PROMOTING EFFICIENT PUBLIC TRANSPORTATION IN GHANA

Presentation by:

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Systems Manager
GAPTE

BACKGROUND INFORMATION

THE MOBILITY CHALLENGE

MANIFESTED BY

CONGESTION ON OUR ROADS

INADEQUATE INFRASTRUCTURE

INDISCIPLINE

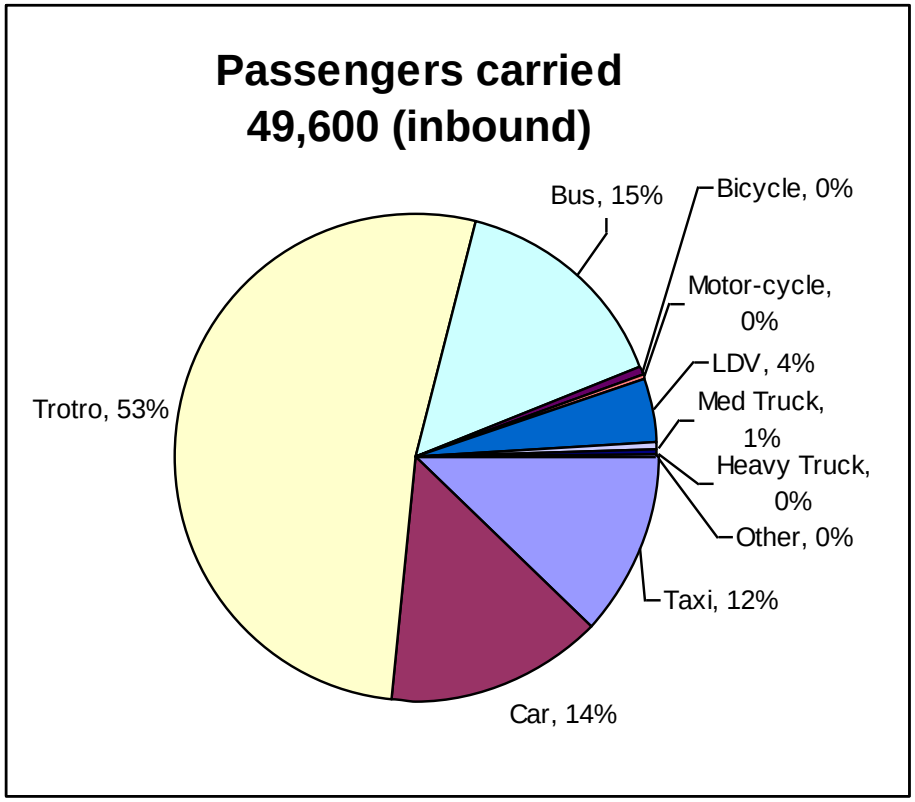
Vehicular-pedestrian conflict at Roman Hill-Kumasi

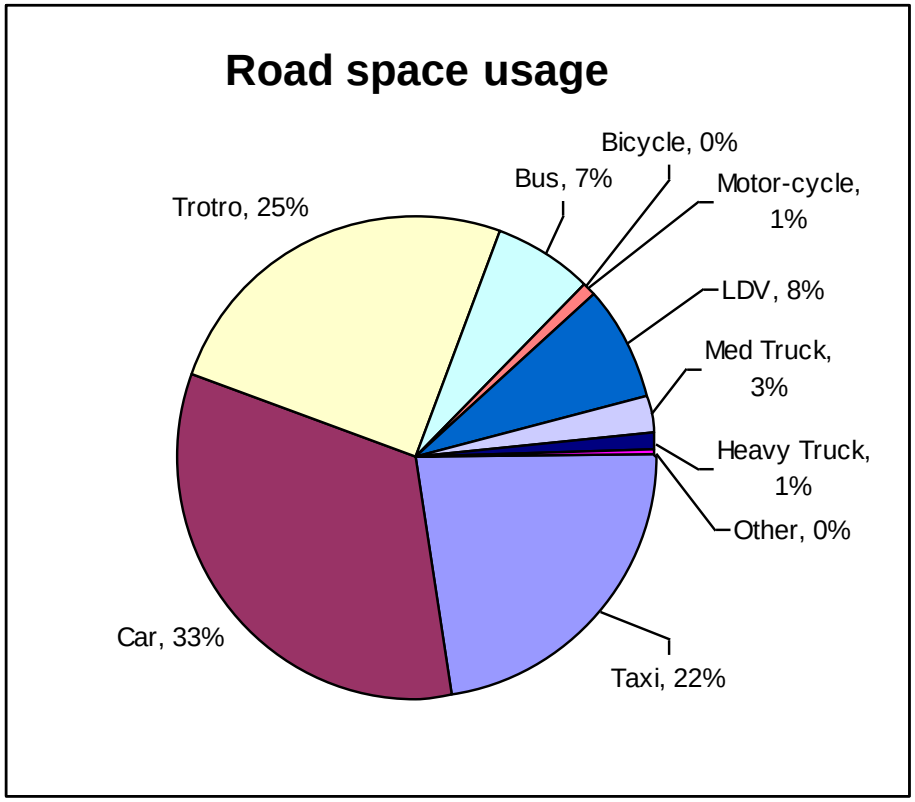
Air Pollution from Vehicular Exhaust fumes

PRESCRIBED SOLUTION

Road Space Usage

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



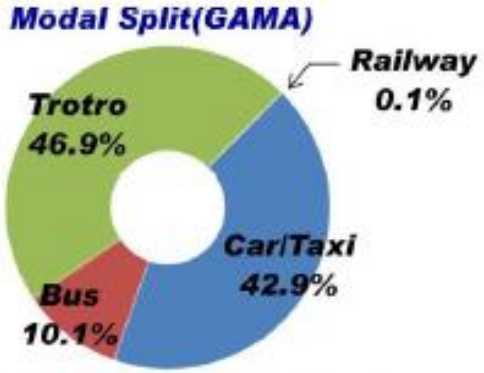


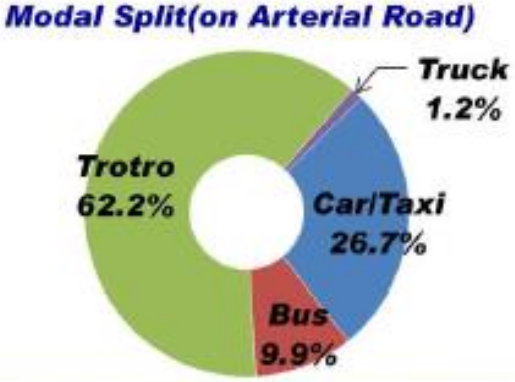
GAMA's Status (Based on 2014year)

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

Source : 2010 Population & Housing Census

Source : DVLA





Summary of the traffic situation

Travel Demand Forecast

Veh-km

2014 → 13,795veh-km

2.8 times

2035 → 39,123veh-km

Speed

2014 → 43.4 km/hr

- 26.3km/hr (-60.6%)

2035 → 17.1km/hr

V/C

2014 → 0.67

1.5 times

2035 → 1.70

Modal Split rate

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

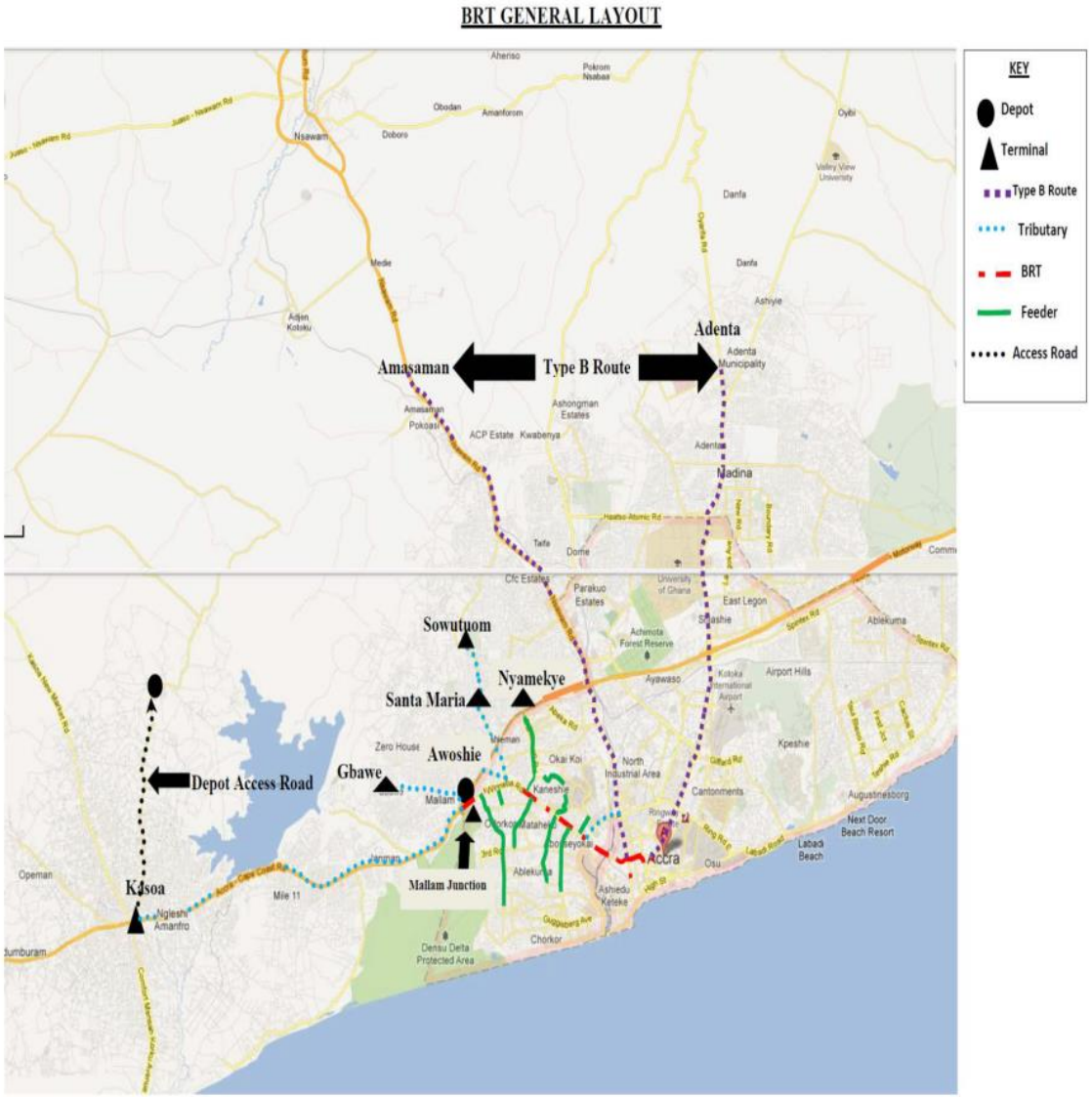
INFRASTRUCTURE

- BUS PRIORITY MEASURES
- HIGH OCCUPANCY VEHICLES
- DEDICATED TERMINALS
- DEDICATED BUS STOPS
- DEDICATED DEPOTS

VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

THE GAMA NETWORK

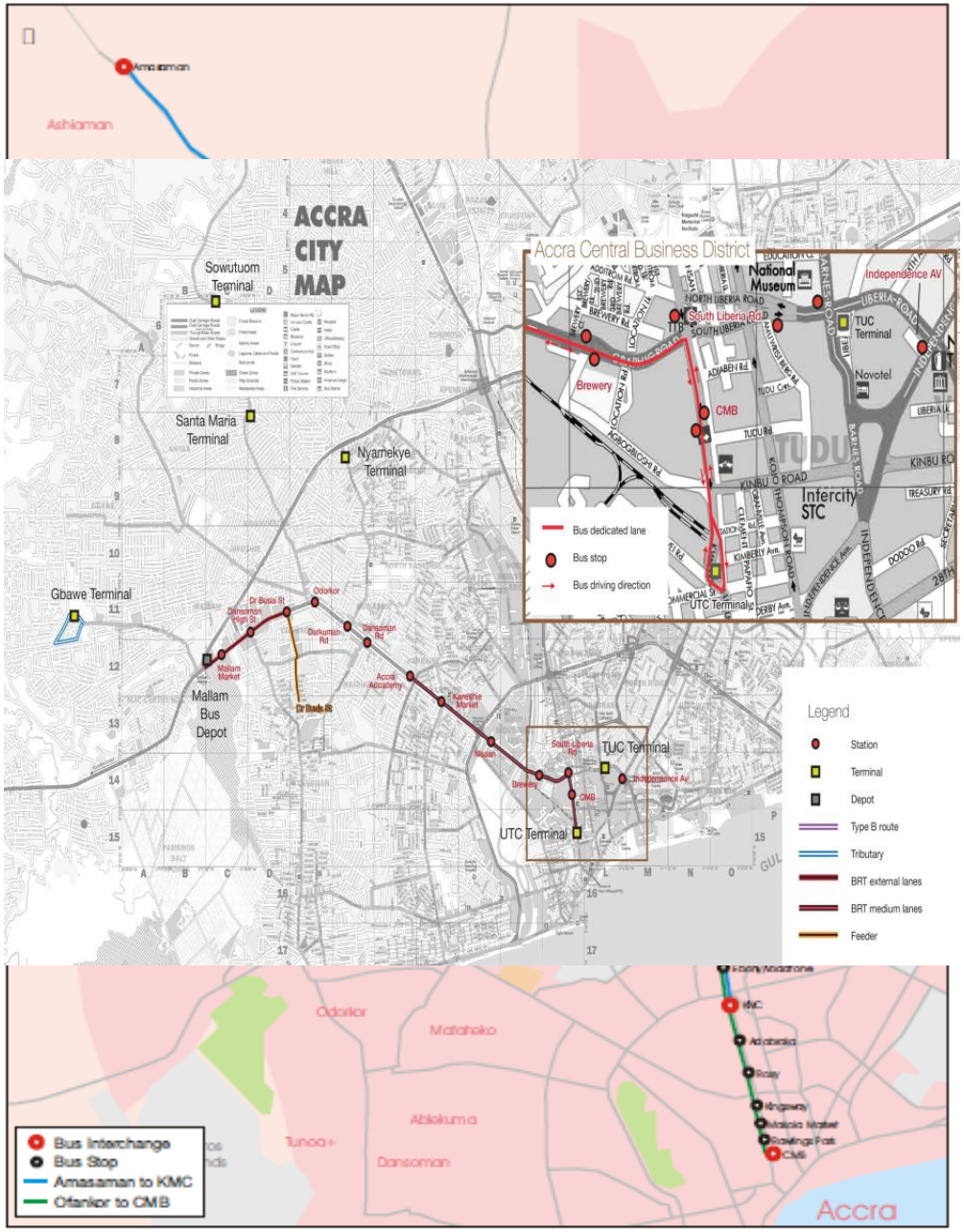
CORRIDORS IDENTIFIED FOR DEVELOPMENT



VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

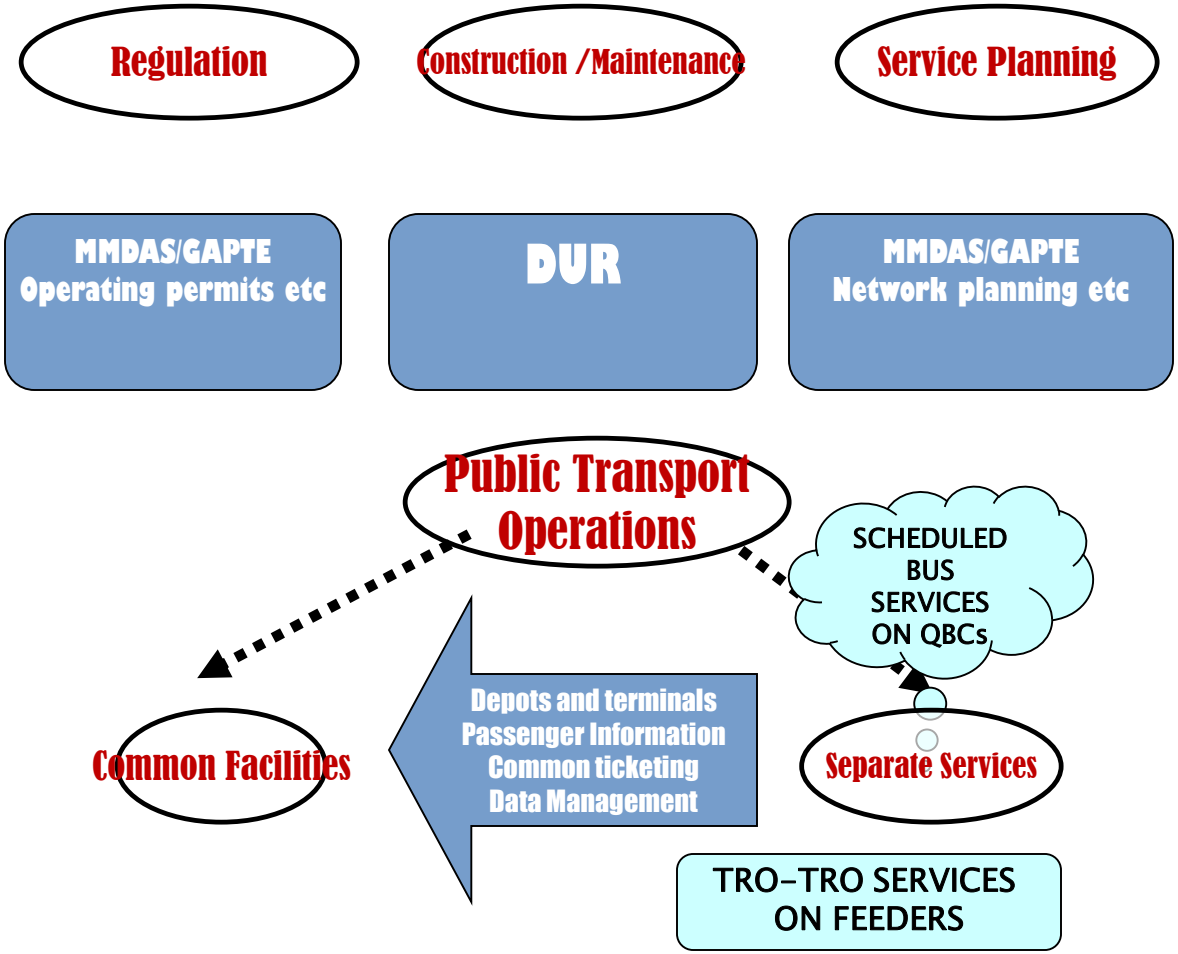
1. **KASOA-CBD**
   - 5km segregated corridor
   - 10 terminals
   - 2 depots
   - 16 stations
   - 12 routes
   - **Costs: approx.USD 107mio**
2. **ADENTA-TEMA STATION**
   - 22km route
   - 22 stops
   - 3 terminals
   - 1 depot
   - 2 routes
   - **Costs: approx USD 25mio**

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

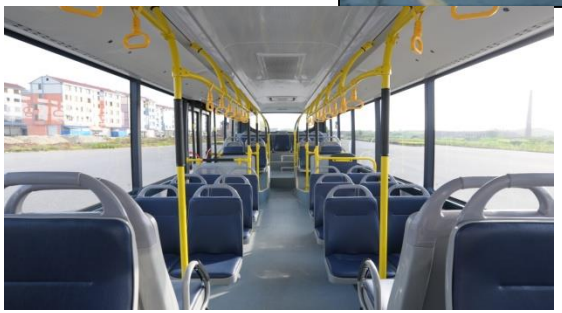


VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

SERVICES

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

SCHEDULED SERVICES USING BIG BUSES ON CORRIDOR S



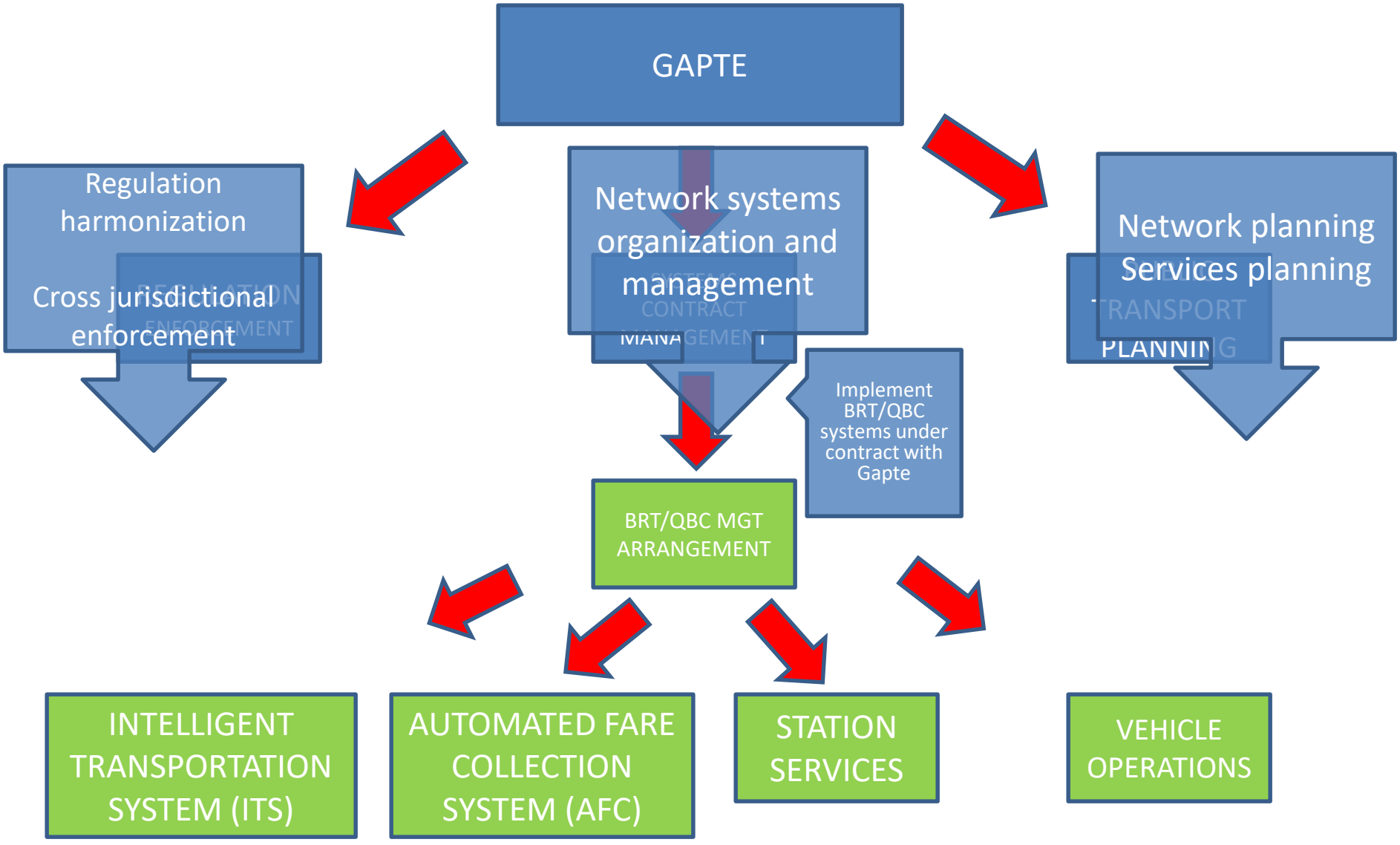
HIGH QUALITY TRO-TROs /TAXIS ON FEEDERS/COLLECTORS

VISION OF PUBLIC TRANSPORT IN GAMA BY 2020

OPERATORS

CURRENT OPERATORS TRANSFORMED INTO OPERATING COMPANIES DELIVERING SERVICES ON THE QBCs.

GREATER ACCRA PASSENGER TRANSPORT EXECUTIVE (GAPTE)


GAPTE
Regulation harmonization
Cross jurisdictional enforcement
Network systems organization and management
Network planning
Services planning
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

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

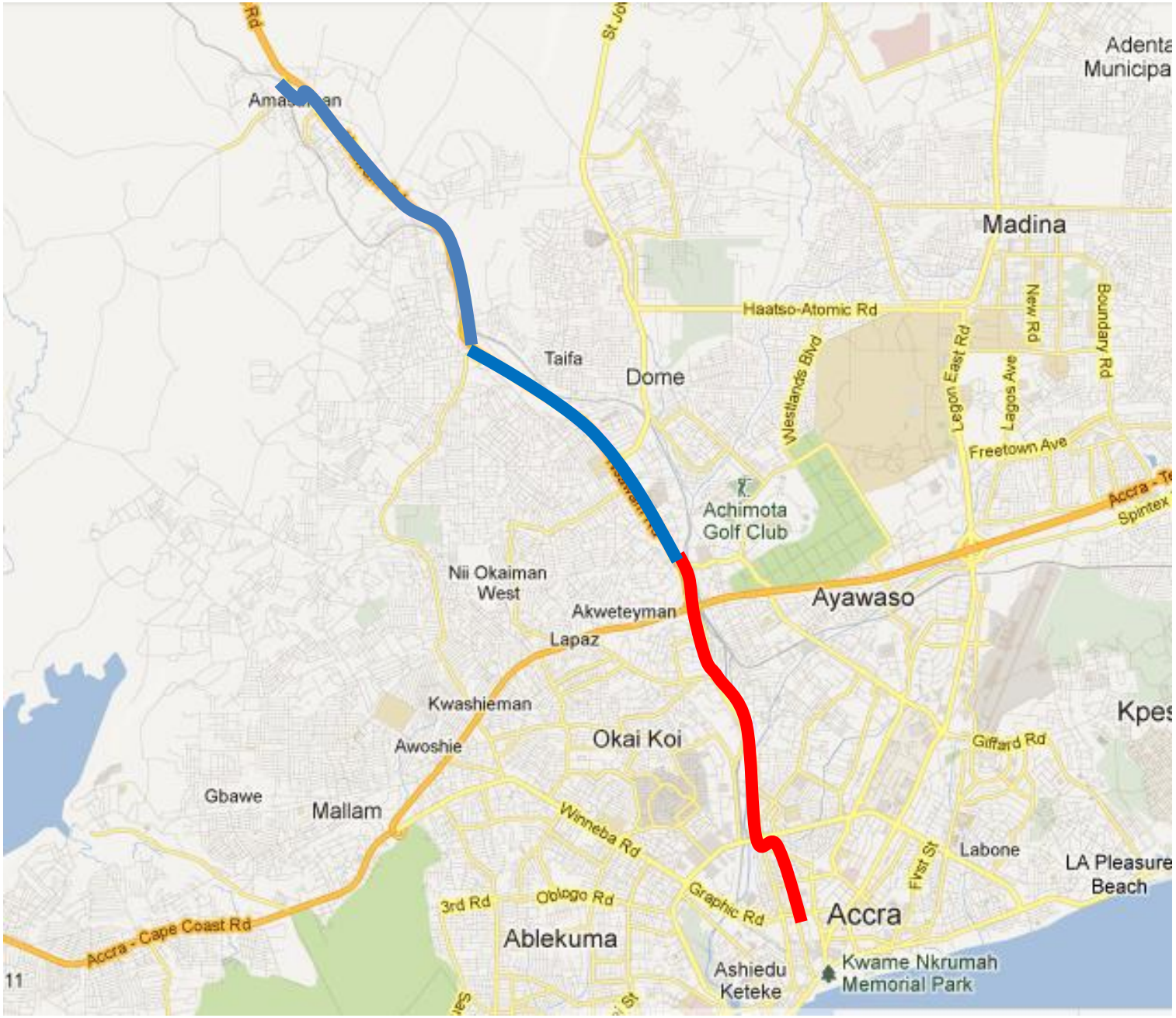
Development Objectives

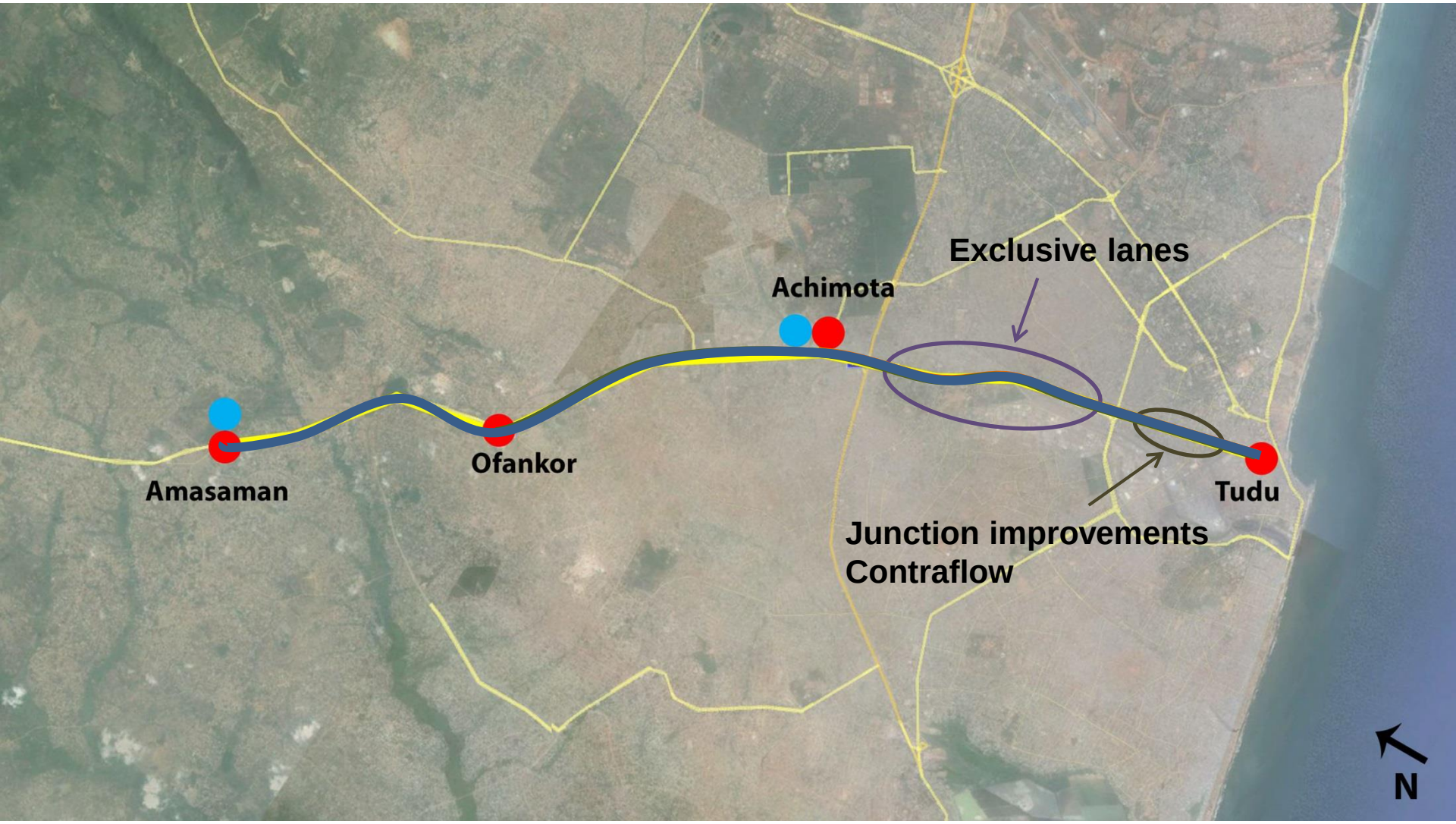
- ✓ Improve mobility (reduce congestion) in Accra and in other participating MMDAs

- ✓ 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


Madina
Haatso-Atomic Rd
Taifa
Dome
Westlands Blvd
Legon East Rd
New Rd
Lagos Ave
Boundary Rd
Freetown Ave
Achimota
Golf Club
Nii Okaiman
West
Akweteyman
Lapaz
Ayawaso
Kwashieman
Awoshie
Okai Koi
Gbawe
Mallam
Winneba Rd
Giffard Rd
Labone
LA Pleasure
Beach
3rd Rd
Obiogo Rd
Graphic Rd
Accra - Cape Coast Rd
Ablekuma
Accra
Ashiedu
Keteke
Kwame Nkrumah
Memorial Park
11

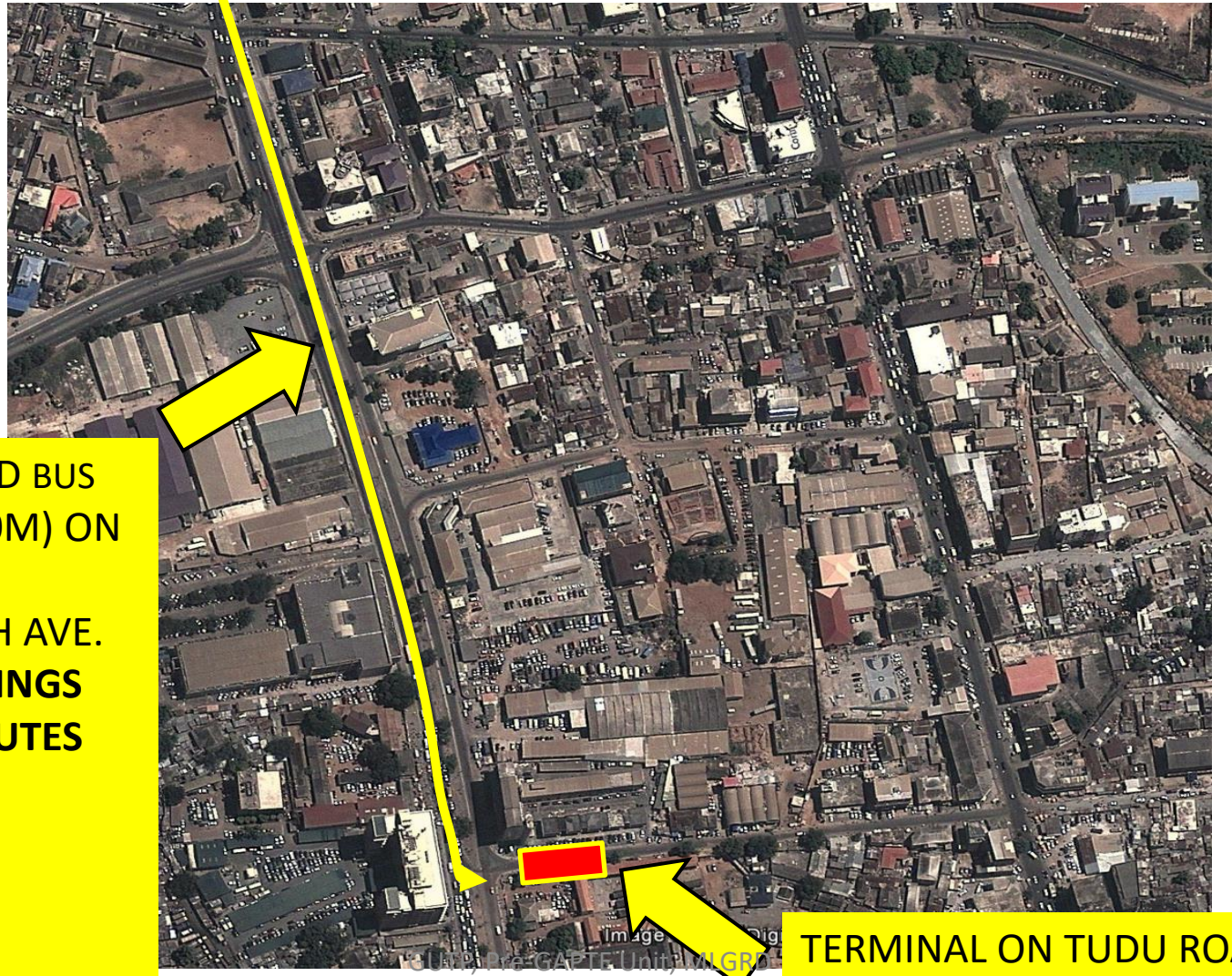

Exclusive lanes
Achimota
Amasaman
Ofankor
Tudu
Junction improvements
Contraflow
N

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**

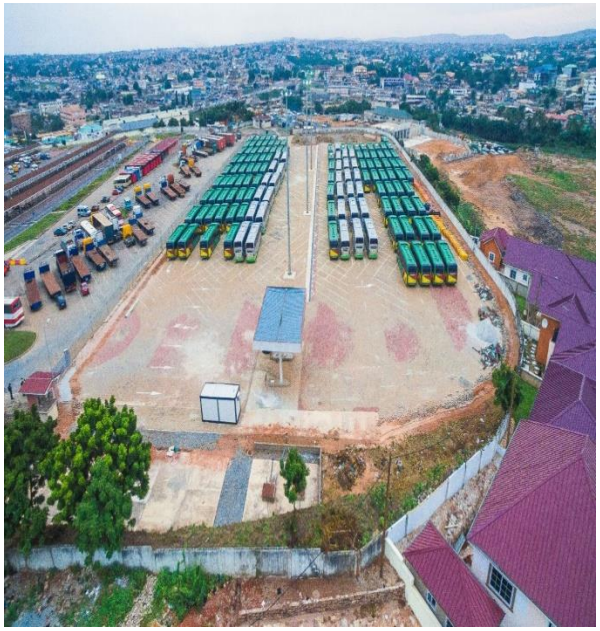
TERMINAL ON TUDU ROAD

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

BUSINESS & CONTRACT STRUCTURE

Existing Model

CURRENT BUS OPERATORS

(TRO-TROs) &

(MMT)

← Operating the buses

← Ticketing

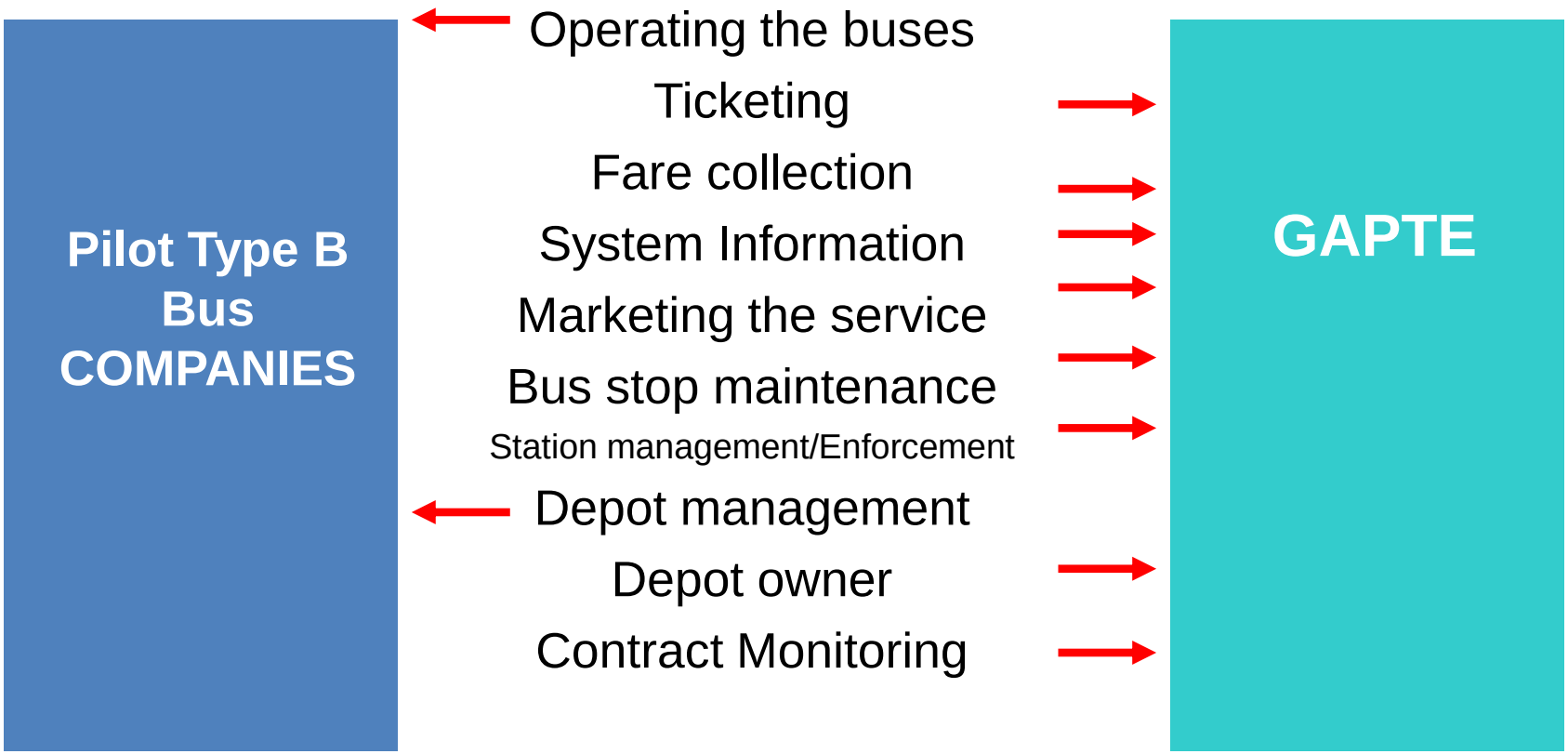
← Fare collection

← Depot management

GAPTE

BUSINESS & CONTRACT STRUCTURE

PILOT TYPE B Model



BUSINESS & CONTRACT STRUCTURE

SERVICE DELIVERY AGREEMENT WITH

GAPTE

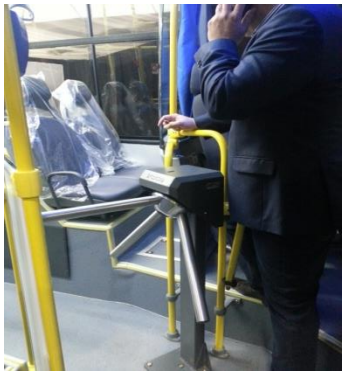
GAPTE	Out-sourced	Outsourced	NEGOTIATE
Control Centre Management	**Fare System Contractor**	**Station Services Contractor**	**Vehicle Operator Contractor**
Fare collection monitoring	Ticketing system & equipment	Access control	Operating the buses
System Information	Fare collection	System Information	Depot management
Contract Monitoring	Ticket sales	Station management	
Enforcement		Cleaning	
		Security	

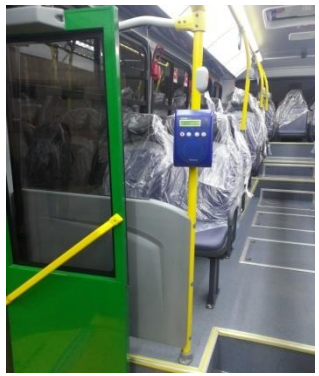
AAYALOLO
Wɔ tɛ...

AAYALOLO
Wɔ tɛ...

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

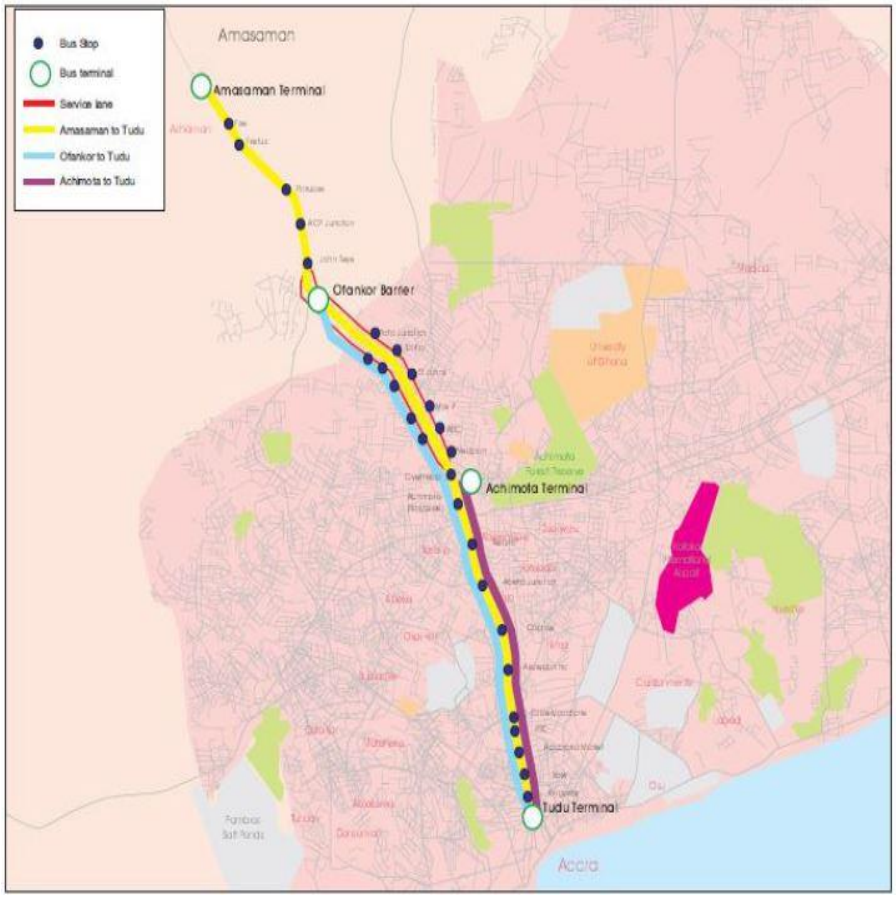
- **WEEKENDS**

  Frequency at Weekends – Every 10 minutes

Amasaman Corridor Vehicle Operator Contracts

3
Contracts

3
Companies



DISTRIBUTION OF CONTRACTS

GPRTU	PROTOA	CO-OP	GRTCC

TRANSFORM

3

Pilot type B VEHICLE OPERATOR COMPANIES

85 buses

CHALLENGE

TRANSFORM

- 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)

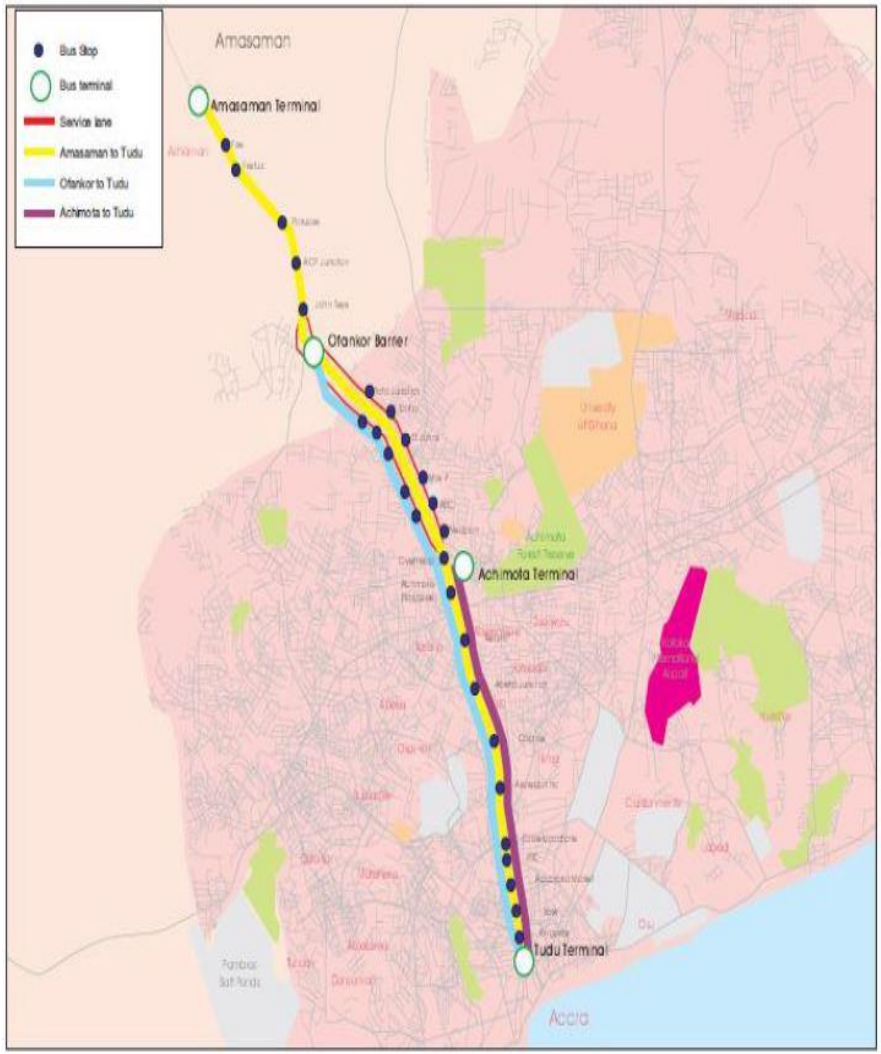
- Semi-fast scheduled service taking Expressway
- Serving end-to-end movements and the important interchanges at Achimota and Circle

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

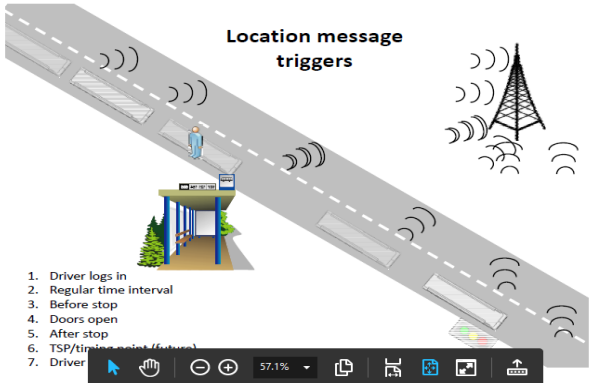
ITMS TO BE EMPLOYED

- **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**

Validation in a zonal system

SERVICE ATTRIBUTES

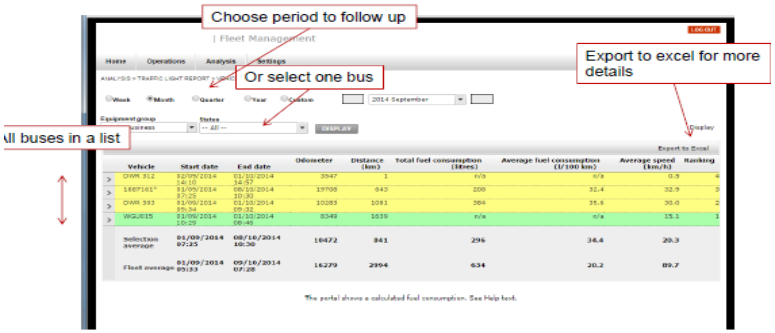
- AUTOMATED FARE COLLECTION SYSTEM
- FLEET MANAGEMENT SYSTEM
- PASSENGER INFORMATION SYSTEMS



Vehicle Displays

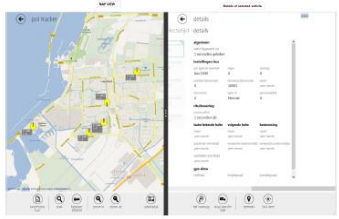
- The on-board system steers
  - Next stop display
  - Outside front display
- The display content is automatically generated by the on-board system

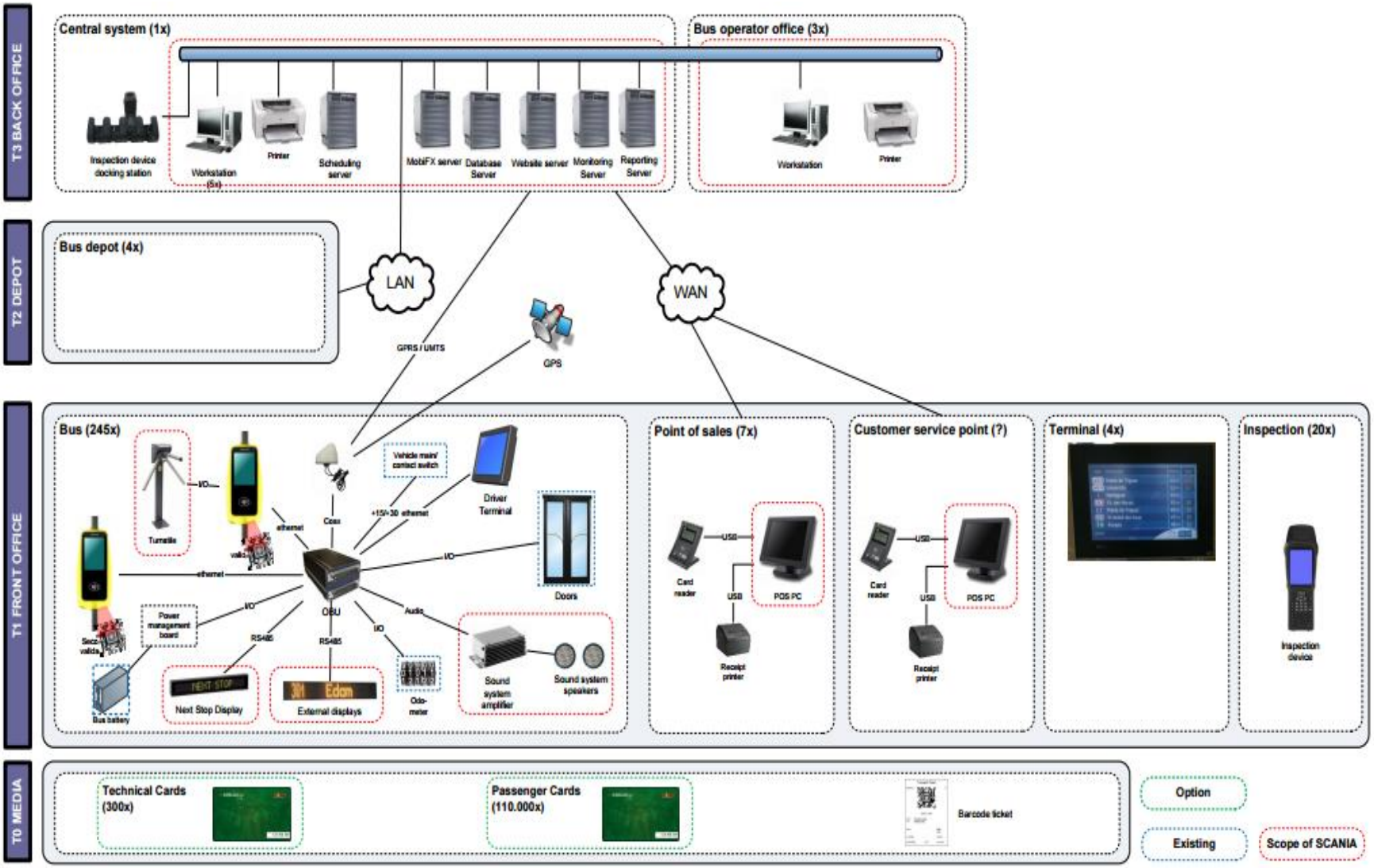
Vehicle follow up



Bus monitoring

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




T3 BACK OFFICE
Central system (1x)
Inspection device docking station
Workstation (5x)
Printer
Scheduling server
MobiFX server
Database Server
Website server
Monitoring Server
Reporting Server
Bus operator office (3x)
Workstation
Printer
T2 DEPOT
Bus depot (4x)
LAN
WAN
GPRS / UMTS
GPS
T1 FRONT OFFICE
Bus (245x)
Turnstile
Vehicle mains' contact switch
Driver Terminal
Coax
+15/+30 ethernet
ethernet
I/O
Doors
OBU
Power management board
RS485
Audio
Sound system amplifier
Sound system speakers
Odo-meter
Next Stop Display
External displays
Bus battery
Point of sales (7x)
Card reader
USB
POS PC
Receipt printer
Customer service point (?)
Terminal (4x)
Inspection (20x)
Inspection device
T0 MEDIA
Technical Cards (300x)
Passenger Cards (110.000x)
Barcode ticket
Option
Existing
Scope of SCANIA

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.

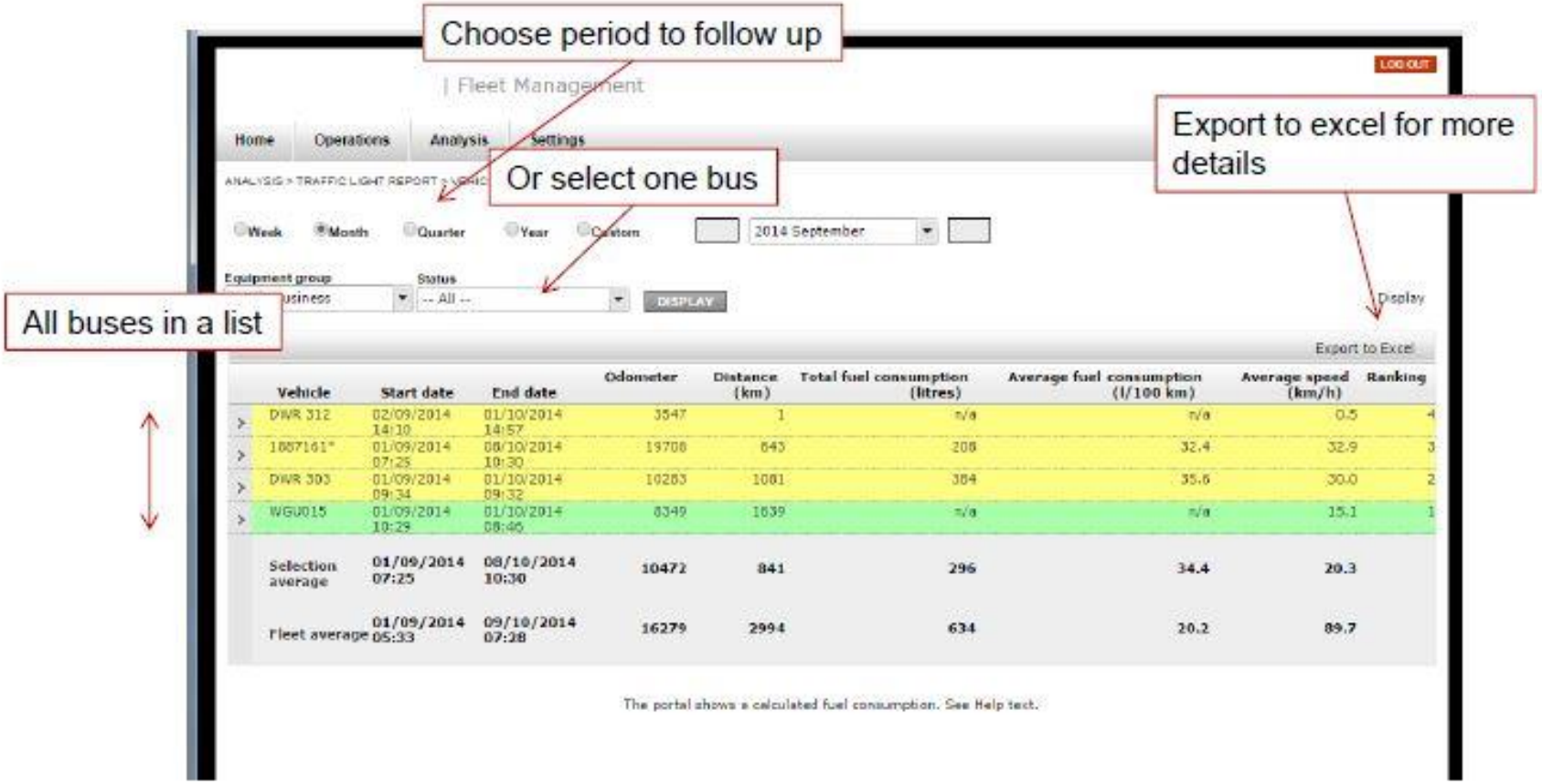
AFC

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

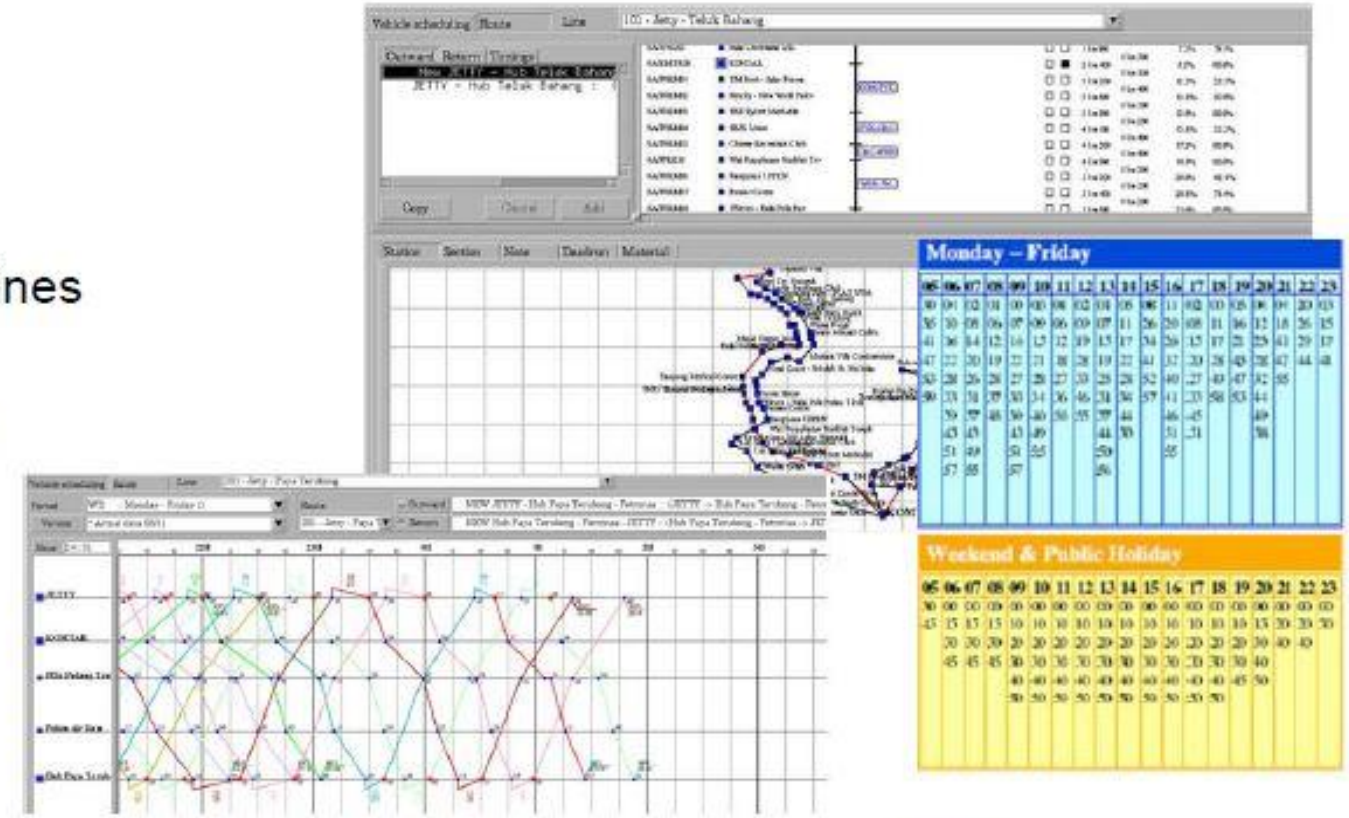
Validation in a zonal system

Vehicle follow up



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**

Amasaman Terminal
SCANIA
VIALE BRT