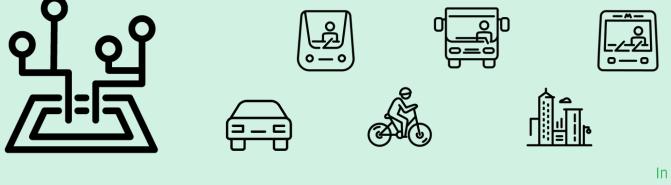
EXECUTIVE VERSION

PLANNING AND OPERATION IN URBAN TRANSPORT

Tool Guide For non-advanced users



In collaboration with:

NOMMON

aimsun.



En asociación con **Deloitte**

November 2023

This document is an executive version of Mobility Insights. The full version will be sent, exclusively, to all Mobility Institute members



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Data is essential for informed and justified decision making in the planning and operation of urban transport systems, allowing the different agents to carry out projects based on evidence and not on assumptions...

... therefore, this executive version of the 'tool guide' aims to help nonadvanced users in the most relevant aspects of urban transport planning and operation, exploring which data are crucial, how they can be worked with and how they can help the different transport agents according to their defined objective.





Urban transport agents

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TRAFFI0 AGENT3

CONCEPTUAL FRAMEWORK FOR URBAN TRANSPORTATION PLANNING AND OPERATION

This Executive Version was created with the objective of organizing the solutions available for the planning and operation of urban passenger transportation

STRATEGIC

PLANNING

OPERATIONAL

REAL TIME

OPERATION

LOCAL ADMINISTRATION

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AUTHORITIES RANSPORT

FRANSPOR

OPERATO



Objectives of this Executive Version of the 'toolkit':

- + Identify the main data analysis modeling needs of the and different actors in the sector
- + Describe the data sources and techniques analysis currently available to meet the different needs of the sector
- + Describe the modeling tools currently available to meet the needs of the sector
- + Present solutions and use cases that provide examples of the **application** of data analysis and modeling tools in the industry

PLANNING APURGE PLANNING & **OPERATION**

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SMART URBAN

TRANSPORT

Source: Mobility Institute in collaboration with Nommon y Aimsun

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1. INTRODUCTION

DATA

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SOURCES

TECHNIQUES OF ANALYTICS

* Technology layers refers to a specific part or level of the technology infrastructure needed to manage, monitor or predict urban passenger transportation systems.

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Nine niche needs have been identified, which must be addressed by the different transport agents defined

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SMART URBAN TRANSPORT PLANNING & OPERATION



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Source: Mobility Institute in collaboration with Nommon y Aimsun

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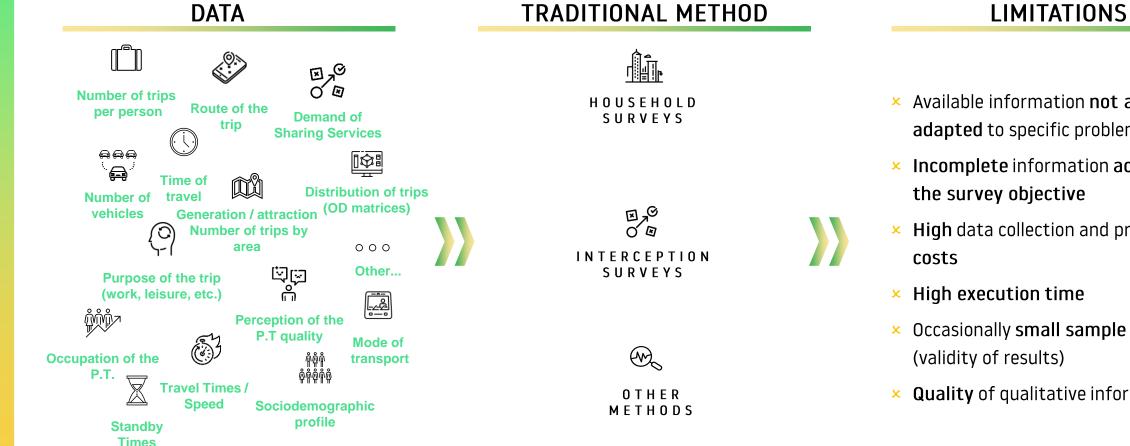
DEFINED TRANSPORTATION AGENTS



3. DATA AND TOOLS: TWO SIDES OF THE SAME

These transport agents have a need for different pieces of information that, traditionally, have been collected through surveys in a slow and expensive way...





- × Available information **not always** adapted to specific problems
- Incomplete information according to
- High data collection and processing
- Occasionally small sample size
- Quality of gualitative information

In addition, new data sources are now available, but it should be emphasized that none of them provides a complete picture of the...







Study of the impact of the pandemic on travel demand in Bogota, Medellin and Buenos Aires

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Detail

 The COVID-19 pandemic severely affected the demand for public transport around the world

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ANALYTICAL

TECHNIQUES

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DATA

SOURCES

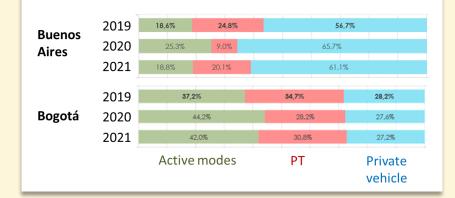
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MONITOR

- In order to help Latin American cities meet this challenge, the World Bank selected Nommon to develop a methodology for monitoring travel demand patterns based on the exploitation of geolocated data from mobile devices
- The methodology was demonstrated in Bogota, Medellin and Buenos Aires, in close collaboration with local transport authorities. The project, which combines cell phone and public transport smart card data, provided a detailed understanding of how the pandemic disrupted mobility patterns, with a particular focus on public transport demand

GRUPO BANCO MUNDIAL NOMMON

budaet (€)



4 - 6 months

(Large Urban Areas)

50,000 - 100,000 € per City

Predicting CO2 savings through shared mobility in Norway



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Ð Ŷ **Technological** 逾 Implementation Agent 3-6 months MODELLING DATA ANALYTICAL Time (aprox.) LOCAL Layer SOURCES TECHNIQUES TOOLS ADMIN. B O B Estimated сщ Necessity Ambit 50,000 - 100,000 € budget (€) STRATEGIC PREDICT Detail NOMMON City of • In Stavenger (Norway), as part of the European AI4Cities program, Nommon and Stavanger Populus worked to develop and implement an AI-based solution that allows cities to analyze the impact of shared mobility on CO2 savings to facilitate the design of sustainable mobility policies POPULUS The solution combines mobile, survey and shared mobility operation data to build ML demand forecasting and modal substitution models that provide the following CO2 PREDICTIONS indicators: Included Zone All Zones • Demand projections for shared mobility trips that have origin and 12.411 total est. shared mobility trips destination in each of the areas of the municipality. 1,456.3 estimated shared mobilit 3.587 private vehicle trips replaced • Estimated CO2 emissions from shared mobility trips and in each of the 549.9 kg-CO2eq saved 1.722 public transit trips replace substitution modes. 318.4 kg-CO2eq saved 6 886 active trips replaced 546.1 kg-CO2eg saved Estimated CO2 savings corresponding to modal shift. 216 other trips replaced 41.8 kg-CO2eg saved estimated CO2 savings from 630.6 replaced trips (Ko-

Dynamic planning and operations model from the Eiffel Tower to the Place de la Bastille (Paris)



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Technological
LayerDATA
DATA
SOURCESImplementation
TOOLSRecurrentNecessityImplementation
ToolsImplementation
Time (aprox.)Recurrent

Detail

- In Paris, the dynamic model in operation since 2010 and covering 500 km2 (3,500 km of roads and 11,000 intersections) informs the city's daily transport planning and operations, from the redevelopment of the entire Eiffel Tower area to the integrated mobility schemes at Place de la Bastille
- The Paris model informs all aspects of:
 - Transportation planning
 - City and neighborhood master plans
 - Design of public transport routes and schedules
 - Active mobility plans: bike lanes and pedestrianization
 - Space creation projects
 - Streetcar extensions
 - Infrastructure planning and design

<image>

Modelo de simulación híbrido (HSM) para mejorar las capacidades de la demanda estratégica existente en Abu Dhabi



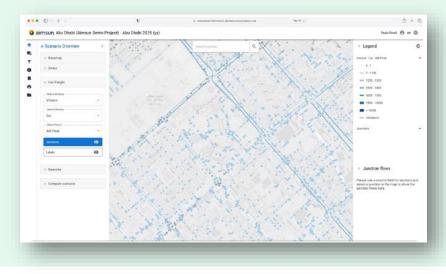
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Technological Implementation Agent 30 months MODELLING Time (aprox.) TRANSPORT Layer TOOLS AUTHORITIES N N N N N **Estimated** ññ têr. Necessity Ambit 2.200.000 - 2.300.000 € budget (€) STRATEGIC PREDICT

- Detail
- En Abu Dhabi, se desarrolló un proyecto cuyo objetivo es implementar un modelo de simulación híbrido (HSM) para mejorar las capacidades de la demanda estratégica existente del modelo
- El HSM proporciona una **plataforma para probar esquemas e intervenciones** con el nivel apropiado de detalle dentro de plazos muy reducidos y con una representación de modelo consistente
- Aimsun desarrolló un conjunto de procedimientos de automatización y secuencias de comandos para procesar la amplia gama de conjuntos de datos disponibles, garantizando que los procesos fueran repetibles
- STEAM+ es una innovadora plataforma de modelización de transporte, basada en un gran almacén de datos, modelos estratégicos y de varios niveles, y una herramienta de visualización que simula el movimiento de 12 millones de personas







Ultimately, to address initiatives to improve decision-making in the planning and operation of urban transport, transport agents are recommended to...





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- Define the purpose and each specific problem to be solved
- Analyze the data-tools binomial that best responds to each need
- Assess the cost-benefit of each solution to be developed and implemented
- Have specialist skills and tools in transportation engineering
- Apply tools that make the most of each data source
- Define the transportation demand data update plan
- Tailor analyses and tools to specific problems
- Handle estimation errors and document validations
- **Transfer know-how** to strategic and operational teams





THANK YOU

hola@mobilityinstitute.es



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