



Networks of the Megacity

The story of mapping Cairo's integrated Metro, Bus and Informal transit network.

Egyptian citizens waiting for a bus at an Informal Bus Station at Gamee't El-Dowal boulevard

2012



Image Courtesy: NASA Goddard Space Flight Center Image by Reto Stöckli (land surface, shallow water, clouds). Enhancements by Robert Simmon (ocean color, compositing, 3D globes, animation). Data and technical support: MODIS Land Group; MODIS Science Data Support Team; MODIS Atmosphere Group; MODIS Ocean Group Additional data: USGS EROS Data Center (topography); USGS Terrestrial Remote Sensing Flagstaff Field Center (Antarctica); Defense Meteorological Satellite Program (city lights).

1972



Image courtesy NASA Johnson Space Center

1968

Image Courtesy Nasa



Policy Gap #1

Image Courtesy Nasa

Public Transport is invisible



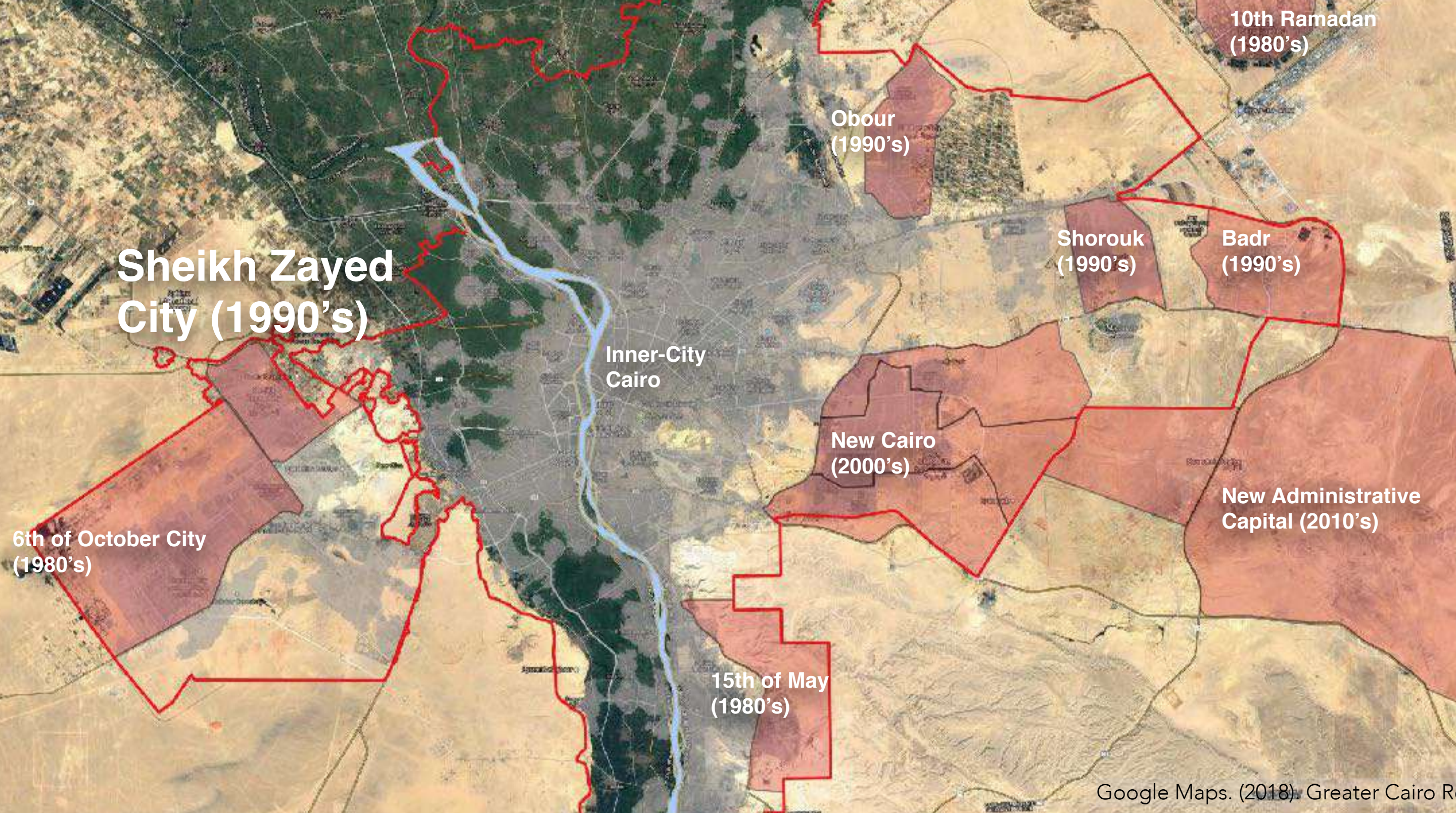
Policy Gap #2

Congestion is incurable



Policy Gap #3

Is urban development leading to the urban mobility future we want?



Let's talk about accessibility

Housing policy

New Desert Communities 'NDC'





Walkable



non-motorized transport NMT infrastructure



no traffic lights

A photograph of a dirt road in a rural or semi-rural area. In the center of the road, a young tree is planted in a circular concrete barrier. To the left, there is a utility pole with several power lines stretching across the sky. A brick wall is visible on the far left. To the right, there is a large green tree with red flowers. In the background, there are some buildings and a clear blue sky. The text "improvised mobility control measure" is overlaid at the bottom of the image.

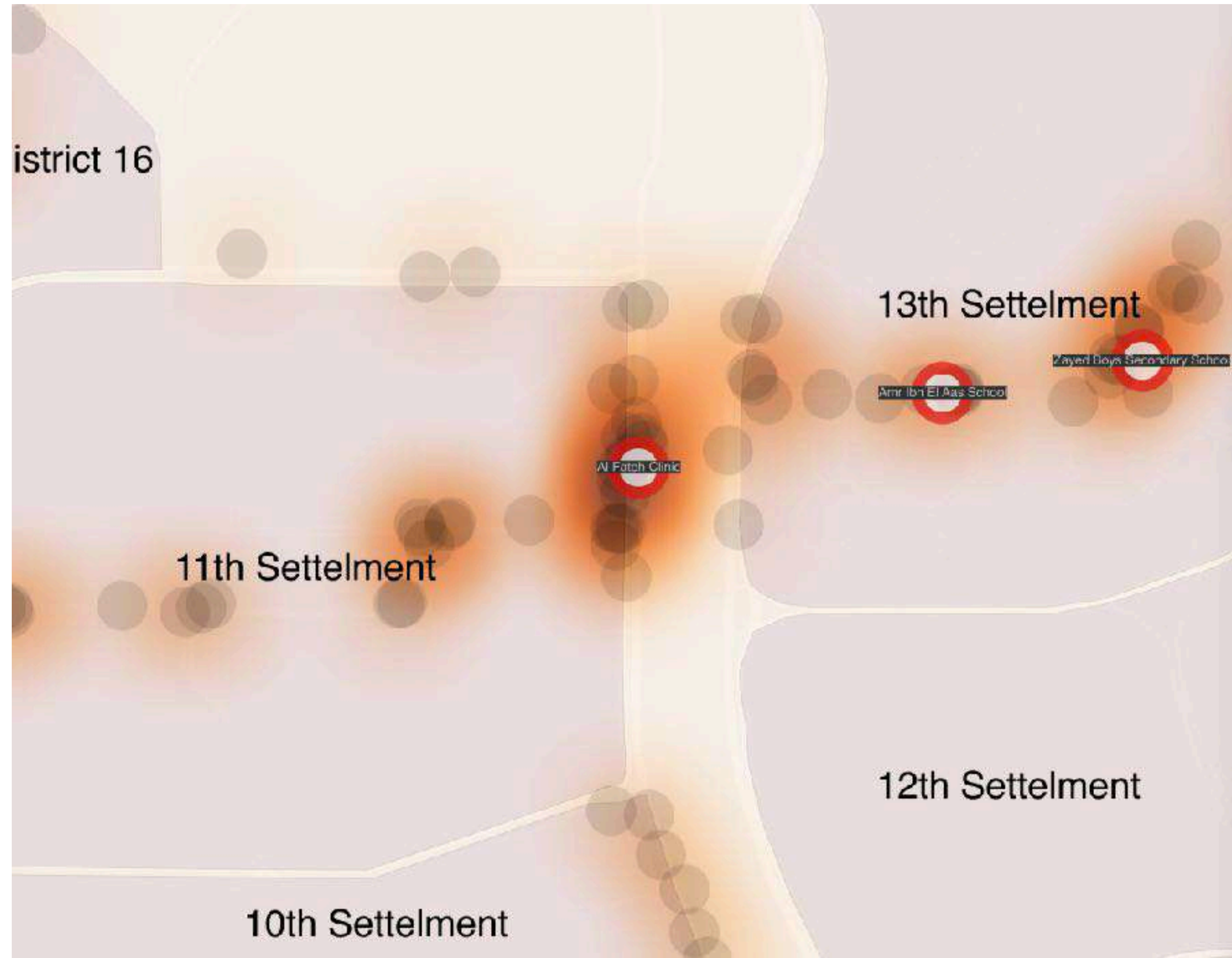
improvised mobility control measure

Friday Prayers - by car



2) Where is my stop?

What if they were centralized in a clear network?



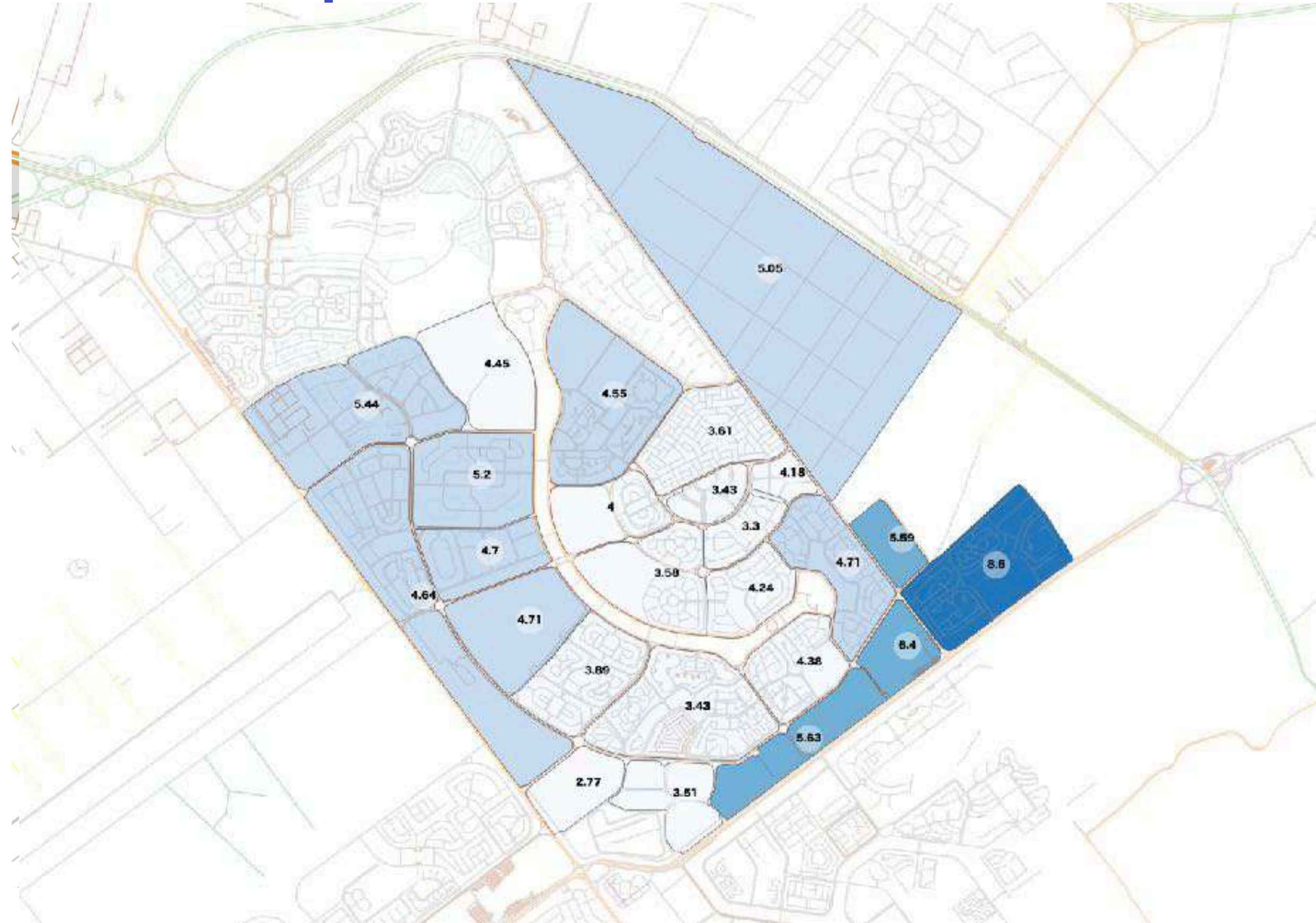
Policy Gap - New urban developments have an accessibility problem

Can you spot people? (or the Suzuki?)



What we do #2

Make public transport understandable



More Accessible

Less Accessible

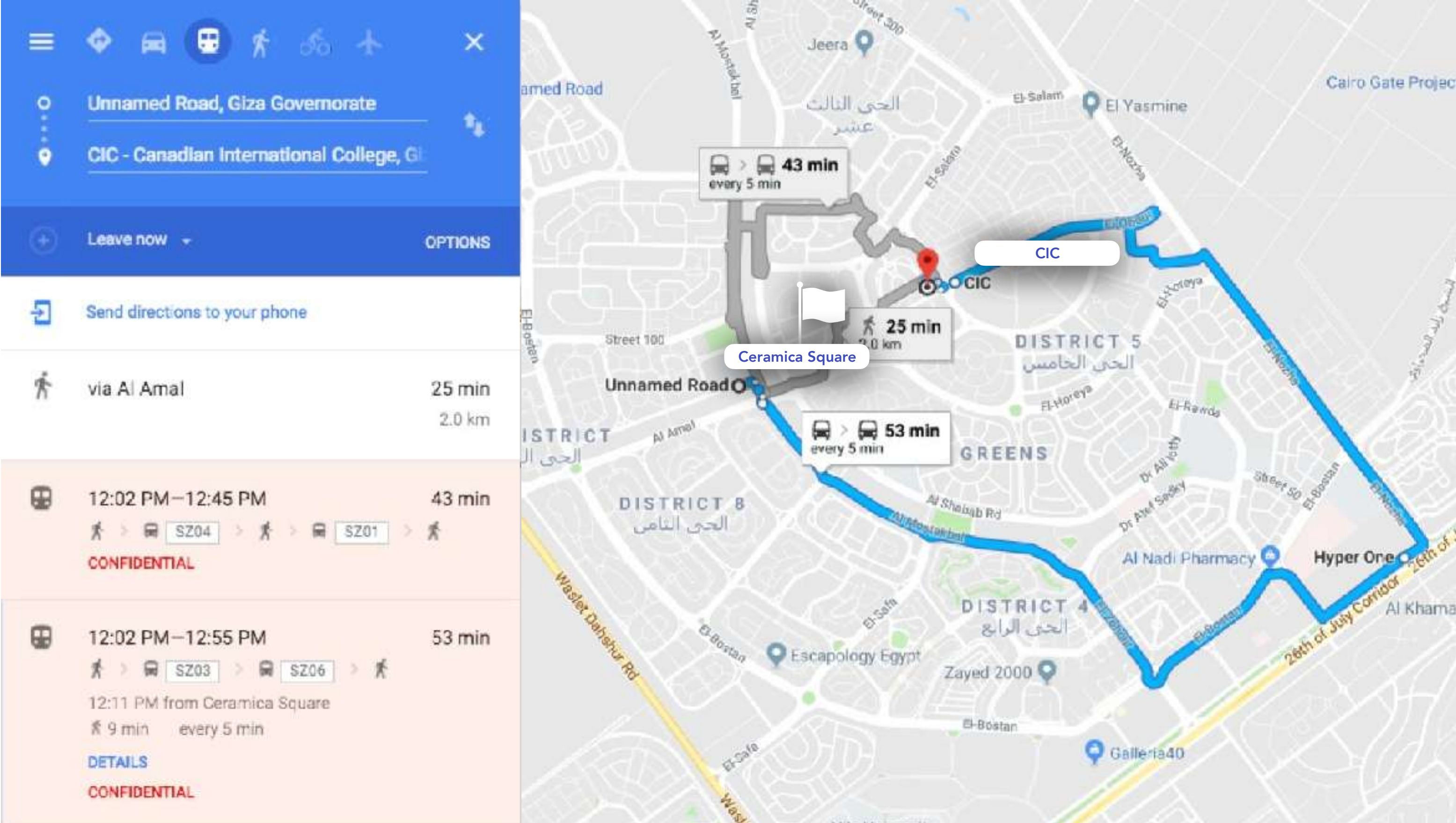
PMI

Potential Mobility Index

Speed in Km/H of travel in all directions using public transport














What we do #2 - Make public transport understandable

PT is a good use of my time & gives me freedom to change my plans



Unnamed Road, Giza Governorate
 CIC - Canadian International College, Gi...

Leave now OPTIONS
 Send directions to your phone

	via Al Amal	25 min	2.0 km
	12:02 PM–12:45 PM	43 min	 >  SZ04 >  >  SZ01 >  CONFIDENTIAL
	12:02 PM–12:55 PM	53 min	 >  SZ03 >  SZ06 >  12:11 PM from Ceramica Square  9 min every 5 min DETAILS CONFIDENTIAL

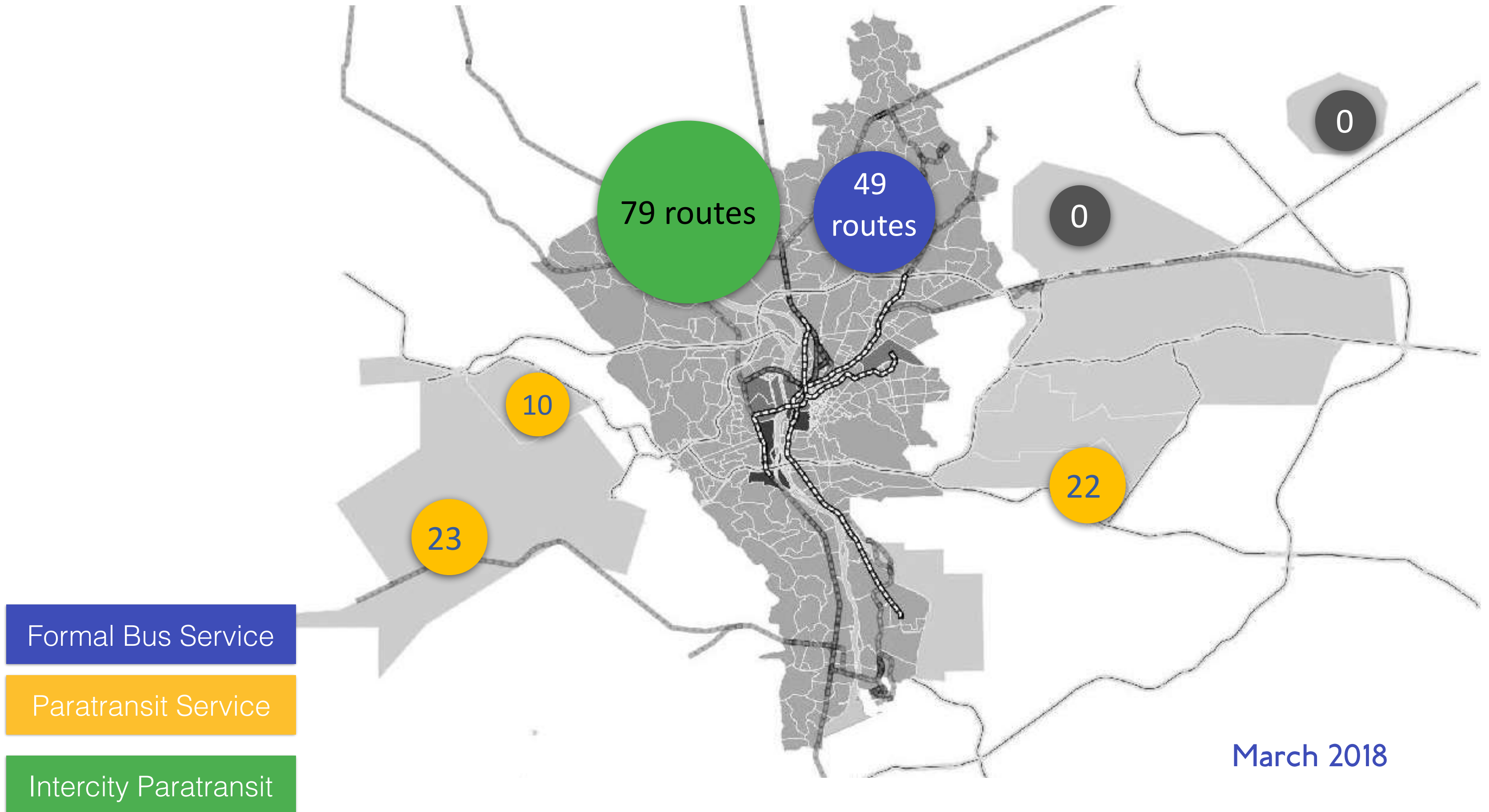
What we do #1 - Make public transport visible

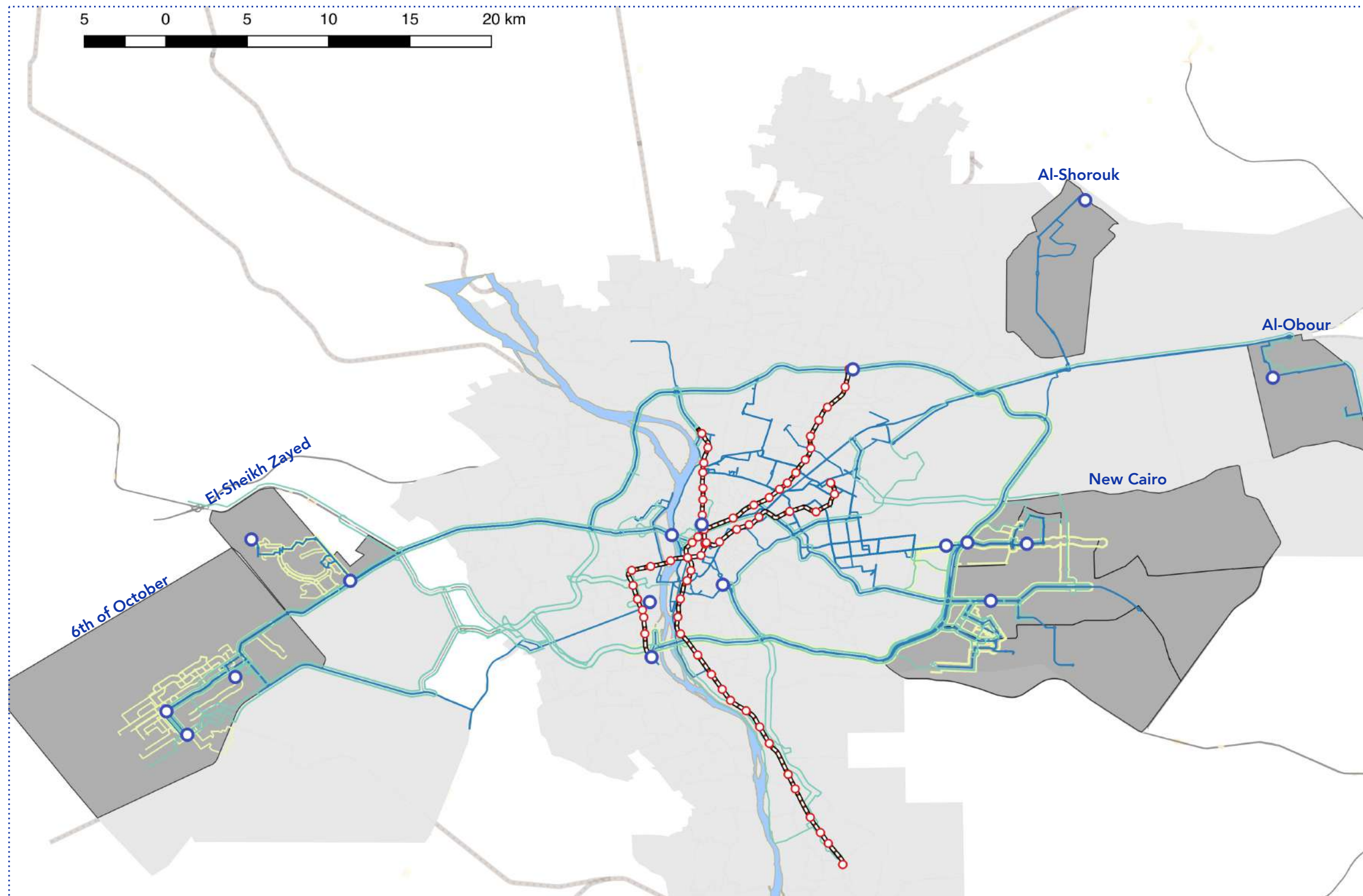
Integrated Metro, Bus and Paratransit network



What we do #1 - Make public transport visible

Cairo's metropolitan scale mapped





Intercity Paratransit

Abdel Moneam	CA85	El Hossary
	CA83	El Hossary
Al Moassasa	CA30	District 6
	CA46	Mehwar Desert Rd
	CA48	Laylat Al Qadr
	CA52	El Hossary
	CA50	El Hossary
Al Sayeda Aisha	CA93	Kattameyya Church
Al Souq Al	CA01	Al Moassasa
	CA03	Daewoo
Badr	CA67	Mehwar Desert Rd
Bonook	CA87	Al Sayeda Aisha
	CA12	Ramses
	CA12	Helwan
	CA13	Alf Maskan
	CA13	Sagr Quraish
Dandy Mall	CA99	Mehwar Desert Rd
	CA10	Haram Mashaal
Dawaran Shubra	CA44	Shorouq
District 6	CA33	Haram Marioteyya
	CA40	Ramses
	CA36	Ramses
El Hossary	CA26	Dolce
	CA11	Haram Marioteyya
	CA12	Zahraa Madinet Nasr Suez
	CA14	Helwan
	CA15	Awwal Makram
	CA15	Manyal
	CA81	Giza Square
	CA11	Haram Marioteyya
	CA14	Helwan
	CA15	Madinat Al Talaba
	CA65	New Marg
	CA97	Ramses
FUE	CA13	Asher Men Ramadan
Gas	CA12	Al Mostafa
	CA10	Haram Marioteyya
	CA12	Sagr Quraish
Giza Square	CA34	District 6
	CA19	El Hossary
Haram Marioteyya	CA11	Basateen
	CA10	Zahraa Madinet Nasr
Hay Asher	CA20	Shabab Entrance
Hyper	CA11	Dandy Mall
	CA07	Giza Square
	CA13	Haram Marioteyya
	CA15	Haram Mashaal
	CA03	New Marg
	CA05	Moneeb
	CA17	Asher Men Ramadan
	CA19	Ramses
	CA21	Madinat Al Talaba
	CA23	Warrag
	CA25	Basateen
	CA27	Qawmeya Arabeya
	CA27	Qawmeya Arabeya
	CA09	Ramses
Laylat Al Qadr	CA42	Imbaba
	CA11	Haram Mashaal
	CA14	Madinat Al Talaba
	CA61	New Marg
	CA77	Giza Square
	CA95	Ramses
Madinat Al Talaba	CA10	Dandy Mall
	CA14	El Hossary
Mahkama	CA89	Al Sayeda Aisha
	CA13	Alf Maskan
	CA65	Asher Men Ramadan
	CA13	Salam Nahda
Mehwar Desert Rd	CA10	Haram Mashaal
Moneeb	CA69	Bonook
	CA32	District 6
	CA75	El Hossary
	CA73	FUE
	CA71	Mahkama
New Marg	CA83	El Hossary
	CA66	Higher Technological
	CA64	Mahkama
	CA68	Rehab Gate 13
	CA68	Rehab Gate 13
Omaal Square	CA91	Al Sayeda Aisha
Zahraa Madinet	CA14	First Settlement Hospital
Zahraa Madinet	CA11	First Settlement Hospital

Cairo Transport Authority

Abdel Moneam	1013	Al Souq Al Qadeem
	1047	Badr
	1056	Shorouq
	1063	AUC
	1083	Obour
	1137	Third Settlement
	211	Qalyub
Ahmed Helmy	1024	Kattameyya
Al Moassasa	1032	Obour
Al Souq Al	1017	Al Moassasa
	1022	Giza Square
Badr	370	Abbaseyya
	1020	Ahmed Helmy
First Settlement	1031	Abdel Moneam Riyad
	1130	Abdel Moneam Riyad
	1136	Al Zawyia Al Hamra
	1010	Attaba
	1033	Dawaran Shubra
	30	Abdel Moneam Riyad
	1019	Masaken Zainhom
	1078	El Matbaa
Kattameyya	1107	Imbaba
Moneeb	573	Alf Masnaa
Third Settlement	1016	Ahmed Helmy
	1064	Attaba
	1122	New Marg
	1111	Shubra El

CTA Minibus

Abdoud	1	Police Academy
First Settlement	142	Abdoud
	304	Abdoud
	321	Abdoud
Hay Asher	19	Abdel Moneam Riyad
Hyper	117	Abdel Moneam Riyad
	14	Abou El Reesh
	62	Al Zawyia Al Hamra
	159	Dawaran Shubra
	87	Isko
	108	Masaken Ain Shams
	109	Madinat Al Talaba
	126	Dawaran Shubra
	225	Dawaran Shubra
	302	Mamaleek
	12	Masalla Gedeeda
Laylat Al Qadr	400	Isko

Intercity

Legend

- New Desert City 'NDC' Area
- Cairo Metro Track
- Cairo Metro Station
- Public Bus Route Network
- Paratransit Inter-city Route Network
- Paratransit Intra-city Route Network
- Public Bus & Paratransit Intermodal Station

6th of October

Al Souq Al Qadeem	6003	Daewoo
	6012	Industrial Zone 3
	6016	El Hossary
Bashayer	6047	Magda Square
District II	6049	Magda Square
District 6	6018	Bashayer
	600-1	District 6
	6005	Motamayez
	6018	Bashayer
District 7	6030	Mostaqbal Entrance
	6021	Bashayer
	6028	District 10
	6007	Motamayez
	6007	Motamayez
El Hossary	6044	Ahram Canadian
	6044	Ahram Canadian
	6036	Al Muluk
	6038	Al Muluk
	6051	Bashayer
	6053	District 11
	6034	District 8
	6026	Dolce
Laylat Al Qadr	6042	Ahram Canadian
	6069	District 10
	6032	District 7
	6023	Dolce
	6023	Dolce
	6055	El Hossary
	6014	Industrial Zone 3
	6010	Motamayez
	6057	Total 6 October
	6040	Outlet
Mostaqbal Entrance	6001	Masaken Othman

EL-Sheikh Zayed

Badr	SZ18	Hyper
	SZ26	Azhari Institute
	SZ24	Sheikh Zayed General
Hyper	SZ12	Azhari Institute
	SZ16	CIC
	SZ14	District 11
	SZ20	District 16
	SZ01	Zayed 2000
	SZ10	Sheikh Zayed General
Sheikh Zayed	SZ22	District 11
Zayed 2000	SZ03	District 11 Entrance
	SZ05	Zayed 2000 Gate 3
	SZ08	Al Joman
	SZ06	Zayed 2000 Gate 3

New Cairo

Akhnatoun	NC39	Moneeb Konayyasa
	NC43	El Hamd
	NC46	Higher Technological
	NC49	Mahmoudeyya
Bonook	NC63	Asher Men Ramadan
EL Hamd	NC67	Arabella
	NC41	Moneeb Konayyasa
First Settlement	NC24	Hay Asher
	NC31	Zahraa Madinet Nasr Suez
	NC51	El Hamd
	NC59	FUE
	NC06	Metro Zahraa
	NC53	Omaal Square
	NC55	Mahmoudeyya
	NC57	Shabab Entrance
	NC61	Moroor Kattameyya
Hay Asher	NC10	Bonook
	NC22	FUE
	NC08	Zahraa Madinet Nasr Suez
	NC12	Mahkama
	NC16	Omaal Square
	NC18	Kattameyya Church
	NC26	Police Academy
	NC29	Rehab Gate 6
	NC14	Higher Technological
	NC26	Police Academy
	NC20	Shabab Entrance
Higher	NC69	Arabella
Mahkama	NC65	Asher Men Ramadan

New Cairo-1

Mahmoudeyya	NC73	Arabella
	NC71	Higher Technological
	NC75	Shabab Entrance
	NC01	Gas
	NC01	Gas
	NC04	Omaal Square
	NC47	Akhnatoun
Omaal Square	NC81	South
Police Academy	NC79	Zahraa Madinet Nasr
Rehab Gate 13	NC77	Masraweeya
Rehab Square	NC37	Police Academy
Zahraa Madinet	NC33	Rehab Gate 13
	NC35	Mir 2000

Intracity

AL-Obour

No Intercity Service

AL-Shorouk

No Intercity Service

How to read this data visualization?

This is a data visualization of the transit network covering five of Cairo's New Desert Communities. It includes multiple networks:

- The public bus network operated by the Cairo Transport Authority 'CTA' and minibuses operating under a concession of the CTA using **blue** route numbers.
- The paratransit network connecting the New Desert Cities with central Cairo and each-other operated by the informal transport sector using **green** route numbers¹.
- The paratransit network providing service within the New Desert Cities and connecting with the inter-city services operated by the informal transport sector using **yellow** route numbers¹.

¹ The route-numbers have been created by the Transport for Cairo team.



إكسبو 2020 دبي
دبي، الإمارات العربية المتحدة
DUBAI, UNITED ARAB EMIRATES



مواصلات القاهرة
www.transportforcairo.com

This map was created within the scope of the Digital Cairo project, which is funded as part of the ExpoLive 2020 Impact Grant programme. Digital Cairo is a joint consortium of Digital Matatus, Takween for Integrated Community Development and Transport for Cairo. This map is not for circulation, and is for illustration purposes only. February 2018.

A roadmap for making the system better

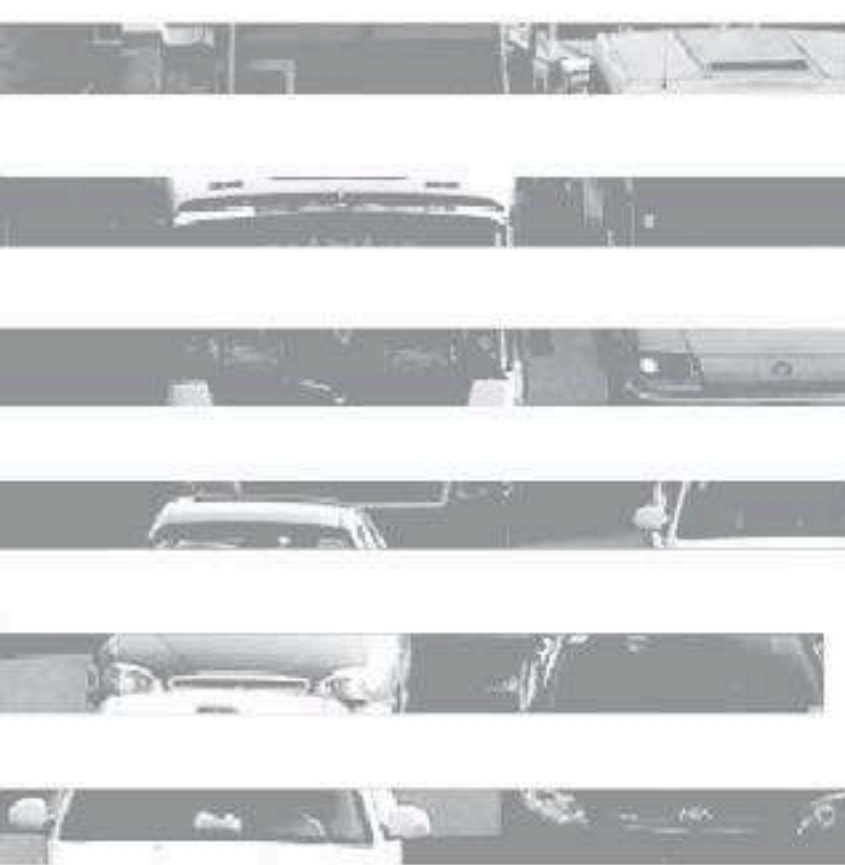


What we do #3 - A roadmap for making the system better

PT respects me in the level of safety, comfort, and amenity it provides



315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43
 982 564 666 337 555 182 878 840 991 932 810
 315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43
 982 564 666 337 555 182 878 840 991 932 810
 315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43



How can Transit Mapping contribute to achieving Adequate Urban Mobility?

The case of the Greater Cairo Region (GCR)



315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43
 982 564 666 337 555 182 878 840 991 932 810
 315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43
 982 564 666 337 555 182 878 840 991 932 810
 315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43

Environmental

Indicator

8.1.1 Average concentration of particulate matter (PM2.5 and PM10) in urban areas

Indicator

8.1.2 Percentage of urban population living in slums

Indicator

8.1.3 Percentage of urban population living in informal settlements

Indicator

8.1.4 Percentage of urban population living in informal settlements

Financial/Economic

Indicator

8.2.1 Percentage of urban population living in slums

Indicator

8.2.2 Percentage of urban population living in informal settlements

Indicator

8.2.3 Percentage of urban population living in informal settlements

Indicator

8.2.4 Percentage of urban population living in informal settlements

Social

Indicator

8.3.1 Percentage of urban population living in slums

Indicator

8.3.2 Percentage of urban population living in informal settlements

Indicator

8.3.3 Percentage of urban population living in informal settlements

Indicator

8.3.4 Percentage of urban population living in informal settlements

Governance

Indicator

8.4.1 Percentage of urban population living in slums

Indicator

8.4.2 Percentage of urban population living in informal settlements

Indicator

8.4.3 Percentage of urban population living in informal settlements

Indicator

8.4.4 Percentage of urban population living in informal settlements

Safety

Indicator

8.5.1 Percentage of urban population living in slums

Indicator

8.5.2 Percentage of urban population living in informal settlements

Indicator

8.5.3 Percentage of urban population living in informal settlements

Indicator

8.5.4 Percentage of urban population living in informal settlements

Accessibility

Indicator

8.6.1 Percentage of urban population living in slums

Indicator

8.6.2 Percentage of urban population living in informal settlements

Indicator

8.6.3 Percentage of urban population living in informal settlements

Indicator

8.6.4 Percentage of urban population living in informal settlements

Affordability

Indicator

8.7.1 Percentage of urban population living in slums

Indicator

8.7.2 Percentage of urban population living in informal settlements

Indicator

8.7.3 Percentage of urban population living in informal settlements

Indicator

8.7.4 Percentage of urban population living in informal settlements

Availability

Indicator

8.8.1 Percentage of urban population living in slums

Indicator

8.8.2 Percentage of urban population living in informal settlements

Indicator

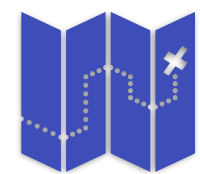
8.8.3 Percentage of urban population living in informal settlements

Indicator

8.8.4 Percentage of urban population living in informal settlements



Transport for Cairo: An urban mobility lab



Geographic mapping



Temporal Modelling



System Adequacy



Qualitative Research

Research

315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43
 982 564 666 337 555 182 878 840 991 932 810
 315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43
 982 564 666 337 555 182 878 840 991 932 810
 315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43

How can Transit Mapping contribute to achieving Adequate Urban Mobility?

The case of the Greater Cairo Region (GCR)

FRIEDRICH EBERT STIFTUNG

Logo of the Greater Cairo Region (GCR)

315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43
 982 564 666 337 555 182 878 840 991 932 810
 315 35 948 940 328 990 900 921 927 935 919 11
 995 430 952 338 824 840 977 950 55 290 321 43
 982 564 666 337 555 182 878 840 991 932 810
 315 35 948 940 328 990 900 921 927 935 919 11



Product

○ **Cairo Zoo**
El-Giza, Cairo

🚌 **990** towards Masaken Ein-Shams
~ 9 min (3 Stops)

○ **Kasr EL-Nil**
Al-Sayedra, Cairo

Walk
~ About 5 min, 300 m

○ **Al-Sayedra Zeinab Metro Station**
Al-Sayedra, Cairo

🚶 **1** towards El-Marg
~ 18 min (6 stops)

○ **Al-Shohadaa**
Al-Fagala, Cairo

Cost: EGP2.00

Theory of Change

4 Vision



3 Impact



2 Outcome



1 Strategy



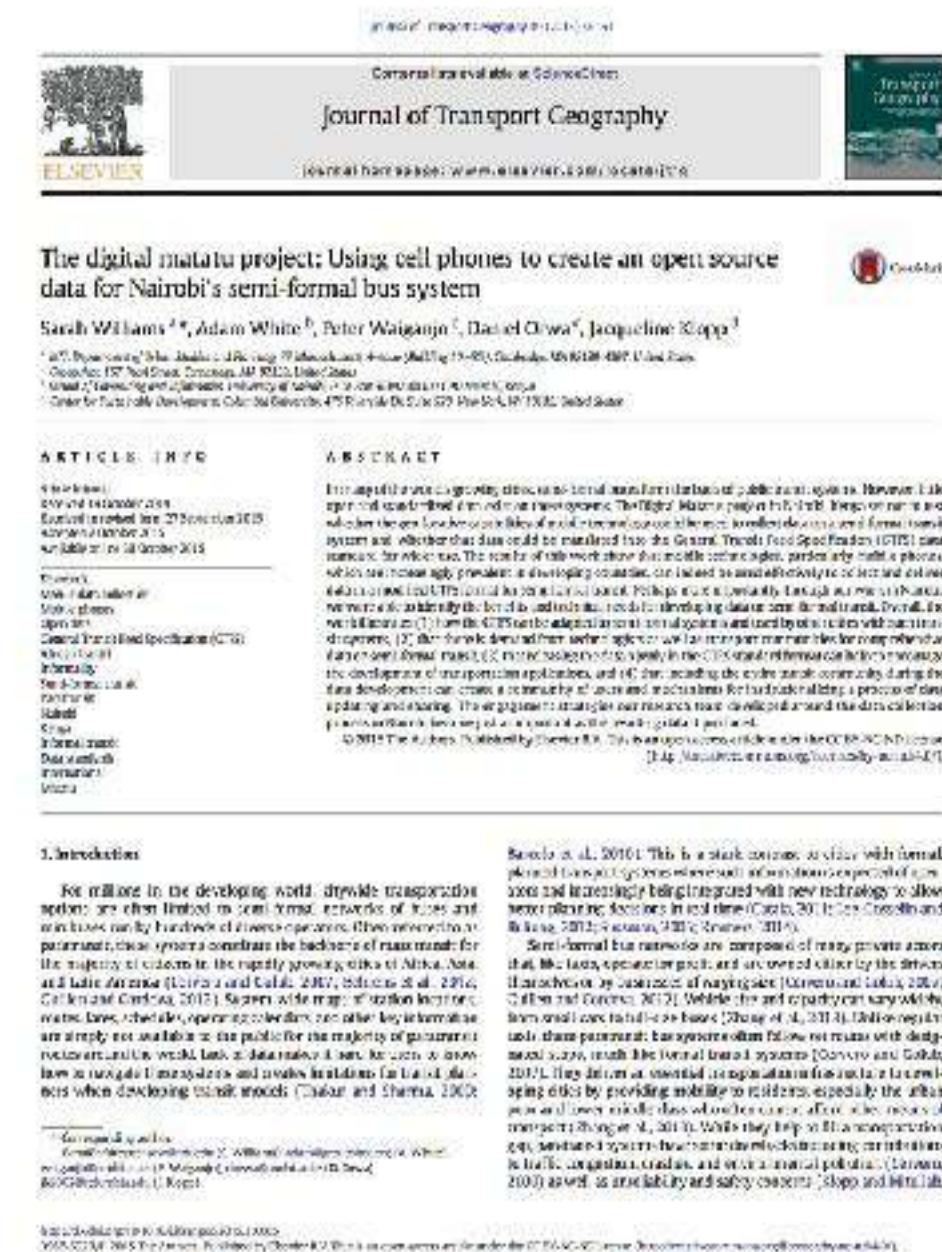
Tools & Technology



GTFS



Methodology & Research



Journal of Transport Geography

The digital matatu project: Using cell phones to create an open source data for Nairobi's semi-formal bus system

Sarah Williams^{a,*}, Adam White^b, Peter Waiganyo^c, Daniel Ojwa^d, Jacqueline Skopp^e

ARTICLE INFO

ABSTRACT

1. Introduction

For millions in the developing world, driveways transportation options are often limited to semi-formal, unregulated buses and minibuses run by hundreds of drivers operating their own routes. In particular, these systems constitute the backbone of mass transit for the majority of citizens in the rapidly growing cities of Africa, Asia, and Latin America (Chava and Galati, 2017; Johnson et al., 2016; Galati and Chava, 2017). Despite wide usage, information on routes, fares, schedules, operating conditions, and other key information are simply not available to the public for the majority of passenger routes and this weak link in data makes it very difficult to develop more navigable transportation and mobility solutions for these cities when developing transit models (Chava and Sharma, 2016).

Basels et al., 2016). This is a stark contrast to cities with formal, planned transit systems where well-defined routes are expected to be used and increasingly being integrated with new technology to allow better planning. Activities in real time (Chava, 2017; Chava and Basels, 2017; Chava, 2017; Chava, 2017).

Semi-formal bus routes are composed of many private actors that, like taxis, operate for profit and are owned either by the driver themselves or by businesses of varying sizes (Chava and Galati, 2016; Galati and Chava, 2017). Vehicle size and capacity can vary widely, from small vans to full-size buses (Chava et al., 2017). Unlike regulated, formal transit, bus operators often follow no routes with designated stops, unlike formal transit systems (Chava and Galati, 2017). They do not offer essential transportation services such as low-income pricing or by providing mobility to residents, especially the urban poor and lower-income classes who live in areas of low density and high poverty (Chava et al., 2017). While they help to fill a mobility services gap, semi-formal systems face many challenges, such as irregular routes, traffic congestion, crowding, and other operational problems (Chava, 2017) as well as availability and safety concerns (Skopp and Basels, 2016).

TfC - Capacity Building at its best

2015 - Humble Beginnings



TfC - Capacity Building at its best

2017 - Digital Cairo: A consortium

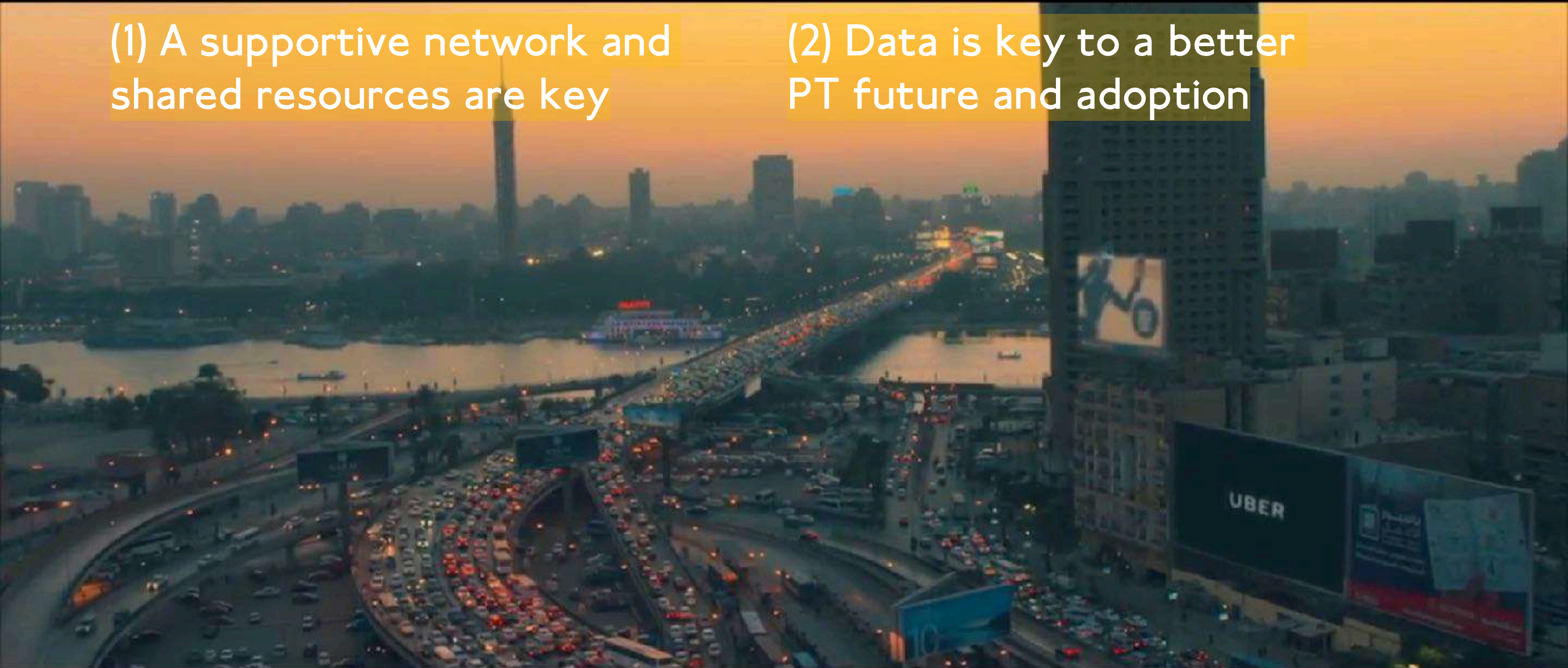


Key Messages

Congestion is incurable

(1) A supportive network and shared resources are key

(2) Data is key to a better PT future and adoption



Thank you

Address

4 Road 160 (Borg Reham),
Floor 8, Apt. 602
Maadi
Cairo
Egypt

Contacts

Mohamed Hegazy
m.hegazy@transportforcairo.com
EG: (+2) 0 1001422068
FR: (+33) 7 69 14 90 75
www.transportforcairo.com

Transport
for Cairo



مواصلات
للقاهرة



Have a break' and let others wrestle with traffic

Passengers sitting in crowded bus stop in Downtown, Cairo