





Sustainable Urban Mobility Plan in 6th of October

Phase 1

June 2021

UN HABITAT FOR A BETTER URBAN FUTURE







Sustainable Urban Mobility Plan for 6th of October City Final Report Date 26/01/2020



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Title Picture: Title picture taken from the median refuge in front of Al-Hosary Mosque in the 6th of October City. Taken by Abdelrahman Hegazy, November 2019

About Transport for Cairo

Transport for Cairo (TfC) provides data, tools and research to improve urban mobility in emerging cities, primarily in Africa. Rapid Urbanization, economic and population growth in times of the climate crisis forces us to tackle the complexity and ever-changing urban mobility scene in developing cities. TfC is a disruptive transport consultancy that optimizes existing transport systems and develops flexible and sustainable mobility solutions for our future.

TfC has previously collaborated with several international financial institutions such as the AFD, EBRD, FES, WRI, World Bank; private sector transport providers such as Mwasalat Misr and leading ridehailing companies, public and private operators on the local and international level; and industry working groups such as the UITP.

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

This publication does not express the opinion of the Friedrich-Ebert-Stiftung and the author bears full responsibility for the content of the publication.

About New Urban Communities Authority (NUCA) and 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

267/2017.

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

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Acknowledgment

Outside the principal project team, many other individuals and organizations contributed with comments, insights and data. We would like to thank Dr Ahmed Osama (Former Head of TRU), Eng. Sami Abouzeid (Ministry of Housing), Farida El-Kattan and Salma Mousallam (UN-Habitat), Nour ElDeeb (ITDP) for investing much time and effort in a series of workshops that helped shape this project.

The team also benefited greatly from expert feedback sessions and support from Dr Ahmed Elkafoury (Head of TRU), Eng. Eman Nabil (General IT Manager at NUCA) and Eng. Mostafa Lotfy (NUCA).

This project wouldn't have been possible without the generous support from Friedrich-Ebert-Stiftung (FES) in Egypt. We would like to thank Richard Probst, Waleed Mansour and Khaled Osman for their immense support throughout the project



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The purpose of this project is to work on developing a **Sustainable Urban Mobility Plan (SUMP)** for the urban agglomeration of 6th of October City.

This Final Report combines the outputs of the SUMP planning process which started in August 2019 and continued through February 2020.

The **Introduction** walks the reader through the SUMP guidelines, prepared by the European Platform on Sustainable Urban Mobility Plans for the European Commission, which are the theoretical basis for the planning process. It includes an overview of four steps of the guidelines present in this report.

The following chapter presents step 2, the **Diagnostic.** It includes the definition of background concepts for the remainder of the study; the development of the analytical framework; the actual analysis and data utilized and ends with conclusions derived from the analysis that form the base for the plan.

The third chapter presents step 3, the **Scenarios**. Three different future scenarios are illustrated to assess the consequences of current trends, measures already programmed and new policy choices.

The fourth chapter presents step 4, the **Vision**. The vision presents qualitative description of a desired urban future and serves to guide the development of appropriate planning measures.

The SUMP (Sustainable Urban Mobility Planning) Process



Starting August 2019; TfC was supported by the Friedrich Ebert Stiftung with seed funding to start developing the 6th of October City SUMP; the first of its kind in Egypt. With the support of UN-Habitat; the

New Urban Communities Authority (NU CA) mandated TfC to start working on the SUMP.

Phase I of the project (Sep - Dec

2019) covers steps I - IV of the "Guidelines. Developing and Implementing a Sustainable Urban Mobility Plan" report published by the European Commission, and herefrom referred to as the SUMP Guidelines (Rupprecht Consult – Forschung und Beratung GmbH et al., 2014).

The figure to the right shows the complete steps of the SUMP Guideline with steps I to IV highlighted:

- Determine the City's potential for a successful SUMP
- Define the development process and scope of plan
- Analyse the mobility situation and develop scenarios
- Develop a common vision





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Overview of SUMP Steps (P1)



Determine the City's

potential

Objectives & Geographic Scope



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The study area is limited to the administrative boundaries of Old 6th of October City and Hadayek 6th of October, as highlighted with the dashed outlines in the Figure. This area spans **427 km2.**

Specifically, this project will aim to:

 Develop a diagnostic on the current status of urban mobility and transport in 6th of October

2. Define the SUMP creation process and scope

3. Analyze the status of urban transport service provision in 6th of October, including public transport, private transport, ride-hailing and active travel.

4. Describe different scenarios in a quantitative and qualitative way

5. Develop a common vision of mobility and beyond - a long-term goal for transport and mobility development in 6th of October as a guiding element for the planning process.

Step 2 - Diagnostic

Before deciding on future policies, it is essential to know where the city currently stands. In urban transport and mobility, this knowledge is often very fragmented and incomplete. Like pieces of a puzzle, data and information need to be put together in order to describe what is going on, and to name the related problems. This analysis is crucial in helping to define appropriate policies and provides the necessary baseline against which progress can be measured. The analysis should be as comprehensive as possible, but also needs to be manageable with the given resources. It should also include the resilience of the urban transport systems (i.e. their capacity to absorb stressors or shocks) towards both expected and unexpected events (e.g. energy shortage, natural disaster), especially if they affect long-term decisions. (Rupprecht Consult – Forschung und Beratung GmbH et al., 2014)

I. Objectives

- Provide a quantified review of the current status of mobility and transport
- Identify deficits, problems and opportunities that relate to urban transport and mobility
- Develop a better understanding of what needs to be done to enhance the planning process.
- Identify data availability and quality, accessibility and secure coverage of data requirements for creating the plan.
- Prepare a baseline analysis to identify and prioritize key problems to be addressed by the plan.



Guidelines for the Diagnostic







Tools

Analysis



Urban mobility is how people in cities move to access opportunities and services. This movement is translated into trips made by individuals using different modes of transport.

Analyzing trips play a major role in understanding the current status of urban mobility. Trip numbers, lengths and mode choices determine the level of pressure on the road network, which finally shape the urban mobility experience in the city.

Trips are analyzed on three main levels:

• Modal Share:

Calculate the percentage of trips made by different modes out of the total daily trips.

- User experience of Active Travel: Assess the street design and to how extent it provides accessible and safe mobility by cycling and walking
- User experience of Mass Transport Modes:

Assess the competitiveness of Mass Transport by analyzing reliability of the service in terms of trip times, schedules and geographic coverage and the quality of service in terms of safety and comfort.

All levels of analysis are based on geographic, quantitative and qualitative data that is collected using 3 main assessment tools:

- I. Passenger Survey
- 2. Street Level Diagnostic
- 3. Public Transport Network Diagnostic

The figure to the left shows the diagnostic process highlighting tools used for each level of analysis.

final diagnostic outcomes feed into the next step "Scenario Generation".

Breakdown of Trips by Mode

Active Travel

- Walking
- Cycling

Mass Transit

- Suzuki / Microbus
- Peak-hour Commuter Services (i.e. SWVL, Uber Bus, Careem Bus etc)
- Public Bus

Private Motorization

- 2-Wheeler (Motorcycle / E-bicycle)
- 4-Wheeler (Private Car / Taxi / Ride-hailing)

Freight Transport

- Heavy
- Medium / Light







How do citizens move within 6th of October?

The following framework breaks down the three main categories of modes of transport used:

- Active transport (walking and cycling)
- Mass transport (publicly or privately operated; formal or informal)
- private motorized modes of mobility

While Freight transport is not counted as part of daily trips, it forms an important and impactful component of the urban mobility system. It is considered separately within this Diagnostic.

The Passenger Survey will aim at arriving an *estimated* modal share of travel, for each of the aforementioned travel patterns. This estimate would form the basis of the Baseline, and the starting point for the Sustainable Urban Mobility Plan.



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The User Experience of Travel by Mode



The User Experience, broken down by steps.

This visualisation compares a likely hypothetical journey across modes by total cost (Y Axis) and trip duration in time (X Axis). Actual ranking of modes might differ. (Hegazy et al., 2019)

The User Experience highlights two important dynamics:

- Every trip starts and ends with Active Travel.
- Active Travel constitutes a bigger portion of mass transit (Public Transit & Peak-Only) trips.

Thus, use of mass transit is directly correlated to the quality of the Active Travel Experience.

The User Experience of Mass Transit

What constitutes good Public Transport? A definition by Jarrett Walker.

• It takes me where I want to go

This deals with coverage. What is the reach of the service? Can it take me from where I am to where I want to go?

• It takes me when I want to go

Some services may satisfy the coverage but only at certain times of day. Higher frequencies throughout the day means people don't need to think about sticking to a schedule; the service is there when they need it. Infrequent and peak-only commuter services do not satisfy this criterion since they have limited availability and so cannot be relied on throughout the day.

• It is good use of my time

The efficiency of the service is also key. A connected network that allows me to travel between two points in a reasonable time will be seen as a good alternative to a private vehicle. A large gap between travel time using a private vehicle and using collective means of transport is an indication of a poor service.

• It is good use of my money

The cost of a service determines who it is available to. Public transport is meant to be an affordable means of transportation, but not all forms of collective transport are in the same price range. A number of new services in Cairo offer collective means of transport at prices that are targeted at high-income groups.

• It respects me in the level of safety, comfort, and amenity it provides. I can trust it.

The quality of a service is a determining factor for many potential users. Informal transport vehicles are renowned for reckless driving, and so are ignored by some commuters. Some services are not designed to accommodate people with disabilities while others are not convenient for women due to factors such as limited personal space.

• It gives me freedom to change my plans

This is tied to how the user interacts with the service. A service that requires booking in advance is more rigid; if the user changes their plans then they need to cancel their initial booking and pay a fine for doing so. A traditional service that can be waived down on the street is more accommodating to flexible plans and requires no planning ahead of time.

Source: Walker, Jarett. 2012. Human Transit.





The User Experience of Active Travel







The User Experience of Active Travel, broken down by steps.

In a vehicle dominated streetscape, assessing the viability of active travel (walking and cycling) plays a major role in the user experience.

Basic requirements for walking to be

physically possible and desirable are identified in the The Walkability Hierarchy of Needs Pyramid (IWONA et al. 2018).

Cycling experience often involves additional time and effort to find a safe parking area. Thus, walking activity is likely to be involved in a cyclist's trip.

As mentioned earlier, Active Travel constitutes a portion of mass transit (Public Transit & Peak-Only) trips.

Use of mass transit is directly correlated to the quality of the Active Travel Experience.

Capacity & Congestion







As 6th of October grows, it requires the capacity to reduce crowding and support increasing numbers of people travelling, on roads and using mass transit.

Mass Transit

Matching mass transit supply and demand is a function of balancing **Number of seats offered** with the **Number of trips demanded**.

This takes places spatially and temporally.

Private Motorized

Cars are a relatively inefficient means of moving people around. Cars, taxis and ride-hailing vehicles take up the majority of all the street space, but account for a fraction of distance travelled.

The level-of-service of roads *Vhd (Vehicles-per-hour-per-direction)* measures the percentage of times cars can achieve free-flow travel speed.

A different measure of capacity looks at how efficient road-space is used, and measures *Phd (Passengers-per-hourper-direction).*

Measuring the percentage of time there is overcrowding / traffic congestion indicates the balance between supply and demand.

The figure compares capacity of passenger movement per hour of different modes. Under normal circumstances, planners need to design for the peak-morning and peak-evening hours; and ensure sufficient capacity for traveller movement then.

Modes and Modal Share











Microbus (60 Licenses)

High Quality Buses

(MM/STP)











People in 6th of October City use a variety of transportation modes for their trips within and outside of the city. These modes are either public or private, motorized or non motorized (Active) with different legal status and operational structures:

Private Motorized Modes:

- 1. Privately Owned Cars and Motorcycles Regulated by the traffic law 21/2008
- 2. Tok-Tok Regulated by law 142/2014 with formal prohibition interventions by 6th of October's City Authority
- 3. Company Buses Regulated by the traffic law 21/2008

Public Motorized Modes:

- I. CTA Buses & Minibuses Regulated by Presidential Decree 2716/1966
- 2. Mwasalat Misr
- 3. NUCA Buses Direct formal intra-city transport service by NUCA
- 4. Locally Licensed Microbuses Provides Intra-city transport services under a local license by 6th of October City.
- 5. Microbuses (Other Licenses) Connects 6th of October with GCR under Al-Servees Project of Giza Governorate
- Suzuki Minivans
 Provides Intra-city transport services under a local license by 6th of 15 October City.





Stakeholders Mapping



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To obtain a comprehensive picture, three types of stakeholders should be distinguished according to their specific power position in the process:

• Primary stakeholders:

Who will ultimately be affected – positively or negatively - by new transport measures (e.g. citizens in general, different social groups or professions, certain city districts, business branches, individual organizations)?

• Key actors:

Who has political responsibility (mayors, councilors, other authority levels)? Who has the financial resources (public and private funds)? Who has the authority (by domain or territory)? Who has the skills and expertise (public administrations, universities, private sector) – in transport and related domains (land use, environment, education, health, tourism, etc.)?

• Intermediaries:

Who implements transport policy (PT and infrastructure operators, public administrations, police, etc.)? Who carries out major transport activities (freight operators, harbors, airports, etc.)? Who represents pertinent interest groups (associations, chambers, cooperatives, networks)? Who informs and reports on transport (authorities, operators, local media)? (Rupprecht Consult – Forschung und Beratung GmbH et al., 2014)

 Intermediaries are broken down into regional (i.e. 6th of October) and metropolitan / national (i.e. Greater Cairo Region and state level) in the Figure on the left.

Mass Transport Network Diagnostic



Mass Transport Network is geographically and temporally analyzed using a variety of datasets. For geographic analysis, the consultant uses a GIS Route Mapbook generated based on data for mass transport routes, stops and terminals that was collected by the consultant from the field in 2018 and updated in 2019.

Geographic data for routes, stops and terminals is used to analyze the operational pattern of different modes (i.e. express or local) and spatial distribution of major transport hubs.

The consultant uses the outcomes of computed travel time of long-distance commutes from 6th of October City by different modes in order to analyze the trip time gap between private and mass transport modes. Travel times were calculated using TfC's network data and traffic big data. (Hegazy et al., 2019)



Passengers' Satisfaction Survey



<u>Figure</u> I: Breakdown of study area into distinct areas

Figure 2: 6th of October City segmented based on population number using H3 layer

6 am -9 am	9 am - 6 pm	3 pm – 6 pm	6 pm- 9 pm
Morning-peak	Off-Peak	Evening-Peak	Off-Peak

Table I: Temporal Break-down of a typical day





Sampling

The survey used a stratified multi-stage sample design. The study area was broken down over two major distinct areas as highlighted in Figure 1:

• 6th of October (Central District), estimated to have 62.3% of the total 6th of October population

• 6th of October (Fringe Districts), estimated to have 37.7% of the total 6th of October population.

Geographic Clustering:

Figure 2 segments 6th of October City based on the population distribution. To do so, we break down the study area into 181 H3-level 8 hexagons -each 0.88km2 large-, with an estimated population value assigned to each area.

This clustering highlights the western side of the Central Districts to be the most densely populated; followed by the north-eastern areas of the Fringe Districts. The southeastern fringe districts and western factor area have very low population densities.

Main landmarks in each category have been identified, representing hotspots for human clustering in those areas. Based on the types of landmarks (ex. terminals, universities, shopping malls etc.) the number of conducted surveys in those hotspots will be set, making sure that a fair distribution of our targeted audience is met.

Temporal Clustering:

At least 20% of survey forms will be collected during weekend days. Each day will be divided into four intervals (see table 1), upon which the surveys will be somewhat equally distributed. This is to ensure that all types of commuters participated in the survey.

(Check Appendix for detailed methodology)

Passengers' Satisfaction Level

- It takes me where I want to go?
- It takes me when I want to go?
- It is good use of my time?
- It is good use of my money?
- It respects me in the level of safety, comfort?
- It gives me freedom to change my plans?

To measure the level of satisfaction of the respondents we used a definition developed by Jarette Walker about what constitutes a good public transport (Walker, 2012) highlighted in the 6 statements in **blue**

Passenger experience of respondents from **different gender groups (males and females)** are captured and analyzed in order to inform gender sensitive policies and interventions.

Ownership of private vehicle status

is also considered in the analysis in order to better understand the following:

- Aspects of mass transport services that highly affect their competitiveness with private modes of mobility.
- Major mobility challenges that face captive riders who have no access to private modes of mobility

Passenger satisfaction analysis helps define improvement priorities for a more competitive, accessible and reliable mass transportation in the city.

(Check Appendix for detailed methodology)





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Breakdown of Trips by Distance

XYZ million number of daily trips



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How many trips take place everyday?

To answer this, we need to arrive at estimates for how many trips take place.

- within 6th of October (Central);
- Connecting 6th of October (Central) with 6th of October (Fringe Districts) and El-Sheikh Zayed City;
- Connecting 6th of October (Central) with the rest of the GCR (Central, Inner, and Eastern NUCs)

Summing up the three figures would yield total number of trips of concern to the study area.





Street Design Elements



The main geographic scope of the project is the administrative boundaries of 6th of October City, as highlighted in light blue in figure (1). In order to diagnose the current status of urban mobility in 6th of October City, different modes of mobility, including

- active transport (walking and cycling)
- mass transport (public and private; formal and informal);
- private motorized modes of mobility

are taken into account. These different modes of transport compete on a limited space of roadway. Thus current street management approaches and infrastructure conditions are also diagnosed.

Due to the vast geographic area of the city (207 km2), we limit the geographic scope of the diagnostic to two specific sub-levels as a sample for the urban mobility challenges and opportunities of the whole city:

Commercial Intersection

Al-Hosary Square, which accommodates most services, commerce and opportunities in 6th of October; and where most mass transport routes and most of the traffic pass through.

Residential Area:

A district-level diagnostic is conducted to analyze last-mile transport challenges and potentials. The 6th District is chosen due to its relatively high population, accommodating around 25% of the city total (CAPMAS, 2018). 21

Street Design Elements



At present, streets are the key urban space where urban transportation takes shape. Streets are a place of conflict between mobility and liveability: While different modes compete for limited space at different speeds, traditional uses of social gathering, commerce and economic activity inevitable take place.

Good streets serve all users. Active travel, or the ability to walk or cycle, can be supported by complete street design.

This Diagnostic focuses on six street design elements, as street components with specific functions and effects on Active Travel. These components are adapted from the ITDP guide for better streets. (Kost and Nohn, 2011), and are each shown in the figure.

- **Footpaths**
- Pedestrian Crossing
- Median & Pedestrian Refuge
- On-street Parking
- Traffic Calming Elements
- Bus Stops

Each component is explained and explored in more detail, at two different areas in 6th of October city.

The different design elements in the graph are explained below.





Regulations, Institutions and Projects



To understand the influences on urban transportation, it is effective to look at relevant legislation, regulations, institutions and the projects

operationalized by these institutions as part of their effort to fulfill their mandate.

The Figure on the left visualizes a highlevel overview of the three aforementioned levels for Egypt since the mid 19th century; with a special focus on the 2010's.

Several projects on the regional level will affect urban mobility in 6th of October. These projects include:

I. Metro Line 4 that will connect 6th of October with New Cairo

2. Monorail Project that will connect 6th of October with Central and Inner Giza.

3. Sustainable Transport Project (STP) that will connect 6th of October with Cairo University in Giza through Bus Services

4. Bus Rapid Transit Project (BRT) that will connect 6th of October with Central and Inner Giza (Through Faisal Street to Giza Square).

Ongoing expansion of the Egyptian National Railways are unlikely to affect much change on urban mobility on 6th of October.

Future Measures



BRT (Bus Rapid Transit) Giza Governorate / UN-HABITAT / ITDP

- Phase 1: 42 km with 43 Stations
- Phase 2: 25 km of extensions by 2030
- Starting daily capacity estimated at 126'000 Passengers / Day



Monorail Ministry of Transport

- From Mohandessin to 6th of October
- Including 12 stations



Internal Bus Network

- Internal Bus network operated by Mandolin/MM
- Six Bus lines



Urban expansion

- Unifying 6th of October and Sheikh Zayed
- South west extension of 6th of October (New 6th of October)
- South east extension of 6th of October (Hadayek October)



ITS (Intelligent Transport System) Traffic Management Unit

 IT-main roads and Traffic intersections controlled by Traffic manag ement unit

Roads and Flyovers MoT and MoH

 Building free ways as well as flyovers to reduce the traffic congestion in main roads In 6th of October City certain measures are either implemented having a planned extension, are about to get implemented or planned for the coming future.

Some of these measures are directly affecting the mobility of 6th of October thus influencing the future scenarios.

Listed are the main mobility related projects happening in 6th of October till the year 2030.





[1] Diagnostic/ Analysis

Planned Projects



Mapping prospective projects and plans is an essential activity for the SUMP development process. Understanding relevant regional projects, either under implementation or already programmed, serves as a direct input in creating comprehensive scenarios and vision in later steps at the end of this phase of the SUMP.

As shown on the map on the left, one of the two **monorails** that have been studied will connect the cities of 6th of October and Sheikh Zayed to Central Giza (Game'et Al-Dowal).

Work has also begun on the first phase of Metro Line 4, which is meant to connect the cities of 6th of October (Hay Al-Ashgar) and New Cairo. (Hegazy, M., Kalila, A., Mahfouz, H., Transport for Cairo, 2019)





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Key Actors & Stakeholders



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The **primary** stakeholders of the mobility field in 6th of October are divided between governmental institutions and nongovernmental ones. The 6th of October Authority, the Transport Regulatory Unit (TRU) as part of NUCA and the 6th of October board are the most powerful bodies on the local scale. They have the authority over any policies or local measures being implemented in 6th of October.

As for the **key actors**, they are mainly service providers or operators with high influence on the mobility system of 6th of October city. These actors are either considered part of the private sector, like Mwaslat Misr, Mandolin and the paratransit sector, or as part of the public sector, like the CTA. In addition to these service providers, several governmental institutions, like Land Transport Regulatory Authority (LTRA), Ministry of interior and Ministry of Environment, as well as non-governmental organization like UN- Habitat are key players in the mobility field of 6th of October, providing or supporting mobility projects or regulations.

The private service providers and operators, like Careem and Uber bus and SWVL, are considered intermediaries on the regional level. While connecting 6th of October with other neighborhoods, these peak-only services have lower influence on the local mobility system of the city.

The remaining stakeholders are considered as intermediaries on the metropolitan level, having a substantial indirect effect on the mobility status of 6th of October through their metropolitan plans and projects. This includes Giza Governorate and Ministry of Transport.

Public Transport / User Experience-Short Commutes

6th of October Transit Map Getting around inside 6th of October



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Al-Hossary square contains the main transit hub for travel *within* 6th of October.

• While a number of services originate at Al-Hossary in all directions; the majority of services operating within 6th of October *pass through* Al-Hossary. The same applies for long-distance commute services operated by the formal sector; Al-Hossary acts as a hub primary for long-distance commute services.

Al-Souq Al Qadeem and Laylat Al-Qadr act as secondary transit hubs.

• Both host a number of last-mile services to the industrial zone (west) and fringe residential neighborhoods (south)

The majority of services operate on one main east-west axis split between two primary roads: AI Mehwar Al-Markazy (north) and Al Mehwar AL Markazy Nassr street (south). The distance between both roads is ~300m.

6th of October is built around districts, organised in a grid like fashion. Most districts average somewhere around 1km in width and length; with a noncontinuous internal network of tertiary and residential roads.

----This map was developed based on Digital Cairo data collected by TfC in 2018. Some routes have changed since; Box vehicles no longer operate in 6th of October. An assumption was made, that the operated services did not change.

Public Transport / User Experience-Short Commutes



Paratransit Sector / Specialized Routes

Example: Hossary-6th District (6th of October), operated by Suzuki Minivan

This service connects the commercial heart of Al-Hossary with the residential 6th district at high frequency using low capacity vehicles.

It follows a **L-Shape**, and can be considered a Specialized Service focusing on the connection between origin and destination.

Red circles denote where passengers alight or board.

Image by TfC.

Formal Sector / Circuitous Route

Example: (6h of October local bus Line B), concessioned by NUCA and operated by Mandolin

This service drives a Circuitous route providing wide coverage across central 6th of October.

Image from 6th of October Bus Service Tendering documents.

The following analysis is based on the consultant visual analysis of the mapbook of routes.

Virtually all routes operating within 6th of October City follow a L-shape. The L-shape is the local version of a direct service: Taking a direct line across either east-west axis; and then a sharp 90° turn towards the final destination.

There are more than 15 such direct services. Thus the network is essentially an amalgamation of specialized services aiming to connect some origindestination points through direct services.

Only a handful of routes have small deviations, normally related to turns within the area between both central axis. Only one route (Masaken Othman-Al Mostaqbal Entrance) exhibits a significant deviation, due to the geography of entering Masaken Ossman.

The formal bus services operate circuitous routes. Such services normally aim to provide basic coverage, often for social service purposes but with no intention of competing with other alternatives. The longer travel times make them very unattractive for travellers.

Given the competition by the informal sector, it is unlikely for the formal service to attract passengers away from the informal service.

In summary, the network as a whole remains below potential. The current paradigm involves:

An oversupply of routes competing on the same corridors

Below-potential coverage, that could be supplied through intersecting routes on the grid

Below-potential directness for the majority of destination pairs.







Public Transport / User Experience-Long Commutes



Laylat Al-Qadr and Al-Hossary Square act as the primary transit hubs for long distance commutes, operated by the informal sector. Further, CTA routes pass through both hubs (except CTA 1043)

Al Souq Al Qadeem acts as the terminus for four CTA lines; the fifth operating to the 12th District - Kan Kan stop.

There is a big overlap of intercity routes servicing long commutes on the Al Mehwar AL Markazy Nassr street (south).

Services serve a variety of destinations within the GCR, enabling direct point-topoint services from the hubs to transit hubs in Central and Inner Cairo.





Public Transport / User Experience–Long Commutes

Mode	To Data Item	Abbassi- ya	Abdel Moneim Riyad	Attaba	El- Moneeb - Metro	Giza Square – Metro	Lebanon Square	Ramses - Metro
Private Car Time in min, total trip duration includ- ing walking, exclud- ing parking	mean	73.8	59.9	70.4	42.6	45.6	45.2	75.8
	min	51.4	40.7	50.5	21.8	25.4	26.3	56.1
	median	74.5	61.2	71.7	43.5	46.5	46	76.9
	max	87.3	71.2	82.2	57	60	56.7	89.3
	sd	8.8	8.1	8.2	8.9	8.7	8	8.3
Journey Gap ⊠ Travel Time of Transit to Private Car		152.71%	143.41%	128.69%	233.10%	203.51%	147.57%	122.30%
Transit Time in min, total trip duration including walking, waiting, transfers	mean	112.7	85.9	90.6	99.3	92.8	66.7	92.7
	min	73.3	45.6	49.5	57.9	51.8	26.5	50.9
	median	112.9	85.8	89.2	99.8	92.9	66.4	94.2
	max	137.1	116.3	114.2	121.6	116.4	99.8	115.6
	sd	14.5	15.8	13.3	15.5	14.8	15.6	13.5
Transit Walking Distance in min	mean	1268	1244	1348	2129	1951	1225	1450
	min	357	193	397	905	890	193	639
	median	1194	1138	1322	2042	1888	1120	1400
	max	2108	2435	3011	3199	3504	3146	2962
	sd	523	594	567	643	713	666	528
Transit Number Transfers	mean	1.61	0.68	1.82	1.57	0.96	0.79	1.64

TABLE 1 Travel Times from Sixth of October to Inner-City Cairo (in minutes)¹³





Table I computes travel time of long distance commutes from 6th of October City. (Hegazy et al., 2019)

Long-Distance Commute [min 30 km]

Includes any travel to Inner Cairo; Central Cairo and Eastern New Urban Communities.

Challenges facing mass transit uptake for long-distance commutes:

• Long trip durations

that exceed travel time by private cars extensively. (See Journey Gap)

• High number of transfers

Travellers dislike transfers disproportionally, often preferring longer trips over transfers.

• Long walking distances to access transit which often exceed reasonable international standards.

Public Transport / User Experience-Long Commutes



Paratransit Sector / Express Service

Example: Laylat AlQadr-Imbaba, operated by a 14-seater microbus

This service serves two long non-stop segments: First from 6th of October to El-Sheikh Zayed, and then from El-Sheikh Zayed to Inner Cairo. It then starts operating as a local service within the area of Central Cairo; making numerous stops within that target area. As it inherently specialized; frequency is likely to be much higher during the peak commute period.

Image by TfC.

Formal Sector / Local Service

Example: Kan Kan (12th District) - Imbaba, operated by a 44-seater CTA Bus

This service serves closely spaced stops, allowing a big number of users to alight and offboard along the length of the route. Thus it is a typical **local service**. This increases coverage of the service, at the expense of travel speed. Given the long total distance, it is unlikely for passengers to be using the trip to travel from the origin to the destination, but rather using the service to travel sections of the route.

Image by TfC

The following analysis is based on the consultant visual analysis of the mapbook of routes.

All long-distance commute routes operating from 6th of October City travel to the northeast to connect with El-Sheikh Zayed City and then Central Cairo; or to the southeast passing by the fringes of 6th of October towards Giza.

The two sample routes operate from within 900m of each other in 6th of October towards the same destination of Imbaba. They operate on the same corridor, and thus compete.

However, the nature of the service differs strongly; and are thus targeting different user segments.

All formal bus services operate **local services**. Such services normally aim to maximise coverage, at the expense of travel time.

Given the fixed price of the formal service; travelling long distance can also provide value-for money to travellers..

Informal services focus highly on **express services**. Such services normally are much faster as they stop less, and thus more attractive to working professionals who value travel time, over direct savings to travel cost.

A potential combination of both service types yield the best of both worlds: the ability minimise walking distance to stops with the ability to maximise service frequency (lowering waiting times) abd lower travel time through long direct nonstop segments.





Pax Survey / Breakdown of Trips by Distance





Key results

A total of 1600 respondents participated in a street-intercept survey. 52% of the sample are males and 48% are females.

- On average, participants live 17.5km from where they live.¹
- 50% of participants live 10km or less from where they live.

6th of October_6th of October 66.8% (997)

Cairo_6th of October	18.2% (272)
6th of October_Cairo	13.1% (196)
6th of October_NA	0.9% (14)
Cairo Cairo	0.6% (9)
Cairo NA	0.3% (4)

- Two thirds live work and live within 6th of October
- One third commutes between 6th of October and Central / Inner Cairo daily.
- Of those, more people commute to 6th of October than from it; which corresponds to an earlier TfC studied that idenfied 6th of October to have 4.3% of GCR Jobs but only 1.3% of GCR population
- Twice as many commuters use 26th of July Corridor compared to the proposed BRT route from Giza via Al-Remaya Square.

Numbers estimated using the passenger satisfaction survey

a) Estimating daily number of trips per person = 2.37

I: Values over 70km were discarded, as they are outside the range of the GCR

Pax Survey / Breakdown of Trips by Distance in 2030





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Pax Survey / Breakdown of Trips by Activity



What is the motivation for taking trips?

To answer this, we need to break down why citizens decide to travel. Suggested categories include:

- I. Home Work
- 2. Home Education
- 3. Home Child-Related / Personal
- 4. Home Shopping
- 5. Home Other
- 6. Work Other
- 7. Other

These categories simplify the complex reasons and patterns behind individual decisions to take trips.

Blue accounts for the majority of trips taking place during the *morning peak hour* (*mpp*).

Orange accounts for the majority of trips taking place during the *evening peak hour* (*epp*).

A lot of trips take outside of peak hours. While these trips are of high importance, they are normally easier to cater for compared with fulfilling peak-hour travel demand.



Modal Share



The latest efforts to produce a modal share for 6th of October was back in 2001 as a part of Cairo Regional Area Transportation Study (CREATS) by JICA using a household interview survey (HIS). The resulted modal share is highlighted in Figure 2.

The consultant used a street-intercept individual survey to calculate modal share for 2020 as shown in Figure 1. However, it's highly recommended to follow a household interview survey for future modal share calculations.

Active Travel:

Percentage of trips by active travel has decreased sharply between 2001 and 2020. The numbers of 2020 might be undercounted due to exclusion of the under 18 years old population which overlooks many active trips by school students. However, continuous horizontal urban expansion accompanied by inatractive with no equivalent expansion in mass transport network and active travel infrastructure are main causes for unattractive and often risky active travel experience.

(Check Appendix for detailed analysis)




Pax Survey / Satisfaction Level



It takes me where I want to go PT_R_R_1_Geo



It takes me when I want to go PT R R 2 Sched



It takes me when I want to go PT R R 2 Sched



It is good use of my money PT R R 3 Fare



It is good use of my money PT_R_R_3_Fare



Sex	Coverage	Schedule	Fares
Female	3.4	3.2	3.0
Male	3.4	3.3	3.1

(Check Appendix for detailed analysis)





Pax Survey / Satisfaction Level



Sex	Travel Time	Safety	Comfort	Freedom
Female	3.1	2.6	2.6	2.8
Male	3.0	3.4	3.0	3.0

(Check Appendix for detailed analysis)





Street Design Elements / Al-Hosary Square





Al Hosary Square is one of the most important areas in 6th of October City. It hosts a lot of activities and acts as one of the main interchange terminals of the city.

Being a terminal for formal and paratransit mobility services, it is dominated by active travel done by commuters interchanging between modes.

Due to its variety of activity provision, like the mosque and commercial activities, as well as having the 6th of October University nearby, it also attracts traffic and private cars.

All these layers contribute to the complexity of the area. Thus, it is very critical in terms of street design, accommodating all these layers.

To analyze the area and its street design, we use the street design elements identified by ITDP (Kost and Nohn, 2011), which together act as the main street components.

- Footpaths
- Pedestrian Crossing
- Median & Pedestrian Refuge
- On-street Parking
- Traffic Calming Elements
- Bus Stops

Accordingly, each street design element is discussed briefly, identifying the deficits, problems and opportunities of each of these elements.

Street Design Elements / Al-Hosary Square



FRIEDRICH EBERT STIFTUNG



The diagnostic of street design elements shows a bias towards private motorized modes of mobility, and missing focus on active travel:

I - Lack of consistency of pedestrian pathways, sufficient shading and conflict between pedestrian and vehicular movements produce an unfavorable and often unsafe pedestrian experience.

2- Lack of protected pedestrian crossing options with efficient traffic calming elements and lack of consistent median pedestrian refuges demonstrate a vehicle dominated streetscape.

3- Inefficient and unrestricted supply of onstreet parking act as comparative advantage for private vehicular mobility at the expenses of pedestrian movement and mass transport modes. Parking supply's failure to meet the growing demand encourages violation of pedestrian pathways for parking purposes,

4- Inefficient geographic allocation of bus stops around areas of interest causes 2 main problems:

- Informal occupation of roadside around areas of interest to benefit from the centralized demand. This severely affects both traffic and pedestrian flow.
- Additional walking distances in a vehicle dominated streetscape. This acts as an indirect disadvantage for public transport.

This contributes to a **clear bias of users** towards adopting private modes of

mobility over mass transit and active travel, contributing to a skewed modal share.

(Check Appendix for detailed analysis) 39

Street Design Elements / Sample of the 6th District



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The diagnostic of the 6th District defines the main challenges of active mobility as a primary mode of mobility within the district. This covers active mobility [1] as a last mile solution and [2] as a main mode for intra-district trips.

6th District is home to an estimated 25% of the population of 6th October (Hegazy et al., 2019). The diagnostic covers the core residential area and four main streets as highlighted on the map.

To analyze the district and its street design, we use the street design elements identified by ITDP (Kost and Nohn, 2011), which together act as the main street components.

Accordingly, each street design element is discussed briefly, identifying the deficits, problems and opportunities of each of these elements.

Street Design Elements / 6th District



Mobility issues differentiate based on the context. As a residential neighbourhood, the 6th District suffer from several cross cutting problems that hinder pedestrian accessibility and safety, contributing to a modal share dominated by private motorized modes of transport:

I. Streetscapes the prioritize vehicular mobility at the expenses of active mobility. This problem is manifested in Inadequate pedestrian footpaths that lacks continuity and consistent, absence of safe crossing options and shading, inducing growing dependency on vehicular mobility even in short intradistrict trips.

2. Traffic-generating land uses in the middle of a residential neighbourhood contribute to extra demand on parking by non-residents in a limited roadspace. Excessive on-street parking often hinders pedestrian accessibility and even result in violation of footpaths at some locations.

3. Lack of adequate bus stops that can be easily identified and used negatively affects mass transport experience, inducing growing dependency on private modes of transport such as Tok-Tok.

(Check Appendix for detailed analysis)

Street Design Elements / Final Assessment

Street Design Element	Commercial CBD (Al-Hosary Square)	Residential (The 6 th District)	Impact
[1] Footpaths	-Low continuity -poor maintenance -Insufficient width	-Low continuity -poor maintenance -Insufficient width	-Unsafe pedestrian experience -High reliance on motorized modes for short and last mile trips
[2] Pedestrian Crossing	-Ineffective & insufficient pedestrian crossing options	-No safe pedestrian crossing options	-Unsafe pedestrian experience
[3] Median & Pedestrian Refuges	-No frequent median breaks -insufficient width in the segments with high pedestrian crossing density	NA	-Unsafe pedestrian experience -Excessive extra vehicles miles travelled during change of directions -Congestion
[4] On-street Parking	-Accessible and unmanaged on-street parking on the roadside. -Violation of pedestrian footpaths due to high demand on parking.	On street parking is not common in core residential areas. In streets with high commercial activity,	-High reliance on private modes of transport -Unsafe pedestrian experience -Traffic flow interruptions -Congestion
[5] Traffic Calming Elements	-Insufficient number of speed bumps provide limited traffic calming solution	-Lack of properly designed traffic calming elements allows high vehicular speeds in primarily residential streets. -informal traffic calming elements installed by the residents.	-Unsafe pedestrian experience -High reliance on private modes of transport
[6] Bus Stops	-Insufficient number of bus stops with adequate shading and seating. -Spatial allocations of terminals discourages intermodality.	-Insufficient number of bus stops with adequate shading and seating. -Proximity of terminals encourages intermodality.	-Additional trip times for public transport users (due to long transfer times) -High reliance on private modes of transport -Informal random stops -Traffic flow interruptions





Challenges and Potentials

Challenges



Unsafe pedestrian experience due to lack of infrastructure and proper management of vehicular speeds

 Higher dependence on motorized modes for short intracity trips

Potentials



Inefficient allocation and management of road space for vehicular movement, parking activities and pedestrian flow

CongestionTraffic flow interruptions



Mass transport is not protected from the congestion

Lack of mass transport intermodal integration due to lack of intermodal stops and terminals

- Additional trip times for mass transport
- · Higher dependence on private modes of mobility



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The current status of 6th of October City's roads clearly prioritize vehicular modes over Active modes (Walking & Cycling) by road space allocation and non-restricted accessibility they provide to vehicles. It also prioritize private motorized modes of mobility over mass transport modes by the non-restricted parking and absence of protection for mass transport vehicles from the traffic.

Mass transport suffers from the weak intermodal connectivity. Terminals of different modes of mass transport are often spatially fragmented and with no adequate connectivity by adequate pedestrian path.

This status poses huge risk and extra costs on pedestrians and mass transport users, which in turn encourages faster growth of car ownership and inadequate urban mobility experience for mass transport captive riders (individuals who can't afford owning a private vehicle.

On the other hand,, the city has a tangible potential for a better mobility. High-Quality Mass Transport Services are planned to start operating by 2030. Unlike Central Greater Cairo, the city has wide roads, which can boost road space reallocation and design interventions in favor of active and mass transport in order to exploit the full potential of these High-Quality Mass Transport Services and ensure better connectivity between with intra-city mass transport network.





Passengers' Satisfaction Levels

Improvement priorities based on the results of the passenger satisfaction survey



Based on the passenger satisfaction survey and the ratings of each aspect of the public transportation service, we managed to produce an improvement priorities list. This list is separated based on the user type, car owner or public transport user. This way it became clear what qualities might encourage car users to start using public transport more and what qualities might make public transport users eventually stop using public transport.

For both users, comfort and safety are at the top of the list. Lack of comfort and safety negatively affects mass transport experience for captive riders, especially women. It also affects the competitiveness of the service, pushing people more towards private cars.

As a third place, both users have totally different priorities. For mass transport users, cost is a very important aspect that affects their experience and choices. Integrated ticketing might unlock new potentials for financial sustainability for the mobility system that can enable targeted subsidy schemes.

For private car owners time is an important aspect keeping them away from using public transport Bridging the gap can contribute to a modal shift towards mass transport



Data Requirements

Data Type	Data	Availability Status	Source	Last Updated	Notes
Geographic	Paratransit Network (Microbuses & Suzuki)	Available	Digital Cairo Project Transport for Cairo (TfC)	2018	
	CTA Buses and Minibuses Network	Available	Digital Cairo Project Transport for Cairo (TfC)	2018	
	NUCA Buses Network	Unavailable	NA	NA	
	Detailed Road Network (Roadway & Pedestrian network)	Available	NUCA and GOPP 2010	NA	
Statistical/Geo graphic	Ridership Data (CTA, MM & NUCA)	Unavailable	NA	NA	
Temporal	Schedules and Operating Times (CTA, MM, NUCA & Intra- City Paratransit)	Unavailable	NA	NA	
Statistical	Modal Share	Available	6O SUMP – Pax Survey Transport for Cairo (TfC)	2020	Household surveys are recommended for future surveys

Availability and quality of transportation data largely affect the quality of planning process and outcomes. High quality data enables a better understanding of the current status of urban mobility, precise modeling and projection for the future.

Progress towards the objectives of the SUMP and meeting the targets needs regular assessment based on the indicator framework. Therefore, appropriate actions are required by relevant the Transport Planning Unit of NUCA to ensure timely access to the relevant data and statistics.

The table to the left highlights the main data points needed for a better planning, their availability status and the latest versions available for each as identified by the consultant.





A City for Private Cars or for People



Step 3 - Scenarios

Scenarios help stakeholders better understand the likely combined effects that the measures discussed in a Sustainable Urban Mobility Plan will have. By illustrating different future situations, it allows them to assess independently the consequences of current trends, measures already programmed, and new policy choices. Examining the effects of these different scenarios enables you to set realistic targets for outcome indicators. (Rupprecht Consult – Forschung und Beratung GmbH et al., 2014)

ı. Objectives

- Describe different scenarios in a quantitative and qualitative way:
 - A business-as-usual scenario describes the development of actions that are already programmed implemented
 - Different alternative policy scenarios describe developments resulting from the choice of different policies and measures.
- Assess interdependencies between sectoral trends: Transport, land use, environmental, and economic development, demography, etc. Identify in a basic way synergies, potential for integration and negative effects of sectoral trends. An example for a reinforcing effect would be the use of a cleaner public transport fleet that could reinforce emission reductions for hot spots within a congestion-charging zone. A negative effect could be the isolated implementation of new "park & ride" locations that may trigger new urban development instead of reducing car traffic.
- Take into consideration the resilience of the transport system against expected or unexpected events.
- Incorporate previous analysis and models of 6th of October created by the consultant as part of previous projects
- Stimulate discussion of policy alternatives and their impacts with key stakeholders.



Scenarios



for Cairo

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This section aims at describing different scenarios in a quantitative and qualitative way:

- A Do Nothing scenario describes the development of actions that are already programmed implemented
- Healthy and Planned scenarios describe developments resulting from the choice of different policies and measures.

The process will be built on an assessment of interdependencies between sectoral trends: Transport, land use, environment and economy

The framework is built around Indicators developed to assess the current status and predict the future based on the influence of **Future** Variables of different scenarios.

The upcoming slides illustrate the detailed framework

Approach





Developing the different scenarios are based on certain indicators and future variables that together influence the future outcomes.

Indicators are chosen aspects that can act as comparison points between the current state and the future one.

Future Variables are aspects that affect the current situation, influencing the future scenarios.

As an outcome, different scenarios can be reflected, each being influenced by different future variables.

Indicators



Scenario



Trip Distances

External/ Influenced

Average distance of trips in different mobility modes, such as active travel, mass transit and private motorized



Eight indicators were chosen to represent different future scenarios. Most can be measured quantitatively, whereas; the quality of Public Services and Mobility Infrastructure is imagined qualitatively.

All Scenarios are equally affected by external indicators; which represent external forces.

The influenced indicators represent trends that affect the outcome of each scenario. Example: Modal Share is a result of citizens use of different modes of travel. Use is in turn influenced by the quality of the different modes.

This example further highlights how indicators are interlinked with one another. If the number of trips per person per day increases, the trip distances and Passenger km traveled (PkmT).



Population

External/Influenced

General Population growth as well as migration process in and from the city



PkmT

Influenced

A result of the estimated total trips taken across the population and the average distance of trips



Modal share

Influenced

Percentages of mode usages, divided into active travel, Mass Transit and Private Motorization



Air Quality

Influenced

Represented in the total amount of GHG and PMs produced by transportation activities



of trips per person/day

Influenced

Average number of trips taken per

person per day

Public Transport Service Quality

Influenced

The quality of public transport service measured through different indicators like comfort, travel time, safety etc.



Mobility Infrastructure Quality

Influenced

The quality of the mobility infrastructure serving vehicles, public transport and active travel mobility





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Future Variables



Scenario



Trends

External

External factors happening as a natural process of different urban sector



Measures

Planned / programmed

Factors that are already programmed and are implemented or will be in the coming future



Policy Choices

Optional

Policy choices set to achieve a certain goal in the future

Future variables are divided into three categories, trends, measures and policy choices.

Trends are external factors that happen as a natural process, like population growth, urbanization etc.

Measures on the other and, are programmed and planned factors, like projects that are being currently implemented or are planned to get implemented in the coming future.

While the previous two categories are factors that either will happen naturally or are planned to happen, policy choices are used as an optional factor to achieve a certain goal or scenario.







Scenario Alternatives



Scenario

Scenarios are usually analyzed in three:

- **Do-Nothing scenario**, where measures are not implemented. This could act as the worst-case scenario
- **Planned scenario**, where measures are implemented, and no further interference is taking place
- **Sustainable scenario**, where measures are implemented alongside policy choices towards positive targets. This scenario represents the scenario where the SUMP is being implemented



Do-Nothing Scenario

No interference

Describes development if measures already programmed are not implemented.





Planned interference

Describes development if actions that are already programmed are implemented with no additional interference.



Sustainable Scenario

Positive future interference

Describes development if measures already programmed have a successful impact. Policy choices are taken towards a positive direction.







Transport Demand Modelling





To conduct the quantitative side of the scenario analysis, indicators and variables were inputted together in a tabular spreadsheet. The spreadsheet contains a high-level and strongly simplified version of the **classical transport model**, which aims at predicting the total number of trips generated (Trip-Generation); a simplified distribution over space (Trip-Distribution); the choices of modes (Modal-Split); and the allocation of trips to modes (Trip-Assignment).

Some assumptions are made:

- Trip-generation is considered as inelastic, or independent of the quality of the system and equal across all scenarios;
- Base figures for Trip-generation and distribution are derived from the passenger survey, which gives rough estimates used for generation and distribution;
- New Public Transport Services (BRT/Monorail etc.) will attract their full daily ridership;
- All future scenarios will see a small level of motorization and trip activity due to rising national income

The model is validated using multiple data-points and calibrated manually. It works best to

- estimate aggregate future transport demand;
- The impact of expected infrastructure.

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Trends of 6th of October



- Overcrowding
- Decrease of air quality
- Increase of congestion



- car dominance favors certain income groups
 - Inequality
 - Social segregation
 - Underpopulated
 areas

Like most cities in Cairo, 6th of October goes through two main challenges: Population growth and urban expansion.

The population growth is mainly a natural trend happening based on the increase of the population but also an influenced trend happening based on people's migration to the city. As a consequence, there is an increase in the number of trips happening within and from and to the city. Unless certain measures are taken, this increase results in overcrowding, congestion and decrease in air quality.

Another trend is the urban expansion, which contributes to the increase of mobility demand. In some areas like in 6th of October, private vehicles are the dominating mode of transportation, which automatically favors certain social income groups that can afford using this mode. If certain interventions are not made to create a balanced prioritization in modal share, this could lead to inequality in the housing accessibility in the area as well as social segregation. All these aspects can result into underpopulated areas and thus in the decrease of the service quality provided in this city.





Do-Nothing Scenario / Congestion Scenario



"Prioritizing cars over public transportation and active travel would lead to a **sharp increase of congestion**, pollution, fatalities, and health problem."

Summary

- **150%** rise in Trips by Private Motorized Modes
- **Growing congestions** affects mass transport trip times and competitiveness.
- **Growing numbers** of road fatalities and accidents
- **75% rise in GHG emissions** which negatively affects the urban environment and quality of life
- **Growing Economic Losses** due to all of the above



Planned Scenario / Motorized Scenario



"Providing a mix of formal transit options would be accompanied by an **increase in private motorization and congestion** and increase health and environmental risks. Tendency to become like central Cairo"

Summary

- 68% rise in Trips by Private Motorized Modes
- Introduction of High-Quality Mass Transport Options, which result in a higher level of competitiveness within Mass Transport Modes
- Improvement of urban mobility options in general
- **21%** rise in GHG emissions lowering GHG emissions per capita by 39%



Sustainable Scenario / SUMP Scenario



Future Variable





Summary

- Limit the growth of Trips by Private Motorized Trips to 40%
- Score a 240% growth in Active Travel Trips within 60
- Prioritize Mass Transport Vehicles over private vehicles on the road which improves their competitiveness and reliability
- Limit the rise in GHG emissions at 7%. This means lowering GHG emissions per capita by 46%

[2] Scenarios / Outcomes

Modelled Modal Split by Scenario



Conclusion

The simplified transport demand model is useful to:

- to estimate aggregate future transport demand;
- the impact of expected infrastructure.

It further calculates a number of useful environmental indicators, such as Greenhouse Gas Emissions (GHG); GHG-density and Fleet requirements. The model can further be tweaked by editing variables such as Commercial Speed; Vehicle Capacity; Load Factor; Seat Turnover; Fuel Consumption and more.

The modelling is useful in learning some important points:

• The BRT and Monorail play a very important role, but are not the solution

At best, they would transport 12.6% of expected Trips

Heavy infrastructure projects such as the BRT and Monorail are required to handle the increase in passenger capacity, and could be responsible for almost \sim 25% of short and long commutes. Possibly even more during peak-hours However, they will not play significant roles for travel within 6th of October. Even in the sustainable scenario, the total number of private cars, paratransit vehicles and formal transport buses would still increase compared to the present, by 4%, 30% and 400% respectively.

• Motorization risks getting out of control

The demand for road space could more than double over 10 years

If left unchecked, the number of private cars on the road will more than double, while the number of paratransit vehicles would increase by ~75%. This would stress the road network and cause central-Cairo style traffic congestion. It is imperative that any future policy recommendation not only manage road capacity but traffic; but manage (and reduce) demand for private cars and parking.

• Increasing Formal Public Transport is inevitable, but Paratransit would still remain dominant

At Best, NUCA would have to grow ridership 25x, Public Bus Services 6x and paratransit be limited to ~45% growth.

Even with the BRT and Monorail at full capacity, formal services would need to grow considerably, and paratransit managed well. Increasing ridership by 25 times is a difficult undertaking, and requires strong customer acquisition. To attract, and maintain, so many riders smart policies are needed: Managing, and limiting, the growth of the paratransit sector; providing a powerful user experience; limiting the journey gap between transit and private modes; transport-demand management, parking management, complete streets and many more.

The modal shares of the sustainable scenario are best understood as targets, rather than predictions. Policies and projects should aim to fulfill these targets.

(Ortuzar, Luis G. Willumsen)



Step 4 - Vision

What kind of city do we want 6th of October to be? How will it differ from other New Urban Communities? How can the experience inform and be re-applied in other New Urban Communities?

These are the central questions that need to be answered by a visioning exercise involving all stakeholders. A vision provides a qualitative description of a desired urban future and serves to guide the development of appropriate planning measures. It needs to place transport and mobility back in the wider context of urban and societal development. The vision should be prepared taking into consideration all policy perspectives concerned, especially general policy frameworks (e.g. Sustainable Development Strategy 2030, Ministry of Transport Ongoing Projects, other strategic plan), urban and spatial planning, economic development, the environment, social inclusion, gender equity, health and safety. (Rupprecht Consult – Forschung und Beratung GmbH et al., 2014)

Objectives

- Elaborate a draft vision and discuss with stakeholders
- Publish the vision in an easy-to-understand format



[3] Vision

Vision

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



Vision /Objectives and Goals



Smart

Digitally-driven, selffinanced operations, lowemissions, and publicly accepted

- Introduce intelligent transport systems (ITS)
- Encourage expansion of service by selffinanced operations



Safe Streets

Zero death, zero roadcaused injuries and zero security incidents

- Create safe streets with zero road injuries and accidents
- Increase safety
 measures in public
 transportation
- Develop effective reporting mechanisms for harassment, theft and other violent acts in mass transportation and streets.



Integrated Streets

Streets which promotes attractive whole-journey experiences for all users

- Create welcoming streets for all, including vulnerable groups
- Improve air quality through adequate street design and low-emission mobility options



Attractive Active Travel

- A third of trips within 6th of October are active
 - Improve quality of infrastructure for pedestrians
 - Introduce
 infrastructure for
 cycling



Competitive and available Mass Transportation

Competitive Mass Transit Services for all

- Improve city's internal mass transport network in terms of geographic coverage, trip times and quality of service.
- Optimizing formal mass transport services
- Professionalize the paratransit system
- Limit private motorization increase to **42%**





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Thank you

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Passengers' Survey / Questionnaire Designs

Meta Data	Answer Type
1. Date Collected	Automatically Recorded
2. Start and End Time	Automatically Recorded
3. User	Automatically Recorded
4. Location (Latitude/Longitude)	Automatically Recorded
Demographic Data	Answer Type
1. Respondent's Gender	Multiple Choices (Choose one)
2. How old are you?	Multiple Choices (Choose one)
3. Are you employed?	Multiple Choices (Choose one)
4. How much is your monthly income?	Multiple Choices (Choose one)
General User Experience (Present and Past)	Answer Type
1. Do you have access to the mobility modes (listed)	Multiple Choices (Choose multiple)
2. Where do you live?	Short String
3. Where do you work or study?	Short String
4. How many trips do you make daily?	Integer
5. Has your daily trip number changed in the last 3 years?	Multiple Choices (Choose one)
6. Has the distance of your daily commute changed in the last 3 years?	Multiple Choices (Choose one)
7. Has your modal choice changed in the last 3 years?	Multiple Choices (Choose multiple)
8. How much time do you spend in your daily trips?	Integer
Special Questions for Unusual Modal Choice	Answer Type
1. Do you use any modes apart from private car in 2+ kilometers trips?	Multiple Choices (Choose multiple)
Do you cycle for 2+ kilometers trips?	Multiple Choices (Choose one)
Questions about Trips (Groups unlocked based on number of trips)	Answer Type
3. What is trip's purpose?	Multiple Choices (Choose one)
4. What is the level of the trip?	Multiple Choices (Choose one)
What are the modes used in the trip?	Multiple Choices (Choose multiple)
6. How much is the total trip fare?	Integer
Current level of satisfaction with the public transport service	Answer Type
1. Public Transport takes you where you want to go?	Multiple Choices (Choose one)
Public Transport takes you when you want to go?	Multiple Choices (Choose one)
Public Transport is a good use of your time?	Multiple Choices (Choose one)
4. Public Transport is a good use of your money?	Multiple Choices (Choose one)
5. Public Transport is safe?	Multiple Choices (Choose one)
6. Public Transport is comfortable?	Multiple Choices (Choose one)
Public Transport gives you freedom of choice?	Multiple Choices (Choose one)
Personal preference in potential service improvements	Answer Type
 What are your top three areas of improvements for Public Transit? 	Multiple Choices (Choose multiple)
Current level of satisfaction with the private mobility experience	Answer Type
1. How do you rate trip time?	Multiple Choices (Choose one)
How do you rate availability of parking spaces?	Multiple Choices (Choose one)
3. How do you rate mobility costs?	Multiple Choices (Choose one)
Personal preference in potential infrastructure improvements (for Private Vehicles)	
1. What are your top three areas of improvements for Private Mobility?	Multiple Choices (Choose multiple)
Priorities of mass transport service improvements for modal shift	
1. What are your top three areas of improvements for Public Transit to consider modal shift?	Multiple Choices (Choose multiple)
Extra comments	Answer Type
1. Do you have any extra comments?	Long String
2 Field Researcher's qualitative notes	Long String





The questionnaire was designed to be administered in under 10 minutes, to maximize the response rate and limit respondent's fatigue. Multiple-choice questions were mostly used to allow for statistical analysis and eventual comparison. String questions were limited to questions that require string or numerical input, e.g., Trip Fare and Extra Respondent's Comments.

The survey was made available through the mobile application in Arabic. Surveyors were allowed to ask the question in Egyptian Dialect based on the training notes.

The final choice of questions shown in Table I had been iterated over multiple times before getting administered widely; and incorporated feedback from surveyors and the consortium partners.

The questions can be grouped into the following eight categories:

I.Demographic information about the respondent

2.Questions about the respondent's general mobility experience.

3. Questions about the respondent's trips

4.Special Questions for unusual modal choice for cyclists and private car drivers

5.Current level of satisfaction with the public transport service

6.Personal preferences of public transport future service improvements

7.Current level of satisfaction with the private mobility experience

8.Willingness to adopt new modes of mobility

Detailed question of each category is shown in the table on the left.

Passengers' Survey / Data Collection Factsheet

Total Respondents	-	(1534) 100%		X				2 Jan F
Distribution by Gender	Males	(723) 47%			- Committee	1220 10		for a series
	Females	(811) 53%						
Distribution by	Central Districts	(920) 60%		XX	nden	-		
Geography	Fringe Districts	(614) 40%			-			OF THE
	18 – 25	(714) 46.6%						
	26 - 35	(398) 26.0%						a the second
Distribution by	36 - 45	(268) 17.5%						
Age Group	46 - 55	(126) 8.2%			0			
	56 - 65	(25) 1.6%	134	0	O			
	Older than 65	(1) 0.1%		0 00				A // 988 9
Distribution by	Employed	(861) 56.2%		and a constant		- 0		
	Unemployed (used to work)	(2) 0.1%	Ø -	5	1			
	Unemployed (never worked)	(2) 0.1%		0			0	
Employment Status	Student	(591) 38.6%		00				
	Housewife	(59) 3.9%	0					
	Retired	(4) 0.3%						
	0 – 1800 LE	(74) 4.82%		0				
Distribution by Income Level	1800 – 2400 LE	(172) 11.2%						
	2400 – 3300 LE	(341) 22.2%						
	3300 – 5250 LE	(244) 15.9%						Logand
	5250 – 10500 LE	(59) 3.9%						Legend
	More than 10500 LE	(5) 0.3%						Adminstrative
	Not stated	(639) 41.7%						GCR Inner [189]
Temporal Distribution	Working Day	(1242) 81%	2.5 5 k	m				6 October (Fringe District) [28]
along the week	Weekend	(292) 19%						6 October (Central District) [

The Field Research Team administered the survey based on the pre-prepared sampling strategy). The table shows basic statistics from the actual survey results.

Gender ratio: 53% males to 47 females. [within range]

• Workdays to weekends 81% to 19%. [tolerable shift from range]

Geographic distribution: 60% in Central Districts to 40% in Fringe Districts. [within range]





Passengers' Survey / Modal Share at present

Long_Commute_30+	Short_Commute_10-30	Inter_District_2-10	Intra_District_0-2	
5.8% (89)	6.9% (69)	15.7% (328)	60.3% (234)	Active Travel
3.2% (49)	0.3% (3)	0.7% (14)	- (NA)	Formal Buses (CTA and MM)
3.0% (46)	0.7% (7)	- (NA)	- (NA)	Metro
- (NA)	1.3% (13)	0.3% (7)	- (NA)	NUCA Buses
46.4% (708)	39.0% (390)	16.1% (336)	4.1% (16)	Microbuses
17.6% (269)	30.8% (308)	47.2% (985)	14.7% (57)	Suzuki Mini Vans
1.2% (19)	0.5% (5)	- (NA)	- (NA)	Minibuses (Other)
3.1% (48)	2.8% (28)	1.5% (32)	0.5% (2)	Private Bus (Company , School)
2.0% (30)	0.5% (5)	1.1% (24)	0.8% (3)	Peak Only Services (Uber Bus, Careem Bus, SWVL)
8.5% (130)	7.1% (71)	7.8% (162)	11.9% (46)	Informal Private (Tok Tok)
8.3% (126)	7.6% (76)	7.5% (156)	7.2% (28)	Privately Owned Car
- (NA)	0.7% (7)	0.4% (8)	0.3% (1)	Privately Owned Motorbike
0.9% (13)	1.8% (18)	1.7% (35)	0.3% (1)	Ride hailing Services (Careem, Uber)
100.0% (1527)	100.0% (1000)	100.0% (2087)	100.0% (388)	





Passengers' Survey / Modal Share at present



Methodology:

To estimate the modal share, survey respondents described their most likely daily trip pattern. Each respondent could provide up to 4 trips; and describe the sequence of modes used per trip.

How to read:

A total of ~3600 trips were described. This table synthesizes the dominant mode in each itinerary.

- Values in **orange** denote the percentage by mode, i.e. "What is the share of Active Travel across each Trip Category.?"
- Values in **blue** denote the percentage by Trip category, i.e. "What is the modal share for Long-Distance Commutes?"

Key Results:

 Most short trips are walked or cycled (Active Travel). But, there are few short trips due to geography of 6th of October.

• Paratransit dominates!

• The longer the trip, the more likely passengers are to take a private car.





Passengers' Satisfaction Level

Geographic Coverage







Passengers' Satisfaction Level

Schedule Reliability







Passengers' Satisfaction Level

Travel Time





Private Vehicle Owners It is good use of my time PT_R_R_4_TripT



Female Respondents It is good use of my time PT_R_R_4_TripT



Male Respondents It is good use of my time PT_R_R_4_TripT


Travel Cost







72

Safety







73

Comfort









It respects me in the level of comfort, and an PT_R_R_6_Com

 Male Respondents

 It respects me in the level of comfort, and an PT_R_R_6_Com



Freedom of Choice







75

Street Design Elements / Al-Hosary Square [1] Footpaths



△ Better example of footpath: Availability of shading, better zoning of street furniture in relation to pedestrian movement and consistent grade.



P Bad example of footpath: lack of shading, conflict between street furniture and pedestrian movement and grade differences.



#	Diagnostic Aspect	Rating	
1	Continuity, accessibility and width		
2	Comfort (shading and seating)		
То	tal Score		

Pedestrian movement is highly dependant on the availability of continuous footpaths with sufficient width, minimal grade differences, efficient zoning of activities and enough shading. This applies to [1] through movement or [2] transitional movement between different modes of transport

Footpaths in Al-Hosary square and 6th of October in general lack continuity, consistent width and shading. This disincentivizes pedestrian movement and often forces pedestrians to walk on roadways especially in the peak-hours that witness a larger flow of pedestrian and motorized traffic.





Street Design Elements / Al-Hosary Square [2] Pedestrian Crossing



△ Relatively better, but still problematic, example of pedestrian crossing: The speed bump (traffic-calming element) does force vehicles to slow down prior to the zebra crossing. However, pedestrians are still left in conflict with vehicles.



 \bigtriangledown Ineffective example of pedestrian crossing: absence of traffic calming elements allows fast movement for vehicles.



Street crossing is an integral part of pedestrian movement. Availability and adequacy of street crossing options highly affects accessibility and safety for pedestrians.

Al-Hosary Square lacks sufficient crossing options for pedestrians. Zebra crossings are only located around the fenced median island in the 3 points shown on the map. Only point (1) is paired with a traffic calming element (speedbump) to force vehicles to slow down.

This leaves the majority of the square without any specific and safe pedestrian crossing options. Instead, unsafe pedestrian crossing at random locations is left as the only option.





Street Design Elements / Al-Hosary Square [3] Median & Pedestrian Refuges

Diagnostic Aspect

Accessibility and width

2 Frequency of median breaks



A Relatively better example of medians: sufficient width acts effectively as a refuge for crossing pedestrians and also accommodate pedestrian movements especially in segments with limited footpaths on the roadside.



 \mathbf{P} Bad example of medians: the limited width forces pedestrians to step into the roadway while waiting for traffic to clear.



Score

Medians aim at reducing conflict between traffic moving in different directions and provide refuge for pedestrians in their ways across streets, especially in wide streets such as Al-Mehwar Al-Markazi.

We look at:

- Availability of effective medians with sufficient width.
- Frequency of median breaks

Medians in Al-Hosary Square are inconsistent, and with limited width in crossing areas. Pedestrians tend to unsafely step into the roadway waiting for traffic to clear

An important distinction should be made between offering pedestrians refuge, and managing traffic through distant median breaks.

The Availability of wide medians at few segments provide alternative footpaths for pedestrians, considering the lack of adequate footpaths on the roadside. Such median-footpaths, while continous, are often not attractive due to exposure to traffic and weather conditions.





1

Total Score

Street Design Elements / Al-Hosary Square [4] On Street Parking



Parallel parking is the most efficient layout in terms of number of cars to area occupied. It also causes the least disruption for traffic and pedestrian accessibility as it produces more in between spaces



Perpendicular parking occupies more space and causes more interruption for the moving traffic. It also allows drivers to park their vehicles too close to each others which limits the in-between spaces for pedestrians to access footpaths.



On-street parking is widely common, especially in active urban nodes like Al-Hosary Square. On-street parking often accumulate organically around points of interest especially when it's free of charge and because of the lack of formally managed parking spaces.

On street parking occupy most of the roadside in Al-Hosary Square. Vehicles are parked in a mix of formations including parallel, perpendicular and angular. Parking activities often cause conflict with pedestrians and moving vehicles. In rush-hours, vehicles are found parking over pedestrian footpaths where accessible.

Availability of free and unrestricted onstreet parking serves as an indirect subsidy for private motorized mobility that disincentivizes desirable modal shift towards sustainable mobility alternatives.





Street Design Elements / Al-Hosary Square [5] Traffic Calming



△ Relatively better example of pairing pedestrian crossing with a speed bump (traffic calming element). However, the speed bump doesn't efficiently solve the conflict between pedestrian and vehicular movements.



♥ Absence of traffic calming elements allow drivers to violate pedestrian crossing zones with high speed.



Traffic calming is of a paramount importance to safety of both pedestrians and vehicles by reducing vehicular speed.

Al-Mehwar Al-Markazi reaches as much of 70 meters wide in some sections. Curb radiuses are large enough to allow drivers to take turns on high speeds. With this significant lack of traffic calming elements, such as speed bumps and traffic lights, demonstrate a high level of priotrization of vehicular movement at the expenses of pedestrian safety, which contributes to a modal share dominated by private motorized mobility.





Street Design Elements / Al-Hosary Square [6] Bus Stops



△ Better example of bus stop: easy to identify, provide waiting space for passengers and close to pedestrian crossings (100 meters away). However, stop's capacity, safety and comfort conditions need improvement.





Bus stops are the interface between the street and a city's public transport system. They can help make the bus network usable and attractive to city residents.

6th of October city lacks adequate bus stops. Passengers' boarding and drop off is entirely demand-based at any point on the route. Public transport vehicles often occupy the roadside to get passengers from areas of interest,

Al-Hosary Square hosts 3 major intracity transport terminals:

I - Suzuki Mini-Vans Terminal

Informal terminal with no identifiable shelter within suitable distance of a pedestrian crossing.

2- Mandoline Minibuses Terminal

Formal terminal with an identifiable shelter within suitable distance of pedestrian crossing.

3- Intra-city Microbuses Terminal

Informal terminal with no specific geographic boundaries or identifiable shelters.





Street Design Elements / Al-Hosary Square Road Space Allocation





مواصلت Transport و مواصلت فقاد المعامر معامر م معامر معامر معامر معامر المعامر المعامر المعامر المعامر المعامر المعامر المعامر معامر مع The bias towards private motorized modes of mobility, and missing focus on active travel, is highlighted further by analyzing two street sections and assessing the width of the road, in percentage terms, allocated towards different modes:

Mass Transit and Private Motorization share vehicular lanes. No right-of-way exists for mass transit.

Active Travel is given a very low percentage of street width. (between 7% and 18%) Despite the high width of streets, no dedicated facilities for cycling exist.

Street Design Elements / 6th District [1] Footpaths





P Bad example of footpath: limited width, zoning conflict between pedestrian zone and footpath furniture, poorly maintained surface.





P Bad example of footpath: Good width but with conflicting zoning between pedestrians, street vending and parking.

Footpaths in the 6th district lack continuity, consistent width and shading. This disincentivizes pedestrian movement and often forces pedestrians to walk on roadways or use motorized alternatives such as Tok-Toks as alternatives for short distance trips.

Recurrent problems include the following:

- Inconsistent footpath levels and surface conditions.
- Inconsistent width due to design errors or conflict between private and public property. I.e. fenced footpath sections.
- Zoning conflicts between different uses such as pedestrian flow, street vending, parking and footpath furniture.



Street Design Elements / 6th District [1] Footpaths



☆ good example of footpath: consistent width and level with good shading provide safe walking environment.



P Bad example of footpath: limited width and danegerous change of levels make walking unsafe.

STIFTUNG





☆ good example of footpath: mixed use, consistent width and level with good shading provide safe walking environment.

Fragmented distribution of buildings in residential areas unlocks the potential of using the intermediary spaces between them as a pedestrian-only network. Using these spaces as parallel pedestrian networks away from motorized mobility can induce more dependency on active modes, especially for intra-district trips.

A pedestrian-only network can also provide multi-use spaces for social activities and safe areas for children to play. This mix of activities maximizes the perceived safety of walking, especially during the night.

 # Diagnostic Aspect
 Rating

 1
 Continuity, accessibility and width

 2
 Comfort (shading and seating)

Total Score



Street Design Elements / 6th District [2] Pedestrian Crossing



P Bad example of street intersection: Wide carriageway with no safe crossing option.



P Bad example of pedestrian crossing: Ineffective zebra crossing with no enforcement on vehicles to slow down.





P Bad example of street intersection: Wide carriageway at a main entrance for the district (Laylat Al-Qadr square) with no safe crossing option.

The 6th district lacks pedestrian crossing options. Major streets such as Al-Central and Al-Mazni suffer more from the absence of safe crossing options because of their relatively higher vehicular speeds. In some locations, zebra crossings are available but with no enforcement for vehicles to slow down by traffic calming elements. This makes available crossing options inefficient,

Absence of safe pedestrian crossing options induces pedestrians unsafe crossing at random places. Vehicular oriented street design produces higher dependency on private modes of transport such as private cars or Tok-Toks for short intra-district trips.

Street Scope

District Administrative Boundaries ____

#	Diagnostic Aspect	Rating		
1	Availability & Location			
2	Effectiveness			
То	tal Score			





Street Design Elements / 6th District [2] On Street Parking



 ⊕ Bad example of on-street parking: Angular and perpendicular parking layouts produce more interruption of traffic by maximizing road space needed for maneuvering.



 \bigtriangleup Good example of on-street parking: Parallel parking is the most efficient parking layout that causes the least interruption to traffic.







 \bigtriangledown Bad example of on-street parking: lack of enforcement and physical protection of footpaths allows vehicular access to them as safe parking spaces.

In the 6th District, on-street parking is not common in the core residential area except for limited number of residents' vehicles. However, on-street parking is concentrated around points of interest such as [1] Egypt Post branch and [2] the agglomeration of car repair shops at Al-Mazni Street.

Land uses such as car repair shops induce extra demand for parking. Formal supply of parking through organized parking spaces is likely to fall short.

Inefficient management of parking activities in residential neighborhoods hinders pedestrian accessibility. Thus, parking demand management interventions, such as land use reforms, are needed.





Street Design Elements / 6th District [2] Traffic Calming Element



P Bad example of traffic calming: absence of traffic calming elements at a main entrance (Laylat Al-Qadr) accompanied by large radius curbs allow high vehicular speeds.



Better example of traffic calming: a sequence of speed bumps forces drivers to slow down in Mohamed Karim Street. Some of them seem to be informally installed by the residents though.



Total Score



P Bad example of traffic calming: absence of traffic calming elements at an agglomeration of services in Al-Mazni Street allows high vehicular speeds that negatively affect pedestrian flow and safety.

The 6th District endures severe shortage of traffic calming elements necessary to control vehicular speeds. Apart from a sequence of speed bumps in Mohamed Karim Street [1], there's no traffic calment elements installed in major intersections and points of interest such as Laylat Al-Qadr [2] and a commercial agglomeration at Al-Mazni Street [3]

Lack of traffic calment elements negatively affect pedestrian flow and safety inducing more dependency on motorized modes of transport..





Street Design Elements / 6th District [2] Traffic Calming Element



P Bad example of bus stop: absence of properly designed bus stop at the main entrance of the district (Laylat Al-Qadr Square) causes traffic interruption.



P Bad example of bus terminal: absence of proper zoning of the terminal within the streetscape causes random parking of mass transport vehicles and violation of pedestrian pathways.



The 6th District completely lacks adequate bus stops. Mass transport drivers tend to stop randomly to pick up or drop off passengers and therefore interrupt the traffic [1]

Mass transport terminals suffer from inadequate zoning within the streetscape. Drivers tend to park in inconsistent and random locations, including pedestrian footpaths [2]. Inadequate zoning weakens the interface between users and mass transport, contributing to unreliable mass transport services that are less identifiable and usable,

Inadequate zoning of mass transport services acts as an indirect incentive for a modal share that's dominated by private motorized modes of transport.





Assessment of Modes

	Mode	Modal Share	Quality of Infrastructure Bad – Medium – Good	Safety, Environment, Health Status Bad – Medium – Good	Current Status, Implementation of Measures Bad – Medium – Good	License	Analysis for modes What needs to be done?	
Mass Transit	Formal Bus	1.5%	Stops Terminals	- Shared Mode - Run on Diesel - First/Last Mile Trips - Safety	High Activity NUCA Buses STP & MM Monorail & BRT	СТА	Optimize for Competitiveness	
	Formal Bus (NUCA Buses)					NUCA		
	Paratransit (Minibus Other License)	71%	Stops Terminals	- Shared Mode - Run on Diesel/Petrol - Hailed Stops - High Speed Service - High Coverage - Safety	Low Activity	Cooperatives Law No.124/1975	Professionalization of the sector	
	Paratransit (Microbus 60 / Other Licenses)					Paratransit Law No. 124/1974 & NUCA		
	Paratransit (Suzuki)					NUCA		
Peak-Only	Ride-hailing Bus (SWVL / Buseet / Careem Bus / Uber Bus)	2.5%	Stops Terminals	- Shared Mode - Run on Diesel - High Speed Service	Low Activity	Prime Minister Decree No. 2180/2019	Integration with Mass Transit Network	
	Private Bus (Company / School Fleet)			- Shared Mode - Run on Diesel - High Speed Service		Touristic Vehicle License	NA	
Private Motorization	Ride-hailing (Careem / Uber)	9%	Stops	- Private Mode - Run on Petrol - Parking	Low Activity	Prime Minister Decree No. 2180/2019	Traffic Calming Transport Demand Management	
	Paratransit (Tok-Tok / Other)			- Private Mode - Run on Petrol - Parking				
	Private Car	8%	Parking Road	- Private Mode - Run on Petrol - Parking	High Activity New Roads & Flyovers Pedestrian Bridges	Traffic Law	Parking Management	
	Private Motorcycle			- Private Mode - Run on Petrol				
Active	Active Travel (Walking / Cycling)	7%	Cycling Networks Pedestrian Bridges Pedestrian Paths Crossings	- Low Use - Safety (Road Fatalities)	Low Activity	-	Traffic Safety Reallocation of Road space	
Analysis (Aspect) Good — Medium - Bad		Mass Transport Dominated Modalshare	Private Car Dominated Infrastructure	- Traffic Safety - Congestion - Air Quality	No attention towards Walking and Cycling			
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