



## - System Dominum -

Increasing energy efficiency in buildings  
by greatly enhancing your home's value

*Slovenia*

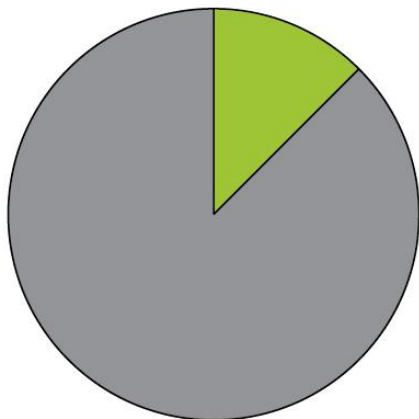
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## Apartment buildings in Slovenia 1950 - 1970

## Seismic risk



**250,000 inhabitants of Slovenia**

live in multi-dwelling buildings built before 1963, when no regulations have been adopted to ensure the earthquake safety of buildings!

A small earthquake could trigger a real social bomb (after the 2009 study, about 28,000 buildings would be damaged in Ljubljana only), and a serious earthquake would even be a humanitarian catastrophe.





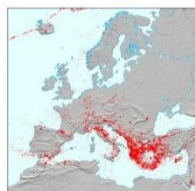
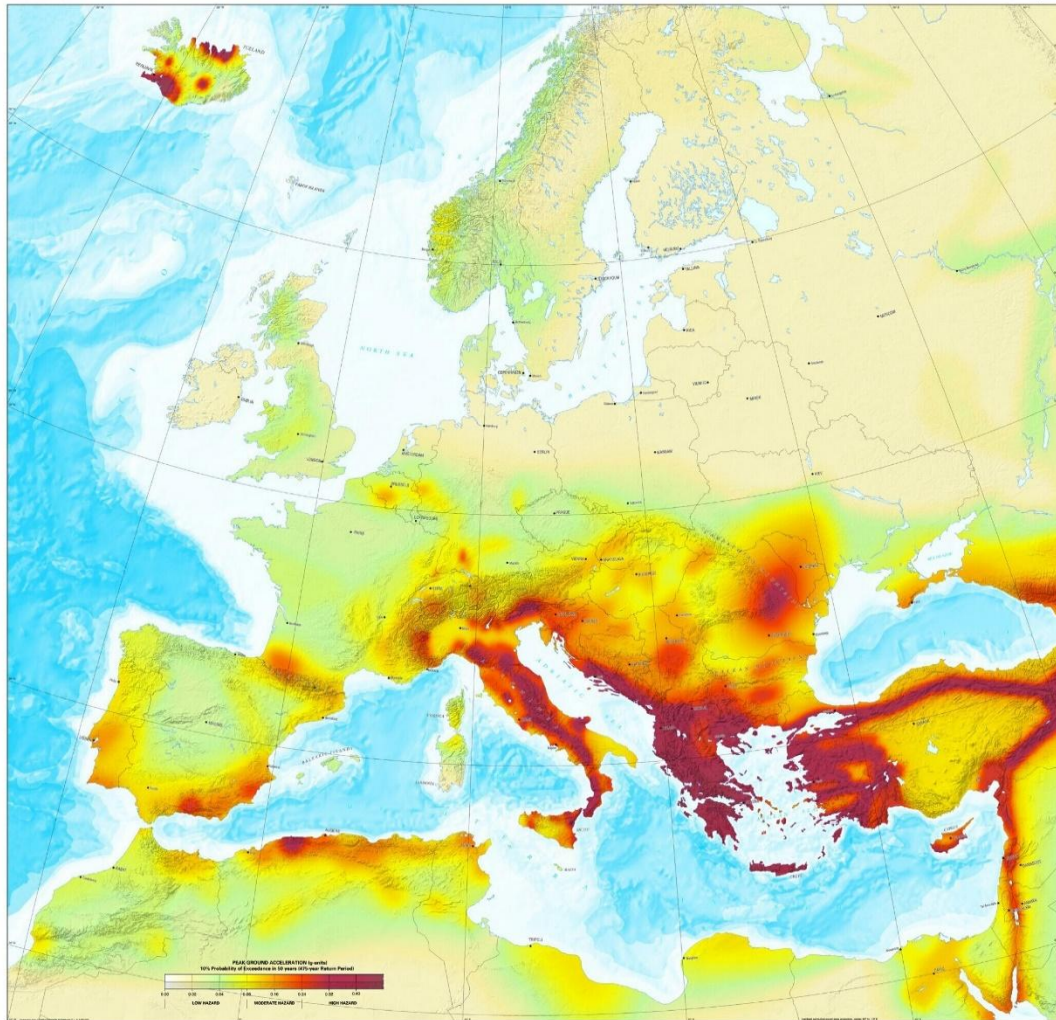
# EUROPEAN-MEDITERRANEAN SEISMIC HAZARD MAP

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February 2003

Scale 1:5 000 000



**Seismic hazard**

The seismic hazard map shows the estimated peak ground acceleration (PGA) values for a 10% probability of exceedence in 50 years (10% 50-year return period). The map is based on the results of the European-Mediterranean Seismic Hazard Assessment (EMSHA) project, which was a collaborative effort between the European Seismological Commission (ESC) and the International Geological Correlation Program (IGCP) Project 382: SESAME.

The map is divided into several regions, each with its own set of hazard values. The regions are defined based on geological and tectonic considerations. The hazard values are expressed in terms of peak ground acceleration (PGA) in m/s<sup>2</sup>. The map is color-coded to show the distribution of hazard values, with red indicating high hazard and blue indicating low hazard.

The map is based on the results of the European-Mediterranean Seismic Hazard Assessment (EMSHA) project, which was a collaborative effort between the European Seismological Commission (ESC) and the International Geological Correlation Program (IGCP) Project 382: SESAME.

**Legend**

The map uses a color scale to represent peak ground acceleration (PGA) values. The scale ranges from 0.05 m/s<sup>2</sup> (blue) to 0.40 m/s<sup>2</sup> (red). The scale is divided into four main categories: Low hazard (0.05 to 0.10 m/s<sup>2</sup>), Moderate hazard (0.10 to 0.20 m/s<sup>2</sup>), High hazard (0.20 to 0.30 m/s<sup>2</sup>), and Very high hazard (0.30 to 0.40 m/s<sup>2</sup>).

The map also includes labels for major cities and geographical features. The map is based on the results of the European-Mediterranean Seismic Hazard Assessment (EMSHA) project, which was a collaborative effort between the European Seismological Commission (ESC) and the International Geological Correlation Program (IGCP) Project 382: SESAME.

**References**

Giardini, D., Grünthal, G., & Jiménez, M. J. (2003). European-Mediterranean seismic hazard map. *European Seismological Commission Bulletin*, 12(1), 1-10.

Grünthal, G., & Grünthal, G. (2003). European-Mediterranean seismic hazard map. *European Seismological Commission Bulletin*, 12(1), 1-10.

Jiménez, M. J., Grünthal, G., & Grünthal, G. (2003). European-Mediterranean seismic hazard map. *European Seismological Commission Bulletin*, 12(1), 1-10.



## Seismic hazard map of Europe



Two examples:

**16%**

Of earthquake safety  
according to today's standards (EC8)

15 apartments, about 35 inhabitants  
Study: ZAG, 2018



**20%**

Of earthquake safety  
according to today's standards (EC8)

45 apartments, about 100 inhabitants  
Study: ZAG, 2016





## **Renovation of seismically non-save multi-apartment building in Ljubljana**

The cracks on the load-bearing facade were only covered with styrofoam.

With government subsidy!



## Potemkin's renovations

Potemkin's renovations are those renovations where the building, which is worn-out in many respects, is simply covered with a new facade, without considering what kind of defects it actually has.

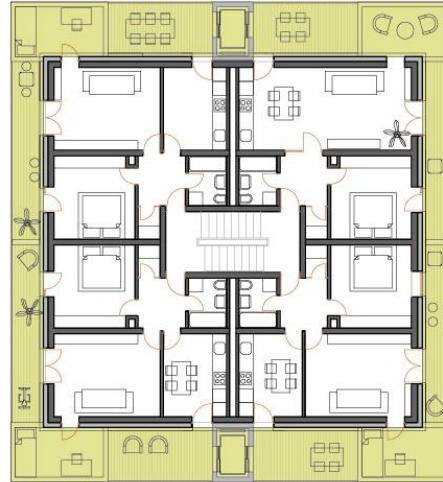
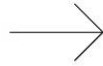
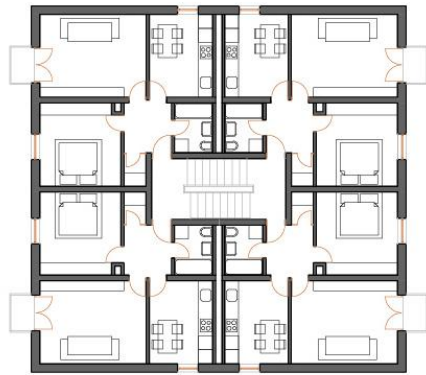
SYSTEM DOMINUM

**PROJECT: PR5**

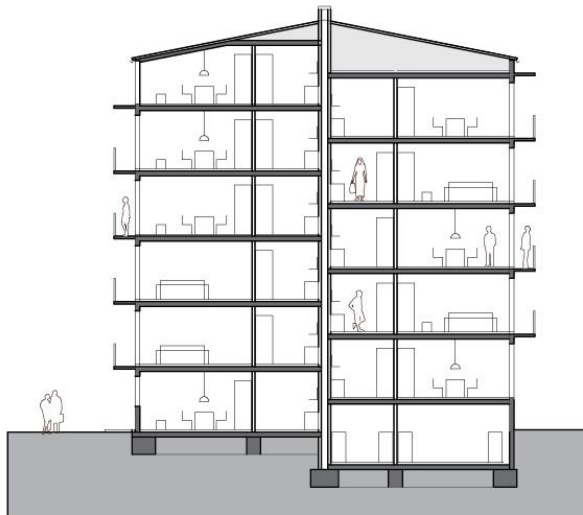


## Before renovation:





**Extension:**  
increasing the floor  
area of the existing  
apartments



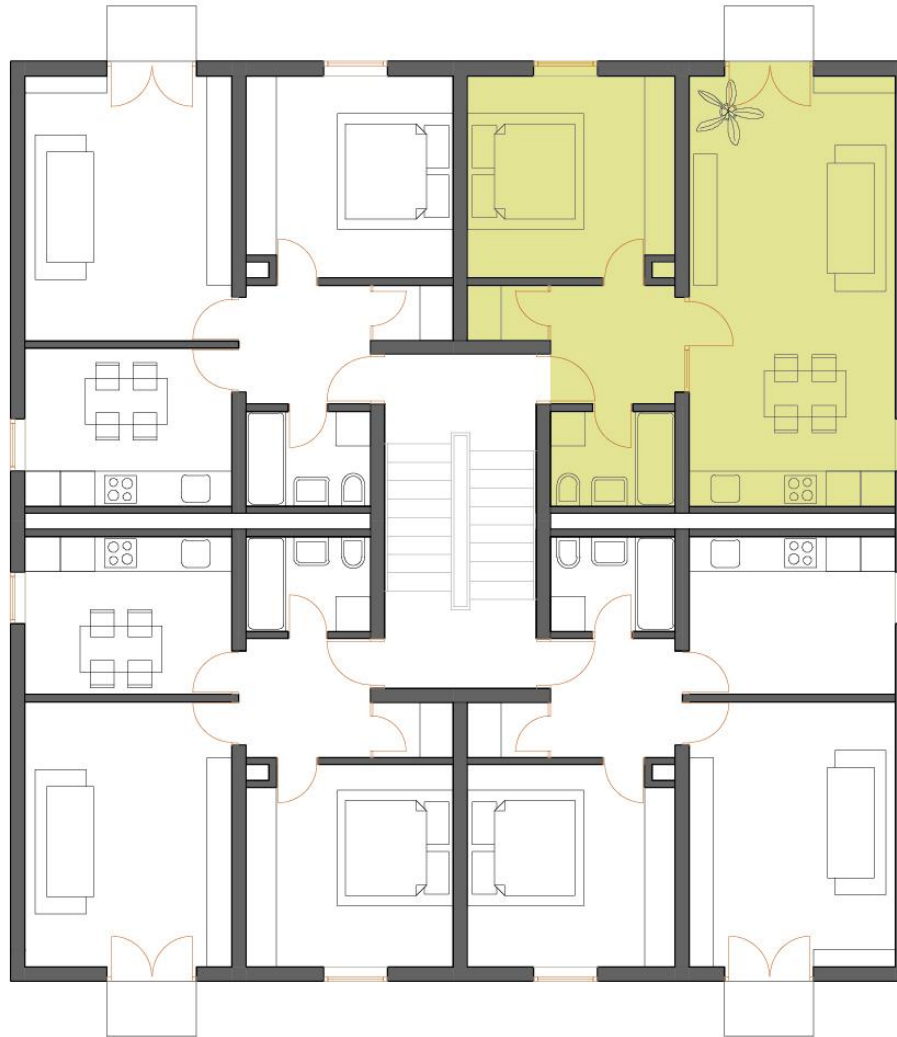
**Addition on top:**  
adding the new  
apartments



After renovation:







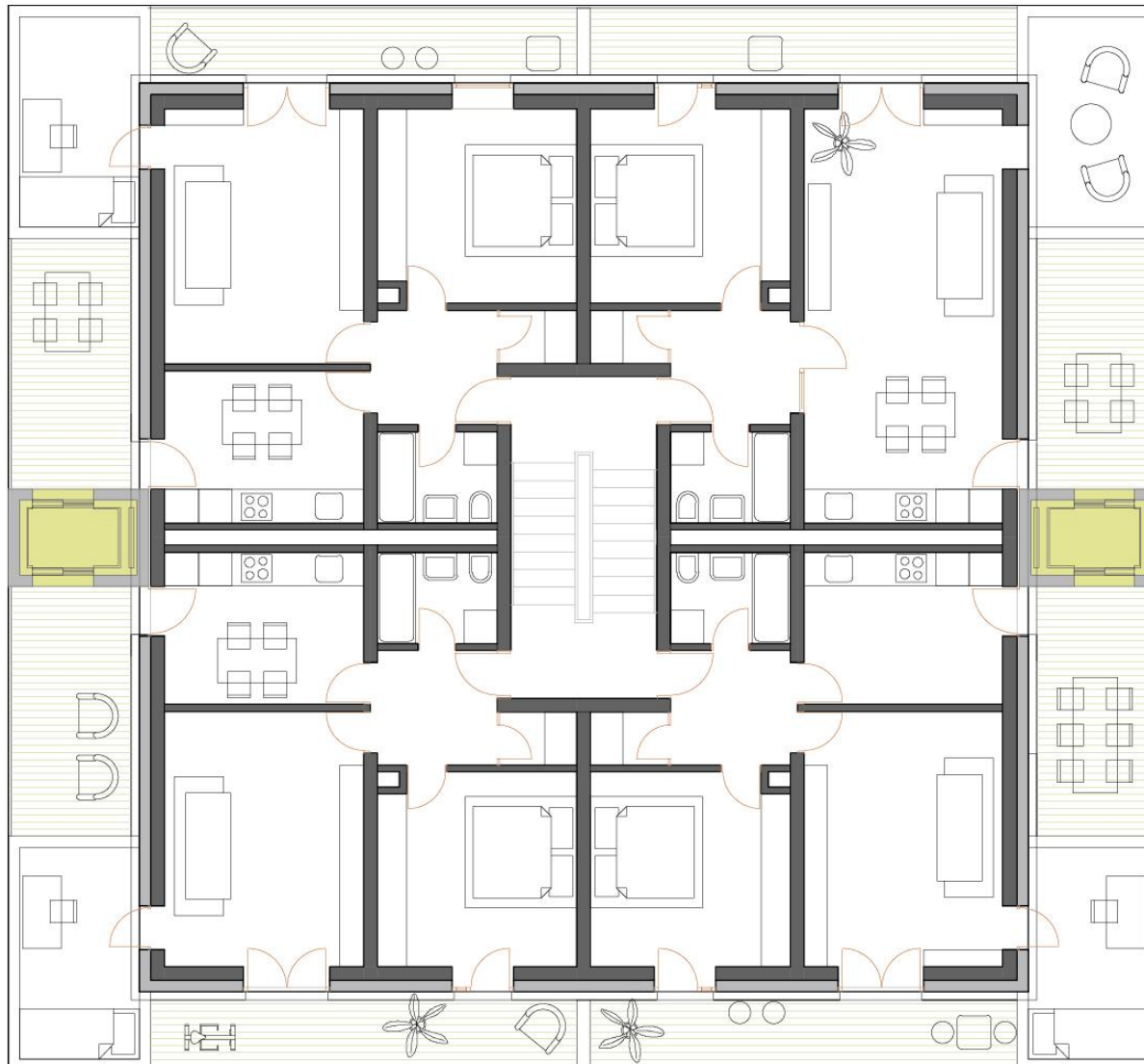
## Before renovation:

- Small apartments
- No elevator
- No earthquake safety
- No thermal insulation



## Comprehensive renovation:

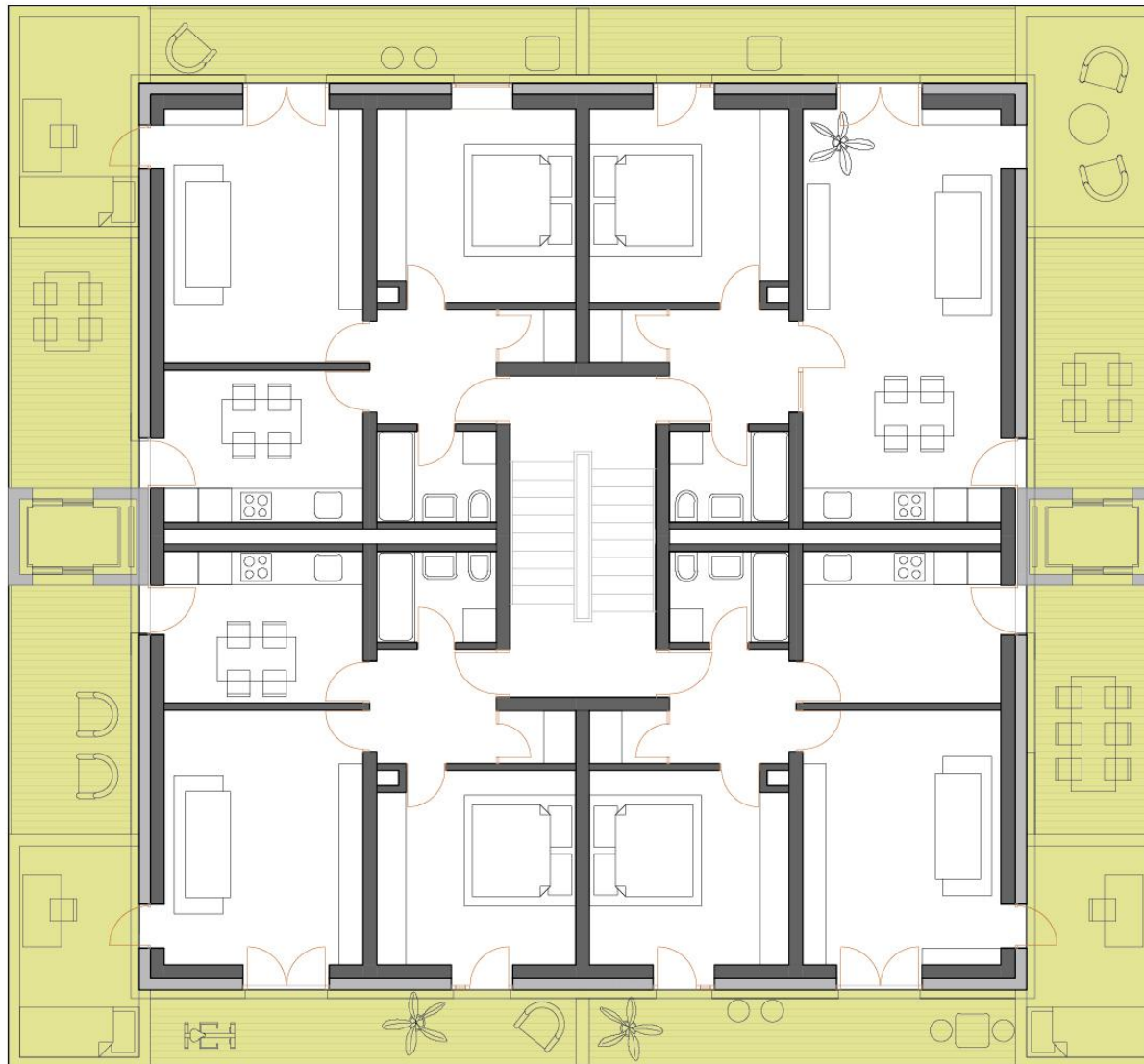
1. Larger apartments
2. Flexibility of the apartments



## Comprehensive renovation:

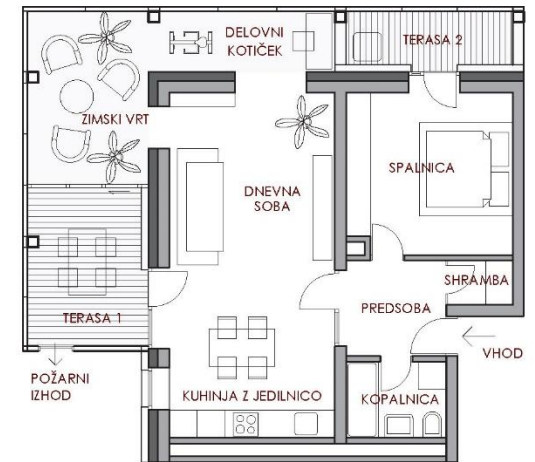
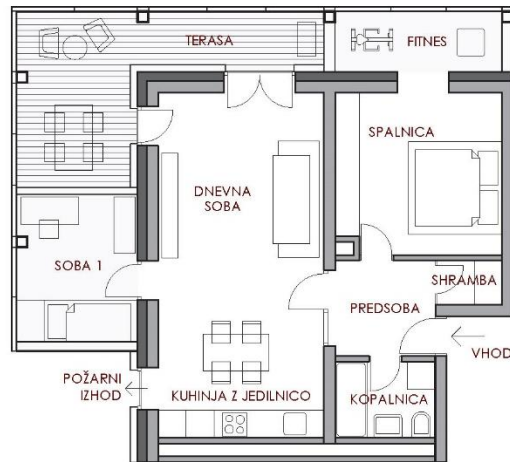
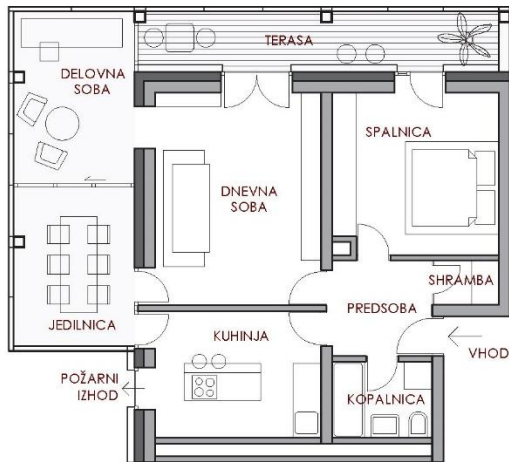
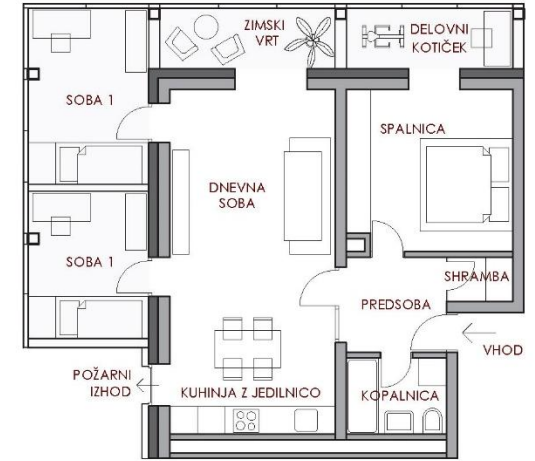
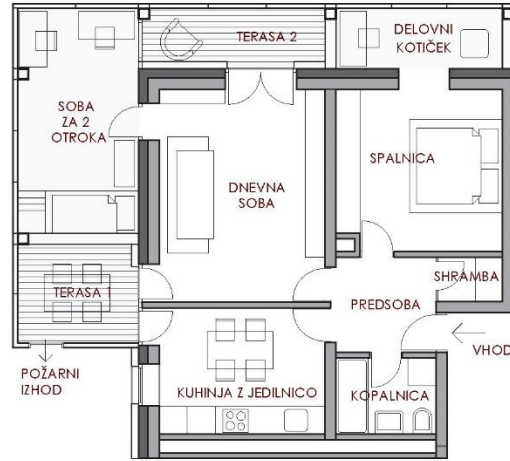
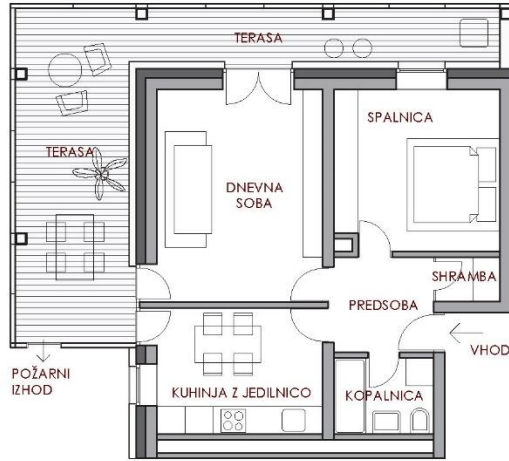
3. New elevator(s)
4. Renovated building services





**Comprehensive renovation:**

3. Earthquake safety
4. Thermal insulation



**Flexibility: possible arrangements of each apartment**





## Pr5 renovation

Before / after







## Pr5 renovation Before / after



SYSTEM DOMINUM

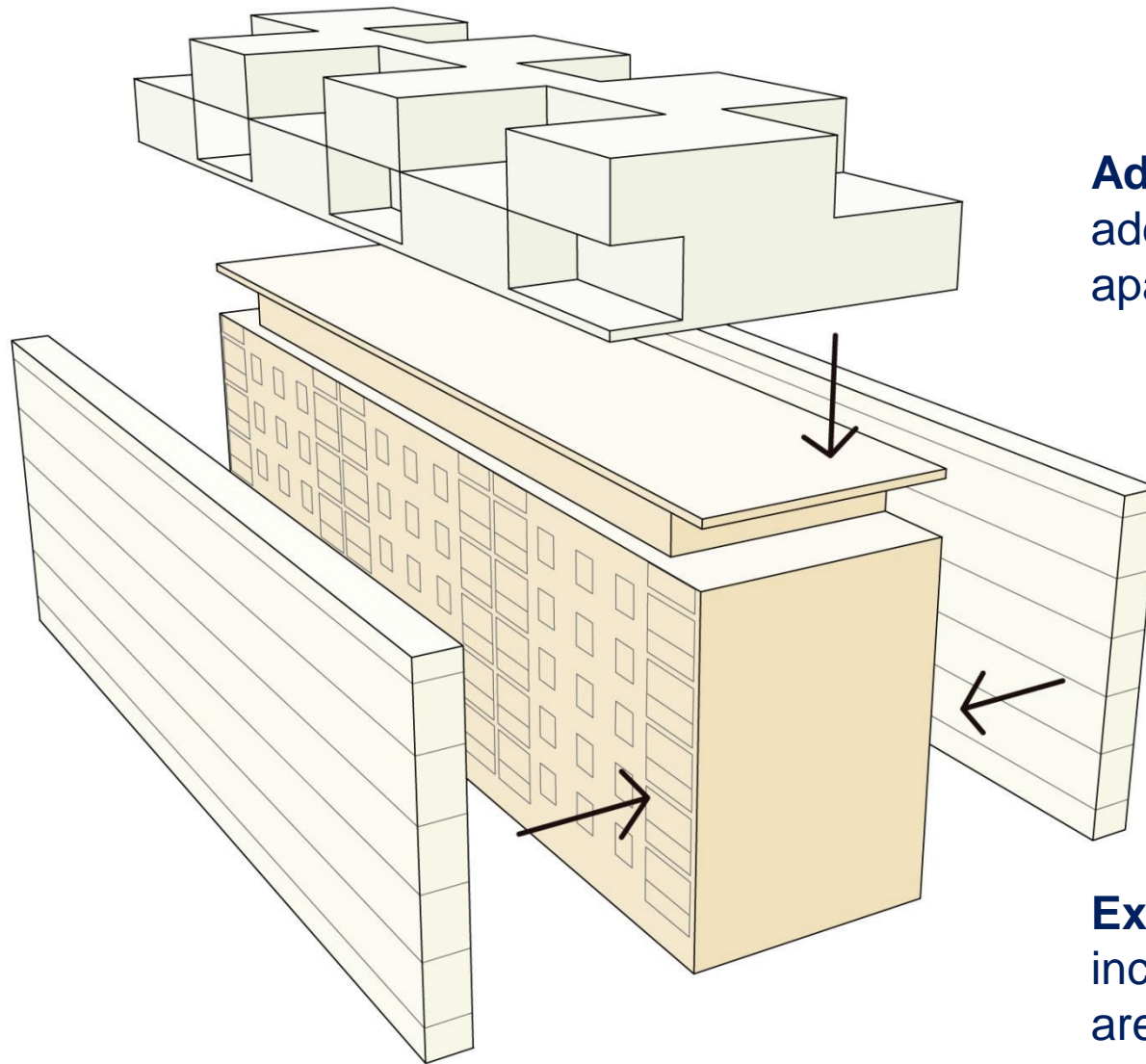
# PROJECT: TS2



## Before renovation:







**Addition on top:**  
adding the new  
apartments

**Extension:**  
increasing the floor  
area of the existing  
apartments

## After renovation:













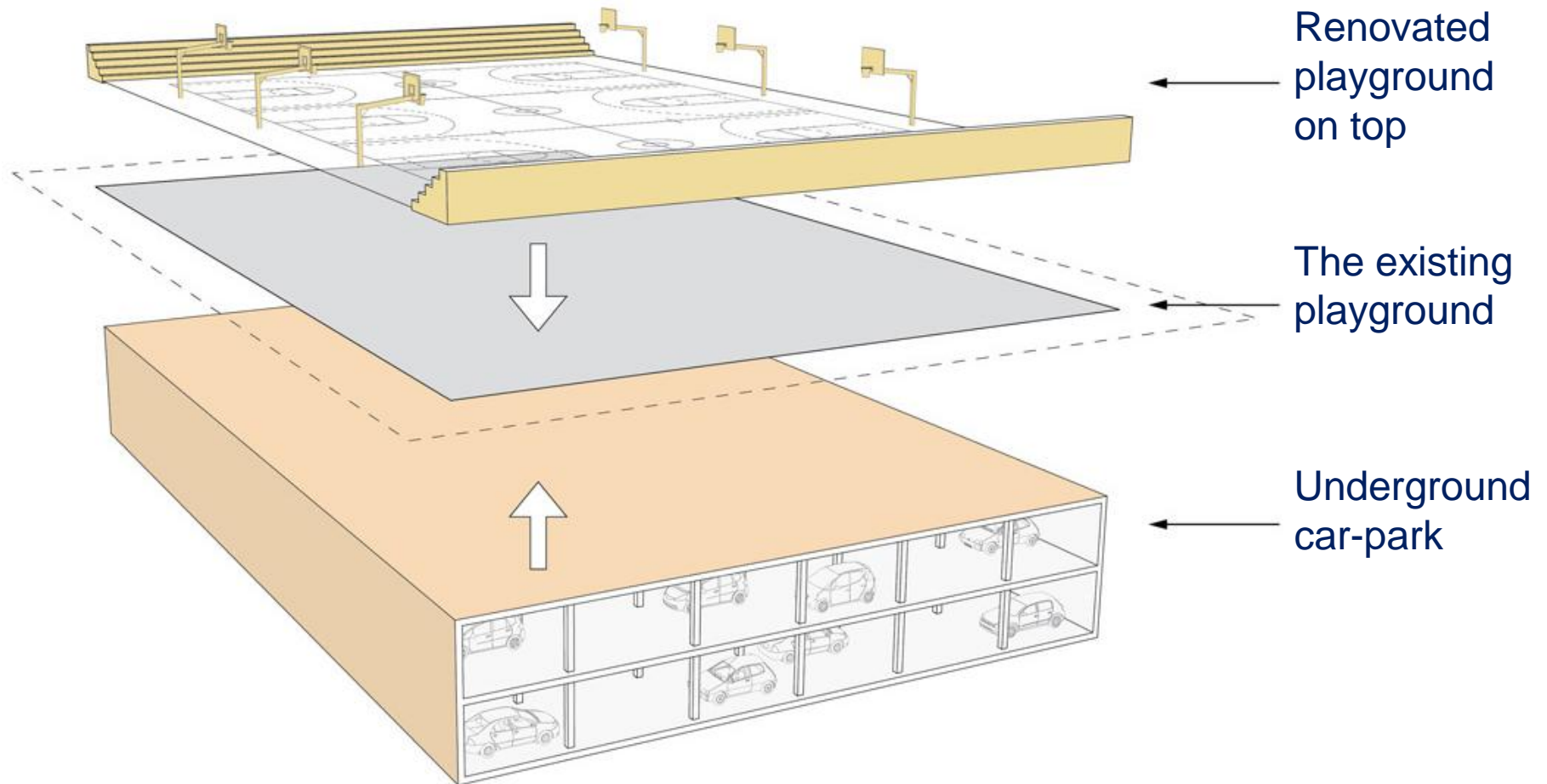
Comprehensive renovations

# UNDERGROUND CAR-PARK





School's outdoor playground  
Before the renovation



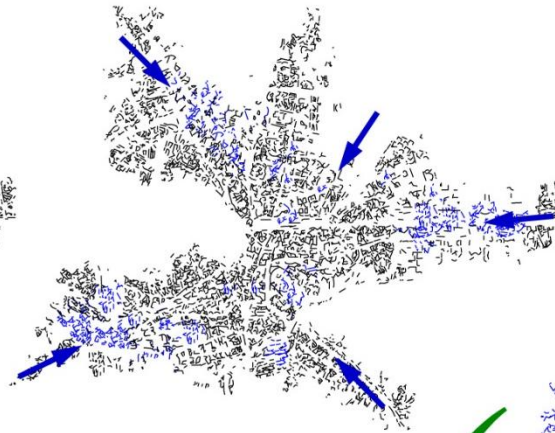


School's outdoor playground  
After the renovation

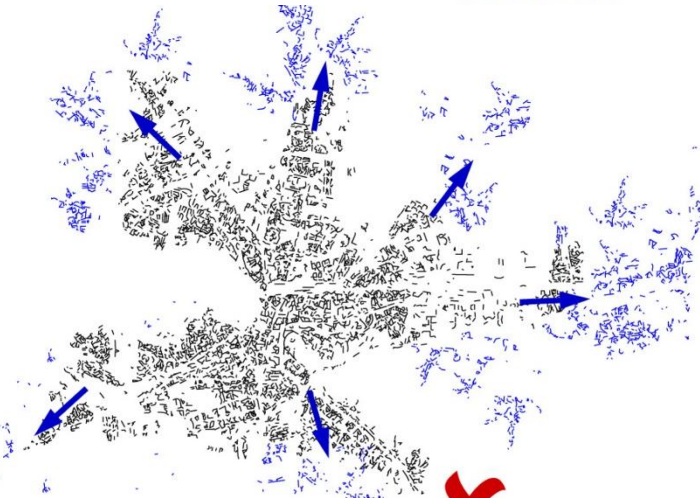




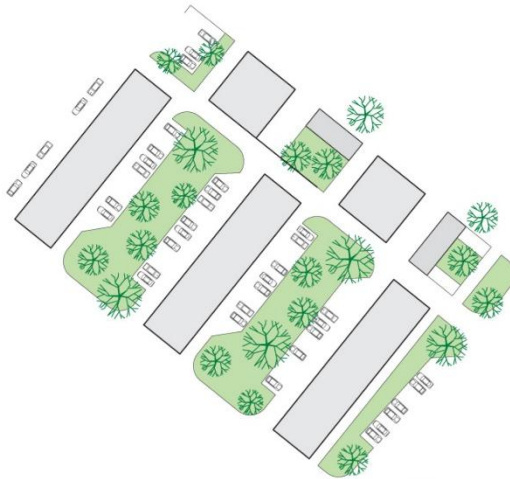
SUSTAINABLE STRATEGY  
FOR CITY GROWTH



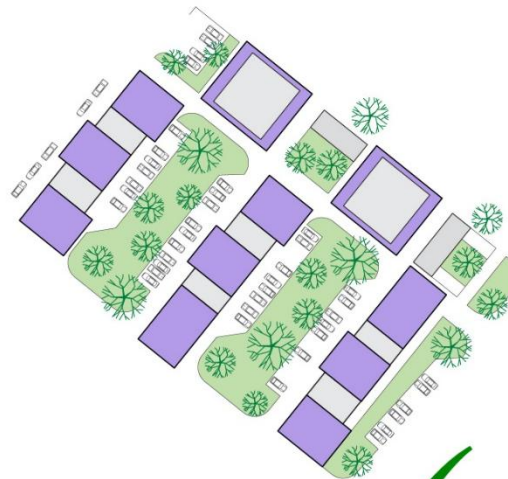
GROWING TO THE INSIDE  
/ INCREASING THE DENSITY



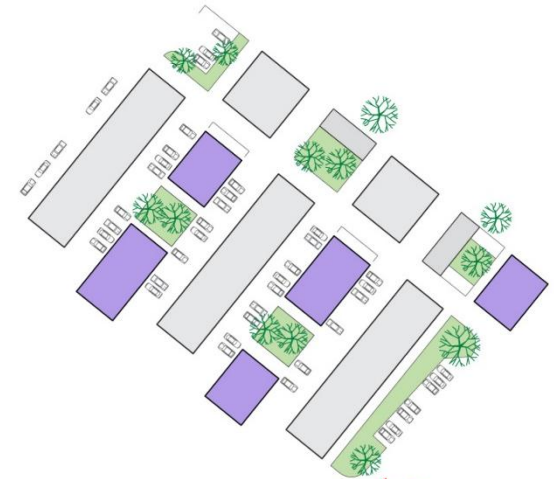
GROWING TO THE OUTSIDE  
/ ENLARGING THE AREA



SUSTAINABLE STRATEGY  
FOR INCREASING THE DENSITY



INCREASING THE CAPACITY  
OF THE EXISTING BUILDINGS



BUILDING NEW BUILDINGS  
ON EMPTY AREAS AND PARKS





# BUILD2LC

Interreg Europe



European Union  
European Regional  
Development Fund

Thank you!

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