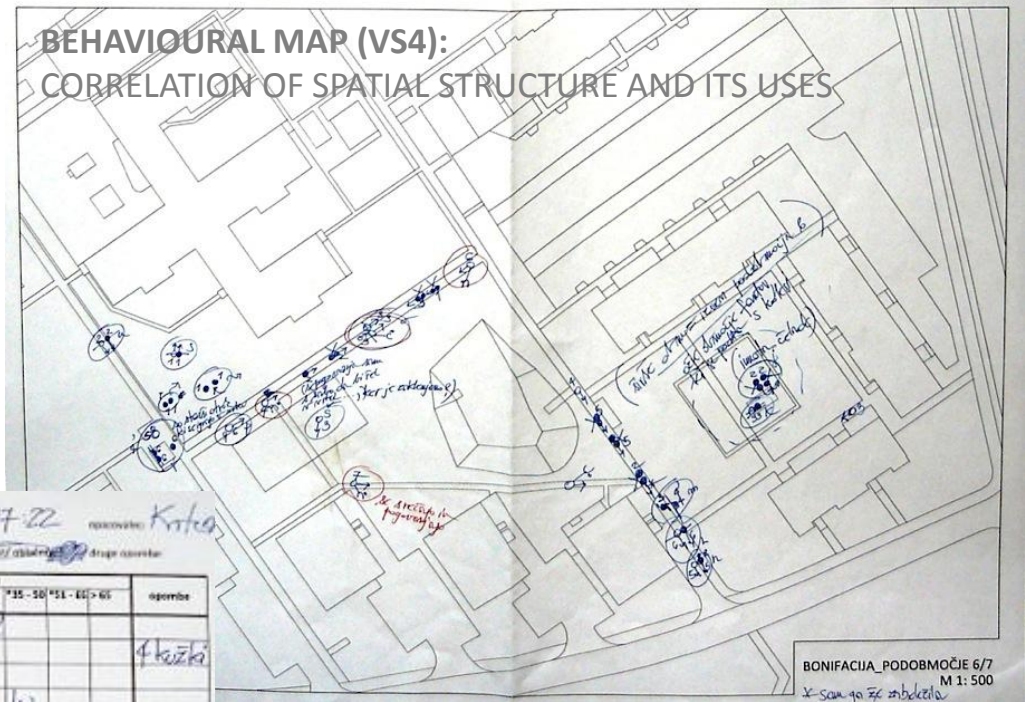
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2. Observations & behavioural mapping

Numerical data show only a partial version of the situation . . .

BEHAVIOURAL MATRIC (VS4):
QUANTITATIVE DESCRIPTION TOOL OF INDIVIDUAL ACTIVITIES



Vrednotna matrika
stanovske razpore: *oc* početnik: *5* datum: *28.9.* čas: *17-22* razpisatelj: *Kofca*
stanovske razpore: *oc* temperatura: *18°C* vrsta: vrsta/ovlaževanje: drugi opombe:

dejavnost	Dan							Noč							opombe			
	0-5	6-12	13-19	20-24	25-30	31-05	05-05	0-5	6-12	13-19	20-24	25-30	31-05	05-05				
S PISOM			<i>1a</i>	<i>1a</i>														
E NOKI S PSI			<i>1a</i>	<i>1a</i>														<i>4 kofice</i>
KOLESI																		
OTROBI	<i>1a</i>																	
NOVA KI SE	<i>1a</i>																	<i>1a</i>
NOVA PRI KOF																		
S PISOH			<i>1a</i>															
S KOLESI			<i>1a</i>															
HSDITI			<i>1a</i>															
Kolo																		
TEK V IGR																		
NOVA S PISOM																		

starostni razred 1 2 3 4 5 6 7 1 2 3 4 5 6 7

čas: 1= manj kot 1min., 2= 1-2min., 3= 2-5min., 4= več kot 5min., čas posameznega opazovanja: 10minut

. . . objective descriptions of residential areas were complemented using the method of observations and behavioural mapping.

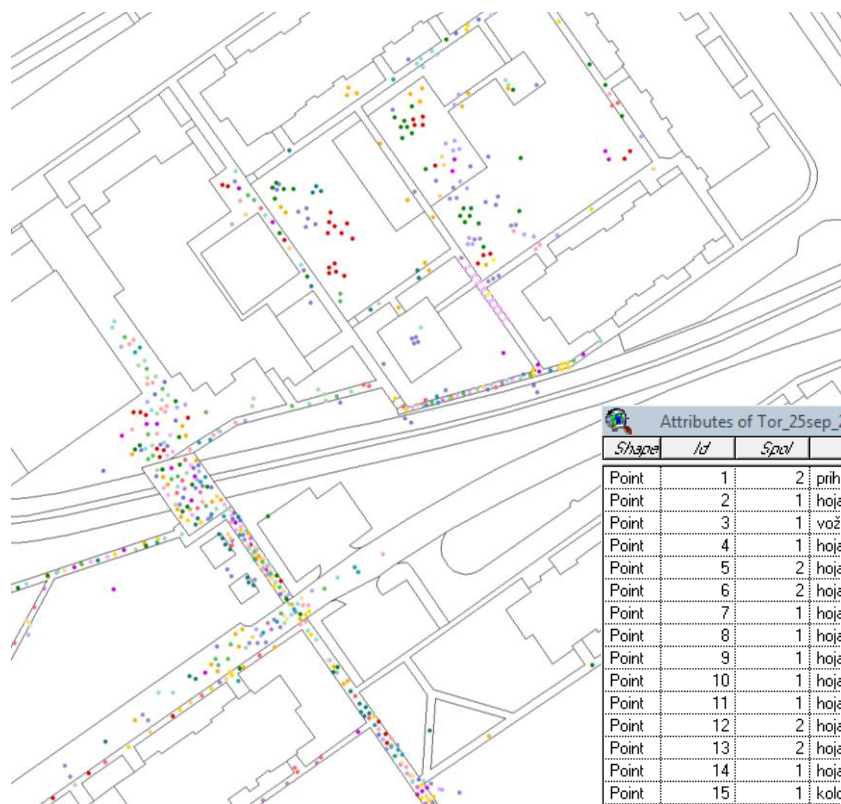


2. Observations & behavioural mapping

The field work observations → data transfer into a digital Geographical Information System

Every data input - parameters within the following categories: SEX, ACTIVITY, CATEGORY OF ACTIVITY, AGE, DURATION, TIME OF DAY, PART OF THE WEEK, TEMPERATURE, WIND, AIR HUMIDITY, CLEAR OR OVERCAST SKY, AND DATE.

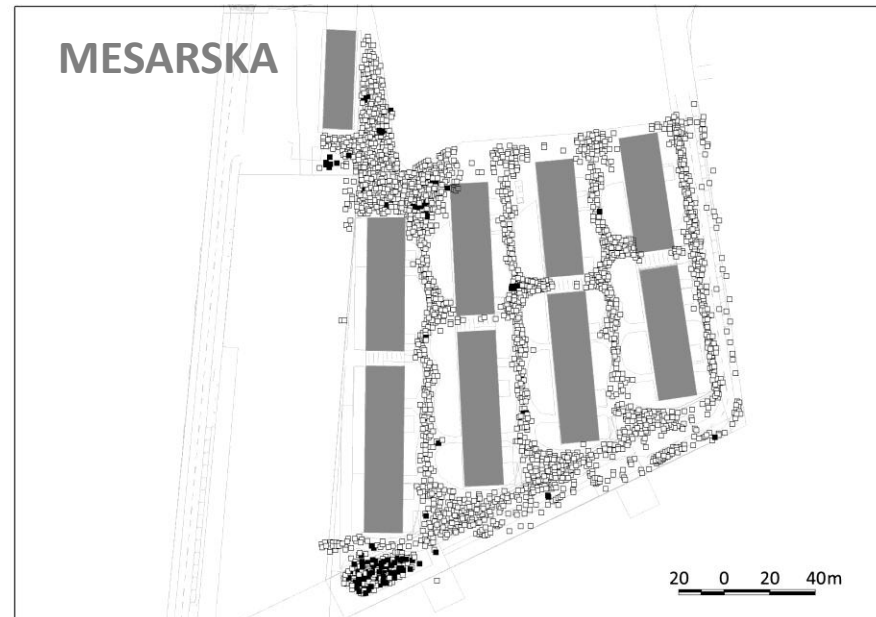
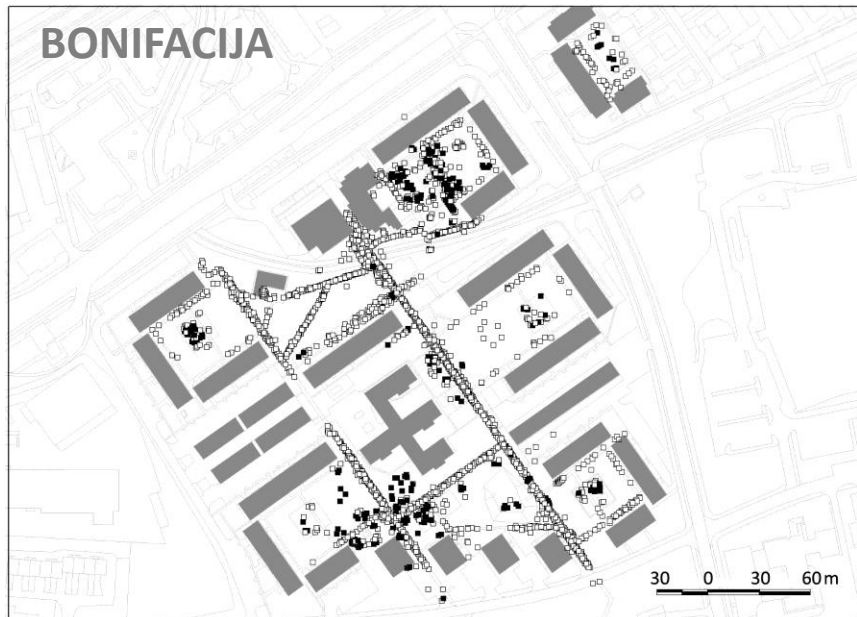
The database - data manipulation and graphically presenting the observed activities according to chosen categories



Shape	Id	Spol	Aktivnost	Kat_akt	Starost	Trajanje	Del_dneva	Del_tedna	Temp	Veter	Vlaga	Son_obs	Datum
Point	1	2	prihod	2	3	0	2	1	4	3	1	2	25.9.
Point	2	1	hoja-otr kolo	2	5	0	2	1	4	3	1	2	25.9.
Point	3	1	voznja s kolesom	2	1	0	2	1	4	3	1	2	25.9.
Point	4	1	hoja	2	4	0	2	1	4	3	1	2	25.9.
Point	5	2	hoja	2	5	0	2	1	4	3	1	2	25.9.
Point	6	2	hoja-otr voz	2	6	0	2	1	4	3	1	2	25.9.
Point	7	1	hoja skupaj	2	4	0	2	1	4	3	1	2	25.9.
Point	8	1	hoja skupaj	2	4	0	2	1	4	3	1	2	25.9.
Point	9	1	hoja skupaj	2	4	0	2	1	4	3	1	2	25.9.
Point	10	1	hoja skupaj	2	4	0	2	1	4	3	1	2	25.9.
Point	11	1	hoja v paru	2	7	0	2	1	4	3	1	2	25.9.
Point	12	2	hoja v paru	2	7	0	2	1	4	3	1	2	25.9.
Point	13	2	hoja	2	6	0	2	1	4	3	1	2	25.9.
Point	14	1	hoja	2	4	0	2	1	4	3	1	2	25.9.
Point	15	1	kolo_skoki	3	3	1	2	1	4	3	1	2	25.9.
Point	16	1	hoja skupaj	2	3	0	2	1	4	3	1	2	25.9.
Point	17	1	hoja skupaj	2	3	0	2	1	4	3	1	2	25.9.
Point	18	1	kolesarjenje	2	6	0	2	1	4	3	1	2	25.9.



2. Results: observations & behavioural mapping



Graphical presentation by the filter

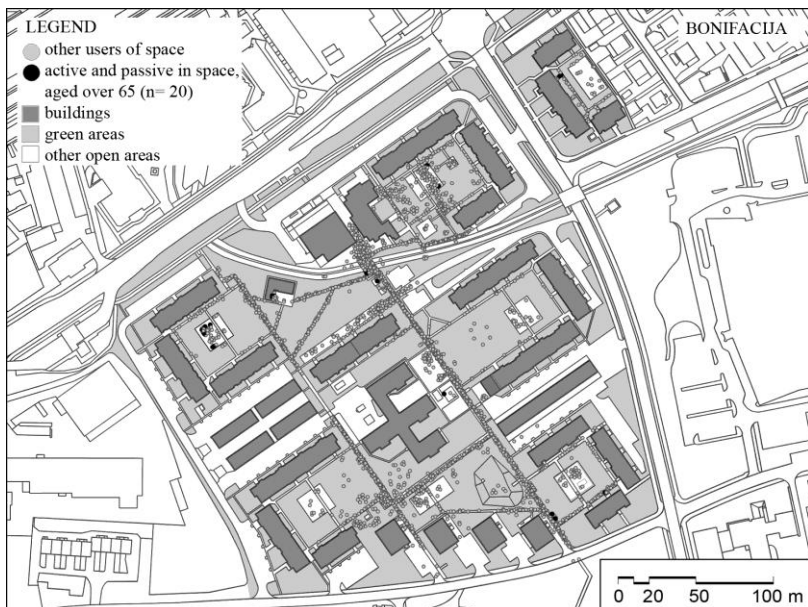
- ‘Category of activity’ – ‘Active in space’
- ‘Age’ (up to 12 years):

ACTIVE CHILDREN IN SPACE

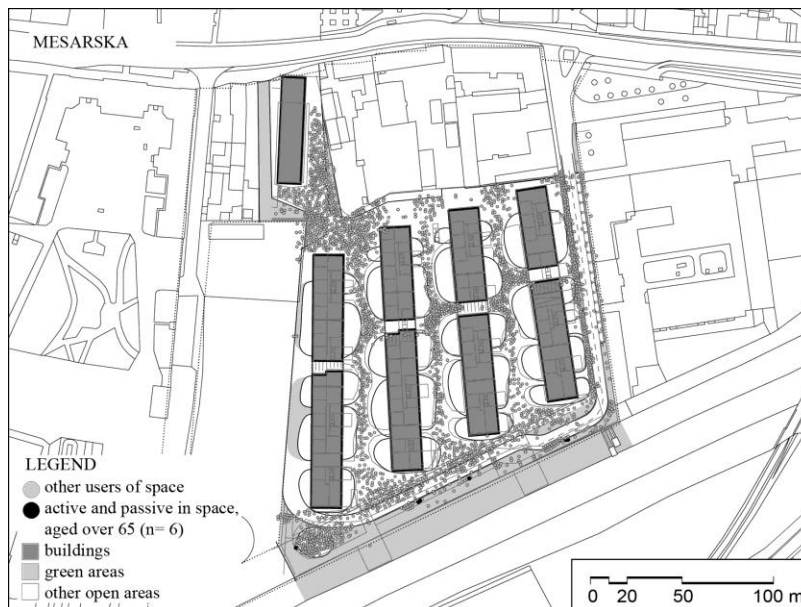


2. Results: observations & behavioural mapping

BONIFACIJA



MESARSKA



Graphical presentation by the filter

- ‘Category of activity’ – ‘*active in space*’ and ‘*passive in space*’
- ‘Age’ (above 65 years) :

ELDERLY OUTSIDE



3. Questionnaire

Focal questions :

- What do you normally do when you spend time outdoors?,
- Time in hours per week spent outdoors/ on patios and balconies in residential area (adults, children),
- What do you like the most about your residential area open space/what do you find disturbing,
- Self-assessed health of residents.

subjective assessments of the local environment & lifestyle features indicating health issues (CHMS)

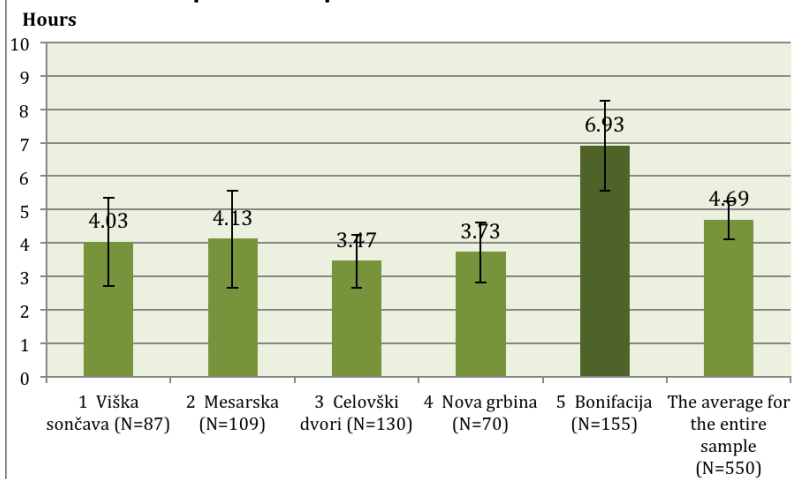
Sample:

Nova Grbina 74 (24.00% response rate),
Viška sončava 86 (28.00%),
Celovski dvori 132 (32.00%),
Mesarska 107 (26.00%),
Bonifacija 155 (27.00%).

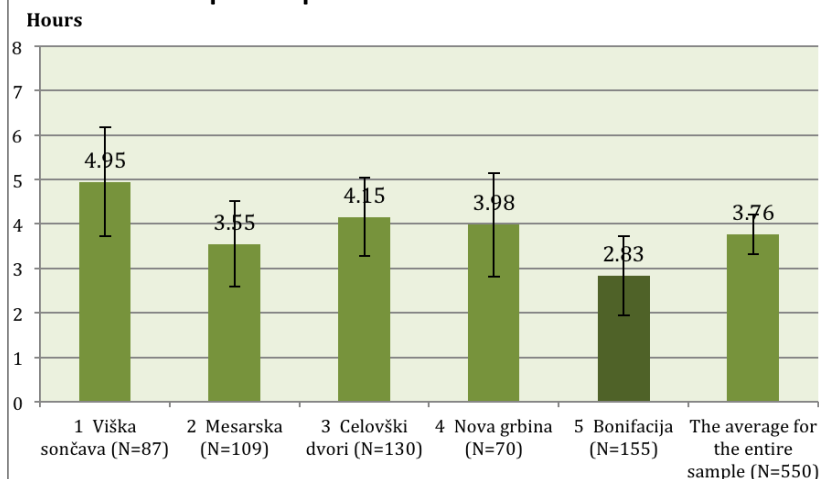


3. Results: Questionnaire

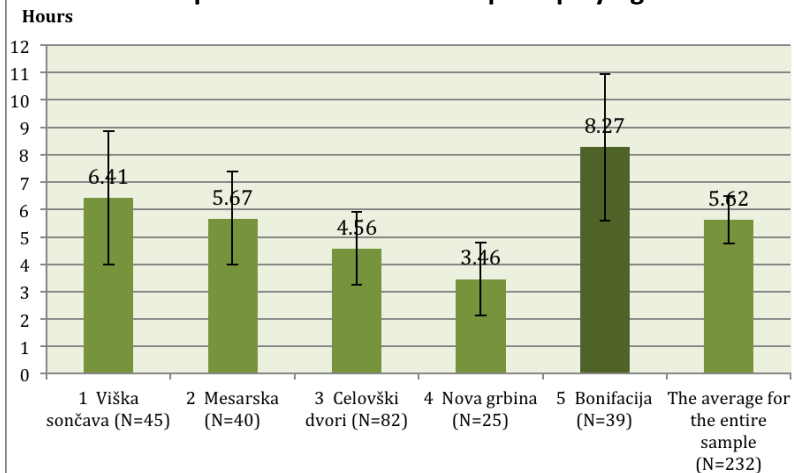
Time in hours per week spent outdoors in their residential area



Time in hours spent in patios and balconies.



Time in hours per week that children spend playing outdoors.



Time spent outdoors
(95% Confidence Interval of the Difference - 5% risk)



3. Results: Questionnaire

Correlations between certain key variables for the entire sample

		satisfaction with the apartment	satisfaction with the residential area	economic status	very intensive sport exercise	level of completed education	self-assessed health of residents	self-assessed health of residents children
satisfaction with the apartment	Pearson Correlation	1.00	0.61(**)	-0.01	0.02	0.02	0.18(**)	0.21(**)
	Sig. (2-tailed)		0.00	0.75	0.58	0.55	0.00	0.00
	N	542.00	542.00	527.00	542.00	541.00	536.00	228.00
satisfaction with the residential area	Pearson Correlation	0.61(**)	1.00	0.05	0.01	0.08	0.22(**)	0.23(**)
	Sig. (2-tailed)	0.00		0.27	0.82	0.06	0.00	0.00
	N	542.00	543.00	528.00	543.00	542.00	537.00	229.00
economic status	Pearson Correlation	-0.01	0.05	1.00	0.16(**)	0.52(**)	0.25(**)	0.01
	Sig. (2-tailed)	0.75	0.27		0.00	0.00	0.00	0.90
	N	527.00	528.00	535.00	535.00	534.00	529.00	230.00
very intensive sport exercise	Pearson Correlation	0.02	0.01	0.16(**)	1.00	0.21(**)	0.27(**)	0.03
	Sig. (2-tailed)	0.58	0.82	0.00		0.00	0.00	0.68
	N	542.00	543.00	535.00	550.00	549.00	544.00	236.00
level of completed education	Pearson Correlation	0.02	0.08	0.52(**)	0.21(**)	1.00	0.33(**)	0.06
	Sig. (2-tailed)	0.55	0.06	0.00	0.00		0.00	0.36
	N	541.00	542.00	534.00	549.00	549.00	543.00	236.00
self-assessed health of residents	Pearson Correlation	0.18(**)	0.22(**)	0.25(**)	0.27(**)	0.33(**)	1.00	0.24(**)
	Sig. (2-tailed)	0.00	0.00	0.00	0.00	0.00		0.00
	N	536.00	537.00	529.00	544.00	543.00	544.00	234.00
self-assessed health of residents children	Pearson Correlation	0.20(**)	0.23(**)	0.01	0.03	0.06	0.24(**)	1.000
	Sig. (2-tailed)	0.00	0.00	0.90	0.68	0.36	0.00	
	N	228.00	229.00	230.00	236.00	236.00	234.00	236.00
** Correlation is significant at the 0.01 level (2-tailed).								
* Correlation is significant at the 0.05 level (2-tailed).								



Conclusions

Socio-economic characteristics of the neighbourhoods are bound to change.

Urban transformation in the transition period resulted in housing neighbourhoods with lower quality of open/green areas, compared to older ones.

the changing demographic structure / risk for decreased life quality of older people

Today Societal Challenge: ageing of the population.

To ensure healthy ageing it is important to start in childhood, as the habit of regular exercise is formed during childhood and lasts a lifetime.



Thank you for your attention!

Mail: KatarinaAna.Lestan@bf.uni-lj.si

