POTENTIAL OF CENTRALIZING AND OPENING DATA ON TRANSPORTATION

STRATEGY FOR A RESOURCES CENTER
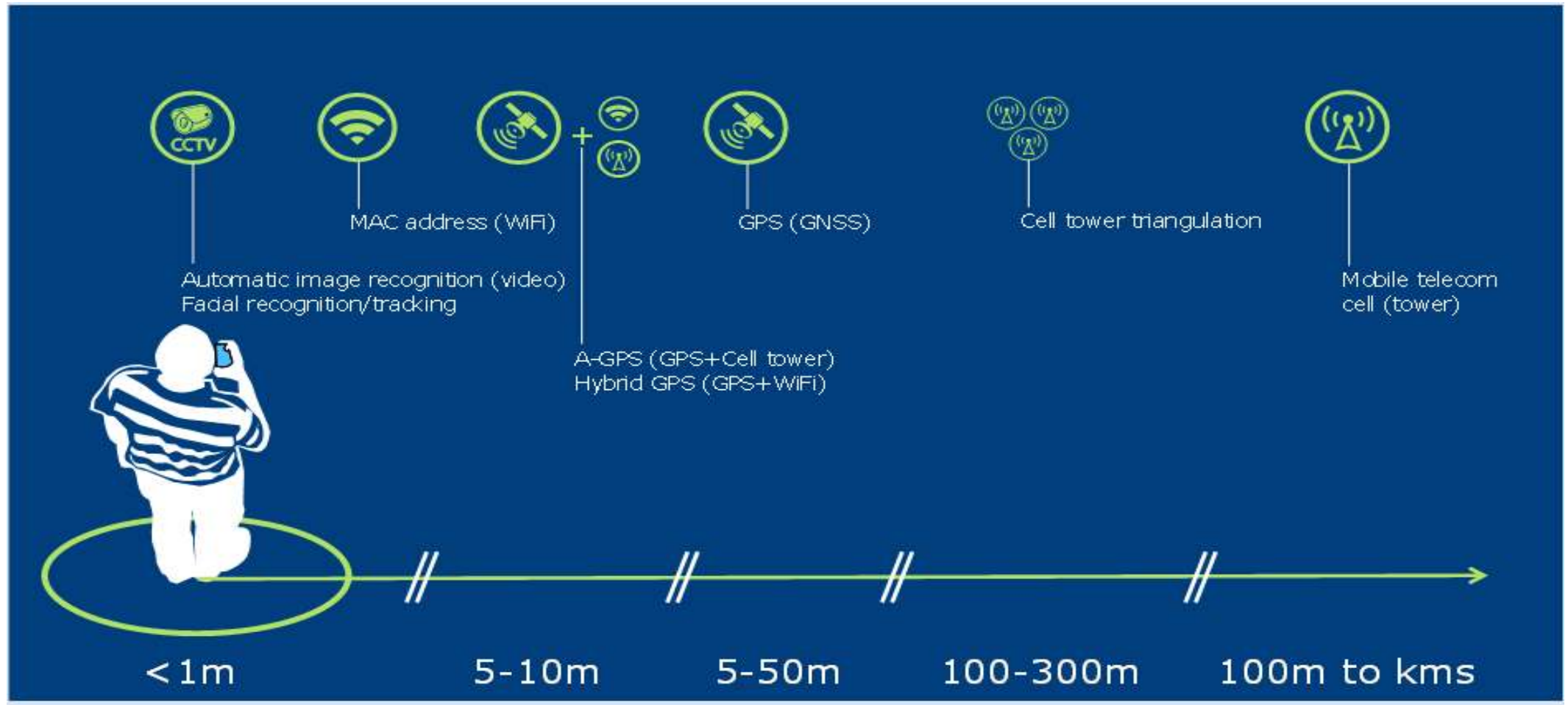
Céline Jacquin, WRI

Diego Canales Salas, WRI

WORLD
RESOURCES
INSTITUTE

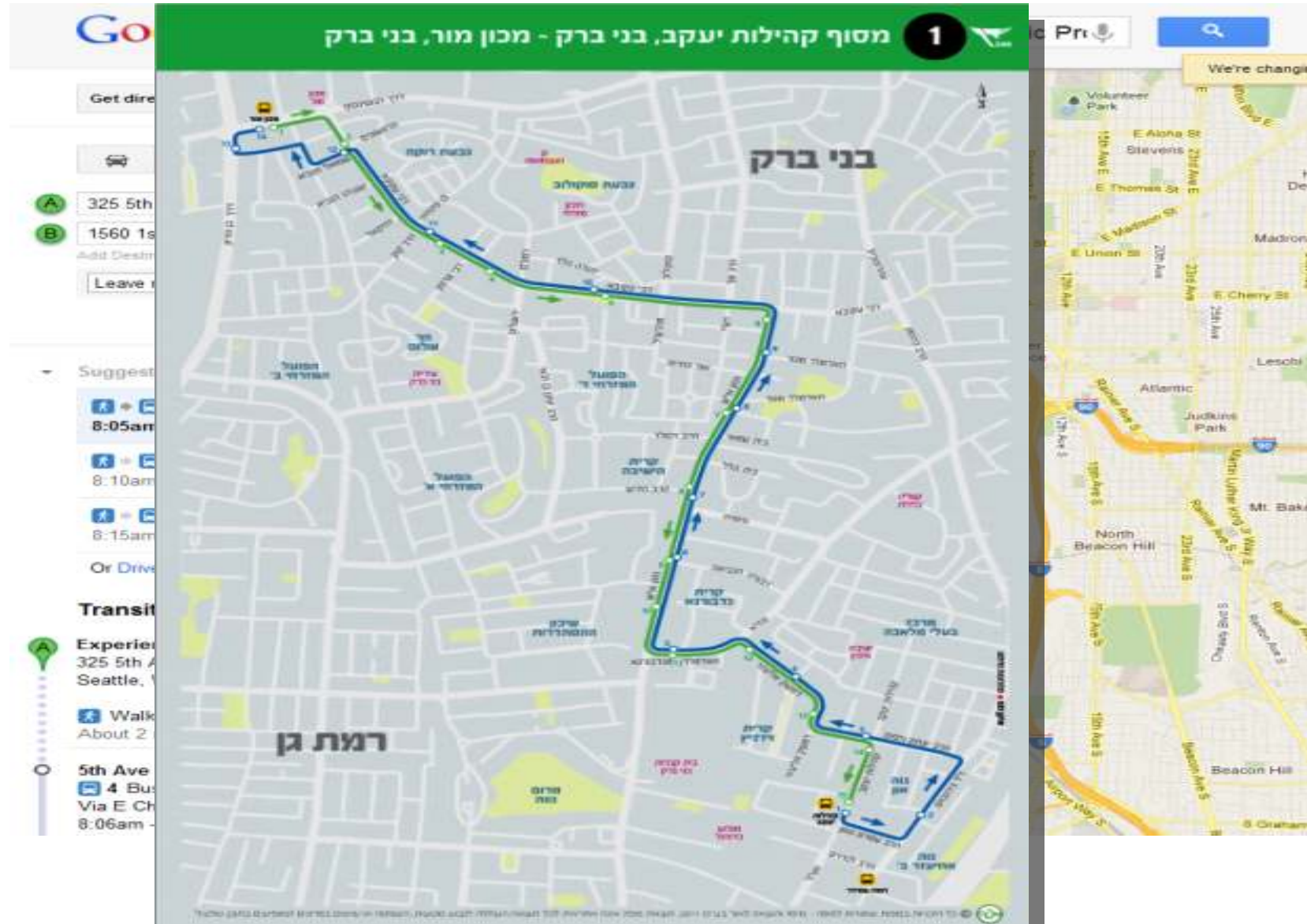STATE OF
THE MAP
Milan, Italy 2018

Explosion of Demand-driven data

An explosion of mobile sensor-generated data has been the real disruptor in mobility, opening the door to new services not possible before

Needs of information for transport travelers

Needs of information for transport planners
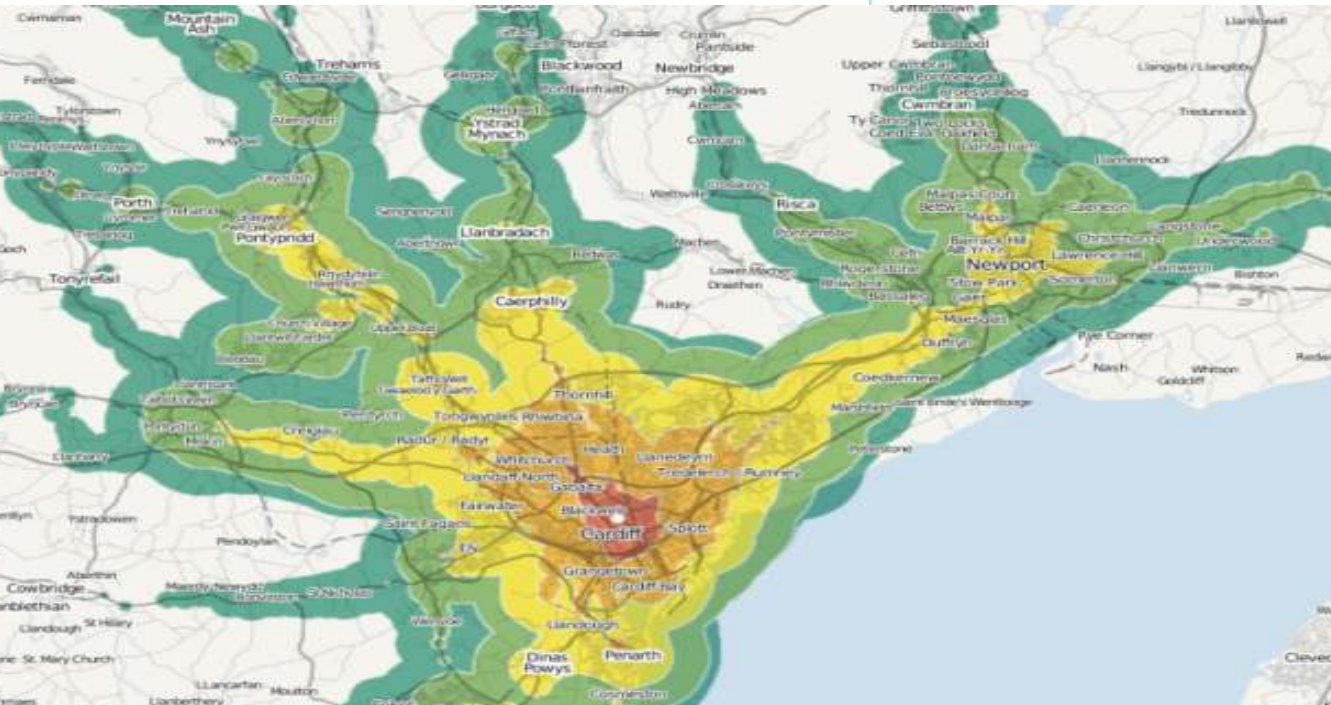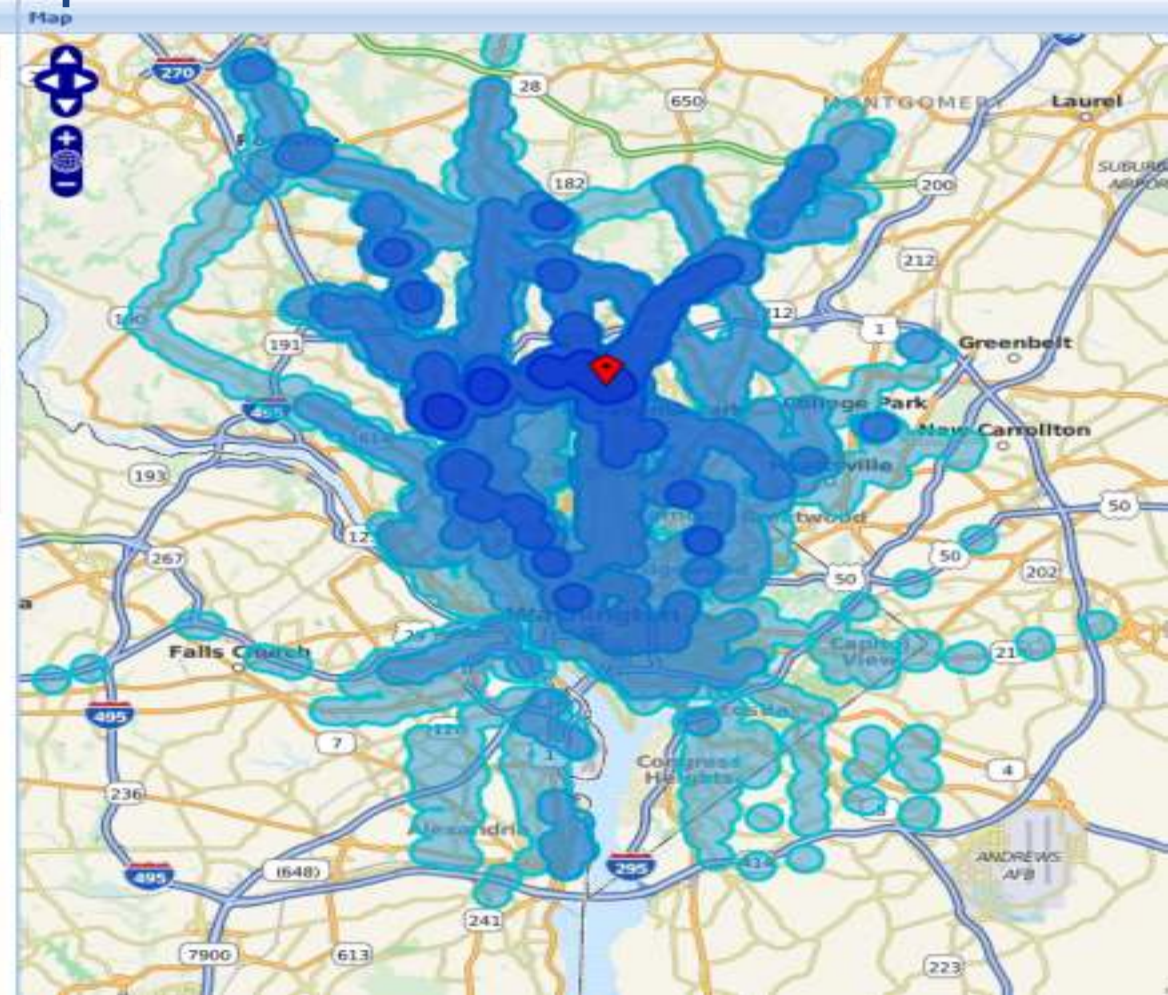
What do we mean by transport data?

A digital representation of transport systems:

- Maps of routes and stops

- Speeds

- Timetables for scheduled services, frecuencies

- *Real-time location updates of transit vehicles*

- *Real-time traffic and congestion updates*

What is transport open data?

A set of free public services (or 'feeds') that:

- Standard format

- Resource for government and private applications that make use of transport data

- Allow others to innovate <u>without</u> needing to collect case by case and maintain basic information about transport systems

Tools for collecting Transit Data…TransitWand

■ _TransitWand_ is an open-source web and mobile application for collecting transit data – It is used to create GTFS feeds, capture passenger counts or generate GIS datasets.

Web-based visualization
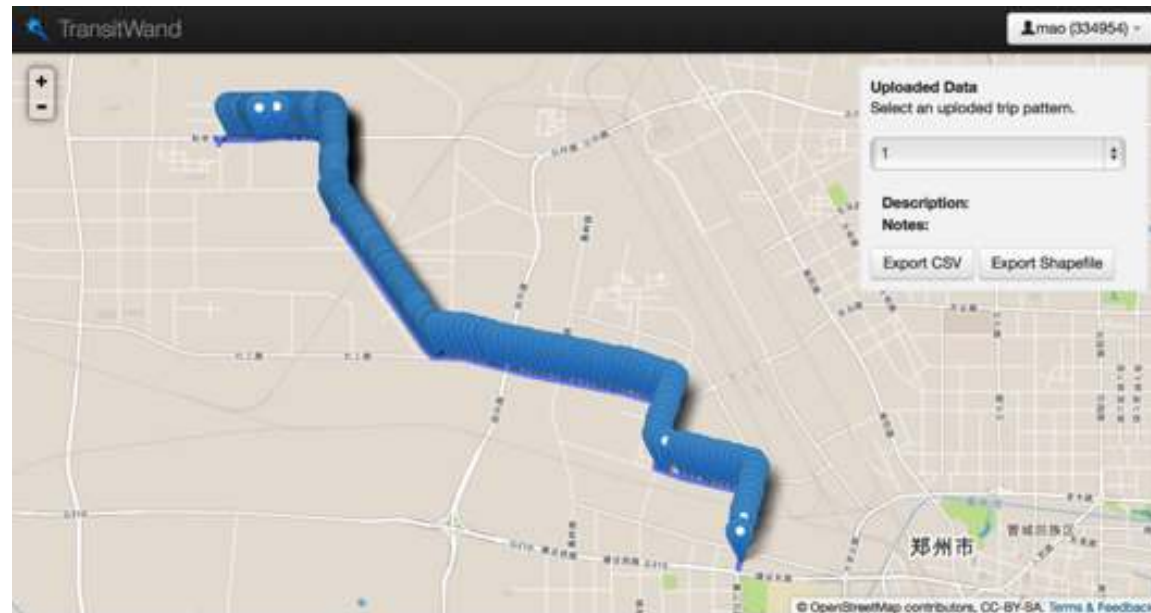
Mobile App

Tools for collecting Transit Data…Transitmix (now Remix)

- *Transitmix* is an open-source web-based sketching tool developed by Code for America to help transit planners draw routes, powered by open data and standards (OSM, Open Source Routing Machine and GTFS).

Tools for Managing Transit Data…GTFS Editor

- *GTFS Editor* is a Java-based open-source software for managing and editing GTFS data. Mexico City's SEMOVI is the admin and each of the 5 transit agencies has a login

SEMOVI's GTFS
Editor Manual
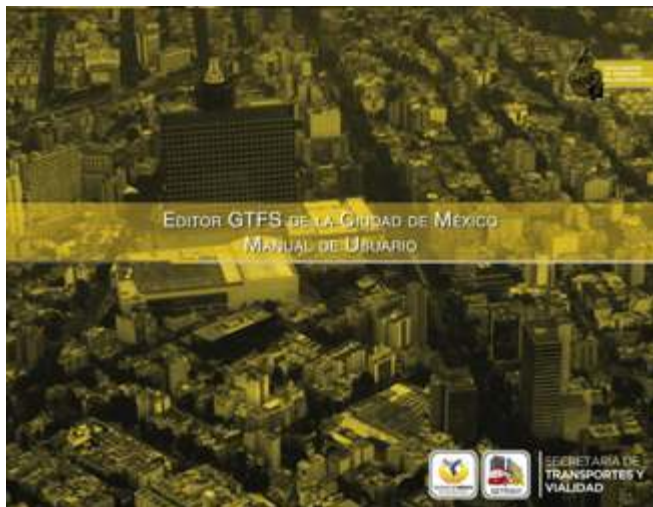
User Information for Trip Planning…the power of Open Data

- *Open Transport Data in GTFS format* has spurred the creation of multiple trip planners and products
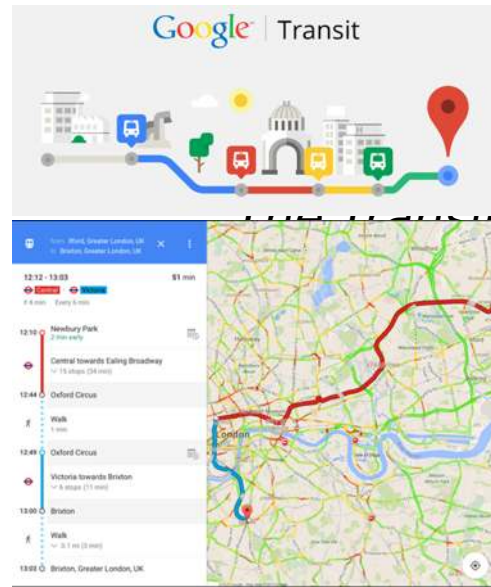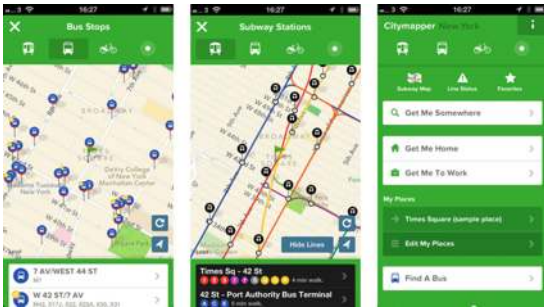
Nairobi, Kenia
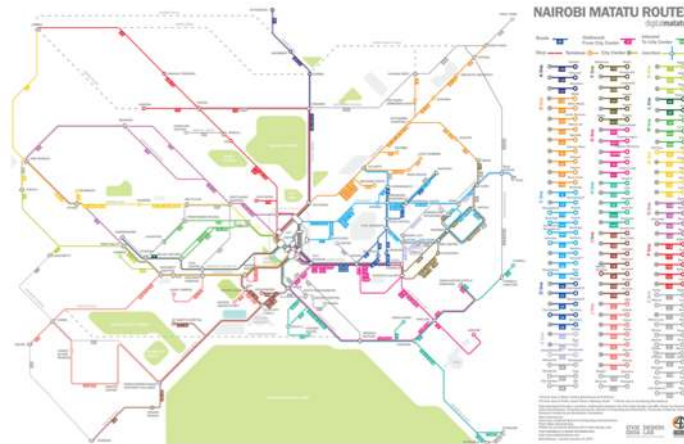
Managua, Nicaragua

Cape town, South Africa

Worldwide repositories of GTFS data…Transitland

- Mapzen launched Transitland. In 2017, more than 1,500 operadores from 37 countries, 300 cities integrated under an open-source suite of tools and open data
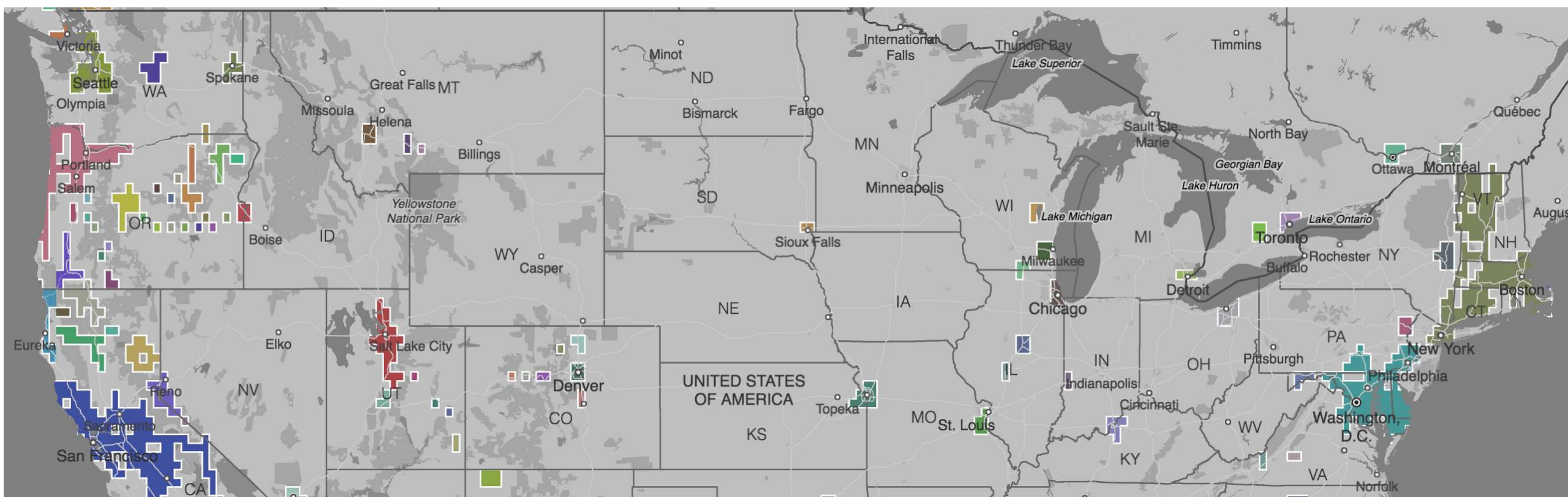
There is a data-divide between global and north cities

- Transitfeeds, more than 400 cities… However, challenge for south cities, challenge for informal systems
- WRI, MIT, World Bank, Resources Center in project: share open data, technologies, methodologies for **informal systems**, experiences, network
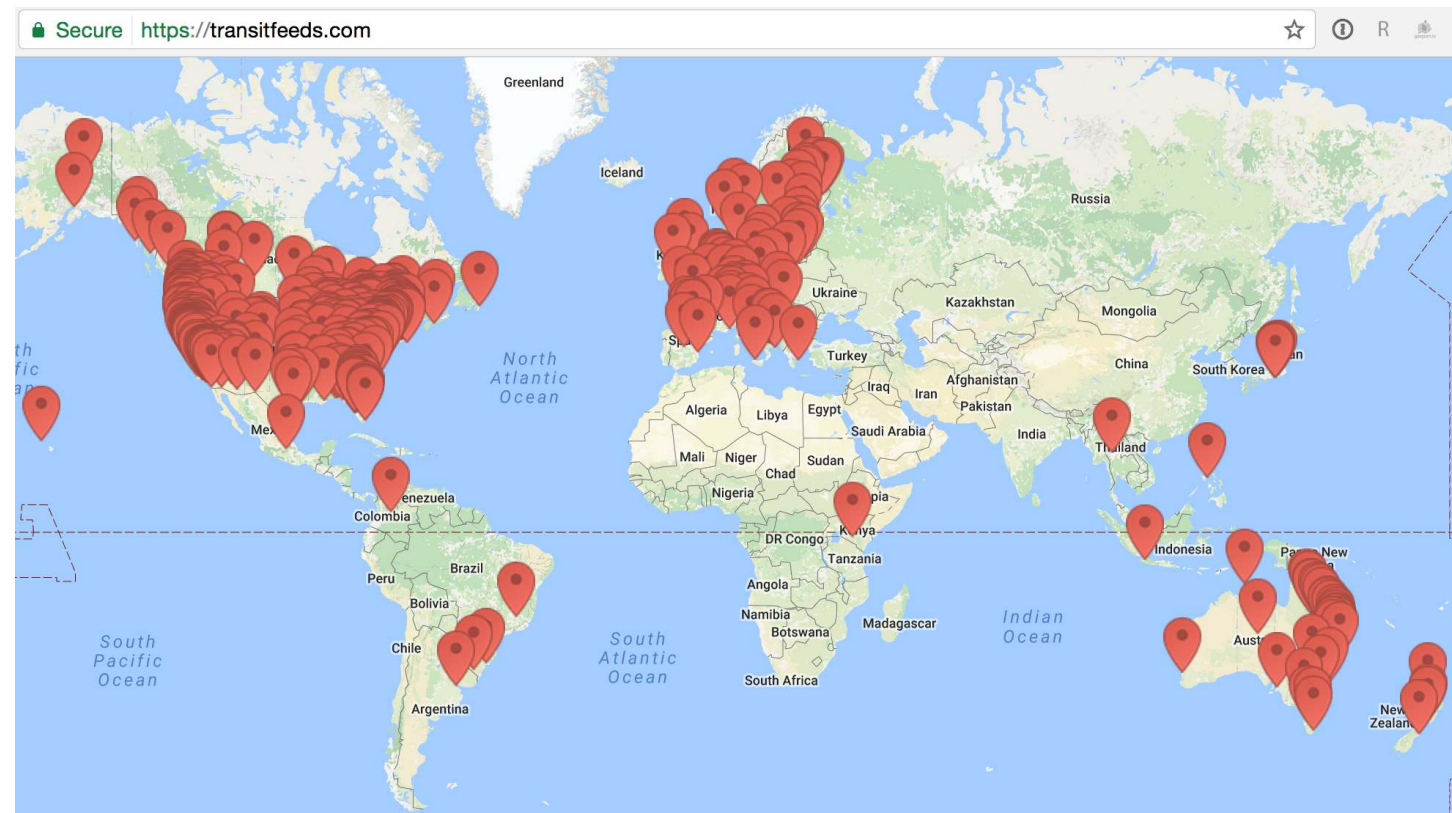
Same Transit data underlies planning tools…the power of open standards

- GTFS data underlying accessibility analysis in Mexico City comparing and measuring the increase in the # of jobs with the addition of two new transit routes within 60 minutes from the markup point.
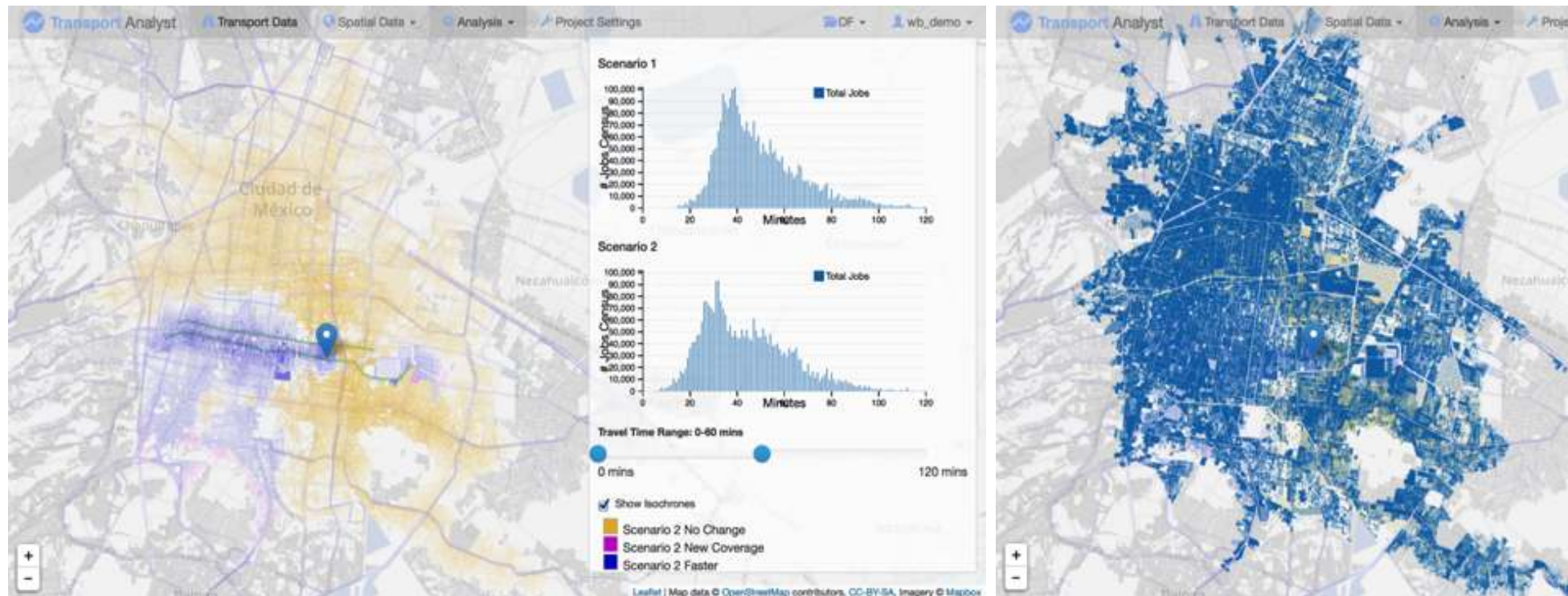
Accessibility tool

- **Simple** planning tool to quantify urban accessibility
- This tool leverages **digital, open, and standardized data**
  - Road Network: OpenStreetMap
  - Transit Network: General Transit Feed Specification (GTFS)
  - Shapefiles of population
  - Shapefiles of "opportunities": Jobs, schools, health centers, parks
- Estimated travel times for each travel modes (car, transport, bike, pedestrian) and calculate the accessibility value to opportunities for every point in the city for a given time threshold.

Why analyzing Accessibility?

- Global and Local Tracking Framework
  - Planning Indicators
  - Benchmarking
  - Sustainable Development Goals
- Transport and Land Use Planning
  - Quick and simple modeling tool
  - Move towards a data-driven and evidence-based planning
- Investment Prioritization

Accessibility for different modes

Public transportation
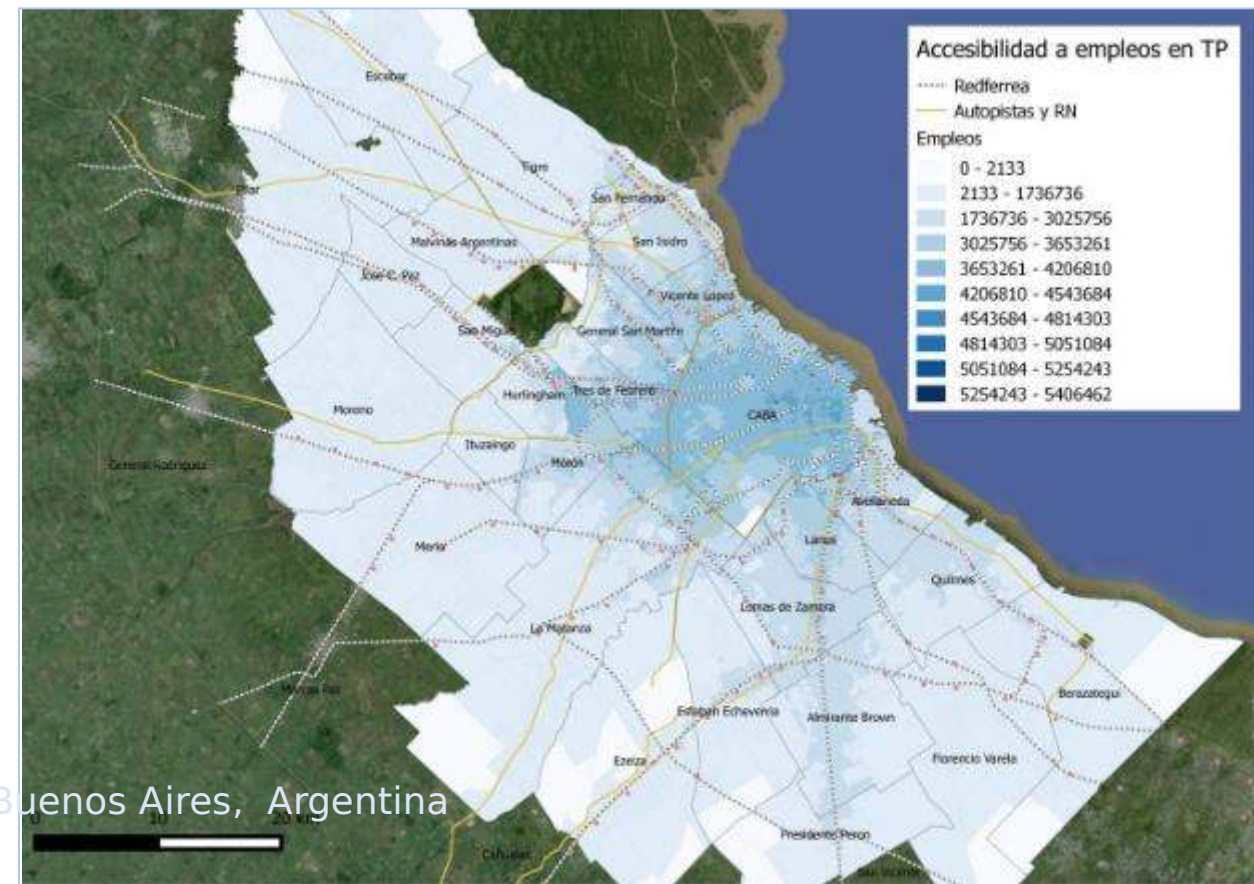
Automobile
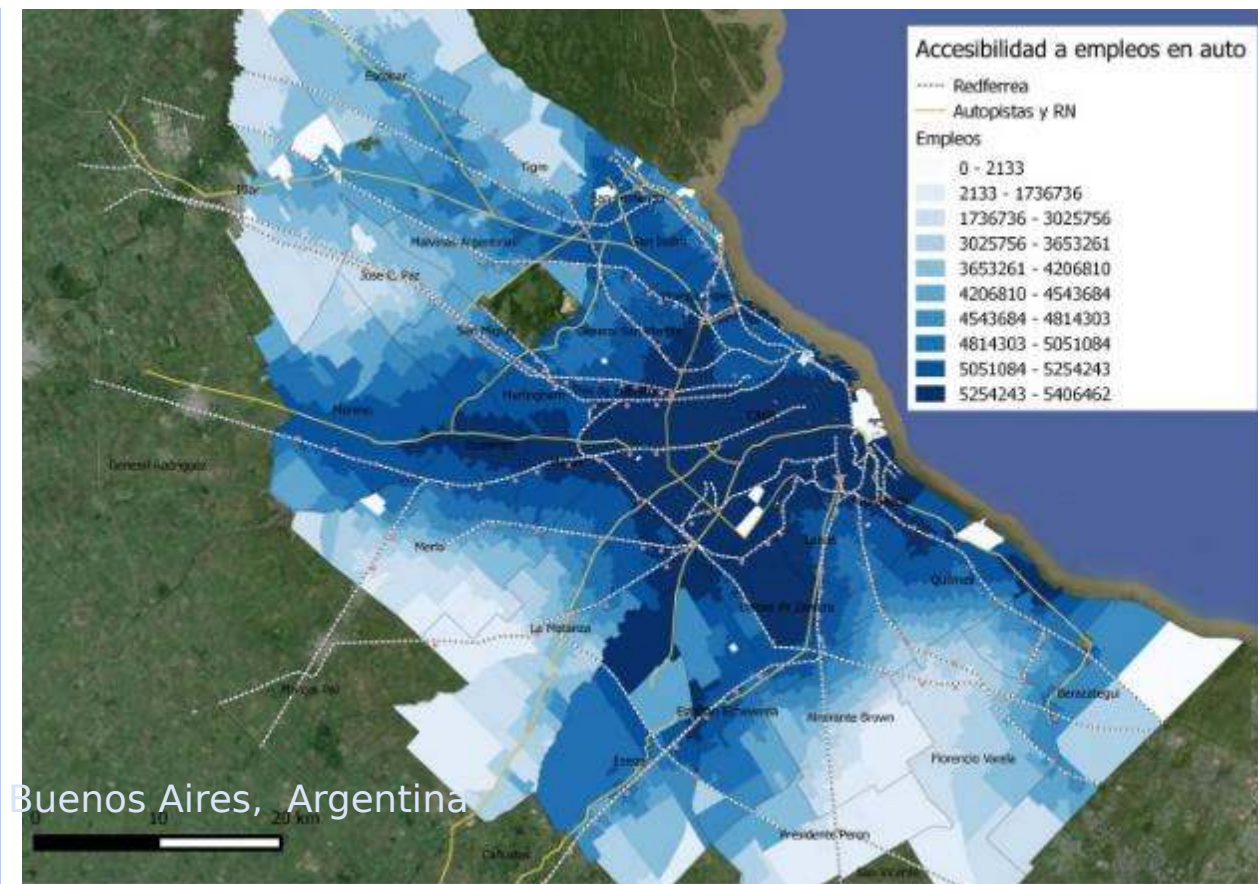
Finding the optimal location of housing

Legend

Employment Density - Percentage
- 0-5
- 5-10
- 10-20
- 20-30
- 30-40
- 40-50
- 50-60
- 60+

Population Denisty
- 0 - 3000
- 3000 - 6200
- 6200 - 9500
- 9500 - 12900
- 12900 - 16800
- 16800 - 20900
- 20900 - 25400
- 25400 - 31500
- 31500 - 39700
- 39700 - 63800
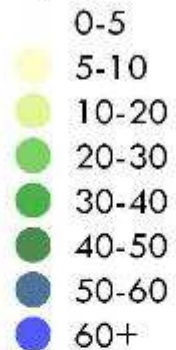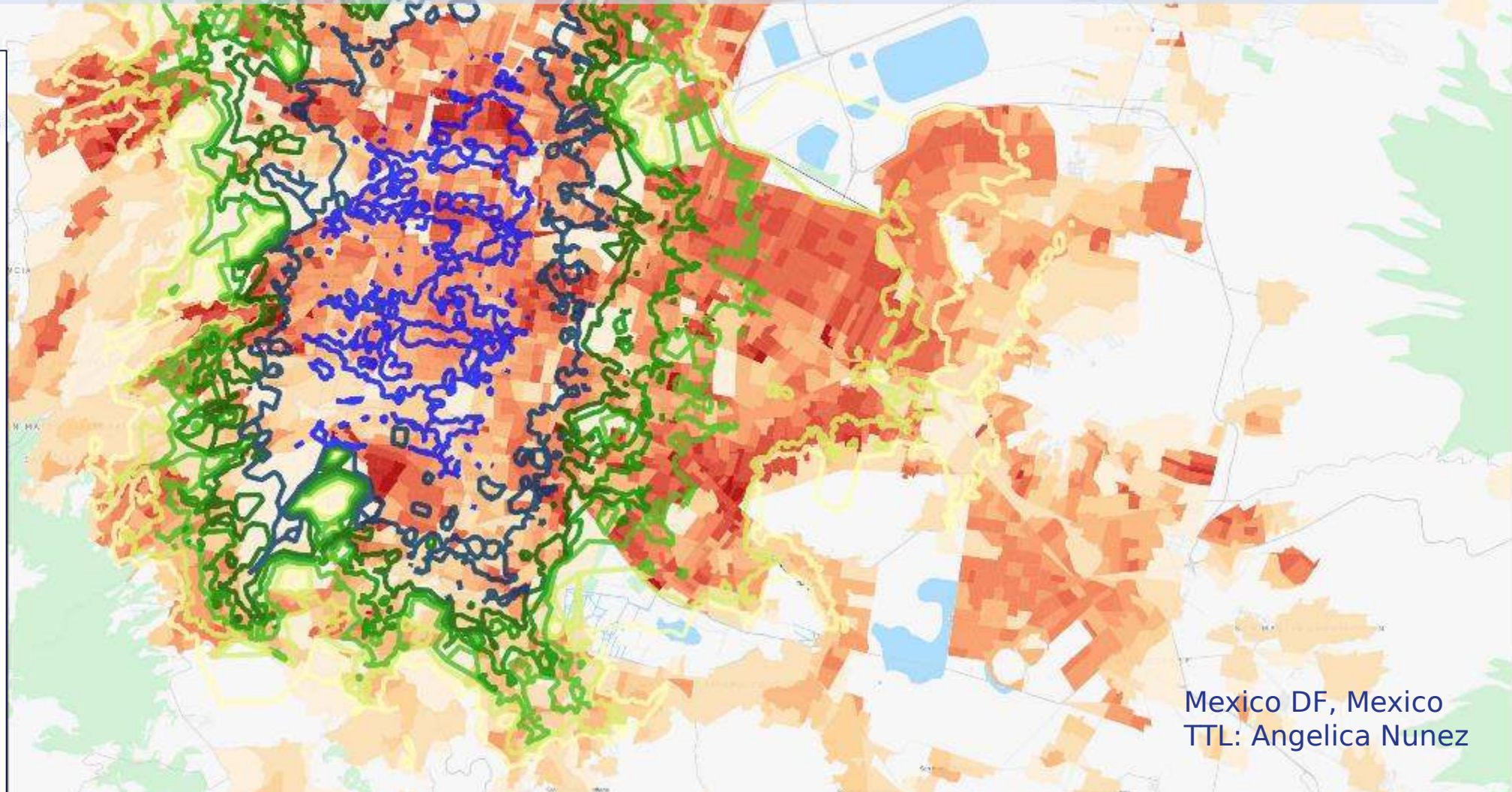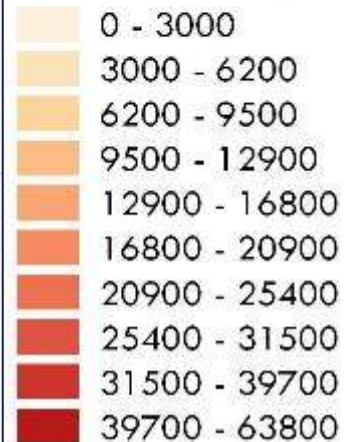
Mexico DF, Mexico
TTL: Angelica Nunez

Employement accessibility indicators

33.97%

Maximum Labor Market Efficiency**
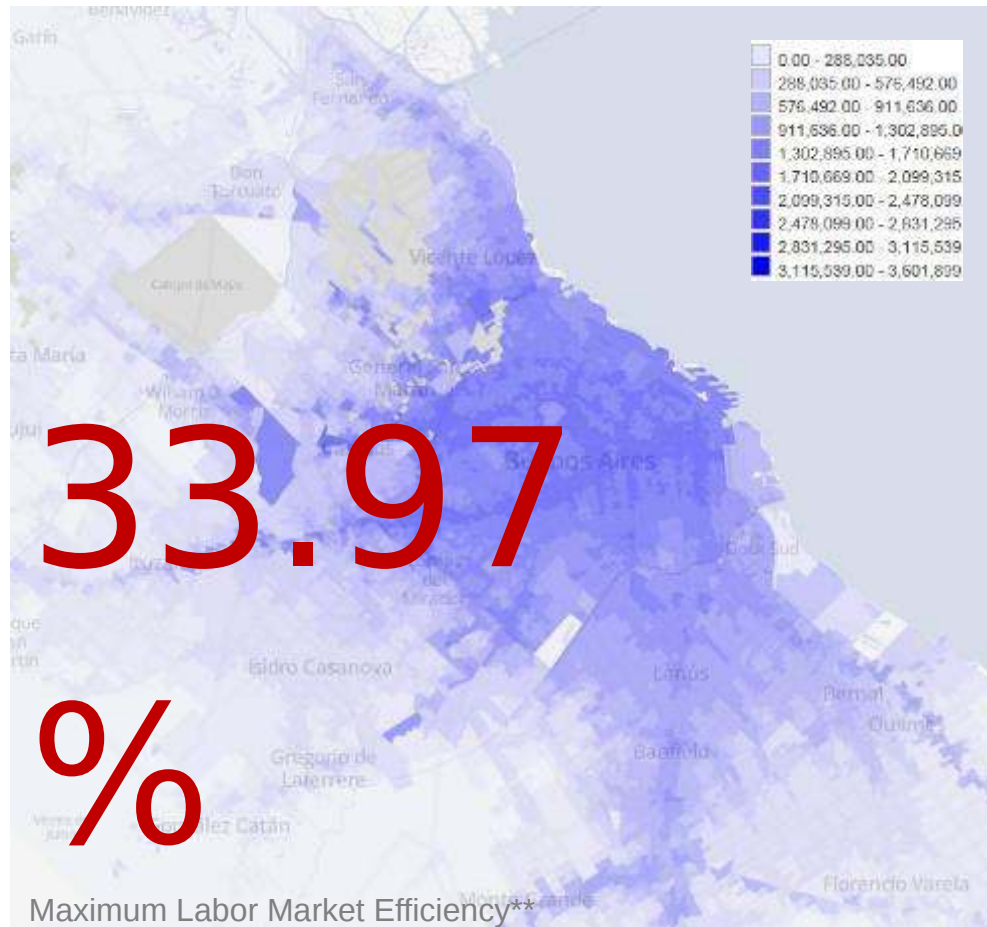
Effective size of the labor market

Someone living in Buenos Aires can access approximately 34 percent of the jobs in the metropolitan area in 60 minutes.

Map legend:
- 0.00 - 288,035.00
- 288,035.00 - 576,492.00
- 576,492.00 - 911,636.00
- 911,636.00 - 1,302,895.0
- 1,302,895.00 - 1,710,669
- 1,710,669.00 - 2,099,315
- 2,099,315.00 - 2,478,099
- 2,478,099.00 - 2,831,295
- 2,831,295.00 - 3,115,539
- 3,115,539.00 - 3,601,899

Performance of projects

Regional Analysis of the Current Transport System (60 Minutes):
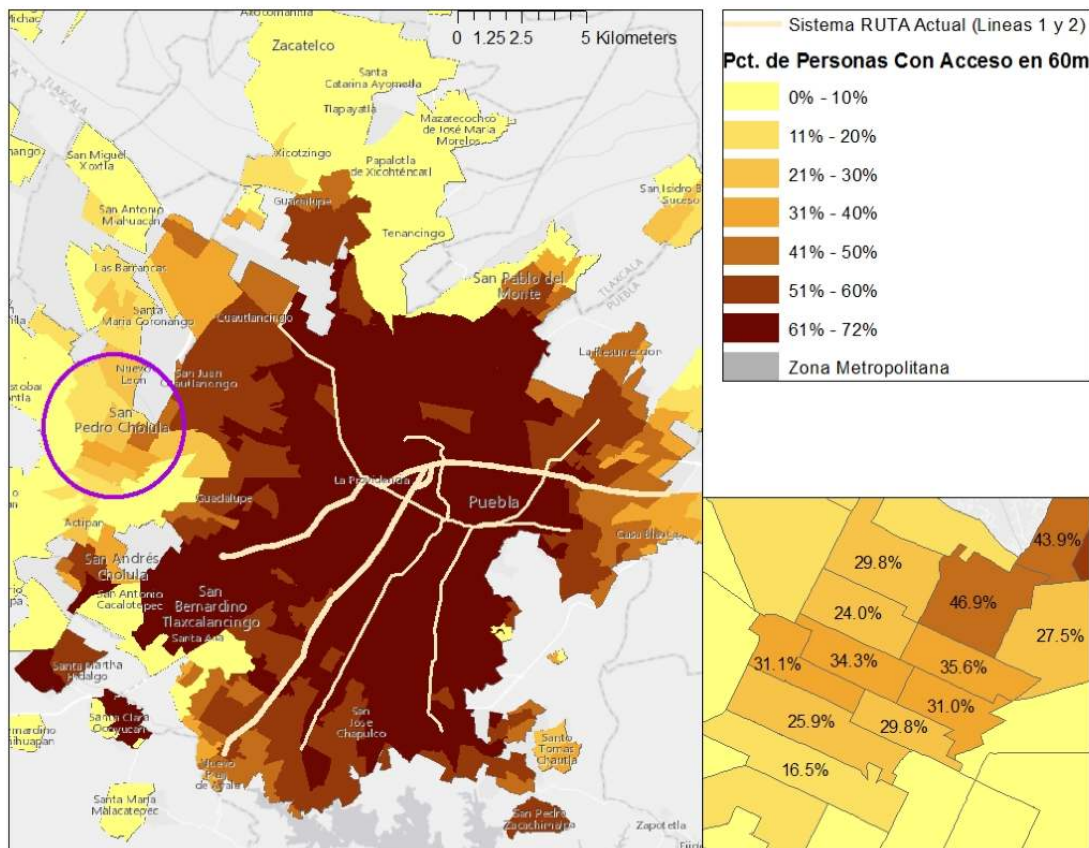
Regional Analysis of the Current Transportation System + L5 ROUTE (60 Minutes)
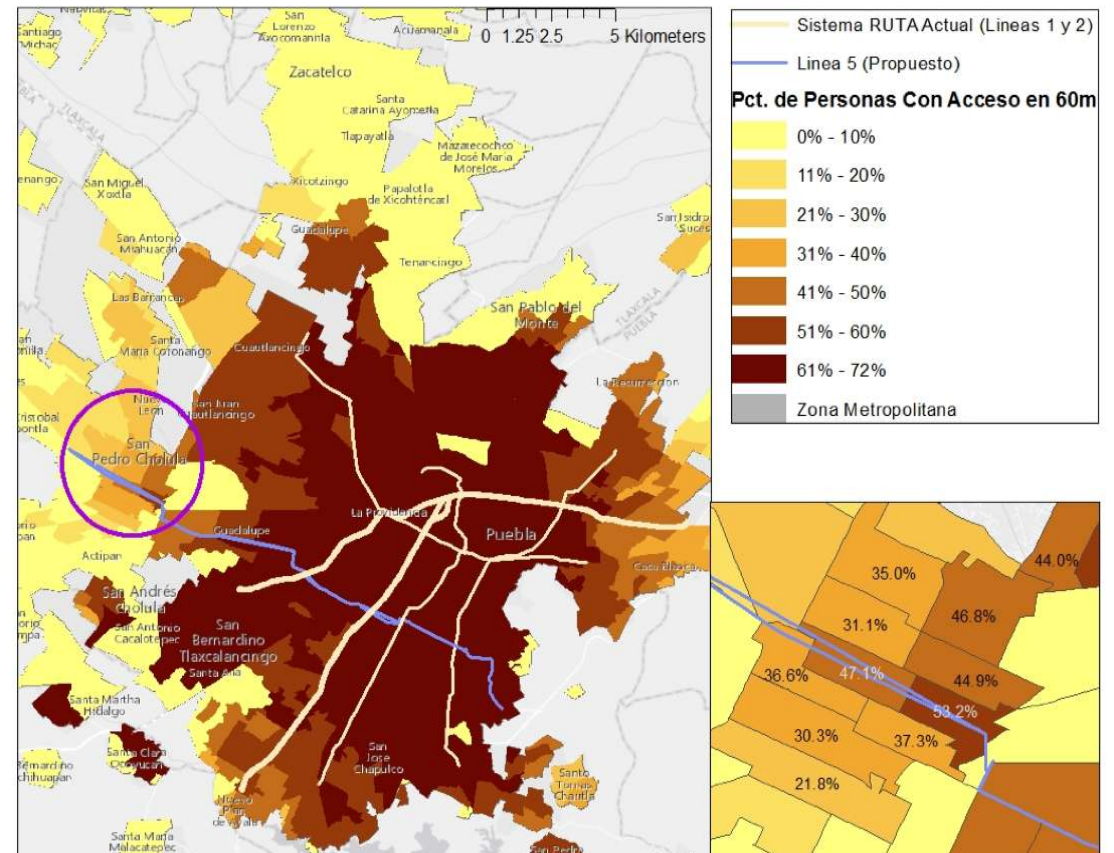
Comparisons of accessibility in cities

International Transport Forum - 2017 Transport Outlook report
Accessibility by Public Transport
30 and 60-minute isochrones

Berlin   Paris   Toronto   Mexico City   Sao Paulo   Belo Horizonte   Manila   Nairobi

Washington   Madrid   Cairo   Budapest   Sydney

Ranking of cities

US cities ranking according to their accessibility to jobs by transit

Jobs within 30 minutes
(Transit, AM peak)

	Rivers/Lakes
	0-1,0000
	1,000-2,500
	2,500-5,000
	5,000-7,500
	7,500-10,000
	10,000-25,000
	25,000-50,000
	50,000-75,000
	75,000-100,000
	100,000-250,000
	250,000-500,000
	500,000-750,000
	750,000-1,000,000
	1,000,000-2,500,000
	2,500,000-5,000,000
	5,000,000-7,500,000
	7,500,000-10,000,000
	10,000,000+

Design by Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under CC BY SA. © Mapbox © OpenStreetMap **Improve this map**

1. New York
2. San Francisco
3. Los Angeles
4. Washington, D.C.
5. Chicago
6. Boston
7. Philadelphia
8. Seattle
9. Denver
10. San Jose
11. Portland
12. Milwaukee
13. Minneapolis
14. Baltimore
15. Miami
16. Houston
17. Salt Lake City
18. San Diego
19. Phoenix
20. Sacramento
21. Dallas
22. Pittsburgh
23. San Antonio
24. Las Vegas
25. Buffalo
26. Cleveland
27. Columbus
28. St. Louis
29. Hartford
30. Atlanta
31. Providence

Source: Accessibility Observatory by UMN

CIVIC DESIGN
DATA LAB

GLOBAL NETWORK MAPPING TRANSIT

Overview

Semi-formal transport commonly emerges in developing cities as a reaction to fast urban growth, helping to alleviate mobility demand that formal systems are unable to satisfy. These systems evolve autonomously —developing routes, stops, and schedules based on market needs. As a consequence, commuting can be not only inefficient but also challenging to navigate. Users, carriers, and planners have little information to understand the system as a whole. GPS and mobile technology, however, create new opportunities for data collection.

Enthusiasts in cities around the world have taken up this opportunity to map informal transport. Using hybrid techniques of crowdsourcing and in-hand technology to collect data about routes and schedules, residents can visualize their city's transport map.

Global Network Mapping Transit is bringing together innovative methodologies for mapping urban transit systems. Our objective is to understand the achievements and challenges faced in each project, using cross-case comparisons to promote knowledge exchange between cities.

Members

Research Leads:
Sarah Williams

Researchers:
Akemi Sato

Collaborators:
Digital Matatus
World Resources Institute
Center for Sustainable Urban
Development

A Global Resources Center

Digital Concho

City: Santo Domingo, Dominican Republic

Leaflet | © OpenStreetMap

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Method

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Researchers:
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Digital Matatus
World Resources Institute
Center for Sustainable Urban
Development

Massachussetts Institute of Technology, *Civic Design Data Lab*
World Resources Institute
and others

Data Compilation
Attention to informal systems
Network, Platform for experience and resources sharing
Online training, support for local governments
GTFS repositories

South-south cooperation, Open Governance, Social innovation

Thank you

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