Leveraging Urban Mobility Strategies to Improve Accessibility and Productivity of Cities

Aiga Stokenberga
World Bank

GPSC African Regional Workshop
May 15, 2018
Roadmap

1. Africa’s urbanization and its promise (and challenge)
2. Urban transport investment as a poverty reduction strategy
   - Direct pathway
   - Indirect pathways
3. Leveraging transport systems to improve mobility and accessibility: the evidence
4. Integrated transport and land use planning to further improve accessibility and productivity
1. Africa’s urbanization and its promise (and challenge)
AFRICA’S URBANIZATION AND ITS PROMISE (AND CHALLENGE)

- Travel time to the nearest city in many parts of SSA continue to exceed 5 hours.
- Densities in many countries remain very low, with a few urban centers concentrating increasingly large populations.
- Urbanization as a pathway out of poverty and to access to opportunities.
- Most viable opportunities for economic diversification will be found in cities, but their success will require that cities function efficiently.

Urban areas in Africa comprise **472 million** people. The largest cities grow at **4%** annually. **160 million** additional jobs need to be created in African cities by 2030. **2/3** of urbanization is yet to happen – need to ensure it is productive.
AFRICA’S URBANIZATION AND ITS PROMISE (AND CHALLENGE)

Congestion and lack of efficient transport options have a very direct impact on city productivity: time and money are wasted that could be spent on productive activities. Impacts of congestion worse in developing mega-cities, as they represent a major share of national output.

In many cities it takes 1–2 h to reach the CBD from the surrounding suburbs by means of motorized transport.

Waiting times at minibus terminals reach at 15–30 min.

Transport costs take a large share - 10–40% - of household income.

Many cities lack data on the mobility patterns and transport demands of their residents, efficient planning tools, and data on their transport systems – this is the starting point for improving accessibility.
Productivity in African cities constrained by 3 features:

**Crowded** — the costs of congestion overwhelm the benefits of urban concentration.

**Disconnected** — preventing firms from reaping scale and agglomeration benefits.

In 2000–2010, between 46 and 77% of new development in African cities occurred as outward expansion.

A 1% increase in spatial fragmentation $\rightarrow$ 12% increase in urban costs.

**Costly** — deter investors, reduce expected returns on investment.

City dwellers pay around 42% more for transport in Africa than in low-income and middle-income countries elsewhere.

Lack of affordable, mass transit options limits residents’ access to jobs.

African cities are 20% more spatially fragmented than Asian and Latin American ones, limiting economies of scale and agglomeration economies.
AFRICA’S URBANIZATION AND ITS PROMISE (AND CHALLENGE)

Tro-tro informal bus system mapped using smart phone technology

Source: Cheng et al. 2017

Source: AFD
How can African cities become economically dense?

How can they attract firms and skilled workers?

- **Economic density**
  - Support clusters of firms and increase connectivity among workers

- **Livability**
  - Make cities more livable for poor and middle class residents, by providing affordable services.

**Theory of Change?**

Source: Africa’s Cities: Opening Door to the World (2017)
Transport investment as a strong signal to investors/developers to overcome coordination failures...

... increasing the city’s ‘effective density’ (firms, workers economically closer)

But, while tradable sectors benefit from agglomeration economies, non-tradable sectors are limited by the size of local markets.

Transport cannot do it alone – well functioning land markets key
2. Urban transport investment as a poverty reduction strategy

- **Direct pathway**: improved accessibility
- **Indirect pathways**: economic growth, reduced externalities
What we DO know:

Urban poor generally live on city peripheries

Difficult to access public services and economic opportunities located in city center

May be particularly damaging for women’s employment potential and wages

May affect the decision to participate in the formal employment market in the first place.
URBAN TRANSPORT INVESTMENT AS A POVERTY REDUCTION STRATEGY: DIRECT PATHWAY

1. **Jobs and income**: generated through the planning and construction of transport projects

2. **Improved ability to access employment opportunities and services** as a result of better connectivity and personal mobility

**Economic**
- Broadening the access of employers to a pool of qualified labor
- Improved accessibility to jobs for employment seekers

**Social**
- Improved access to jobs and services for disadvantaged population groups

**Improved UT can address key market failures:**
- Lack of access to information about job openings due to poor transportation access
- Even if information flows are not impeded, inability to take jobs due to transportation barriers
1. **Economic growth and land use change stimulated by improved accessibility:** attraction of investment; increased markets; local economic development; reduced prices of final goods and services.

2. **Productivity improvements due to reduced air pollution:**
   - Ill health due to pollution found to translate into negative effects on labor, as caregivers, usually women, devote more time caring for sick relatives.
   - Reduction in income due to pollution-related health impacts can spell disaster for those with little savings or insecure jobs.

3. **Reduced expenditures on energy:** freed up public and private resources to make productive investments; high-quality urban transport systems play a key role in preserving urban densities.
3. Leveraging transport systems to improve mobility and accessibility: the evidence
Bus Rapid Transit in Dar es Salaam, Tanzania
LEVERAGING TRANSPORT SYSTEMS TO IMPROVE MOBILITY AND ACCESSIBILITY: THE EVIDENCE

Existing BRT systems in Africa: Cape Town, Johannesburg, Dar es Salaam, Lagos
59% of the city’s jobs accessible within 1 h of commute in public transit, compared to 52% in the baseline scenario.

For the poor, the increase will be from 46% to 51%.

The share of people able to access the CBD in 1 hour will increase from 57% to 69%.
LEVERAGING TRANSPORT SYSTEMS TO IMPROVE MOBILITY AND ACCESSIBILITY: THE EVIDENCE

With the entire investment in the BRT network, the number of people who will be able to access the center of the city in 1 h using PT to increase from 42% to 73%.

Implementation of a BRT in Kigali could increase accessibility to employment opportunities by as much as 75% in some areas.

Estimated impact of the Dar es Salaam BRT on Accessibility to CBD

Source: World Bank staff simulation through the OTPA tool developed by the World Bank.
Reduction in travel times as a result of BRT are remarkable...

... but productivity gains and increase in economic activity are observed also in relation to road construction and paving (in Dar es Salaam, Nairobi, Kigali, and Addis)
4. Integrated transport and land use planning to further improve accessibility and productivity
INTEGRATING TRANSPORT AND LAND USE PLANNING TO FURTHER IMPROVE ACCESSIBILITY AND PRODUCTIVITY

A significant increase in average job accessibility can be achieved when complementary policies are combined:

- **Densification** at high levels around transit stations (“TOD”)

- **Multimodality** that includes non-motorized transport (“last mile”)

---

**Accessibility to Jobs in Zhengzhou in 45 minutes**

- **a. Metro lines 1, 2, 3 and walking**
  - 12% of jobs accessible

- **b. Scenario a. + buses**
  - 28% of jobs accessible

- **c. Scenario b. + TOD**
  - 39% of jobs accessible

- **d. Scenario c. + bicycle access**
  - 46% of jobs accessible

Source of Zhengzhou results: Li et al (2016)
INTEGRATING TRANSPORT AND LAND USE PLANNING TO FURTHER IMPROVE ACCESSIBILITY AND PRODUCTIVITY

In developed cities with high-quality transit, > 1/3 of all jobs are within 500 m of a transit stop.... .... ensuring a high and predictable ridership base for their PT systems.

![Circle chart showing job accessibility in Hong Kong and New York.](source: WRI/ World Bank)
TOD channels growth and market activity to areas well connected by transit.

When commercial and retail businesses are clustered around transit stations, they can benefit from agglomeration economies.

Local economic development:

TOD maximizes access to transit and reduces transport costs for residents, who can spend the money on local goods and services instead; this creates a positive cycle of reinvestment in the local economy.

Source: WRI/ World Bank
INTEGRATING TRANSPORT AND LAND USE PLANNING TO FURTHER IMPROVE ACCESSIBILITY AND PRODUCTIVITY

Affordability needs to be part of the equation.

Creation of transit corridors can connect low-income populations to employment and public services...

... but if affordable housing is not preserved or created, low-income populations may be displaced away from opportunities

Sequencing is also key: consider the relation of new transport systems and industrial zones.

Area around the Gangding station, in Guangzhou, before and after construction of the BRT system

Source: Suzuki Cervero, and Luchi 2013
Thank you