LIÈGE université

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CPDT

Conférence Permanente du Développement Territorial

Urban recycling and optimal use of built stock and artificial land

Intersoil 2022, 5 octobre 2022

Context

- CPDT Research « Intensification and requalification of centralities to reduce urban sprawl and car dependency »

- DPR 2019-2024 : intention to stop urban sprawl
    - Reduce the consumption of undeveloped land by limiting it by 2025;
    - Preserve as much agricultural land as possible;
    - Preserve, reuse or renovate existing buildings;
    - Locate buildings to be constructed as far as possible in existing built-up areas (urban, rural or peri-urban) located near services and public transport.

- Demographic forecasts : + 166,000 Walloon households by 2050 (BFP, 2021)
    - Housing production : how many ? where ? what size ?

No net land take

Objective: 100% of housing production on built-up land (via urban recycling)

- Modification of existing buildings (divisions, extensions, requalification, etc.)
- New construction on artificial land
- Demolition - reconstruction

What has been the part of urban recycling in the housing production in recent years?

Diachronic analysis of housing production (2010 - 2016)

Present day

What potential for housing production does the already developed land represent?

Modelling the potential for residential densification (5 soft densification modes)

Available data sources

Données ex-ante

- Data from the delivery of permits (Work-flow, GESPER)
  - Data on operations (constructions, modifications, demolitions)
  - Spatialization at the communal level
  - No distinction can be made between building on greenfield and building on artificial land

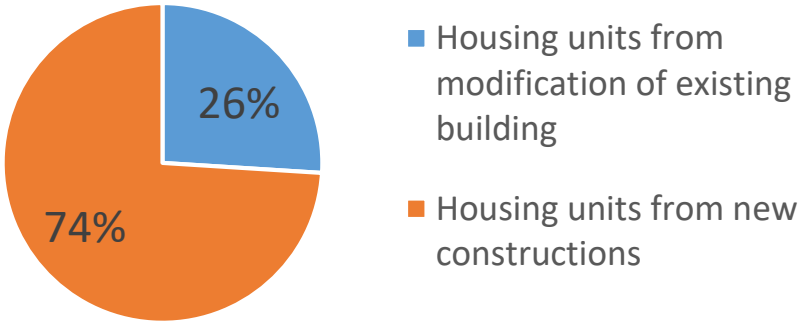
Données ex-post

- Data from the registration after the work has been completed (Cadastre)
  - Data on the land and building stock situation at a given time
  - Spatialization at the parcel level
  - Possibility of distinguishing between building on greenfield and building on artificial land

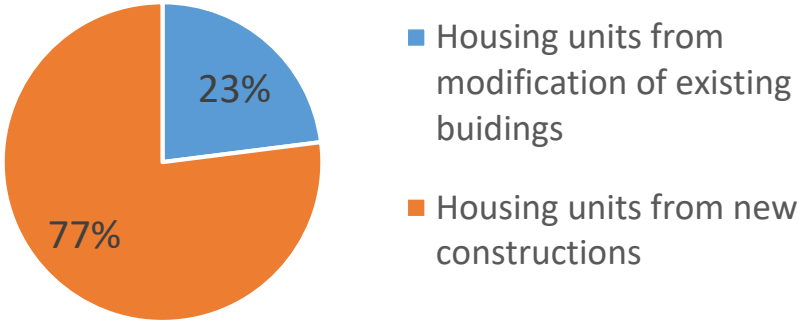
Part of urban recycling in housing production

Previous analysis (ex-ante data)

- Two different work attempted to estimate the part of urban recycling based on data from the permit delivery process
    - CPDT Plan de secteur durable, 2014 (data from *Work-flow* – SPW Territoires)
    - IWEPS Observatoire du développement territorial (data from SPF Economie)
- Estimated part of urban recycling at about 25% for the period 2009-2012



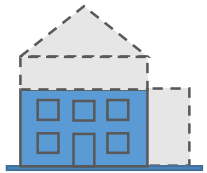
CPDT, 2014



IWEPS, 2014

Diachronic analysis (ex-post data)

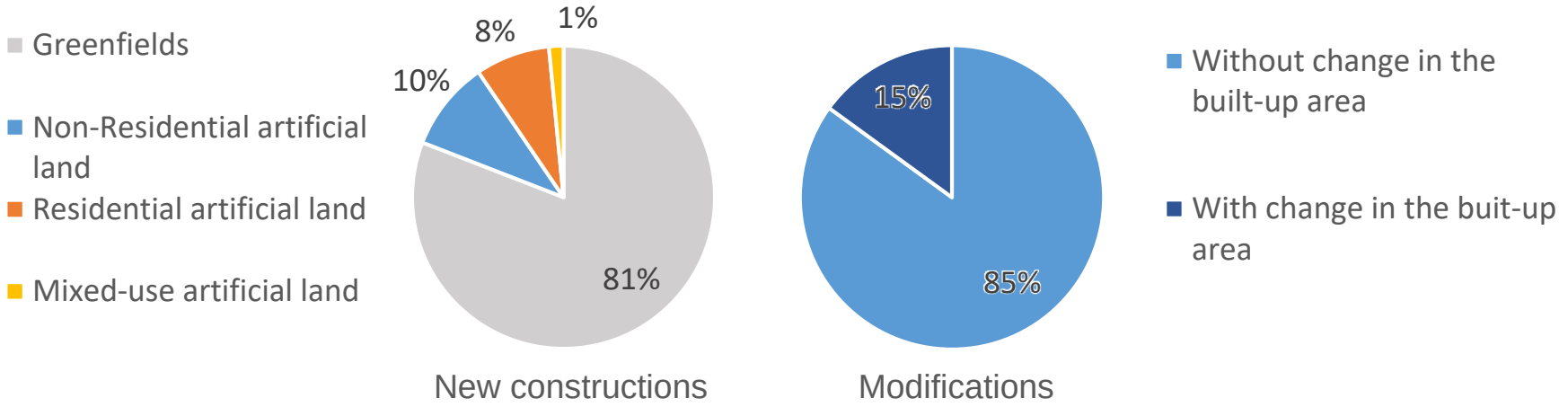
Comparison of cadastral data between two years (2010 and 2016)

Identification of parcels	Evaluation of the evolution of the number of housing units	Classification of the type of development
 Constructions First construction year 2010 < x < 2016	Field scale comparison : • Capakey • Location based on the centre of the buildings	Nature cadastrale
 Modifications Last modification year 2010 < x < 2016		Nature cadastrale Emprise bâtie
 Démolitions Loss of buildings and housing units		Nature cadastrale

Diachronic analysis (ex-post data)

- Possibility to distinguish between the construction of buildings on greenfield and those that take place on land that was previously artificialised

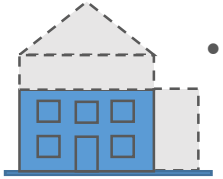
- Possibility to associate some housing production
  - with an increase in the built-up area
  - with changes in land use (e.g. from non-residential to residential use)



Results

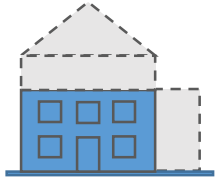
Housing units increase

- 10 880 housing units / year
  - 8800 on greenfields
  - 2080 on artificial land



- 5400 housing units / year
  - 4590 without change in the built-up area
  - 810 with change in the built-up area

Housing units decrease

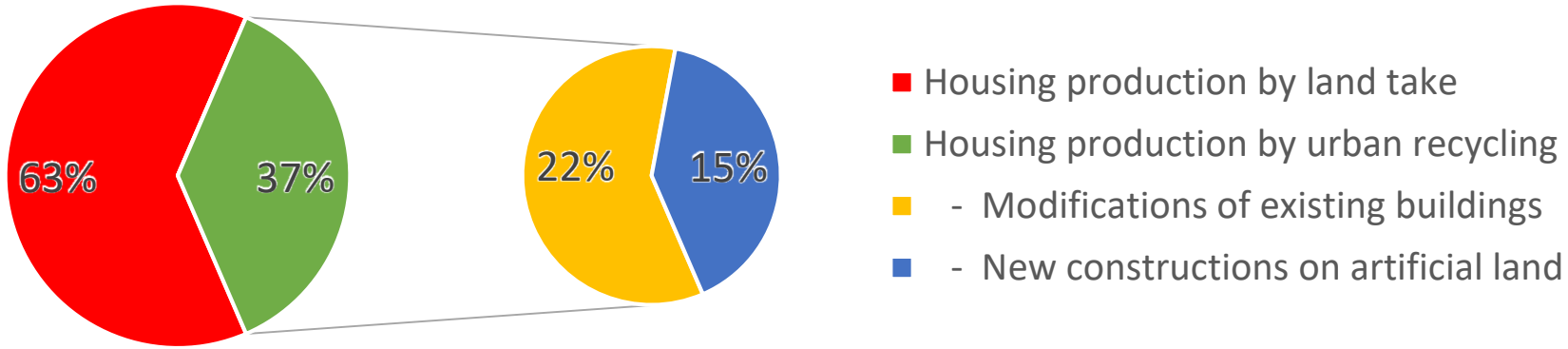


- 800 housing units / year

- 1580 housing units / year (Particular period of time)

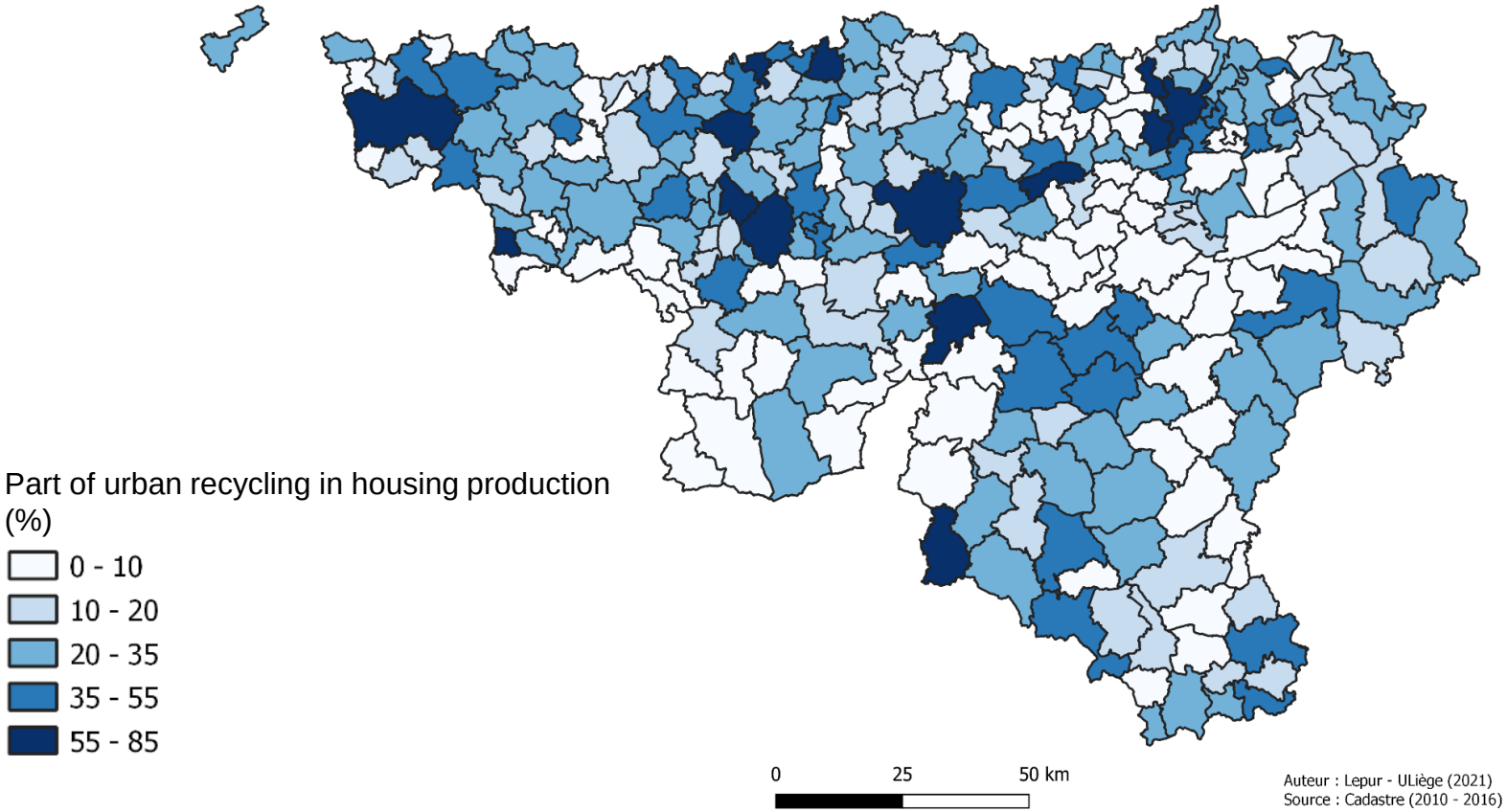
Results

Part of urban recycling in housing production



	Annual average	Relative part
New constructions on greenfields (land take)	8819	63%
New constructions on artificial land	2083	15%
Modifications (include suppressions)	3046	22%
Net housing production	**13948**	**100%**

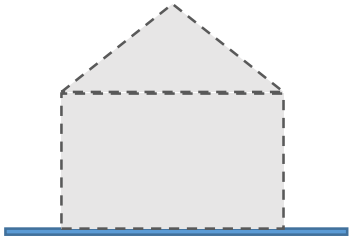
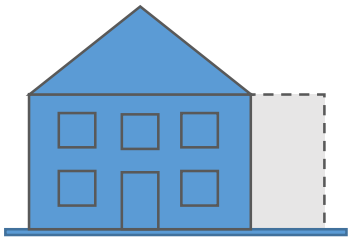
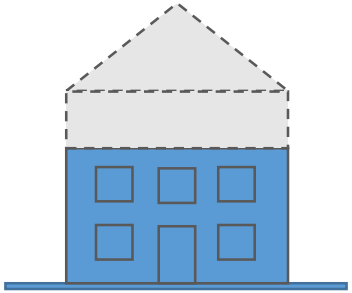
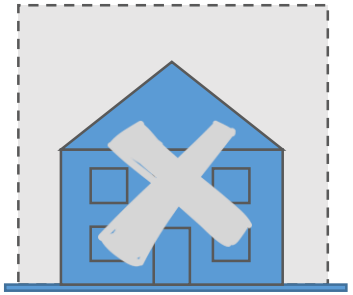
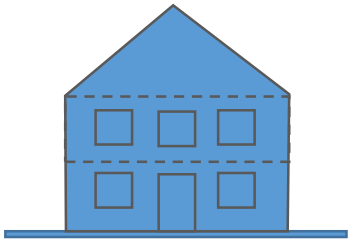
Results


Part of urban recycling in housing production (%)
0 - 10
10 - 20
20 - 35
35 - 55
55 - 85
0
25
50 km
Auteur : Lepur - ULiège (2021)
Source : Cadastre (2010 - 2016)

Potential for residential densification

Method

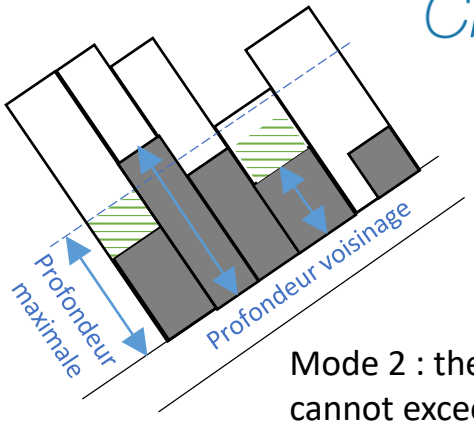
Estimating the potential for housing production on developed land for residential use through five different mode.

Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
				
New constructions on already developed land (bimby)	Horizontal extension of an existing building	Vertical extension of an existing building	Demolition-reconstruction	Division of existing housing units

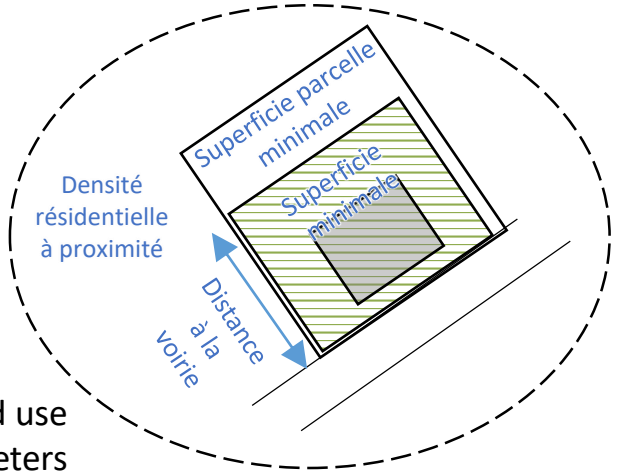
Method

1. Identify applicability criteria for each mode:

- Minimum area required
- Accessibility to roadway
- Distance to roadway
- Distance to existing building
- Size of existing building
- Average density within a specified radius
- Part of single-family housing units (non-subdivided buildings) within a specified radius



Mode 2 : the extension cannot exceed the depth of the existing building

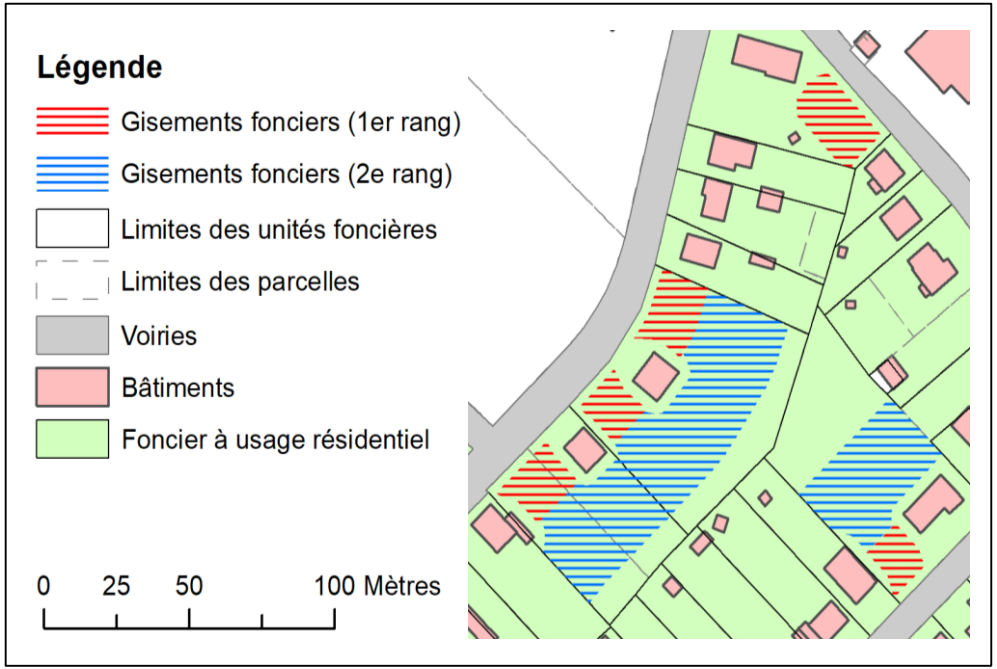


Mode 4: reconstruction is done according to the average land use coefficient (LUC) of housing units located within 500 meters

Method

2. Determine the available areas by these criteria on residential land occupied by single-family homes:

- Available land areas
- Available floor areas
- Available heights



Mode 1: Determining the amount of land available for a new building on already developed land

Method

3. Convert available areas into number of housing units:

- Minimum housing unit size (100 m² floor area)
- Density of housing units per available area within a specified radius (500 m)

4. Decline the potential according to the proximity to basic services and structuring public transport stations :

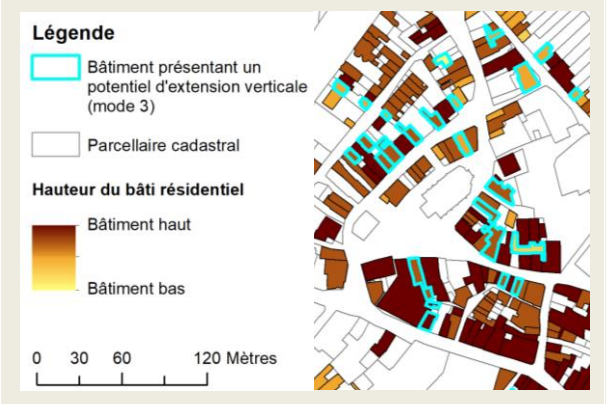
- Proximity to at least two services (shops, pharmacies, primary schools)
- Proximity to a major stop (train stations and bus stops with sufficient service)

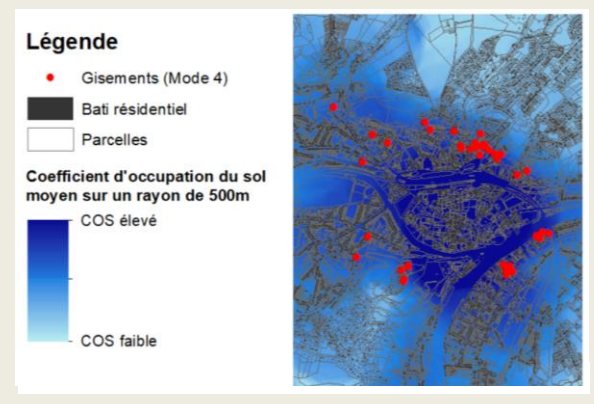
< 500 m	> 500 m et < 1000 m	> 1000 m

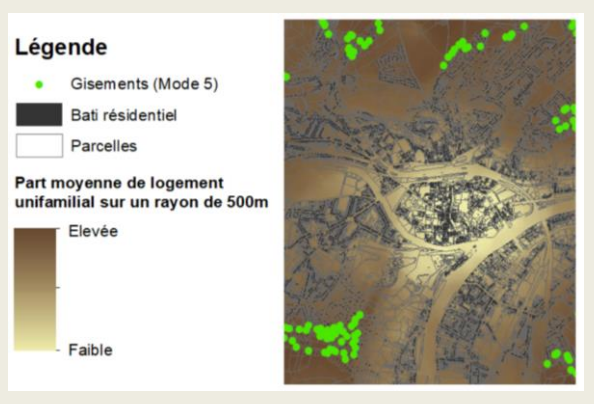
Results

Number of potential units for the 5 modes

Proximity to services or structuring stops	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Total
Less than 500m	52 448	56 060	27 161	26 936	33 518	196 123
Between 500m and 1000m	51 813	24 208	6621	2657	27 244	112 543
More than 1000m	100 939	23 365	5226	743	44 760	175 033
Total	**205 200**	**103 633**	**39 008**	**30 336**	**105 522**	**483 699**







Conclusions

- The part of urban recycling is about 37% of housing production. Recycling processes are already well established in some municipalities.
- In average, the municipalities can increase their housing stock by 20% through the analyzed modes.
- From a technical point of view, it seems perfectly possible to meet future residential needs without consuming new land.
- The criteria used to evaluate the potential for residential densification were intended to be realistic and reasonable, even minimalist in some cases. The analysis does not take into account all forms of housing production that do not involve the use of land.
- The results are orders of magnitude. In reality, it is up to the policy-maker to ensure that the dynamics of densification are accompanied by a maintenance, or even a reinforcement, of the quality of the area.

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