Intervention Summary

The project is intended to implement a 25km BRT service from JKIA (Airport) through the CBD to the western side of the city. The objective is to reduce congestion, improve mobility and access to services.
Evaluation Questions

• What is the impact of the BRT (Ndovu Line) along the A104 corridor on:
  (i) Access to employment and services?
  (ii) Location of economic activities?
  (iii) Land use and land values?

• How can we induce modal shift amongst pedestrians, car users and matatu (mini bus) users?

• Two experimental designs for the two categories of users
Evaluation Design (RCT 1)

- **Pedestrians**: Intervention – fare subsidy
- Influence: price
- Treatment group 1: high subsidy (300)
- Treatment group 2: medium subsidy (300)
- Treatment group 3: low subsidy (300)
- Control group: no subsidy (300)

Testing causal impact of prices on modal shift among pedestrians, and subsequent economic outcomes
Evaluation Design (RCT 2)

- **Car and Matatu users**: Intervention – information
- **Influences**: speed, reliability
- **Treatment group**: receive morning phone texts with travel time info on both modes (BRT and car/Matatu) - sample size (1000)
- **Control group**: no information provided – sample size (1000)

Testing causal impact of information to car users and matatu on modal shift and economic outcomes
Data collection

1. Household survey
   – Household characteristics
   – Household location
   – Job location
   – Commuting time
   – Mode of transport

2. Cell phone surveys
Implementation Timeline

- Two waves of survey work – baseline and follow up:
  (i) Implement experiments within a defined time window (say 6 months) before start of the BRT
  (ii) Same experiments 6 months after start of BRT
- Frequent cellular contacts to determine monthly changes in commuter patterns and jobs
Presentation ends here
Impact Evaluation of Dar es Salaam Bus Rapid Transit (BRT) System
Tanzania
June 25, 2015
Intervention Summary

Development Objective: “To support Tanzania’s economic growth by providing enhanced urban transport facilities that are reliable and cost effective”
Components to be Evaluated:

- Phase 1 of a Bus Rapid Transit system in Dar es Salaam (DART System phase 1)
- Accompanying activities:
  - protect the poor from displacement and expropriation due to rising land values and/or speculation
  - manage public expectations and head off conflict with existing service providers (daladalas)
- Evaluate BRT expansion in Phases 2-6
Evaluation Questions

Primary Question:

[P1] Can improving public transportation via a DART system

- Reduce travel times and increase urban mobility?
- Increase employment and growth by reducing job search costs and raising worker and firm productivity?
- Increase inter-firm trade and competition between markets?
- Improve air quality by displacing polluting vehicles, reducing private vehicle use and lowering vehicle idle time?
- Increase road safety, via fewer vehicles and better roads?
- Improve individual welfare, by increasing commuter income, health, leisure consumption, and property values?
Secondary Questions:

[S1] Can short-term incentives (1 week free BRT travel) nudge people into regularly using public transport?

[S2] Can access to land/residential license/title protect poor homeowners from displacement and expropriation by speculators?

[S3] Can rent subsidies protect the poor from displacement?
Evaluation Design

Improving public transport:

Two strategies:

1. Difference-in-Differences

2. Randomized Controlled Trial
Strategy 1:
1. Difference-in-Differences
   - Compare “control” individuals (for whom travel route via BRT is equivalent to route via *daladala*) to “treatment” individuals (whose travel routes are affected)
   - Use variation in treatment intensity (proximity to BRT terminal) to identify treatment effects
1. Difference-in-Differences

All locations 1 hr travel time from central Dar

1 hour w/ daladala

Before BRT is introduced

Control

Treatment
1. Difference-in-Differences

All locations 1 hr travel time from central Dar

1 hour w/ daladala

45 mins w/ daladala

15 mins w/ BRT

Control

Treatment

After BRT is introduced
Strategy 2:

2. Randomized Controlled Trial
   - Encouragement design: offer randomly selected group of ~1000 commuters free BRT passes for one week
   - Measure outcomes (including sustained use/change in travel habits) before and periodically after, for an appropriate time to be decided
2. Randomized Controlled Trial
Evaluation Design

Protecting the poor

Problem: Poor homeowners/renters displaced due to rising rents/speculative land purchases

Two treatments:

1. Land titles
   - Finance purchase of land licenses/titles for 1,000 land/homeowners randomly selected from 500m band alongside BRT corridor
   - Provide information about expected future land values to discourage immediate land sales

2. Rent subsidy
   - Provide $10-40 monthly rent subsidy (using external funds) to offset expected rent increases for 1,000 renters randomly selected from 500m band alongside BRT corridor
Managing expectations

Problem: Public and daladala owners upset about disruption to regular commute, facing higher costs / reduced profits

Possible treatment: Public information campaign
- Provide information about travel time, safety, comfort
- Target randomly selected individuals using robocalls, text messages
- Possible variation: User testimonials about satisfaction with BRT
Sample and Data

• Existing data
    • Collected by DART Agency
    • Data on pre-BRT commute times for all planned phases
  – 2012 census
    • Information on demographics, land ownership, assets, firms

• Planned survey data collection
  – Baseline and follow-up data to be collected in and around planned BRT expansion areas
    • Will also be used as baseline for future expansion (Phases 2-6)
  – Outcomes include commute times, usage, willingness to pay, subjective satisfaction, demographics, income, employment, consumption, etc.
Thank you
Lima Metro Line 2
Peru
June 25, 2015
Objective: Improve accessibility and reduce emissions

Target population 2,261,804
Population in 13 districts 2,412,724
Travel demand per day 660,000
Evaluation Questions

First order questions:
• What is the impact of the metro line on:
  – accessibility (job, education, health)?
  – housing values?
  – on job generation in surrounding areas?
  – emissions and noise in surrounding areas?
  – on quality of life (income, assets, health, education)?

Second order questions:
• Impact on the demand of the metro and other outcomes of:
  – different information campaigns?
  – different levels or types of incentives?
  – different Transit Oriented Development Initiatives around stations?
Existing data

• **Household level data** (Baseline JICA 2011 O/D Travel Survey)
  – 22,700 households and 78,850 people
  – Assets, mobility patterns, education, employment, household composition, income, etc.

• **Housing values data** (Municipality cadastral and Capeco data)

• **Air quality data** (Cleaner Air Institutional Committee)
Data collection
Household survey sample

- **Step 1:** Stratified random sampling within predetermined bands around the metro corridors using JICA sample
- **Step 2:** Use matching methods to select the best control households, excluding those close to connections to the metro (aprox. 4000 households)
- **Step 3:** Collect panel data (every two years) on balanced (pre-matched) subsample, giving them ICT devices
Household survey sample

Matched ~ 1,300 Control Households (C)

Stratified Random sampling
~ 2,700 Treatment Households (T)
Evaluation Design

Phase 1:

• **Difference-in-Differences** estimation (Fixed effects regression)

Phase 2:

• **Experimental design**
  – Random promotion (information and/or incentives) to subset of treatment HHs
  – Evaluate the impact of the promotion per se

• **Instrumental variables**: Use the promotion as an IV to estimate the impact of using the metro
Timeline

2015 – Finalize Evaluation Design - Funds / Sampling Frame

2016 – Pilot Survey – Focus groups - Baseline

2017 – Random Promotion

2018 – 2\textsuperscript{nd} Survey

2020 – 3\textsuperscript{rd} Survey

2022 – 4\textsuperscript{th} Survey
That’s all folks!
Team and staffing

• Ministerio de Transportes y Comunicaciones y AATE
• World Bank, IDB, CAF
• External researchers
Budget

• **Surveys:** US$ 50 per HH, US$ 30 Data plan promotional, 4000 HHs: US$ 320,000 per wave

• **Number of Waves:** 4

• **Institutional strengthening:**

• **2 External Researchers:**

• **Staff time:**

• **Quality control:**
Rio de Janeiro: Enhancing Public Management for Service Delivery Project

Brazil

June 25, 2015
<table>
<thead>
<tr>
<th>Equipe</th>
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<tr>
<td>Roberto Motta (SETRANS)</td>
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<tr>
<td>Luis Gustavo Martins (SEASDH)</td>
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<td>Adriana Mota (SEASDH)</td>
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<td>Henrique Futuro (SETRANS)</td>
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<td>Kaio Marcio de Pava (SEASDH)</td>
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<td>Julio Nascimento (PUC-RJ)</td>
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<td>Washington Faustino (PUC-RJ)</td>
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Componentes a serem avaliados

Componente 1 - Transport subsidy targeting

Componente 2 - Gender segregated public transport

Componente 3 - Using Public Transport to Improve Women's Access to GBV Services

• What are the relevant constraints to seek access to GBV-targeted public services?

• Is information on the types of violations and services offered sufficient or are there other barriers like fear of retaliation, transportation, etc.? The assessment of potential barriers will feed into the design of an IE to test how to overcome these additional barriers.
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Component 1: Intervention Summary

- Objective: Target the Single Fare Policy (Bilhete Unico Intermunicipal-BUI): Key social program of the State: 1 million trips per day

- Components to be evaluated:
  - Inter-municipal transport service (Suburban rail, ferries, long haul buses)
Evaluation Questions

• Is the subsidy policy benefiting those who need it the most?

• Does the subsidy have an impact on the income of those who benefit?
  – How do impacts differ by gender, education and other characteristics, and how can this help improve targeting?

• What other benefits could be obtained by changing the subsidy rules?
  – To increase impact on incomes
  – To reduce social costs (congestion, CO2 emissions)
Evaluation Design

• Natural experiment – using change time window for transport subsidy change
• Treatment group: Live far enough away to be affected by this change
• Control group: people who are indifferent to change
Sample and Data

• Main Data:
  – Fare card data from users

• Survey

• Additional Data
  – Micro data from urban transport master plan
  – Origin-Destination Survey results
Timeline

• Confirm data availability: July 2015
• Review additional sources of data: July-August 2015
• Prepare detailed concept: September 2015
• First mission: October 2015
• Implementation: October 2015-2016
Componente 2: Intervenção

Vagão exclusivo no Sistema de Trem e Metro:

• Um grande número de mulheres sofrem assédio no transporte público, gerando a necessidade de uma política que possa garantir a segurança das passageiras durante o seu deslocamento.

• Lei 4733/2006: As empresas que administram o sistema ferroviário e metroviário no Estado do Rio de Janeiro ficam obrigadas a destinarem vagões exclusivamente para mulheres.
Vagão Rosa

Horário 6h – 9h  17h – 20h
Pergunta de Pesquisa

Qual a efetividade da política pública de vagão exclusivo para mulheres na redução da sua vulnerabilidade ao assédio nos transportes urbanos?
Desenho da Avaliação

Horário do dia

<table>
<thead>
<tr>
<th>Linha de base</th>
<th>Status quo</th>
<th>Melhora na visibilidade e cumprimento da lei</th>
<th>Extenção do horário</th>
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<tr>
<td>6h–9h</td>
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<td>17h–20h</td>
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<td>10h–5h</td>
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</table>

Tempo
Desenho da Avaliação

Grupo de Controle  
Grupo de Controle

Grupo de Controle  
Grupo de Tratamento

Linha de base  
Status quo

Melhora na visibilidade e cumprimento da lei

Avaliar Impacto da melhora do cumprimento

Extenção do horário

6h – 9h

17h – 20h

Tempo
Desenho da Avaliação

Avaliar impacto do vagão:

RDD + Diff-em-Diff

Melhora na visibilidade e cumprimento da lei

Extenção do horário

Tempo

Horário do dia

6h – 9h

17h – 20h

21h

16h
Desenho da Avaliação

Assédio

Extenção do horário

Tempo

20:30h

19:30h
Data Collection Phase 1

Days 1 - 30:

1. Build an initial baseline network of 50-60 local women distributed across the system
2. Build and test geo-sample frame
3. Complete and test infrastructure
4. Begin to test four sample methodologies
   a. 1 or 2 Hour Sessions
   b. 3-5 Station Rides
   c. Control Ride
   d. Platform Survey
5. Investigate Question Format
   a. Subject questions only
   b. Subway status questions plus subject
   c. Control questions (no harassment)

**Key:** We don’t know so gather a lot of data

1. ~50 ppl X 2 rides per day X 5 days a week X 2 weeks = 1000 rides in 2 Weeks
Data Collection - Phase 2

Objective: Have the network // Drive a lot of capture

Days 31 - 60:
1. Determine whether network size is optimal
2. Finalize ride modalities
3. Operationalize Network
4. Finalize Sample Methodology
5. Drive Volume

Key: Frequently review data coming in

1. ~60 ppl X 2 rides per day X 5 days a week X 4 weeks = 2400

Observations in 4 Weeks
Objective: Add enforcement activity to survey

Days 61 - 90:
1. Review network
2. Add questions / attempt to keep modalities
3. Monitor Network (bias)
4. Monitor Methodology

Key: Frequently review data coming in
1. ~60 ppl X 2 rides per day X 5 days a week X 4 weeks = 2400 Observations in 4 Weeks
Objective: Add Time Extension to Survey

Days 91 - 120:
1. Review Network
2. Add questions / attempt to keep modalities
3. Monitor Network (bias)
4. Monitor Methodology

Key: Frequently review data coming in

1. ~60 ppl X 3 rides per day X 5 days a week X 4 weeks = **3600**

*Observations in 4 Weeks*
OBRIGADA!!
Pro poor incentives to public transport

Colombia
June 25, 2015
Intervention Summary

• Objective: The objective of the project is to improve the affordability of public transport and the mobility of poor and marginal individuals of Bogotá in order to increase their access to labor market opportunities and improve their quality of life.

• Components to be evaluated: pro-poor subsidy for users of the TransMilenio BRT targeting persons with a SISBEN score less than or equal to 40. We will evaluate different budget-neutral subsidy designs.

• Primary outcomes: labor market and quality of life outcomes

• Currently each eligible person receives a 50% subsidy for up to 40 trips (36,000 COP per month)
Subsidy design

<table>
<thead>
<tr>
<th>Trips</th>
<th>Actual</th>
<th>Design 1</th>
<th>Design 2</th>
</tr>
</thead>
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<tr>
<td></td>
<td>40</td>
<td>36</td>
<td>30</td>
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</tbody>
</table>

Current Subsidy

- Actual: 900
- Design 1: 1000
- Design 2: 1200
Evaluation Questions

1. Does the subsidy increase use of the Transmilenio system?

2. Which subsidy design is most effective in increasing use?

3. Which subsidy design has the greatest positive impacts on labor market and quality-of-life outcomes?
Evaluation Design

- **RCT**
  - 1
  - 2
  - 3
  - Pure control

- **Bogota population**
  - **Eligibles** (Sisben <40)
    - Claim
    - Use
    - No use
  - **Ineligible** (Sisben >40)
    - No Claim
Sample and Data

Data:
1. SISBEN data: National program (administered by local governments) which seeks to classify individuals’ eligibility for different social programs
2. Secretary of Mobility- Transmilenio data: Information related to public transportation
3. Baseline data (dedicated questionnaire)
4. Follow up data (dedicated questionnaire; at least one round; maybe high-frequency data collection through mobile phones)

Sample:
Criteria to be considered in the design and sample selection and randomization of the subsidy:
• It is intended to be representative by gender: analyze heterogeneous effects of the subsidy.
• Stratify by “clusters” of SISBEN score (e.g. 0-10; 11-20; etc.)
• Reference outcomes for sample size calculations: likelihood of being employed, labor income per hour, victimization
Timeline

1. Proposal of evaluation and intervention design to the Capital District. Discussion of modalities of intervention and impact assessment - April 2016

2. Preparation of concept note by the research team equipment - July 2016

3. Selection of participants (invitation) – September 2016

Thank you!
Wuhan Integrated Transport Development
China
June 25, 2015
**Intervention Summary**

**Project objective:** Improve Transport Efficiency, Management, and Planning in Wuhan.

- Big Data Center
- Platforms to make information available
- Pilot projects

**Data enables:**

- Better decision making and more efficiency (users and authorities)
- New types of interventions (pilots)
- Better impact evaluations 😊
Evaluation Questions

• **Pilot 1: Public Transport Information**
  1. What is the impact of providing users with Bus location and occupancy on a) ridership b) user satisfaction?

• **Pilot 2: Smart Parking**
  2. What is the impact of providing users with Smart Parking information on congestion?

• **Pilot 3: Intelligent Traffic management pilot**
  3. What is the impact of providing users with expressway traffic information on congestion?
Evaluation Design

• Experimental variation of sign functionality.

• Signs ON/OFF several times using an experimental methodology during a trial period.

• We expect congestion to fall and driving patterns to change where signs are active.
Evaluation Design (2)

ON OFF

Average Speed

Volume

Average Speed

Time
Sample and Data

Real time Data:
- Speed on segments between links on express way
- Traffic volume
- Other (weather, time, accidents)

Sample:
- Daily congestion level.
Thank you!
Timeline

• Data collection is already in place.

• Pilot 1: Intelligent Transport Systems in specific expressways starts in the later 2016.

• Pilot 2: Smart Parking Area starts this year

• Pilot 3: Public Transport Information starts in the beginning of 2017