CHAPTER 4

Transport

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> Everybody should have the right to live his life without owning a car.[1]

1 Introduction[2]

The transport sector has a strong impact on our society and all aspects of our lives. In this regard, the European Environment Agency (hereinafter EEA) notes that:

> transport plays a vital role in society and the economy. Our quality of life depends on an efficient and accessible transport system. At the same time, transport is a key source of environmental pressures in the European Union (EU) and contributes to climate change, air pollution and noise. [...] Transport also continues to be a significant source of air pollution, especially in cities. Air pollutants, such as particulate matter (PM) and nitrogen dioxide (NO2), harm human health and the environment. Although air pollution from transport has decreased in the last decade because of the introduction of fuel quality standards, the Euro vehicle emission standards and the use of cleaner technologies, air pollutant concentrations are still too high.[3]

1 K. Diehl, *Autokorrektur – Mobilität für eine lebenswerte Welt* (S. Fischer Verlag 2022).

2 In the joint elaboration of this Chapter, sections 2.1, 2.2, 2.3, 3.2, 3.2.1 and 3.2.2 were written by Alessio Claroni, sections 3.1, 3.1.1 and 3.1.2 by Ekkehard Allinger-Csollich, and sections 1 and 4 by both.

3 Source: https://www.eea.europa.eu/themes/transport/intro. All internet sources in this chapter were accessed on 16 June 2022.

These indications by the EEA are extremely interesting (and, in some ways, concerning). On the one hand, it is made clear that the development of human society depends on transport. In other words, a society without transport, or in which transport is limited, is under the current circumstances scarcely able to evolve, also in economic terms. On the other hand, the EEA clearly emphasizes that a connection exists between the transport sector and environmental pressures, also highlighting that the sector in question contributes to climate change and that air and noise pollution mainly affects urban settings.

In order to break the vicious circle between the transport sector and effects on the environment, while ensuring the development opportunities that the aforementioned sector offers, including at local level, the European Union (EU) – and, in turn, individual Member States – have intervened by implementing a transport decarbonization policy. In this regard, it must be said that, as was highlighted in the interviews, also at the subnational level "the stimulus provided by the European Union is described as being fundamental".[4]

Given the importance of EU input and the corresponding relevance of the national implementation measures, in the following sections, we provide a partial overview of the recent European and national policies on decarbonization (from 2016 onwards) for the transport sector with specific reference to Austria and Italy.[5] This overview is instrumental to illustrating to what extent the EU framework on transport and decarbonization is shaping subnational policies with regard to the context under consideration. Such EU influence, however, results in a significant emphasis on the concept of sustainable mobility, whereas climate change policy integration (CPI) concerns do not appear explicitly considered at the subnational level.

2 The European and National Decarbonisation Policy for the Transport Sector

2.1 *Low-Emission Mobility*

The overarching framework for decarbonization in the EU is provided by the European Commission's communication titled "A European Strategy for Low-Emission Mobility" (COM(2016) 501 final).[6] This indicated that today more

4 See N. Bertuzzi *et al.* (eds.), *Interview Report Bolzano, Trento, Vorarlberg and Tyrol* (2021), at 29.

5 On older European Union policy on sustainable transport, see, among others, D. Eißel and C. Peng Chu, "The Future of Sustainable Transport System for Europe", *AI & Society*, 29 (2014) 387–402.

6 As indicated by K. Malnaca and I. Yatskiv, "Impact of Critical Variables on Economic Viability of Converted Diesel City Bus into Electric Bus", in E.G. Nathanail and I.D. Karakikes (eds.),

than in the past, the transport sector can contribute to reducing emissions from the EU, in line both with the Paris Agreement on climate change[7] and the 2030 Agenda on Sustainable Development.[8] Given that more than 90% of transport energy needs in the EU are still met by oil, the European Commission highlights the need to speed up the transition to transport powered by low-emission alternative energy sources.

In this respect, action should be directed to both means of transport and infrastructure. Concerning the former, it is necessary to identify new forms of alternative renewable energies. If "[t]he widest range of options is currently available for passenger cars and buses"[9] (including electro-mobility) and the electrification solution is best suited for railways, advanced biofuels and hydrogen, for example, it will be of particular importance in the medium term for air transport, trucks and buses. Furthermore (excluding the current war situation in Ukraine), an increasing use of natural gas (especially through power-to-gas technologies, which result in the use of bio-methane and synthetic methane) is expected as an alternative fuel for marine use in the maritime and river transport sector; similarly, it could represent an alternative to diesel fuel for trucks and buses.

With regard to infrastructures, the European Commission refers to Directive 2014/94/EU on the deployment of alternative fuels infrastructure (the so-called DAFI Directive).[10] In summary, the objective of this directive is to minimize dependence on oil and mitigate environmental impact from the transport sector by identifying a common framework of measures aimed at creating alternative fuels infrastructure within the EU, such as recharging points for electric vehicles and refueling points for natural gas.[11]

Data Analytics: Paving the Way to Sustainable Urban Mobility. Proceedings of 4th Conference on Sustainable Urban Mobility (CSUM2018), 24–25 May, Skiathos Island, Greece (Springer 2019) 847–855, at 847, "[t]hrough the Strategy, the European Commission is working to strengthen the economy by promoting sustainable urban mobility and increased use of clean and energy efficient vehicles, and looking into how to accelerate this process".

7 Paris Agreement (Paris, 12 December 2015, in force 4 November 2016).

8 Transforming our World: the 2030 Agenda for Sustainable Development. UN res. A/RES/70/1 (21 October 2015).

9 See COM(2016) 501 final, Chapter 2.2 "Scaling Up the Use of Low-Emission Alternative Energy for Transport".

10 As S. Furfari, "The Energy Dimension of Cities", in M. Fernández-Prado and L. Domínguez Castro (eds.), *City Policies and the European Urban Agenda* (Palgrave Macmillan 2019) 195–223, at 212, pointed out, the "[…] 2014 Directive on the deployment of alternative fuels infrastructure—sometimes known as DAFI—is a milestone in the deployment of alternative solutions to the hegemony of oil products in the transport sector".

11 The DAFI Directive was implemented in Italy with D.lgs. 257/2016, "*Disciplina di attuazione della direttiva 2014/94/UE del Parlamento europeo e del Consiglio, del 22 ottobre 2014,*

Another principle to which the 2016 communication refers is "moving towards zero-emission vehicles", according to which the "[i]mproved efficiency of the transport system and shift to low-emission alternative energy need to be complemented by policies to support efficiency and innovation in vehicles and demand for such products".[12] This principle will also need to apply to trucks and buses, and will have to involve not only vehicle manufacturers but also users.[13]

Among the cross-cutting initiatives and actions at all levels that the European Commission has identified in order to ensure the transition towards low-emission mobility, the one relating to "Investment" is highly relevant. In this context, in fact, the communication in question states that, in addition to the availability of various specific EU funds,[14] "[…] EU investment instruments will be geared towards supporting higher efficiency of the transport system in a technology neutral way, low-emission alternative energy for transport and low- and zero-emissions vehicles".

Considering the fact that an important cause of atmospheric pollution can be identified in urban transport,[15] the "Action by cities" also deserves a specific mention. As indicated by the Commission, the implementation of this strategy depends above all on "cities and local authorities". In particular, the Commission identifies solutions to the problem of urban pollution in the adoption of alternative mobility solutions to private vehicles and supporting

sulla realizzazione di una infrastruttura per i combustibili alternativi". In Austria, the DAFI Directive implementation process followed an extensive participation process initiated, in 2015, by AustriaTech on behalf of the Ministry for Transport, Innovation and Technology (BMVIT). This process led to the adoption of the *Bundesgesetz zur Festlegung einheitlicher Standards beim Infrastrukturaufbau für alternative Kraftstoffe* (BGBl. I No. 38/2018; 12 July 2018). On the Austrian implementation process, see "Deployment of Alternative Fuels Infrastructure Implementing the EU Directive 2014/94/EU on the Alpine territory. An overview from the Working Group Transport of the Alpine Convention" (December 2018). Source: https://www.alpconv.org/fileadmin/user_upload/fotos/Banner/Topics/transport/AlpineConvention_TransportWG_AlternativeFuels_012019.pdf.

12 See COM(2016) 501 final, Chapter 2.3 "Moving towards Zero-Emission Vehicles".

13 See COM(2016) 501 final, Chapter 2.3 "Moving towards Zero-Emission Vehicles".

14 In fact, according to the communication, "[…] a number of specific EU funds are available. The transport-related envelope under the European Structural and Investment Funds totals EUR 70 billion, which includes EUR 39 billion for supporting the move towards low-emission mobility. This in turn includes EUR 12 billion for developing low-carbon, multimodal sustainable urban mobility. The Connecting Europe Facility offers EUR 24 billion. A significant portion of Horizon 2020's transport research and innovation programme amounting to EUR 6.4 billion is focused on low-carbon mobility".

15 More precisely, COM(2016) 501 final, "[u]rban transport is responsible for 23% of EU's greenhouse gas emissions".

public transport and other sustainable modes of mobility (such as cycling, walking, and shared mobility).

2.2 *The Clean Vehicles Directive* (*CVD*)

The revised Clean Vehicles Directive (CVD) needs to be read within the context of two "Mobility Packages",[16] adopted by the European Commission respectively on 31 May and 8 November 2017 as part of the initiative "Europe on the Move". More precisely, through the "Europe on the Move" initiative, the European Commission has proposed to modernize mobility and transport at European level, in terms of clean, competitive and connected mobility for all,[17] with reference also to the issue of climate change.[18]

After the first Mobility Package, on 8 November 2017 the European Commission proposed specific measures to accelerate the transition to low- and zero-emission vehicles, which were contained in the so-called "Clean Mobility Package". This Package was strongly oriented towards combating climate change, as evidenced by the words of the (then) President of the European Commission:

> I want Europe to be the leader when it comes to the fight against climate change. The Commission wants to make our industry stronger and more competitive. I call on the car industry to come clean and make it right. Instead of looking for loopholes, they should be investing in the clean cars of the future. The Commission will shortly present proposals

16 On 17 May 2018, a third Mobility Package was presented in order "to ensure a smooth transition towards a mobility system which is safe, clean and connected & automated". The third Mobility Package concludes the set of measures launched with the previous packages of May and November 2017, with which it forms "a single set of consistent policies addressing the many interlinked facets of our mobility system". See https://ec.europa.eu/commission/presscorner/detail/en/IP_18_3708.

17 See Chapter 4 "Conclusions" of the 2017 communication from the European Commission on "Europe on the Move. An agenda for a socially fair transition towards clean, competitive and connected mobility for all" (COM(2017) 283 final).

18 See, in particular, Chapter 3.1 "Accelerating the shift to clean and sustainable mobility", in which it is specified that "[a]lready today, many cities in Europe have decided to tackle the challenges posed by climate change, congestion and air pollution in a concerted manner". That said, it is emphasized that "[t]hey are committed to investment in clean public transport and are also promoting active and sustainable modes of transport, supported by multimodal travel information services, which offer users a range of mobility options, including bicycle and car-sharing schemes". Furthermore, "[s]ome cities are introducing or considering vehicle access restrictions in an effort to reduce the high levels of air pollution from road transport".

> to reduce the carbon emissions of our transport sector (President Jean-Claude Juncker, State of the Union Speech, 13 September 2017).[19]

This mobility package consists of numerous measures, one of which is particularly interesting to consider here. We are referring to the aforementioned CVD, or Directive 2009/33/EC on the promotion of clean road transport vehicles in support of low-emission mobility, as amended by the Directive (EU) 2019/1161, whose objective is to "[…] promote clean mobility solutions in public procurement tenders and thereby provide a solid basis to stimulate demand and the further deployment of clean mobility solutions".[20]

In its article 1, the CVD:

> requires Member States to ensure that contracting authorities and contracting entities take into account lifetime energy and environmental impacts, including energy consumption and emissions of CO_2 and of certain pollutants, when procuring certain road transport vehicles with the objectives of promoting and stimulating the market for clean and energy-efficient vehicles and of improving the contribution of the transport sector to the environment, climate and energy policies of the Union.

In this context, the CVD aims to define minimum procurement targets for clean light-duty vehicles and clean heavy-duty vehicles, where these targets, to be achieved in two reference periods ending on 2025 and 2030, "are expressed as minimum percentages of clean vehicles in the total number of road transport vehicles covered by the aggregate of all contracts referred to in article 3 […]", including, in compliance with certain thresholds, "public service contracts within the meaning of Regulation (EC) No. 1370/2007[21] […] having as

19 See Preamble to the 2017 communication from the European Commission entitled "Delivering on low-emission mobility. A European Union that protects the planet, empowers its consumers and defends its industry and workers" (COM(2017) 675 final).

20 See the 2017 Communication from the European Commission entitled "Delivering on low-emission mobility. A European Union that protects the planet, empowers its consumers and defends its industry and workers" (COM(2017) 675 final).

21 It should be noted that Regulation (EC) 1370/2007, which concerns public passenger transport services by rail and by road, "[…] lays down the conditions under which competent authorities, when imposing or contracting for public service obligations (PSO), compensate public service operators for costs incurred and/or grant exclusive rights in return for the discharge of public service obligations". (see article 1 of the Regulation (EC) 1370/2007). To be more precise, PSO means "a requirement defined or determined by a competent authority in order to ensure public passenger transport services in the general interest that an operator, if it were considering its own commercial interests, would not

their subject matter the provision of passenger road transport services […]"[22] (article 5 Directive 2009/33/EC, as amended).

With specific reference to Austria and Italy, the percentages of clean light-duty vehicles compared to the total number of light-duty vehicles covered by the contracts are 38.5% by 2025 and 2030 respectively. As for clean heavy-duty vehicles, again with reference to Austria and Italy, the percentages of these compared to the total number of heavy-duty vehicles covered by the contracts are 10% (trucks) and 45% (buses) by 2025; 15% (trucks) and 65% (buses) by 2030.

TABLE 1 Minimum procurement targets for the share of clean light-duty vehicles

	From 2 August 2021 to 31 December 2025		From 1 January 2026 to 31 December 2030	
Austria	38.5 %		38.5 %	
Italy	38.5 %		38.5 %	
	Trucks (vehicle category N_2 and N_3)		Buses (vehicle category M_3)	
	From 2 August 2021 to 31 December 2025	From 1 January 2026 to 31 December 2030	From 2 August 2021 to 31 December 2025	From 1 January 2026 to 31 December 2030
Austria	10 %	15 %	45 %	65 %
Italy	10 %	15 %	45 %	65 %

DIRECTIVE 2009/33/EC, AS AMENDED BY THE DIRECTIVE (EU) 2019/1161 (FROM TABLES 3 AND 4 OF THE ANNEX; SOURCE: HTTPS://EUR-LEX.EUROPA.EU/LEGAL-CONTENT/EN/TXT/HTML/?URI=CELEX:02009L0033-20190801&FROM=EN)

Another important aspect of the CVD is the notion of "clean vehicle". The CVD (and, specifically, article 4 Directive 2009/33/EC, as amended) introduces a definition of "clean vehicle", which considers the requirements for the reduction of greenhouse gas emissions and air pollutants by light-duty vehicles. Also

assume or would not assume to the same extent or under the same conditions without reward" (see article 2(e) of Regulation (EC) 1370/2007). From an environmental point of view, it is interesting to note that Recital 17 of the Regulation in question states that "[…] competent authorities are free to establish social and qualitative criteria in order to maintain and raise quality standards for public service obligations, for instance with regard to […] environmental protection […]".

22 Among the contracts considered by article 3 of Directive 2009/33/EC, as amended, reference is also made, for example, to "contracts for the purchase, lease, rent or hire-purchase of road transport vehicles […]".

interesting is the definition of clean heavy-duty vehicles (i.e. vehicles of category M_3, N_2 or N_3), defined as such if they use alternative fuels, according to the aforementioned Directive 2014/94/EU.[23] Still in relation to heavy-duty vehicles, the CVD also identifies the definition of "zero-emission heavy duty vehicle", that is a clean vehicle "without an internal combustion engine, or with an internal combustion engine that emits less than 1 g CO_2/kWh […]".[24]

As regards national law, it should be noted that Italy has implemented the directive (EU) 2019/1161 with D.lgs. 187/2021. Regarding Austria, the Directive is implemented in national law by the "*Straßenverkehr-Beschaffungsgesetz*" (BGBl. I No. 163/2021) of 27 July 2021. In addition, "Austria's 2030 Mobility Master Plan" has to be considered, which "identifies ways to avoid, shift and improve traffic and transport and significantly increase the share of eco-mobility in total transport – foot and bicycle traffic, public modes of transport, and shared mobility".[25] Within that context, with specific reference to the CVD applied to the public transport sector, it is specified that:

> in addition to greatly expanding public transport, we also need to make sure that existing and new public road transport is zero-emission. The specifications of the Clean Vehicles Directive (CVD) provide support by setting ambitious targets for procuring clean vehicles between now and 2030. To meet Paris climate targets and achieve climate-neutrality by 2040 new registrations of buses must be limited to zero-emission buses (class M2 and M3) by 2032. In addition to battery electric buses, hydrogen fuel cell buses will be used so that lines that are difficult to electrify can also be operated with zero emissions. Funding mechanisms to reduce the added cost of electrifying bus fleets and a gradual phase-out of diesel will be needed in order to implement the Clean Vehicles Directive. Electric road systems, batteries and hydrogen will make public transport's dependence on fossil fuels – on the road and on the rails – a thing of the past.[26]

2.3 *Clean Mobility, with a Special Focus on Urban and Rural Areas*

In order to prevent the risks associated with climate change through outlining a transition towards zero GHG emissions by 2050, the 2018 European Commission's communication entitled "A Clean Planet for all – A European strategic long-term vision for a prosperous, modern, competitive and climate

23 See article 4, No. 4 (b) Directive 2009/33/EC, as amended.
24 *De facto* 4 Directive 2009/33/EC, as amended.
25 See https://www.bmk.gv.at/en/topics/mobility/mobilitymasterplan2030.html.
26 *Ibid.*

neutral economy" (COM(2018) 773 final) identifies a joint action, divided into seven strategic components, the third of which concerns mobility. According to this third component entitled "Embrace clean, safe and connected mobility", all transport modes must contribute to the decarbonization of the mobility system, with a prevalence of rail transport over road transport, which is more polluting.

This system-based approach requires that low and zero emission vehicles with highly efficient alternative powertrains are used for all modes of transport. However, the communication points out that since the solution of using renewables alone for electrification is not immediately applicable to all means of transport, it is necessary to identify alternative solutions, such as alternative fuels and hydrogen-based technologies.[27] For instance, in relation to long-distance haulage, in the short-term, a solution can be represented by the use of liquefied natural gas with high blends of bio-methane.

In a similar way to the 2016 communication analyzed above, the Commission reiterates that clean mobility also requires deep commitment in urban areas, as these (together with smart cities) are set to become "the first centres of innovation in mobility"[28] with a view to achieving sustainable and safe mobility. Furthermore, transition towards net-zero in 2050 also depends on infrastructure, which must be improved to adapt to the use of less polluting means of transport.

In 2019, the communication from the European Commission on "The European Green Deal" (COM(2019) 640 final)[29] reiterated the commitment, already included in the aforementioned communication of 2018, to achieve climate neutrality by 2050,[30] and provided for the adoption in 2020 of a specific strategy for sustainable and smart mobility. The European Commission's 2020 communication on a "Sustainable and Smart Mobility Strategy – putting European transport on track for the future" (COM(2020) 789 final) clearly

27 The Commission takes the example of "electric vehicles and vessels based on fuel cells".

28 See Chapter 3 "Pathways for the Transition to a Net-Zero Greenhouse Gas Emissions Economy and Strategic Priorities", *sub* action No. 3.

29 On the relationship between the Communications from the European Commission "A Clean Planet for all […]" and "The European Green Deal", see F. Rolando, "L'attuazione del Green Deal e del Dispositivo per la ripresa e resilienza: siamo effettivamente sulla strada per raggiungere la sostenibilità ambientale?", *Osservatorio europeo Diritto dell'Unione Europea*, (2022) 1–19, at 4.

30 Also assuming a reduction in EU's greenhouse gas emissions by 2030 of at least 50–55% compared to 1990 levels, later confirmed ("at least 55%") in the communication from the European Commission entitled "Stepping up Europe's 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people" (COM(2020) 562 final).

highlights that "[…] the most serious challenge facing the transport sector is to significantly reduce its emissions and become more sustainable".[31] In this regard, the strategy, in highlighting that "[g]reening mobility must be the new licence for the transport sector to grow",[32] defines ten flagship areas, where mobility must lead to a fully sustainable future.[33] In relation to interurban and urban mobility, Flagship 3 (entitled "Making interurban and urban mobility more sustainable and healthy") underlines the need for a truly multimodal system with regard to sustainable and smart mobility services. In this system, rail transport needs to be further enhanced, including through the development of high-speed rail services on short-haul distances.

Furthermore, according to the Commission, seamless multimodality is key in urban and suburban areas, and can develop thanks to digital solutions. An emerging digital solution that may encourage multimodality can be seen in the integration of different transport services into a service accessible on request, according to the so-called Mobility as a Service (MaaS) model, as "digitally connected transport services provided by companies, public institutions or individuals to paying customers which can make owning a private car obsolete".[34]

Equally important in limiting the number of private vehicles on the roads are "shared and collaborative mobility services (shared cars, bikes, ride-hailing, and other forms of micromobility)", which have developed thanks to digital platforms.[35] Furthermore, from a functional point of view, the 2021

31 On the concept of sustainable mobility see, among others, S. Maggi, *Mobilità sostenibile. Muoversi nel XXI secolo* (Il Mulino 2020); also for the cited bibliography see A. Claroni, "Il mobility manager quale figura di impulso nella ricerca di una mobilità pienamente sostenibile", *Il Diritto Marittimo*, III (2021) 463–483, at 464 footnote 4.

32 See Chapter 1 "Our vision", *sub* point No. 6.

33 According to the communication, "it is crucial that mobility is available and affordable for all, that rural and remote regions are better connected, accessible for persons with reduced mobility and persons with disabilities, and that the sector offers good social conditions, reskilling opportunities, and provides attractive jobs".

34 M. Neef, T. Dettmber and L. Schebek, "Comparing Carbon Performances of Mobility Services and Private Vehicles from a Life Cycle Perspective", in F. Teuteberg, M. Hempel and L. Schebek (eds.), *Progress in Life Cycle Assessment 2018* (Springer 2019) 47–60, at 49. Regarding the problems that could arise from mismanagement of the information collected through the MaaS platform, see M. Themou, F. Mikiki and M. Markou, "Mobility as a Service: Implications for Spatial and Social Cohesion", in E.G. Nathanail and I.D. Karakikes (eds.), *Advances in Mobility-as-a-Service Systems. Proceedings of 5th Conference on Sustainable Urban Mobility, Virtual CSUM2020, June 17–19, 2020, Greece* (Springer 2021) 626–632, at 630.

35 There is extensive literature on the topic of shared mobility. Among others, see G. Smorto and I. Vinci (eds.), *The Role of Sharing Mobility in Contemporary Cities. Legal, Social and Environmental Issues* (UNIPA Springer Series 2020).

communication from the European Commission on "The New EU Urban Mobility Framework" (COM(2021) 811 final) indicates that micro-mobility services can be particularly useful "[…] in order to cover the last mile where access points are far or frequency of public transport is low".[36]

It must be said that the same 2021 communication also refers to rural areas (which include most parts of the Alpine Space), specifying that "[p]ublic transport planning should also address connections with the areas outside the city centre, including connections to the suburbs and rural areas beyond the city". More broadly, the European Commission has dedicated its 2021 communication on "A long-term Vision for the EU's Rural Areas – Towards stronger, connected, resilient and prosperous rural areas by 2040" (COM(2021) 345 final) to rural areas; the topic is also highly relevant to the issue of climate change because, as specified in this communication, "[r]ural areas are active players in the EU's green and digital transitions. Through sustainable production of food, preservation of biodiversity and the fight against climate change, they play a key role in achieving the European Union's Green Deal […]". In this context, it is specified that, in order for rural areas to develop further, they must be well connected to each other and to urban and peri-urban areas.[37] Finally, in order to improve connections with rural areas, the last communication cited points out that it is necessary to resort to digitalization, as this will be able to guarantee sustainable and innovative multimodal mobility solutions.

3 Regional Regulation and Strategies to Change the Transport System

3.1 *Austria*

According to the Austrian Constitution[38] most transport related matters are the legal responsibility of the *Bund*, but have to be administered at regional (*Länder*) level, either in indirect federal administration or in autonomous *Land* administration. The following examples will show this constitutional cooperation between federal and regional levels.

a) *StVO – Straßenverkehrsordnung*[39] (Road traffic regulations)

Traffic laws enacted by the *Bund* represent a very important instrument to shift traffic from motorized vehicles to active and sustainable forms of mobility.

36 See point 30.

37 See Chapter 2.2 "Connected rural areas".

38 B-VG, *Bundesverfassungsgesetz*, articles 10–14.

39 StVO- S*traßenverkehrsordnung*, *Straßenverkehrsordnung 1960*, current version BGBL I, No. 154/2021.

Regulations to minimize the discrimination of pedestrians and bicycles with regard to cars and trucks have a direct influence on the attractiveness of these sustainable transport modes. For example, rules for shared space,[40] priority and speed limits enable regions and communities to prioritize walking and cycling by creating specific lanes on the road in order to make these modes safer and faster.

b) *ÖPNRV-G*[41] – Law on planning and financing public means of transport

This federal law establishes the responsibility for and the planning and financing of public transport in Austria with the aim of strengthening and optimizing rail and bus services (especially at regional level). The Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK) has to cooperate with the *Länder* in financing regional public services; the *Länder* themselves are responsible for the optimization and planning of timetables, tendering of services and customer relations. The *Verkehrsverbundorganisationen* (*Verkehrsverbünde* – transport networks) are responsible for the organization of public transport services.

Many other legal frameworks (e.g. financial rules, rules for train services, combined goods transportation, technical rules for motorized traffic[42] etc.) form the basis for the Austrian current transport system. This patchwork of measures, however, is insufficient to achieve a decarbonized and sustainable transport system in line with EU requirements. In this respect, what would be necessary, as indicated in the "*Mobilitätsmasterplan 2030*", is "a sensible combination of avoiding traffic, shifting traffic and improving the efficiency of each mode of transport … backed by a marked increase in the energy-efficiency of the entire transport system within the available carbon budget".[43]

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40 Shared Space refers to a planning concept according to which public road space, which is dominated by motor vehicle traffic, is to be made more livable, safer and the flow of traffic improved. The idea of doing without traffic signs, signal systems and road markings is characteristic. At the same time, road users should be given equal rights, with the right of way rule continuing to apply. In contrast to conventional traffic calming, it should also be possible to use this on main roads.

41 ÖPNRV-G, *Öffentliches Personennah- und –Regionalsverkehrs-Gesetz* 1999, current version BGBL. I, No. 59/2015.

42 E.g. FVG, *Finanzverfassungsgesetz*; current version available at https://www.ris.bka.gv.at/Dokumente/BgblPdf/2003_100_1/2003_100_1.pdf; EisBG; Eisenbahngesetz; current version BGBl. I No. 231/2021; KFG; *Kraftfahrwesen-Gesetz*; current version BGBl. I No. 48/2021; KflG; *Kraftfahrliniengesetz*; current version BGBl. I No. 61/2015.

43 *Mobilitätsmasterplan 2030 – Weg zur Klimaneutralität 2040*, Vienna 2021; Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology; Publication of counterproductive subsidies, bmk.gv.at (*Veröffentlichung kontraproduktiver Anreize und Förderungen*), Vienna 2021; published by the Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology.

The "*Mobilitätsmasterplan 2030*" addresses the "*Zielbild 2040*" (target 2040) and describes all necessary measures to enable Austria to finally reach the necessary climate targets in the year 2040. The *Mobilitätsmasterplan* is backed by a marked increase in the energy efficiency of the entire transport system within the available carbon budget. It states however that even with 100% percent electrified car-mobility, it is still necessary to reduce road traffic by approximately one quarter by 2040.[44]

3.1.1 Tyrol

Tyrol reports its developments in mobility and traffic to the Tyrolean parliament in the yearly "*Verkehrsbericht*" (Traffic report),[45] which informs the public in a transparent way on changes to the mobility and traffic system. From this report it emerges that the new strategy of sustainable development in Tyrol with many measures in the field of mobility is currently in progress.[46] The measures that make up this strategy were published in April 2022.[47] Over the next three years, the main topics to be addressed include active mobility, public transport, new infrastructure, future oriented goods-traffic, sharing models and new fields of mobility and transport policies.

In the transport sector, *Land* Tyrol has been working since 2005 on subsidies for sustainable forms of traffic. Since 2008, the mobility program of the Tyrolean government has subsidized Tyrolean citizens to encourage walking, cycling and public means of transport.[48] The subsidies run from planning to investment in these modes.[49] In 2016 an initial cycling strategy was implemented with the main focus on building and refurbishing the cycling infrastructure on the most important regional connections in Tyrol. This strategy will be extended and renewed in 2022 according to the above-mentioned

44 Mobilitätsplan 2030, at 27.

45 Verkehrsbericht Tirol, yearly report on mobility and transport in Tyrol – latest version 2020; www.tirol.gv.at/Verkehr/publikationen.

46 *Tiroler Nachhaltigkeits- und Klimastrategie – Leben mit Zukunft*; www.tirol.gv.at.

47 *Leben mit Zukunft – Tiroler Nachhaltigkeits- und Klimastrategie – Maßnahmenprogramm 2022–2024*: https://www.tirol.gv.at/fileadmin/presse/Tiroler_Mao_nahmenprogramm_zur_Nachhaltigkeits__und_Klimastrategie_.pdf.

48 *Mobilitätsprogramm 2008 – 2013; Mobilitätprogramm 2013 – 2020* incl. extension to 2021; *Mobilitätsprogramm 2022 – 2030*; Tyrolean government; www.tirol.gv.at/verkehr/mobilitaetsplanung/mobilitaetsprogramm.

49 Please refer to rules for subsidies in building cycle routes, car-sharing, mobility concepts, transport, bicycles at www.tirol.gv.at.

"*Maßnahmenprogramm 2022–2024*" with the goal to establish Tyrol as a cycling region for citizens and tourism.[50]

Public forms of transport, rail and bus services, have also been extended in recent years. In particular the tariff system has been changed and now offers travel throughout the region for a flat rate. Since 2016 the region-wide flat rate annual seasonal ticket "*Klimaticket Tirol*" has enabled all Tyrol's citizens to use public transport for a very affordable price. There are also concessions available (eg for senior citizens over 65 years and young people under 26 years of age).[51]

Furthermore, since 2008 Tyrol has made an effort to strengthen its major public transport infrastructures by implementing the following initiatives:

(a) the *S-Bahn* rapid regional rail concept, which has led to the creation of new railway stations and the refurbishment of existing ones in the central region of Tyrol;[52]
(b) the construction of the new regional tramway from Rum to Völs;[53]
(c) the new "*Tirol-Vertrag II*" contract between *Land* Tyrol and the *ÖBB* federal railways concerning barrier-free access to all major stations in Tyrol and the strategic development of new rail infrastructure in Tyrol (two-track extension in the Tyrolean "*Oberland*", *Fernpassbahn*, *Taerra raetica*, ...).

With regard to goods transportation, the most important change is the building of the Brenner Base Tunnel and the new railway line through the Lower Inn Valley to shift transport from road to rail. The TEN-T Corridor of the European Union, which will run from the Northern European countries down to Malta, and especially its most important section between Munich and Verona, should enable the EU to reach its goals in transitioning from road to rail on long distance services.[54]

Although the above-mentioned initiatives have been adopted in Tyrol, individual motor driven road traffic is still predominant. A clearer step towards alternative modes of transportation was taken in September 2021, when the

50 www.tirol.gv.at/meldungen/meldung/landesregierung-beschliesst-massnahmenprogramm-zur-tiroler-nachhaltigkeits-und-klimastrategie/.
51 All prices at www.vvt.at.
52 Newly built stations: Hall/Thaur (2017), Messe (2021), Wifi-Innrain (planned 2024).
53 In 2019 the tram service entered operation within the boundaries of Innsbruck, in January 2023 the section to Rum will follow and by the end of 2026 the tram service will continue from the western end as far as Völs Station.
54 See https://transport.ec.europa.eu/transport-themes/infrastructure-and-investment/trans-european-transport-network-ten-t_en.

regional government for the first time prioritized active mobility (walking and cycling) for short distances in the "*Leitantrag – Land und Klima schützen*".[55]

3.1.2 Vorarlberg

Since Vorarlberg – as a *Land* of Austria – has the same constitutional status as Tyrol, national and EU-rules dictate matters and influence the administration in a very similar way. Nevertheless, there are some differences in the way the region is administered and its responsibilities. The involvement of stakeholders and the population has a long tradition in Vorarlberg. The founding of "*Bürgerräte*" and civil participation in nearly all high profile projects helps to establish a wide basis for acceptance at the level of politics, the economy and the population.[56]

Within this context, Vorarlberg has adopted a Mobility Concept.[57] The Mobility Concept Vorarlberg 2019 formulates principles for Vorarlberg's future transport policy, on which goals and priorities are based. The goals primarily serve to examine the effects of the main issues and ongoing activities. For example, objectives regarding the choice of mode of transport aimed at increasing the proportion of journeys on public transport and bicycle were anchored in the draft assessment. This strategy is continuously amended and detailed by sub-strategies on cycling and e-mobility.[58] Having adopted such detailed strategic documents, Vorarlberg is highly advanced in comparison to other *Länder* in Austria. Nevertheless, individual road traffic will still continue to play an important role in practice, as demonstrated by the extensive new road infrastructures planned in the regions of Bregenz and Feldkirch.

Public transport in Vorarlberg is organized by the VVV ("*Vorarlberger Verkehrsverbund*") in cooperation with the office of the *Land*. Since 2009 has Vorarlberg improved regional mobility by creating rail connections through the Kloster and the Rhine valleys from Feldkirch to Bregenz. Within the new contract period (2019 – 2028), this offer could be expanded, especially through

55 *Leitantrag – Land und Klima schützen* (tirol.gv.at); https://www.tirol.gv.at/fileadmin/presse/bilder/Platter/Regierungsklausur_2021/Leitantrag___Land_und_Klima_schOtzen.pdf.

56 About the installation of *Bürgerräte* (citizens' assemblies): https://vorarlberg.at/-/buergerraete-in-vorarlberg. See Chapter 9 in this volume.

57 E.g. Mobility Concept (strategy 2006–2019); https://vorarlberg.at/-/mobilitaetskonzept-vorarlberg-2019.

58 E.g. Cycling Strategy; https://vorarlberg.at/-/ketten-reaktion-vorarlbergs-radverkehrsstrategie; E-Mobility-Strategy; https://www.klimafonds.gv.at/wp-content/uploads/sites/16/E-Mob-Strategie-Vorarlberg-1.pdf.

the introduction of new rolling stock (railway wagons), which will be delivered in 2023.

At the moment a concept for freight transport is in progress[59] and is expected to be completed in the second quarter of 2022. Target issues will be the construction of new terminals, new logistic concepts for regional and urban transport and the decarbonization of freight transport itself.

Vorarlberg's mobility concept also includes the implementation of the cycle traffic strategy "*Kettenreaktion*". Vorarlberg has a long tradition of the government itself taking responsibility for its regional cycle routes and infrastructure. Municipalities are given financial incentives and provided with workforce to build new cycle routes. This is reflected in cycling representing a high share of overall mobility. Like in Switzerland, bicycles (often in combination with public transport) constitute an important part of the mobility system and are accepted by all levels of society (politics, the economy and citizens).

3.2 *Italy*

Italy is committed to developing a transport system that is sustainable in all its different modalities.

With regard to local public transport,[60] it is interesting to mention D.L. 59/2021 concerning "*Misure urgenti relative al Fondo complementare al Piano nazionale di ripresa e resilienza e altre misure urgenti per gli investimenti*", which is of particular interest in the context of this research, and an example that reflects the recent regulatory framework. In particular, it allocates considerable resources for the renewal of vehicles destined for local public transport.[61] This is in order "to accelerate the renewal of the bus fleet with vehicles powered by LNG[62] and CNG,[63] therefore by methane, destined for suburban and interurban transport".[64]

59 Güterverkehrskonzept; https://vorarlberg.at/-/gueterverkehrskonzept-vorarlberg.

60 On the subject of local public transport, without claiming to be exhaustive, D.lgs. 422/1997, *Conferimento alle regioni ed agli enti locali di funzioni e compiti in materia di trasporto pubblico locale, a norma dell'articolo 4, comma 4, della legge 15 marzo 1997, n. 59* should also be mentioned. See, in particular, articles 14 and 18(3-quarter)(b), on the environmental sustainability profile.

61 Article 1, paragraph 2(c) of the D.L. in question, in fact, allocates, for buses: 62.12 million euros for 2022, 80.74 million euros for 2023, 159.01 million euros for 2024, 173.91 million euros for 2025 and € 124.22 million for 2026.

62 Liquified Natural Gas.

63 Compressed Natural Gas.

64 Source (in Italian): https://temi.camera.it/leg18/temi/l-innovazione-nel-trasporto-stradale-e-la-mobilit-sostenibile.html.

In addition to this, L. 232/2016[65] provided for the preparation of a "*Piano Strategico Nazionale della Mobilità Sostenibile*" ("National Strategic Plan for Sustainable Mobility"), approved through the D.P.C.M. 30 April 2019.[66] In particular, as specified by article 1, paragraph 613, the National Strategic Plan is aimed at the renewal of bus fleets of local and regional public transport services and the promotion and improvement of air quality through innovative technologies, in line with international agreements as well as with guidelines and EU legislation.

Alongside the National Strategic Plan, the aforementioned article 1, paragraph 613, provided additional financial resources to a fund for the improvement of means for local public transport[67] with specific resources for sustainable mobility, so as to implement the National Strategic Plan in question. Specifically, this fund was increased by 200 million euros for the year 2019 and by 250 million euros for each of the years from 2020 to 2033.

As well as initiatives concerning sustainable urban mobility, Italy is also committed to promoting electric micro-mobility. Without claiming to be exhaustive, on electric micro-mobility, article 1, paragraph 102 of L. 145/2018[68] authorized the experimentation of road circulation of personal mobility vehicles using mainly electric propulsion, such as Segways, hoverboards and scooters. In this regard, the Decree of the Ministry of Infrastructures and Transport (today, Ministry of Sustainable Infrastructures and Mobility) of 4 June 2019 defined the implementation methods and operational instruments of the aforementioned experimentation. Equally interesting on the subject of micro-mobility is D.L. 162/2019,[69] which regulates the circulation of electric scooters, also with regard to sanctions.

3.2.1 Autonomous Province of Bolzano

Various initiatives have been taken into consideration by the Autonomous Province of Bolzano as a means of developing an environmentally friendly

65 L. 232/2016, *Bilancio di previsione dello Stato per l'anno finanziario 2017 e bilancio pluriennale per il triennio 2017–2019*.

66 Source: https://www.mit.gov.it/sites/default/files/media/normativa/2019-06/DPCM_PSNMS.pdf.

67 Referred to in article 1, paragraph 866, of L. 208/2015, *Disposizioni per la formazione del bilancio annuale e pluriennale dello Stato* (*legge di stabilità 2016*).

68 L. 145/2018, *Bilancio di previsione dello Stato per l'anno finanziario 2019 e bilancio pluriennale per il triennio 2019–2021.*

69 D.L. 162/2019, *Disposizioni urgenti in materia di proroga di termini legislativi, di organizzazione delle pubbliche amministrazioni, nonché di innovazione tecnologica.* See, in particular, article 33bis.

transport system. Through "Green Mobility South Tyrol", for example, the Autonomous Province of Bolzano, with the coordination of *STA – Strutture Trasporto Alto Adige SpA*, has set itself the ambitious goal of transforming South Tyrol into a model region for sustainable Alpine mobility. Specifically, "Focusing on connecting and expanding many different forms of sustainable transport (walking, cycling, public transport), the "Green Region" South Tyrol is re-thinking mobility and transport – by working towards solutions that are emission-free and harmless to the environment and its people. Electric mobility especially is an integral part of the approach to a smart and sustainable alpine mobility".[70] From the latter point of view, it is significant to highlight the fact that the Autonomous Province of Bolzano is the leader "in Italy for what concerns the proportion of residents/cars charging stations".[71]

An additional significant initiative is represented by the "*Südtirol Pass*": a personalized annual electronic season ticket that can be used on all means of public transport throughout South Tyrol. In this sense, this initiative intends to increase the use of alternative modes to private transport, through an "integrated response to the necessity of moving around the province".[72] To facilitate the use of public transport, the "*Südtirol Pass*" is based on the following formula: the more kilometers one covers in a year, the cheaper each new journey becomes. Another interesting initiative is represented by "*Alto Adige Pedala*", which encourages the use of bicycles by entering those who travel a certain number of kilometers into a prize draw.[73]

As far as rail transport is concerned, it should be noted that in 2005 the Val Venosta Railway, which connects Merano and Malles, was reopened.[74] As specified in the interview report (at 7), the initiative assumes particular importance as it has given rise to similar projects at the provincial level, by "creating alternatives to the use of cars", thus contributing to the reduction of environmental pollution.[75]

From a legislative point of view, in terms of eco-sustainable mobility, it is also interesting to mention article 51(5)(f) L.P. 9/2018, *Territorio e paesaggio*,

70 Source: https://www.greenmobility.bz.it/en/.

71 IntBZ_05.

72 IntBZ_09.

73 A similar initiative is that of the "Bike cream challenge", which offers, in the summer, an ice cream for those who frequently use a bicycle. For more information on this initiative, see https://news.provincia.bz.it/it/news/bike-cream-challenge-si-pedala-per-una-settimana.

74 On the subject, see https://www.provincia.bz.it/turismo-mobilita/mobilita/ferrovia-della-val-venosta.asp.

75 N. Bertuzzi *et al.* (eds.), *Interview Report*, *supra*, at 7.

which provides that municipalities must prepare a municipal development program, which must include a mobility and accessibility program aimed at limiting motorized traffic and favoring cycle and pedestrian mobility. The "Save the Air – *Insieme per un'aria migliore*" initiative must also be highlighted. This information campaign aims to raise awareness among citizens on the importance of protecting the air as a common good.[76] The information campaign also encourages the use of public transport, such as trains and buses. With regard to buses, it is interesting to highlight the use of hydrogen buses, which are increasingly environmentally friendly.[77] Furthermore, the L.P. Bolzano 15/2015, *Mobilità pubblica*, encourages sustainable and eco-friendly transport of people and intermodal mobility.[78]

In terms of sustainability, especially with regard to the transport of goods, the Brenner Base Tunnel (BBT), which provides for connection "for 55 km between Innsbruck (in Austria) and Fortezza (in Italy)", should also be mentioned: in this regard, in fact, it is pointed out that "[t]he BBT is meant primarily for freight transport, allowing a modal shift of traffic from road to rail. Passenger trains can also travel through the tunnel".[79]

3.2.2 Autonomous Province of Trento

The Autonomous Province of Trento aims to reduce the climate impact of the transport sector in the coming years[80] through L.P. 6/2017, "*Pianificazione e gestione degli interventi in materia di mobilità sostenibile*". This provincial law imposes, among other things, principles aimed at protecting the social and public right of citizens to mobility throughout the provincial territory. In terms of content, this law represents a sort of exception, as it aims to identify objectives that are normally found in non-normative documents.[81] In this perspective, the Provincial Mobility Plan (referred to in article 2) promotes numerous solutions – including innovative ones, such as "the coordinated management of the various transport systems, both for people and goods, promoting integrated mobility systems also through the use of drones" (article 2(3)(a), in Italian) – aimed at achieving sustainable mobility. The integration of local public transport with other forms of sustainable mobility, including shared mobility, is also important (article 2(4)(a)). Verification of the implementation of the

76 Source: https://ambiente.provincia.bz.it/aria/missione-aria-pulita.asp#save-the-air.
77 Source: https://news.provincia.bz.it/it/news-archive/655761.
78 See, in particular, article 30.
79 Source: https://www.bbt-se.com/en/tunnel/european-dimension/.
80 See N. Bertuzzi et al. (eds.), *Interview Report*, *supra*, at 29.
81 *Ibid.*, at 28.

Provincial Mobility Plan is the responsibility of the Provincial Observatory on Sustainable Mobility, established pursuant to article 10 of the provincial law in question.

A crucial aspect of L.P. 6/2017 concerned popular participation in the actual drawing up of the provincial law. Indeed, article 1(4) of the same law establishes that "The Province promotes popular participation in choices about mobility, in a perspective of shared responsibility". This is to be considered a positive development since, if everyone participates in the process of defining the rules to be applied in terms of sustainable mobility, those new behavioral rules will probably be better accepted (and applied) by citizens.

In addition to the aforementioned Provincial Mobility Plan, another interesting plan regarding the relationship between the environment and the transport sector is the Provincial Plan for the Protection of Air Quality 2018[82] (hereinafter, the Air Quality Provincial Plan).[83] The Air Quality Provincial Plan, in particular, allows the Autonomous Province of Trento to plan how to act on the main sources of emissions affecting the quality of ambient air (Chapter 1 – Objectives of the Plan). Interestingly, in Chapter 6.4 concerning the "Transport sector and sustainable mobility" ("*Settore trasporti e mobilità sostenibile*"), it highlights that road transport is one of the most significant sources of emissions in the Province of Trento. As such, the Air Quality Provincial Plan recognizes the importance of increasing the electric traction of vehicles. In this regard, it should be noted that in 2017 the Province of Trento adopted the Provincial Plan for Electric Mobility ("*Piano Provinciale per la Mobilità Elettrica*" – PPME[84]). It should also be specified that this Plan was reviewed by the PEAP (*Piano Energetico Ambientale Provinciale* 2021–2030), focusing on the achievement of three specific objectives: increase in electric bicycles (e-bikes); increase in electric traction vehicles; increase in charging infrastructure.[85]

Returning to the Air Quality Provincial Plan, in terms of sustainable mobility, this promotes the complete implementation of the aforementioned L.P. 6/2017, leading to a constant increase in the use of local public road and rail transport. As for rail transport, the interviews highlighted the peculiarities of the PAT territory, which is largely mountainous and which, consequently,

82 Source: http://www.appa.provincia.tn.it/pianificazione/Piano_tutela_aria/-Pianotutela_aria_2018/.

83 IntTN_07.

84 Source: https://www.ufficiostampa.provincia.tn.it/Comunicati/Il-Piano-provinciale-per-la-mobilita-elettrica-diventa-realta.

85 See, in particular, PEAP 2021–2030 (source: https://drive.google.com/file/d/1hFUtV26-DI6uWR7-b6ZHHBOHEInI_pIQ/view), 159.

makes rail transport less efficient than road transport. Despite this, rail transport must not be abandoned, instead it is necessary to carefully plan where to construct new lines. Furthermore, rail transport involves large investments and, therefore, requires significant public funding.[86] However, there are also virtuous examples of significant improvements made with few resources, as in the case of the Valsugana and Trento-Malè lines.[87]

The Air Quality Provincial Plan also promotes the use of bicycles, favoring modal interchange with local public transport.[88] It is interesting to note that, with reference to the use of bicycles, from an infrastructural point of view, Trentino is at the forefront as regards the development of cycle routes and cycle tourism.[89]

Still on the subject of sustainable mobility, the project to quadruple the Brenner railway is extremely important. This aims to optimize the use of the high-capacity line guaranteed by the new Brenner Base Tunnel, and directly affects the province of Trento.[90] It is also important to mention the LIFE BrennerLEC Project.[91] The Project is coordinated by *Autostrada del Brennero S.p.A.* in collaboration with the Provincial Agency for Environmental Protection of Trento, the Environmental Agency of Bolzano, the University of Trento and local companies CISMA and IDM Südtirol-Alto Adige.[92] As the official website of the initiative indicates, "BrennerLEC aims at making traffic along the Brenner axis more respectful of the local population's health and more compatible with the geographical features of the land, in order to protect the particular Alpine environment crossed".[93] It is interesting to note that the Project has made it possible to verify that reducing speed in some sections can lead to pollution reductions and safety improvements.[94]

86 See N. Bertuzzi *et al.* (eds.), *Interview Report*, *supra*, at 30.

87 *Ibid.*, at 28.

88 See, in addition, article 1 of L.P. Trento 12/2010, *Legge provinciale sulle piste ciclabili,* which states (in Italian) that "[…] the Province promotes mobility and cycling to promote intermodality and the best use of the territory […]".

89 See N. Bertuzzi *et al.* (eds.), *Interview Report*, *supra*, at 28.

90 For more information, see https://corridoiodelbrennero.provincia.tn.it/.

91 LEC stands for Lower Emissions Corridor.

92 Source: http://www.appa.provincia.tn.it/brennerlec.

93 Source: https://brennerlec.life/the-project.

94 Source: https://www.giornaletrentino.it/cronaca/brennerlec-finita-la-sperimentazione-biossido-di-azoto-ridotto-del-10-sull-a22-1.3010329.

4 Conclusions

Several strategies and initial changes in legislation concerning transport and mobility, in terms of greater respect for the environment, have been published at all levels of administration and government in the last few years. The goal of decarbonizing our mobility system is set.

Despite the geographical and political differences that may distinguish Austria from Italy, i.e. the two countries to which the focus of this study is addressed, it is equally true that this study has allowed us to highlight how these differences tend to diminish when analyzing transport policy in relation to the issues of environmental pollution and climate change. There is a plurality of reasons for this: one reason may be related to the fact that national policies must take into account those developed at the EU level; another may depend on the specific geographical context taken as a reference, namely that of Tyrol and Vorarlberg for Austria, and Autonomous Provinces of Trento and Bolzano for Italy, which is similar from a landscape point of view, making the solutions adoptable in terms of sustainability applied to the sector in question suitable for reverberation; there are also objective correspondences present in the legislation, for example in the CVD (see section 2.2), which establishes, for Austria and for Italy, the same parameters as regards the minimum procurement targets for the share of clean light-duty and clean heavy-duty vehicles. These analogies are clearly emphasized, for example, in relation to local public transport, which both Austria and Italy tend to place increasing value on.

It is therefore important to increase transport by bus and rail, in the face of a reduction in private traffic (from this point of view and in general terms, the emancipation from the sometimes "forced" use of private cars gives a good idea of the meaning of the quotation that opens this chapter). This rings even more true in specific geographical contexts, such as those taken as a reference in this research work, which require particular attention from the environmental point of view so as to preserve their natural peculiarities (as well as, of course, the health of the people who live there).

Alongside local public transport and shared and collaborative mobility services, soft mobility,[95] a form of mobility which "includes all forms of non-motorized transport (NMT) that use only the "human energy" (Human Powered

95 Similarly, "[a]ctive mobility (or active transportation) is the generic term for all non-motorized travel modes. Prime examples are walking and cycling" (see S. Winter and S. Goel, *Smart Parking in Fast-Growing Cities: Challenges and Solutions* (TU Wien Academic Press 2021), at 80).

Mobility)",[96] is also relevant. This is due to "soft mobility (pedestrian, cycle and other not motorized displacements) [being] a "zero impact" mobility".[97] Also from this point of view, the research showed a convergence of intentions towards forms of soft/active mobility between the different territorial contexts considered.

Finally, it should be pointed out that sustainable mobility also requires a change of mentality in people, through the formation of an awareness of the benefits (not only in environmental terms) to which it can lead.

In conclusion, from a more practical perspective, it could be useful to indicate some important actions that would require rapid implementation:

1. Clear and target orientated EU directives und regulations to strengthen active mobility, public modes of transport and better efficiency in our mobility

National and regional governments will only focus on climate friendly transport modes if the rules of play are coordinated and harmonized throughout Europe. Examples on the European level that can be mentioned are:

– harmonized speed limits,
– true cost pricing between road and rail,
– fair and climate orientated taxation for commuters,
– faster ban of fossil-fuel driven vehicles, …

2. A clear focus on active short distance mobility

There must be a clear priority on active mobility. This could be achieved especially in urban and densely populated areas in the Alpine space by shifting road space from vehicle traffic to bicycles and pedestrians. The change of use of some roads in urban areas and returning these for communications and living purposes will be a key factor in achieving our targets. This is not a step backwards in our quality of life but can represent – if done in the right way – a great step forward and a significant increase in living standards in the Alpine regions.[98]

3. Public transport is the backbone of our future mobility

96 R.A. La Rocca, "Soft Mobility and Urban Transformation: Some European Case Studies", *TeMALab Journal of Mobility, Land Use and Environment*, 2 (2009) 85–90, at 85.

97 *Ibid.*, at 85.

98 In Tyrol and Vorarlberg there are many examples of best practice in new use of existing road infrastructure: e.g. Prutz, Silz Innsbruck, Hart, ("*Begegnungszone*") or pedestrian zones e.g. in Bregenz and Innsbruck. Similarly, as regards the Autonomous Provinces of Trento and Bolzano, e.g. in terms of cycling/pedestrian zones.

Investing in rail and bus infrastructure is necessary. Offering a high quality (fixed interval service, customer orientated tariff systems,…) even in rural areas is crucial to enabling citizens and tourists to make the shift to climate-friendly modes of transport. Investments in such infrastructures might also allow policy-makers to pursue a better CPI with a fruitful interrelation between spatial planning and transport sectors at the subnational level on the one hand and a major incentive to encourage the use of public transport and reduce the use of private vehicles on the other hand. If we are to change people's behavior, it is time to divert and increase financial resources to rail and bus services.[99]

4. Sustainable mobility needs not only to be climate friendly, it also has to fit social requirements.

We do not have a traffic problem in the rural areas of the Alpine region – yet we have a mobility problem. About 40% of all citizens (younger than 18 and mostly older than 65) are not able or willing to drive a car. We have to offer car-free modes of mobility in order to treat citizens equally and not engage in discrimination (shared mobility, for example in terms of sharing micro-mobility, could also be useful from this point of view).

99 As regards Italy, for example, "the National Recovery and Resilience Plan (PNRR) […] provides for the development of more sustainable local transport, with an estimated expenditure of 8,580 million euros. Additional resources are foreseen for […] investment in electric buses" (see in Italian: https://temi.camera.it/leg18/temi/tl18_il_trasporto_pubblico_locale.html).

In Austria, the *Bund* started in 2021 to invest more money in regional and local public services (100 Mio. €/year). The *Länder* and the Communities have increased their budget every year in the last decade.