FRIEDRICH EBERT STIFTUNG

Transport for Cairo

مواصلات للقاهرة

Sustainable Urban Mobility Plan in 6th of October

Phase 2

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Internal Project Glossary

Term	Acronym	Description
6th of October City Authority	6O-CA	NUCA's subsidiary that governs 6th of October City.
Egyptian National Railways	ENR	A governmental agency developing, running, and maintaining railway services.
European Commission	EC	Executive Body of the European Union
General Organization for Physical Planning	GOPP	A governmental organization that is responsible for urban and regional planning.
Greater Cairo Region	GCR	A conglomeration of the governorates of Cairo, Giza, and Qalyubia constituting the capital region.
Hadayek October City Authority	HO-CA	NUCA's subsidiary that governs Hadayek October City.
Land Transport Regulatory Authority	LTRA	A governmental agency that is planning, regulating, and managing land transport services.
Ministry of Housing, Utilities, and Urban Communities	MoH	A political and administrative unit of the central state, responsible for urban development on the strategic and executive levels.
Ministry of Transport	MoT	A political and administrative unit of the central government, responsible for transport on the national and regional levels.
New 6th of October City Authority	N6O-CA	NUCA's subsidiary that governs New 6th of October City.
New Urban Communities Authority	NUCA	An agency under the Ministry of Housing (MoH) responsible for the management of new urban communities nationwide
Transport Regulatory Unit	TRU	

About Transport for Cairo

Transport for Cairo (TfC) L.L.C. provides consultancy services, data, tech and research to improve urban mobility in emerging cities. Established in Cairo, Egypt in 2015, we bring the best of the information, urban and transportation worlds together to provide disruptive transport consultancy services. To date, TfC successfully completed more than 20 projects in 5 countries in Africa.

We are internationally recognised for our work in data collection, data analytics and transport policy reform. The TfC Urban Mobility Lab is an international focal point for research, collaboration and innovation. It provides public and private actors with insights and new approaches to implementing efficient, integrated, multi-modal transport networks, transitioning towards active mobility and electric mobility, and successful projects.

Transport for Cairo is driven to provide clients with solutions which surpass their expectations of what is achievable within particular constrains. Our track record of highly satisfied clients includes IFI's, public sector authorities and private tech companies and bus operators attest to our unique ability to provide customer value.

Transport for Cairo is the producer of this Report and will be referred to in the body of the paper as the 'Consultant'.

This project is generously supported by Friedrich-Ebert-Stiftung

About New Urban Communities Authority (NUCA) nad Transport Regulatory Unit (TRU)

The New Urban Communities Authority is an Egyptian government authority affiliated with the Ministry of Housing. Its headquarters are in Sheikh Zayed City. It was established in accordance with law No. 59/1979.

In 2018, the Minister of housing established the Transport Regulatory Unit (TRU) in New Urban Communities (NUCs). According to the ministerial decree #1064/2018, the TRU is responsible for planning and regulatory activities for transportation in the NUCs.

About Friedrich-Ebert-Stiftung (FES) in Egypt

Inspired by its general aims to promote democracy and social justice, to support economic and social development, the Friedrich-Ebert-Stiftung (FES) started working in Egypt in 1976. For almost 40 years, the office operates in cooperation with local partners within the framework of an agreement with the Egyptian government. This agreement was endorsed by Presidential Decree 139/1976 and by the Egyptian parliament. The agreement was renewed in 1988, endorsed by Presidential Decree 244/1989 and approved by the Egyptian parliament.

In March 2017, a new Additional Protocol was signed in Berlin by both, the Egyptian and the German governments, amending the Cultural Agreement of 1959. This protocol was ratified by the Egyptian parliament in July 2017 and entered effect in November by Presidential Decree 267/2017.

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- Cooperation and International Dialogue

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2. Introduction

2.1. Background of 6th of October City

The master plan of the 6th of October city was produced in 1979[1]. Designed as an independent industrial town, it lies approximately 40 km away from the centre of Cairo. The target population was first set at 350,000 to 500,000 but was incrementally increased to 3 million targeted inhabitants in 2030[2]. In 2018, the Central Agency for Public Mobilization and Statistics (CAPMAS) reported it to have a population of 355,616 inhabitants based on the 2017 Census. However, the New Urban Communities Authority (NUCA) reports 1.5 million inhabitants to be living in the city[2]. 6th of October City Authority estimates 2 million inhabitants to be living in the city in 2020[3].

6th of October City is managed by the 6th of October City Authority (6O-CA), which is affiliated to NUCA, an authority under the Ministry of Housing (MoH) responsible for the management of new urban communities nationwide. In 2017, MoH declared Hadayek October (located between Al-Wahat Road to the north and Fayoum Road to the east) a separate new urban community managed by Hadayek October City Authority (HO-CA)[4].

Intercity routes connecting the city with Inner and Central Cairo are operated by the Cairo Transport Authority buses. Informal transit is responsible for most internal trips. It also provides a feeder network to transport hubs as well as intercity routes to the rest of the GCR[5].

Additional long-commute mass transport services are expected to start operating by 2030, including a monorail line connecting the city with Central Giza (Game'et Al-Dowal)[6], a Bus Rapid Transit (BRT) line connecting it with Central Giza (Giza Square)[7] and Metro Line 4 connecting the city to Central Giza (Giza Metro Station on Line 2) in the first phase and New Cairo in the second phase[8] (Figure 1)[9].

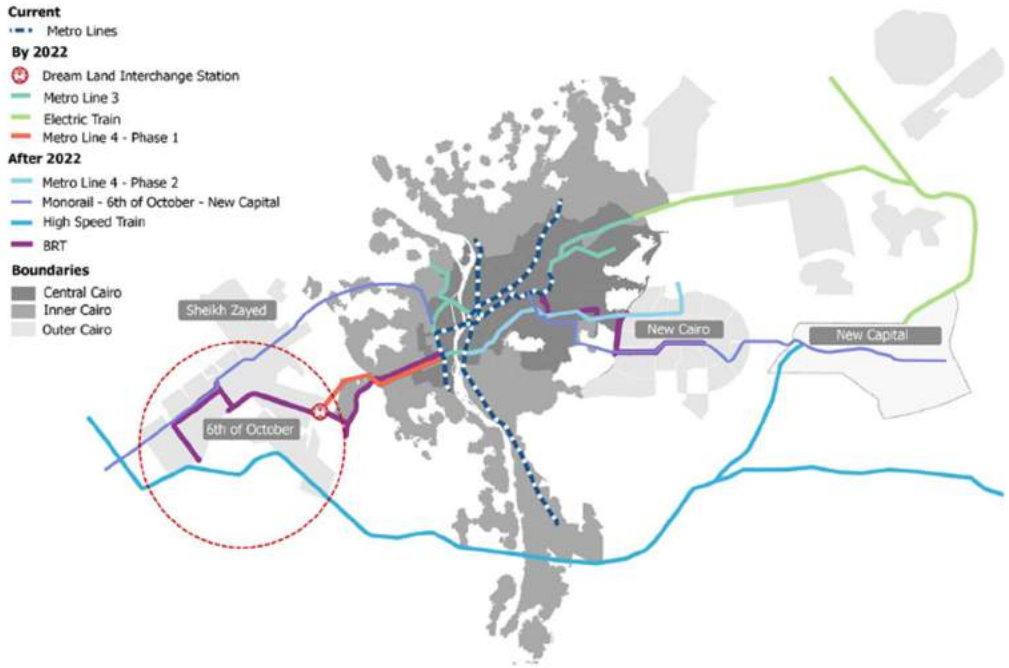


Figure 1: Future mass transport services linking 6th of October City with Central GCR and other New Urban Communities

Earlier this year, a bus service connecting the city to Central Giza (Cairo University Metro Station) was launched by Ministry of Environment, MoH and United Nations Development Programme (UNDP) as a part of the Sustainable Transport Project (STP)[10]. Mwasalat Misr (MM) operates the service. New bus routes managed by NUCA's Transport Regulatory Unit (TRU) in NUCs, and subcontracted to operator Mandolin, have recently begun offering formal Intracity services as feeders to the intercity network.

Improving the service quality of the existing informal transport network is high on the policy agenda of the 6O-CA, as stipulated by the transport and transit committee of the 6th of October council[11]. Proposed policy interventions include forbidding Autorickshaws (Tok-Tok) from operating within city borders; offering licenses for Suzuki 7-seater Vans and improving service provisions on transit hubs[11]. Integrating different modes and the ongoing process of formalization of stops and services is likely to be a risky and challenging process. Hence, finding alignment between different stakeholder interests is crucial.

The growing interest in 6O from various stakeholders is promising. However, without a joint vision and strategic plan, these interests will get translated into fragmented interventions, not reaching their maximum potential and effectiveness. Thus, it is crucial to create a shared vision and strategy that aligns different stakeholder interests and creates a space for cooperation and integration between them. Developing a Sustainable Urban Mobility Plan for 6th of October City will contribute to achieving a common vision and objectives for the city, ensuring the sustainability of all plans and future projects.

2.2. SUMP Planning Process

The Sustainable Urban Mobility Plan (SUMP) is a mobility planning scheme introduced by the European Commission, focusing on people. It departs from the vehicle-centric planning schemes, requiring active participation of a variety of stakeholders to project different needs and priorities[12]. The scheme is broken into four phases. The first phase is concerned with analyzing the mobility situation in the target area and developing scenarios based on that analysis. The second phase is concerned with developing the strategies necessary to arrive at the SUMP in coordination with the relevant stakeholders, ending up with a list of measures. The third phase aims to determine the operational steps aiming at implementing the agreed-upon measures, ending up with an implementation plan. Finally, the fourth phase is about the actual implementation of the measures and the enactment of the monitoring and evaluation mechanisms necessary for follow-up and potential adjustments[13].

This project follows the framework proposed by "Guidelines. Developing and Implementing a Sustainable Urban Mobility Plan" report published by the European Commission (Rupprecht Consult – Forschung und Beratung GmbH et al., 2014)[14], and hereafter referred to as the EU SUMP Guidelines. It aims at tackling present and future mobility-related challenges for the entire urban agglomeration of the 6th of October City until 2030. This includes all modes and forms of transport: public and private, passenger and freight, motorized and non-motorized, moving and parking. It is built on the common Vision that was developed in partnership with NUCA's Transport Regulatory Unit (TRU) and UN-Habitat between September 2019 and March 2020 as a result of SUMP Phase I[9].

2.2.1. Strategy for Phase 2

In August 2019, the Consultant started to develop a SUMP for 6O that focuses on people and meeting their future mobility needs regardless of their age, gender, socioeconomic level or physical ability. The SUMP targets all transport modes people use to move within the city, including active travel modes such as walking and cycling.

What turns a plan into a "Sustainable" Mobility Plan?

"A Sustainable Urban Mobility Plan aims to create a city-wide urban transport system by addressing – as a minimum – the following objectives:

- Ensure all citizens are offered transport options that enable access to key destinations and services;
- Improve safety and security;
- Reduce air and noise pollution, greenhouse gas emissions and energy consumption;
- Improve the efficiency and cost-effectiveness of the transportation of persons and goods;
- Contribute to enhancing the attractiveness and quality of the urban environment and urban design for the benefits of citizens, the economy and society as a whole"[13]

Source: Rupprecht Consult – Forschung und Beratung GmbH, Wefering, F., Rupprecht, S., Sebastian, B., Böhler-Baedeker, S., 2014. Guidelines - Developing and implementing a Sustainable urban mobility plan. European Commission

The development process of 6O SUMP was inaugurated even before securing full funding. The objective is to improve the programme effectiveness of 6O by transforming it into a competitive city that improves the quality of life of its citizens, enhances accessibility to opportunities and services and enables the local economy to attract investments.

The long term objective of the 6O SUMP is to lead to a model where the SUMP process is replicable in the other NUC's. This would assist Egypt to meet its ambitious SDS-2030 targets[15].

A typical SUMP for a small city in France costs between 200,000 and 400,000 EUR, excluding hidden subsidies and externalized costs[14]. Such a cost is prohibitive to cities in Egypt. The localization of the SUMP project thus focuses on adopting low-cost techniques to achieve maximum impact quickly and cost-effectively.

The outcomes of the SUMP will be publicly published by the end of this phase. The Consultant will launch a digital dialogue to engage the public in a discussion about the type of cities we want for the future and how can urban mobility be more efficient and inclusive.

Localization of the SUMP process

The SUMP Guidelines act as a general framework to be followed as much as possible within each local context. Each city responds to different approaches and should be planned differently to achieve maximum effectiveness. In this project, the Consultant aims at applying the SUMP guidelines to the local context, considering the difference in stakeholder dynamics, interests, demands, and capacities.

The process is also tailored to accommodate the budget allocated for the project, the existing expertise and the available timeframe. This led to dividing the SUMP process into three phases. Each phase follows the broader interpretation of several steps in the guidelines. All three phases are being adapted to the Egyptian context (See Figure 2)

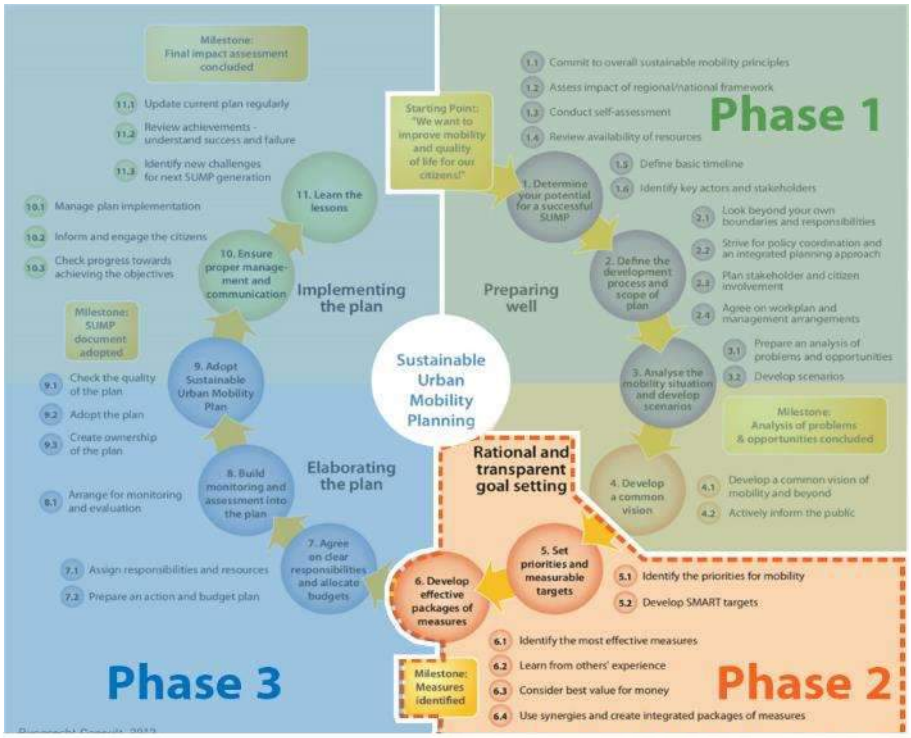


Figure 2: The full cycle of the EU SUMP Guidelines broken down in 3 phases as planned by the Consultant.

Phase 1: covers the three steps of the first phase and the first step of the second phase of the SUMP Guidelines (Step I to Step IV)

1. Phase 2: covers the two remaining steps of the second phase of the SUMP Guidelines (Steps V and VI)
2. Phase 3: covers the third and fourth phases of the SUMP Guidelines (Step VII to XI)

Phase 1 (September 2019 – February 2020) was based on a collaboration between UN-Habitat, the New Urban Communities Authority (NUCA) and the Consultant to develop the future scenarios and a vision for how to achieve them. This Vision covers the future hoped for urban mobility for the study area. The results were shared with the project beneficiary – 60-CA – at the end of Phase 1.

Phase 2 entails two consequent steps: The identification of priorities and their development into actionable measures. Each of them requires proper consultation with concerned stakeholders (Lindenau & Böhler-Baedeker, 2014). Both steps are directed towards the generation of actionable measures, built on the sustainable scenario for the urban mobility future in the study area.

In optimal conditions, this process would rely on ongoing interaction with a network of concerned stakeholders with various levels of interest, influences, and technical expertise. However, due to financial and temporal constraints, the activities of this phase will be conducted inhouse by the Consultant. The

> "**Accessible**, **safe** and **inclusive** urban mobility experience for all through **competitive**, **integrated** and **smart** mass transportation and streets that promote **walking** and **cycling**"

ongoing COVID-19 pandemic further makes stakeholder engagement less likely and possible.

To mitigate these limitations, the Consultant will conduct an extensive stakeholder analysis. This will include analyzing their interests, influences, legal and political foundations, and availability of resources for each stakeholder. The exercise will cover the stakeholders' groups, as identified in the first phase of the SUMP.

Outcomes will be incorporated into the measures development process to ensure stakeholders acceptance for the proposed measures. The Consultant will share the outcomes of Phase 2 with stakeholders to lay the foundations for Phase 3, the final one. Phase 3 aims to (1) adjust the SUMP strategies to navigate the current COVID-19 Crisis and prepare for the next normal; (2) expand engagement with the stakeholders and beneficiaries through a series of workshops to assist their mitigation and adaption efforts, and to (3) conclude the SUMP process.

2.3. Purpose of the Project

The purpose of this project is to work on developing the second phase of the SUMP for the study area – 6th of October City and parts of Hadayek October City (See Figure 3). A SUMP would serve to meet the need for improved mobility of people in the 6th of October new urban community (NUC) and its surrounding areas, aiming for an integrated transportation system and a higher quality level of service. Knowledge on the latest sector trends and cooperation with other stakeholders involved in urban mobility would benefit transport planning in by 6th of October City and Hadayek October City authorities for their respective cities. The three phases are detailed below.

2.3.1. Review of Phase 1 (Step I – IV)

In Phase 1, the Consultant worked extensively with NUCA and UN-Habitat towards developing a common vision for urban mobility in the city. The phase started with creating Memorandum of Understanding (MOU) signed by the three parties. The MOU outlined the expected outcomes of the phase and roles of each party in the process.

Phase 1 covered the first four steps of the SUMP Guidelines. The work commenced by analyzing and assessing the current status of urban mobility in the city using a multi-level and user-centric diagnostic to identify urban mobility challenges and gaps. The diagnostic was conducted on the following three levels:

- A Public Transport Network Diagnostic to assess the public transport service provision and user experience.
- A Street Design Diagnostic to assess the active travel user experience.
- A Passenger Survey (Pax Survey) to collect baseline data for computing fundamental mobility indicators such as modal share, trip numbers and lengths, and the user satisfaction levels.
- Based on the outcomes of the diagnostic and feedback sessions with the stakeholders, the Consultant developed three future scenarios for urban mobility in 2030: A Do-Nothing scenario, a Business as Usual scenario and a Sustainable scenario. The Consultant utilized the baseline indicators from the Passenger Survey to develop a quantitative model describing the three scenarios.

- Based on the Sustainable scenario quantified targets, the Consultant developed the Vision and presented the outcomes of the phase to 6O-CA, NUCA and UN-Habitat in March 2020. The vision statement is:

2.3.2. Overview of Phase 2 (Step V – VI)

In Phase 2, the Consultant elaborates on the Vision to develop a SMART (specific, measurable, achievable, realistic, time-bound) set of targets that reflects the objectives of the Vision. Targets should be aligned with the urban mobility indicators developed in Phase 1 to enable comparability and tracking of progress over time.

To achieve the targets, the Consultant will develop a set of actionable and feasible measures and group them into integrated packages which serve as alternatives for adoption and implementation by policymakers. The Consultant will work on Phase 2 in a silo, as highlighted in the Project Strategy (Section 1.5).

Phase 2 will serve as a foundation for Phase 3, in which active involvement of the stakeholders will be essential.

2.3.3. Overview of Phase 3 (Step VII – XI)

In Phase 3, the Consultant will target the active involvement of the stakeholders in the finalization of the SUMP. Throughout the project, we will be working closely with the Transport Planning Unit within NUCA, the beneficiary client. Project outputs will be prepared and translated for the 6th of October City Authority.

The process will start by collectively reviewing and refining the selected package of measures to reach a joint agreement. The Consultant will then develop detailed budgets and time plans for the measures and compile them into a unified action and budget plan. These will be discussed and agreed on with the stakeholders. In parallel, sources of funding will be explored nationally and internationally.

Based on the action and budget plan, the Consultant will design and propose a monitoring and evaluation framework, which includes performance indicators to help local authorities periodically measure the progress towards realizing the targets.

Finally, the Consultant will compile the final version of the SUMP incorporating the amendments from stakeholders. The plan will be disseminated widely through a series of events and publications to maximize the chances of adoption on the local level and advocate for replicability of the SUMP process in the other NUC's to improve their effectiveness in tackling future urban mobility challenges.

2.4. Project Scope

2.4.1. Geographic Scope

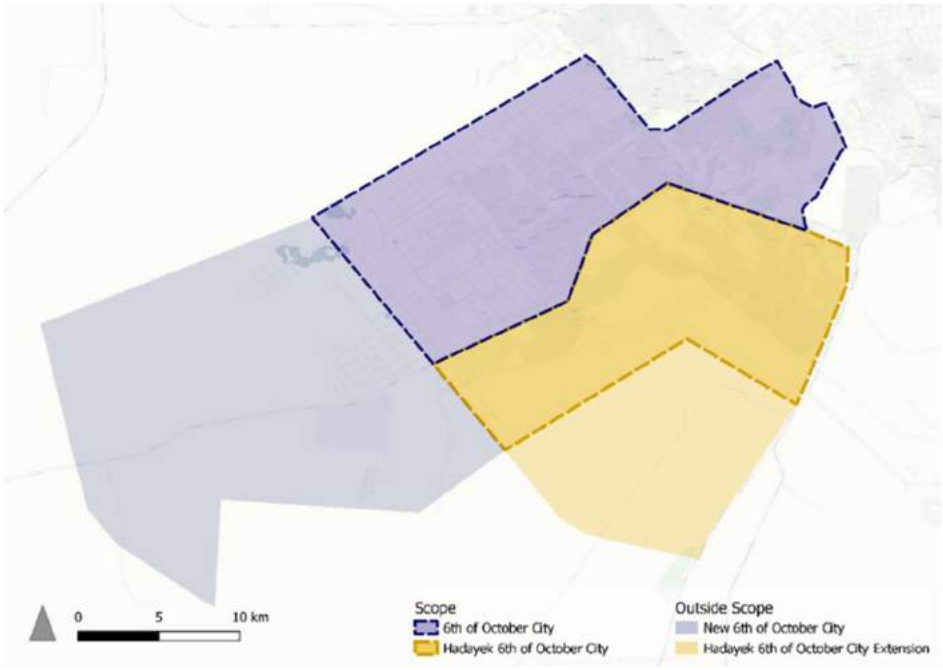


Figure 3: Map highlighting 6th of October city administrative boundaries

The study area is limited to the administrative boundaries of 6th of October City and Hadayek October City, as highlighted with the blue and yellow dashed outlines in (Figure 3).

The entire urban conglomeration, including Sheikh Zayed, Hadayek October Extension, New 6th of October, New Sheikh Zayed, and Sphinx, cannot be covered in the study, given the financial and temporal constraints of the project. The selected area includes a wide variety of land uses – residential, commercial, industrial, leisure, and mixed-use – which makes it a realistic representation of demand and supply for mobility. This area spans 427 km2, which is equivalent to 95% of the area enclosed by the Ring Road.

2.4.2. Scope of work and Objectives of Phase 2

Phase 2 builds on the Vision outlined in Phase 1 by translating it into priorities and measurable targets. These priorities and targets will then be transformed into effective measures. The measures will be combined into integrated packages to benefit from synergies and increase their effectiveness. This phase is important as it acts as a transitional phase between the Vision and having tangible measures to be implemented on the ground.

This process aims at achieving the following objectives:

1. Identify the current mobility priorities
    a. Mapping the current mobility plans and projects related to the study area on the national, regional, and local levels
    b. Identifying the influence and priorities of stakeholders
2. Develop SMART targets to be adopted by decision-makers
3. Transform the targets into actionable measures
4. Create integrated, feasible and effective packages of measures as alternatives for implementation

Phase I of the SUMP ended with a Vision for 6th of October City's urban mobility in 2030. The Vision is a qualitative description of the desired future.

Phase II set priorities and measurable targets to produce an effective package of implementable measures. It is equivalent to steps V and VI of the EU SUMP guidelines. (See Figure 2)

3. Step V: Set priorities and measurable targets

Step V formulates targets based on the Vision and objectives from Step IV (Figure 4).

Targets are clear and measurable. Indicators measure the baseline and define the future, to ensure that progress towards the achievement of targets can be assessed.

Figure 4: SUMP Vision and Objectives

3.1. Activity 5.1: Identify the current priorities for mobility

SUMP Targets must be in alignment with the current priorities and plans of concerned stakeholders, across the national, regional and local governance levels.

We identify these priorities through reviewing current plans, projects and mandates of these stakeholders.

3.1.1. Mapping of ongoing Plans and Projects

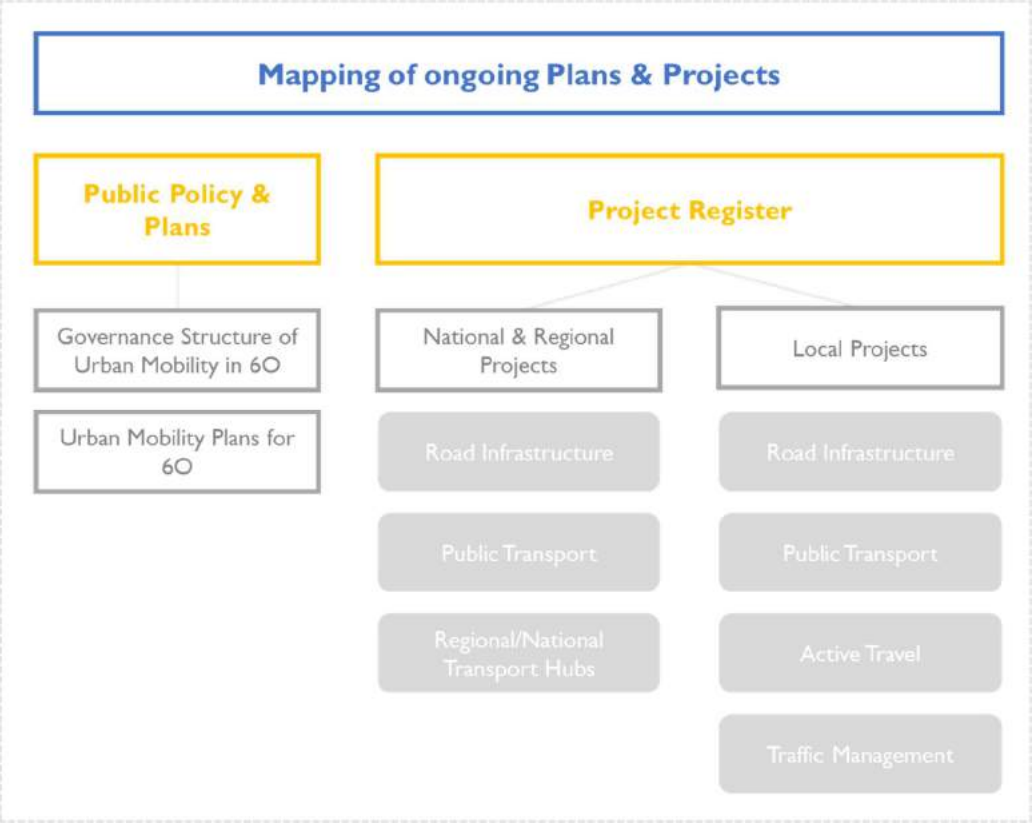


Figure 5 The detailed structure of the activity

3.1.1.1. Methodology

Public Policy and Plans include a review of the governance structure and of the official plans that shape the urban mobility policies and investments in the study area.

The Project Register includes all mobility-related projects that serve 6O on local, regional, and national levels. It consists of:

- GIS Database: A geo-database of all projects that have a geographic component
- Project Cards: Each project is described on a card which identifies the objectives, geographic scope, allocated budget, financial source and time plan for each.

Mobility-related projects include the Road-, Public Transport-, Active Travel- and Traffic Management-infrastructure, in addition to Transport Hubs.

We aggregated data through reviewing publicly available data by governmental authorities and the local press. Data sources included:

- Official decrees and plans by local, regional and national authorities
- Official statements and press releases by governmental authorities
- Official governmental websites and newsletters (i.e. Egypt's Projects Map and NUCA's website)
- Local and International press articles that included governmental statements on the projects
- Interviews with experts in NUCA. MoH, UN-Habitat and ITDP

3.1.1.2. Outcomes

Public Policy for New Urban Communities such as 6th of October City envisions them becoming centres of population and employment. (GOPP, 2014) To implement this policy, the government is developing multiple projects to increase public transport capacity and connectivity with the Greater Cairo Region.

Public Policy and Plans

The governance structure of urban mobility in 6O

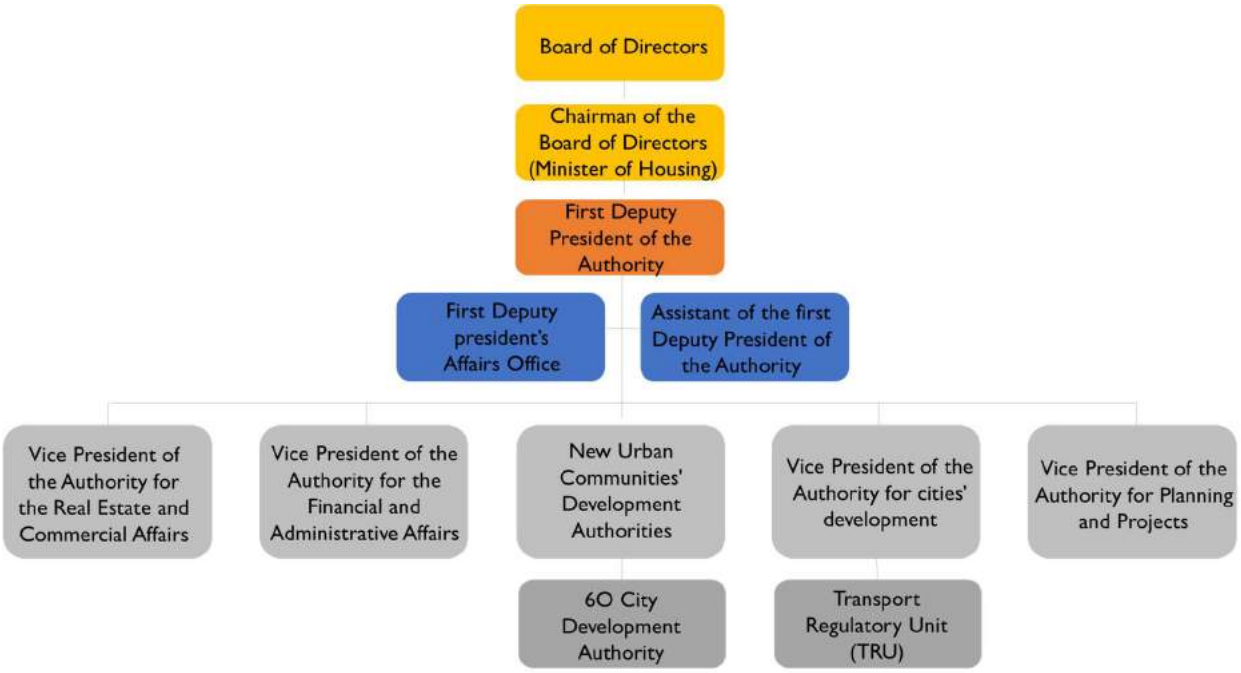


Figure 6: The organigram of New Urban Communities Authority (NUCA)

6th of October City (6O) is one of the first generation NUCs that are developed and governed by NUCA. It is the most populous NUC with a population of around two million inhabitants and is governed by the 6th of October City Authority (6O-CA), which is a subsidiary of NUCA.[2]

In 2018, the Minister of housing established the Transport Regulatory Unit in NUCs (TRU)[16].

Legal Mandate of the Transport Regulatory Unit

- Prepare smart urban mass transit plans within the NUCs and link them to the main and neighbouring cities with mass transit stations
- Define scenarios of the current and future situation as NUCs develop
- Prepare contracts with investors and operators to establish, manage, operate and maintain mass transportation services TRU is offering through NUCA
- Monitor and supervise the management, operation and maintenance of NUCA's smart and traditional transportation systems.
- Develop criteria for evaluating the level of performance
- Develop frameworks for penalties, incentives and rewards for operators. And manage the procurement of equipment and devices through grants and investments that provide monitoring and evaluation of transportation systems
- Recruit qualified experts and provide them with essential training to manage and operate TRU's tasks and activities

(Source: Minister of Housing Decree 1064/2018)

Figure 7: 6th of October and Sheikh Zayed Extensions

The latest strategic plan for 6O outlined the official interest in planning 6O and SZ as a unified urban agglomeration at the western GCR[17].

The two cities are already linked through real estate developments - mostly residential - on the 26th of July corridor; Dahshour corridor (Waslet Dahshour) and 6O's northern expansions. NUCA released a master plan for Sheikh Zayed City's Expansions in 2019[18] under the presidential decree of establishment number 77–230/2017[19]. The city will be adjacent to 6O's northern expansions (Figure 7).

Objectives of the Strategic Plan for Western NUC's in the GCR

- Activate the role of national development corridors that start from the city through the exploitation of its economic and urban system
- Exploit the economic and urban weight of the city to increase the vitality of the national development axes emanating from the region.
- Provide incentives for the private sector and creating an encouraging investment climate.
- Encourage urban growth on desert lands.
- Provide and raise the efficiency of production services and infrastructure.
- Develop city's export capacity by capitalizing on its comparative advantages.
- Create a unique urban, social and economic environment that acts as a population magnet.

The plan comprehensively defines the urban mobility challenges in the city. Challenges include:

1. limited intercity accessibility between the two cities and the rest of the GCR via mass transport;
2. limited intracity accessibility via mass transport;
3. domination of informal transport;
4. lack of pedestrian and vehicular safety in the city.

The underlying reasons are defined as follows:

1. lack of intercity and intracity mass transport services;
2. inadequate institutional framework for mass transport;
3. lack of enforcement of traffic laws and regulations;
4. penetration of many residential districts by regional roads with high vehicular speeds.

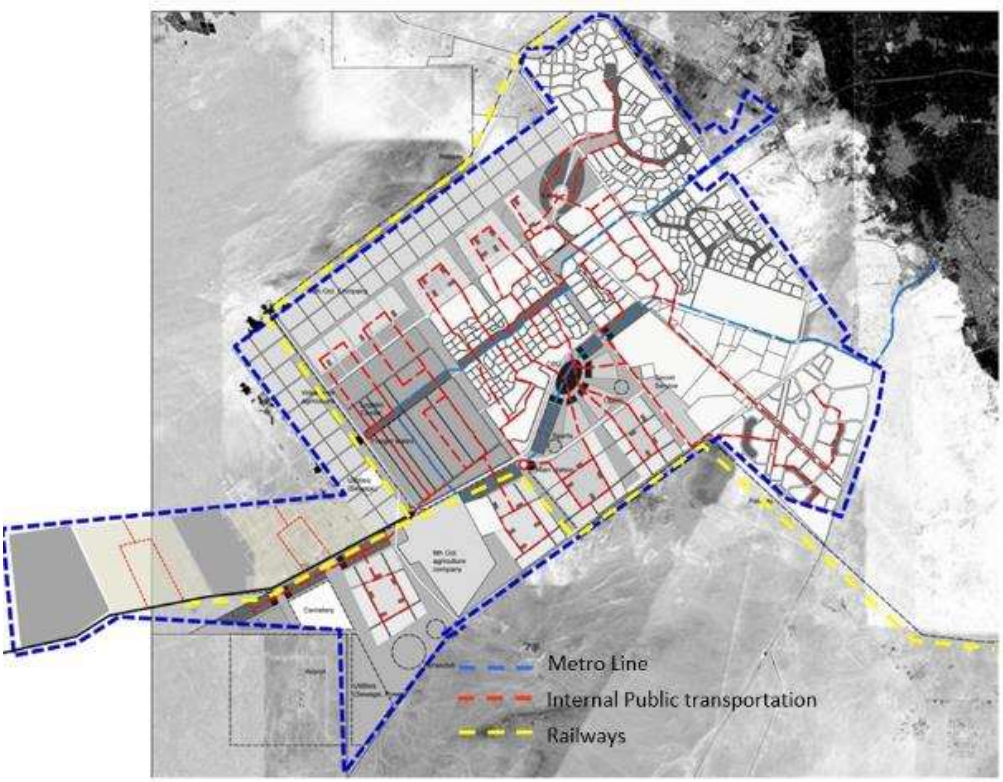


Figure 8 Proposed mass transport network for 6O and SZ (GOPP & NUCA 2010)

These problems are expected to aggravate as the two cities grow in geographic size and population[17].

To tackle these challenges, the plan aims to improve regional connectivity of the new cities by investing in regional mass transport projects such as Metro Line 4 and the Monorail. The plan also proposes a local mass transport network that includes a circular metro line around the urban agglomeration and an internal bus network of ten routes[17] (See Figure 8)

In 2017, NUCA's board of directors (NUCA BoD) agreed to add two new cities to 6O and SZ and to establish an independent authority for each: Hadayek October City Development Authority (HO-CDA) and New 6th of October City Development Authority (N6O-CDA). The decree outlined the space reallocation for the four western NUCs (NUCA BoD meeting 109/2017).

In the light of TRU's roles and the growing urban agglomeration of the western NUCs, the SUMP would be a potential for 6O to holistically tackle the future mobility challenges and sustainably cope with the growing population and trips. Engaging TRU in the SUMP process to build their technical capacity, institutional effectiveness and ownership of mobility planning and regulatory authority would be of paramount importance for a sustainable and effective mobility planning in 6O and other NUCs.

Project Register

Regional/National projects focus on improving regional connectivity within the GCR, linking 6O with the GCR by rail and road-based mass transport services and the introduction of new international and regional transport hubs for both goods and passengers.

Local Projects focus on creating intersection-free urban roads, formalizing/regulating the local paratransit sector, investing in formal intracity bus services and initiating Active Travel infrastructure.

Regional and national projects

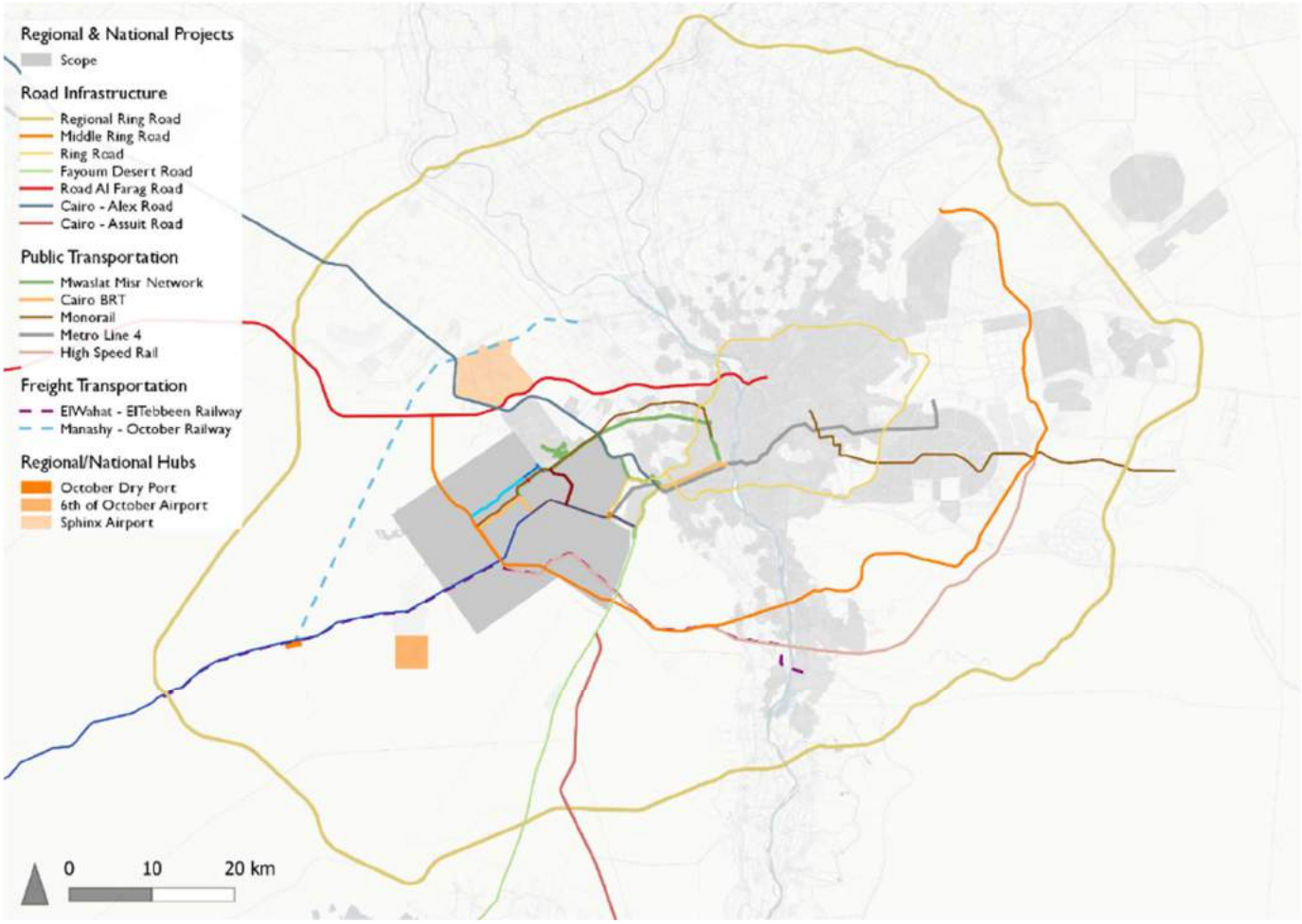


Figure 9: Regional and National Projects

Improve 6O regional connectivity

6O originally had two main regional connections with the GCR:

- *26th of July Corridor* linking it with inner and central GCR;
- *Al Wahat Road* linking it with outer GCR through the Ring Road.

Recently three entrances were added following the introduction of three new corridors:

- *The Middle Ring Road* provides direct access to 6O, passing through the residential and industrial parts of the city and linking it to outer GCR including Eastern NUCs.
- *The Regional Ring Road* intersects with Cairo-Alexandria Desert Road in the northern peripheries of the city. This intersection provides a direct inter-regional connection with the Nile Delta,

Fayoum, The New Administrative Capital (NAC), Eastern NUCs, Suez Road, Ismailia Road and Ain Sokhna Road.

- *Rod Al Farag Corridor* intersects with the Middle Ring Road, providing a northern entrance to the city and linking it with northern GCR in Shubra from to the east and North Coast in Al Alamein and Al Dabaa to the west.

Link 6O with the GCR by rail and road mass transport services

The population of 6O is around two million inhabitants in 2020[3]. 3.25 million inhabitants are estimated to be living in the city by 2030[9]. The continued urban and population growth of the city will result in an increasing number of trips to and from the GCR. Passenger trips between 6O and the GCR are expected to reach 3.6 million trips per day in 2030[9]. To tackle the growing mobility demand, new regional mass transport services are either recently introduced or expected by 2030 by different stakeholders. The services include:

1. *6O Monorail:* The MoT is constructing a monorail line that links 6O with Inner Giza in the Mohandessin District. The line is initially expected to provide 148,000 passenger trips per day with a maximum expected capacity of 500,000 passenger trips per day[20].
2. *6O-Giza BRT:* The MoH, Giza Governorate, UN-Habitat and ITDP are working on a BRT line that links 6O with Inner Giza in Giza Square. The pre-feasibility study for the line was completed by ITDP[7]. The line is initially expected to provide 126,000 passenger trips per day[7] with a maximum expected capacity of 500,000 passenger trips per day upon full deployment[20].
3. *Metro Line 4:* The MoT is working on Metro Line 4 that links the peripheries of 6O with New Cairo City passing by inner and central GCR[8]. MoT secured funding for the construction of the first phase, which links 6O with Fustat, through a €1.75 billion soft loan from JICA[6]
4. *High-Speed Rail:* The MoT is planning a three-phased High-Speed Rail line that will connect Al-Ain Al-Sokhna and the NAC with Al-Alamein and Alexandria passing by 6O[21]. The first phase of the project will connect 6O with NAC, and it has reached the final phase of the tendering process with two consortiums competing for the construction[22].
5. *Mwaslat Misr Network (STP):* In March 2020, Mwasalat Misr started operating seven bus lines that connect 6O and SZ with Cairo University's Metro Station[10]. The service aims at reducing GHG emissions and improving air quality by shifting away from private vehicles towards more sustainable mobility options. The project is a part of the Sustainable Transport Project (STP) by MoE, MoH and UNDP[23].

Introduce new international and regional transport hubs for both goods and passengers

1. *Sphinx International Airport:* The airport was constructed in 2016 with a primary target of supporting Cairo International Airport and reducing traffic congestion on major corridors in the Eastern GCR. The airport was planned to serve 6O, SZ and nearby Governorates such as Fayoum and Beni Sweif[24].
2. *6O Airport:* The airport is planned to be in New 6O City. The land is already allocated to the airport in the city's Master Plan[25].
3. *6O Dry Port:* In 2018, the Prime Minister issued decree #2561/2018 ordering The General Authority for Land and Dry Ports, affiliated to MoT, to establish 6O Dry Port on Wahat Road[26]. The project aims at improving 6O Industrial Area's shipping and storage capacity to alleviate the pressure on Alexandria and Dekheila Ports and minimize goods waiting times at the ports[27].

Local projects

Figure 10: Local Projects

Intersection-free urban roads

Relieving traffic congestion is high on MoH and 6O-CA agendas. MoH is constructing a total of 14 flyovers, including four on intracity urban (the Central Corridor, the Parallel Corridor, Gamal Abdel Nasser Road and Boulevard Road). The construction of flyovers aims at eliminating at-grade intersections to ensure smoother traffic flow within 6O[28].

MoH targets replacing all at-grade U-Turns on Wahat Road with flyovers to reduce vehicular traffic accidents. Four pedestrian bridges are also being constructed on Wahat Road[28].

Formalizing and regulating the local paratransit sector

In 2019, 6O-CA started to issue local licenses for paratransit operators within the city. The targeted modes are Mini Vans and Microbuses aiming at replacing the now banned Boxes and Pick-Up Trucks. 6O-CA initially provided 500 licenses for Mini Vans and 188 for Microbuses in 2019[29].

Earlier in 2019, 6O-CA banned Tok-Toks from operating within the city[11]. However, they continue to provide limited intradistrict services away from the city's major corridors[9].

Investing in formal intracity bus services

In 2019, new bus routes managed by the TRU, and subcontracted to operator Mandolin, began offering formal Intracity services in 6O as feeders to the intercity network. The service targets solving intracity transportation problems[30].

The service faces fierce competition from the intracity paratransit sector which are responsible for 74% of the intracity trips. Therefore, effective network planning and more investments are essential for the service to be reliable and attract riders[9].

Early interest in Active Travel infrastructure

In 2018, 6O-CA introduced a pilot project of two kilometres long bike lane and pedestrian paths in Gamal Abdel Nasser Corridor. The new active travel infrastructure is a part of an overall upgrading process of the corridor that includes green spaces, streetscape development and upgrading of several squares[31].

The pilot project demonstrates a growing interest in active travel. However, more political interest and investments are needed for planning and implementing active travel infrastructure in major roads with higher traffic volumes such as the Central Corridor.

3.1.2. Defining stakeholders' priorities for urban mobility

3.1.2.1. Methodology

The process of mobility and transport planning entails interaction between a wide variety of stakeholders, each with a set of interests and priorities (Arsenio et al. 2016).

The list of concerned stakeholders will be revisited and expanded where necessary. This list will be aggregated into a **Stakeholder Register.** This register consists of detailed information about each stakeholder, such as its affiliation, date of establishment, mandates and organigram. (See Table 1)

All relevant stakeholders are divided under functional groups based on their scale or type of work. The functional groups are as follows:

- **Local/regional Government:** Governmental stakeholders working on the local and regional level, or 6th of October and Greater Cairo, Including public authorities and departments.
- **National Government:** Ministries and other national-level authorities affiliated to the central government's cabinet.
- **Financial Stakeholders**: National and international stakeholders working in the field of financial investments, such as banks and donors.
- **Public:** 6th of October citizens and daily commuters.
- **International Development Organizations:** Organizations that operate in GCR and have projects related to 6th of October City such as UN-Habitat, UNDP and ITDP
- **Private Transport Service providers:** All private transport service providers and operators, such as Uber, SWVL, Mwaslat Misr and the paratransit sector.
- **Urban Developers:** All private investors in traffic generating investments that include residential compounds, commercial centres, office complexes and small local businesses.

Functional Group	Stakeholder Name	Arabic Name	Affiliation	Date of Est.	Type	Scale	Organigram	Public/ Private
National Government	NUCA	هيئة المجتمعات العمرانية الجديدة	MoH	November 1979	Authority	National	Link	Public

Table 1: Stakeholder Register Template

We will identify the interests and priorities of stakeholders, from their presumed perspective. The process will rely on the stakeholders' official mission and expert judgment. Assumptions will be clearly outlined as such.

Ideally, we would assess the interests and priorities together with key stakeholders through workshops and formal questions. This is anticipated as a follow-up activity in Phase 3 (Seeking funding). However, due to the lack of funding, the representation of stakeholder interests and priorities will be done through **roleplaying**. In that case, after grouping the stakeholders in functional groups, those functional groups will be assigned to one or more of the team members to represent their priorities according to their hierarchy, mandate, and resourcefulness. Each team member will research the following information for the stakeholders in each assigned group:

- **the main legal documents for establishing their existence and mandating their scopes**
- **their hierarchy within the functional groups and relations to other groups**
- **their workflow**
- **their priorities and projects**

In some cases, some of the stakeholders' activities don't fall directly under their mandates. Therefore, priorities are divided into two categories: [1] priorities by mandate and [2] priorities by activity. Priorities of each category will be ranked on a scale from high to low.

After aggregating all stakeholders' priorities and discussing them, the priorities of each functional group are combined and refined based on their respective rankings. (Figure 11)

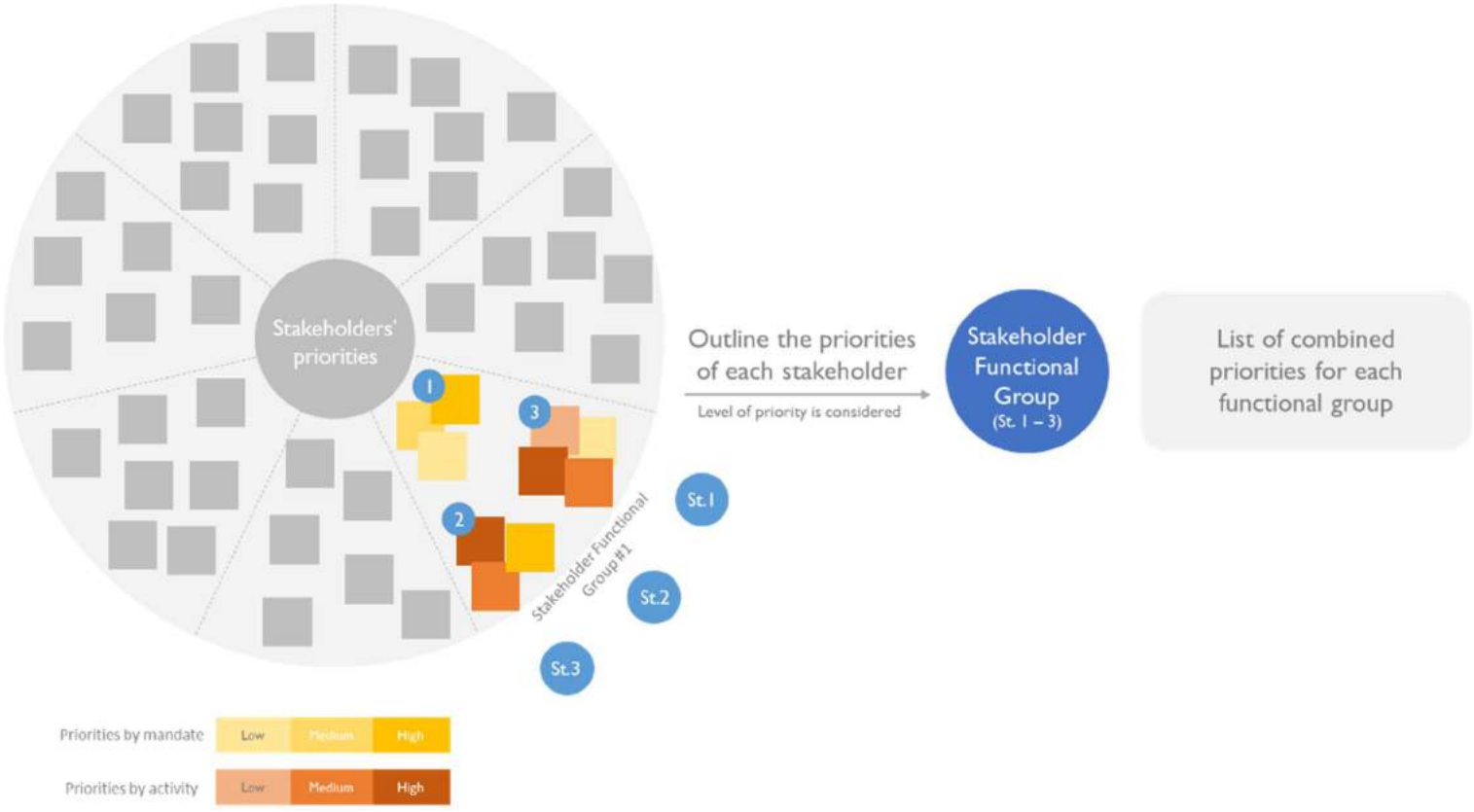


Figure 11: Process of Identifying Stakeholders Priorities through roleplaying

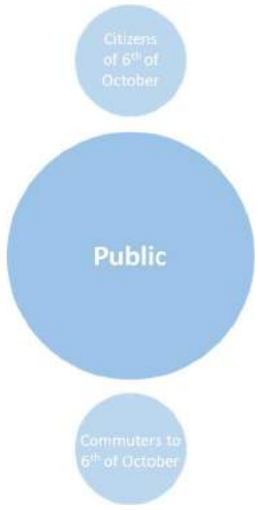
3.1.2.2. Outcomes

- Sell land, manage Land use and enforce building codes
- Provide basic services (educational, health...) and utilities (water, electricity...)
- Regulate traffic and parking
- Execute and regulate urban expansion plans
- Plan, supervise, and implement local transport infrastructure
- Provide public transport services through concessions for private operators
- Regulate and license paratransit and TNCs services

- Accommodate Egypt's growing population
- Achieve NUCs population Targets
- Execute the National Network of Roads and major regional roads
- Execute major rail transport projects (Railway, Monorail and Metro)
- Develop Western NUCs into a unified urban agglomeration of four cities.
- Reduce GHG emissions and improve air quality
- Attract Foreign Direct Investment

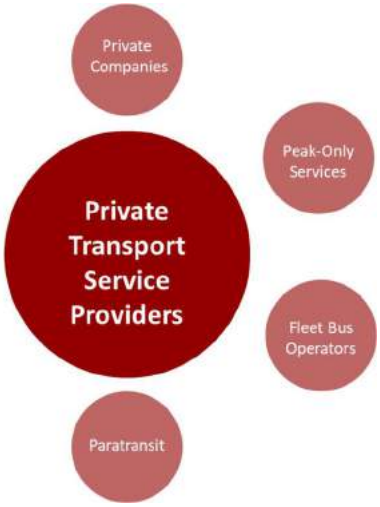
- Hand out loans for development projects
- Alleviate poverty
- Maximize the Return on Investment (ROI)
- Mitigate climate change

- Safer and more comfortable public transport
- Safer and more comfortable active travel
- Shorter travel times and less congestion
- More affordable urban mobility



- Transform mobility for the benefit of people and the environment
- Advocate for sustainable and resource efficient mass transport systems (e.g., BRT)
- Improve population accessibility to services and opportunities
- Mitigate climate change and improve air quality
- Advocate for walkable cities that enable active travel

- Maximize Ridership and farebox revenues
- Improved public transport infrastructure (stops and stations)
- Increase passenger satisfaction
- Fiscal and bureaucratic incentives



3.2. Activity 5.2: Develop SMART targets

3.2.1. Develop SMART targets

3.2.1.1. Methodology

Targets represent the most concrete form of commitments. They [a] ensure that the objectives all along the SUMP development process are fulfilled and [b] help to create monitoring and evaluation mechanisms in later stages of the SUMP.

Targets should be SMART (specific, measurable, achievable, realistic, time-bound) to lead the whole process of SUMP development and help develop clear indicators to measure the success of any adopted measures[14].

The main objectives of developing targets are creating a leading development outline for measures (Activity 6.1) and assessing whether an adopted package of measures serves the objectives of the vision[14]. Hence, targets should be SMART as follows:

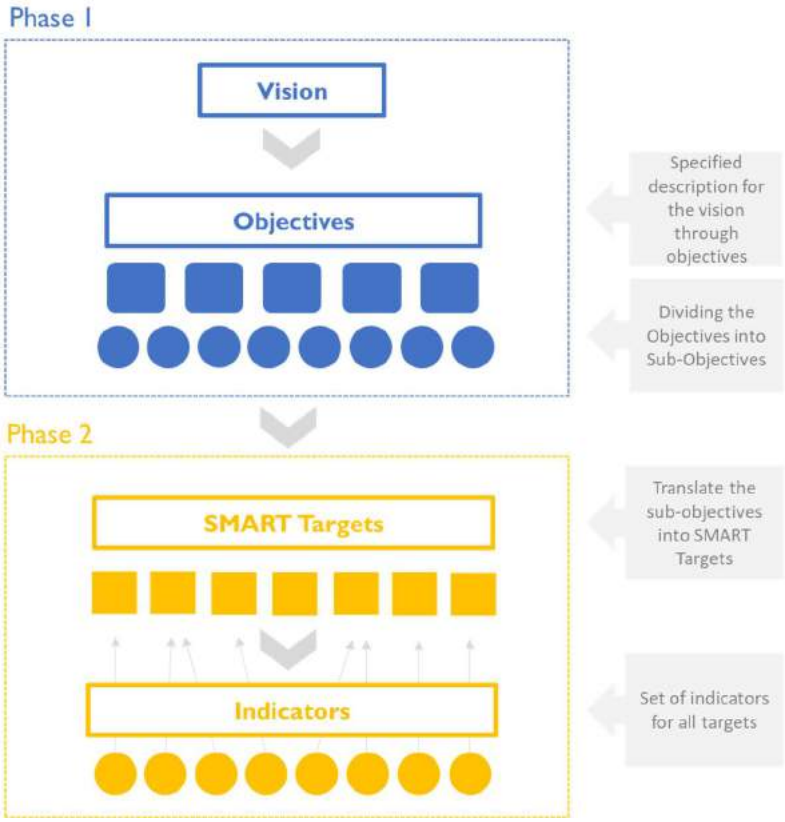


Figure 12: Process of developing SMART Targets

- **Specific:** Targets should be precisely described through quantitative and/or qualitative terms commonly understood and used by stakeholders.
- **Measurable:** Targets should follow the same quantitative and qualitative measurement frameworks the Consultant used in the assessment of the current situation (Urban Mobility Diagnostic) and scenarios generation process in the first phase of the SUMP to enable impact assessment of the adopted measures.
- **Achievable:** Targets should be technically and financially viable with the available resources of the stakeholders.
- **Relevant:** Targets should be aligned with the objectives of the Vision of improving urban mobility and the regional and national urban mobility targets.
- **Time-bound:** Targets should have key dates of achievement

The Consultant will build the **list of targets** on the foundations of the high-level objectives of the Vision (See Figure 12). We will also study multiple global experiences from cities with similar conditions in terms of population and area that developed and implemented target-based urban mobility plans.

3.2.1.2. Outcomes

Targets are developed to measure and track the progress towards solving urban mobility challenges or meeting vision objectives identified in the first phase of the plan. The Consultant developed a total of six targets (See Figure 13).

1. **Decrease the number of accidents and incidents by 30% within the city**

Accidents include all types of vehicle-to-vehicle, vehicle-to-pedestrian, and vehicle-to-object collisions within 6O. Incidents include theft, ethnic-based violence, and gender-based violence incidents in streets and public transportations facilities within 6O. Traffic police records are used for calculating baseline numbers of 2020 and targeted numbers in 2030. Monitoring the progress towards the target requires active engagement of the local traffic police department in surveillance, data collection and reporting.

2. **Increase satisfaction rate of internal mass transport services by 30%**

The passenger satisfaction rate is measured for seven aspects on a Likert scale of five points. Aspects are geographic coverage, schedules, fares, travel time, safety, comfort, and freedom of choice. In 2020, the compound satisfaction rate of mass transport services in 6O is 3.1 points[9]. The targeted compound satisfaction rate for 2030 is 4.0 points. Specific focus should be directed towards the least rated aspects, comfort and safety, that score 3.0 and 2.8 points respectively in 2020.

3. **A third of trips in 6O are active**

Increasing active travel trips made is a core component of the plan. Intracity trips in 6O are expected to increase from 2,188,450 trip/day in 2020 to 4,350,719 trip/day in 2030[9]. The targeted number of active travel trips within 6O is 856,225 trip/day (11% of the total intracity trips). Active modes must attract 30% of the linear increase of intracity trips made by private cars between 2020 and 2030[9].

4. **Reduce travel time gap between public transport and private cars to be 30%**

For trips between 6O and central areas of the GCR, public transportation takes on average 60% more time than private cars, including an average of 1.5 km of walking per trip[32]. The target is to reduce the travel time gap to 30% and the average walking distance per trip to 1.0 km by 2030.

5. **6,170,000 trips offered by all public transport modes by 2030**

The overall target of public transport supply for 2030 is 6,170,000 trips/day on all intracity and intercity trips that originate or end in 6O. NUCA's local bus trips should increase by 25 fold to attract the growing private cars trips and decrease 6O's reliance on paratransit network which provides 74% of intracity 6O in 2020[9]. CTA intercity trips should grow by five folds to support the 1 million prospective trips by the BRT and Monorail lines by 2030. The growth of the number of trips made by private modes should be limited to 42%, decreasing private modes share of total trips from 16.1% in 2020 to 11.5% in 2030[9].

6. **Limit the rise of GHG emissions from transport to 7%**

Transport activities in 6O currently produce GHG equivalent to 1,740,105 tons of CO2 annually. The number of trips in 6O is expected to double by 2030. Hence, the increase of total GHG emissions from transport activities is inevitable. The target is to limit the increase to 7%, which means decreasing annual GHG emissions per capita by 46%[9].

Measurement methodologies are unified throughout the diagnostic phase (baseline year), target setting and future tracking of the progress (target year). Check 5.3 Annex C for measurement indicators.

Figure 13: SMART Targets

4. Step VI: Develop effective packages of measures

Measures are the tools for achieving the targets and objectives. Agreeing on measures among stakeholders plays a vital role in maximizing their chances of implementation and effectiveness in achieving the targets. Hence, the Consultant develops relevant and actionable measures, in alignment with the priorities of the stakeholders. Step VI consists of three activities as follows:

Figure 14: Step VI Process

4.1. Activity 6.1: Identify the most effective measures

Measures are prioritized based on their effectiveness and realism within the available resources. The activity starts with creating a preliminary list of possible measures followed by an appraisal process to identify the final list of measures.

4.1.1. Develop actionable measures to realize the targets

4.1.1.1. Methodology

The pool of actionable measures will include a variety of urban mobility policy reforms, public transport planning and management interventions, infrastructure projects, and traffic management interventions that are designed to achieve the targets by 2030.

Each measure will be thoroughly defined in terms of the assigned targets, the type (i.e. infrastructure, policy, etc.), and a high-level timescale and budget estimates (See Table 2).

Targets	Measures	Category	Timescale	Estimated Budget	Interdependent Measures
Target 1: 75% of trips within the city are made by Active Modes	1.1: Construct a network of Bike Lanes	Infrastructure	Medium	Medium	2.1, 2.2
	1.2:				
	1.3:				

Table 2 Preliminary schema for the list of measures

4.1.1.2. Outcomes

Each target is divided into areas of interventions (Themes) to be tackled through the measures. As an example, the first target "Decrease the number of accidents and incidents by 30 % within all local public transportation services (vehicles and stations) by 2030" consists of themes such as "improving pedestrian and cycling safety" and "improving the safety and security at stations and on vehicles".

The result of this activity is 39 measures categorized by 17 themes (Check 5.4 Annex D). The measures are varying in types, such as infrastructure, regulations, or management, in timescale and the high-level estimated budget. The identified interdependencies between measures help in highlighting synergies of measures which later support the package creation process.

Targets	#	Theme	#	Measures	Type	Timescale	Estimated Budget	Interdependent Measures
Decrease the number of accidents and incidents by 30 % within all local public transportation services (vehicles and stations) by 2030	1	Improving pedestrian and cycling safety	1	Reduce speed in main intersections by implementing traffic calming elements	Infrastructure	Medium	Medium	10
			2	Provide an integrated and continuous pedestrian network	Infrastructure	Long	High	3,20,24,25
			3	Create safe pedestrian crossings near all landmarks and intersection points	Infrastructure	Medium - Long	Low - Medium	1,24

Table 3: Sample of List of Measures

4.1.2. Measures appraisal and prioritization process

4.1.2.1. Methdodology

Measure appraisal is the process of identifying the most suitable and cost-effective policy measures to achieve the SUMP's Vision and objectives and overcome the identified challenges. Creating a large and diverse pool of measures is important to maximize the options for the city. However, the SUMP process has to go beyond a broad wish-list of measures to a concise, effective and realistic package of measures[33].

Objectives

- Identify the most effective measures as per the SUMP targets
- Identify the most realistic measures for adoption by the relevant stakeholders and the public
- Produce the final list of measures

Rating Process

The measures appraisal activity follows a weighted rating process. Each measure is rated based on three main criteria:

- **Effectiveness** towards achieving the targets *(50% of the total score)*
  a) Effectiveness towards achieving the assigned target
  b) Effectiveness towards achieving all of the other targets.
- **Acceptability** by relevant stakeholders and the public *(20% of the total score)*
  a) Acceptability by the stakeholders (See section 0).
  b) Acceptability by the public as per the measures appraisal survey (See 5.8 Annex H).
- **Economic feasibility** per the available and potential resources *(30% of the total score)*

The total score of each measure is calculated on a Likert scale from 1 to 5. Measures with a total score of 3.5 or above qualify to the final list of measures (See Figure 15).

Figure 15: Measures Appraisal Process

4.1.2.2. Outcomes

The appraisal process produces a pre-final list of twenty-two measures that score 3.5/5 or above. This list is further refined based on lessons learnt from other cities experiences in the design and implementation phases. Hence, some measures are filtered, combined, or redefined. The final list consists of fifteen measures (Check Figure 16). Measures are accompanied by SMART indicator to ensure consistent tracking of their success towards achieving the targets (Check 5.6 Annex F for indicators).

For the 6th target "Limit the rise of GHG emissions from transport to 7%" only one measure is developed. The rating of the measure is below the accepted score. However, several measures indirectly tackle the 6th target as demonstrated by their effectiveness scores towards achieving the 6th target (See Table 4).

Effectiveness towards 6th Target	Score
Increase service availability	4.00
Connect all areas of 6th of October with direct, continuous bike lanes	4.67
Construct bike racks near major landmarks of 6th of October city	4.67
Integrate cycling with public transport (integrated network, interchanging stops, bike parking at stations)	4.67
Implement a bike sharing system to be used as first/last/only mile mobility option	4.33
Implement sidewalks following (inter)national codes in all main and secondary streets	4.33
Schedule and implement regular maintanance cylces for all sidewalks and crossings	4.33

Table 4: Sample of the top effectiveness scoring towards the 6th target

Targets	Measures	Effectiveness towards own target	Stakeholder Acceptability	Value for Money	Effectiveness towards other targets	Public Acceptability (Survey)	Total Score	Total weighed score
		Total	Total	Total	Total			
Decrease the number of accidents and incidents by 30 % within all local public transportation services (vehicles and stations) by 2030	Reduce speed in main intersections by implementing traffic calming elements	**5.0**	3.8	5.0	1.6	4.0	3.9	4.1
	Provide an integrated and continuous pedestrian network	3.5	2.5	2.3	2.7	4.6	3.1	3.0
	Create safe pedestrian crossings near all landmarks and intersection points	**5.0**	4.0	4.8	2.7	4.7	4.2	4.3
	Identify which vehicle types get involved in high accident rates and regulate the vehicle mix on the streets accordingly	3.0	2.8	2.8	1.4	4.3	2.8	2.7
	Implement a security strategy, e.g. by installing cameras at stops and on the vehicles	2.3	4.0	2.0	1.4	4.2	2.8	2.4
	Create safer conditions at stations and their surroundings (e.g. better lighting)	3.0	3.3	4.0	2.9	4.5	3.5	3.5
	Conduct safety and security trainings for drivers and awareness campaigns for passengers	2.3	2.5	2.8	1.8	4.2	2.7	2.5
	Include first aid and fire fighting system in all public transportation facilities, such as vehicles and stations	3.5	3.0	4.8	1.3	4.3	3.4	3.5
	Include a dedicated police department/officer in each main station for fast reporting	2.5	2.3	2.8	1.7	4.1	2.7	2.6
	Set a speed maximum of 30 km/h in inner streets; 60km/h in main streets.	3.5	1.5	3.5	2.6	3.7	3.0	3.1

Table 5: Sample of the Measures Appraisal Matrix

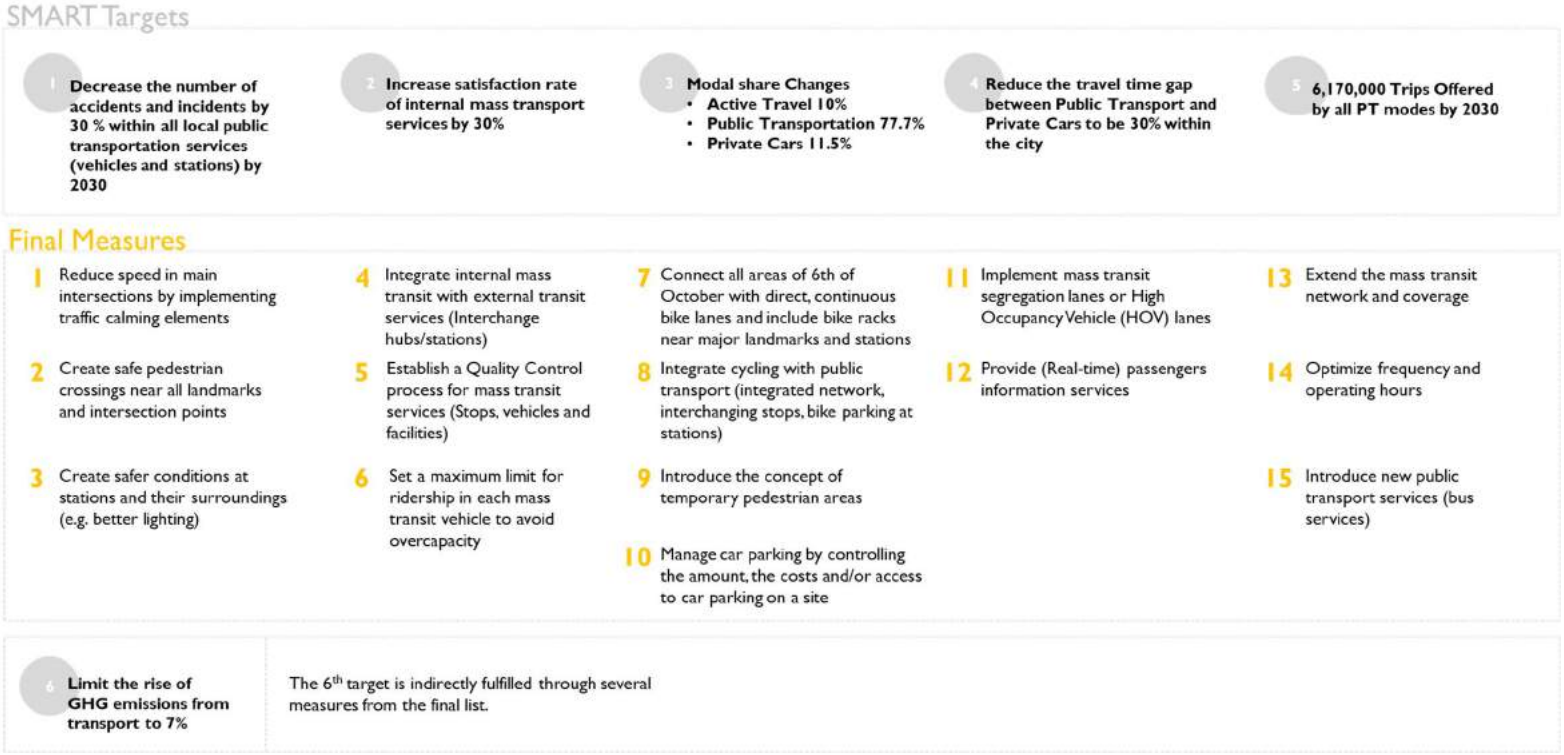


Figure 16: Final List of Measures

4.2. Activity 6.2: Learn from others' experience

4.2.1. Gather feedback/lessons learned from cities with similar challenges and resources.

Looking at different experiences in different cities is an essential exercise for the prioritization of measures. While innovative and courageous ideas do not always work as planned, this activity aims at better estimating costs and benefits of different measures by looking at experiences in cities with similar challenges and resources.

The Consultant expands the Urban Mobility Plans (UMPs) Knowledge Base of the first phase of the project by reviewing urban mobility plans developed in other cities with similar population size, geographic size and spatial relationship with the surrounding metropolitan areas.

The process of learning from other cities is iterative throughout the measures development process. The Consultant incorporates lessons learnt from other cities in developing the preliminary list of measures, measures appraisal activity and producing the final list of measures.

4.3. Activity 6.3: Use synergies and create integrated packages of measures

4.3.1. Combine measures into integrated packages

4.3.1.1. Methodology

Measures that qualify to the final list are grouped into integrated packages to exploit potential synergies for implementation. Compiling measures into packages unlocks the potentials of integrated management of resources between the measures and the ongoing projects and plans on local and regional levels[14]. All packages should meet the following criteria:

- Includes a minimum of one measure per target
- Ensures Balanced timescale distribution among the measures
- Ensures balanced budget levels among the measures
- covers all trip scales (Intradistict, interdistrict, short and long commutes)
- covers all mobility modes (Mass transport, active travel, private cars)

The Consultant evaluates the packages based on the cumulative score of their measures as per the appraisal activity (See section 4.1.2). The package with the highest score undergoes further refinement and adjustment to fulfil all of the beforementioned criteria to qualify as the final package.

4.3.1.2. Outcomes

The outcome of the package creation process is three candidate packages following three themes. The first package follows the theme of expansion; it limits the introduction of new infrastructures and projects and focuses on **expanding** the existing ones. The package includes measures like extending the mass transit network and coverage and creating safer conditions at stations and surroundings.

The second package focuses on **enhancing** the existing services and infrastructures by optimizing the frequency and operating hours of the mass transport services and establishing a quality control system for the services. The last package relies on **providing** new transport services and infrastructure by Introducing new public transport services and designing streets for pedestrians and cyclists.

Based on the cumulative scores of each package, the third qualifies as the final package. According to stakeholder priorities, the public acceptability, and the lessons learnt from other cities, supporting measures are added to maximize the effectiveness and integration of the package. The final package has a total of 10 measures (See Figure 17).

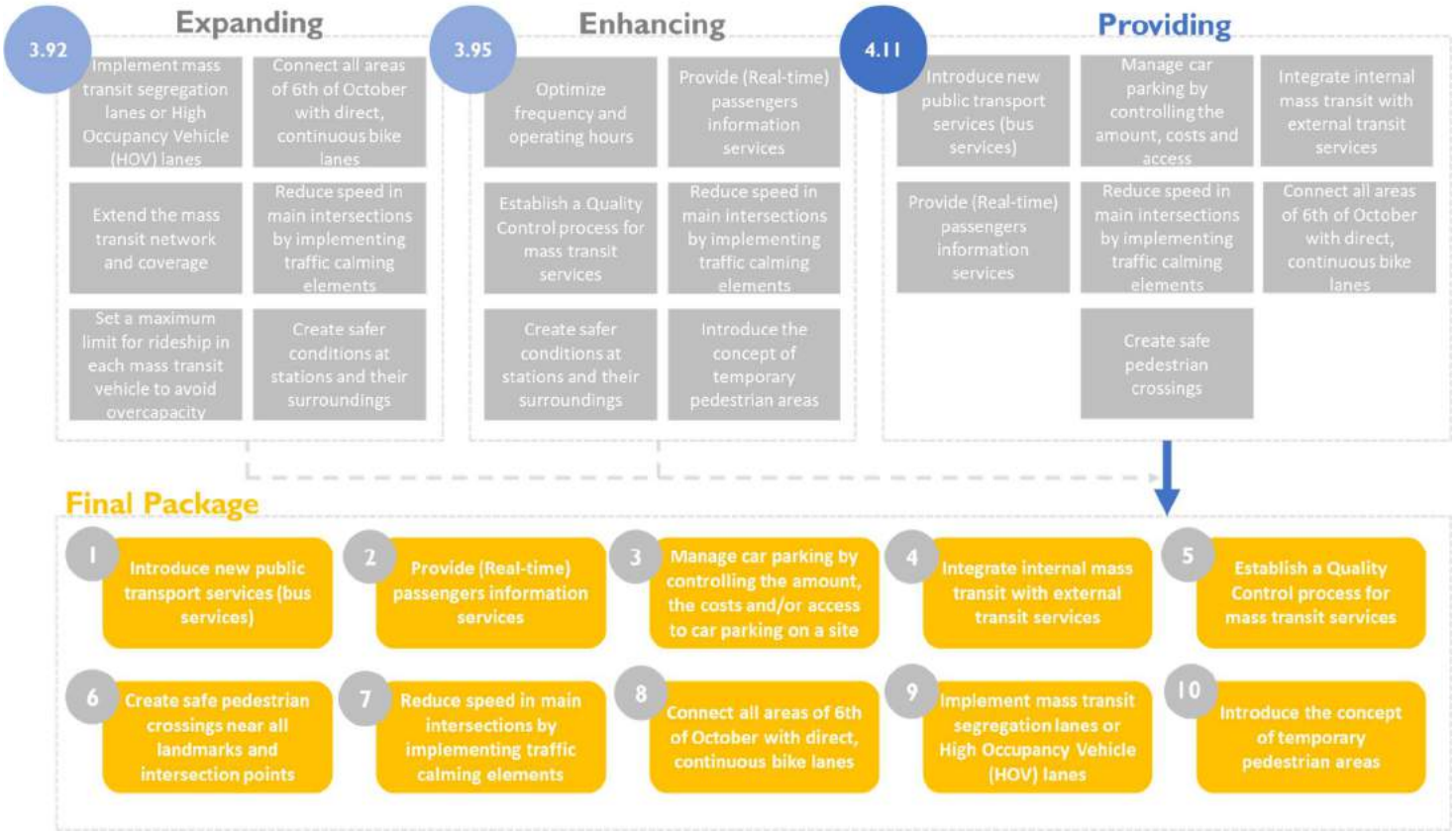


Figure 17: Package Creation Process

Elaboration on the measures of the final package

1. Introduce new public transport

The 6th target aims to increase the offered public transportation trips to arrive at 6,170,000 trips by 2030. This measure helps in achieving this target by providing new public transport services, such as bus services, that complement the existing services and cover the areas with no or limited network coverage. This contributes to fulfilling one of the main priorities of the 6O citizens according to the passenger satisfaction survey in Phase 1.

6O's mass transit services mainly operate between Al-souq Al-Qadeem and Al-Hossary Square, keeping other parts of the city with no coverage, like Al Motamayez District and Hadayek October (See Figure 18). The new public transport services should cover underserved areas connecting them to the rest of the network.

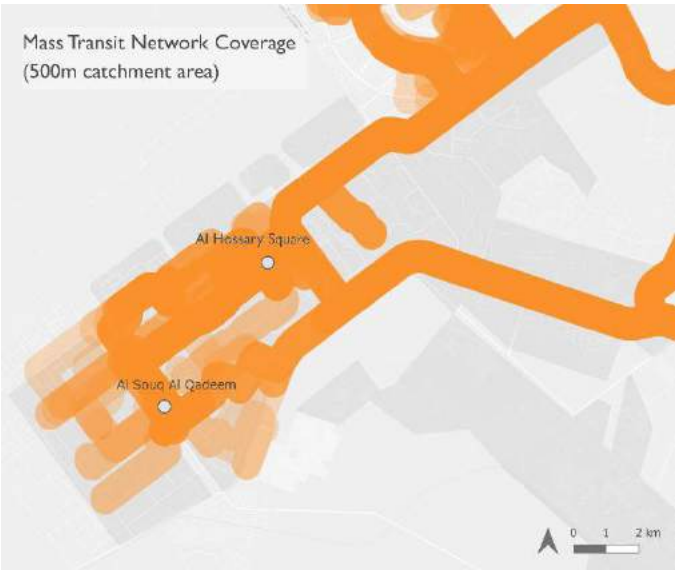


Figure 18: Current Mass Transit Network Coverage (500m catchment area)

2. *Provide (real-time) passengers information services*

The increasing complexity of travel patterns, and the wider range of service providers and travel alternatives, has led to higher demand for high quality, comprehensive and up–to–date passenger information. Passengers information mainly describe when and how a particular trip can be made by public transport. According to the measure appraisal survey, this measure was the top-scored measure by the public.

The aim of providing passenger information is to improve the quality and experience of using public transport services by providing regular, frequent and reliable information for trip planning. Providing integrated information on several mass transit services also contributes to the promotion of intramodality. This contributes to the target of limiting private motorized transportation and increasing the modal share of public transportation.

Real-time passenger information systems allow passengers to plan their journey better through information on live public transport route schedules and updates on service interruptions.

3. *Manage car parking by controlling the amount, the costs and/or access to car parking on a site*

The main objective of parking management is to efficiently use and manage parking supply by either reducing the supply and/or managing an already limited supply.

Examples of parking management include:

Users can be charged to use the parking space, by the day, week, month or year, with a flat charge or charges varying according to one or several criteria

Access can be time-limited, based on the activity of the facility or site

Special parking spaces can be reserved for carpoolers, for example, to give people an incentive to share their car on the trip to work

When implemented as part of a mobility plan, parking management is a powerful tool to influence people's mode choice. This is especially effective in situations which parking supply is below demand; thus, the number of people choosing to commute by car to this specific site is influenced.

4. Integrate internal mass transit with external transit services

Integrating mass transit services maximizes its efficiency. One of the main integration techniques is creating interchange hubs that connect several transportation services, especially internal and external transit services.

This push towards intermodality helps in improving the quality and structure of internal mass transit services. It also contributes to increasing the satisfaction rate, to encourage the use of mass transit services and to decrease the private motorized mobility, which all fulfil various aspects of the vision objectives and targets.

In 6th of October, three potential hubs can efficiently act as interchange hubs. Al Hossary Square is already an interchange hub connecting most of the internal and external mass transit services. However, the disorganization of the hub itself makes it hard for commuters to have a smooth interchange experience. Al Hossary hub is the eastern link of 6th of October with Inner Cairo.

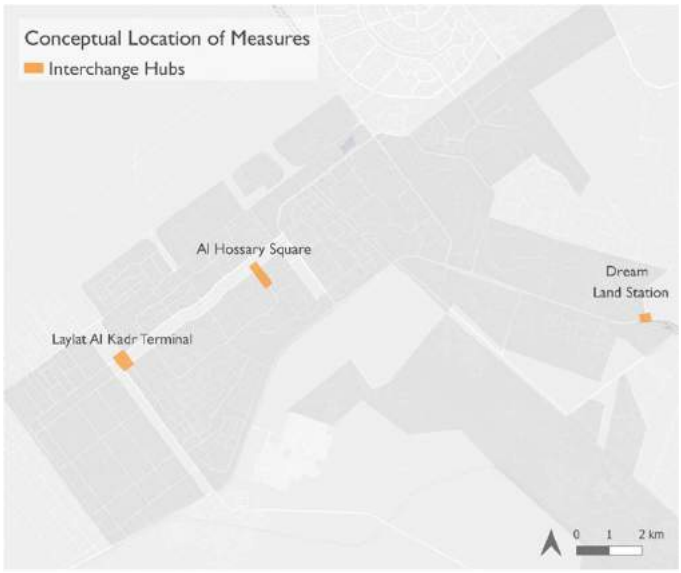


Figure 19: Interchange Hubs

Laylat Al Kadr terminal has a high potential to become a vital interchange hub due to the future mobility projects originating from this terminal, such as the monorail and the Bus Rapid Transit. Not only will it connect the west of 6th of October with Cairo, but it will also connect it with cities to the south, such as Fayoum.

The last proposed interchange hub is Dream Land station at the peripheries of the city. This station will be the end terminal of the 4th metro line; thus, it will have a high potential to act as a hub to interchange between several mobility modes which connect the external transit to the internal one.

5. Establish a Quality Control process for mass transit services

Quality is an essential aspect of mass transport. It can be assessed through the condition of the stops, vehicles and facilities, as well as the comfort, safety and availability of the service. Regular quality control cycles contribute to better service, higher passenger satisfaction and potentially increased ridership. It also ensures regular maintenance and thus enhances safety.

In the case of 6th of October, the proposed quality control process should entail all mass transit services operating in the city, such as public transportation and the paratransit sector.

6. *Create safe pedestrian crossings near all landmarks and intersection points*

Safety is the most critical aspect for pedestrians when crossing roads. For designing or improving the pedestrian facilities to cross the roads, four main aspects should be considered [34]:

Safety

Level of service (the number of crossings)

Integration with services, facilities and common destinations

Specific access provision for vulnerable groups

This measure helps reduce vehicles-to-pedestrians collisions contributing to achieving the target of decreasing the accidents within 6O by 30%.

Pedestrian crossings generally divide into three categories[34]:

Physical aids: These types of aids reduce the crossing distance and the amount of traffic the pedestrian has to cross, such as medians and pedestrian islands.

Time separated/priority control: These types include pedestrian priority and signal control, such as traffic lights. They should only be considered after providing the best combination of physical aids for the site.

Figure 20: Conceptual Pedestrian Crossing Locations

Spatially separated facilities: These facilities can eliminate conflict with vehicles; however, they can increase pedestrians' travel time and exerted effort due to the requirement to change levels or other detours.

As seen in Figure 20, this measure aims at implementing safe pedestrian crossings at all major intersections as well as landmarks in 6th of October. The intersections highlighted are on main streets. The landmarks include universities, commercial hubs and services.

7. *Reduce speed in main intersections by implementing traffic-calming elements*

Traffic calming is the use of physical and regulatory measures to reduce vehicle speeds. It aims to improve conditions for non-motorized street users. It focuses upon improving neighbourhood safety, comfort and livability while maintaining necessary levels of traffic circulation. This measure is used as a tool to decrease the accidents resulting from vehicle-to-pedestrian/cyclist collision.

In 6th of October, traffic-calming elements would be best implemented in intersections on the main streets of the city (See Figure 21).

Figure 21: Main Intersections in 6th of October

8. *Connect all areas of 6th of October with direct, continuous bike lanes and include bike racks near major landmarks and stations*

To encourage cycling as a daily means of transport, the city infrastructure needs to be adapted to ensure that riding a bicycle is safe, efficient, attractive, comfortable and convenient. Several case studies, such as Seville City in Spain[35], show that the modal share of cycling increased dramatically through the implementation of adequate cycling networks and infrastructure. This measure will help in increasing active travel within 6O to arrive at 11% of the modal share by 2030, as part of the third target, and limiting the modal share of private motorization.

The aim of this measure is to implement a cycling network that includes continuous bike lanes and bike racks near major landmarks and stations to integrate with the facilities, services and transportation of the city.

Figure 22: Potential Cycling Lanes

In addition to encouraging more people to cycle, and helping to reduce congestion and pollution, potential benefits of cycling include greater opportunities for social interaction and reduced cyclist/pedestrian conflict, resulting in more livable streets.

Based on the street grid of 6th of October, the proposed location for the main bike lanes is Al Mehwar Al Markazy due to its function as the main spine connecting most of the city districts and passing by main landmarks and services, such as universities, commercial hubs and stations. Secondary lanes in each district would lead to Al Mehwar axis, creating an integrated cycling network.

9. Implement mass transit segregation lanes or High Occupancy Vehicle (HOV) lanes

Mass transit segregation lanes require allocation of dedicated lanes either in the median road lane or in the kerb-side lane to provide priority passage to the movement of mass transit services. These lanes separate the mass transit services from other traffic, enabling them to avoid traffic congestion. By using the lanes, mass transit has shorter journey times, more controllable frequencies, and better adherence to time schedules. As a result, the travel time gap between mass transit and private cars will be decreased, contributing to achieving the target of reducing the travel time gap from 60% to 30% by 2030.

Figure 23: Segregation Lane Proposal

HOV lanes are designed to discourage single or low occupancy car use by providing priority to vehicles with more than a minimum number of commuters. They encourage carsharing and mass transit use by allowing users to reduce their journey times relative to single-occupant vehicles.

The implementation of both lane types can be through colored pavements or separation through medians.

Al Mehwar Al Markazy axis represents an adequate location for this measure as it is the main spine of the city passing by several districts, landmarks and services, connecting the west with the east.

10. Introduce the concept of temporary pedestrian areas

Temporary pedestrian areas are created by limiting traffic volumes for specific time slots in certain areas in the city and make it available for pedestrians only. These temporary pedestrian-only areas lead to the best possible conditions for pedestrian freedom of movement and road safety.

Figure 24: Temporary Pedestrian Zones

Pedestrian-only zones could be implemented through different forms[34]:

A closed street, dedicated to pedestrian use only

A pedestrian plaza

A continuous area (several streets and cross streets)

Temporary pedestrian-only areas are most beneficial when there is a heavy pedestrian activity, commercial areas, and a high number of pedestrian-vehicle conflicts. This measure aims to influence pedestrian behaviour and to provide attractive pedestrian areas and routes. This could result in encouraging and increasing active travel in the long term. In 6th of October, a potential area would be the block between Al Hossary Mosque and 6th of October University. This block is mixed-used and provides a lot of commercial services and leisure activities. Currently, it is dominated by car traffic and parking. Another potential area would be Al Souq Al Qadeem.

4.3.2. Develop a High-level timeline for the final measure

4.3.2.1. Methodology

The Consultant creates a **high-level timeline** for the final package showing the short-term, medium-term, and long-term milestones similar to the format followed by the Land Transport Authority of Singapore (See Figure 25).

The final package will be briefly presented to the main stakeholders: UN-Habitat, TRU and 6O-CA.

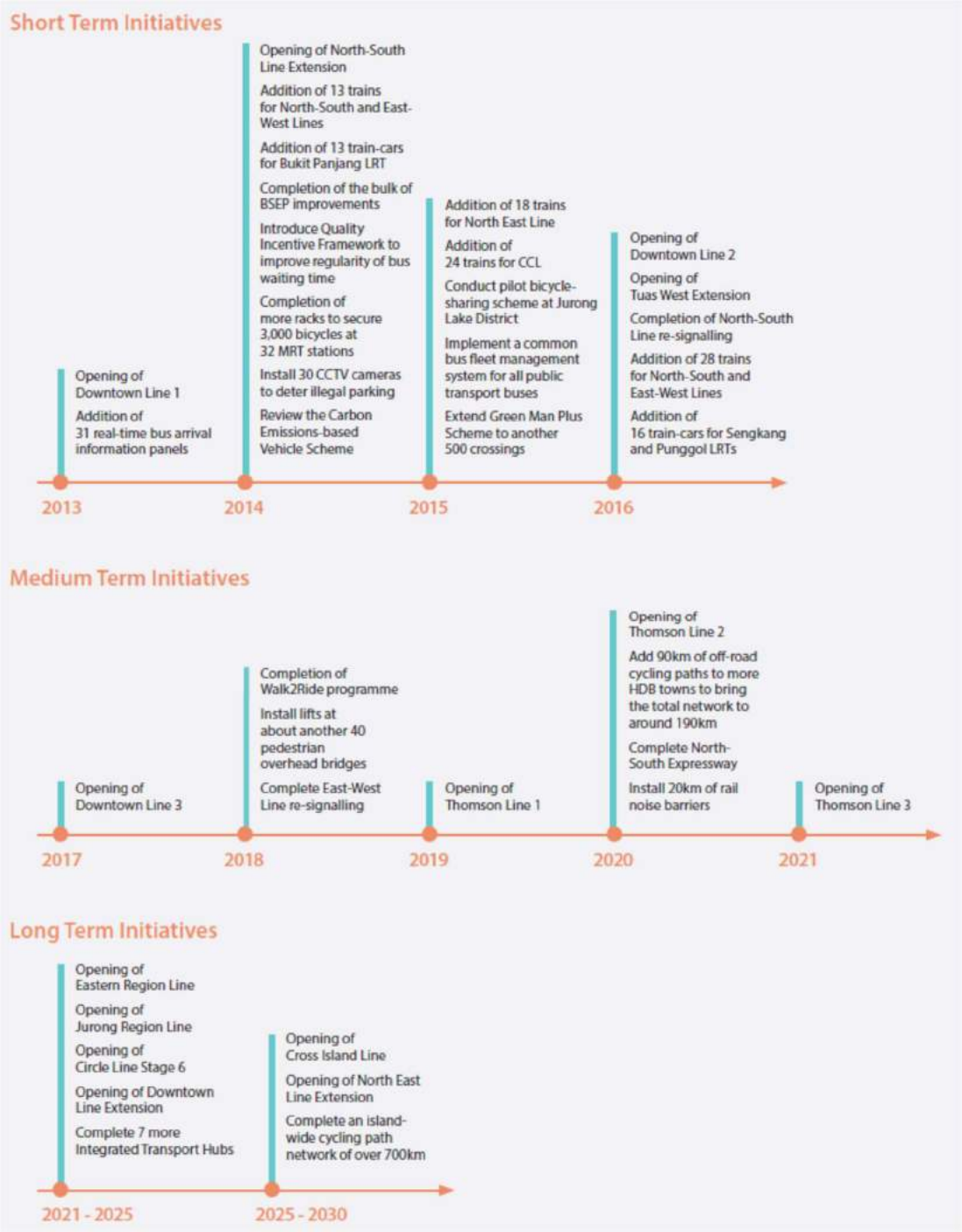


Figure 25 Milestones of Land Transport Initiatives in Singapore (LTA 2013)

4.3.2.2. Outcomes

This SUMP is created to be achieved by 2030; thus, the measures are planned to take place in this period. The timeline is based on the different timescales created for each measure during the measure development process.

As seen in the timeline, there is a variety of timescales; short, medium and longer-term. Based on the assessment of technical capacity and financial resources, some measures will be implemented in parallel while some will need to be implemented sequentially. Each measure has several milestones or phases that would be achieved within the implementation period highlighted in blue.

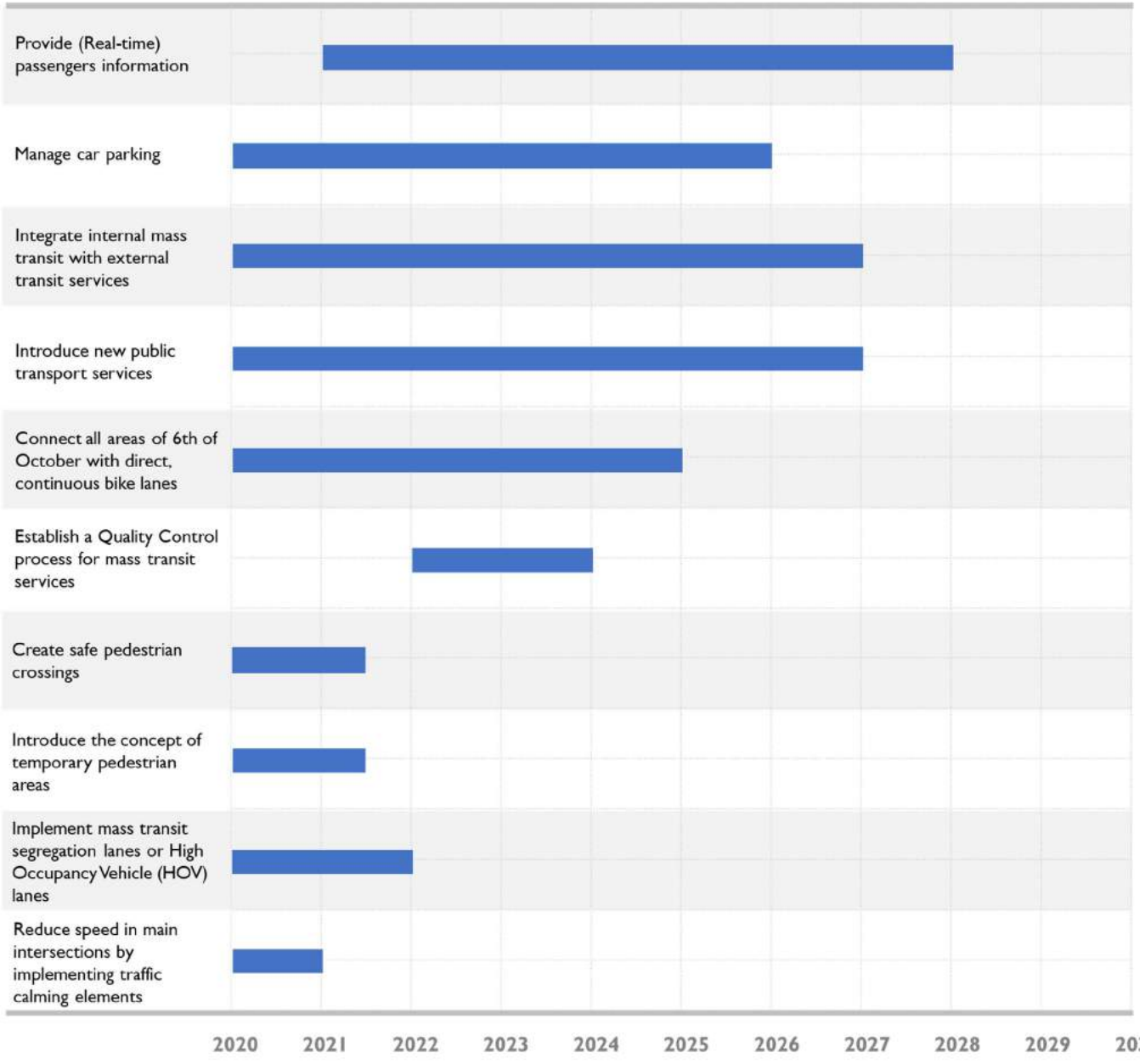


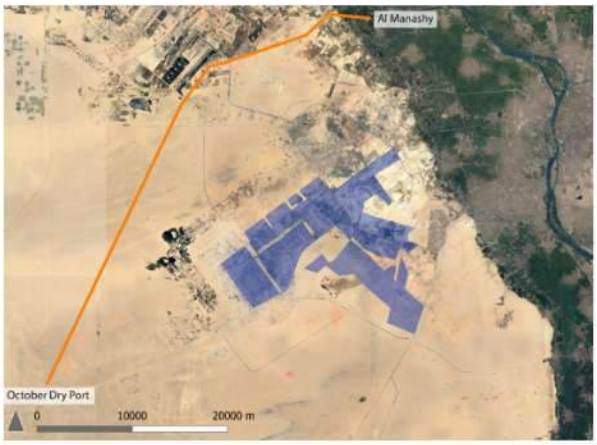
Figure 26: High-Level Timeline of Final Package

5. Annexes

5.1. Annex A - Project cards

The project cards represent each project with its relevant details taken from the project register. The figure below shows an example of project cards. All projects are available in the supporting document "Project Cards".

Regional and National Projects \ Public Transport Projects



Project Name	October - Manashy Railway
Project Type	Public Transport
Project's Owner	NA
Funding Source	World Bank (under negotiation)
Budget	$ 200 Mil. (Estimate)
Length	65 km
Expected Inauguration Date	NA

This project aims at the construction of a railway link between the October Railway Station located in the southwestern end of the city and El-Manashy line. This line - the Manashy Line - extends in the direction north by northwest following the western side of the Nile Delta, passing through secondary population centers like ElKhatatba, and Kom Hamada until it joins the main Cairo Alexandria Railway line at Italy ElBaroud. The main purpose of this project is to create a railway link between the proposed October Dry Port and the Port of Alexandria.

Figure 27: Project Card Example

5.2. Annex B - Stakeholder Register

This table shows part of the stakeholder register. The full stakeholder register which includes more date is available in the supporting document "Stakeholder Register".

Stakeholder Functional G	Stakeholder Name	Affiliation	Date of establishment	Type	Scale	Public/ Private
Central Government	Ministry of Transport	Ministry of Transport		Ministry	National	Public
	National Authority for Tunnels	Ministry of Transport	1983	Authority	National	Public
	Ministry of Defense	Ministry of Defense		Ministry	National	Public
	Ministry of the Interior	Ministry of the Interior		Ministry	National	Public
	Minisrty of Housing	Minisrty of Housing		Ministry	National	Public
	General Organization for Physical Planning	Ministry of Housing	1973	Authority	National	Public
	Ministry of Environment	Ministry of Environment		Ministry	National	Public
	Ministry of Planning and Administrative Reform	Ministry of Planning		Ministry	National	Public
	New Urban Communities Authority (NUCA)	Ministry of Housing	Nov-79	Authority	National	Public
Local / Regional Governr	Cairo Transporation Authority (CTA)			Authority	Local / Regional	Public
	Traffic Police	Ministry of the Interior		Department	Local / Regional	Public
	6th of October Board			Board?	Local / Regional	Public
	6th of October Authority	NUCA		Authority	Local / Regional	Public
	Transport Regulatory Unit	NUCA		Department	Local / Regional	Public
Public	Commuters to 6O	NA		Public	National	NA
	6O Citizens	NA		Public	Local	NA
International Organizatio	UN - Habitat Egypt	UN-Habitat	2007 (Egypt)	Organization	International	Private
	ITDP Africa	ITDP	1985	Organization	International	Private
	TUMI			Organization	International	Private
Financial Stakeholders	Ministry of Finance	Ministry of Finance		Ministry	National	Public
	IDA (WB/ EBRD/ IFC..)			Organization	International	Private
	International Finance				International	Private
	Local Finance				National	Private
	Venture Capital (Uber/SWVL..)				National/International?	Private
	Tahya Masr Fund		2014	Funding Body	National	Public
	Egypt Sovereign Wealth Fund		2018	Funding Body	National	Public
	Multilateral Loans (AFD/JICA..)			Organization	International	Private

Table 6: Stakeholder Register

5.3. Annex C - SMART Target

This table summarizes the process of developing SMART Targets. It combines the challenges, vision keywords, objectives, SMART targets and the quantified indicators.

Key Challenges	Indicators	Baseline Source	Baseline Figure (Primary)	SMART Target Figures	SMART Targets	Objectives	Vision Keywords
PT Capacity	Trips	Scenarios	3000000	6170000	6,170,000 Trips Offered by all PT modes	Competitive Mass Transit Services for	Competitive and available mass
GHG Emissions / Air QualityAccessibil	Mt CO2	Scenarios	1740105	1865960	Limit the rise of GHG emissions from transport to 7%	Digitally-driven, self-financed operations, low-emissions, and publicly accepted	Smart
Increasing Private Motorization	Modal Share	Scenarios	16%	[AT 10% / PT 77.7% / Private 11.5%]	Modal Share	A third of trips within 6th of October are active	Attractive active travel
Unsafe Roads / Road Fatalities	Fatalities / Injuries	Official Sources (Police Department)	100	70	Decrease the number of accidents /incidents by 30 % within all local public transportation services (vehicles and stations) by 2030	Zero death, zero road-caused injuries and zero security incidents	Safe Streets
Accessibility / Inequity	Accessibility Score	[6] WB Study / [15]	6.1%		Reduce the travel time gap between PT and Private Cars to be 30% within the city	Streets which promotes attractive whole-journey experiences for all users	Integrated street
	Passenger Satisfaction	[15] Pax Survey		Up by 30%	Increase satisfaction rate of mass transport services by 30%		

Table 7: SMART Targets and Indicators List

5.4. Annex D - List of measures

Targets	#	Theme	#	Measures	Type	Timescale	Estimated Budget	Interdependent Measures	Relevant case study	Reference
Decrease the number of accidents and incidents by 30 % within all local public transportation services (vehicles and stations) by 2030	1	Improving pedestrian and cycling safety	1	Reduce speed in main intersections by implementing traffic calming elements	Infrastructure	Medium	Medium	10	Sweden - Vision Zero	http://www.konsult.leeds.ac.uk/pg/65/ http://www.konsult.leeds.ac.uk/pg/13/
			2	Provide an integrated and continuous pedestrian network	Infrastructure	Long	High	3,20,24,25		
			3	Create safe pedestrian crossings near all landmarks and intersection points	Infrastructure	Medium - Long	Low - Medium	1,24		
	2	Regulating vehicle mix	4	Identify which vehicle types get involved in high accident rates and regulate the vehicle mix on the streets accordingly	Regulation	Short - Medium	Low			
	3	Improving the safety and security at stations, at stops and on the vehicles for passengers and drivers	5	Implement a security strategy, e.g. by installing cameras at stops and on the vehicles	Infrastructure	Short - Medium	Medium			CIVITAS: Enhancing the quality of public transport services
			6	Create safer conditions at stations and their surroundings (e.g. better lighting)	Infrastructure	Medium	Medium	5,8		
			7	Conduct safety and security trainings for drivers and awareness campaigns for passengers	Governance	Short - Medium	Low			
			8	Include first aid and fire fighting system in all public transportation facilities, such as vehicles and stations	Infrastructure	Short - Medium	Low - Medium	5		
			9	Include a dedicated police department/officer in each main station for fast reporting	Regulation	Medium	Low			
	4	Regulating vehicular speed on streets	10	Set a speed maximum of 30 km/h in inner streets; 60km/h in main streets.	Regulation	Short	Low	1		
Increase satisfaction rate of internal mass transport services by 30%	5	Improving mass transit accessibility	11	Increase service availability	Management and service	Long	High	35		http://epomm.eu/old_website/index.php?Main_ID=2174&ID1=2176&id=2241
			12	Increase comfort	Management and service	Medium	Medium - High	15,16,19		
			13	Increase affordability	Management and service	Medium - Long	High			
			14	Ease the access for all individuals (also barrier free design for people with physical or mental disabilities)	Infrastructure	Medium - Long	Medium - High			
			15	Provide passenger information services	Management and service	Short - Medium	Low - Medium			
	6	Improving the quality and structure for internal mass transit services	16	Schedule and conduct regular maintanance for mass transit facilities (stops and vehicles)	Management and service	Long	High	16		https://civitas.eu/measure/improving-quality-and-structure-public-transport-services
			17	Establish a Quality Control process for mass transit services (Stops, vehicles and facilities)	Management and service	Medium	Medium	15		
			18	Integrate internal mass transit with external trannsit services (Interchange hubs/stations)	Infrastructure	Long	Medium - High			
	7	Regulating Mass Transit Vehicle Capacity	19	Set a maximum limit for rideship in each mass transit vehicle to avoid overcapacity	Regulation	Short	Low	12		

Table 8: List of Measures (Part 1)

Modal share Changes Active Travel 10% Public Transportation 77.7% Private Cars 11.5%	8	Introducing Cycle Networks	20	Connect all areas of 6th of October with direct, continuous bike lanes	Infrastructure	Medium	Low - Medium	20	https://www.euronews.com/2018/10/12/seville-how-a-small-spanish-city-	http://www.konsult.leeds.ac.uk/pg/49/ http://www.konsult.leeds.ac.uk/pg/46/
			21	Construct bike racks near major landmarks of 6th of October city	Infrastructure	Short	Low - Medium	19		
			22	Integrate cycling with public transport (integrated network, interchanging stops, bike parking at stations)	Infrastructure	Medium	Low - Medium	19,20		
	9	Implementing a bike sharing system	23	Implement a bike sharing system to be used as first/last/only mile mobility option	Infrastructure	Medium - Long	Medium - High	19,20	-a-bike, Gern	http://www.k
	10	Implementing measures to influence pedestrian behaviour and to provide attractive pedestrian areas and routes	24	Implement sidewalks following (inter)national codes in all main and secondary streets	Infrastructure	Medium - Long	High	2	German Cities (http://www.konsult.leeds.ac.uk/pg/49/)	http://www.konsult.leeds.ac.uk/pg/49/
			25	Schedule and implement regular maintanance cylces for all sidewalks and crossings	Management and service	Medium	Medium - High	2,23		
			26	Introduce the concept of temporary pedestrian areas: Limit traffic volumes for specific time slots in certain areas in the city and make it available for pedestrians only	Regulation	Short	Low			
			27	Introduce the concept of Low Traffic Neighborhoods: Ban motorized traffic in certain areas except for residents	Regulation					
	11	Managing Car Parking	28	Manage car parking by controlling the amount, the costs and/or access to car parking on a site It can include:	Regulation	Medium - Long	Low			http://epomm.eu/old_website/index.p
			29	Provide off street parking: Off-street parking is a special facility (multi-storey) or area (surface) that is dedicated for parking	Infrastructure	Long	High			
	12	Implementing Park & Rides	30	Implement Park and Ride facilities or areas near main mass transit stations/hubs, eg. Al Hosary	Infrastructure	Medium	Medium	17,30,31		http://www.konsult.leeds
	13	Implementing Promotional Activities	31	Implement promotional activities to shift social norms through information campaigns (promote active travel, environmental (CO_2 emission) awareness, shift from private to PT)	User behaviour	Short	Low - Medium	all measures	http://www.konsult.leeds.ac.uk/pg/55/	http://www.konsult.leeds.ac.uk/pg/55/
Reduce the travel time gap between Public Transport and Private Cars to be 30% within the city	14	Introducing High Occupancy Vehicle Lanes	32	Introduce High Occupancy Vehicle (HOV) lanes by providing priority to vehicles with more than two passengers	Regulation	Short	Low		UK, Spain, USA (http://ww	http://www.konsult.leeds.ac.uk/pg/29
	15	Prioritizing mass transport services	33	Implement mass transit segregation lanes	Regulation	Short	Low - Medium		http://www.konsult.leeds.ac.uk/pg/41/	http://www.konsult.leeds.ac.uk/pg/41/
			34	Enhance stops and station condition	Infrastructure	Short - Medium	Medium - High			
			35	Provide Real-time traveller information	Management and service	Medium - Long	Medium - High			
6,170,000 Trips Offered by all PT modes by 2030	16	Increasing the supply of mass transport services	36	Extend the mass transit network and coverage	Infrastructure	Long	High			
			37	Optimize frequency and operating hours	Management and service	Medium - Long	Medium - High			
			38	Introduce new public transport services (bus services)	Infrastructure	Medium - Long	High			
Limit the rise of GHG emissions from transport to 7%	17	Introducing Low Emission Zones	39	Introduce Low Emission Zones (LEZs): Limit the access to specific areas only for low emissionn vehicles. Areas are chosen based on landuse density, traffic and population exposure	Regulation	Short - Medium	Low		Environmental Zone in Berlin	http://www.konsult.leeds.ac.uk/pg/63/

Table 9: List of Measures (Part 2)

5.5. Annex E - List of measures with high effectiveness towards GHG emissions Target

Effectiveness towards 6th Target	Score
Increase service availability	4.00
Connect all areas of 6th of October with direct, continuous bike lanes	4.67
Construct bike racks near major landmarks of 6th of October city	4.67
Integrate cycling with public transport (integrated network, interchanging stops, bike parking at stations)	4.67
Implement a bike sharing system to be used as first/last/only mile mobility option	4.33
Implement sidewalks following (inter)national codes in all main and secondary streets	4.33
Schedule and implement regular maintanance cylces for all sidewalks and crossings	4.33
Introduce the concept of temporary pedestrian areas: Limit traffic volumes for specific time slots in certain areas in the city and make it available for pedestrians only	4.67
Introduce the concept of Low Traffic Neighborhoods: Ban motorized traffic in certain areas except for residents	4.00
Implement promotional activities to shift social norms through information campaigns (promote active travel, environmental (CO2 emission) awareness, shift from private to PT)	4.33
Introduce High Occupancy Vehicle (HOV) lanes by providing priority to vehicles with more than two passengers	4.67
Implement mass transit segregation lanes	4.67
Extend the mass transit network and coverage	4.67
Optimize frequency and operating hours	4.67
Introduce new public transport services (bus services)	4.67

Table 10: List of measures with high effectiveness towards 6th target

5.6. Annex F - Final List of Measures

Target	#	Measure	Category	Indicator	Timescale	Budget	Responsible Stakeholder	Relevant Case Study
Decrease the number of accidents and incidents by 30 % within all local public transportation services (vehicles and stations) by 2030	1	Reduce speed in main intersections by implementing traffic calming elements	Regulation/ Infrastructure	Speed/accidents rate	Medium	Medium	TRU/6O Authority	http://www.konsult.leeds.ac.uk/pg/13/
	2	Create safe pedestrian crossings near all landmarks and intersection points	Infrastructure	Accidents rate/pedestrian connectivity	Medium - Long	Low - Medium	TRU/6O Authority	http://www.konsult.leeds.ac.uk/pg/65/
	3	Create safer conditions at stations and their surroundings (e.g. better lighting)	Infrastructure	Crime rate/condition of stations and surroundings	Medium	Medium	TRU/6O Authority	CIVITAS: Enhancing the quality of public transport services
Increase satisfaction rate of internal mass transport services by 30%	4	Establish a Quality Control process for mass transit services (Stops, vehicles and facilities)	Management & Service	Quality of services/schedules of quality control cycles	Medium	Medium	TRU	https://civitas.eu/measure/improving-quality-and-structure-public-transport-services
	5	Integrate internal mass transit with external transit serivces (Interchange hubs/stations)	Management & Service	Level of integration	Long	Medium - High	TRU/6O Authority/Service providers	
	6	Set a maximum limit for rideship in each mass transit vehicle to avoid overcapacity	Management & Service	capacity of vehicles	Short	Low	Service Providers/TRU?	
Modal share Changes Active Travel 10% Public Transportation 77.7% Private Cars 11.5%	7	Connect all areas of 6th of October with direct, continuous bike lanes and include bike racks near major landmarks and stations	Infrastructure	% of cycling/Mode share for short trips	Medium	Low - Medium	TRU/6O Authority	http://www.konsult.leeds.ac.uk/pg/46/ https://www.euronews.com/2018/10/12/seville-how-a-small-spanish-city-became-a-cycling-hub-for-all-
	8	Integrate cycling with public transport (integrated network, interchanging stops, bike parking at stations)	Management & Service	% of cycling/Mode share for short trips	Medium	Low - Medium	TRU/6O Authority/ Initiatives	
	9	Introduce the concept of temporary pedestrian areas: Limit traffic volumes for specific time slots in certain areas in the city and make it available for pedestrians only	Infrastructure	Pedestrian area regular schedule/ % of active tavel	Short	Low	TRU	German Cities (http://www.konsult.leeds.ac.uk/pg/49/)
	10	Manage car parking by controlling the amount, the costs and/or access to car parking on a site	Regulation	Revenue from parking facilities/Limites parking spots on streets	Medium - Long	Low	TRU/6O Authority	http://epomm.eu/old_website/index.phtml?Main_ID=2174&ID1
Reduce the travel time gap between Public Transport and Private Cars to be 30% within the city	11	Implement mass transit segregation lanes or High Occupancy Vehicle (HOV) lanes	Regulation/ Infrastructure	Traffic Flow/Journey Times/Queue Lengths/ (car occupancy)	Short	Low - Medium	TRU/6O Authority	http://www.konsult.leeds.ac.uk/pg/41/ UK, Spain, USA (http://www.konsult.leeds.ac.uk/pg/29/)
	12	Provide (Real-time) passengers information services	Infrastructure	Amount of information provided/Accuracy of information/ Number of service providers included in the information services	Medium - Long	Medium - High	TRU/6O Authority/ Initiatives	
6,170,000 Trips Offered by all PT modes by 2030	13	Extend the mass transit network and coverage	Management & Service	% of network coverage	Long	High	Service Providers	
	14	Optimize frequency and operating hours	Management & Service	Frecuency rate/ duration of operating hours	Medium - Long	Medium - High	Service Providers	
	15	Introduce new public transport services (bus services)	Management & Service	Number of new PT services	Medium - Long	High	Service Providers/TRU?	

Table 11: Final List of Measures

5.7. Annex G - Measures appraisal Matrix

Targets	Measures	Effectiveness towards own target	Stakeholder Acceptability	Value for Money	Effectiveness towards other targets	Public Acceptability (Survey)	Total Score	Total weighed score
		Total	Total	Total	Total			
Decrease the number of accidents and incidents by 30 % within all local public transportation services (vehicles and stations) by 2030	Reduce speed in main intersections by implementing traffic calming elements	**5.0**	3.8	5.0	1.6	4.0	3.9	4.1
	Provide an integrated and continuous pedestrian network	3.5	2.5	2.3	2.7	4.6	3.1	3.0
	Create safe pedestrian crossings near all landmarks and intersection points	**5.0**	4.0	4.8	2.7	4.7	4.2	4.3
	Identify which vehicle types get involved in high accident rates and regulate the vehicle mix on the streets accordingly	3.0	2.8	2.8	1.4	4.3	2.8	2.7
	Implement a security strategy, e.g. by installing cameras at stops and on the vehicles	2.3	4.0	2.0	1.4	4.2	2.8	2.4
	Create safer conditions at stations and their surroundings (e.g. better lighting)	3.0	3.3	4.0	2.9	4.5	3.5	3.5
	Conduct safety and security trainings for drivers and awareness campaigns for passengers	2.3	2.5	2.8	1.8	4.2	2.7	2.5
	Include first aid and fire fighting system in all public transportation facilities, such as vehicles and stations	3.5	3.0	4.8	1.3	4.3	3.4	3.5
	Include a dedicated police department/officer in each main station for fast reporting	2.5	2.3	2.8	1.7	4.1	2.7	2.6
	Set a speed maximum of 30 km/h in inner streets; 60km/h in main streets.	3.5	1.5	3.5	2.6	3.7	3.0	3.1
Increase satisfaction rate of internal mass transport services by 30%	Increase service availability	**5.0**	4.3	4.3	3.8	4.3	4.3	4.4
	Increase comfort	**4.8**	3.3	3.3	2.6	4.6	3.7	3.7
	Increase affordability	3.0	1.5	1.5	1.8	4.1	2.4	2.3
	Ease the access for all individuals (also barrier free design for people with physical or mental disabilities)	3.3	2.5	2.5	1.9	4.7	3.0	2.8
	Provide passenger information services	**4.8**	3.0	4.8	2.6	4.8	4.0	4.1
	Schedule and conduct regular maintanance for mass transit facilities (stops and vehicles)	3.5	2.8	3.5	2.7	4.6	3.4	3.4
	Establish a Quality Control process for mass transit services (Stops, vehicles and facilities)	**4.8**	2.5	3.3	2.5	4.6	3.5	3.6
	Integrate internal mass transit with external transit serivces (Interchange hubs/stations)	**5.0**	4.3	5.0	3.7	4.6	4.5	4.6
	Set a maximum limit for rideship in each mass transit vehicle to avoid overcapacity	**5.0**	2.5	3.3	2.1	4.5	3.5	3.6

Table 12: Measures Appraisal Matrix (Part 1)

Modal share Changes Active Travel 10% Public Transportation 77.7% Private Cars 11.5%	Connect all areas of 6th of October with direct, continuous bike lanes	4.3	2.8	3.8	2.4	4.2	3.5	3.6
	Construct bike racks near major landmarks of 6th of October city	**4.0**	2.5	4.0	2.1	4.2	3.4	3.5
	Integrate cycling with public transport (integrated network, interchanging stops, bike parking at stations)	3.8	2.5	4.0	3.6	4.1	3.6	3.7
	Implement a bike sharing system to be used as first/last/only mile mobility option	3.0	2.3	2.5	3.0	4.1	3.0	2.9
	Implement sidewalks following (inter)national codes in all main and secondary streets	2.8	2.0	2.0	3.0	4.5	2.9	2.7
	Schedule and implement regular maintanance cylces for all sidewalks and crossings	3.0	1.8	2.3	2.6	4.5	2.8	2.7
	Introduce the concept of temporary pedestrian areas: Limit traffic volumes for specific time slots in certain areas in the city and make it available for pedestrians only	**4.3**	3.5	5.0	2.2	3.8	3.7	3.9
	Introduce the concept of Low Traffic Neighborhoods: Ban motorized traffic in certain areas except for residents	3.0	1.3	4.8	2.5	3.7	3.0	3.3
	Manage car parking by controlling the amount, the costs and/or access to car parking on a site	**5.0**	3.5	4.8	2.1	3.3	3.7	4.0
	Provide off street parking: Off-street parking is a special facility (multi-storey) or area (surface) that is dedicated for parking	3.3	2.3	2.3	1.1	4.2	2.6	2.5
	Implement Park and Ride facilities or areas near main mass transit stations/hubs, eg. Al Hosary	3.3	2.8	3.0	2.9	4.5	3.3	3.2
	Implement promotional activities to shift social norms through information campaigns (promote active travel, environmental (CO2 emission) awareness, shift from private to PT)	3.8	3.8	3.0	2.0	4.2	3.3	3.2
Reduce the travel time gap between Public Transport and Private Cars to be 30% within the city	Introduce High Occupancy Vehicle (HOV) lanes by providing priority to vehicles with more than two passengers	5.0	2.0	3.3	4.3	3.2	3.6	3.9
	Implement mass transit segregation lanes	5.0	2.3	5.0	4.5	4.3	4.2	4.5
	Enhance stops and station condition	**4.0**	3.0	3.0	3.3	4.4	3.6	3.5
	Provide Real-time traveller information	4.5	4.3	4.5	3.4	4.7	4.3	4.3
6,170,000 Trips Offered by all PT modes by 2030	Extend the mass transit network and coverage	5.0	5.0	3.3	4.1	4.7	4.4	4.3
	Optimize frequency and operating hours	5.0	5.0	3.5	4.1	4.7	4.5	4.3
	Introduce new public transport services (bus services)	5.0	5.0	3.0	3.6	4.7	4.3	4.1
Limit the rise of GHG emissions from transport to 7%	Introduce Low Emission Zones (LEZs): Limit the access to specific areas only for low emissionn vehicles. Areas are chosen based on landuse density, traffic and population exposure	2.8	1.3	2.3	2.2	3.9	2.5	2.5

Table 13: Measures Appraisal Matrix (Part 2)

5.8. Annex H – Measures Appraisal Survey

1. Methodology

Sustainable urban mobility planning outcomes can only be successful if citizens understand its scope, as per the Vision and targets, and also get actively involved in the measure selection process[14].

The survey aims to engage the public in the SUMP process and specifically in the measures development phase. The survey is a part of the measures appraisal and filtration process to develop the final list of measures. Thus, it is designed to indicate public acceptance levels for the proposed measures and does not require a preset significant response rate.

As the measure selection process progresses, the Consultant considers public acceptance constraints for all essential measures. The constraints will not be taken as reasons for not pursuing any given measure. However, they will be incorporated in producing the final list of measures and guide the careful design of the proposed measures to tackle public acceptance constraints[33].

Objectives

- Inform the public about the SUMP process, including the Vision and the targets.
- Engage the public in the measure selection process.
- Identify the most publicly acceptable measures to different citizen groups.
- Identify public acceptance constraints for essential measures.
- Identify user-behavior interventions essential to gain public acceptance of measures.
-

Target Audience & sampling

The target audience is 6O residents and commuters from and to 6O (i.e. students, workers) who are at least 18 years old.

The objective of the survey is to conduct a preliminary assessment of the public acceptance of the measures for the measures designing process. Generalization to the population is not needed at this point which makes statistical representativeness of the sample neither necessary nor affordable[36]. Hence the survey follows a snowball sampling strategy.

However, the Consultant defined desired targets for the demographic and geographic distribution of the respondents:

- At least 60% of the respondents live in 6O or Hadayek October[1 3]
- At least 30% of the respondents work in 6O or Hadayek October and live outside of them[3]
- Gender distribution is kept within + / - 5% of 50%. (even split across genders)

Survey structure & questions

The survey is divided into two parts, as follows:

1. **Classification questions** to gather basic information that enables population segmentation analysis by grouping respondents into homogenous groups in terms of demographics, geographic and mobility characteristics.

Table 14: Classification Questions

#	Question	Question type	Response options
1	How old are you?	Multiple Choices	○ Age groups
2	What is your gender?	Polar	○ Male ○ Female
3	What is your work status?	Multiple Choices	○ I work ○ Unemployed but used to work ○ Unemployed and never ○ Worked ○ Student ○ Housewife ○ Retired
4	What is your field of expertise?	Multiple Choices	○ Urban Planning ○ Transportation Planning and Engineering ○ Engineering ○ Public Policy ○ Education ○ Healthcare ○ Other
5	Where do you live?	Multiple Choices	○ In 6O central districts ○ In 6O fringe districts ○ Hadayek October City ○ Sheikh Zayed City ○ Outside 6O
6	What is your relationship with the 6th of October City?	Multiple Choices	○ I only live in 6O ○ I only work/study in 6O ○ I live and work/study in 6O ○ I visit 6O occasionally
7	Do you own a private vehicle?	Polar	○ Yes ○ No

II. **Rating questions** to rate a total of 39 proposed measures distributed over six sections. Each section represents one of the SMART targets. Respondents use a five-grade Likert scale to rate the measures.

Survey administration

The Consultant creates the survey and launches it online via 'Google Forms'. The survey will be shared on the Consultant's social media channels and distributed amongst several social media platforms and groups related to 6O and Hadayek October residents and commuters.

Analysis

The average score of each measure will be calculated to be incorporated in the measure appraisal process to produce the final list of measures.

In addition to that, the Consultant will identify the most preferred measures for the respondents to understand their main priorities and interests. The data will also be broken down by mobility characteristics data, such as car ownership to get an in-depth understanding of the different preferences of each group, their similarities, and their differences.

2. Outcomes

The survey received 108 responses and achieved most of the desired targets for the demographic and geographic distribution. The gender balance was kept within the identified margin, with a percentage of 45% Female and 55% Males. As for the geographic distribution, 36.5% of the respondents are living outside 6O or Hadayek October and 63.5% inside the study area.

For the respondents of the survey, the top 11 measures exceeding the score of 4.5 are mainly focused on three targets:

- safety and decreasing the accidents,
- satisfaction rate of the mass transit services
- supply of the public transportation

The measure with the highest score is providing passenger information services, which highlights its value to the public. As for the rest of the top measures, it is evident that the respondents put weight on the availability, reliability, accessibility, comfort, coverage, and quality of the public and mass transportation. Pedestrian mobility seems to be one of their main concerns as well.

When comparing the total public acceptability score and the total weighted score, all measures are included in the final list of measures except three. Those measures did not make it due to the lower scoring in other inputs such as effectiveness or value for money.

Target	Top Measures chosen by the public	Public Acceptability	Total weighted score
Decrease the number of accidents and incidents by 30 % within all local public transportation services (vehicles and stations) by 2030	Provide an integrated and continuous pedestrian network	4.6	3.0
	Create safe pedestrian crossings near all landmarks and intersection points	4.7	4.3
Increase satisfaction rate of internal mass transport services by 30%	Increase comfort	4.6	3.7
	Ease the access for all individuals (also barrier free design for people with physical or mental disabilities)	4.7	2.8
	Provide passenger information services	4.8	4.1
	Schedule and conduct regular maintanance for mass transit facilities (stops and vehicles)	4.6	3.4
	Establish a Quality Control process for mass transit services (Stops, vehicles and facilities)	4.6	3.6
	Integrate internal mass transit with external transit serivces (Interchange hubs/stations)	4.6	4.6
6,170,000 Trips Offered by all PT modes by 2030	Extend the mass transit network and coverage	4.7	4.3
	Optimize frequency and operating hours	4.7	4.3
	Introduce new public transport services (bus services)	4.7	4.1

Table 15: Top Measures chosen by the public

The scoring results of the final list of measures were divided into car users and non-car users for comparison. Most scores are similar and are very close in number, except for three measures for which car users gave a lower rating:

- Reduce speed in main intersections by implementing traffic calming elements
- Introduce the concept of temporary pedestrian areas
- Manage car parking by controlling the amount, the costs and/or access to car parking on a site

These measures are the leading measures that prioritize the benefits of other users over the benefits of car-users, thus it makes sense that the respondents who use cars might assume that they will be negatively affected by these measures.

5.9. Annex H - Developing packages

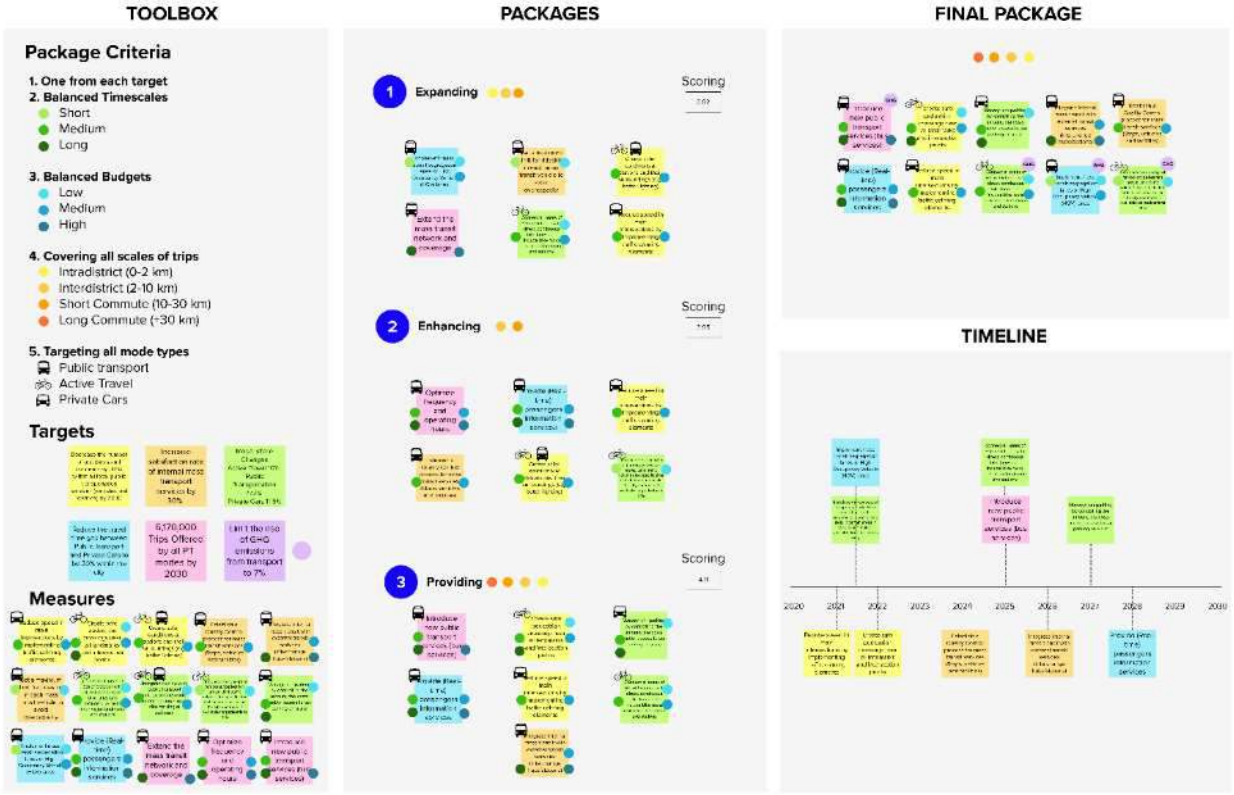


Figure 28: Packages Creation Mural

6. References

1. About 6th Of October City. *Official Website of 6th of October City Development Authority* http://www.6october.gov.eg/pages/%D9%86%D8%A8%D8%B0%D8%A9%20%D8%B9%D9%86%20%D8%A7%D9%84%D9%85%D8%AF%D9%8A%D9%86%D8%A9/%D9%86%D8%A8%D8%B0%D8%A9%20%D8%B9%D9%86%20%D8%A7%D9%84%D9%85%D8%AF%D9%8A%D9%86%D8%A9.aspx (Unspecified).

2. Know About New Cities - 6th of October City. *New Urban Communities Authority's (NUCA) Official Website* http://www.newcities.gov.eg/know_cities/October/default.aspx (Unspecified).

3. Sherbiny, S. & Abozeid, S. Presentation of the outputs of the first phase of the Sustainable Urban Mobility Plan for 6th of October City. (2020).

4. Minister of Housing establishes New 6th of October City Authority according to ministerial decree #746/2017. *New Urban Communities Authority's (NUCA) Official Website* http://www.newcities.gov.eg/Lists/List7/AllItems.aspx?Paged=TRUE&p_Title=%D9%88%D8%B2%D9%8A%D8%B1%20%D8%A7%D9%84%D8%A5%D8%B3%D9%83%D8%A7%D9%86%20%D9%8A%D8%B5%D8%AF%D8%B1%20%D9%82%D8%B1%D8%A7%D8%B1%D8%A7%20%D8%A8%D8%B4%D8%A3%D9%86%20%D8%A7%D9%84%D8%A7%D8%B4%D8%AA%D8%B1%D8%A7%D8%B7%D8%A7%D8%AA%20%D8%A7%D9%84%D9%88%D8%A7%D8%AC%D8%A8%20%D8%AA%D9%88%D8%A7%D9%81%D8%B1%D9%87%D8%A7%20%D9%81%D9%8A%20%D9%85%D8%B2%D8%A7%D8%B1%D8%B9%20%D8%A7%D9%84%D8%AF%D9%88%D8%A7%D8%AC%D9%86&p__x062a__x0627__x0631__x064a__x060=20170601%2022%3A00%3A00&p_ID=421&View=%7BC4D27736%2D215C%2D4CF9%2D96CE%2D51E27AE321CF%7D&SortField=LinkTitle&SortDir=Asc&PageFirstRow=501 (2017).

5. Transport for Cairo. Digital Cairo - Mapping Mass Transport in Greater Cairo's New Urban Communities. (2018).

6. Economic and Financial Feasibility Study for The Administerative New Capital Monorail Transportation System and 6th of October Monorail Transportation System - Scope of Services. (2019).

7. ITDP. *Bus rapid transit for Greater Cairo: Prefeasibility assessment*. (2015).

8. Greater Cairo Metro Line 4. *National Authority for Tunnels Official Website* https://www.nat.org.eg/arabic/line4.html (Unspecified).

9. Hegazy, A., Abu Henedy, S. & Hegazy, M. *First phase of the Sustainable Urban Mobility Plan for 6th of October City - Final Report*. (Forthcoming).

10. Abdel Maaboud, I. & Shaaban, D. Ministers of Environment and Housing launch six bus lines connecting 6th of October and Sheikh Zayed cities with the second Metro Line. *Shourouk News* (2020).

11. Ibrahim, B. 6th of October City Authority launches a campaign against Tok-Tok in the City with 40 to 50 vehicles siezed daily. *Almal News* (2019).

12. Arsenio, E., Martens, K. & Di Ciommo, F. Sustainable urban mobility plans: Bridging climate change and equity targets? *Research in Transportation Economics* **55**, 30–39 (2019).

13. *Annex To the Guidelines For Developing and Implementing a Sustainable Urban Mobility Plan (2nd Edition)*. (2019).

14. Rupprecht Consult – Forschung und Beratung GmbH, Wefering, F., Rupprecht, S., Sebastian, B. & Böhler-Baedeker, S. *Guidelines - Developing and implementing a Sustainable urban mobility plan*. 151 https://ec.europa.eu/transport/themes/urban/urban_mobility/urban_mobility_actions/sump_en (2014).

15. *The Sustainable Development Strategy (SDS) - Egypt 2030*. http://mcit.gov.eg/Upcont/Documents/Reports%20and%20Documents_492016000_English_Booklet_2030_compressed_4_9_16.pdf (2014).

16. Institute for Transport Studies, University of Leeds *et al. Measure selection - Selecting the most effective packages of measures for Sustainable Urban Mobility Plans*. 52 http://www.sump-challenges.eu/file/366/download?token=z7x6M40k (2016).

17. Minister of Housing's Menisterial Decree number 1064/2018. (2018).

18. ARCHPLAN Architects & Planners & Albert Speer and Partners GmbH. Strategic Master Plan for 6th of October and Sheikh Zayed cities as a single city - The Second Volume. (2010).

19. Ministery of Housing, Utilities and Urban Communities. Sheikh Zayed Citie's Expansion - Updated Page. *Ministery of Housing, Utilities and Urban Communities' Official Website* http://www.mhuc.gov.eg/Programs/Index/139 (2019).

20. Know About New Cities - Sheikh Zayed City. *New Urban Communities Authority's (NUCA) Official Website* http://www.newcities.gov.eg/know_cities/Sheikh_Zayed/default.aspx (Unspecified).

21. Mousallam, S., Abozeid, S. & ElDeeb, N. Workshop for developing future scenarios for urban mobility in 2030 - The first phase of the Sustainable Urban Mobility Plan for 6th of October City. (2020).

22. The High-Speed Rail (Alamein - Ain Sokhna). *Egypt's Project's Map* https://egy-map.com/project/%D8%A7%D9%84%D9%82%D8%B7%D8%A7%D8%B1-%D8%A7%D9%84%D8%B3%D8%B1%D9%8A%D8%B9-%C2%AB%D8%A7%D9%84%D8%B9%D9%84%D9%85%D9%8A%D9%86---%D8%A7%D9%84%D8%B9%D9%8A%D9%86-%D8%A7%D9%84%D8%B3%D8%AE%D9%86%D8%A9%C2%BB (2017).

23. A Ministerial Committee to select the winning consortium of the High-Speed Rail's Tender. *Shourouk News* (2020).

24. Sustainable Transport Project. STP launches a 'High Quality Bus' pilot project with 7 new lines connecting 6 October and Sheikh Zayed cities with Cairo University Metro station. *Sustainable Transport Project* http://stp-egypt.org/en/News/stp-launches-high-quality-bus-pilot-project-7-new-lines-connecting-6-october-and-sheikh-zayed (2017).

25. Sphinx International Airport. *Egypt's Project's Map* https://egy-map.com/project/%D9%85%D8%B7%D8%A7%D8%B1-%D8%B3%D9%81%D9%86%D9%83%D8%B3-%D8%A7%D9%84%D8%AC%D8%AF%D9%8A%D8%AF.

26. Ministery of Housing, Utilities and Urban Communities. New 6th of October City - Updated Page. *Ministery of Housing, Utilities and Urban Communities' Official Website* http://www.mhuc.gov.eg/Programs/Index/3176 (2019).

27. Prime Minister's Decree number 2561/2018. (2018).

28. Hamdy, S. Minister of Transport: We plan for construting 8 Dry Ports in order to reach Zero waiting times for goods. *Almal News* (2020).

29. Prime Minister inspects new roads and corridors in 6th of October City. *Alborsa News* (2020).

30. Alaa, M. 6th of October City Authority issues 188 licenses for Microbuses and 500 for Mini-Vans to provide mass transport services. *Shourouk News* (2020).

31. New Smart Buses Lines starts operating in 6th of October City. *Almal News* (2019).

32. Improving Gamal Abdel Nasser Corridor. *Egypt's Project's Map* https://egy-map.com/project/%D8%AA%D8%B7%D9%88%D9%8A%D8%B1-%D9%85%D8%AD%D9%88%D8%B1-%D8%AC%D9%85%D8%A7%D9%84-%D8%B9%D8%A8%D8%AF-%D8%A7%D9%84%D9%86%D8%A7%D8%B5%D8%B1 (2018).

33. Hegazy, M., Kalila, A. & Klopp, J. M. *Towards Transit-Centric New Desert Communities in the Greater Cairo Region*. (2019).

34. KonSULT | Policy Guidebook. http://www.konsult.leeds.ac.uk/pg/49/.

35. Seville: How a small Spanish city became a cycling hub for all | View. *euronews* https://www.euronews.com/2018/10/12/seville-how-a-small-spanish-city-became-a-cycling-hub-for-all-view (2018).

36. (PDF) Sampling Knowledge: The Hermeneutics of Snowball Sampling in Qualitative Research. *ResearchGate* https://www.researchgate.net/publication/248988673_Sampling_Knowledge_The_Hermeneutics_of_Snowball_Sampling_in_Qualitative_Research doi:10.1080/13645570701401305.