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**DIGITIZATION  
OF DESTROYED  
INFRASTRUCTURE**

**Kyiv**  
region



**REBUILD** 

# 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

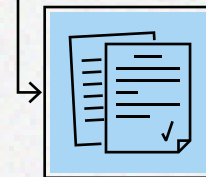
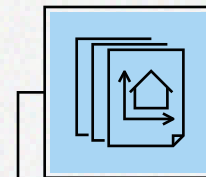
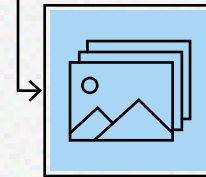
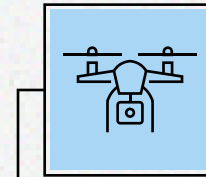
To ensure completeness of the input data, the project team captures photos and videos, as well as collects additional information from verified sources.

### 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:

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



# ABOUT THE LOCALITY


Russian tanks entered the village of Motyzhyn in Kyiv region on the third day of the full-scale invasion of Russian Federation. For a month, the occupiers controlled the village and part of the roads leading to Kyiv.

Residential buildings were damaged by shelling, local infrastructure was destroyed. The occupiers destroyed the Motyzhyn Lyceum, which had been in operation for more than 50 years, caused massive damage to the private dendrological park "Dobropark". Special services are still dealing with the facts of murders and torture of residents.

Find more information about the damage to the village's infrastructure in the RebuildUA report.




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

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



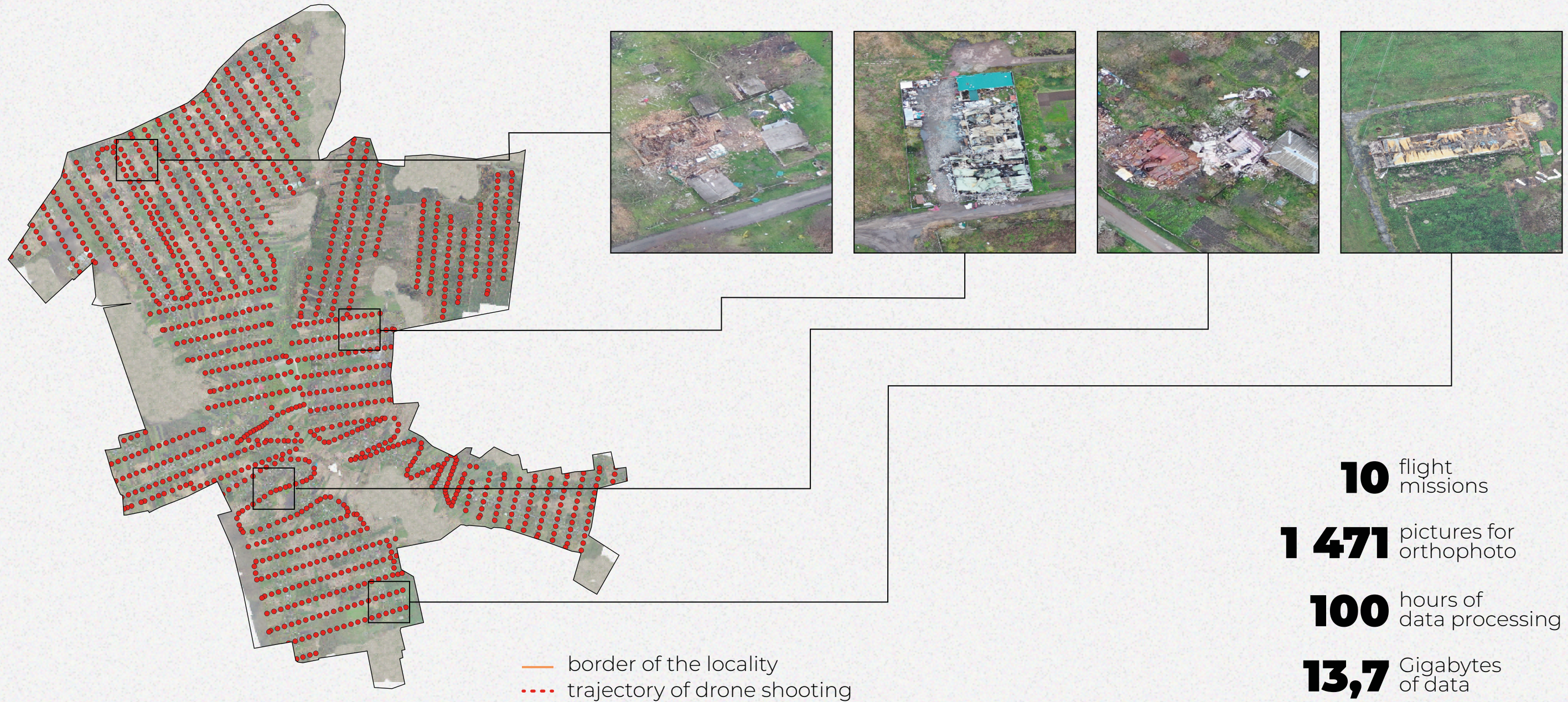
Region **Kyiv**  
 District **Buchanskyi**  
 Community **Makarivska**

 Area  
**4.43 km<sup>2</sup>**

 Population  
**2,582 people**

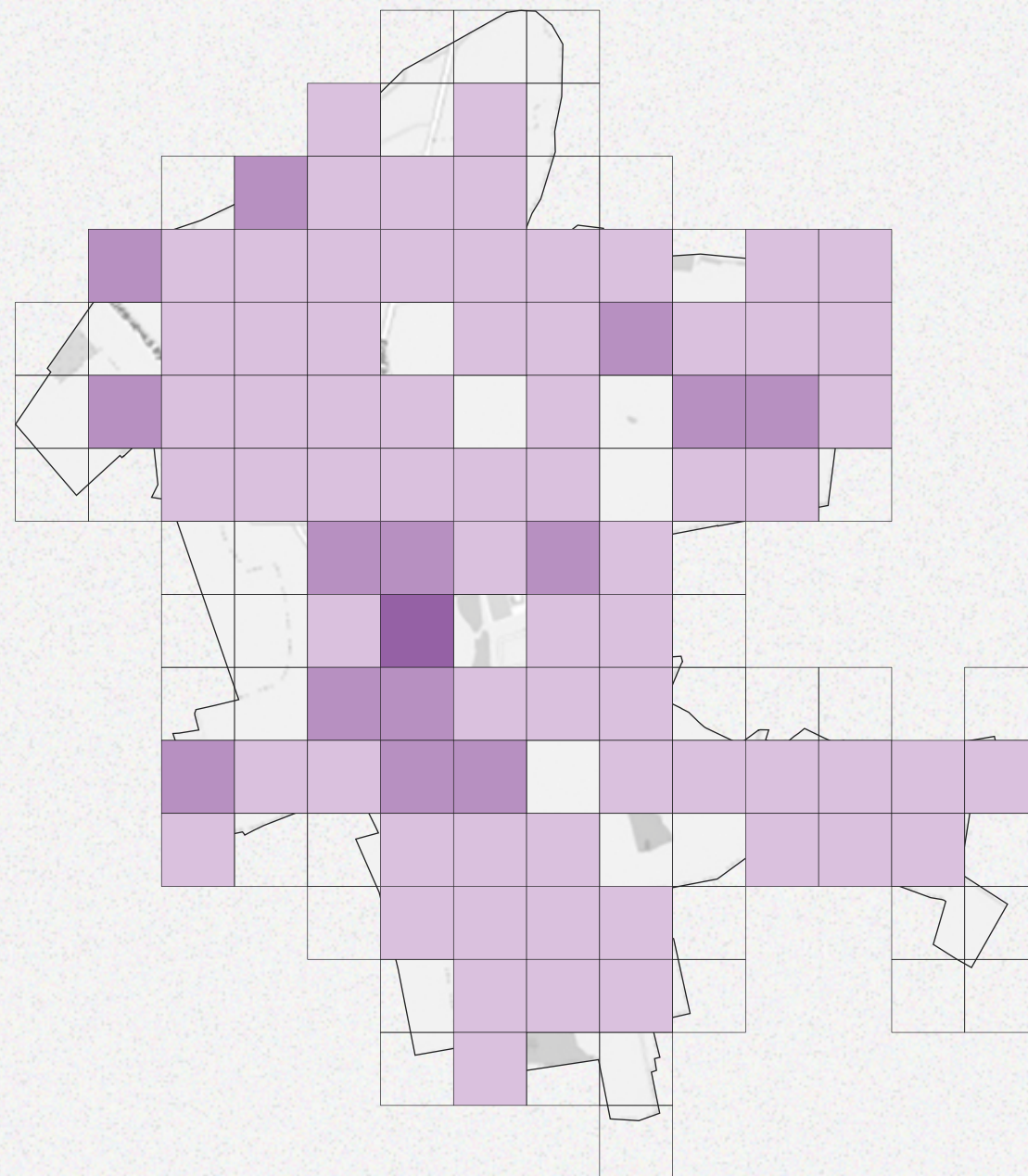


# DIGITIZATION PROCESS





# THERMAL MAP OF DESTRUCTION



20 buildings

8%



19%



14%



13%



12%



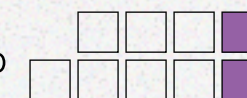
16%



13%



22%



11%



Number of destroyed buildings

- 0
- 11-20
- 1-10
- >20

## Destruction of the largest streets

**58** / 773 Vasyliia Dovhycha

**123** / 642 Sloboda

**60** / 437 Dovga

**52** / 398 Gorkogo

**48** / 393 Shevchenka

**60** / 373 Staryi Shliakh

**42** / 329 Vatutina

**39** / 181 Khutir Nadiia

**12** / 111 Domashenkova

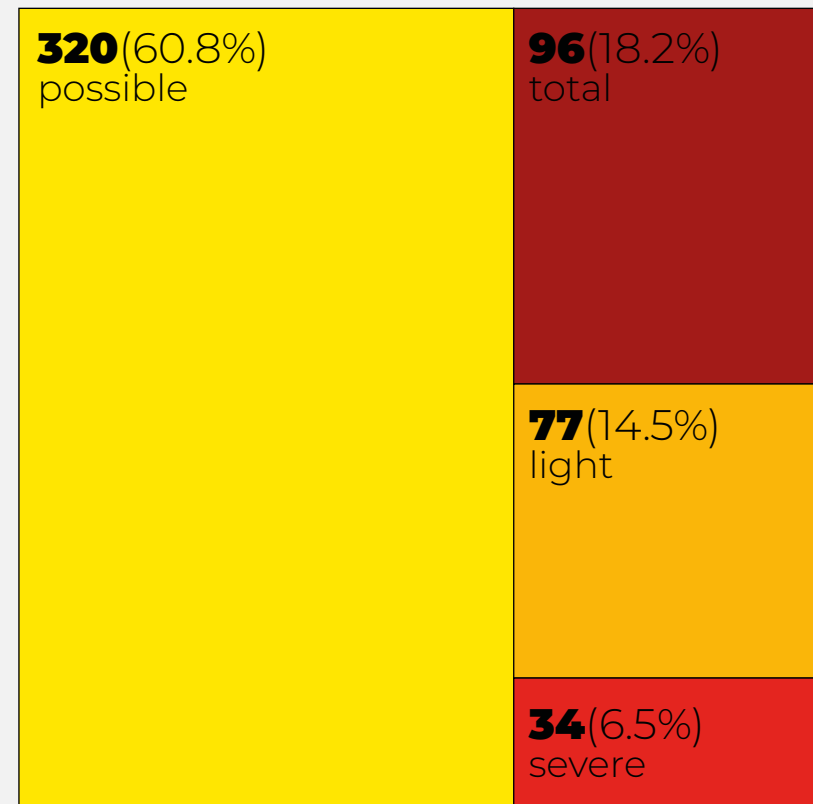


# LEVELS OF DESTRUCTION

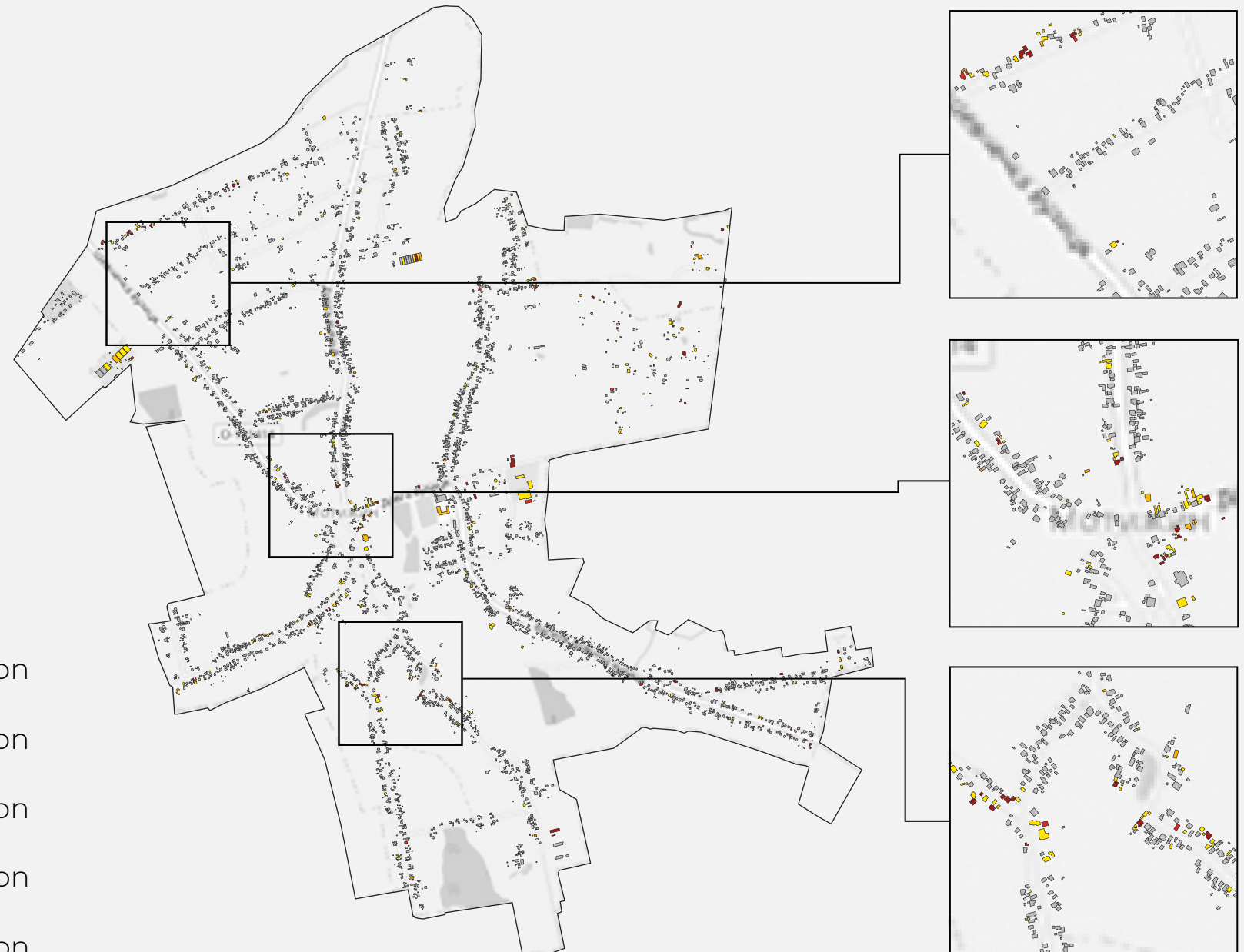
Buildings destroyed:

**527 / 3,998**

Level of destruction, number of buildings

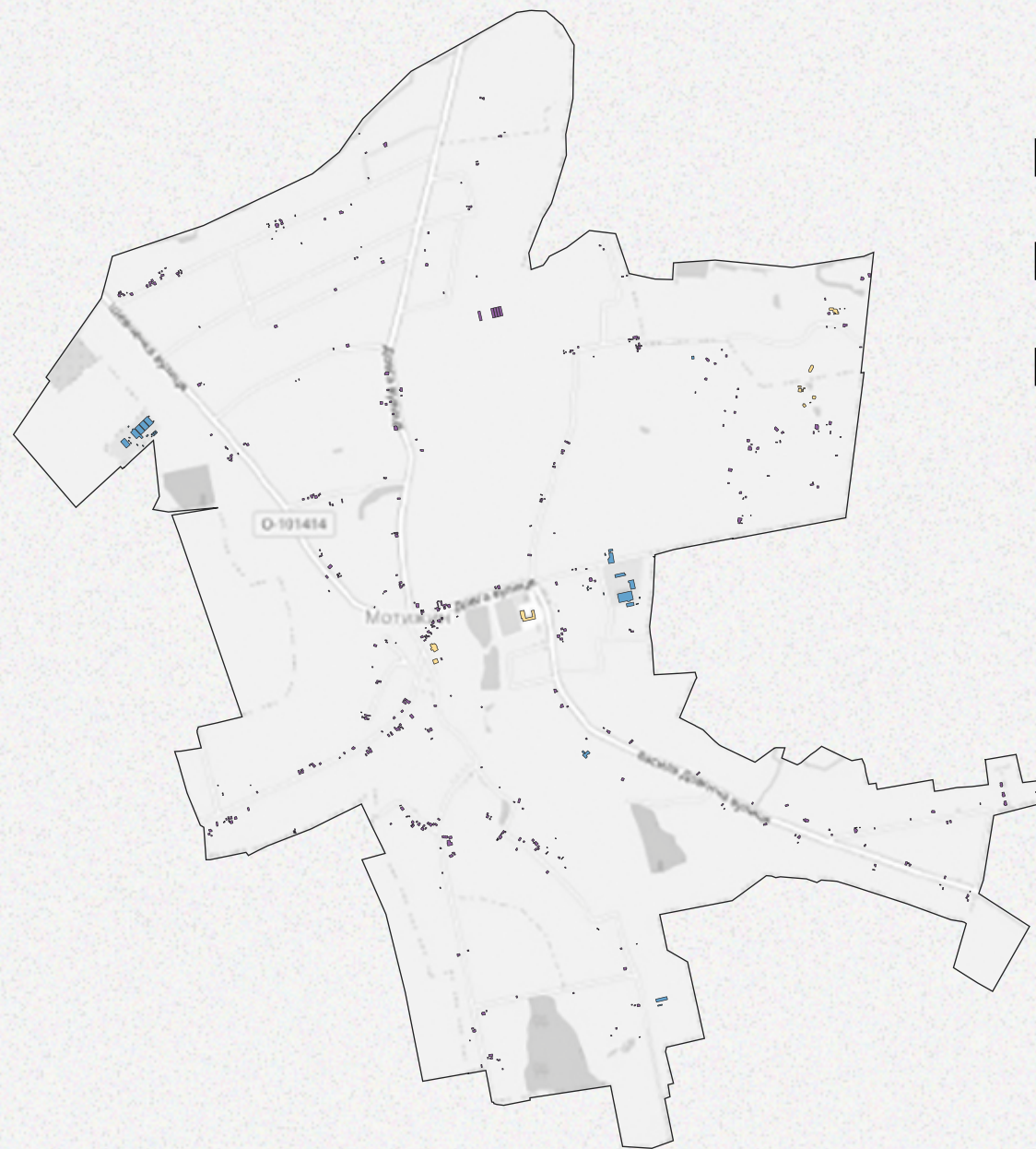
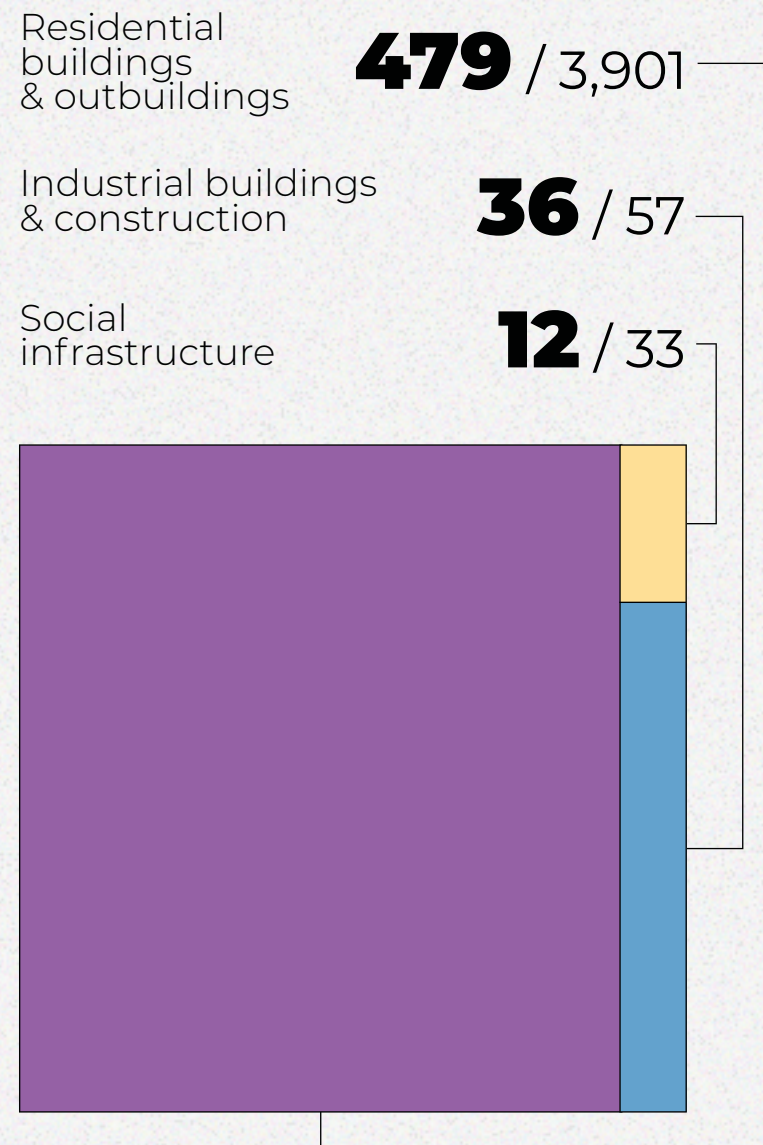


- total destruction
- severe destruction
- light destruction
- possible destruction
- no destruction





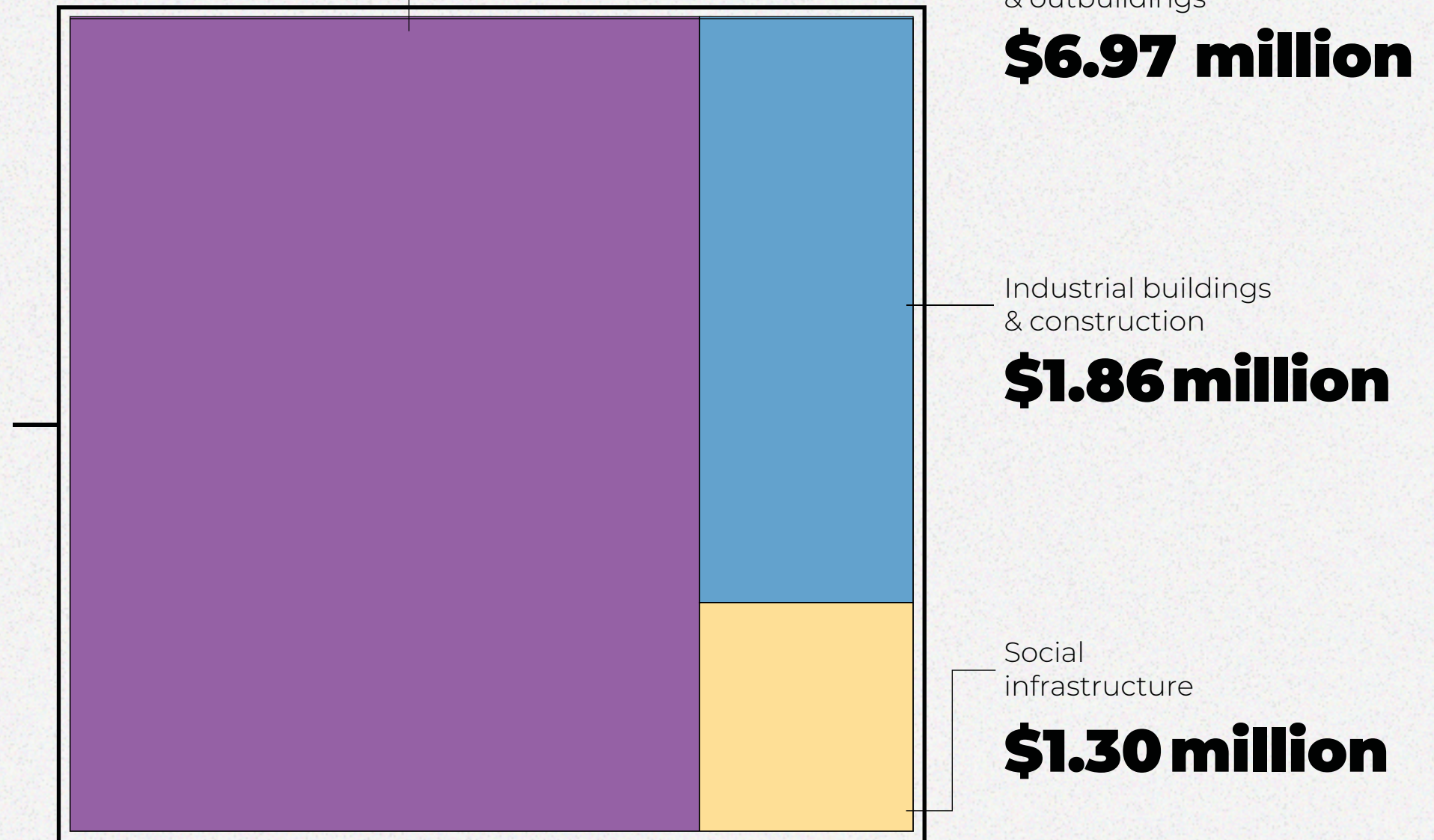
# TYPES OF DESTROYED OBJECTS



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



### Damages by types of buildings



**Total damages**  
**\$10.1 million**  
(UAH 274.9 million)



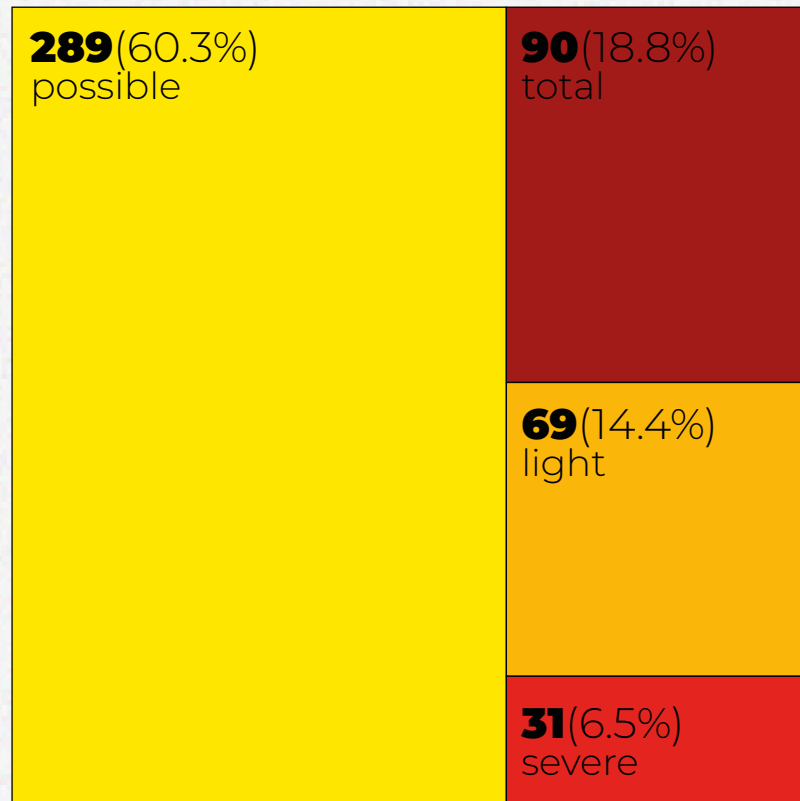
# SCALE OF DESTRUCTION





# SCALE OF DESTRUCTION

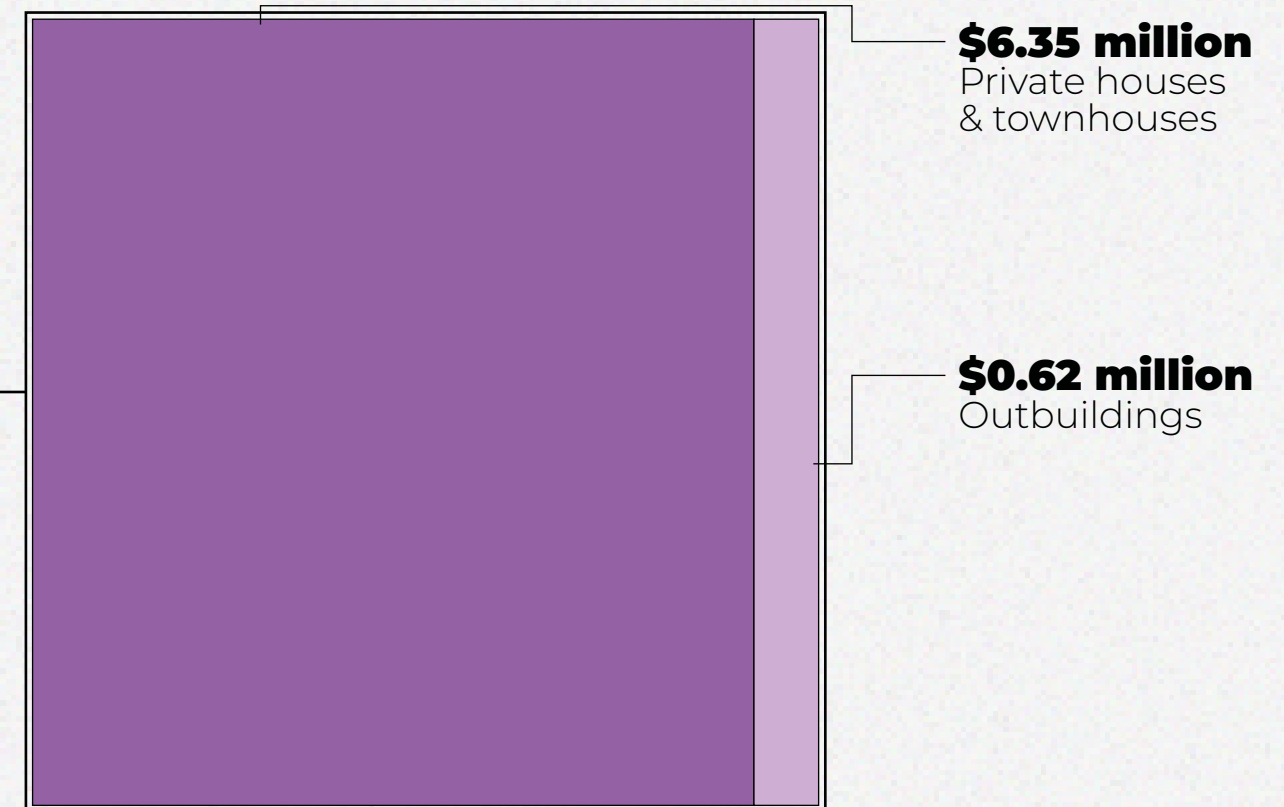
## Level of destruction



## Assessment of damages

Total damages

**\$7.0 million**



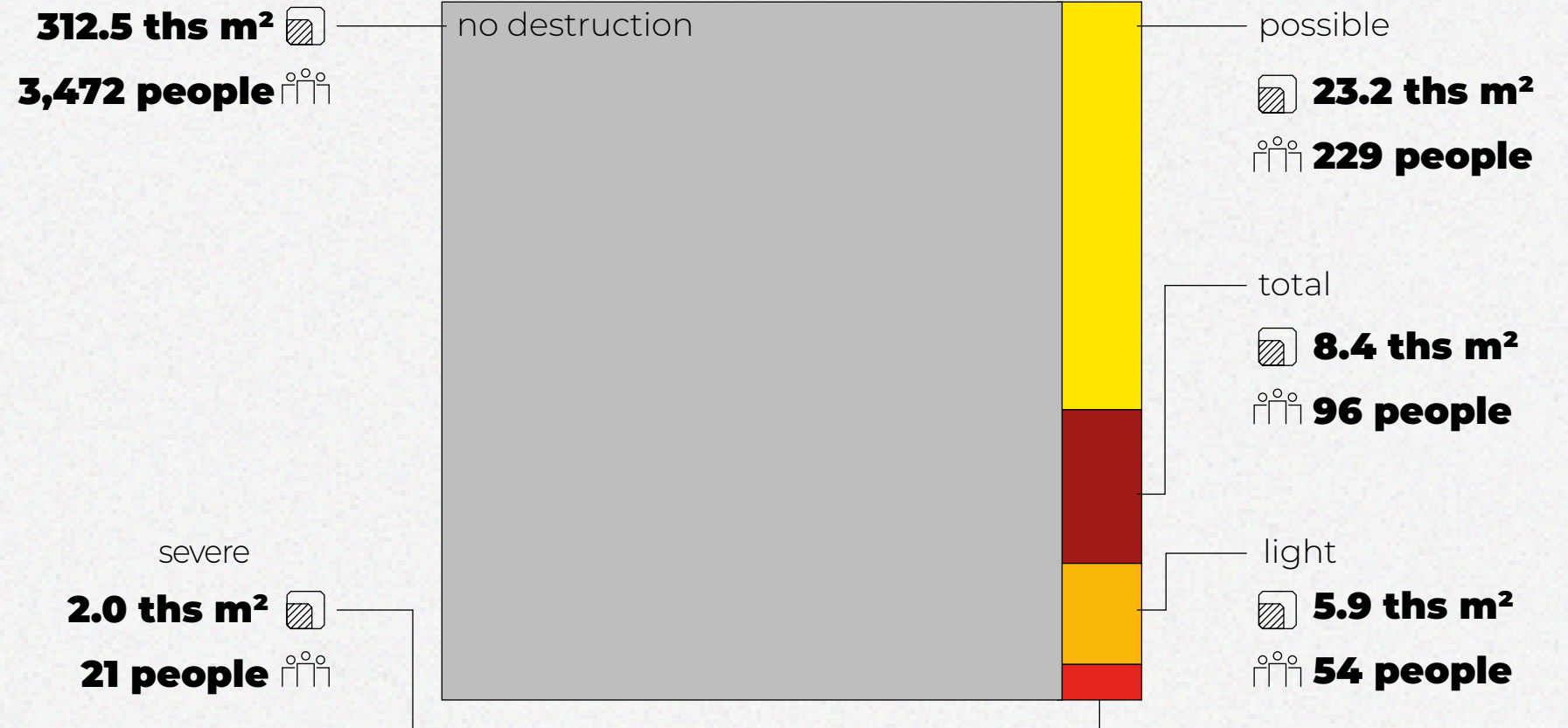


# SCALE OF DESTRUCTION

Private house



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



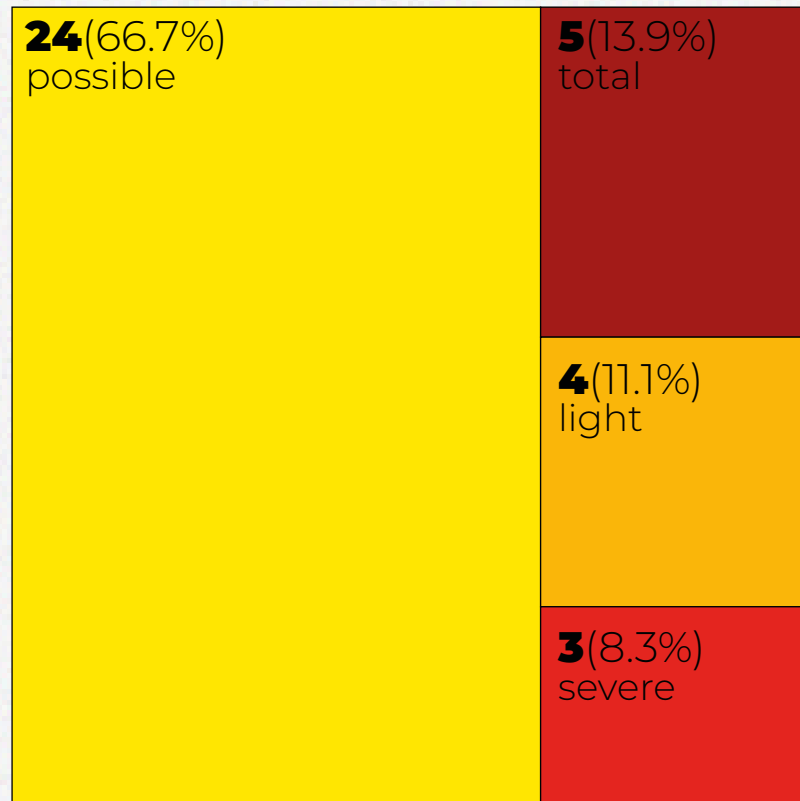
Total area of damage  
**39.5 ths m<sup>2</sup>**

Number of residents affected  
**400**



# SCALE OF DESTRUCTION

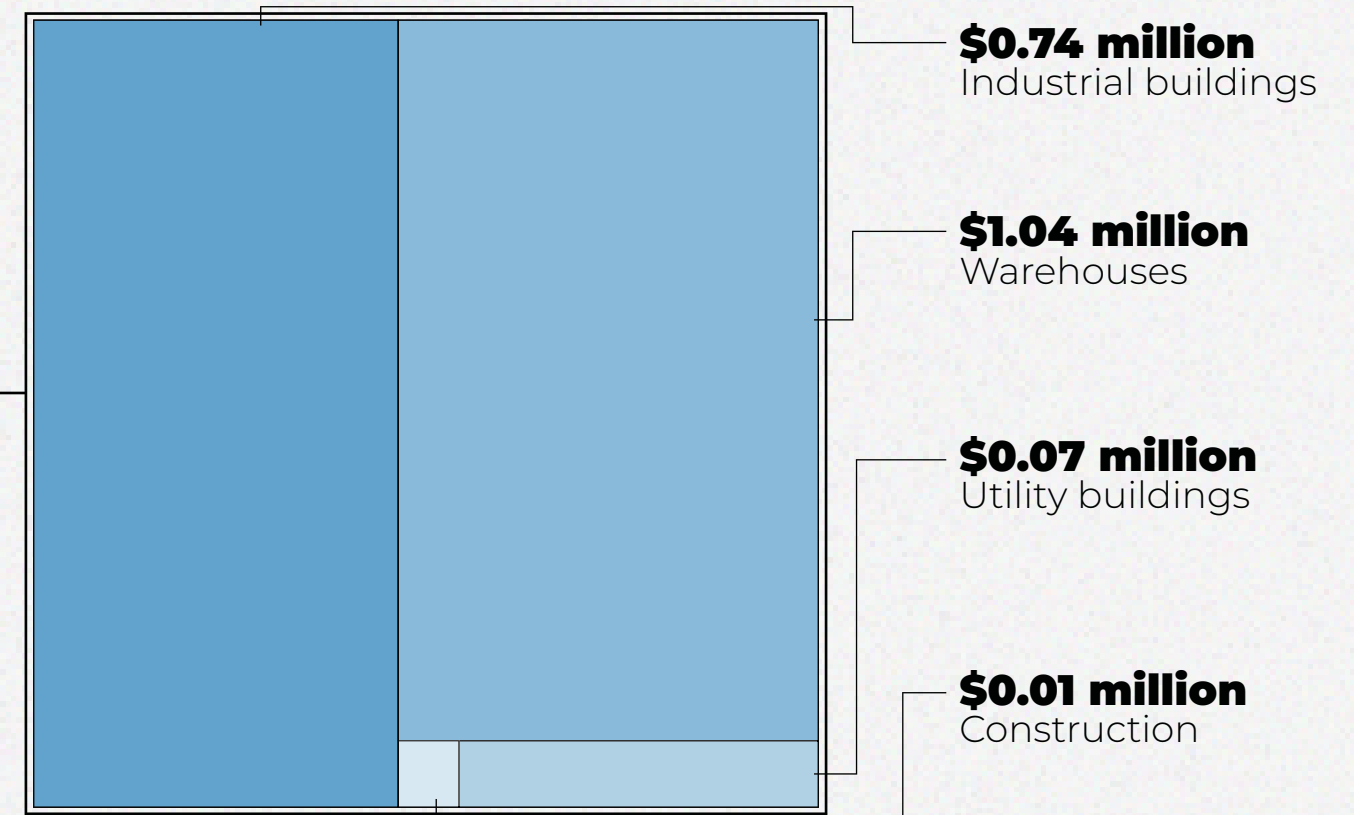
## Level of destruction



## Assessment of damages

Total damages

**\$1.9 million**

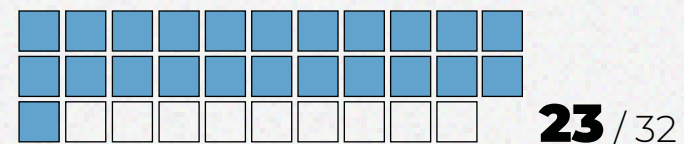




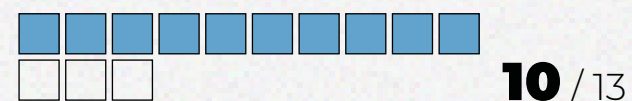
# SCALE OF DESTRUCTION

## Number of destroyed buildings

Utility buildings



Warehouses



Construction



Industrial buildings



Industrial object



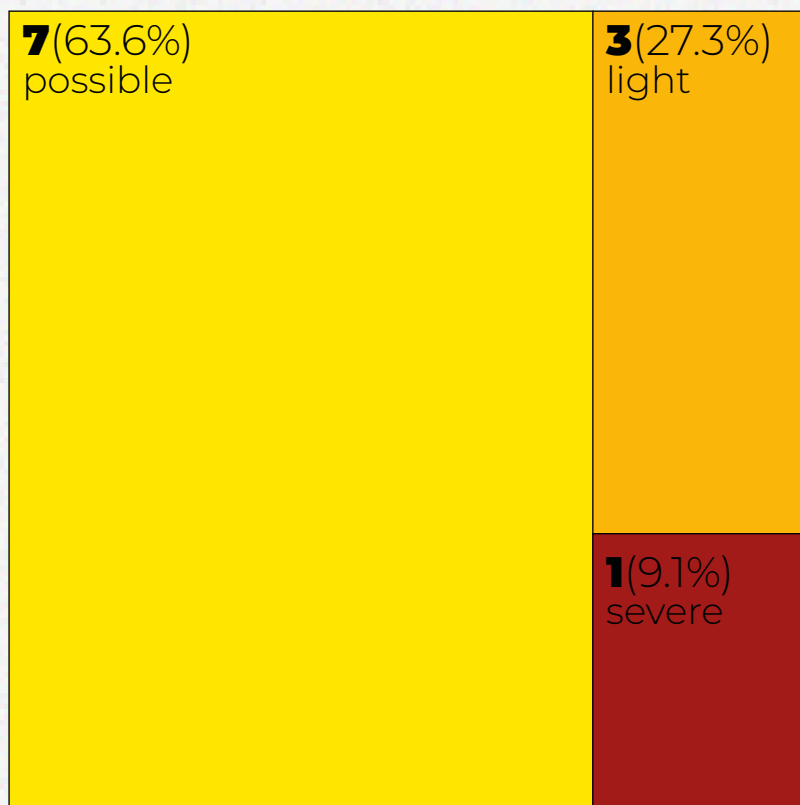
Industrial object





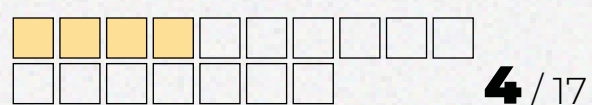
# SCALE OF DESTRUCTION

## Level of destruction



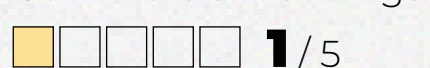
Total damages  
**\$1.3 million**

## Number of destroyed buildings

Buildings of general purpose  

**4 / 17**

Hotels and recreation facilities  

**5 / 6**

Commercial buildings  

**1 / 5**

Culture, religion and sports institutions  

**1 / 5**

Educational institutions  

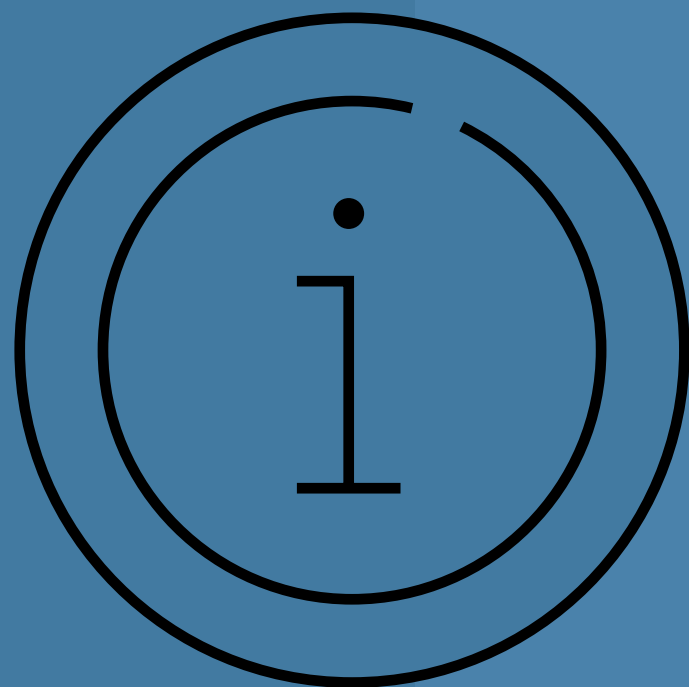
**1 / 2**

Church





# METHODOLOGIES & ADDITIONAL INFORMATION





## 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).



# HOW WE DETERMINE LEVELS OF DESTRUCTION

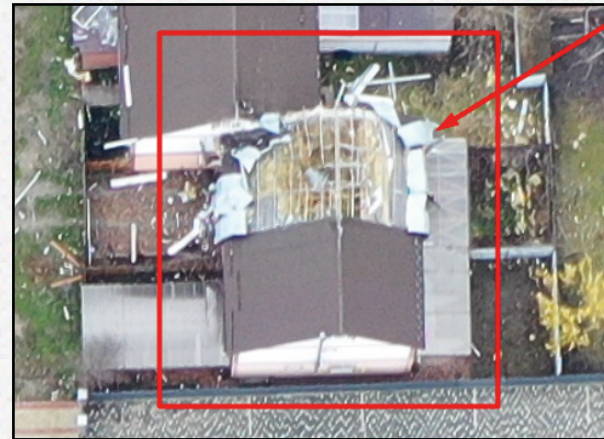
## Total destruction



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.



# MOTYZHYN THROUGH THE EYES OF BEHOLDERS

Ukrainian village leader and family found buried in shallow grave



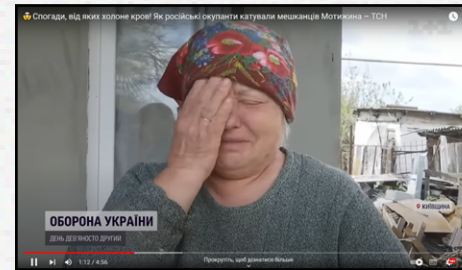
Solidarity during the war. Stories from Makariv and Motyzhyn (podcast)



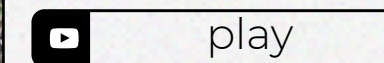
The Devil Wears the Russian Soldier's Uniform. How they tortured people in Kyiv region



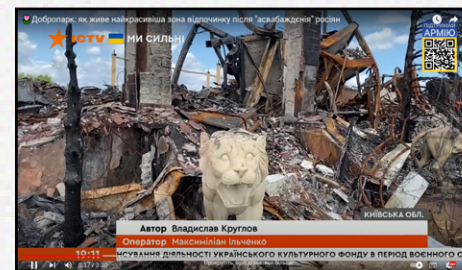
«Where they killed, there they pigged out»: the victims recognized their executioners in Motyzhyn



Blood-chilling memories! How the Russian occupiers tortured the residents of Motyzhyn



De-occupied Motyzhyn. The road of death



Dobropark: how the most beautiful recreation area lives after the «liberation» by russians



An 81-year-old resident of Motyzhyn Lyubov shows her destroyed house



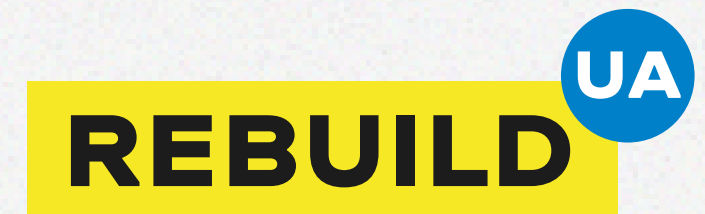
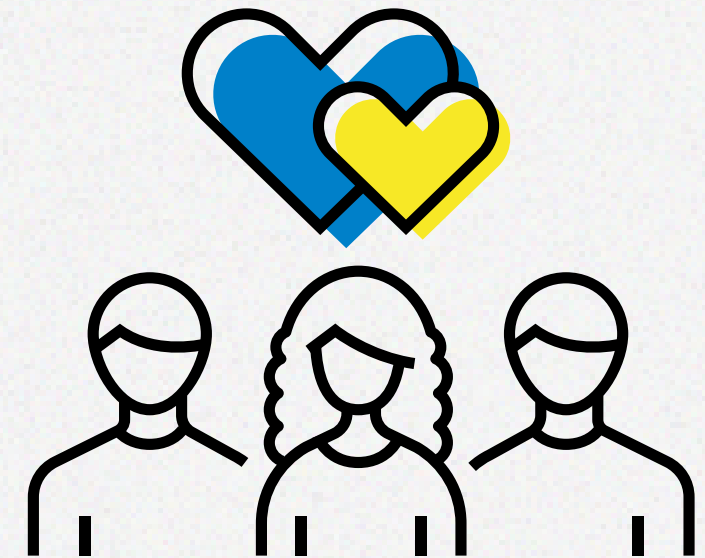


# GRATITUDE TO VOLUNTEERS

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 Motyzhyn:**

Valentyn Shkliarenko  
(completely on his own)





# PREVIOUS REPORTS



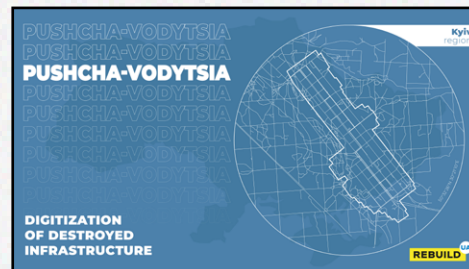
**Moshchun,**  
Buchanskyi district,  
Kyiv region

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**Horenka,**  
Buchanskyi district,  
Kyiv region

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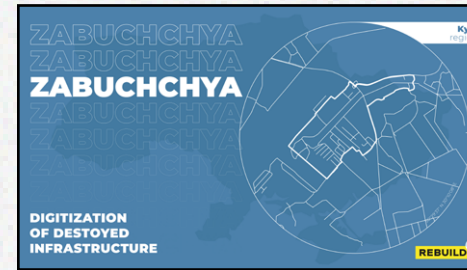
**Pushcha-Vodytsia,**  
district of Kyiv

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**Ozera,**  
Borodianskyi district,  
Kyiv region

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**Zabuchchya,**  
Buchanskyi district,  
Kyiv region

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**Irpın,**  
Buchanskyi district,  
Kyiv region

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**Bucha,**  
Buchanskyi district,  
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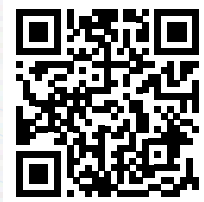


**Hostomel,**  
Buchanskyi district,  
Kyiv region

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# 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:

