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Facilitating electrification through public transport reform

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Institute for Transportation & Development Policy

Promoting equitable and sustainable transport worldwide.

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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

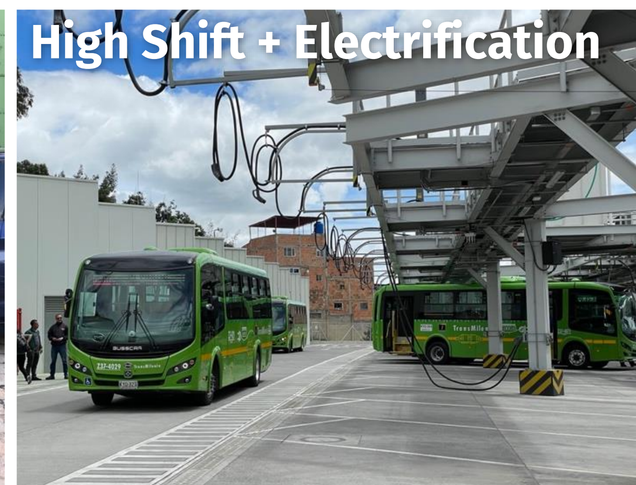
Urban mobility model for African cities developed by ITDP & UC Davis

Cities over 300,000 population

2015 base year

BAU plus three alternate scenarios in 2030 and 2050

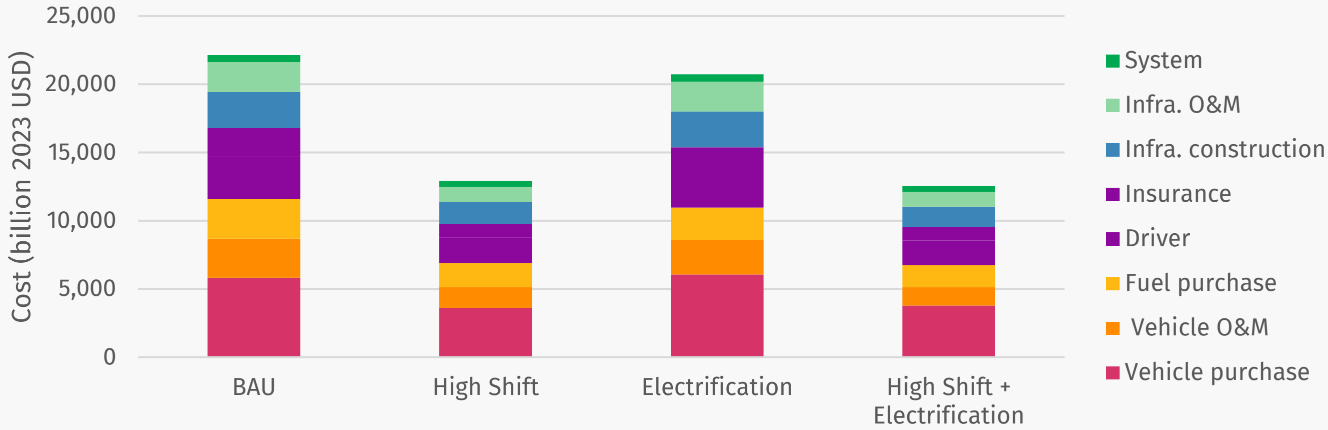
Preliminary results out for peer review



Infrastructure requirements

Facility	*Infrastructure (km/vehicles)*				
	2015	*2050*			
		BAU	*HS*	*EV*	*HS & EV*
Cycle tracks	200	1,100	25,000	1,100	25,000
BRT	200	22,000	89,000	22,000	89,000
Rail	400	8,700	12,000	8,700	12,000
Roads	350,000	1,600,000	750,000	1,600,000	750,000

Infrastructure costs through 2050



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

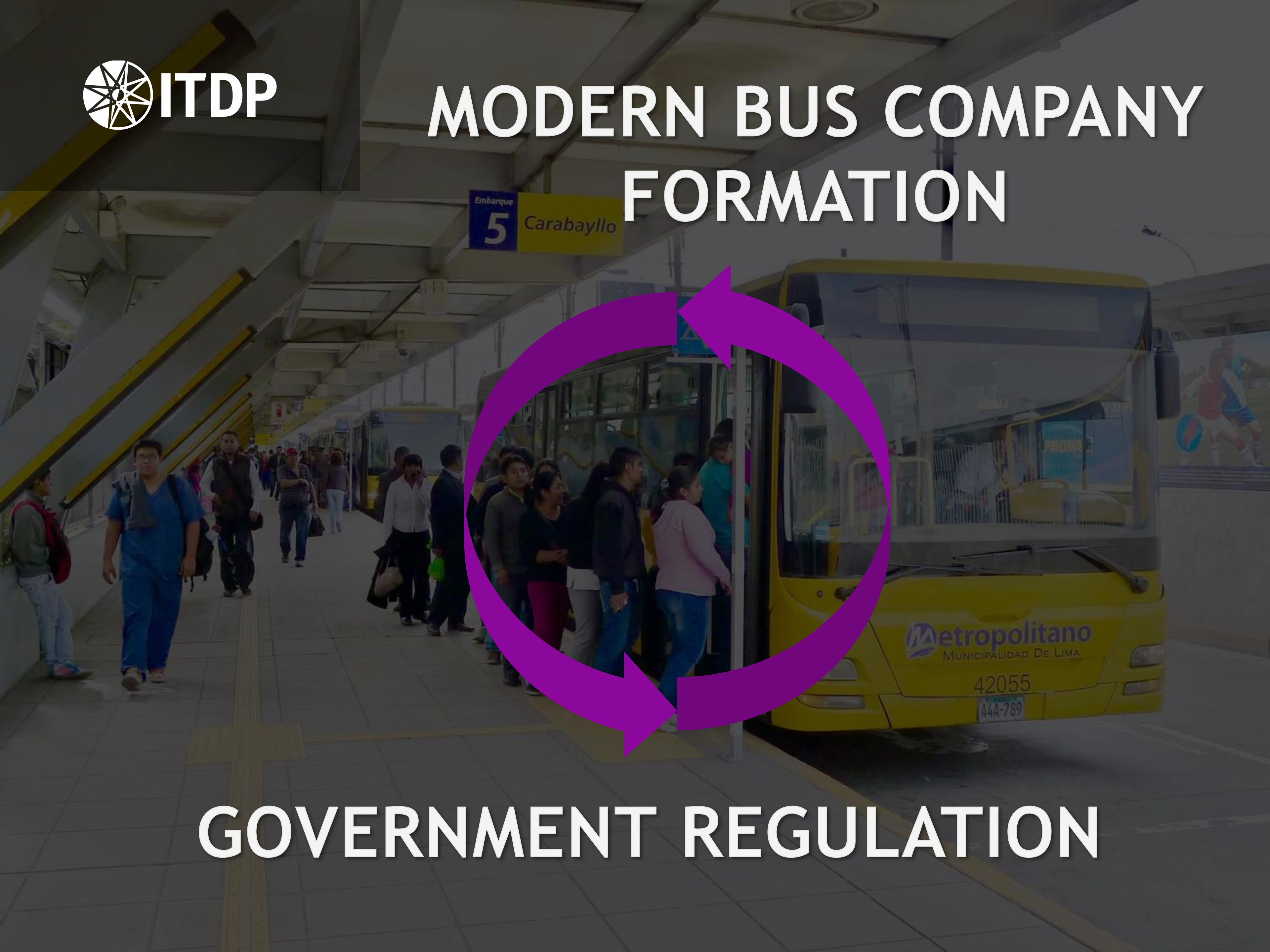
Mass rapid transit

Walking & cycling facilities

Land use-transport integration

Electrification

Travel demand management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MODERN BUS COMPANY FORMATION
GOVERNMENT REGULATION
Embarque
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Carabayllo
Metropolitano
Municipalidad De Lima
42055
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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

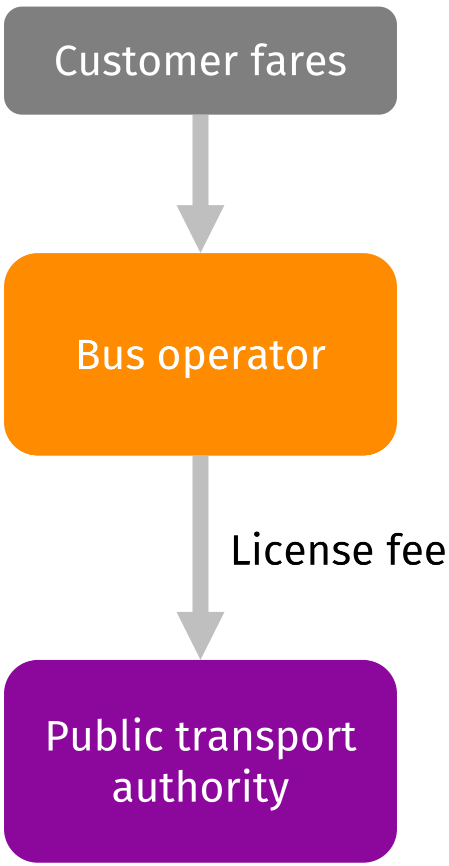
- The bus company has a contract with the government to provide services.
- The contract lays out operational standards.
- Services may be route- or area-based.

What are the components of a bus operating contract?

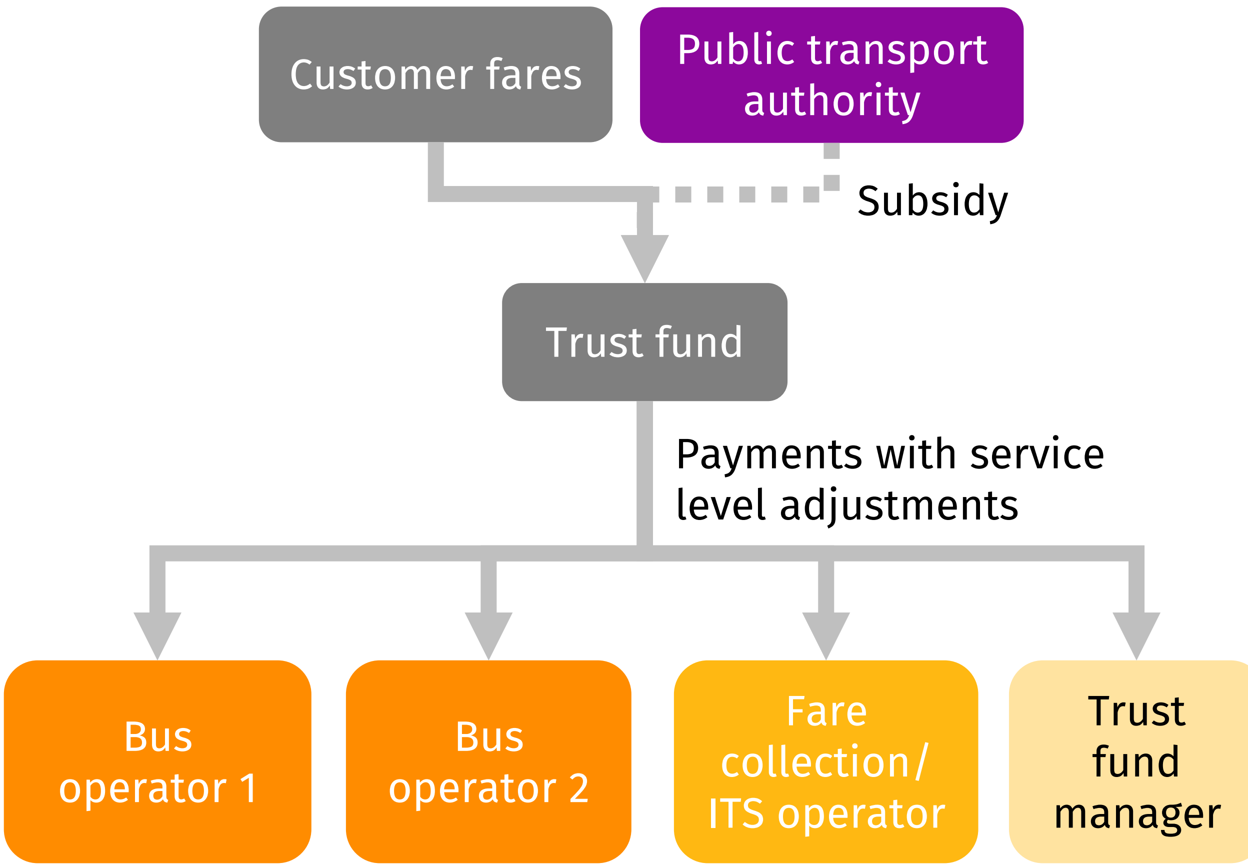
- Specifications for the buses that will be used for the service
- How the company will be paid (e.g., per km, per passenger, etc.)
- Depots where the service will be based, and who is responsible for paying for what
- Detailed explanation of quality-of-service bonuses and penalties
- Process for settling 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



Gross cost contract



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

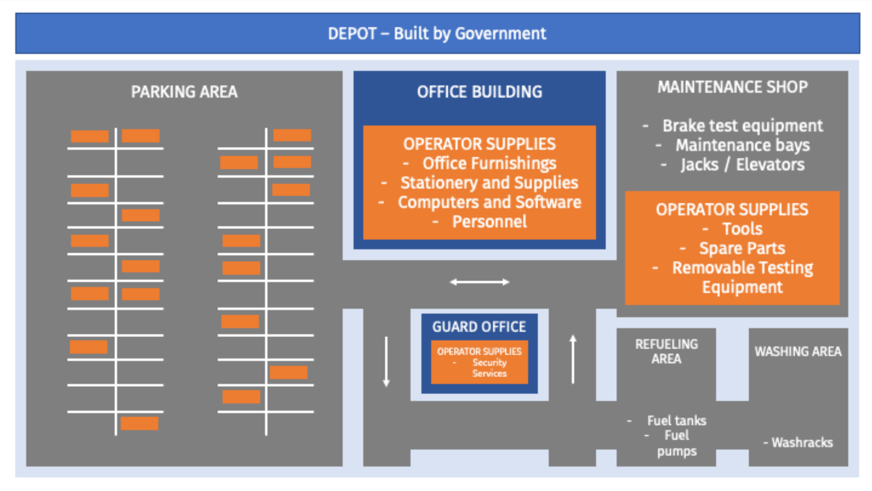
Allocation of risk between government and operators

- 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?

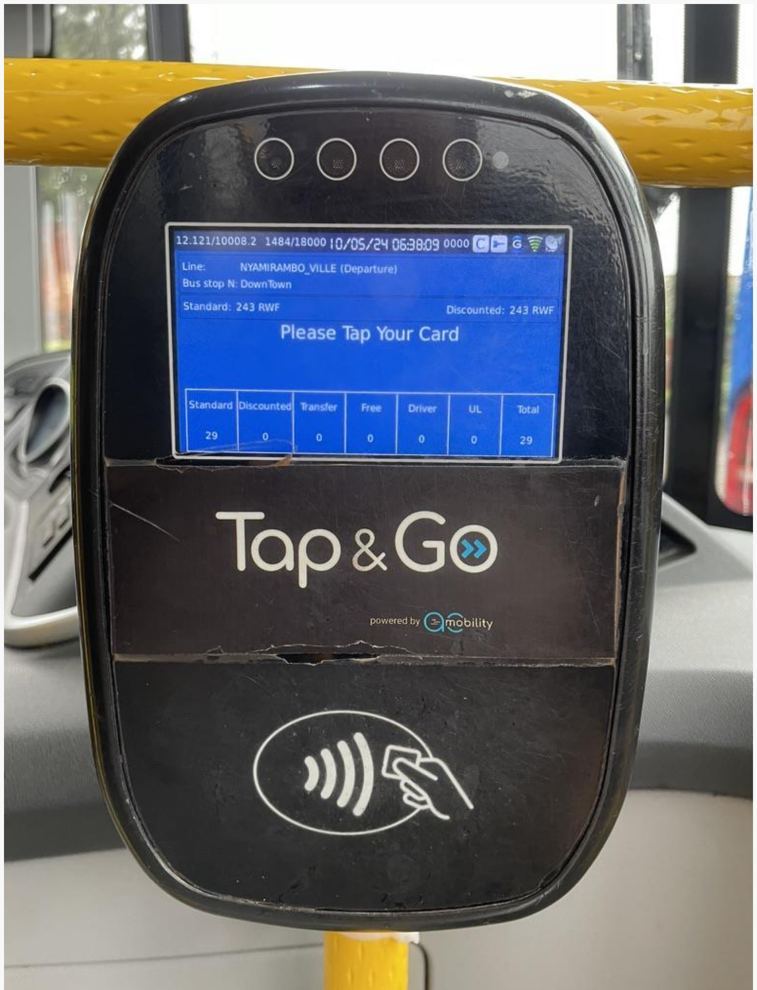
- **Private bus operators** have a financial incentive to properly maintain the buses if they own them
- Companies often know more about buses and are better able to specify the appropriate technical specifications for city conditions
- Companies have established relationships with suppliers. They can 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

	Bus operations	Bus procurement	Fare collection	Trust fund	Control center	Operations planning
Curitiba	Private	Private	Public	Public	Public	Public
Transmilenio, Bogotá	Private	Private	Private	Private	Public	Public
Transantiago, Santiago	Private	Private	Public	Private	Private	Public
Transjakarta, Jakarta	Private	Private	Private	Public	Public	Public
Rea Vaya, Johannesburg	Private	Public	Private	Public	Public	Public
MyCiti, Cape Town	Private	Public	Private	Public	Public	Public
Janmarg, Ahmedabad	Private	Private	Private	Public	Public	Public
Guangzhou BRT, Guangzhou	Private	Private	Public	Public	Public	Public
Metrobus, Mexico City	Private	Private	Private	Private	Public	Public

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

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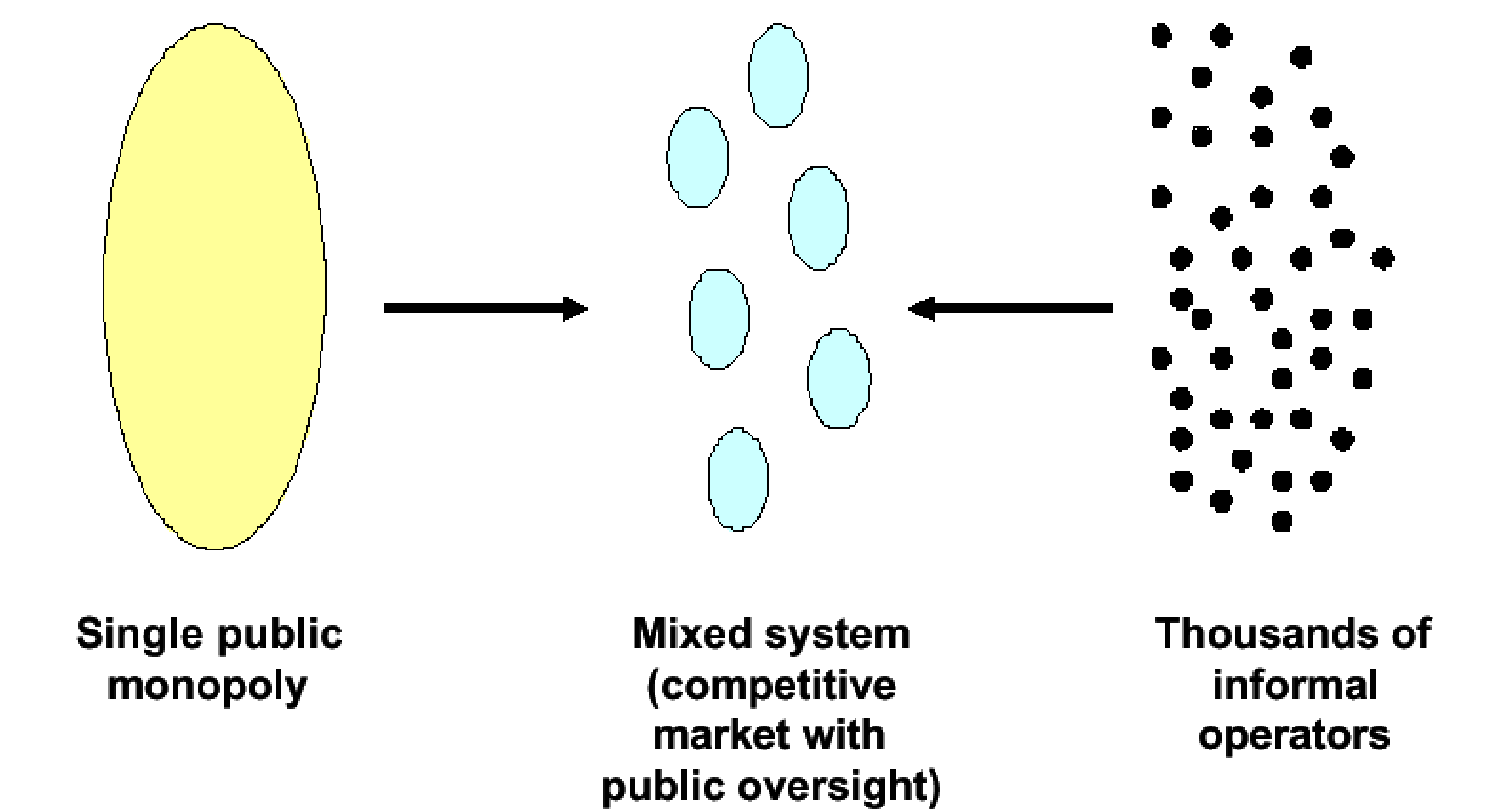
Bus operations best practices

	Competitive tender	Private bus operators	Kilometer based contracts	Separate fare collection	Quality of service contracts	Multiple operators
TransMilenio Bogota	Yes	Yes	Yes	Yes	Yes	Yes
Guangzhou	No	Yes	Yes	Yes	Yes	Yes
Curitiba, Brazil	No	Yes	No	Yes	Yes	Yes
Metrobus, Mexico City	No	Yes	No	Yes	Yes	Yes
Rea Vaya, Johannesburg	No	Yes	Yes	Yes	Yes	Yes
MiCity, Cape Town	No	Yes	Yes	Yes	Yes	Yes
Janmarg, Ahmedabad	Yes	Yes	Yes	Yes	Yes	Yes
TransJakarta, Jakarta	No	Yes	Yes	Yes	Yes	Yes
DART BRT – Current	No	No	No	No	Yes	No
DART BRT – Proposed*	Yes	Yes	Yes	Yes	Yes	Yes
Dakar BRT	Yes	Yes	No	No	Yes	No

*After introduction of 2nd operator

Industry structure



Source: Adapted from Meakin (2003)

Evolution of the public transport industry

INDIVIDUAL OWNER-OPERATORS		BUS OPERATING COMPANY
• Each vehicle is owned and operated by an individual. • The owners are often organised into associations or cooperative societies. • The fleet is usually maintained by individuals.	→	• The fleet is owned by the company rather than individuals. • The company has formal fleet maintenance protocols and access to depot facilities. • There are corporate governance standards.

Organisational structure

VEHICLE CREW OPERATING UNDER THE TARGET SYSTEM		STAFF RETAINED IN SALARIED POSITIONS WITH FORMAL CONTRACTS
• Driver and conductor earnings are directly related to the number of passengers carried. • Little or no job security.	→	• Crew members earn a fixed monthly salary. • Individual performance is incentivised through parameters such as driving safety rather than the number of passengers carried.

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

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Transition process

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Define the service to be tendered	Issue a prospectus of the business	Stop renewing Licenses on affected routes	Identify & register affected operators	Issue tender with incentives to include affected operators

Bidding criteria can reward inclusion of existing operators

Transmilenio bidding criteria

Factor	Description	Eligibility	Min. Points	Max. Points
Legal	Legally registered	X	-	-
Economic	Sufficient investment capital	X	-	-
Price	Price per km offered			350
Operations	Bus operator in city		30	150
Operations	Bus operator in corridor		50	250
Operations	International experience		-	50
Ownership	Shares held by small bus owners		32	200
Environment	Emissions, etc			200
Vehicle source	Local manufacturer			50

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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)

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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

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Thank you

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