

An aerial photograph of the Saltivka district in Kharkiv, Ukraine. The image shows a dense residential area with numerous multi-story apartment buildings. The buildings are interspersed with green spaces, including trees and a small sports field. A road runs along the right side of the image. The overall scene depicts a typical urban environment in a city that has experienced conflict.

# Assessment of damage to residential buildings Saltivka district, Kharkiv

September 2023 | Ukraine



**Funded by:**



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Cover image: World-View 3 satellite image (Maxar Technologies) of residential buildings after damage in Kharkiv City (Kharkivska oblast, Ukraine) acquired on 15 September 2022.

**ABOUT REACH:**

REACH is a leading humanitarian initiative providing granular data, timely information and in-depth analysis from contexts of crisis, disaster and displacement. The work of REACH directly feeds into aid response and decision-making by providing accessible and precise information on the humanitarian situation of crisis-affected populations.

Created in 2010, REACH is a joint initiative of IMPACT Initiatives, ACTED and the United Nations Operational Satellite Applications Programme (UNOSAT). REACH activities are conducted in support and within the framework of inter-agency coordination mechanisms at field and global levels to enabling more efficient aid planning and response.



# ASSESSMENT OF DAMAGE TO RESIDENTIAL BUILDINGS SALTIVKA DISTRICT, KHARKIV

SITUATION OVERVIEW

September 2023 | UKRAINE

## CONTEXT

Saltivka is a densely populated residential area located in the Saltivskiy District of Kharkiv, Ukraine's second most populous city. With a pre-war population estimated between 400,000 and 800,000, Saltivka is one of the most densely inhabited residential areas in Ukraine. Developed in the late 1960s and 1970s, the urban environment is dominated by multi-story panel buildings, typically with 9, 12 or 16 floors. Since the onset of the invasion of Ukraine by the Russian Federation in February 2022, Saltivka has experienced extensive damage to residential buildings and infrastructure due to shelling. The first instance of the Russian Armed Forces entering the city occurred on 26 February 2022, followed by a prolonged period of almost daily bombardments.<sup>1</sup>

The most substantial destruction took place from February to May 2022, when active hostilities unfolded on the outskirts of Kharkiv. Residential buildings across all districts of the city and surrounding villages were affected, with the northern part of Saltivka experiencing the most substantial damage. With the decrease in hostile events in 2023, Kharkiv, along with Donetsk, has emerged as one of the primary destinations for internally displaced persons (IDPs) intending to return.<sup>2</sup>

To support humanitarian response, recovery efforts and reconstruction planning and prioritisation, REACH assessed conflict-related damage to residential buildings and estimated the number of affected residents in Saltivka.

**Image 1 and 2: Examples of detected damage to residential buildings in Kharkiv, Saltivka based on satellite imagery. Red circles depict buildings with clearly visible damage while the orange circle depicts a building likely to be damaged (based on visual inspection).**



## KEY FINDINGS

- **A total of 93 buildings across Saltivka were identified as damaged.** These include 91 apartment buildings and 2 single-family houses. Prior to Russia's invasion of Ukraine, **these dwellings were home to an estimated 34,753 people.**
- The **majority of the damage is concentrated in the northern part of Saltivka.** Neighborhoods 3 and 6 are the most affected, with respectively **8,533 and 7,074 impacted residents.**
- In addition to residential damage, REACH also identified **36 facilities and infrastructural objects that were damaged in the Saltivka area.** These objects encompass a range of services such as education, utilities, business, and finance. This further compounds the impact of residential damage experience by Saltivka residents.

These findings highlight the extensive scale of conflict-related damage in Saltivka, **indicating long-term impacts for residents in terms of living conditions, the availability and accessibility of vital services, economic prospects, and the conditions for displaced individuals wishing to return.** A refined understanding of these long-term impacts is required to inform recovery and reconstruction efforts.

To provide further insight into the long-term impacts of conflict-related damage in Saltivka, REACH is conducting a damage impact analysis in September 2023 to complement this geo-spatial damage assessment. This includes key informant interviews, focus group discussions and participatory mapping exercises with impacted residents, representatives of local authorities, and civil society organisations. This analysis aims to provide data-driven evidence enabling the inclusion of impacted communities' priorities and needs into the recovery and reconstruction plans.



## METHODOLOGY OVERVIEW

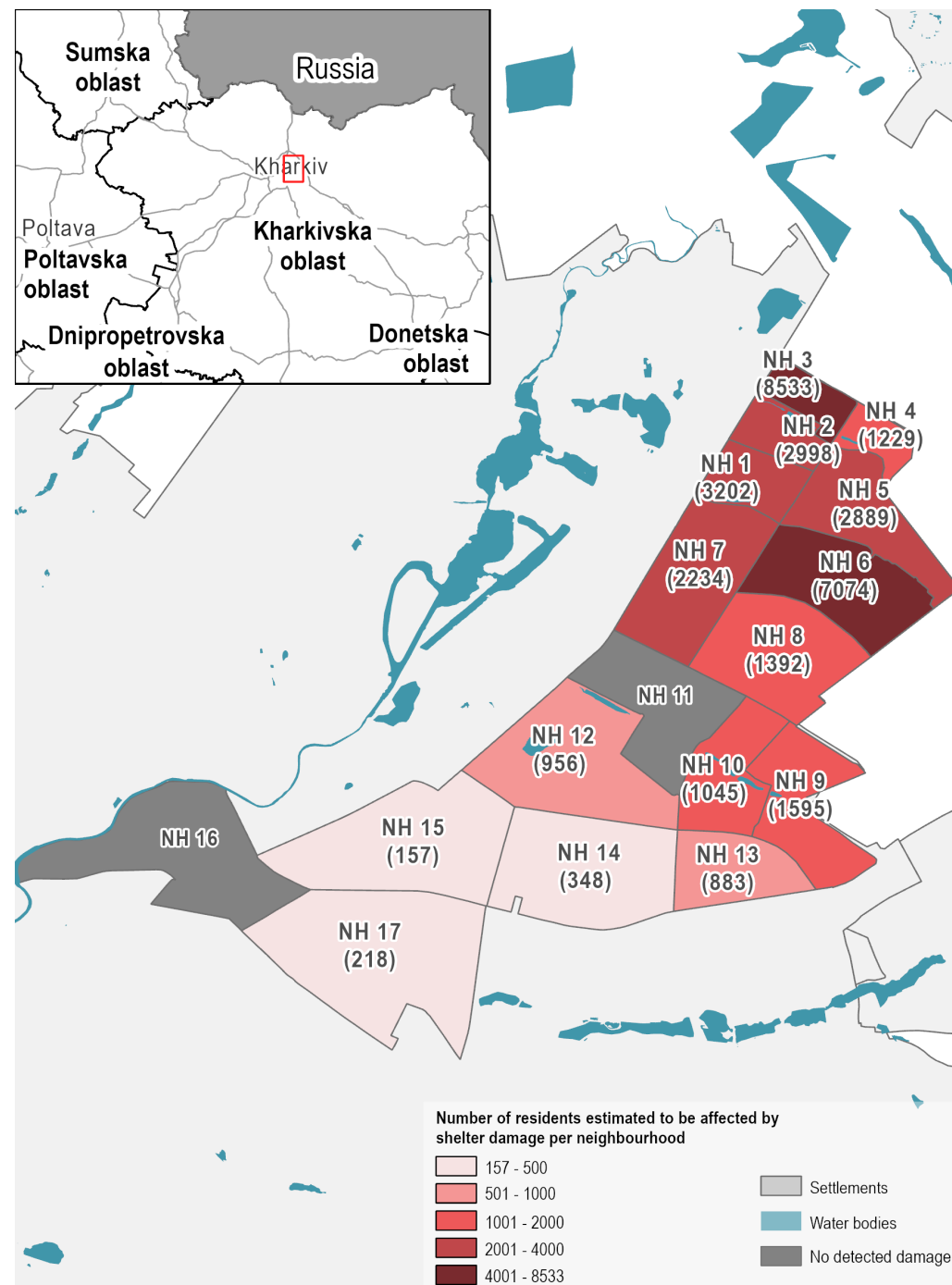
The Saltivka residential area was selected for this assessment based on the intensity of hostilities within and around its boundaries, the extent of reported residential damage, and the need for evidence-based data to inform reconstruction planning. This factsheet covers the 17 neighbourhoods ("microraiions") of Saltivka.

The analysis is based on high resolution satellite imagery acquired on 15 September 2022, triangulated with official information about population and spatial subdivisions of the district, as well as a secondary data review. The analysis leverages REACH's partnership with the United Nations Operational Satellite Applications Programme (UNOSAT), which conducts pre- and post- inspection imagery provided by MAXAR Technologies (World-View and Geo-Eye satellites with 50cm spatial resolution) to detect damage to buildings in urban settlements. The identification of residential buildings and their subsequent classification into single-occupancy dwellings and multi-apartment buildings is based on visual inspection of buildings marked as damaged by UNOSAT via Google Street View mode in Google Earth. Every residential building labelled by UNOSAT as damaged or possibly damaged was considered as a damaged building. The same rule was applied to multi-apartment buildings (meaning that apartment buildings with only partial structural damage were considered as damaged). The analysis does not account for ongoing reconstruction efforts.

The number of apartment units for each multi-apartment building was calculated based on their unique combination of floors and entrances through visual inspection in Google Street View. The number of apartments was multiplied by the average number of household members in Kharkivska oblast (2.42 people, according to 2021 data from the State Statistics Services of Ukraine) to estimate the number of affected people.

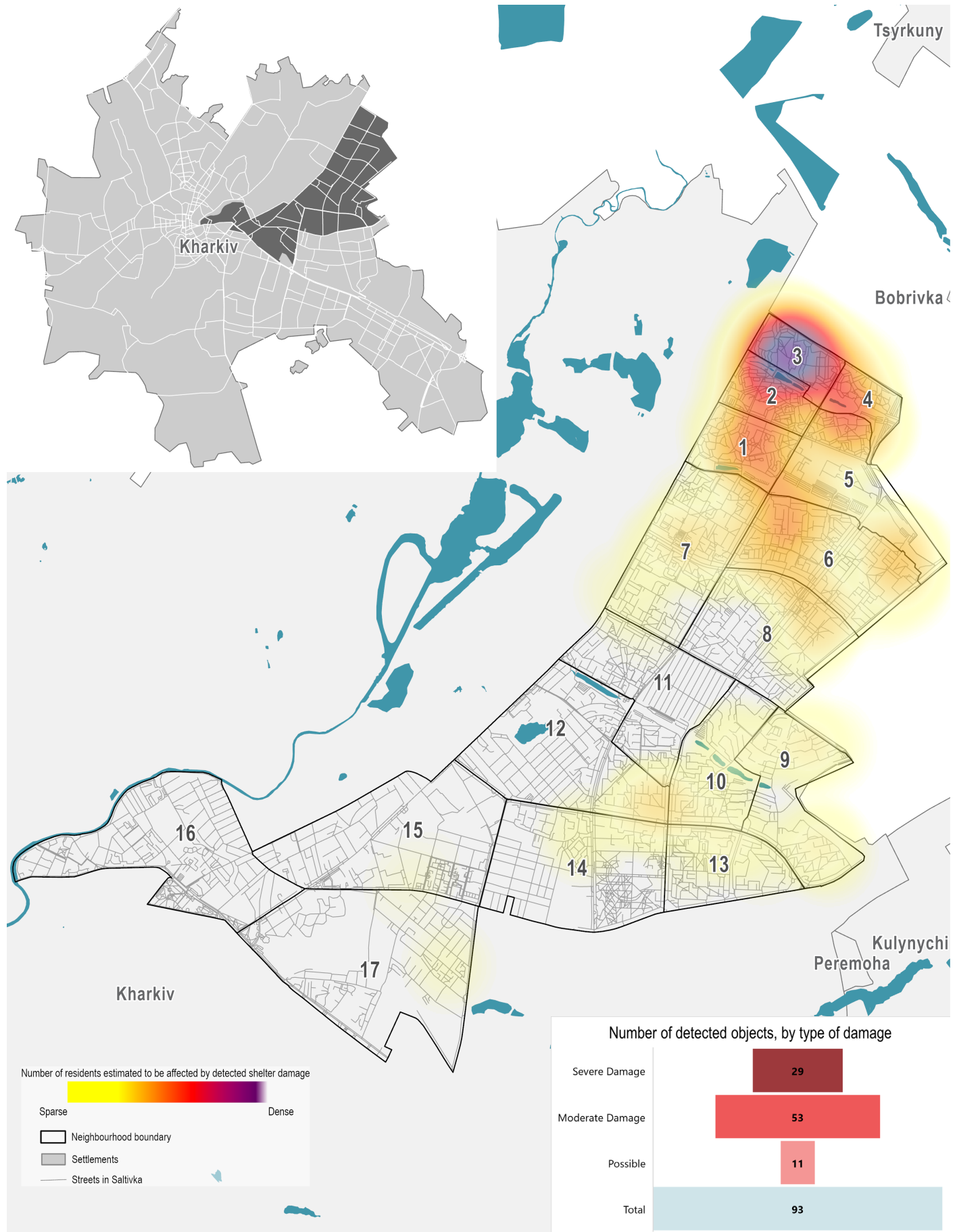
In the absence of official and available information on neighbourhood divisions and other spatial subunits in the residential area of Saltivka in Kharkiv, REACH used satellite imagery, city development plans, and street network data extracted from OpenStreetMaps to draw neighbourhood demarcations (17 in total). This factsheet presents findings for 15 of these neighbourhoods. The assessment excluded neighbourhoods 11 and 16, where no damaged buildings were identified.

As the vast majority of damage to residential infrastructure in Saltivka occurred prior to June 2022, this assessment performed with satellite imagery from September 2022 still accurately reflects the extent of damage as of August 2023.





**UKRAINE – Kharkiv, Saltivka residential damage assessment**  
**Damage density map**

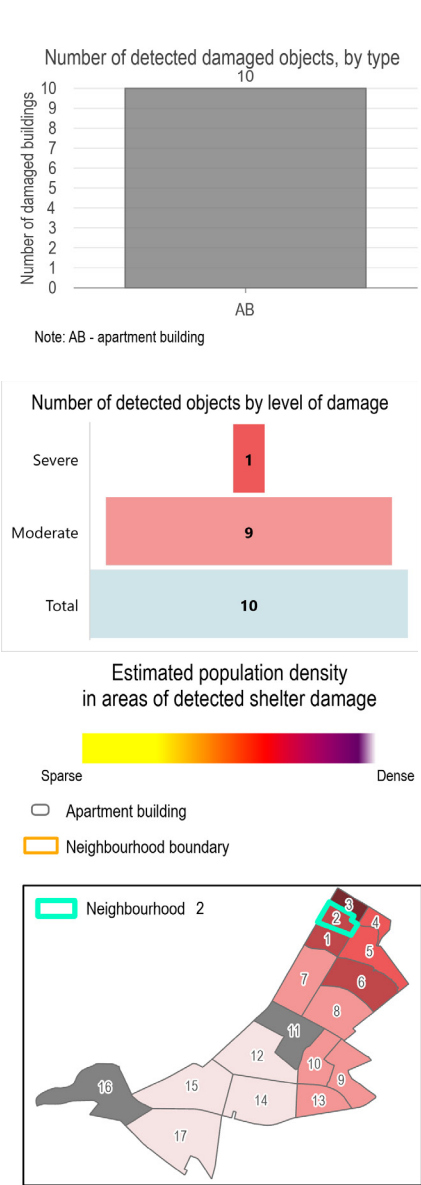






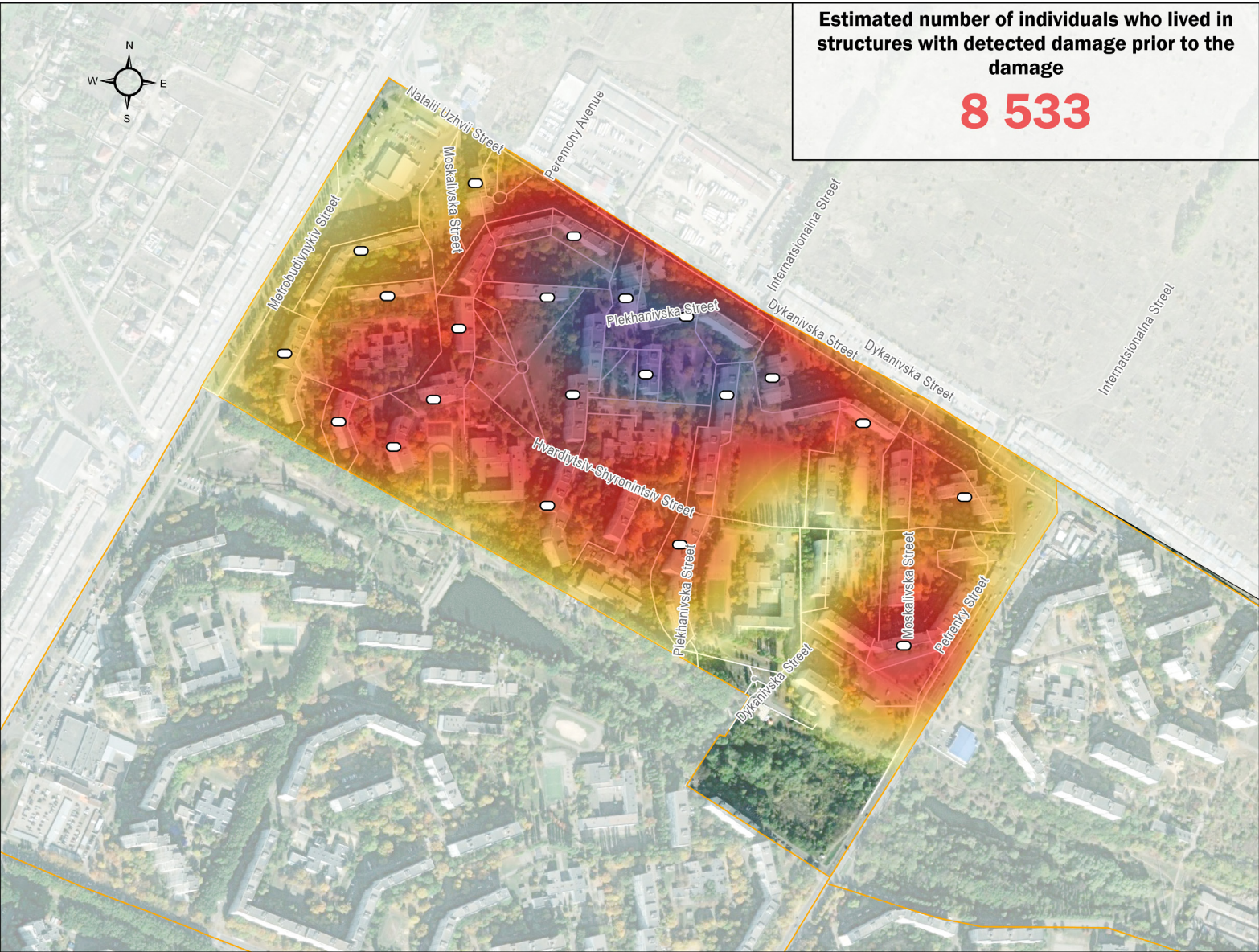
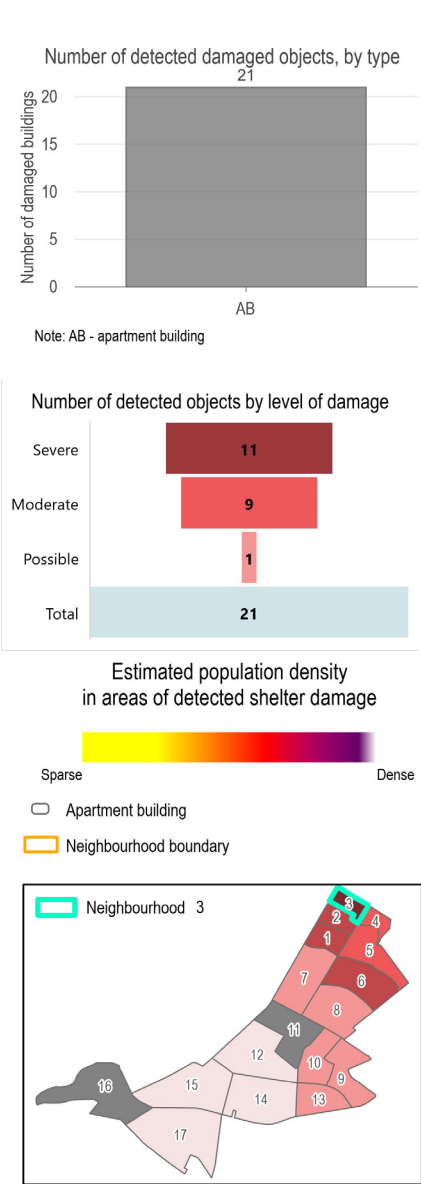


Neighbourhood 2



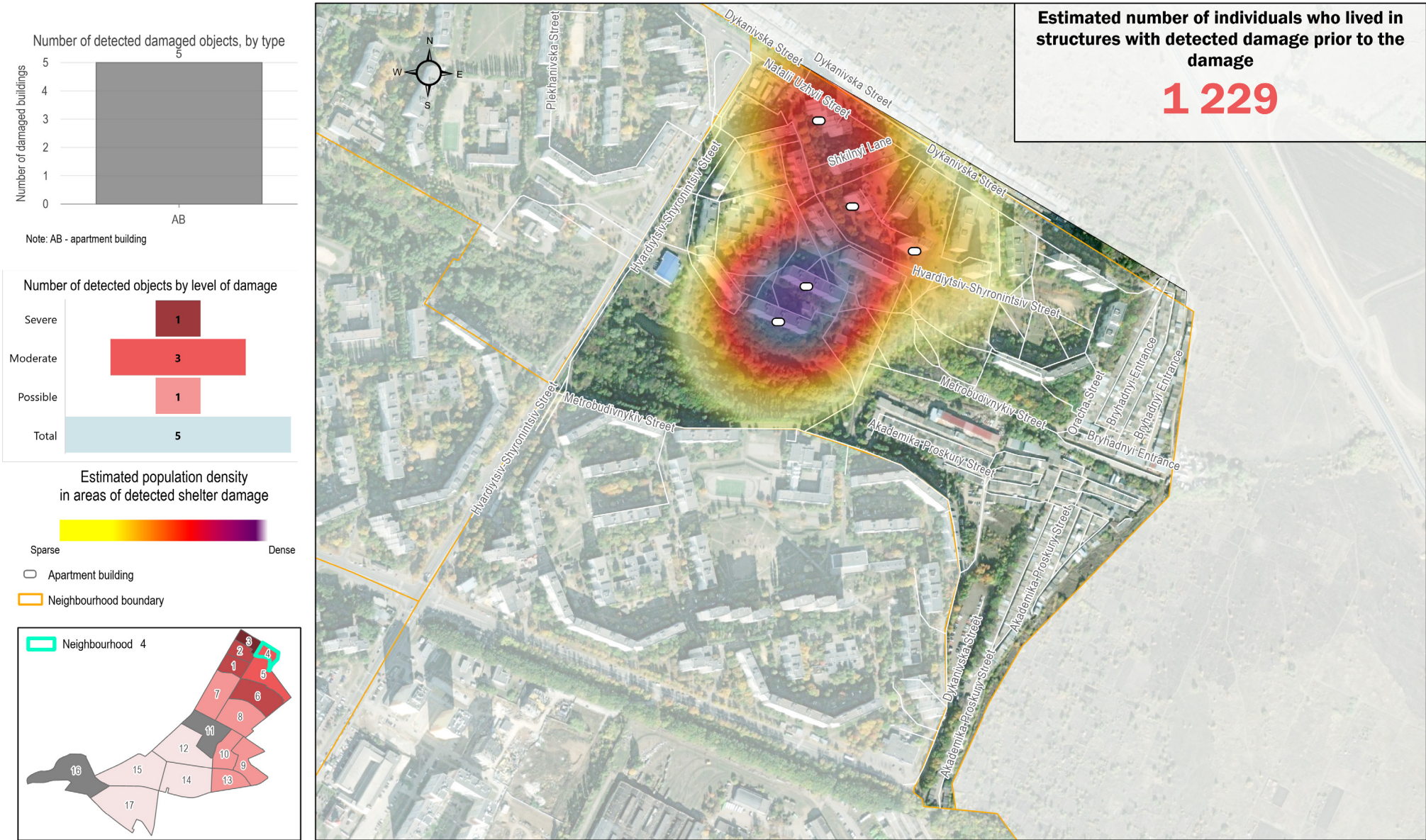


Neighbourhood 3



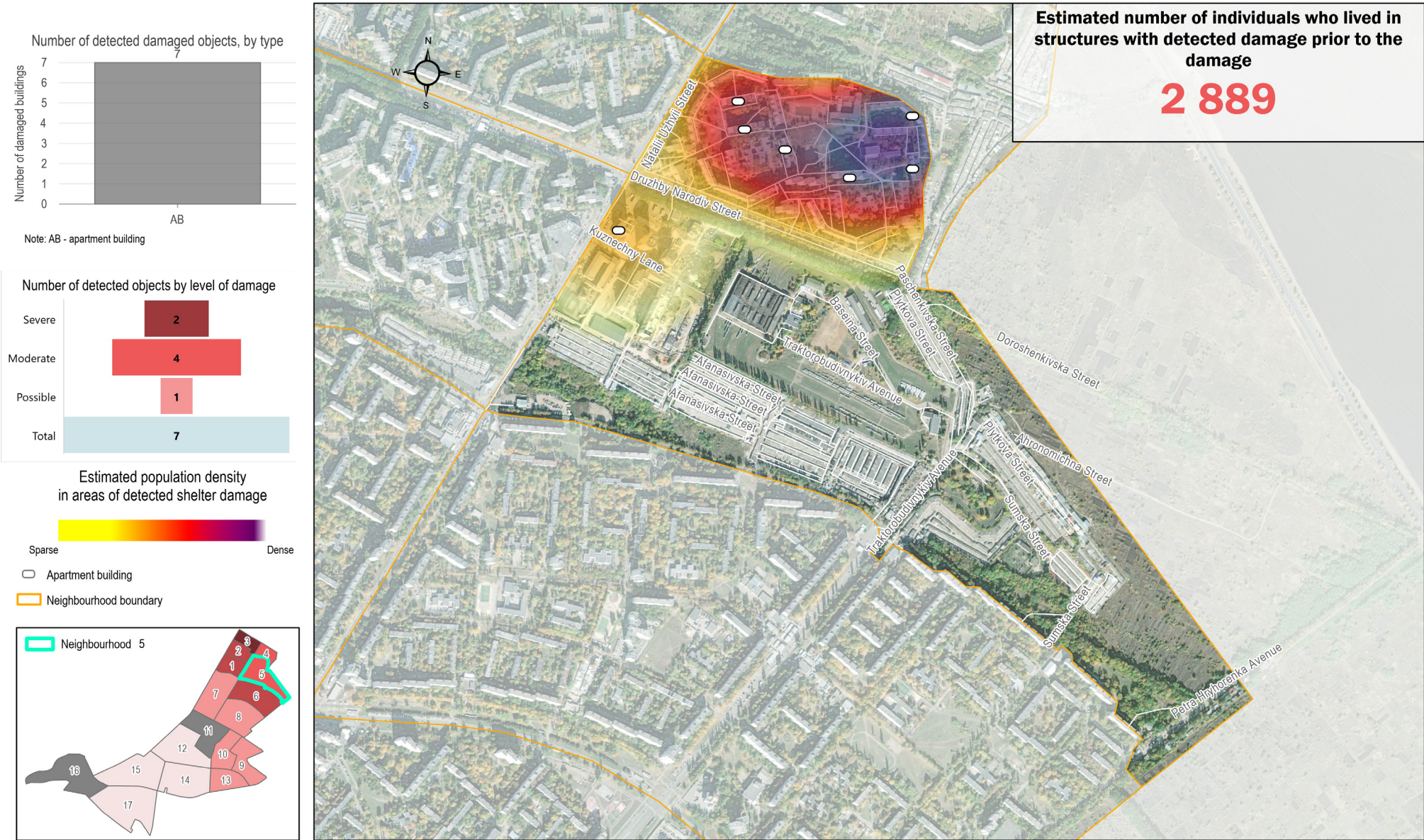


Neighbourhood 4





Neighbourhood 5





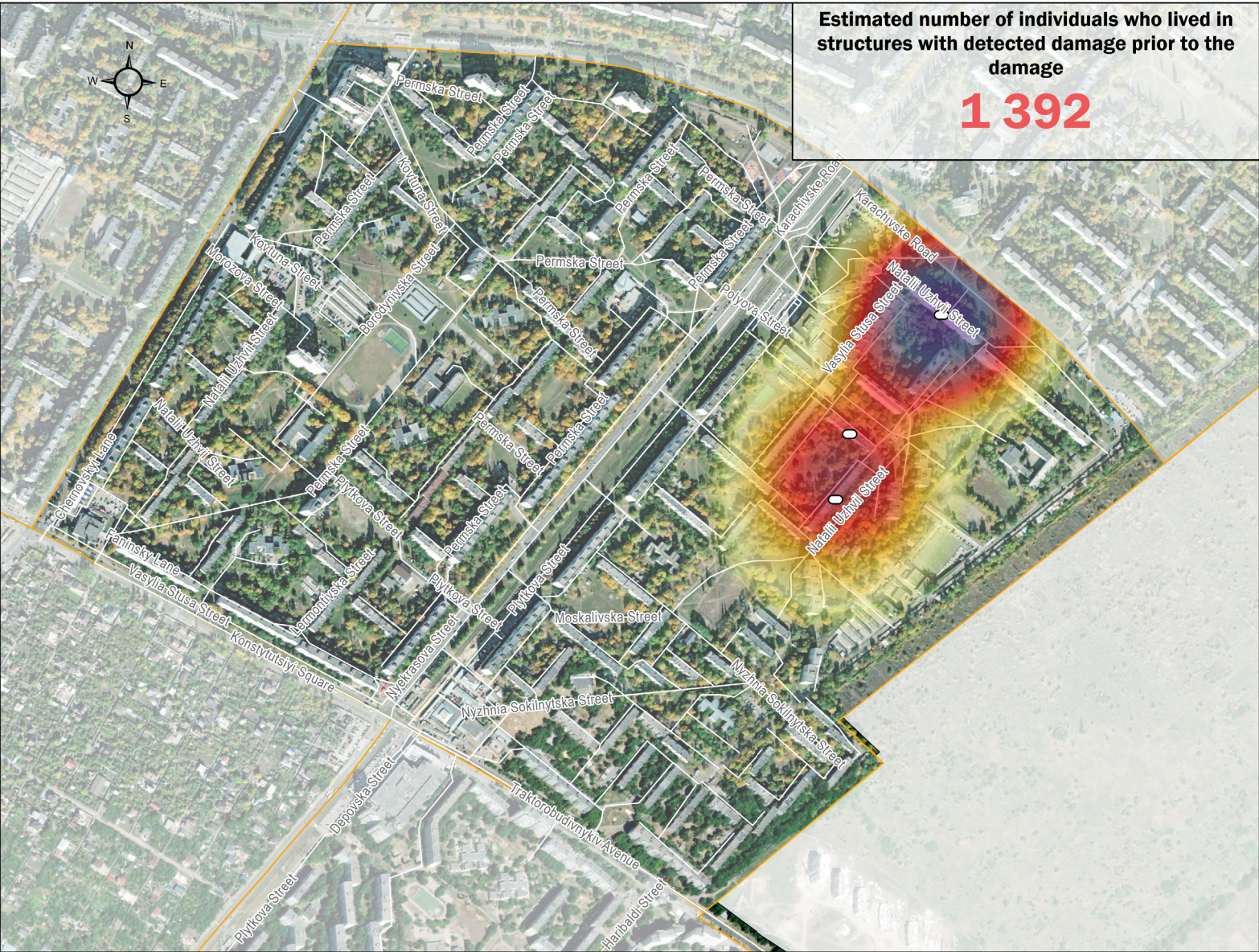
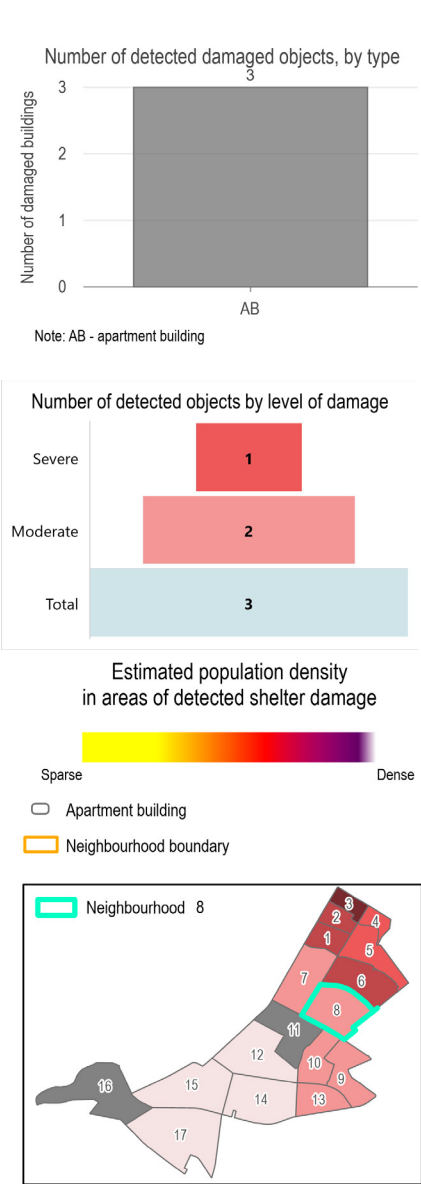






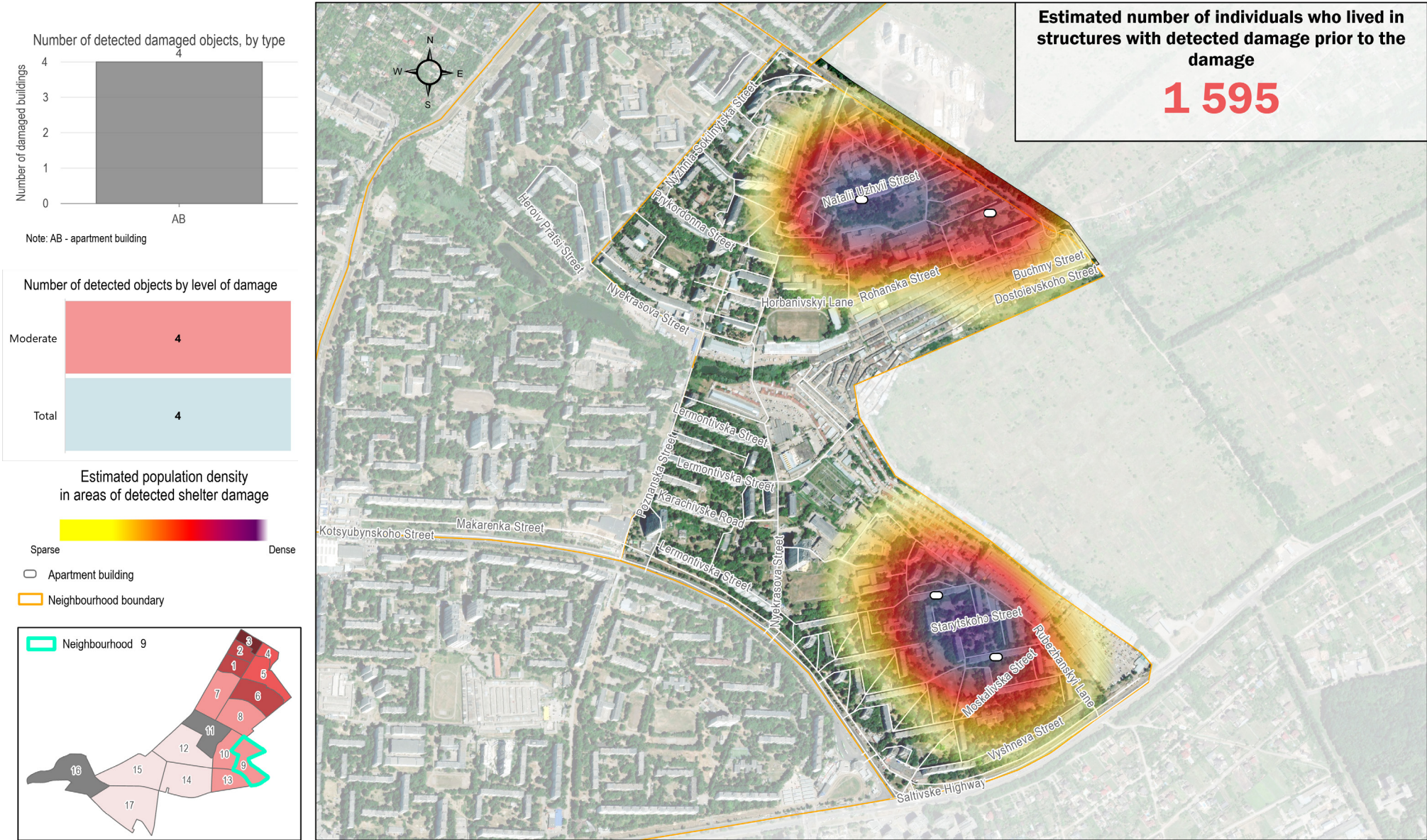


Neighbourhood 8



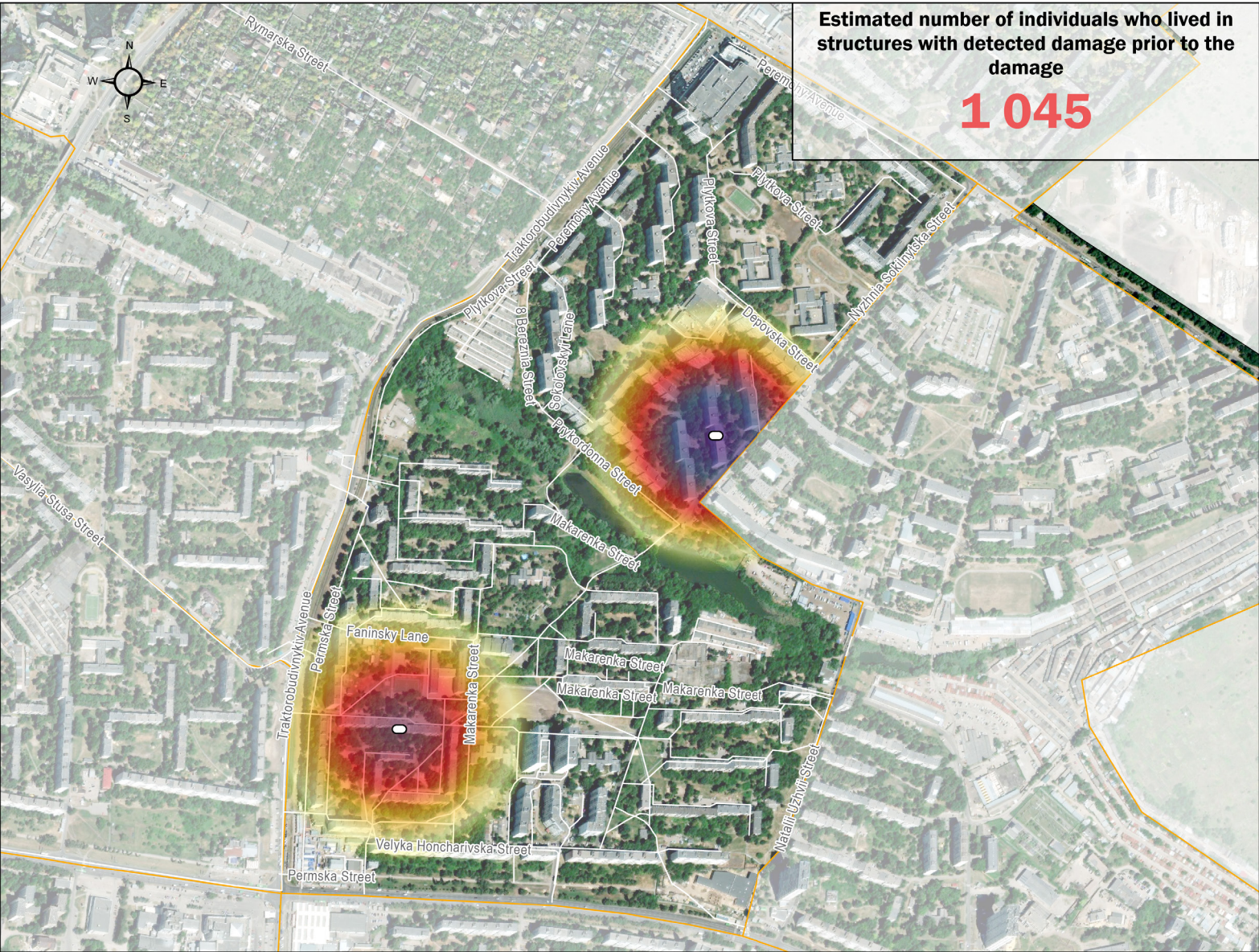
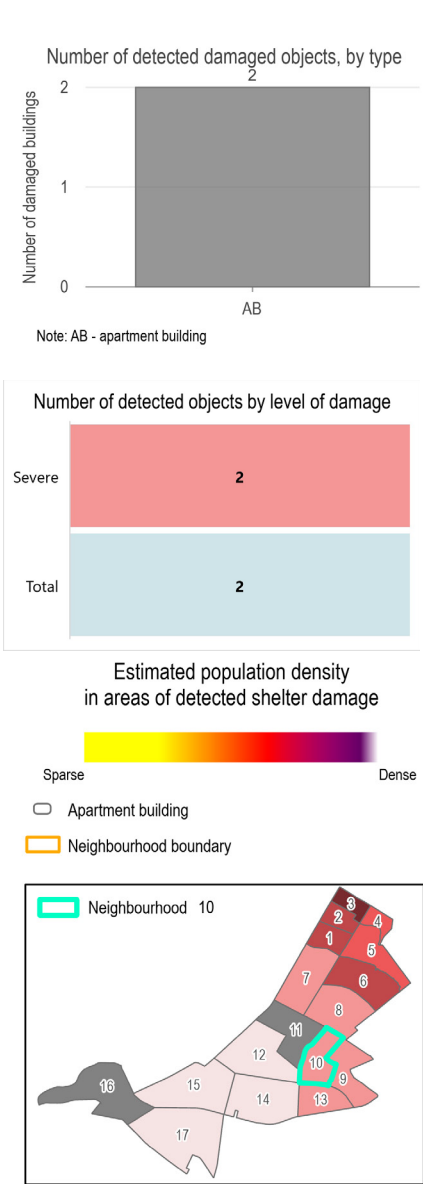


Neighbourhood 9





Neighbourhood 10



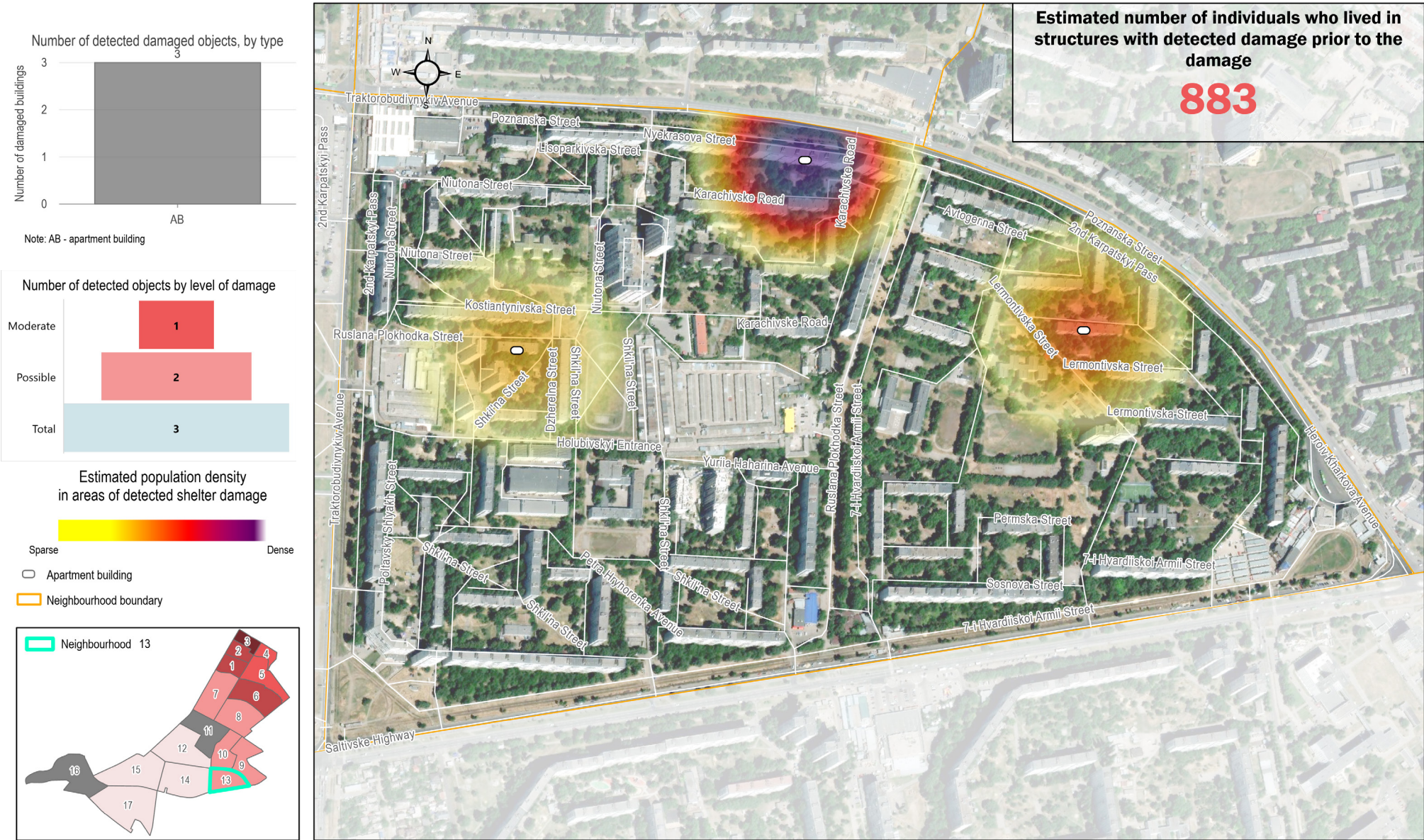


Neighbourhood 12





Neighbourhood 13

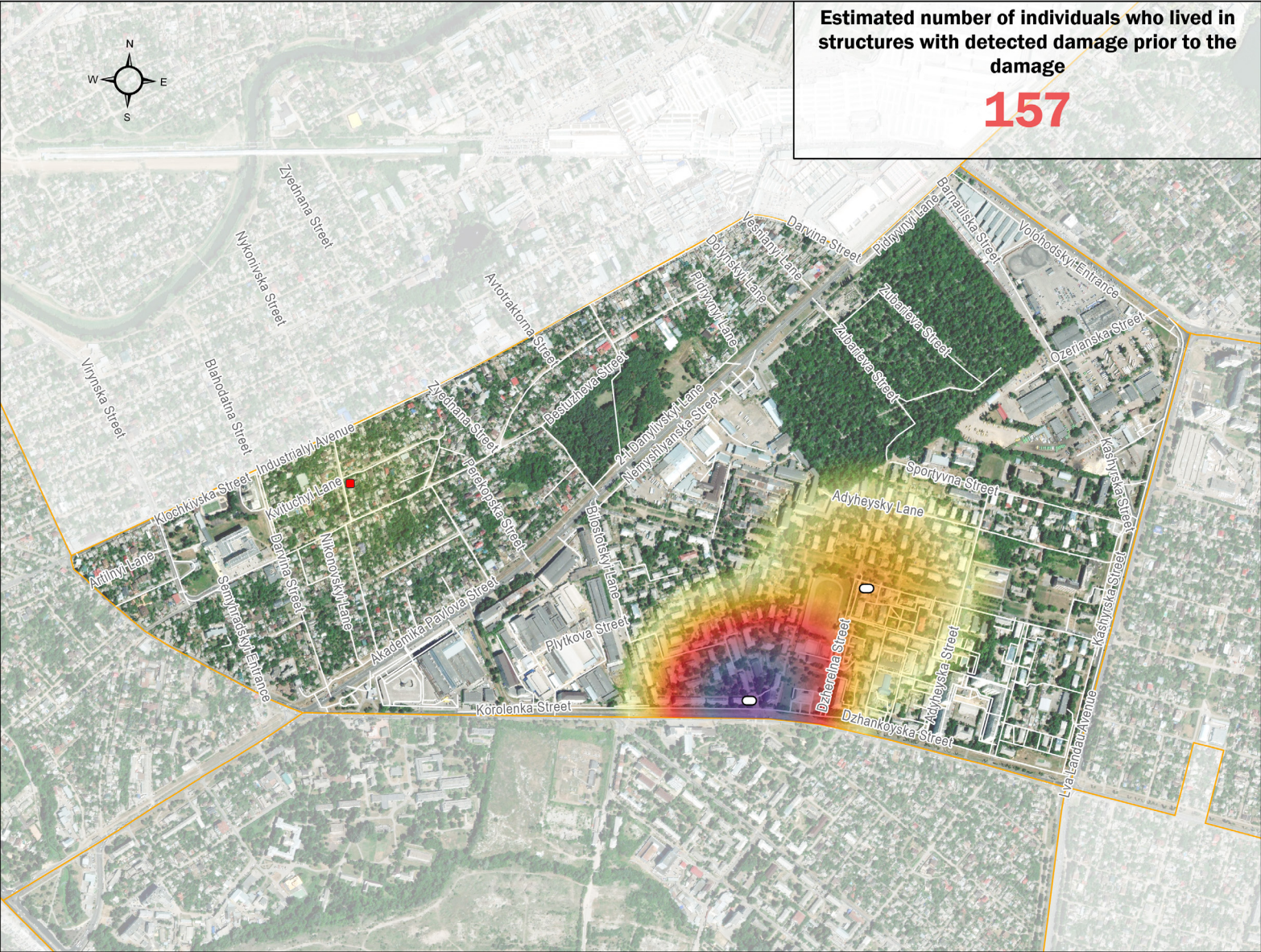
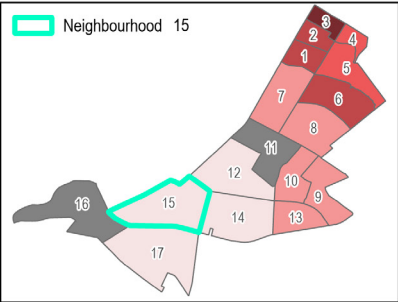
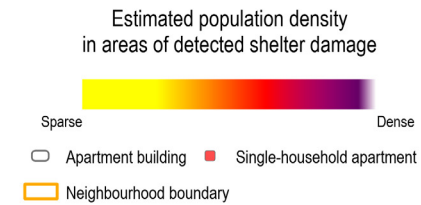
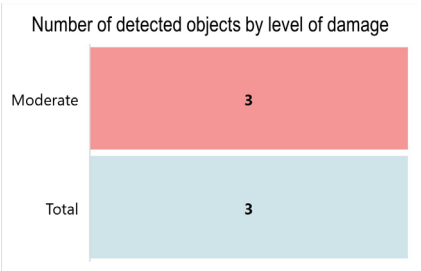
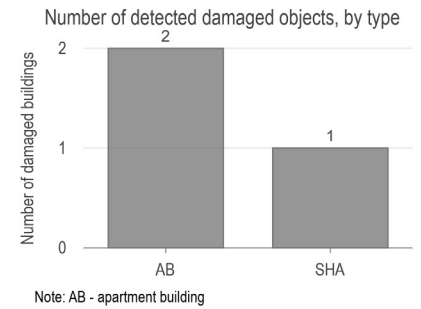








Neighbourhood 15









## ENDNOTES

1 Amnesty International, **“Anyone can die at any time” Indiscriminate attacks by Russian forces in Kharkiv, Ukraine**, 13 June 2022

2 IOM, **“Ukraine Internal Displacement Report”, General Population Survey, Round 13**, June 2023

