

Coding Methodology for Infrastructure Type in the TIME Dataset

The Targeting of Infrastructure in the Middle East project focuses on tracking and analyzing the targeting of civilian and environmental infrastructure by parties to selected conflicts in the Middle East and North Africa (MENA).

This document addresses the specific infrastructure included in the Targeting of Infrastructure in the Middle East (TIME) project. In addition, this document covers how the project assesses and codes for degree of infrastructure functionality, repair time, and the geolocation of infrastructure targeted.

What infrastructure is included in the TIME database?

Infrastructure tracked in the TIME database is divided into six broad categories:

- **Energy:** infrastructure related to energy exploration, production, and distribution
- **Water:** infrastructure related to drinking water, purification, irrigation, wastewater treatment, and sanitation
- **Transportation/Marketing:** infrastructure related to the transportation marketing, and exchange of commodities
- **Energy/Water:** infrastructure related to both producing energy and water (e.g. a dam where hydropower and irrigation functions cannot be separated)
- **Health:** infrastructure related to public health, including but not limited to hospitals, clinics, ambulances
- **Agriculture/Fishing:** infrastructure related to crop cultivation and harvesting, and infrastructure related to fisheries

How is infrastructure coded and integrated into the TIME database?

For each incident recorded in the database, the infrastructure targeted is integrated into the database in three tiers. Each subsequent tier increases in specificity.

The database first codes for Infrastructure Type. Infrastructure Type refers to the six broad categories of civilian and environmental infrastructure discussed above. Based on the event description, researchers categorize and code the infrastructure as energy, water, “transportation”, energy/water, health, or agriculture/fishing.

Increasing in specificity, researchers then code the infrastructure under Infrastructure. Based on the event description, researchers use common coding terms for each subset of infrastructure. The most used terms under each infrastructure type are:

Energy Infrastructure:

- Electricity lines
- Gas station
- Oil pipeline
- Oil refinery
- Oil tanks

- Oil field
- Power plant
- Power station

Water Infrastructure:

- Water well
- Water tank
- Water pump
- Water station
- Water pipeline
- Water desalination plant
- Wastewater treatment plant

Transportation/Marketing Infrastructure:

- Boat
- Road
- Highway
- Railway
- Bridge
- Airport
- Market

Health Infrastructure:

- Hospital
- Ambulance
- Clinic

Energy/Water Infrastructure:

- Dam

Agriculture/Fishing Infrastructure:

- Port
- Farm
- Fishing boat
- Livestock
- Plant nursery
- Agricultural crops

Lastly, researchers code for Specific Infrastructure which refers to the specific infrastructure destroyed. The coding under the Specific Infrastructure column includes detailed descriptions of affected infrastructure and amount of infrastructure destroyed where known.

How do we geolocate infrastructure?

The geolocation of the infrastructure is recorded in the database under the Location, Lat, and Long columns. Researchers code the geolocation of the infrastructure based on information provided in the event description.

The Location column is coded using the name of the administrative division recorded in the event description. Depending on the detail of the event description, the names coded by researchers may correspond to the region, province, state, or city where the incident occurred. Although the spelling of the administrative division where the incident took place may vary among sources, names of regions, provinces, states, and cities are coded with a uniform spelling to the greatest extent possible.

The Lat and Long columns report the coordinates of the incident in decimal degree. Depending on the detail provided in the event description, the coordinates may be coded for the specific infrastructure location or if the specific location is unknown, the coordinates of the city where the incident took place are coded. In some sources, coordinates are provided in the event description, but in most sources, only the names of administrative division are reported, and researchers must find and assign corresponding coordinates.

What is the degree of functionality after attack (“Operationality”)?

The TIME database also tracks the severity of the destruction resulting from an attack, which the database refers to as “operationality”. Not all attacks on infrastructure result in complete destruction: some attacks result in only partial destruction or material damage, allowing infrastructure to remain operational despite the damage. Therefore, the database captures these variations in impact by coding for whether the infrastructure attacked was able to continue normal operations.

How does the TIME database treat operationality?

Operationality is coded under the Operationality column in the TIME database. Based on the incident description, a level of operationality for the infrastructure is assigned and coded where known. Operationality is divided into three categories:

- **Operational:** the infrastructure is still functional
- **Partial:** Some functionality was lost, but not all
- **Non-Operational:** the infrastructure is no longer functional

Based on the operationality, researchers code the infrastructure as “operational”, “partial”, or “non-operational”.

What is repair time after attack?

The TIME database also allows for including the estimated time for the infrastructure to be repaired where known.

How is repair time coded in the TIME database?

Repair time for infrastructure following the attack is integrated into the TIME Database in the Repair Time (Expected/Actual) column. In addition to the repair time (short term or long term), the coding also refers to whether the incident description explicitly refers to the repair time (“actual”) or whether the research inferred the repair time based on the information provided (“expected”). Therefore, this column divides repair time into four categories based on the length of the repair time and whether the information was explicit or inferred. The four categories of repair time are:

- **Short Term-E:** reasonable to assume the infrastructure can be repaired within one month
- **Short Term-A:** reported repair time is less than one month
- **Long Term-E:** reasonable to assume the infrastructure repair time is more than one month
- **Long Term-A:** reported repair time is more than one month

Based on the incident description or their judgement, researchers code repair time as “Short Term-E”, “Short Term-A”, “Long Term-E”, and “Long Term-A”.

What if information on operationality and repair time is not available?

Given the differences among sources in the level of detail and information included in their incident descriptions, most incidents do not provide information on operationality or repair time. For incidents where one or more of these categories or information were missing, researchers code “unknown” in the relevant columns. Most sources do not provide adequate levels of information for these categories; thus, they are usually coded as ‘unknown.’