

UKRAINE CRISIS

CIVILIAN

INFRASTRUCTURE

DAMAGES DATASET

CODEBOOK

April 2022



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Introduction

This document outlines the structure of the ACAPS Ukraine Civilian Infrastructure Damages Dataset. This dataset tracks damages to civilian infrastructure during the Ukraine conflict since 24 February 2022. It uses publicly available sources from various local, regional, and international organisations, including but not limited to operational and non-operational humanitarian organisations, UN agencies, media, and social media platforms. Data collection and updates on the dataset are continuous.

Civilian infrastructure data collection framework

There is no commonly agreed definition of infrastructure, with some definitions broader than others. The term remains fluid and typically includes aspects of transportation, power, education, healthcare, food security, and communication, among other sectors. It is usually a government responsibility, whether publicly or privately funded, that promotes security, prosperity, and a better society. The word is often associated with physical and tangible systems but also includes operating procedures, management practices, policies, information transmission, and needed knowledge and education (The Atlantic 14/07/2021; NYT 05/04/2021; Carse 2017; Torrisi 25/01/2009). The World Bank has indicated that ‘infrastructure’ is an umbrella term for many activities that aim to “support inclusive and sustainable growth, expand markets, create job opportunities, promote competition, and contribute to a cleaner future”. Access to infrastructure includes access to public utilities (such as power, telecommunications, piped water supplies, sanitation and sewerage, solid waste collection and disposal, and piped gas), public roads and irrigation and drainage systems, and other transport sectors (including railways, seaports and waterways, and airports). It also includes education facilities, digital connectivity, and clean cooking solutions (WB accessed 13/04/2022; WB 06/1994). Another perspective comes from the Modern War Institute, which defines ‘infrastructure’ as people or things not intended for military use. This definition divides it into critical infrastructure, foreign infrastructure, and civil infrastructure. The three divisions intersect and overlap (MWI 09/02/2021).

Although the term ‘infrastructure’ describes various kinds of systems and networks, ACAPS shortlisted 22 types of infrastructure that recur across various conceptualisations and definitions of the term. The following table lists these types, with an open category for ‘others’. ‘Others’ covers any civilian infrastructure that does not fall under any listed type. The list is limited to technical, economic, and institutional civilian infrastructure, excluding anything intended for military usage.

Civilian infrastructure	Definition
Road/highway	Any smoothed or paved surface, such as streets, made for travelling by motor vehicle, carriage, and other modes of transport between two or more points (Word Reference accessed on 21/04/2022).
Bridge	Any structure that provides passage over a river, chasm, road, and other depressions (Designing Buildings 16/02/2022).
Airport	Any facility for the landing, take-off, supply, and repair of civilian aircraft (Cambridge Dictionary accessed on 21/04/2022).
Railway	Any network of tracks with the trains, organisations, and personnel required for its operation (Cambridge Dictionary accessed on 21/04/2022).
Harbour	Any place of water having docks or port facilities to shelter ships, such as piers, jetties, and other similar artificial structures (Cambridge Dictionary accessed on 21/04/2022).
Education facility	Any building owned, leased, or controlled by a public or private school system, college, or university (Education Next accessed on 21/04/2022).
Health facility	Any building that provides healthcare, including hospitals, clinics, public outpatient care centres, and specialised care centres (CDC accessed on 21/04/2022).
Warehouse	Any building where raw materials or manufactured goods and supplies are stored (Cambridge Dictionary accessed on 21/04/2022).
Telecommunications system	Organisations, personnel, procedures, facilities, and networks employed or used to transmit and receive information by electrical or electronic means (Science Direct 2013).
Water supply system	Any system, land and equipment used for water collection (both surface and underground), transmission, treatment, storage, and distribution for to provide potable and sanitary water for human, animal, agricultural on industry or public needs consumption and use (OECD 25/09/2001).
Gas supply system	Any pipeline through which natural gas is transferred from the utility providers' main pipelines for use in plants (Natural Gas accessed on 21/04/2022).
Electricity supply system	Any network of electrical components used to generate, transmit, distribute, and supply electric power (Science Direct 2017).
Nuclear unit	Any thermal power station in which the heat source is a nuclear reactor, whether active or inactive (World Nuclear accessed on 21/04/2022).
Government facility	Any property owned or substantially controlled by the government that is open to the public to provide services (US Treasury 01/10/2005).
Chemical storage unit	Any storage cabinet, drum, vessel, and container typically used to safely store chemical substances within a workplace or laboratory for regular or commercial use (Safeopedia 02/08/2018).

Oil depot	Any place where oil materials (raw or processed), equipment, arms, and other supplies are stored until used (Oil Tanking 12/2015).
Fuel depot	Any place where fuel materials (raw or processed), equipment, arms, and other supplies are stored until used (Oil Tanking 12/2015).
Power plant	Any commercial or public engine or apparatus that provides power for a machine, building, and other similar structures (Energy Education 27/09/2021).
Cultural facility (e.g. museum, theatre)	Any facility operated or used primarily for the performance, exhibition, or benefit of arts and heritage activities, including but not limited to performing arts, visual arts, and other heritage and cultural endeavours (GEMET accessed on 21/04/2021).
Religious facility	Any structure or space where individuals or a group of people, such as a congregation, comes to perform acts of devotion, veneration, worship, or religious study (Al-Azhar 25/07/2019).
Heating and water facility	Any physical plant or system that generates thermal energy from water in the form of steam and a source of fuel for use in heating applications (About Mechanics 09/04/2022).
Aircraft repair plant	Any plant used to restore civilian aircraft or aircraft material to a serviceable condition (NATA accessed on 21/04/2022).
Others	Any facilities or plants intended for civilian usage that facilitate the creation of personal, social, and economic wellbeing not included in these categories.

The extent of civilian infrastructure damage is based on physical status and classified as partially damaged, destroyed, or unknown. **Destruction** occurs when the damage range stands at 100% of the unit cost, with no longer any possibility of being used. **Partially damaged** means the destruction of assets is about less than 50% of the unit cost, with some remaining possibility of usage. **Unknown** is used when there is no available information about the range of destruction given the nature of the crisis, the largely remote nature of the assessment, and other uncertainties. ACAPS records the extent of damage based on what is reported in the source whenever possible.

Sources

Data is mostly sourced from publicly available information, such as reports from humanitarian organisations, international and local media, and social media platforms. There has been a wide dissemination of misinformation and disinformation in this crisis. While the dataset includes damages confirmed by reputable sources, the situation remains extremely fluid, and the presented information may be subject to rapid changes during the conflict.

Sources for publicly available information include governments (e.g. official sites, embassies), UN agencies, news media, and other organisations. The data collection team includes analysts and data

collectors who speak Ukrainian and Russian to minimise linguistic barriers and identify all available information.

Limitations

ACAPS aims to monitor and track daily updates on damages. This dataset presents a broad coverage of reported information to flag damages that may influence access to basic services and inform operational, strategic, and policy decision makers. Considering the diversity and complexity of the crisis, it is important to note that certain types of civilian infrastructure damages may appear to fall outside of this categorisation, and data collectors might not cover every event.

Data collection

A team of ACAPS members trained on data collection methods, civilian infrastructure inclusion criteria, and dataset structure handles data collection. The intended coverage of the dataset includes 12 prioritised oblasts in Ukraine, with a potential expansion to other oblasts and even the whole country.

ACAPS collects data daily. Data collectors extract information from a wide range of reports. They then aggregate the information per damage category and geographical administration level, with level 1 covering oblasts or regions and level 2 covering rayons, when possible. If the source includes information relevant to multiple damage categories and both administrative levels, the source is repeated, and separate lines are created in the dataset. Data on the first and second administrative levels of Ukraine is sourced online from the Database of Global Administrative Areas or GADM (GADM accessed 15/03/2022).

Each line in the dataset includes information relevant to one type of damage category per administrative area (level 2 if available, level 1 otherwise). The event date is tagged unless not included in the source. The source date is always logged.

Data coding

Data is uploaded to the dataset according to the following structure and coding system:

Column	Variable name	Format	Definition	Codes
1	ID	Numeric	Unique code for every entry	None
2	ADM1	Text	Ukraine administrative level 1	The largest subnational administrative region where the event took place (see Annex 1)

3	Crisis ID	Text	Unique code for every crisis	The crisis in Ukraine is Conflict and has the following crisis ID: UKR002.
4	ISO	Text		ISO3 code
5	ADM2	Text	Ukraine administrative level 2	The second-largest subnational administrative region where the event took place (see Annex 1)
6	P Code	Text	Place code used uniformly across the UN identifying the administrative levels of countries	None
7	Type of infrastructure	Text	The type of civilian infrastructure damaged	See the list of infrastructure types on pages 1–2
8	If other, what	Text	Description of the type of infrastructure damaged if falling under 'Others' in the framework on page 1	None
9	Description	Text	Short narrative description of the event	None
10	Date of event	Date (dd/mm/yyyy)	Date of the event	None
11	Source name	Text	Name of the source	None
12	Source date	Date (dd/mm/yyyy)	Publication date of the source	None
13	Source link	Text	URL of the source's webpage	None
14	Additional source	Text	Other publications and alternative sources that support the narrative	None
15	Extent of damage	Text	The extent of reported damage during and after a crisis event	Destroyed, partially damaged, unknown (see page 2)
16	Impact on	Text	The humanitarian sector that the damage may have affected	Economy, food, health, logistics, protection, shelter, supplies, transportation, WASH, education, access

Annex

Ukraine administrative level 1 list: oblasts, cities with special status (Kyiv and Sevastopol), and one autonomous republic (Crimea)

Cherkasy	Luhansk
Chernihiv	Mykolaiv
Chernivetsi	Odessa
Crimea	Poltava
Dnipropetrovsk	Rivne
Donetsk	Sevastopol
Ivano-Frankivsk	Sumy
Kharkiv	Ternopil
Kherson	Vinnytsia
Khmelnyskyi	Volyn
Kyiv	Zakarpattia
Kyiv city	Zaporizhia
Kirovohrad	Zhytomyr
Lviv	