Facilitating electrification through public transport reform

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May 2024
Institute for Transportation & Development Policy

Promoting equitable and sustainable transport worldwide.
Paratransit industry: The status quo

- All of the risk is allocated to the private sector
  - In return, government doesn’t expect much in terms of service quality
- Drivers compensated based on the target system
  - Frequent crashes
  - Poor working conditions
  - Customers treated poorly
- Routes & schedules geared toward profitability rather than passenger convenience or system efficiency
- Unroadworthy, polluting vehicles
Exploring mobility futures for African cities

Urban mobility model for African cities developed by ITDP & UC Davis

Cities over 300,000 population
2015 base year
BAU plus three alternate scenarios in 2030 and 2050
Preliminary results out for peer review
## Infrastructure requirements

<table>
<thead>
<tr>
<th>Facility</th>
<th>Infrastructure (km/vehicles)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015</td>
</tr>
<tr>
<td></td>
<td>BAU</td>
</tr>
<tr>
<td>Cycle tracks</td>
<td>200</td>
</tr>
<tr>
<td>BRT</td>
<td>200</td>
</tr>
<tr>
<td>Rail</td>
<td>400</td>
</tr>
<tr>
<td>Roads</td>
<td>350,000</td>
</tr>
</tbody>
</table>

## Infrastructure costs through 2050

![Cost breakdown chart]

- **System**
- **Infra. O&M**
- **Infra. construction**
- **Insurance**
- **Driver**
- **Fuel purchase**
- **Vehicle O&M**
- **Vehicle purchase**
The sustainable scenario: what will it take?

Curtail investments in car-centric, high-carbon infrastructure

Scale up financing for sustainable mobility

Support sustainable urban mobility plan preparation

Facilitate adequate project preparation

Strengthen government institutions

Public transport reform

Mass rapid transit

Walking & cycling facilities

Land use-transport integration

Electrification

Travel demand management
MODERN BUS COMPANY
FORMATION

GOVERNMENT REGULATION
Evolution of bus sector regulation

**COMMERCIAL OPERATING LICENSE ONLY**
- Individuals, collectives or companies can operate anywhere.
- The market is regulated by informal associations.

**ROUTE LICENSE ONLY**
- Individuals, associations, or companies have licenses to operate specific routes.
- The company or driver collects all revenue.

**SERVICE CONTRACT**
- The bus company has a contract with the government to provide services.
- The contract lays out operational standards.
- Services may be route- or area-based.
What are the components of a bus operating contract?

• Specifications for the buses that will be used for the service
• How the company will be paid (e.g., per km, per passenger, etc.)
• Depots where the service will be based, and who is responsible for paying for what
• Detailed explanation of quality-of-service bonuses and penalties
• Process for settling disputes
• Company’s responsibility versus the government’s responsibility
• Assets the government is providing to the company and the terms of use
How should bus operators be compensated?

**Net cost contract**

- Customer fares
  - Bus operator
  - License fee
  - Public transport authority

**Gross cost contract**

- Customer fares
  - Public transport authority
    - Subsidy
  - Trust fund
    - Payments with service level adjustments
    - Bus operator 1
    - Bus operator 2
    - Fare collection/ITS operator
    - Trust fund manager
New economic model for public transport services

• Company earnings based mostly on vehicle kilometres travelled rather than number of passengers

• Km operated to be controlled and monitored via GPS

Bogotá before BRT: Drivers worked 16 hours per day under difficult conditions

After: Drivers work 6 hours per day under greatly improved conditions and earn more
Allocation of risk between government and operators

• Government should share financial risk with bus operators

• Government takes some of the risk in exchange for demanding higher quality and higher level of service

• Financial risk sharing options:
  • Payment based entirely on km (monitored by GPS)
  • Part of payment (10-20%) based on passengers
  • Or operator payment linked to a proportion of overall system revenues
  • Fixed payment to mitigate risk associate with investment of assets
Who should own the buses?

- **Private bus operators** have a financial incentive to properly maintain the buses if they own them.
- Companies often know more about buses and are better able to specify the appropriate technical specifications for city conditions.
- Companies have established relationships with suppliers. They can usually negotiate a lower price with more service support.
- The contract term should be similar to the lifespan of the buses.
Who should own the depots?

- **Government ownership** of depots makes it easier to handle a change in bus operators.
- Typically, government builds and owns the physical structures, while the operator provides removable furnishings and supplies.
- Government investment in e-bus charging equipment is easier to justify if depot ownership is public.
Advantages of independent fare collection

- Government has more control over service quality if it controls the revenue
- Government receives clear information on the number of passengers and how much money the system is earning
- Multiple bus operators can use the same fare collection system, improving convenience for passengers
- Public access to the systems data which is helpful for service planning
Relationship between transport agency & operators

- **Public transport agency**
  - Private bus operators
    - Procure vehicles
    - Operate services
    - Maintain fleet
  - Fare collection
    - Procure fare equipment
    - Operate fare collection system
  - Fund manager (bank)
    - Verify revenues
    - Distribute revenues
  - Terminal, station, & bus stop management
    - Cleaning
    - Light maintenance
    - Landscaping
  - Control centre
    - Provide ITS equipment
    - Maintain equipment
    - Operate control centre
## Division of responsibilities between government and bus operators

<table>
<thead>
<tr>
<th>Location</th>
<th>Bus operations</th>
<th>Bus procurement</th>
<th>Fare collection</th>
<th>Trust fund</th>
<th>Control center</th>
<th>Operations planning</th>
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</thead>
<tbody>
<tr>
<td>Curitiba</td>
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<td>Transantiago, Santiago</td>
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</table>
Structure of a public transport authority

Board of Directors

Managing Director

Planning & design
- Route planning
- Infrastructure design
- Business model
- Financial analysis
- Long-term vision

Operations
- Scheduling
- Fleet monitoring
- Fare collection
- Quality control

Admin & finance
- Financial management
- Contracting & payments
- Human resources
- Physical resources
- Legal

Communications and marketing
- Public information strategy
- User surveys
- Corporate identity
- Marketing
- Media relations
<table>
<thead>
<tr>
<th></th>
<th>Competitive tender</th>
<th>Private bus operators</th>
<th>Kilometer based contracts</th>
<th>Separate fare collection</th>
<th>Quality of service contracts</th>
<th>Multiple operators</th>
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<td>Metrobus, Mexico City</td>
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<td>Yes</td>
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<td>DART BRT – Current</td>
<td>No</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
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<td>DART BRT – Proposed*</td>
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<td>Yes</td>
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<td>Yes</td>
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<tr>
<td>Dakar BRT</td>
<td>Yes</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

*After introduction of 2\textsuperscript{nd} operator
Industry structure

Single public monopoly

Mixed system (competitive market with public oversight)

Thousands of informal operators

Source: Adapted from Meakin (2003)
## Evolution of the public transport industry

### Organisational structure

<table>
<thead>
<tr>
<th>Individual Owner-Operators</th>
<th>Bus Operating Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each vehicle is owned and operated by an individual.</td>
<td>The fleet is owned by the company rather than individuals.</td>
</tr>
<tr>
<td>The owners are often organised into associations or cooperative societies.</td>
<td>The company has formal fleet maintenance protocols and access to depot facilities.</td>
</tr>
<tr>
<td>The fleet is usually maintained by individuals.</td>
<td>There are corporate governance standards.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vehicle Crew Operating under the Target System</th>
<th>Staff Retained in Salaried Positions with Formal Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver and conductor earnings are directly related to the number of passengers carried.</td>
<td>Crew members earn a fixed monthly salary.</td>
</tr>
<tr>
<td>Little or no job security.</td>
<td>Individual performance is incentivised through parameters such as driving safety rather than the number of passengers carried.</td>
</tr>
</tbody>
</table>

### Staff compensation
Preparing for the transition

- Incentives for the transition process: Fleet renewal, new service plan, BRT system

- The process for identifying affected operators should be transparent:
  - **Fully affected**: The full route or more than half of its initial length is included in the tender or the route is canceled
  - **Partially affected**: Less than half of its total length is included in the tender
  - **Not affected**: The route and frequency are not changed at all or are changed minimally

- Affected operators elect leadership
  - May differ from existing industry associations
Variables used to identify affected operators

- License to operate on the route
- Fleet of each owner and association per route
- Estimated value of the vehicles, per route and per association
- Daily boardings per route
- Daily kilometers per route
Transition process

**STEP 1**
Define the service to be tendered

**STEP 2**
Issue a prospectus of the business

**STEP 3**
Stop renewing Licenses on affected routes

**STEP 4**
Identify & register affected operators

**STEP 5**
Issue tender with incentives to include affected operators
## Transmilenio bidding criteria

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>Eligibility</th>
<th>Min. Points</th>
<th>Max. Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal</td>
<td>Legally registered</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Economic</td>
<td>Sufficient investment capital</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Price</td>
<td>Price per km offered</td>
<td></td>
<td>-</td>
<td>350</td>
</tr>
<tr>
<td>Operations</td>
<td>Bus operator in city</td>
<td>30</td>
<td>150</td>
<td></td>
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<tr>
<td>Operations</td>
<td>Bus operator in corridor</td>
<td>50</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td>International experience</td>
<td>-</td>
<td>50</td>
<td></td>
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<tr>
<td>Ownership</td>
<td>Shares held by small bus owners</td>
<td>32</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>Emissions, etc</td>
<td></td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Vehicle source</td>
<td>Local manufacturer</td>
<td></td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>
Measuring a bus operating company’s development

- Centralised ownership of a modern vehicle fleet
- Sufficient reserve fleet (i.e., at least 6 percent)
- Fleet secured in a modern, fully equipped depot
- IT-based operations control & maintenance scheduling
- Salaried staff
- Good corporate governance (ISO 9000)
Labour & gender standards

- **Priority hiring list:** Bus operating contracts can incentivise that some percentage of staff come from a list of drivers, conductors, and maintenance staff from affected and partially affected routes.

- **Workplace benefits:** Defined work hours, paid sick leave, and paid parental leave.

- **Gender representation:** Contracts can ensure gender inclusion in different aspects of the bus operating business, including drivers, mechanics, and management.
Quick Guide to Bus Sector Modernisation

Download at africa.itdp.org
Thank you

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