PROMOTING EFFICIENT PUBLIC TRANSPORTATION IN GHANA

Presentation by:
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GAPTE
BACKGROUND INFORMATION
THE MOBILITY CHALLENGE
MANIFESTED BY
CONGESTION ON OUR ROADS
INADEQUATE INFRASTRUCTURE
Vehicular-pedestrian conflict at Roman Hill-Kumasi
Air Pollution from Vehicular Exhaust fumes
PRESCRIBED SOLUTION
Road Space Usage

Bus & Trotro Carry 70% of Person Trips but Utilize only 30% of Road Space

- Passengers carried 49,600 (inbound)
  - Trotro, 53%
  - Car, 14%
  - Taxi, 12%
  - Bus, 15%
  - Bicycle, 0%
  - Motor-cycle, 0%
  - LDV, 4%
  - Med Truck, 1%
  - Heavy Truck, 0%
  - Other, 0%

- Road space usage
  - Trotro, 25%
  - Car, 33%
  - Taxi, 22%
  - Bus, 7%
  - Motor-cycle, 1%
  - LDV, 8%
  - Med Truck, 3%
  - Heavy Truck, 1%
  - Other, 0%
GAMA’s Status (Based on 2014 year)

- Population: 4.33 million
- Area: 1,494 km²
- Vehicles: 890,511
- Road: 7,592 km
- Public transport: MMT (148), Trotro (11,195)

Past 4 years:
- 3.6%
  - (2010y) 3,756,423
  - (2014y) 4,334,445
  - (Persons)
  
  Source: 2010 Population & Housing Census

Past 4 years:
- 8.7%
  - (2010y) 638,051
  - (2014y) 890,511
  - (Vehicles)
  
  Source: DVLA

Modal Split (GAMA)
- Trotro 46.9%
- Car/Taxi 42.9%
- Bus 10.1%
- Railway 0.1%

Modal Split (on Arterial Road)
- Trotro 62.2%
- Car/Taxi 26.7%
- Bus 9.9%
- Truck 1.2%

The Transport Master Plan In Greater Accra Region | 5
**Summary of the traffic situation**

**Travel Demand Forecast**

**Veh-km**
- **2014**: 13,795 veh-km
- **2035**: 39,123 veh-km
  - **2.8 times**

**Speed**
- **2014**: 43.4 km/hr
- **2035**: 17.1 km/hr
  - **-26.3 km/hr (-60.6%)**

**V/C**
- **2014**: 0.67
- **2035**: 1.70
  - **1.5 times**

**Modal Split rate**
- **2014**
  - Public: 57.1%
  - Private: 42.9%
- **2035**
  - Public: 42.2%
  - Private: 57.8%

**The Transport Master Plan In Greater Accra Region**
Government Policy

80% of all trips in the Urban Area should be done through public Mass Transit Systems
GOVERNMENT POLICY

ROLE OF GOVT

Government will Invest into urban transport systems by

• providing UPT infrastructure (policy objective 2)
• providing a decentralized institutional and regulatory framework (policy objective 5)
• empowering the private sector to invest into buses and transport service provision (policy objective 4)
• Integrating urban transportation within a strategic urban development framework (policy objective 3)
GOVERNMENT POLICY (CONT’D)

ROLE OF OPERATORS
Current Public Transport Operators will

• Reorganize into business entities to deliver UPT Services
• Comply with Government Regulation and Provide Higher Quality Service

FINANCIAL INSTITUTIONS
Financial Institutions will

• Provide financing for buses and service provision by operators
IMPLEMENTATION STRATEGY

- A Regulatory Framework that provides a legal basis for the re-organization of the sector at the national level
- Regulatory Institutions that have sufficient capability to plan, regulate, and guide the industry at the local level
- An Industry Structure that can compete and operate within the regulatory framework and attract investment
- A culture of Compliance with the regulatory framework, and commitment power to enforce
- Infrastructure and a suitable operating environment to support improved UPT services in Accra

IMPLEMENTING ENTITY

(GAPTE)

DUR
Major Network in Accra
VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

INFRASTRUCTURE

• BUS PRIORITY MEASURES
• HIGH OCCUPANCY VEHICLES
• DEDICATED TERMINALS
• DEDICATED BUS STOPS
• DEDICATED DEPOTS
VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

THE GAMA NETWORK

CORRIDORS IDENTIFIED FOR DEVELOPMENT
VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

1. **KASOA-CBD**
   - 5km segregated corridor
   - 10 terminals
   - 2 depots
   - 16 stations
   - 12 routes
   - Costs: approx USD 107mio

2. **ADENTA-TEMA STATION**
   - 22km route
   - 22 stops
   - 3 terminals
   - 1 depot
   - 2 routes
   - Costs: approx USD 25mio

3. **AMASAMAN- CMB**
   - 20.3km route
   - 42 stops
   - 4 terminals
   - 1 depot
   - 3 routes
   - Costs: approx USD 14.3mio
VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

MANAGEMENT OF THE NETWORK

- Regulation
- Construction / Maintenance
- Service Planning

Public Transport Operations

- MMDAS/GAPTE: Operating permits etc
- DUR
- MMDAS/GAPTE: Network planning etc

Common Facilities

- Depots and terminals
- Passenger Information
- Common ticketing
- Data Management

Separate Services

- SCHEDULED BUS SERVICES ON QBCs
- TRO–TRO SERVICES ON FEEDERS
VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

SERVICES

Different roles for big buses, tro-tros and taxis in the network

SCHEDULED SERVICES USING BIG BUSES ON CORRIDORS

HIGH QUALITY TRO-TROS /TAXIS ON FEEDERS/COLLECTORS
VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

OPERATORS

CURRENT OPERATORS TRANSFORMED INTO OPERATING COMPANIES DELIVERING SERVICES ON THE QBCs.
Regulation harmonization
Cross jurisdictional enforcement

Network systems organization and management
Implement BRT/QBC systems under contract with Gapte

BRT/QBC MGT ARRANGEMENT

INTELLIGENT TRANSPORTATION SYSTEM (ITS)
AUTOMATED FARE COLLECTION SYSTEM (AFC)
STATION SERVICES
VEHICLE OPERATIONS

Network planning
Services planning
GAPTE (created April 2014)

- G – Greater
- A – Accra
- P – Passenger
- T – Transport
- E – Executive

- Inter-MMDA Co-ordinating Body for Public Transport in GAMA (Greater Accra Metropolitan Area)

- Harmonise all regulation of UPT services and enforcement,
- citywide network planning,
- manage integrated citywide operational projects (eg. BRT) and customer services (eg. ticketing, passenger information and conduct the UPT infrastructure planning in association with other mandated MDAs
ASSERTING THE INFLUENCE OF THE REGULATOR

- Bye-laws passed and operational in 2010 in conformance with Local Govt Act L.I. 1961

- Permit type A issued for normal Tro-tro/Taxi operator Entities and renewable yearly

- Permit issued only to operator entities not individuals

- Register of operators created with the permitting system

- Only permitted operators in register to benefit from the opportunities created by the reforms
Statistics on conformance and mitigation

- 565 Tro-tro and Taxi entities from various Unions registered in GAMA MMDAs
- Comprising 20,935 drivers
- 39,816 registered vehicles
- 23 Affected Operators on Amasaman-Tudu (CMB) Corridor
- 57 imparted routes
- 75 imparted route operations
OBTAINING THE SUPPORT OF THE TRO-TRO UNIONS

- Design of the reform strategy includes the incorporation of current informal operators in service provision.

- All modes of carriage i.e. HOVs, Tro-Tros and taxis have role to play in service provision in the network

- OSC created in 2010 as forum for regular interaction with GPRTU, PROTOA, Cooperative and others in the informal sector

- MOU with OSC providing framework for reforms execution negotiated on 30th August 2013

- Three Operator Companies created in December 2013 from affected Operators in the corridor

- Route Service Contracts for services on the corridor negotiated with the three formal Operator Companies in June 2014

- Operator companies being assisted with the procurement of conforming buses for the System
DESCRIPTION OF BUS PRIORITY AND INFRASTRUCTURE ON PILOT CORRIDOR
THE GHANA URBAN TRANSPORT PROJECT (GUTP)
GUTP OBJECTIVES

• Improve mobility in areas of participating MMDAs

• Shift to more environmentally-sustainable transport modes and lower transport-related GHG emissions along the pilot BRT corridor in Accra.
GUTP MAIN COMPONENTS

• Component 1 : Institutional Development
• Component 2 : Traffic Engineering, Management and Safety
• Component 3 : Bus Rapid Transit System
• Component 4 : Integration of Land Development and Transport Planning
• Component 5 : Project Outcome Monitoring & Evaluation
Development Objectives

✓ Improve mobility (reduce congestion) in Accra and in other participating MMDAs

✓ Promote a shift to more environmentally-sustainable urban transport modes and encouraging lower urban transport-related greenhouse gas emissions along the pilot BRT corridor in Accra
Status of Implementation of Pilot Type B Bus System
Pilot Type B Operational concept
Junction enhancement – ‘queue jump’.

New Town Rd Jnct.
Priority Infrastructure Measures – Example: Contraflow Bus Lane on Kwame Nkrumah Ave

DEDICATED BUS LANE (800M) ON KWAME NKRUMAH AVE. TIME SAVINGS OF 8 MINUTES

TERMINAL ON TUDU ROAD
DEDICATED FACILITIES

42 STOPS
4 TERMINALS
1 DEPOT
SERVICE PLAN FOR THE AMASAMAN-TUDU CORRIDOR (3 Different Services)

• Estimated Demand – 2,400 passengers per hour
• Round trip time – 110 mins (+10 min layover)
• Service Frequency – 35 buses per hour
• Peak Vehicle Requirement – 76 buses
• Fleet Requirement – 85 buses
PILOT TYPE B: BUSINESS MODEL & INDUSTRY TRANSITION

BUSINESS & CONTRACT STRUCTURE

Existing Model

CURRENT BUS OPERATORS
(TRO-TROs) & (MMT)

GAPTE

Operating the buses
Ticketing
Fare collection
Depot management
PILOT TYPE B: BUSINESS MODEL & INDUSTRY TRANSITION

BUSINESS & CONTRACT STRUCTURE

PILOT TYPE B Model

Pilot Type B Bus COMPANIES

- Operating the buses
- Ticketing
- Fare collection
- System Information
- Marketing the service
- Bus stop maintenance
- Station management/Enforcement
- Depot management
- Depot owner
- Contract Monitoring

GAPTE
## BUSINESS & CONTRACT STRUCTURE

### SERVICE DELIVERY AGREEMENT WITH GAPTE

<table>
<thead>
<tr>
<th>GAPTE</th>
<th>Out-sourced</th>
<th>Outsourced</th>
<th>NEGOTIATE</th>
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<tbody>
<tr>
<td>Control Centre Management</td>
<td>Fare System Contractor</td>
<td>Station Services Contractor</td>
<td>Vehicle Operator Contractor</td>
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<td>Fare collection monitoring</td>
<td>Ticketing system &amp; equipment</td>
<td>Access control</td>
<td>Operating the buses</td>
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<tr>
<td>System Information</td>
<td>Fare collection</td>
<td>System Information</td>
<td>Depot management</td>
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<td>Contract Monitoring</td>
<td>Ticket sales</td>
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<td>Enforcement</td>
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<td>Cleaning</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Security</td>
<td></td>
</tr>
</tbody>
</table>
QUALITY BUSES

- HIGH CAPACITY
- DISABLE FRIENDLY
- ELECTRONIC TICKETING SYSTEM
- AUTOMATIC VEHICLE LOCATION
- PASSENGER INFORMATION SYSTEM
- ON-BOARD VIDEO CAMERAS
- EURO 3 ENGINES
GENERAL - CORRIDOR BUS TIMES

• WEEKDAYS
  – First Bus from Amasaman Terminal      5 am
  – Last Bus from Amasaman Terminal       8 pm
  – First Bus from Tudu Terminal          5:50 am
  – Last Bus from Tudu Terminal           8:50 pm

Frequency at Peak – Every 6 minutes
Peak = 6am to 10am / 3pm to 7pm

Frequency at Off Peak – Every 8 minutes
Off Peak = 5am to 6am / 10am to 3pm / 7pm to 10pm

• WEEKENDS
  Frequency at Weekends – Every 10 minutes
Amasaman Corridor Vehicle Operator Contracts

3 Contracts

3 Companies
Distribution of Contracts

Pilot type B: Business Model & Industry Transition

3 Pilot type B VEHICLE OPERATOR COMPANIES
85 buses
Only 25% of business on corridor affected

existing 77 affected operator entities transformed into 3 RSCs
SERVICE PROVISION

3 Operator companies created out of current tro-tro operator unions for services on the 3 designed routes

Amasaman to Tudu ([Ghana Co-Operative Bus Rapid Transit Services LTD](#))
- Semi-fast scheduled service taking Expressway
- Serving end-to-end movements and the important interchanges at Achimota and Circle

Ofankor to Tudu ([Accra GPRTU Rapid Bus Services LTD](#))
- Stopping scheduled service taking service lane
- Serving intermediate demand between Ofankor and Achimota

Achimota to Tudu ([Amalgamated Bus Rapid Transit Services LTD](#))
- Serving as efficient 'shuttle' scheduled for the demand interchanging and originating from Achimota towards Central Accra
Ghana Cooperative Bus Rapid Transit Ltd: Amasaman to CBD

- Estimated Demand – 600 passengers per hour
- Service Frequency – 10 buses per hour
- Peak Vehicle Requirement – 21 buses
- Fleet Requirement – 24 buses
Accra GPRTU Rapid Bus Transit co Ltd: Ofankor to CBD

- Estimated Demand – 1250 passengers per hour
- Service Frequency – 20 buses per hour
- Peak Vehicle Requirement – 40 buses
- Fleet Requirement – 44 buses
Amalgamated Bus rapid transit Ltd: Achimota to CMB

- Estimated Demand – 600 passengers per hour
- Service Frequency – 10 buses per hour
- Peak Vehicle Requirement – 15 buses
- Fleet Requirement – 17 buses
ZONAL FARE STRUCTURE

Key:
- Blue: Existing Bus Stop
- Green: Bus terminal
- Purple: Bus route
- Red: Service lane
- Zone 4
- Zone 3
- Zone 2
- Zone 1

Fare tariff:
- Single zone: $0.6
- Two zones: $1.0
- Three zones: $1.3
- Four zones: $1.5

GUTP, Pre-GAPTE Unit, MLGRD
ITMS TO BE EMPLOYED

• Automatic Fare Collection System (AFC)
• (Electronic Ticketing)
• Vehicle Fleet Management System (FMS)
  – Vehicle Follow up
  – Fuel Chart
  – Historical information
  – Vehicle scheduling
  – Location message triggers
  – Bus Monitoring
  – Vehicle schedule reporting
• User Information System (PIS)
  – Vehicle Displays
  – Voice Announcement
SERVICE ATTRIBUTES

- AUTOMATED FARE COLLECTION SYSTEM
- FLEET MANAGEMENT SYSTEM
- PASSENGER INFORMATION SYSTEMS

Validation in a zonal system

Vehicle follow up

Choose period to follow up

Or select one bus

Export to excel for more details

All buses in a list

Bus monitoring

- Monitoring based on automatic vehicle location
- Various view, selection and search options

Vehicle Displays

- The on-board system steers
  - Next stop display
  - Outside front display
- The display content is automatically generated by the on-board system
On-board validator

- High performance device suitable for installation in vehicles.
- Special cradle that is intended for mounting the validator in vehicles and facilitate pre-installation
- Simplified maintenance – simple ‘swap-out’
- Contactless read/write unit ISO14443 Type A/B
- EMV compliant
- Multiple external hardware interfaces in order to interface to other, external devices or systems.
On-board integration with the bus tripod gate

- At door entry
- Interface between the validator and the bus tripod gate
- Entrance controlled by the validator
Validation in a zonal system
Vehicle follow up

Choose period to follow up

Or select one bus

Export to excel for more details

All buses in a list

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Start date</th>
<th>End date</th>
<th>Odometer</th>
<th>Distance (km)</th>
<th>Total fuel consumption (litres)</th>
<th>Average fuel consumption (l/100 km)</th>
<th>Average speed (km/h)</th>
<th>Ranking</th>
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</tr>
</tbody>
</table>

Selection average:
- Start date: 04/09/2014
- End date: 08/10/2014
- Distance: 841 km
- Total fuel consumption: 296 litres
- Average fuel consumption: 34.4 l/100 km
- Average speed: 29.3 km/h

Fleet average:
- Start date: 01/09/2014
- End date: 09/10/2014
- Distance: 2994 km
- Total fuel consumption: 634 litres
- Average fuel consumption: 20.2 l/100 km
- Average speed: 99.7 km/h

The portal shows a calculated fuel consumption. See Help text.
Vehicle scheduling

- The vehicle scheduling solution allows the creation and definition of:
  - Periods
  - Stops
  - Distances
  - Routes and lines
  - Itineraries
  - Travel times
  - Timesheets
Vehicle Displays

- The on-board system steers
  - Next stop display
  - Outside front display
- The display content is automatically generated by the on-board system
ROUTE STATISTICS

• Estimated Route Demand

  • Average Daily Passenger Demand – 50,000 passenger trips per day

  • Annual System Patronage – 16,650,000 passenger trips per year