

# Integrated Transport System & Land-Use Planning

Challenges in Accra Metropolitan Area and Solutions for Addressing Them



SSATP Annual General Meeting

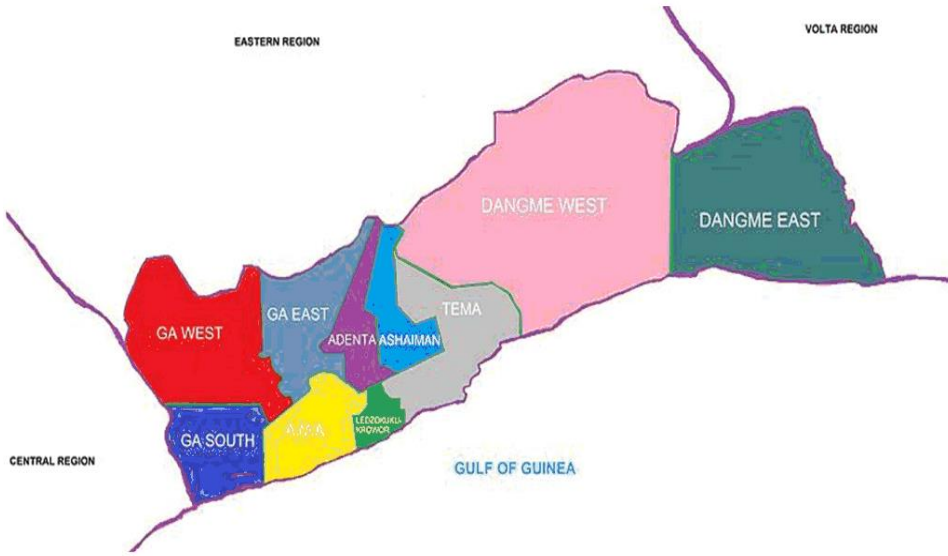
20<sup>th</sup> -24<sup>th</sup> February 2017  
Marrakech, Morocco

# Presentation Outline

- Introduction- Metropolitan Profile
- Integration of Transport Systems and Land-use Planning
  - Institutional
  - Financing
  - Provision of Mass Transport
  - Restructuring of Informal Sector
  - Traffic Management

# Greater Accra Metropolitan Area

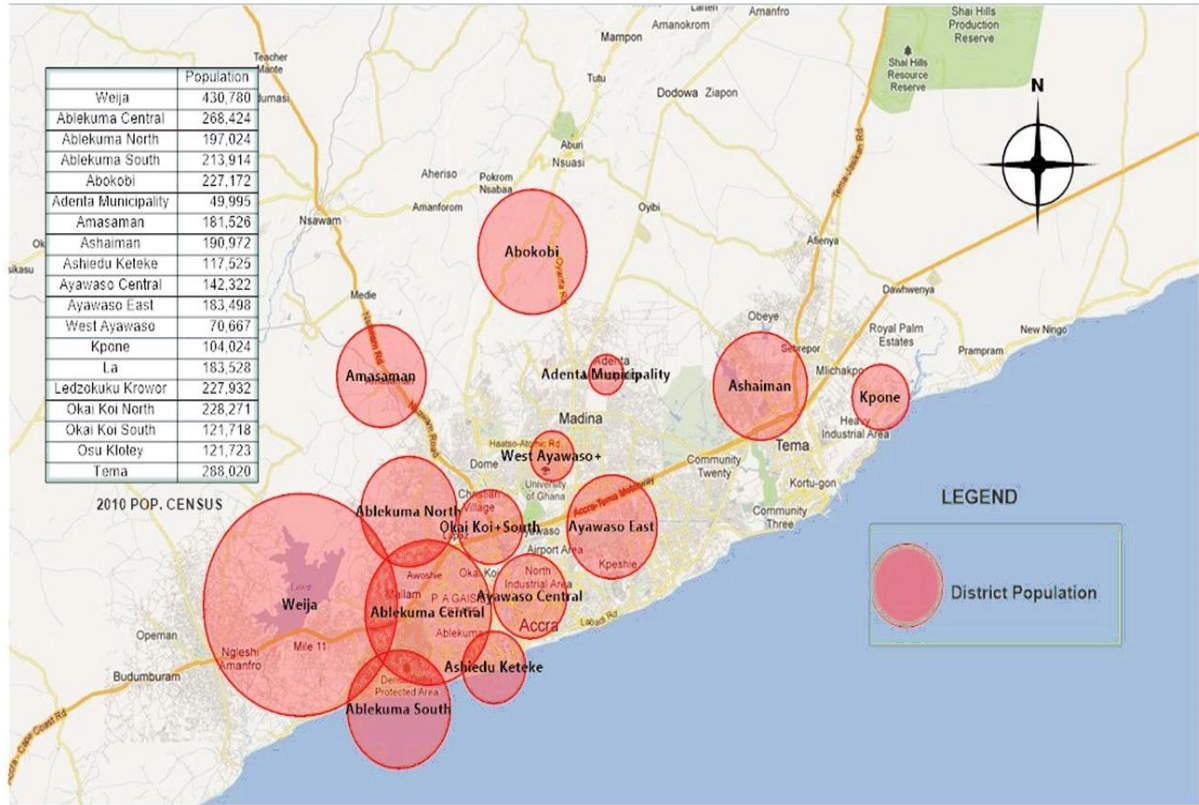
GREATER ACCRA REGION



2010 Census Pop.: 4,010,054

2016 Pop. Est.: 4,613,637

POPULATION STRUCTURE FOR ACCRA URBAN SETTLEMENTS

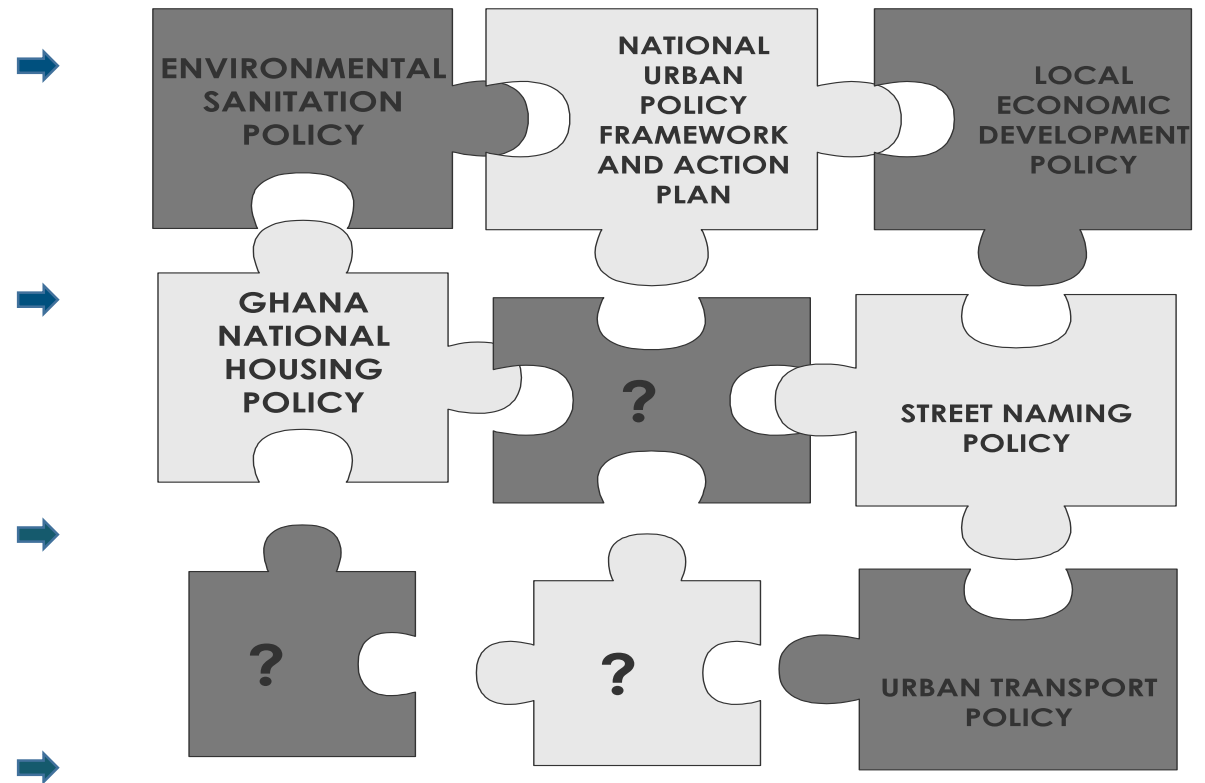


CONTEXTUAL MAP

## Existing Policy Framework

- Environmental Sanitation Policy
- Ghana National Housing Policy
- National Urban Policy Framework and Action Plan
- Local Economic Development Policy
- Street Naming and Property Numbering Policy
- Urban Transport Policy

## Urban Development Strategy



# Urban Development

## Challenges

- Inadequate local government systems management; capacity development and research
- Lack or inadequate investment governance for public funds
- Transport externalities as input for pricing undetermined
- Overly-emphasized service and infrastructure development approach to urban transport

## Solutions

- Systems-view Approach to Local Governance
- Responsive National Development Planning System to Urban Development Strategy
  - Integrate existing policies
  - Implement legislative instruments for new Land Use and Spatial Planning Act
  - Establish Spatial Data Infrastructure
  - Legislate timeframe for the adoption of a single property addressing system

# Institutional Development

## Challenges

- Incomplete decentralisation process
- Unclear mandates and responsibilities for public institutions
- Poor coordination of policies, programmes, projects and activities
- Poor policy and institutional coherence

## Solutions

- Local Government capacity development
  - Activation of Metropolitan Administration, Works and Planning Boards of the Executive Committee under the Local Governance Act, 2016 (Act 936)
  - Implement Legislative Instruments on stakeholder participation provisions of the Local Governance Act
    - Public Sector Agencies
    - Private Sector Institutions
    - Social Institutions
      - Visible and invisible

# Department of Transportation

## Legal Framework

- Policy Provisions
- Acts & Laws
- Ghana Urban transport Project
- Legislative Instruments ( Dept. created by LI 1961)
- Passenger Transport Services Byelaws
  - Public Transport Standards



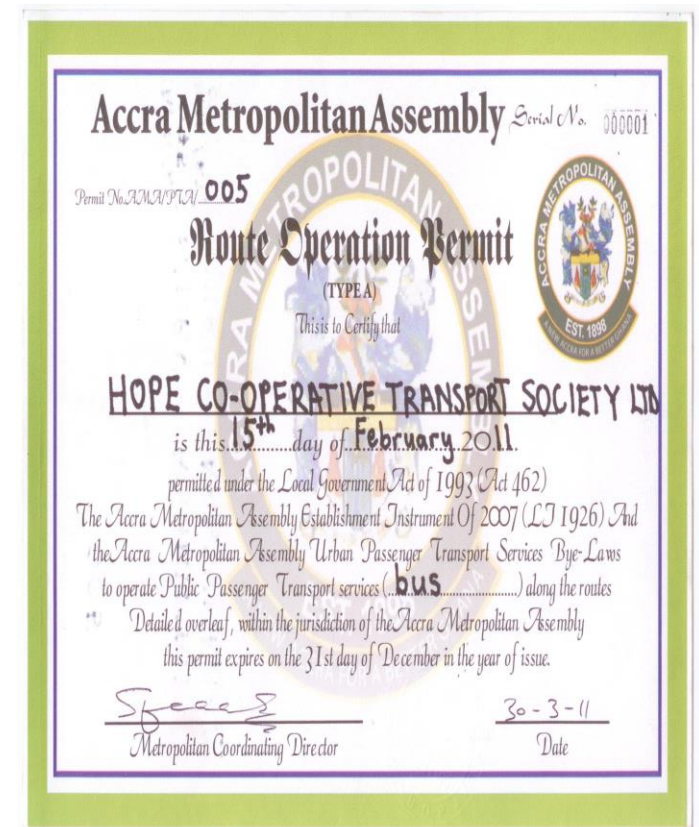
## Regulatory Tools



Security Holograms



Vehicle Sticker



Operating Permit

# Financing of Public Sector

## Challenges

- Application of Marketing Research
- Early stages of adoption of investment governance tools:
  - Multi-donor Budgetary Support System
  - Ghana Integrated Financial MIS
  - Electronic financial transactions and revenue collection
- Consolidated Fund a major drawback on departmental enterprise
- Financial rules used for role-hijacking

## Solutions

- Human capital development
  - Training and Re-orientation of local government staff
- Technical leadership training for local government staff
  - Innovation and departmental vision development
  - Collaborative research with institutions of higher learning
- Research-led problem solving initiatives
  - To engender technical confidence for would-be financiers
  - To attract external funding resources



# Challenges in the Provision of Mass Transport

- Absence of Urban Development Strategy
- Inability to define functional hierarchy of settlements
  - Urban sprawl
  - Difficulty in generating consistent land-use data over time
  - Limited accessibility planning
- Complexities of land market regulation
- Lack of substantive content to guide spatial development
  - Too many procedural documents

# Provision of Mass Transport

## Solutions

- Define/ create compact settlement boundaries through Spatial Development Frameworks
- Expand existing Land Administration Project current national coverage rate beyond 10 percent
  - To strengthen and simplify land market regulation
- Improve accessibility planning through:
  - The creation of Transport Analysis Zones
  - Household Travel Survey
  - Application of the 4-Stage Transport Model
    - Network planning
  - Multimodal Study and Analysis

## Solutions

- Piloting scheduled services for Troto Operations
  - Operator re-orientation
- Introduce fleet renewal programmes
  - Serve as Bus Feeder service
- Improve Troto network infrastructure
  - On Bus Feeder network basis
- Create Geographic Information System attribute for all data
  - Engenders software interoperability

# Other Studies Undertaken

- Reliability Studies and Collection of Service Provider Operational Data
- Transformation of Data into General Transit Feed Specification
- Engagement of Technology Community to Utilize Collected Data
- Data Collection and Mapping of Registered Public Transport Routes
- On-Street Parking Management Studies

# Reliability Studies-What was Measured

## 1. Headway Variability

- Time intervals between departing vehicles from terminal
- Used as proxy to waiting time

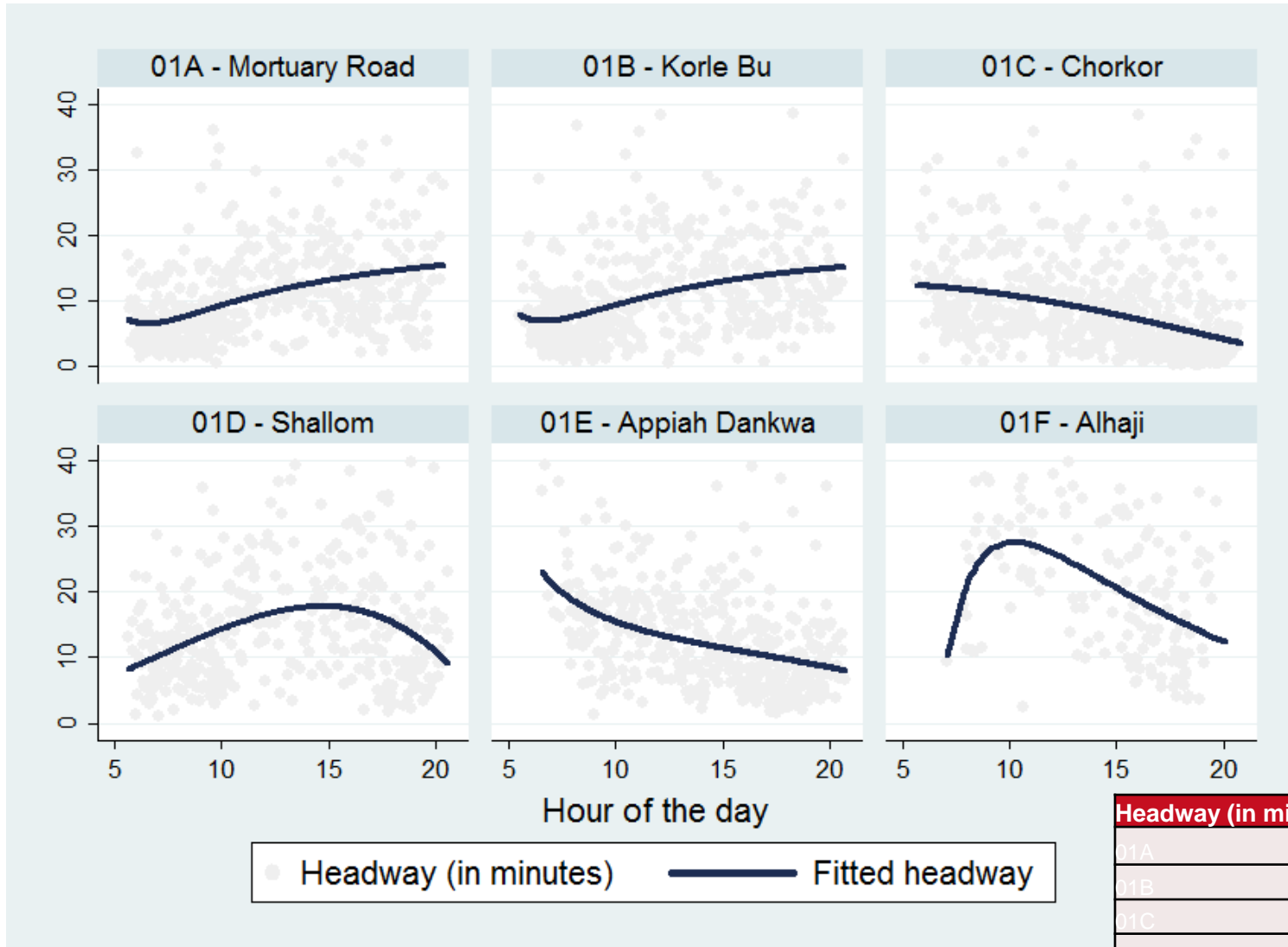
## 2. Travel Time Variability

- How much variation there is in travel between different trips
  - On the same route
  - Or on routes with similar attributes

## 3. Travel Itinerary Variability

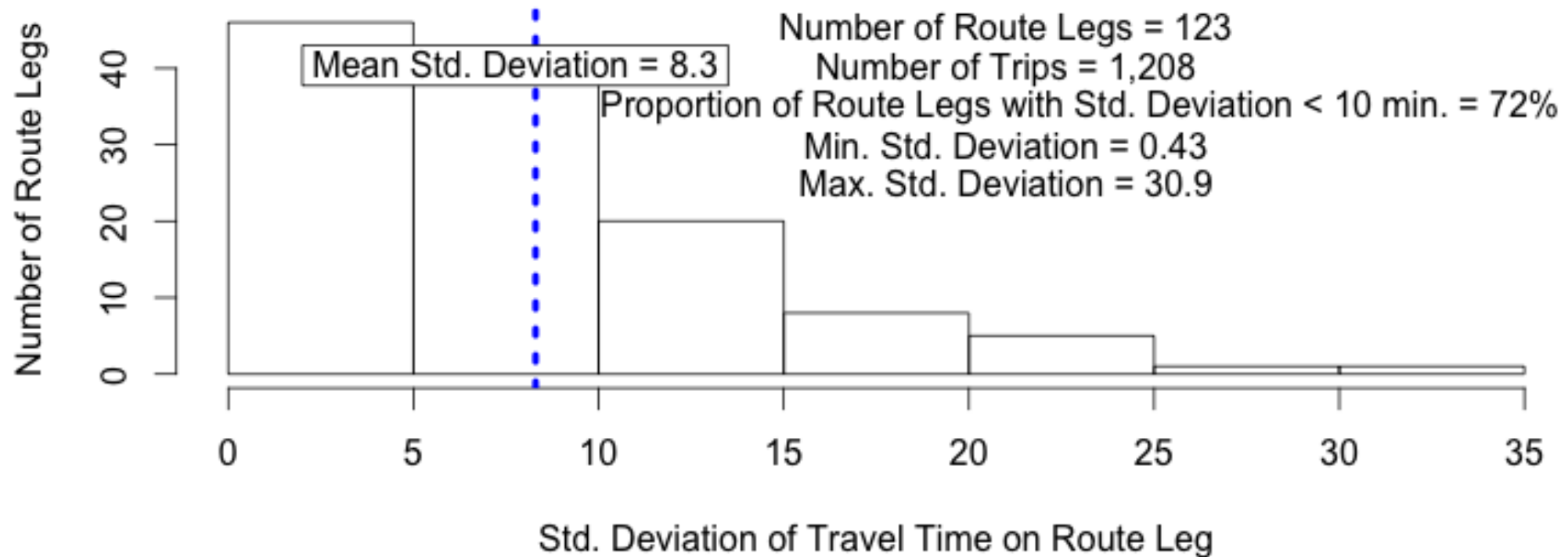
- How much variability there are in the itinerary of trips on the same route
  - A Transit Variation Index (between 0 and 1) of 0 means there is no similarity and 1 means no variation at all

# Headway Variability

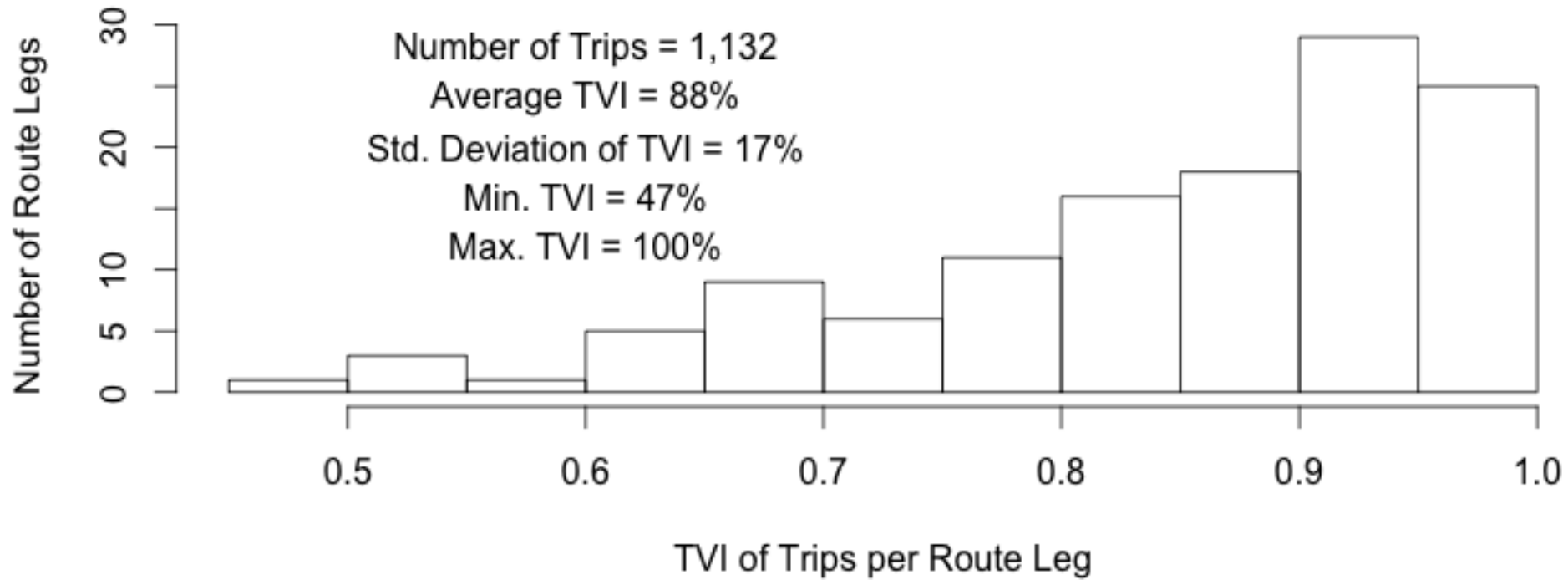


Headway (in minutes)	Freq.	Mean	SD	Min.	Max.
01A	527	11	8.7	0.57	98
01B	519	11	8.9	0.67	79
01C	698	8.5	8.2	0.3	85
01D	385	15	10	1	79
01E	444	13	11	1.3	109
01F	194	26	17	2.6	89
<b>Total</b>	<b>2'767</b>	<b>12</b>	<b>11</b>	<b>0.3</b>	<b>109</b>

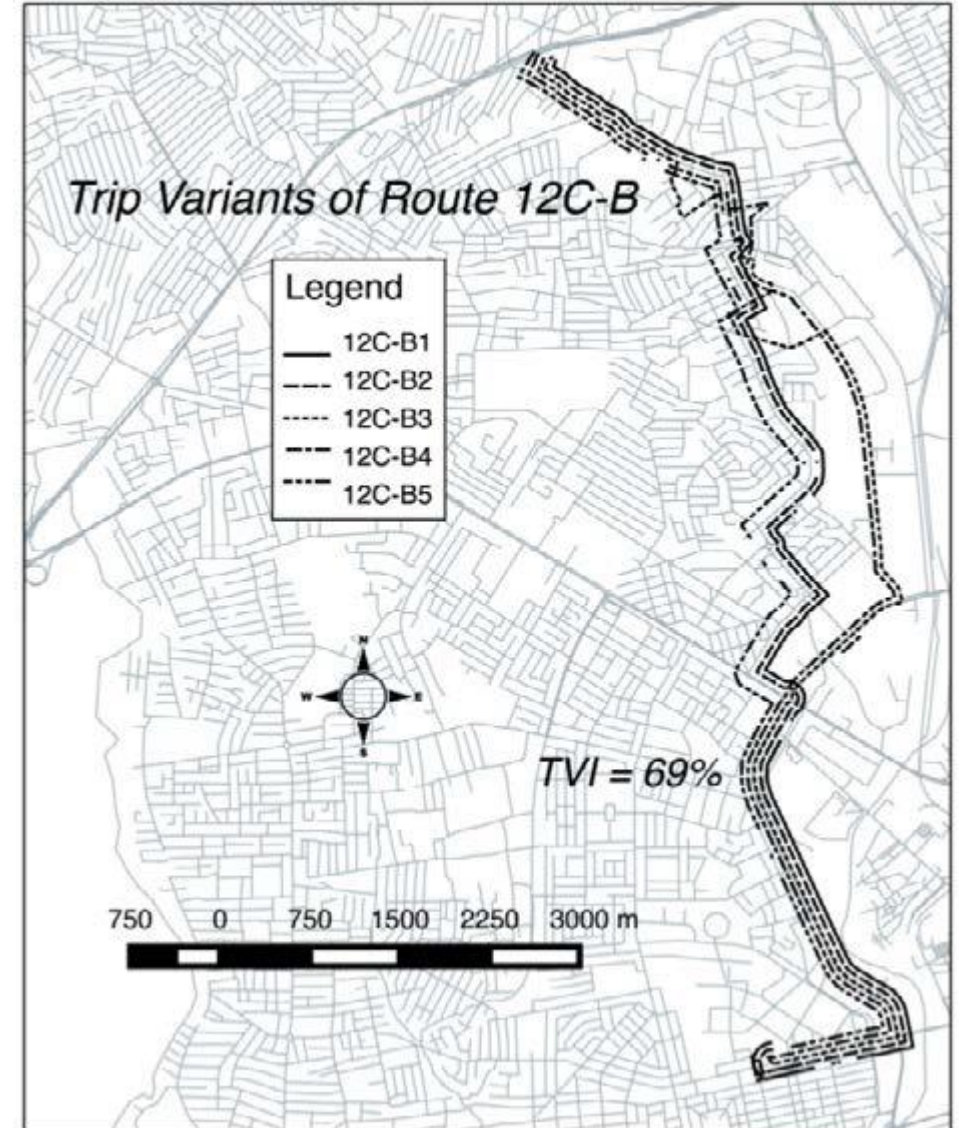
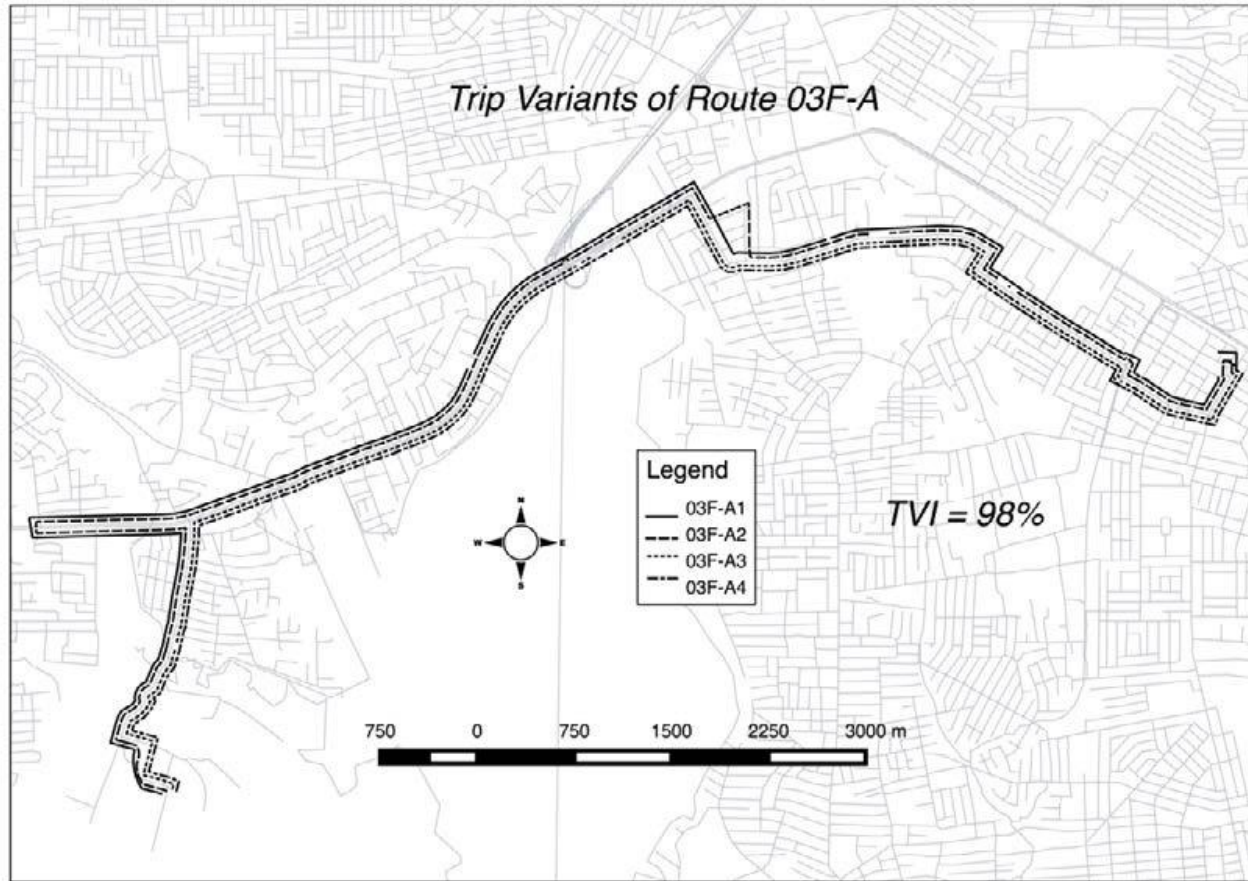
# Travel Time Variability



# Itinerary variability

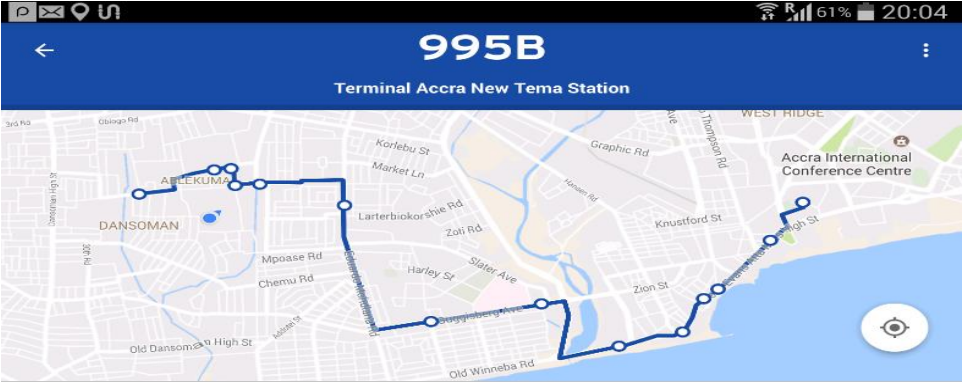


# Itinerary Variability





# GTFS DATA UTILISED ON TRANSITAPP



- Terminal Zamrara Line
- Market 995
- Taxi Rank 995
- Sukura Station
- Borla Junction 1
- Radio Gold 995
- Awotse Kojo
- Mary's
- Fire Service 521
- Light House 485
- One Way 1
- Ussher Fort
- Bishop
- Terminal Accra New Tema Station

# MODEL BUS STOP - INFRASTRUCTURE



Courtesy: Centro Brazil Design

# Restructuring of Informal Sector

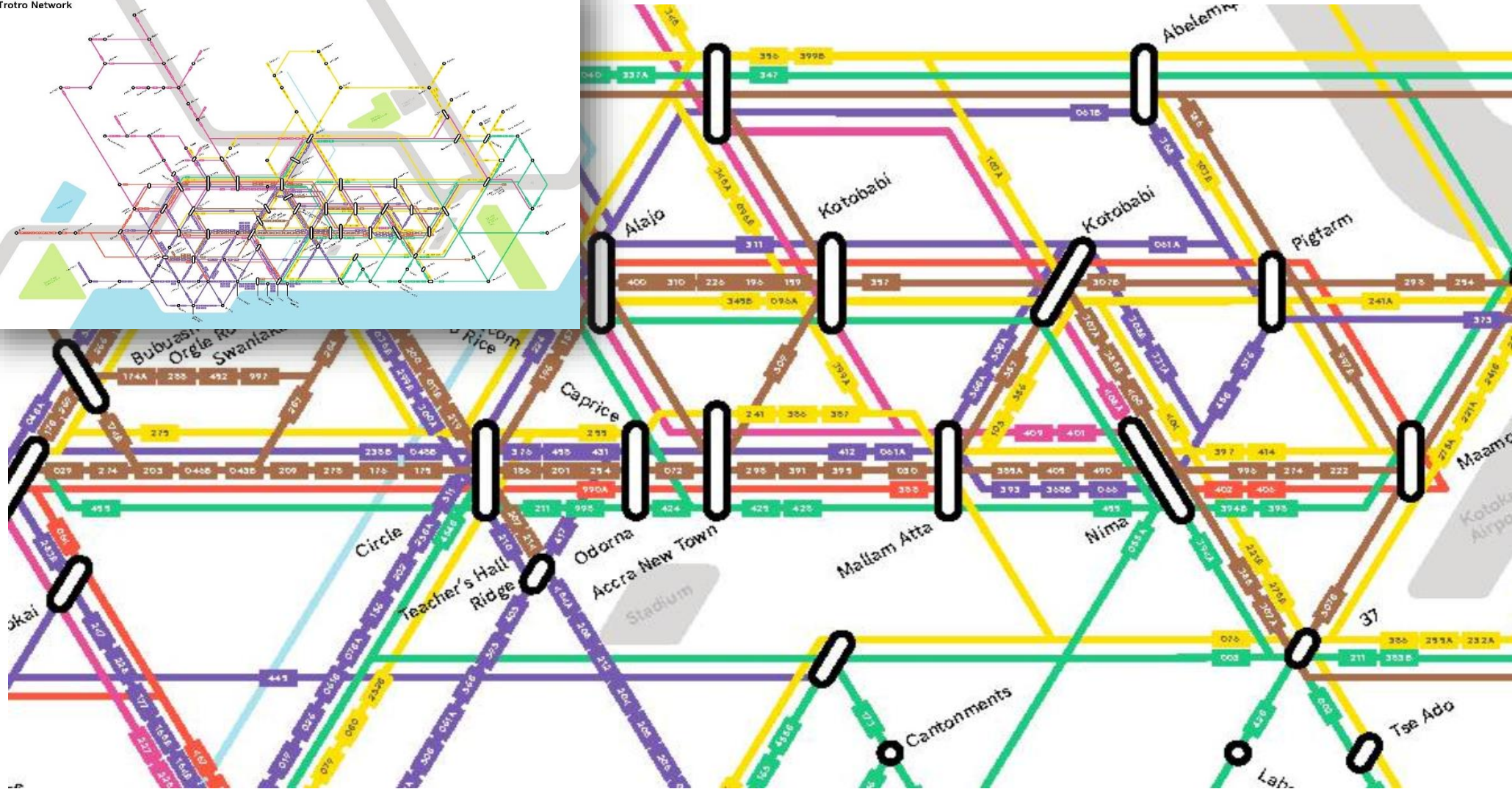
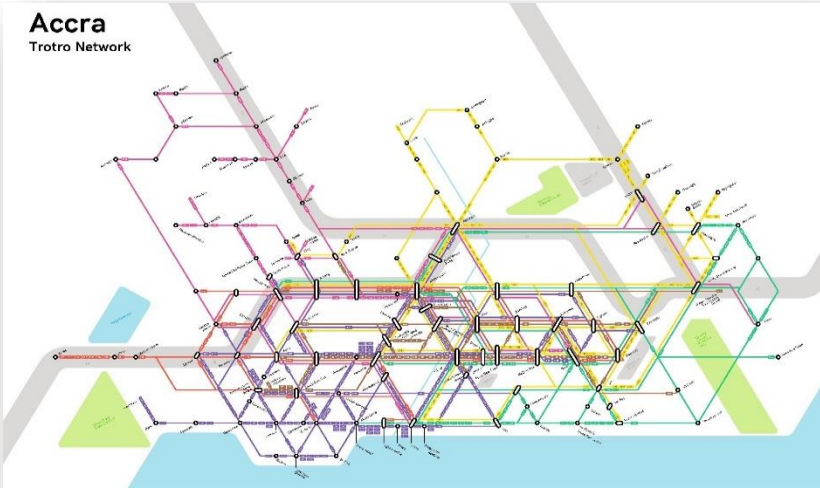
## Challenges

- Manual identification of informal actors & operators
- Building trust for reform activities
- Extensive and expensive nature of regular engagement
- Difficulty in defining mutually acceptable boundaries for regulation
- Difficulty in finding intermediaries to guarantee/provide for fleet renewal initiatives
- Inadequate resources for enforcement of passenger transport byelaws

## Solutions

- Use of crowdsourcing mobile applications to collect and update transport operator and user data
- Create a strong database
- Logistics support to identify new entrants
  - Networking with other registration agencies to receive automatic alerts
- Mobilise additional resources for stakeholder engagements/enforcement
- Adopt decent work approach to group animation
- Use of security holograms to strengthen enforcement regime

# Trotro Network Mapped



# Traffic Management

## Challenges







- Difficulty in managing traffic supply and demand
  - Identification of traffic management sites
- Poor orientation of impact assessments to land-use
- Absence of Intelligent Transport Systems applications
- Poor/limited level/lack of stakeholder engagement in traffic management
- Lack of data for congestion management








## Solutions

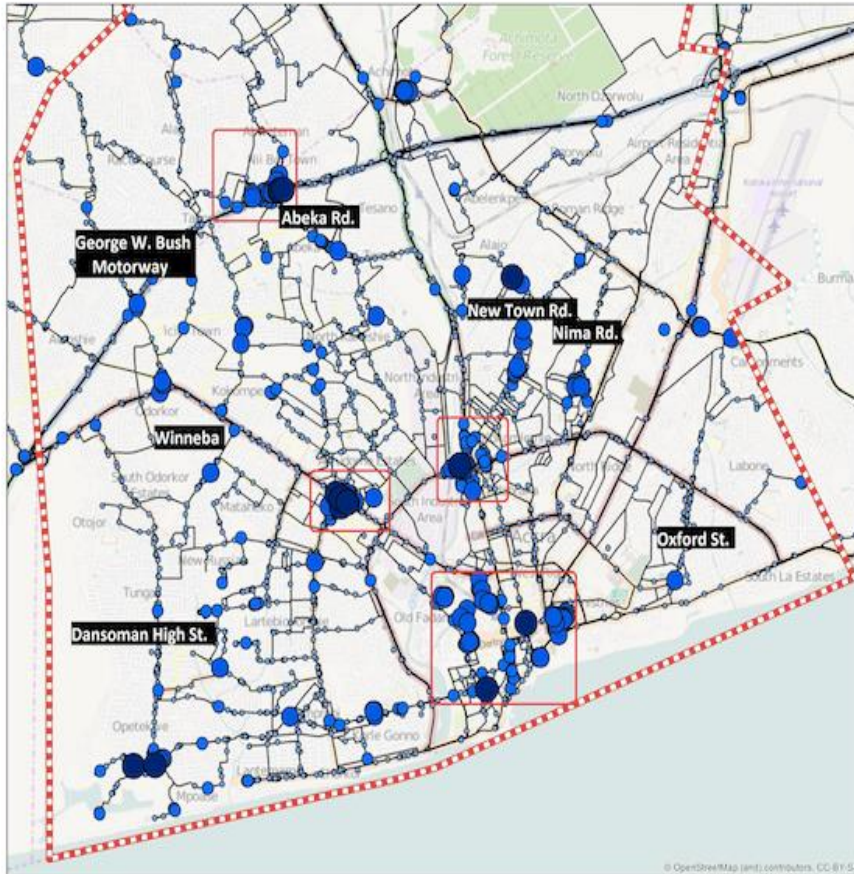
- Undertake Supply and Demand Management Studies
  - Multimodal interaction and analysis
  - On-street parking management studies
- Introduce area-wide traffic control technology applications
  - Establish traffic management centres
  - Real time travel planning information systems
    - Smart transport planning options with mobile technology
- Undertake congestion management studies
  - Stated preference methods
  - Value of travel time analysis
    - Creating income-proxy values for policy debate

# Identification of Traffic Management Sites

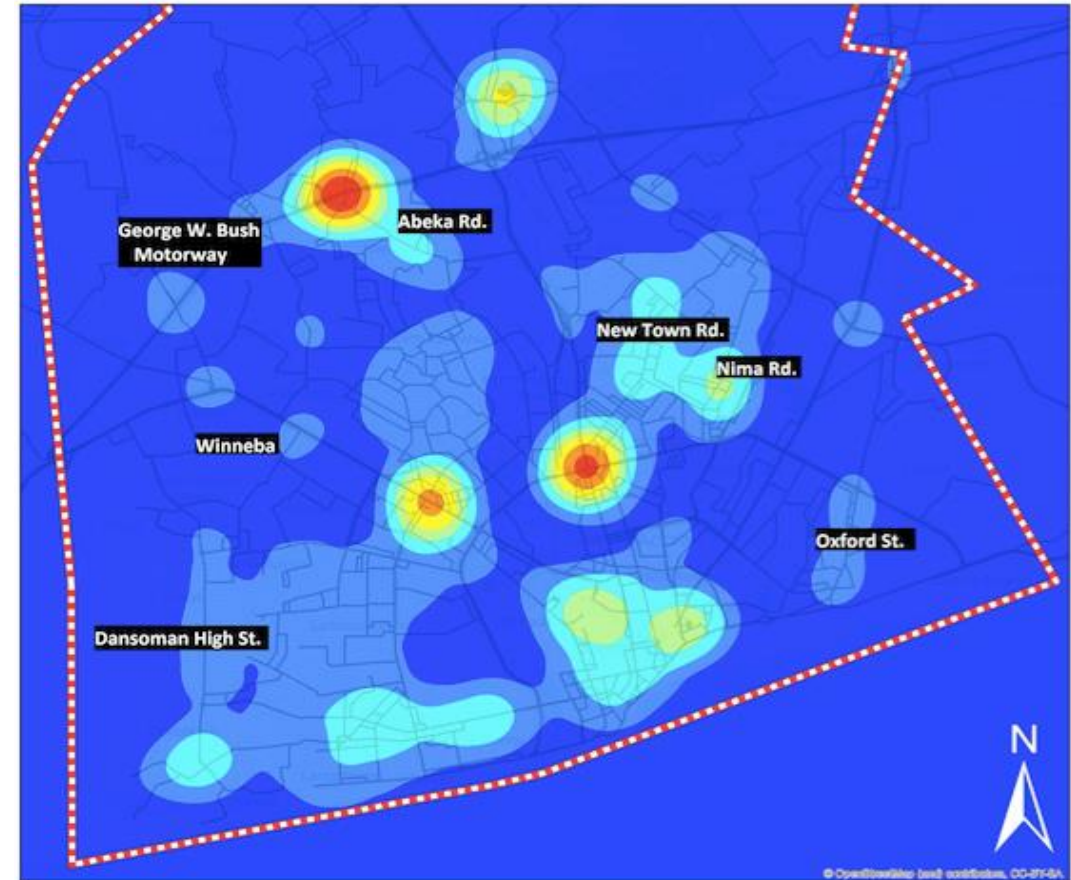
## Boarding and Alighting Patterns

-  AMA Boundary
  -  Trotro route
- Boarding and alighting passengers**
-  1 - 9
  -  10 - 19
  -  20 - 29
  -  30 - 56

- Kernel Density**
-  0 - 382,632
  -  382,633 - 765,264
  -  765,265 - 1,147,896
  -  1,147,897 - 1,530,528
  -  1,530,529 - 1,913,160
  -  1,913,161 - 2,295,792
  -  2,295,793 - 2,678,424



## Public Transport Hotspots



# Demand Management: On-street Parking Scheme

## ASYLUM DOWN ON-STREET PARKING BAY MARKINGS



ROAD NAME	NO. OF BAYS
MANGO TREE AVENUE	P120
5TH CRESCENT	P92
4TH CRESCENT	P50
COCONUT AVENUE	P90
SWAMP GROOVE	P80
3RD MANGO TREE AVE.	P110
AFRAM LANE	P52
MANGO LANE	P112
4TH CRESCENT LINK	P50
OFFIN AVENUE	P30

ASYLUM DOWN AREA STREETS			
ASYLUM DOWN ON-STREET PARKING PROJECT			JOB NO.
DRAWN FOR: BASIC PARKING SYSTEMS			SHEET NO. 3
			SCALE 1CM:23.08M
DATE 20/04/15	CHECKED D	TRACED	DRAWN ALEX JOHNSON
			ISSUED

# Sustainable Development

- Green Technology
- Artificial Landforms
  - Reclamation options
  - Multi-use option (Covered channels & Wetlands)
- Emission Management
- Recycling

# CONCLUSIONS

1. Paratransit not as different as one would think from institutional transport services in terms of service reliability
2. Shows potential for reform and professionalization of the sector rather than simple removal and replacement by formal services (BRT, public buses)
3. Improving mobility requires capacity building and institutional strengthening programs, not just infrastructure building