

# INNOVATIONS IN FARE PAYMENT SYSTEMS IN SUB-SAHARAN AFRICA

Emerging Solutions in the Digitalization Era



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# // Outline

1. Introduction
2. Definitions and Concepts
3. Three perspectives for assessing the fare systems
4. Summary of the case studies
5. Key observations





# INTRODUCTION

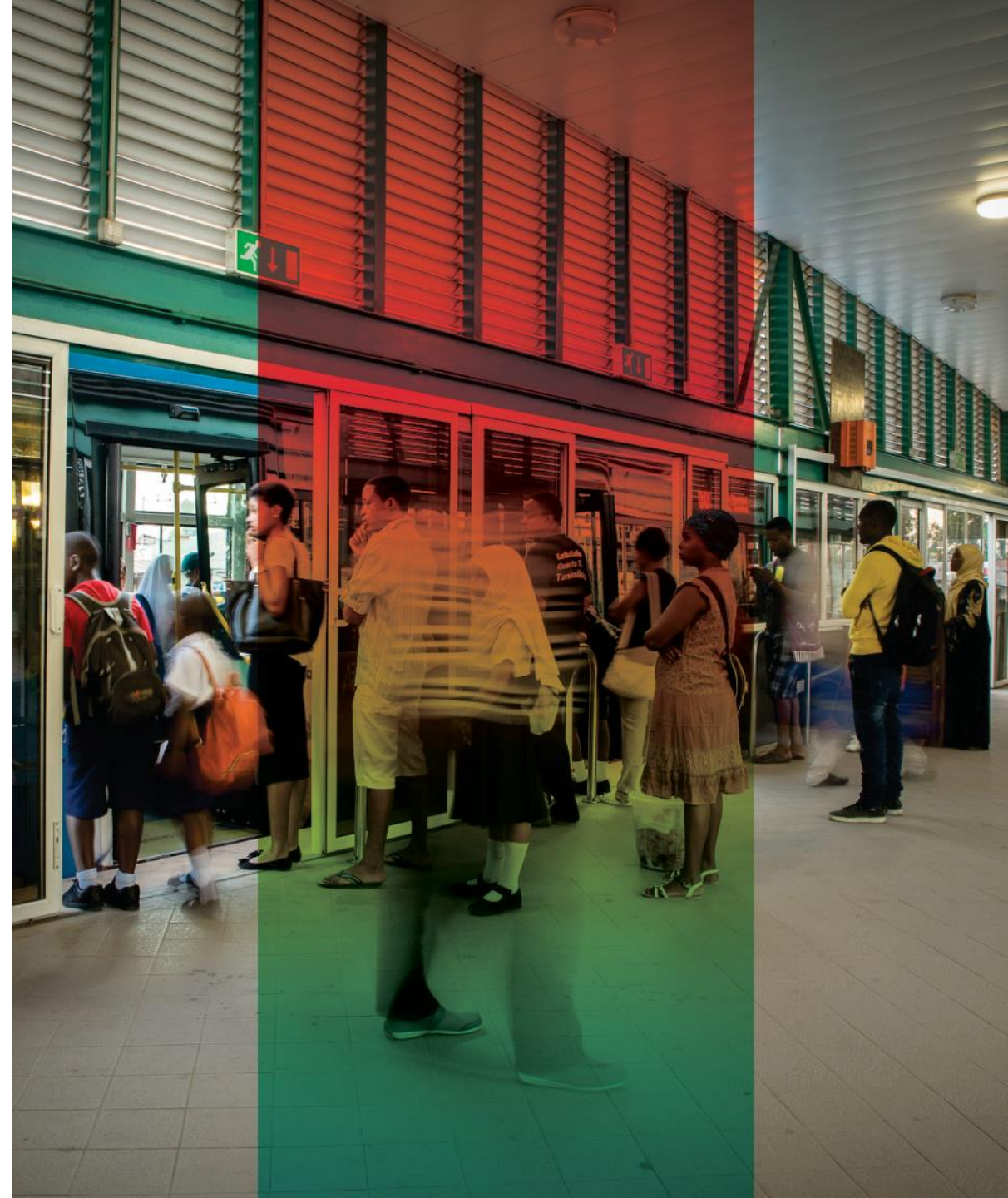


# Purpose of the study

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Inform the development of African fare payment systems within the public transport sector by:

- Examining six case studies
- Researching the case studies to gain insights into the emerging payment landscape in public transport
- Identifying key trends and lessons



# The selected cases



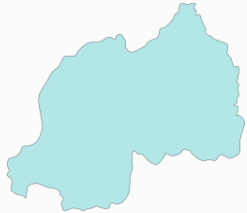
## **Cape Town, SA**

*myconnect* fare system on the MyCiTi BRT service



## **Maputo, Mozambique**

Maputo's new account-based ticketing system currently being implemented



## **Kigali, Rwanda**

AC Group's Tap and Go fare system on the formal bus services



## **Nairobi, Kenya**

Fare payment using M-Pesa on matatus



## **Lagos, Nigeria**

Fare systems on Lagos BRT service - LIT



## **Nairobi, Kenya**

Chalo, a private company providing tracking services in 30 cities in India and automated fare systems in 15 of these cities

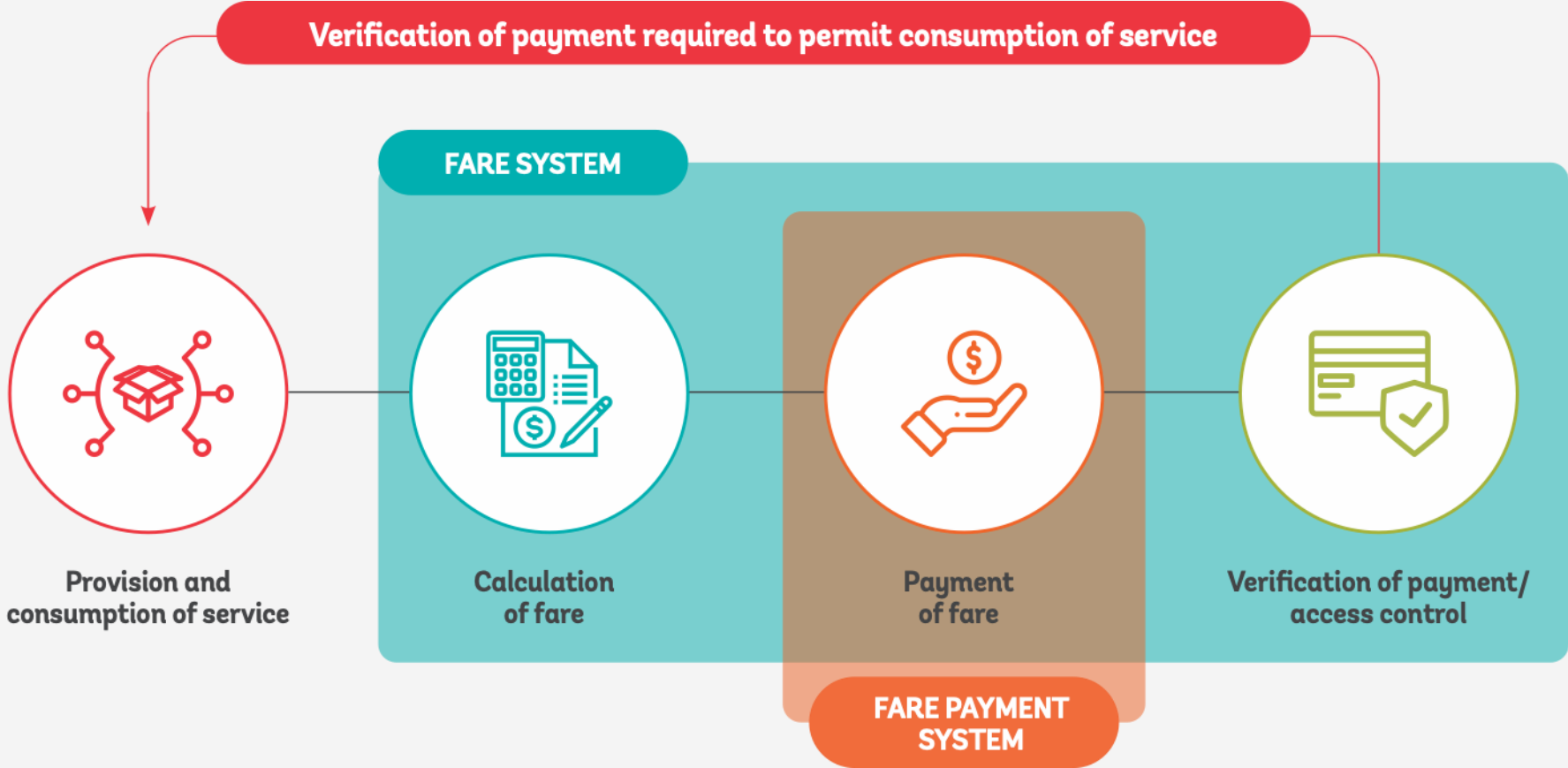


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## DEFINITIONS AND CONCEPTS



# Components of the fare system



# Some definitions

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'Closed' vs 'open' systems



'Interoperability'  
vs 'Integration'



'Standards'



'Back office-centric' vs  
'Card-centric' systems



'Account-based' systems

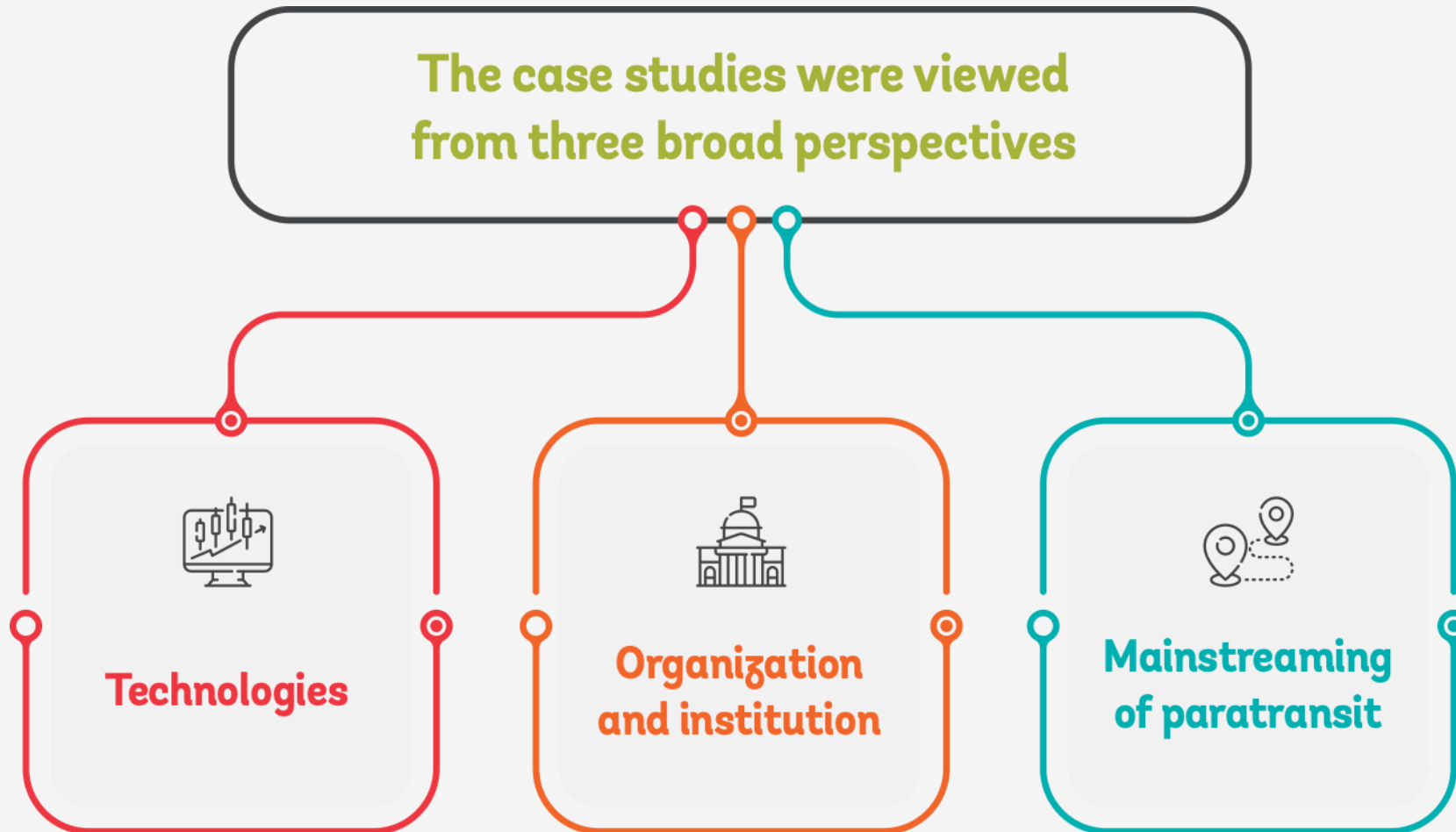




# THREE PERSPECTIVES FOR ASSESSING THE FARE SYSTEMS

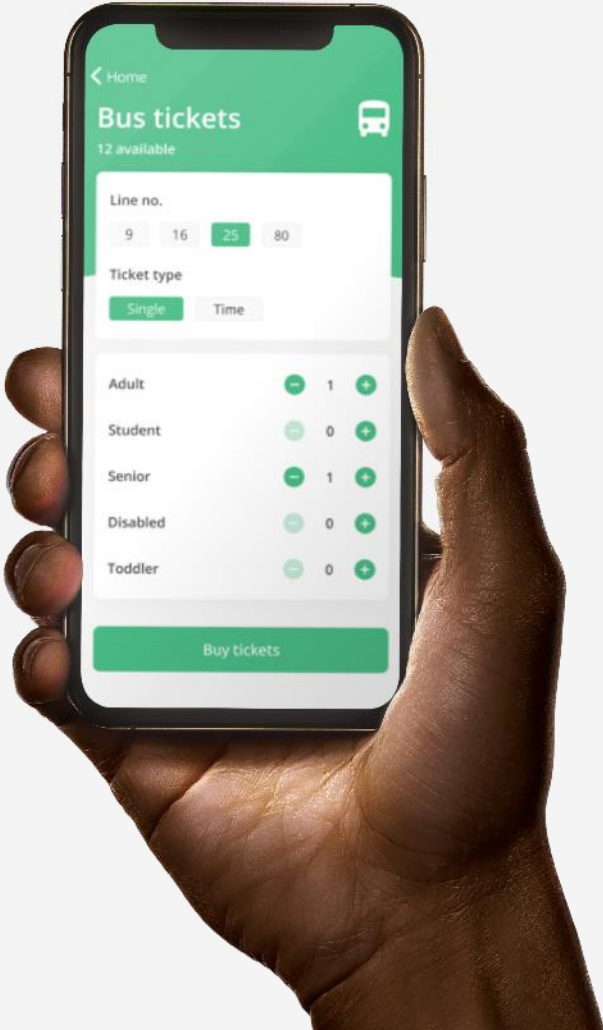
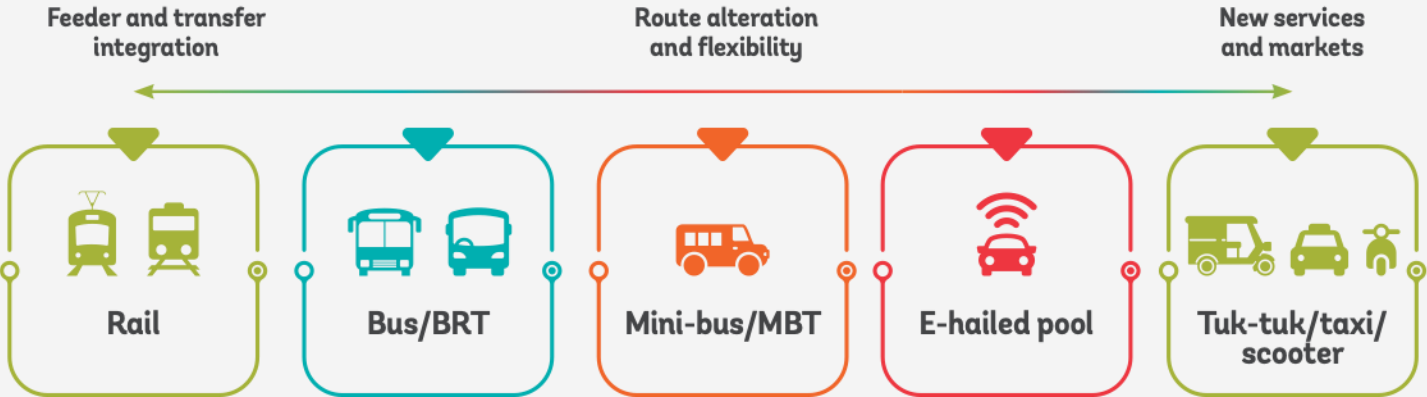


# The case studies were viewed from three broad perspectives



# Technology

Technology is flexible and can be adapted to the type of public transport





## Organization and Institution

The shift to automated fare systems from cash systems usually results in changes to how money flows.

Paying fares is an important element in the relationship between operators and users and can be affected where this happens through a third party.

It is critical to identify how revenue risk is configured and how the introduction of new fare systems changes incentives and power relations.





## Mainstreaming of paratransit

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The introduction of automated fare systems is viewed as a possible mechanism for bringing improvements.

Attempts to introduce electronic fare systems into paratransit have largely been unsuccessful - because of failures to address the implications of disrupting the business model.

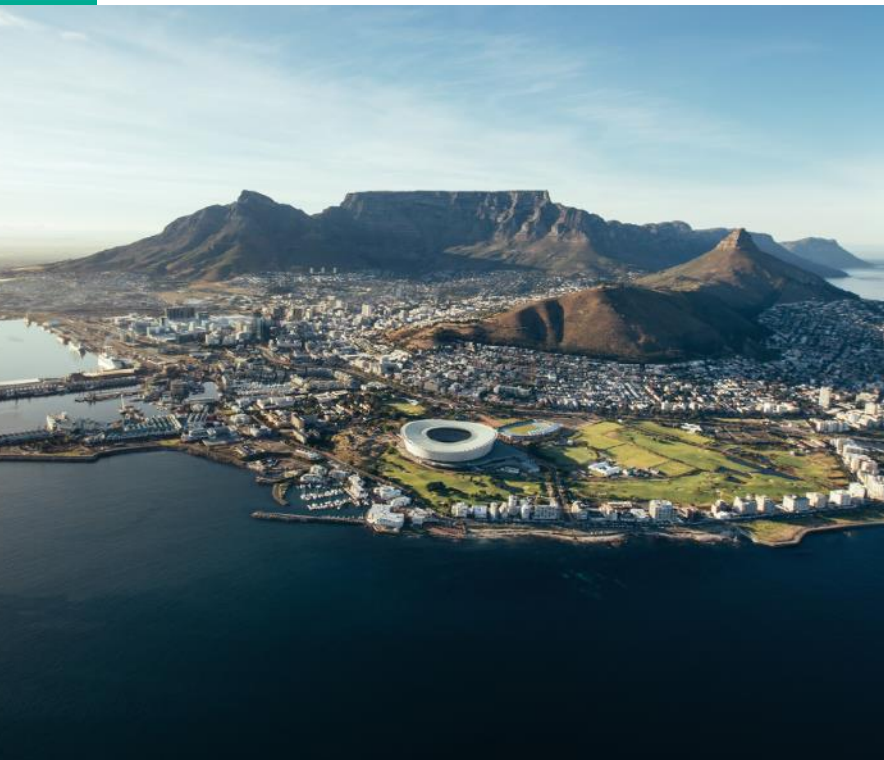
The flexibility of paratransit may enable it to become a key beneficiary of digitization but this is dependent on significant changes to business models, including the collectivization of revenue risk.



# SUMMARY OF THE CASE STUDIES



# Cape Town, South Africa



## System studied

- ❖ *myconnect* card on the MyCiTi BRT system

## Comments

- ❖ Illustrates the benefits (financial support) and costs (impractical technologies) resulting from strong national government involvement
- ❖ Innovation from municipality to reconfigure system
- ❖ Significant challenges arising from national regulation

# Kigali, Rwanda



## System studied

- ❖ *Tap and Go* fare system by AC Group on formal Kigali bus system

## Comments

- ❖ A successful system initiated privately which proved itself on one system and was extended to others, effectively creating a single fare system for all formal bus operators in Kigali
- ❖ Fare system run by specialist independent fare system company
- ❖ Example of informal pressure by government to extend system but hands-off approach towards technicalities of the system



# Lagos, Nigeria



## System studied

- ❖ Progression of fare systems on the Lagos Bus Rapid Transit system – initial electronic fare system (from 2013), *LagosConnect* NFC Card (from 2015) and *FarePay* EMV (from 2018) on line 1
- ❖ Cowry NFC card (from 2020) on line 2; envisaged to replace all other cards

## Comments

- ❖ Establishment of Lagos Metropolitan Area Transport Authority (LAMATA) in 2002 as part of wider reforms has been critical to advances
- ❖ Various failures but process of learning by doing
- ❖ Consolidation around Cowry NFC after unsuccessful experiment with EMV
- ❖ Unless forced to use card-based system users prefer cash tickets

# Maputo, Mozambique



## System studied

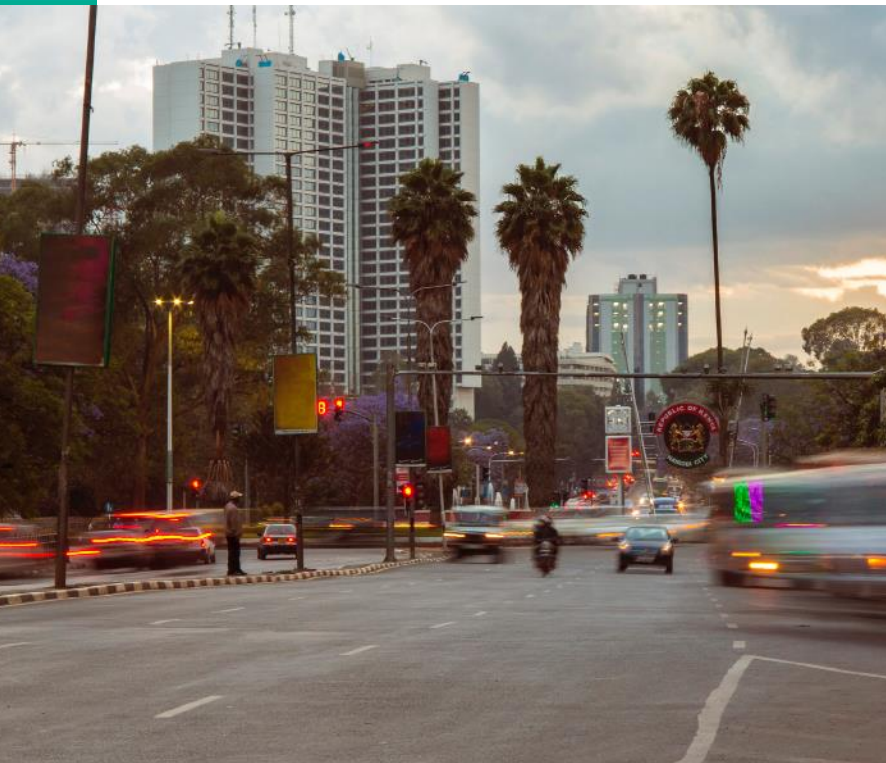
- ❖ *FAMBA* system currently being introduced on newly formed formal bus service

## Comments

- ❖ Creation of Maputo Transport Authority (AMT) key to strategy
- ❖ Plans appear rational although may prove difficult to implement
- ❖ Contractual relationships between stakeholders not yet fully clear



# Nairobi, Kenya



## System studied

- ❖ *M-Pesa* system used on matatus; *SafeBoda* on bodabodas; *SWVL* service

## Comments

- ❖ Fragmented city level institutional arrangements have resulted in limited policy driven reforms
- ❖ Hopes that recently created Nairobi Metropolitan Area Transport Authority (NaMATA) will bring greater coherence
- ❖ Strong privately driven innovation but fragmented outcomes



# India (Chalo)



## System studied

- ❖ *Chalo*, a tracking app (30 cities) and payment system (15 cities) in India

## Comments

- ❖ Innovative combination of business model and technology
- ❖ Benefits from originating in tracking service to user and incremental development based on business experience
- ❖ Independent fare system provider, yet aligns success of fare payment to improved bus services



# KEY OBSERVATIONS



# Five questions

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Are automated fare systems worth it?

1

Is implementing a new fare system primarily a technological challenge?

3

Can paratransit be improved by implementing automated fare systems?

5

What are the most significant technological trends?

2

What role should government play in the implementation of fare systems?

4

# Are automated fare systems worth it?

Clarity about the objectives and realism about all the potential costs and benefits.

Cash remains the most convenient medium for many users.

The data provided by the fare system is arguably the most important benefit.





## What are the most significant technological trends?

Majority of automated fare systems are card-based.

Mobile phones - potential to offer much wider functionality than smart cards – however risk of social exclusion.

Initiatives are being taken to introduce back office-centric, account-based systems but these are not yet proven in the African environment.



# Is implementing a new fare system primarily a technological challenge?

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The implementation of new fare systems is therefore much more than a technological challenge: it impacts incentive structures and power relations.

The design of the fare system must align with how revenue risk is configured.

Alignment of the interests of fare system owners and transport business overall.



# Can paratransit be improved by implementing automated fare systems?

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Significant improvement of paratransit requires changing the business model to enable collective rather than individualized management of the fleet while maintaining the drive toward serving passenger trip needs.

Enabler of the change - but are likely to fail if not implemented in ways that address the power relations and incentive structures between drivers, operators and passengers.



# What role should government play in the implementation of fare systems?

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National or central government: often has the resources and political power to initiate significant new programs; its role should be limited to facilitation and broad support.

City-wide municipalities or transport authorities: play a critical role in facilitating fare systems aligned with wider systems underpinning that success.

A central challenge for such authorities in supporting effective fare systems lies in aligning the creativity and competitive drive of private interests with city-wide public benefit based on multiple modes and focused strongly on the public transport user.





THANK YOU!