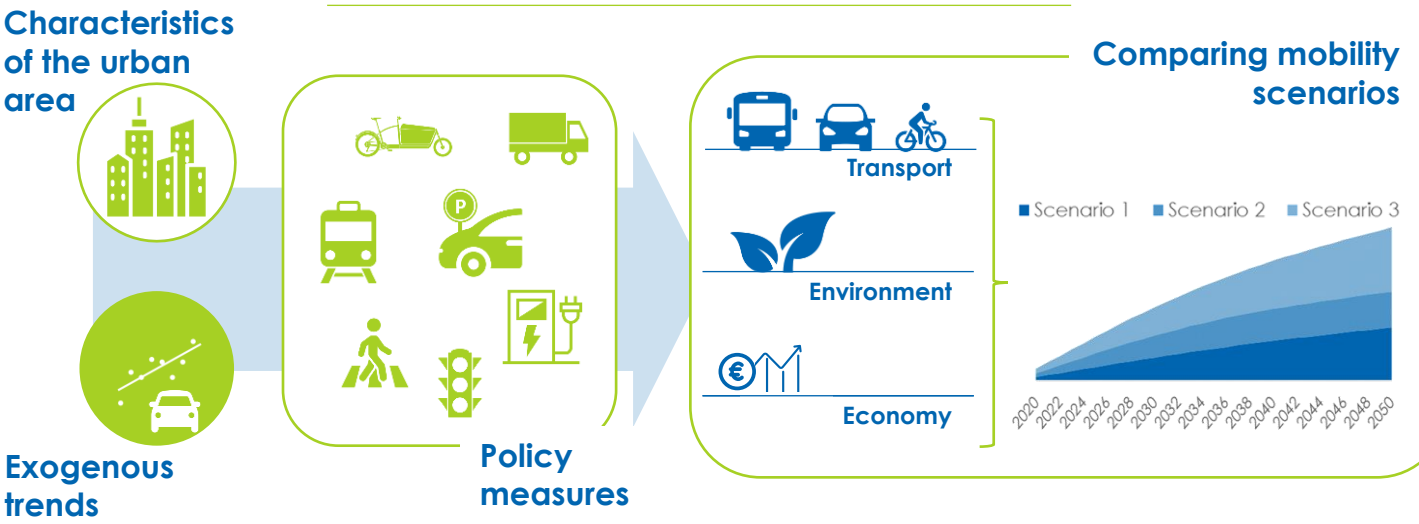
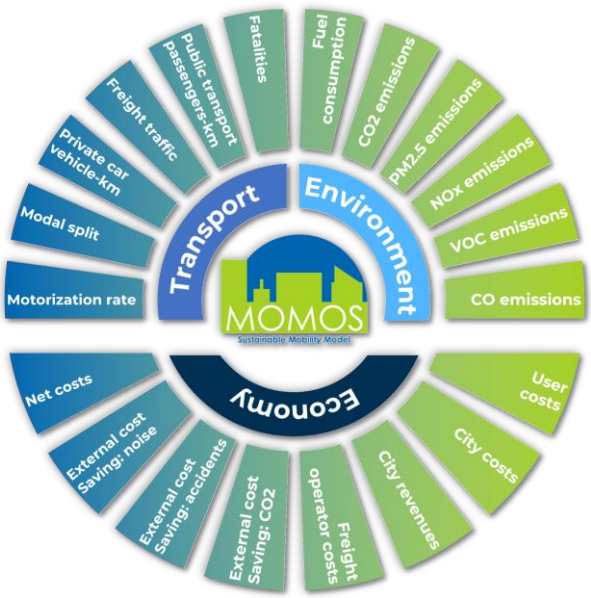
MOMOS

Model for Sustainable Urban Mobility

MOMOS allows to analyse different **policies** for **sustainable mobility in urban areas**, exploring **alternative options** of intervention, estimating with a **strategic and aggregated approach** the expected impacts and the order of magnitude of the **resources needed** on yearly basis **up to the year 2050**.





MOMOS is a flexible tool that can be adapted to different urban contexts, considering specific **characteristics of the urban area** and **exogenous trends**, such as vehicle fleet technology and energy trends.

MOMOS allows to evaluate different scenarios, selecting and defining **urban mobility policy measures**, setting their intensity and temporal dimension.

The model simulates on a yearly basis several **quantitative indicators**, related to **transport**, **environment** and **economy**, to support the comparison of mobility scenarios up to the year 2050.

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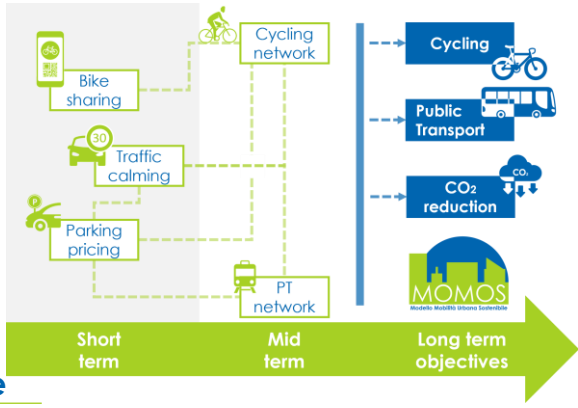
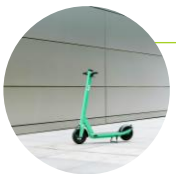
Urban transport policies

MOMOS allows to simulate policy **measures** individually or building **policy packages**, activating multiple measures. Each measure is defined in terms of **intensity** by their specific inputs and by their **initial year**: strategies can be designed in a comprehensive way, considering also the temporal dimension, considering synergies and sequentiality until 2050.



Vehicle Fleet and recharging infrastructure

Fleet renewal and electrification can be accelerated by the introduction of **electric or hydrogen charging stations**, regulations governing the purchase of **new private vehicles, public transport and freight vehicles**.



Innovative and shared mobility services

Car sharing, **bike sharing** e **micromobility** allow to support multimodality. Those services could be further enhanced with innovative strategies such as **MaaS**. Demand-responsive transport (DRT) is conceived to capture demand in areas where standard public transport is not very effective.

Transport infrastructure

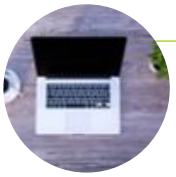
MOMOS allows to simulate policies related to infrastructures such as **bike lanes**, **PT network extension**, or improvement of **frequency**. Measures related to incoming trips include **Park&Ride** and their linkage with sharing services.

Traffic management and control, pricing schemes

Policies related to traffic management involve the implementation of **LTZs**, **LEZs**, **pedestrian areas** or **traffic calming**. **Prioritization of public transportation** can make it more competitive and encourage modal shift. **Access regulation** and/or **parking pricing schemes** can help to effectively manage transport demand.

Urban logistics

Urban logistic can be regulated through **delivery and servicing plans**, where freight distribution is optimized. This is enhanced also by **urban centers and logistic facilities**, as well as incentives and services supporting **cargo-bike** for last-mile delivery.



Transport Avoidance

The pathways toward sustainable mobility could also include measures aiming at transport avoidance. **Smart-working**, **online shopping** and **car-free days** can support this approach.

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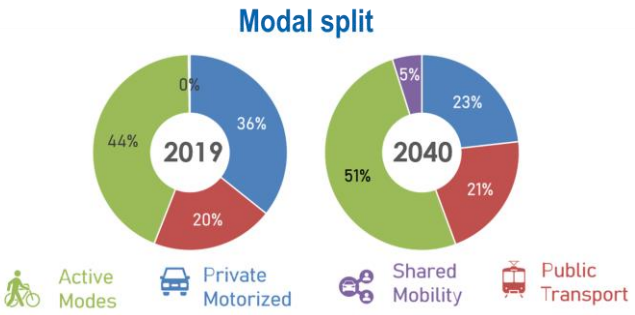
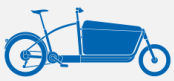
Model results

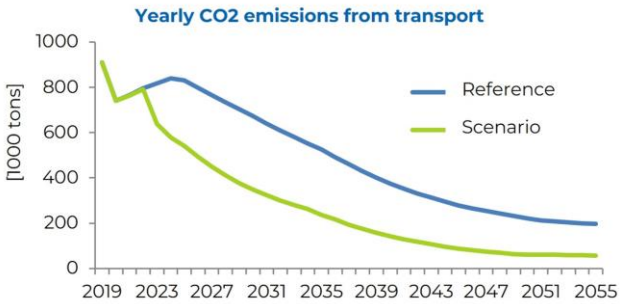
Transport indicators

MOMOS simulates urban mobility by transport mode for both passengers and freights segments. On the passenger side, one of the main indicators is **modal split**. Other indicators estimate **car ownership**, **travel time** per trip, **vehicle fleet composition**, **road accidents** and **fatalities**, etc.



Freight demand is segmented by Light Duty Vehicle (LDV), Heavy Duty Vehicle (HDV)and cargo-bike.



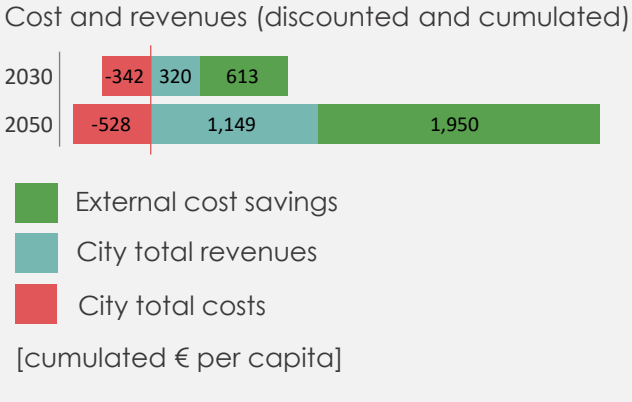


Environmental indicators

The main environmental indicators concern **CO2 emissions** and air pollutants emissions (including **$PM_{2.5}$**, **PM_{10}**, **VOC**, **Nox**, **CO**).
The estimation is based on vehicle fleet composition by technology and transport demand by mode in terms of vehicle-km.

Economic indicators

For each urban mobility policy, **costs and revenues** are estimated, considering different actors involved: **city authority** (and related **service providers**), **passenger transport users**, **freight operators**.
Finally, the model includes the **monetisation of externalities** (**CO2 emissions**, **air pollutant emissions**, **noise**, and **injury accidents**), to support the comparison of scenarios.



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Applications of the model

MOMOS has been used for several applications to support **Sustainable Urban Mobility Plans (SUMP) in Italy**, as well as for the analysis of transport policies for sustainable mobility in different **European cities**.

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Costs and Benefits of the Sustainable Urban Mobility Transition

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Contacts and information

The experts from TRT Trasporti e Territorio are available to provide more details on MOMOS model and on its potential applications.

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