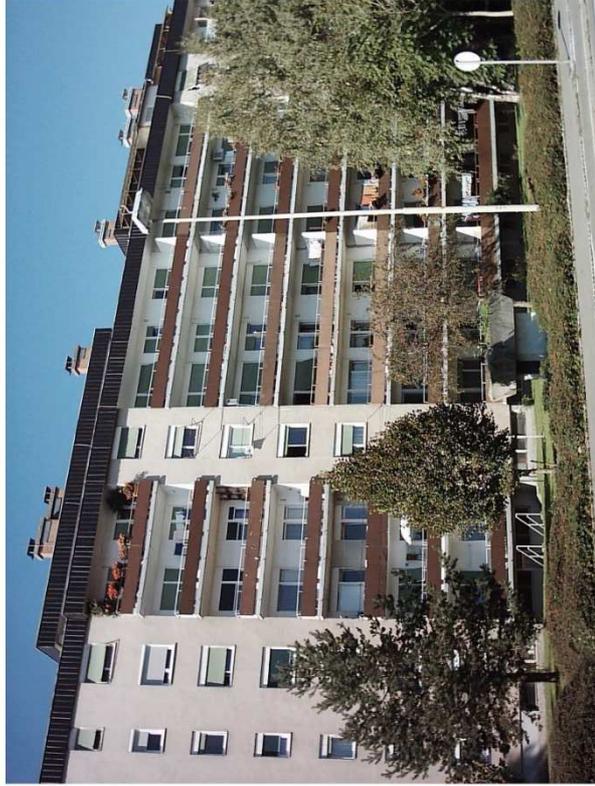


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COMPREHENSIVE RENOVATIONS
OF MULTI-APARTMENT BUILDINGS IN SLOVENIA

Ljubljana, Slovenia
13-14 March 2017

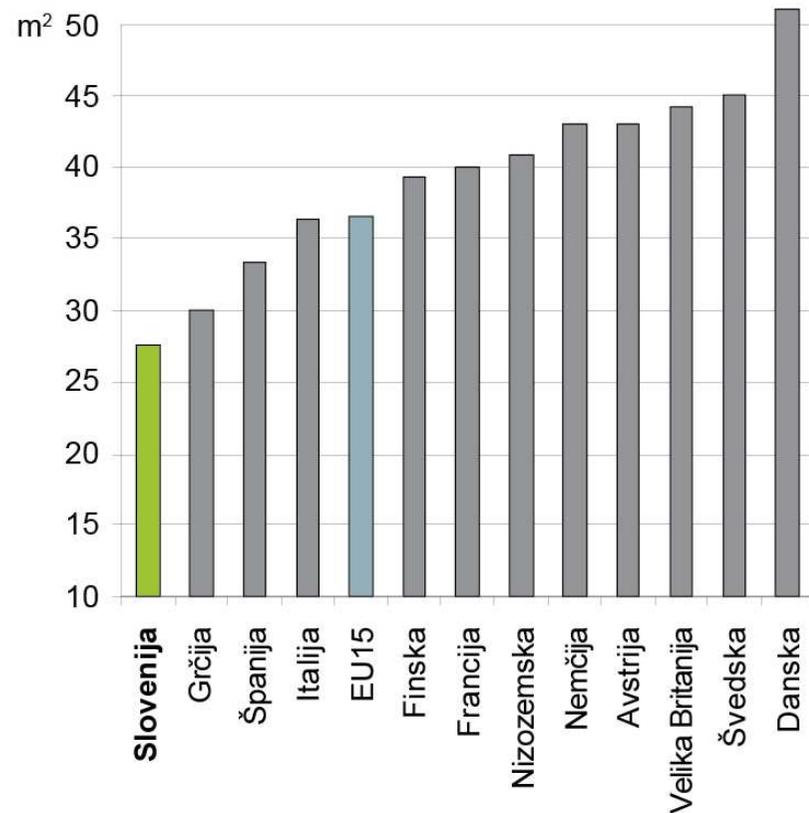
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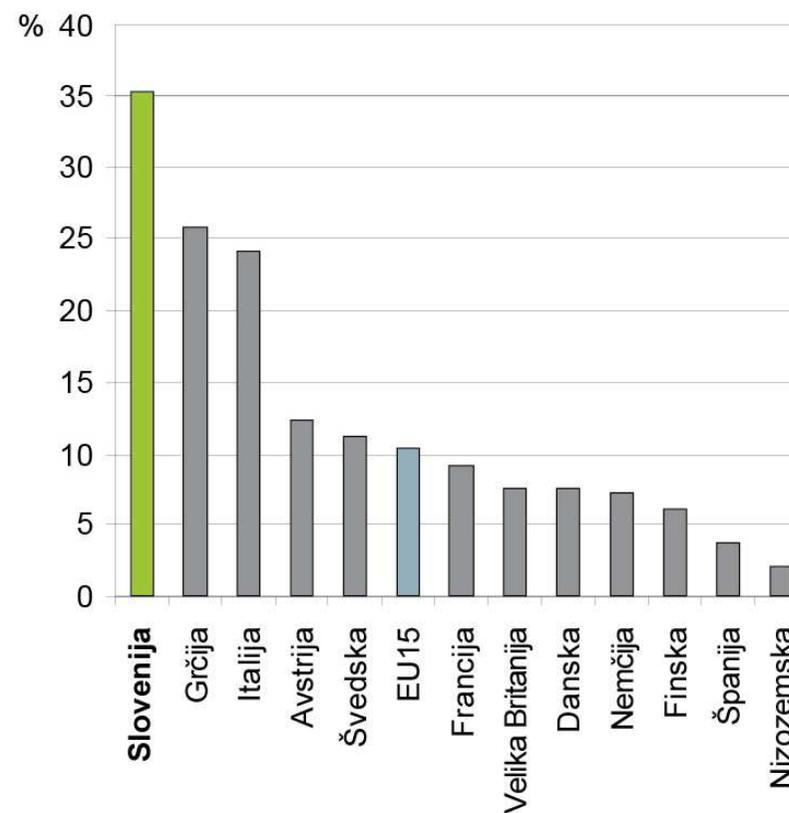
Multi-apartment buildings
from the 1950s and 1960s:

1. TOO SMALL APARTMENTS
2. DYSFUNCTIONAL APARTMENTS
3. INSUFFICIENT EARTHQUAKE SAFETY
4. INSUFFICIENT ENERGY SAVINGS

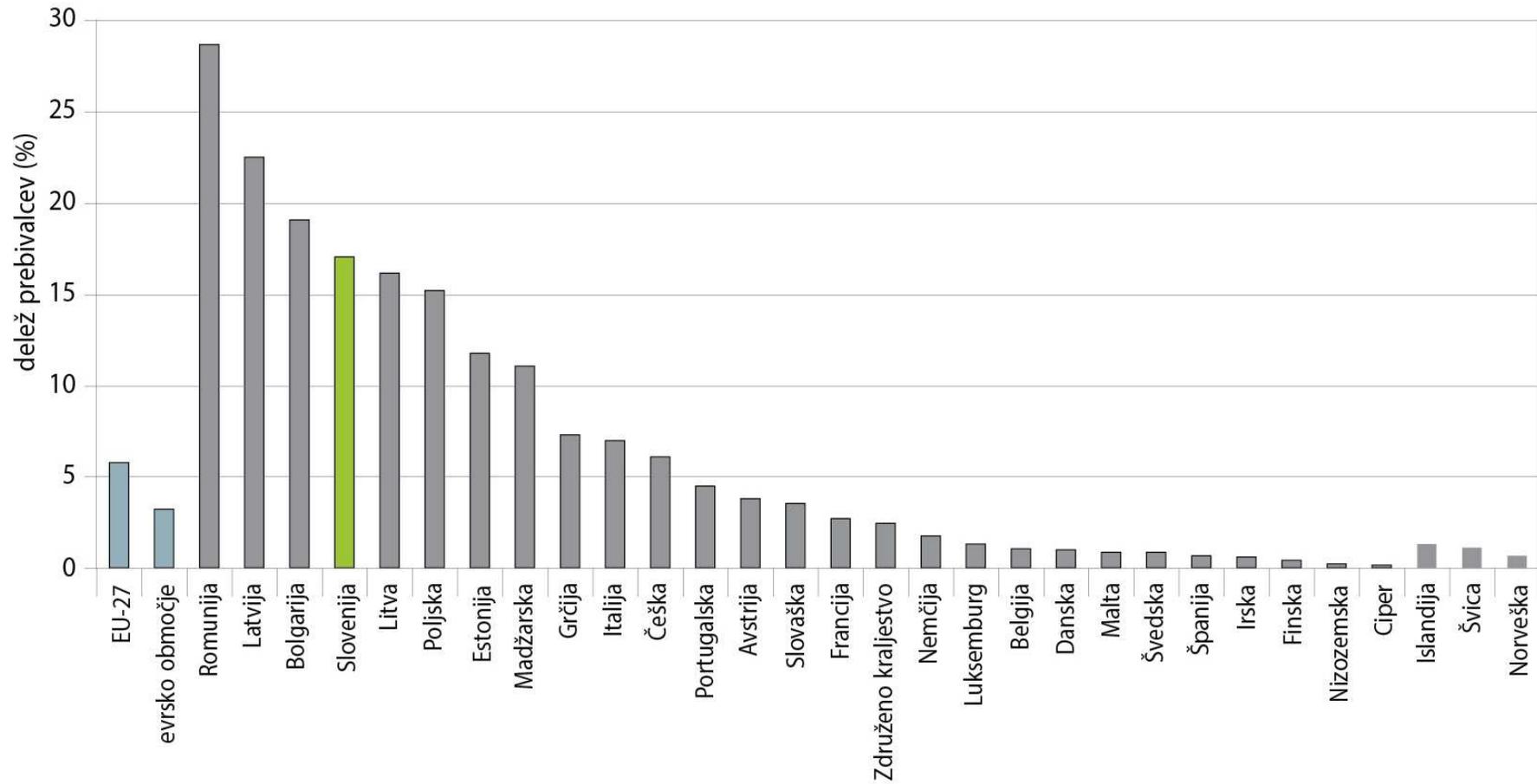
Floor area of the apartment per capita



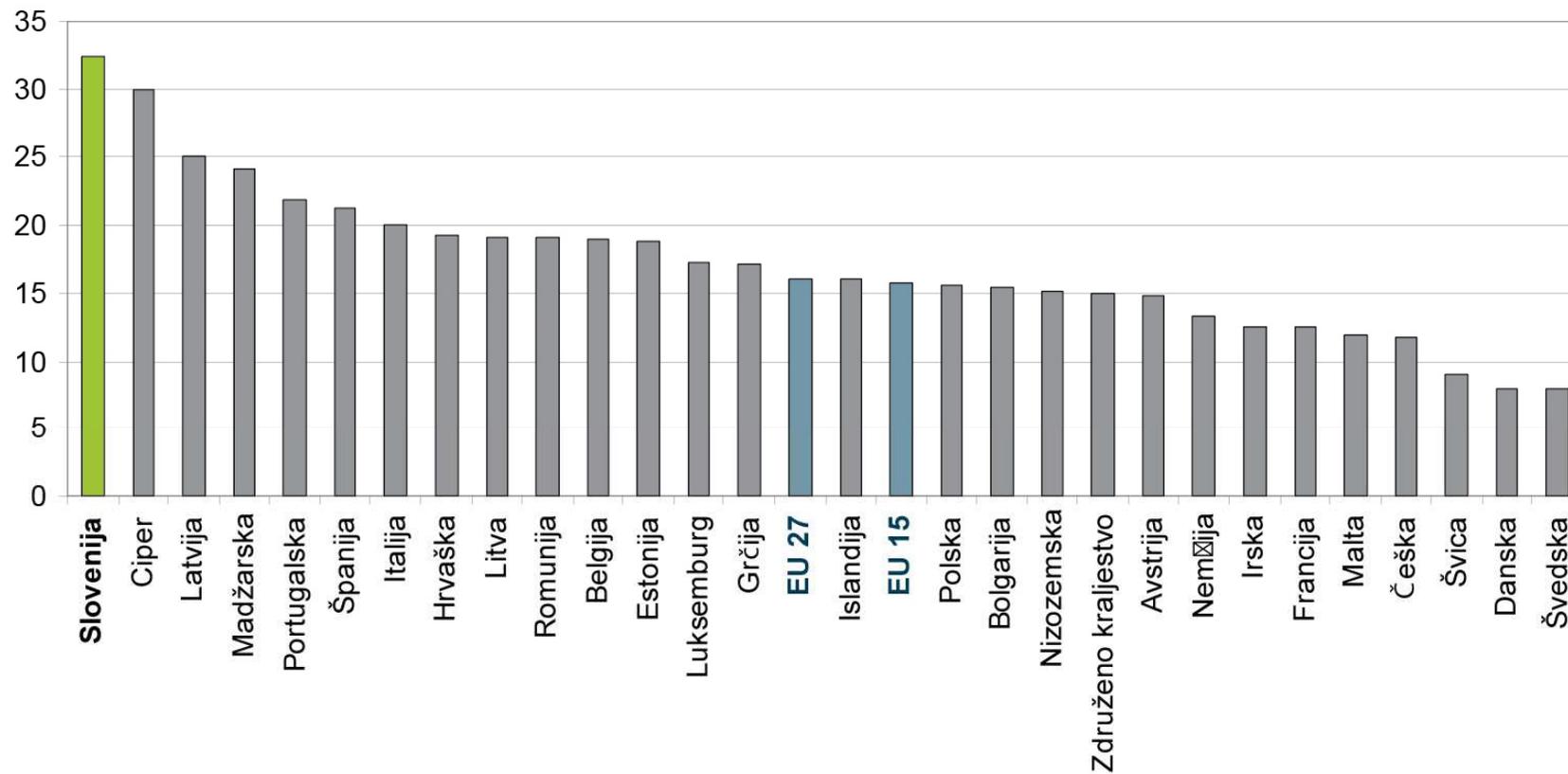
Overpopulated apartments



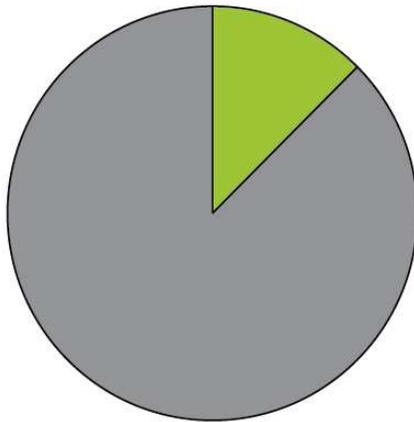
Percentage of population with substantial housing deprivation



The share of households living in the apts with at least one of the following issues: leaking roofs, damp walls, damp bases or floors, pierced window frames or floors



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.

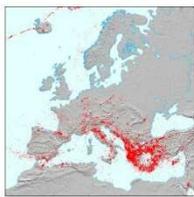
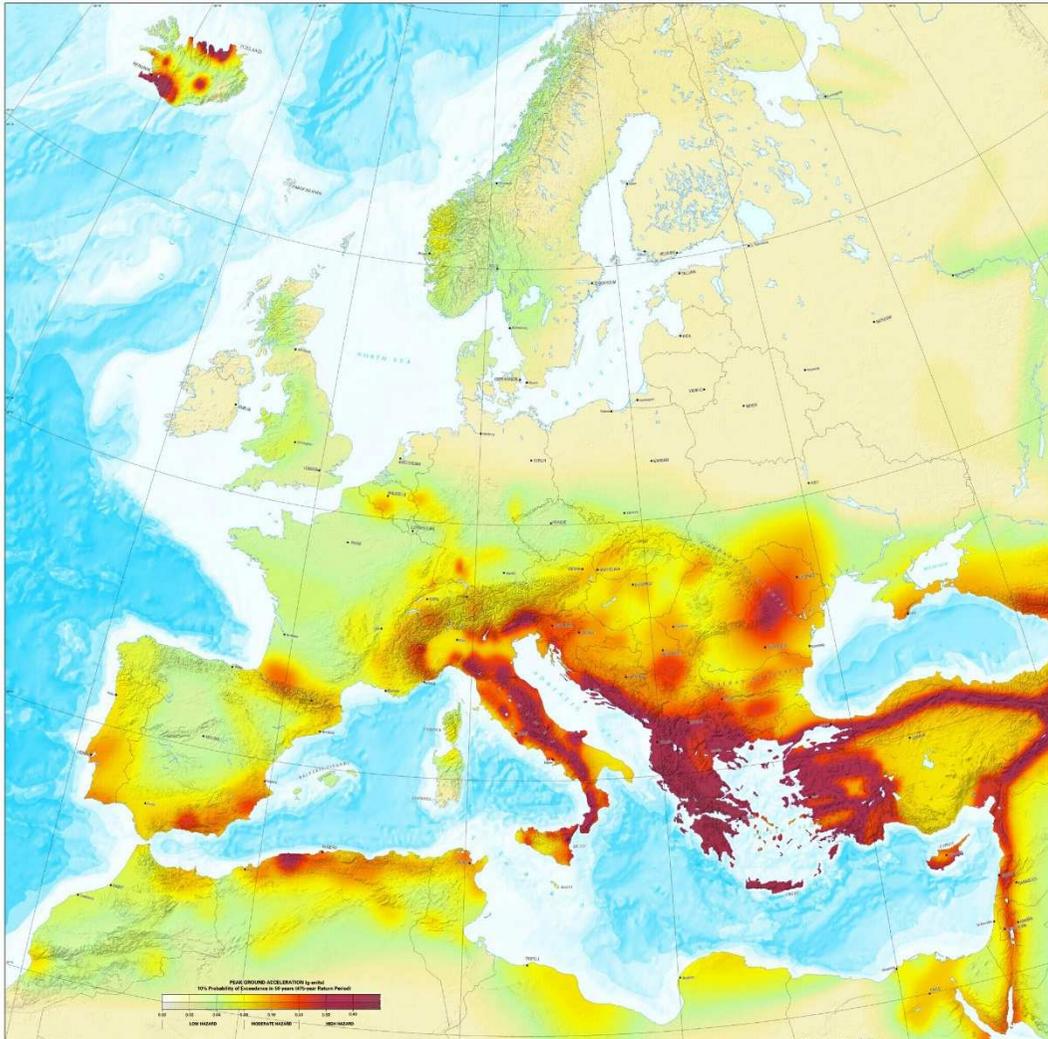
EUROPEAN-MEDITERRANEAN SEISMIC HAZARD MAP

Editors: D. Giardini, M. J. Jiménez and G. Grünthal



Scale 1:5 000 000

February 2003



Disclaimer
The European Seismological Commission (ESC) is not responsible for any errors or omissions in this map. The map is intended for general information only and should not be used for legal or financial purposes. The map is based on the best available data at the time of publication. The map is subject to change without notice. The map is not a warranty of any kind. The map is not a contract. The map is not a representation of any kind. The map is not a statement of any kind. The map is not a guarantee of any kind. The map is not a promise of any kind. The map is not a declaration of any kind. The map is not a covenant of any kind. The map is not a deed of any kind. The map is not a conveyance of any kind. The map is not a transfer of any kind. The map is not a sale of any kind. The map is not a lease of any kind. The map is not a license of any kind. The map is not a franchise of any kind. The map is not a partnership of any kind. The map is not a joint venture of any kind. The map is not a joint project of any kind. The map is not a joint effort of any kind. The map is not a joint undertaking of any kind. The map is not a joint operation of any kind. The map is not a joint enterprise of any kind. The map is not a joint business of any kind. The map is not a joint venture of any kind. The map is not a joint project of any kind. The map is not a joint effort of any kind. The map is not a joint undertaking of any kind. The map is not a joint operation of any kind. The map is not a joint enterprise of any kind. The map is not a joint business of any kind.

References
Giardini, D., Grünthal, G., & Jiménez, M. J. (2003). European-Mediterranean Seismic Hazard Map. European Seismological Commission, Potsdam, MD.

Contributors
The map was prepared by the European Seismological Commission (ESC) and the International Geological Correlation Program (IGCP) Project 382: SESAME. The map was prepared by the following institutions: ETH Zurich, GFZ Potsdam, and other contributing institutions.

Map Symbols
The map uses the following symbols: Blue lines represent major rivers. Green lines represent minor rivers. Brown lines represent roads. Black lines represent boundaries. Red lines represent seismic hazard contours. The map also includes a scale bar and a legend.



Seismic hazard map of Europe



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-safe
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.

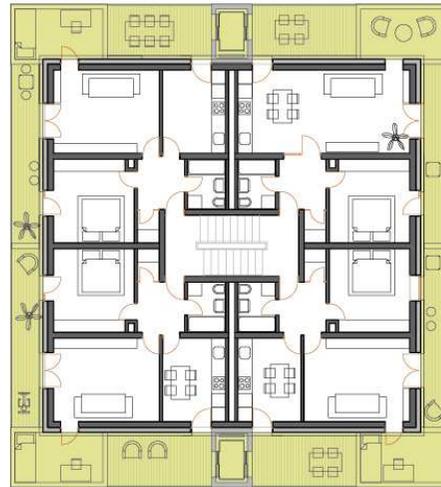
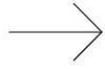
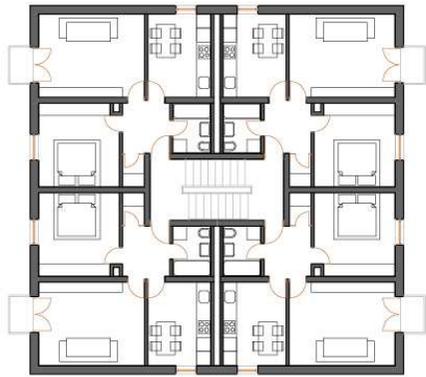
Comprehensive renovation
of multi-apartment building

Pr5

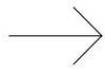
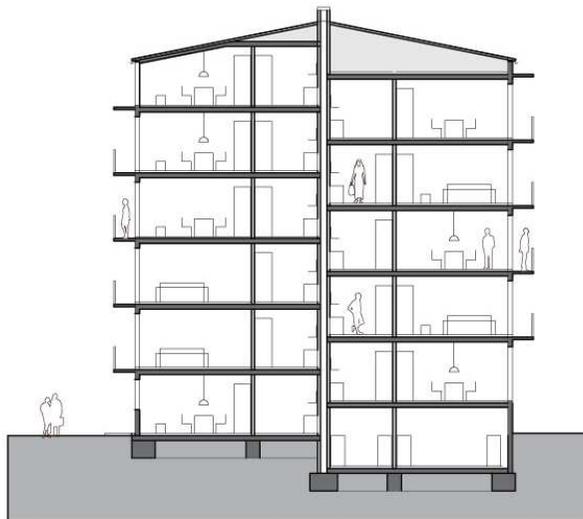
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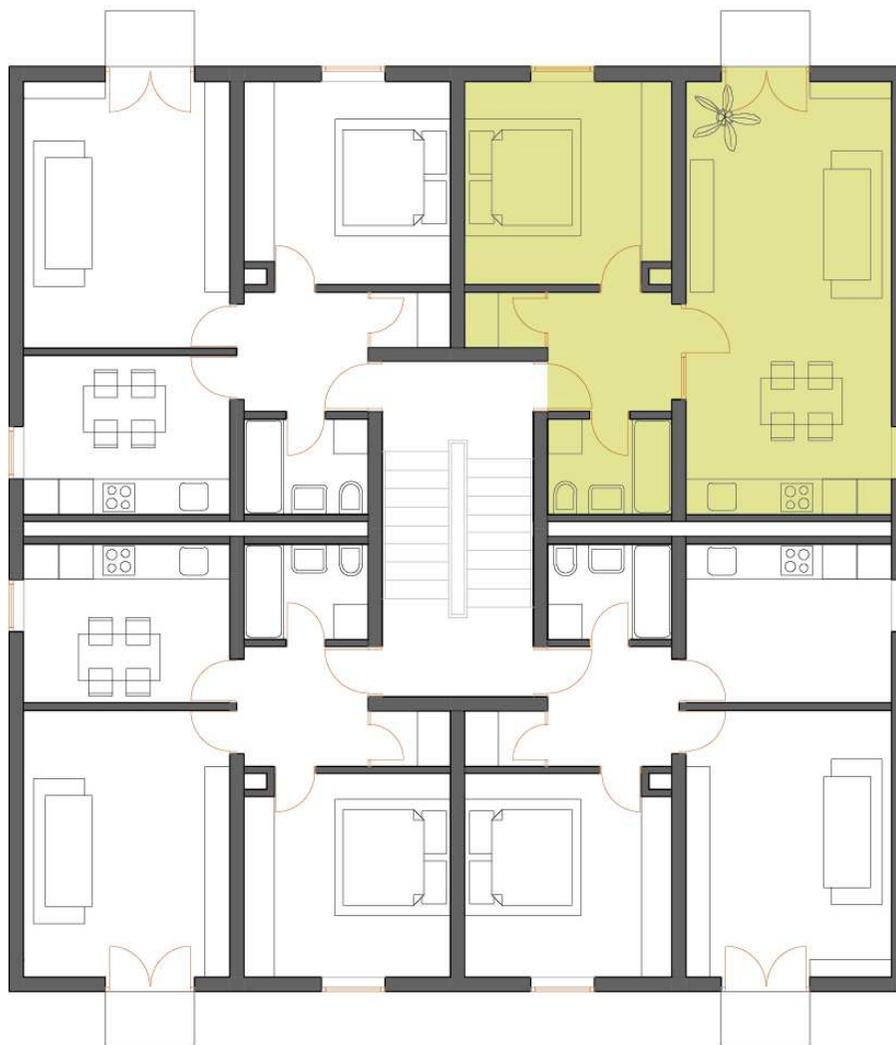


Extension:
increasing the floor
area of the existing
apartments



Addition on top:
adding the new
apartments





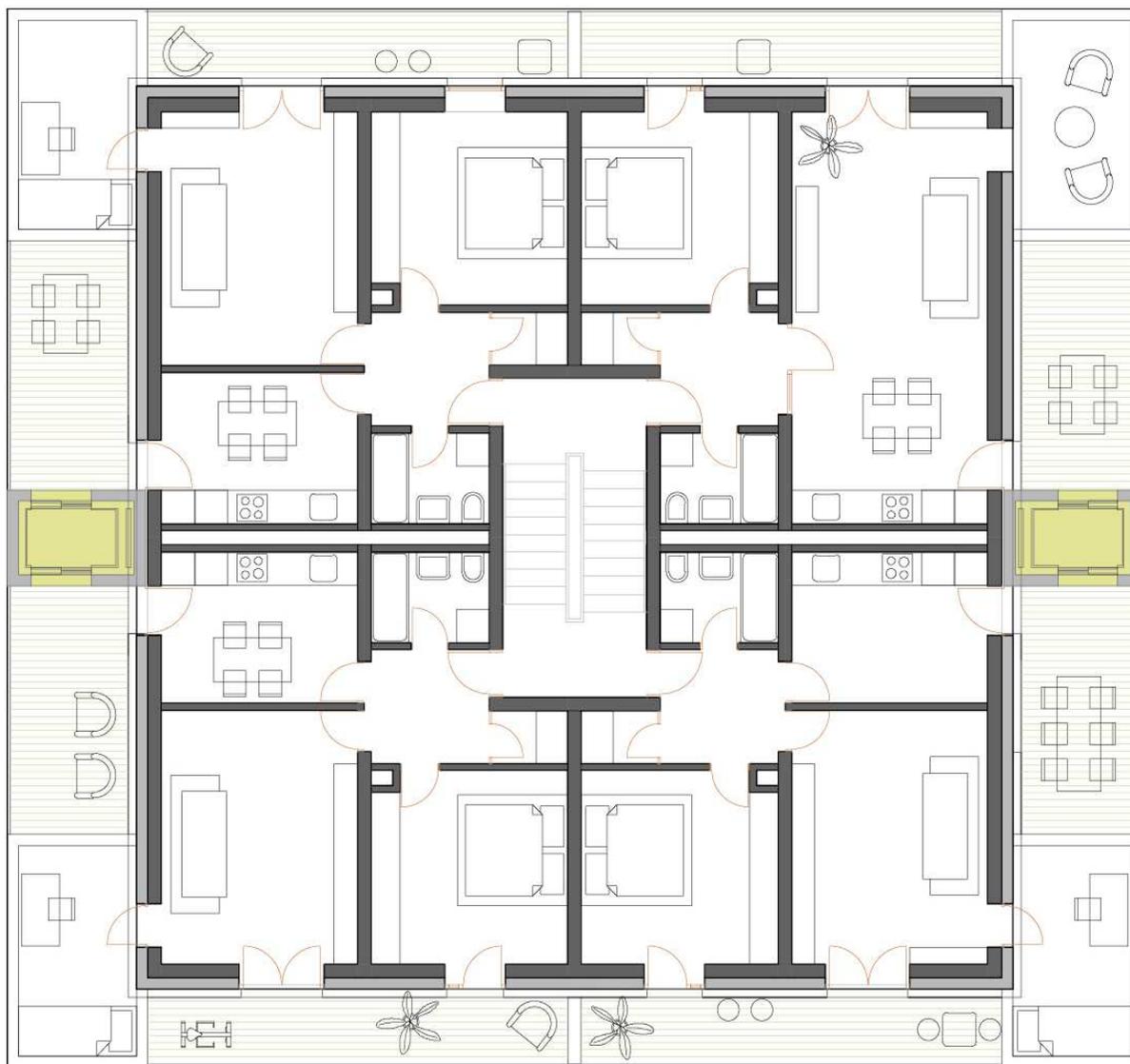
Before renovation:

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



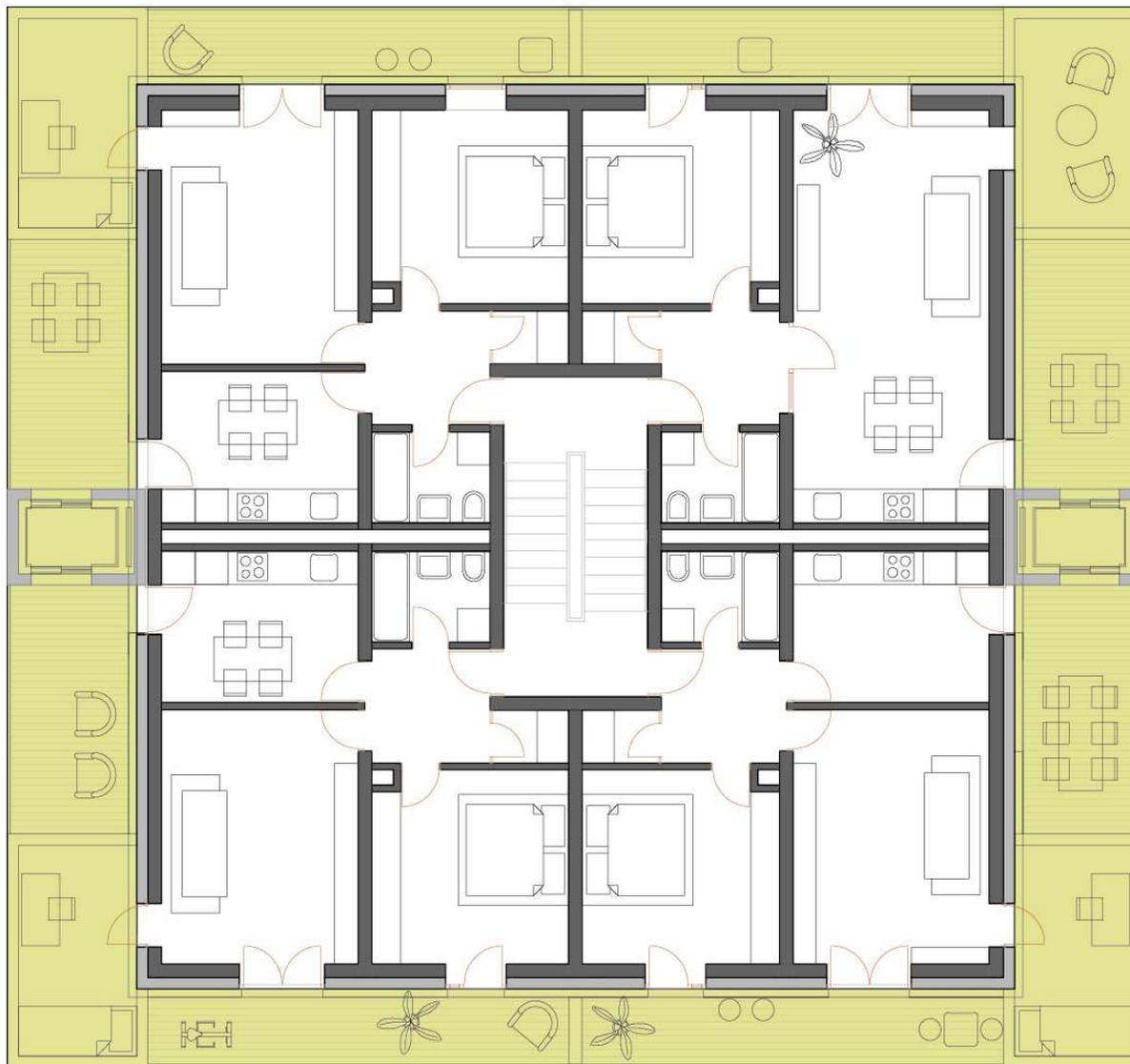
Comprehensive renovation:

1. Larger apartments
2. Flexibility of the apartments



Comprehensive renovation:

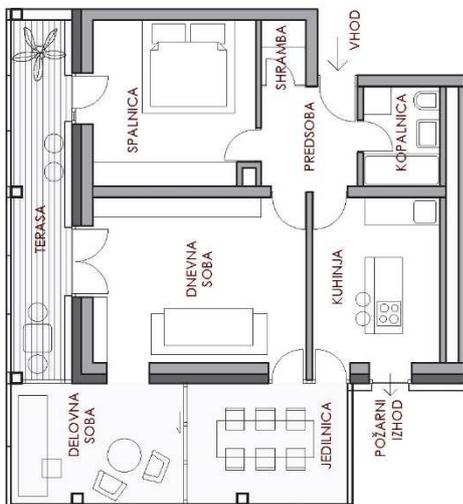
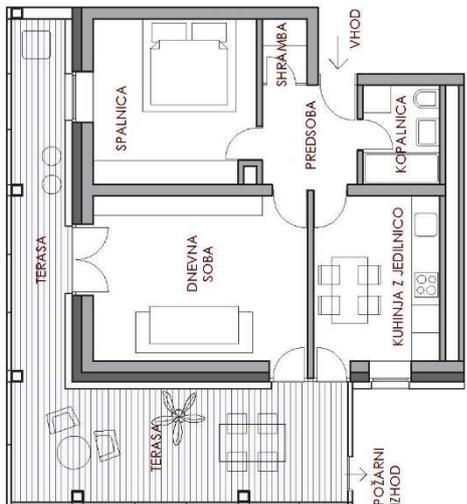
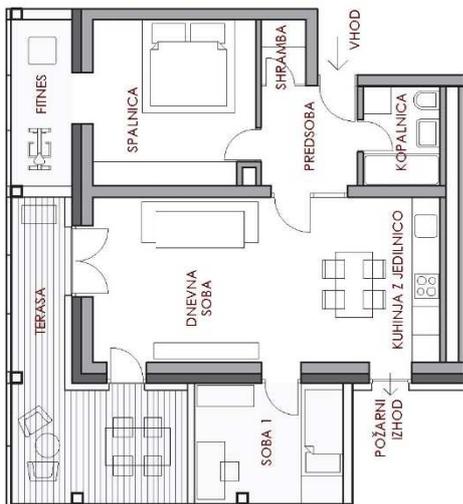
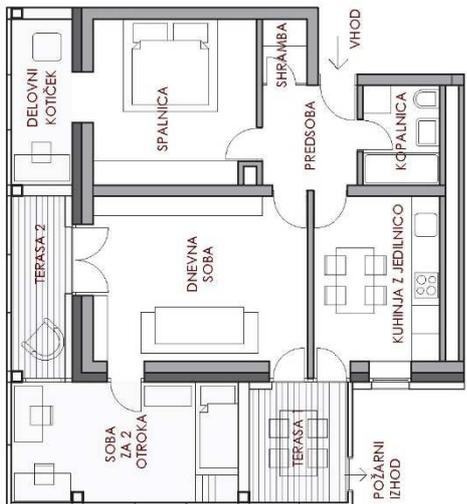
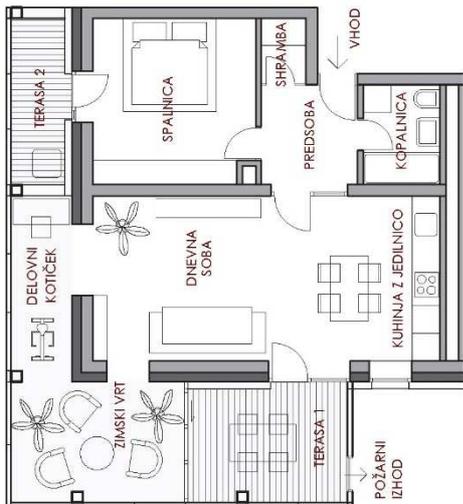
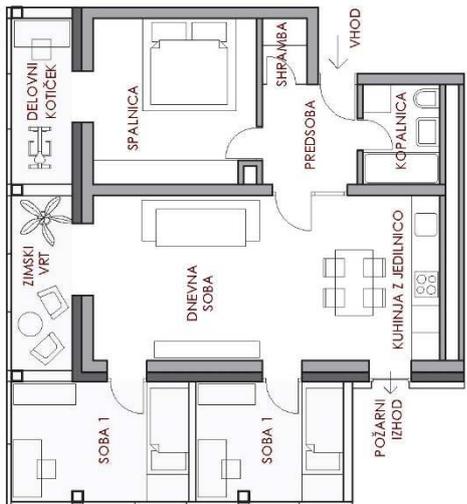
- 3. New elevator(s)
- 4. Renovated building services



Comprehensive renovation:

3. Earthquake safety
4. Thermal insulation

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Pr5 renovation
Before / after



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Pr5 renovation
Before / after

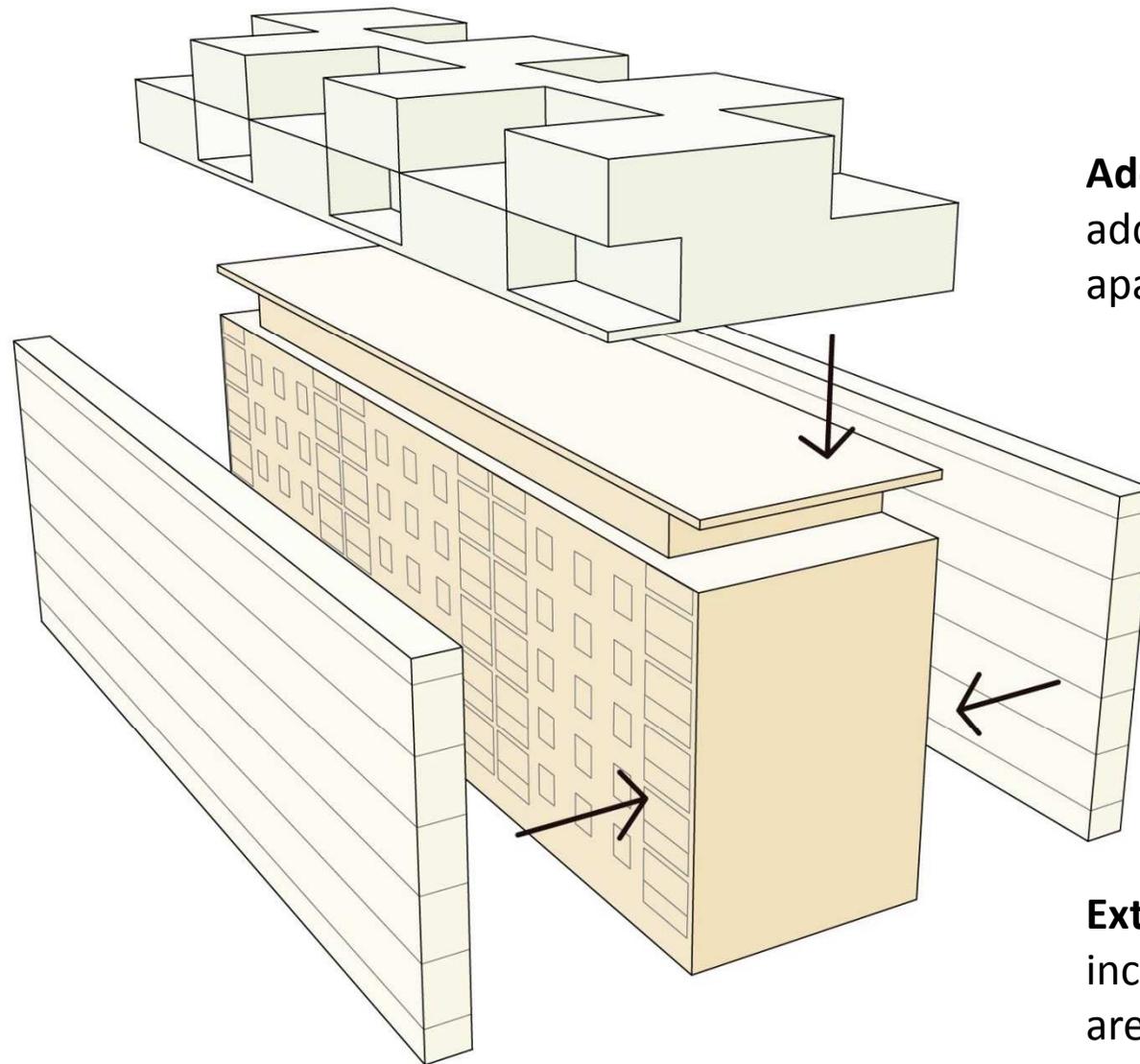


Comprehensive renovation
of multi-apartment building

Ts2

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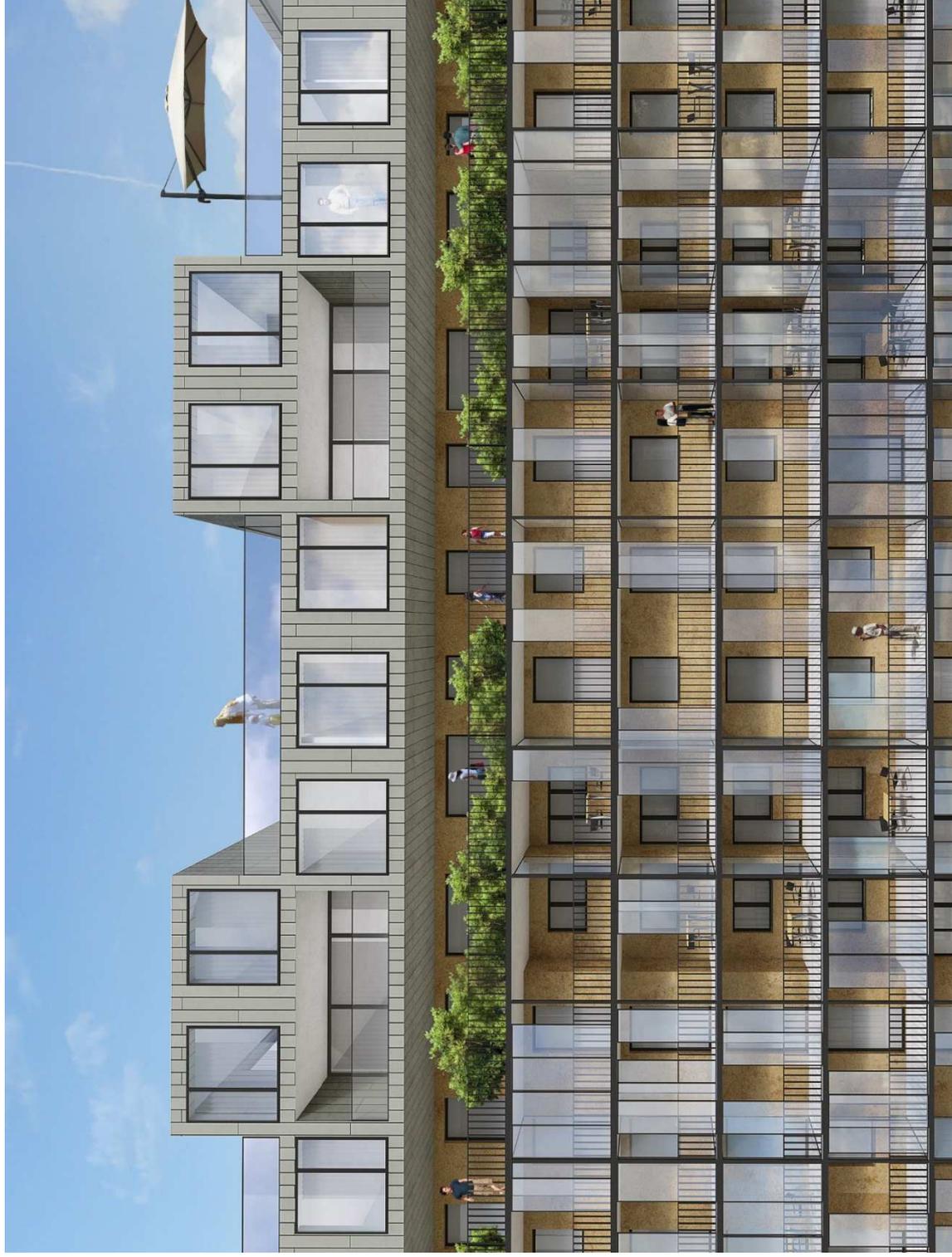


Addition on top:
adding the new
apartments

Extension:
increasing the floor
area of the existing
apartments





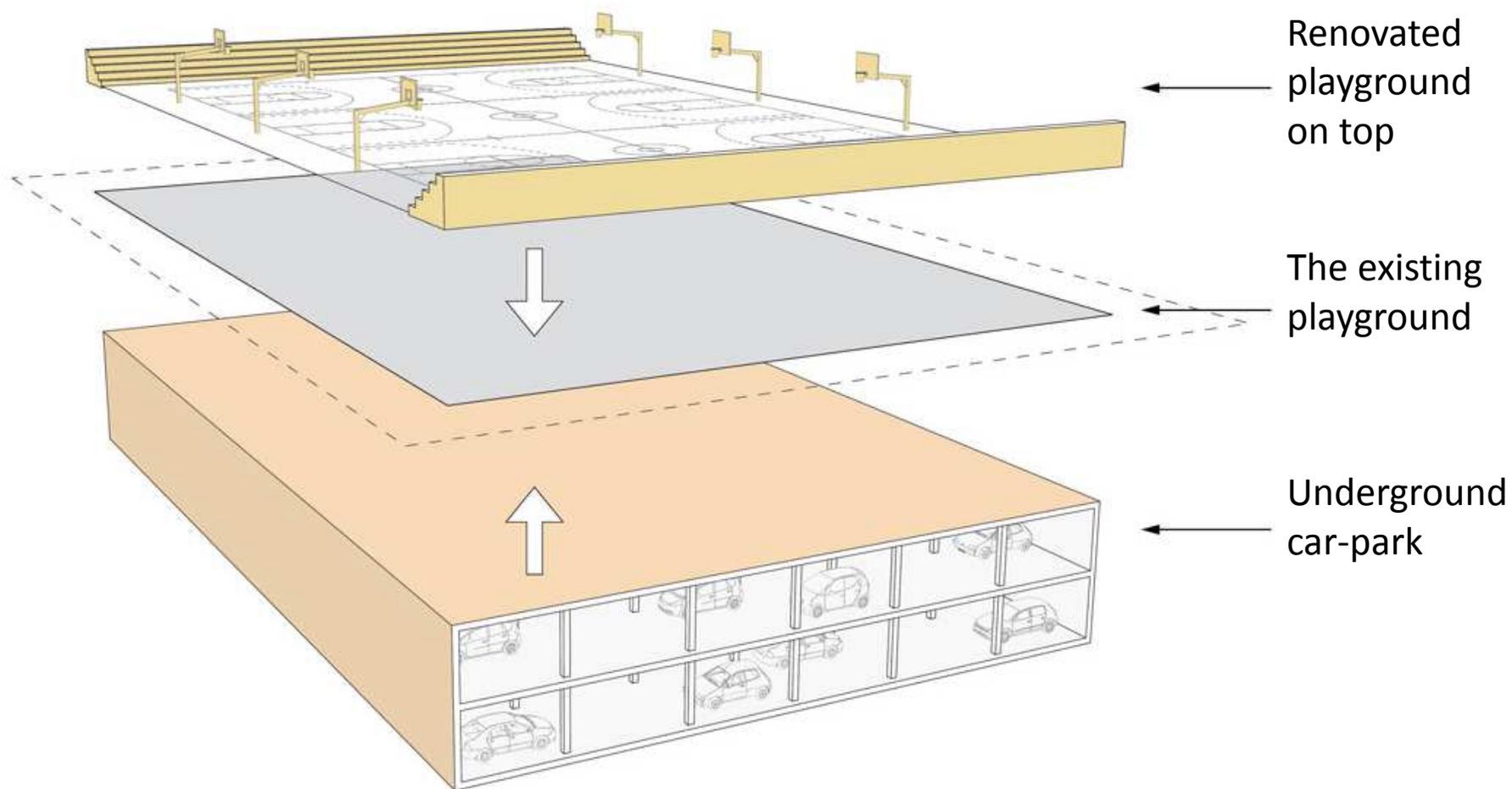


New underground car-park in Prule (Ljubljana)
under the school's outdoor playground



School's outdoor playground
Before the renovation

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School's outdoor playground
After the renovation

CITY GROWTH



OBSTOJEČE STANJE



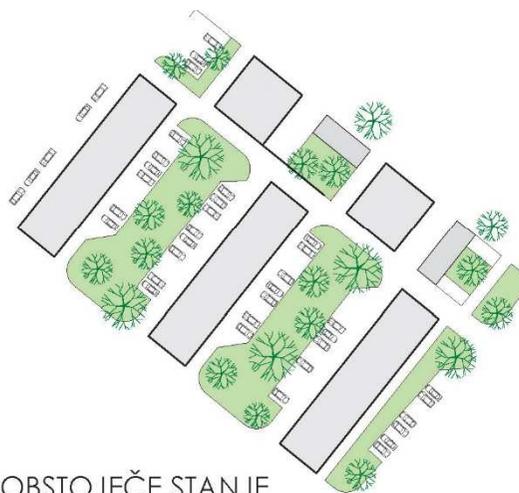
ZGOŠČEVANJE NAVZNOTER...

- zapolnjevanje praznih površin mesta
- ohranjanje zemljišč izven mesta



... NAMESTO ŠIRJENJA NAVZVEN

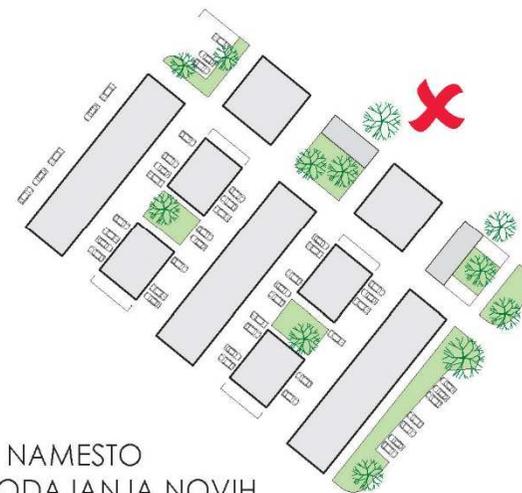
- razpršen nedefiniran rob mesta
- pozidava kmetijskih zemljišč
- podaljševanje razdalj dnevnih migracij



OBSTOJEČE STANJE



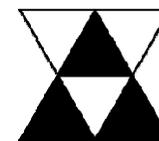
POVEČEVANJE KAPACITET OBJEKTOV...



... NAMESTO DODAJANJA NOVIH



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NEPREMIČNINE IN SVETOVANJE

partners of



THANK YOU!