

# Green Transition of Transport in Egypt: Updates from Greater Cairo Mobility Assessment and Public Transport Improvement Study (MAPTIS)

KGID Spring 2022

Session: Empowering Leaders in Urban Transport Planning and Green  
Transformation of Mobility in Greater Cairo

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Transport  
for Cairo



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Improving the way the world moves



# Egypt presents opportunities for green growth

- Transport sector presents development opportunities for Egypt
  - Transport sector is the second largest (17%) and fastest growing (66% growth 2005-2015) source of carbon emissions in Egypt,. Projection shows transport emission may increase 145% to 175 MtCO<sub>2</sub>e in 2050.
  - Mobile source is one of the three largest sources of air pollutions (PM10) in Greater Cairo.
  - Motorization is accelerating, and weak governance of loosely regulated informal public transport operators (e.g., minivans, 3-wheelers) dwarf competitiveness of formal public transport (e.g., buses).



The World Bank (2019)



El-Dorghamy, A., & Attia, M. (2021) *Low-Emission Zones and Prerequisites for Sustainable Cities and Clean Air in Egypt.*

# Ambitious steps of Egypt toward sustainable transport

- Egypt vision to become a regional leader in climate actions, as the host of COP27 in November 2022.
  - Egypt is implementing an ambitious investment program of EGP 1 trillion (USD 64 billion) in sustainable transport between 2014-2021.
  - Ongoing investment projects include: highways, Cairo Metro Line 3 extension, Monorail, Egyptian National Railways (ENR) modernization, Cairo Ring Road Bus Rapid Transit (BRT), and High Speed Rail.
  - Electric Mobility (E-Mobility): ambition to become a regional manufacturing hub, along with electric bus (E-Bus) pilot projects.



<https://egyptianstreets.com/2022/01/27/all-you-need-to-know-about-the-worlds-longest-monorail-system/>



<https://www.alstom.com/press-releases-news/2019/3/alstom-delivers-interlocking-signalling-system-maghagha-station-egypt>



Korea  
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# Greater Cairo Mobility Assessment and Public Transport Improvement Study (MAPTIS)

- MAPTIS supports Land Transport Regulatory Authority under the Ministry of Transport, by building robust foundation for analytics on mobility and sustainable transport investment opportunities.
- Supported by KGGTF and UK Strategic Partnership TF
- Objectives of MAPTIS:
  - Assess mobility needs of Greater Cairo Region
  - Identify infrastructure projects & policy measures to strengthen transport sector performance and support Egypt's SDG Vision 2030
  - Advise on solutions to streamline transport data collection, management and use



<https://egyptianstreets.com/2022/01/27/all-you-need-to-know-about-the-worlds-longest-monorail-system/>



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# MAPTIS Methodology and Highlights

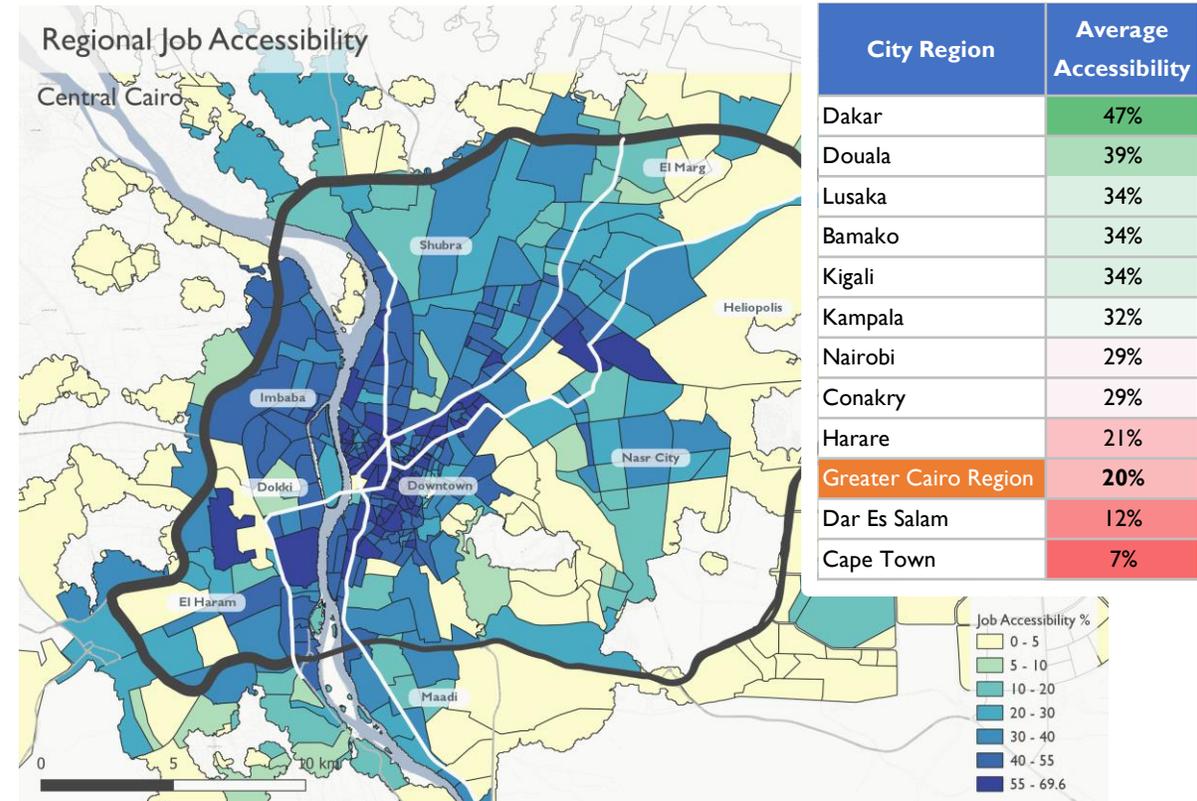
MAPTIS uses innovative data and methodologies to achieve robust analytics to model public transport in Greater Cairo

- MAPTIS uses **smart data** techniques & **passenger interviews** to assess the **mobility needs** and barriers across Greater Cairo Region.
- Uses **New techniques** to collect and analyse data include:
  - GTFS mapping of transit supply
  - GPS-based vehicle speed/flow data
  - GPS enabled boarding/alighting surveys
  - GPS enabled OD surveys
  - Accessibility modelling
  - Open land-use data
- MAPTIS develops a **proportionate and strategic** transport model by incorporating and balancing a **range of datasets**.
- Strong emphasis on 1) use and management of innovative data for effective sector governance and 2) identifying opportunities to address gender accessibility gaps.
- Stakeholder consultation informs developing principles to identify public transport improvement opportunities.

# Summary of Mobility Assessment

MAPTIS Mobility Assessment found investment in public transport key to enhance economic opportunity for all residents

- Mobility trends
  - Growing passenger & freight demand, motorization
  - New Urban Communities, but majority of trips still within the ring road
  - Overcrowded public transport and high congestion
  - Poor cross-city and local accessibility. Barriers for women, poor and disabled
  - Stagnating investment and effectiveness of regulations



# Entry points to improve mobility in GCR

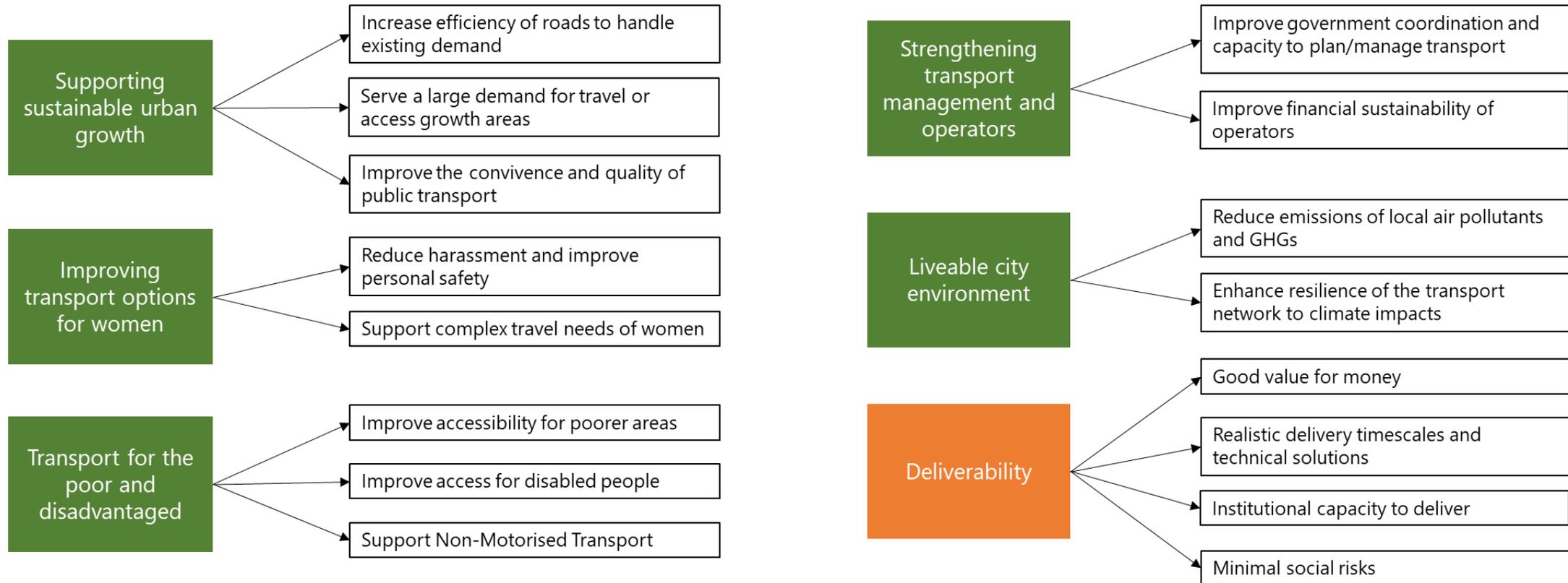
MAPTIS highlights strengthening LTRA will be essential for investment projects to deliver development outcomes to the Egyptians

1. Streamline institutional arrangement and promote collaboration among agencies and authorities
2. Integrating land use development and transport provision
3. Leveraging innovative technologies (Data/ITS) to plan, manage and enforce Public Transport
4. Coordinating network planning
5. Linking bus service contracts with service quality
6. Informing planning and operations through engagement with marginalised groups
7. Prioritising Public Transport and Non-Motorised Transport
8. Leverage the momentum for improvements around development & climate change



# Principles used to identify proposals that improve mobility

Stakeholder consultation guided the principles that have been used to identify public transport improvement opportunities



# Identified investment opportunities

**MAPTIS identified Regulatory, Institutional, and Infrastructure measures to improve mobility in Greater Cairo**

11 investment proposals have been identified through consideration of:

- Guiding principles
- Mobility Assessment
- Root causes of mobility challenges

## 11 investment proposals fall into 3 categories

Regulatory and institutional reforms	Data & ITS management to improve transport	Strategic investment for sustainable transport
<ul style="list-style-type: none"> <li>• Bus sector reform pilot corridor</li> <li>• Women's safety improvements &amp; operator accreditation</li> <li>• On-street parking pricing</li> </ul>	<ul style="list-style-type: none"> <li>• Digitalize bus operations</li> <li>• E-ticketing for road-based transport</li> <li>• Urban traffic management</li> </ul>	<ul style="list-style-type: none"> <li>• BRT</li> <li>• Key interchange improvements</li> <li>• Integrated Corridor Management on key corridors</li> <li>• Walking &amp; cycling routes in NUCs</li> <li>• Inner-city streetscape upgrades</li> </ul>

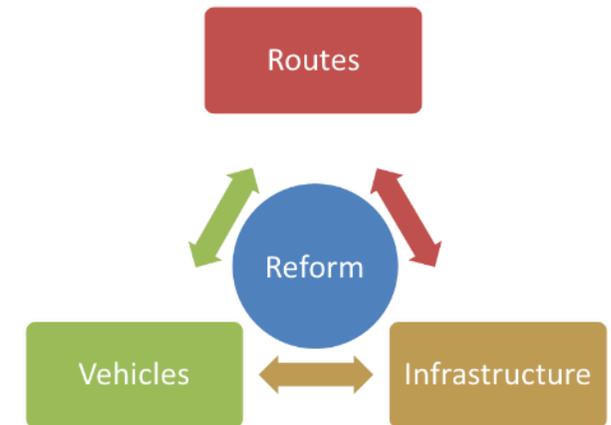
# 1. Bus sector reform pilot corridor

- The **under-regulation** of road-based PT results in a **poor passenger service** from:
  - **Over-competition** for the passenger **on the road**
  - Lack of exclusivity for operators to specific passenger markets **prevents vehicle financing**
  - A large number of minibuses is an inefficient method to carry large passenger flows causing in **congestion and pollution**
- Problem is **common in many cities** around the world, some of which have implemented **bus sector reform programs** that **consolidate operators, rationalise routes**, and implement **competitive tendering**.
  - [Seoul, South Korea](#), [Manila, Philippines](#), [Kaunas, Lithuania](#), [Dakar, Senegal](#), [Kigali, Rwanda](#), [Freetown, Sierra Leone](#)



# 1. Bus sector reform pilot corridor

- Successful reform requires a **change across a number of supportive areas**.
- This **unlocks a new business model** for operating affordable, quality and profitable PT:
  - **Routes:** Rationalise routes to **reduce number & overlap**, increase **exclusivity of passengers** to a route. Consider passenger **demand** and **operational efficiency**.
  - **Infrastructure:** Carriageways re-modelled to facilitate flow of PT. Remove **parking**, organise **vendors**, simplify **junctions**, **priority** for PT. Covered **bus stops**, raised platforms, **pedestrian** crossings. Provide **depo**.
  - **Vehicles:** Larger **12m vehicles** increase capacity, enable on-route boarding/alighting, increase revenue per vehicle.
  - **Operator reform:** Operators consolidated to form **companies** able to **bid for packages of routes**, employ **salaried** drivers/engineers, run a **depo**, organise dispatch, respond to incidents.
  - **Institutional reform:** Regulatory change to enable **tendering of route packages**. Route **contracts long in duration** to enable vehicle financing (e.g. 7+ years). Contracts include **quality measures** with monitoring & enforcement (e.g. reliability, driver training, vehicle maintenance, safety).



# 2. Women's safety improvements

Regulatory and institutional reforms

4 measures targeted at improving mobility for women

## 1. Pro-women operator accreditation scheme

- Demonstrates an **operator's commitment** to tackling harassment
- Includes driver **training**, **employment** of women, **systems to report** harassment, and ensuring harassers are reprimanded.

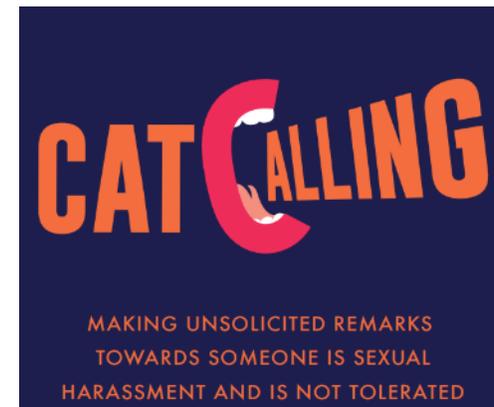
## 2. Anti-harassment public awareness campaigns

- Encourage public **understanding** of what sexual harassment 'looks like' and to encourage people to **intervene** or contact authorities where appropriate.

## 3. Female security personnel

- More **proactive policing** of anti-harassment laws
- Particularly effective if enacted by female officers or security guards who are **more aware** of the challenges faced.

## 4. Space and priority seating for women



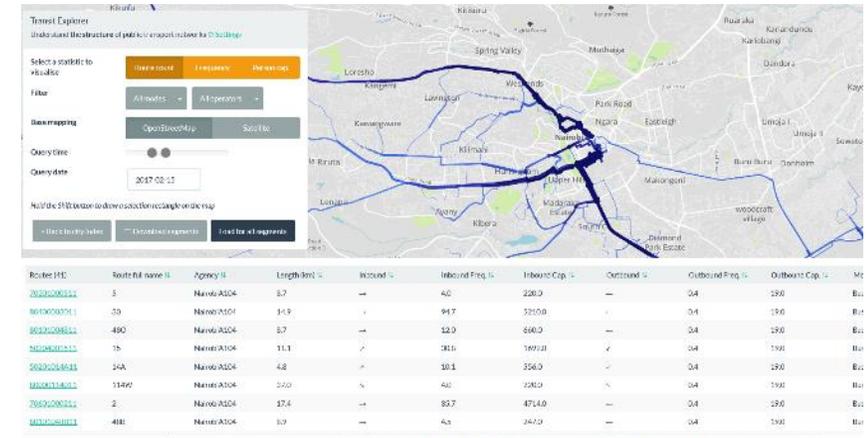
# 4. Digitise bus operations

Data & ITS management to improve transport

- Maintenance of a **GTFS feed** that describes the supply of public transport can improve **contracting**, **planning**, and **monitoring** of PT services
- Such data can be used with analysis tools to **plan** and **reorganise** routes as needed – e.g. accessibility modelling
- Supports passenger information: **journey planning** apps and live network status (e.g. delays).

## Automatic Vehicle Location (AVL) with monitoring centre

- Requires AVL devices in buses & central **control centre** and staff operated by a suitably empowered agency (e.g. LTRA).
- Identifies real-time **disruptions**, monitor performance and control **dispatch**
- Enables an authority & operator to understand daily issues such as road network bottlenecks, issues with specific vehicles or routes, and driver performance/behaviour
- Proactive management of network issues will **improve reliability** for the passenger



# 5. E-Ticketing for road based PT

Data & ITS  
management to  
improve transport

- Today fares are collected by drivers, who take wages out of the fare. Drivers are incentivised to collect as many passengers as possible per run resulting in **fill'n'go**.
- Alternatively a route can be operated by one operator, whose drivers maintain a **constant headway**, irrespective of how many passengers they collect.
- In this situation fares are pooled by the operating company which provides salaries to drivers. **Salaried drivers work shorter shifts improving vehicle safety**.
- E-ticketing can support this system. One of the greatest benefits comes when a common e-ticket is used across all modes and operators (multi-operator ticketing)
- A **unified ticket** (multi-operator ticket) is currently being implemented in GCR to cover Metro, Monorail and the Electric Train .
- The investment opportunity is to **assess the unified ticketing system and pilot it on road-based modes**.
- Would include reviewing the technology, the back office, financial clearing house, customer interaction and payment options to determine the **best business plan to roll out across formal and informal PT modes**.



# 7. Bus Rapid Transit (BRT)

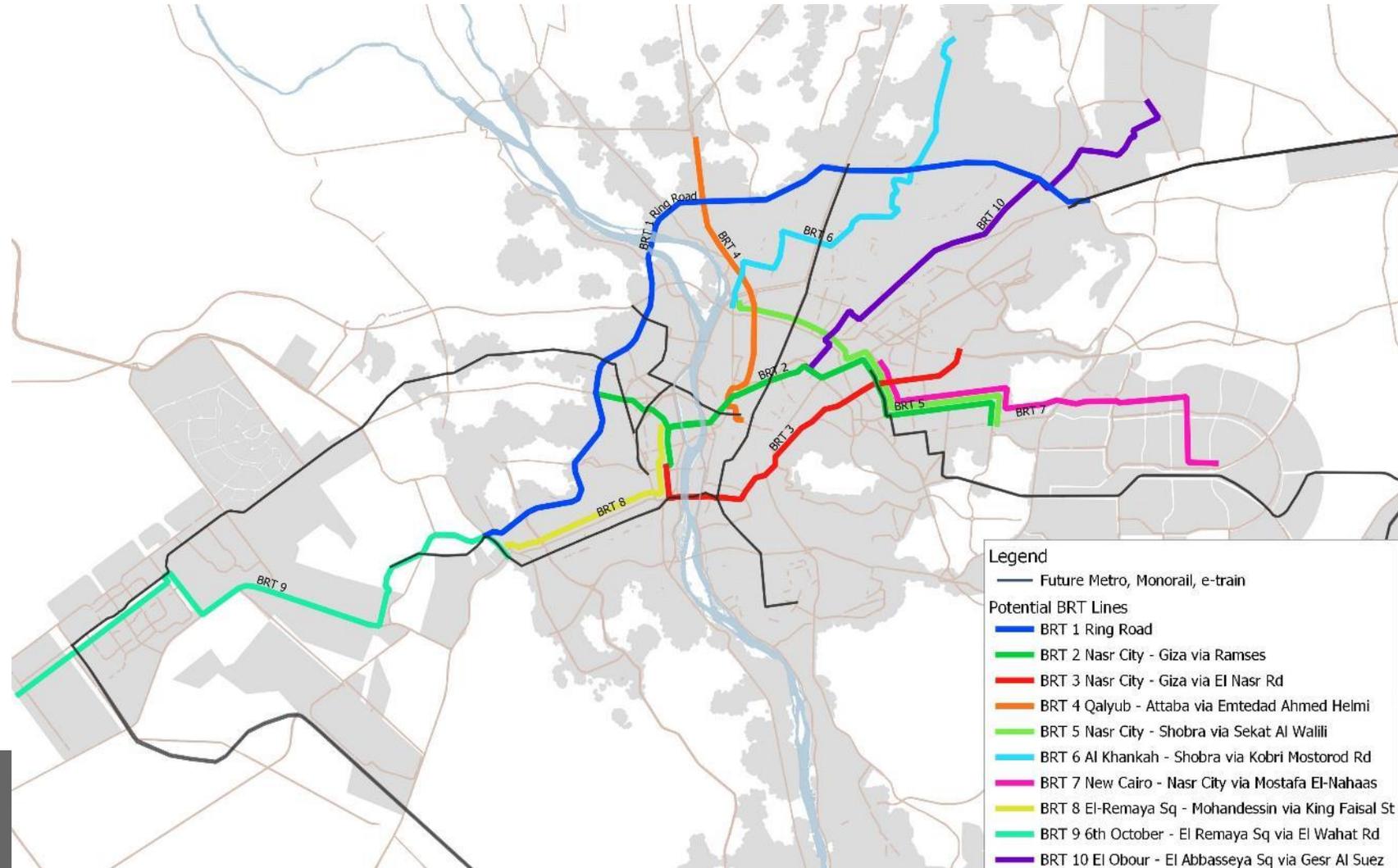
Strategic investment  
for sustainable  
transport

- BRT can provide a large increase in PT capacity. BRT is versatile it can permeate dense inner-city areas, serve NUCs, and connect a range of destinations.
- This study has identified 10 potential BRT lines by considering:
  - City-wide gaps between supply and demand, and the impact of new mass transit lines
  - Deficit in local access for particular areas
  - Earlier studies that recommend BRT: World Bank 2019, ITDP 2015
  - Modelling the BRT lines within the MAPTIS Cube model to determine their potential patronage
- The 10 BRT lines would make for a good network that improves cross-city accessibility, enables connections between mass transit modes (Metro, Monorail) and enhance local access
- We anticipate MAPTIS to take forward only 1 or 2 of these potential lines for further study
- This choice could consider the social and economic benefits of each line and deliverability challenges. The choice should also consider the need to develop a cohesive Public Transport network step by step.

# 7. BRT

Strategic investment  
for sustainable  
transport

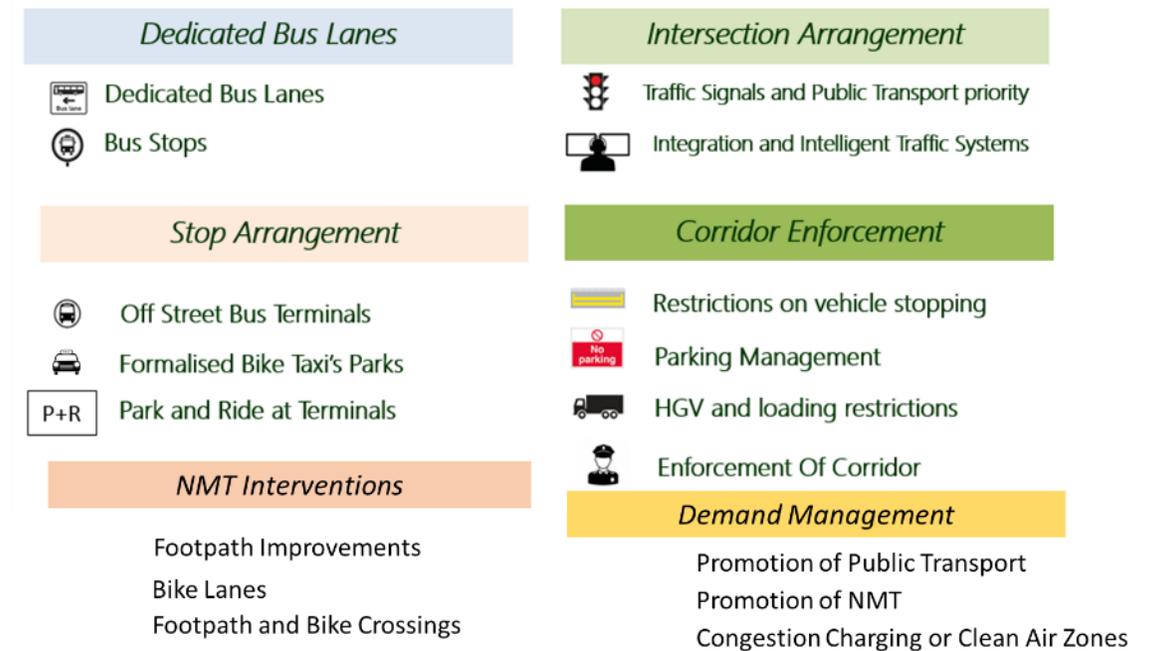
Line Code	Route
BRT 1	Ring Road
BRT 2	Nasr City - Giza via Ramses (With spur to Ard El Lewa)
BRT 3	Nasr City - Giza via El Nasr Rd
BRT 4	Qalyub - Attaba via Emtedad Ahmed Helmi
BRT 5	Nasr City - Shobra via Sekat Al Walili
BRT 6	Al Khankah - Shobra via Kobri Mostorod Rd
BRT 7	New Cairo - Nasr City via Mostafa El-Nahaas
BRT 8	El-Remaya Sq - Mohandessin via King Faisal St
BRT 9	6th October - El Remaya Sq via El Wahat Rd
BRT 10	El Obour - El Abbasseya Sq via Gesr Al Suez



# 9. Integrated Corridor Management

Strategic investment  
for sustainable  
transport

- Most PT, traffic management and safety improvements work better in an integrated corridor package than separately:
- ICM examines all aspects of corridor performance and service provision
- Applies a **range of supportive interventions** to a corridor to increase its **carrying capacity** and amenity for the road's users including **passengers, residents, workers** and customers.
- Most importantly, **institutional coordination** between LTRA, Governorates, the Ministry of Transport, and the Ministry of the Interior are essential for success, as the integrated changes span the remit of many agencies



# 11. Walking and cycling in New Urban Communities

Strategic investment for sustainable transport

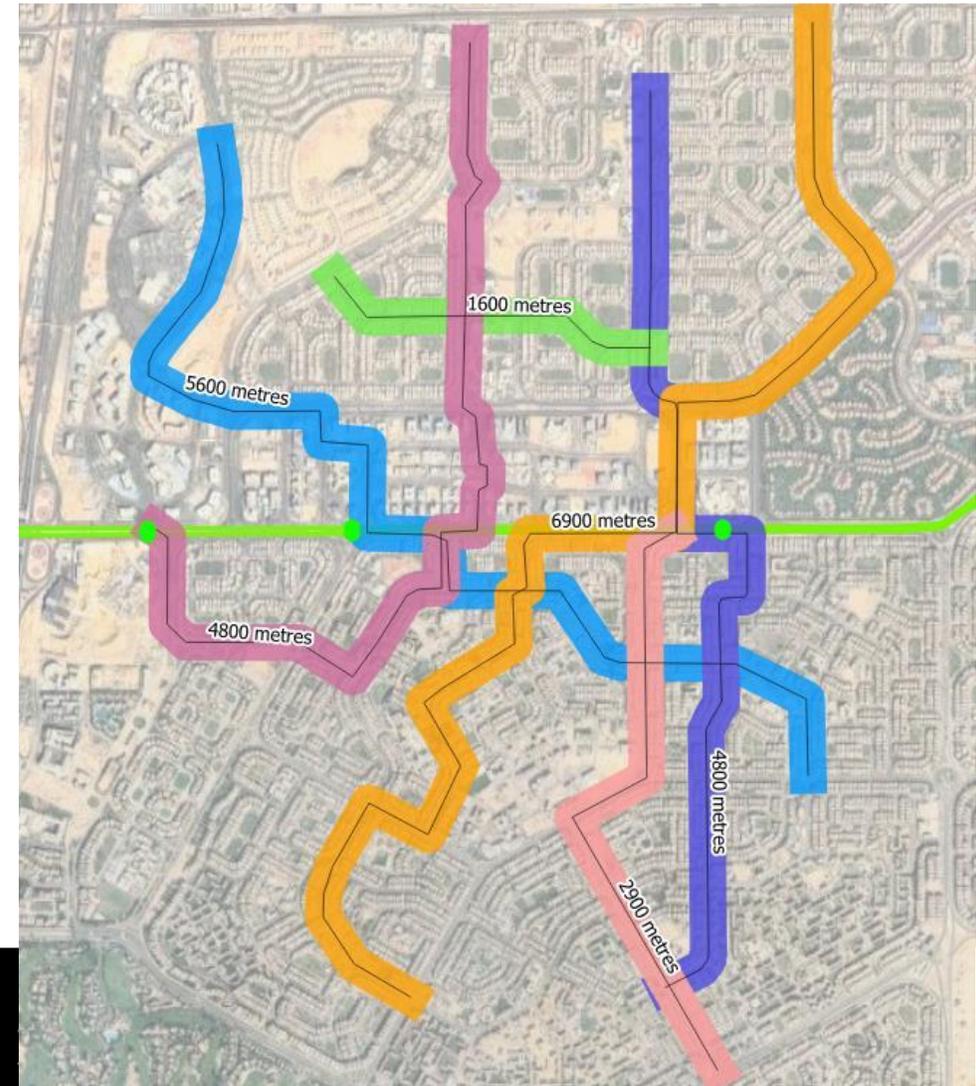
- The investment opportunity is to construct a network of safe, convenient and comfortable walking and cycling routes through a NUC which connect to local amenities and public transport services.
- Walking and cycling routes can be inserted into secondary roads away from main traffic flows, as long as routes are continuous and clear.
- Routes should be shaded, segregated, direct, well lit



Doha, Qatar



Kuwait Towers, Kuwait



# Next Steps

- MAPTIS will be completing soon, with a training program for LTRA engineers (June) and a dissemination event (details TBD).
- The Bank team is in dialogue with LTRA on possible ways to continue collaboration and support, technical and financial.
  - LTRA is implementing Ring Road BRT with a plan to operate electric fleet
  - The Bank's Energy-Transport team is implementing a study assessing opportunities and challenges of E-Mobility focusing on public transport.
  - The Bank's Environment-Transport team is financing a demonstration of 100 e-bus fleet for Cairo Transport Authority operation.
  - Sector digital transformation is an area for further exploration based on MAPTIS.



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Questions, comments, and/or suggestions?



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