Smart Optimisation of Public Transport

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Who we are:

Ministry of Transport Communications & Works (MTCW):

Responsibilities of the MTCW focus on developing and maintaining air, maritime, and land transport.

Driving Quality and Sustainability

Ongoing improvements in transport infrastructure and services aim at high quality and sustainable mobility, benefiting society and the environment.

Involved Departments and their Relevance to this Proposal:

Road Transport Department:

Responsible for the supervision of Concession Contracts for Regular Public Transport Services in Cyprus.

Public Works Department:

Responsible for the design and development of Infrastructure and Tools for the management and supervision of Concession Contracts for Regular Public Transport Services in Cyprus.

Public Transport In Cyprus

Public Transport Framework:

- Public Transport Services are delivered by Bus. Cyprus does not have rail or inland waterways.
- The Services are delivered by private companies which maintain 10year Concession Contracts with the MTCW.
- Six Concession Contracts cover the whole of Cyprus under the control of the Republic of Cyprus. Namely they cover the districts of Nicosia, Limassol, Larnaca, Paphos, Famagusta and the Intercity Service.

Current Public Transport Mobility Share:

- It currently attracts between 4-5% of the total number of trips in urban areas.

Sustainable Mobility:

- The MTCW is looking to upgrade the public transport system so it can attract more usage, reducing traffic congestion, lowering emissions and enhancing mobility.

Organisation & Planning of Public Transport Services

Concession Contracts:

- Six Concession Contracts cover the area of Cyprus under the control of the Republic of Cyprus. Namely they cover the districts of Nicosia, Limassol, Larnaca, Paphos, Famagusta and the Intercity Services. The contracts provide for:
  - Renewal of Fleets
  - Area coverage & Frequency of Service
  - Use of PT Telematics Systems
  - Additional Services (Demand Responsive & Express Services)

Network & Services:

- Based on Sustainable Mobility Plans and Feasibility Studies carried out for each area,
- Transport Models calibrated based on surveys (traffic and passenger counts on primary roads, 3000 household surveys)

The Challenge – Better Service Planning:

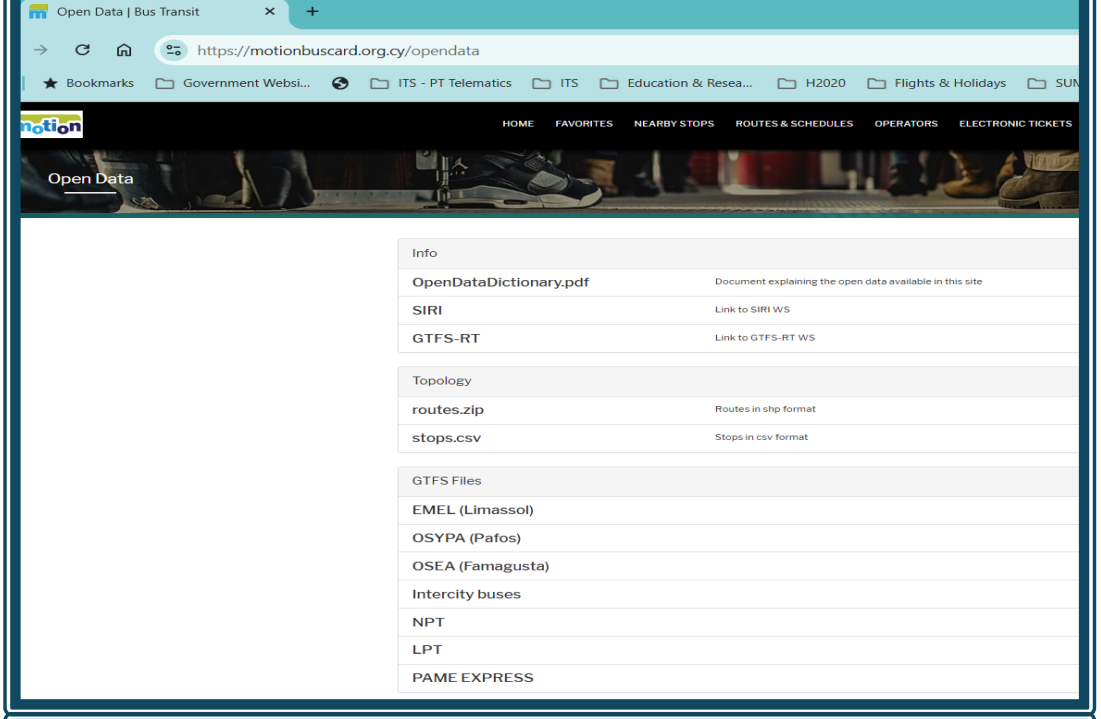
Current Service Planning:

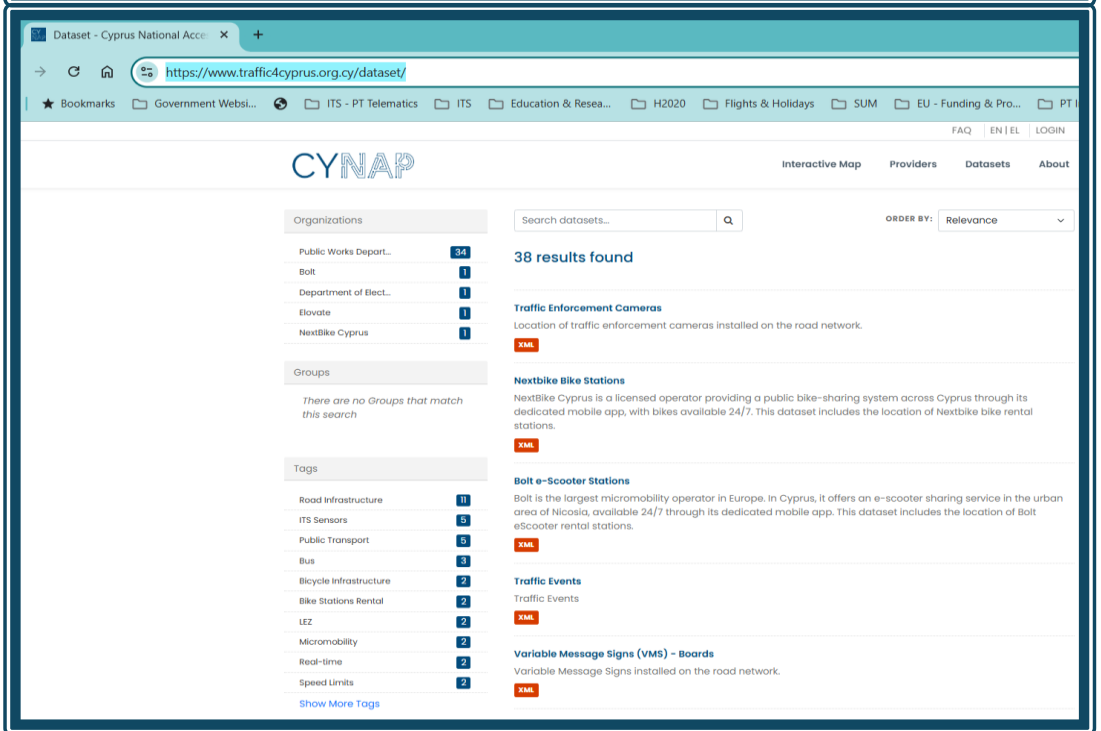
- Based on static or period demand analysis. This may result in insufficient coverage (special or time) which translate for the customer and/or service in:
  - delays that increase travel times,
  - limited reliability and attractiveness of services,
  - reduced use of Public Transport and increased dependence on private cars.

Dynamic Analysis of Travel Demand:

Using modern technologies, crowdsource data can be gathered regarding mobility demand and particularly data per trip related to:

- Origin – Destination
- Time of Travel
- Length of route
- Duration of Journey





Challenge – Move From Static to Dynamic Data Collection

Static vs Dynamic Data Collection and Analysis:

Moving away from static travel demand models allows for more accurate understanding of citizens' day to day mobility patterns.

Leveraging MTCW's Existing Systems Data:

Entities may use:

- Open Data provided by the Public Transport Telematics System

  https://motionbuscard.org.cy/opendata

  - GTFS Static
  - GTFS Real Time

- Open Data collected from MTCW's traffic counters on primary roads.

  https://www.traffic4cyprus.org.cy/dataset/

Challenge – Move From Static to Dynamic Data Collection

Static vs Dynamic Data Collection and Analysis:

Moving away from static travel demand models allows for more accurate understanding of citizens' day to day mobility patterns.

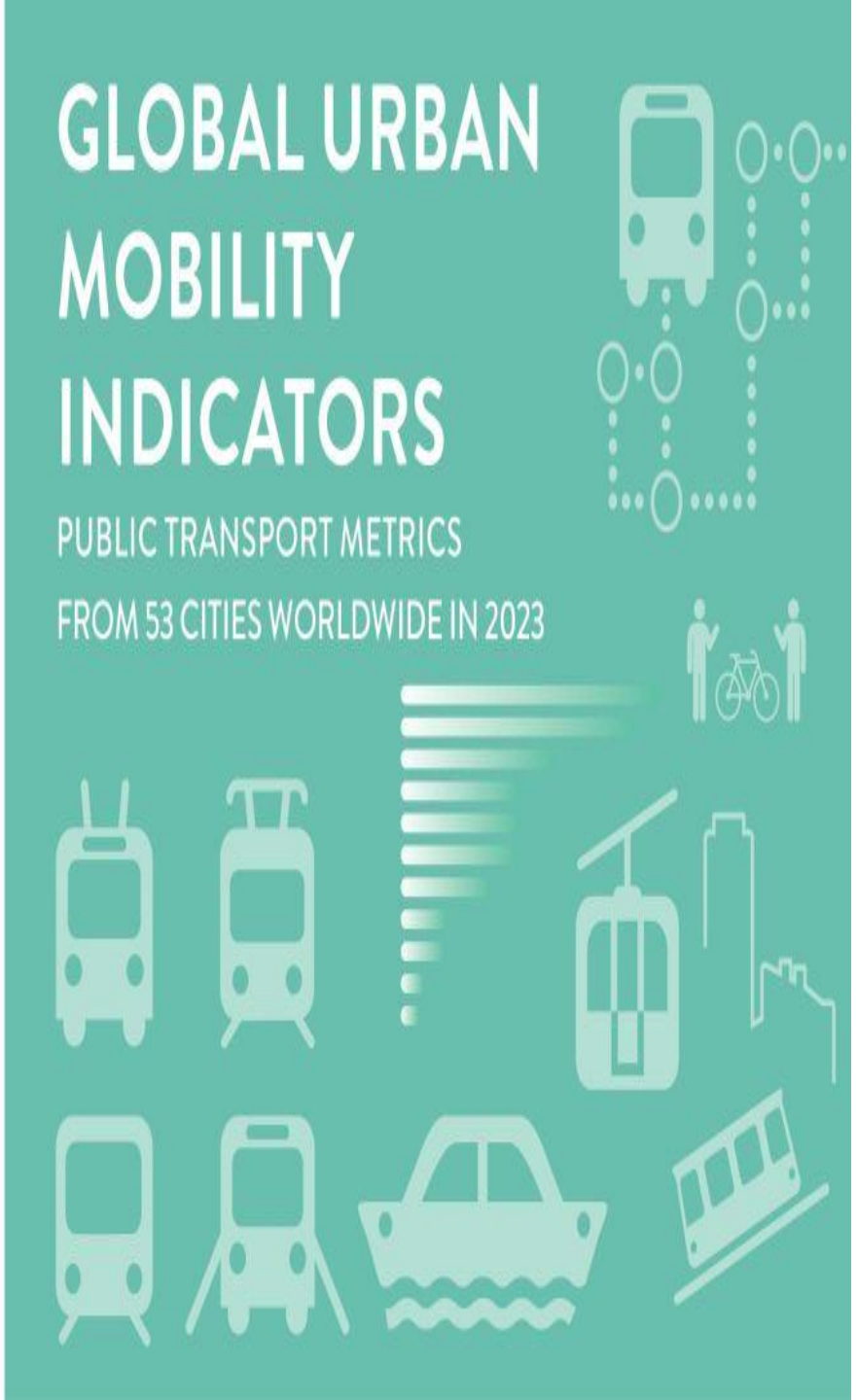
Leveraging Crowdsourced Data:

Entities may use their own or third-party data such as:

- Geospatial data and route searches available from platforms such as Google Maps, Waze, TomTom, Garmin, Bing Maps,
- Their own Multimodal Platforms,
- Cyprus Mobile Apps such as Pame, etc.

Note that there is no agreement between the MTCW and the mapping platforms or Mobile App Providers.

Aim – creation of an effective tool formulating proposals for Public Transport improving Service routes and Schedules

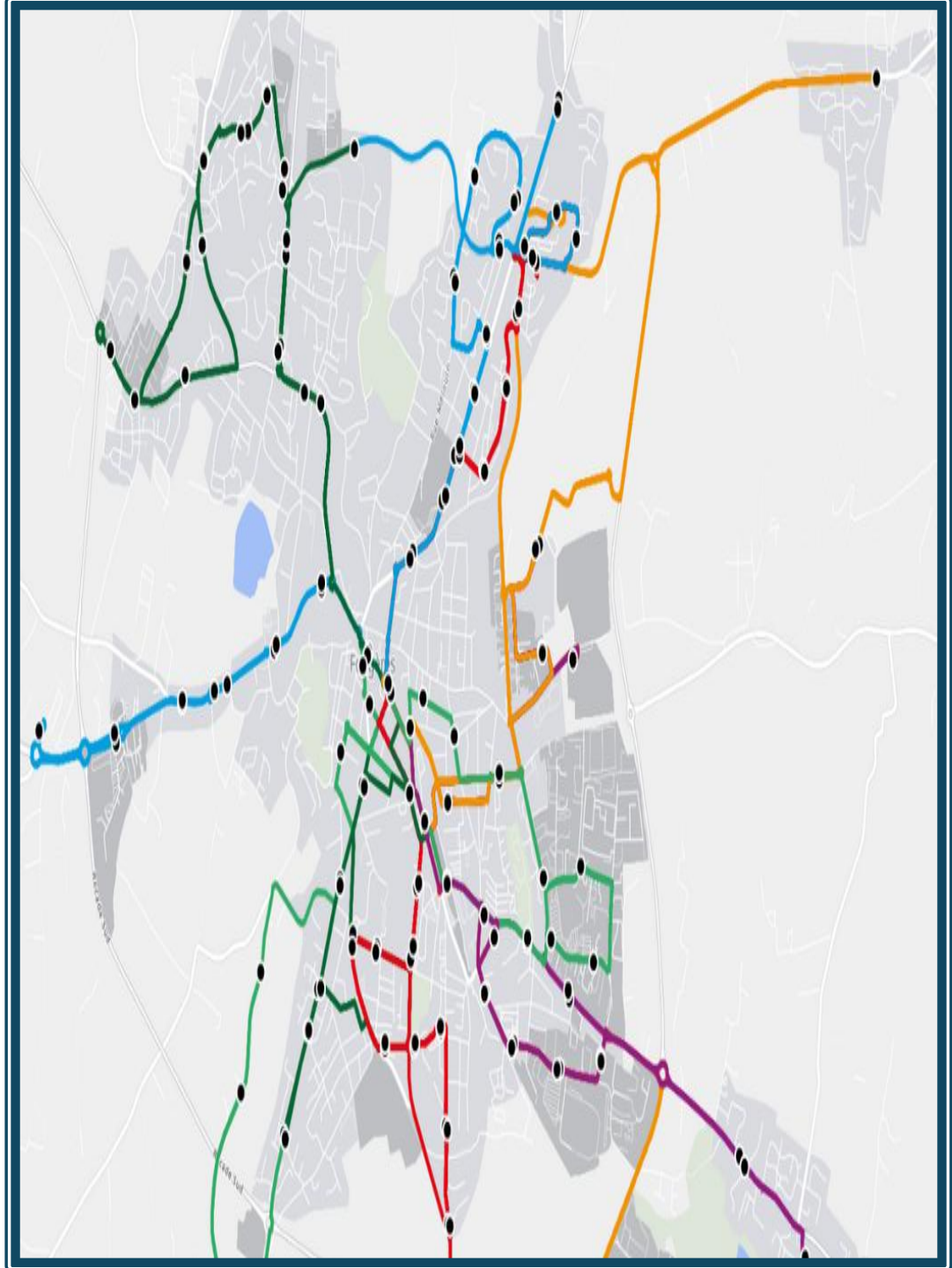


Baseline Requirements & Values Explained:

- Quantification of travel demand (Origin-Destination) in at least three urban areas and the interurban network
- Minimum number of searches/movements detected: 5,000 per area per day (about 1% of the total daily demand per area)
- **Average travel time**
  - Peak hours: ~45 minutes
  - Off-peak hours: ~30 minutes
- **Transfer waiting times**
  - Peak hours: ~15 minutes
  - Off-peak hours: ~30 minutes
- **Reliability/accuracy of bus arrival times**
  - Deviation from scheduled arrival time: Peak hours: up to +10 minutes
  - Off-peak hours: up to +5 minutes
- **Peak hours are defined as:**
- 06:30–08:30 (morning) - ~ 8% of total trips
- 16:00–18:00 (afternoon) - ~ 6% of total trips

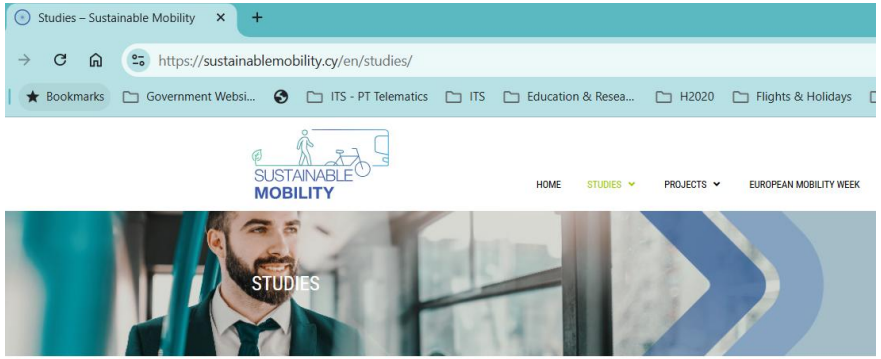
Key Performance Indicators (KPIs) Explained:

- Origin-Destination mapping in at least three urban areas
- Reduction in average travel or transfer time per route
- Percentage improvement in reliability/accuracy of bus arrival times



Identified Challenge Areas

https://sustainablemobility.cy/studies/



Urban Nicosia Congestion

Urban Nicosia experiences frequent traffic congestion and high travel demand. Passenger demand on primary accesses is high. There is difficulty in accessing primary lines as the city is widely spread and has low density populated areas. There is a need for improved connections.

Limassol's Complex Travel Patterns

In Urban Limassol, experiences frequent traffic congestion and high travel demand. Travel is influenced by both tourism and commerce, resulting in intricate and variable movement patterns. Passenger demand on primary accesses is high. There is difficulty in accessing primary lines as the city is widely spread and has low density populated areas. There is a need for improved connections.

Interurban Connectivity Solutions

Interurban routes prioritize linking city centers and other Park & Ride facilities at the edges of the cities, enhancing regional mobility across major population areas. There is high demand for intercity travel.

Budget & Funding Structure

Initial Phase Funding - Prototype Development

Phase A allocates €150,000 Its purpose is to create a functional prototype that demonstrates its technical and commercial viability. The prototype may be based on open data, synthetic data, or virtual data, which will be used to simulate real-world scenarios as described in the challenge..

Duration: Up to 9 months

Pilot Installation and Further Development:

Phase B significantly increases the budget up to €500,000, enabling further development and scaling of the project. It involves installing and testing the prototype in a real environment, as well as developing it into a fully functional product, service, or solution.

Duration: Up to 27 months

Expert Guidance and Integration

MTCW provides two person-months annually for expert guidance, collaborative design, and integration support.

Strategic Framework Alignment

Sustainable Mobility Enhancement

The initiative increases transport share and supports service modernisation, aligning with sustainable mobility and national strategic plans.

AI for Public Sector Challenges

Advances the National AI Strategy by applying artificial intelligence to solve real public sector problems effectively.

Emission Reduction and Electromobility

Supports emission reduction goals and increases electromobility, in line with European Green Deal and energy-climate plans.

Asked Questions for Discussion:

- ❑ Which real-time data streams (GTFS-RT, telematics, sensors, network APIs) will be available from the Ministry of Transport or the Public Transport Organization?
- ❑ Are there specific reliability KPI targets that the solution must meet (e.g., delay reduction, headway variance, improvement in punctuality)?
- ❑ Does the challenge allow for a multimodal approach and simulation components (e.g., demand forecasting, disruption propagation, EV fleet optimization)?
- ❑ Is access to historical data foreseen for training predictive models?
- ❑ Is collaboration with a Cypriot entity required, or can the coordinator be international (e.g., from the EU or third countries)?

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