## digital **matatus**









GROUPSHOT



#### 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.



# From Outdated Paper Records to Digital Data!

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	Ciecular within CBD	Muthurwa- Globe Cinema Roundabout (via Haile Selaasie 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	Cerular within CBD	Muthurwa – Community (via Haile Selassie Avenue and Ngong road) Globe Cimema 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*	Kemarock	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



#### Theory of Change: Data as a Lever to Promote Public Transport Improvements

DIY, COLLABORATIVE DATA COLLECTION

DEVELOP OPEN DATA

# 

CHANGE

USER/PLANNING APPS AND INFO

TRANSPORT MODELS

PUBLIC TRANSIT VISIBLE

INNOVATION

IN (GTFS) STANDARD FORMAT

ONLINE AND PAPER INFORMATION FOR ADVOCACY

#### **EMPOWERED USERS, PLANNERS, RESEARCHERS, OPERATORS**

## Sample Base Data on One Route: Part of a GTFS Data Set

LORESHO

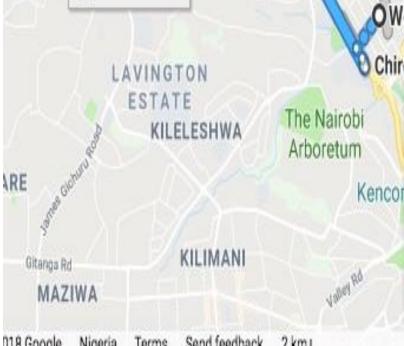
Sigiria -Irura Forest

HIG



VU 🛈

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

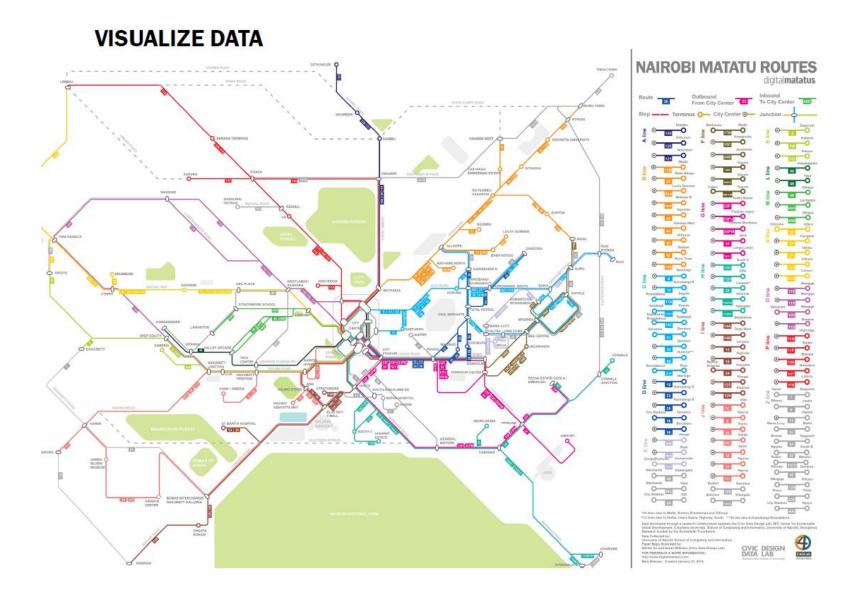


🔒 1 h 10 min

#### New Planning Tools to See System...

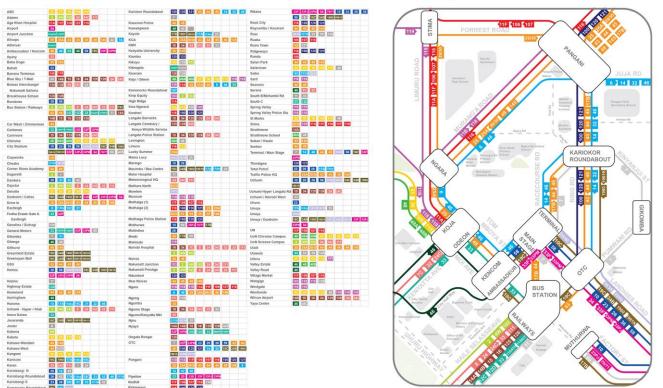


#### New Ways to See the System



## **Network** Analysis and Design

MATATU STATION LIST



**CITY CENTRE** 

Disorganized transit systems "planned" by the actions of many private actors do naturally evolve certain forms of efficiency, but they do not naturally evolve into the *most* efficient and productive network for the whole city. That final push into coherence requires <u>network design</u>! Jarett Walker 2014

## Measuring Access to Services

Table 4.3: Number and share of Nairobi City County's population with access to public services within 30 minutes, walking or by matatu

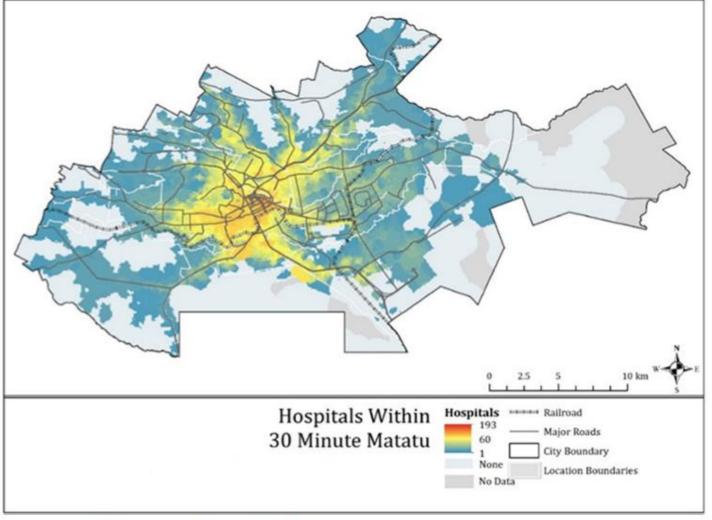
Destination	30-minute walk		30 minutes by matatu	
	Population with access	Share (%)	Population with access	Share (%)
Hospitals	2,955,473	74.8	3,387,962	85.7
Schools	3,335,202	84.4	3,942,722	99.8
Existing park	2,528,747	64.0	3,193,028	80.8
Proposed park	3,528,392	89.3	3,743,169	94.7

Source: Hospital locations, Google Maps; park and school locations, Columbia University CSUD (2005); population density, WorldPop; 30-minute accessibility calculated by Conveyal.

#### Kenya Urbanization Review World Bank 2016

## Access to Hospitals (World Bank 2016)

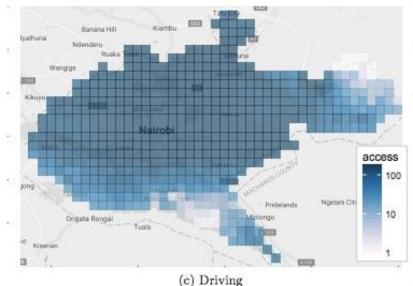
#### Figure 4.21: Hospitals within a 30-minute matatu ride



Source: Google Maps; Conveyal; OpenStreetMap.

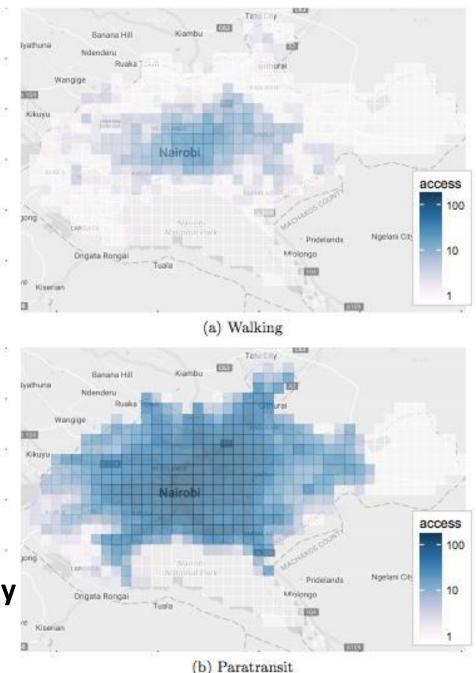
#### Figure 3: Access to Health

## Comparing Place Accessibility

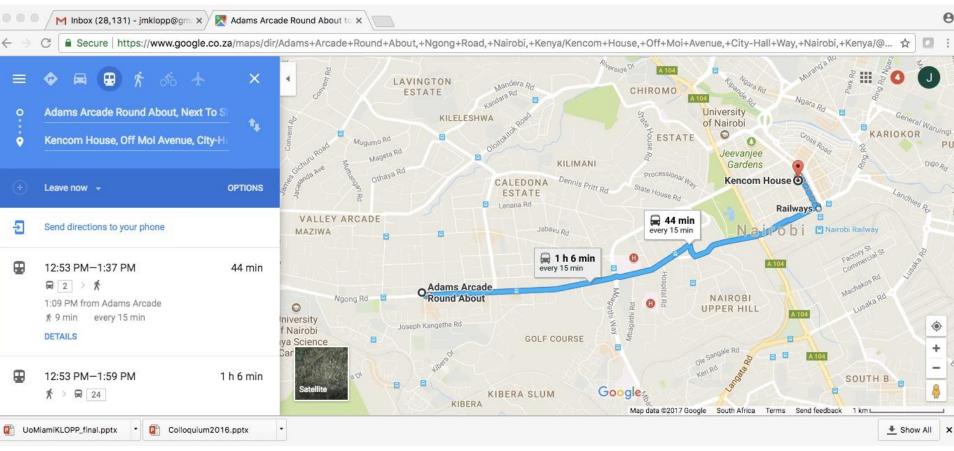


#### Campbell, Rising, Klopp and Mwikali 2018

Need to integrate fares, quality of service indicators etc...



#### Nairobi's Matatus on Google Maps: New Passenger Services

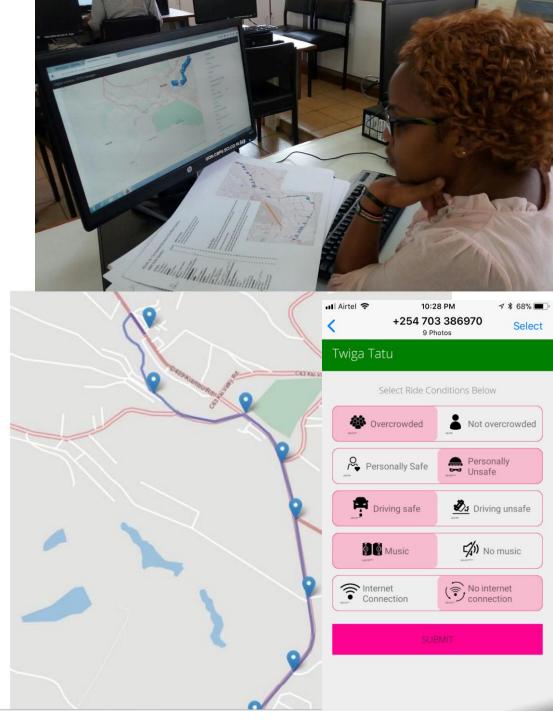


#### Accessibility is also about information. Increases public transport use? Helps business?

## Open Source Tools for Updating, Adding Data

ROUTE: 100 - O.T.C-Pangani-Muthaiga Roundabout-Kiambu Road-Kiambu Institute-Kiambu DIRECTION: Kaka

STOPS:		
Kiambu Bus Terminus	Y	N
Old Kiambu	Y	N
Kwa Do/Kiambu-Limuru Road Junction/Red Nova	Y	N
Kirigiti	Y	N
Kist	Y	N
5 Star Estate	Y	N
Mushroom	Y	N
Thindigwa	Y	N
Diamond Flats	Y	N
Brentwood Hotel	Y	N
Balkan Sec School	Y	N
Kwaheri Flyover	Y	N
Githogoro	Y	N
Runda Junction	Y	N
Nakumatt Ridgeways	Y	N
Ridgeway Springs	Y	N
Wonderjoy	Y	N
Rock City	Y	N
Shark'S Palace	Y	N
Cid	Y	N



### **New Data Driven Public Policy Dialogue**



To Improve African Public Transport Systems Collaboratively with Drivers, Operators, Users

# digital matatus

Collaborative Mapping for Public Transit Everywhere

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