



Open lecture

Mapping and mobilization for public transport advocacy in African cities

Presenter: Jacqueline Klopp

Centre for Sustainable Urban Development, Columbia University

29 August 2017

Mapping and Mobilization for Public Transport Advocacy in African Cities



Jacqueline M. Klopp
Center for Sustainable Urban Development
Columbia University /DigitalMatatus

Agenda

- Quick overview of why paratransit mapping/data collection matters
- One example of mapping effort (Digital Matatus in Nairobi)
- Brief look at the spread of mapping in African cities and implications
- Challenges/opportunities moving forward

Semi-Formal Bus Systems: critical circulatory systems for many cities



Matatu - Nairobi



Jeepney - Manila



Dhaka



Car Rapide- West Africa



Colectivo - Mexico City



Manical - Panama City



Lima



Marshrutkas - Russia



Tap, Tap - Haiti



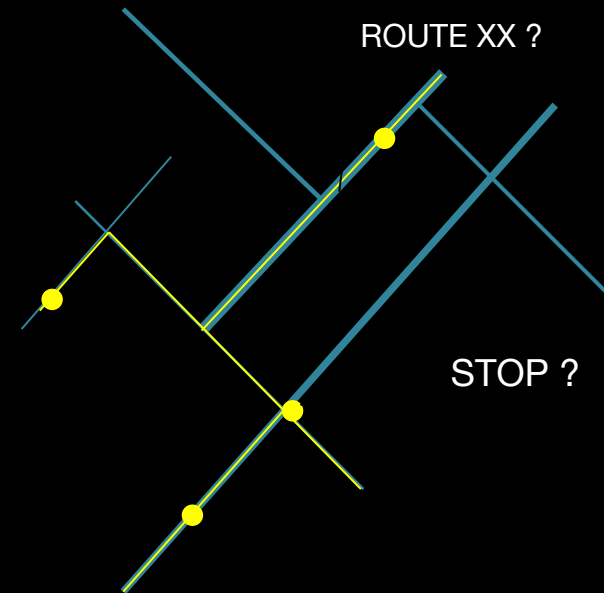
Daladala - Dar Salaam



Dolmuş in Bodrum, Turkey

Semi-formal Bus Systems Lack Data!

- Few Maps/Passenger Information/Apps (access/saves time)
- Few planning tools/network understanding esp coverage, access dynamics
- Monitoring USDG 11?



Subtarget 11.2

- By 2030, provide access to **safe, affordable, accessible and sustainable transport systems for all**, improving road safety, notably by **expanding public transport**, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

These transit systems are often invisible in planning for African cities



digital**matatus**



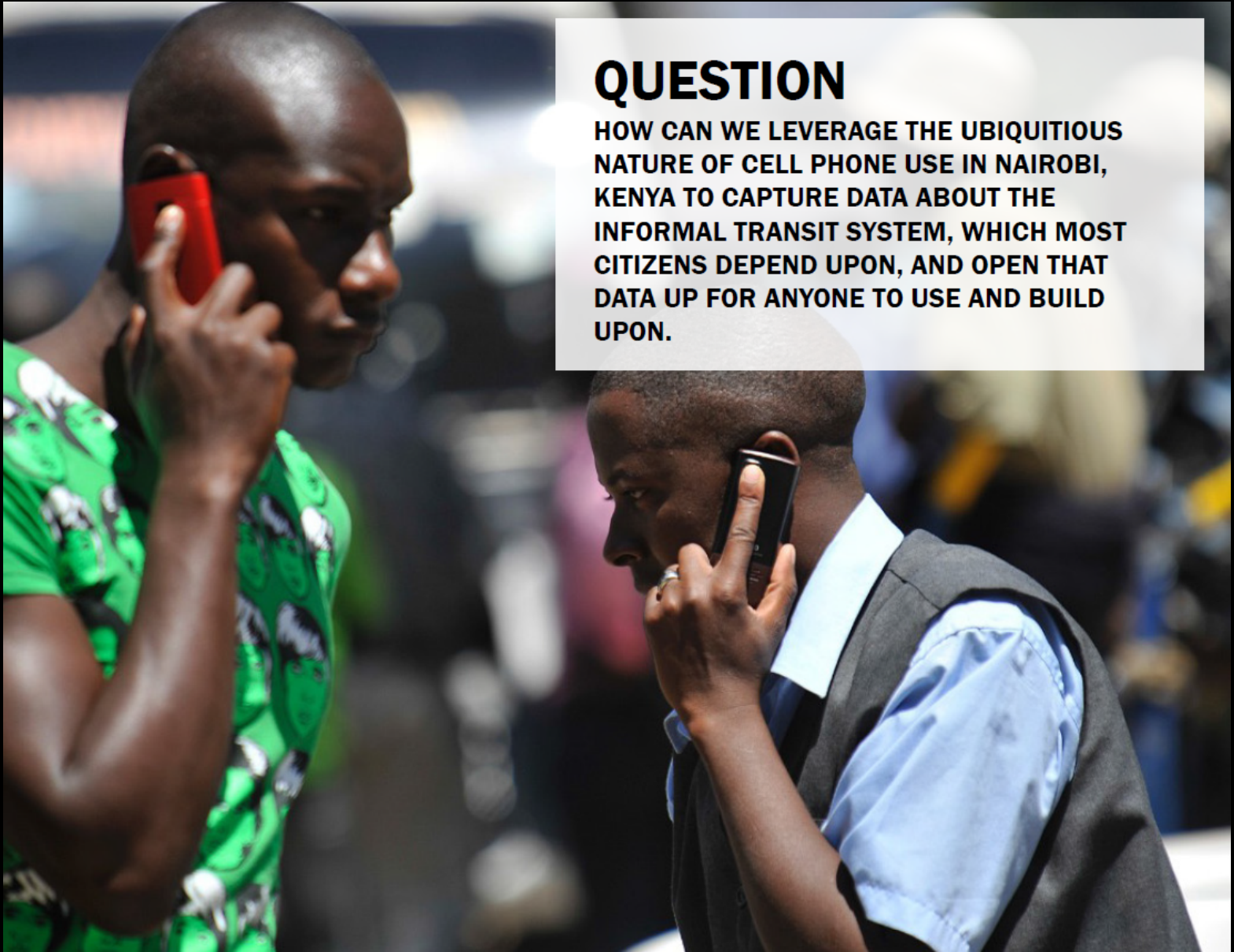
GROUPSHOT



Nairobi: A Transit dominant city

3.5 MILLION PEOPLE
DEPEND ON NAIROBI'S 130 MATATU ROUTES





QUESTION

HOW CAN WE LEVERAGE THE UBIQUITIOUS NATURE OF CELL PHONE USE IN NAIROBI, KENYA TO CAPTURE DATA ABOUT THE INFORMAL TRANSIT SYSTEM, WHICH MOST CITIZENS DEPEND UPON, AND OPEN THAT DATA UP FOR ANYONE TO USE AND BUILD UPON.

Leverage Growing Cellphone Use to Collect Missing Transit Data

DIY DATA
COLLECTION

+ DEVELOP **OPEN** DATA

= CHANGE



USER/PLANNING
APPS AND INFO

TRANSPORT
MODELS

PUBLIC TRANSIT
VISIBLE

IN (GTFS) STANDARD
FORMAT

+ ONLINE AND
PAPER
INFORMATION FOR
ADVOCACY

=
**INNOVATION,
EMPOWERED
USERS AND
PLANNERS**

Dialogue with Operators, Transit Users, Policy analysts, Technologists



KIPPRA THINK TANK



GROUND TRUTHING DATA

MATATU DRIVERS AND OWNERS

Original data –outdated, analog

The Local Government Act

(Cap. 265)

IT IS NOTIFIED for general information that the City Council of Nairobi has amended its omnibus By-law to provide for the following routes and designated parking for omnibus-

TERMINUS	ROUTE	DESTINATION	ROUTE DESCRIPTION
Circular	CBD Shuttle A	Circular within CBD	Muthurwa- Globe Cinema Roundabout (via Haile Selassie Avenue-Moi Avenue-Muranga Road) Community (via Tom Mboya Street - Cabral Street - Moi Avenue - Kenyatta Avenue-Ngong Road) and back to Muthurwa (via Ngong Road - Haile Selassie Avenue)
Circular	CBD Shuttle B	Circular within CBD	Muthurwa – Community (via Haile Selassie Avenue and Ngong road) Globe Cinema Roundabout (via Ngong Road – Kenyatta Avenue – Moi Avenue- Muranga Road) and back to Muthurwa (via Tom Mboya Street - Moi Avenue - Haile Selassie Avenue
Muthurwa	19/C	Komarock	Komarock Estate - Kangundo Road - Outer Ring Road - Jogoo Road Muthurwa
Muthurwa	19/60	Kayole	Kayole Estate - Kangundo Road - Outer Ring Road - Jogoo Road Muthurwa
Muthurwa	19/61	Kayole	Kayole Estate - Kangundo Road - Outer Ring Road - Jogoo Road Muthurwa



Sample Digital Data

WESTLANDS – KIKUYU SECTION ROUTE # 105

Label	Description	Latitude	Longitude	Type of Stop
1	Westlands	-1.2628	36.80031	D
2	St. Marks	-1.26132	36.79749	D
3	Lions Place	-1.26109	36.79608	U
4	Brookside	-1.26075	36.79245	U
5	AACC/Safaricom/Church Road	-1.25982	36.78687	D
6	Aga Khan High School	-1.25934	36.78281	D
7	ABC Place Stage	-1.25897	36.7786	D
8	ABC Place Entrance	-1.25919	36.77746	U
9	James Gichuru Junction	-1.25946	36.77551	U
10	KARI	-1.25974	36.77392	D
11	Nairobi School	-1.26035	36.77108	D
12	Deloitte	-1.26309	36.76439	U
13	AFRALTI	-1.26366	36.7613	D
14	Kianda School	-1.26395	36.75863	U
15	Sodom	-1.26425	36.75426	D
16	Kangemi Market	-1.26429	36.74858	U
17	Sugarboard/Shell	-1.26454	36.74197	U

Stops analysis-degree of informality



A Wider Conversation with new information

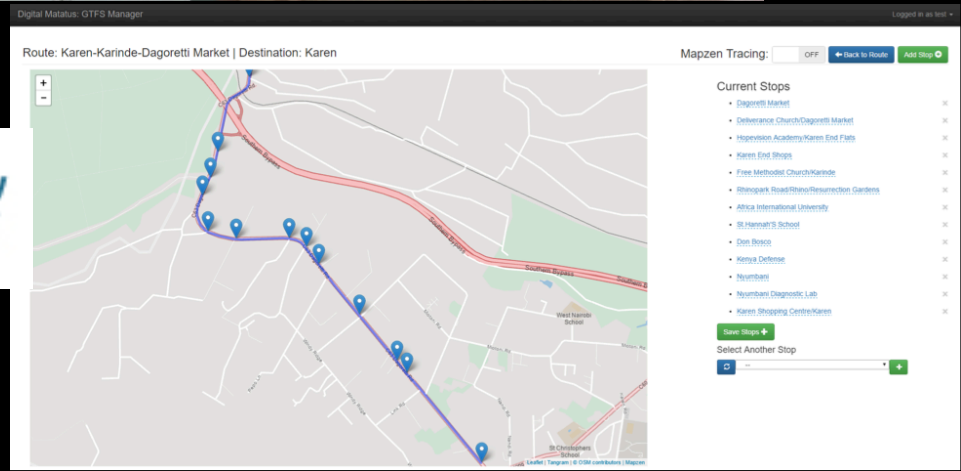
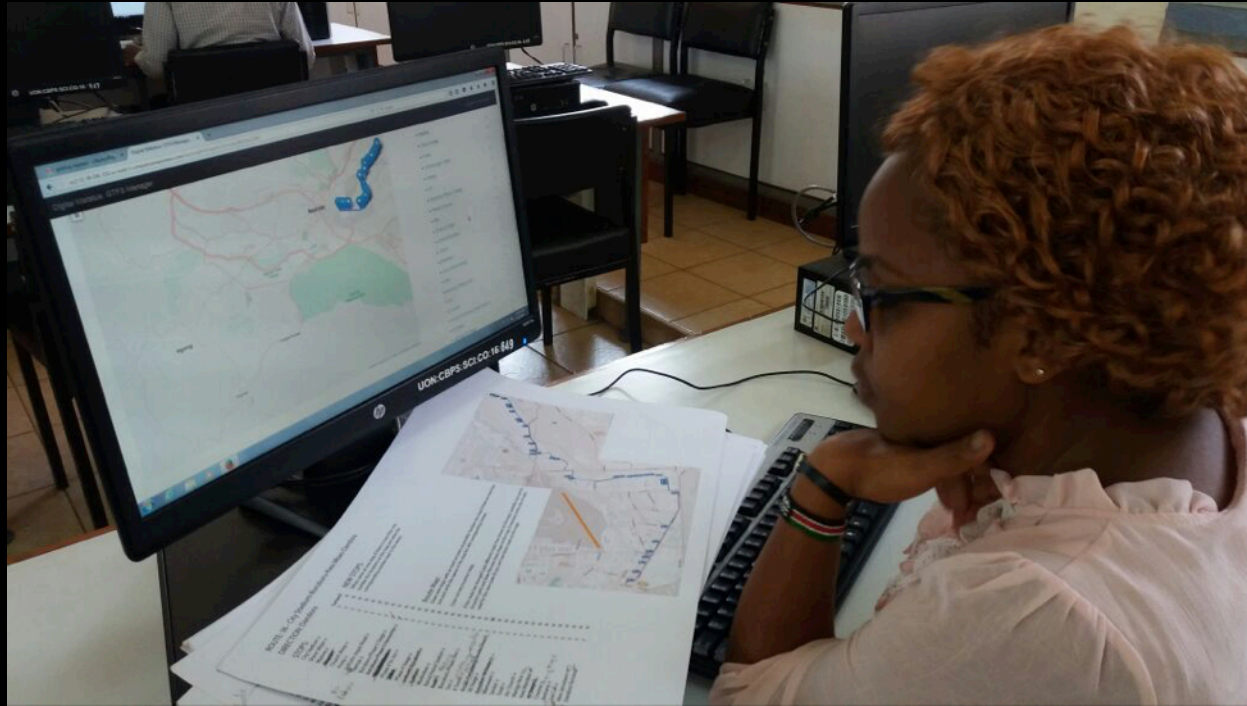


Policy Dialogue

POLICY SUPPORT



Keeping data up-to-date



University
of Nairobi

Nairobi's Matatus on Google Maps

The screenshot displays a Google Maps interface with a search bar at the top containing the URL: <https://www.google.co.za/maps/dir/Adams+Arcade+Round+About,+Ngong+Road,+Nairobi,+Kenya/Kencom+House,+Off+Moi+Avenue,+City-Hall+Way,+Nairobi,+Kenya/@...>

The left sidebar shows the search results and route options:

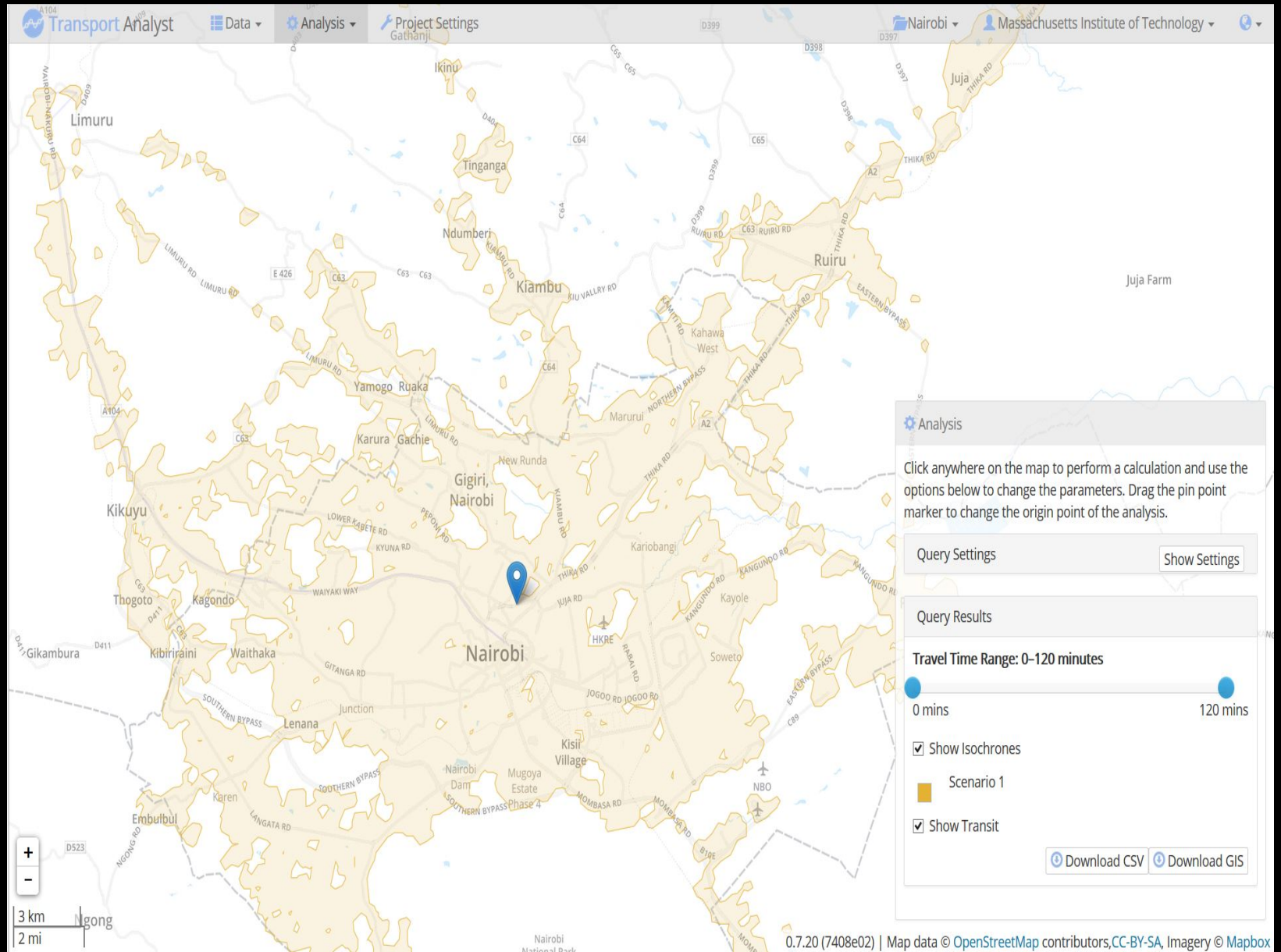
- Destination: Adams Arcade Round About, Next To S
- Destination: Kencom House, Off Moi Avenue, City-H
- Leave now
- OPTIONS
- Send directions to your phone
- 12:53 PM–1:37 PM, 44 min, 2 buses, 1:09 PM from Adams Arcade, 9 min every 15 min, DETAILS
- 12:53 PM–1:59 PM, 1 h 6 min, 24 buses

The map shows a blue route starting at Adams Arcade Round About and ending at Kencom House. Two callout boxes indicate the travel time and frequency: "44 min every 15 min" and "1 h 6 min every 15 min". The map also shows various neighborhoods in Nairobi, including Lavington Estate, Kilimani, Nairobi Upper Hill, and South B.

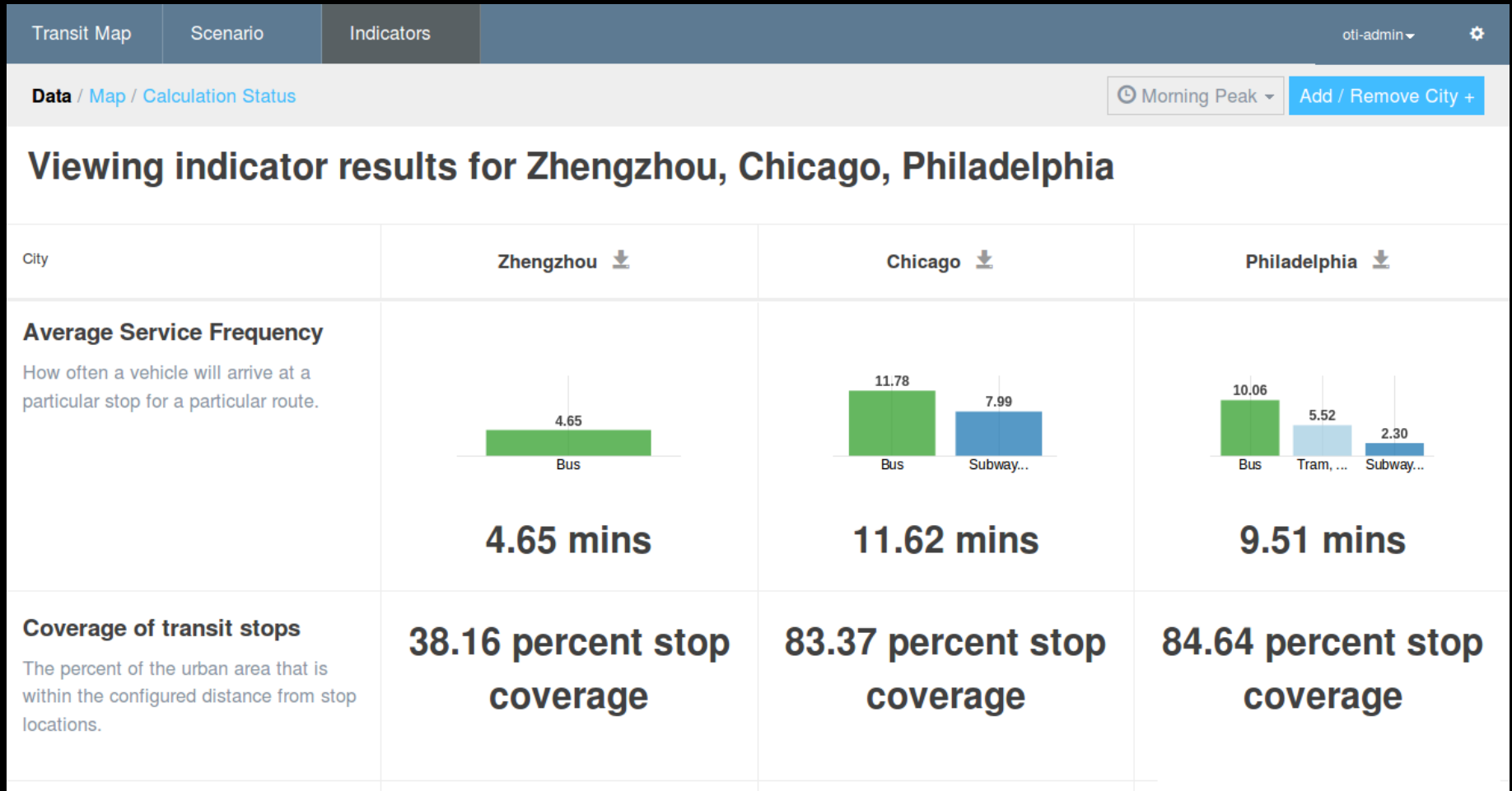
At the bottom of the screen, there are file names: "UoMiamiKLOPP_final.pptx" and "Colloquium2016.pptx".

And other apps ma3route, Transitapp...

Trip Analyst MIT

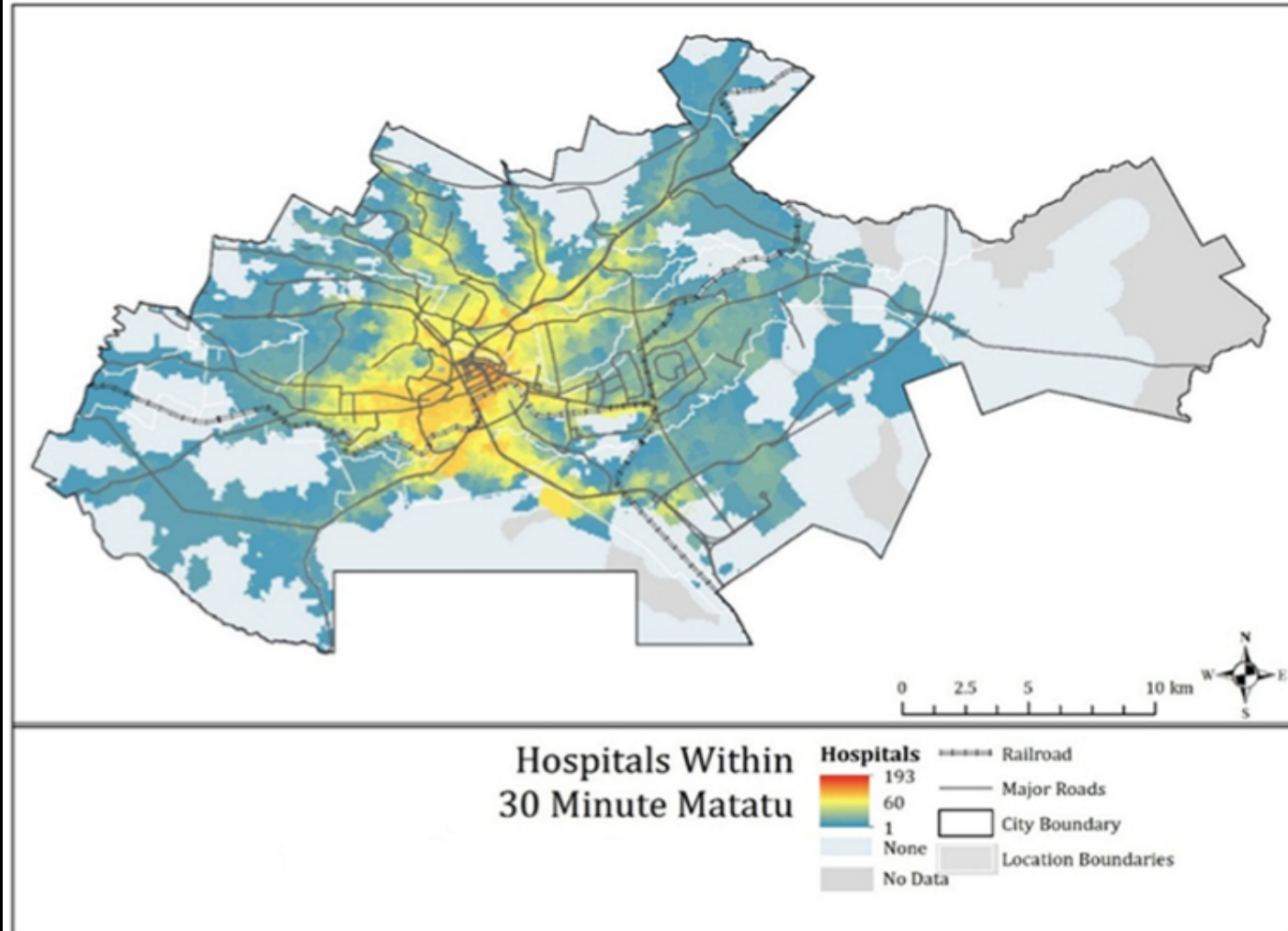


World Bank Open Transit Indicators



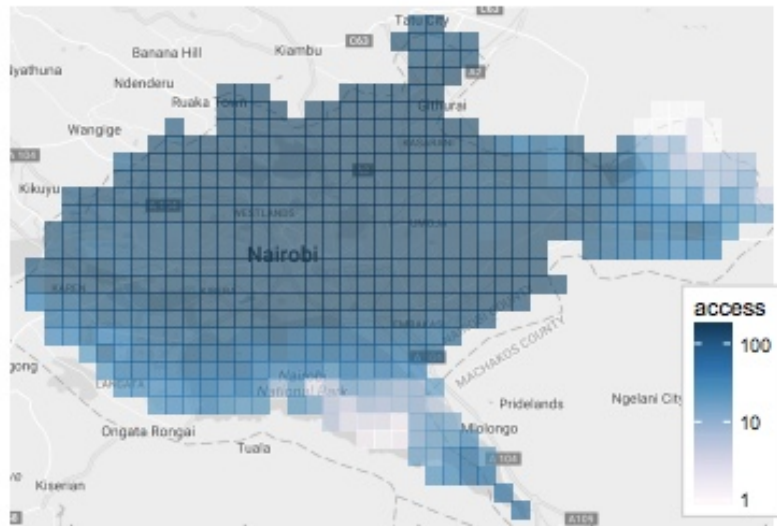
Access to Hospitals (World Bank 2016)

Figure 4.21: Hospitals within a 30-minute matatu ride

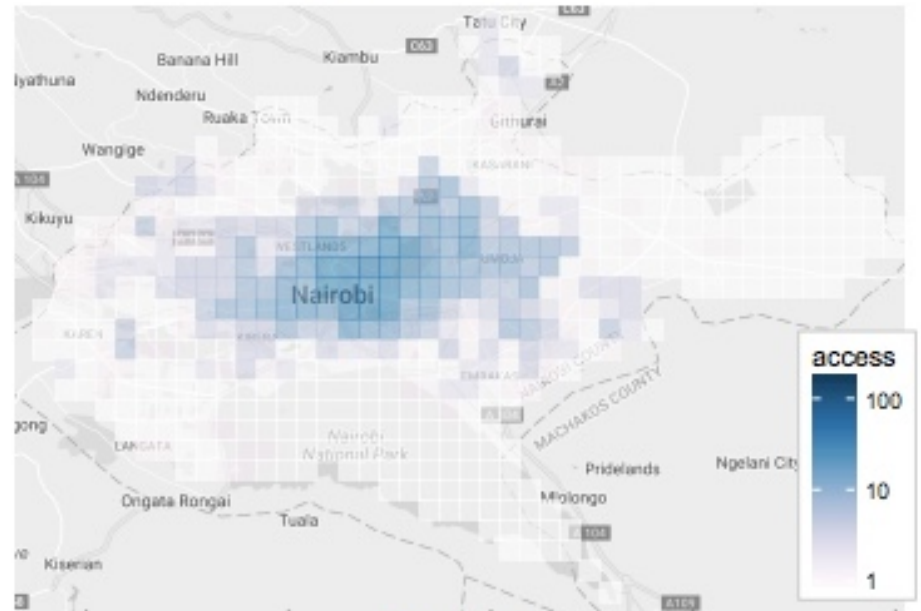


Source: Google Maps; Conveyal; OpenStreetMap.

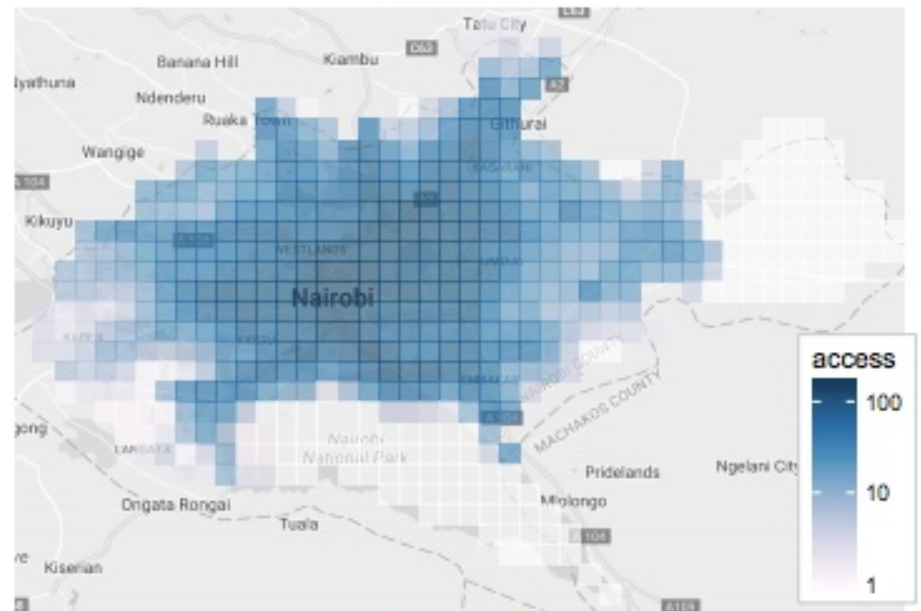
Comparing Access



(c) Driving



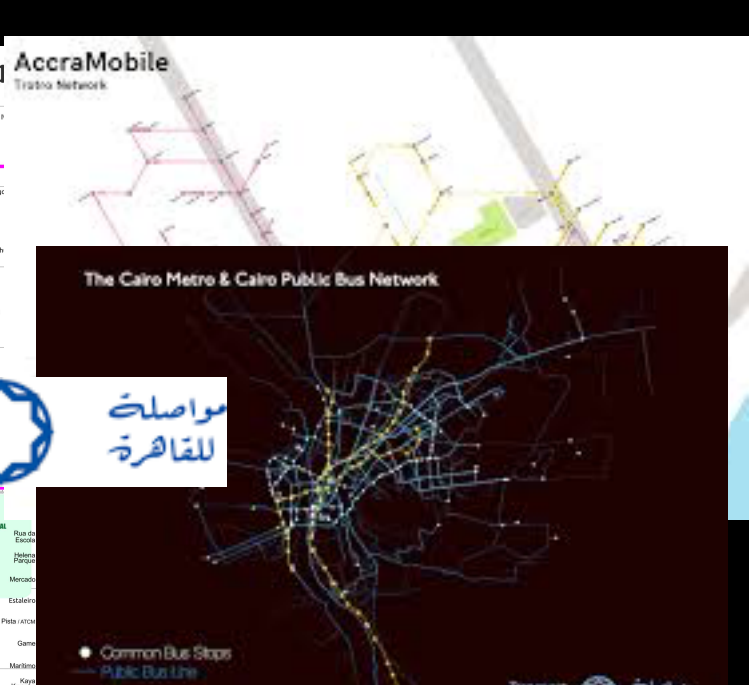
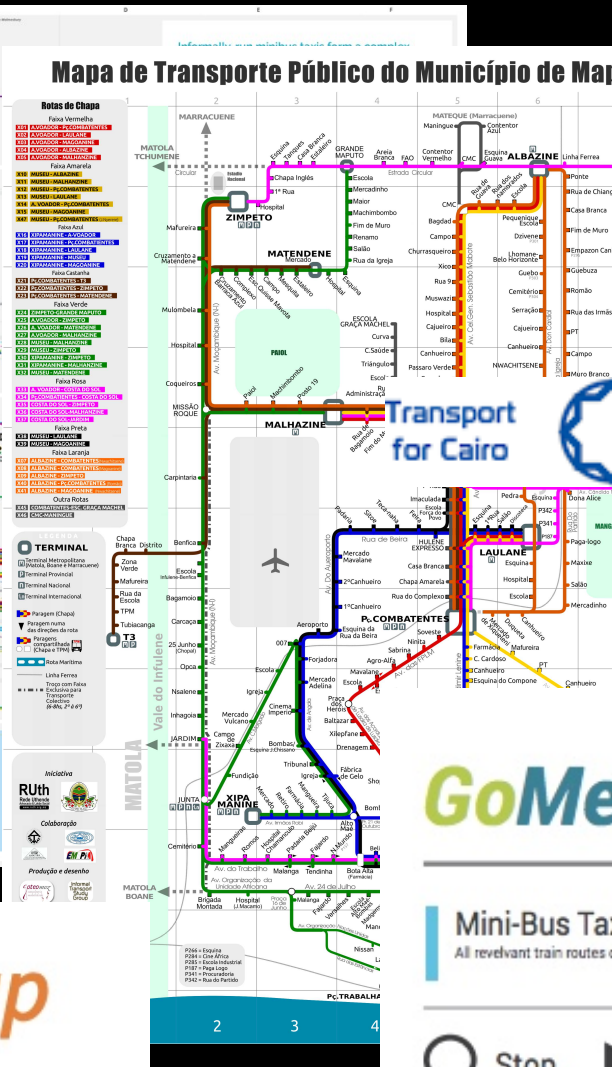
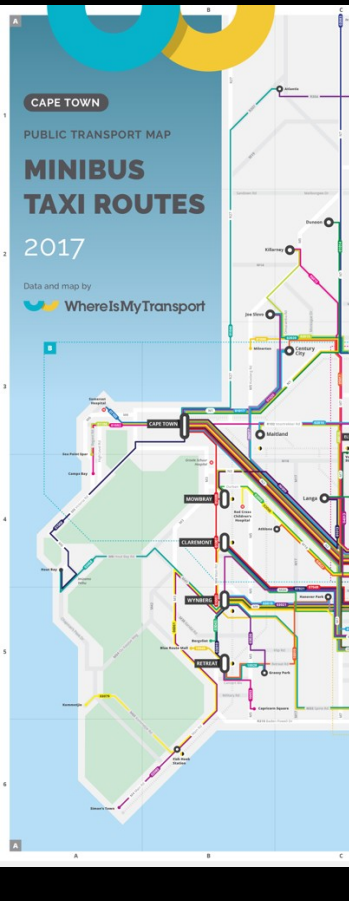
(a) Walking



(b) Paratransit

Campbell, Rising, Klopp and Mwikali
2017

Mapping is expanding



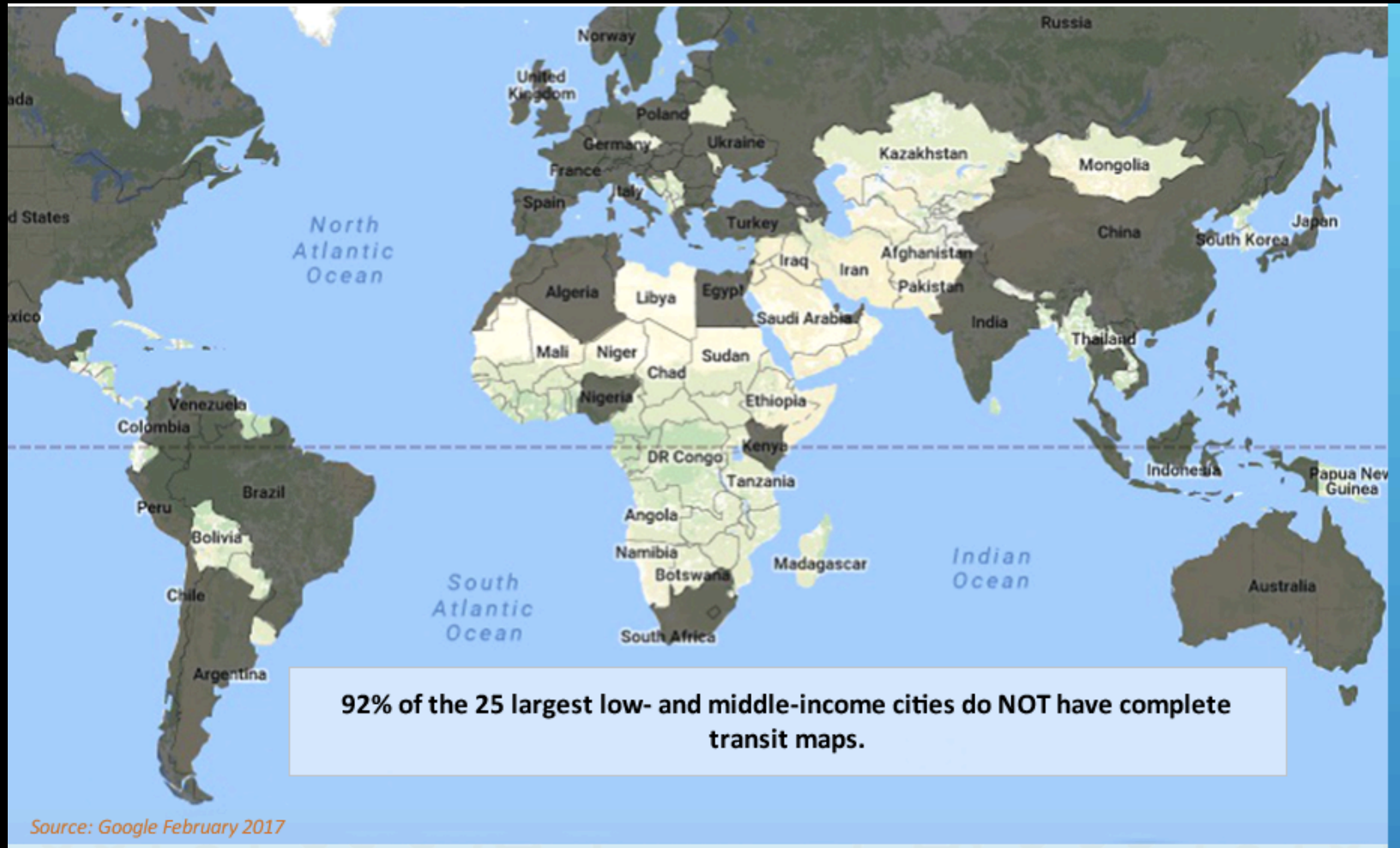
GoMetro Bellville Map

- Mini-Bus Taxi**
All relevant train routes depicted
- Bus**
All relevant train routes depicted
- Train**
All relevant train routes depicted

○ Stop
▶ One Direction
⋮ Bellville Area
⊙ Interchange



Still a lot of work to do



Encouraging the spread of mapping: share knowledge and tools



Introduction to the General Transit Feed Specification (GTFS) and Informal Transit System Mapping (Self-Paced)

(ID: 00019500)

Course description :



Self-paced course

OLC Brought to you by **WORLD BANK GROUP**
Open Learning Campus
ACCELERATING SOLUTIONS THROUGH LEARNING

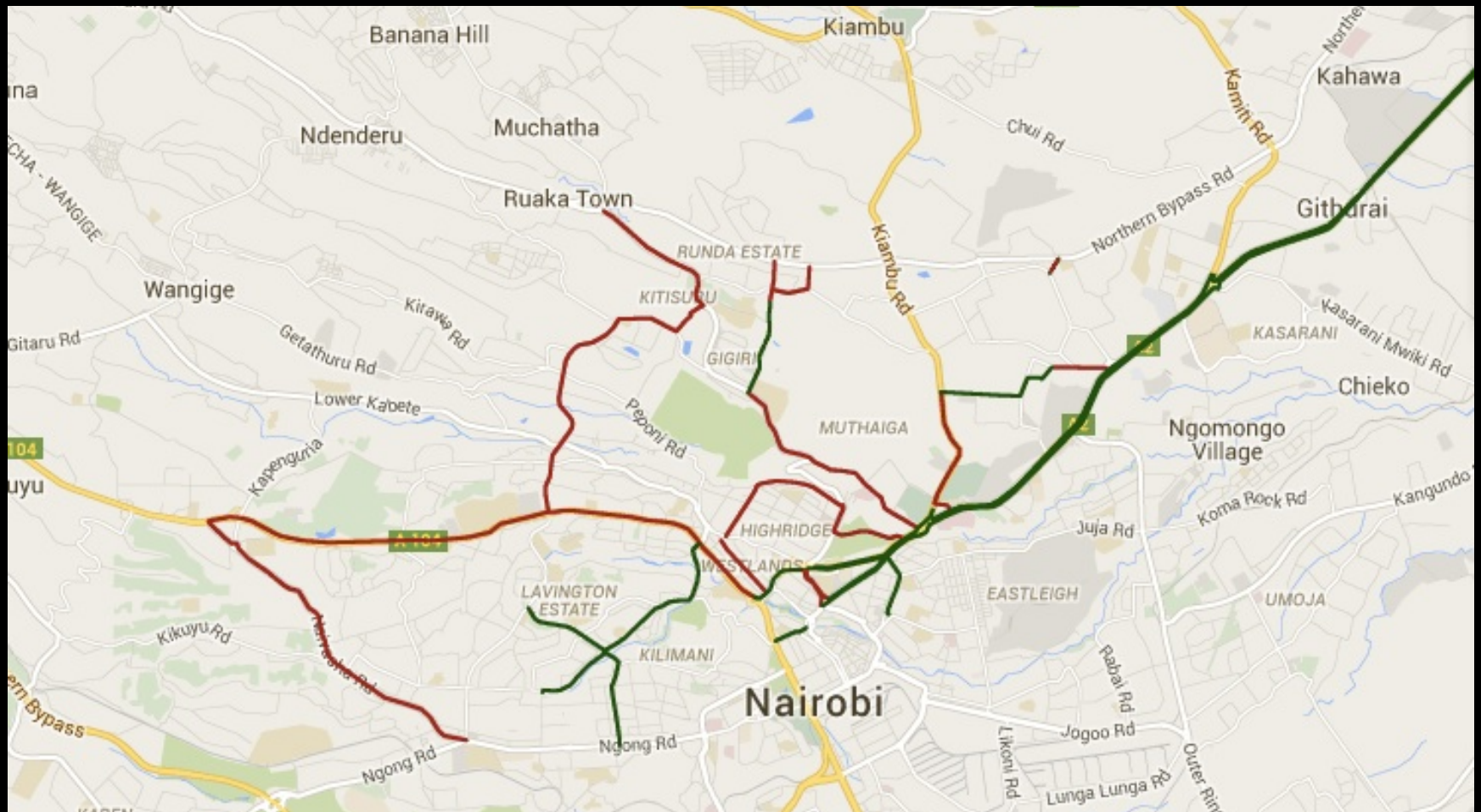
Ministry of Strategy and Finance

Introduction to the General Transit Feed Specification (GTFS) and Informal Transit System Mapping

Module 0	Module 1A	Module 1B	Module 2	Module 3A	Module 3B	Module 3C	Module 4A	Module 4B	Module 5	Module 6
Welcome	What is GTFS? History & File Structure	What is GTFS? Visualization & Community	Setting up a GTFS Feed	How to collect data for a city's first feed	How to map transit data	Stories from the field	Introduction to GitHub & Open Source Tools	App Survey	GTFS-Realtime	Conclusion & Looking Forward

About the Course

Next Steps: Mapping and integrating cycling lanes



CHALLENGES AHEAD

- Develop better data collection/editing tools and resources to more efficiently generate GTFS and OSM data and enhance scalability and sharing across cities (African public transport mapping summit)
- Move to REAL TIME and apps for public transport operators and cities to improve operations and service/Crowdsource passenger input/feedback
- Support open transport data, portals and institutional systems to encourage transparency, independent analysis and tech innovation
- Analyze new data generated for better network and accessibility analysis
- Explore which forms of passenger information most effective for different groups including the poor and the impacts of more information (Shaheen et al; 2016)
- Convince those that finance transport infrastructure across the globe to support tech innovation to fill the data gap for public transit- accountability, equity and sustainability issue