



Dhaka Bus Network and Regulatory Reform

April 30, 2013



An affordable and efficient public transport is vital for the development of Dhaka, given the current socioeconomic framework

- The current population in DMA is estimated at over 11 million people, expected to grow significantly in the coming years (over 3% annually)
- Around 30% of this population lives in poor conditions; the average income per capita is only 550 USD/year
- Population densities are very high, reaching over 45,000 persons/km² in the downtown area
- **High mobility needs: over 21 million trips per day inside DMA only**

There is a need for an efficient and affordable public transport system in order to support the future development of Dhaka



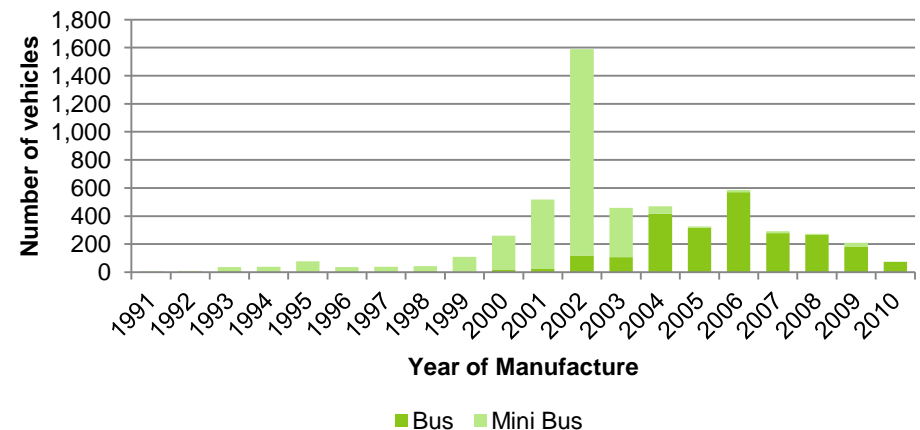
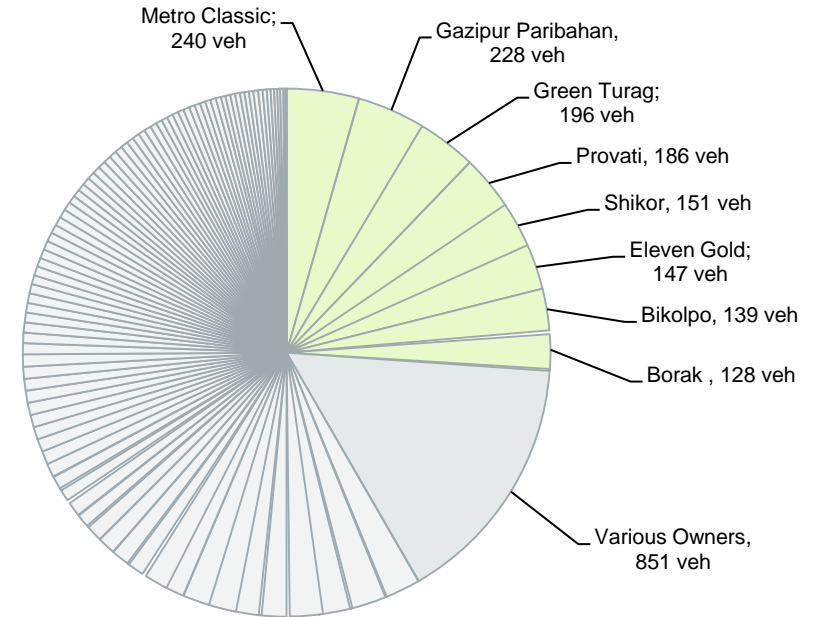
The bus industry is extremely fragmented and the vehicle fleet in operation is not suitable for a megacity such as Dhaka

Fragmented bus operation:

- **137** companies are currently operating in the network
- The **8** biggest companies only account for **26%** of the fleet
- 73 companies have less than 50 vehicles
- In addition, there are several individual owners operating
- Often various operators share the same route

Vehicle fleet issues:

- Private operators: 7,053 buses or minibuses
- BRTC: 974 buses
- 50% of the vehicle fleet has already reached its service life (10 years)
- Low vehicle maintenance standards are common
- Authorities wish to gradually phase out minibuses, but it has not always been possible due to pressure from the operators



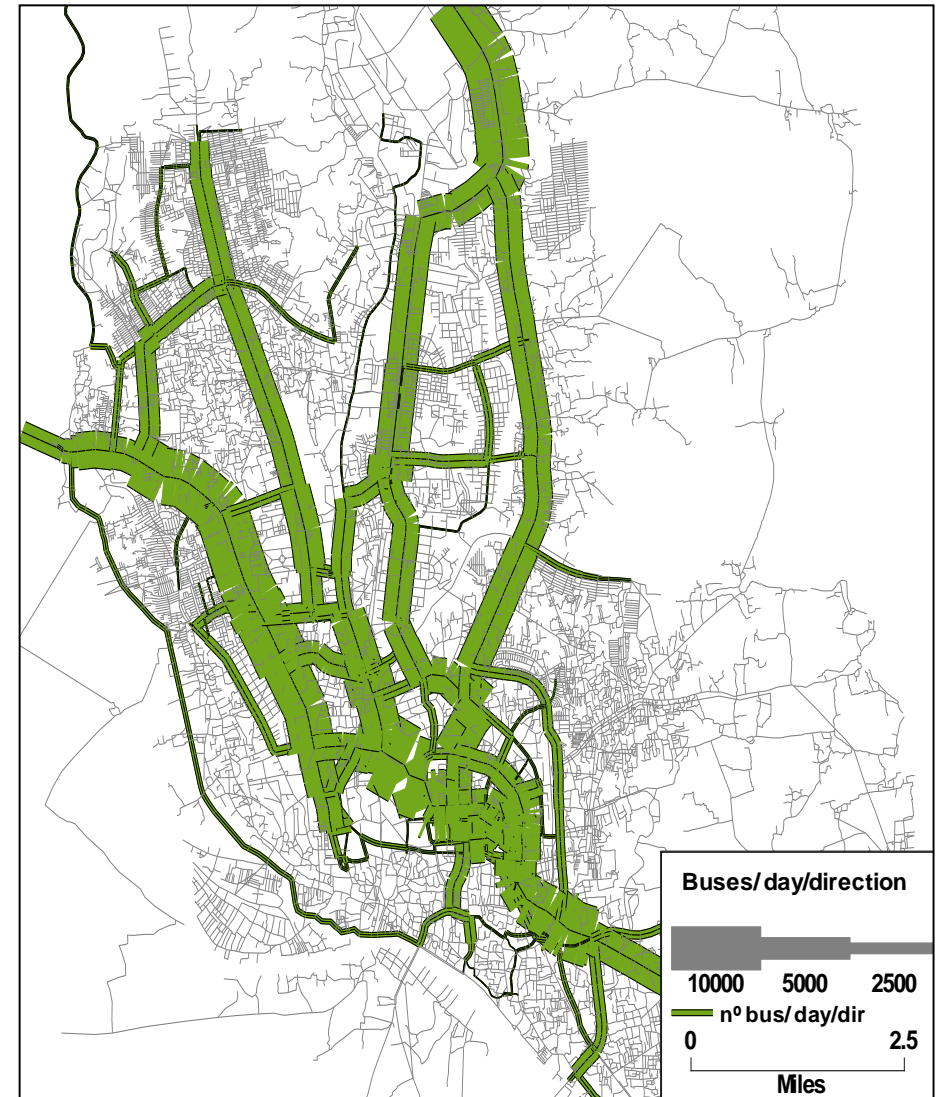
The current bus network provides low coverage, has several route overlaps and does not meet passenger trip patterns

Issues of the existing route network:

- 152 bus routes
- They are basically distributed in 40 different corridors, having long and frequent overlaps
- Several areas have a low coverage (especially in Old Dhaka and the suburbs)
- Buses pile up in the arterials, with combined frequencies that even reach 9 buses per minute in the same direction
- For 22% of users, the travel distance using public transport is over 2 times the travel distance using a car
- The passengers most affected are those making east-west trips, given that most routes are north-south

The current road network is a big part of the public transport problem:

- 88% of the roads are local streets, which are normally too narrow to host bus services
- There is a lack of east-west arterials



Furthermore, road congestion is creating excessive pollution in Dhaka. Improving bus capacity and design standards should alleviate the problem

- There are around $250 \mu\text{g}/\text{m}^3$ of suspended particulate matter in Dhaka air (5 times the acceptable limit)
- Congestion increases the average trip times and, hence, fuel consumption

The current bus fleet is not environmentally friendly:

- Excessive vehicle age (50% of the fleet over the service life)
- Inadequate maintenance status
- 55% of the fleet are minibuses, with more emissions per passenger than standard buses



Need for improvements in the current fleet and its management:

- Use vehicles with higher passenger capacities and lower levels of emissions
- Improve levels of maintenance
- Scrap the vehicles that exceed the recommended service life



The current network is not profitable, which means that the service quality could further decrease and/or fare prices would rise

The profitability of each route has been assessed considering: vehicle type, age, number, fare levels and operating costs

Results are very negative

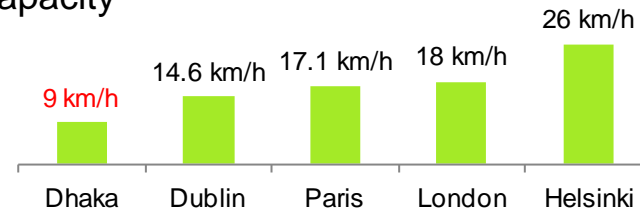
Average profitability: - 31%

Some routes would lose as much as 92%

Only 12 routes would be profitable, from 0 to 12%

Main reason

- Very low commercial speeds that increase operating costs and reduce passenger capacity



Likely consequences

A. Increased fare prices

B. Reduction of:

- Wages
- Maintenance levels
- Vehicle frequencies
- Hours of operation

Reassignment of vehicles to other routes

Negative social impacts

Reduced level of service



The existing public transport culture creates a low quality service, adds to road congestion and has negative social impacts



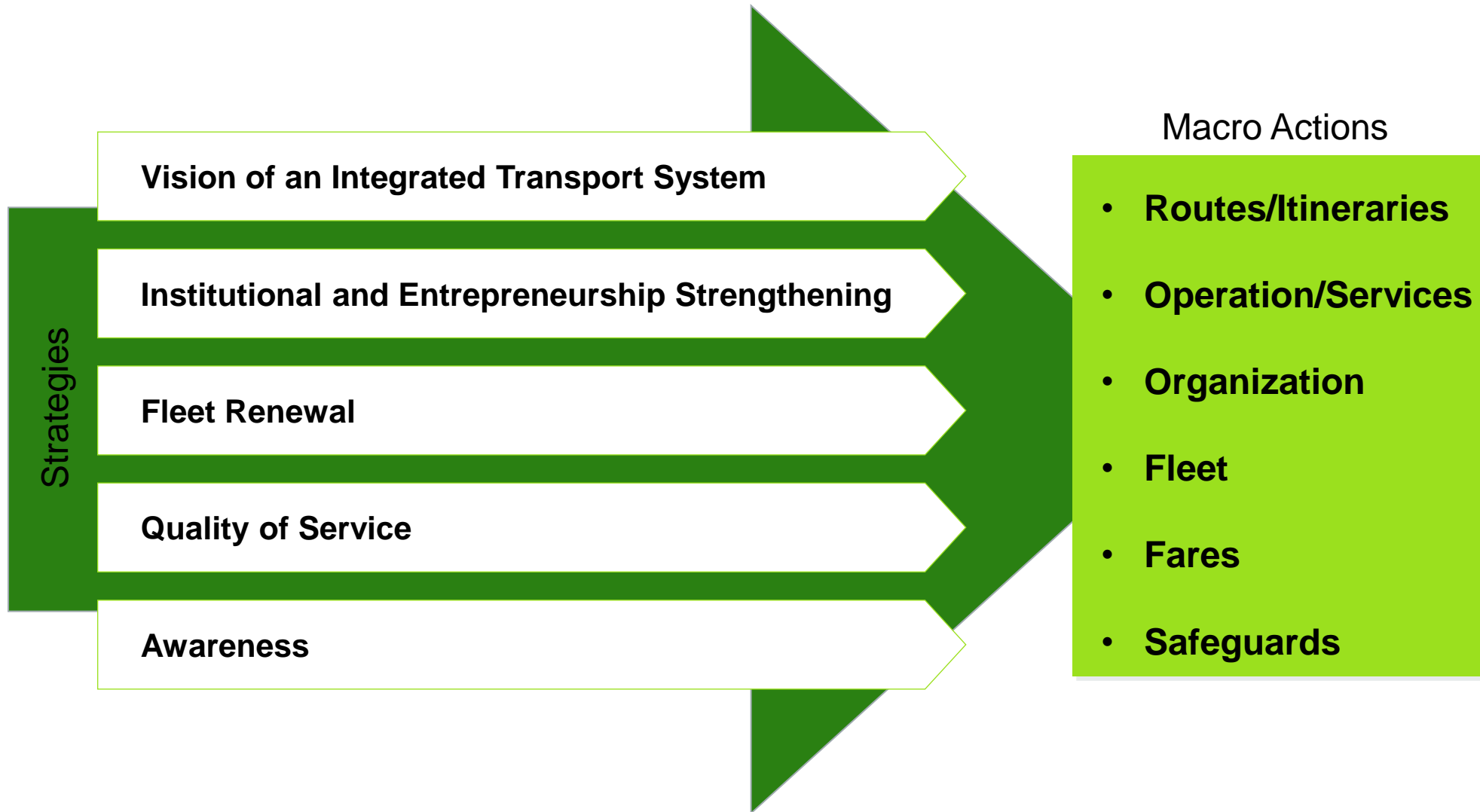
Unsuitable public transport culture:

- Competition between operators for passengers
- Reckless and untrained bus drivers
- Long pedestrian queues in ticket booths
- Lack of use of designated stopping locations
- Buses laying over at the road sides
- No seats available for women

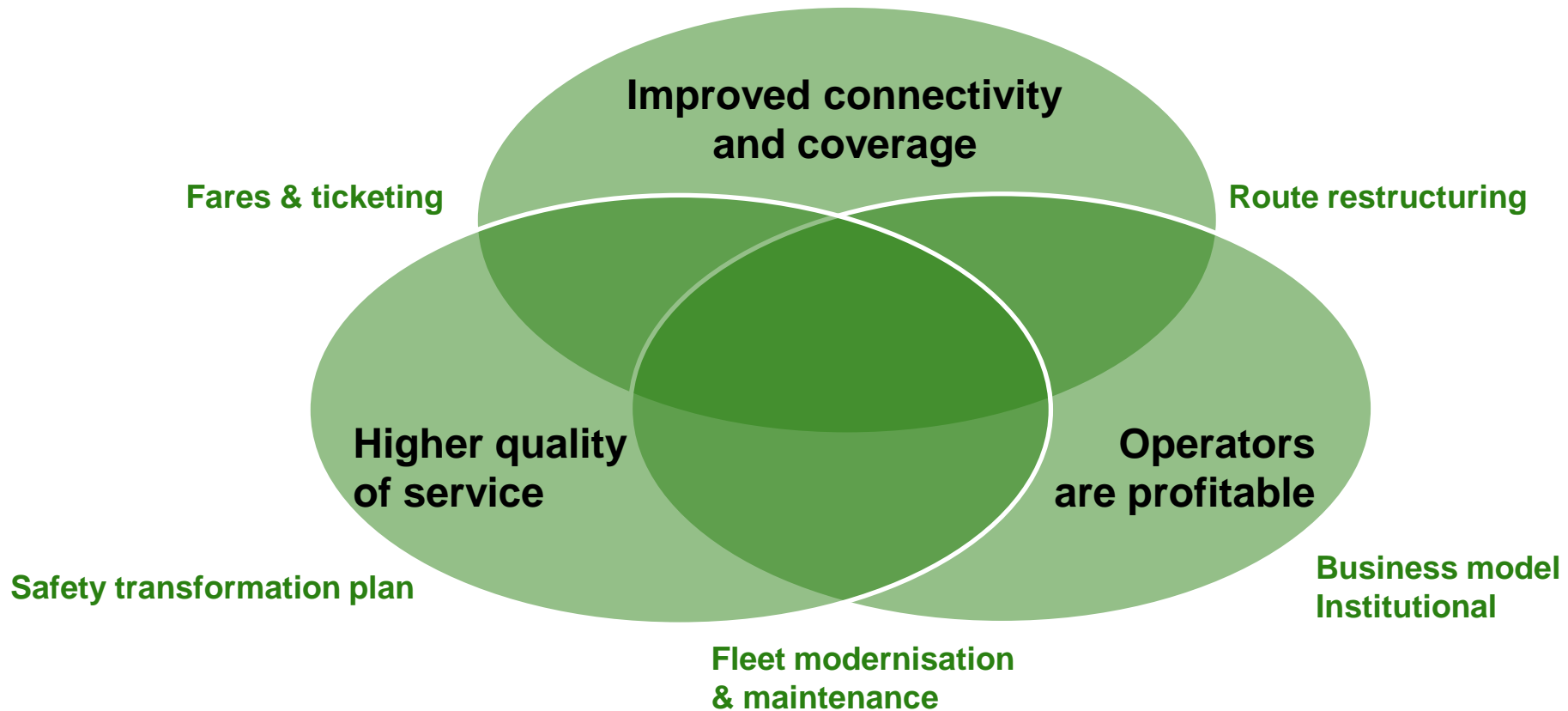
Core problems behind these issues:

- Multiple, uncoordinated and weakly regulated bus operators
- Inadequate level of training among their employees
- Significant disregard for passenger safety
- Lack of respect for female passengers
- Inefficient and unintegrated fare payment methods
- Inexistence of adequate infrastructure (bus stops, lanes, depots)

The strategies to address the issues detected will imply a deep restructuration of the sector, based in 6 macro actions



These challenges lead to a number of objectives for the network restructuring

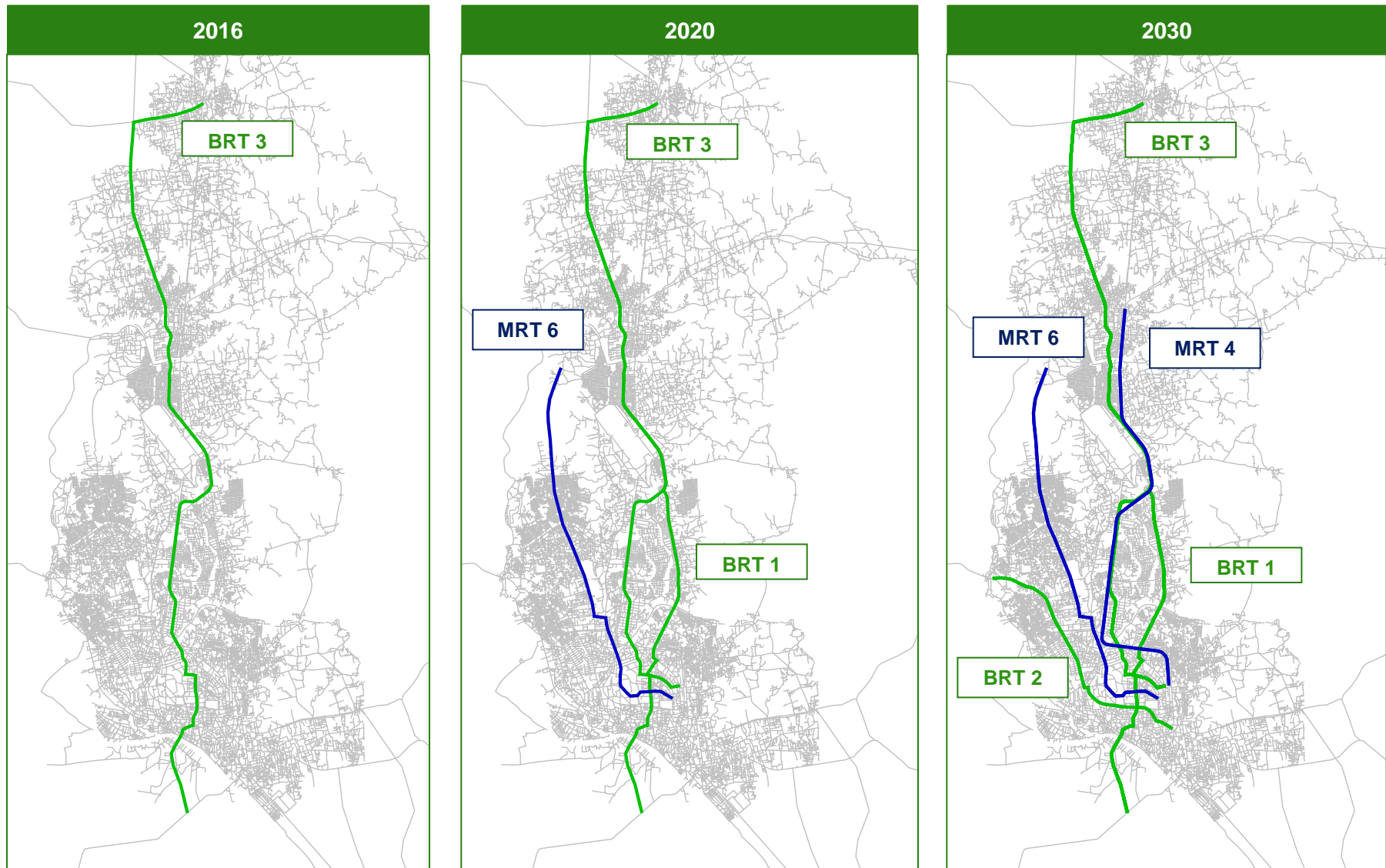


Main objective of the restructuring process for Dhaka:

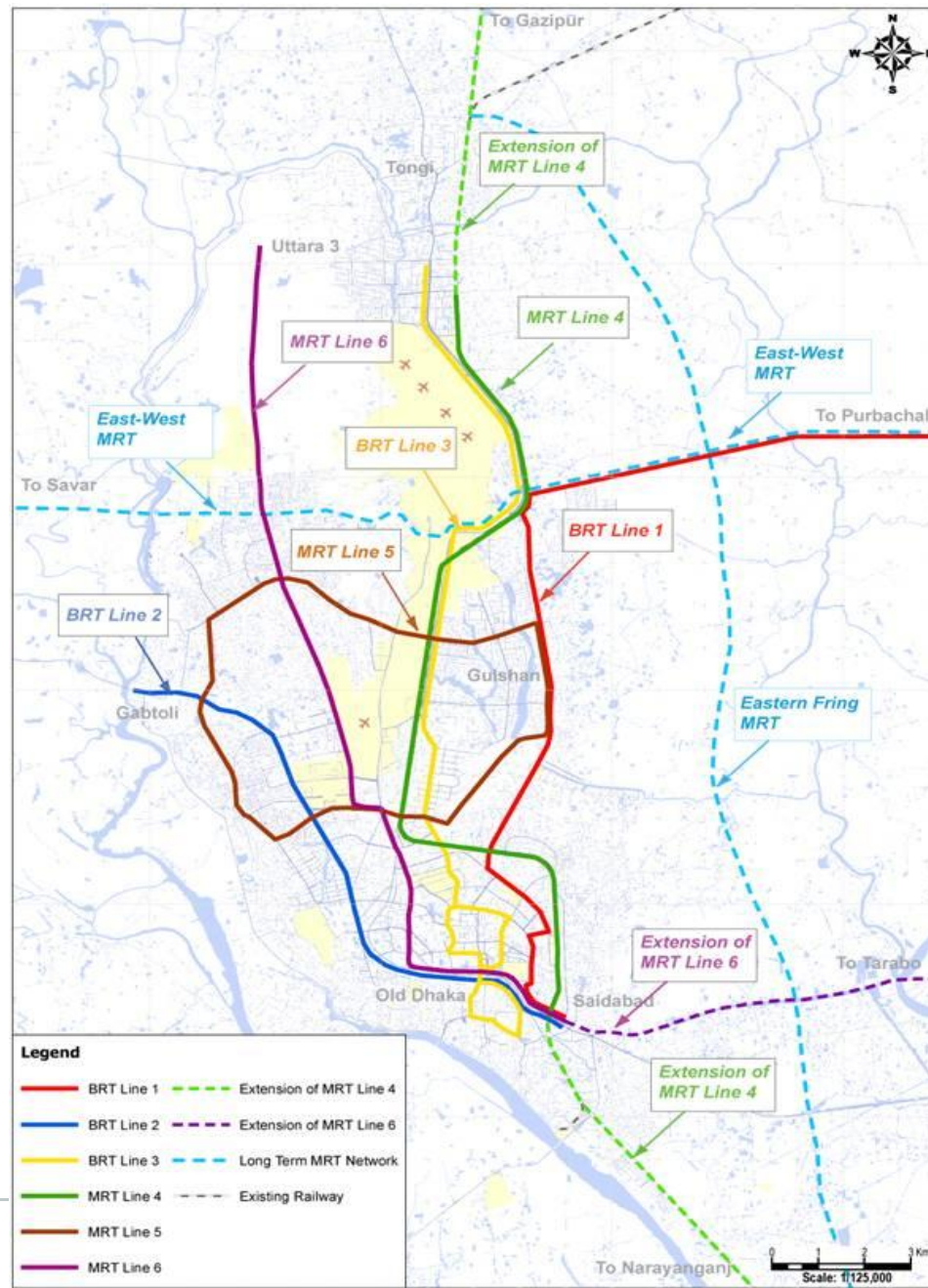
Maximize the **connectivity and accessibility** among all social groups and zones within Dhaka, **prioritizing a public transport** system through a restructured network based on a mass transit system, improving the current conditions of **quality service, efficiency and profitability** of public transport in a context of sustainable mobility, introducing a new transport culture and a new transport organization.



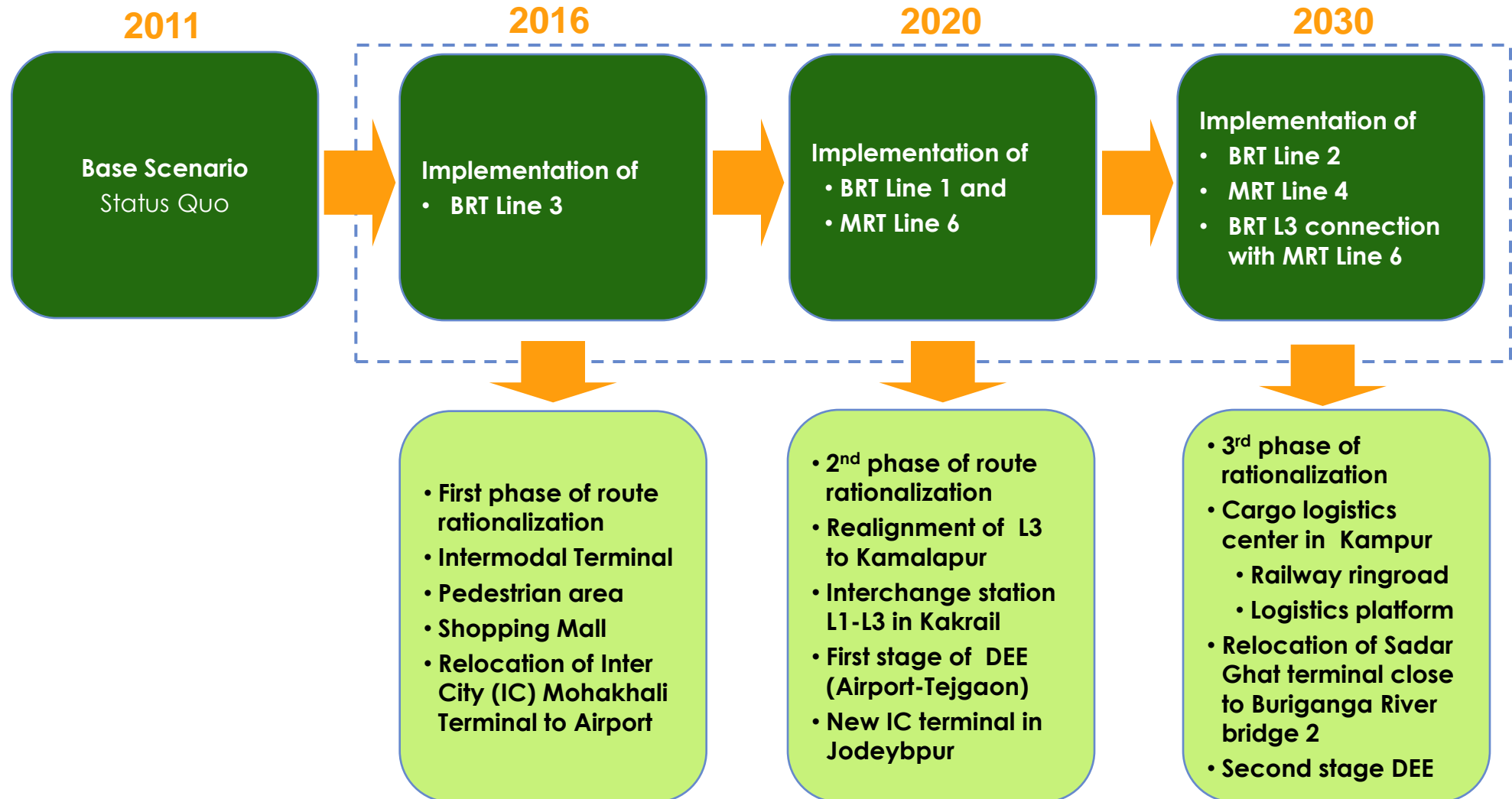
The implementation of new mass transit systems is an opportunity to restructure the bus network



Proposed Mass Transit Network Towards-2050



Bus Network restructuring needs to be implemented in parallel to the implementation of mass transit corridors and other mobility strategies





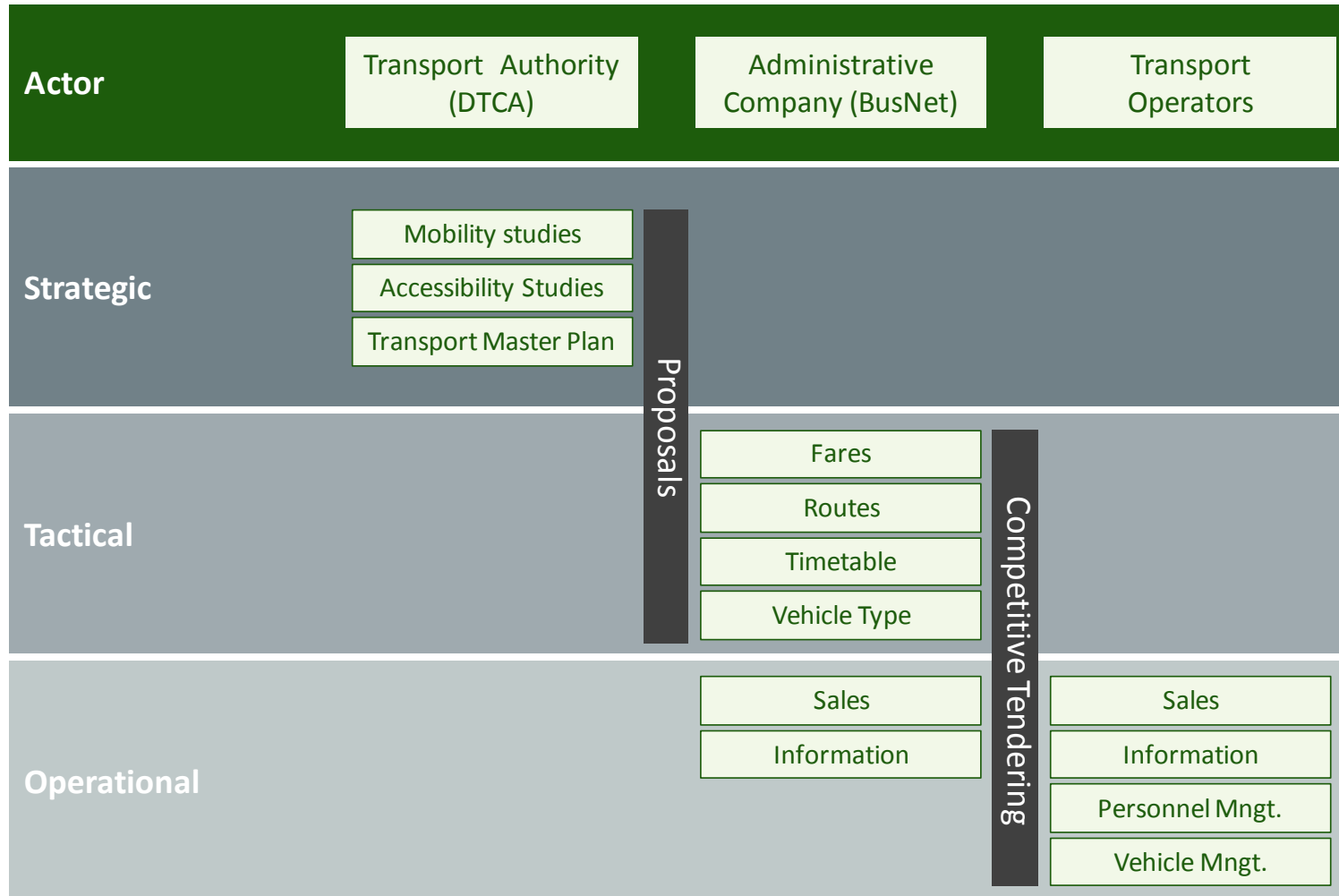
Authorities have a
polluted city and
inefficient operations

Bus users receive
a poor level of
service

Improve public transport in Dhaka

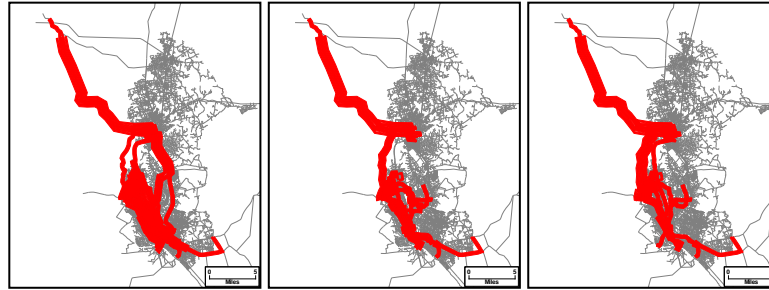
Transport sector employees work under inadequate
conditions and are poorly recompensed

Dhaka Bus Network Institutional arrangements: Central planning with sub-network tendering



Geographic distribution of routes plays a role in route packaging

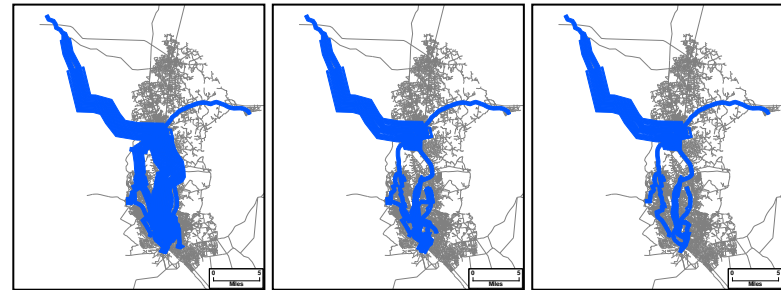
Package 1



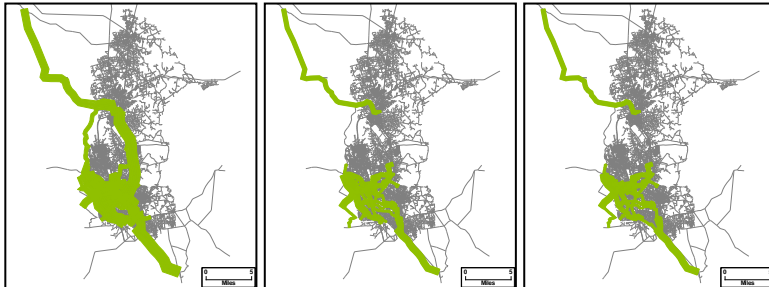
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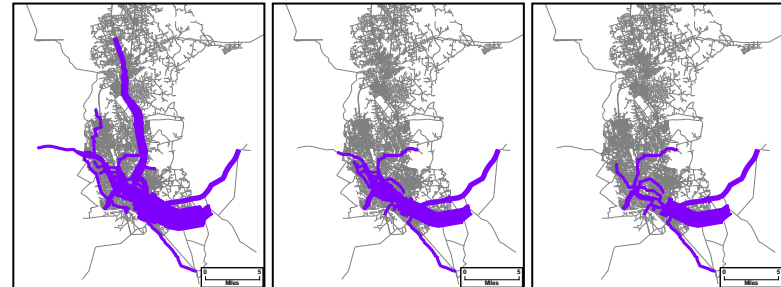
Package 4



Package 5



Package 6



Why route packaging is necessary?

Operational reasons

- The scale of the operation cannot be fulfilled with small independent operations
- There is a pressing need to use high capacity vehicles
- Professionalization of the staff
- The public deserves and expects a reliable operation

Safety reasons

- Well structured bus maintenance programs require enough trained personnel, knowledgeable of the fleet's mechanical details

Institutional reasons

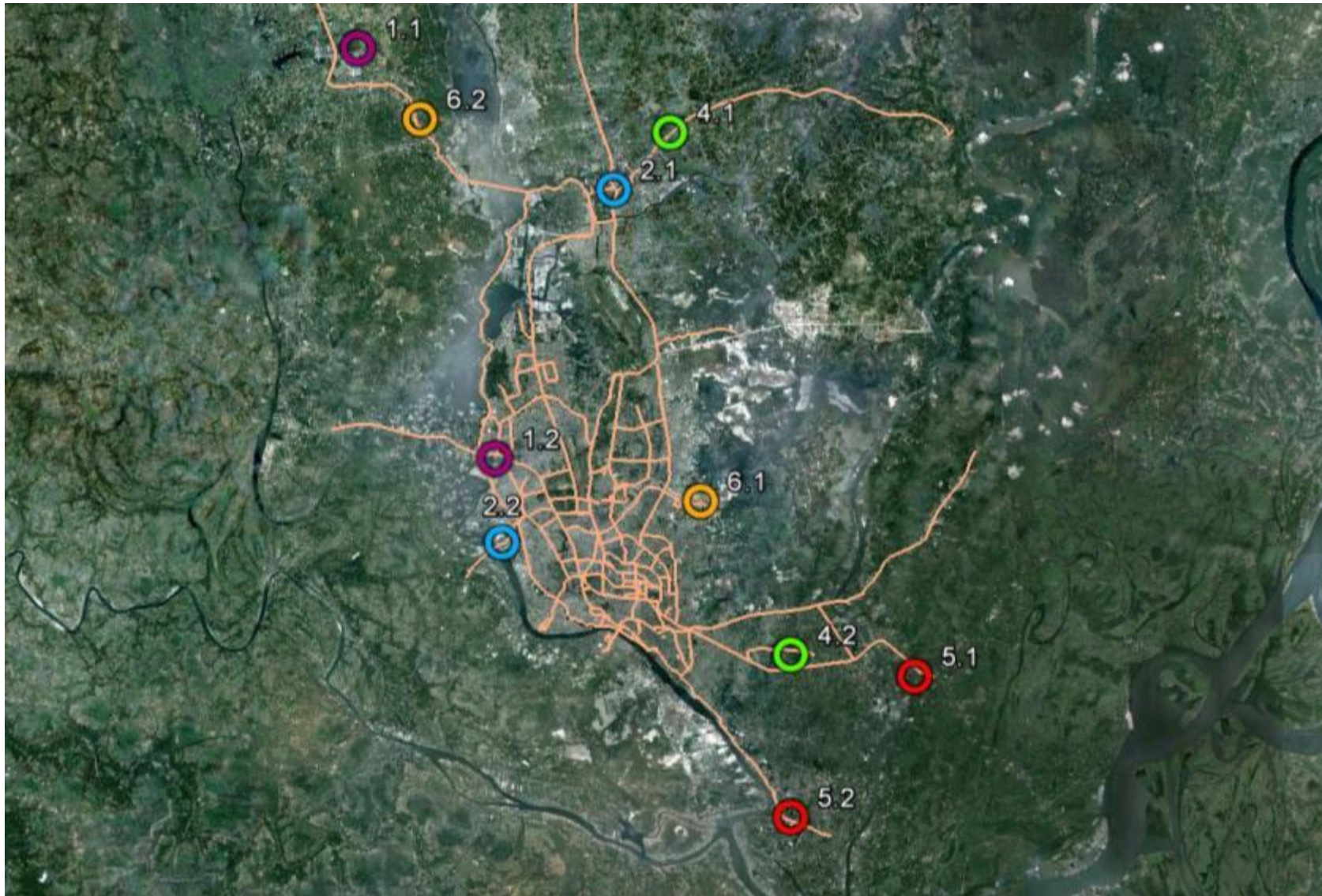
- Formalization of an important sector of the economy
 - Widening of the taxation base: more contributors paying their fair share
 - Pensions and other social services
- Contract management by the Government and Operators

Financial reasons

- Fare integration can be set up among a few
- Institutional financing (banks) will flow if operations are formalized

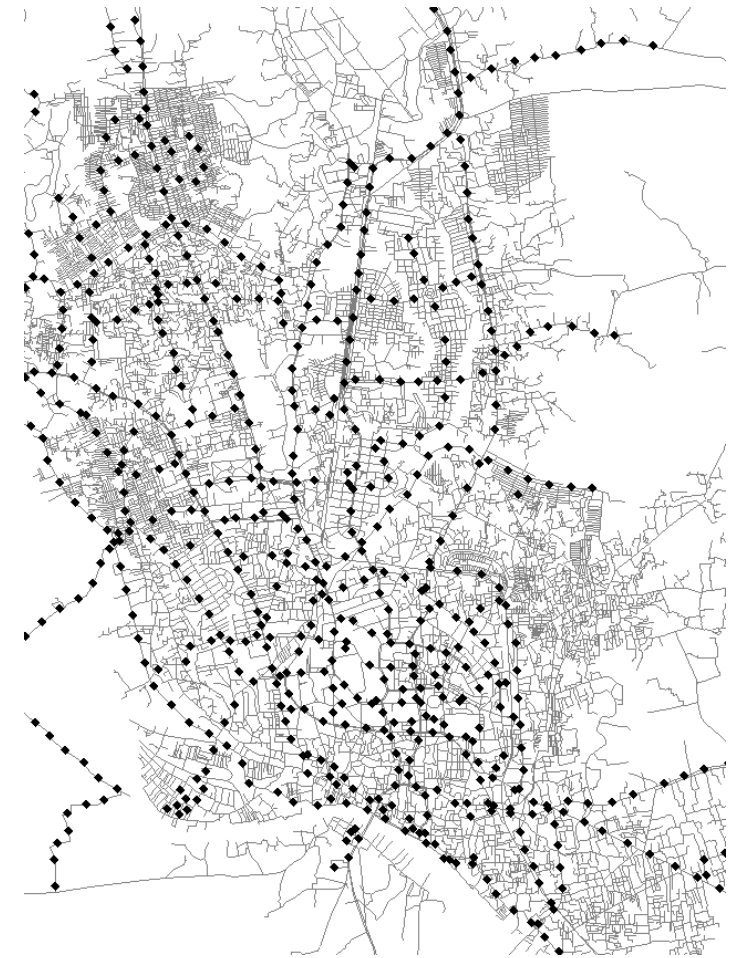


Results: Possible depot locations by concessional package (2016)



Bus network facilities: bus stops

- Optimal **bus stop spacing** is generally agreed to be between 400 – 500m.
- Initial planned locations have been identified for 1,660 bus stops, at an average interval of **470m between stops**.
- Depending on the number of services using each stop, the number of necessary bays has been defined for each stop and the need for offline stops in a number of locations.
- Stops with lower demand will only have a stop post (below left), whilst where there is greater demand there will be posts to mark the bays, and shelters



Bus stop posts identify stop location and provide basic route information



Whilst shelters offer protection from the elements and more detailed information on the city's transport systems

Ticketing system

Off-bus purchase (ticket vending machines) should be adopted in all routes of Dhaka's Bus Network in order to improve boarding times at all bus stops.

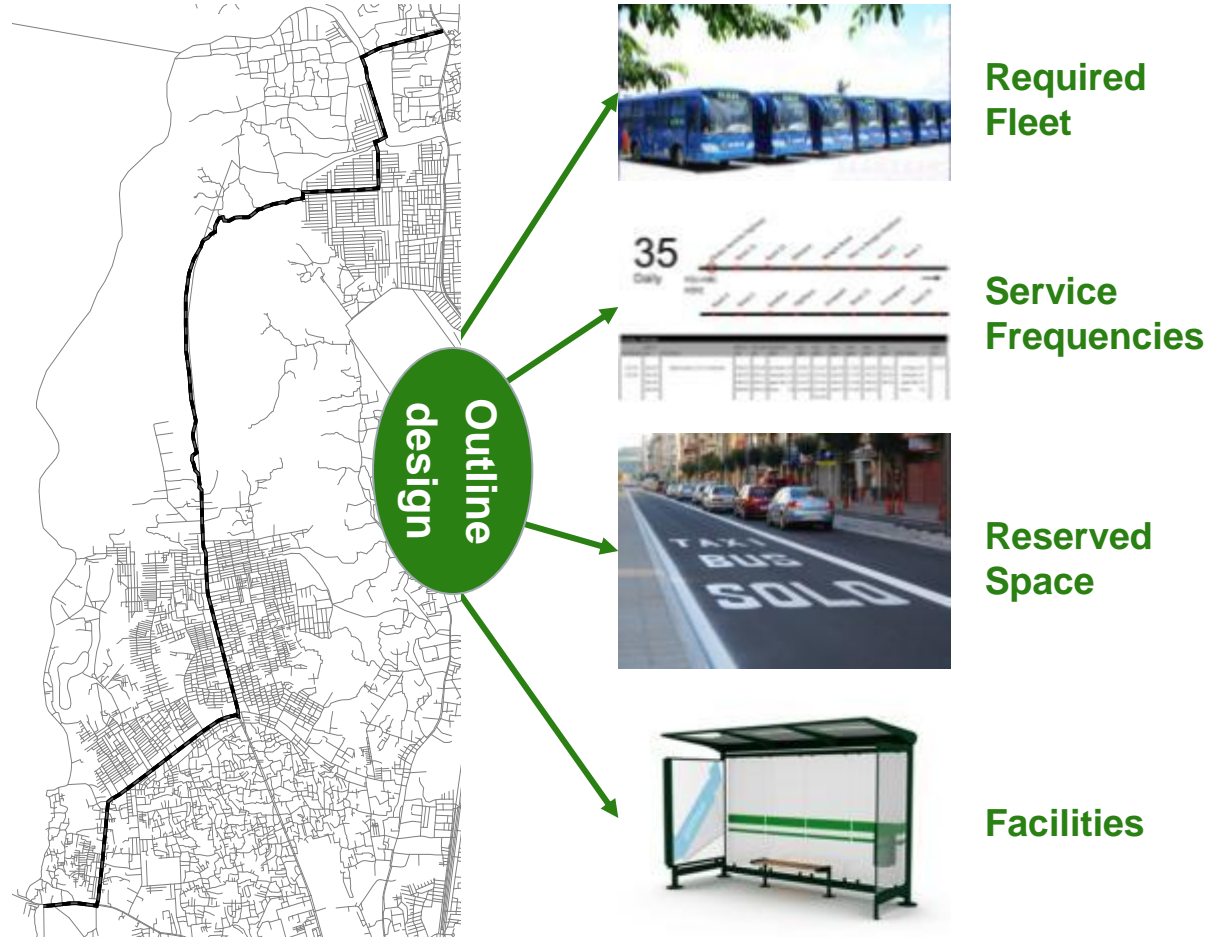
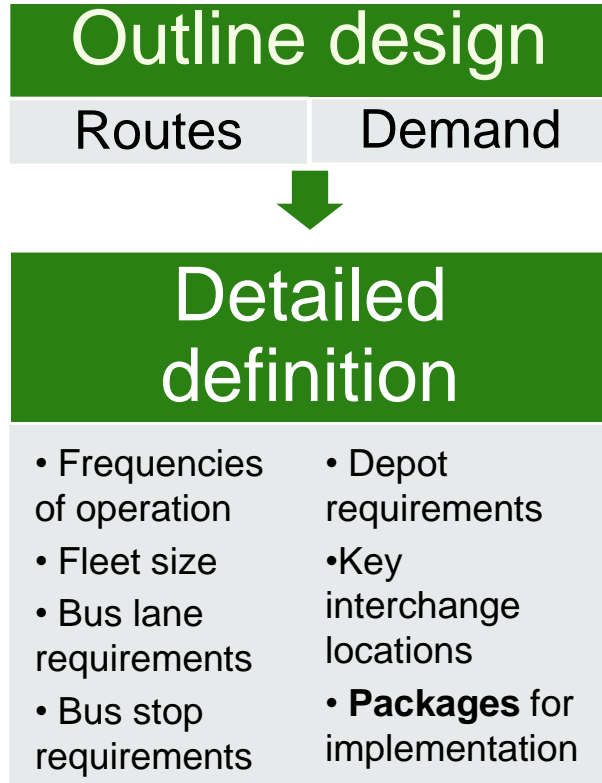
Validation will be **self-validation on-board**, since off-bus (on-platform validation) without closed bus stations could increase fare evasion.

It is recommended that passengers be required to “touch in” when they board the vehicle and “touch out” and they exit the vehicle, so as to reduce potential fraud associated with a distance-based fare system.

It is advisable to adopt the **Contactless Smart Cards based in the FeliCa technology** currently under implementation in Dhaka.



The restructured routes are then further detailed and dimensioned



Fleet of 11,100 buses required for 2016, decreasing to 9,600 in 2030

Required service frequencies and fleet have been calculated:

Inputs

- Demand profile for each route
- Physical constraints of the roads traversed
- Possible vehicle selections & capacities
- Commercial speed
- Maximum accepted level of crowding

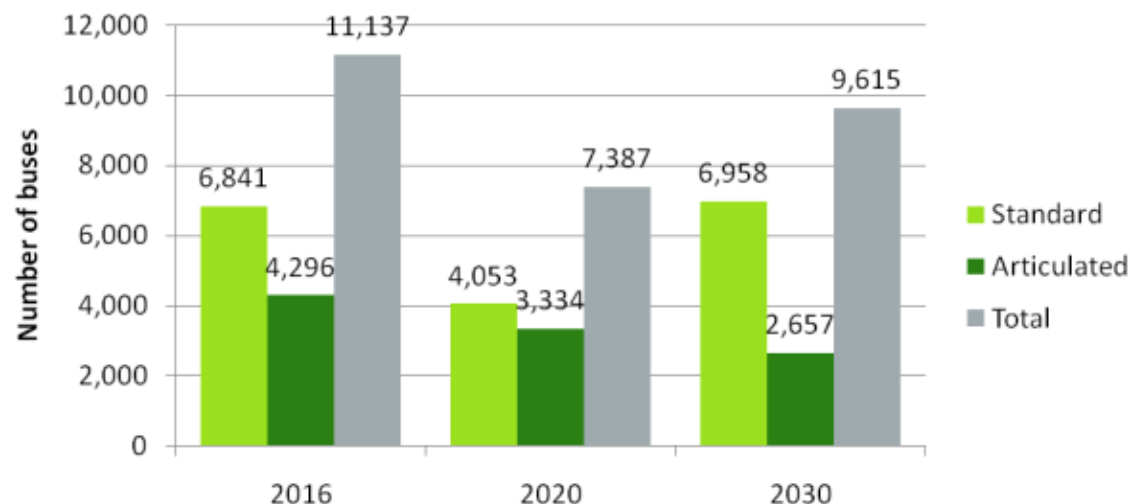


Outputs

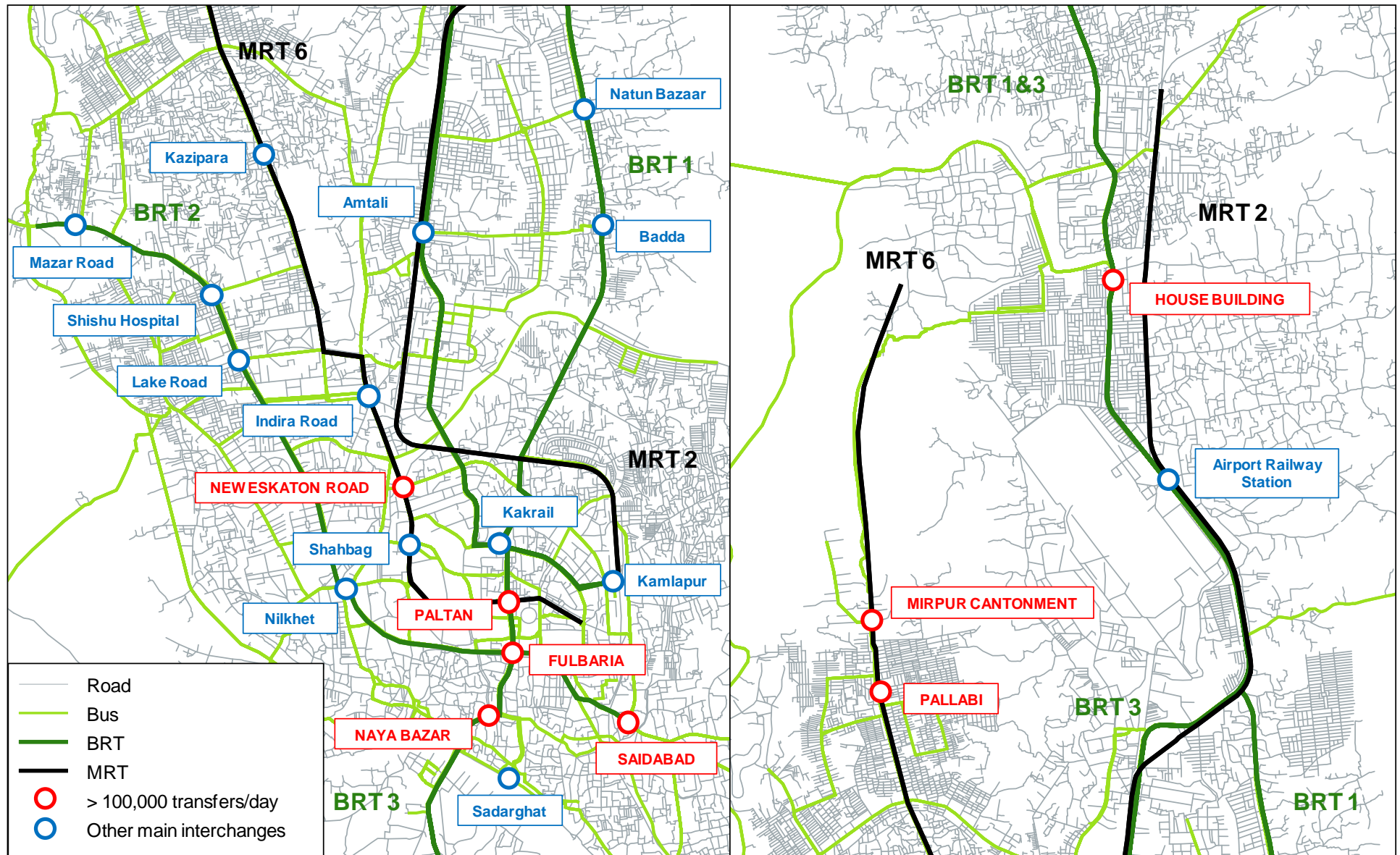
- Required peak hour service frequencies
- Vehicle type to be used on each route
 - Standard 12m bus (capacity of 65)
 - Articulated 18m bus (capacity of 140)
- Total fleet size
- Depot requirements

Results







- The initial requirement will be for a fleet of 11 thousand vehicles, compared with the current 10 thousand
- As further mass transit systems are brought online and the restructuring continues, the required fleet decreases
- Many high frequencies required on routes in order to meet the current and future transport demand



Results: Main future public transport interchanges (2030)



Responsibility sharing between public sector entities and private parties

Activity	DTCA / BusNet	Private Operator
Bus Network Planning		
Physical Specification of the Bus Terminal		
Preparation of Detailed Operational Plan		
Investment (vehicle fleet, depots and other equipment)		
Bus network operation and asset maintenance		
Revenue Collection		












Asset ownership

Activity	DTCA / BusNet	Private Operator
Vehicles		✓
Depots	✓	✓
Supporting Infrastructure (e.g. bus stops)	✓	
Other assets (e.g. ticketing equipment)		✓
Management and transport service delivery		✓



Key risks for the public and private sector

Activity	DTCA / BusNet	Private Operator
Procurement of buses for the commencement of operations		
Cost for the procurement of buses		
Provision of operations and maintenance of the buses		
Demand Risk		
Adherence to service quality and performance parameters		
Fare Collection		
Labor		
Force majeure		



Actions associated with the implementation of the first phase are anticipated to occur over a period of 3-4 years

Activities	Year 1				Year 2				Year 4				Year 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
I. Start-up activities																
Definition of the vehicles standards																
Programming of route operations																
Stations and terminal management model																
Definition of the pay system and equipment																
Training programs to the concessionaire employees																
Supervision of rolling-stock defined for the operation																
Supervision of the instalations of the terminals																
Design of the information system for the passengers																
Work plan and traffic detours plan in the working area																
Accessibility plan and urban improvements																
II. Institutional and communication strategy activities																
Bidding process																
Bidding award																
Marketing campaign																
Business transport organization program																
Negotiation with transport operators																
Institutional capacity building program																
III Complementary Infrastructure and Operational Actions																
Activities related to control and traffic lights synchronization																
Implementation of bus-only lanes																
Small works and road rehabilitation																
Signaling and urban equipment																
IV Monitoring and control activities																
Design and implementation of the Control Centre																
Preparation of the Quality Management Plan																
Emissions Control																
First phase implementation of the Operational Assistance System (OAS)																
Management model of incidences and emergencies																
Design of the commercial management system and customer service																
Permanent monitoring and control of the system operation																

Major Recommendation

- Establishment of new institutions based on modern regulatory framework that effectively plans, regulates and supervises the bus network could be named as Dhaka BUS or BUSNET
- Programme for entrepreneurial strengthening
- Negotiation of routes packages for contract operations(6 packages)
- Fleet Renewal programme
- Deployment of a Modern fare ticketing system
- Deployment of Supporting structures Bus stops, ticket counter etc



Thanks