VORZEL

DIGITIZATION OF DESTROYED INFRASTRUCTURE

REBUILD UA

ABOUT THE PROJECT

Background

The russian aggression has caused a large amount of damage and destruction in almost all regions of Ukraine — housing and infrastructure have been destroyed, and industrial facilities and local businesses shut down.

The speed and efficiency of the country's recovery processes directly depend on a competent assessment of the damage, correct budgeting and a step-by-step plan for reconstruction. A transparent assessment of damages will justify the need for funding as well as simplify the process of raising funds for recovery.

About the project

The RebuildUA project aims to digitize, analyze and demonstrate to the world the destruction of Ukraine's infrastructure. The geography of the project covers all regions of the country affected by military aggression.

The results will be made public, communicated to communities, public authorities and specialized recovery funds.

Project founders:

Drone survey and digitization of geospatial information:

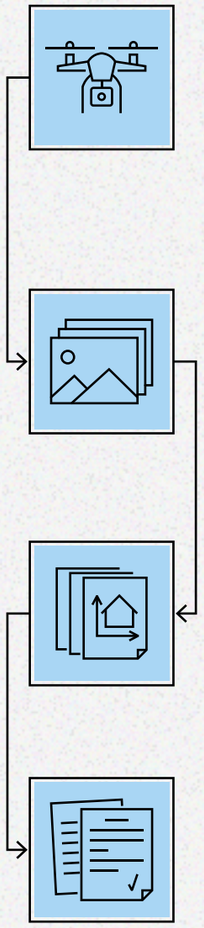
SMART Farming

Land analysis and interaction with communities:

VKURSI ZEMLI

The initiative is being financially and technically supported by the United Nations Development Programme in Ukraine.

Methodology



1. Drone photography and orthophoto creation

The use of drones allows the project team to collect detailed data on the destruction: to fly at low altitudes, and shoot buildings at different angles and from all sides.
For localities where drone shooting is not possible, we use high-resolution satellite images.

2. Collection of photos and videos

To ensure completeness of the input data, the project team captures photos and videos, as well as collects additional information from verified sources.

3. Destruction detection and data processing

Based on orthophotos, GIS specialists digitize all buildings, identify destroyed objects, classify building types, and determine levels of destruction.

4. Publication of analytical reports

Designers and content managers present the complete information in public infographic reports.

Find out more at the project website: rebuildua.net

ABOUT THE LOCALITY

Vorzel is slowly coming back to life after the occupation: people are cleaning and covering the windows broken by the explosions, but they still don't feel completely safe here.

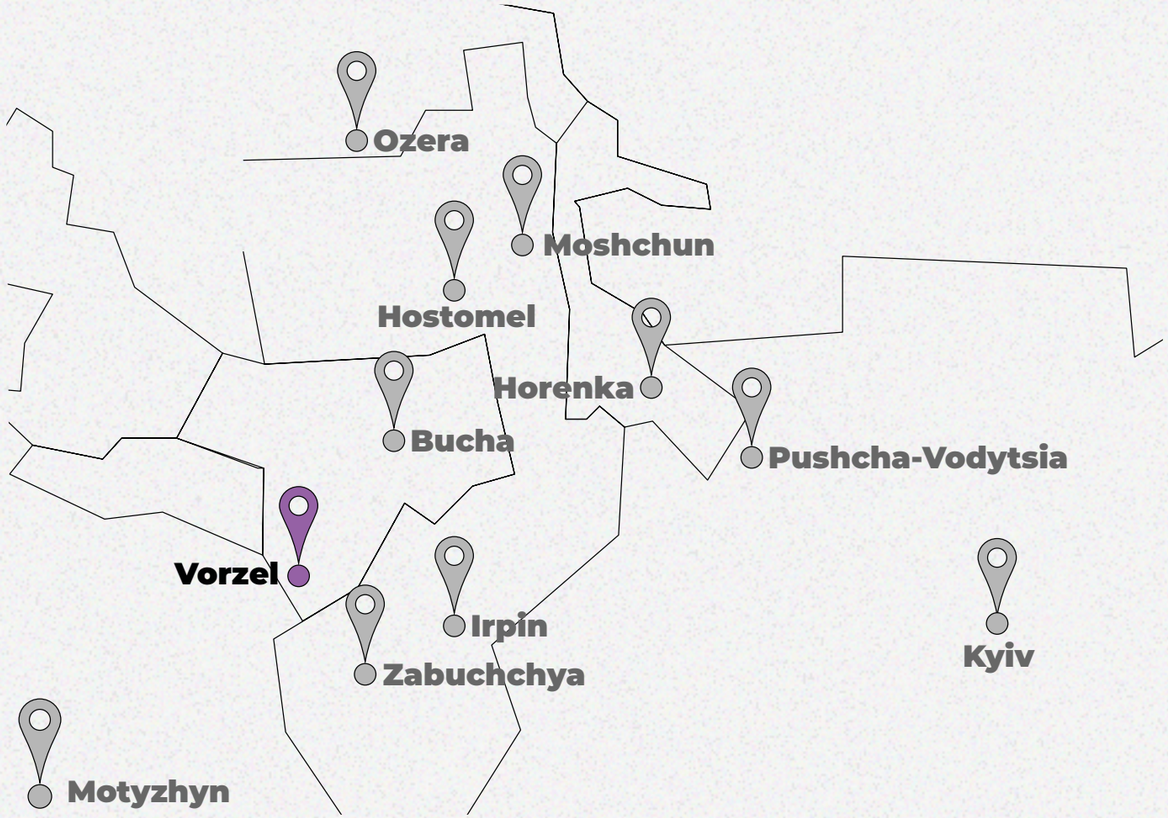
At the end of February, russian military forces entered the village of Vorzel on their way from Bucha, and more than 3,000 people did not have time to evacuate. The local orphanage was damaged by shelling, the Lastivka kindergarten was destroyed, and a headquarters was set up on the premises of the psychoneurological hospital No. 2. The occupiers conducted searches of residents and robbed their houses.

Read more about the destruction of Vorzel by russian occupiers in our report.

rebuildua.net

/rebuildua.net

Photos: gazeta.ua

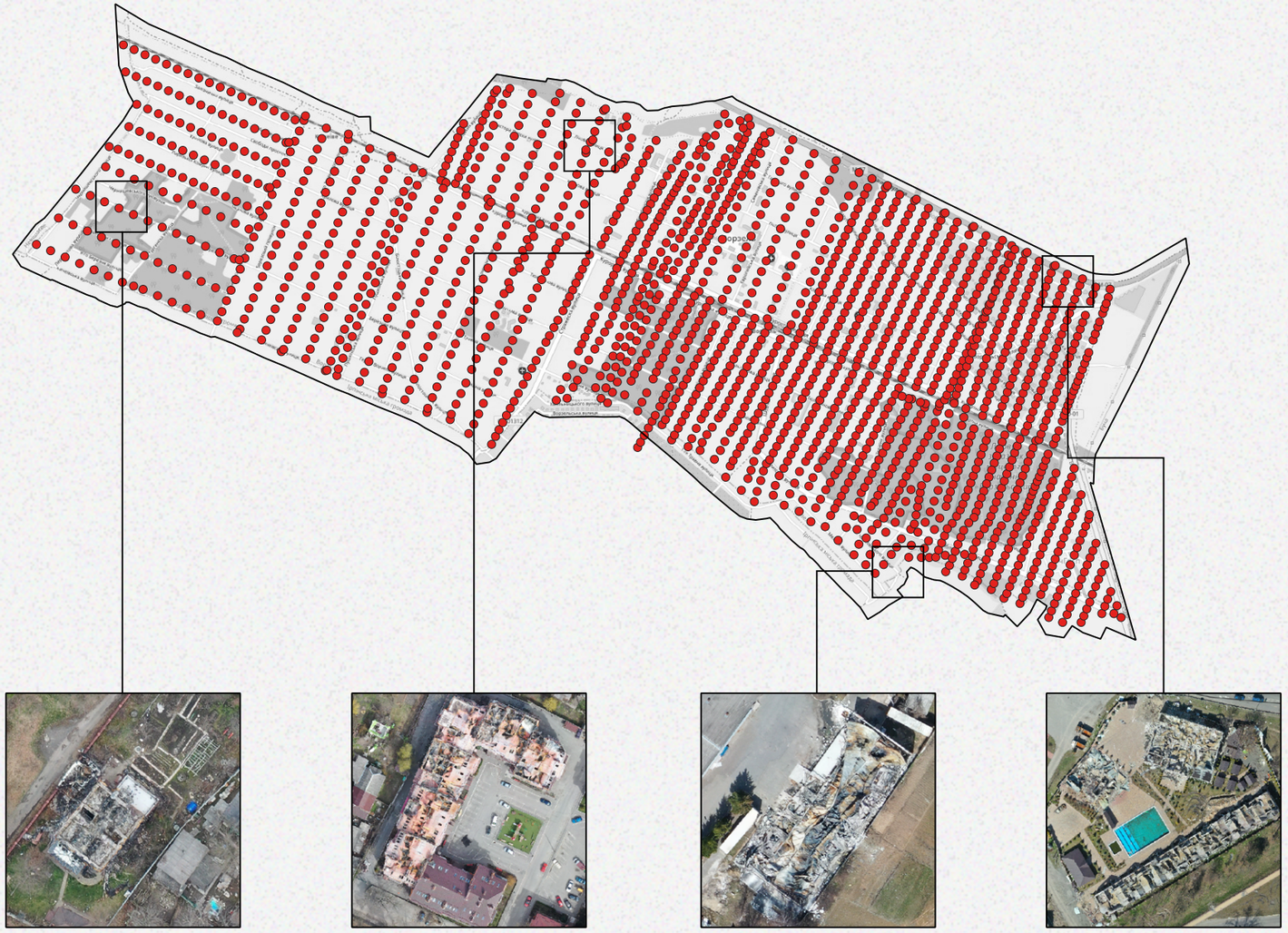


Region	**Kyiv**
District	**Buchanskyi**
Community	**Buchanska**

Area
930 hectares

Population
6,618 people

DIGITIZATION PROCESS



12 flight missions

1,874 pictures for othophoto

250 hours of data processing

19.4 Gigabytes of data

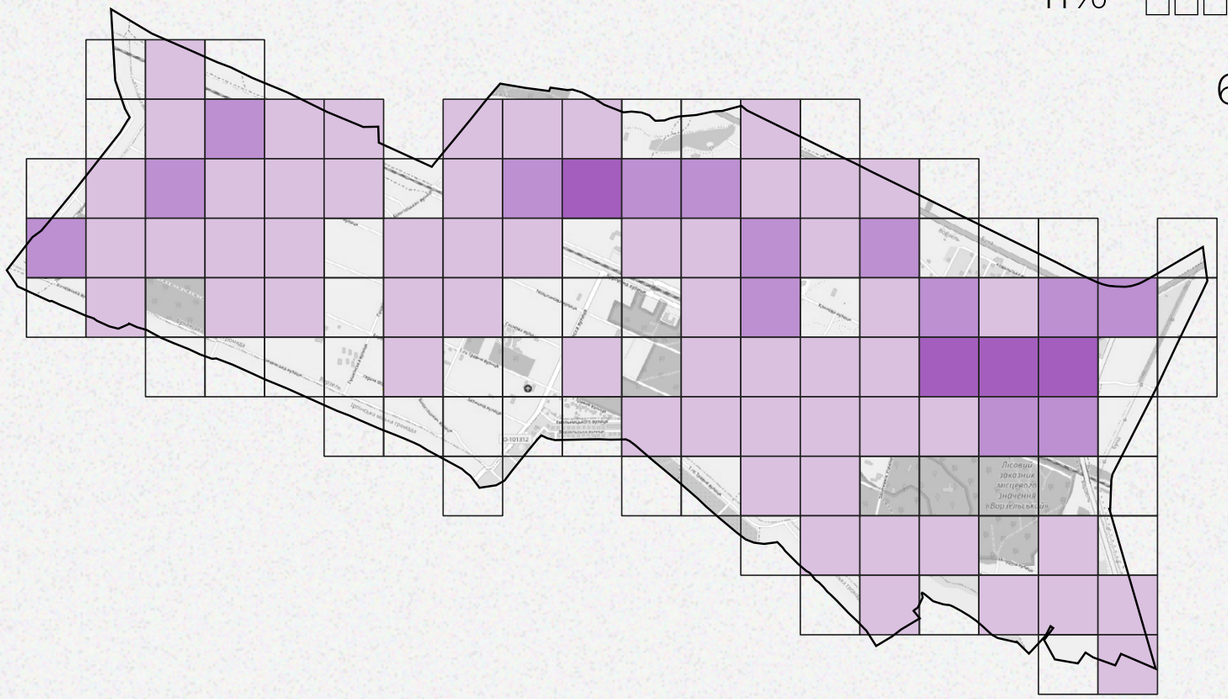
border of the locality

trajectory of drone shooting

THERMAL MAP OF DESTRUCTION

Number of
destroyed buildings

- 0
- 1–25
- 26–100
- 101+



Destruction of the largest streets

10 buildings

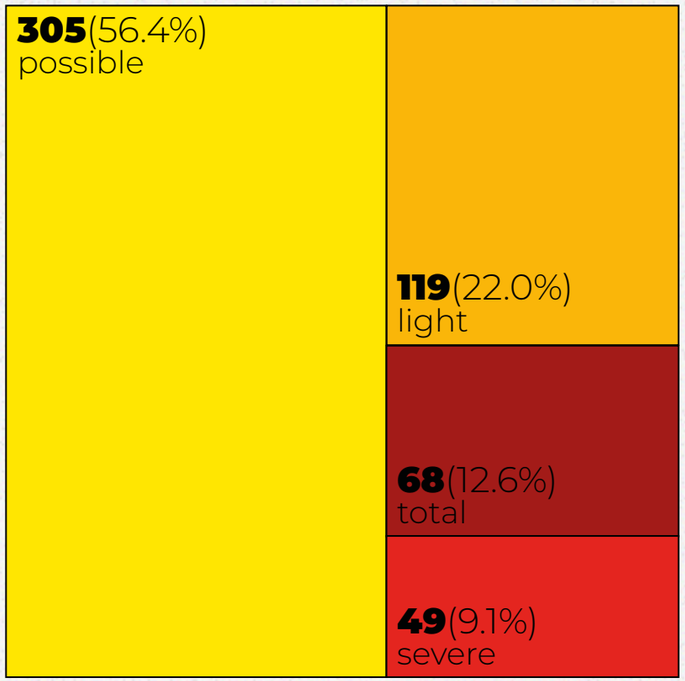
7%	**37** / 566	Lisova
12%	**60** / 506	Klenova
11%	**54** / 490	Kurortna
6%	**21** / 377	Yablunska
3%	**8** / 310	Sosnova
3%	**7** / 273	Tulpanova
11%	**28** / 261	Vatutina
21%	**45** / 213	Molodizhna
7%	**13** / 196	Myru
10%	**17** / 179	Yevropeyska

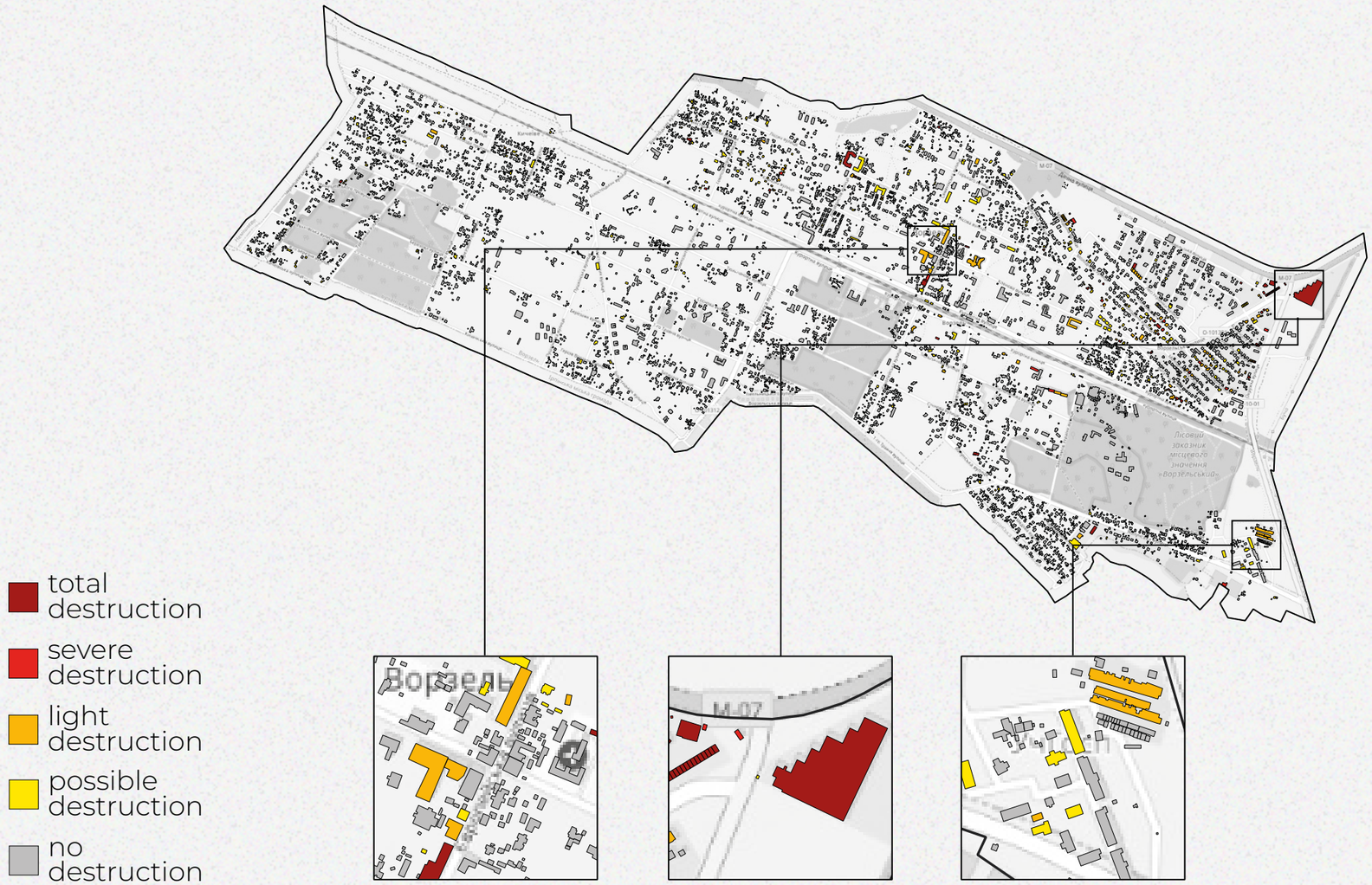
LEVELS OF DESTRUCTION

Buildings destroyed:

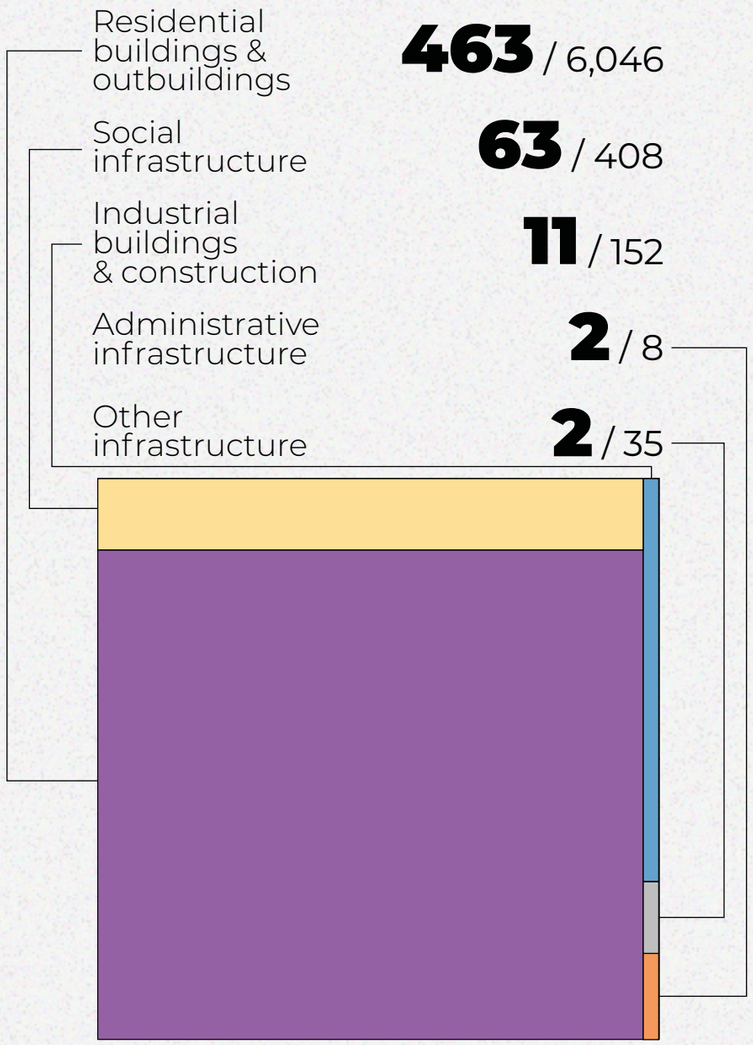
541 / 6,649

Level of destruction, number of buildings





TYPES OF DESTROYED OBJECTS



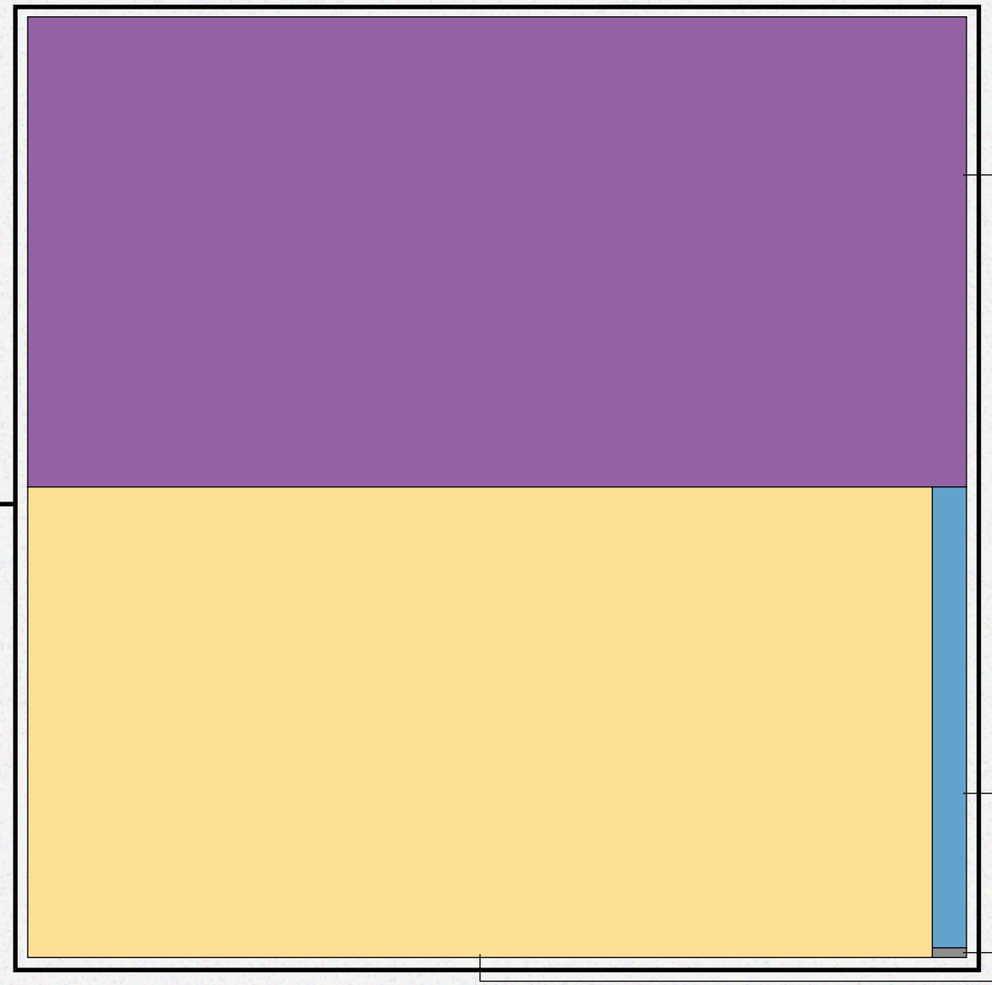
ASSESSMENT OF DAMAGES

KSE Institute

Damages by types of buildings

Total damages

$52.0 mln



$24.9 mln
Residential buildings
& outbuildings

$2.8 mln
Industrial buildings
& construction

$0.02 mln
Other infrastructure

$24.3 mln
Social infrastructure

SMART Farming

VKURSI ZEMLI

TOP LEAD

RESIDENTIAL BUILDINGS & OUTBUILDINGS

SCALE OF DESTRUCTION

Residential buildings & outbuildings

Private houses

173 / 1,828

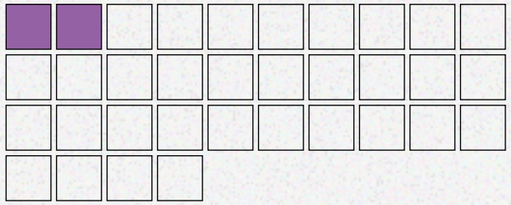
Townhouses & duplexes

52 / 295

Apartment buildings

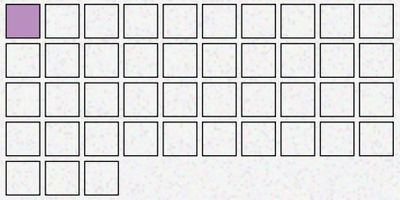
21 / 45

Outbuildings



206 / 3,435

Garages & parking spaces

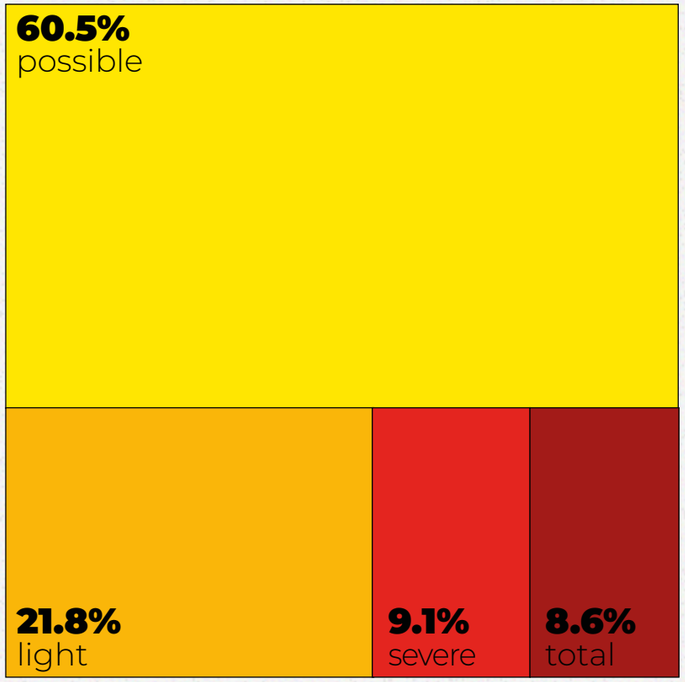


11 / 431

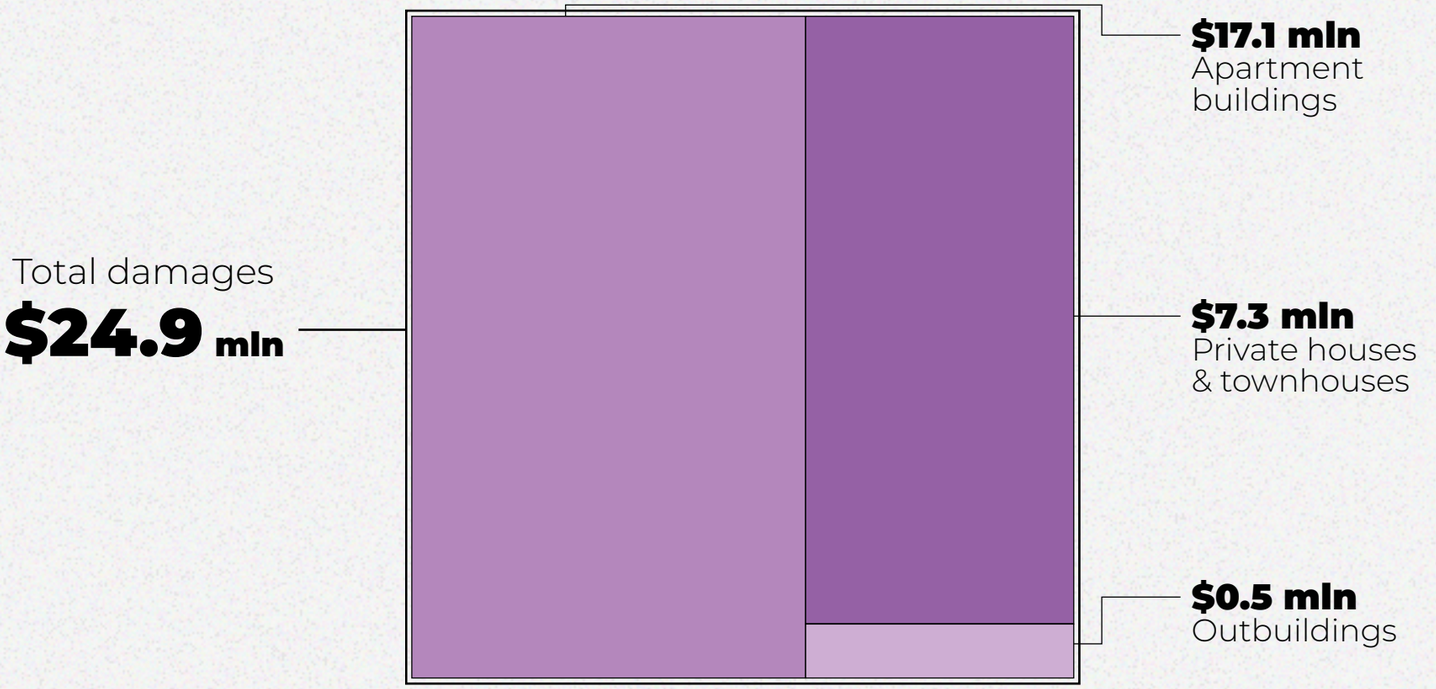
SCALE OF DESTRUCTION

RESIDENTIAL BUILDINGS & OUTBUILDINGS

Level of destruction

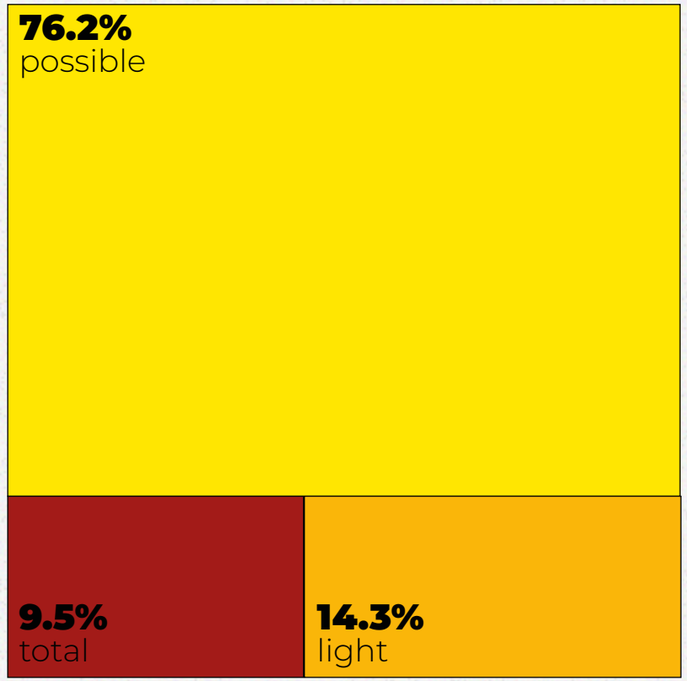


Assessment of damages

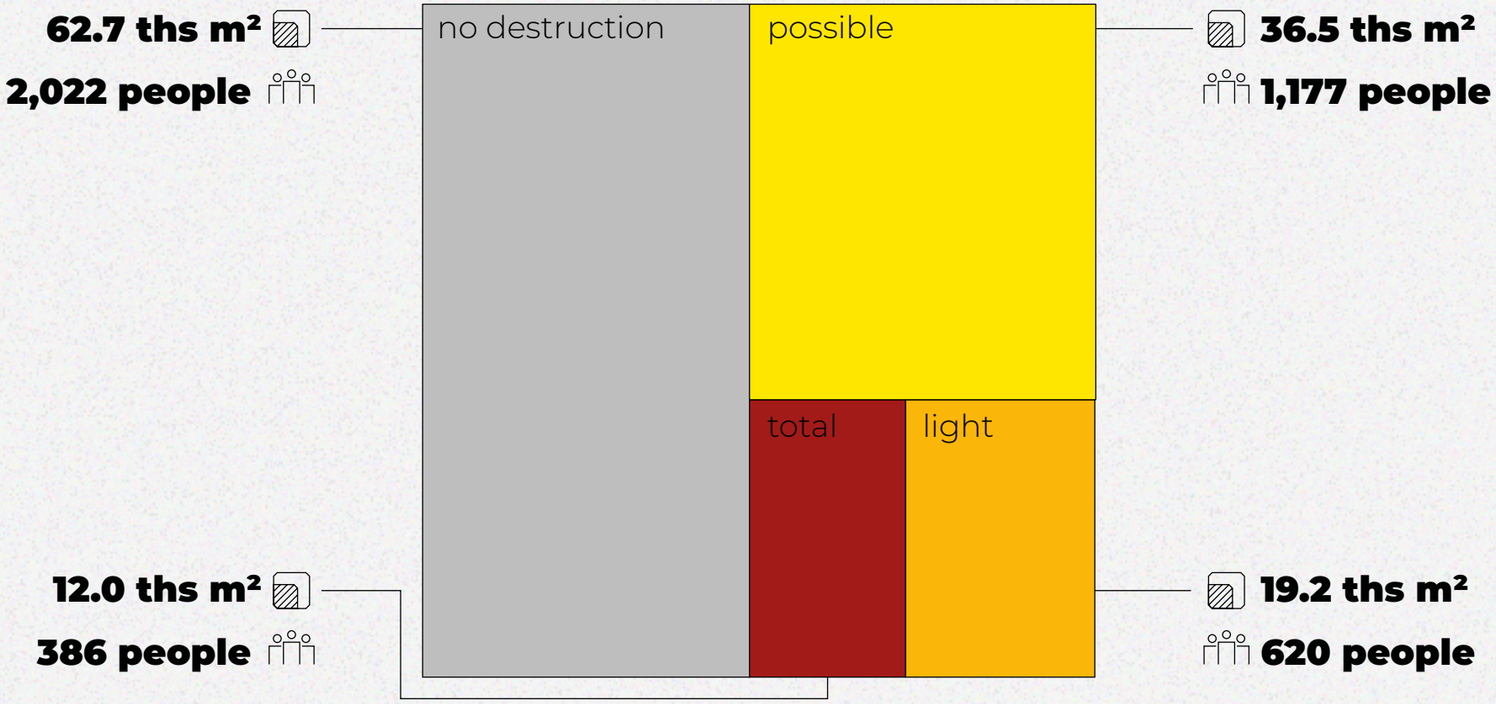


APARTMENT BUILDINGS

Level of destruction



The area of destruction and the number of residents who suffered damage



Total damages

$17.1 млн

Total area of damage

67.7 ths m²

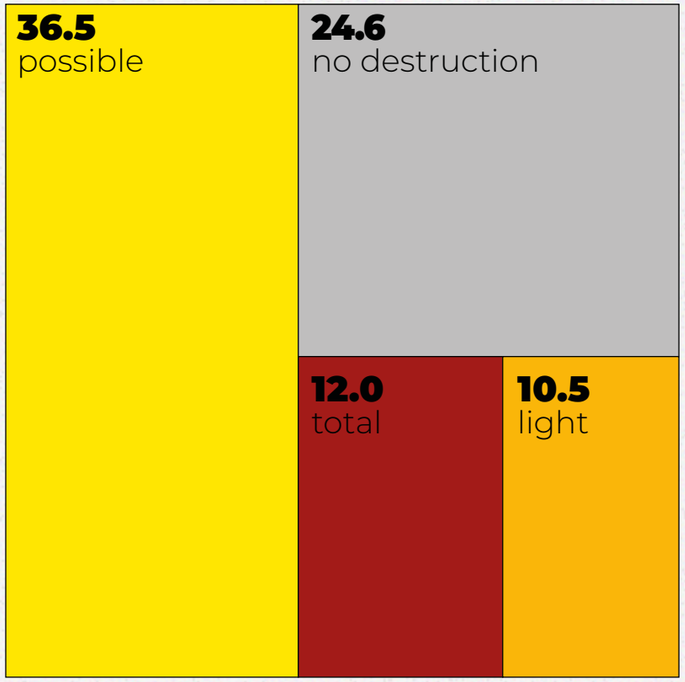
Number of residents affected

2,182

APARTMENT BUILDINGS

Typical apartment buildings (by the number of floors) and their destruction

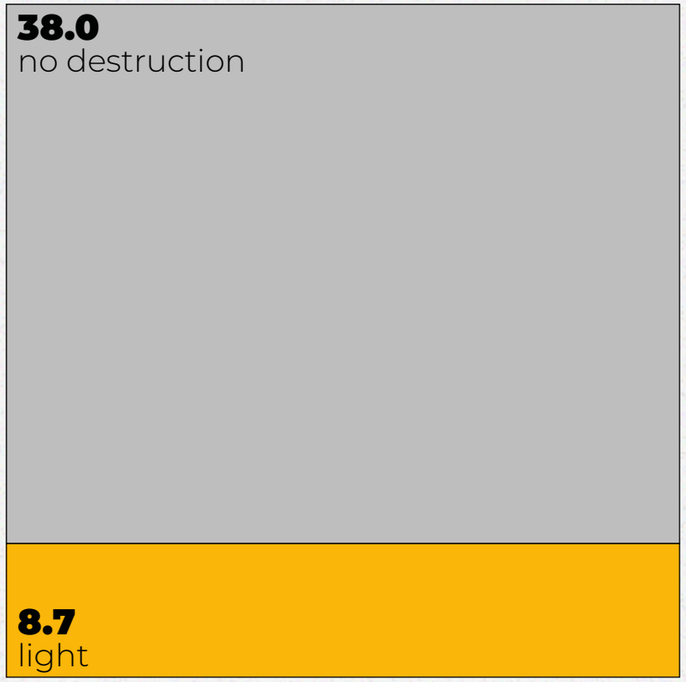
5 floors (ths m²)



Total area of damage

59.0 ths m²

6+ floors (ths m²)



Total area of damage

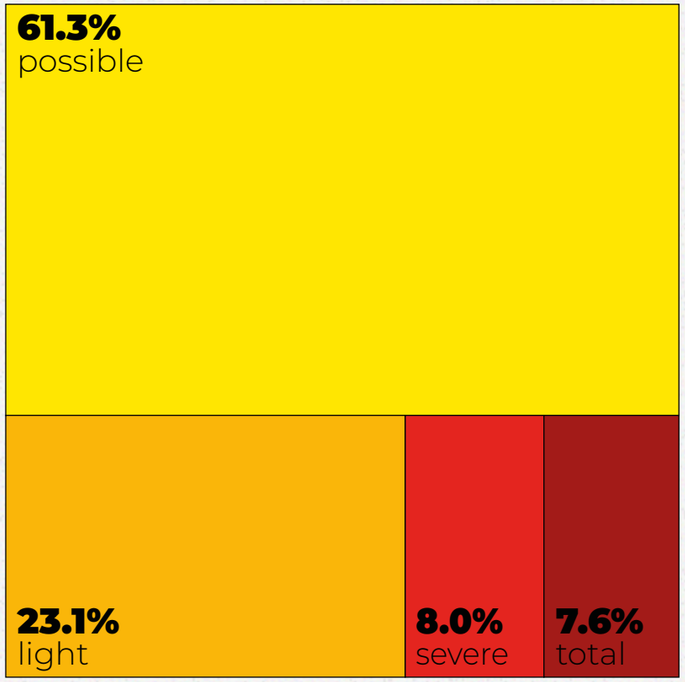
8.7 ths m²

Residential complex

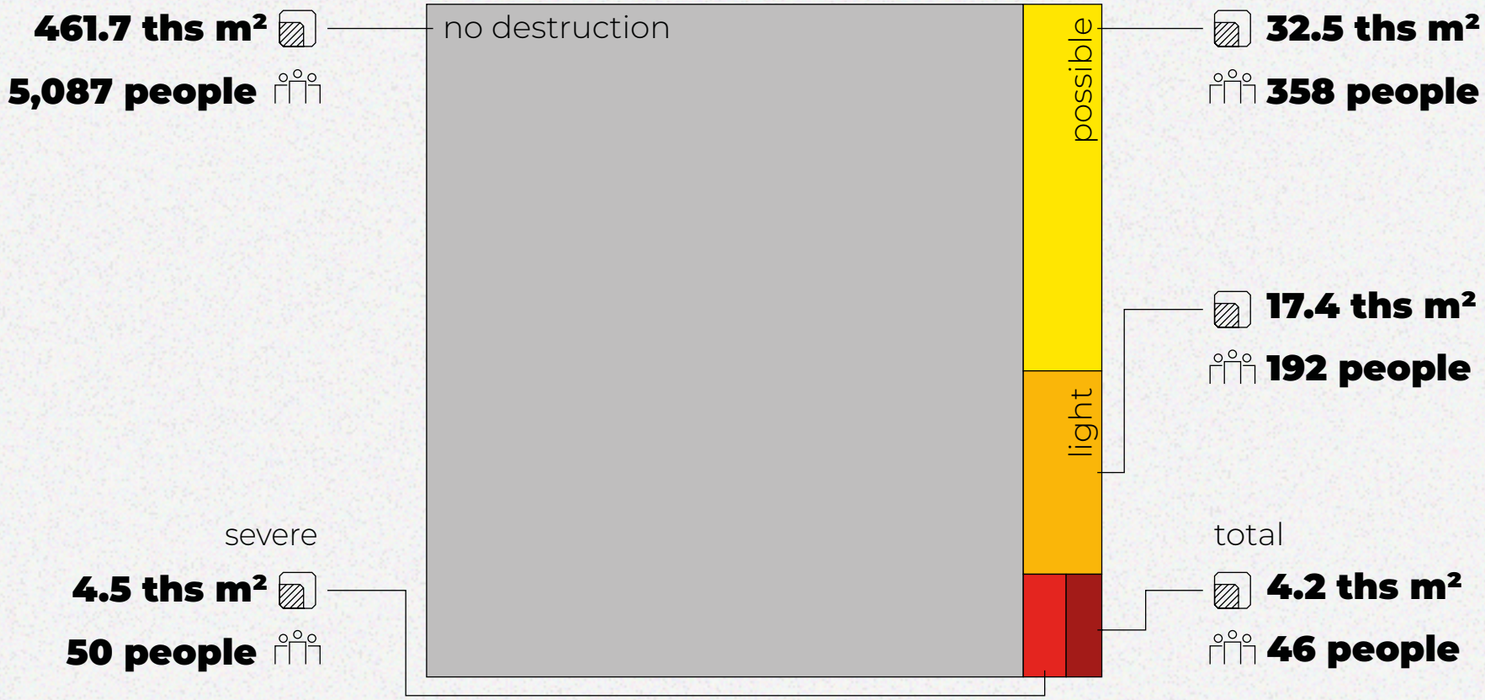
PRIVATE HOUSES & TOWNHOUSES

RESIDENTIAL BUILDINGS & OUTBUILDINGS

Level of destruction



The area of destruction and the number of residents who suffered damage



Total damages

$7.3 mln

Total area of damage

58.6 ths m²

Number of residents affected

645

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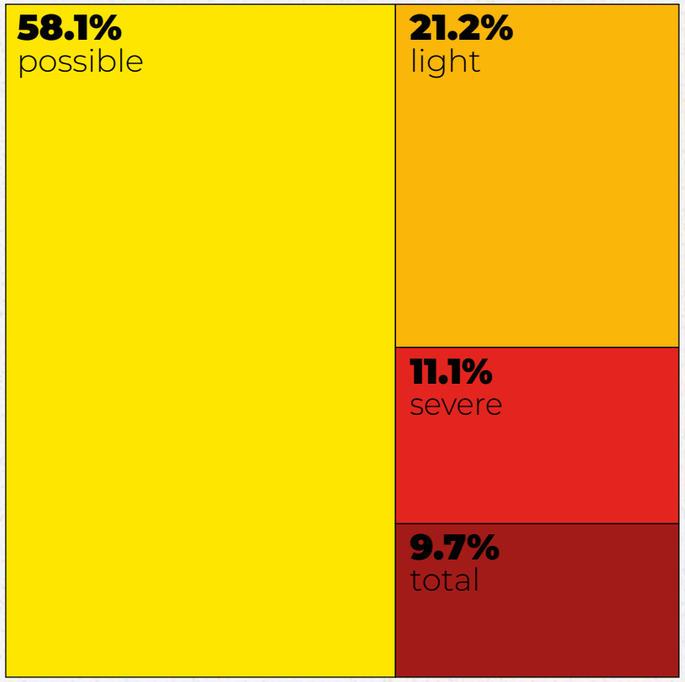
OUTBUILDINGS

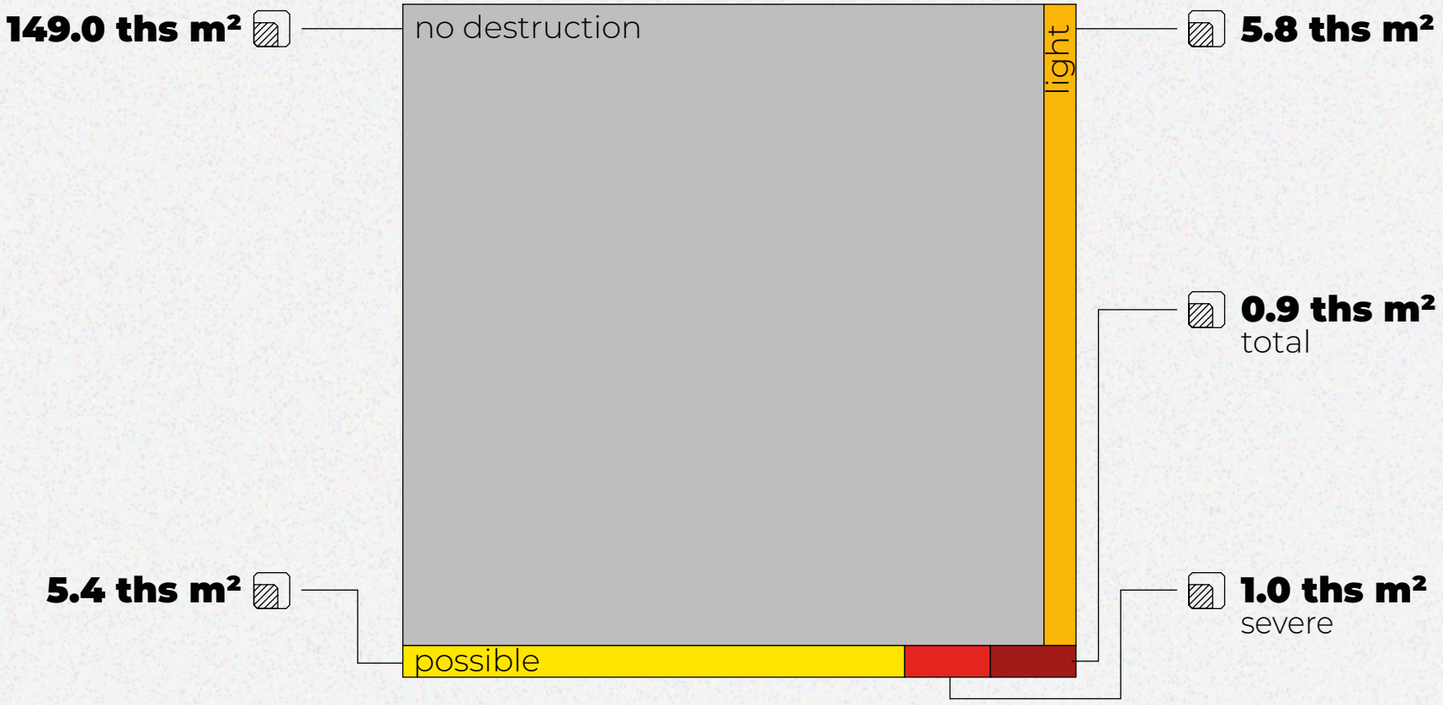
Level of destruction



Total damages

$0.5 mln

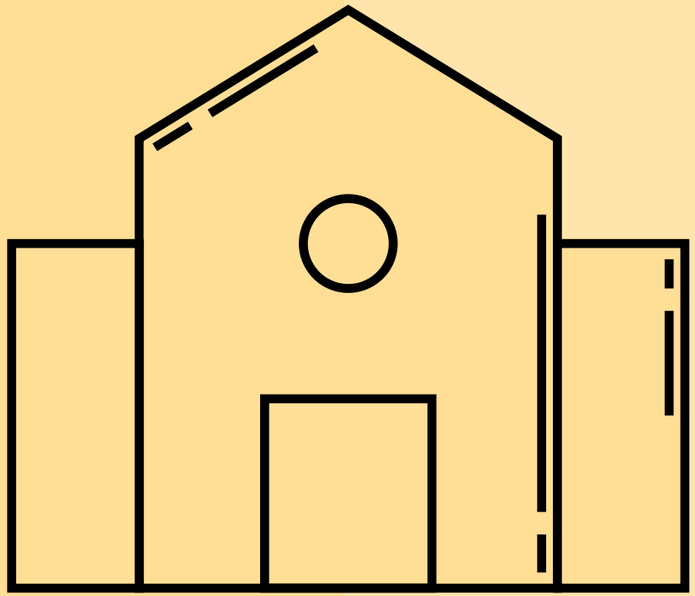
Area of destruction



Total area of damage

13.1 ths m²

SOCIAL INFRASTRUCTURE



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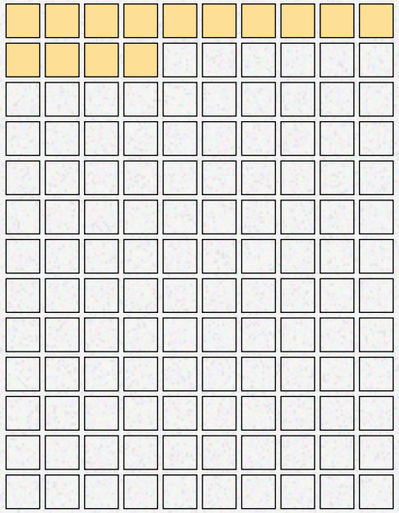
SCALE OF DESTRUCTION

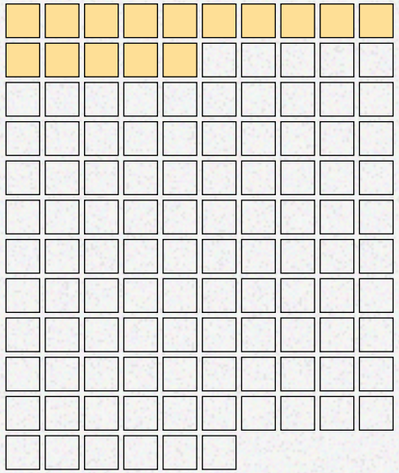
Social infrastructure

Buildings of general purpose



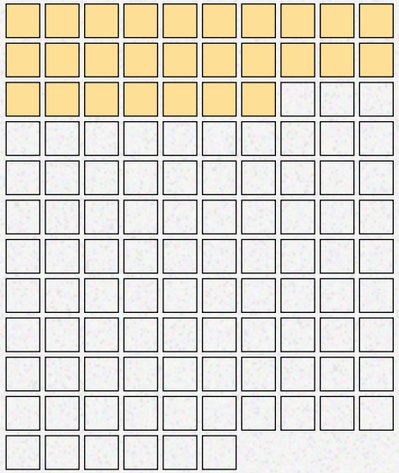
14 / 130

Trade and commerce



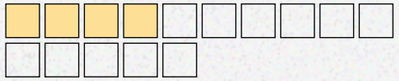
15 / 116

Hotels and recreation facilities



27 / 113

Healthcare institutions



4 / 15

Culture, religion and sports institutions

2 / 14

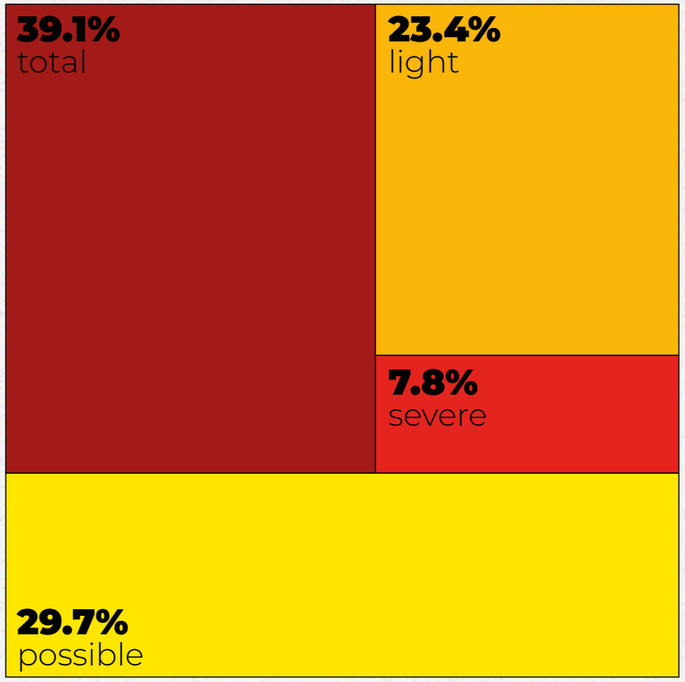
Educational institutions

1 / 18

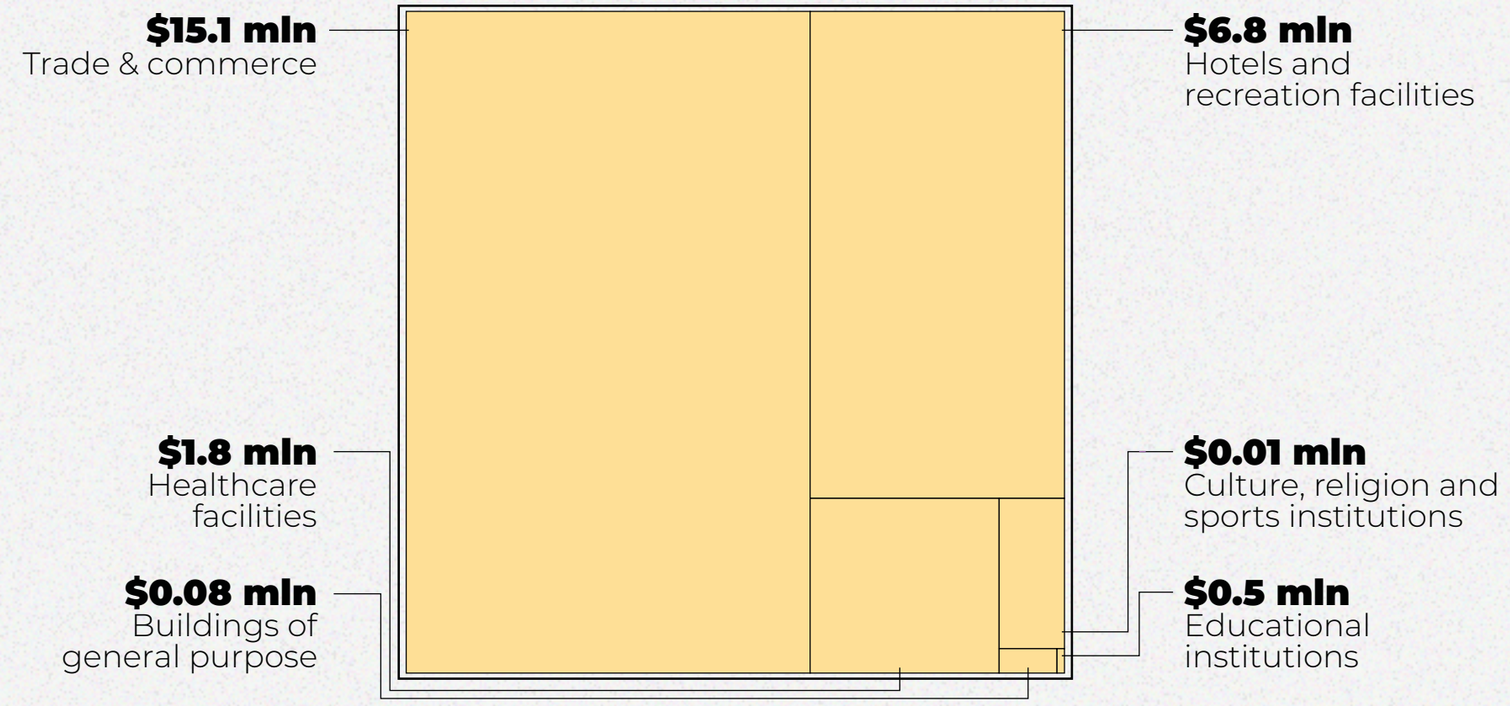
SCALE OF DESTRUCTION

SOCIAL INFRASTRUCTURE

Level of destruction



Assessment of damages

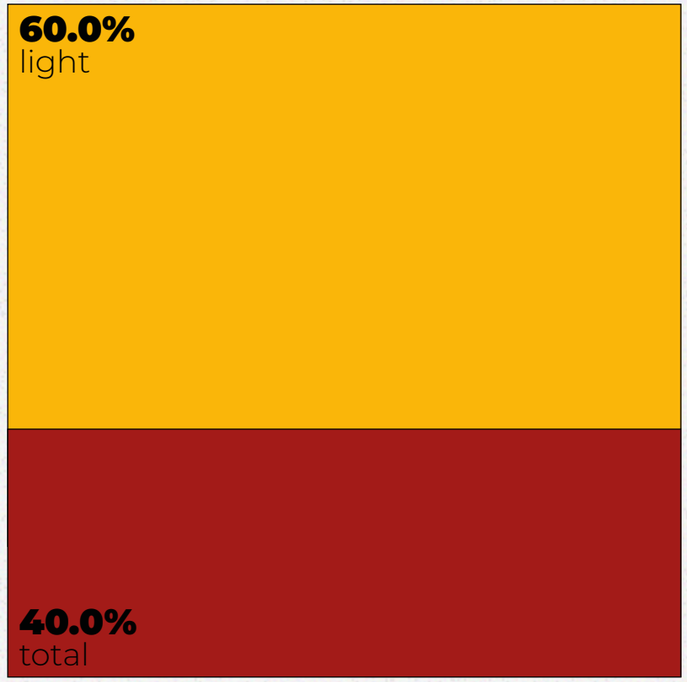


Total damages

$24.3 mln

HEALTHCARE & EDUCATION

Level of destruction



Total damages

$0.5 mln

Scale of destruction

Healthcare facilities

4 / 15

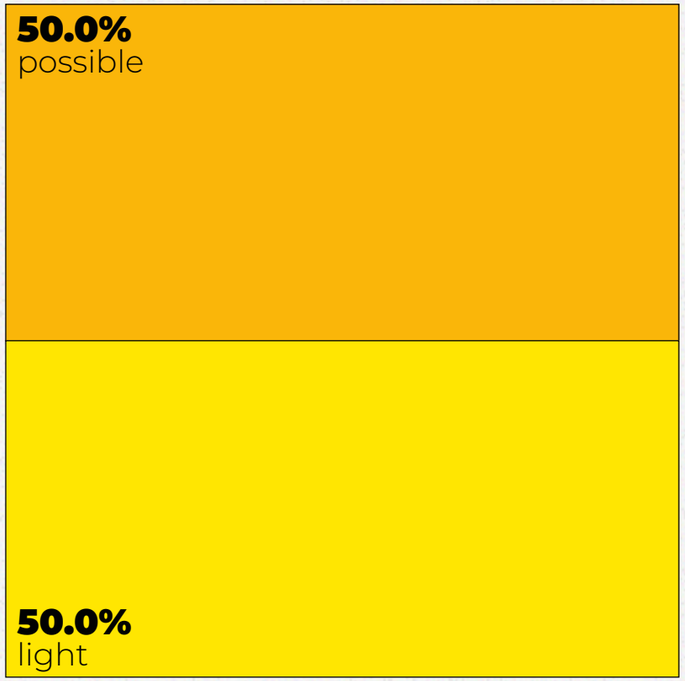
Educational institutions

1 / 18

Kindergarten

SPORT, CULTURE & RELIGION

Level of destruction



Total damages

$0.01 mln

Scale of destruction

Churches

1 / 6

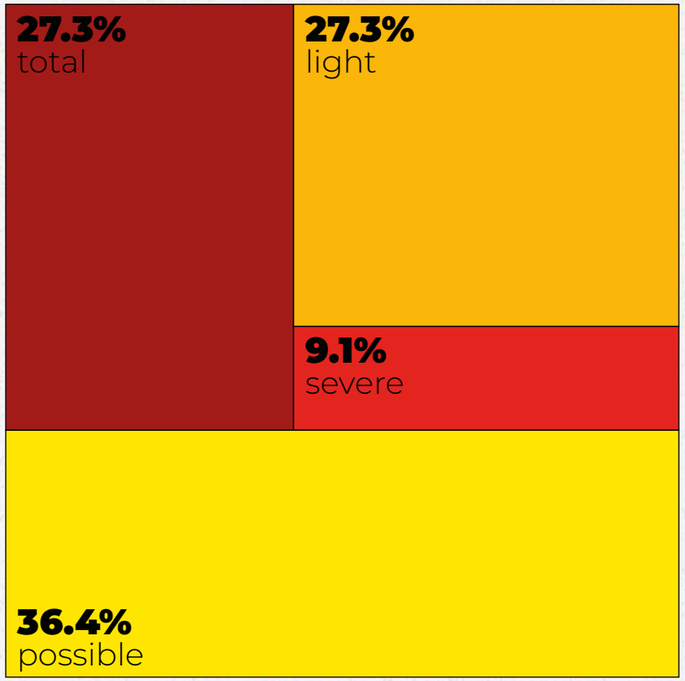
Orphanage buildings

1 / 6

The Church of the Apostles Peter and Paul

COMMERCIAL BUILDINGS

Level of destruction

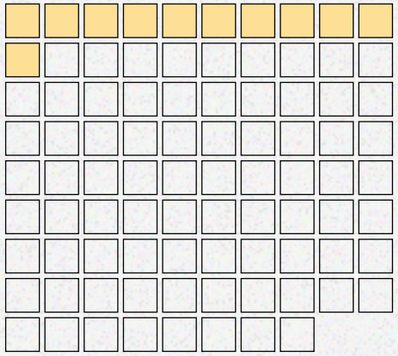


Total damages

$15.1 mln

Scale of destruction

Commercial services and institutions



11 / 88

Trade

1 / 3

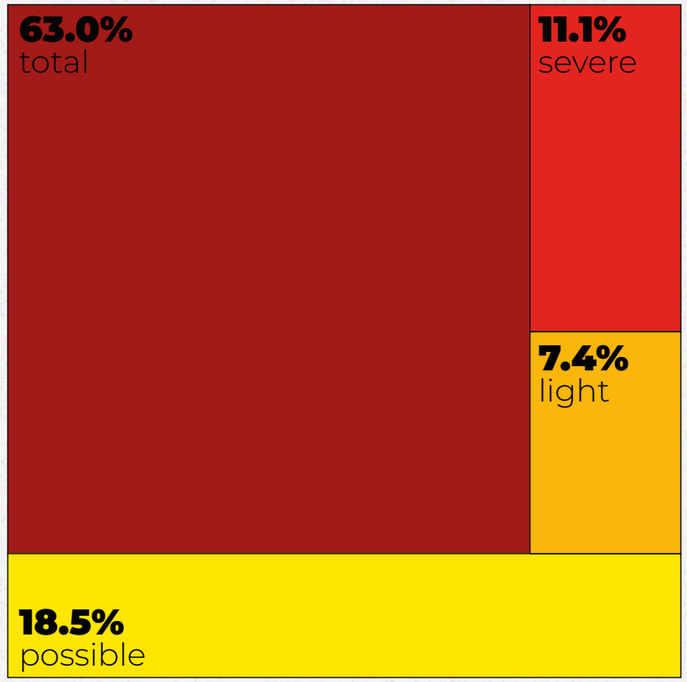
Grocery stores

3 / 20

Commercial object

HOTELS & RECREATION FACILITIES

Level of destruction

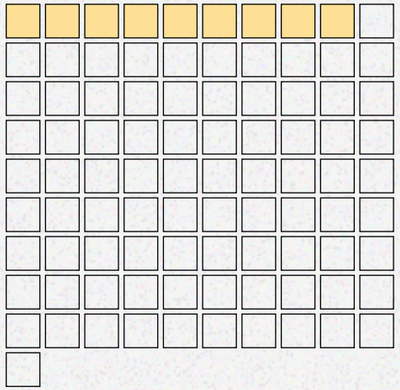


Total damages

$6.8 mln

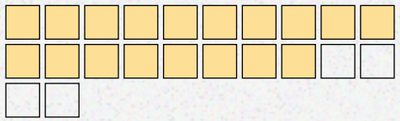
Scale of destruction

Recreation facilities



9 / 91

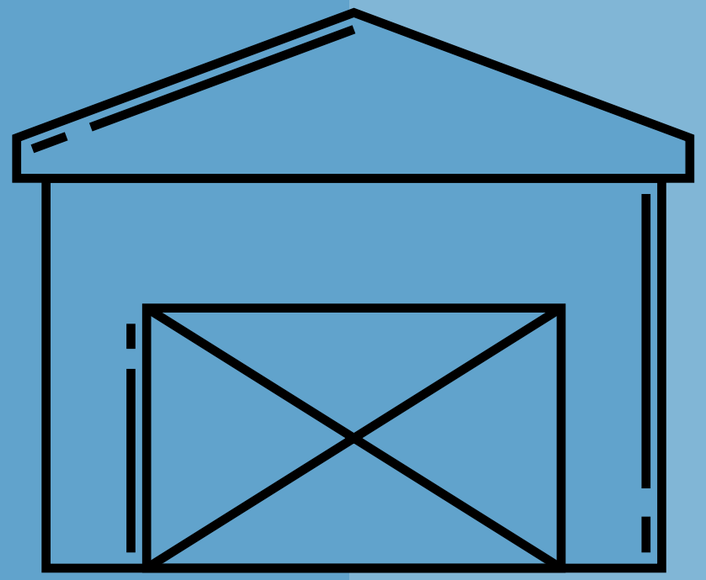
Hotels



18 / 22

Abandoned sanatorium «Vorzel»

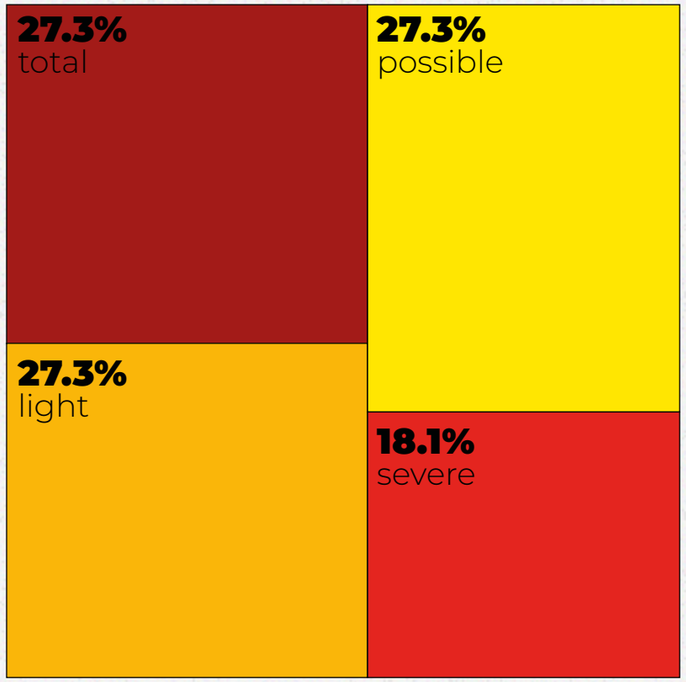
INDUSTRIAL INFRASTRUCTURE



SCALE OF DESTRUCTION

INDUSTRIAL INFRASTRUCTURE

Level of destruction

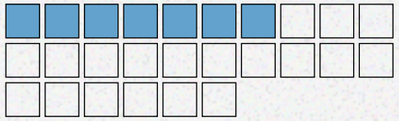


Total damages

$2.8 mln

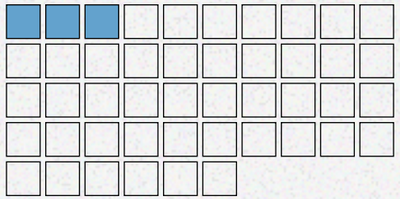
Scale of destruction

Industrial buildings



7 / 26

Utility buildings



3 / 46

Warehouses

1 / 3

Industrial object

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Урбанина

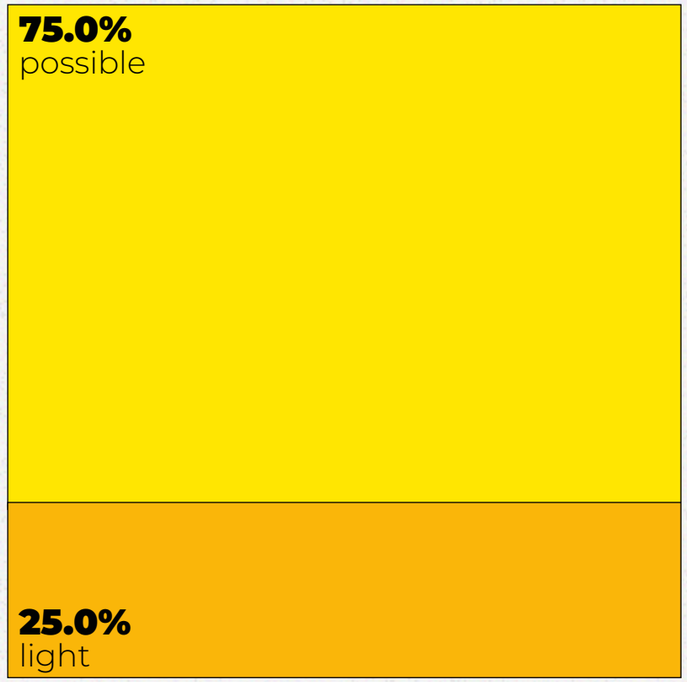
TOP LEAD

ADMINISTRATIVE AND OTHER INFRASTRUCTURE

SCALE OF DESTRUCTION

ADMINISTRATIVE AND OTHER INFRASTRUCTURE

Level of destruction



Total damages

$0.02 mln

Scale of destruction

Post office

1 / 5

Government and administrative buildings

1 / 2

Utility companies

2 / 19

Lost working places

39 / 64

Object of communcal services

Total area of damage

0.4 ths m²

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METHODOLOGIES & ADDITIONAL INFORMATION

METHODOLOGY OF CALCULATION

KSE | Institute

1. Assumptions

The following fractions were used for calculations:

100%
of the replacement cost of total destruction

50%
of the replacement cost of severe destruction

10%
of the replacement cost of light destruction

0%
of the replacement cost of possible destruction

2. Value determination

Large objects
The assessment of large objects, in particular enterprises, is calculated individually on the basis of financial statements and other public sources regarding value information.

Medium objects
Medium facilities, in particular, social infrastructure, trade objects, and services (health, education and culture, shops, hotels, restaurants, etc.) are calculated on the basis of average cost data, taking into account the type of area (urban/rural).

Small objects
Small objects, which include residential buildings, outbuildings and garages, are calculated based on the average footage (taking into account the area and type of area) and the cost per square meter (nominal cost + cost of redecoration repairs + cost of dismantling).

* All calculations are made according to the dollar exchange rate as of January 1, 2022

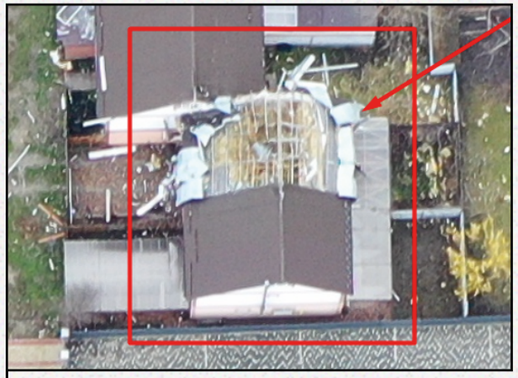
HOW WE DETERMINE LEVELS OF DESTRUCTION

Total destruction

Appointed when the original structure of the building is no longer detectable restoration is impossible, namely:

- the building is completely or significantly destroyed (> 50%);
- only part of the building collapsed to the foundation.

Severe destruction



Implies significant visible damage to the building and its structure, which includes:

- collapse of part of the roof;
- serious destruction and damage to the walls.

Light destruction

Implies minor partial damage to the building and its structure:

- minor damage to the roof,
- collapse of chimneys,
- damage to facade, decorative and removable elements,
- a large amount of debris.

Possible destruction

Intended for buildings that are difficult to interpret due to lower image quality (for example, shadow or poor resolution due to high angle of shooting).

Visual signs may include be small amounts of debris, gravel or sand around the building.

PHOTO EVIDENCE

Outpatient clinic

Apartment building

Townhouse

Commercial object

Apartment building

Industrial object

Townhouse

Private house

Private house

Private house

VORZEL THROUGH THE EYES OF BEHOLDERS

Vorzel in Kyiv oblast was under occupation for more than a month. The parishioners of the local church set up a volunteer center while the priest was looking for his son in Belarusian concentration camps

read

How ‘Angel of Vorzel’ rescued Ukrainians trapped behind Russian lines

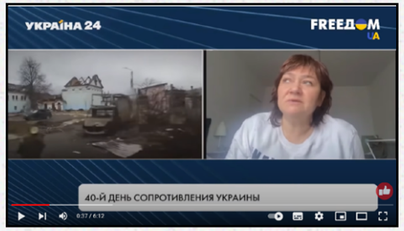
read

Rashists in Vorzel organized a support camp for further offensive on Bucha, Irpin and Kyiv

read

The day after the evacuation, “Kadyrovites” broke into our institution — the story of the Mykhailo Horodetsky Children’s Home in Vorzel, near Kyiv

read



They killed a neighbor, blew up a house: how russian occupiers acted in Vorzel

play

Terrible consequences of shelling and life in occupied Vorzel, Kyiv region

play

«I survived the Second World War, but the Germans were not this cruel»: a resident of Vorzel about the atrocities of the rashists

play

Vorzel after occupation

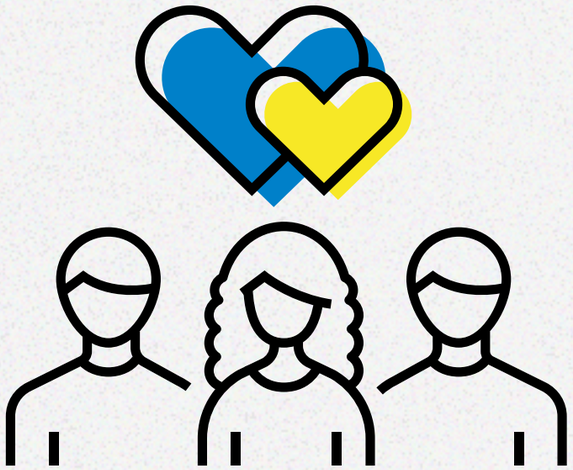
play

GRATITUDE TO VOLUNTEERS

Being a volunteer is a necessary and responsible mission, because the contribution of every citizen is important for the reconstruction of the country. The active position, engagement and tireless work of volunteers support the work of the RebuildUA project team, bringing us closer to the desired result.

These people helped RebuildUA digitize the destruction of Vorzel:

Kevin Casey
Dmytro Kostian
Kateryna Kulyk
Vladyslav Poda
Serhii Ponomarenko
Mykola Skoryk
Artem Sorokin



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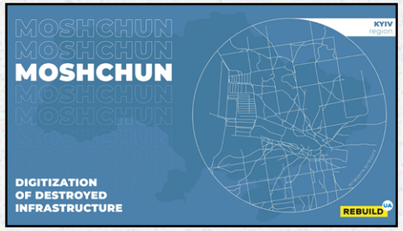
PREVIOUS REPORTS



Moshchun,
Buchanskyi district,
Kyiv region

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Horenka,
Buchanskyi district,
Kyiv region

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Ozera,
Borodianskyi district,
Kyiv region

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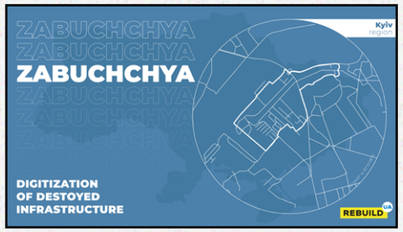

Zabuchchya,
Buchanskyi district,
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Irpin,
Buchanskyi district,
Kyiv region

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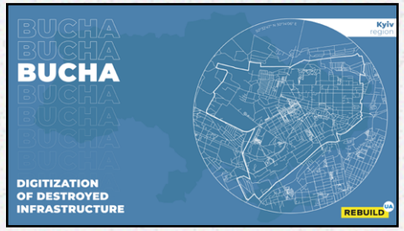

Bucha,
Buchanskyi district,
Kyiv region

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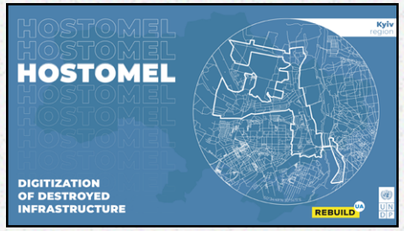

Hostomel,
Buchanskyi district,
Kyiv region

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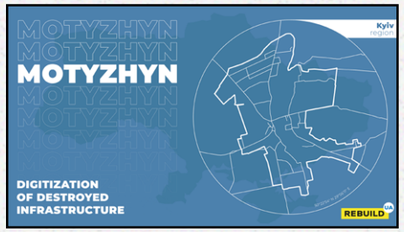

Motyzhyn,
Buchanskyi district,
Kyiv region

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Assessment of losses and damages, budgeting:

KSE Institute

Financial and technical support

UNDP

Shooting of settlements

CULVER AVIATION

Digitization of geospatial information:

Урбанина

Visual style and content:

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Support in cooperation with public authorities:

Centre for Economic Recovery

Cooperation & analysis of community economy, Vkursi Hromada:

Center for Innovations Development

Creation of an online map of destroyed new buildings

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