

Solutions for the decarbonisation of mobility along the A22

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**Autostrada del Brennero SpA
Brennerautobahn AG**



The Brenner Motorway

314 KM

1 TRAFFIC CONTROL CENTRE

23 TOLL GATES + 1 TOLL BARRIER

6 MAINTENANCE CENTRES

6 SERVICE CENTRES

22 SERVICE AREAS + 1 TRUCK PARK

147 OVERPASSES

30 MONODIRECTIONAL TUNNELS (12.6 km)

144 BRIDGES AND VIADUCTS (31.2 km)

139 OVERPASSES

427 LAY-BYS

84.1 KM OF NOISE BARRIERS





Average Daily Theoretical Vehicles 2022



13.845/ day → 31,32%

+



30.353/ day → 68,68%

=



+



44.198/ day → 100,00%

-0,26 % compared to 2019

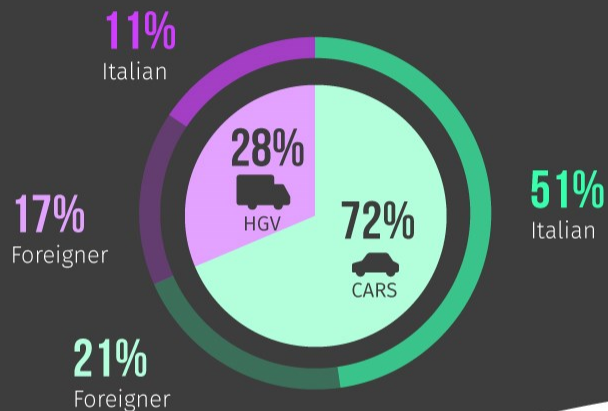
+39,9% compared to 2020

+17,4 % compared to 2021

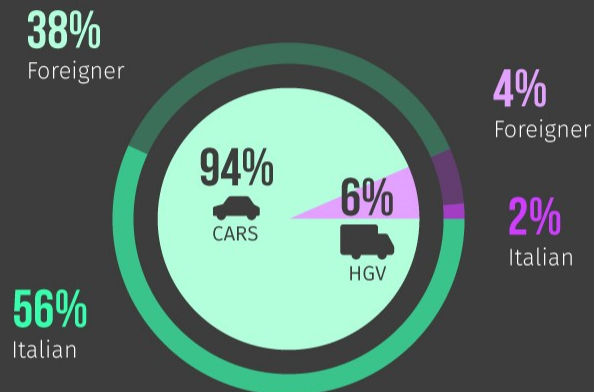


TYPES OF VEHICLES TRANSITING

WORKDAY WITHOUT TOURISTS



HOLIDAY WITH TOURISTS



VEHICLES FLEET ALONG THE BRENNER MOTORWAY

PASSENGER CARS



76,5%

>40% Euro 6 class
>20% Euro 5 class

DIESEL

HEAVY DUTY VEHICLES



98,6%

approx. 75% Euro 6 class

DIESEL



A22 Towards a Sustainable Mobility

A22 is particularly sensitive to environmental issues and wishes to give an active contribution to the "decarbonisation" of transport





GREEN DEAL

Set of policy initiatives proposed by the European Commission



Reduce greenhouse gas emissions by 55% compared to the 1990 scenario by 2030



Achieve climate neutrality by 2050



Make Europe the 1st 'green' continent

URGENCIES TO MITIGATE CLIMATE CHANGE AND REDUCE POLLUTION



70,3%

of the sector's carbon dioxide emissions come from **passenger transport**



93,6%

the share due to **road passenger and freight transport**



23,3%

of total **greenhouse gas emissions** is produced by **road transport**



167.565 KM

length of the Italian **road network**

6.977 KM

are **motorways**

RAIL TRANSPORT

ITALY

6%

of **passengers**

11%

of **freight**

EUROPEAN AVERAGE

7,9%

of **passengers**

18,7%

of **freight**



A22 Plans for the Next Years

Complete the ecological transition of Autostrada del Brennero towards a

European Green Digital Corridor Brenner-Modena



Sustainability, Innovation and Digitization

The main areas of investment
for the transformation of the **A22** into a **Smart Highway** are:





SUSTAINABLE ACTIONS



Main Areas of Intervention in the Process of Transformation of the Brenner Motorway



Infrastructure for low-emission vehicles



Green energy production

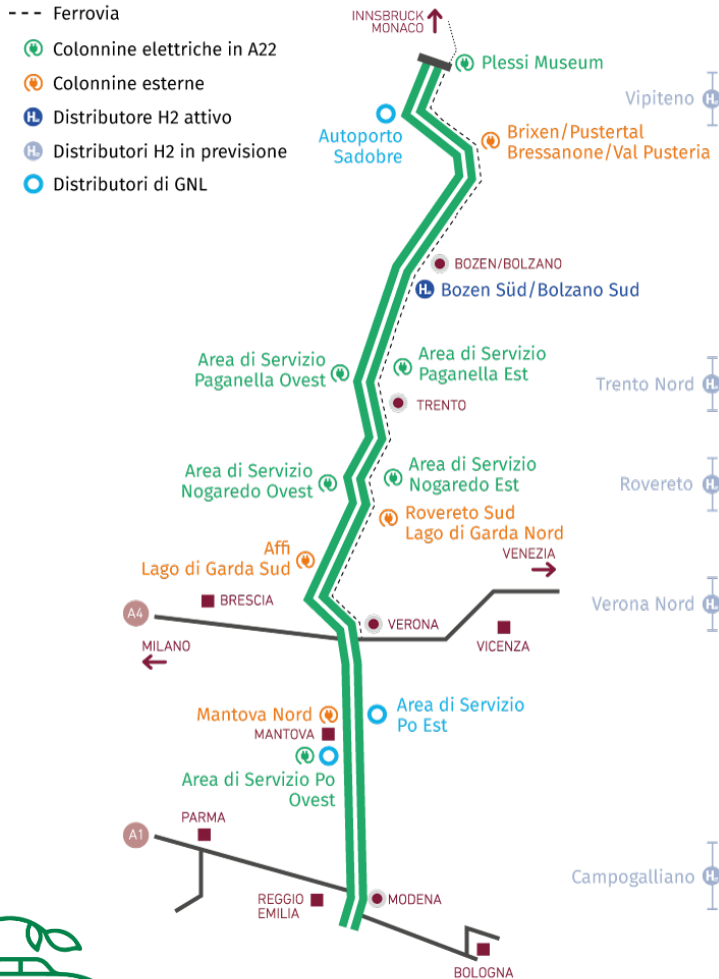


Use of innovation to grant more regular flows



Intermodal Mobility Management along the Brenner Axis

Infrastructure for Low-Emission Vehicles



- Development of distribution network for **alternative fuels**
- ● Development of **electric vehicle charging network**
- ● Development of green **hydrogen production and distribution network**





- Colonnine elettriche in A22
- Colonnine esterne
- Colonnine elettriche in A22 in apertura



E-Chargers

Development strategy

■ FOR EXTERNAL USERS

PHASE 1

MULTISTANDARD CHARGERS 50 kW at least every 80-90 km

PHASE 2

CHARGERS UP TO 350 kW at least every 100-120 km

■ FOR THE COMPANY FLEET AND PRIVATE CARS OF EMPLOYEES

22 kW CHARGERS at toll gates, at maintenance centres, at the A22 headquarters



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270 km



LNG for Trucks

+ 1 refuelling station
at the Sadobre Truck Park

+

2 LNG + CNG refuelling stations at the Po
East and Po West service areas



First Plant for the Production, Distribution and Storage of Green Hydrogen for Automotive Use in Italy



Green Hydrogen

Autostrada del Brennero SpA supported the establishment of the first plant for the production, distribution and storage of green hydrogen for automotive use in Italy in Bolzano Sud.

Over the next few years, we plan to build more plants in 5 new sites.





Hydrogen Infrastructure

- Phase 1 – production in Bolzano / other centres: refuelling by means of special tank wagons / mainly refuelling of cars



- Phase 2 and 3 – start of production in other sites / start refuelling trucks

Brenner/Vipiteno



Bolzano
production centre



Trento



Rovereto Sud



Verona



Campogalliano





Green Energy Production



Electricity produced by the fotovoltaic noise barrier of Marano

2021

733,040 kWh

2,638 Gj





Green Energy Production



Electricity produced by the wind blade installed in the service area Paganella Est

2020

1,731 kWh

6,23 GJ



Use of Innovation to Grant more Regular Flows



The Brenner Motorway is...

among the first motorway operators in Europe to be equipped with a C-ITS infrastructure

capable of transmitting messages to vehicles equipped with the technology to receive them.

CCAM projects





The Brenner Motorway has the tools to get directly to the vehicles to:



- improve traffic flows
- increase the motorway capacity
- reduce accidents
- reduce the impact on the environment

Hazardous Location notification



Weather condition



Road Works Warning



In-vehicle signage



Weather condition



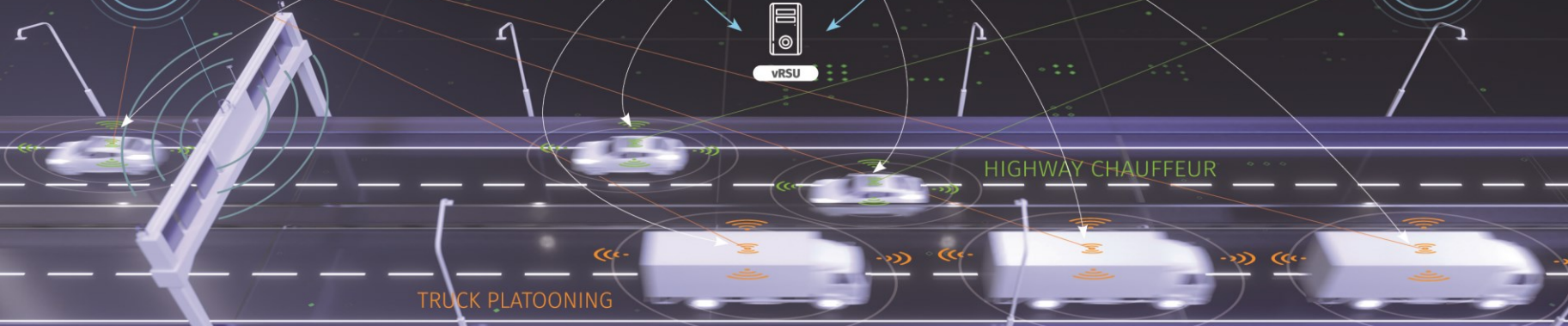
SERVER C-ITS



vRSU

RSU
Road Side Unit

RSU
Road Side Unit



HIGHWAY CHAUFFEUR

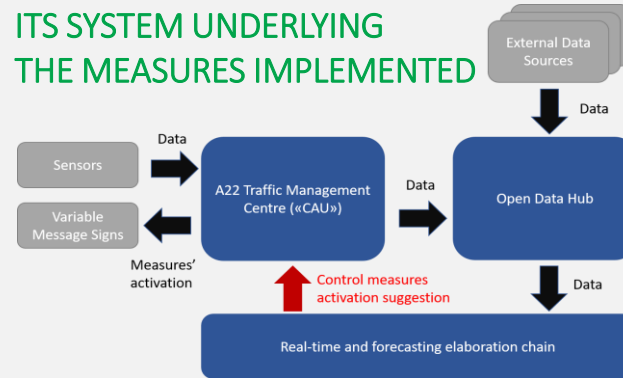
TRUCK PLATOONING



Dynamic Speed Management



ITS SYSTEM UNDERLYING THE MEASURES IMPLEMENTED



An Open data hub collects all traffic, weather and air quality data to dynamically activate speed limits.



Dynamic Speed Reduction

For environmental purposes

Pollution Reduction

- 10% NO₂ at the roadside

The algorithm implemented by Autostrada del Brennero shows the optimal speed, thus helping to reduce pollution



Dynamic Speed Reduction

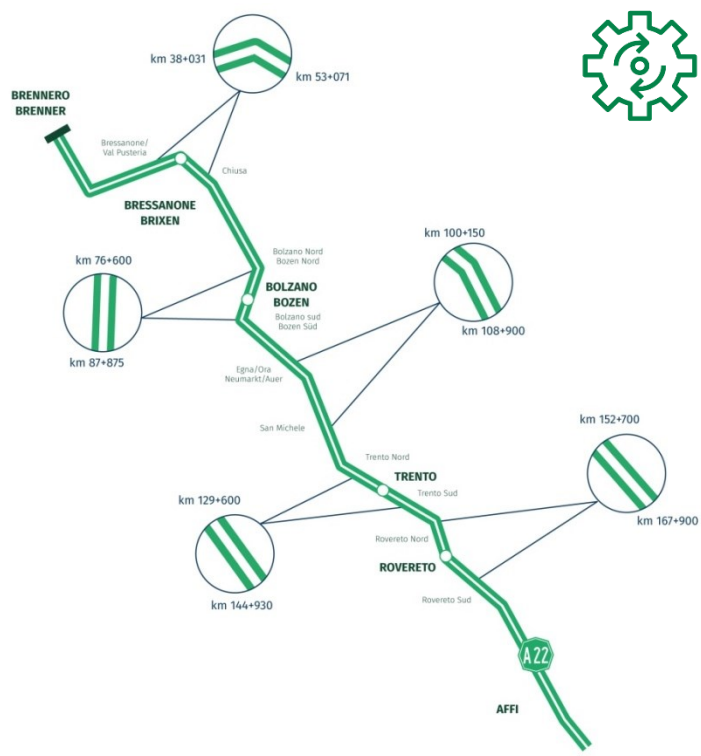
For traffic purposes

Increased Levels of Service

+ 10%

In heavy traffic conditions, dynamic speed management can reduce accidents, shorten travel times and improve traffic flow.





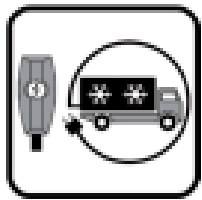
Dynamic speed limits to improve air quality



Dynamic speed limits to increase capacity and safety

Replication of Management Measures after the LIFE Programme

The BrennerLEC model has proved its worth: it will be extended along the A22 and replicated on other road sections.



ELECTRICAL CHARGING POINTS

for supplying temperature controlled trucks generators



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E-Chargers for Refrigerated Trucks



Installed in three parking areas for trucks





Plans to Upgrade all Service Areas





Plans to Upgrade all Service Areas

- use of renewable sources (photovoltaic and solar panels, wind power)
- electricity storage systems
- stall roofing with photovoltaic system
- air conditioning system with heat pump with integration of geothermal wells
- performance building envelope
- rainwater collection to limit consumption of drinking water
- exterior and interior lighting with LED





Intermodal Mobility Management along the Brenner Axis

We move yearly:

20,000 trains

310,000 containers on trains



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