The contribution of Urban Para-transit Mapping to Road Safety

Elleni Ashebir, Cities & Urban Mobility Program Manager
WRI Ross Centre for Sustainable Cites Africa

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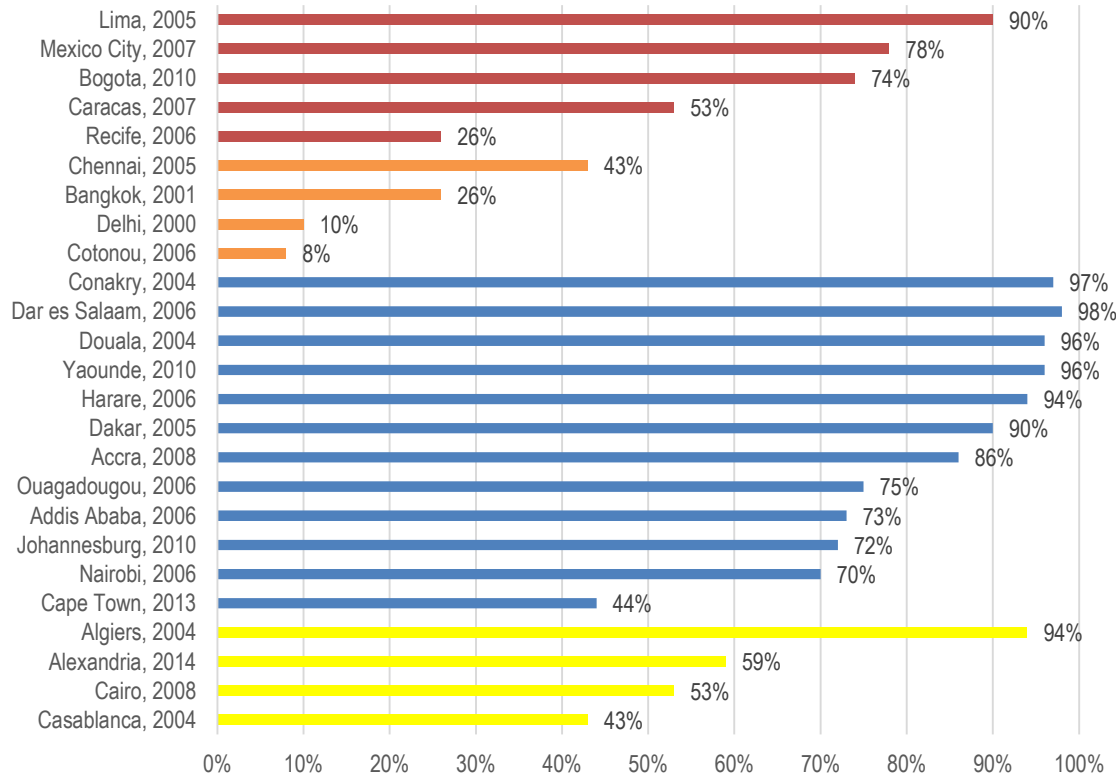25 November 2019, Vic Falls, Zimbabwe

CITIES IN THE GLOBAL SOUTH FACE THEIR OWN SET OF CHALLENGES

- **Up to 95%** all public transport trips are paratransit in some African and Latin American cities;

- **1.35+ million people** die in road crashes annually, **90%** in the global south;

- **Up to 10% of GDP** Value of time lost in **congestion** in Beijing and Sao Paulo

- **50-97%** portion of motorized, two-wheelers in cities in Asia

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Paratransit as share of collective transit

City	%
Lima, 2005	90%
Mexico City, 2007	78%
Bogota, 2010	74%
Caracas, 2007	53%
Recife, 2006	26%
Chennai, 2005	43%
Bangkok, 2001	26%
Delhi, 2000	10%
Cotonou, 2006	8%
Conakry, 2004	97%
Dar es Salaam, 2006	98%
Douala, 2004	96%
Yaounde, 2010	96%
Harare, 2006	94%
Dakar, 2005	90%
Accra, 2008	86%
Ouagadougou, 2006	75%
Addis Ababa, 2006	73%
Johannesburg, 2010	72%
Nairobi, 2006	70%
Cape Town, 2013	44%
Algiers, 2004	94%
Alexandria, 2014	59%
Cairo, 2008	53%
Casablanca, 2004	43%

'Paratransit' refers to demand-driven, often unscheduled and flexible public transport services provided by small operators, in small to medium-sized motorized or non-motorized vehicles, generally under the lack of effective regulatory frameworks.

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PARATRANSIT

Downside
- Unorganized (individual or small) owner-operators
- Small, aging and polluting vehicles
- Highly competitive market with little differentiation
- Low quality of services
- Vehicle safety concerns

Upside

- Extensive and demand responsive coverage
- Flexible schedules, with higher frequencies during peak periods, flexible curbside pick-up and drop-offs
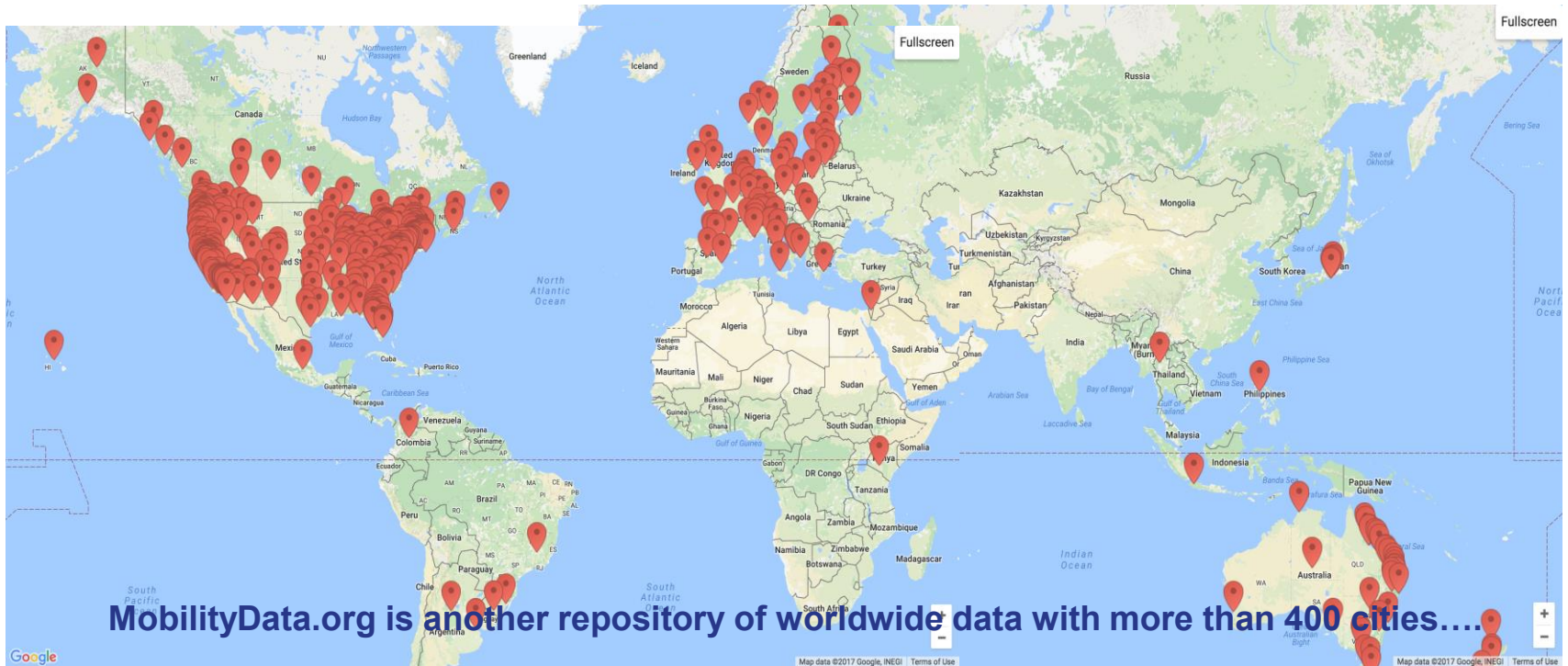- Affordable

THE CASE OF ADDIS ABABA

Fatal and injured victim						
Casual vehicle type	Pedestrian	Passenger of vehicle	Driver of vehicle	Cyclist	Motorcyclist	Total
Automobile	513	85	50	3	19	670
Bajaj	109	103	12	0	2	226
Bicycle	33	1	0	3	1	38
Bus	72	26	3	0	1	102
Construction machine	6	0	1	0	0	7
Lada	49	7	2	0	3	61
Light truck	239	69	23	1	5	337
Minibus	542	131	26	2	12	713
Motorcycle	149	7	7	0	42	205
Truck	115	37	19	1	6	179
other	7	0	0	0	0	7
	1834	466	143	9	91	2545

Fig 25: Deaths and injuries by causal vehicles

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DATA-DIVIDE BETWEEN GLOBAL NORTH AND SOUTH CITIES

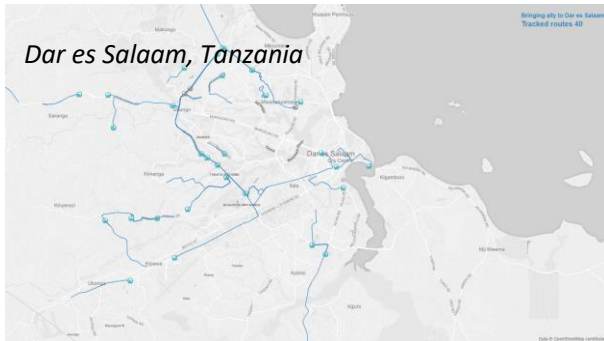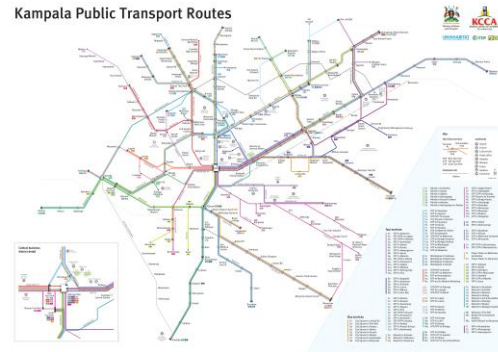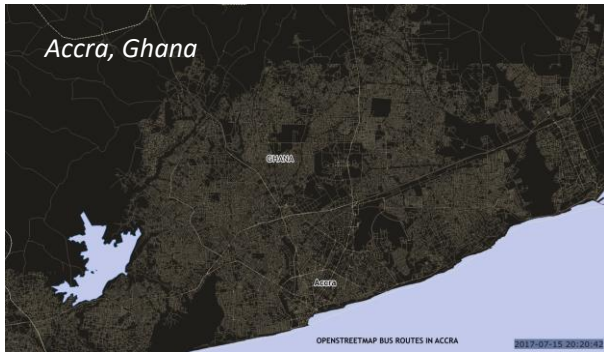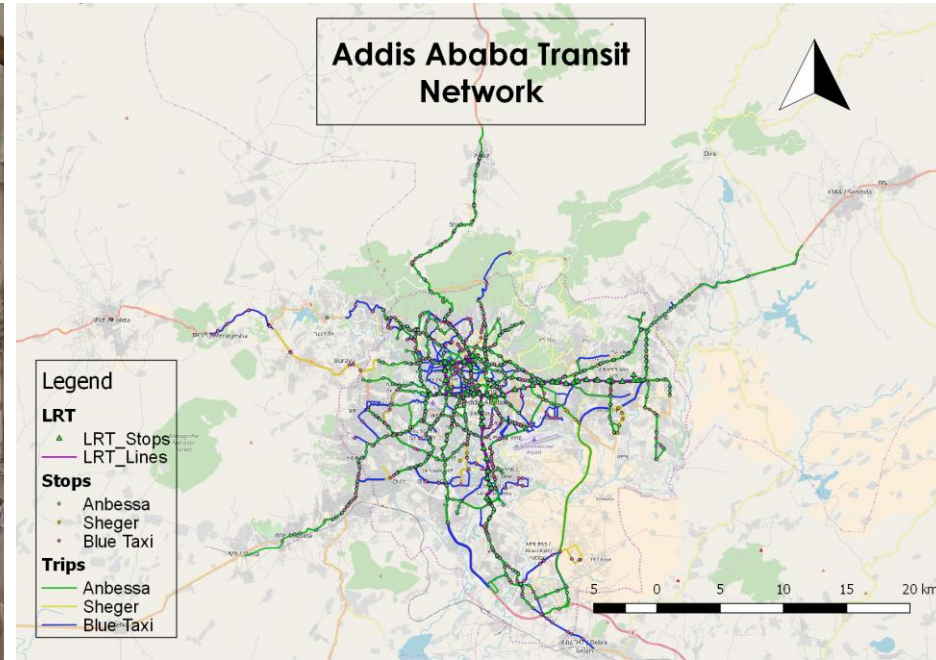MobilityData.org is another repository of worldwide data with more than 400 cities....

Source: Google

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PUTTING TRANSIT ON THE MAP

Accra, Ghana

Dar es Salaam, Tanzania

Kampala Public Transport Routes

Nairobi, Kenya

NAIROBI MATATU ROUTES

Cape Town, South Africa

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https://digitaltransport4africa.org/

Work with government, private sector and civil society actors to map city transit networks and foster ecosystems and skills that enable cities to leverage data for critical transport improvements

Creation : Fabrique des Mobilités I Management : WRI & AFD

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PLATFORM FOR LEARNING AND SHARING

Create

Whether you are creating a map for your city's public transport network or designing data-driven mobility solutions, Digital Transport can help connect you to the data and tools you need to get started.

T Tools
Group ID: 38

https://git.digitaltransport4africa.org/learn/tools

Choose the right tools for collecting, analyzing, editing, and visualizing your city's GTFS data

Subgroups and projects | Shared projects | Archived projects | Search by name | Last created

P **public-transit-tools**
Tools for working with GTFS public transit data in ArcGIS
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S **static-GTFS-manager**
GUI interface for creating, editing, exporting of static GTFS data for a public tran...
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A **Awesome GTFS Tools**
Comprehensive list of GTFS tools from the Center of Urban Transportation Resea...
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D Data
Group ID: 3

https://digitaltransport4africa.org/

Access GTFS and other transit data

Subgroups and projects | Shared projects | Archived projects | Search by name | Last created

Africa
Transit data from cities around Africa
📁 0 🔖 7 👥 0

Latin America
Transit data from cities around South and Central America and the Caribbean
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Community blog
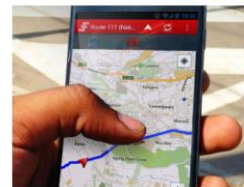
10 Mobile Apps to Start Mapping your City's Transit Network

🕐 27 March 2019 ♡ 0 💬 0

By Lily Bui and Griffin Kantz, 3/29/2019 When you first start out collecting, analyzing, editing, and visualizing GTFS data, the landscape of available tools can be [...]

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DIGITAL MAPPING FOR INNOVATION, INTEGRATION AND CITY PLANNING

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A REGIONAL CONVENING MECHANISM AND SPRINGBOARD

Sustainable Development Goal measurement:
Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities
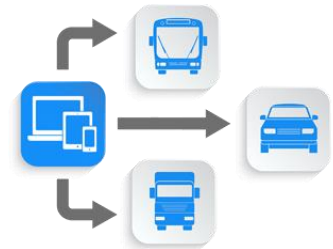

Mobility planning:
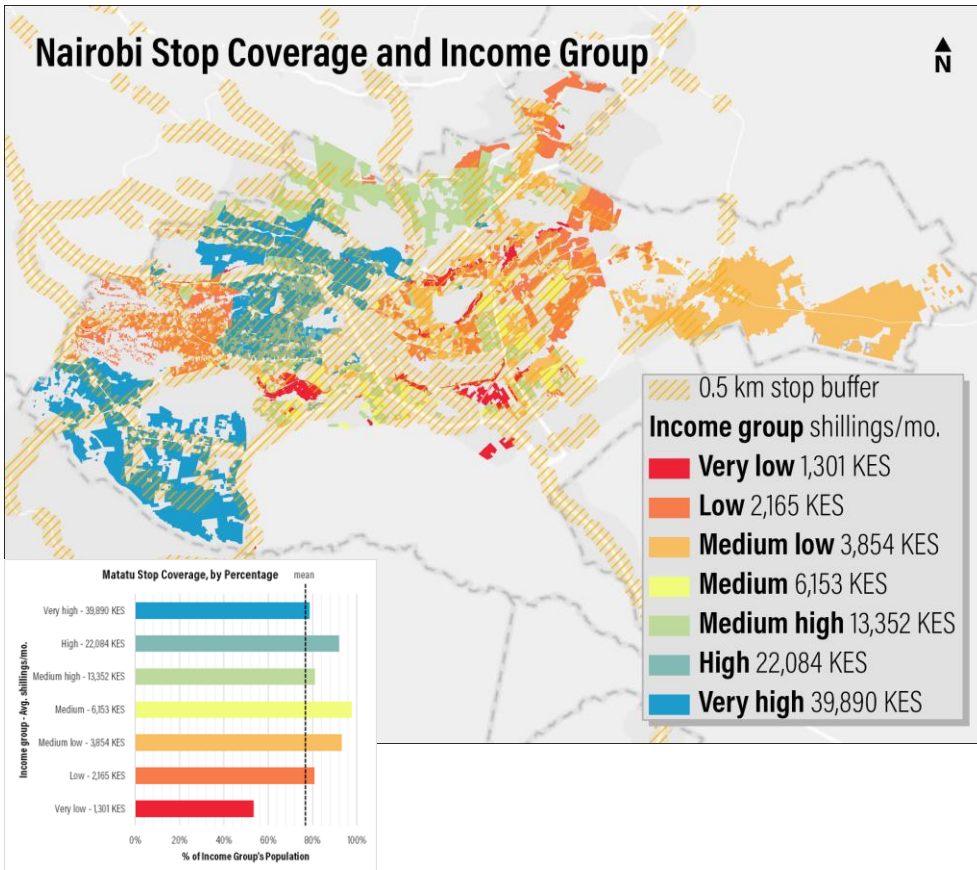Integration with BRT and paratransit reform

Transit user experience improvements: Improving accessibility through route planning and real-time

Enterprises: A new form of integration evolving
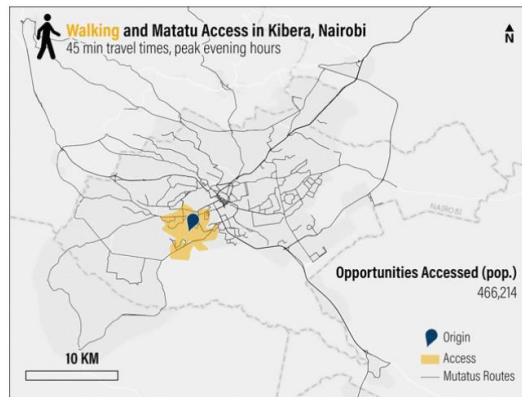
SUSTAINABLE DEVELOPMENT GOALS: TRANSIT ACCESS BY INCOME

Including land use data reveals income groups' varying levels of access to matatu stops.

In Nairobi:

- **1.1 million** *low* (2,165 KES/mo) and *very low* (1,301 KES/mo) income residents live within 0.5 km of a matatu stop.

- **876 thousand** *medium low* (3,854 KES/mo), *medium* (6,153 KES/mo), and *medium high* (13,352 KES/mo) income residents live within 0.5 km of a matatu stop.

- **222 thousand** *high* (22,084 KES/mo) and *very high* (39,890 KES/mo) income residents live within 0.5 km of a matatu stop.

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ACCESS TO JOBS IN NAIROBI'S LARGEST SLUM USING DIFFERENT TRANSIT MODES

In Kibera, **466 thousand opportunities** can be accessed by walking to matatus stops within 45 minutes total travel time.

Integrating matatus with cycling and motor-cycle taxis have the potential to greatly increase accessibility.
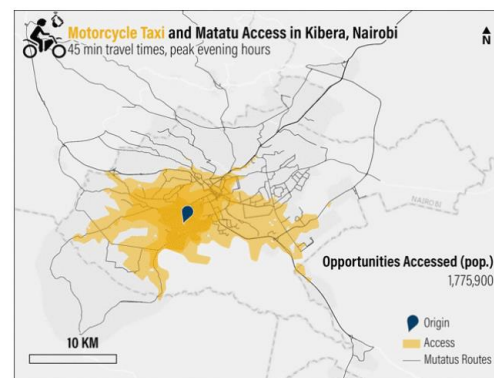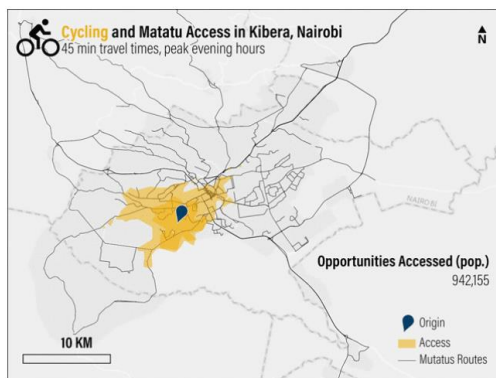
By connecting to matatus via cycling and motor-taxis during the first-/last-mile, we see the number of **accessed opportunities increase to 942 thousand and 1.78 million**, respectively. That said, the modal share for cycling is relatively low (only 3%). Though motorcycle-taxis, also called *boda-boda,* are faster than matatus, they are more expensive and generally cost-prohibitive to low-income users.

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PUBLIC TRANSPORT AS A SAFE MODE OF TRANSPORT

Figure 1 VKT on urban roads and traffic fatality rate, US states, 2008

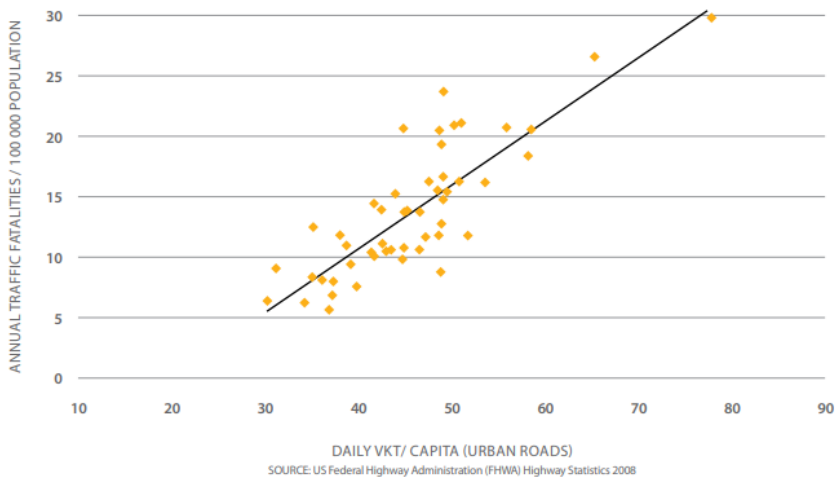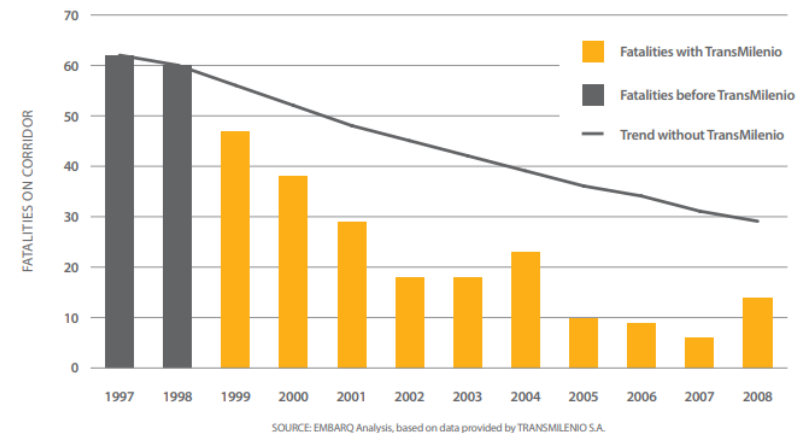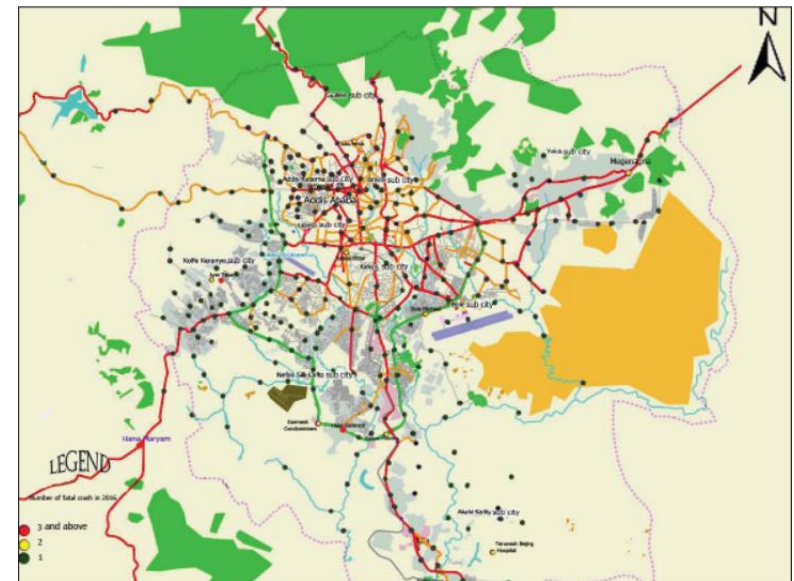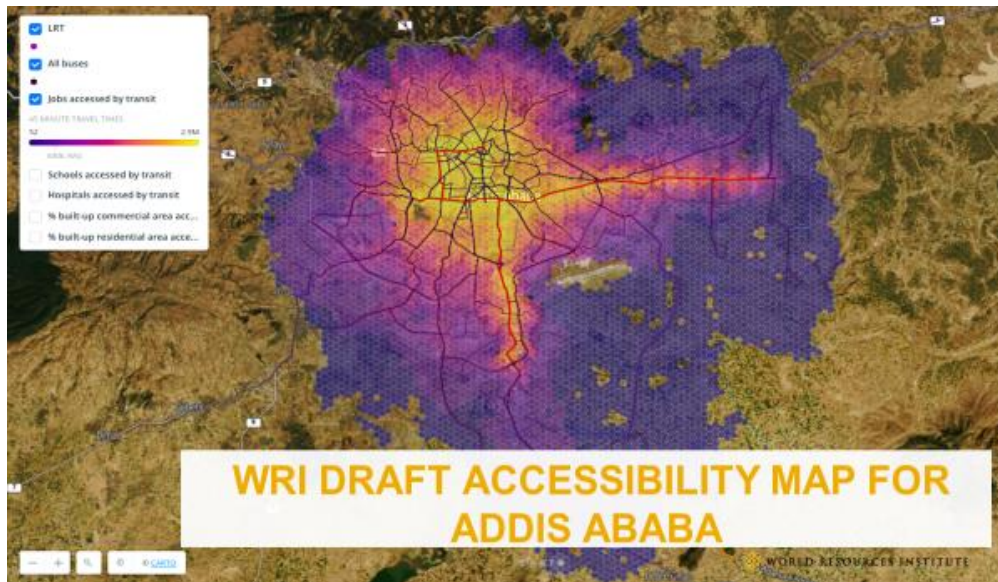SOURCE: US Federal Highway Administration (FHWA) Highway Statistics 2008

Figure 2 Reported traffic fatalities on Avenida Caracas (first TransMilenio BRT corridor) in Bogotá, before and after the implementation of the BRT

SOURCE: EMBARQ Analysis, based on data provided by TRANSMILENIO S.A.

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ACCESSIBILITY & SAFETY ANALYSIS

WRI DRAFT ACCESSIBILITY MAP FOR ADDIS ABABA

- **Accessibility and Safety:** Using mapping to understand where public transit stops are located and targeting road safety measures to enhance accessibility to station areas.

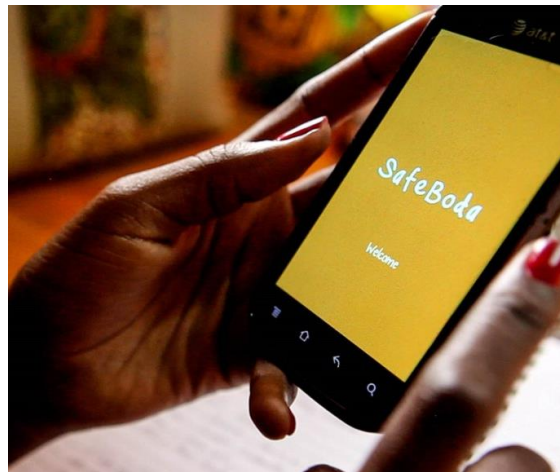- **Transit physical integration**: use the maps to enhance integration between routes and modes,

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...to improve minibus and 'informal'sector

SafeBoda, motorcycle taxis in Kampala, Uganda

Ubi interactive kiosks in Maputo, Mozambique provide information on transport schedules, specific locations as well as events happening in the city.
Source: Klopp (2018); http://ubi.co.mz/en/about/; SafeBoda; GoMetro
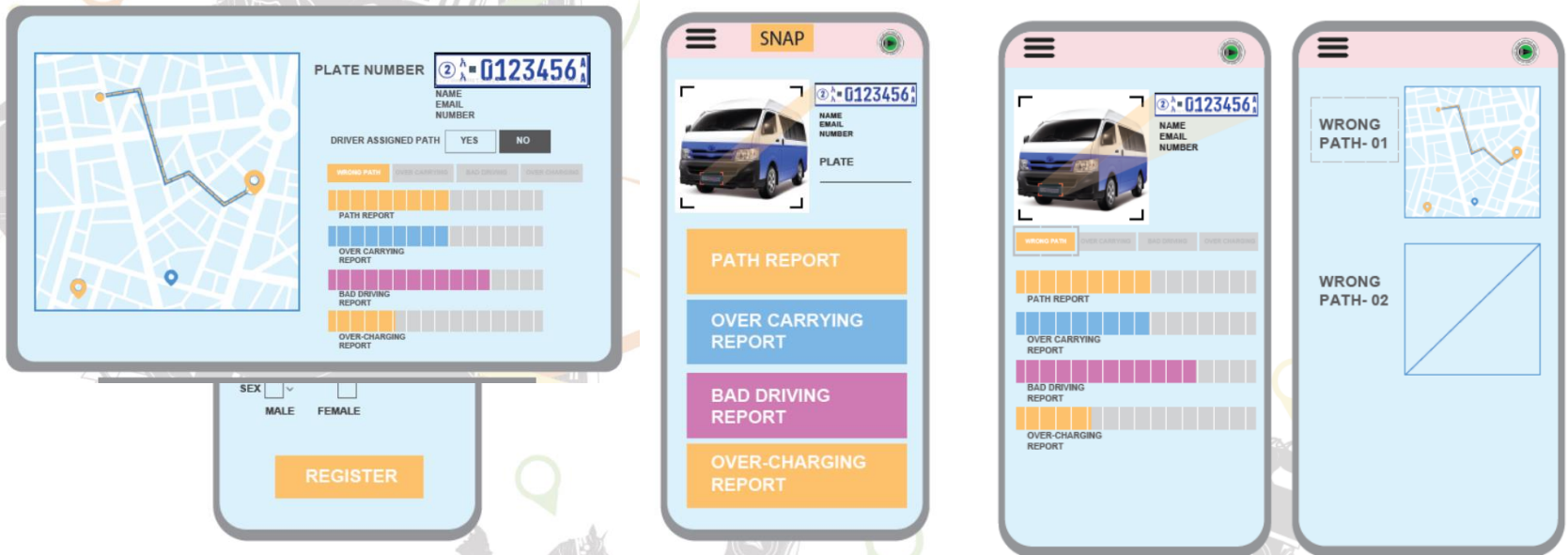
"I usually work late in Bukuto. If I know a SafeBoda can pick me up [from work] it makes my life easier. I [used to] end up sleeping at work for safety."—a female SafeBoda user.
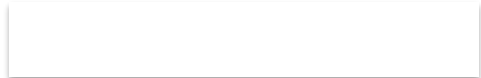
GoMetro, a mobile transit info app that provides users with bus information to improve commuting experience

NEW FORMS OF INTEGRATION

- Safe & Accessible Paratransit
- Community regulation of paratransit services
- Shared minibus Ride

Thank you for your attention

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