ASECAP DAYS
MADRID 2025

52nd ASECAP DAYS

Challenges of Future Mobility | The Role of Road Infrastructure

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Asociación de Empresas Constructoras y Concesionarias de Infraestructuras

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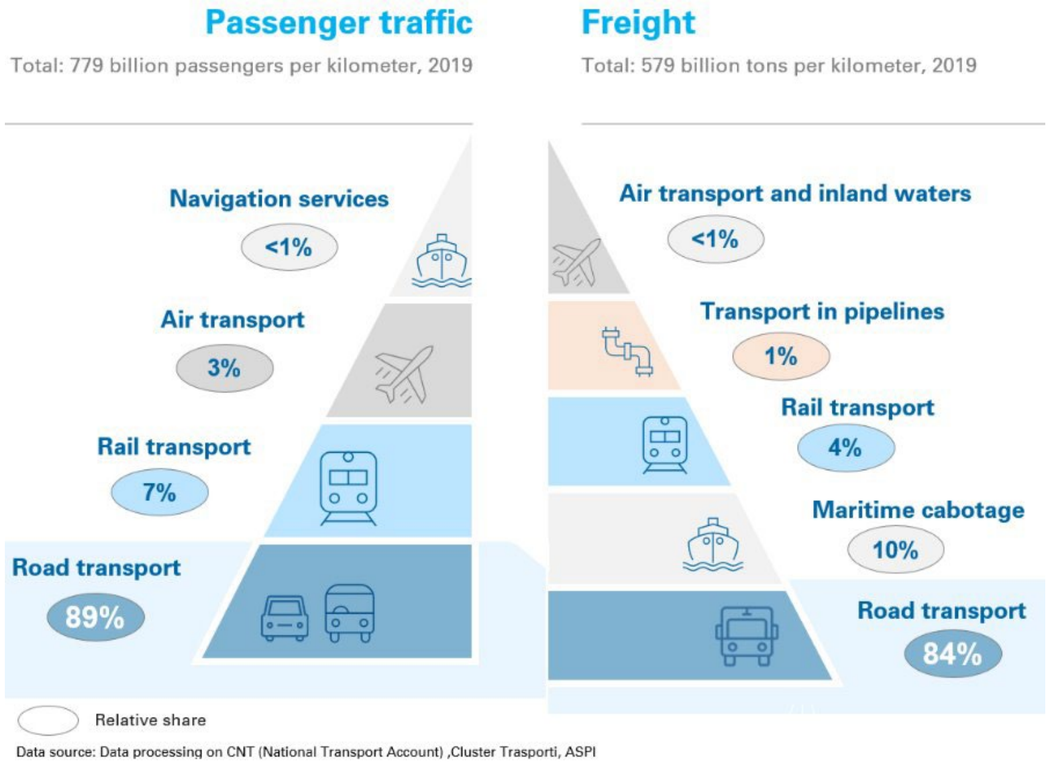
Dynamic Pricing for Traffic Management and Environmental Sustainability

Domenico Zagari & L

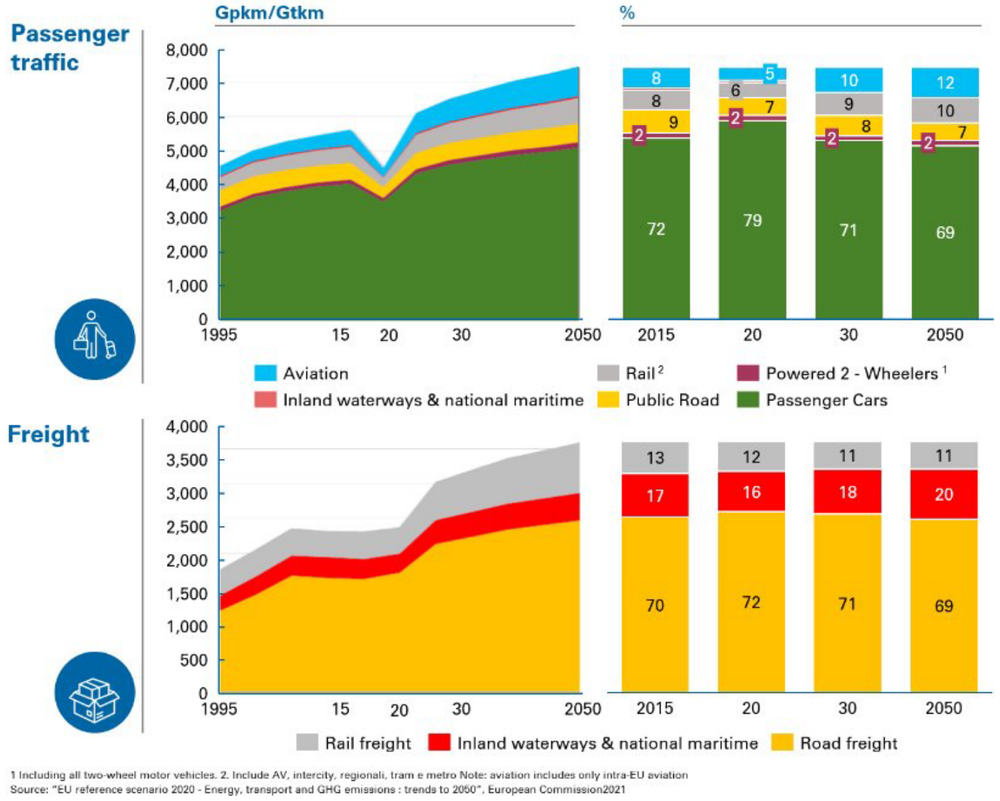
Autostrade per l

Current and prospective centrality of road transport

Road and motorway infrastructure in Italy serves ~90% of passenger traffic and ~85% of freight transport in Italy



In the EU transport system, mobility is expected to grow, with a relative share for road transport in 2050 still above 70%



1 Including all two-wheel motor vehicles. 2. Include AV, intercity, regionali, tram e metro Note: aviation includes only intra-EU aviation
Source: "EU reference scenario 2020 - Energy, transport and GHG emissions : trends to 2050", European Commission2021

download Autostrade Green Book - https://libroverde.autostrade.it/en/

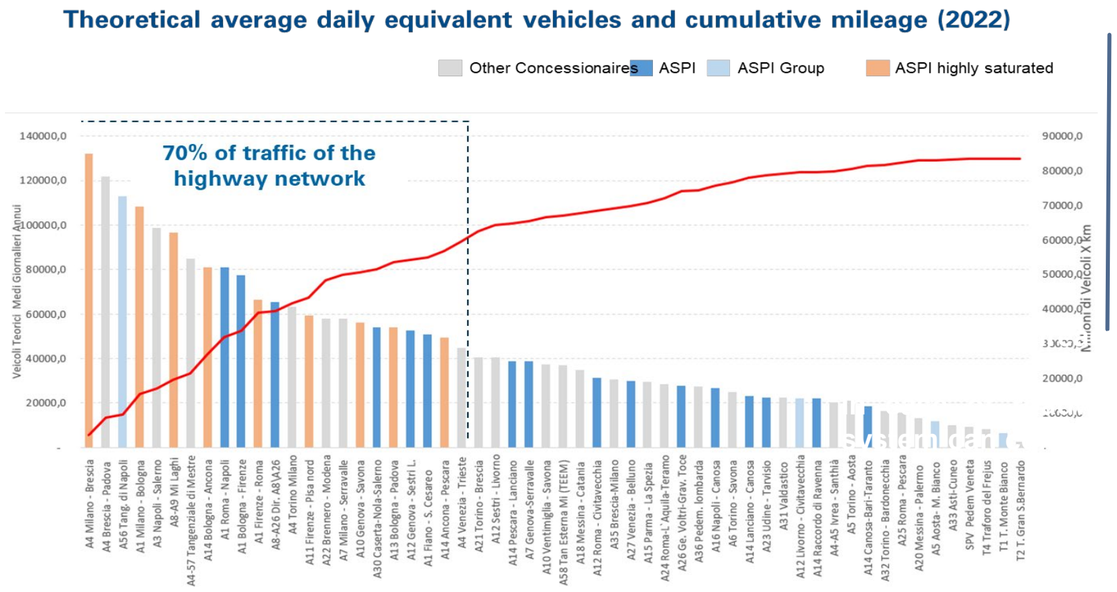
Autostrade per l'Italia's role

- **4° Country in Europe** for **mileage extension** after Spain, Germany and France (~3 thousand km network out of ~7thousand km of motorways in Italy).
- **↑ Per km of bridges** equal to **14% on km extension vs a European average 2.6%** (4.140 bridges and viaducts, of which 2.062 with L>10m).
- **↑ By number of tunnels, owning 50%** (~500km) **compared to the European countries examined.**
- **↑ By age: 85% of the network built by the '70s** , while other nations reach this situation not before the '90s-2000s.
- **↑ Country by motorway traffic vs average* of other EU countries:**
  1. 40k ADTV** in Italy vs 30k in France and 20k in Spain.
  2. 10k ADTV goods in Italy vs 5k in France and 1k in Germany.

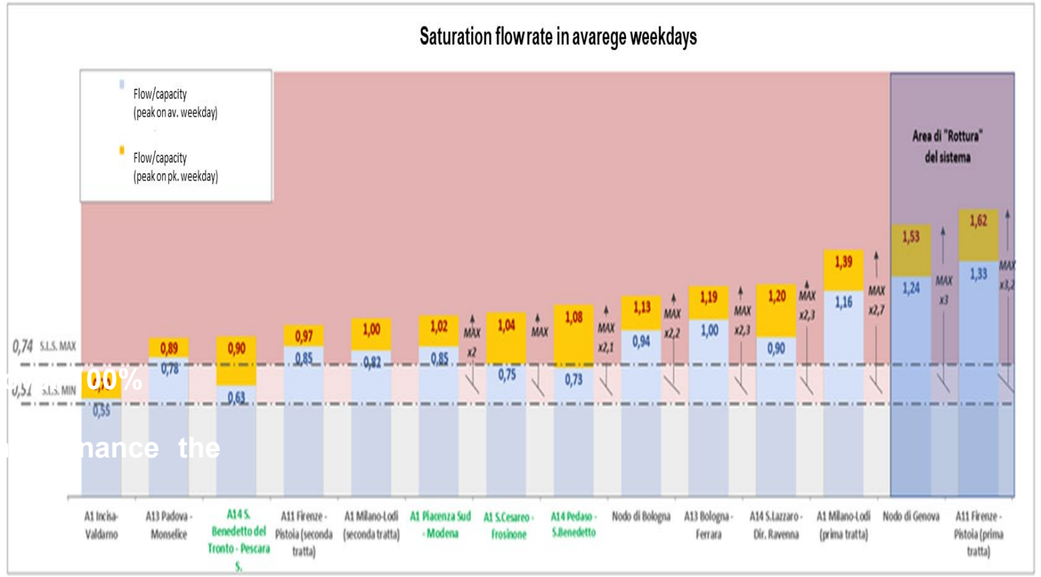
*The average was calculated by weighting the volumes in relation to the km of network in each country. Germany was excluded from the calculation as light vehicles are not included

** Annual Average Daily Traffic for Vehicles (ASECAP 2021)

Reached road capacity limit for most of national highways



~60%÷70% of the total traffic (vehicles*km)
on 51% of the toll network (ASPI Group)



Saturation is already close or over 100%

In case of roadworks for maintenance the system can collapse

Deep transformation

VISION

Transport will be connected and interconnected, greener and safer and supported by zero-emission vehicles and systems.

CHALLENGES

- Improving safety, efficiency and environmental sustainability of demand.
  - Reduce the number and duration of queues.
  - Reduce congestions.
- Monitoring and maintaining both the physical and IT infrastructure.

DRIVERS

- Decarbonization of mobility.
- Development of assisted and autonomous driving technologies.
- Application of Smart Mobility Services.

Innovation Programme Mercury
1,5 billion € over 15 years

MERCURY SMART SUSTAINABLE MOBILITY

The Mercury programme

The five clusters of innovative and technological initiatives

CONNECTED INFRASTRUCTURE

Infrastructure digitalization initiatives and activities to **enable systems & technologies**, collect and **exchange information**

INTELLIGENT ROADS

Projects in thefield of **traffic control**, **road safety** and **improving traffic** through infrastructure of **intelligent road systems**

SMART TOLLING

Initiatives in the field of **digitalization** and **automation** of **collection systems**

GREEN SOLUTIONS

Activities in the field of **environmental sustainability** and generation of **energy from renewable sources**

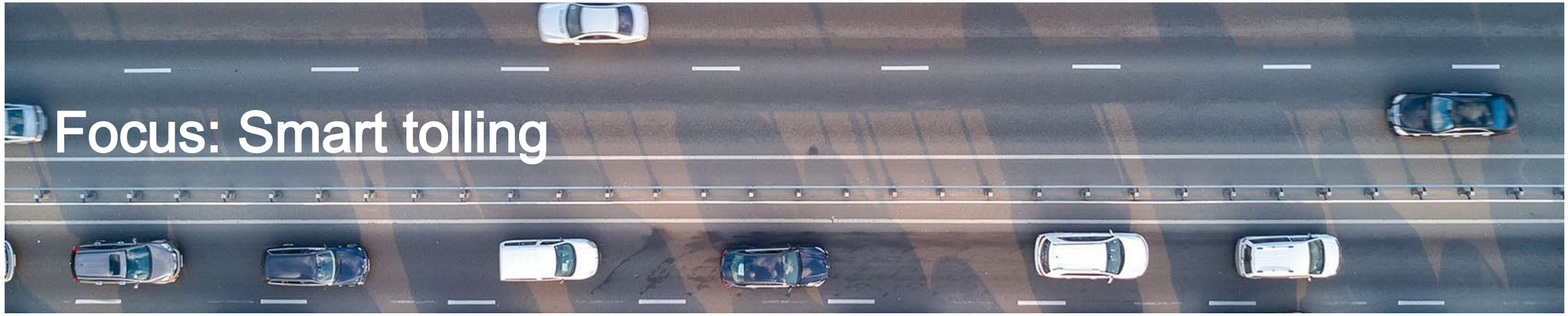
URBAN MOBILITY

Initiatives to improve **mobility services & solutions in urban centres**

Targets

- Zero accidents (50% by 2030)
- 15% reduction of travel time
- 20% reduction of queues and congestions

Focus: Smart tolling



Initiatives in the field of **digitalization** and **automation** of **collection systems**

AIM

Making **toll payment mechanisms more flexible and efficient** to simplify payment operations and transform the toll collection system into a pricing tool, useful for **reducing congestion, encouraging sustainable behavior and multi-modality.**

PROJECTS

Station 2.0

Smart tolling solutions

- Cashback
- Ticket dematerialization
- Video Tolling

Video Tolling

OBJECTIVES

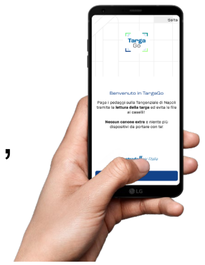
The rationale for the intervention is to advance the technology and the toll collection system toward new modes of payment, with minimum impact on customers.

UNDERLYING TECHNOLOGIES

The system is based on license plate recognition, thanks to cameras installed at toll booths, central data/image processing systems and the use of advanced image analysis technology (OCR).

USE

To use the service, it is necessary to be registered, by downloading the TargaGoapp or accessing the TargaGowebsite.



Video tolling does not require a track stop or on-board apparatus, or additional physical facilities.

- No additional costs
- No additional devices
- Free flow tolling
- Sustainable service (no queues)
- Dedicated online assistance

autostrade per l'Italia

tangenziale di Napoli

*(OCR - Optical Character Recognition).

Video Tolling: application

TARGA GO

Innovativetoll payment tool based on videotolling technology, launched by ASPI and Tangenziale di Napoli, in agreement with MITM(Ministryof Transport), complementaryto other methods already in use (electronic toll collection, cards, cash).

Since the start upto July 2024, the Targa Go app has recorded more than 47.000 downloads and the service is used by more than 10.000 customers and counts more than 680.000 transits.

1 DOWNLOAD AP/P ACCESS WEBSITE

Download the **app** «**TargaGo**» or access the website to start the trip

2 REGISTRATION

Activating a "TargaGo" profile by entering personal data, and vehicle license plate

3 RECHARGE FOR PAYMENT

Digital purse reload, using credit, debit or prepaid card

4 TRANSIT

It is possible to use the lanes dedicated to Telepass (yellow)

5 AUTOMATED TOLL CHARGE

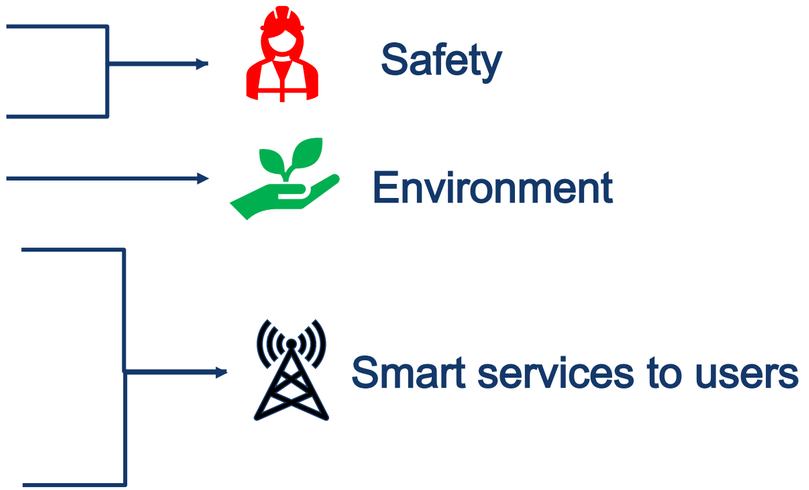
As the vehicle passes, the **toll is automatically deducted** from the TargaGo purse upon recognition of the license plate

THE SERVICE IS ACTUALLY AVAILABLE FOR VEHICLES

Dynamic Pricing tool for Traffic Management and environmental Sustainability

OBJECTIVES

1. Less accidents caused by heavy traffic congestions.
2. Reduction probability to have queues.
3. Reduced emissions from traffic congestion and improved air quality.
4. Real-time traffic data and information sent to driver (informed s decisions).
5. More efficient road infrastructure use by:
   - suggesting alternative routes or times to drivers to avoid peak hours,
   - decreasing traffic jams during the busiest times of day.



NEEDED TOOL

Prediction of traffic volume that will be on a particular highway segment on a given day or time period.

From smart departures to economic departures

1. **NATIONAL TRAFFIC MODEL FOR PRICING SIMULATION**

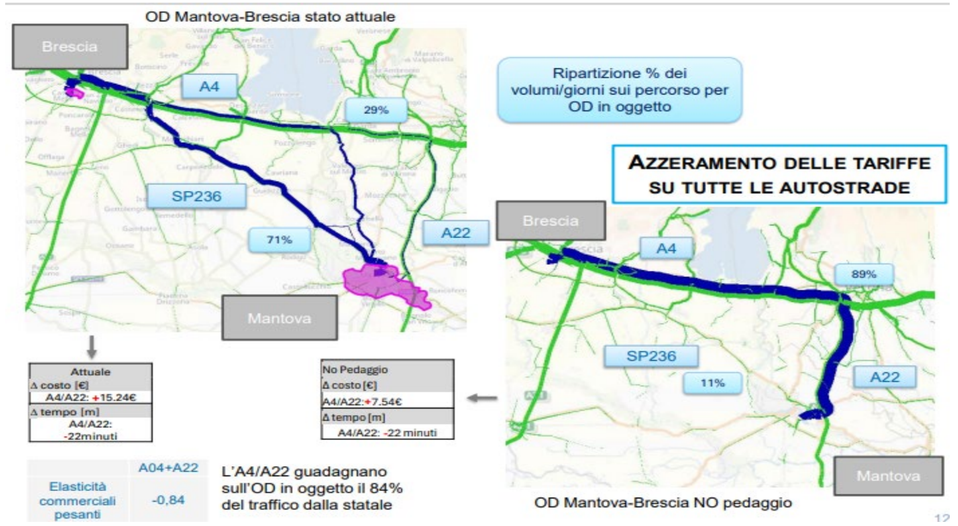
   To evaluate the effects of changes in highways toll prices on traffic volume, emissions, and road safety: different scenarios and optimal pricing decisions (**75000 km of road network**).

2. **DYNAMIC PRICING MODEL**

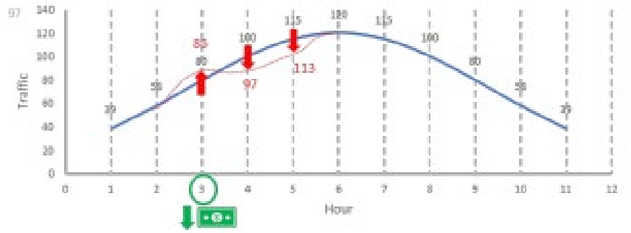
   (overall model to predict traffic fares)

   Determining optimal dynamic toll rates to be charged **at different times and locations** considering various factors:

   a. traffic volumes,
   b. demand patterns,
   c. classes of vehicles
   d. type of users (i.e. commuters)
   e. congestion levels,
   f. events (i.e. roadworks, summer holydays)



Simulation: NO Tolling



Modified traffic distribution due to the change in prices.

Eurovignette

(Directive (EU) 2022/362)

OBJECTIVES

- Strengthening the implementation of polluter-pays principles.
- Promote the decarbonization of transport by contributing to the implementation of the Paris Agreement on climate change and EU plans to reduce CO2 emissions.

SIMULATION HAS BEEN CONDUCTED IN ASPI, considering:

1. Application of the Vignette to commercial vehicles, according to German toll fares, on the entire national highway network.
2. KPIs:
   - Variation in veh-km by vehicle classes and emission classes.
   - Variation in revenue to the Companies.

The toll rate on German highways is calculated on the basis of 4 cost categories:

- Infrastructure,
- air pollution,
- noise pollution,
- CO2 emissions.

RESULTS (1)

Change in travel by vehicle class and network type compared with the current scenario.



+15%

-10%

-19%

Tot: +7%

RESULTS (2)

Breakdown of mileage by euro class commercial vehicles on highway network (in red the current scenario).

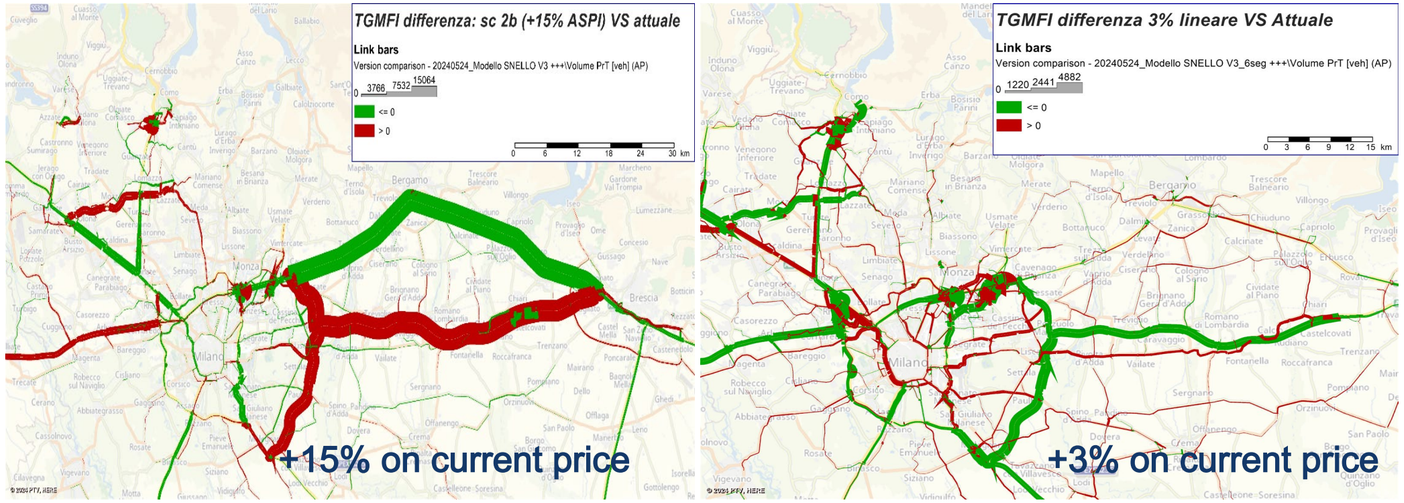
	EUR 0	EUR 1	EUR 2	EUR 3	EUR 4	EUR 5	EUR 6	Totale
	0,9% (1,0%)	0,5% (0,6%)	2,0% (2,2%)	7,4% (8,0%)	17,1% (17,8%)	31,3% (32,0%)	40,9% (38,4%)	**100%**
	3,6% (4,3%)	1,0% (1,2%)	6,1% (7,0%)	23,5% (25,7%)	7,5% (7,5%)	38,6% (37,4%)	19,7% (16,9%)	**100%**

Other Scenarios simulated and conclusions

(compared with current situation)

Free of charge simulation

Price Elasticity of Demand (overall network)	
light vehicle	11.50%
heavy vehicle	5.70%



1. **Ready to simulate:** to understand how traffic varies depending on the price applied and as the **basis for a possible dialogue** with our stakeholders (i.e. Ministry of Transport).

2. Potentially, we can achieve more fluidity in traffic by redistributing traffic over the entire available national network, that means a **reduction in queues and in congestions.**

Thank You

Contact Us

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