Navigating data scarcity to mainstream accessibility analyses in Africa

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Objectives

- Compute accessibility to employment in 11 Africa cities
  - Bamako, Cape Town, Conakry, Dakar, Dar Es Salaam, Douala, Harare, Kampala, Kigali, Lusaka, Nairobi.
- Create metrics and visuals to compare accessibility across cities
- Create a range of datasets that can be re-used
  - To engage with clients
  - To investigate the impacts of land use planning/changes and transport investments through counterfactuals
- Investigate the impacts of disruption from natural hazards
Why Accessibility matters

1/ At the aggregate urban level
- Long commuting time
- Lack of positive spatial spillover

2/ At the household level
- High job searching costs
- Become inactive labor force

HH/locational factors

- Long distance from jobs
- Transport not reached (network); not reliable (congestion); not affordable.
- Geographic/environmental constraints (hills, slums, etc).

2/ Aslund, Osth and Zenou (2010), Jin and Paulsen (2017), Franklin (2015), Chen et al. (2017), Norman et al. (2017),…

Low job accessibility

Lower labor productivity

Low income = Poverty

Lower chance of finding good jobs
Accessibility – a simple and powerful metric
Accessibility – getting around data scarcity

People

Transport

Jobs

OK

Getting there

Problem
Building proxies for the distribution of employment opportunities

Using Open Source data to proxy for the location of jobs and inform urban planning and transport policies for accessibility

Extracting amenities, points of interest, road intersections, transportation hubs... from OSM and Google Maps

Using these data to proxy for the location of jobs. An 80% correlation in Greater Kampala with business registries

Avner et al., 2019, “Rapid Appraisal Methodology to determine Employment Opportunity Areas in African Cities”, World Bank, draft
Distribution of employment opportunities
Distribution of accessibility and population

Bamako

Douala

Kampala

Nairobi

Note: Height is accessibility level and color is population density
Average accessibility across cities
Capturing inequality in access

- **Average accessibility** only tells us one side of the story...

- Capturing how **equally/unequally distributed accessibility levels are** in the urban area shows another important dimension

- The use of classic inequality metrics applied to the spatial distribution of accessibility levels: **Lorenz curves and Gini coefficients**
The impact of floods on accessibility to services

Road segments affected by a flood with a 50 year return period in Kampala
The impact of floods on accessibility to services

a. Mean travel times from locations in all of Inner Kampala to healthcare facilities

Hallegatte et al. 2019
Lifelines. The Resilient Infrastructure Opportunity
Conclusions

- An initial benchmark for accessibility in Africa cities: Equal, Unequal and In between cities
- The basis to look at counterfactual scenarios of land use changes and transport investments
- ... And the basis to look at the impact of disruptions from natural hazards on accessibility to jobs and services. And to prioritize interventions!
- Freely re-usable sets of data
  - Employment Opportunity Areas (all 11 cities)
  - Transport GTFS data for (Douala, Harare, Nairobi, Kigali...)