

Costs and benefits of the sustainable urban mobility transition

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Co-funded by the
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Study objectives and scope

Research questions:

- How much will the transition to sustainable urban mobility (-55% CO2 by 2030 and -90% CO2 by 2050 compared to 1990 levels) cost?
- What are its benefits, including the monetization of all externalities?
- What range of costs and benefits can be identified according to city variables?
- What are the most cost-efficient measures to accelerate sustainable urban mobility?

Scope: 779 EU cities of more than 50 000 inhabitants



Urban Mobility Next #5

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EIT Urban Mobility

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eurbanmobility.eu

Modeling and analysis
TKT

Co-funded by the
European Union





Methodology (1/2) – City prototypes

Three pathways to sustainable mobility have been applied to **12 City Prototypes**, to account for differences among cities in their dimension and geographic area

The model's output (indicators) have been **generalized at the EU27 level** (779 cities)

Characteristics and transport parameters of each City Prototype have been defined using **30 reference cities**:

	Southern Europe	Central Europe	Northern Europe	Eastern Europe
Small City 50-100K inhabitants	Alessandria (IT) Faro (PT) Zadar (HR)	Klagenfurt (AT) La Rochelle (FR) Leuven (BE)	Galway (IR) Lahti (FI)	Daugavpils (LV) Tartu (EE) Zilina (SK)
Medium City 100-500K inhabitants	Perugia (IT) Ljubljana (SI)	Bielefeld (DE) Eindhoven (NL)	Uppsala (SE) Oulu (FI)	Gdynia (PL) Klaipeda (LT) Szeged (HU) Timisoara (RO)
Large City >500K inhabitants	Athens (EL) Barcelona (ES)	Bordeaux (FR) Munich (DE)	Copenhagen (DK) Dublin (IR) Göteborg (SE)	Prague (CZ) Sofia (BG)



Methodology (2/2) – Transition pathways

6 policy groups

29 policy measures

3 transition pathways to sustainable mobility:

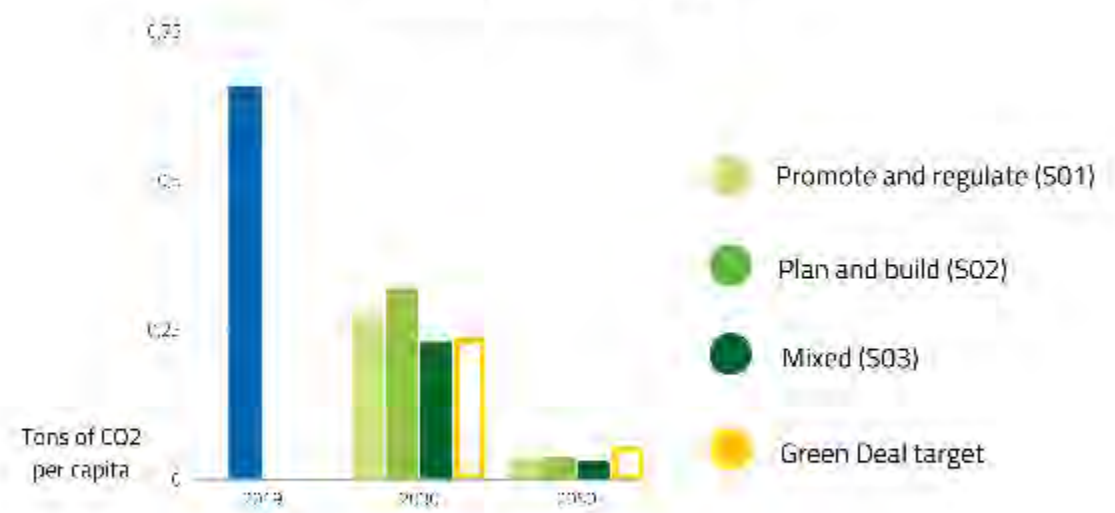
- Promote and Regulate
- Plan and Build
- Mixed

Policy Group	Policy Measure	S01: Promote and Regulate	S02: Plan and Build	S03: Mixed
Shared Mobility and Demand Management	Sustainable travel information and promotion (behaviour)	X		X
	Mobility as a Service (MaaS)	X		X
	Bike sharing	X		X
	Micro mobility	X		X
	Carsharing	X		X
	Delivery and servicing plan	X		X
	Teleworking	X		X
Innovative Services	Autonomous vehicles		X	X
	Demand-responsive transport (DRT)		X	X
	Intelligent Transport Systems (ITS)		X	X
Green Public Transport and Logistics Fleets & Charging Infrastructure	Electric energy refuelling infrastructure	X	X	X
	Hydrogen energy refuelling infrastructure	X	X	X
	Green public fleet	X	X	X
	Green logistics fleet	X	X	X
Pricing Schemes	Congestion and pollution charging	X		X
	Parking pricing	X		X
	Public transport integrated ticketing and tariff schemes	X		X
Transport Infrastructure	Bus network and facilities		X	X*
	Tram network and facilities		X	
	Walking and cycling networks and facilities		X	X
	Park and ride (multimodal mobility hubs)		X	X
	Metro network facilities and light rail		X	
	Urban Delivery Centres and city logistics facilities		X	X
Traffic management and control	Legal and regulatory framework of urban freight transport	X		X
	Legal and regulatory framework of new mobility services	X		X
	Prioritizing Public Transport		X	
	Access regulation and street space reallocation	X		X
	Traffic calming measures	X		X
	Pedestrian Areas	X		X

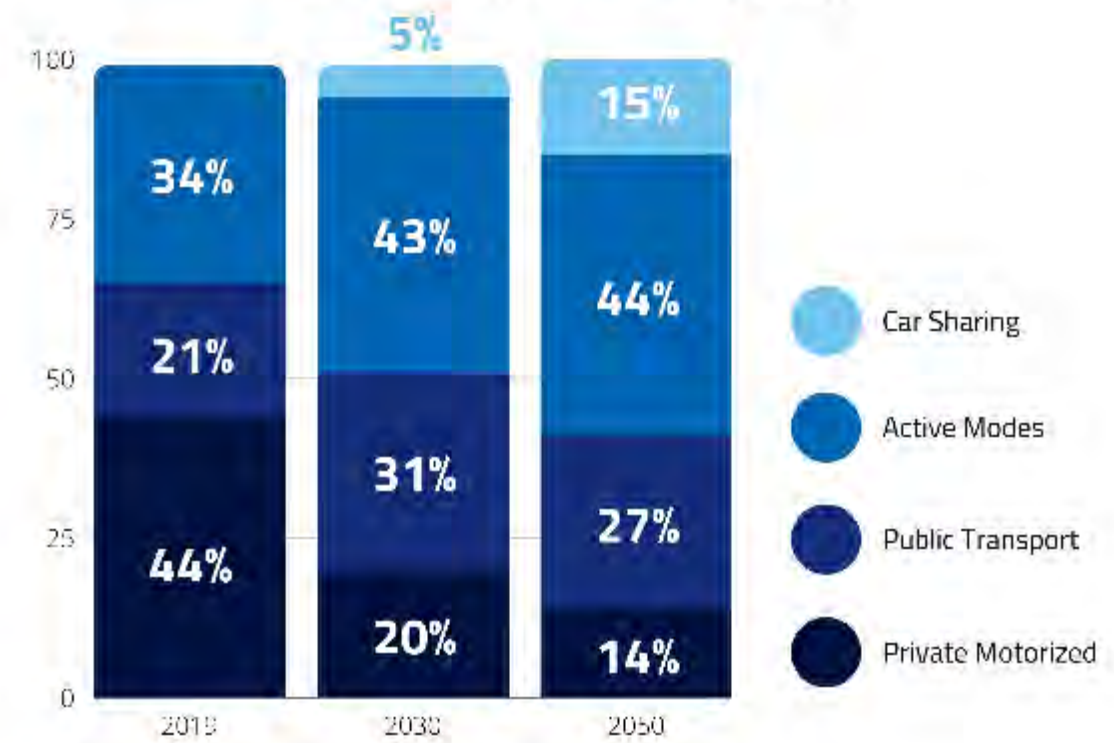


Meeting the 2030 Green Deal target requires ambitious reduction of private motorised trips

Emissions of CO2

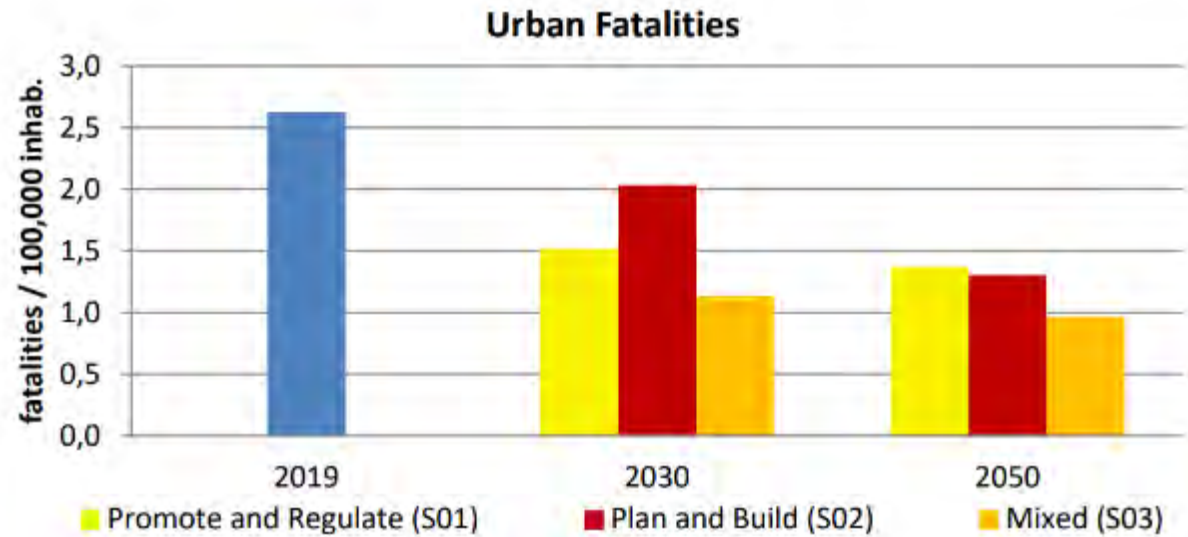


Modal Split: Mixed (S03)



Additional efforts are required to make Vision Zero a reality across EU cities by 2050

The most ambitious transition scenario reduces urban fatalities by 63% in 2050



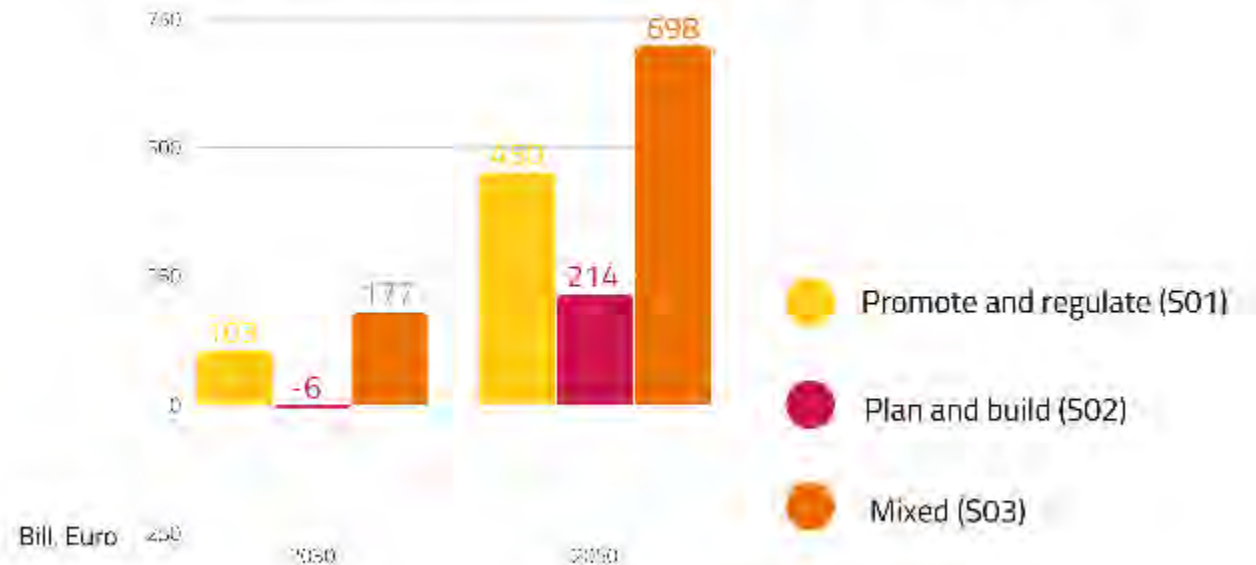


Each euro invested in the transition can generate up to €3,06 by 2030 ; and up to €5,66 by 2050

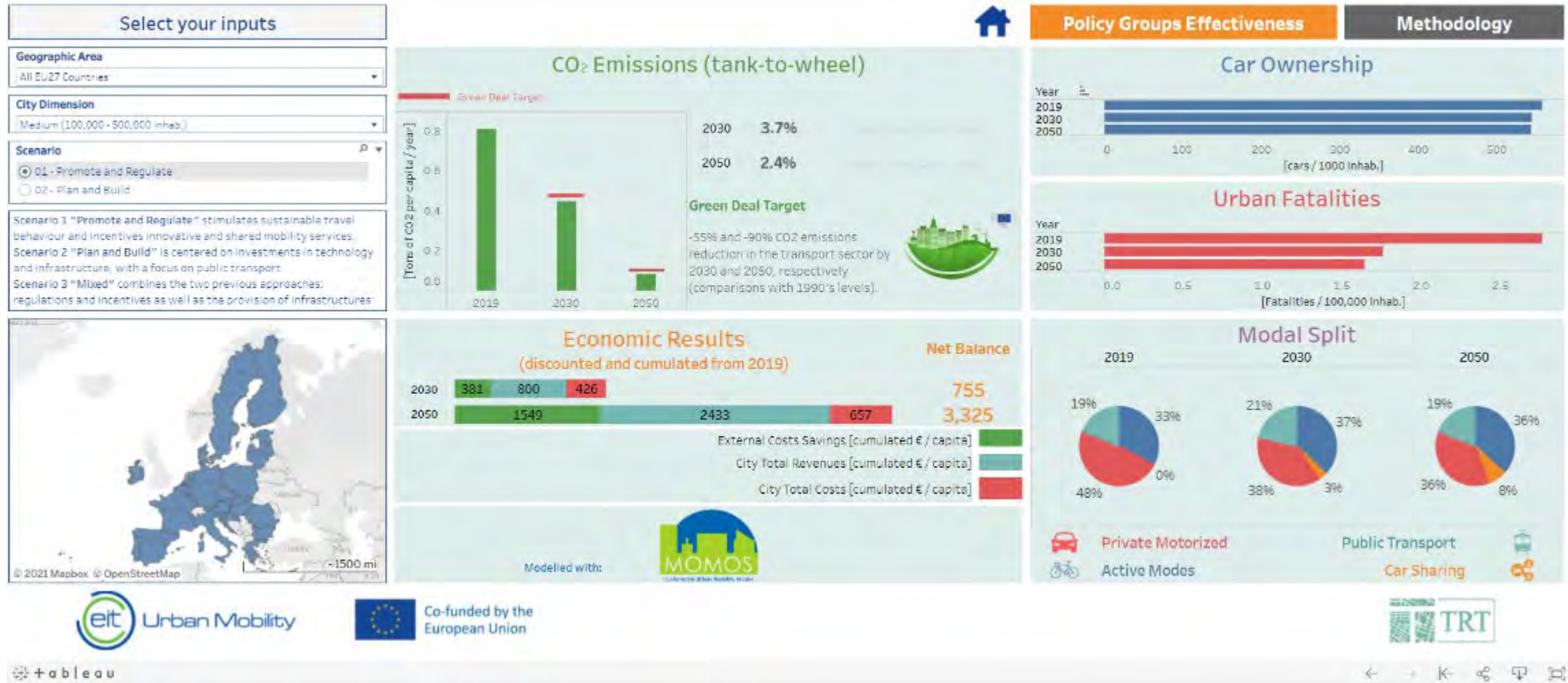
The transition can lead to net benefits of up to €177bn by 2030, €698bn by 2050...

... but requires €86bn extra investments compared to business-as-usual scenario by 2030, and €150bn by 2050.

Net Balance (discounted, cumulated from 2019)



Using our findings for your city



Which of these policy groups is the best mix between cost-effectiveness and CO2 emissions reduction in large European cities?

0 3 4

(1/2)

Shared mobility and demand management (MaaS, vehicle sharing, logistics delivery plans, teleworking)

9 %

Innovative services (Demand Responsive Transport, autonomous shuttles, Intelligent Transport Systems)

3 %

Pricing schemes (Congestion and pollution charging, parking pricing, public transport integrated ticketing and tariff schemes)

47 %

Transport infrastructure (Bus & tram network and facilities, walking and cycling networks and facilities, P+R, urban delivery centres)

26 %

Which of these policy groups is the best mix between cost-effectiveness and CO2 emissions reduction in large European cities?

0 3 4

(2/2)

Traffic management and control (Legal and regulatory framework for urban freight/micromobility, prioritizing public transport, access regulation and street space reallocation, traffic calming & pedestrian areas)

 15 %



Policy group effectiveness – takeaway for public transport

- **Innovative services** (e.g. DRT, ITS, autonomous shuttles) are mostly profitable in large cities **where demand is likely higher**
- **Transport infrastructure extension** has positive impact in smaller cities, but a limited one in larger cities
- By 2050, **Innovative Services** followed by **Shared Mobility and Demand Management** are the most efficient & profitable groups in medium and large cities. **Pricing Schemes** are the best option in small cities.