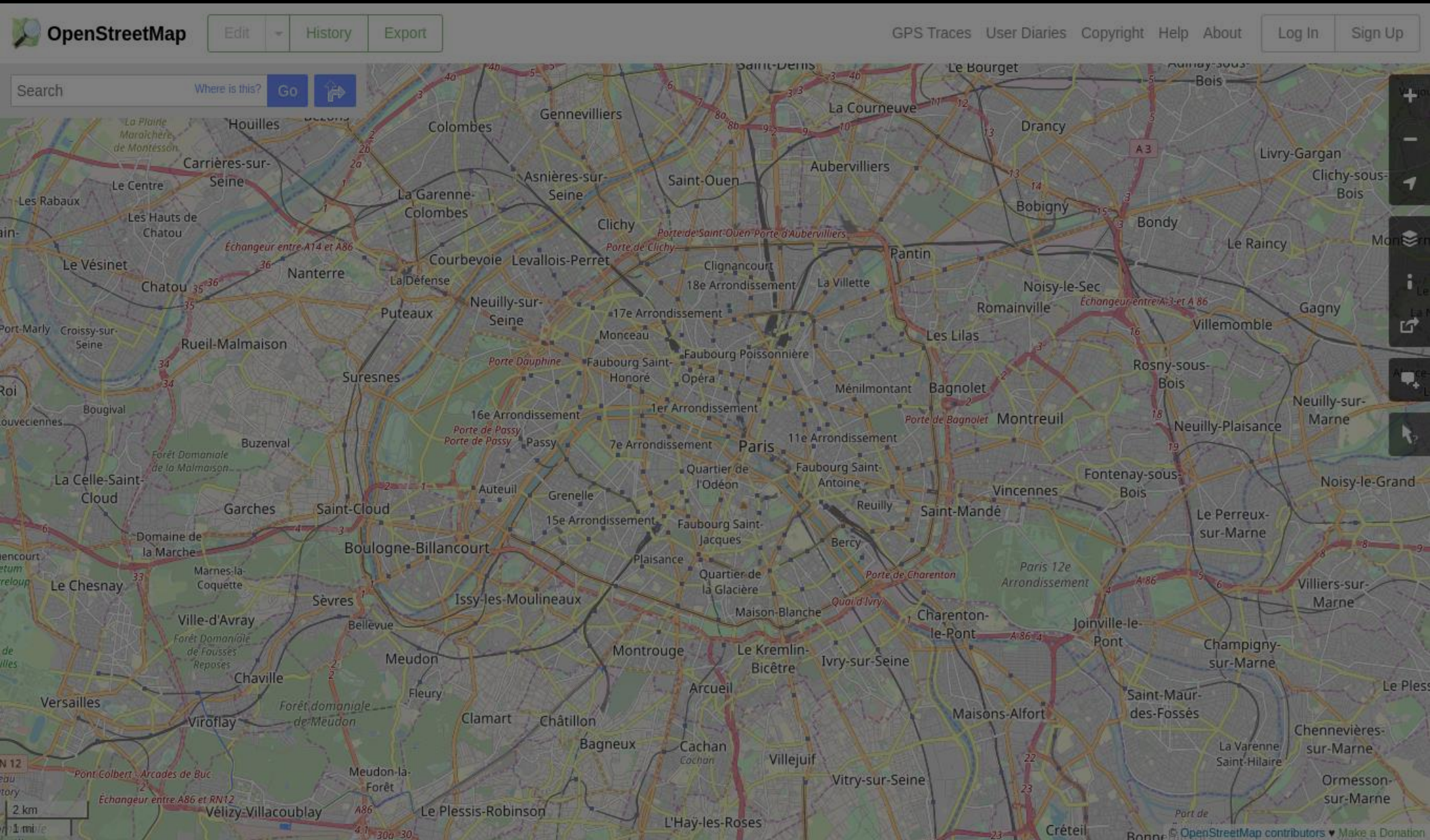




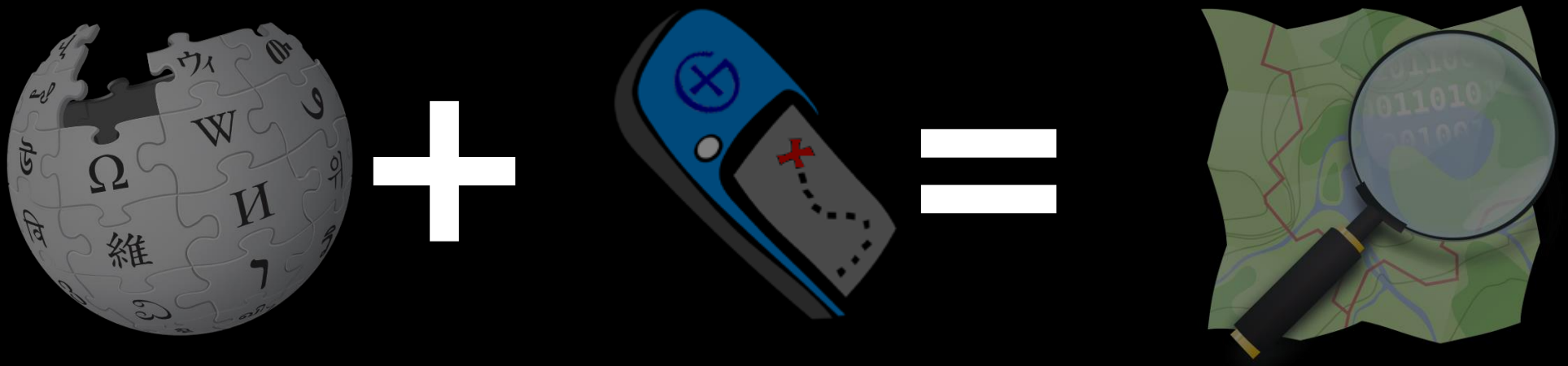
Participatory Public Transport Mapping with OpenStreetMap and GTFS

Digital Transport 4 Africa, Paris
14.11.2018

Felix Delattre
<http://felix.delattre.de>



OpenStreetMap.org



Depot for open geospatial data



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Cartography

From Wikipedia, the free encyclopedia

Not to be confused with [Cartogram](#).
"Cartographer" redirects here. For other uses, see [Cartographer \(disambiguation\)](#).

Cartography (/kɑːrˈtɒɡrəfi/; from Greek χάρτης *chartēs*, "papyrus, sheet of paper, map"; and γράφειν *graphein*, "write") is the study and practice of making **maps**. Combining **science**, **aesthetics**, and technique, cartography builds on the premise that reality can be modeled in ways that communicate spatial information effectively.

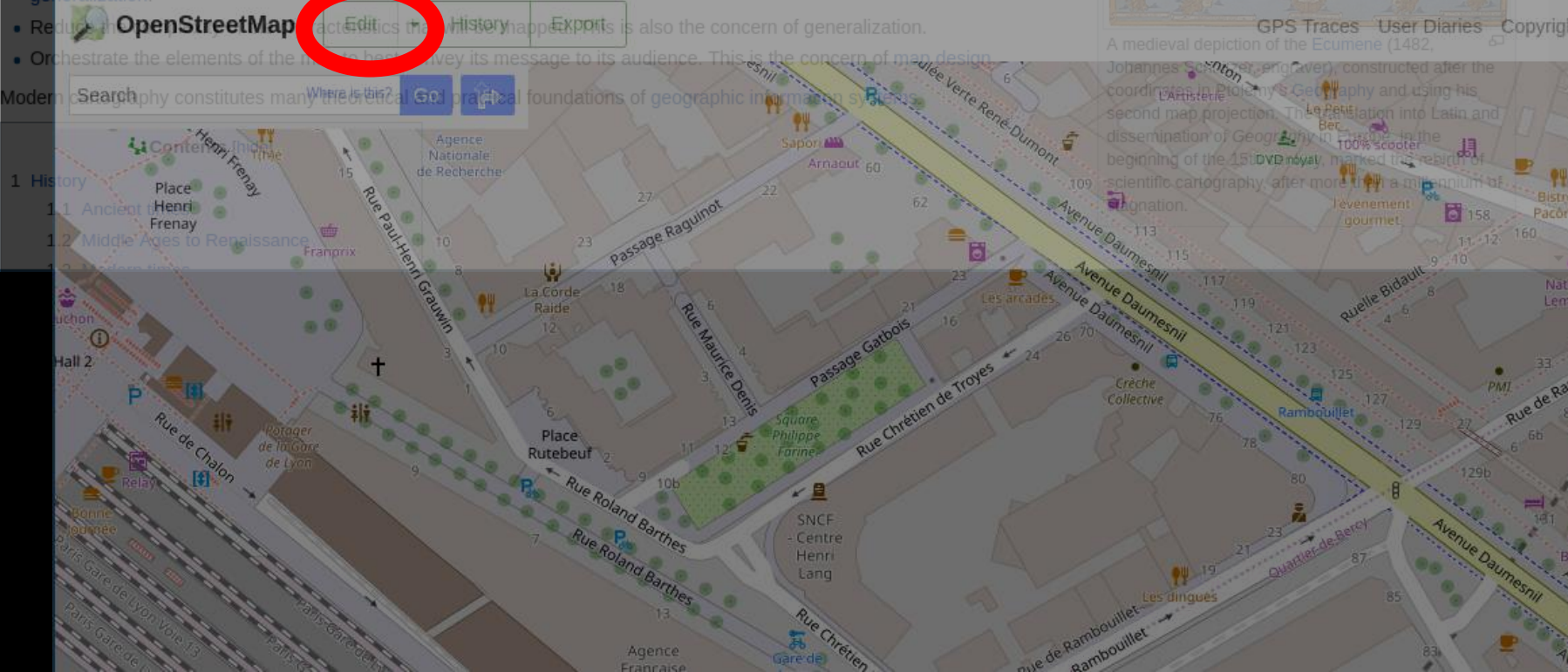
The fundamental problems of traditional cartography are to:

- Set the map's agenda and select traits of the object to be mapped. This is the concern of map editing. Traits may be physical, such as roads or land masses, or may be abstract, such as **toponyms** or political boundaries.
- Represent the terrain of the mapped object on flat media. This is the concern of **map projections**.
- Eliminate characteristics of the mapped object that are not relevant to the map's purpose. This is the concern of **generalization**.
- Reduce the data to a suitable symbolic representation in an appropriate form. This is the concern of **map design**.
- Orchestrate the elements of the map to best convey its message to its audience. This is the concern of **map design**.

Modern cartography constitutes many theoretical and practical foundations of geographic information systems.



A medieval depiction of the Ecumene (1482, Johannes Schönerer engraving), constructed after the coordinates in Ptolemy's Geography and using his second map projection. The revelation into Latin and dissemination of Geography in Europe in the beginning of the 15th century marked the rebirth of scientific cartography, after more than a millennium of stagnation.





OpenStreetMap

Edit



History

Export

[GPS Traces](#) [User Diaries](#) [Copyright](#)

Edit feature



Building

▼ All fields

Name

Common name (if any)

Building

yes

Levels

2, 4, 6...

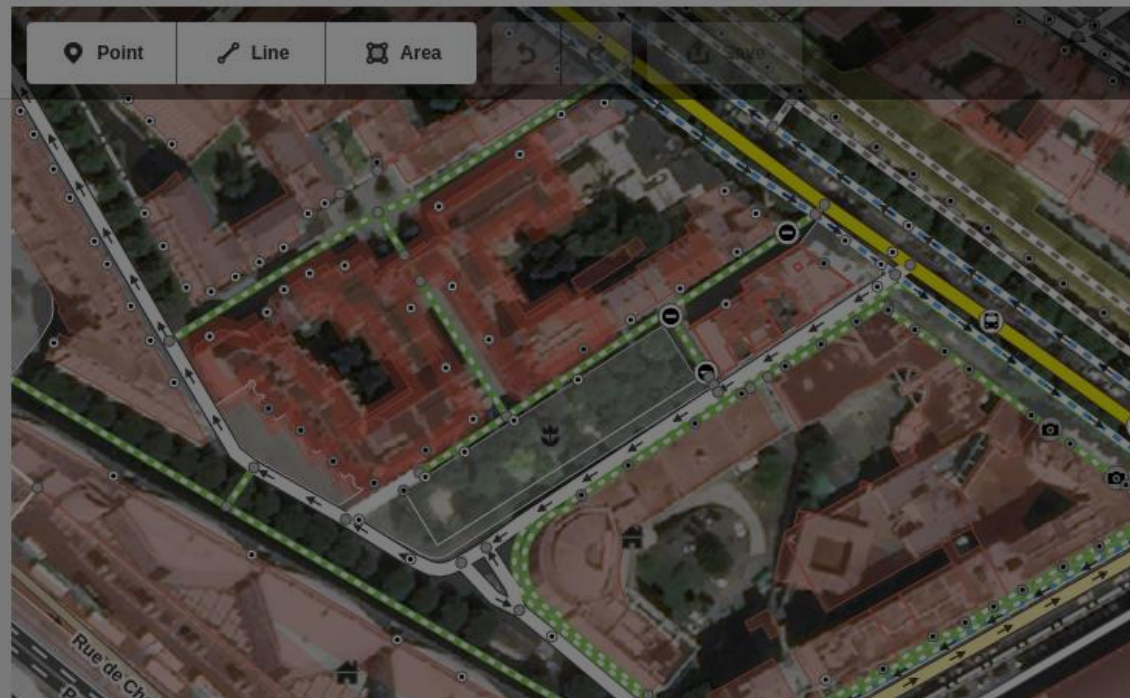
Height (Meters)

Point

Line

Area

Save







Planet OSM

The files found here are regularly-updated, complete copies of the OpenStreetMap.org database, and those published before the 12 September 2012 are distributed under a Creative Commons Attribution-ShareAlike 2.0 license, those published after are Open Data Commons Open Database License 1.0 licensed. For more information,

[see the project wiki.](#)

Complete OSM Data

[Latest Weekly Planet XML File](#)

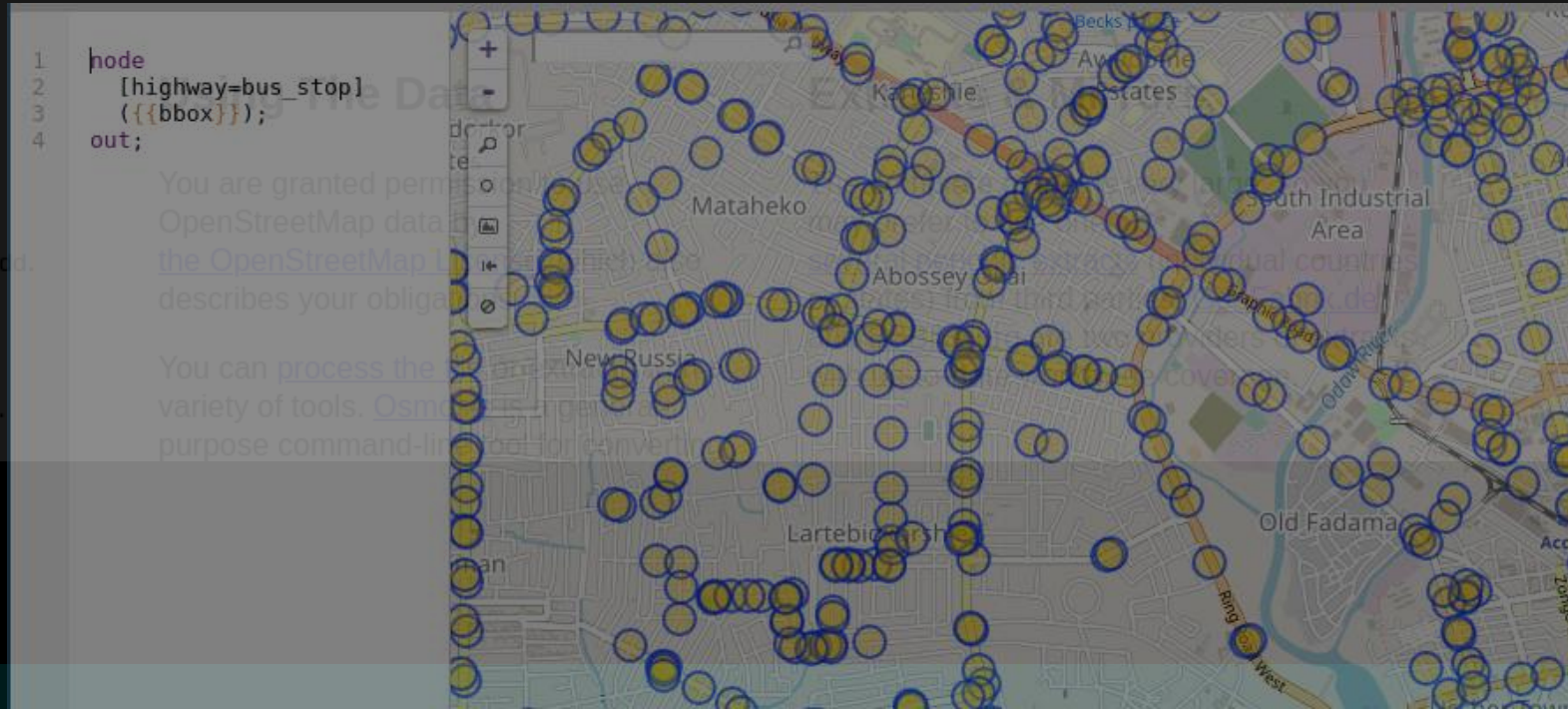
71 GB, created 5 days ago.

md5: 0bd33480156d4090e258694d5885ecdd.

[Latest Weekly Changesets](#)

2.4 GB, created 5 days ago.

md5: 91f43712acb3f7f2e481ac2d07f22ab7.



71 GB of data
1 million contributors
4.8 billion nodes

Open Data

**NGOs
(non-profit)**

**LOCAL
COMMUNITIE
S**

**ACADEMI
A**



**GOVERNMENT
S**

**GLOBAL
COMMUNITY**

**COMPANIE
S
(for-profit)**

**NGOs
(non-profit)**



Humanitarian
OpenStreetMap
Team

**LOCAL
COMMUNITIE
S**



OpenStreetMap
Community
Nicaragua

**ACADEMI
A**



OpenStreetMap
Foundation

**GLOBAL
COMMUNITY**

ON/OFF

Consulting and
development for
International
cooperation

**COMPANIE
S
(for-profit)**

**GOVERNMENT
S**



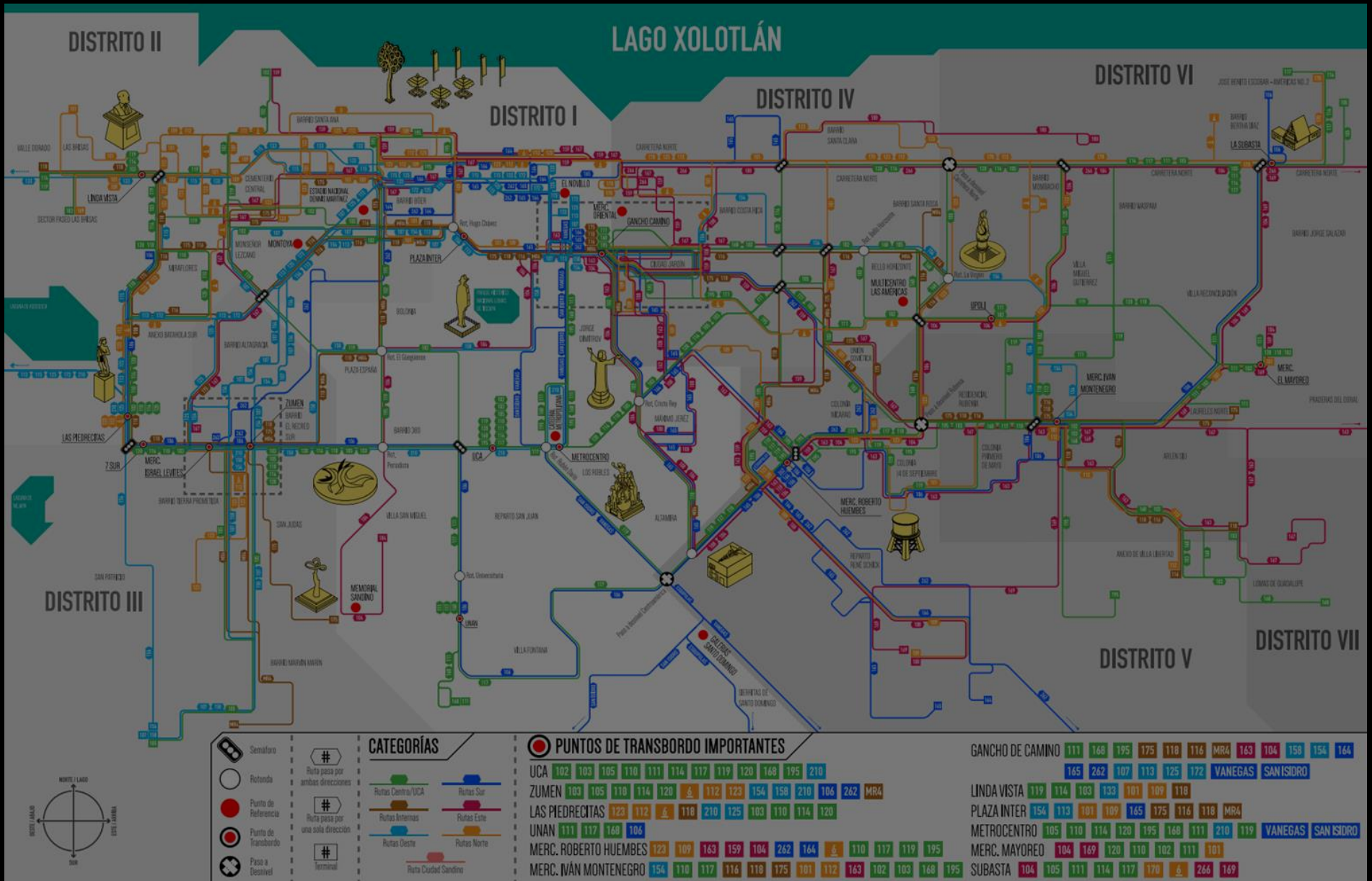


Managua, Nicaragua

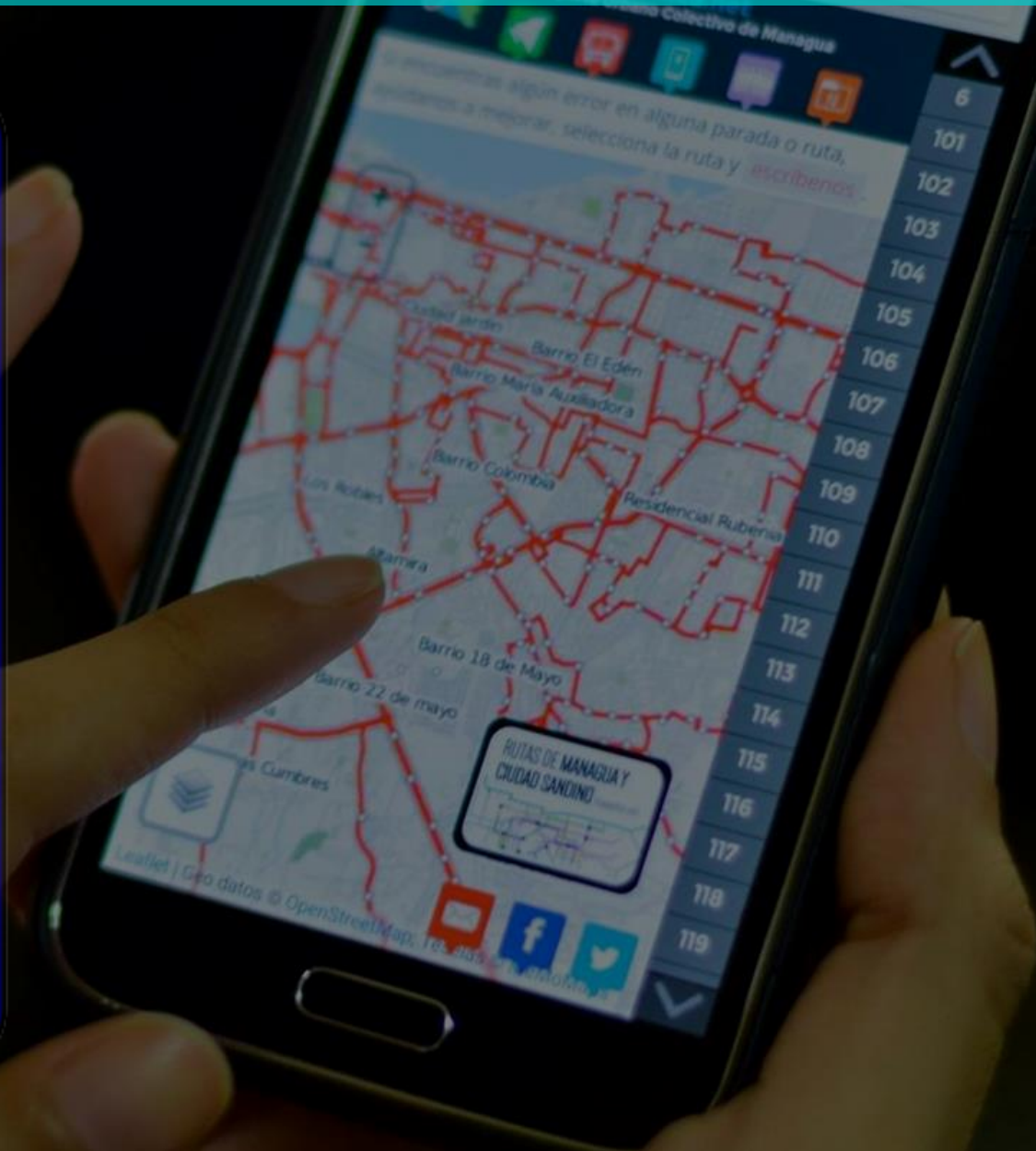
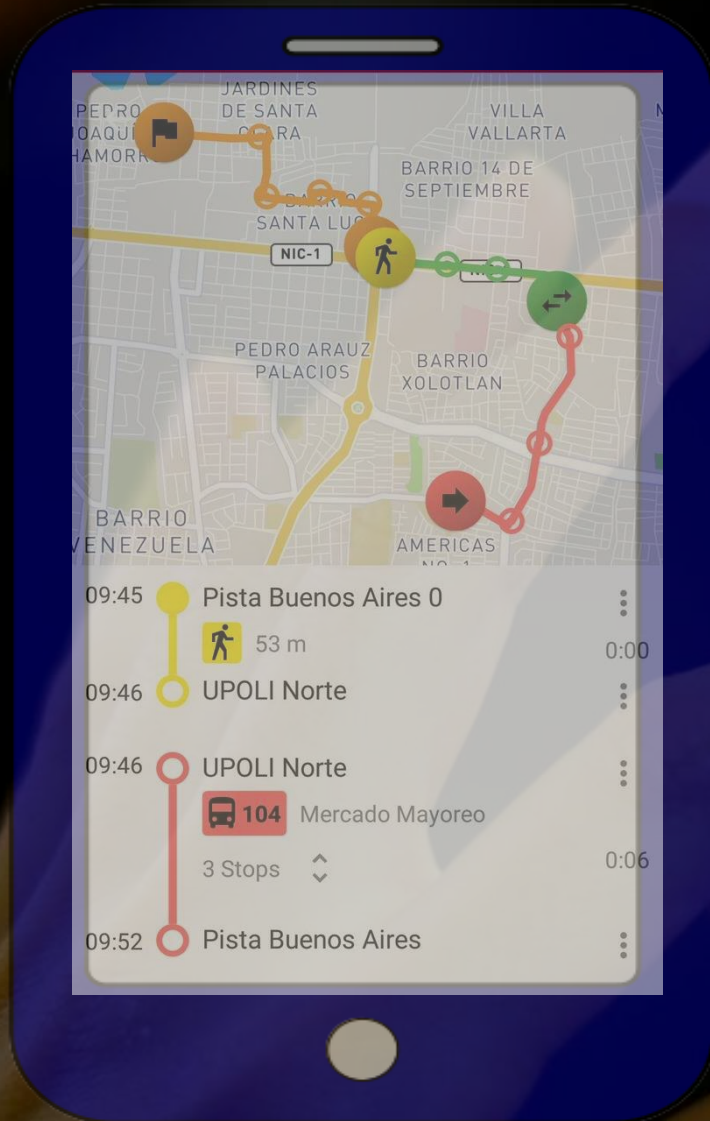




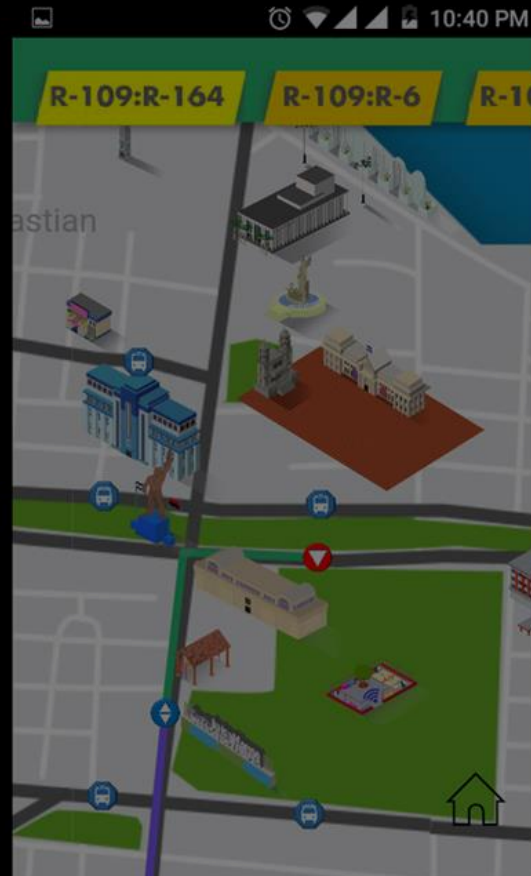
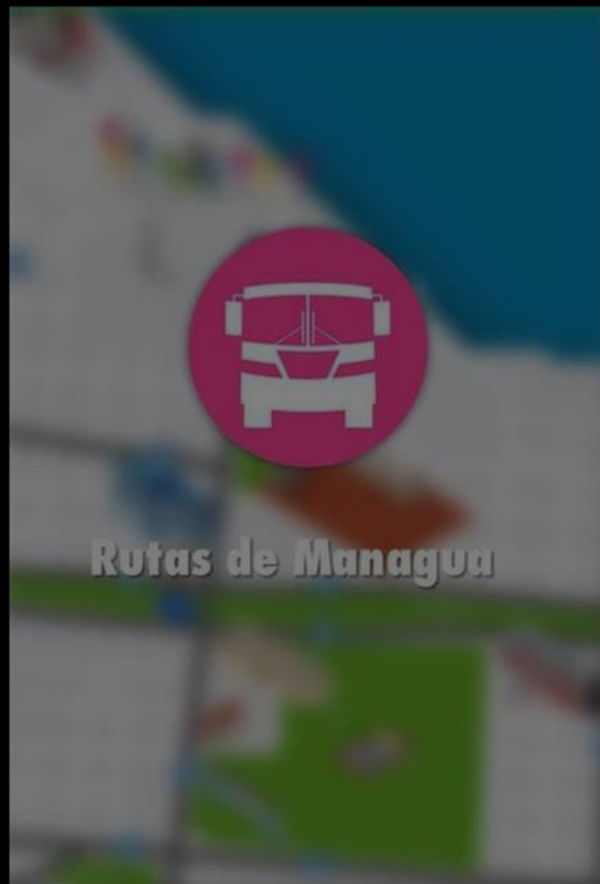
Schematic paper map



Open Source mobile applications



Picked up by the government





Approach

United Nation's Sustainable Development Goal (SDG) 11:

Sustainable Cities and Communities

United Nation's Sustainable Development Goal (SDG) 17:

Strengthen means of implementation and revitalize global partnerships for sustainable development

- *Implementation as an integrated, holistic, multi-stakeholder approach: A need for systems thinking in practice*

Communities of practice

The Role of Systems Thinking in the Practice of Implementing Sustainable

Development Goals by M. Reynolds, C. Blackmore, R. Ison, R. Shah, and E. Wedlock

Springer International. Handbook of Sustainability Science and Research, World Sustainability Series

Achieving Sustainable Development Goals (SDGs) Through Transformative Governance

Practices and Vertical Alignment at the National and Subnational Levels in Africa by K.

Urama, N. Ozor and E. Acheampong (2014)

African Technology Policy Studies Network (ATPS). Regional Practice Paper 2014

Student organizations and Communities of Practice: Actions for the 2030 Agenda for

Sustainable Development by J. Garaldi Borges, L. Oranges Cezarino, T. Capellaro Ferreira,

O. Travençolo Muniz Sala, D. Lehr Unglaub, A. C. Ferreira (2017)

Elsevier. The international journal of management education, ISSN 1472-8117, Vol. 15, N°. 2, 2017

Communities of Practice: Using systems thinking to co-create a better world by Scott

Francisco (2016)

Pilot Projects Design Collective LLC

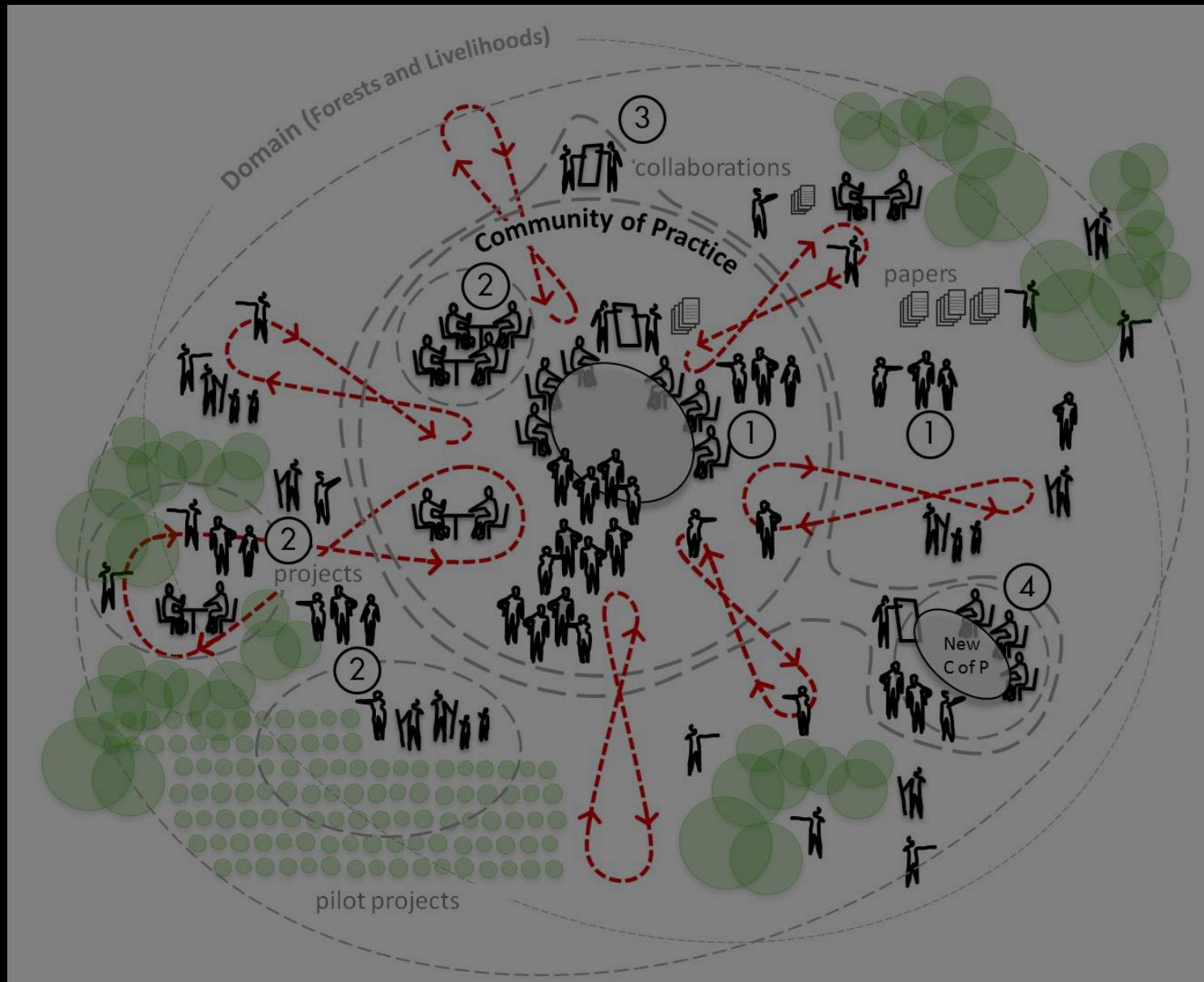
Communities of practice

Communities of practice are groups of **people who share a passion for something they do** and who **interact regularly to learn how to do it better.**

Wenger, E., McDermott, R., Snyder, W. (1992).

Cultivating communities of practice: a guide to managing knowledge

Communities of practice



Communities of practice

Characteristics

- Peer-to-peer collaborative networks.
- Driven by the willing participation of their members.
- Focused on learning and building capacity.
- Engaged in sharing knowledge, developing expertise, and
- solving problems.

*Serrat, O, (2008). Asian Development Bank.
Building Communities of Practice*

Principles for Digital Development



Design With the User



Understand the Existing
Ecosystem



Design for Scale



Build for Sustainability



Be Data Driven



Use Open Standards,
Open Data, Open Source,
and Open Innovation



Reuse and Improve



Address Privacy &
Security



Be Collaborative

digitalprinciples.org

Communities of practice

Participation

Communication

Responsibility

OpenStreetMap

Is not the perfect technical tool for public transportation, yet,

...

... it is a tool that – by itself - leverages communities of practice.

Digital Transport 4 Africa

Shared vision around the principles of mapping *artesanal* transport in the world:

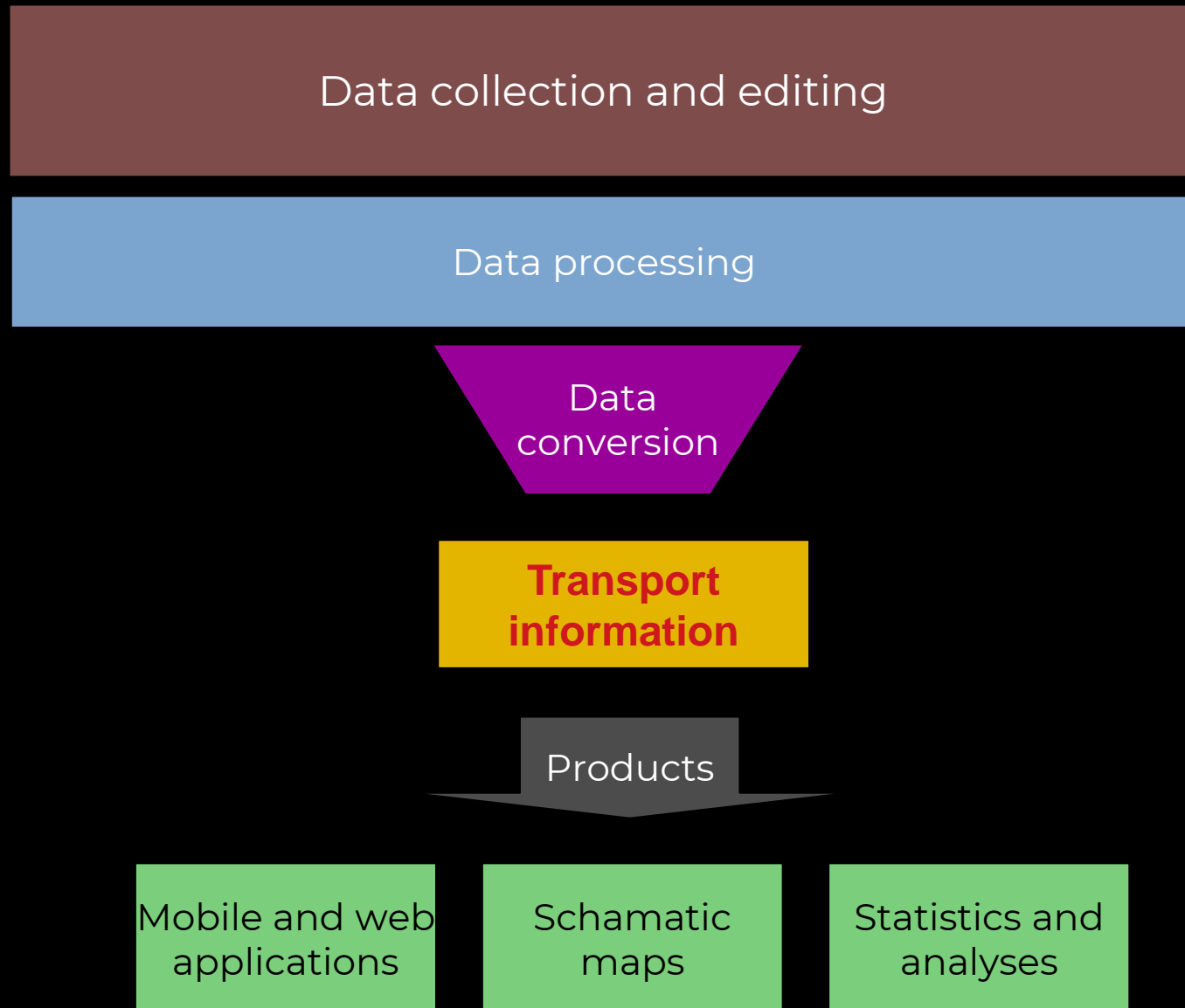
- rely and develop **open tools** and **data**
- build unite efforts through **collaboration**
- focus on sustainability and **resilience**

Digital Transport mapping

General schema of technical tasks when mapping public transport:

- data **collection**
- data **editing**, processing and conversion
- quality assurance, **maintaining**/updating data
- **use** of data (visualization, analysis, products, like applications)

Usual data to information workflow



GTFS *directly*

Expert group data collection and editing

Local tools and local data

GTFS

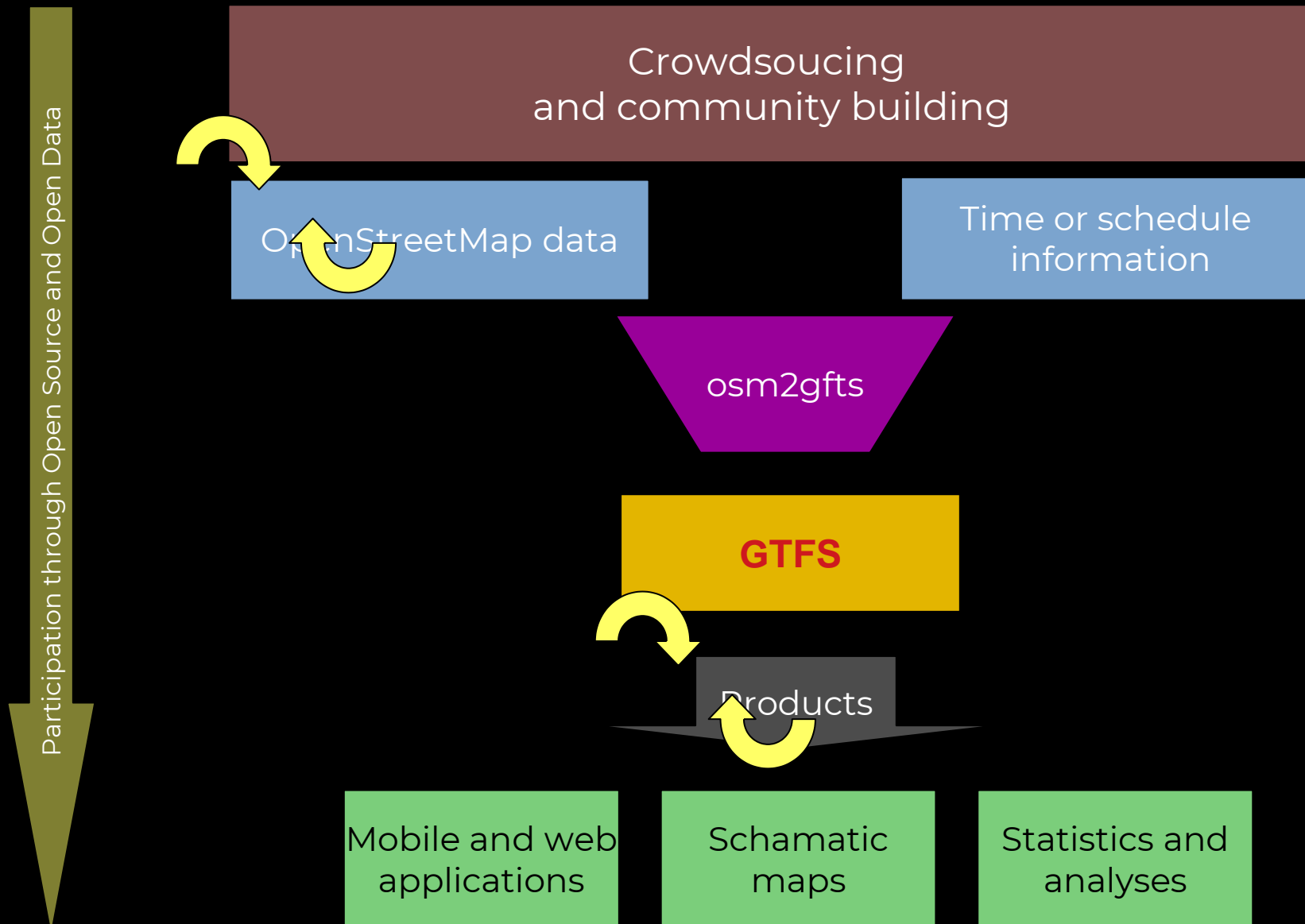
Products

Mobile and web
applications

Schamatic
maps

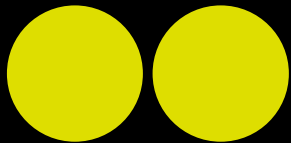
Statistics and
analyses

OpenStreetMap to GTFS

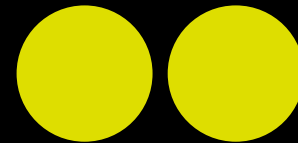


Comparison: Data collection

**OpenStreetMap to
GTFS**

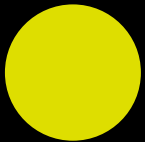


**GTFS
directly**

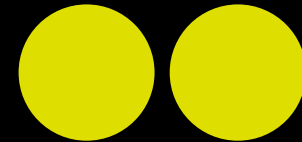


Comparison: Data editing and processing

**OpenStreetMap to
GTFS**

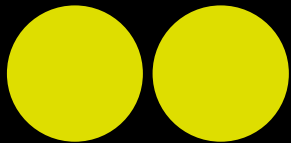


**GTFS
directly**

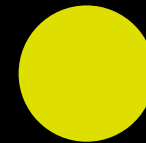


Comparison: Data maintenance/updating

**OpenStreetMap to
GTFS**

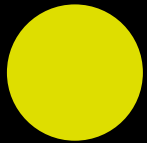


**GTFS
directly**

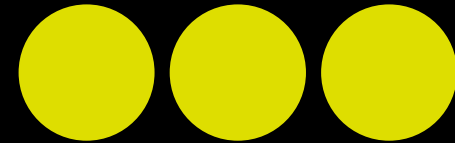


Comparison: Data use and products

**OpenStreetMap to
GTFS**



**GTFS
directly**

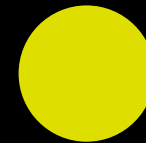


Comparison: Openness

**OpenStreetMap to
GTFS**

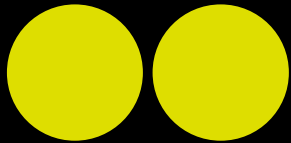


**GTFS
directly**



Comparison: Resilience

**OpenStreetMap to
GTFS**

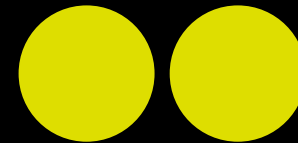


**GTFS
directly**

Comparison: Conversion

**OpenStreetMap to
GTFS**

**GTFS
directly**



Result

GTFS *directly*

Advantages

- easiest and quickest approach
- transport data in one format and location

Challenges

- Opening data must be done proactively (often not done)
- Efforts can be lost (not very resilient)
- Participatory process and its infrastructure must be actively designed and implemented (in itself an opposite of a community of practice)

OpenStreetMap to GTFS

Advantages

- Open by default (resilient)
- Existing ecosystem of software and infrastructure
- Leverages communities of practice by itself

Challenges

- Not all steps in the workflow optimized for public transport mapping
- Time/schedule information needs to be handled separately
- Currently IT skills required

Teaching somebody how to use your privately held software is like giving her fish. Teaching her how to understand and improve upon software is teaching her how to fish.

Calhoun N. (2016) in UNICEF Stories of Innovation: “Why and How the International Development Community is Going Open.”

Vision

Jointly develop OpenStreetMap to become the perfect tool and open data depot for collaborative public transport mapping

Talk to me:

www.felix.delattre.de

felix@delattre.de

Share as much as you can!

The presentation:

<https://f.delattre.de/digitaltransport4africa-osm-gtfs.pdf>

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<http://www.felix.delattre.de>

