



Annual Report 2025

Setting the scene for a new
cooperation phase 2026-2028

iMONITRAF! Annual Report 2025

Setting the scene for a new cooperation phase 2026-2028

INFRAS / Climonomics / Eurac Research with inputs of iMONITRAF! partners

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The iMONITRAF! year 2025 at a glance

Interested in more than “Information at a glance” but not having capacities to read the full report → Then we invite you to explore our new **Summary booklet** of the Annual Report, available in **German, French, Italian and English** on our homepage: www.imonitraf.org

iMONITRAF! network – A success story for cooperation beyond borders to be continued

iMONITRAF! brings together the Alpine regions along the major transalpine corridors to limit the negative impacts of freight and passenger transport. Established under the Alpine Space Programme in 2005, it has become a key platform for developing coordinated and sustainable transport strategies. The network brings together policy makers and technical experts to design and implement joint solutions. It supports the Alpine regions to raise visibility on specific needs and challenges with respect to decision processes at national, macroregional, and EU levels. iMONITRAF! combines scientific expertise with political advocacy, serving as a recognized knowledge hub. A cornerstone of its work is the common monitoring system, which provides comparable data across 10 indicators and a 20-year time series. The network also shares knowledge on relevant policy measures and coordination needs.

Throughout 2025, iMONITRAF! partners have laid the ground for continuing the cooperation beyond the current cooperation phase. The process was launched with a political networking event in April 2025 in Amsteg/Erstfeld (Canton Uri), giving political representatives from the iMONITRAF! regions the opportunity to exchange on current challenges and need for cooperation. On this basis, partners developed a new Partnership Agreement 2026-2028 as well as a detailed Work Plan for 2026 – setting the scene for continued activities.

Defining priorities for the next cooperation phase

In the 2023–2025 cooperation period, iMONITRAF! focused on further refining its common policy pathway and instrument mix. After exploring capacity management and steering mechanisms in 2023 and analysing the role of combined transport and rail freight efficiency in 2024, partners consolidated these insights in 2025 as part of the initial steps toward a comprehensive update of the iMONITRAF! policy pathway. This work included a review of emerging framework conditions as well as considerations on how to integrate a stronger focus on clean technologies into the pathway.

At the beginning of 2026, iMONITRAF! enters a new cooperation phase, marked by the signing of a renewed partnership agreement confirming the network’s strategic importance for coordinated action on the transalpine corridors. The evolving policy landscape at regional, national, macroregional and especially European level, as well as rapid technological developments, requires the network to further strengthen its analytical capacity in order to build a solid knowledge base and deliver technical insights on questions related to policy design. A systematic review of the iMONITRAF! monitoring system and how it interacts with the elements of the policy pathway will therefore be central to reinforcing the technical foundation. According to the new work plan, the main priorities will include a review and possible enhancement of the monitoring system, further development of the policy pathway with a stronger emphasis on clean technologies, and continued knowledge exchange on regional measures and coordination needs.

EU level: Ensuring that the new EU framework supports modal shift

At EU level, iMONITRAF! continued to explore the Greening Freight Package and related European initiatives through coordination and networking activities. The network remains firmly committed to ensuring that these dossiers support modal shift, recognizing rail as the existing green solution for transalpine freight. Also, iMONITRAF! keeps under review all relevant dossiers influencing the decarbonisation of road freight transport, recognizing the clean technologies pillar of the Combined Scenario.

As the 2024–2029 European Parliament term progressed, 2025 saw developments across key dossiers—particularly the Weights & Dimensions Directive, Combined Transport Directive, and CO₂ standards for heavy-duty vehicles. Ongoing updates to the Eurovignette Directive as well as the Alternative Fuels Infrastructure Regulation (AFIR) also drew attention. In addition, the agreement on the new EU climate target for 2040 and related decisions on the EU Emissions Trading System ETS2 are interesting for iMONITRAF!. Overall, trends at EU level are very ambivalent when reviewing their impacts from the perspective of the Alpine regions. Nevertheless, the combined impacts of the different dossiers will have an influence on the level playing field of different transport modes and technologies. iMONITRAF! continues to collaborate with EU partners to ensure the revision process benefits the iMONITRAF! objectives of modal shift.

Monitoring update – Increasing passenger transport volumes become challenging

For the monitoring year 2024, traffic volumes have continued their rising trend and have by now clearly exceeded the pre-pandemic levels for both passenger and freight transport. The total daily number of vehicles crossing all iMONITRAF! corridors increased by 2.5% between 2023 and 2024, reaching 113,250 vehicles/day. About **24,800 heavy vehicles per day** (HV/day) crossed the seven major transalpine corridors, exceeding the 2023 values by 1.9%. With respect to **Light vehicles**, an even stronger upwards trend was observed in 2024, with approx. 88,450 vehicles/day, i.e. +2.6% compared to 2023, and +8% compared to 2019 (before the Covid-19 pandemic).

Overall, a **freight volume of 156.5 Mt** was transported on the iMONITRAF! corridors in 2024. Compared to 2023, the volume remains nearly the same (-0.6%). When looking at transport modes, this overall trend is generated by a decrease in rail transport (-2.5%) and a slight increase in road transport (+0.3%). For 2024, this relates to a modal split of 30% rail (47.6 Mt) and 70% road (108.9 Mt). The share of rail thus decreases further by one percentage point compared to 2023. The **annual air pollutant concentrations** of NO₂ show a further decreasing trend by -6% across all the monitoring stations compared to the previous year. When looking at the 17 relevant monitoring stations, 12 out of the 17 active monitoring stations register a decrease of NO₂ concentrations, 4 stations register the same value of the previous year, while only one station (Susa along the Fréjus) registers an increase: from 10 to 11 µg/m³. In 2024, the NO₂ values do not exceed the current EU annual limit of 40 µg/m³ at any station. However, 8 out of 17 available stations register values >20µg/m³ (the new EU annual limit as of 2030).

Regarding the **iMONITRAF! target indicator**, the developments of 2024 show an ambivalent picture. For the Brenner, the decrease in rail modal split was reversed in 2024 – thus providing a signal in the right direction. However, rail share further decreased on the Gotthard corridor, due to the limited availability of the base tunnel during repair works after the incident in summer 2023. For heavy vehicle volumes, the picture is reversed with a slight decrease on the Brenner and an increase on the Gotthard is visible. Yet, despite the slight decrease of heavy vehicle volumes on the Brenner, both corridors lie clearly outside the target path to reach the target indicators.

Knowledge sharing on regional measures 2025 – Need to better integrate modal shift and decarbonisation policies

Throughout 2025, the set of policy measures and frameworks was further developed across all iMONITRAF! regions. Looking at pillar 1, which deals with information, monitoring and awareness raising, the need for an ambitious enforcement of social and technological standards became obvious to the partners during the field visit of the Heavy Goods Vehicle (HGV) traffic control centre in Erstfeld in spring 2025. In pillar 2, the instrument mix to reduce negative impacts on air quality, noise and safety was further developed, especially to deal with seasonal traffic peaks. As new element in pillar 2, we took a detailed look at measures supporting the decarbonisation of road freight transport. In this respect, several measures to further develop charging infrastructures for electric trucks were reported both along the Gotthard and Brenner corridors. In policy pillar 3, which is dealing with modal shift, inputs from the regions highlight pricing measures related to road and rail, a new structuring of financial support to rail services and the discontinuation of the rolling motorway concept in Switzerland. Looking at passenger transport, all iMONITRAF! regions have continued to pioneer new solutions to increase attractiveness of public transport - including new mobility concepts, ticketing solutions, extension and further development of infrastructure and services as well as decarbonisation of public transport fleets.



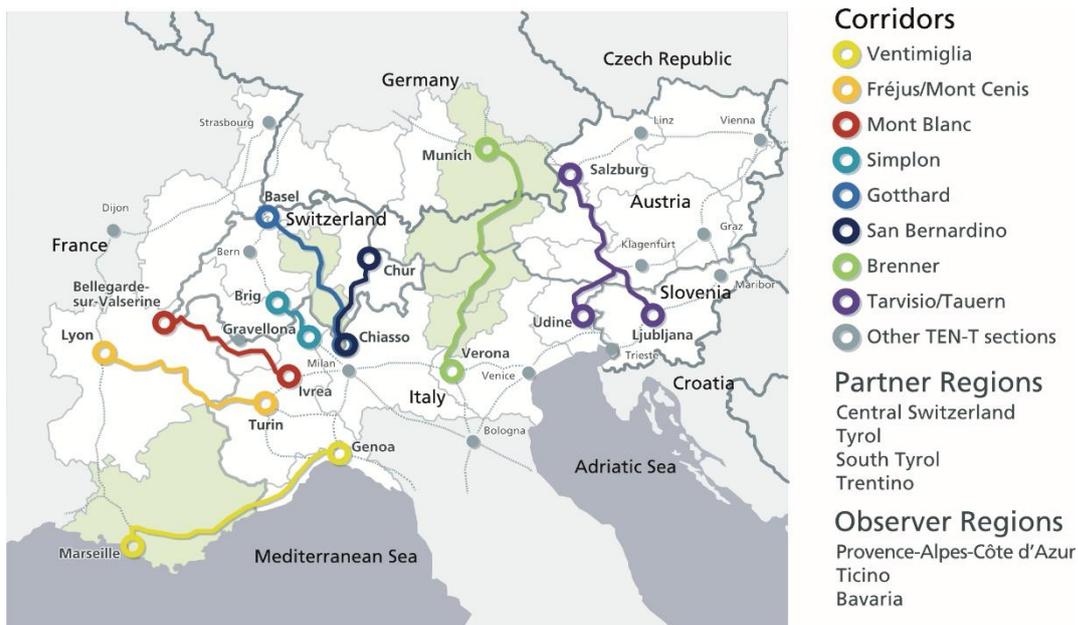
1 Background and objectives

iMONITRAF! network – A success story for cooperation beyond borders

iMONITRAF! brings together the Alpine regions along the major transalpine corridors to limit the negative impacts of freight and passenger transport. Established under the Alpine Space Programme in 2005, it has become a key platform for developing coordinated and sustainable transport strategies. The network brings together policy makers and technical experts to design and implement joint solutions. Its strength lies in acting as the unified voice of the Alpine regions along the main transalpine corridors at national, macroregional, and EU levels. iMONITRAF! combines scientific expertise with political advocacy, serving as a recognized knowledge hub.

The iMONITRAF! network involves seven partner regions and observers along the major axes: On the Brenner corridor, the State of Tyrol, the Autonomous Province of Bolzano – South Tyrol and the Autonomous Province of Trento are partners of the network, the Free State of Bavaria has observer status. On the Gotthard, Central Switzerland (representing the Cantons of Uri, Schwyz, Obwalden, Nidwalden, Lucerne and Zug) is partner, the Canton of Ticino acts as observer. Ventimiglia as most important East-West corridor is represented by Provence-Alpes-Côte-d’Azur which joined the network as observer.

Stakeholders from other corridors are involved in the monitoring system. All in all, the eight most relevant transalpine transport corridors are represented in the network.



Overview map: iMONITRAF! Corridors and partner regions

Transitioning from the work programme 2023-2025 to a new period

In the two initial years of the current work programme 2023-2025, iMONITRAF! put substantial efforts into further developing specific elements of the iMONITRAF! policy pathway and the common instrument mix. In 2023, the potential of capacity management and steering mechanisms was explored in the frame of a technical input paper. In 2024, project partners discussed the role of policy measures to support combined transport (CT) and to improve efficiency of rail freight transport. Insights from these activities were capitalized in 2025 with initial activities for a comprehensive update of the iMONITRAF! policy pathway. Specifically, the project team explored new framework conditions and developments with impact on the current elements of the policy pathway as well as the need for additional elements to be added to the pathway – e.g. to better reflect the framework for decarbonisation of road transport.

Activities in 2023-2025 laid the ground for the development of a new partnership agreement. During a political networking event in Central Switzerland in April 2024, political representatives gave the mandate for developing such a new partnership agreement and voiced their support for continuing the cooperation. At the beginning of 2026, iMONITRAF! thus enters a new cooperation phase with a partnership agreement confirming the network's strategic importance for coordinated action on the transalpine transport corridors. The evolving policy landscape at regional, national, macroregional and especially European level, as well as rapid technological developments, requires the network to further strengthen its analytical capacity to deliver a solid knowledge on questions related to policy design. A systematic review of the iMONITRAF! monitoring system and how it interacts with the element of the policy pathway will therefore be central to reinforcing the technical foundation.

Annual Report 2025 – overview on main iMONITRAF! activities

As in previous years, the Annual Report provides a glance at all relevant iMONITRAF! activities summarized in one document – including developments in the Alpine regions, at national as well as at European level. The comprehensive report is aimed for knowledge exchange and information at technical level – the factsheet-style summary (also available on our homepage) provides main insights for readers that prefer a quick read.

The report includes the main activities of the year 2025. It starts out with an overview on the iMONITRAF! policy pathway and relevant need for action for an update. Chapter 3 provides an overview on developments at EU, including measures of the Greening Freight Package but also framework conditions regarding CO₂-standards, other pricing components and infrastructure development. Chapter 4 presents networking activities, especially the political networking event of iMONITRAF! in spring 2025. In chapter 5, an update of monitoring results is presented, this year in a shortened version and with improved graphical representations. Chapter 6 then presents the update of regional measures, including information on all iMONITRAF! policy pillars. Finally, the report includes an outlook to the new cooperation phase 2026-2028.

2 Updating the iMONITRAF! policy pathway – initial ideas

General idea of the policy pathway

Based on the insights of the Policy Scenarios 2030 (as developed in 2020) and the need for a combined approach, the iMONITRAF! team has developed the iMONITRAF! Policy Pathways. This Pathway, as developed in 2021, builds on the existing objectives of iMONITRAF! (as defined in the Policy Scenarios, Common strategy and political resolutions 2016 and 2020) and the available toolbox, and can be seen as strategic orientation for further activities.

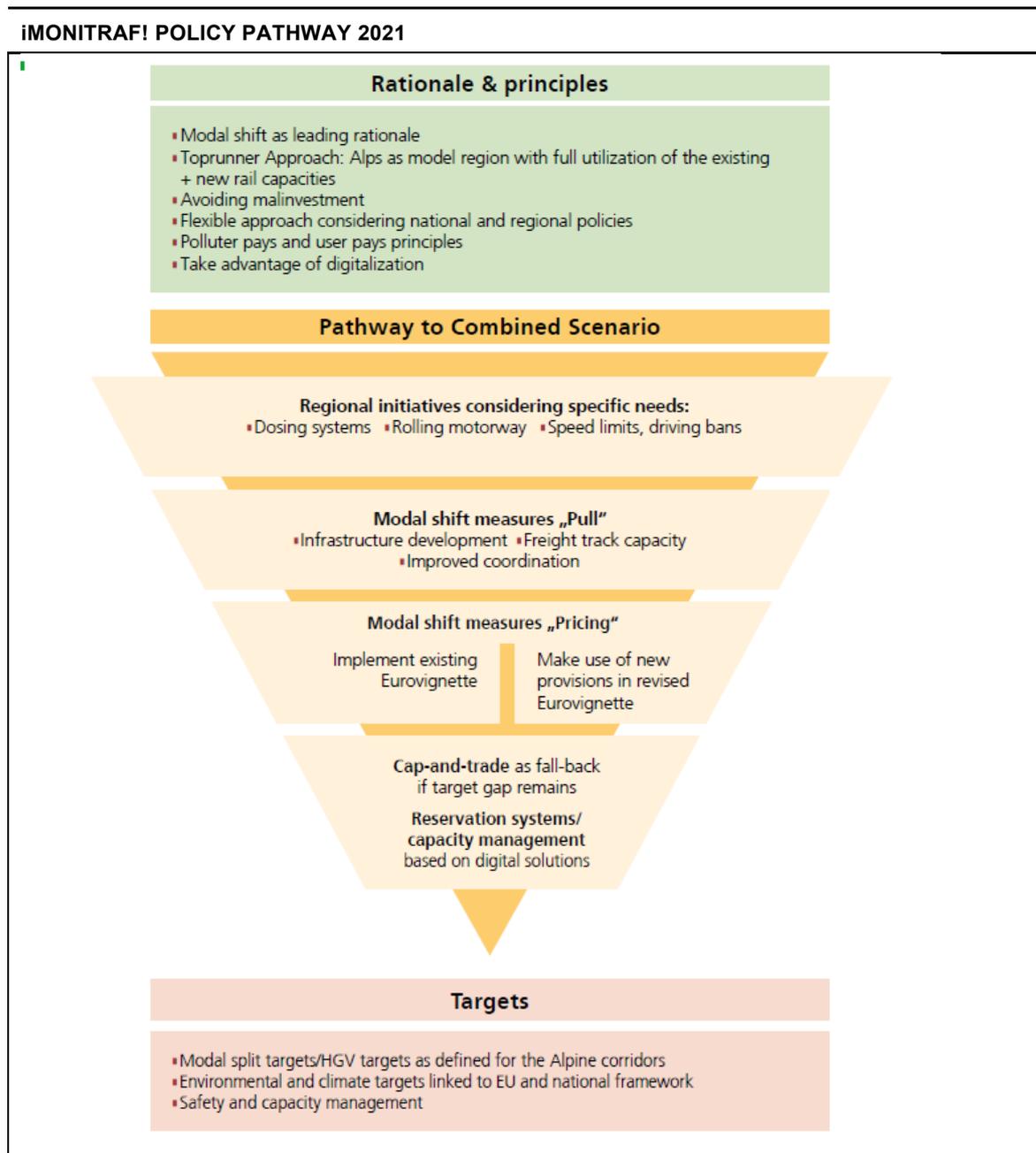


Figure 1: Illustration of the iMONITRAF Policy pathway

Needs for dynamic development of the Policy Pathway

The initial pathway, as developed in 2021, is closely linked to activities at national and EU level to ensure that needs of the Alpine regions are embedded in relevant processes. Recognizing that the relevant framework conditions have changed considerably since 2021, an update of the policy pathway was initiated in 2025. With an update, the iMONITRAF! team will also have the opportunity to integrate new insights of recent iMONITRAF! activities on how to finetune and further develop the pathway, e.g. from the discussion papers on capacity management (2023), combined transport (2024) or the special focus on support measures for alternative drive-train technologies in the Annual Report 2024.

Specially, the update shall also take into consideration the clean technologies pillar of the combined scenario, in order to better streamline the two pillars for a fair level-playing field for different transport modes and technologies.

Insights from first discussion paper and exchange

An internal discussion paper for the iMONITRAF! network provides a first overview on potential adjustment needs and new elements of the iMONITRAF! policy pathway. The following table summarizes the main insights per layer of the pathway, highlighting some main adjustment needs which are due to changes in framework conditions or technological trends and relevant need for action.

The table shows that overall the elements of the policy pathway are still relevant but that they need some finetuning and re-structuring. Also, the first analysis highlights some gaps in the policy pathway and new elements are proposed.

OVERVIEW: ADJUSTMENTS NEEDS TO POLICY PATHWAY

Specific element of pathway	Adjustment needs	Need for action
Level 1: Regional initiatives considering specific needs		
Dosing systems	New insights from the iMONITRAF! corridors related to role and potential design of dosing systems. New technological opportunities with ITS solutions and smart logistics.	Clarify the role of dosing systems in the iMONITRAF! policy pathway: safety and/or capacity management. Potential to show clearer link between dosing systems, HGV control, parking spaces, safety.
Rolling motorway	Changes in subsidy frameworks and rolling motorway services with overall objective to shift transport to UCT. New technological solutions available also for non-craneable containers	Clarify role of rolling motorway in our pathway: short-term and mid-term. How do we deal with rolling motorway when rail capacities become scarce?
Speed limits	New insights on role and impacts of speed limits from Brenner LEC project	Take a broader approach to this topic, extending this element to traffic management (speed limits, routing, regulatory measures dealing with congestions etc.).

OVERVIEW: ADJUSTMENTS NEEDS TO POLICY PATHWAY

Specific element of pathway	Adjustment needs	Need for action
Driving bans	Discussion around relevance of driving bans with increasing share of zero-emission HGV, linked to CT Directive and regional measures.	Clarify the role of driving bans, also in a scenario with a higher share of zero-emission vehicles.
Level 2: Modal shift measures “Pull”		
Rail infrastructures	Accident in Gotthard basetunnel as well as closures on DE/FR network highlight the need for a joint crisis/resilience management – also taking into account further development of rail access routes.	Take broader approach to this element, including resilience. Discuss need for a joint crisis/resilience management across the Brenner and Gotthard corridors.
Freight track capacity	Discussions at EU and national level on prioritization of freight vs. passenger transport and the role of minimum slot availability for long freight trains. Role of new technologies and timetable redesign for improving efficiency in rail freight.	Take broader approach to this element, including freight track quality (e.g. provisions for long trains, high-profile trains, etc.).
Improved international coordination	Several new provisions implement new coordination mechanisms (e.g. the corridor coordinators at EU level with new scope). This requires a better streamlining with corridor and European initiatives. Also, a stronger coordination with industry stakeholders has been mentioned in recent iMONITRAF! activities.	Specify the aspect of coordination in the policy pathway: improved coordination between and along the corridors and with stakeholders.
New option: Support for Combined Transport	To support discussions on the EU Combined Transport Directive, iMONITRAF! has developed some Alpine-specific claims for the support of CT. Financial CT has been identified as crucial element for the modal shift policy mix.	Specify a joint approach to deal with support measures for Combined Transport, also with respect to future discussions on the Combined Transport Directive.
Modal shift measures “Pricing”		
Implement Eurovignette Directive	Several provisions of new Eurovignette framework implemented along the corridors, including CO ₂ -charging and new differentiation of tolls. Current discussions highlight the role of pricing for the uptake of zero-emission HGV.	Alignment of pricing measures, especially regarding exemptions for zero/low-emission HGV.

OVERVIEW: ADJUSTMENTS NEEDS TO POLICY PATHWAY

Specific element of pathway	Adjustment needs	Need for action
New option: Pricing components	As revenue structures from road charging will change with a decarbonisation of vehicle fleet, new pricing components are being discussed (e.g. a specific charge for electric vehicles). Also, the interfaces between different pricing components need to be better considered to set clear and transparent incentives	Improve knowledge exchange on pricing components for different vehicles technologies and lessons learned.
Level 4: Fall-back options		
Cap-and-trade mechanisms	The new EU ETS 2 will introduce a cap-and-trade mechanism for road transport at EU level (start postponed from 2027 to 2028). Specific impacts for Alpine freight transport and the interfaces with other measures need to be taken into consideration.	Cross-check how EU ETS 2 affects the measures as included in the iMONITRAF! policy pathway and how to avoid overlaps.
Reservation mechanisms & capacity management	Ongoing discussion on capacity management on all corridors, as highlighted in our report on capacity management 2023. Specific discussion on capacity management during maintenance/construction work.	Specify the role of reservation system and capacity management in our policy pathway – with the aim to consider both freight and passenger transport.
New level: Clean technologies		
New: Incentive mechanisms for roll-out of zero-emission HGV	Several regions have implemented specific measures that support the uptake of new HGV technologies (e.g. specific purchase subsidies).	Improve knowledge exchange and coordination on regional measures.
New: Regional initiatives to support charging infrastructure development	The regions also play a role for the development of charging infrastructure for zero-emission HGV. A coordination and exchange of lessons learned along and between corridors seems crucial to develop an efficient and high-quality infrastructure.	Improve knowledge exchange and coordination on regional measures and coordination with national measures.

Table 1: Overview of elements of iMONITRAF! policy pathway and adjustment needs.

With the detailed work plan for 2026, iMONITRAF! partners will decide which elements of the policy pathway will be further investigated in the next year.

3 Trends for transport and environmental policies at EU level

At EU level, iMONITRAF! continued to explore the Greening Freight Package and related European initiatives through coordination and networking activities. The network remains firmly committed to ensuring that these dossiers support modal shift, recognizing rail as the existing green solution for transalpine freight. Also, iMONITRAF! keeps under review all relevant dossiers influencing the decarbonisation of road freight transport, recognizing the clean technologies pillar of the Combined Scenario.

As the 2024–2029 European Parliament term progressed, 2025 saw developments across key dossiers, particularly the Weights & Dimensions Directive, Combined Transport Directive, and CO₂ standards for heavy-duty vehicles. Ongoing updates to the Eurovignette Directive as well as the Alternative Fuels Infrastructure Regulation also drew attention. Also, the agreement on the new EU climate target for 2040 and related decisions on the EU ETS2 are interesting for iMONITRAF!. Overall, trends at EU level are very ambivalent when reviewing their impacts from the perspective of the Alpine regions. Especially, the combined impacts of the different dossiers will have influences on the level playing field of different transport modes and technologies which will need to be further analysed.

Weights and Dimensions Directive

The Directive on weights and dimensions sets the rules for the maximum allowable weight and dimensions of vehicles used in road transport in the EU and thus is a crucial factor influencing the level-playing field between road and rail as well as between different vehicle technologies. It ensures that vehicles are safe, do not damage infrastructure and have limited impact on the environment by not polluting more than they should due to extensive weight. Already in July 2023, the European Commission put forward an amendment to modernise the current rules, with the specific objective to support the uptake of zero-emission vehicles. As the Directive has the objective to create an efficient transport system in the EU, the revision of the Directive also includes a proposal to extend the possibility for cross-border circulation of European Modular System EMS (=“Gigaliners”). In a position paper from November 2023, iMONITRAF! highlighted concerns regarding the new proposals for zero-emission HGV and EMS, focusing on the potential negative effects on modal shift. During 2024 and 2025 the proposal was further discussed. After the agreement in Parliament in May 2024, the Council set its position only at the end of 2025 – including some changes to the ZEV weight bonus to avoid potential damages to road infrastructures. Regarding EMS, the Council position states that operation across borders is possible as long as the starting and destination countries permit this. Overall, the Council position can be seen as a balanced approach that takes the different Member States’ concerns into consideration. Final trilogue negotiations are foreseen for 2026.

Combined Transport Directive

The revision process stalled in 2025 after months of debate on definitions and digital compliance. In October 2025, the European Commission withdrew the proposal from its 2026 work programme, sparking criticism from intermodal stakeholders who see this as a setback for the objectives of the Green Deal. Next steps regarding the Combined Transport Dossier are still unclear, several stakeholders have argued for a re-consideration of the withdrawal decision. iMONITRAF! will stay in the loop for future developments, recognizing that the CT Directive is a crucial element influencing road and rail transport on the Alpine corridors.

CO₂ emission standards for trucks – changes in Automotive Package Dec 2025

With the objective to further support the transition process towards clean vehicles and to maintain competitiveness of European vehicle manufacturers, the European Commission with its Automotive Package of Dec 2025 proposed several changes to existing legislation on CO₂ emission standards – taking a more pragmatic approach and giving higher flexibility to manufacturers. The Automotive Package includes a review of existing CO₂ emission standards for cars and vans and a targeted amendment to those for heavy-duty vehicles (HDVs). On the demand side, it proposes an initiative to decarbonise corporate vehicles with binding national targets for zero- and low-emission vehicles. For cars, the Package moves away from the initially foreseen ban for new internal combustion engine vehicles from 2035 to a 90% CO₂ emissions reduction target. The remaining 10% emissions will need to be compensated through the use of low-carbon steel, or from e-fuels and biofuels. For HDVs, the amendment aims at giving additional flexibility to HDV manufacturers in achieving compliance with their 2030 emission targets. They can earn more emission credits between 2025 to 2029 as the baseline for credits has been changed from a dynamic trajectory approach (with annual improvements) to a “freeze-in” at the level of the 2025 target. The International Council for Clean Transportation (ICCT) estimates that this amendment will lead to an increase of CO₂ emissions of 21 MT CO₂ until 2040 and in a lower sales share of zero-emission HDV (18-28% in 2034 with new flexibility, compared to 35% under existing standards).¹ For iMONITRAF!, it will be critical to review the impacts of this proposal on the decarbonisation strategies along the corridors and also on potential impacts regarding competitiveness road and rail.

Eurovignette Directive

The Commission proposed in August 2025 to extend toll exemptions for zero-emission trucks until 2031, alongside CO₂-based toll differentiation. The measure is intended to offset the higher upfront costs of battery-electric and fuel-cell trucks and buses and to provide long-term planning certainty for operators. The opportunity for extending the exemptions beyond the initially foreseen date in December 2025 has already been implemented in Germany and Austria (see chapter 6).

Alternative Fuels Infrastructure Regulation (AFIR)

Being effective since April 2024, AFIR mandates deployment of EV charging and hydrogen refuelling stations along the TEN-T network. In Spring 2025, four new Delegated Acts specified several technical and data-related requirements for the roll-out of AFIR, including technical standards for smart charging and bidirectional integration, new requirements for data ecosystems as well as standards for wireless charging and vehicle-to-grid communication. The additional Acts shall ensure that alternative fuels infrastructure in Europe will evolve in a smart, scalable and user-friendly manner, especially regarding interoperability and harmonisation.

Clean Transport Corridor Initiative (CTCI)

The Clean Transport Corridor Initiative is a new EU action designed to accelerate the rollout of recharging infrastructure for heavy-duty vehicles along major freight routes. The initiative, endorsed by nine Member States, will be launched on the Scandinavian–Mediterranean and North Sea–Baltic TEN-T corridors as test cases.

¹ <https://theicct.org/wp-content/uploads/2026/01/ICCT-comments-on-HDV-CO2-proposed-amendments.pdf>

The Declaration sets out a shared political commitment to address the main barriers to deploying truck charging infrastructure, such as complex planning and permitting procedures, limited suitable locations, fragmented funding, grid capacity constraints, and delays in connecting to the electricity grid. It serves as both a joint vision and a strategic framework for strengthening Europe's network of clean freight corridors.

The European Commission will now work with Member States to translate these commitments into a detailed implementation roadmap and plans to gradually extend the initiative to additional TEN-T corridors. For iMONITRAF!, this offers the opportunity to embed initiatives at regional and corridor level into a broader European initiative and to share insights with other corridors.

EU Agreement on New Climate Targets and postponement of EU ETS2 start

At the beginning of December 2025, EU member states and the European Parliament reached a political agreement on the still pending 2040 climate target, endorsing a cut of greenhouse gas (GHG) emissions by 90% compared with 1990 levels. The target is a crucial milestone to the EU's ambitious goal of reaching climate neutrality by 2050. The provisional agreement introduces new elements to the EU climate policy framework, including additional flexibilities for Member States and companies in reaching the target. These flexibilities include the use of high-quality international credits towards the 2040 target (with extra safeguards on credit quality) as well as the potential to use domestic permanent removals. Also, the new provisions introduce a biennial assessment of the Climate Law implementation.

As part of the provisional agreement, the start of the new ETS for buildings and road transport (EU ETS 2) was postponed by one year to 1 January 2028 to give Member States more preparation time. The auctioning of ETS 2 allowances will commence as planned in 2027, providing governments with revenues to fund decarbonisation solutions for vulnerable households ahead of the system's start.

4 iMONITRAF! Networking and communication activities 2025

Political network event Amsteg/Erstfeld

As part of its continuous efforts to strengthen cooperation among Alpine regions, iMONITRAF! organised a dedicated political networking event focusing on current challenges in transalpine transport and on strategic impulses for future cooperation. On 3 April 2025, political representatives from Tyrol and Central Switzerland met in Amsteg/Erstfeld (Switzerland) for a high-level exchange on the pressing issues of transalpine transport. Twenty years after the launch of the iMONITRAF! cooperation, the event once again highlighted the urgency of joint, coordinated action to limit the negative impacts of freight and passenger transport across the Alps.

The meeting provided an opportunity for a targeted exchange on current “hot topics” through a structured political roundtable. The discussions were enriched by expert contributions from Tyrol and Central Switzerland and by visits to two key infrastructures:

- **Gotthard Base Tunnel:** Participants received an in-depth overview of the operational principles and strategic relevance of the world’s longest railway tunnel. The visit illustrated Switzerland’s long-standing commitment to rail freight transport and provided a concrete basis for discussing the future of modal shift policies in the Alpine region.
- **Heavy Traffic Control Centre Erstfeld:** The group gained insights into the comprehensive checks and enforcement measures applied to heavy-duty vehicles on the Gotthard corridor. These controls play a crucial role in improving road safety and ensuring compliance with transport regulations, thereby supporting a fair competitive environment between road and rail.

The political roundtable formed the concluding element of the programme. Building on the site visits and the exchanges throughout the day, the roundtable provided a structured setting to discuss key themes that are central for future iMONITRAF! cooperation.

- **Future importance of capacity management:** In light of the insights gained during the visits to the Gotthard Base Tunnel and the Heavy Traffic Control Centre, the roundtable considered the relevance of capacity management for both road and rail. Questions centred on which aspects should receive particular attention, how integration across modes and transport segments could be improved, and where further analysis by iMONITRAF! may be needed.
- **Combined Transport:** discussions picked up the question of how support measures for Combined Transport (CT) can be further developed, including how short-distance CT can benefit and how ongoing EU discussions on the CT Directive relate to the situation in Alpine regions.
- **Energy efficiency in freight transport:** On this topic, the discussion focused on potential incentives for regions and the need for corridor-wide coordination to increase load factors and improve efficiency, particularly in a multimodal context.
- **Communication and networking:** The roundtable also explored how iMONITRAF! results can be better integrated into political communication and how cooperation with other Alpine and European actors could be further strengthened. The discussion addressed how increased visibility and synergies with networks such as EUSALP AG4 or the Alpine Convention could enhance impact.

Finally, the roundtable considered the continuation of the cooperation beyond 2025. The guiding questions focused on possible adjustments to the structure and functioning of iMONITRAF!, the thematic priorities for a future period, and expectations for the outcomes of the cooperation by 2028. The meeting in Amsteg/Erstfeld sent a clear signal for renewed political commitment and

strengthened cross-border collaboration. The insights gained during the site visits and the strategic discussions will feed directly into ongoing iMONITRAF! activities and the design of the new cooperation phase.



iMONITRAF! political representatives and partners during field visits in Amsteg/Erstfeld (©Lea Knabl)

Networking with other Alpine and European stakeholders

As in the previous years, iMONITRAF! has collaborated closely with the EU Strategy for the Alpine Region EUSALP, in particular Action Group 4 Mobility (AG4) and other networks and initiatives at Alpine level. Especially the following coordination activities can be mentioned for 2025:

- EUSALP AG4: During each AG4 meeting, iMONITRAF! presents an update of its activities as well as specific insights. In 2025, especially insights on the policy pathway and the development of the new partnership agreement were shared with AG4 members. Through the joint leadership role in both iMONITRAF! and AG4, the State of Tyrol was also able to give a high priority to the topic of sustainable transport and mobility in the EUSALP co-presidency of Austria and Liechtenstein in 2025. In late November, a workshop on energy efficiency in transport during the EUSALP Annual Forum 2025 and the 7th EUSALP Mobility Conference in Innsbruck provided a platform for exchange with stakeholders.
- WG Transport Alpine Convention: The WG Transport has launched its new mandate 2025-2026 with many interfaces to iMONITRAF! activities. Networking with the Lead-team of WG Transport as well as the relevant experts at the Permanent Secretariat of the Alpine Convention ensure that we can use synergies between the two groups.
- The “Alpine Transport Community”, as initiated by the Alpine Climate Board, has again been used as an effective platform to “coordinate the coordinators” and to streamline activities. The ACB Transport Community met twice during 2025.
- The Simplon Alliance has taken no further steps in 2025, also it needs to be noted that the Follow-up Zurich Process is “on hold” at the moment.
- iMONITRAF! closely cooperated with other institutions and stakeholders in the field of trans-alpine freight transport, especially the cooperation with CIPRA and the Alpine Initiative has been further developed.

Communication: new homepage and factsheet format

To improve communication activities and to better share insights of iMONITRAF! with interested stakeholders, a new homepage was launched at the beginning of 2025. This homepage provides a state-of-the-art interface with new pictures and design. The structure of the previous homepage was largely maintained, especially all outputs and publications of iMONITRAF! are still available. The homepage also provides the link to the Alpine Platform of Knowledge/Web GIS which contains all information on the monitoring data.

To strengthen communication, the network also launched a new publication series “Indicator in spotlight”. Short factsheets are aimed at providing additional inputs on monitoring data and interpretations. The factsheet series is aimed at leveraging iMONITRAF!’s strength with the monitoring system.



5 Monitoring of iMONITRAF indicators

5.1 Foreword – iMONITRAF! Monitoring approach

Monitoring indicators: Since monitoring data for a full calendar year are published by the different sources throughout the following year, the monitoring data presented in the iMONITRAF! Annual Reports focus on the previous year. Therefore, the Annual Report 2025 presents data for 2024 for the following indicators: 1) road traffic volumes, 2) transported tons and modal split, 3) concentration of air pollutants, and 4) exposure to noise. Additionally, the report presents monitoring data for 2025 regarding further four indicators: 5) toll prices, 6) fuel prices, 7) alternative fuels recharging and refuelling stations, and 8) unitary pricing components. Table 2 provides an overview of these indicators. Some methodological choices are made for the data collection, analysis and interpretation. This chapter focuses on the description of the monitoring results, while Annex 1 provides the relevant methodological explanations for each indicator.

Corridors and countries: Data concerning the indicators 1-8 are collected at the corridor or country level. Data for indicators 1, 2, 3, 4, 5 and 7 refer to monitoring stations along the main transalpine corridors: Ventimiglia, Fréjus/Mont Cenis, Mont Blanc, Gotthard, San Bernardino, Simplon, Brenner, and Tarvisio/Tauern (Table 2). Data for indicators 6 and 8 are country-based, referring to Austria, Germany, Switzerland, Italy, France. To identify the transalpine corridors and countries, a consistent colour scale has been adopted (Table 2 and Figure 1).

iMONITRAF! monitoring indicators		Level of analysis										Figures		
N. Indicators	N. Sub-indicators	Corridor level							Country level					
		Ventimiglia	Fréjus/Mont Cenis	Mont Blanc	Gotthard	San Bernardino	Simplon	Brenner	Tarvisio/Tauern	Austria	Germany	Switzerland	Italy	France
1. Road traffic volumes	1a. All vehicles	•	•	•	•	•	•	•	•					
	1b. Light vehicles	•	•	•	•	•	•	•	•					
	1c. Heavy vehicles	•	•	•	•	•	•	•	•					
2. Transported tons and modal split	2a. Transported tons rail-road	•	•	•	•	•	•	•	•					
	2b. Modal split rail-road	•	•		•		•	•	•					
	2c. Modal split rail services	•	•		•		•	•	•					
3. Concentration of air pollutants	3a. Nitrogen dioxide (NO ₂)	•	•	•	•	•		•	•					
	3b. Particulate matter (PM ₁₀)	•	•	•	•	•		•	•					
4. Exposure to noise	4a. Overall noise level		•	•	•	•			•					
	4b. Night noise level		•	•	•	•			•					
5. Toll prices	5a. Whole price for transit	•	•	•	•	•	•	•	•					
	5b. Km price for transit	•	•	•	•	•	•	•	•					
6. Fuel prices (petrol and diesel)									•	•	•	•	•	
7. Alternative-fuel refuelling stations		•	•	•	•	•	•	•	•					
8. Unitary pricing components										•	•	•	•	•

Symbolic colours of the corridors: ■ Ventimiglia; ■ Fréjus/Mont Cenis; ■ Mont Blanc; ■ Gotthard; ■ San Bernardino; ■ Simplon; ■ Brenner; ■ Tarvisio/Tauern. **Symbolic colours of the countries:** ■ Austria; ■ Germany; ■ Switzerland; ■ Italy; ■ France.

Table 2: List of monitoring indicators addressed in the iMONITRAF! Annual Report.

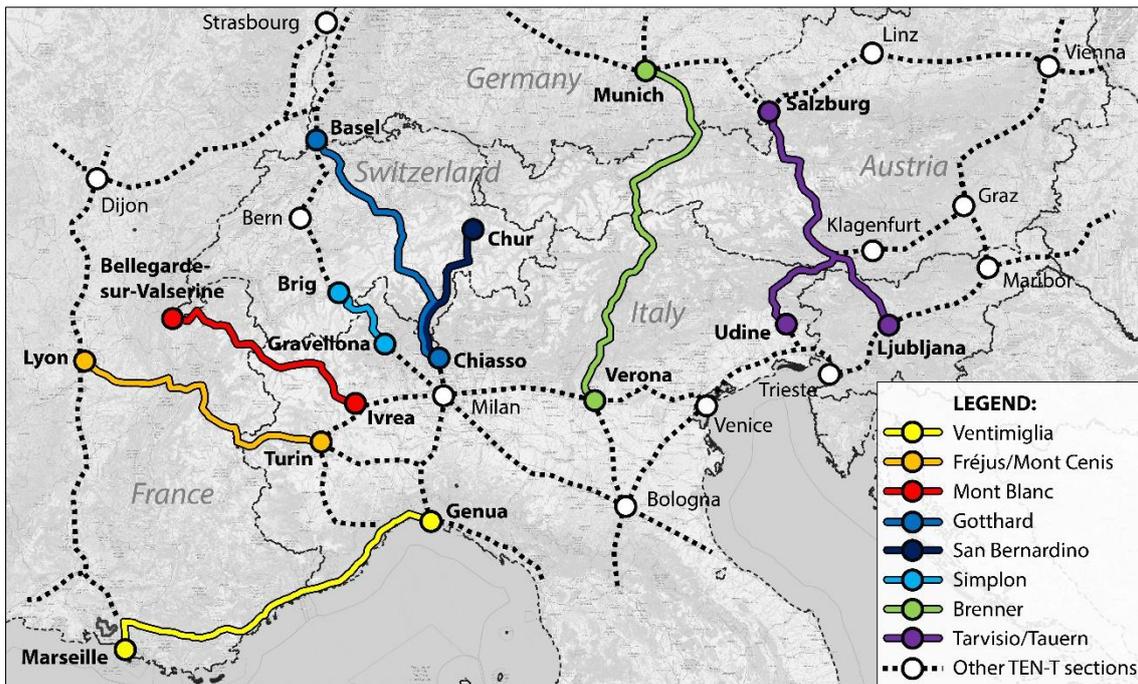


Figure 1: Map of the transalpine corridors and Alpine countries addressed in the iMONITRAF! Annual Report.

WebGIS application: The data presented in this report (together with further data) are available in the iMONITRAF! WebGIS: <http://sdi.eurac.edu/AlpinePoKforTransportandMobility/>. This application allows visualising, analysing and freely downloading the data collected during the last year, as well as time series of data collected in the iMONITRAF! framework since 2005.

5.2 Evaluation of monitoring results

Indicator 1: Road traffic volumes

Figures 2, 4 and 5 show the annual average daily traffic for all, light and heavy vehicles in the period 2005-2024, while Figure 3 focuses on 2024. Daily average traffic data is obtained by summing the vehicles circulating along the corridors, divided by 365 days (366 in leap years as 2024).

(1a) All vehicles (Figures 2 and 3): In 2024, the annual average daily number of vehicles crossing all iMONITRAF! corridors is ca 113,250 vehicles/day, i.e. +2.5% compared to 2023, and +7% compared to 2019 (before the Covid-19 pandemic). With 32,996 vehicles/day, the Brenner corridor presents the highest traffic flows (29% of the total transalpine traffic volume), followed by Ventimiglia and Gotthard. Compared to 2023, traffic-flow variations range between -4.3% and +12.9%. More specifically, Brenner, Gotthard, Fréjus and Mont Blanc all register increases by at least +3.6%. Tarvisio and Ventimiglia show a general stabilisation: +0.8% and -1.0%. San Bernardino is the only corridor registering a more evident decrease, by -4.3%. This variability across corridors is linked to multiple factors. First, San Bernardino has a relatively low absolute number of vehicles, and the registered decrease brings its value back to the status registered in 2022. Second, also the relevant increase of Fréjus (+12.9%) is linked to its low absolute values, as well as to the closure of the Mont Cenis rail corridor in 2024 (due to the effects of a landslide), which had a rebound effect on vehicle flows. Finally, even the data registered at Mont Blanc (+8.5%) must be interpreted with caution, since the daily average is calculated on 262 days, excluding the closure period of the Mont Blanc tunnel between September and December 2024.

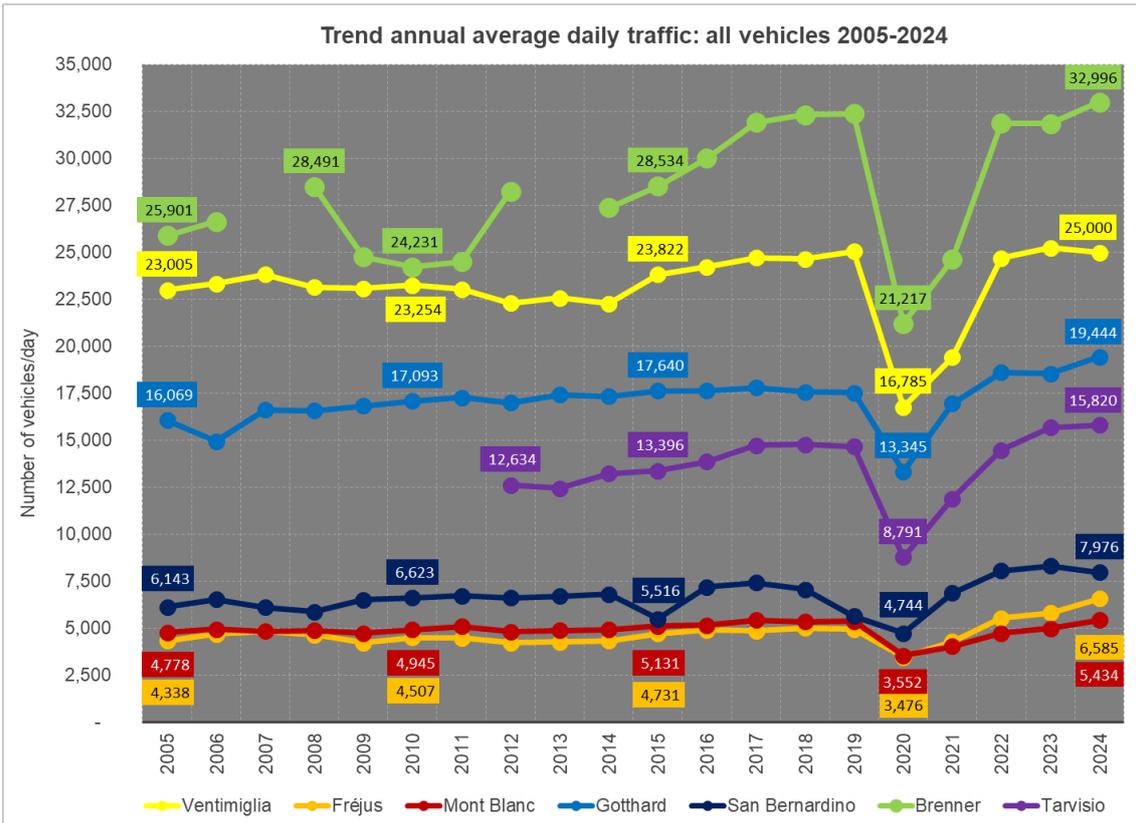


Figure 2: Annual average daily traffic: all vehicles per day.

MAIN INSIGHTS: Ca 113,250 heavy and light vehicles cross the seven major Alpine corridors per day: ca +2.5% compared to 2023 and +7% compared to 2019. As in the previous year, overall flows exceed the pre-pandemic values.

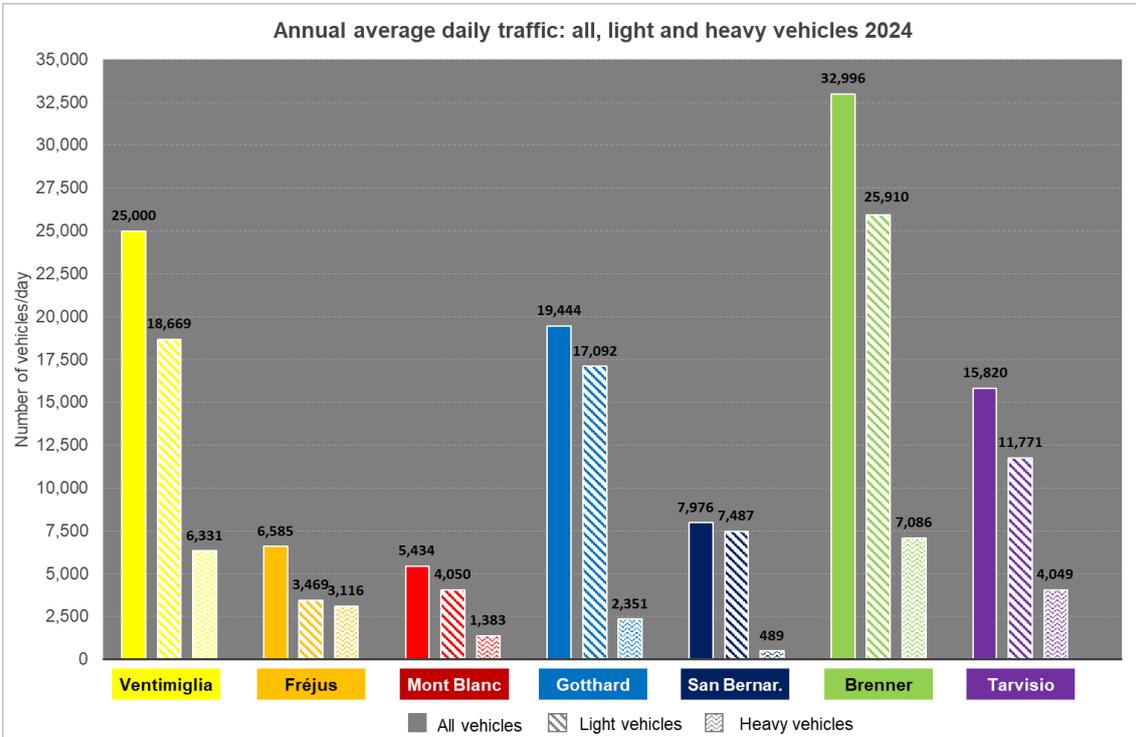


Figure 3: Annual average daily traffic: all, light and heavy vehicles per day in 2024.

MAIN INSIGHTS: The Brenner corridor registers the highest amount of both light and heavy vehicles per day (ca 25,900 and 7,100), representing almost 30% of total flows across all the observed iMONITRAF! corridors.

(1b) Light vehicles (Figures 3 and 4): In 2024, the annual average daily number of light vehicles crossing all iMONITRAF! corridors is ca 88,450 vehicles/day, i.e. +2.6% compared to 2023, and +8% compared to 2019 (before the Covid-19 pandemic). This condition is similar to the one described above for all vehicles (light plus heavy vehicles), although the increase is slightly more evident. Also in this case, the Brenner corridor presents the highest traffic flows: about 25,900 light vehicles/day (i.e. ca 29% of the overall volume), always followed by Ventimiglia and Gotthard. Compared to 2023, light-vehicle flows show diverse trends across corridors, as described above for all vehicles. Mont Blanc, Fréjus, Brenner and Gotthard register the most relevant increases, between +4.3% (Gotthard) and +18.5% (Mont Blanc). Tarvisio and Ventimiglia show generally stable values (+1.1% for the former and -1.8% for the latter). San Bernardino is the only one registering a more evident decrease, by -4.1%. The reasons listed above (i.e. influence of low absolute values for certain corridors, as well as exceptional closures) may be recalled also in this case to explain the reported trends.

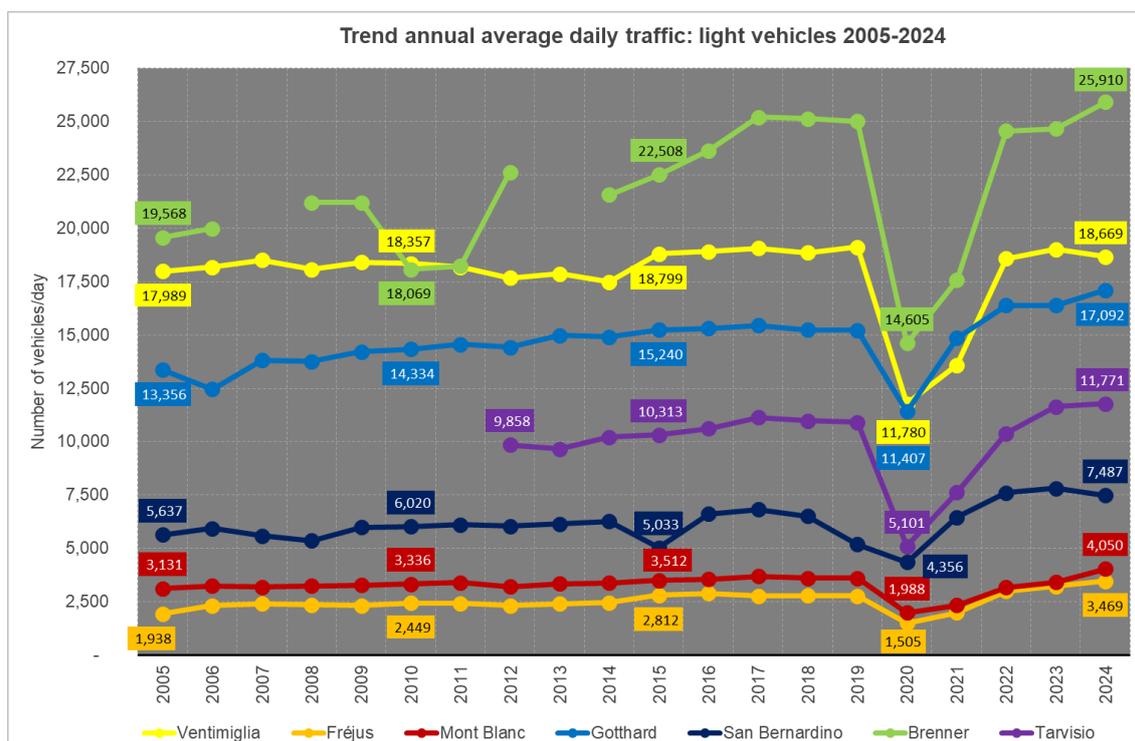


Figure 4: Annual average daily traffic: light vehicles per day.

MAIN INSIGHTS: Ca 88,450 light vehicles per day cross the seven transalpine corridors: ca +2.6% compared to 2023 and +8% compared to 2019. As in the previous year, overall flows exceed the pre-pandemic values.

(1c) Heavy vehicles (Figures 3 and 5): In 2024, the annual average daily number of heavy vehicles crossing all iMONITRAF! corridors sums up to ca 24,800 vehicles/day, which is a 1.9 % increase to 2023. Similarly to light vehicles, Brenner registers the highest flows: almost 7,100 heavy vehicles/day (all vehicles >3.5t counted, at the Austrian monitoring station of Brennersee)², which corresponds to ca 29% of the total flows across all the iMONITRAF! corridors. Ventimiglia and Tarvisio follow closely, with ca 6,300 and 4,000 heavy vehicles/day on average. Compared to 2023, trends across the single corridors differ from each other significantly, and they also differ

² **Attention:** this value may differ from the one in other relevant reports (such as the yearly reports “Verkehr in Tirol” and “Alpenobservatorium CH-EU”). This difference is due to: (a) the selected source and monitoring station representing the vehicle flows; and (b) the approach of the source to the classification of light and heavy vehicles. Further methodological details in this regard are provided in Annex 1.

from light-vehicle trends in some cases. Brenner and Mont Blanc register a decrease of heavy vehicles (-1.4% and -12.8%) while they registered an increase in light-vehicle flows. For Mont Blanc, this may be due to the closure period (September to December) and the effect it had on the route choices of operators. For Brenner, it must be underlined that this decrease is registered on the observed station of Brennersee/A13, while a slight increase is registered at other stations along the corridor, like Bolzano South, Trento and Rovereto. This highlights variability across national sections of the corridor. San Bernardino and Tarvisio also show negative variations (-6.5% and -0.1%, respectively), which are in line with the variations registered for light vehicles. Fréjus and Gotthard register an increase (+19.6% and +8.7%) that is in line with the one observed for light vehicles. Especially for heavy vehicles, the closure of Mont Blanc had a rebound effect on road traffic flows across the Fréjus. For the Gotthard, it needs to be noted that the rail base tunnel was only partly available in the period January-September 2024 due to repair work after the incident in August 2023. This may explain some traffic shifts from rail to road in this period. Finally, Ventimiglia registers an increase by +1.6%, while its light-vehicle trend is limitedly negative (-1.8%).

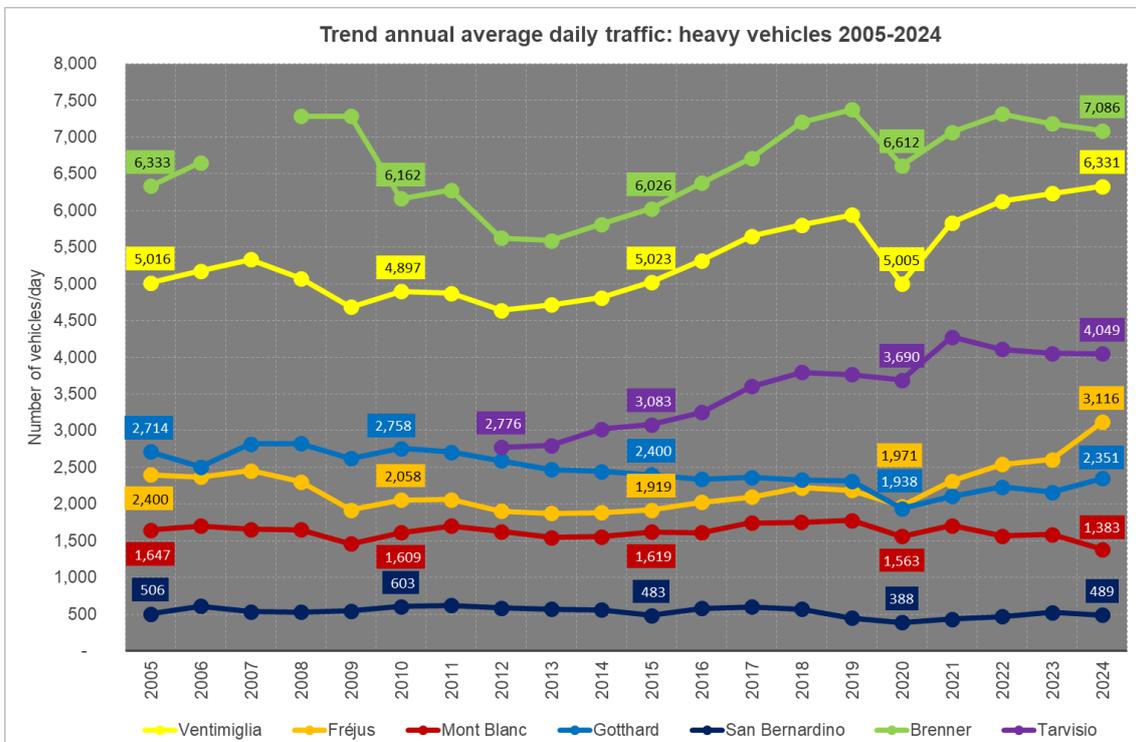


Figure 5: Annual average daily traffic: heavy vehicles per day.

MAIN INSIGHTS: Ca 24,800 heavy vehicles per day cross the seven iMONITRAF! corridors: almost +2% compared to 2023 and +4% compared to 2019 (pre-pandemic values).

Indicator 2: Transported tons and modal split

Figure 6 shows the development of the annual number of tons transported along the iMONITRAF! corridors in the period 2005-2024 by road and rail, while Figure 7 focuses on 2024. To provide more detailed information, Figure 8 focuses on the modal split road-rail for the corridors offering both options, while Figure 9 shows the modal split among the different types of rail services.

(2a) Transported tons rail-road (Figures 6 and 7): In 2024, over 156.5 Mt are transported across the eight observed corridors. About 108.9 Mt are transported by road (70%) and ca 47.6 Mt by rail (30%). The Brenner road corridor registers the highest amount among the iMONITRAF! corridors: ca 38.3 Mt, i.e. over 24% of the total. The Ventimiglia road corridor registers the second highest value (22.4 Mt), followed by the Gotthard rail corridor (17.8 Mt). Compared to 2023, a general stability of values is registered: -0.6%, from 157.5 to 156.5 Mt. However, this overall trend is generated by a decrease in rail transport (-2.5%) and a slight increase in road transport (+0.3%). The rail corridor registering the sharpest decrease is Mont Cenis (rail): -100% (no rail transport in 2024). This is due to the rockslide that caused the closure of the rail line since August 2023 and for the whole 2024. As indirect effect, the Ventimiglia rail corridor registers +48.6% in transported tons (since it represents the closest rail alternative to Mont Cenis). Even Simplon, Tauern and Gotthard register negative changes in rail transport: ca -8%, -4% and -2%, respectively. For the Gotthard, again the impacts of the repair works on the base tunnel in the period January-September 2024 need to be noted. Finally, Brenner registers a positive rebound of rail tons, with a +8% increase compared to the previous year. Among the road corridors, negative variations are less evident. Only Mont Blanc and San Bernardino register sharp decreases (-32.7% and -12.8%), with the former affected by the maintenance works of the Mont Blanc tunnel. Most of the other corridors register minor variations between -4% and +4%, except for Gotthard (+9.5%) and Fréjus (+20.4%). This last variation is also a side effect of the Mont Cenis closure in 2024. To summarise, 9 out of the 14 observed road and rail corridors register a decrease in 2024 compared to 2023, with the two most evident negative changes (Mont Cenis rail and Mont Blanc road) influenced by exceptional events.

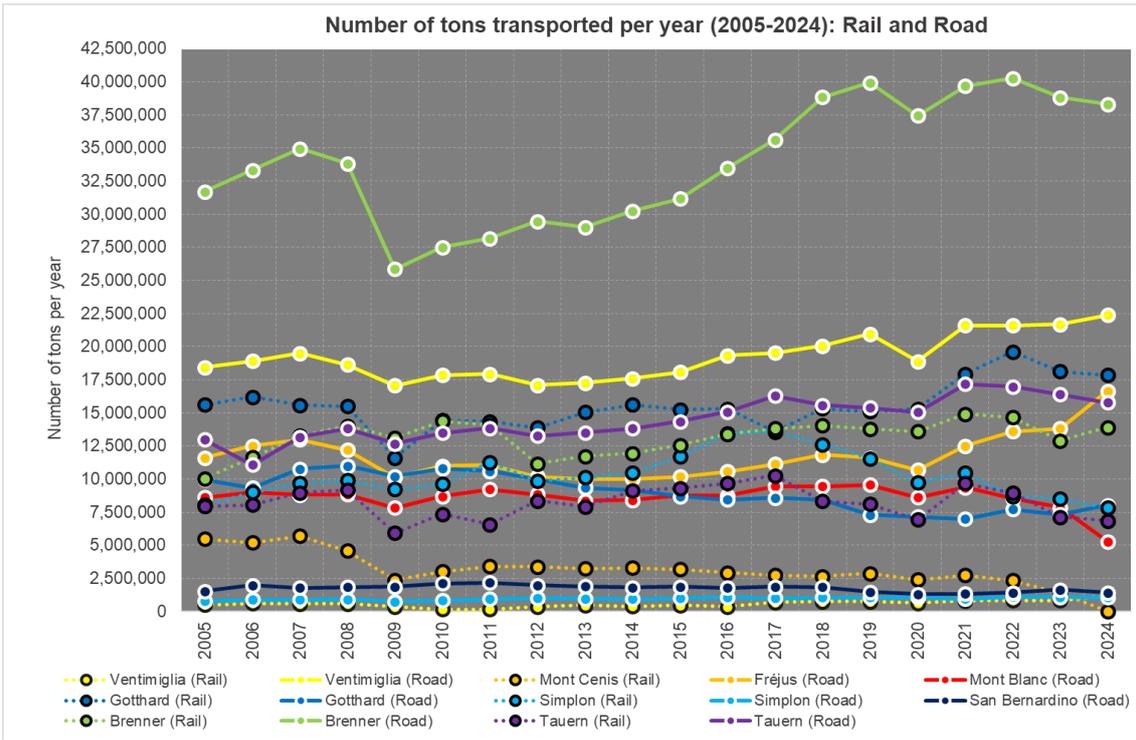


Figure 6: Number of transported tons per year by rail and road.

MAIN INSIGHTS: 108.9 Mt/year by road (70%) and 47.6 Mt/year by rail (30%). Rail volumes decreased compared to 2023 by 2.5%, while road volumes increased by 0.3%, leading to an overall slight decrease (-0.6%).

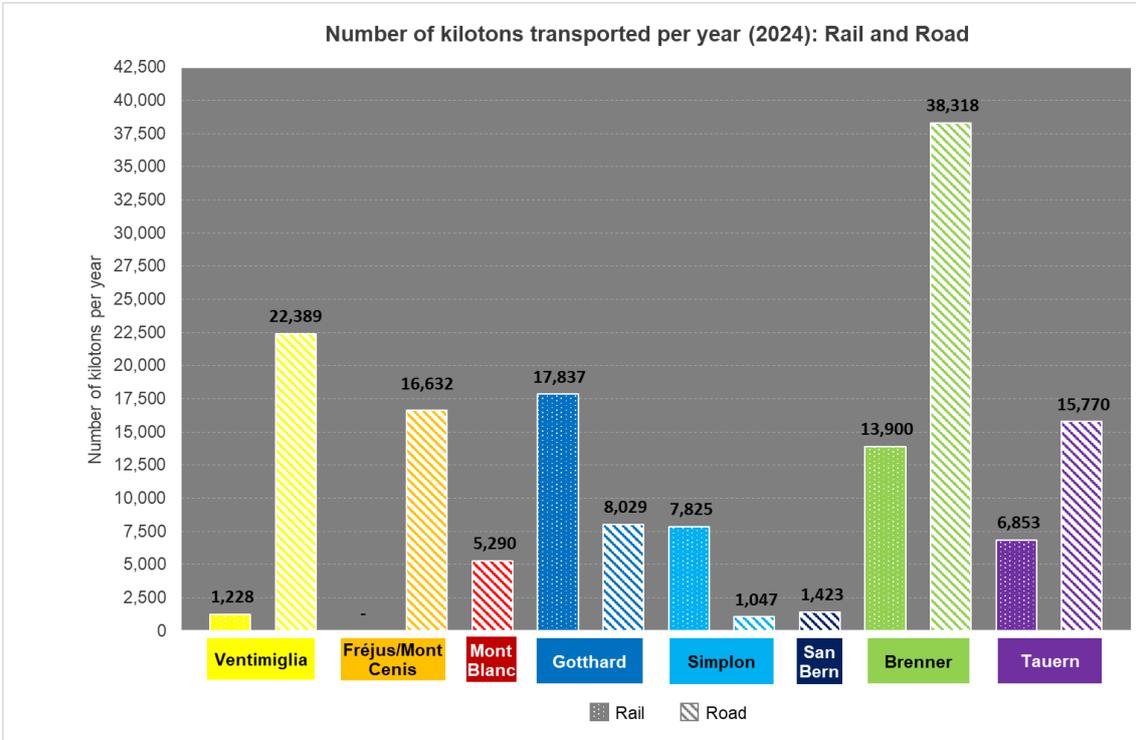


Figure 7: Number of transported kilotons per year by rail and road in 2024.

MAIN INSIGHTS: Highest road volumes at the Brenner (38.3 Mt/year) and rail ones at the Gotthard (17.8 Mt/year). This hierarchy is the same as in 2023 and in the previous years.

(2b) Modal split rail-road (Figure 8): In 2024, two out of the six corridors offering both rail and road transport exceed the share of 50% for rail transport: Simplon (88%) and Gotthard (69%). The other four ones register shares between 0% and 30%: Tauern (30%), Brenner (27%), Ventimiglia (5%), and Mont Cenis (0%, due to the closure of the line). Compared to 2023, diverse trends in rail share can be described for the corridors. In particular, we can refer to four clusters. Mont Cenis was closed in 2024 as said above due to the rockslide occurred in 2023, therefore its rail share was 0%. Ventimiglia and Brenner registered a slight increase in rail transport: from 4% to 5% for the former; and from 25% to 27% for the latter. This last change brings Brenner values back to the figures registered in the previous three years 2020-2022. Tauern stabilises at 30%, as registered in 2023. Finally, both Gotthard and Simplon register slight negative changes: from 71% to 69% for the former; and from 89% to 88% for the latter. As for the Gotthard, such reduction in rail modal split may be partially linked to the repair works on the tunnel occurred in January-September 2024, which affected the rail transit.

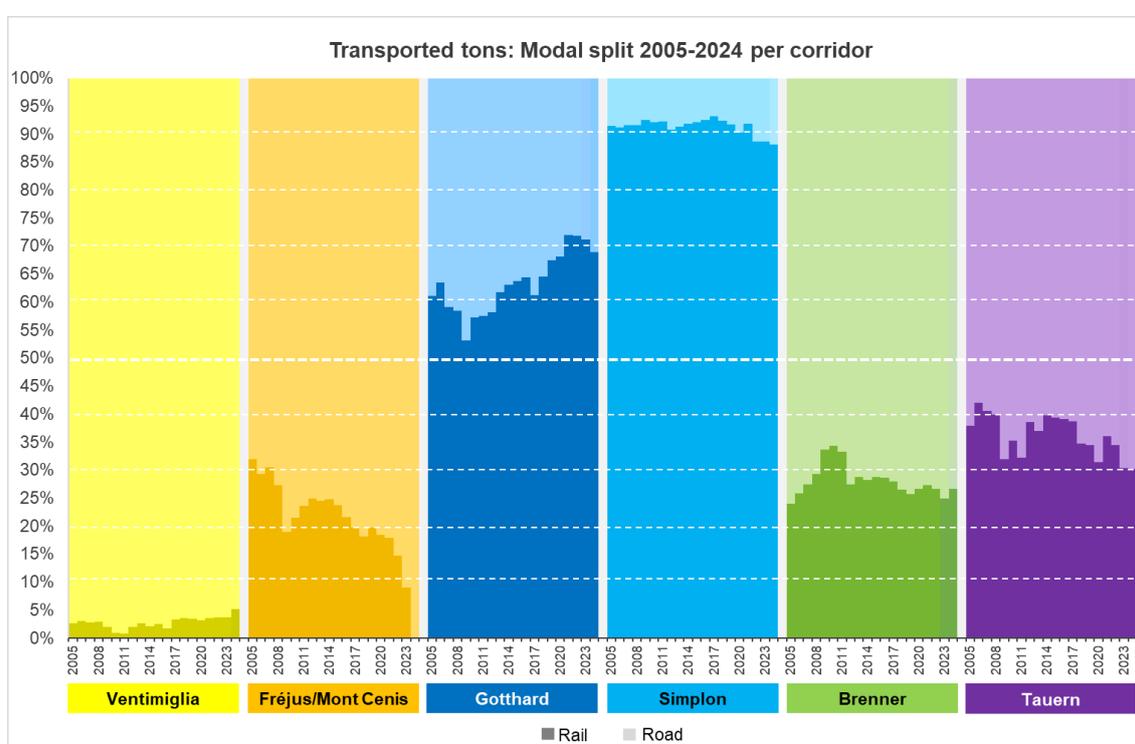


Figure 8: Modal split of transported tons per year: road and rail.

MAIN INSIGHTS: Diverse trends across corridors: (a) Ventimiglia and Brenner register slight rail increases; (b) Tauern stabilises; (c) Simplon and Gotthard register slight decreases; (d) Mont Cenis has no rail transport in 2024 due to rockslide.

(2c) Modal split rail services (Figure 9): The railway component distinguishes the type of service between conventional transport, unaccompanied combined transport (UCT) and accompanied combined transport (ACT). In 2024, conventional rail transport is the most diffused option for Ventimiglia and Tauern (over 60% for both) and plays a relevant role for the other three active rail corridors, excluding Mont Cenis (with a share between 11% and 28%). UCT is instead the most adopted option in the three other active corridors (Gotthard, Simplon, Brenner), with values of 73% (Simplon), 72% (Gotthard), 60% (Brenner). Finally, ACT generally plays a minor role, covering a share of ca 15% for the Brenner and Simplon, while being phased-out at the other rail corridors.

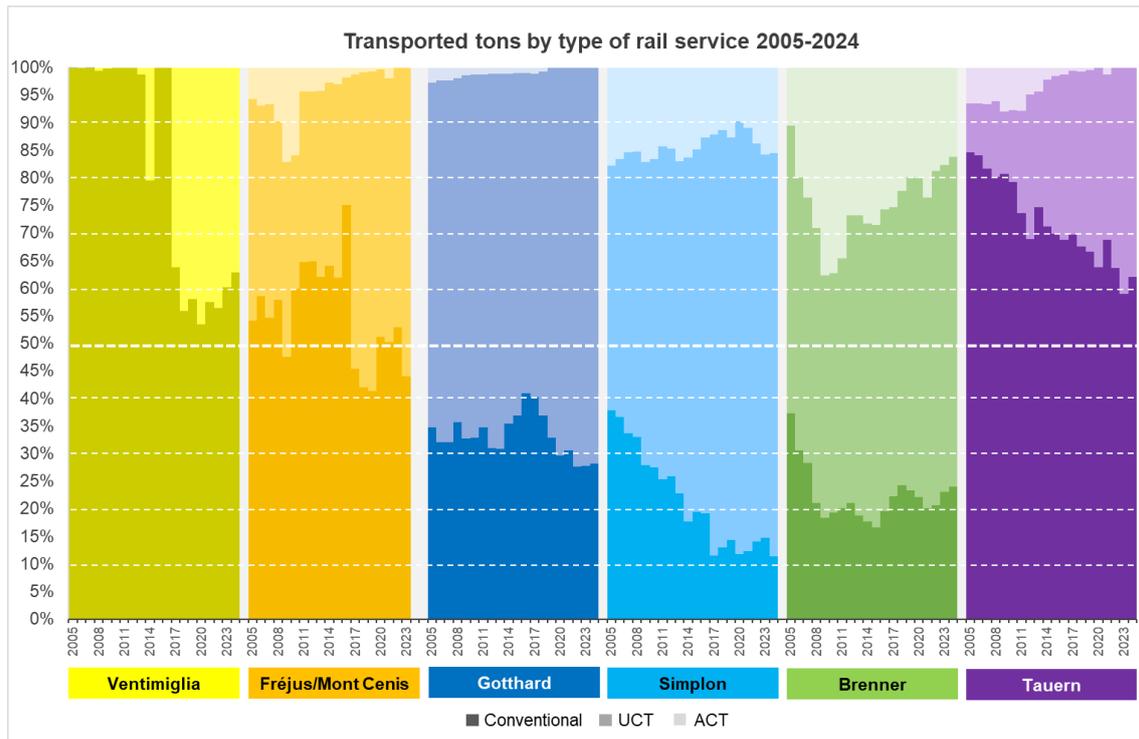


Figure 9: Modal split of transported tons per year: rail service type.

MAIN INSIGHTS: Conventional rail service and UCT remain the most used types of rail transport in most of the corridors. ACT plays a minor role and is used only at the Brenner and Simplon corridors.

Indicator 3: Concentration of air pollutants

Figures 10 and 12 illustrate the trend in annual average for nitrogen dioxide (NO₂) and particulate matter (PM₁₀) ambient concentrations in the period 2005-2024. Figures 11 and 13 focus on 2024. NO₂ data are collected at stations near the highways of the observed iMONITRAF! corridors since NO₂ is mainly related to road transport (and particularly to diesel vehicles). Similarly, the analysis of PM₁₀ concentration data is restricted at the roadside stations.

(3a) Nitrogen dioxide - NO₂ (Figures 10 and 11): In 2024, the highest concentrations are measured at the stations of Bressanone sud/Brixen süd (36 µg/m³) and Avio (33 µg/m³), both along the Brenner; followed by Vomp and Camignolo (both 29 µg/m³), respectively on the Brenner and Gotthard. This result is related to the road traffic volumes, but it is also affected by other elements like the composition of vehicle fleet (share of vehicle categories, share of EURO classes) and meteorology. In 2024, the NO₂ values do not exceed the current EU annual limit of 40 µg/m³ at any station. However, 8 out of 17 available stations register values >20µg/m³ (the new EU annual limit as of 2030). Moreover, the stations of Camignolo (Gotthard, CH) and Vomp (Brenner, AT) almost reach the national limits defined in Switzerland and Austria (30 µg/m³), but they remain below these thresholds. Compared to 2023, 12 out of the 17 active monitoring stations register a decrease of NO₂ concentrations, 4 stations register the same value of the previous year, while only one station (Susa along the Fréjus) registers an increase: from 10 to 11 µg/m³. On average, concentration decreases by -6% across all monitoring stations compared to the previous year. The stations registering the most evident decreases are Entreves (Mont Blanc, -32%) and Oberaudorf (Brenner, -14%).

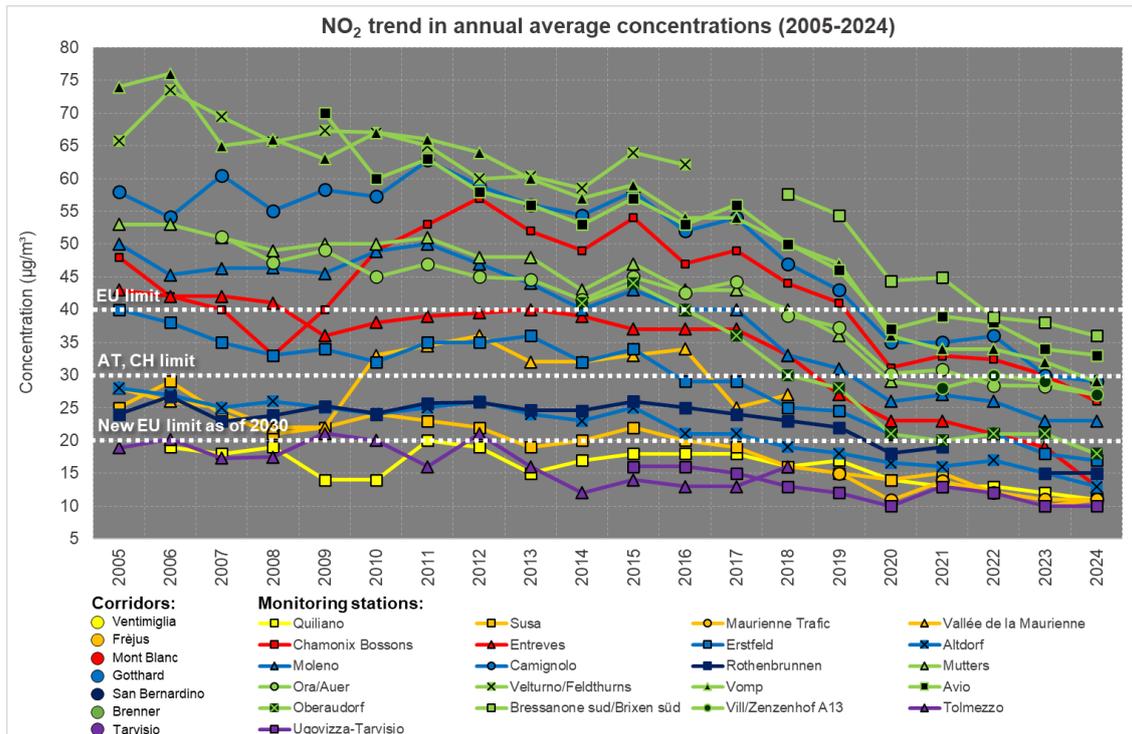


Figure 10: NO₂ trend in annual average concentrations (2005-2024).

MAIN INSIGHTS: 2024 values are on average lower by 6% than those of 2023 across all the stations. 12 stations out of 17 register a decrease of values. 8 stations exceed the EU limit of 20 µg/m³ planned for 2030.

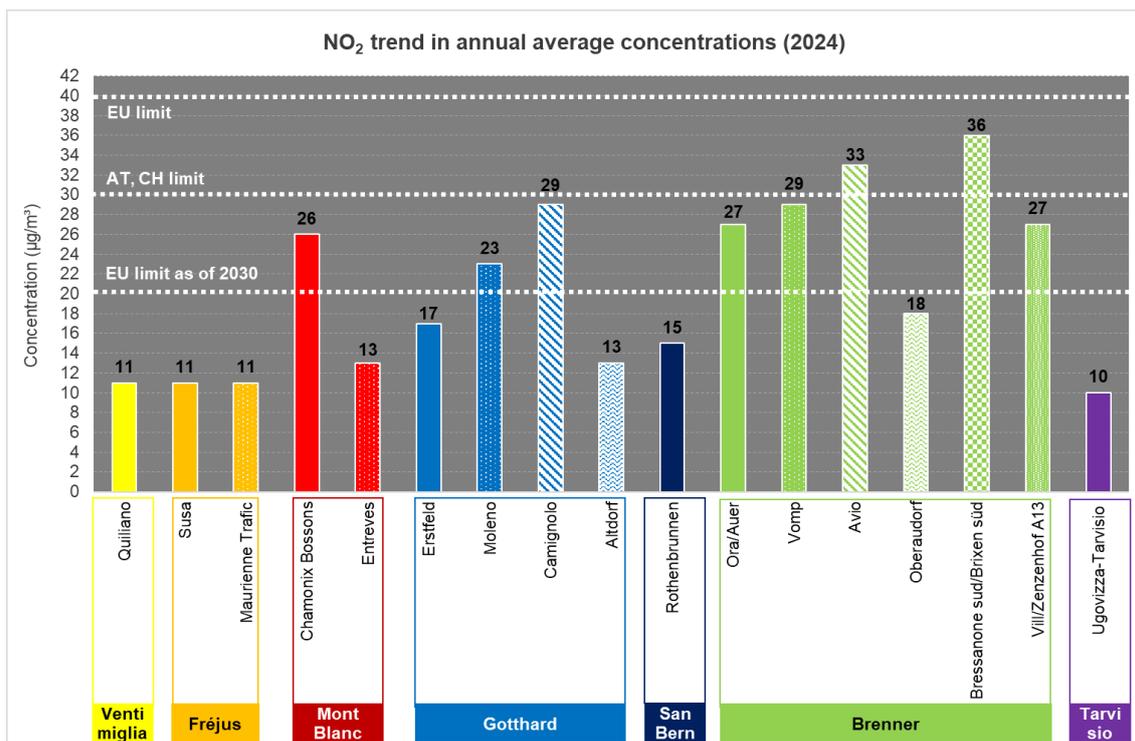


Figure11: NO₂ trend in annual average concentrations (2024).

MAIN INSIGHTS: No station exceeds the current EU limit of 40 µg/m³ but 8 stations exceed the planned EU limit as of 2030. The four stations with the highest values are located along the Brenner (3 stations) and Gotthard (1 station).

(3b) Particulate matter - PM₁₀ (Figures 12 and 13): In 2024, the highest PM₁₀ concentrations are registered at two Brenner monitoring stations: Ora/Auer and Bressanone sud/Brixen süd (16 and 17 µg/m³); one Ventimiglia station: Quiliano (16 µg/m³); as well as at one Tarvisio station: Tolmezzo (16 µg/m³). Nevertheless, no station reaches or exceeds the EU limit of 40 µg/m³, with the highest value reaching 17 µg/m³. Compared to 2023, a general decrease of PM₁₀ concentration values is registered, with some exceptions. Specifically, 11 out of the 18 active monitoring stations register a decrease of values; 5 stations maintain the same value as in 2023; while two stations register minor increases: Vill/Zenzenhof A13 (Brenner) and Ugovizza-Tarvisio (Tarvisio). On average, the decrease registered across all observed stations is -5%. The stations registering the most evident negative variations are Avio (Brenner) and Camignolo (Gotthard) with -17% and -14%, respectively, followed by Susa (Fréjus) with -13%.

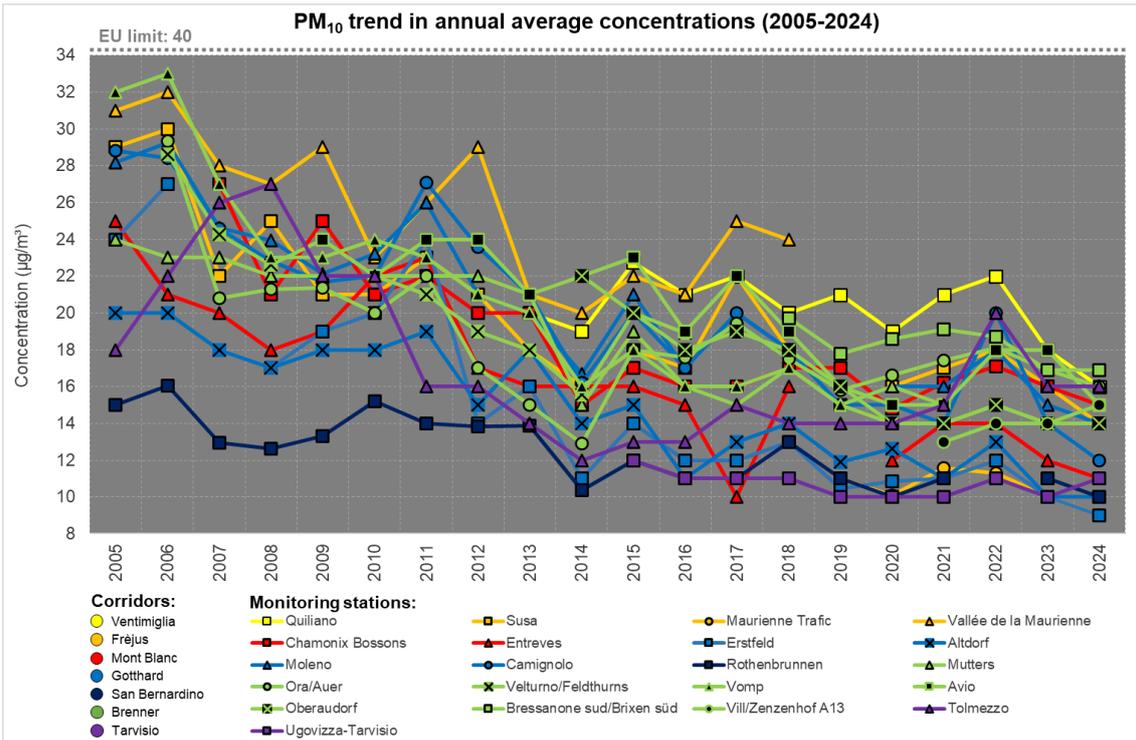


Figure 12: PM₁₀ trend in annual average concentrations (2005-2024).

MAIN INSIGHTS: 2024 values are on average lower by 5% than those of 2023 across all the measuring stations. 16 stations out of 18 register a stabilisation or decrease of values, while 2 stations register a minor increase.

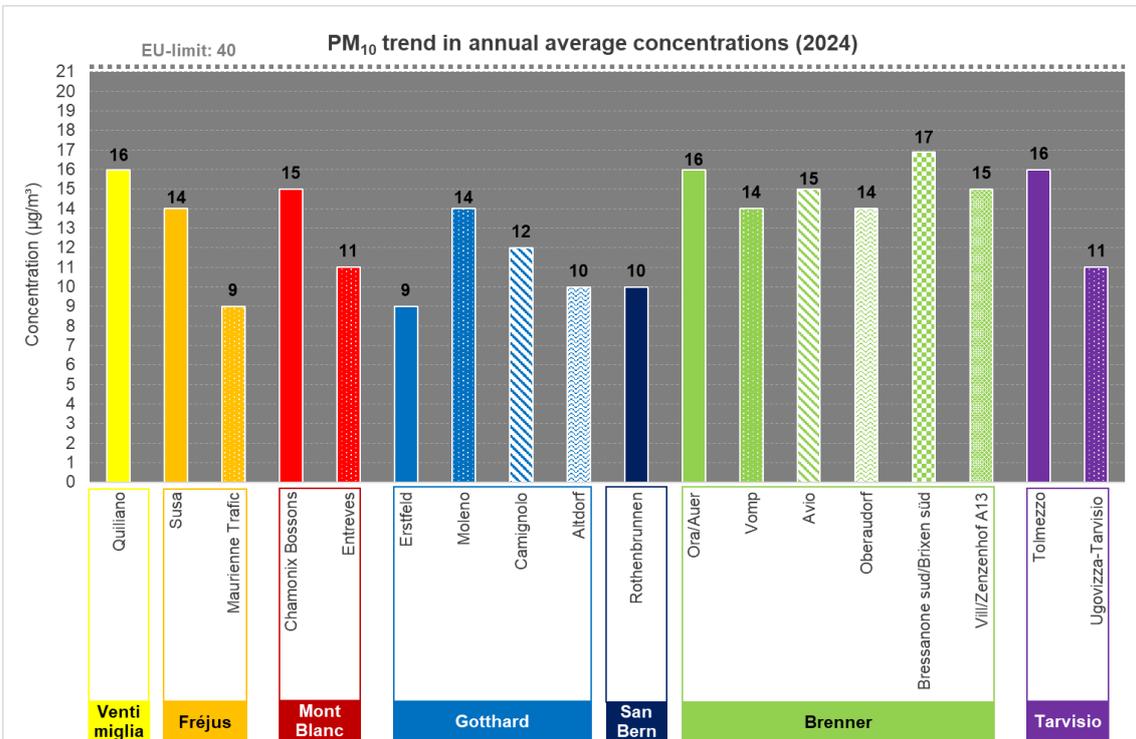


Figure 13: PM₁₀ trend in annual average concentrations (2024).

MAIN INSIGHTS: No station exceeds the EU limit of 40 µg/m³. The four stations with the highest values are located along the Brenner (2 stations), Tarvisio (1 station), and Ventimiglia (1 station).

A couple of caveats are necessary: PM₁₀ concentrations are (more strongly than NO₂) influenced by sources other than transport, such as wood heating installations. Yet, secondary PM₁₀, built from gaseous precursor concentrations (NO_x, SO₂, NH₃, VOC), can contribute to half of the PM₁₀ concentrations measured. The long-term trends can therefore not only be traced back to the development of PM₁₀ emissions of road vehicles.

Indicator 4: Exposure to noise

Figures 14 and 15 illustrate the trend in annual average level of exposure to noise through two indicators: L_{den} and L_{night}, respectively. The former defines the overall level registered during the day, evening and night and is used to describe the general annoyance caused by noise. The latter indicates the levels registered during the night only and it is used to describe sleep disturbance.

(4a) Overall noise level - L_{den} (Figure 14): In 2024, L_{den} lies in the range between 69.5 dB(A) registered at Châtillon (Mont Blanc) and 77.6 dB(A) at Camignolo (Gotthard). The other active monitoring station considered along the Gotthard (Reiden) registers the second highest value, despite the decrease in 2023 due to a new pavement: 76.7 dB(A). Compared to 2023, three different trends can be observed. Four stations along the Gotthard and Mont Blanc show minor increases of values, in the range between +1% and +3%. The station of Rothenbrunnen (San Bernardino) registers a stabilisation of values at 73.9 dB(A). Finally, the station of Camporosso shows a decrease by ca -5% compared to 2023. Among these trends, it is relevant to mention that the rebound of values along the Mont Blanc are linked to the maintenance works that limited the traffic along the highway in 2023 (and partially also in 2024), thereby influencing the noise measurements occurred in the affected days.

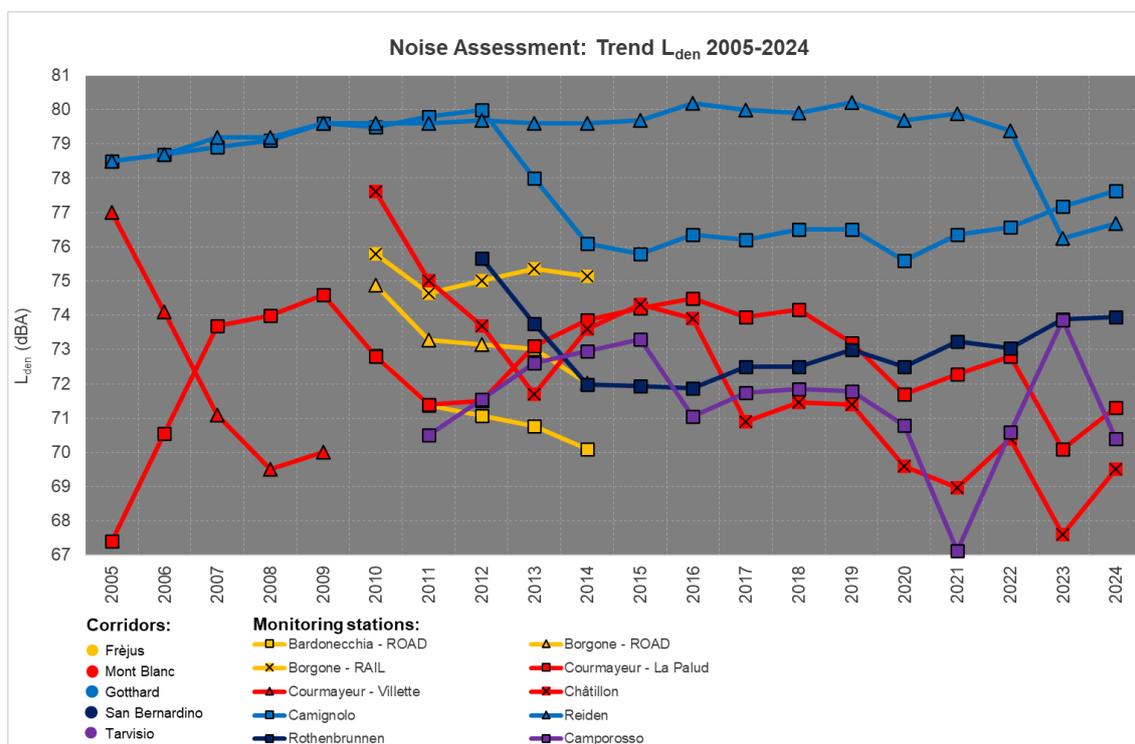


Figure 14: L_{den} trend in daily average noise level (2005-2024).

MAIN INSIGHTS: Noise levels register a decrease or stabilisation in 2024 compared to 2023 in two out of six stations, while the remaining four stations register a minor increase up to 3%.

(4b) Night noise level - L_{night} (Figure 15): The L_{night} data basically reflects the hierarchies and trends described for L_{den} . In 2024, L_{night} lies in the range between 61.3 dB(A) at Châtillon (Mont Blanc) and 69.8 dB(A) at Camignolo (Gotthard). The latter is closely followed by Reiden (Gotthard), with 69.3 dB(A). Compared to 2023, also the L_{night} values show a slight increase in range +1-2% for the two monitoring stations along the Gotthard and for Châtillon along the Mont Blanc. Instead, Courmayeur - La Palud (Mont Blanc) and Rothenbrunnen (San Bernardino) are generally stable, with variations within +/-1%. Finally, Camporosso (Tarvisio) shows a more evident decrease by -4%, similar to the trend registered for L_{den} .

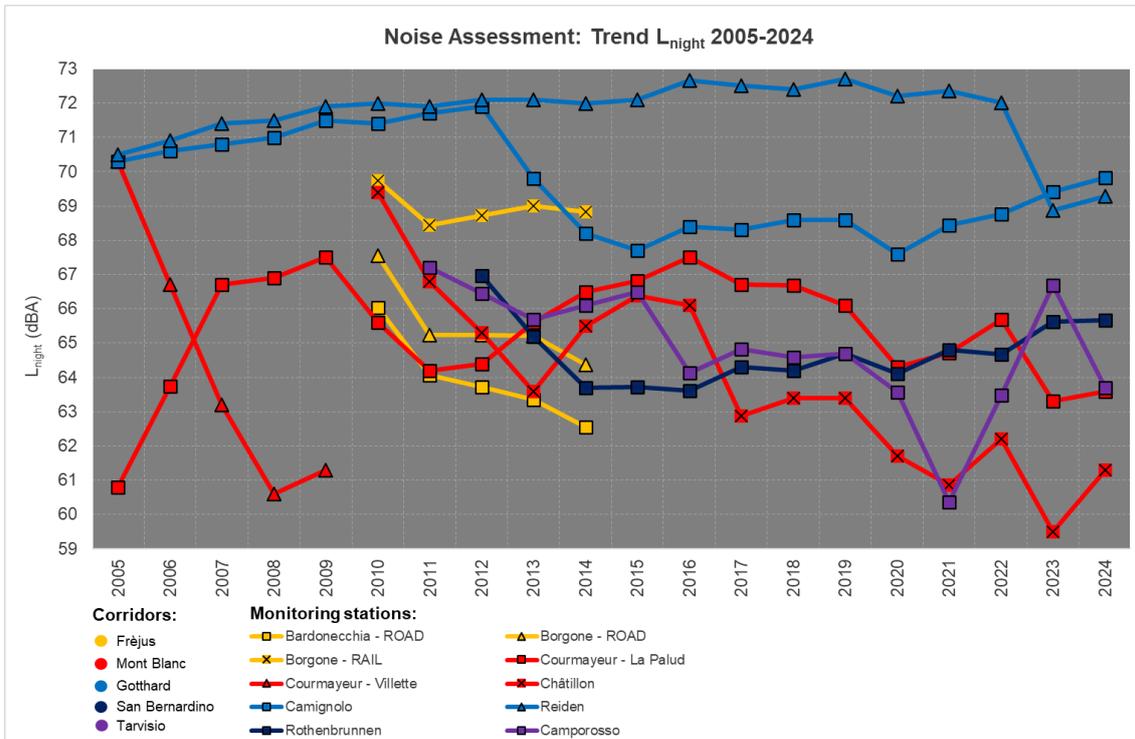


Figure 15: L_{night} trend in night average noise level (2005-2024).

MAIN INSIGHTS: The noise levels during the night follow the general trend of the noise levels during the day. Noise levels lie in the range between 61.3 dB(A) at Châtillon (Mont Blanc) and 69.8 dB(A) at Camignolo (Gotthard).

Indicator 5: Toll prices

Toll prices (as well as all other economic indicators) are presented for 2025. Figures 16 and 17 show the total price of a single transit in direction north-south for each corridor, and the kilometric cost of the same transit, respectively. For freight forwarders, the kilometric price is an important criterion for choosing the most convenient corridor and transport mode. Prices are reported for a standard passenger car and for standard heavy vehicles of 5 axles and 40 t, with a distinction between three EURO-classes (II, V and VI), as well as electric/hydrogen heavy vehicles.

(5a) Whole price for transit (Figure 16): In 2025, the highest tolls for **passengers cars** are applied at the Fréjus and Mont Blanc (€96.80 and €90.80 respectively). These values are highly affected by the cost of the passage across the tunnels. The charges for Ventimiglia, the Swiss highways and Brenner are in the mid-range (between €41 and €47), while the costs at Tarvisio are the lowest (€35.00). For **heavy vehicles**, road tolls follow a similar West-East-divide as for passenger cars: highest tolls apply at the Fréjus and Mont Blanc; middle-range values at the Gotthard and San Bernardino; lowest values for the Brenner, Tarvisio. Ventimiglia does not fit into the West-East-divide as it does not include a tunnel charge. Simplon charges low prices but its distance is considerably shorter than the other corridors. When comparing **EURO classes**, Italian and French highways apply the same tolls to all the EURO classes, as evident for the Ventimiglia, Fréjus and Mont Blanc corridors. This partially affects also the Brenner and Tarvisio, where EURO II and V vehicles pay respective ca 10% and 4% more than EURO VI ones. Conversely, the most evident EURO-dependent gap is registered at the Gotthard and San Bernardino, where EURO II and V heavy vehicles pay the same amount, which is ca 36% higher than EURO VI ones. Even for **E/H2 heavy vehicles**, involved countries apply different approaches. In Switzerland and Germany, E/H2 heavy vehicles are exempt from highway tolls, as reflected by the Gotthard, San Bernardino and Simplon. In Italy and France, E/H2 heavy vehicles pay the same amount as EURO VI vehicles. Accordingly, the same toll is registered for Ventimiglia, Fréjus and Mont Blanc. In Austria, E/H2 heavy vehicles benefit from a significant reduction of tolls, which is partially reflected by the lower values registered along the Brenner and Tarvisio (over -60% compared to EURO VI vehicles). In this respect, the tolls applied at Tarvisio and especially Brenner are the result of three different policies adopted in Italy, Austria and Germany.

Compared to 2024, a general increase of toll prices is registered, with minor exceptions. For **passenger cars**, the increase ranges between ca +1.2% (for Fréjus and Mont Blanc), +2.2% (for Gotthard and San Bernardino), ca +5-6% (for Brenner and Tarvisio), and +7% (for Simplon). Conversely, Ventimiglia shows a decrease by -3% after the significant grow registered in 2024 compared to 2023. For **heavy vehicles**, increases are more diverse, also depending on EURO classes. Fréjus and Mont Blanc apply a flat increase by 1.2% to all EURO classes. Swiss corridors apply an increase by 7.1%, except for EURO V vehicles that are charged more heavily (+24%) to align their tolls with the ones paid for EURO II heavy vehicles. Increases along the Brenner and Tarvisio slightly vary across EURO classes, in range +5-6% for Brenner, and +9-10% for Tarvisio. Finally, Ventimiglia applies a reduction even for heavy vehicles, by 1.4% for all classes. Nevertheless, values are still ca 2% higher than in 2023.

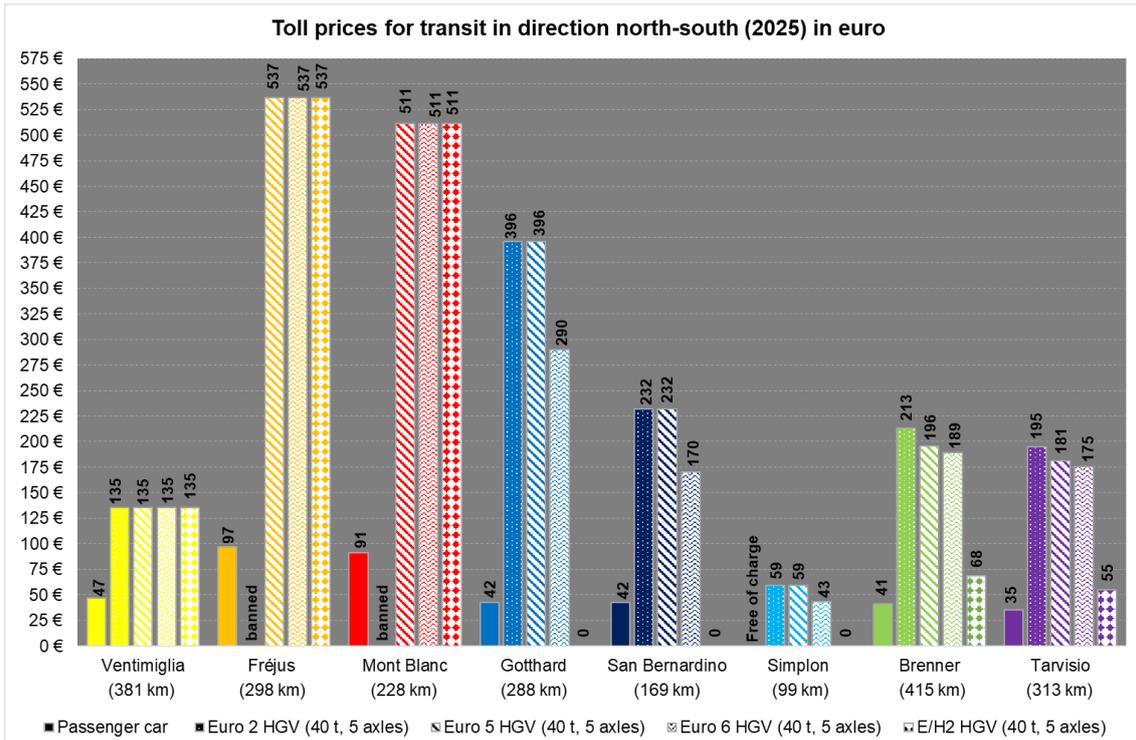


Figure 16: Toll prices for a single transit on the iMONITRAF! corridors in direction North-South (2025).

MAIN INSIGHTS: Similarly to the previous years, considerable differences along corridors exist. This is visible especially for E/H2 heavy vehicles, which transit free of charge in Switzerland and Germany, benefit from discounts in Austria, while they pay the same amount as fossil-fuel vehicles in Italy and France.

(5b) Km price for transit (Figure 17): In 2025, the order of corridors from highest to lowest prices remains similar to that one derived from absolute costs. For instance, focusing on a EURO VI heavy vehicle of 40 t, the highest km values are registered at the Mont Blanc (€2.24/veh-km) and Fréjus (€1.80/veh-km). Conversely, the lowest values regard E/H2 heavy vehicles travelling in Switzerland (no cost) and along the Brenner and Tarvisio (€0.16-17/veh-km). Even the variations compared to 2024 are generally consistent. In particular, EURO V heavy vehicles show the highest relative increase (from 1.11 to 1.37 along the Gotthard and San Bernardino), since they now pay the same amount as EURO II heavy vehicles.

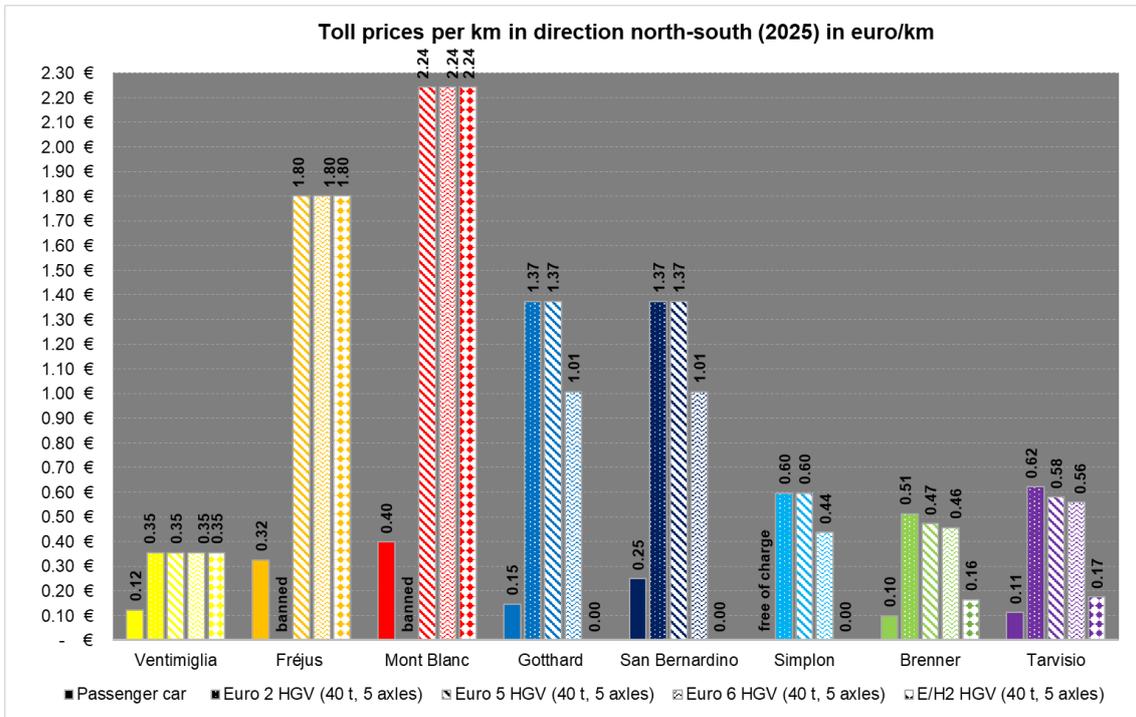


Figure 17: Kilometric toll prices (€/km) for a single transit on the iMONITRAF! corridors in direction North-South (2025).

MAIN INSIGHTS: Considerable differences between the kilometric toll prices can be seen, showing a similar pattern than the absolute values. Gotthard and San Bernardino now charge the same amount for EURO II and EURO V vehicles.

Indicator 6: Fuel prices

Figure 18 reports the average yearly prices of diesel and petrol at national level in Austria, France, Italy, Switzerland and Germany (i.e. the key countries crossed by the iMONITRAF! corridors).

In 2025, average prices registered across the five observed countries are €1.68/litre for diesel and €1.71/litre for petrol. The highest diesel and petrol prices are registered in Switzerland (€1.96 and €1.87)³, while the lowest values are reached in Austria (€1.53 and €1.52). Compared to 2024, prices are lower by 3% for diesel and 4% for petrol across all the considered countries. The most evident decreases regard the prices of petrol in France and Italy (reduction by 5% in both cases); followed by a price decrease of 4% registered for both diesel and petrol in Austria, and a decrease of 4% even for diesel in Italy and France. Considering a longer period since the begin of the Covid-19 pandemic (2020-2025), the decrease registered in 2025 compared to 2024 is in line with the previous decreases registered in 2024-2023 and 2023-2022 (price decrease ca.-5% for diesel and 2% for petrol on average across the five observed countries). Nevertheless, the values registered in 2025 are still sensibly higher than those registered in 2021 for all the countries: ca +15-18% (with 2021 being the last year before the beginning of the war in Ukraine and of the following growth of the inflation rate).

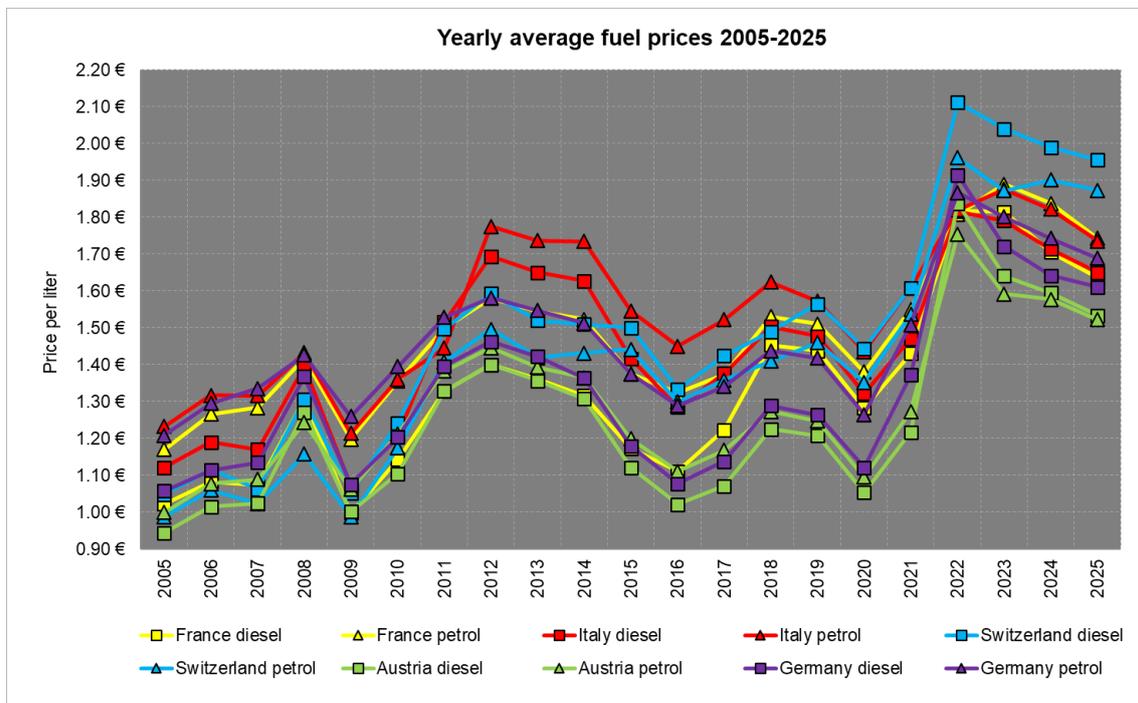


Figure 18: Annual average fuel prices for diesel and petrol at the national level in € per litre (2025).

MAIN INSIGHTS: Fuel prices have generally decreased by 3% for diesel and 4% for petrol compared to 2024. This decrease is consistent with that one registered in previous two years, but prices are still ca 15-18% higher than in 2021.

³ Exchange rates (EUR/CHF) used for the estimation: 1.0645 (January 2025); 1.0664 (May 2025); 1.0754 (July 2025); 1.0692 (October 2025). Source: <http://www.frasi.net/utilita/cambiovalute/default.asp?ISO=CHF>

Indicator 7: Alternative-fuel refuelling stations

Figure 19 illustrates the alternative-fuel (AF) stations per corridor available in both directions (North-South and South-North) in 2025. The length of the corridors is defined considering the same origins and destinations used for the indicator 5 (toll prices). Methodological details about the data sources and the counting of the stations are available in the related Annex 1.

EV charging stations are the most diffused AF stations along the iMONITRAF! corridors, with 79 stations in total in 2025 (regardless of the number of single charging points). With 20 and 18 stations, the Brenner and Ventimiglia register the highest amount, followed by Gotthard and Mont Blanc (both 11). Hydrogen and LNG stations are instead the least diffused across the iMONITRAF! corridors, with 6 and 4 stations in total, respectively. Only 3 out of 8 considered corridors offer hydrogen refuelling stations: Brenner (3), Gotthard (2) and Fréjus (1). Instead, LNG stations are available only along the Brenner (2), Tarvisio and Mont Blanc (both 1). LPG and CNG stations are widely diffused, although not as much as the EV charging stations. In total, 58 LPG and 49 CNG stations are counted along all the corridors. The Brenner and Gotthard are the two corridors with the highest number of CNG stations (22 and 9 respectively), thus covering ca 60% of the total. Instead, LPG stations are more evenly distributed among corridors, with the Brenner, Gotthard, Fréjus and Ventimiglia all providing between 10 and 12 stations.

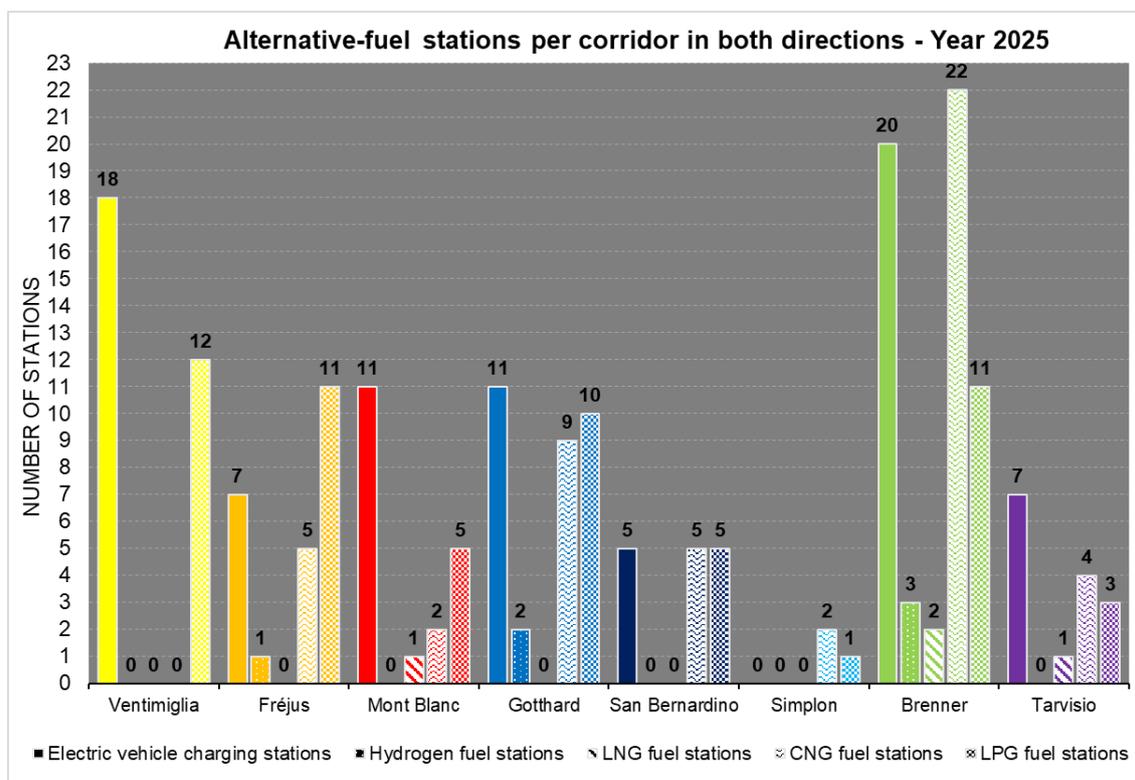


Figure 19: Alternative-fuel stations per corridor in both directions (2025).

MAIN INSIGHTS: EV charging stations are most diffused across the iMONITRAF! corridors with 79 charging stations in total. LPG and CNG stations are also diffused (58 and 49 respectively). Hydrogen and LNG stations are low available.

Indicator 8: Unitary pricing components

Figure 20 shows the aggregated amount of €/year that vehicle owners have to pay during a vehicle lifecycle to cover taxes related to its purchase and ownership. We consider four taxes (purchase tax, registration tax, ownership tax, insurance tax); four sample vehicles (petrol and electric light vehicle, diesel and electric heavy vehicle); and five countries (France, Italy, Switzerland, Austria, Germany). To allow the aggregation of tax components and comparison among vehicles and countries, we apply some conversions as detailed in the methodological Annex 1.

Light vehicles: For **petrol cars**, Austria has the highest total cost (€612/year), while Switzerland registers the lowest one (€291/year). The purchase tax covers the largest share for most countries (between 38% and 60%), while the registration tax has a minor influence (1% to 10%). The ownership and insurance tax show heterogeneous trends. The former ranges between not being due in France to ca 44% of the total in Switzerland. The latter goes from 9% of the total in Austria, to 37% in France. For **electric cars**, a general increase of the total cost is registered, also because the top-sold e-car in Europe in the period 2022-24 was the Tesla model Y, which is significantly more expensive than the petrol counterpart (Dacia Sandero). Smallest increase is registered in Austria, where the total cost is 44% higher than for petrol car. The other four countries register an increase in the range of 108-115%. This happens especially due to the purchase and insurance taxes, whose amounts are directly related to the purchase price of the observed vehicle. Nevertheless, it is worth mentioning that the registration tax decreases or remains unvaried in four out of five countries, while the ownership tax is eliminated in Austria and decreased in Germany.

Heavy vehicles: For **diesel heavy vehicles**, Switzerland shows the highest tax cost (€3,752/year), while France registers the lowest value (€1,268/year). These differences are mostly linked to the ownership and insurance tax, while the registration and purchase tax have minor influences (the latter is deductible in all the countries). The ownership tax covers ca 50% of the total cost on average among the five countries, but with relevant differences between Switzerland (88% of the total) and France or Italy (29% of the total in both cases). The incidence of insurance tax is similar among France, Italy and Germany (in range 65-68% of the total), while its relative weight is lower in Austria (39%) and especially in Switzerland (12%). The condition of **electric heavy vehicles** in comparison with their diesel counterparts significantly varies across countries. In France and Italy, diesel and electric trucks pay almost the same amount (since no specific deduction is given). In Germany and Austria, electric trucks pay 17% and 59% less than diesel ones, respectively, thanks to a reduction (Germany) or elimination (Austria) of the registration tax. Finally, the total costs applied in Switzerland (Canton Zurich) are remarkably lower: €3,752/year for diesel heavy vehicles against €456/year for the electric variant. This is due to the exception from the ownership tax currently applied by the Canton Zurich to electric heavy vehicles.

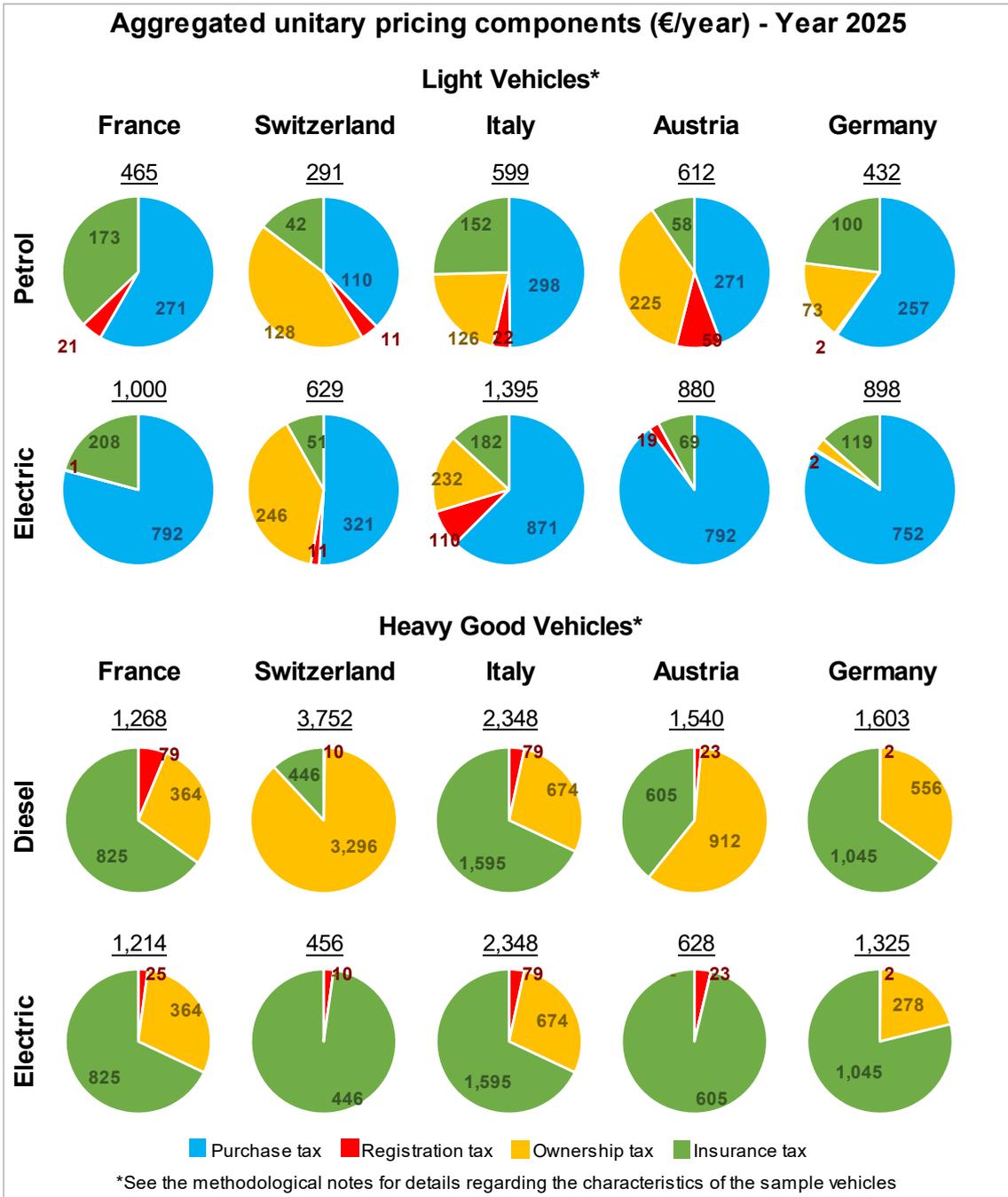


Figure 20: Aggregated unitary pricing components (2025).

MAIN INSIGHTS: For electric cars, overall tax costs tend to increase for all countries due to the higher purchase price of the top sold e-car model in EU. For electric heavy vehicles, reductions or eliminations of the ownership tax in AT, DE and CH play a major role in decreasing total tax costs.

5.3 Developments with respect to the iMONITRAF! target indicators

To establish a stronger link between the iMONITRAF! monitoring activities and the policy pathway, iMONITRAF! agreed on a new set of target indicators in 2022. For the work programme 2023-2025, the target indicators are now an integral part of the Annual Report. The target indicators strengthen the fact-based approach of iMONITRAF! as they show if developments are in line with the target paths or if additional action is necessary. Results can be seen as “early-warning”. If developments are not in line with the target path, joint efforts need to be improved.

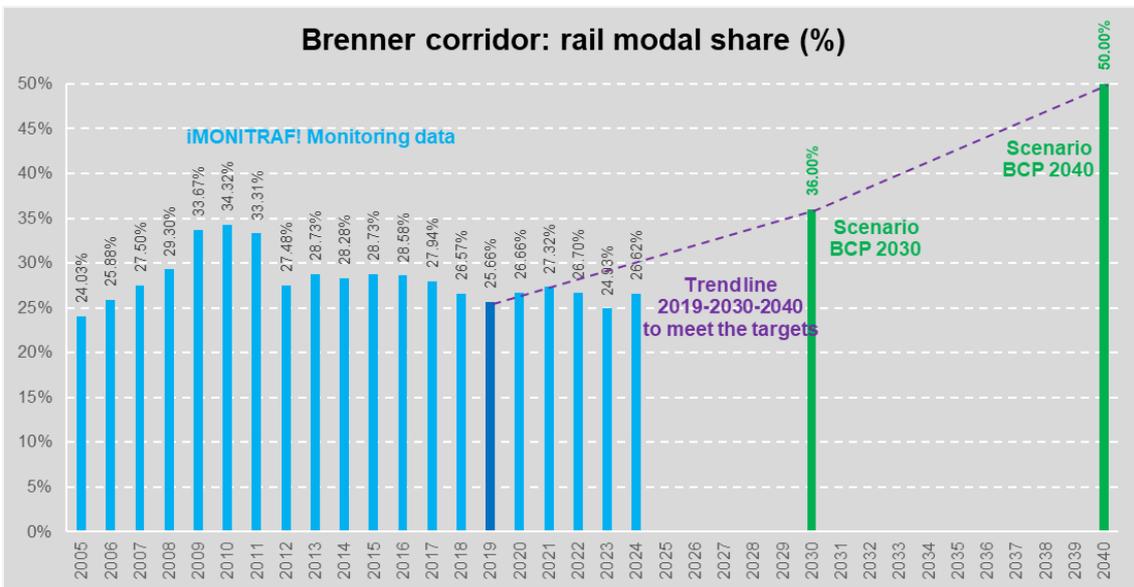
Progress in reaching the modal split target indicators

Modal split targets were defined on the basis of existing strategies and frameworks of the iMONITRAF! regions. For the Brenner, the path leads to the target of a 50% share of rail transport in 2040, assuming that the Brenner Base Tunnel (BBT) and its access tracks are in full operation at this point in time. As intermediate target, a modal split of 36% shall be reached by 2030.

For the Swiss corridors, a modal split of 83.7% is envisaged for 2030. After that, the additional potential is very limited.

The following Figure 21 displays the available modal split data for the Brenner and Swiss corridors (Gotthard, San Bernardino and Simplon) and put them in comparison with the rail modal split targets for 2030 and 2040.

Comparing the 2024 monitoring data with the target paths, an ambivalent picture can be seen: on the Brenner, the negative trend for rail modal split of the last years could be reversed in 2024 – with an increase of modal split by nearly two percentage points (from 24.9% to 26.6%). However, modal split decreased on the Swiss corridors, reflecting the impacts of the repair work on the basetunnel in the period January-September 2024. Even with the positive dynamics on the Brenner, a considerable gap to the trendline and thus the target path can be seen.



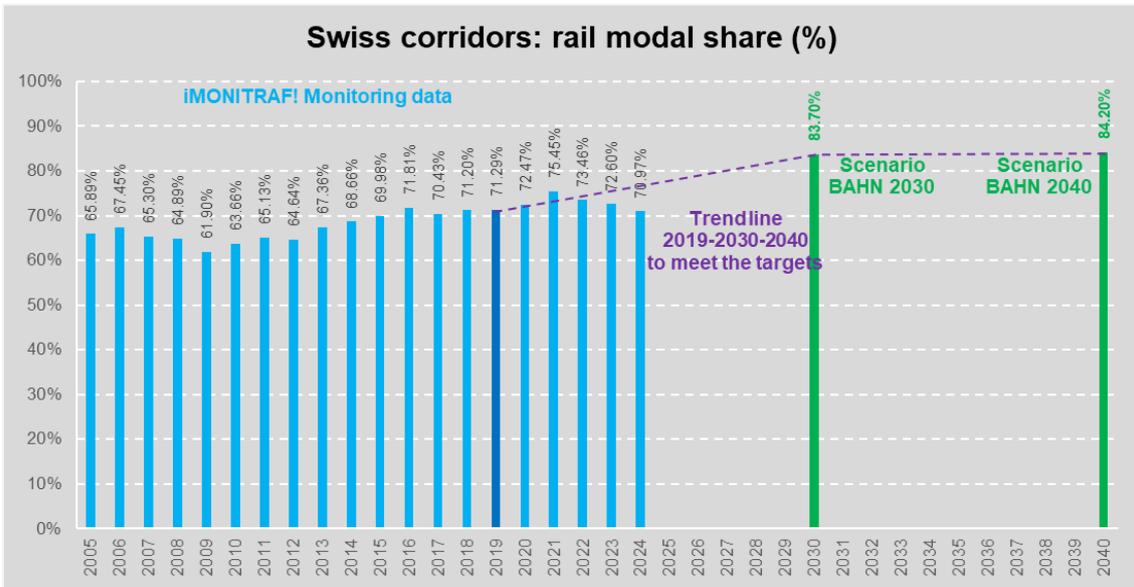
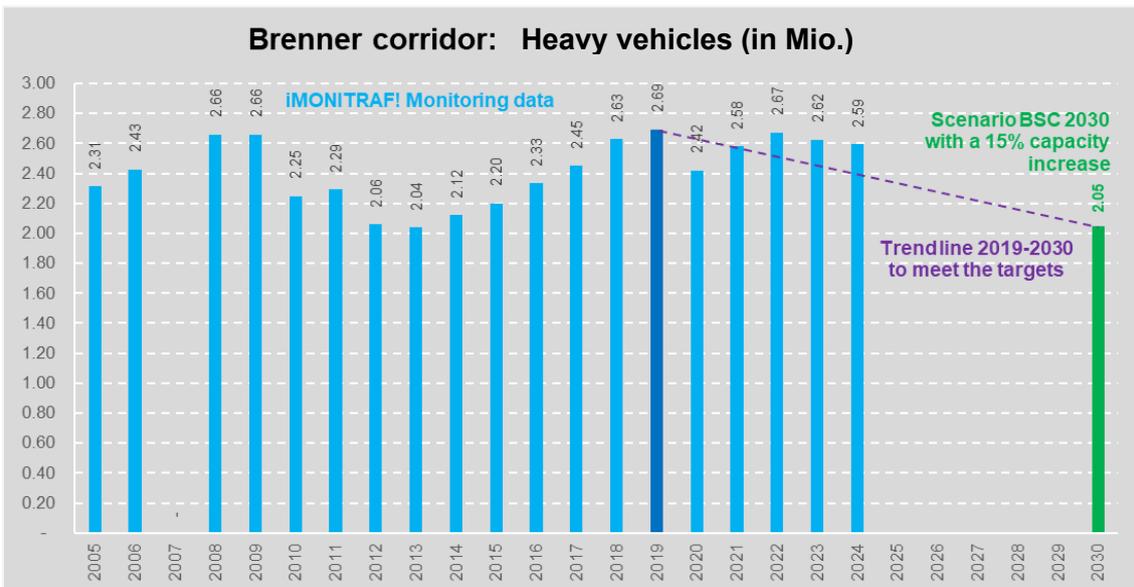


Figure 21: Modal split target indicator and target path for the Brenner and the Swiss corridors

The graph shows in blue the monitoring data collected since 2005. In green there are the target indicators for the Brenner and Swiss corridors for 2030 and 2040. The violet dashed line indicates the target path that should be seen in the next years to reach the defined targets (for information on data sources please refer to the Annex).

Progress in reaching the heavy vehicle (HV) target indicators

Similarly, Figure 22 below highlights the progress in reaching the HV target indicators. When interpreting the figure, the special effects of the COVID-19 pandemic need to be considered which led to the visible “dip” in HV volumes in 2020. The figures show the obvious rebound of traffic volumes – both on the Brenner and the Gotthard corridors. For the Brenner, the year 2022 seems to provide a peak year for traffic volumes, since then the number of heavy vehicles has decreased slightly – both in 2023 and 2024. For the Swiss corridors however, HV volumes are on the rise and clearly above the necessary target path.



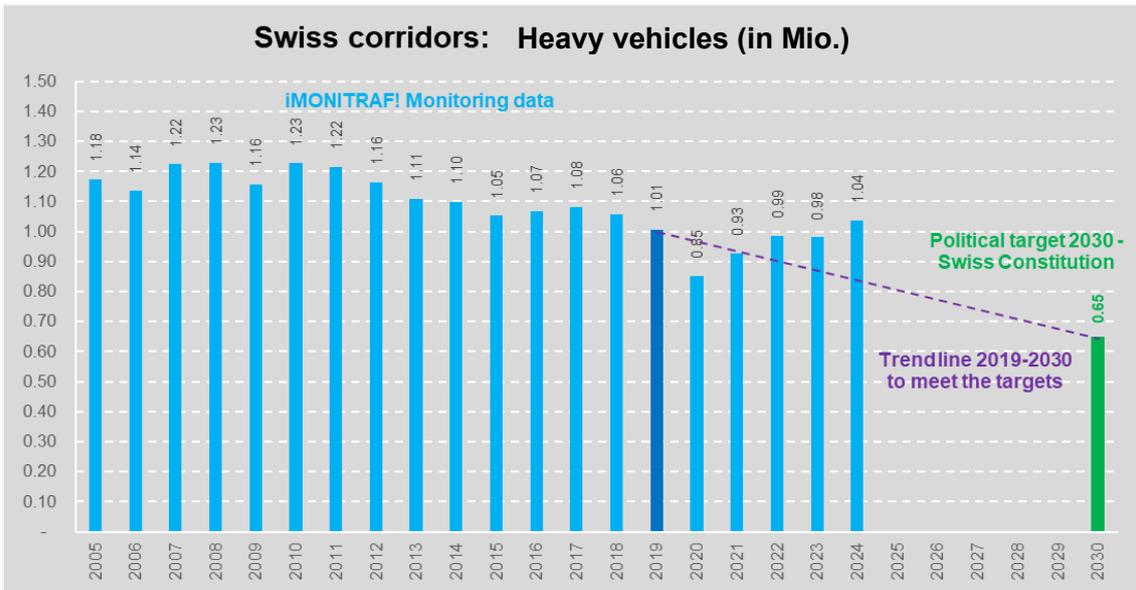


Figure 22: HV target indicator and target path for the Brenner and the Swiss corridors
 The graph shows in blue the monitoring data collected since 2005. In green there are the target indicators for the Brenner and Swiss corridors for 2030. The violet dashed line indicates the target path that should be seen in the next years to reach the defined targets.

6 Moving ahead on regional and national level: Knowledge sharing on new measures

6.1 Overview on revised and new regional measures

Throughout 2025, the set of policy measures and frameworks was further developed across all iMONITRAF! regions. Looking at pillar 1, which deals with information, monitoring and awareness raising, the need for an ambitious enforcement of social, technological and environmental standards became obvious to the partners during the field visit of the HGV traffic control centre in Erstfeld in spring 2025. In pillar 2, the instrument mix to reduce negative impacts on air quality, noise and safety was further developed, especially to deal with seasonal traffic peaks. As new element in pillar 2, we took a detailed look at measures supporting the decarbonisation of road freight transport. In this respect, several measures to further develop charging infrastructures for electric trucks were reported both along the Gotthard and Brenner corridors. In policy pillar 3, which is dealing with modal shift, inputs from the regions highlight pricing measures related to road and rail, a new structuring of financial support to rail services and the discontinuation of the rolling motorway concept in Switzerland. Looking at passenger transport, all iMONITRAF! regions have continued to pioneer new solutions to increase attractiveness of public transport, including new mobility concepts, ticketing solutions, extension and further development of infrastructure and services as well as decarbonisation of public transport fleets.

OVERVIEW: REGIONAL MEASURES UPDATE 2025

Policy Pillar	Name of measure	Country/region
Pillar 1: Monitoring, Information & awareness raising	Continuation of monitoring campaigns	All regions
Pillar 2: Limiting negative impacts of Alpine transport	Air quality, noise and safety	
	Further implementation of noise protection plan, with work on noise barriers along Brenner motorway A22	South Tyrol
	Driving bans in lower-level road network	Tyrol
	Repair work on Lueg Bridge: Traffic diversion system to ensure traffic flow during maintenance works	Tyrol
	Decarbonisation of road freight transport	
	New megawatt e-charging stations for decarbonisation of freight transport	South Tyrol
	Industry programme charging infrastructure for electric trucks	Switzerland
Pillar 3: Modal Shift	Modal shift policy mix and CT	
	Proposal for the adjustment of the Swiss HGV charge	Switzerland

OVERVIEW: REGIONAL MEASURES UPDATE 2025

Policy Pillar	Name of measure	Country/region
	Adjustment to road charging systems, adjustments of external cost charging and exemptions for zero-emission HGV	Austria and Germany
	Discontinuation of rolling motorway	Switzerland
	Infrastructure	
	Brenner Base Tunnel and access routes: milestones	Tyrol, South Tyrol, Trentino
	Lyon-Turin Railway link: Update on construction work	France, Italy
	Formal initiation of the public Consultation on the rail bypass of Rovereto (continuation of the Brenner Corridor Fortezza–Verona)	Trentino
Pillar 4: Passenger transport	Mobility management, ticketing & ride sharing	
	Mobility coordinator	Tyrol, Bavaria
	EUREGIO Ticket	Euregio Tyrol -South Tyrol-Trentino
	New “Euregio ticket”	South Tyrol
	New ticket “Fix365”	South Tyrol
	Mobility management through mobility app“MaaS4Italy” – especially on-demand bus services	South Tyrol
	Mitfahrbänkli	Switzerland
	Infrastructures & services for public transport and cycling	
	Third wave of MVV network expansion:	Bavaria
	Missing link in regional railways: Construction of railway variant of the Val di Riga/Riggertal	South Tyrol
	Electrification of Vinschau/Val Venosta railway line – final steps	South Tyrol
	Electrification of the railway line Trento – Borgo Valsugana	Trentino
	Further development of new train stop San Giacomo/St. Jakob on the Brenner railway line	South Tyrol
	Cross border mobility - bus connection Mals/Malles – Landeck and to Switzerland	South Tyrol
	New train station next to Bolzano/Bozen airport	South Tyrol
	Improved access to railway stations, barrier-free access (Bolzano implemented, plans for stations of Vipiteno/Sterzing and San Candido/Innichen.	South Tyrol

OVERVIEW: REGIONAL MEASURES UPDATE 2025

Policy Pillar	Name of measure	Country/region
	Bolzano Multimodal Node	South Tyrol
	Construction of two new aerial cableway systems (Trento – Monte Bondone and San Martino di Castrozza–Passo Rolle)	Trentino
	Decarbonisation of passenger transport	
	Programme for decarbonisation and reduction of private transport	South Tyrol
	Decarbonisation of public bus fleet	South Tyrol
	Investments in cycling mobility	South Tyrol
Pillar 5: Innovative approaches	No new measures reported	

Table 1: Source: Compilation of the iMONITRAF! network

6.2 Regional measures per policy pillar

6.2.1 Pillar 1: Information, monitoring, awareness raising

Overall, **monitoring campaigns** are continued as in previous years and as summarised by the iMONITRAF! monitoring activities (see detailed description in chapter 5). This includes the use of new monitoring station and equipments..

The important role of HGV control centres was highlighted during the political networking event of iMONITRAF! in Erstfeld where political representatives and members of iMONITRAF! visited the control centres in Erstfeld and could gain a direct insight into the role of the control centres for traffic safety and the enforcement of environmental and social standards.

6.2.2 Pillar 2: Limiting impacts of Alpine transport (and safety)

Pillar 2 deals with all regulatory and incentive measures that have the direct objective to limit negative impacts of transalpine freight transport, especially regarding air quality and noise. As second element of pillar 2, we introduce a specific focus on measures that support the decarbonisation of road freight transport, including measures that support the uptake of zero-emission HGV and the roll-out of charging infrastructures.

Measures related to air quality, noise, safety

In 2025, only few measures were reported in this policy pillar – highlighting that this type of measure is very much used to its full potential. Especially in the **State of Tyrol**, the Euroclass driving bans ensure that only the cleanest vehicles (EURO VI) are in operation on the Brenner motorway

– in the night even focusing on ZEV only for transiting Heavy Goods Vehicles (HGV). To avoid negative impacts during passenger transport peaks with diversions on the lower road network, the State of Tyrol has however extended the **driving bans on the lower-level road network**. On specific weekends during winter high season, vehicles are not allowed to leave the motorway networks to bypass congestion. This measure only applies to selected exits, where congestions could lead to serious road safety concerns along the lower level road network. The measure is designed as a situational, safety-oriented intervention rather than a broad traffic ban, aiming to protect the functionality and safety of the secondary road network during peak periods.

After major progress in 2024, the **Brenner motorway company A22** further advanced the **implementation of its noise protection plan** in 2025. Especially, the noise protection plan is extended to further sections along A22. Works on the new sound-absorbing structures in the municipality of Funes/Villnöss are nearly completed, while works in the municipality of Velturno/Feldthurns has been started and further investments has been approved in the municipality of Fortezza/Franzensfeste. The new noise barriers are capable to significantly reduce both noise and air pollution.

To maintain **safety on the Brenner corridor**, maintenance works have been started on the Lueg bridge on the A14 Brenner Motorway which, after 55 years, requires extensive structural work. To avoid a complete closure of the bridge, an innovative traffic management system is implemented – allowing a one-lane/direction service in general and a two-lane service for particularly busy days. ASFINAG, as operator of the Brenner Motorway, has introduced several traffic management systems to guarantee good traffic flow during the maintenance works. A new homepage has been put into place, including real-time traffic information and a driving calendar which includes information on all measures and restrictions. On relevant days, additional rolling motorway are provided to offer further capacities to freight transport. For the two-lane service of the bridge, a specific traffic management system has been introduced that is in-line with the structural needs of the construction process: To make sure the bridge allows for two-lane traffic on days of heavy traffic, it is necessary to have heavy vehicles with a weight above 3.5 tons (trucks, buses, motorhomes) use the inner lanes of the bridge. This relieves the superstructure. All vehicles exceeding 3.5 tons need to switch to the left and thus, inner, lane. Passenger vehicles can continue to use both lanes as usual. Scientific test runs have shown that this innovative two-lane traffic guidance works.

Decarbonisation of road freight transport

In **Switzerland**, the roll-out of charging infrastructure for electric trucks is supported by an industry programme under the so-called “Climate and Innovation Act”. In 2025, the contract has been awarded to the Swiss Commercial Vehicle Association (ASTAG) to coordinate the programme. From 1 January 2026, SMEs in the road transport sector will have the opportunity to submit funding applications for the construction of charging infrastructure (planning, grid connection, supply line, charging equipment).

The decarbonisation of road freight transport also is a key policy objective on the Brenner corridor. In the **Autonomous Province of Bolzano – South Tyrol**, a specific strategy for the roll-out of electric vehicles is included in the “Provincial plan for sustainable mobility 2035” (Landesplan für nachhaltige Mobilität 2035) which introduced the “Brenner Digital Green Corridor” concept. The aim is to significantly increase the proportion of zero-emission vehicles and to use digitalisation to manage traffic intelligently. In this context, the first **megawatt charging station** has opened in May 2025 (Bolzano South exit of the Brenner motorway) and a second one at the exit Varna/Vahrn in November 2025. As the first installations of their kind in Italy, they represent an

important step for the entire corridor. The project was realised through a cooperation between the Autonomous Province of Bolzano, the motorway operator A22 and private partners. In addition, FERCAM – a logistic service provider from Bolzano - put into operation its first Mercedes-Benz eActros 600, an electric truck optimised for long-distance routes. The vehicle will primarily operate along the Brenner corridor, delivering cargo to Daimler.

The activities of the Autonomous Province of Bolzano – South Tyrol will now be supported by the EU's Clean Transport Corridor Initiative (CTCI, for more information please refer to chapter 3). In the frame of the CTCI, the Scandinavian-Mediterranean corridor is a primary focus for piloting clean freight.

6.2.3 Pillar 3: Modal shift

Pillar 3 focuses on modal shift measures, including both push and pull measures. It includes policy measures related to modal shift, with a special focus on developments related to the common measures of the iMONITRAF! strategy as well as infrastructure measures. The section on policy measures first highlights pricing measures related to road and rail, then focuses on financial support for combined transport and rail services.

Policy measures

To further support the objective of internalisation of external costs, road pricing systems have been further developed in Switzerland, Austria and Germany in 2025:

- Switzerland: From 2029, the performance-related Swiss HGV fee (LSVA) shall also apply to electrically powered lorries to cover infrastructure costs. To maintain incentives for fleet modernisation, a temporary discount scheme will be introduced and remain in place until 2035, providing transport companies with planning security. The Federal Council adopted the corresponding message to Parliament on 28 May 2025.
- Austria: The Austrian government decided in September to increase not only the price for the vignette but also the road toll for heavy goods vehicles. For heavy goods vehicles, higher external costs for air pollution, noise pollution and CO₂ emissions totalling €42 million are taken into account. Furthermore, the government plans that ZEVs will be exempt from tolls until 2030 (taking up adjusted framework of the Eurovignette)
- Germany: According to the adjusted framework of the Eurovignette (see chapter 3 above for more information), also the German government has decided in October 2025 to extend the full exemption of zero-emission trucks until the end of 2031. Initially, it was foreseen that the full exemptions come to a stop at the end of 2025 and that electric trucks have to pay 25% of charges related to infrastructure, air quality and noise costs. In terms of toll costs, an electric 40-ton truck currently saves around 35 cents/kilometer compared to a diesel truck.

In Switzerland, the further **design of financial support to rail transport in CT** has been agreed. In line with Parliament's 2025 mandate to create more effective incentives for shifting freight to rail, the financial support for rail freight transport has been further developed in **Switzerland with the revision of the Goods Transport Act** (Gütertransportgesetz GÜTG). The Goods Transport Act is the main legal framework in Switzerland that governs organisation and financing of freight transport. With the revision of the framework, the Federal Council follows the objective to strengthen also domestic freight transport on rail. The revised Goods Transport Act is intended to promote the loading of goods onto rail and the transshipment of goods between rail and other

modes of transport. The federal government will pay transshipment and loading subsidies to operators of connecting tracks and transshipment facilities for combined transport. The subsidies will be paid for each loaded rail car (received or dispatched) and will amount to a flat rate of CHF 40. A total of CHF 50 million is available for this purpose each year. During a transitional period, financial support is also to be provided for single wagonload transport. The Federal Council has concluded a new performance contract with SBB Cargo for financing single wagonload transport.

The promotion of transshipment and loading facilities with investment subsidies has been a proven instrument for rail freight transport for many years. This promotion is now to be expanded and simplified: in future, lump-sum subsidies will also be used to support investments in transshipment areas and mobile equipment. The introduction of digital automatic coupling (DAK) is important for the continued existence of single wagon load transport (EWLV). The federal government will pay flat-rate contributions per vehicle – up to a total of CHF 180 million – for the corresponding equipment of rail cars and locomotives.

Infrastructure measures and services

In **Switzerland**, the NEAT infrastructures are under full operation again (after the freight-train derailment in 2023) but construction sites on the NEAT approach line are affecting the quality of rail freight transport. The Swiss Federal Government will therefore continue to advocate for the rapid modernisation of rail infrastructure in neighbouring countries in the coming years. It will also work to ensure that construction work is well coordinated internationally and that sufficient high-capacity diversion routes are available for rail freight transport. A round table has been established to coordinate measures managing the several construction sites.

For the **Brenner Base Tunnel**, some crucial milestones could be reached in 2025, especially the breakthrough of the exploratory tunnel between Italy and Austria on 18th September 2025. This was celebrated with a high-level political event at Brennero. The exploratory tunnel of the Brenner Base Tunnel is a unique feature of this construction project. With a length of around 57.5 kilometres, it is one of the longest of its kind in the world. It is not intended for train traffic, but is to be used for technical aspects such as pre-excavation geological prospection, material transport, service and maintenance purposes, and can also be used as an escape route in case of an incident.

On the Italian side, the tunnel drilling machine “Flavia” has completed excavation works and reached the state border with Austria. Drilling machine “Kathrin” started excavation works for the southern BBT access route Fortezza/Franzensfeste-Ponte Gardena/Waidbruck.

In the municipality of Bronzolo/Branzoll a new BBT-Infopoint has been opened, to bring the project closer to the public.

The final breakthrough of the main tunnel tubes is planned for 2026, followed by interior work and commissioning.

As part of the **southern access to the new Brenner railway line**, the **Autonomous Province of Trento** is working on the **Rovereto rail bypass**. A public debate will be initiated in 2026 to provide clarifications, collect critical issues and topics for further analysis and to highlight technical aspects for the subsequent design phases. The public debate will include meetings as well as technical and thematic working groups and will support the identification of the most technical and socially sustainable solution. Overall, the upgrading of the Fortezza–Verona railway line will lead to increased capacity and performance, as well as higher maximum operating speeds, reaching peaks of approximately 250 km/h.

Construction is also continuing for the **Lyon-Turin railway link**. Excavation of the last of the four ventilation shafts of the Lyon-Turin base tunnel began on 18 October. Starting from the Avrieux platform, the Raise Boring Machine started the bottom-up boring of the 500-metre-deep shaft at

a rate of 7.7 metres per day. Work is also progressing on the project's other construction sites, both above ground and underground, where 18 excavation fronts are active: the total progress of the tunnels at the end of October 2025 was 45.3 km (27.7%), of which 19.2 km was in the Mont Cenis base tunnel.

Regarding rail services, the discontinuation of the rolling motorway in Switzerland has to be noted. This discontinuation is considered long overdue because declining rail reliability, rising financial losses, and the system's outdated ecological and economic inefficiency have made its continued operation impractical despite substantial subsidies. The Federal Government is offering financial incentives to transfer the relevant transport operations to unaccompanied combined transport. Additional funding will be made available next year as a result of the discontinuation of the RoLa service.

6.2.4 Pillar 4: Passenger transport

In 2025, all iMONITRAF! regions have continued to pioneer new solutions to increase attractiveness of public transport and alternative mobility solutions. Also with respect to passenger transport, decarbonisation strategies play a crucial role and several measures have been implemented in the iMONITRAF! regions. As many measures were reported on this policy pillar in 2025, the chapter is structured in three parts: Mobility management & ticketing, infrastructure & services as well as decarbonisation of public transport and passenger cars.

Mobility management, ticketing, ride-sharing

To support and improve **public transport solutions between Tyrol and Bavaria**, a new Interreg project has been launched to establish a cross-border mobility coordinator for the Lower Inn Valley (Austria) and Upper Bavaria (Germany). The initiative aims to strengthen coordination in public transport planning and to improve cross-border connections, addressing organisational and operational barriers between the two regions.

Building on ongoing efforts to improve the attractiveness of cross-border public transport in the **European Region Tyrol-South Tyrol-Trentino**, a new annual cross-border subscription ticket, the **EUREGIO ticket**, was introduced. The ticket is valid across Tyrol (Austria), South Tyrol (Italy) and Trentino (Italy), further simplifying access to public transport and strengthening seamless mobility within the Euregio. The ticket, priced at €750, will be available from December 2025 and enter into force in January 2026.

In addition, the **Autonomous Province of Bolzano – South Tyrol** has introduced a new annual public transport pass “**Südtirolmobil Fix365**” at a price of €250. The launch was accompanied by improvements to several functions of the online portal, and the initiative was recognised as a “European Mobility Action”. The Fix365 is also available to companies as an employee benefit, supporting a shift towards public transport while offering tax advantages. Following a decision by the South Tyrolean provincial government, around 50,000 provincial employees, including teaching staff, have been able to apply for the Fix365 free of charge since November 2025.

Regarding mobility management, the project **mobility app “MaaS4Italy”** has been further developed in the Autonomous Province of Bolzano – South Tyrol. The aim is to create a digital platform providing information and ticketing options for traditional public transport services and complementary services such as on-demand transport, car sharing, bike sharing and parking lots at railway stations. In 2025 the pilot project for **on-demand public transport “Callbus Olang Valdaora”** was launched.

Ride sharing services are promoted in the Canton of Uri. The “**Mitfahrbänkli**” initiative provides an informal ride-sharing option in areas with limited public transport. By sitting on the marked bench, users signal that they are looking for a lift, and passing drivers may voluntarily stop to offer a ride. The concept offers a simple and flexible mobility solution, particularly for remote areas or for covering the last mile.

Infrastructures and services for public transport and cycling

To further develop public transport and to improve its quality, several milestones could be reached in relevant infrastructure works. Several projects were already illustrated in previous Annual Reports and have reached new milestones in 2025:

- **Expansion of public transport in Bavaria:** For several years now, one of the main focuses of Bavarian transport policy has been network expansion. Now in its third wave of expansion, the Munich Transport and Tariff Association (MVV) welcomed the districts of Garmisch-Partenkirchen, Mühltal a. Inn and Landshut, as well as the city of Landshut, to the MVV on 1 January 2026. Passengers benefit from attractive network tickets, standardised passenger information and digital ticket sales. The area covered by the MVV network will thus grow to around 13,600 km², adding around 450,000 inhabitants to the MVV. As a result of this further expansion, more than four million people will benefit from the advantages of the MVV in future. This will bring the city and the countryside even closer together, make commuting easier and make public transport even more attractive.
- **Missing link between Brenner railway and Val Pusteria/Pustertal railway:** Construction works on the Val di Riga/Riggertal railway variant continued in 2025. Following the line closure that began in December 2024, sections of the Val Pusteria/Pustertal line were upgraded and prepared for the installation of ETCS. Additional investments were carried out at stations, in safety systems and in accessibility. According to the current schedule, the works on the Riggertal loop, an important missing link in the provincial railway network, are expected to be completed by mid 2027.
- **New train stop on the Brenner railway line:** Construction work on the new train stop in S. Giacomo/St. Jakob (municipality of Laives/Leifers) along the Verona–Brenner railway line progressed further in 2025. The future stop, designed as a mobility hub with 30-minute connections and direct access to Bolzano/Bozen Airport, continues to be largely financed through the EU Fund for Development and Cohesion. Updated estimates foresee around 200,000 passengers per year once the stop becomes operational. Completion of the works are scheduled for 2027.
- **Improved accessibility of Bolzano train station:** At Bolzano station, several platforms have been raised to enable level and barrier-free access to and exit from trains. Investments are also planned at the stations of Vipiteno/Sterzing and San Candido/Innichen.
- **Electrification of railway lines in the Autonomous Provinces of Bolzano – South Tyrol and Trento:** Electrification works on the Val Venosta/Vinschgau railway entered their final phase in 2025. Following the line closures that began in February, current activities focus on installing the new overhead line as well as on the commissioning, test runs and approval procedures for the European Train Control System (ETCS) on both the existing and the new rolling stock. The reopening of the line is planned for spring 2026.

In the Autonomous Province of Trento, the electrification of the Trento–Borgo Valsugana railway line represents the completion of the electrification of the railway network managed by RFI in the Trentino-Alto Adige Region. This intervention is explicitly referred to in the Framework Agreement for the use of railway infrastructure capacity within the territory of the

Autonomous Province of Trento, signed on 9 August 2016 by the Autonomous Province of Trento and RFI, and was requested by the local authorities, also in view of the 2026 Winter Olympic Games.

- **Multimodal hub station Bolzano:** The Autonomous Province of Bolzano – South Tyrol could secure funding from the CEF for preliminary design phase on the upgrade for a multimodal hub station in the node of Bolzano. The project aims to transform the Bolzano Railway Area into a highly integrated multimodal passenger hub. The main benefit of the project will be the future construction of the multimodal hub in Bolzano. The proposal has been submitted by the Italian Railway infrastructure manager RFI as coordinator, the Autonomous Province of Bolzano will contribute to the implementation and also to the funding.
- **Cross-border mobility by bus:** The express bus connection between Malles/Mals (South Tyrol) and Landeck (Tyrol) will continue to operate, with the service guaranteed until 2036. The line offers hourly connections along this important cross-border link. Also, the agreement with the Canton of Grisons for the cross-border bus service between Malles/Mals and Müstair has been extended. The service will remain in operation until the end of 2026.
- **New cableway systems:** Two new aerial cableway systems are planned in the Autonomous Province of Trento. The first one between Trento and Monte Bondone is foreseen as system for rapid mass transit, providing a connection between the city of Trento and the suburbs of Monte Bondone. It is not specifically designed for touristic objectives but rather as part of local public transport. The second system shall close a link between San Martino di Castrozza and Passo Rolle, integrating cableway transport and ski access and thus providing an alternative local mobility solution as well as a ski connection.

Decarbonisation of public transport and passenger cars

The Autonomous Province of Bolzano – South Tyrol has implemented and further developed a broad range of measures to support decarbonisation of road transport and to shift to alternative mobility, especially biking: In 2025, subsidy schemes supporting decarbonisation and the reduction of private motorised transport were reorganised. The revised programmes provide incentives for public and private actors to purchase e-bikes with pedal assistance, install bicycle parking boxes and make use of e-car-sharing services. Also, approximately €22 million has been invested in expanding and improving the cycle path network in urban and rural areas. The aim is to promote everyday mobility in particular, but also leisure mobility, in order to encourage people to switch to environmentally friendly forms of transport.

To decarbonise the public transport fleet, the first of a total of nine zero-emission eCitaro fuel cell buses was introduced in 2025. The 18-metre hydrogen-powered vehicles will be deployed in interurban services. In addition, funding has been approved for the procurement of a further 120 zero-emission buses to be put into service by 2031. The total investment amounts to €71.5 million.

7 Outlook 2026 and beyond

At the beginning of 2026, iMONITRAF! is transitioning into a new cooperation phase. A new partnership agreement has been signed by political representatives on 28th January 2026, highlighting again the important role of iMONITRAF! for coordinating efforts for sustainable transport and mobility on the transalpine transport corridors. In the new cooperation phase, iMONITRAF! will have to take a close look at changing framework conditions at regional, national, macroregional and especially European level as well as the dynamics around crucial technological trends. Finding compromises around different needs and interests becomes ever more complex in the current setting, iMONITRAF! thus needs to further develop its technical knowledge base to help navigate challenging questions, e.g. related to investment decisions, the design of policy measures and potential impacts of European policies. A review of the iMONITRAF! system will be a crucial element for the network to strengthen its knowledge base.

According to the new work plan, the network will put the following activities in the focus:

- **Monitoring:** The collection and further harmonisation of traffic and traffic related data on the different transalpine corridors remains at the core of the cooperation. In the period 2026-2028, the network aims at further advancing and improving the common monitoring system and will review the set of monitoring indicators. The aim is to maintain and strengthen the role as data platform of reference for the alpine region.
- **Knowledge sharing:** The annual exchange on regional measures will be continued. Main insights of this exchange are summarised in the frame of the Annual Report. According to the needs of the iMONITRAF! regions and potential windows-of-opportunity, specific measures that are in line with the iMONITRAF! Combined Scenario will be analysed in-depth by the network.
- **Networking and coordination:** iMONITRAF! will maintain and nurture its network to ensure visibility for the specific needs of the regions situated along the major transalpine corridors – also sharing insights from the monitoring and the activities on regional measures.

In addition, as in the years before, specific focus topics will be developed by the Coordination Point (e.g. specific elements of the Combined Scenario, further development of the target indicators, specific insights on technological trends, etc.).

Also in the new period, the Annual Report will remain a crucial output of iMONITRAF! for communication and knowledge exchange.

Annex 1: Monitoring indicators – methodological explanations

iMONITRAF! partners', observers' and stakeholders' contribution

The monitoring data presented in this report derives from a data collection process involving the iMONITRAF! partners and observers, as well as external stakeholders supporting iMONITRAF! on yearly basis. Their contribution is essential to guarantee a consistent and exhaustive monitoring activity every year. In this regard, **a special thanks goes to:** 5T Torino, ARPA Valle d'Aosta, ARPA Friuli Venezia Giulia, ARPA Piemonte, ARPA Liguria, Rete Ferroviaria Italiana (RFI), Interbrennero SpA, A22 Autostrada del Brennero, the Swiss Federal Office of Transport (FOT), and ATMO Auvergne-Rhône-Alpes.

Indicator 1: Road traffic volumes

Road traffic volumes can be measured in different ways, depending on the measuring stations and the counting systems considered. The aim of iMONITRAF! is to ensure the greatest possible comparability between the corridors when defining and selecting data. As for the **measuring stations**, for Fréjus, Mont Blanc, San Bernardino and Gotthard data regards the stations at the entrance of the tunnels. For Brenner and Tarvisio, the data stems from the Austrian stations of Brennersee and Maglern, which are the closest ones to the Italian-Austrian border at the time being. Finally, for Ventimiglia, the Italian toll station of Ventimiglia (that is the closest to the FR-IT border) is considered. Regarding the **counting systems**, Brenner and Tarvisio adopt the Austrian classification for road detection, as provided by ASFINAG: all vehicles below 3.5 t are counted as light vehicles, whereas those above 3.5 t are classified as heavy vehicles. For Swiss corridors, the official classification adopted by the Federal Office of Transport (FOT) is considered: vehicles belonging to classes 1-3 (passenger cars, motorcycles and light commercial vehicles) are counted as light vehicles; those belonging to classes 4-7 (buses, coaches, HDV trucks, HDV truck trailers and HDV articulated trucks) as heavy vehicles. Finally, vehicles along Italian-French corridors are reckoned according to the system used by the Italian highways: the light vehicle category consists of vehicles belonging to class A (height below 1.3 m), while the heavy vehicle category includes those means belonging to class B (height above 1.3 m) and classes 3, 4, 5 (according to the number of axles). This methodological approach implies some **limitations** that are worth mentioning. In particular, the selection of a single measuring station to represent the flows along each corridor implies that flows may be either underestimated or overestimated compared to specific corridor sections. To understand the variability of flows among different sections, interested readers are invited to consult the WebGIS platform, where data is provided for more measuring stations along each corridor. Some **limitations regarding the 2024 data** must be mentioned. Due to maintenance works, the data for the Mont Blanc tunnel is not available for the whole year. Therefore, the average daily traffic volumes are calculated on 262 operative days (rather than 366). This makes the daily average less reliable but comparable with the figures of the other corridors. As for the Brenner, data of the monitoring station of Brennersee/A13 (AT) shows a slight decrease of heavy traffic flows in 2024 compared to 2023. This decrease is not registered for other Brenner monitoring stations observed by the iMONITRAF! network in Italy and Germany, which instead register a slight increase of flows (by ca +1-2% for most stations; WebGIS platform). Therefore, Brenner data must be interpreted by considering the variability of traffic conditions among different sections of the corridor in Italy, Austria and Germany. Finally, data on the IT-FR corridors are influenced by the closure of the Mont Cenis rail corridor for the whole 2024, likely generating a traffic shift on the other road corridors.

Indicator 2: Transported tons and modal split

The analysis of the tons transported per year is largely affected by the difficulties in finding reliable and consistent data. However, thanks to the information collected and provided by the Swiss Federal Office of Transport - Observatory for Road and Rail Freight Traffic in the Alpine Region (France, Switzerland, Austria; FOT), data for all corridors has been collected until 2024. The FOT report with the 2024 figures is expected to be available online at: <https://www.bav.admin.ch/bav/de/home/verkehrsmittel/eisenbahn/gueterverkehr/verlagerung/berichte-und-zahlen.html> (German version).

Indicator 3: Concentration of air pollutants

Some details regarding the measurement stations have to be mentioned. First, the South Tyrolean station of Velturno/Feldthurns was deactivated at the end of 2016 and the station of Bressanone sud/Brixen süd (located 1.5 km northward from Velturno/Feldthurns, south of Bressanone/Brixen) has replaced it since 2018. South Tyrol is thus described by the stations of Velturno/Feldthurns (years 2005-2016), Bressanone sud/Brixen süd (years 2018-2021) and Ora/Auer (years 2007-2021). On the Austrian side of the Brenner, the station of Mutters is not active anymore since 2022. The new station of Vill/Zenzenhof A13 replaces it with data starting from 2021. Since NO₂ is not monitored at Tolmezzo since 2019, it is flanked with the station of Ugovizza-Tarvisio. This station was activated at the end of 2014 and data is available from 2015. Finally, data for the station of Vallée de la Maurienne is not available since 2019 and from that moment replaced by Maurienne Traffic.

Indicator 4: Exposure to noise

The data regarding noise exposure is regularly provided by several stakeholders collaborating with the iMONITRAF! team every year. They include [ARPA Valle d'Aosta](#) and [ARPA Friuli Venezia Giulia](#). A comparison between the values (L_{den} and L_{night}) registered in different corridors may be not appropriate due to different distances between the microphones and the streets. However, the variations along the individual corridors are consistent throughout the years. Gotthard and Mont Blanc are the only corridors with continuous data collection for the period 2005-2024 (measuring stations of Camignolo, Reiden and Courmayeur), whereas noise is not monitored along Brenner and Ventimiglia. Only partial data is available along San Bernardino (Rothenbrunnen), Tarvisio (Camporosso), Fréjus (Bardonecchia) and Mont Blanc (Châtillon). Regarding the first station, data collection started in 2012 and is currently ongoing; in Camporosso data is available since 2011. Regarding Bardonecchia, updated values are not available. In Châtillon, data collection is available for 2010-2024.

Indicator 5: Toll prices

The origins and destinations for the calculation of toll prices are defined as follows:

- Ventimiglia: from Marseille (FR) to Genova (IT) via Ventimiglia (381 km)
- Fréjus: from Lyon (FR) to Torino (IT) via Fréjus road tunnel (298 km)
- Mont Blanc: from Bellegarde-sur-Valsérine (FR) to Ivrea (IT) via Mont Blanc road tunnel (228 km)
- Simplon: from Brig (CH) to Gravelona Toce (IT), via Simplon pass (99 km)
- Gotthard: from Basel (CH) to Chiasso (CH) via Gotthard road tunnel (288 km)
- San Bernardino: from Chur (CH) to Chiasso (CH) via San Bernardino road tunnel (169 km)
- Brenner: from Munich (DE) to Verona (IT) via Brenner pass (415 km)
- Tarvisio: from Salzburg (AT) to Udine Nord (IT) via Villach (313 km)

The calculated prices refer to the prices for a single passage (in direction north-south). The direction is relevant because different VAT are applied to the prices for the passage across the IT-FR tunnels depending on the direction. This approach holds for the Fréjus and Mont Blanc tunnels,

the Austrian highway vignette and the separate Brenner highway toll on the A13 in Austria as well as for the Swiss highway toll (passenger cars). For these corridors, return tickets and yearly subscriptions are also available, which would lower the cost for a single passage. For Switzerland, only a yearly ticket is available for passenger cars, meaning that only the first passage costs, while all subsequent passages within the same year are free.

Indicator 6: Fuel prices

The fuel-prices values are the annual averages of the values officially registered in every country on four days in all seasons (15th Jan, May, Jul, Oct). Data is provided by ÖAMTC for Austria, the Federal Statistical Office for Switzerland SFSO, ISTAT for Italy, INSEE for France and ADAC for Germany. Swiss values are converted from CHF to Euros based on the exchange rates applied on the 15th Jan, May, Jul, Oct of the relevant year. Therefore, variations in Swiss prices are partially determined by variations in the CHF/€ exchange rate.

Indicator 7: Alternative-fuel refuelling stations

The following alternative fuels (AFs) are considered to map their refuelling stations: electricity (EV), hydrogen (H₂), liquid natural gas (LNG), compressed natural gas (CNG), and liquid petrol gas (LPG). For each corridor, the AF stations located in the service areas and in the parking areas of the toll gates as well as those stations located in the autoports and at the entrance/exit of the road tunnels are identified. However, some methodological differences need to be specified, as well as the sources used to retrieve the data. In detail:

- **EV stations:** Since 2024, data about recharging stations along the corridors has not been collected from aggregated EU sources, but rather from local portals of the single highways. This allows increasing the accuracy of data collection. According to this source type, only the recharging stations accessible along the highway infrastructure are considered, while those in the nearby are excluded.
- **H₂ stations:** Since 2024, data is collected from the EU platform “HRS Availability Map” (<https://h2-map.eu/>). This platform allows a consistent data collection among all the corridors. Given the limited diffusion of H₂ stations in EU, the data collection considers also stations available in a buffer area of 1 km around the highways.
- **LNG, CNG and LPG stations:** Since 2024, data is collected from the EU platform “TENtec” (<https://webgate.ec.europa.eu/tentec-maps/web/public/screen/home>). This platform allows a consistent data collection among all the corridors. According to the filters provided by the platform, only the stations located in a buffer area of 1 km around the highways are considered.

The approach and updated sources described above hamper the full comparability of 2024 data with the previous monitoring years.

Indicator 8: Unitary pricing components

Four components are observed for France, Switzerland, Italy, Austria and Germany:

- the *purchase tax*, expressed in % of the one-only purchase cost of vehicle
- the *registration tax*, expressed in Euros, to be paid one time with the purchase of vehicle
- the *ownership tax*, expressed in Euros, to be paid yearly
- the *insurance tax*, expressed in % of the yearly insurance costs

Data sources: Until 2022, the ACEA (European Automobile Manufacturers' Association) released every year the so-called “ACEA Tax Guide”. This document provided a summary of the rules applied in all EU countries for the calculation of the unitary pricing components considered in iMONITRAF!. As such, this was the main data source. However, this document is not realised anymore. Therefore, since 2023 we rely on the online sources and calculators provided by the single countries.

Considered regions: In France, Switzerland and Italy, the unitary pricing components vary from region to region. Therefore, sample regions are considered: the Department 73 – Savoie in France, Canton Zurich for Switzerland (since 2025), Lombardy for Italy.

Considered vehicles: Additionally, the unitary pricing components depend on the type of vehicle considered and its specific characteristics (like weight, powertrain and CO₂ emissions). Four sample vehicles are thus selected: a petrol car, electric car, diesel HGV, and electric HGV. In particular, we focus on the top-sold car models in EU in the last years (2022-2024), and on the most diffused and typical kinds of HGVs. They are: 1) Dacia Sandero; 2) Tesla Model Y; 3) Volvo FH; 4) Volvo FH Electric. The characteristics of these models are reported in Table A-1.

Aggregation of the unitary components: The four pricing components are aggregated in order to obtain a synthetic figure of the yearly cost of the purchase and ownership of a vehicle (€/year during the vehicle lifetime). Since the components have different units of measures, a series of information is needed to allow the conversion and aggregation. First, the purchase price of the vehicles is needed for the conversion of the purchase tax. Data is collected from the model producers in each observed country, and an average purchase price is established for each model. Second, the annual insurance premium is necessary to convert the insurance tax. In this case, data is obtained thanks to market calculators in each country and the average is derived. Finally, the vehicle lifespan allows the conversion of the purchase and registration tax. In this case, average data per country is provided by the ACEA, and an overall average across the considered countries is obtained. Table A-1 summarises the conversion factors calculated for each vehicle type (column “Average”, cells in light blue), based on the data collected for each country.

Petrol car						
	France	Switzerland	Italy	Austria	Germany	Average
Model	Dacia Sandero (top sold petrol car in EU in the 3 years 2022-2024)					
Characteristics	49 kW; 999 cc; 5 Puissance fiscale in France; 121 g CO ₂ /km; 1,099 kg					
Purchase price	€ 15,500	€ 16,500	€ 16,000	€ 12,500	€ 12,000	€ 14,500
Insurance premium	€ 470	€ 600	€ 600	€ 450	€ 500	€ 524
Lifespan	10.5 years	12.0 years	12.2 years	8.7 years	10.1 years	10.7 years
Electric car						
	France	Switzerland	Italy	Austria	Germany	Average
Model	Tesla Model Y (top sold electric car in EU in the 3 years 2022-2024)					
Characteristics	220 kW; 300 cv; 16 Puissance fiscale in France; 0 g CO ₂ /km; 1,909 kg					
Purchase price	€ 44,990	€ 46,500	€ 44,990	€ 44,990	€ 44,990	€ 45,292
Insurance premium	€ 1,000	€ 1,200	€ 1,300	€ 1,200	€ 1,500	€ 1,240
Lifespan	10.5 years	12.0 years	12.2 years	8.7 years	10.1 years	10.7 years
Diesel HGV						
	France	Switzerland	Italy	Austria	Germany	Average
Model	Volvo FH (Volvo is one of the five EU most popular players for selling diesel trucks)					
Characteristics	330 kW; 420 cv; 30 Puissance fiscale in France; Euro 6; NA g CO ₂ /km					
Purchase price	NA	NA	NA	NA	NA	€ 155,000 ¹
Insurance premium	NA	NA	NA	NA	NA	€ 5,500 ¹
Lifespan	9.2 years	14.2 years	19.0 years	6.6 years	9.7 years	11.7 years
Electric HGV						
	France	Switzerland	Italy	Austria	Germany	Average
Model	Volvo FH Electric (Volvo is one of the leading companies selling electric trucks. In 2022, Volvo kept the highest market share in EU: 32% of new sold HGVs)					

Characteristics	490 kW, 666 cv, 64 Puissance fiscale in France, 0 g CO ₂ /km					
Purchase price	NA	NA	NA	NA	NA	€ 400,000 ¹
Insurance premium	NA	NA	NA	NA	NA	€ 5,500 ²
Lifespan	9.2 years	14.2 years	19.0 years	6.6 years	9.7 years	11.7 years
Notes:						
¹ Country-level data on the purchase price and insurance premium not available. Only average EU values available, derived from non-country-specific sources.						
² Data on the insurance premium of electric HGVs not available. We assume the same premium as diesel HGVs.						

Table A-1: Factors for the conversion and aggregation of the unitary pricing components (column "Average", cells in light blue), based on country-level data.

