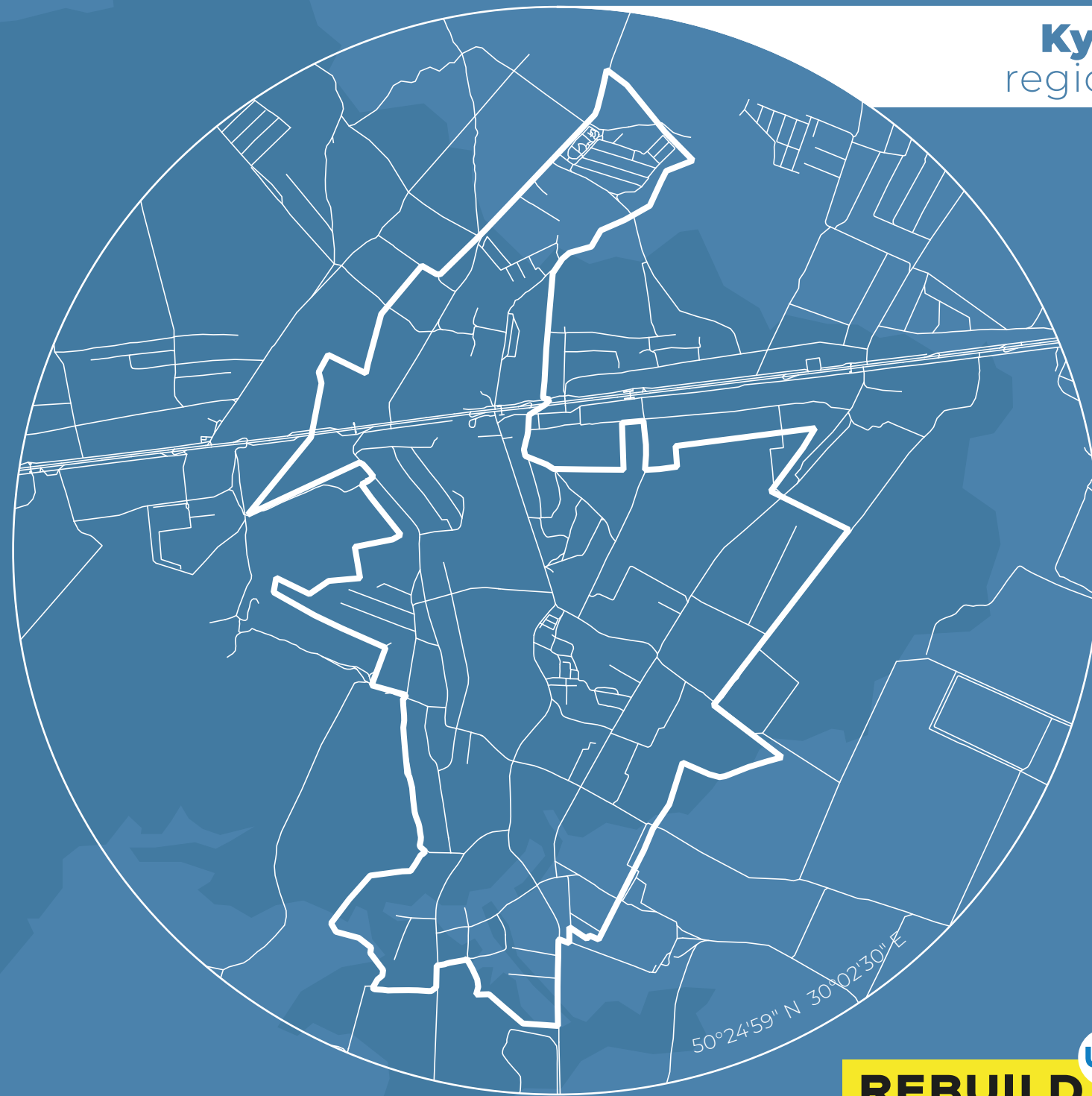


BUZOVA  
BUZOVA  
**BUZOVA**

BUZOVA  
BUZOVA  
BUZOVA  
BUZOVA  
BUZOVA  
BUZOVA

**DIGITIZATION  
OF DESTROYED  
INFRASTRUCTURE**

**Kyiv**  
region



**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:



Land analysis and interaction with communities:



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

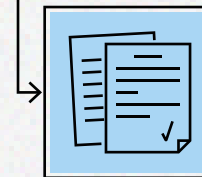
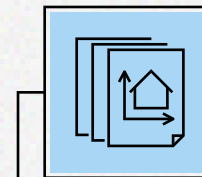
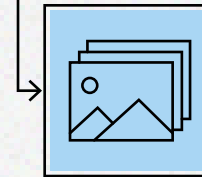
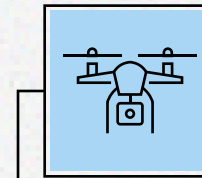
To ensure completeness of the input data, the project team captures photos and videos, as well as collects additional information from verified sources.

### 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:





# ABOUT THE LOCALITY


The village of Buzova is located just a few dozen kilometers from the capital of Ukraine, on the Kyiv-Zhytomyr highway. The occupiers tried to move towards Kyiv along this route, causing damage to everything in their path.

As a result of the numerous shelling, the houses of the civilians in the village were damaged, russian tanks hit the maternity hospital, and the local school was hit by all the available military equipment and was almost destroyed. At the time of the shelling children and women were hiding in the bomb shelter inside the school.

RebuildUA team has analysed the consequences of the russian occupation for the village of Buzova.




 [rebuildua.net](https://rebuildua.net)

 [/rebuildua.net](https://facebook.com/rebuildua.net)

Images: UNIAN, open sources



Region **Kyiv**  
 District **Buchanskyi**  
 Community **Dmytrivska**

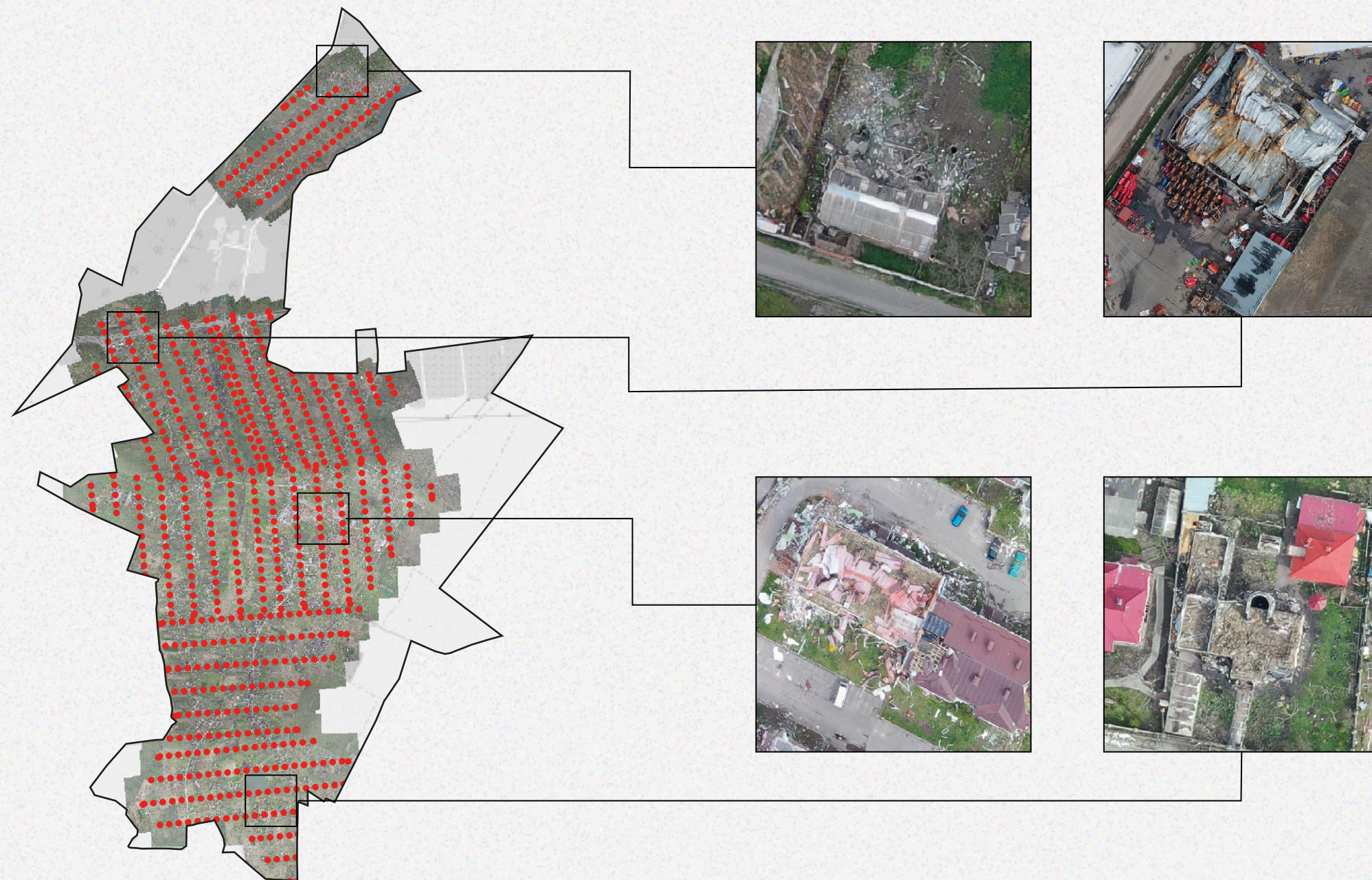
 Area  
**224 hectares**

 Population  
**1,548 people**





# DIGITIZATION PROCESS



**7** flight missions

**720** pictures for othophoto

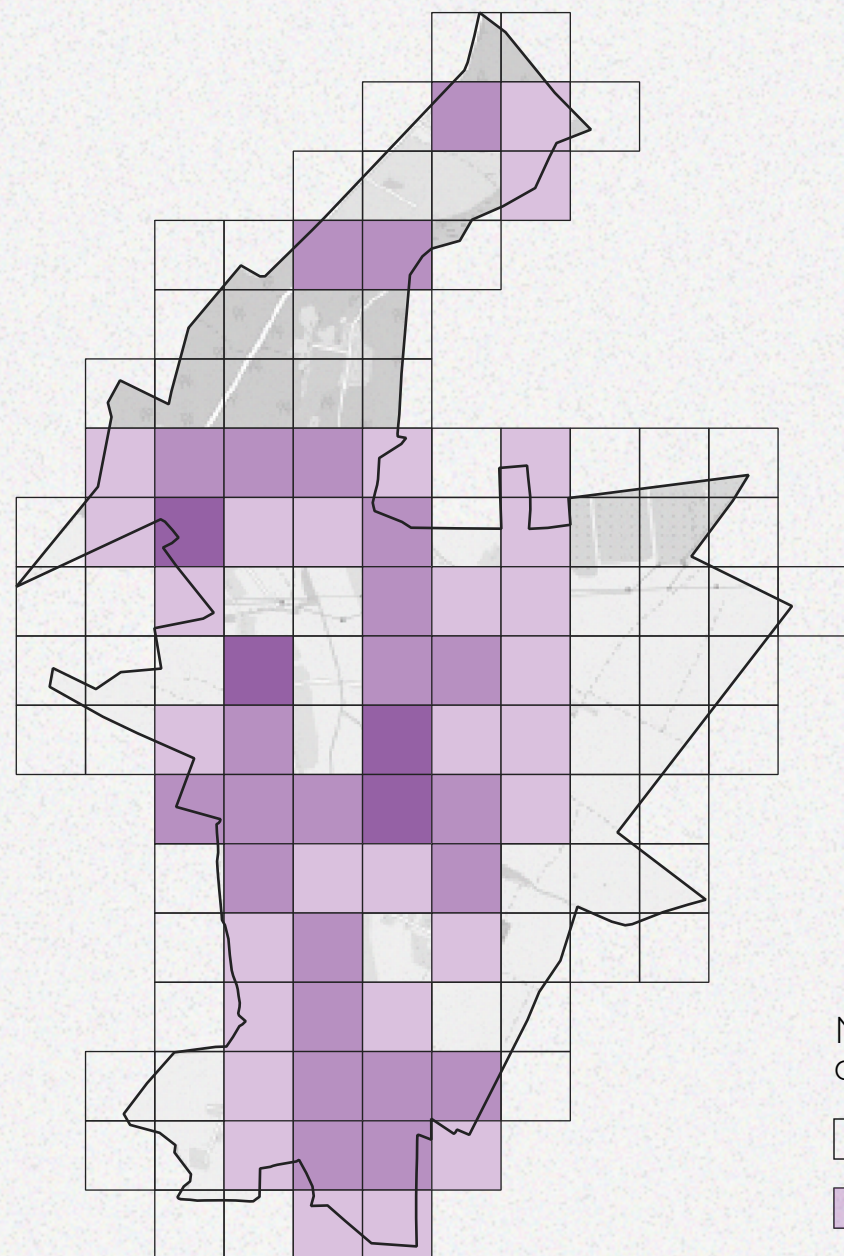
**50** hours of data processing

**7.1** Gigabytes of data

— border of the locality  
- - - trajectory of drone shooting



# THERMAL MAP OF DESTRUCTION



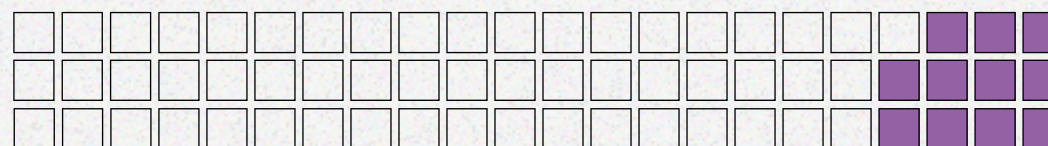
Number of destroyed buildings



10 buildings

## Destruction of the largest streets

17%



**110** / 660 Tsentralna

14%



**36** / 262 Sadova

7%



**18** / 243 Sviatkova

9%



**21** / 230 Gagarina

14%



**31** / 225 Shevchenka

12%



**24** / 207 Dnirovaska

9%



**11** / 120 Dzvonova

41%



**36** / 88 Sadovskogo

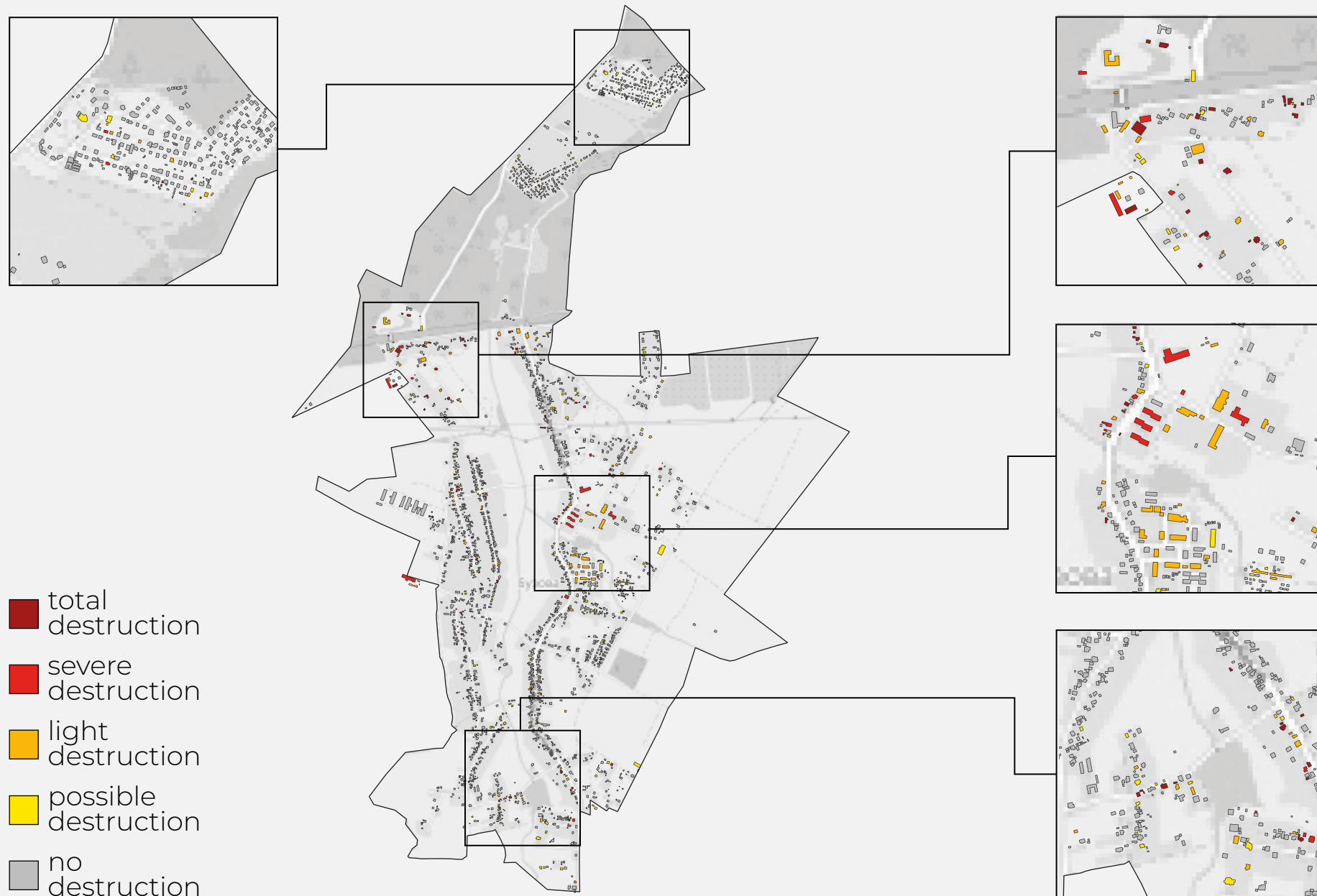
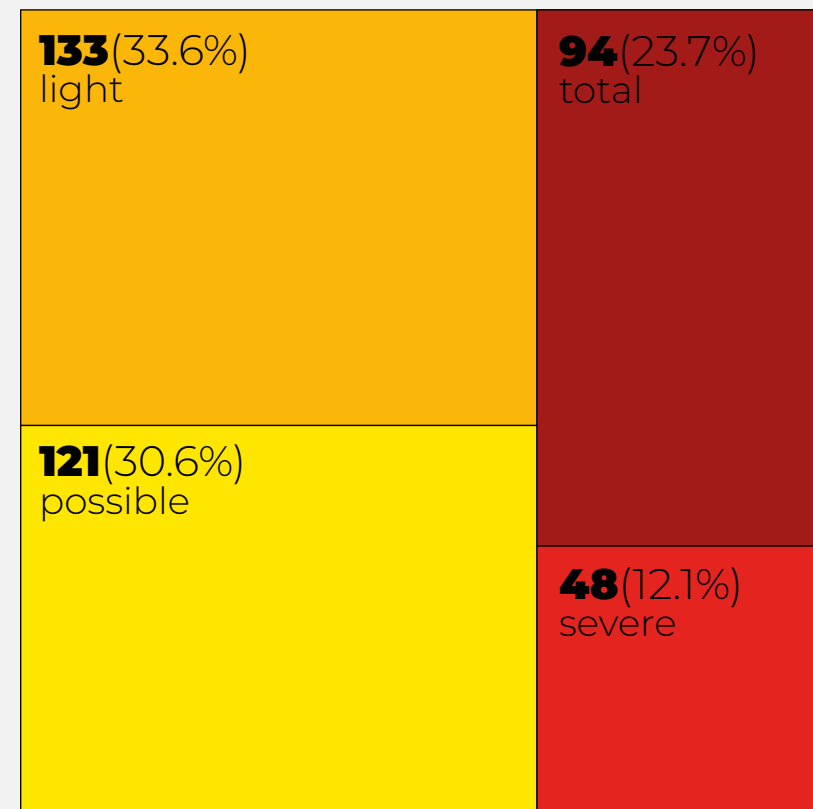


# LEVELS OF DESTRUCTION

Buildings destroyed:

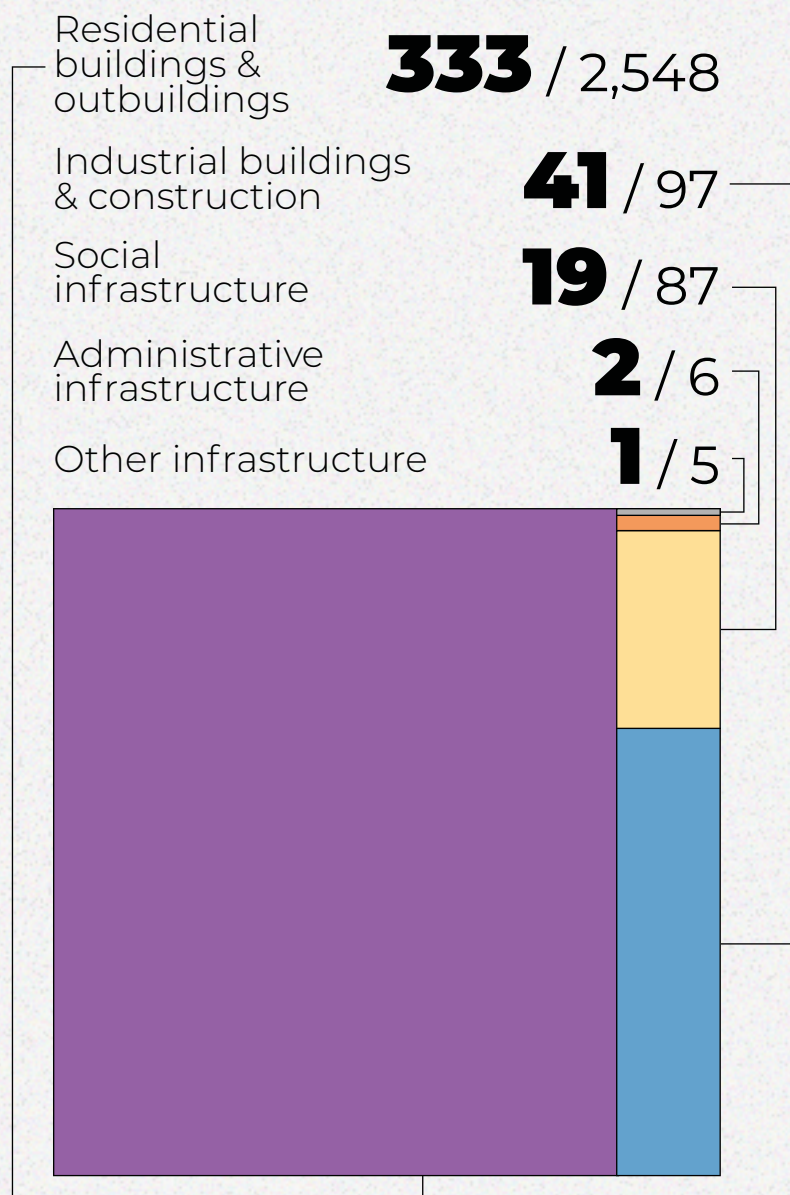
**396 / 2,743**

Level of destruction, number of buildings





# TYPES OF DESTROYED OBJECTS



- Residential buildings & outbuildings
- Industrial buildings & construction
- Social infrastructure
- Administrative infrastructure
- Other infrastructure

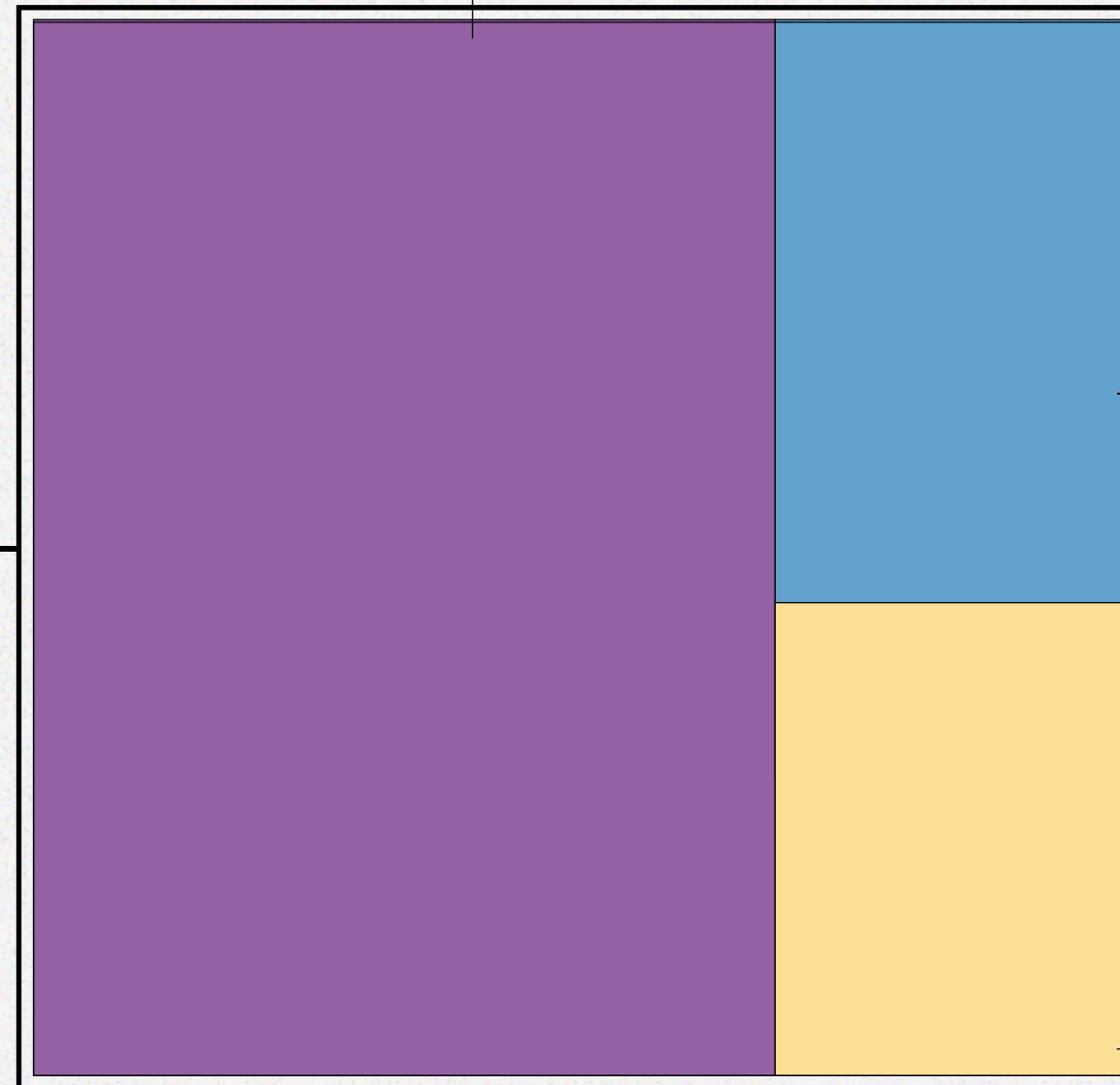


# ASSESSMENT OF DAMAGES

Damages by types of buildings

Total damages

**\$29.7 million**



**\$16.97 million**

Residential buildings & outbuildings

**\$8.87 million**

Industrial buildings & construction

**\$3.86 million**

Social infrastructure



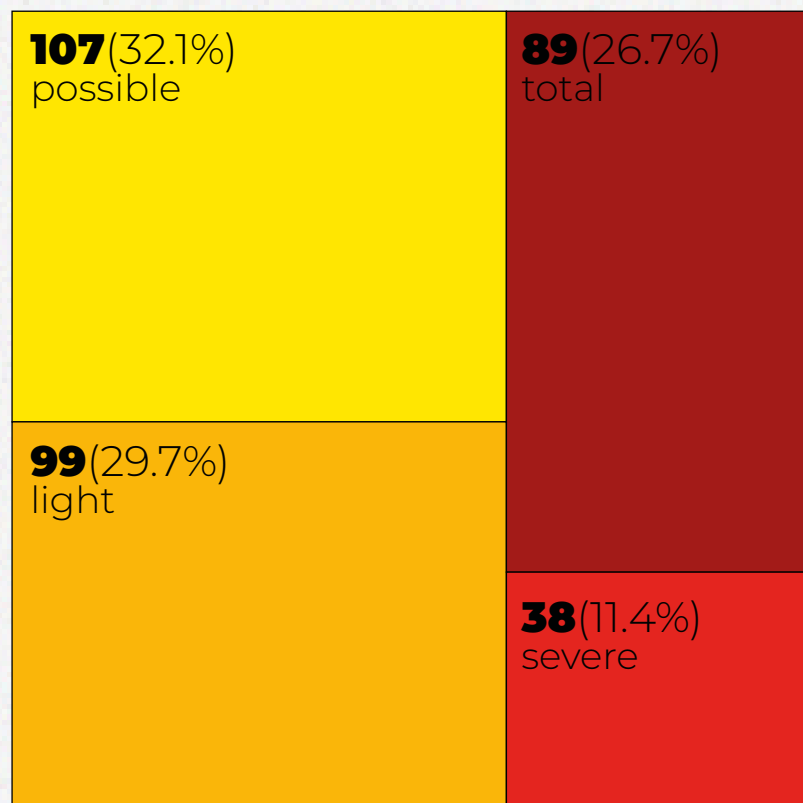
# SCALE OF DESTRUCTION





# SCALE OF DESTRUCTION

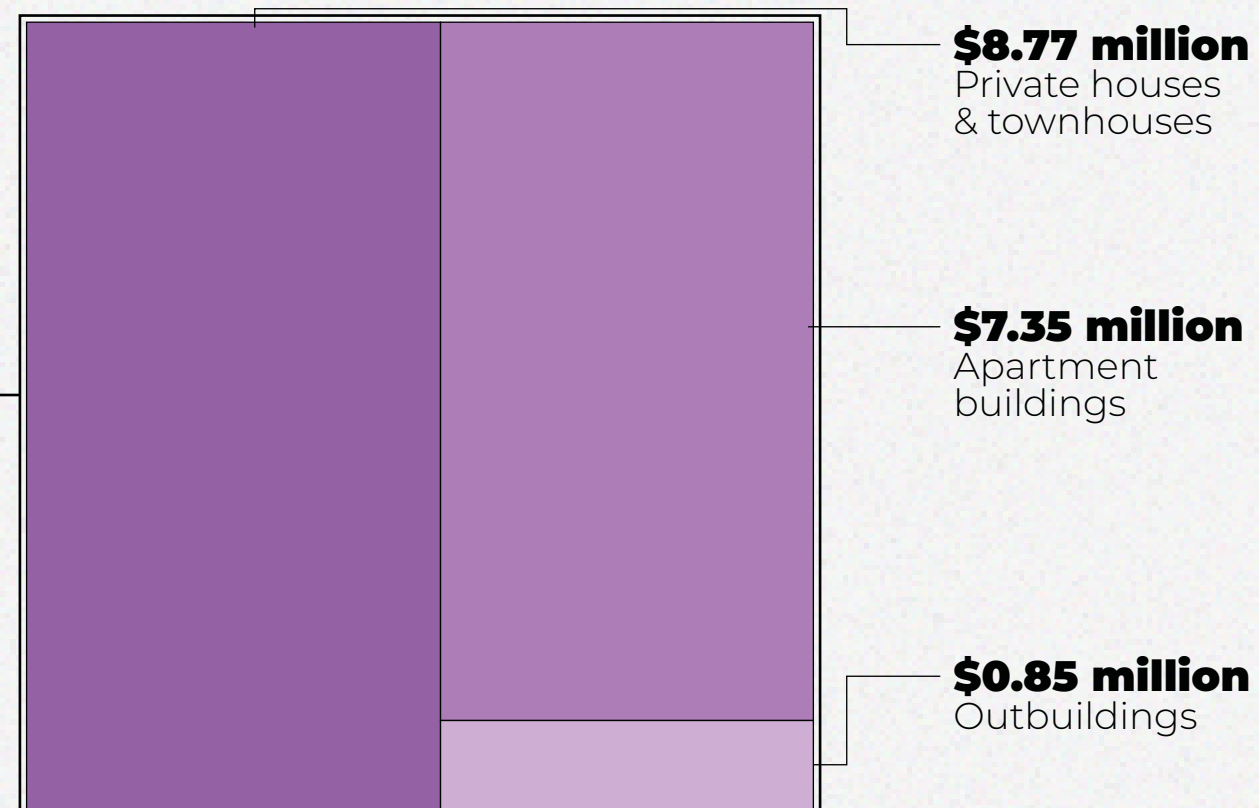
## Level of destruction



## Assessment of damages

Total damages

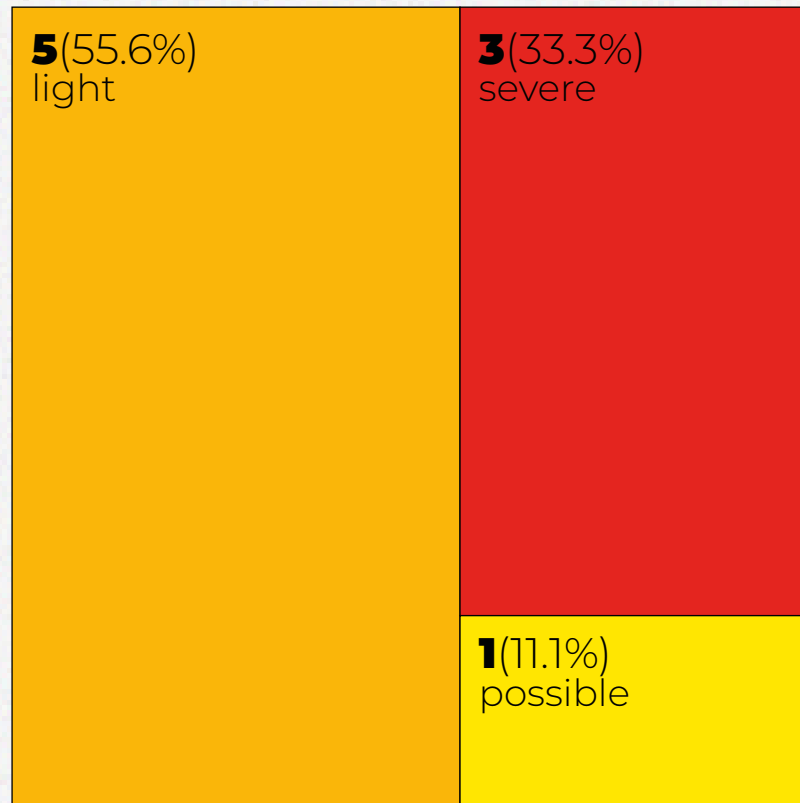
**\$17.0 million**



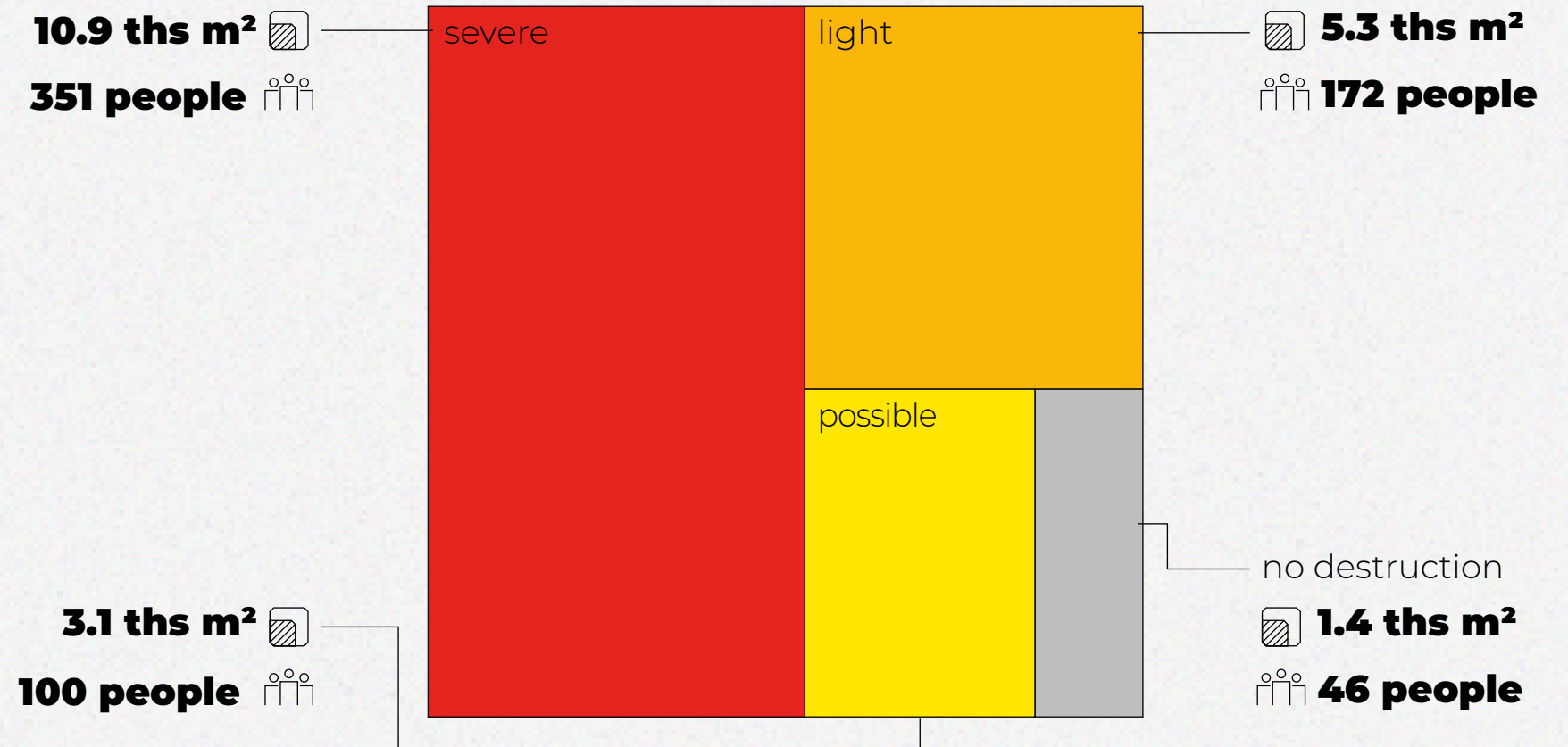


# APARTMENT BUILDINGS

## Level of destruction



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



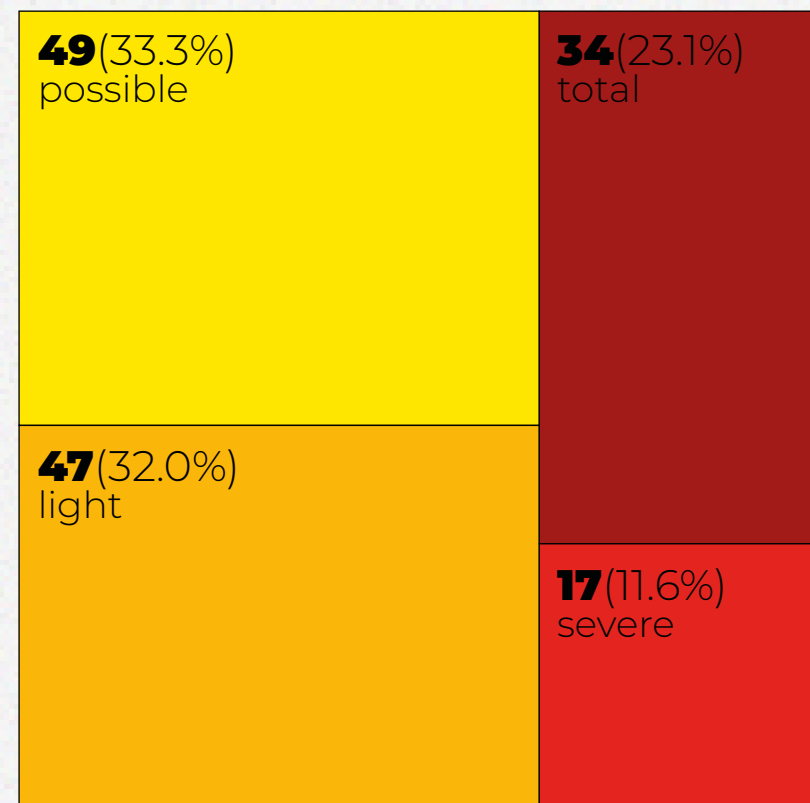
Total area of damage  
**19.3 ths m²**

Number of residents affected  
**623**

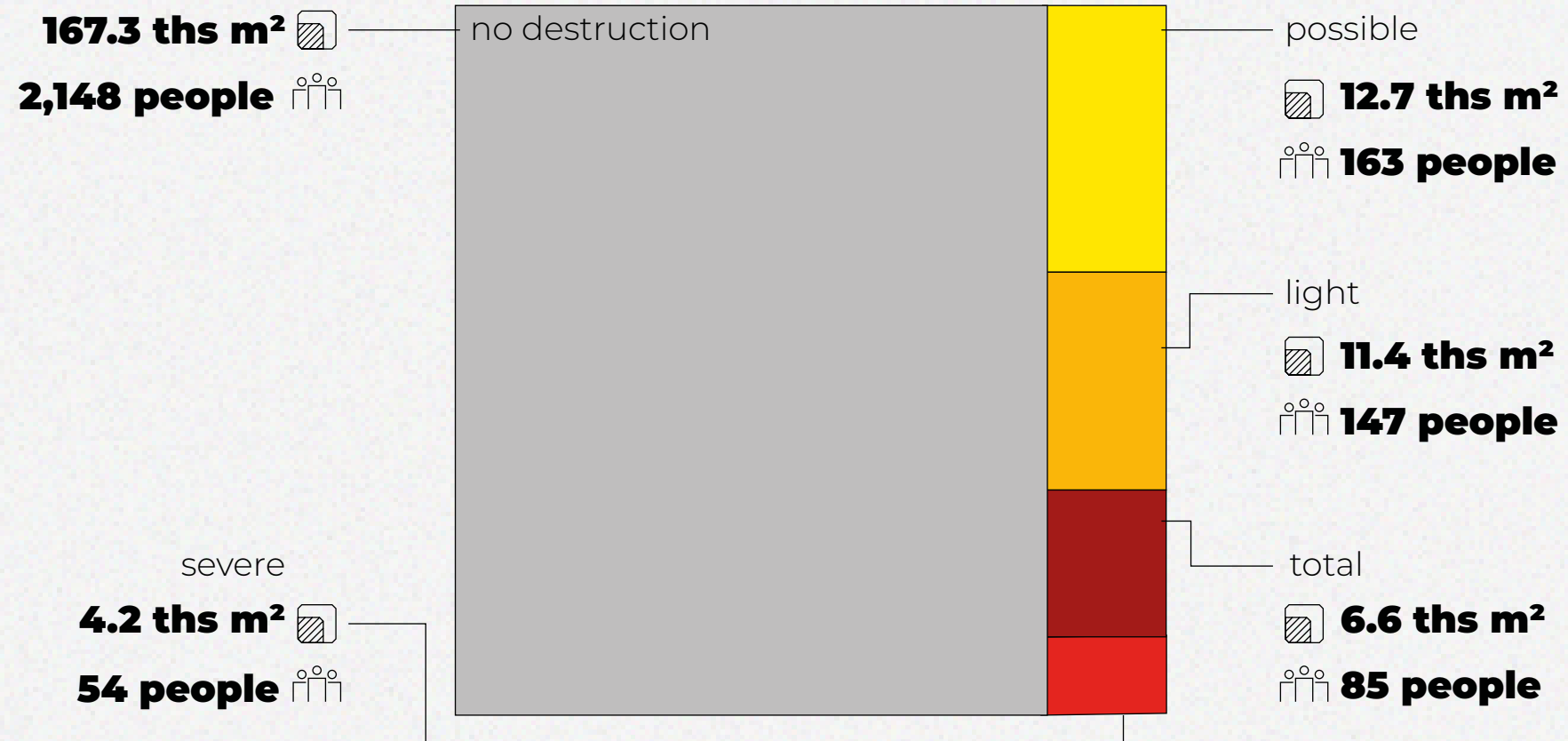


# PRIVATE HOUSES & TOWNHOUSES

## Level of destruction



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



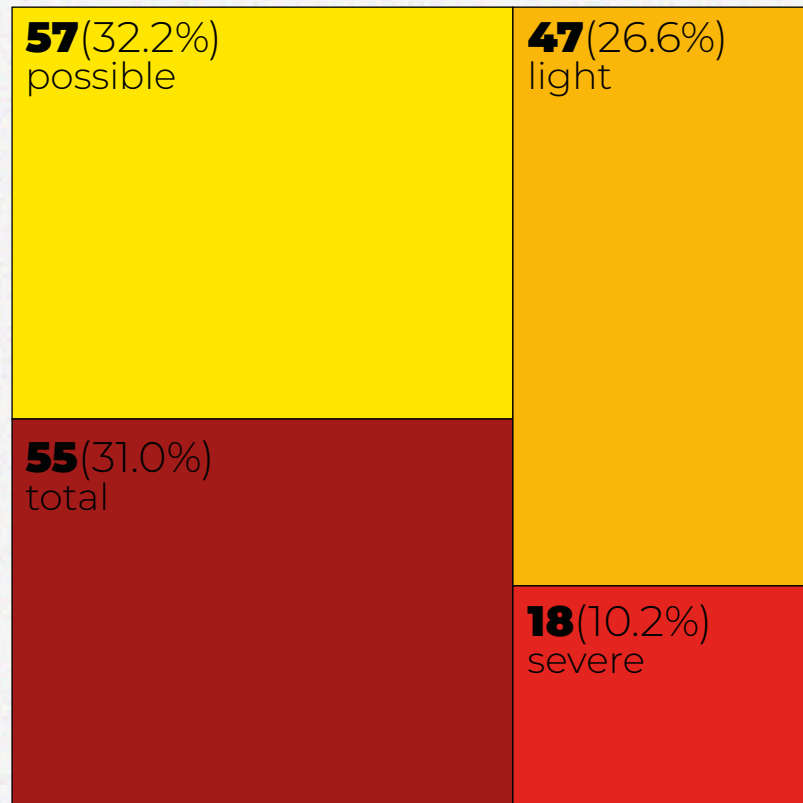
Total area of damage  
**35.0 ths m<sup>2</sup>**

Number of residents affected  
**449**



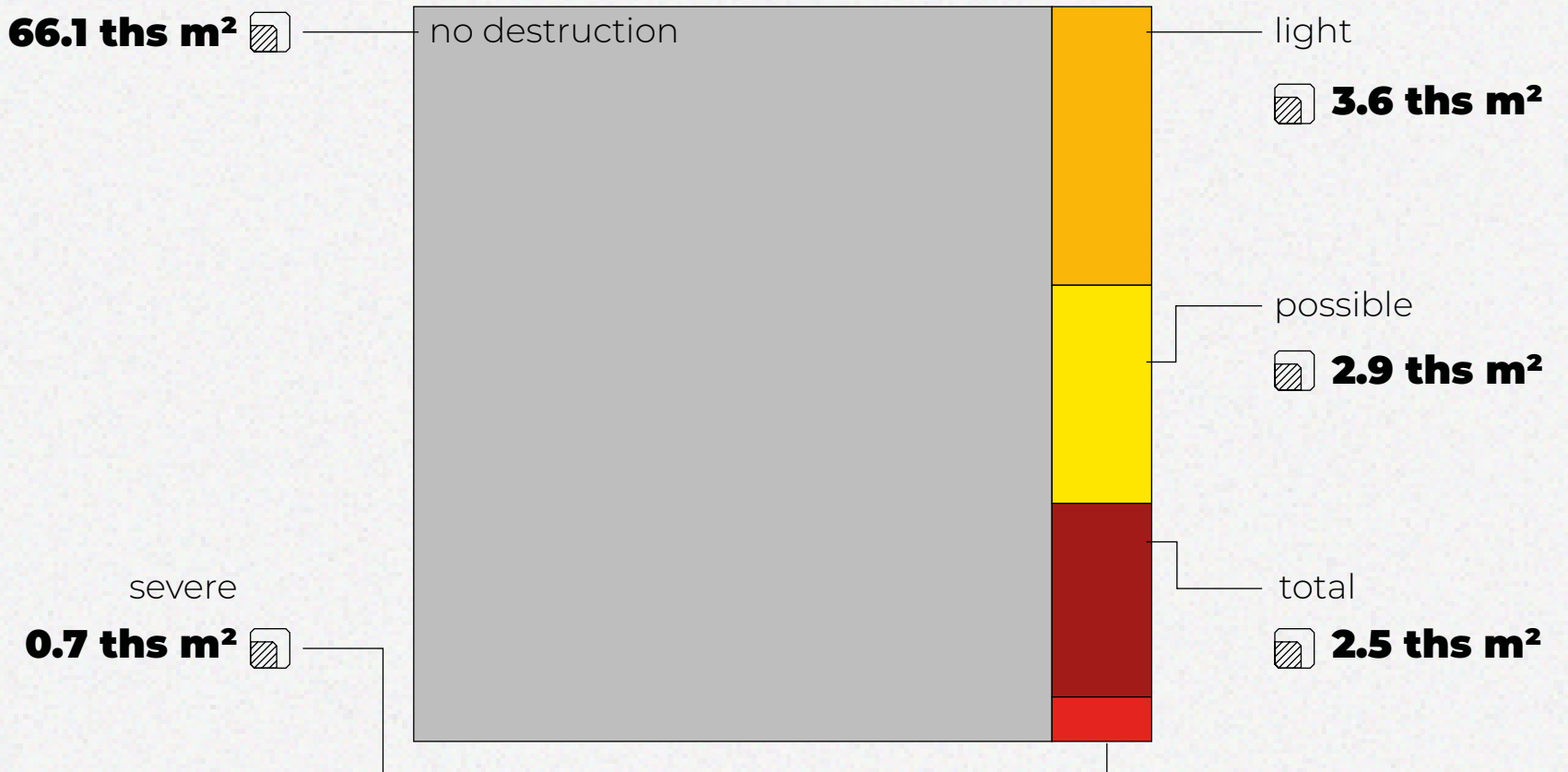
# OUTBUILDINGS

## Level of destruction



## Area of destruction

**66.1 ths m<sup>2</sup>**



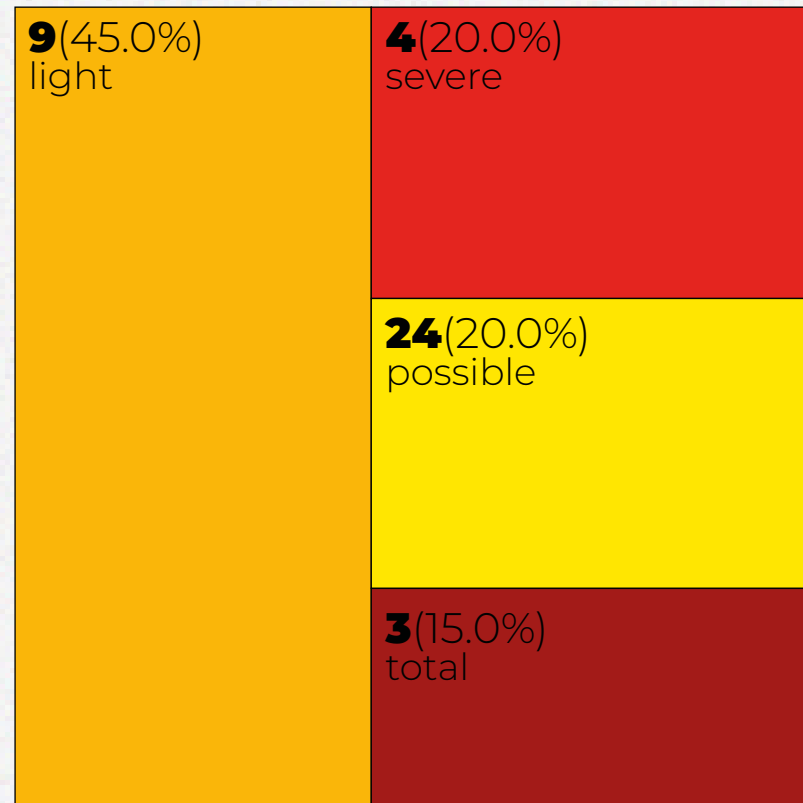
severe  
**0.7 ths m<sup>2</sup>**

Total area of damage  
**9.7 ths m<sup>2</sup>**



# SCALE OF DESTRUCTION

## Level of destruction



## Assessment of damages

Total damages

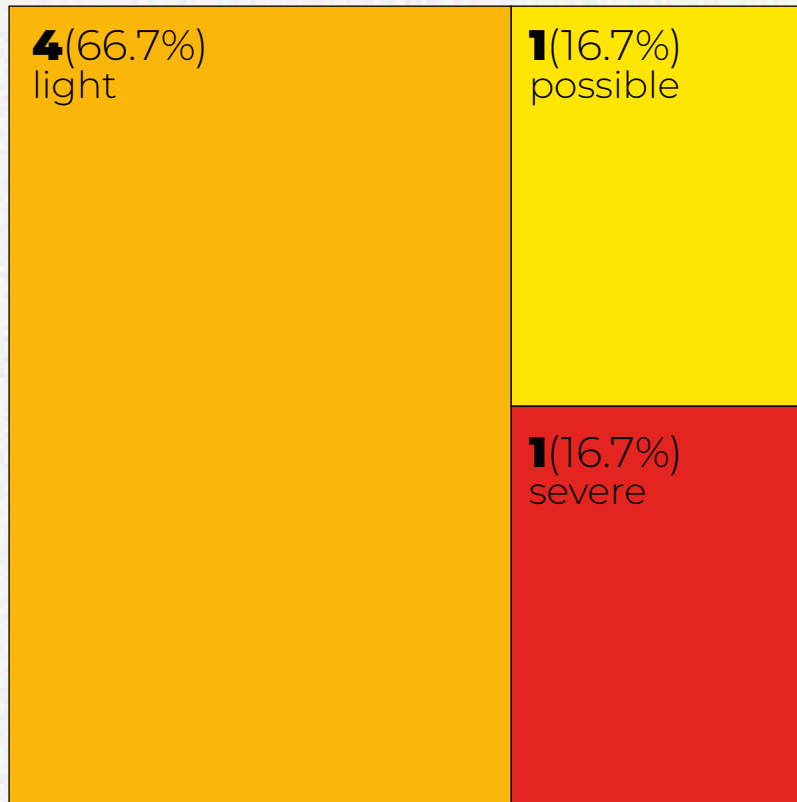
**\$3.9 million**





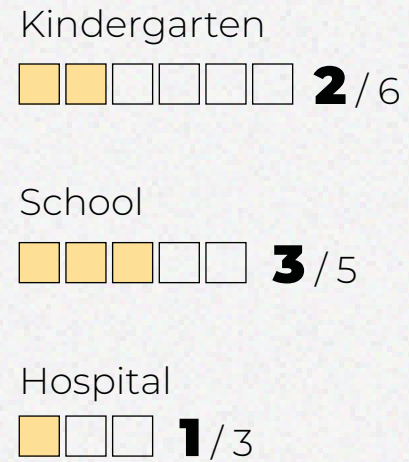
# EDUCATION & HEALTHCARE

## Level of destruction



Total damages  
**\$2.4 million**

## Number of destroyed buildings



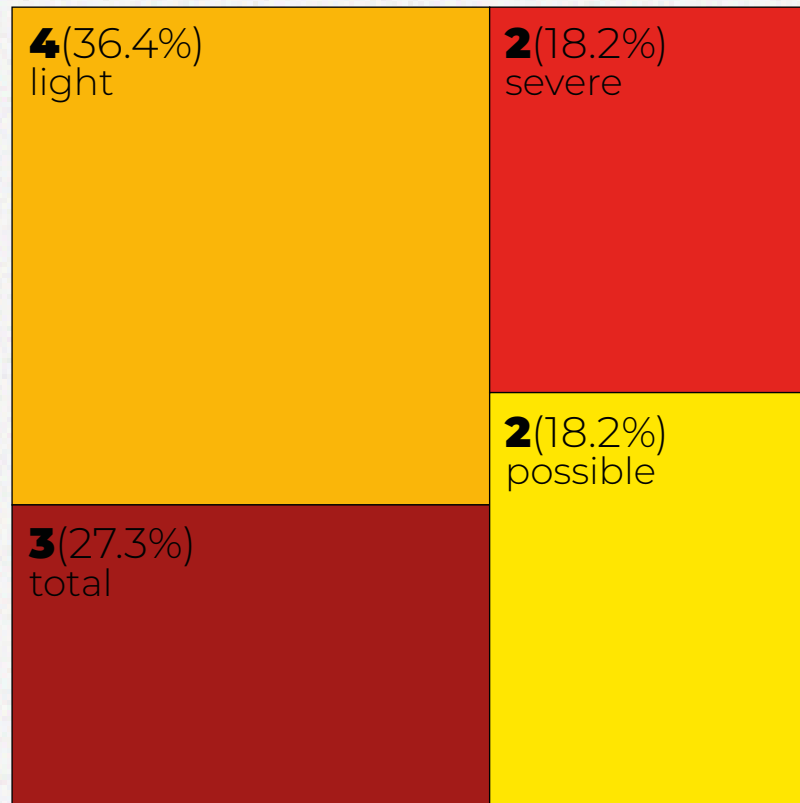
Local school





# COMMERCIAL AND OTHER BUILDINGS

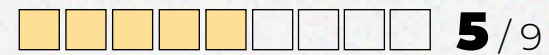
## Level of destruction



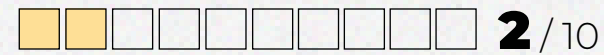
Total damages  
**\$1.4 million**

## Number of destroyed buildings

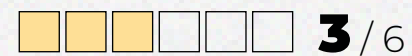
Commercial services and institutions



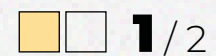
Grocery stores



Cafes & restaurants



Offices



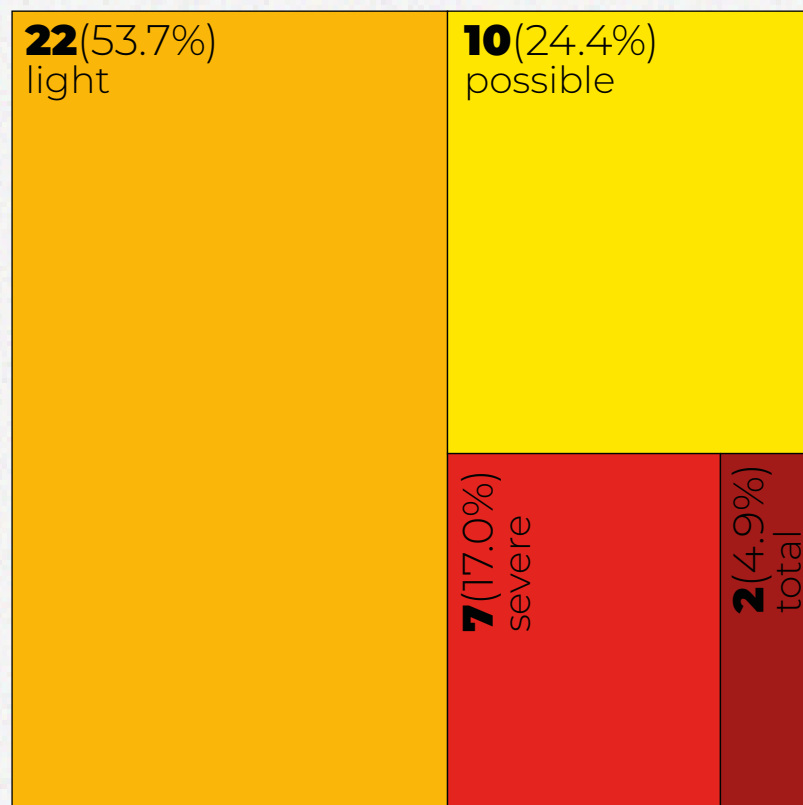
Commercial object





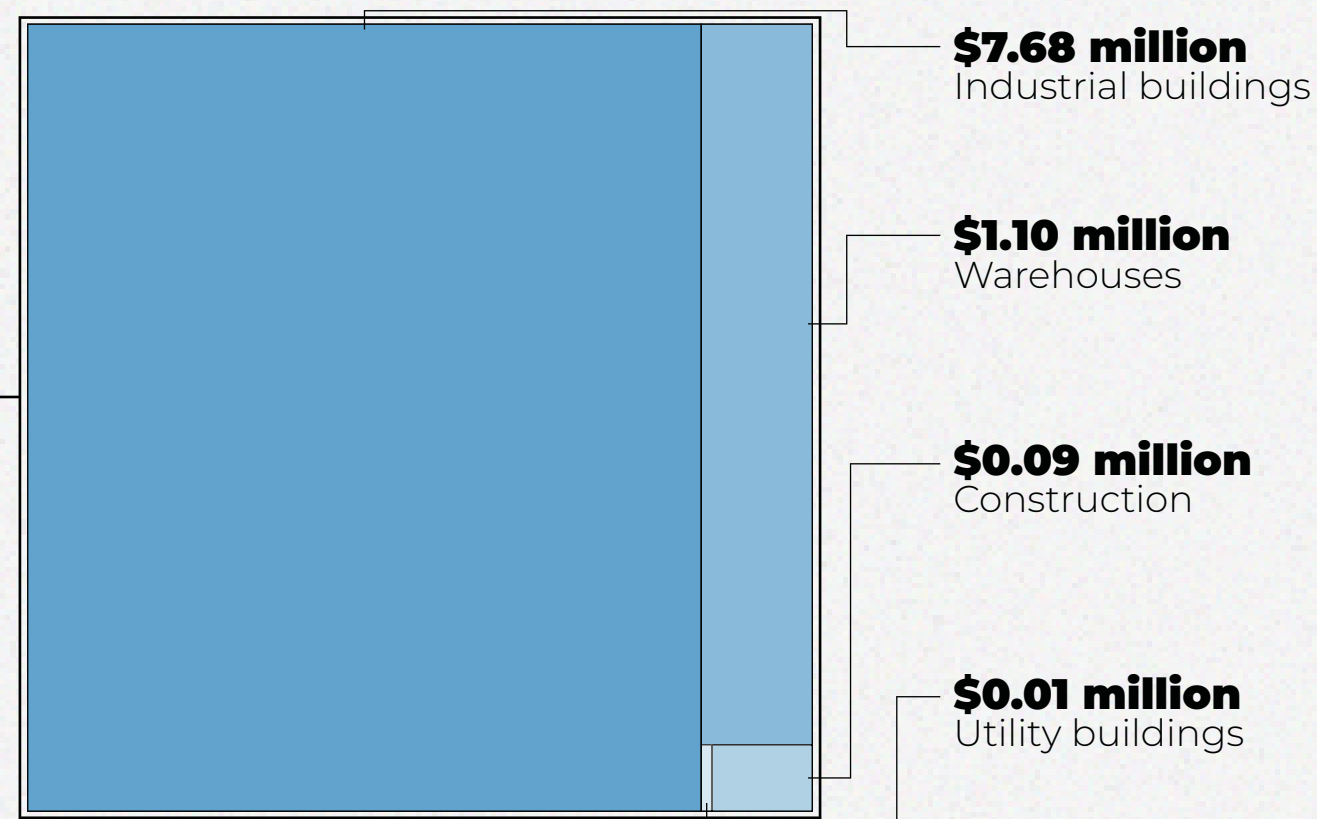
# SCALE OF DESTRUCTION

## Level of destruction



## Assessment of damages

Total damages  
**\$8.9 million**

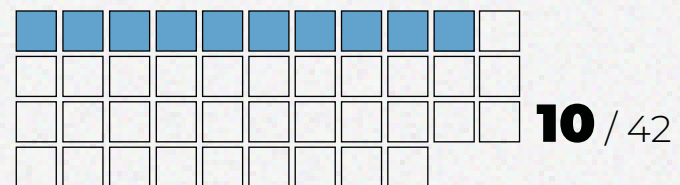




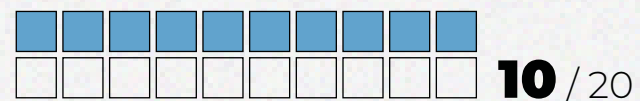
# SCALE OF DESTRUCTION

## Number of destroyed buildings

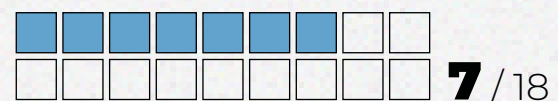
Construction



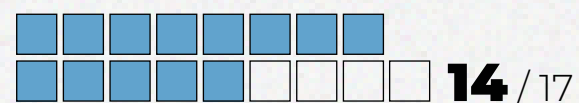
Industrial buildings



Utility buildings



Warehouses

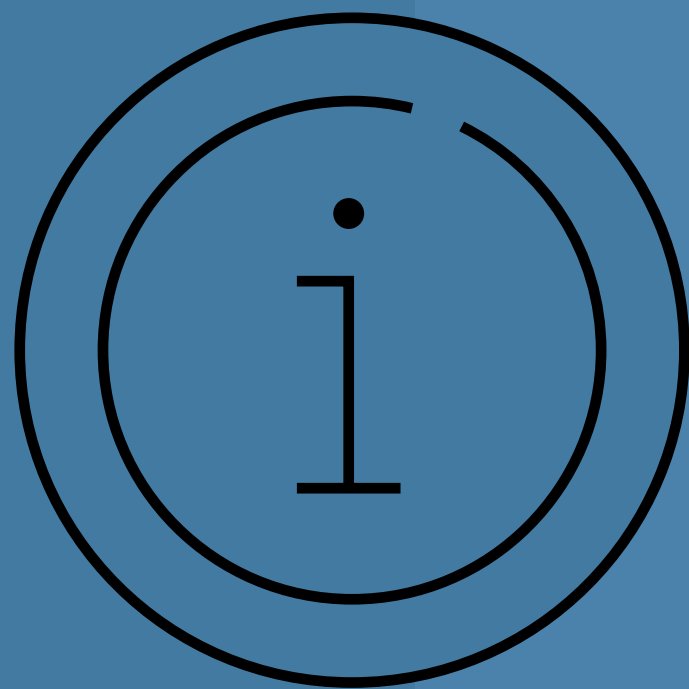


Industrial object





# METHODOLOGIES & ADDITIONAL INFORMATION



**REBUILD**





# HOW WE DETERMINE LEVELS OF DESTRUCTION

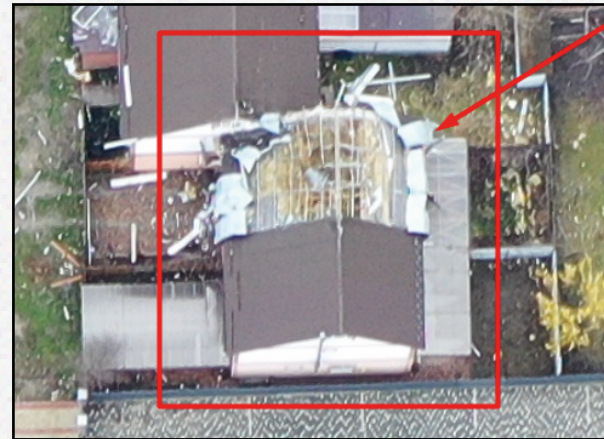
## Total destruction



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.



## 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).



# BUZOVA THROUGH THE EYES OF BEHOLDERS

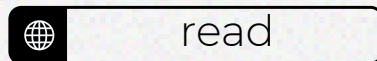
The maternity hospital in Buzova, Kyiv region, was hit by shelling



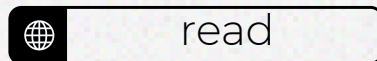
Consequences of the «russian reace» in Buzova and Kukhary in Kyiv region: schools and a maternity hospital were bombed



In the village of Buzova in the Kyiv region, a program to restore war-damaged housing has begun



Mass burial near Kyiv: new evidence of atrocities by the occupiers was found in the liberated territories



Executions of civilians and heroic doctors: how people of Dmitrivska community lived during the occupation



Residents of Buzova, Dmitrivska community, lived in hell



Shelling books: the occupiers bombed a school near Kyiv



They gave birth at the time of shelling: the occupiers destroyed the maternity hospital in Buzova



Battles near Buzova: destroyed school, military equipment in the garden, shelled maternity hospital



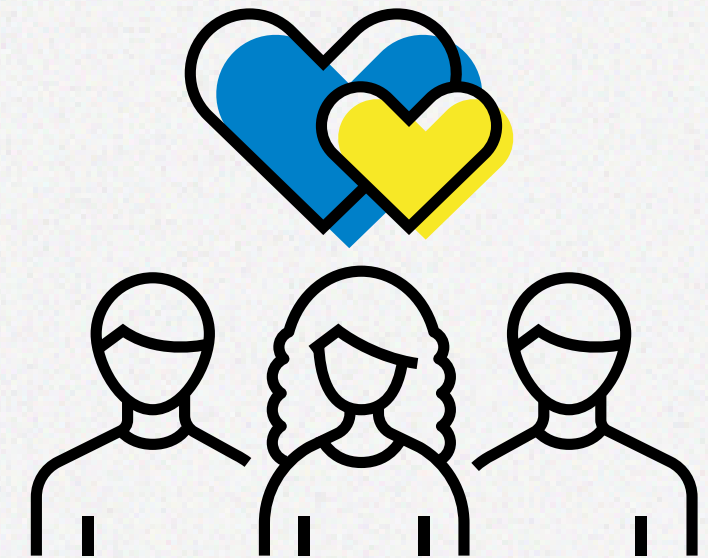


# GRATITUDE TO VOLUNTEERS

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.

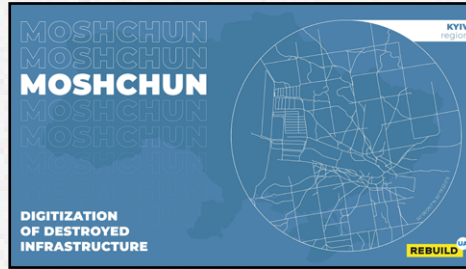
## **These people helped RebuildUA digitize the destruction of Buzova:**

Kateryna Tkachenko  
(completely on her own)





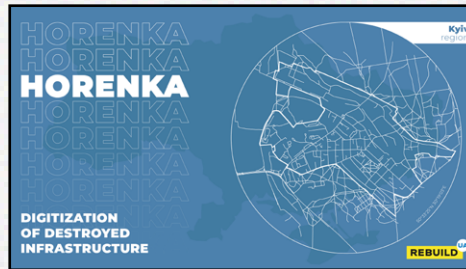
# PREVIOUS REPORTS



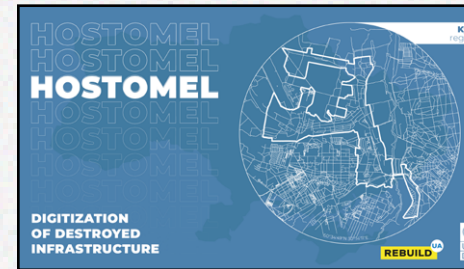
**Moshchun,**  
Buchanskyi district,  
Kyiv region



**Bucha,**  
Buchanskyi district,  
Kyiv region



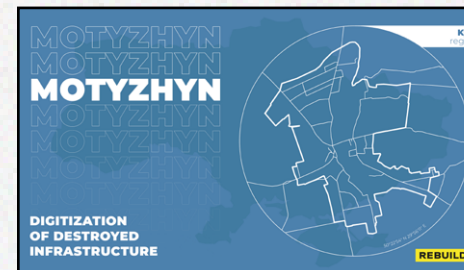
**Horenka,**  
Buchanskyi district,  
Kyiv region



**Hostomel,**  
Buchanskyi district,  
Kyiv region



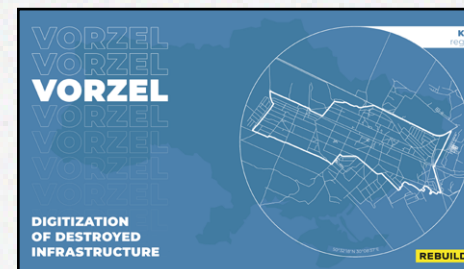
**Ozera,**  
Borodianskyi district,  
Kyiv region



**Motyzhyn,**  
Buchanskyi district,  
Kyiv region



**Irpin,**  
Buchanskyi district,  
Kyiv region

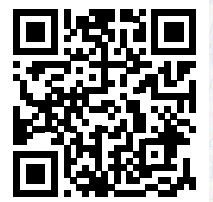


**Vorzel,**  
Buchanskyi district,  
Kyiv region





# REBUILD



[rebuildua.net](http://rebuildua.net)

### Partners:

Assessment of losses and damages, budgeting:



Financial and technical support



Shooting of settlements



Digitization of geospatial information:



Visual style and content:



Support in cooperation with public authorities:



Cooperation & analysis of community economy, Vkursi Hromada:



Creation of an online map of destroyed new buildings



### Supported by:

