

# FlowKit

## Unlocking the potential of mobile data for humanitarian and development purposes

Understanding the mobility and characteristics of populations are critical to inform humanitarian and development programmes.

Mobile phone data can provide **vital information to improve decision making** in humanitarian operations and in support of development programmes. The insights derived from this data can allow practitioners to understand where affected populations are located, as well as how they are moving. Traditional field-based methods to collect this data are expensive and prone to bias, especially in rapidly changing circumstances, such as sudden onset disasters. However, despite the fact that many projects across the globe have explored the use of mobile data derived insights, they are in routine use only in a handful of countries.

## About FlowKit

**FlowKit** is an open-source suite of software tools designed and developed by Flowminder to address several limiting factors in the use of mobile operator data for humanitarian and development purposes. **FlowKit enables clear, secure and compliant access by analysts to de-identified mobile data** behind MNOs' firewalls, thereby facilitating stronger partnerships between MNOs and approved third parties. FlowKit provides humanitarian and development practitioners with analytical tools developed specifically for their needs.

As an **open source**, community-focused software project, all FlowKit documentation and code are openly accessible and available. FlowKit will continue to evolve as techniques and learnings derived from research and the wider community are incorporated back into the core tools.

## Results & outputs

FlowKit is a **mobile data analysis toolkit that enables the secure analysis** of de-identified subscribers' mobility patterns and network usage. Examples of **analytical features** include:



**Identification of meaningful locations**, useful for dynamic population mapping and post-disaster displacement monitoring.



**Production of origin-destination matrices**, to estimate commuter flows or identify unusual patterns of mobility post-disaster.



**Estimation of a range of subscriber features**, (such as nocturnal calls, network size etc.) as input to estimate the distribution of poverty and other vulnerability indicators.



**Extraction of network activity by location** to monitor post-disaster network recovery.



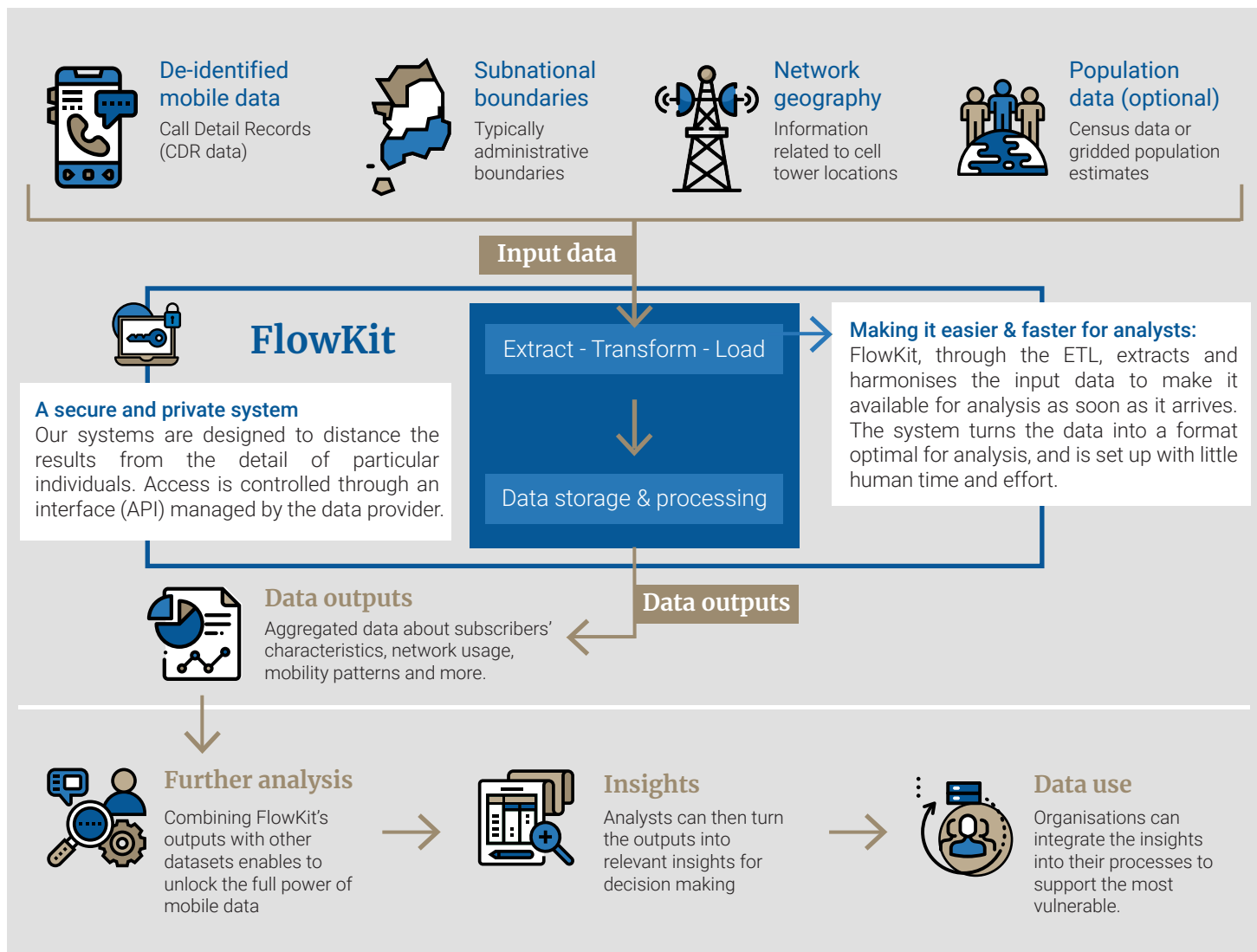
## Sensitive data in trusted hands

To protect subscribers' personal data and preserve commercial confidentiality, secure and compliant access to mobile data must be guaranteed. This is why FlowKit runs behind the MNO's firewall, facilitating compliance with data privacy regulations and GSMA guidelines.

FlowKit utilises locational information from mobile phone data and does not use (and never has access to) the content of calls or text messages. FlowKit is set up to ensure that the MNO can control data access. By providing a trusted, secure method for data access, FlowKit simplifies the challenge of facilitating compliant access to this sensitive data.

Access is controlled through an API (Application Programming Interface), which provides a restricted, audited and secure access to the algorithms and methods built within FlowKit. Data analysts can then interact with the aggregated data to carry out their analyses.

# How FlowKit works



FlowKit's primary data input is **de-identified Call Detail Records (CDR data)**. CDR contains information about the origin, destination and duration of a call, as well as the ID of the mobile phone tower routing the call. FlowKit harmonises and extracts CDR from the source to make it available for analysis as soon as it arrives. Data engineers can also define and automatically run quality checks on data at this stage. CDR is then loaded into a database where it is combined with other data types, including **boundaries and network geographies** (e.g. administrative areas). At this point, users can interact with FlowKit's suite of analytical features according to their needs.

**FlowKit's outputs** are aggregated data (group level statistics) which no longer contain individual level information and can be taken out of the MNO environment. Analysts can then incorporate population and survey data to produce insights that are more representative of the population of interest.

## Applications



**Disaster preparedness**



**Official statistics**



**Infrastructure development**



**Health**



**Finance**