



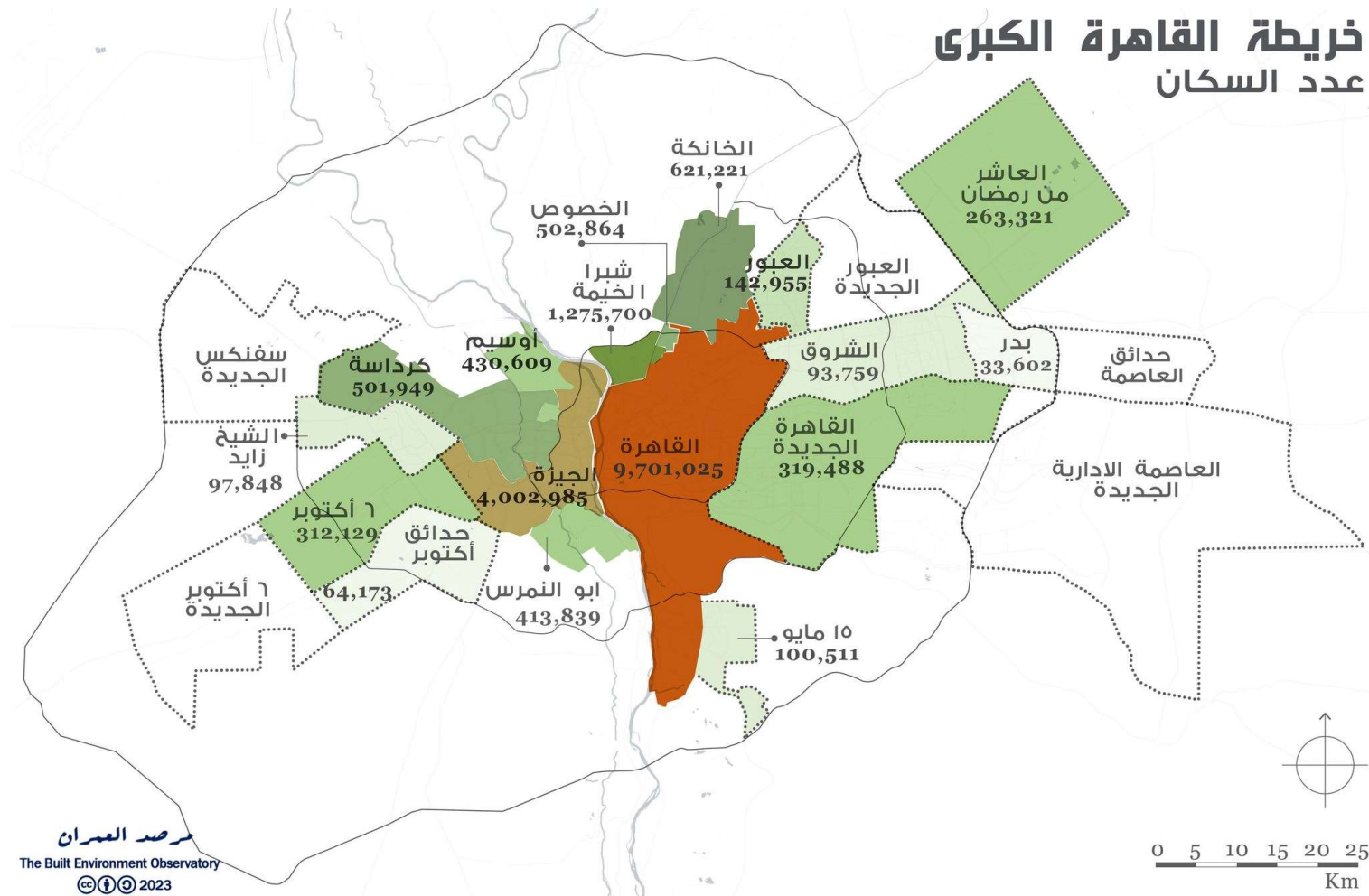
Transportation Key Challenges in Cairo, Egypt



Center of **Mo**bility Research

 **BRITISH
COUNCIL**

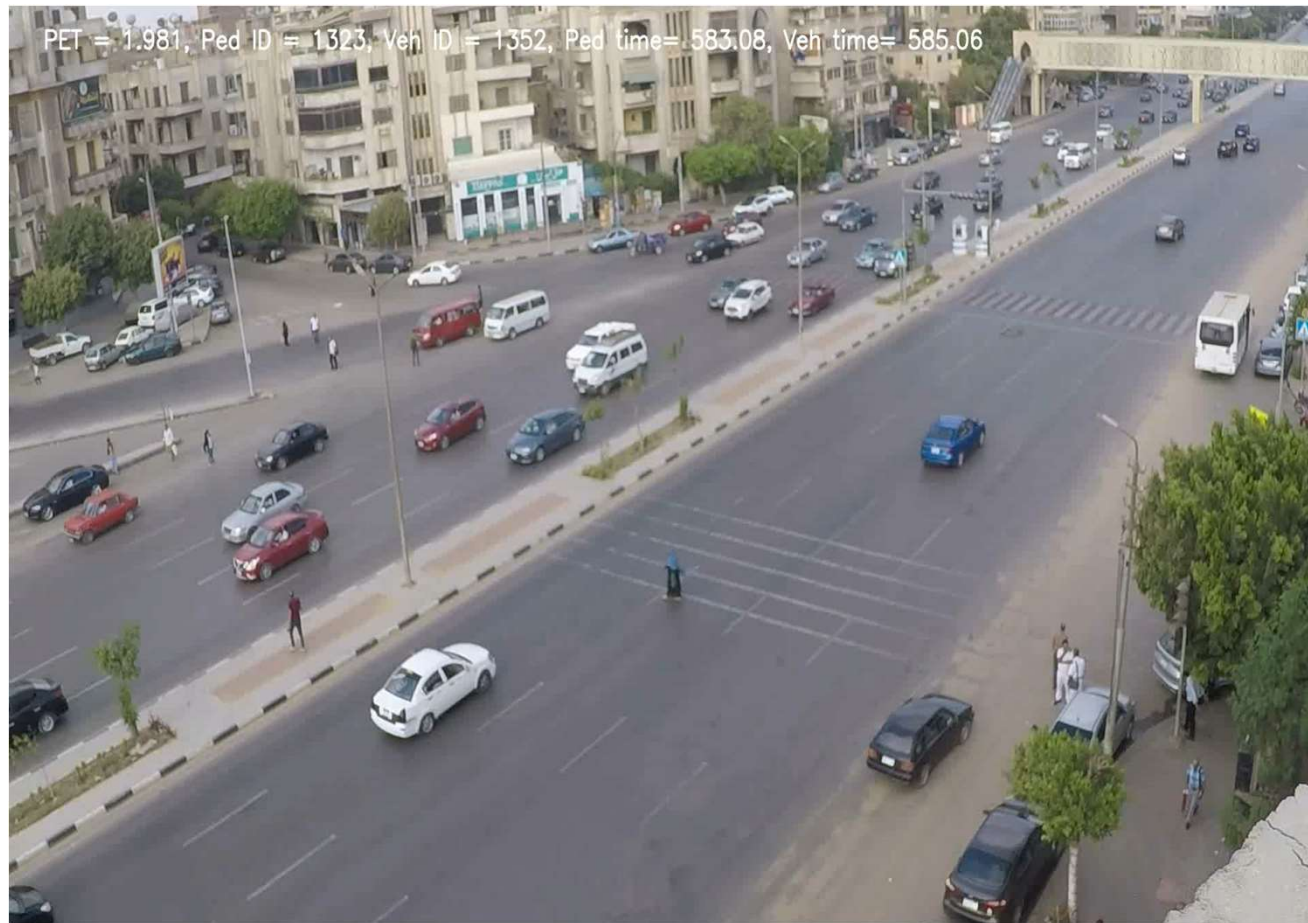
Why Cairo (Egypt)?



Transportation Challenges in Egypt (Cairo,

- Transport projects are often planned and executed without considering alternative approaches and with limited number of stakeholders
- Transport planning in Cairo and Egypt tends to be framed by engineering solutions that are car-oriented (favor road widening and bridge building)
- Although low- and middle-income countries own only half of the world's vehicles, they have 90% of the world's traffic deaths, and Egypt is among the top twenty total traffic deaths
- The cumulative cost of Egypt's traffic fatalities and injuries is 10 billion dollars (3.2 % of its GDP) affecting more than 100,000 Egyptians annually.

Example-Motivation



Safety Planning

• Data

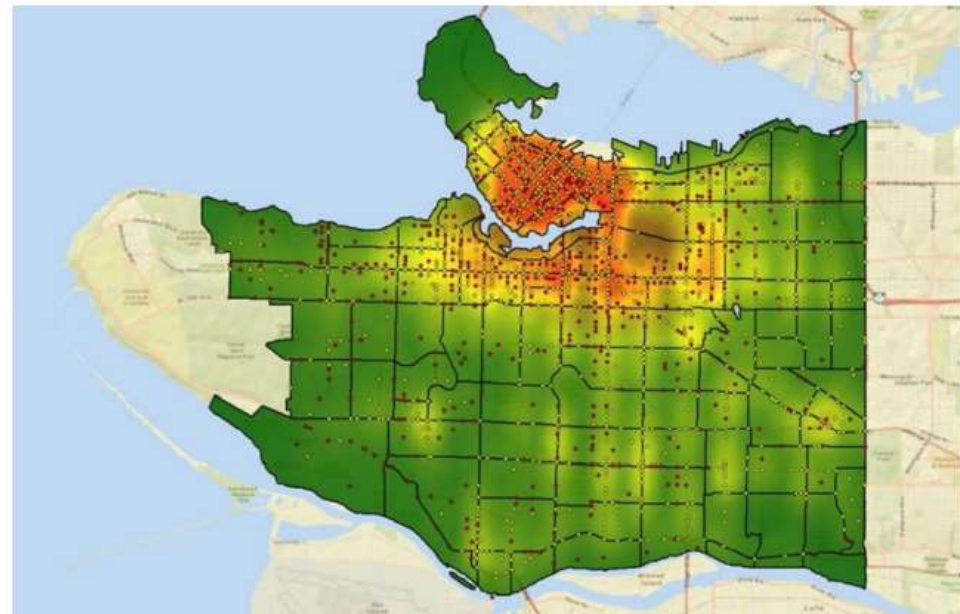
• Hotspots Engineering

• Analysis Engineering

• Policy Recommendations

• Implementation Engineering

Evaluation



IT'S ALL ABOUT THE

DATA

Traffic Incident Data Challenges

- Long collection cycles to gather sufficient data for the analysis
- No sole champion is responsible
- Under-reporting is widespread. Many studies indicate that the range of under-reporting of fatalities is around 25 to 50 percent in developing countries
- It misses a significant portion of low-level incidents (e.g., PDO and near misses)
- Coding errors throughout the process from the onsite report form filling to the data entry and transfer is a common occurrence

Data Sources



REAL DATA



SENSORS



CROWDSOURCING

Data Crowdsourcing

- Crowdsourcing is collecting data by citizens themselves and is gaining popularity for creating data rich environments and changing scientific research paradigms
- The data generated from crowdsourcing can supplement and extend data coverage
- Few studies have looked into crowdsourcing of traffic incident data:
 - ✓ BikeMaps.org
 - ✓ Data from Waze and Twitter

Data Crowdsourcing

- On the one hand, crowdsourcing has some challenges such as redundancy of crowdsourced traffic incident reports, false data that might be recorded by some users, and the continuous need to motivate users for data input
- On the other hand, there are major advantages of crowdsourcing:
 - ✓ Collecting data that cannot be measured in another way
 - ✓ Changing the trend of fieldwork with office work
 - ✓ Providing information for the whole traffic network
 - ✓ No need for installation or maintenance of roadside units and devices

What is StreetKey?

MVP Frontend

1. Interactive Map

Report & view incidents and experiences



2. Communities Engagement

Share, up/down vote, comment, and earn rewards



3. User Experience

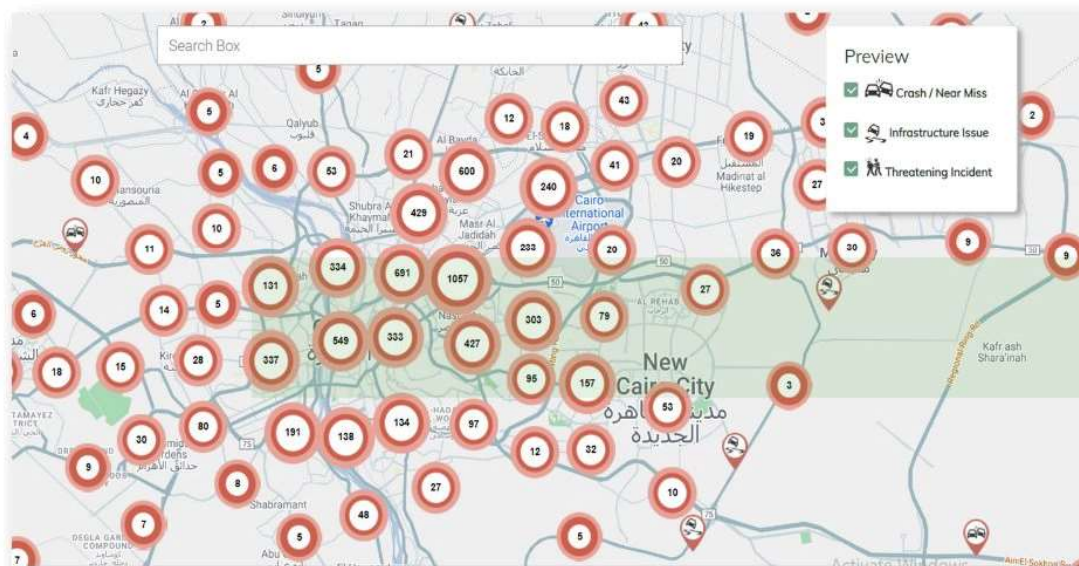
Stay informed with trending posts and community discussions

Real users' reports



What is StreetKey?

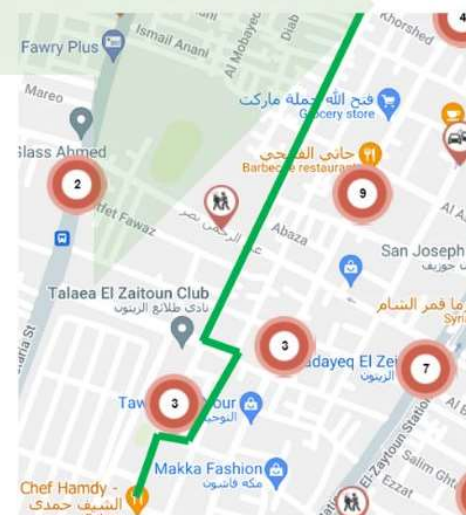
MVP Backend



Check: map.streetkey.net

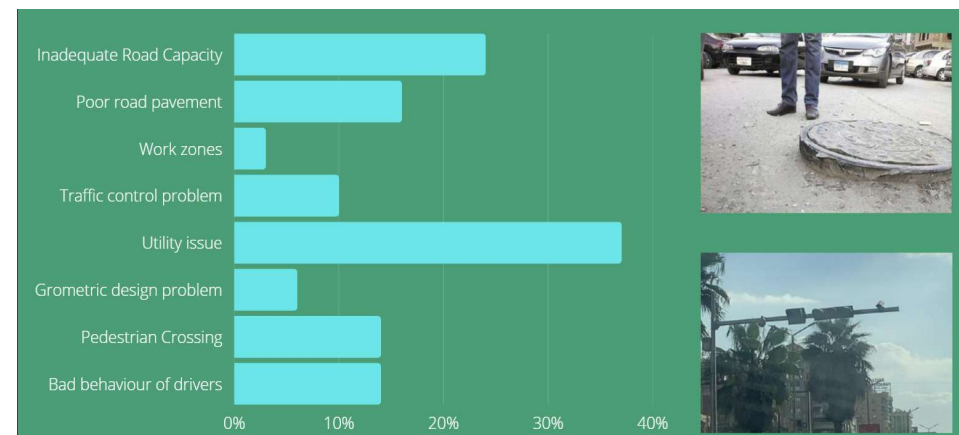
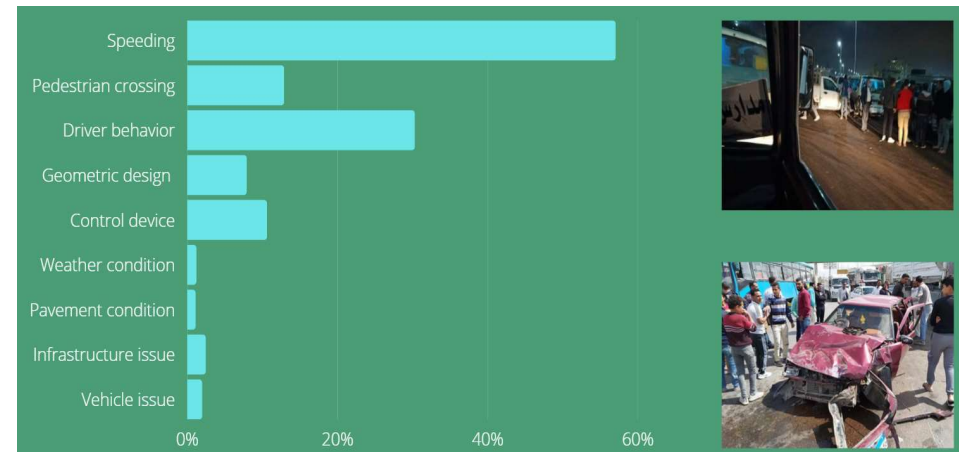


Information for
Governance, Real
Estate, NGOs, and
Citizens/Tourists



Crowdsourced Data

- StreetKey currently contains around 10,000 data-points in Greater Cairo, Egypt.
- The data it provides is key to addressing the inconsistency and deficiency in the different data sources of street problems
- StreetKey incorporates various types of incidents for a more holistic view of urban activity and safety/security to allow for analysis of hotspots and broader urban trouble areas
- This helps the decision makers to find optimum solutions based on scientific analysis of the crowdsourced traffic incident data



Safety Planning

- Data

- Hotspots

- Analysis

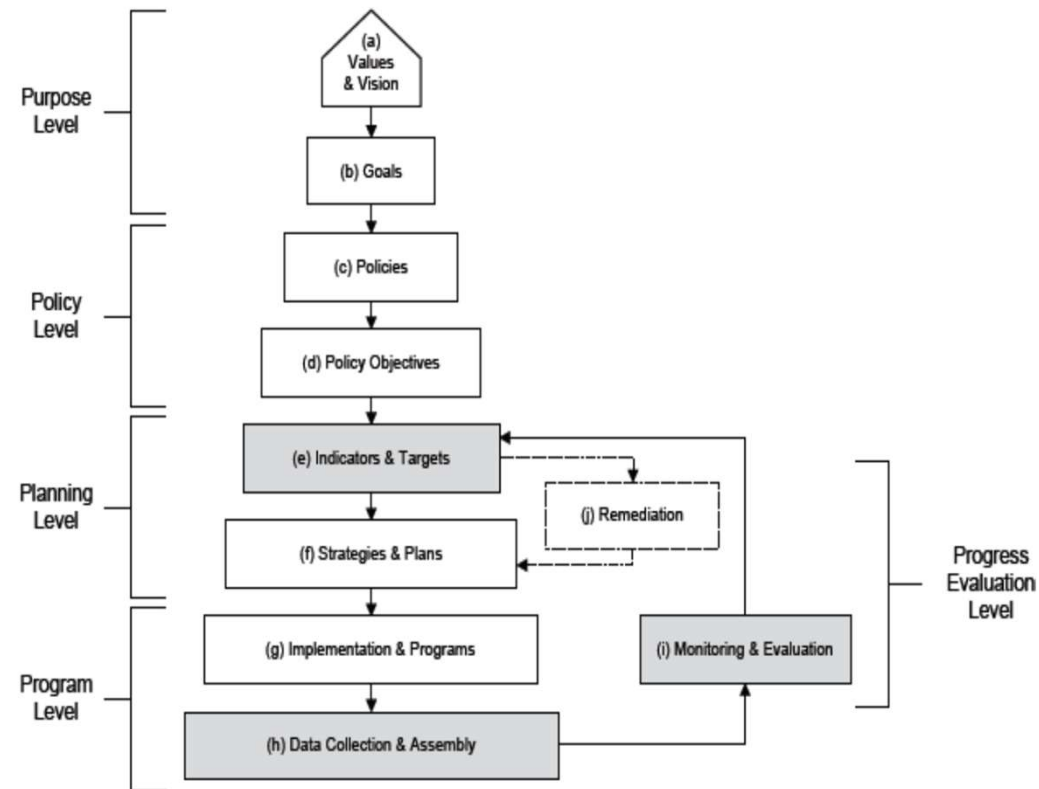
- Policy Recommendations

- Implementation

Policy Recommendations Challenges

- The mono-rational approach is the standard process for policy recommendations in Egypt
- The lack of a clear decision-making framework and project implementation process
- Different transport projects may be affiliated to different entities through a hidden system
- If a particular transport project was not in the best interest of some government entities, decisions could be manipulated

Policy Recommendations Levels

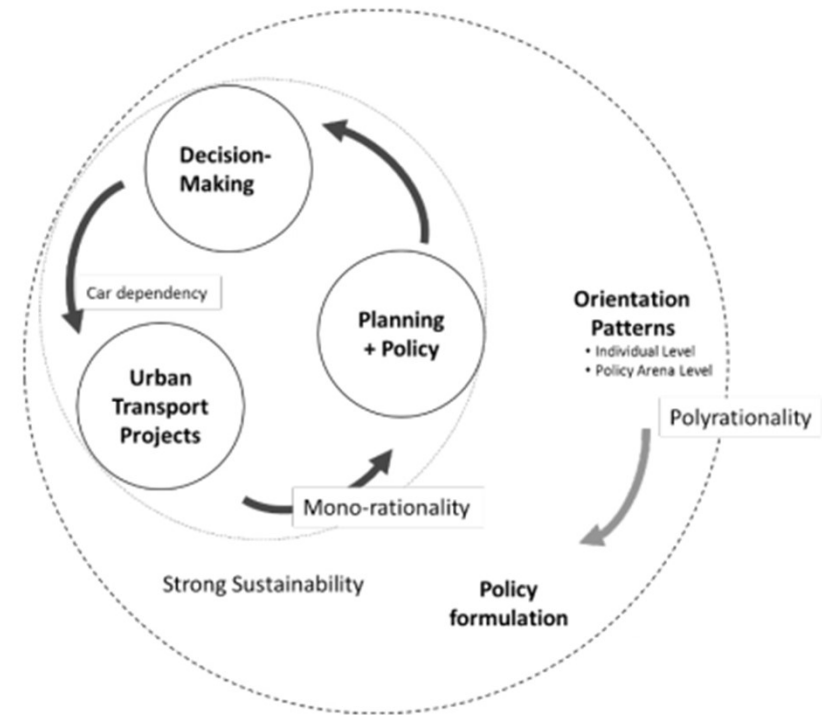


"The P5 Strategic Process", Lim, C.,

Policy Recommendations

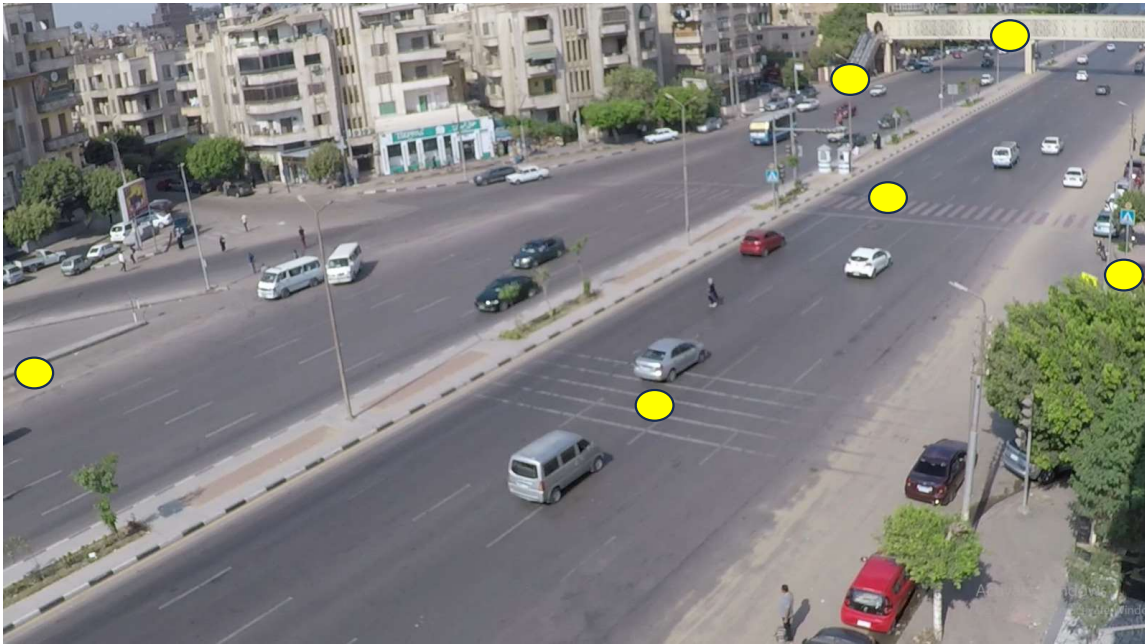
Purpose and Policy Levels

- We need to break the mono-rational approach of policy framing
- The views and rationalities of different stakeholders have to be included in the wider policy cycle starting the proposal stage



Policy Recommendations

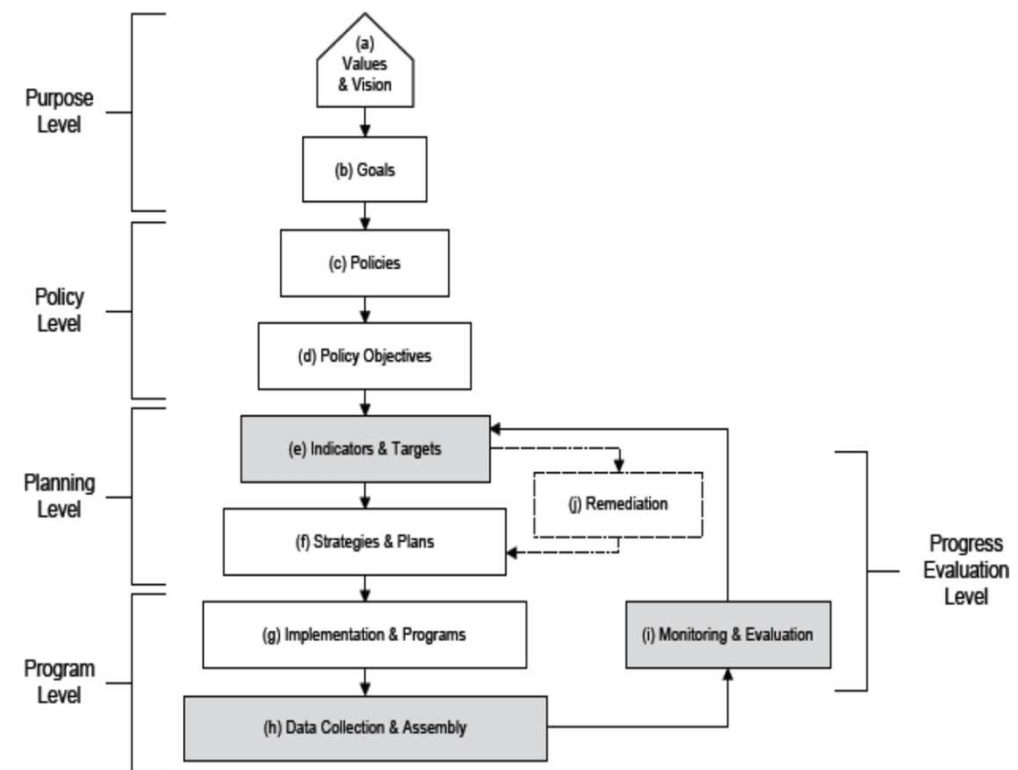
Purpose and Policy Levels



Policy Recommendations

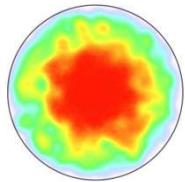
Program and Progress Evaluation Level

- Decisions and evaluation needs to be data driven qualitatively and quantitatively
- Remediation can then be put for the policy-makers for better implementation



"The P5 Strategic Process", Lim, C.,

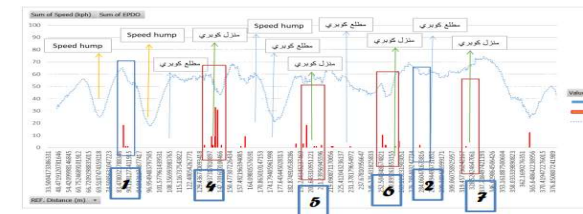
Policy Recommendations Program and Progress Evaluation Level



Heat Maps



Analytical Reports



Befor-After Publications



Ways Forward

- The necessity of a clear framework for transportation projects planning and responsibilities
- Stakeholders decision making approach is important for a successful planning and implementation of a transportation project
- Data driven planning, implementation, and evaluation based on different levels (macro vs micro level) is a must
- The integration of official data and crowdsourced/sensors data to ensure broad network coverage needs to be investigated

References

- Telima, Mostafa, et al. "The use of crowdsourcing data for analyzing pedestrian safety in urban areas." Ain Shams engineering journal 14.6 (2023): 102140.
- Hassan, Sara, and Lisa Goodson. "The Cultures of Decision-Making: A qualitative study of urban transport projects in Alexandria, Egypt." Transportation Research Procedia 48 (2020): 2401-2420.



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[Transportation Safety Plan...](#) [ITS](#) [Active Transportation](#) [Public Transportation](#)



Thank You!

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Purpose and Policy Levels CMOR

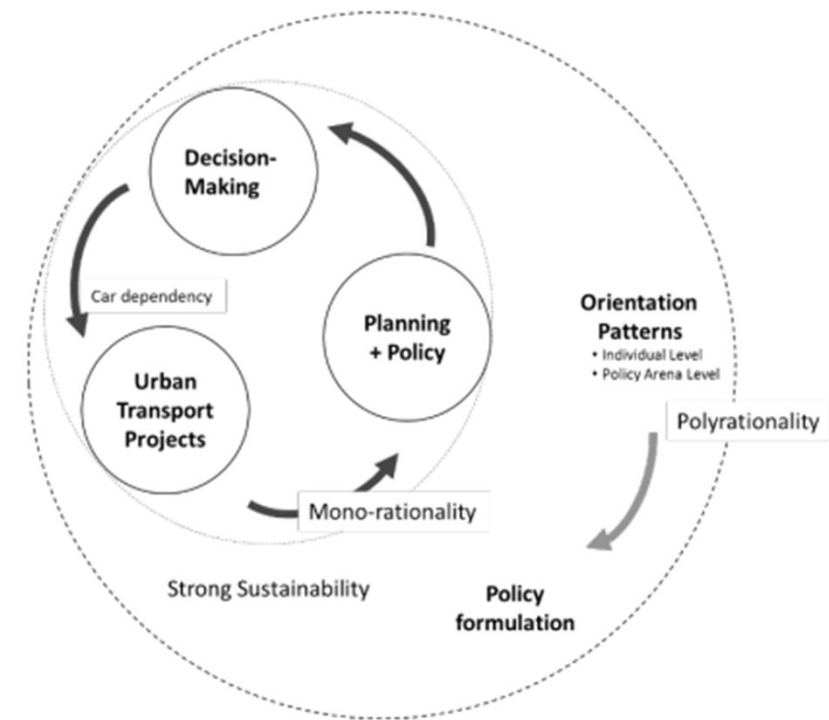
- Urban Planners
- Academia
- NGOs
- School Directors
- Parents
- Safety Advocates
- Road Engineers
- Policy Makers
- Can you think of others??



Policy Recommendations

Purpose and Policy Levels

- In order to break the mono-rational approach of policy framing, the views and rationalities of different stakeholders have to be included in the wider policy cycle starting the proposal stage



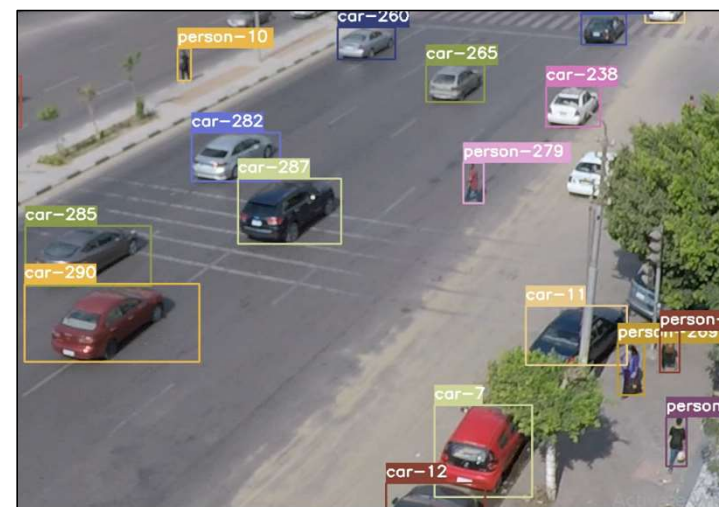
Transportation Planning



Sensors Data (Computer Vision Analytics)

- The use of advanced image processing and machine learning techniques to analyze visual data captured by cameras or sensors in order to gain insights and make informed decisions regarding transportation safety, efficiency, and planning
- Computer vision analytics enables detection of traffic conflicts as well as safety hazards such as reckless driving and pedestrian violations
- By analyzing traffic patterns and congestion hotspots, computer vision analytics aids in developing effective strategies for optimal routing, capacity planning, and infrastructure improvements

Sensors Data



What is StreetGuards/StreetKey?

- Through Street Guards' website and App, road users can report the location and attributes of the incident by clicking the “Locate & Report” button and adding the location where the incident occurred on the map
- Afterwards, a window appears with the various inquiries according to the incident type; crash/near miss, threatening incident or infrastructure issue
- Promoting for Street Guards website, to encourage people to report and map issues regarding road safety, has been carried out through social media, mainly on Facebook through “Street Guards - ” شارع آمن page

East Cairo (Micro-level Data Analysis)

